INDUSTRIAL HEAT TRACING PRODUCTS & SERVICES

IEC / ATEX

nVent

RAYCHEM

We Manage The Heat You Need

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ADVANCED INDUSTRIAL SOLUTIONS

As the world's largest provider of complete electrical heat management systems, primarily for the general process, oil and gas, chemical, and power generation industries, nVent provides innovative products and turnkey solutions under market-leading brands—nVent RAYCHEM and TRACER.
Our premiere turnkey solutions include full life cycle support—ranging from front-end engineering and installation to maintenance and operation services. Our global experience and office presence in 50 countries uniquely position us to manage the heat needed for projects of any size and scope.

THE HEART OF OUR SOLUTIONS

As the inventor of self-regulating heat tracing, our nVent RAYCHEM brand is recognized for technical leadership in the industries we serve. nVent RAYCHEM cable delivers the appropriate amount of heat exactly when and where it is needed, adjusting the output produced in response to ambient and process conditions, making it ideal for heat management systems. Since inventing the technology, nVent has sold over 1.6 billion feet (500,000 km) of nVent RAYCHEM self-regulating cable.

In addition to the self-regulating heat-tracing technology, we also provide parallel constant wattage cables, series polymer insulated cables and series mineral insulated cables for a full range of temperature needs.

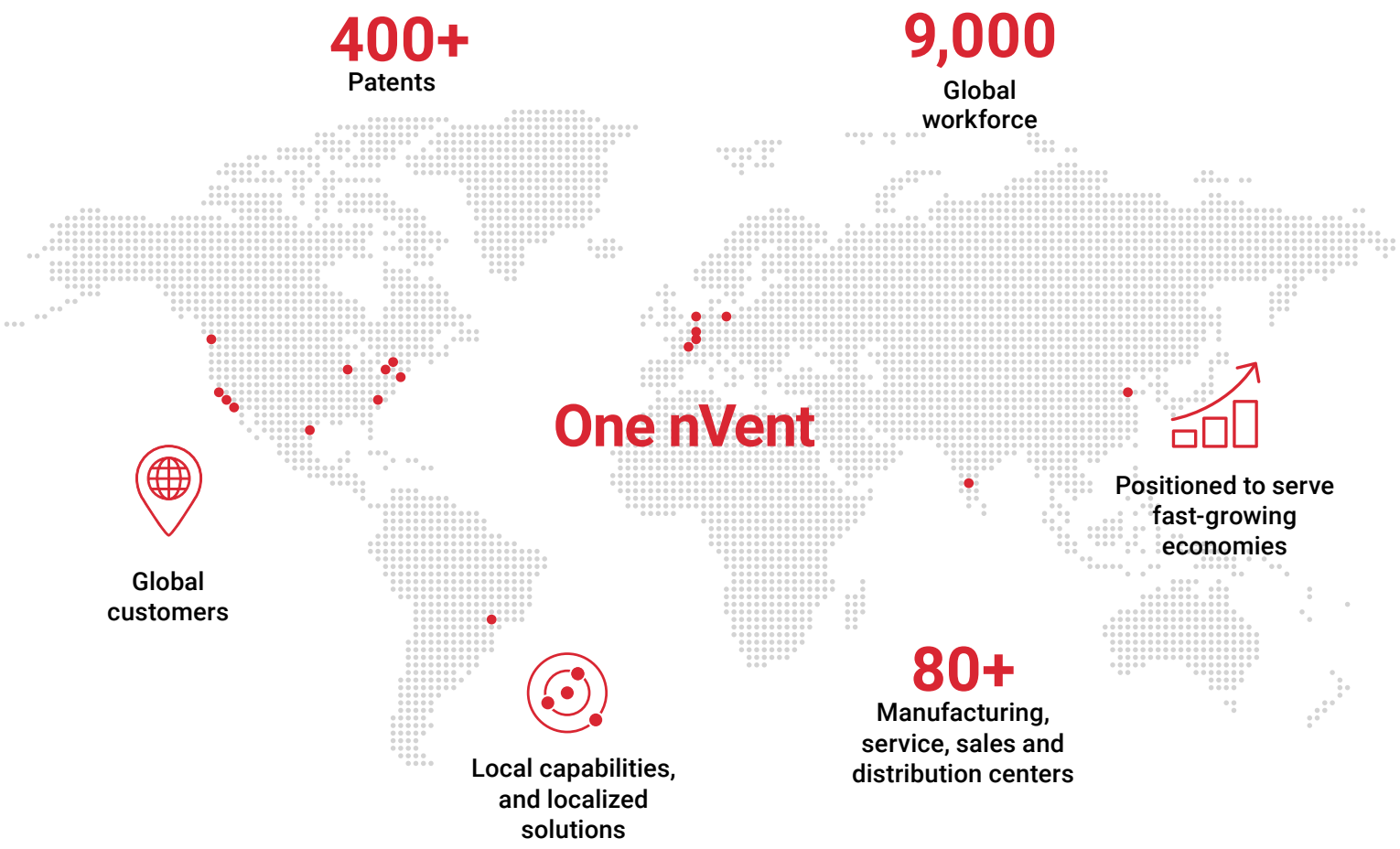
Our brand of mineral insulated heating cables and wiring have led the industry for more than 75 years. Able to withstand extreme, harsh environments, nVent RAYCHEM heat-tracing cables provide the most reliable solution for high-temperature applications. These cables perfectly reflect the superior reliability that comes with this product brand.

nVent RAYCHEM control & monitoring products represent the industry's most complete range of dedicated heat-tracing control and monitoring systems, from simple thermostats to advanced networked systems, with easy-to-use interface technologies that put information and programming at your fingertips.

Our nVent TRACER Turnkey Solutions Team is widely regarded as the premiere provider of industrial turnkey heat-tracing solutions. With our full suite of services, from front-end engineering and installation to maintenance and operation services, we are capable of handling heat-tracing projects of any size and scope. By focusing on safety and utilizing time-tested methods and solutions, our heat-tracing designs and installations are timely, thorough, and cost-effective.

POLE TO POLE, ONE RELIABLE PARTNER IN HEAT TRACING

We have the capabilities to make the difference in any project, from increasing safety to adding comfort while lowering total installed costs.
We are where you need us, with more than 9000 employees and partnerships with leading wholesalers, we service the globe. We travel the globe to support our customers in their most exigent projects, providing design and installation support where needed.



We Manage The Heat You Need

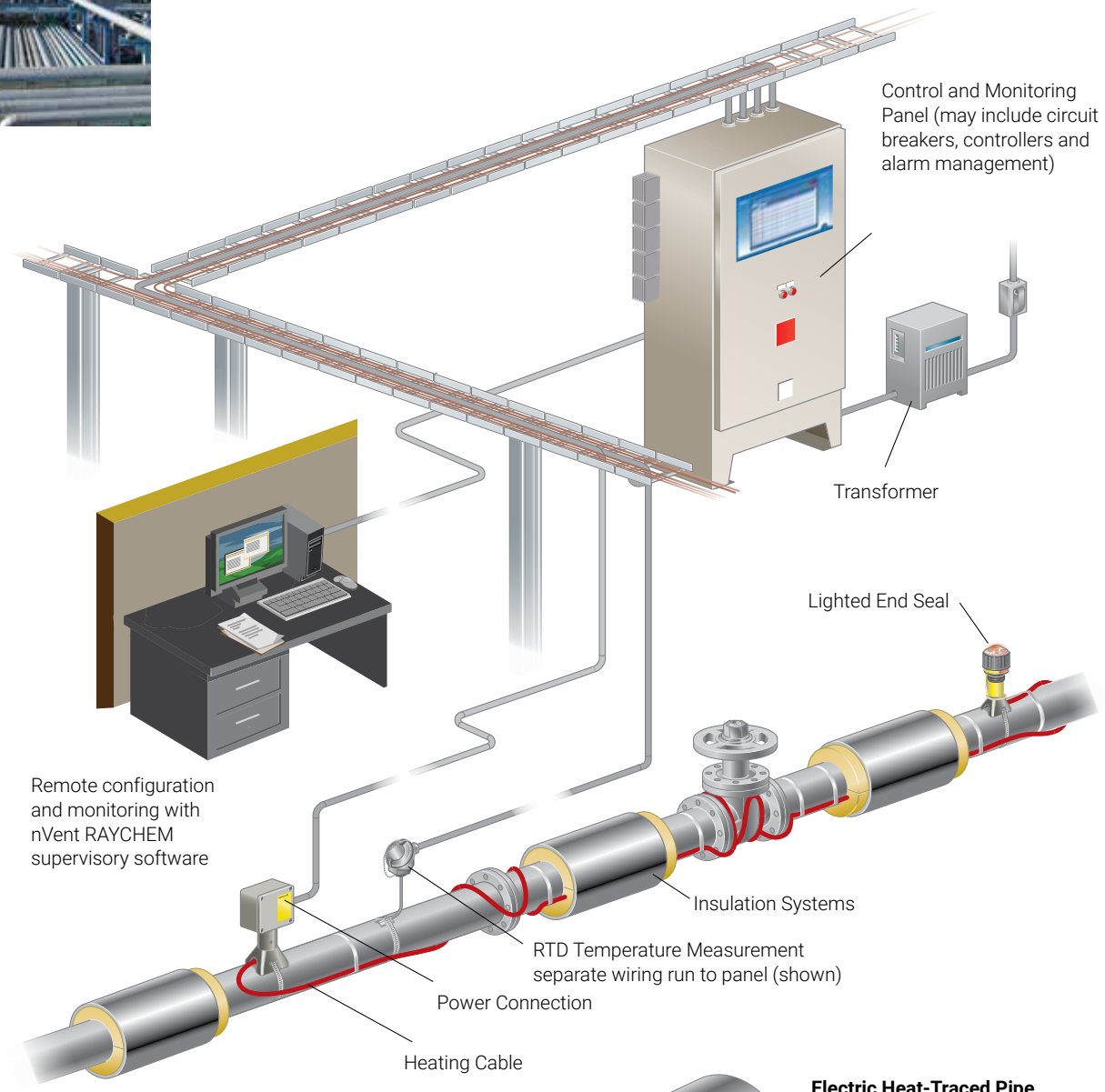
BEFORE YOU BUY, WEIGH THE FACTS

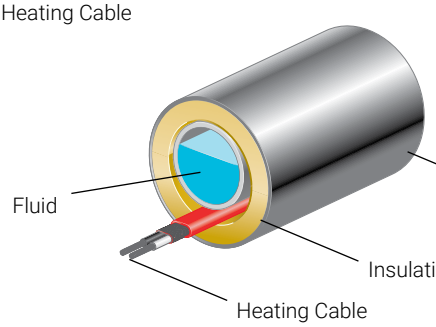
- Widest range of heat-tracing technologies for any application
- Continuous innovation of our products and services
- Advanced line of control and monitoring systems
- Highest excellence in operations with major logistic hubs and customer service centers worldwide
- Global company with local presence—more than 2,500 employees in over 85 locations

We are the leading full-service integrator for heat management systems offering project services for complete construction, project management and maintenance and we provide total care in heat tracing.

Electric Heat-Tracing Systems

An electrical heat-tracing system is much more than just the heating cable. nVent provides a complete system including the transformer, control and monitoring panels, power connections, heating cable, end terminations, and related accessories. We manage the heat you need - from pipe freeze protection, or process temperature maintenance, to process heat-up applications.



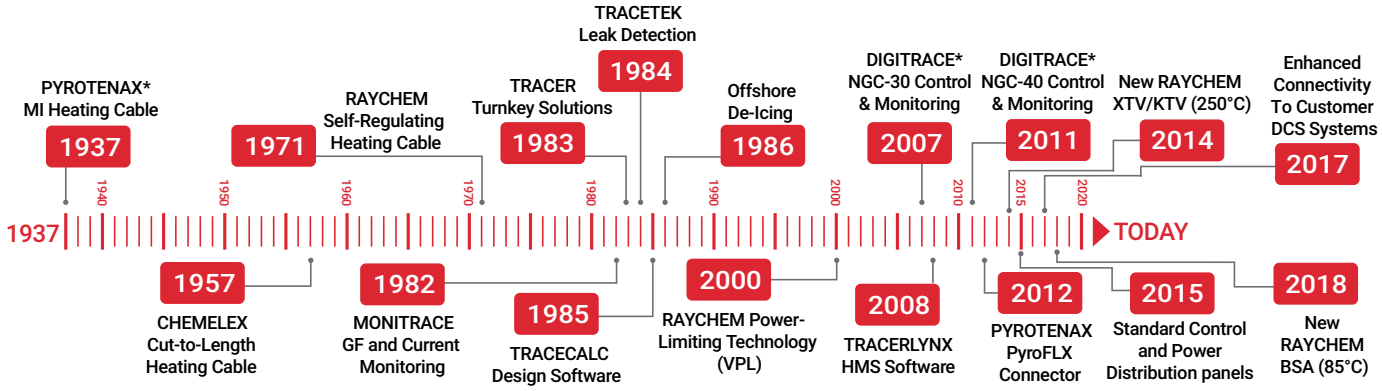


Electric Heat-Traced Pipe

A typical cross section of an electrically heat-traced pipe.

Note: The illustrations on these pages do not necessarily depict actual applications and illustrations.

A Rich History In Innovations



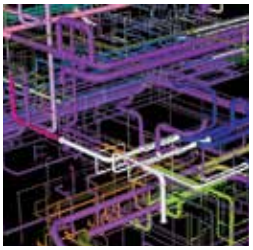
*Rebranded to RAYCHEM

Heat Tracing

Turnkey Solutions

Control and Monitoring

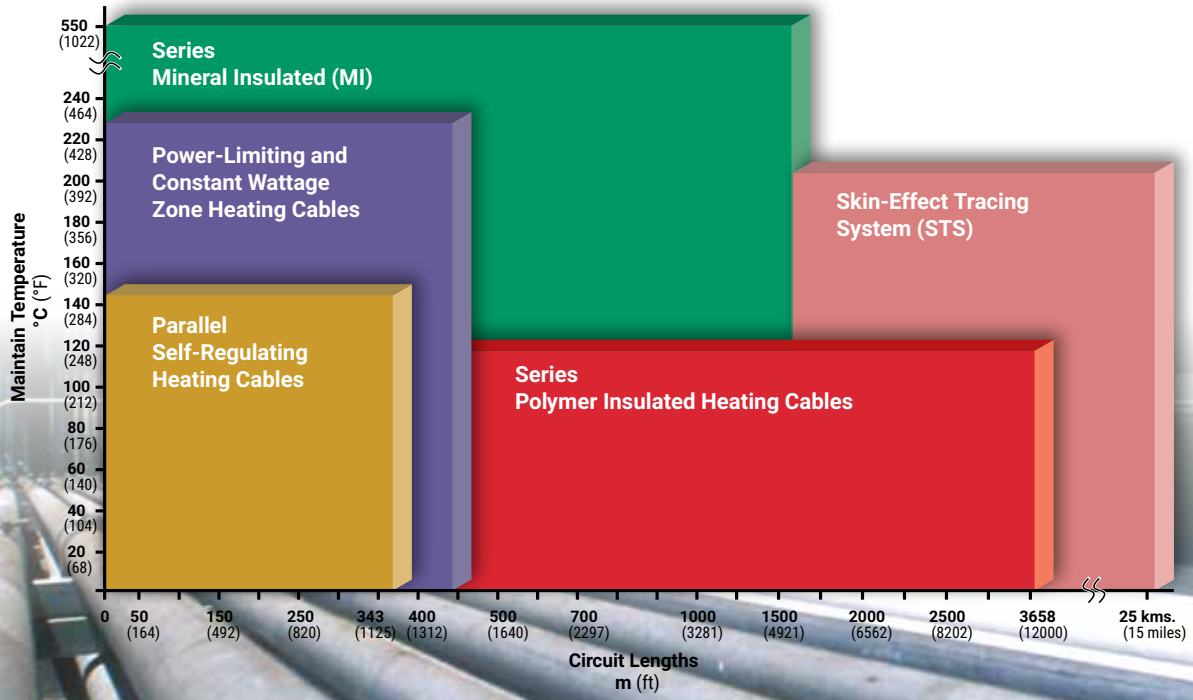
Fire-Rated Wiring Products



3D Plant Modeling

Product Technology Portfolio

nVent offers the industry's most complete line of heat-tracing product technologies to meet every need—for everything from pipe freeze protection to high temperature process maintenance. We provide solutions that cover a wide range of temperature and length requirements for any application.



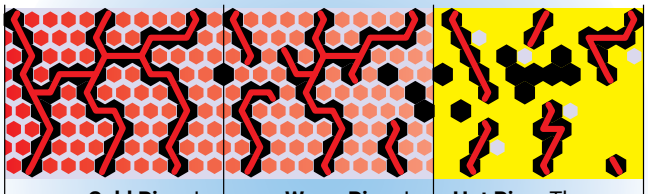
Innovative Heat-Tracing Systems

SELF-REGULATING TECHNOLOGY

nVent RAYCHEM revolutionized the heat-tracing industry when it invented self-regulating heating cable technology over 40 years ago. Self-regulating heating cables incorporate a heating element made of polymer mixed with conductive carbon black. This special formulation of materials creates an electrical path for conducting current between the parallel bus wires along the entire cable length. In each heating cable, the number of electrical paths between the bus wires changes in response to temperature fluctuations, allowing for more uniform temperatures. Additionally, the ability to cut-to-length on site allow for easy installation.

Applications include: freeze protection, temperature maintenance, viscosity control, or anti-condensation for any process in pipes, tanks or vessels.

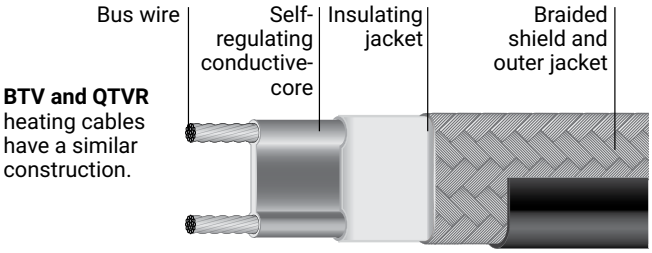
How it works:



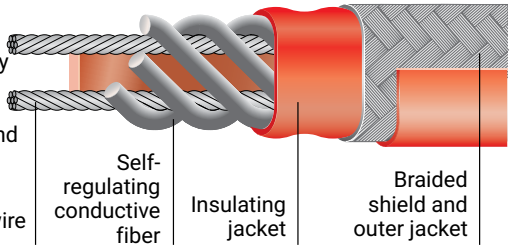
Cold Pipe: In response to cold, the core or fiber contracts micro-scopically opening up electrical paths.

Warm Pipe: In response to warmth, the core or fiber begins to expand microscopically disrupting the electrical paths.

Hot Pipe: The core or fiber expands enough to disrupt almost all of the electrical paths.



BTV and QTVR heating cables have a similar construction.

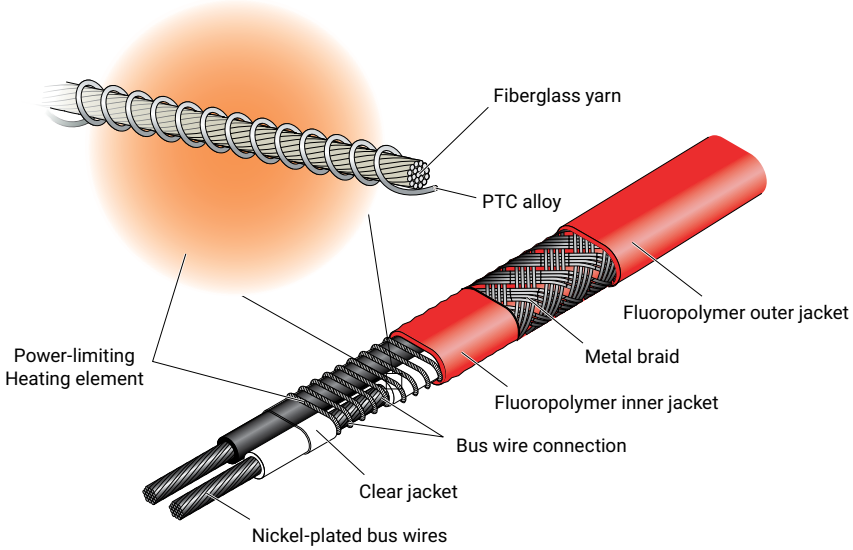


XTV and KTV heating cables have a fiber-wrap construction that can easily be cut back for power connection and termination.

POWER-LIMITING TECHNOLOGY (VPL)

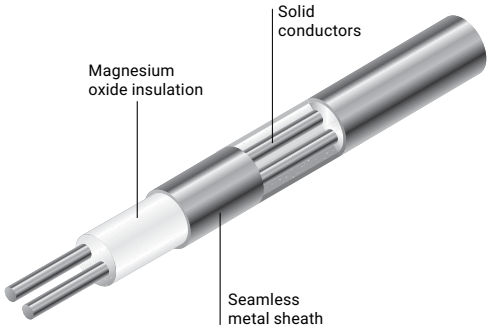
The nVent RAYCHEM Power-Limiting (VPL) heating cable is based on a coiled resistor alloy heating element wrapped around two parallel bus wires. The resistance of this heating element increases as its temperature increases, creating a positive temperature coefficient (PTC) effect.
VPL can be used for high power output and /or high temperature exposure requirements which can reduce the number of heating cable runs required.

Applications include: all industrial applications with a need for high maintain or high continuous exposure temperatures.



MINERAL INSULATED TECHNOLOGY (MI)

The PYROTENAX brand has been synonymous with the production of the highest quality mineral insulated (MI) systems for decades. Now rebranded to nVent RAYCHEM, these heating systems provide the optimum solution when extreme high power outputs and temperatures are required. Applications include: industrial processes with a need for very high maintain temperatures (<600°C) or extreme exposure temperatures (<1000°C).

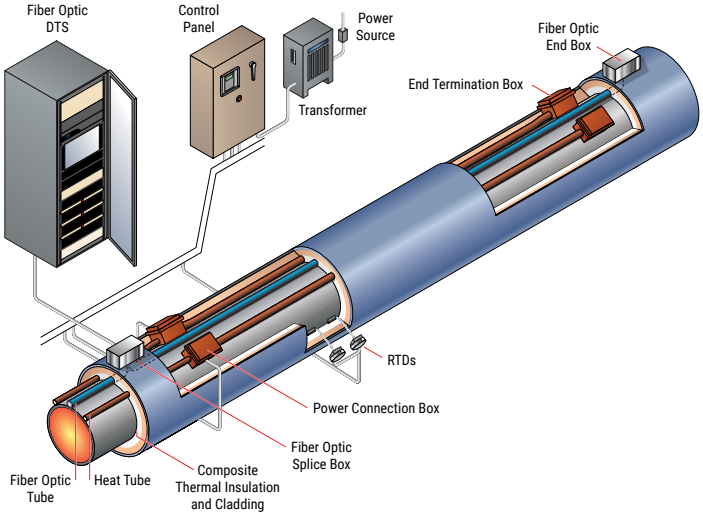


SKIN-EFFECT HEAT-TRACING TECHNOLOGY (STS)

The nVent RAYCHEM STS Skin-Effect Heat-Tracing System is a multipurpose engineered technology configured to deliver heat for medium to long pipelines with circuit lengths up to 25 kilometers/15 miles.

Applications include: temperature maintenance in material transfer lines, snow and ice melting, tank foundation heating, and subsea transfer lines.

This system is ideally suited for the transportation of critical temperature maintain applications such as heavy or waxy crude oil and sulphur and can be bundled with Fiber Optic Distributed Temperature Sensing Systems (DTS) to provide the user with real time temperature monitoring for the entire length of the pipeline.



ADVANCED CONNECTION KITS

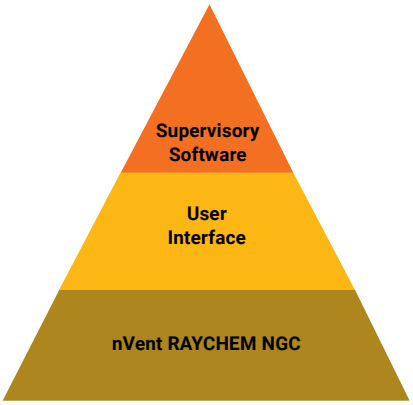
nVent RAYCHEM connection kits are rugged, resist corrosion, take less time to install, have fewer parts and permit visible monitoring status of power and continuity.

- One range of connection kits for all self-regulating identified nVent RAYCHEM earlier.
- An integral part of the complete hazardous area system approval.
- Unique nVent RAYCHEM cold-applied core sealer (patented technology) allows connection without the use and required curing time of RTV silicone.
- Spacious boxes with front access, reliable spring type terminals and captive lid screws for fast installation.

Control and Monitoring Systems

Many aspects can influence the selection of the control and monitoring system for each project and application. The most effective solutions are often a blend of various combined technologies to achieve a balance between total installed costs (TIC), total operating cost (TOC) and long-term benefits associated with the entire heat management system, during the life of the plant.

nVent offers a wide range of control and monitoring systems that provide scalable solutions from the most proven and economical simple mechanical thermostats to the very latest innovations in local control and central monitoring systems.

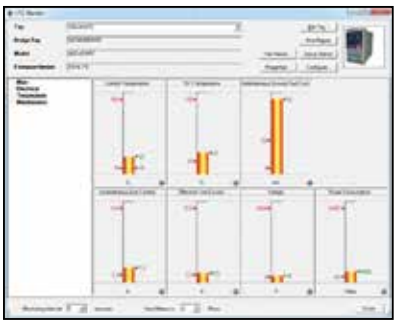


NGC-30 AND NGC-40

nVent RAYCHEM NGC-30 is an advanced electronic multipoint control, monitoring and power distribution system for industrial heat-tracing applications for up to 260 circuits.

nVent RAYCHEM NGC-40 is an advanced modular control, monitoring and power distribution system whose single control module per heat tracing circuit provides the highest reliability architecture for your heat-tracing application.

SUPERVISOR SOFTWARE



nVent RAYCHEM supervisory software is an integrated configuration and monitoring software for the NGC system family. It provides the capability to remotely configure the control systems, monitor status, alarms and other advanced features such as data logging and trending reports for a heat-tracing system.

FEATURES

- Most comprehensive product line to cover single circuit and multi-circuit applications
- Advanced monitoring and diagnostic capabilities
- Modular systems including single point architecture for maximum reliability
- State-of-the-art touch screen user interface
- Multiple RTD capabilities-versatile system for critical applications
- Capable of switching up to 690 V and 60 A current ratings to reduce power distribution costs
- Value-added accessories to provide significant cost savings

Specialized Engineered Systems

TRAC-LOC TANK INSULATION SYSTEM

The nVent TRACER TRAC-LOC standing seam tank insulation system is a thermally efficient and cost effective solution designed to help reduce a customer's total installed and operating costs. The system is virtually maintenance free and provides a lower insulation cost when compared to conventional insulation methods.

The TRAC-LOC insulation system is ideal for large, flat-bottomed tanks used for the storage of materials that are sensitive to temperature fluctuations and require a covering of insulation and jacketing to reduce heat loss or gain. With its unique design, panel construction and installation techniques, TRAC-LOC is provided as a complete installed heat management system.

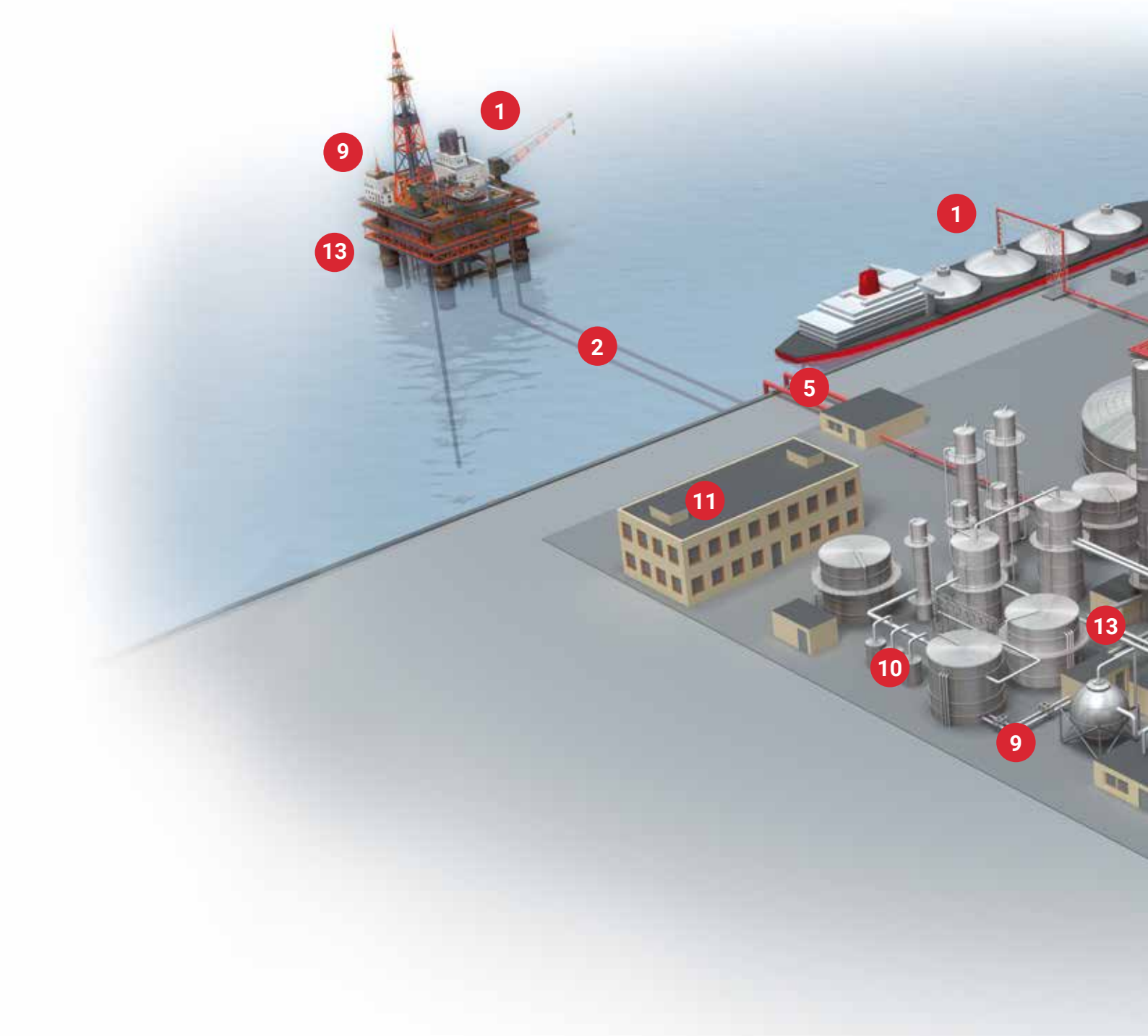
COMPREHENSIVE PIPELINE AND STORAGE TANK LEAK DETECTION SOLUTIONS

Pipelines and tanks throughout the world which transport and store critical temperature maintenance applications, are often located in remote regions which are sensitive to environmental harm and are occasionally prone to local pilfering of both the pipeline service and material components.

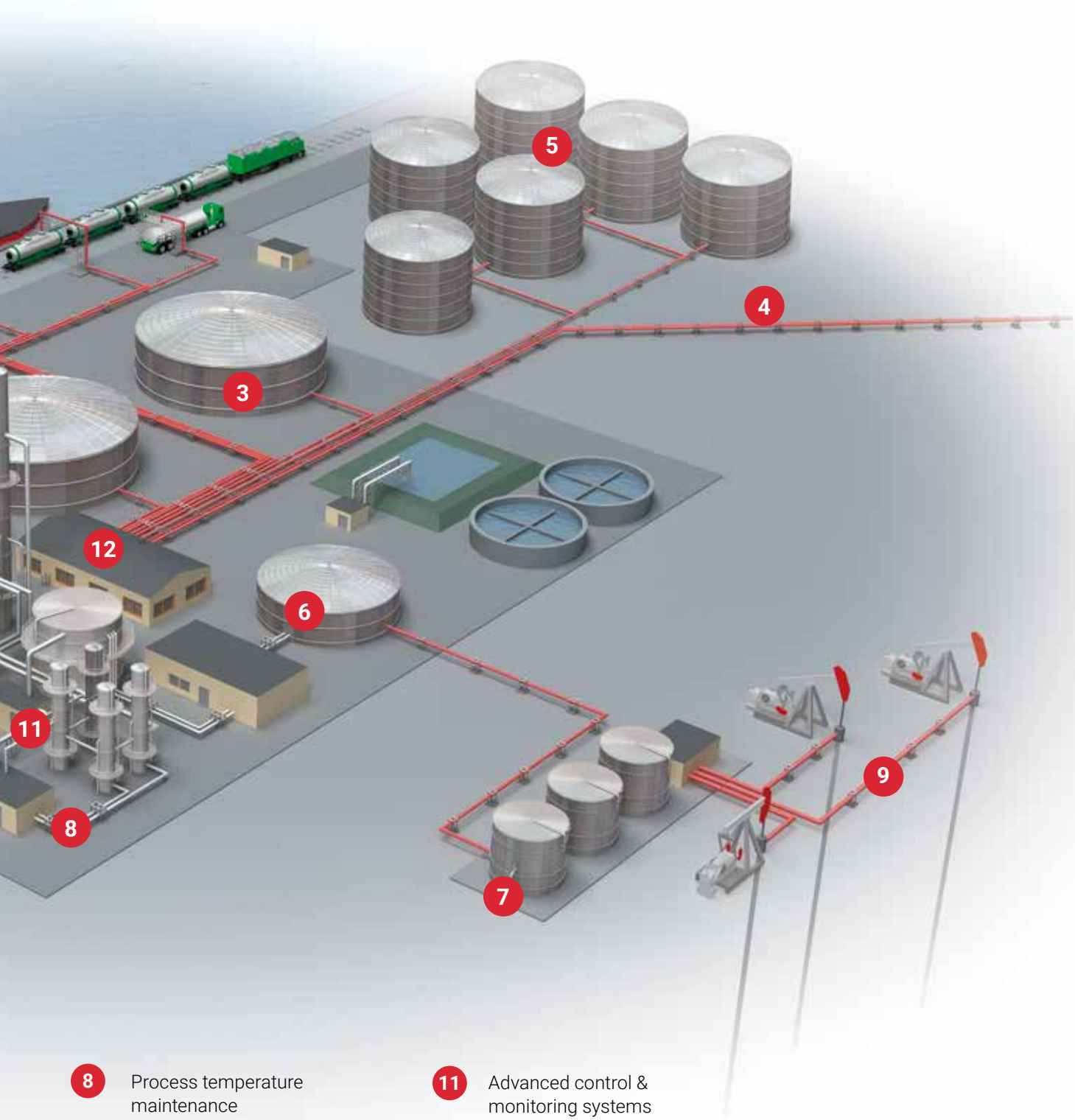
nVent's pipeline and storage tank leak detection solutions including fiber optic DTS, DAS and sensor based DAS are engineered to continually monitor these technologies which help to reduce the environmental and financial impact of a potential catastrophic event while also protecting the valuable commodity which is being stored or transported from local threats.

Advanced Industrial Solutions

nVent provides solutions to a wide range of Industrial markets, primarily for the Oil and Gas, Power generation, Transport and Storage, and (Petro-) Chemical Industries.



1. Anti-icing & de-icing
2. Heating of subsea transfer lines
3. Frost heave prevention of cryogenic LNG tanks
4. Long line heating with nVent RAYCHEM STS skin effect systems & pre-insulated pipes
5. Comprehensive Pipeline and Storage Tank Leak Detection Solutions
6. Tank insulation with nVent TRACER vertical lock seam systems
7. Tank heating



8 Process temperature maintenance

9 Pipe freeze protection

10 Pre-traced, pre-insulated tubing for instrumentation & sample lines

11 Advanced control & monitoring systems

12 Power distribution

13 Fire & performance wiring

Turnkey Solutions

A Heat Management System is an engineered system designed to maintain or protect process piping, equipment, vessels and instruments at predetermined temperatures and within defined design criteria.

Committed to safety through proactive safety management techniques.

Safety

Safety is our number one concern. We are recognized as a leader in the industry in safety performance by consistently challenging the norm through safety innovations including training and motivational programs.

Warm Pipe Warranty

By allowing nVent to handle all of the engineering, design, and construction of your heat-tracing system, we can provide you with a Warm Pipe Warranty, ensuring that the system operates as specified.

Detailed Engineering

Our experienced engineers apply product and optimization strategies to design a heat management system which meets your specific requirements at the lowest possible cost.

Front End Planning

Engaging nVent early in the planning process allows us to help you make decisions which can reduce the overall installed cost of the heat management system.

Post Installation Services and Maintenance

Providing regular Heat Management System audits or implementing a maintenance agreement, nVent provides you with the security of having your system regularly evaluated by experts in the heat-tracing industry, allowing timely resolution of potential system problems.

Procurement

nVent will manage all materials procurement and fabrication activities making sure the right materials get to the right work location at the right time.

Installation and Construction

Our construction teams are fully trained and experienced in heat-tracing installation techniques. Leverage our expertise to ensure timely and correct installation of your heat management system components, insulation and cladding.

Site Services

Using our Site Services allows you to maintain a single point of responsibility and accountability through the entire installation process. This ensures continuity of project knowledge from engineering through start-up. We can manage all the necessary services you need:

Engineering, Procurement, Construction and Construction Management, Quality Assurance.

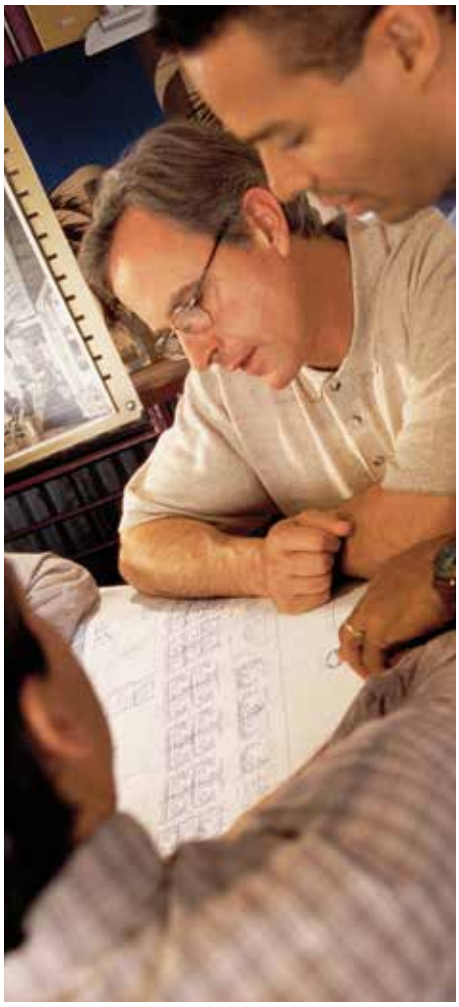
Commissioning

Our commissioning services ensure that the heat management system is operating as expected. This includes full system audits, programming and set up of control panels and operational checks.

Quality Assurance/ Quality Control

Our Quality Management System addresses all processes including the design, supply, installation, and commissioning to ensure your Heat Management System is operating as intended.

Approvals and Warranty



GLOBAL APPROVALS

nVent's range of heating systems are tested to the most stringent industry standards to ensure maximum reliability and performance for our customers. They are approved and certified for use in nonhazardous and hazardous locations by the major agencies including FM, CSA, UL, PTB, Baseefa, NEPSI, DNV, ABS and many more.

WARRANTY

As an endorsement of our product quality and our commitment to providing customer value and peace of mind, a 10-Year extended product warranty program is available. Visit our website for more information.

By allowing nVent to handle all of the engineering, design, and construction of your heat-tracing system, we can provide you with a Warm Pipe Warranty, ensuring that the system operates as specified.

Web Services And Software

VISIT NVENT.COM

Our website provides all the latest tools and information you need to design, select, and purchase a complete heat-tracing system. Use our web-based program, or download design software to help you with your projects.

Browse and find the most up-to-date product brochures, data sheets and installation instructions.

DESIGN SOFTWARE

TraceCalc Pro design software brings you the latest advances in automated heat-tracing design capabilities.

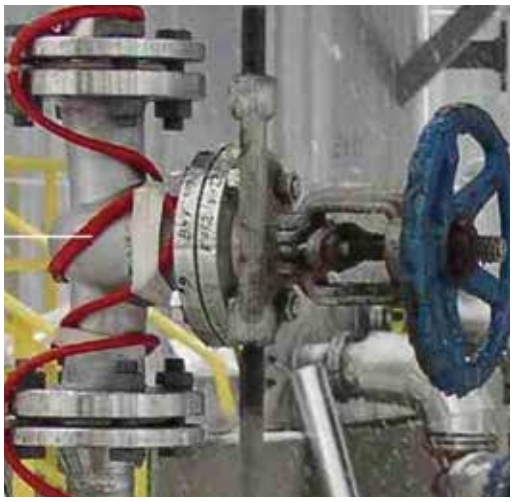
It a provides an intuitive, easy-to-navigate and user-friendly interface to create simple or complex heat-tracing designs for pipes, tanks and vessels.

With Tracecalc Net online tool, you can create a heat-tracing design in a few simple steps to:

- Finding the right products for your application
- Choosing quantities for a complete bill of materials
- Selecting optional control and monitoring systems

TraceCalc Pro

Parallel Heating Systems



Innovation

Since the invention of RAYCHEM self-regulating technology that revolutionised the industry, our customers worldwide have benefited from constant developments and new product innovations that have enabled the use of parallel heating systems on an ever wider variety of industrial applications.

They've gained through the simpler, more efficient installation of unique fibre-wrap constructions; benefited from the higher power and higher exposure temperature resistance of power limiting technology, with the continuing reassurance that the systems they install contain the industry's most advanced technologies for parallel heating systems.

Completed by a full range of components design for easy installation and lowest maintenance, parallel heating systems provide the most flexible solution for any project. Changes between the engineering stage and the construction can be best accommodated with their cut-to-length feature and easy redesign.

From the inventor of self-regulating technology and with a installed base exceeding 500,000 km, nVent RAYCHEM self-regulating systems offer a proven and most reliable solution.

1970s

Invention of **self-regulating technology**

1980s

Introduction of **self-regulating fibre technology** for high temperature and steam cleaning

1990s

Enhanced version of **monolithic cables** with QTVR family

1997

Full range of **cold applied components** for easy installation and lowest maintenance

2000

Introduction of **power limiting technology** for higher temperatures and high power output at elevated temperatures

2006

Introduction of **nVent RAYCHEM FxT, an economic constant wattage system** with a highly reliable round heating cable construction

2008

IECEx approvals for entire range

2014

nVent RAYCHEM XTV and **KTV** range with exposure temperature 250°C

2018

BSA range (85°C exposure) for non-hazardous industries

Self-Regulating Technology

INTRODUCTION

From the inventor of self-regulating technology and with installed base output exceeding 500,000 km, nVent RAYCHEM self-regulating systems offer a proven and most reliable solution.

Operating to voltages up to 277 V, the wide range of self-regulating products can provide:

Temperature maintenance up to 150°C

Exposure temperature up to 250°C

Circuit lengths up to 245 m

CONSTRUCTION

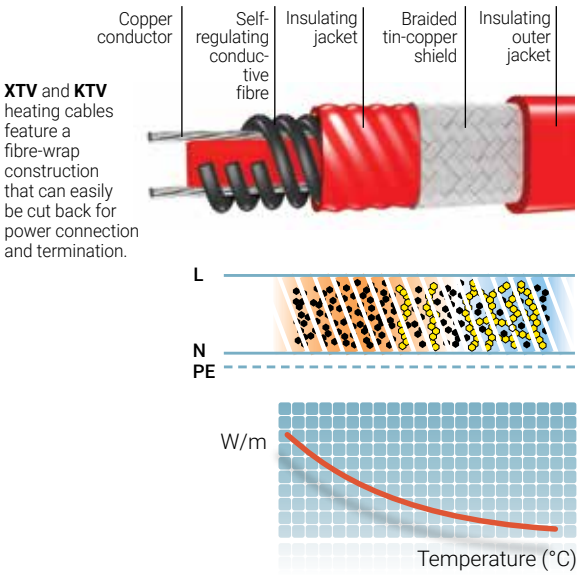
The most forgiving of all existing heat-tracing technologies, self-regulating heating cables incorporate a heating element made of polymers mixed with conductive carbon black. This special blend of materials extruded between the conductors creates electrical resistive paths. The number of electrical paths changes in response to temperature fluctuations.

HOW IT WORKS

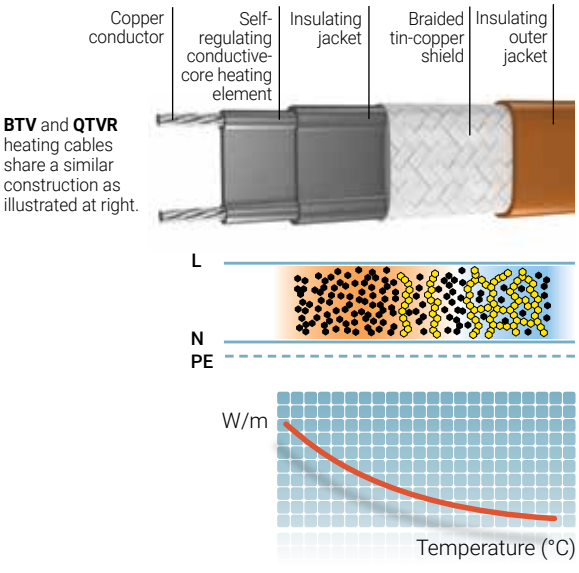
As the temperature surrounding the cable decreases, the conductive core contracts on a microscopical level, decreasing the electrical resistance and creating numerous electrical paths between the conductors. Current flows along these paths to warm the core.

As the temperature rises, the core expands on a micro-scopical level, increasing electrical resistance and decreasing the number of electrical paths.

As a result, the heating cable can be overlapped several times without risk of degradation, since the power is greatly reduced at high temperatures.



XTV and **KTV** heating cables feature a fibre-wrap construction that can easily be cut back for power connection and termination.



BTV and **QTVR** heating cables share a similar construction as illustrated at right.

BENEFITS

EASY INSTALLATION

Self-regulating heating cables may be cut-to-length on-site and can be overlapped multiple times at valves, flanges and instruments without the risk of local overheating.

MORE UNIFORM TEMPERATURES

Because the heating cable senses and responds to actual conditions along the pipe, the system accommodates variations due to static fluid and differing elevations.

PREDICTED MAXIMUM GENERATED TEMPERATURES

nVent RAYCHEM self-regulating heating cables offer unconditional T-ratings as specified by European norm EN 60079-30-1 (no requirement for sheath temperature calculations/controls).

When designed properly, the process medium won't exceed a certain temperature even when temperature controls fail.

APPLICATIONS

Any process in pipes, tanks or vessels for freeze protection, temperature maintenance, viscosity control, or anti-condensation.

Typical industries include:

- Oil and gas (exploration, production, refining, distribution)
- Chemical and petrochemical
- Pharmaceutical and healthcare
- Power (bio-diesel, solar, hydro...)
- General industries

Power-Limiting Technology

A NEED FOR HIGH POWER OR HIGH TEMPERATURE EXPOSURE?

Power-limiting heating cables (VPL) can be used for freeze protection and process temperature maintenance requiring high power output and/or high temperature exposure.

Operating to voltages up to 480 V, power-limiting heating cables can provide:

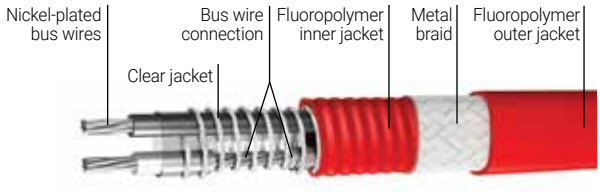
Temperature maintenance up to 235°C

Exposure temperature up to 260°C

Circuit lengths up to 450 m

CONSTRUCTION

Power-limiting cables are formed by a coiled resistor alloy heating element wrapped around two parallel conductors. At a fixed distance the insulation is removed from one of the conductors and the process is repeated, removing the insulation from the other conductor. The distance between contact points forms the heating zone length.

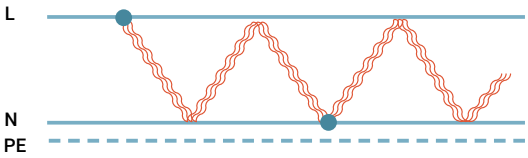


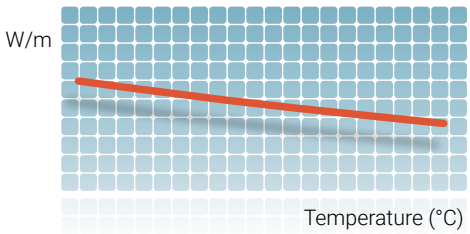
HOW IT WORKS

The positive temperature coefficient (PTC) of the alloy resistor heating element allows an adaptation of power in relation to the temperature of the system on which the heating cable is installed.

As the temperature surrounding the cable decreases, the resistance of the heating element reduces, resulting in an increase of power output. As the temperature rises, this resistance increases generating a limitation of the power output.

This effect allows the power-limiting cable to be overlapped once, since the power-output of the heating element is reduced at cross-over points.





BENEFITS

REDUCED HEATING CABLE QUANTITY

Power-limiting heating cables provide high power-output at elevated temperatures which can reduce the number of heating cable runs required.

LOWER START-UP CURRENT

The relatively flat power temperature curve ensures a lower start-up current.

LONGER CIRCUIT LENGTHS

When operating at higher voltages, the maximum circuit lengths increase and therefore the number of circuits and use of junction boxes, power cables and other components can be reduced.

EASY INSTALLATION

Power-limiting heating cables may be cut-to-length on-site according to heating zone length and can be overlapped once at valves, flanges and instruments without the risk of local overheating.

LIMITED MAXIMUM GENERATED TEMPERATURES

By their specific power-limiting technology, nVent RAYCHEM VPL heating cables offer the possibility of stabilised design T-ratings as specified by European norm EN 60079-30-2.

APPLICATIONS

Typical applications include needs for high maintain temperatures or continuous high exposure temperatures in all industrial applications.

Constant Wattage Technology

A NEED FOR HIGH POWER OR TEMPERATURE EXPOSURE?

Constant wattage products are high-quality general-purpose heating cables that can be used for a wide variety of applications.

Operating to voltages up to 415 V, constant wattage heating cables can provide:

Temperature maintenance up to 230°C

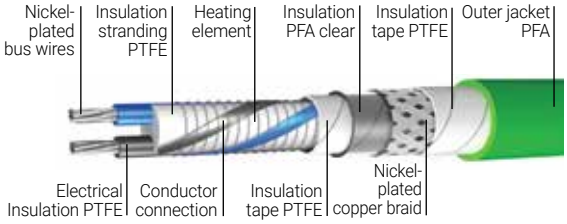
Exposure temperatures up to 260°C

Circuit lengths up to 330 m

CONSTRUCTION

Constant wattage cables are formed by a Ni-Chrome resistor heating element wrapped around two parallel conductors.

At a fixed distance the insulation is removed from one of the conductors and the process is repeated, removing the insulation from the other conductor. The distance between contact points forms the heating zone length.

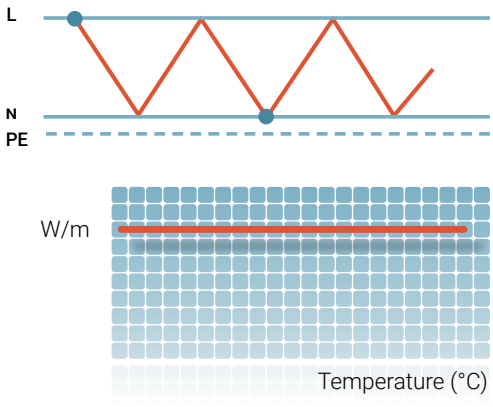


HOW IT WORKS

This construction, with heating zones, generates a constant power on the entire length of the cable. As a result, surrounding temperature does not influence this power output, which remains constant.

Several standard ranges of power output are achieved during manufacturing by adaptation of heating element resistance and heating zone length.

Due to their mode of heat emission, constant wattage parallel heating cables cannot be overlapped as this could lead to a local degradation of the cable.



BENEFITS

EASY INSTALLATION

nVent RAYCHEM constant-wattage zone heating cables with their unique round construction ensure a high flexibility of installation and limit risks of local overlapping at valves, flanges or other pipe fittings.

ECONOMICAL SOLUTION

Increased range of temperature exposure while maintaining the benefits of cut-to-lengths cables.

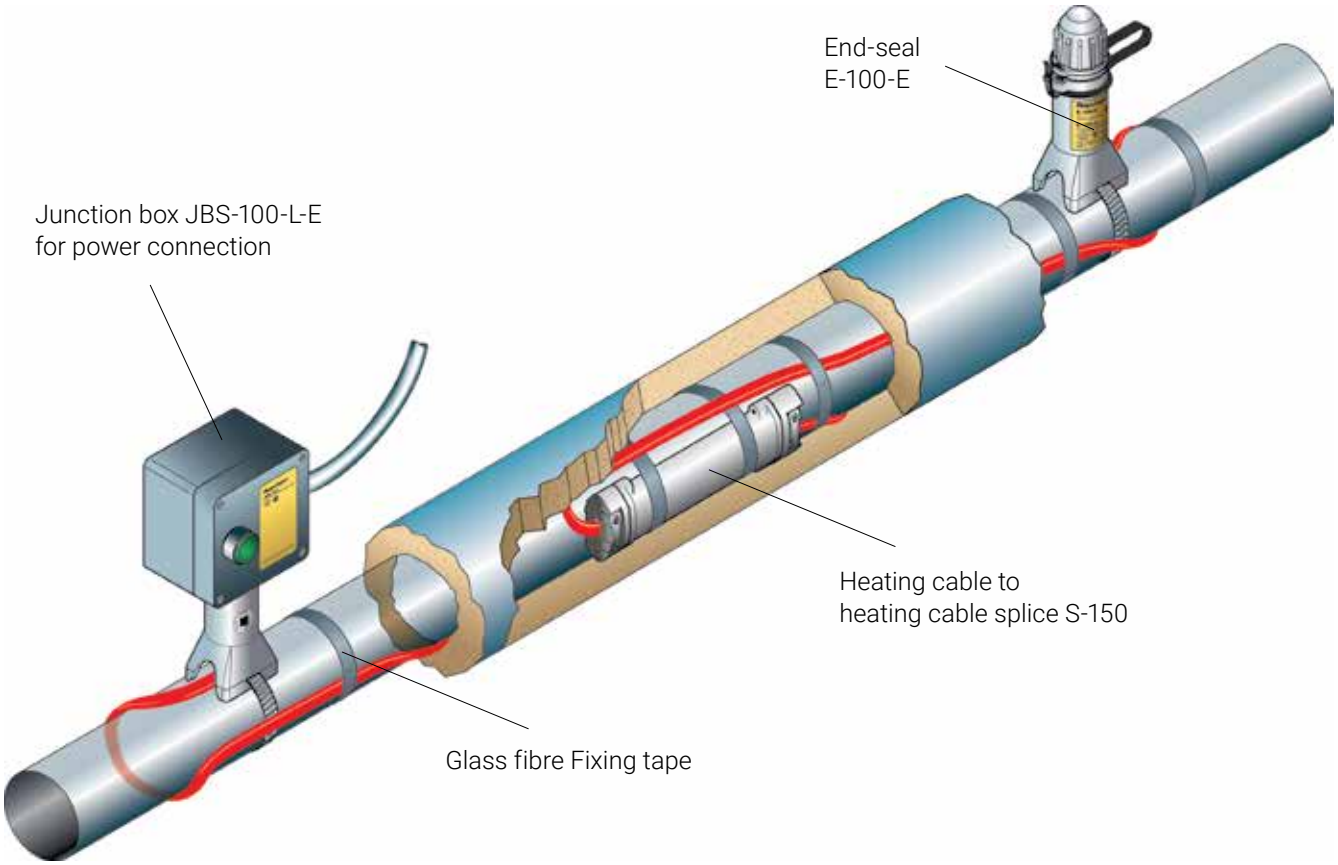
REDUCED NUMBER OF HEATING CIRCUITS

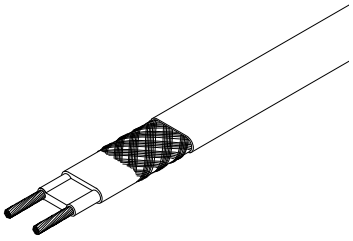
Due to the lower start-up current, the number of circuits or rating of circuit breakers can be reduced compared to self-regulating or power-limiting technologies.

APPLICATIONS

Simple piping systems, equipment where temperature control systems can easily be implemented in association with heating cables.

Typical Configuration for nVent RAYCHEM Self-Regulating or Power-Limiting Heating Systems

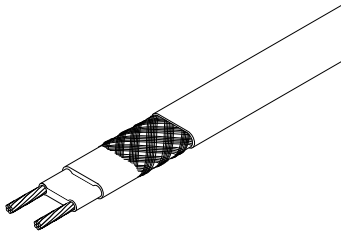




BTV

The nVent RAYCHEM BTV range of self-regulating heating cables is mainly used for frost protection of pipes and vessels but can also be used to maintain processes up to 65°C. These heating cables are available in two different outer jacket materials. The polyolefin outer jackets (-CR) are suitable for use in areas where the cables will only be exposed to mild inorganic solutions whereas the fluoropolymer outer jackets (-CT) offer a high general chemical resistance.

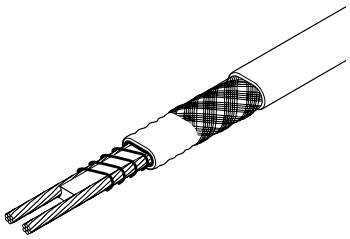
The products are approved for use in hazardous areas Zone 1, Zone 2 (Gas), Zone 21 and Zone 22 (Dust) and have an absolute temperature classification of T6 in accordance with European Standard EN 60079-30-1.



QTVR

The nVent RAYCHEM QTVR range of self-regulating heating cables is mainly used for frost protection of pipes and vessels requiring a higher power output than the BTV heating cables can supply. They can also be used to maintain processes up to 110°C. These heating cables all have fluoropolymer outer jackets offering a high chemical resistance.

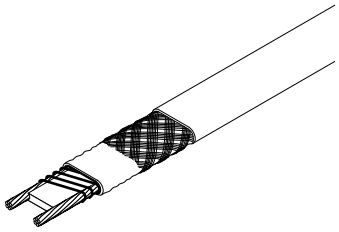
The products are approved for use in hazardous areas Zone 1, Zone 2 (Gas), Zone 21 and Zone 22 (Dust) and have an absolute temperature classification of T4 in accordance with European Standard EN 60079-30-1.



XTV

The nVent RAYCHEM XTV range of self-regulating heating cables is used for frost protection of pipes and vessels that require steam cleaning. They can also be used to maintain processes up to 121°C. These heating cables all have fluoropolymer outer jackets offering a high chemical resistance.

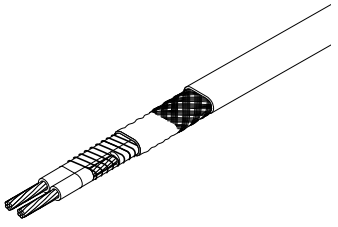
The products are approved for use in hazardous areas Zone 1, Zone 2 (Gas), Zone 21 and Zone 22 (Dust) and have an absolute temperature classification of T3 (except 20XTV2-CT-T2) in accordance with European Standard EN 60079-30-1.



KTV

The nVent RAYCHEM KTV range of self-regulating heating cables is mainly used for frost protection of pipes and vessels that require steam cleaning . They can also be used to maintain processes up to 150°C. These heating cables all have fluoropolymer outer jackets offering a high chemical resistance.

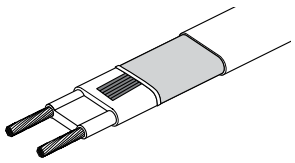
The products are approved for use in hazardous areas Zone 1, Zone 2 (Gas), Zone 21 and Zone 22 (Dust) and have an absolute temperature classification of T2 in accordance with European Standard EN 60079-30-1.



VPL

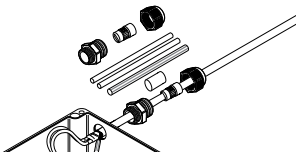
The nVent RAYCHEM VPL range of power-limiting heating cables is mainly used for temperature maintenance of processes and offers the advantage of a high power output at high temperatures which can reduce the number of heating cables required. They can also be used for frost protection of pipes and vessels that require steam cleaning. These heating cables all have fluoropolymer outer jackets offering a high chemical resistance. The VPL products are available in various voltages, 110 Vac, 230 Vac and 480 Vac. The 480 V version offers the further advantage of long circuit lengths potentially reducing the number of supply points required.

The products are approved for use in hazardous areas Zone 1, Zone 2 (Gas), Zone 21 and Zone 22 (Dust). Unlike the self-regulating heating cables the T-classification for these products has to be calculated and will depend on the design conditions, this may also result in the need to use a safety temperature limiter.



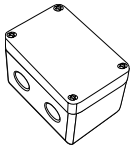
BSA

The BSA self-regulating heating cable is designed for industrial pipe freeze protection without steam cleaning and moderate process temperature requirements, up to 65°C. It can be used in ordinary (non-hazardous) area applications with mild inorganic exposure. The foil wrap /drain-wire construction provides a highly flexible cable, that is easy to install around complex or small pipe networks.



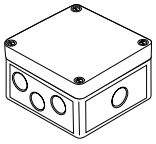
C25-01

The C25-01 is a non-hazardous connection kit for terminating BSA and BTV-CR heating cables to a non-hazardous junction box.



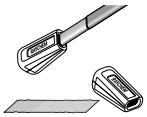
JB-NH2

The JB-NH2 is a non-hazardous junction box for use with various heating cable types with M25 connection kits. Through the two entries a heating cable and a power cable, or two heating cables can be connected. connection kits.



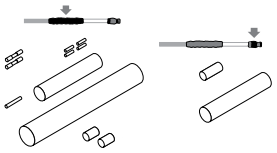
JB-NH4

The JB-NH4 is a non-hazardous junction box for use with various heating cable types with M25 connection kits. Up to four heating cables or three heating cables and a power cable can be connected.



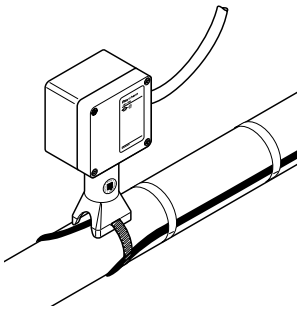
E-02-AL

The E-02-AL is a cold applied end seal kit for termination of BSA heating cables in non-hazardous area.



CSE-05-DR

The CSE-05-DR non-hazardous kit contains a power connection (or splice) and an end termination for BSA heating cables.

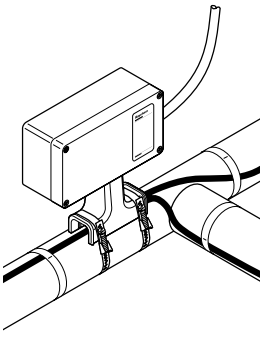


JBS-100-E

Cold applied integrated power connection for 1 heating cable. One power cable gland included. Suitable for use with all nVent RAYCHEM industrial self-regulating or power-limiting heating cables in hazardous and non-hazardous areas. Requires 1 pipe strap, to be ordered separately.

JBS-100-EP

Cold applied integrated power connection for 1 heating cable. Includes earth plate and earth stud for use with armoured cables. Suitable for use with all nVent RAYCHEM industrial self-regulating or power-limiting heating cables in hazardous and non-hazardous areas. Requires 1 pipe strap and 1 metal power cable gland to be ordered separately.

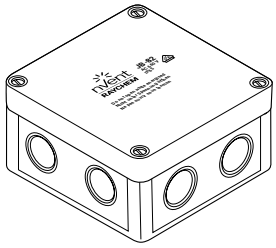


JBM-100-E

Cold applied integrated power connection for up to 3 heating cables. May also be used for tee and splice connections. One power cable gland included. Suitable for use with all nVent RAYCHEM industrial self-regulating or power-limiting heating cables in hazardous and non-hazardous areas. Requires 2 pipe straps, to be ordered separately.

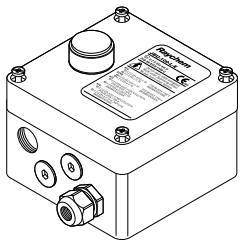
JBM-100-EP

Cold applied integrated power connection for up to 3 heating cables. Includes earth plate and earth stud for use with armoured cables. May also be used for tee and splice connections. Suitable for use with all nVent RAYCHEM industrial self-regulating or power-limiting heating cables in hazardous and non-hazardous areas. Requires 2 pipe straps and 1 metal power cable gland, to be ordered separately.



JB-82

The JB-82 nVent RAYCHEM is a standard, non-hazardous polycarbonate junction box. Up to four heating cables or three heating cables and the appropriate size power cable can be accommodated through the four entries and connected to the rail mounted terminals



JBU-100-E

This junction box provides four M25 threaded entries, stopping plugs and one plastic power cable gland. Suitable for use with all nVent RAYCHEM industrial self-regulating or power-limiting heating cables in hazardous and non-hazardous areas. Connection kits (M25), insulation entry kits and support bracket have to be ordered separately.

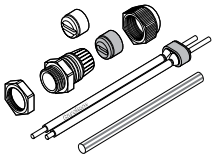
Also available with a green light for basic monitoring.

JBU-100-EP

This junction box provides four M25 threaded entries, an earthing plate and an external earth stud. It is designed for use with armoured power cables and metal glands. Suitable for use with all nVent RAYCHEM industrial self-regulating or power-limiting heating cables in hazardous and non-hazardous areas.

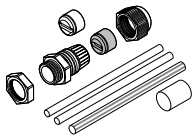
Metal power cable gland, connection kits (M25), insulation entry kits and support bracket have to be ordered separately.

Also available with a green light for basic monitoring.



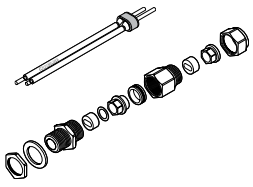
C25-100

These cold applied connection kits are designed for terminating all nVent RAYCHEM self-regulating and power-limiting industrial parallel heating cables to a junction box in hazardous and non-hazardous areas, whilst maintaining electrical insulation of the heating cable conductors and core.



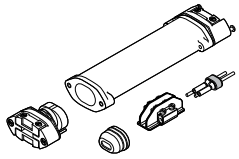
C25-21

This hot applied connection kit is designed for terminating all nVent RAYCHEM self-regulating and power-limiting industrial parallel heating cables to a junction box in hazardous and non-hazardous areas, whilst maintaining electrical insulation of the heating cable conductors and core.



C25-100-METAL AND C3/4-100-METAL

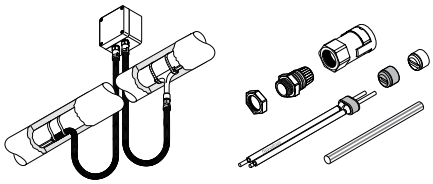
These cold applied connection kits are designed for terminating all nVent RAYCHEM self-regulating and power-limiting industrial parallel heating cables to a junction box with an internal earth plate, whilst maintaining electrical insulation of the heating cable conductors and core. These kits are made from brass, but are also available in a nickel plated version.



C-150-E

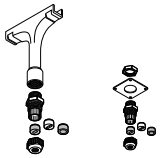
Cold applied low profile power connection for one heating cable for use in hazardous and non-hazardous areas. Maximum load of 25 A. Suitable for non-armoured power cables up to 2.5 mm^2 with stranded copper conductors C-150-E is used as a connection kit:

- Where connection to a junction box is difficult e.g. because of space limitations on instrument lines or loading arms
- Where installation of under insulation components is preferred as a cost effective alternative for JBS-100-E on short lines
- The kit is not suitable for use with VPL heating cables.



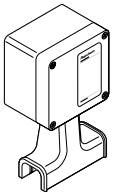
CCON2X-C.. AND ACCESSORIES

Conduit system for additional mechanical protection of accessories self-regulating and power-limiting heating cables when using off-pipe mounted junction boxes. Designed to allow for usage in hazardous areas and to provide additional mechanical protection of heating cables between the junction box and entry into the insulation. The conduit system is available in different materials for different temperatures and fully supported with all required accessories for different connection methods.



IEK-25-PIPE/IEK-25-04

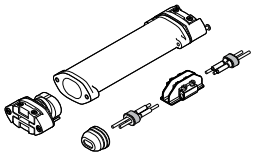
Insulation entry kits for pipes, tanks and vessels usable for nVent RAYCHEM IEK-25-04 heating and power cables with outside diameter in the range of 8 - 17 mm. The nVent RAYCHEM IEK-25-PIPE has a high temperature stand that can be fixed to the pipe whereas the IEK-25-04 is mounted on the cladding.



T-100

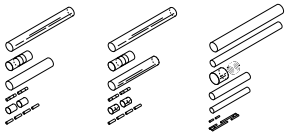
Cold applied kit for making tee or splice connections with crimps, above the insulation in hazardous and non-hazardous areas. Requires 2 pipe straps, to be ordered separately.

Required crimp tool, reference: **T-100-CT**
Suitable for use with all nVent RAYCHEM industrial self-regulating or power-limiting heating cables.



S-150

Cold applied low profile splice kit for making splice connections with terminals under the insulation in hazardous and non-hazardous areas. Not suitable for use with VPL heating cables.



S-19/S-21/S-69

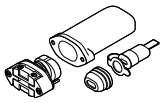
Hot applied under insulation splice kits for use in hazardous and non-hazardous areas. S-19 is for use with BTV heating cables, S-21 is for use with QTVR heating cables and the S-69 is for use with XTV and KTV heating cables.

E-100-E

Cold applied mechanical end seal for use in hazardous and non-hazardous areas, above insulation for easy access for testing. Requires 1 pipe strap, to be ordered separately. Suitable for use with all nVent RAYCHEM industrial self-regulating or power-limiting heating cables.

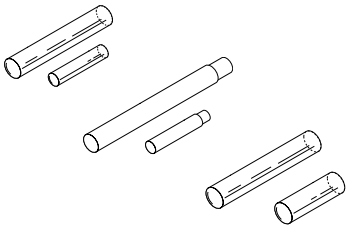
E-100-L-E

Cold applied mechanical end seal with green LED light module for use in in hazardous and non-hazardous areas, above insulation for easy access for testing. Requires 1 pipe strap, to be ordered separately. Suitable for use with all nVent RAYCHEM industrial self-regulating or power-limiting heating cables.



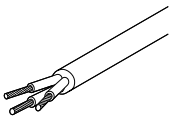
E-150

Cold applied low profile end seal for use in hazardous and non-hazardous areas. Not suitable for use with VPL heating cables.



E-06/ E-19/ E-50

Hot applied under insulation end-seal kits for use in hazardous and non-hazardous areas. E-06 is for use with BTV and QTVR heating cables, the E-19 is for use with XTV and KTV heating cables and the E-50 is for use with the VPL heating cables.

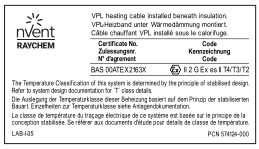


C-150-PC

3-core flexible power cable for connection to C-150-E. 3 x 2.5 mm^2, silicone insulation, temperature range: –40°C to +180°C, short term: 215°C

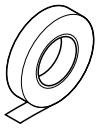
LAB-I-01

Self-adhesive warning label: For proper marking of electrical heat-tracing systems. One label per 5 m of traced pipe. Also available in other languages.



LAB-I-35

Self-adhesive warning label stabilised design for VPL, English, French and German.



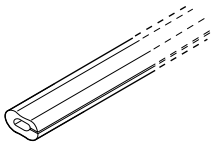
GT-66 AND GS-54

GT-66: Glass fibre fixing tape for polymer insulated heating cables on pipes. Not suitable for use on stainless steel pipes. 20 m/roll, width: 12 mm.

GT-54: Glass fibre fixing tape for polymer insulated heating cables on stainless steel pipes. Low halogen, 16 m/roll, width: 12 mm.

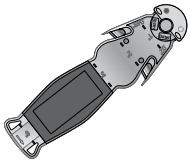
ATE-180

Aluminium adhesive tape, low halogen, for polymer insulated cables on tanks and pipes. Min. recommended installation temperature: 0°C. 55 m/roll, width: 63.5 mm



G-02

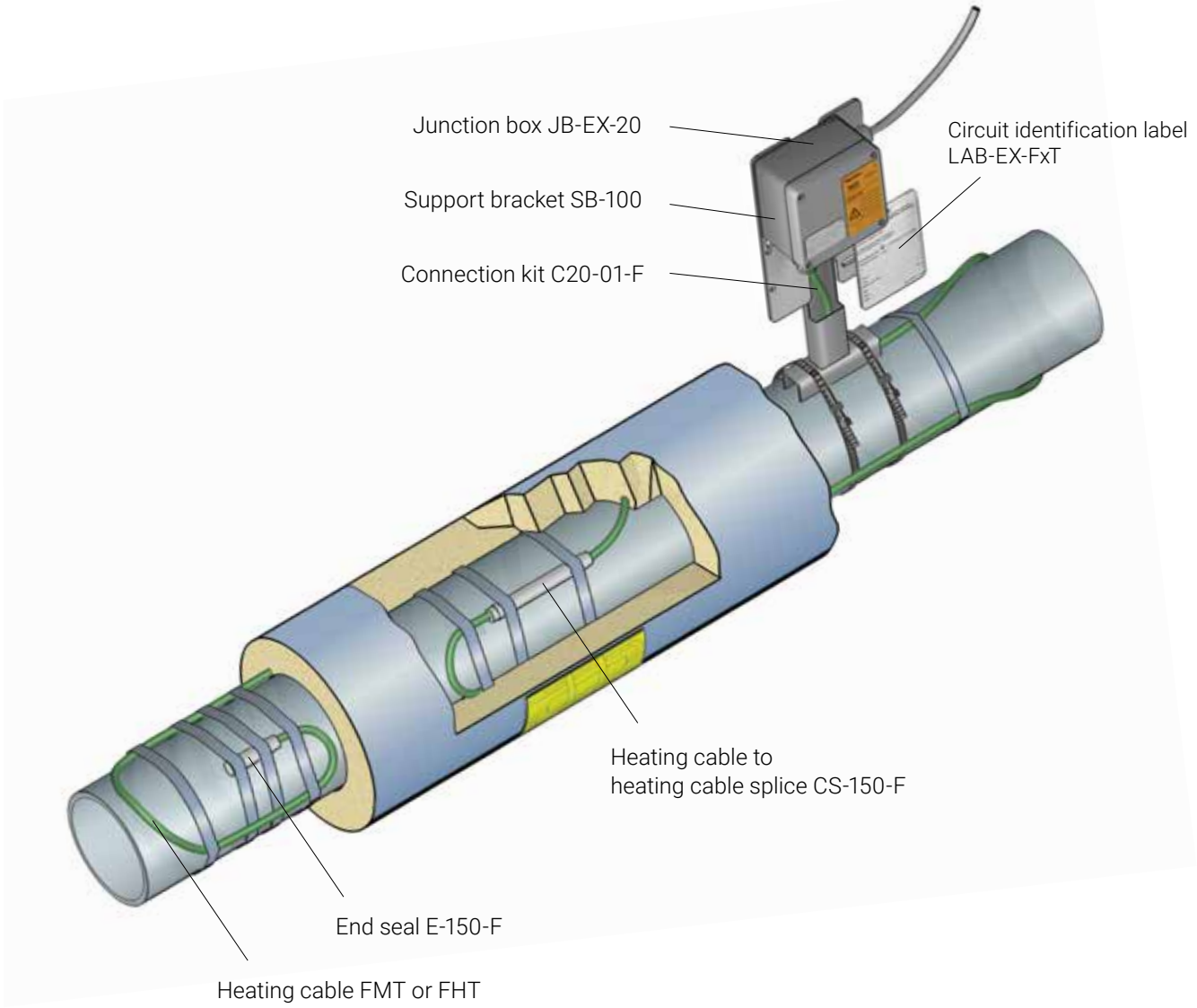
Silicone rubber sleeve, mechanically protects heating cables on edges, flanges, insulation cladding and end plates. Cut-to-length on-site. 1 m long. Temperature resistant up to 215°C.



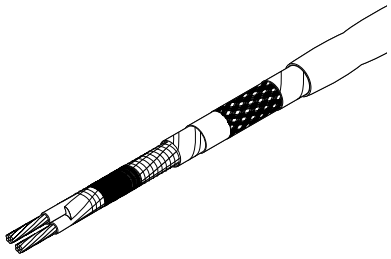
STRIPPING-TOOL-SR-CABLE

Stripping tool designed for use with BTV, QTVR, XTV and KTV self-regulating heating cable.

Typical Configuration for nVent RAYCHEM Constant Wattage Parallel Circuit Heating Systems



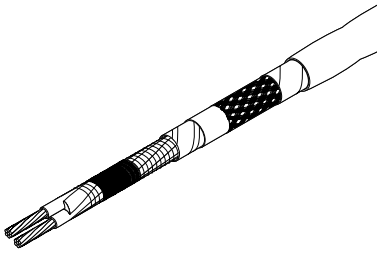
PARALLEL CONSTANT WATTAGE HEATING CABLES



FMT

The nVent RAYCHEM FMT range of constant wattage parallel cables is used for frost protection of pipes and vessels that are subject to steam cleaning but can also be used to maintain processes up to 150°C. They can withstand up to 200°C power-off. These heating cables all have fluoropolymer outer jackets offering a high chemical resistance.

The products are approved for use in hazardous areas Zone 1, Zone 2 (Gas), Zone 21 and Zone 22 (Dust). Unlike the self-regulating heating cables the T-classification for these products has to be calculated and will depend on the design conditions, this may also result in the need to use a safety temperature limiter.



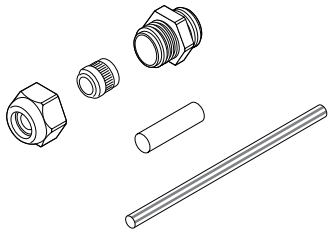
FHT

The nVent RAYCHEM FHT range of constant wattage parallel cables is used for frost protection of pipes and vessels that are subject to steam cleaning but can also be used to maintain processes up to 230°C. They can withstand up to 260°C power-off. These heating cables all have fluoropolymer outer jackets offering a high chemical resistance.

The FHT products are available in two voltages, 230 Vac and 400 Vac. The 400 Vac version offers the advantage of long circuit lengths potentially reducing the number of supply points required.

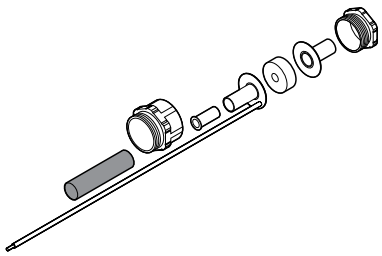
The products are approved for use in hazardous areas Zone 1, Zone 2 (Gas), Zone 21 and Zone 22 (Dust). Unlike the self-regulating heating cables the T-classification for these products has to be calculated and will depend on the design conditions, this may also result in the need to use a safety temperature limiter.

COMPONENTS AND ACCESSORIES



C20-01-F

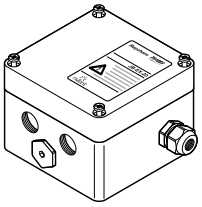
Hot applied connection kit designed for terminating FMT and FHT heating cables to a junction box, whilst maintaining electrical insulation of the heating cable. Uses a M20 plastic gland. Approved for use in hazardous areas.



C20-02-F

Hot applied connection kit designed for terminating FMT and FHT heating cables to a junction box with an internal earth plate, whilst maintaining electrical insulation of the heating cable.

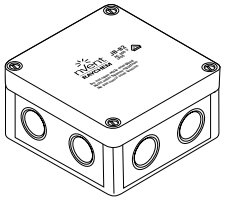
Uses a M20 metal gland. Requires crimp tool C20-02-CT. Not approved for use in hazardous areas.



JB-EX-20

Junction box, 3 x M20 entries and 1 x M25 with power cable gland, approved for use in hazardous areas. For use with C20-01-F connection kits.

Also available with internal earth plate and earth stud for use with armored power cables, order reference: JB-EX-20-EP (not shown).

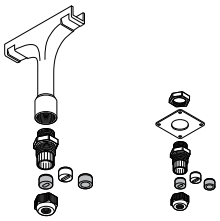


JB-82

The JB-82 is a standard, non-hazardous polycarbonate junction box. Up to four heating cables or three heating cables and the appropriate size power cable can be accommodated through the four entries and connected to the rail mounted terminals.

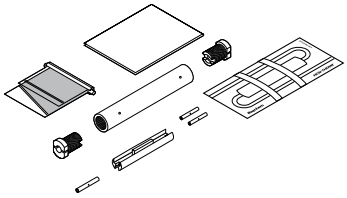
HWA-PLUG-M20

Stopping plug EX e (M20), polyamide, spare part for various EXe junction boxes.



IEK-25-PIPE/IEK-25-04

Insulation entry kits for pipes, tanks and vessels usable for and IEK-25-04 heating and power cables with outside diameter in the range of 8-17 mm. The IEK-25-PIPE has a high temperature stand that can be fixed to the pipe whereas the IEK-25-04 is mounted on the cladding.

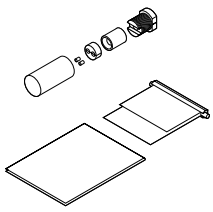


CS-150-F

Cold-applied under insulation splice for FMT and FHT heating cables. Maximum continuous exposure temperature 180°C. Uses a PTFE housing filled with silicone for electrical and mechanical sealing. Approved for use in hazardous areas.

E-50-F

Hot-applied under insulation end seal for FMT and FHT heating cables. Uses high temperature heat shrink sleeves for electrical and mechanical sealing. Approved for use in hazardous areas (no picture shown).



E-150-F

Cold-applied under insulation end seal for FMT and FHT heating cables. Maximum continuous exposure temperature 180°C. Uses a PTFE housing filled with silicone for electrical and mechanical sealing. Approved for use in hazardous areas.

C20-02-CT

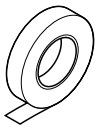
Crimp tool for braid connection on FMT and FHT heating cables. Only required when using C20-02-F connection kits.

LAB-I-01

Self adhesive warning label: For proper marking of electrical heat-tracing systems. One label per 5 m of traced pipe. Also available in other languages,

LAB-EX-FXT

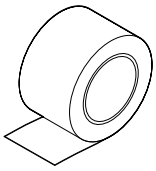
Circuit identification label for use in hazardous areas.



GT-66 + GS-54

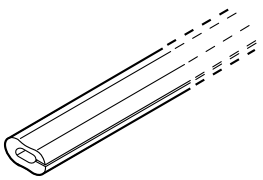
GT-66: Glass fibre fixing tape for polymer insulated heating cables on pipes. Not suitable for use on stainless steel pipes. 20 m/roll, width: 12 mm

GS-54: Glass fibre fixing tape for polymer insulated heating cables on stainless steel pipes. Low halogen, 16 m/roll, width: 12 mm.



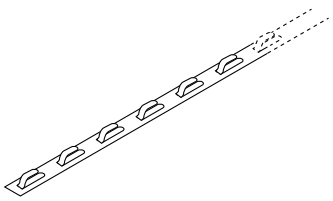
ATE-180

Aluminium adhesive tape, low halogen, for polymer insulated cables on tanks and pipes. Min. recommended installation temperature: 0°C. 55 m/roll, width: 63.5 mm.



G-02

Silicone rubber sleeve, mechanically protects heating cables on edges, flanges, insulation cladding and end plates. Cut-to-length on-site. 1 m long. Temperature resistant up to 215°C.



HARD-SPACER-

Pre-punched stainless steel strap, which allows fixed distances, SS-25MM-25M when heating cables are attached to surfaces of bigger pipes and vessels. Punch interval: 25 mm, length: 25 m.

Polymer Insulated (PI) Series Heating Systems*

Innovation

Since we first introduced its high-performance nVent RAYCHEM XPI series heating cable in collaboration with Hew-Kabel (Germany), its customers have been able to take advantage of a series of innovative product developments that have made these systems yet simpler, more versatile and economical to use.

The development of XPI cables provided customers with highest quality series heating systems featuring higher temperature and power ratings than ever before.

They also benefited from improved flexibility of maintenance, through the development of a fully compatible range of components which also simplified circuit assembly. XPI heating cables were further developed, with an even more robust construction allowing easier termination and customers were able to select from a wider range of options where high impact resistance is vital. XPI (previously branded HEW-THERM) meets the highest standards for Polymer Insulated (PI) series heating cables.

2003

Joint development of **XPI heating system** with **Hew-Kabel**

2006

Improved construction of **XPI,** development of **XPI-NH & XPI-S**

2011

IECEx approvals for entire range

2014

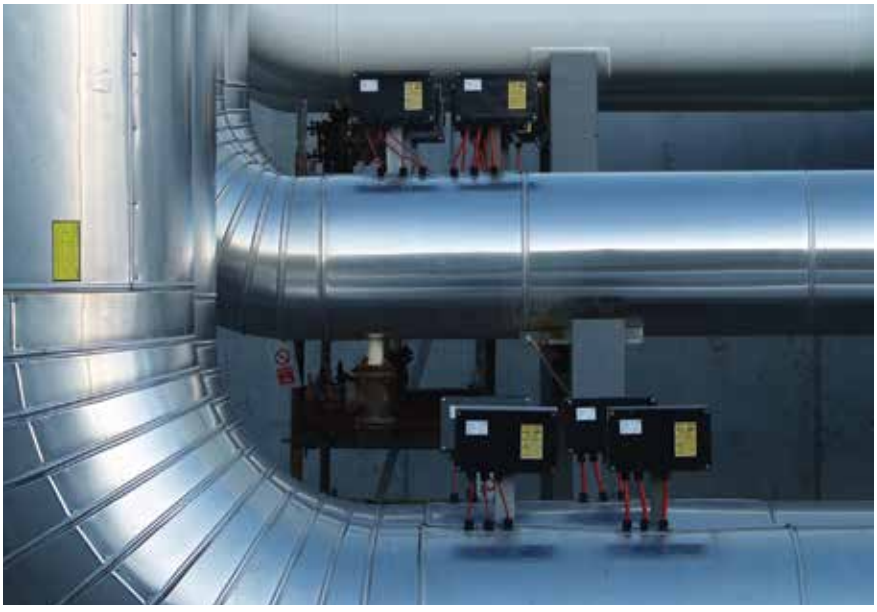
HEW-THERM Products rebranded to **RAYCHEM**

2017

Development of **nVent RAYCHEM XPI-F** heating cable

*Previously branded HEW-THERM

Temperature maintenance of fluid storage vessels with nVent RAYCHEM XPI tracing cable.



Complete and fully certified heat-tracing solution with easy-to-install connection system for long transfer lines.

Polymer Insulated (PI) Series Constant Wattage Technology*

INTRODUCTION

The most proven and reliable range of nVent RAYCHEM XPI heating systems is the industry-preferred solution when circuit lengths exceed the ratings of parallel heating cables and the number of power supply points is a constraint.

Operating to voltages up to 750 V

Temperature maintenance up to 200°C

Short term exposure temperatures up to 100°C (XPI-F) or 300°C (XPI and XPI-S)

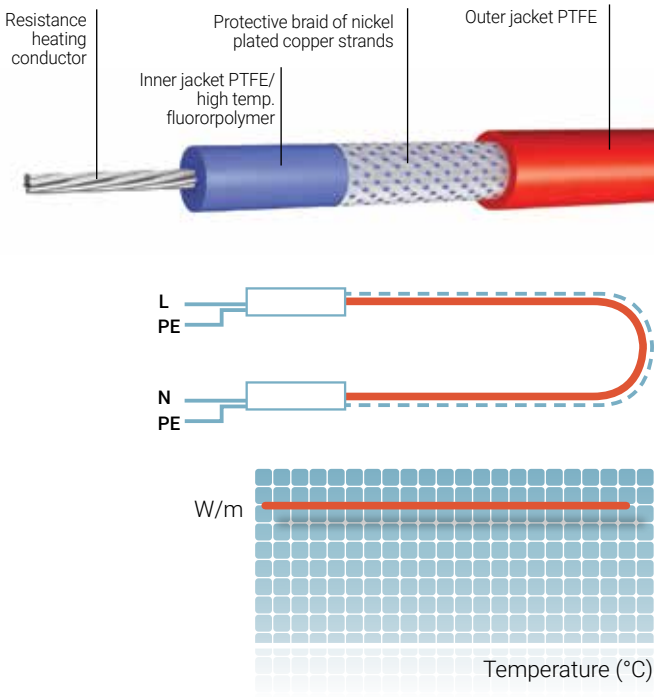
Circuit lengths up to 5 kilometres

Approved to various international standards, refer to datasheets for more detailed information.

CONSTRUCTION

XPI and XPI-S :

The stranded high temperature conductor is nickel plated to ensure a long life at elevated temperatures in corrosive environments. It is electrically isolated using an innovative sandwich construction of selected high-temperature fluoropolymers. A braid of nickel plated copper strands provides extra mechanical protection as well as a low Ohmic resistance earth path. A final PTFE jacket ensures optimum chemical resistance and highest temperature withstand capabilities.



XPI-F :

The XPI-F cable is a low temperature variant of the XPI family, designed for frost protection and low temperature applications. The construction combines in the inner jacket the advantages of PTFE in a sandwich construction, but this time with a polymer rated for lower temperatures. The outer jacket is a made of a hybrid low temperature polymer and the braid is tin plated instead, in line with the lower temperature ratings.

The end result is a robust alternative for frost protection and low temperature maintain applications for less demanding environment and exposure conditions.

HOW IT WORKS

Heat is generated in the central conductor through the principle of Ohmic resistance heating. A variety of conductor materials is used, depending on the specific resistance requirements.

Power output and temperature of a PI series heating system depend on the specific application. Design parameters including type/resistance used, circuit length, applied voltage and electrical configuration directly influence the performance of the heating system. Design and product selection should be carried out by qualified personnel using appropriate design software. Any change to these parameters can be critical and requires are-validation of the design.

BENEFITS

LARGE VARIETY OF RESISTANCES

nVent RAYCHEM XPI heating cables are available in a very wide resistance range to meet the requirements of the broadest range of applications. And for the less demanding applications (e.g. freeze protection), there is also a low temperature variant XPI-F available.

EASY TERMINATION ON-SITE WITH RELIABLE COMPONENTS

nVent RAYCHEM PI heating cables can easily be terminated in the field. The fabrication method keeps the cables very flexible and allows for easy stripping while printed metre marks facilitate on-site handling.

The components for our XPI systems are specifically developed to ensure maximum reliability of the heat tracing system and deal with the fact that the electrical connections are subjected to extreme temperature conditions.

These additional technical requirements have lead to the development of custom made connections in combination with specific tooling and installation methods, resulting in the most reliable connections in the market.

MAXIMUM CHEMICAL RESISTANCE OF PTFE

The use of PTFE provides maximum chemical resistance and ensures the highest lifetime insulation resistance over the entire temperature range.

APPLICATIONS

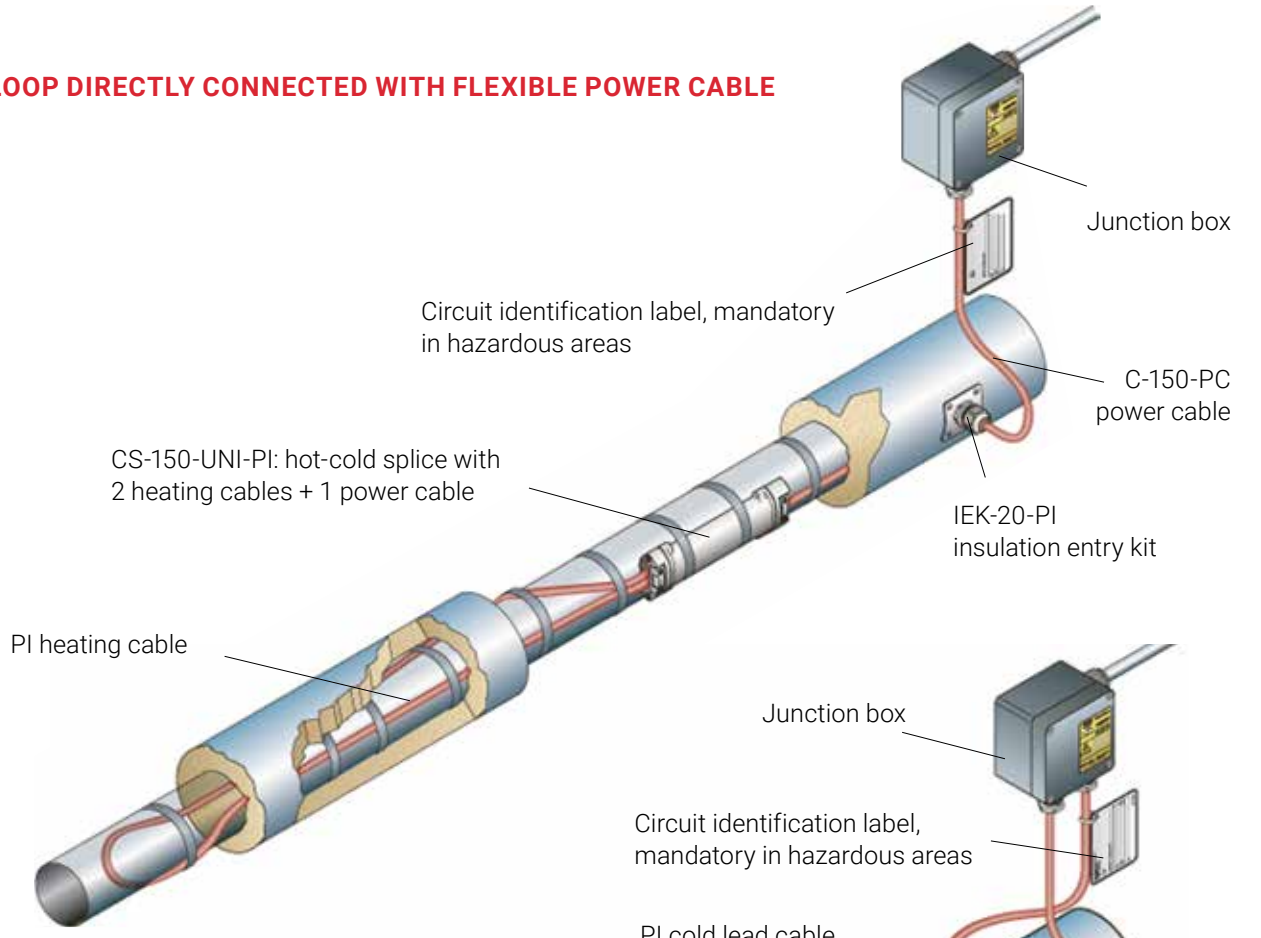
PI heating systems can be used for applications involving maintain temperatures up to 200°C and exposure temperatures up to 300°C. Maximised circuit lengths can significantly reduce the total installed cost.

Refineries	Natural gas plants	General industrial facilities
Crude oil gathering lines (viscosity control)	Natural gas lines (condensation prevention)	Tank farms
Off-site crude oil lines	Sulphur lines (viscosity control & melting)	Storage facilities
Fuel oil lines	Transfer lines	Bitumen lines
Sulphur lines (viscosity control & melting)	Caustic soda lines	Product transfer lines
Transfer lines	Waste water lines	Frost protection of long transfer lines
Caustic soda lines		
Waste water lines		

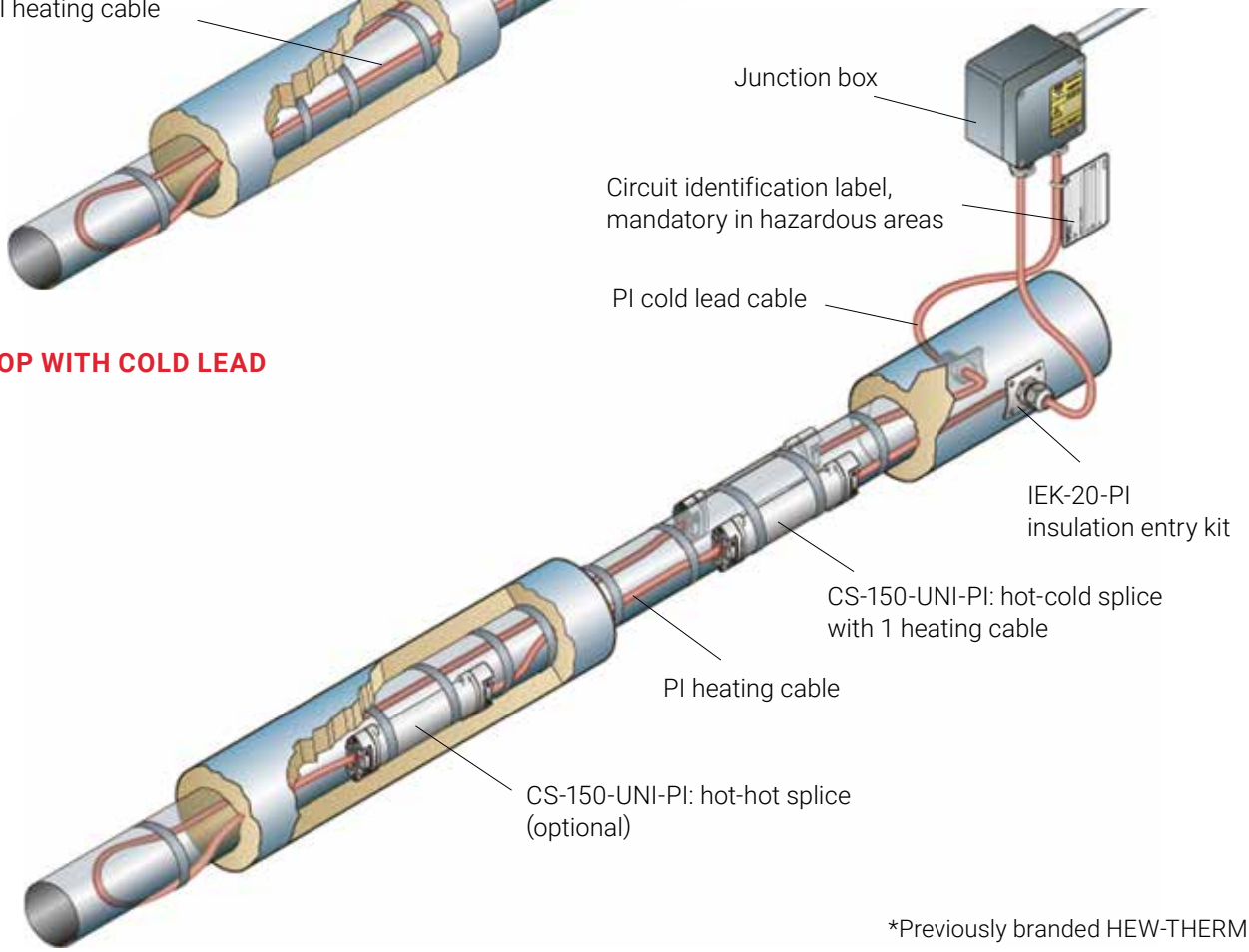
*Previously branded HEW-THERM

Typical Configurations for nVent RAYCHEM PI Heating Systems*

SINGLE LOOP DIRECTLY CONNECTED WITH FLEXIBLE POWER CABLE



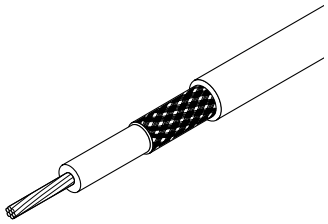
SINGLE LOOP WITH COLD LEAD



*Previously branded HEW-THERM

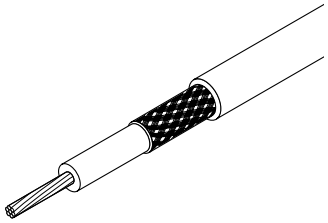
nVent offers Polymer Insulated heating cables in a very wide range of resistances as well as a complete range of components and accessories to build a complete heat-tracing system. All components are fully compatible across the three types and entire range of resistances.

HEATING CABLES



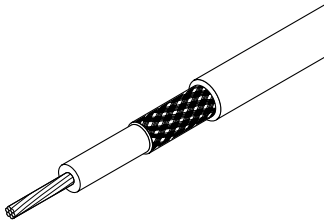
XPI-F

nVent RAYCHEM PI series heating cable for use in hazardous area (gas and dust environments). The heating cable can be used for temperatures up to 90°C with an intermittent exposure up to 100°C. The inner insulation layer consists of a sandwich construction of a polymer rated for lower temperatures and PTFE and the outer jacket is made of a hybrid low temperature polymer, providing a highly flexible, easy to terminate, robust heating cable with good chemical resistance and excellent mechanical strength (4 J impact resistance).



XPI

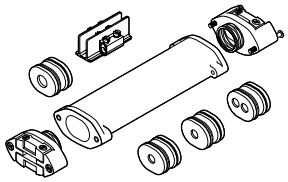
nVent RAYCHEM PI series heating cable for use in hazardous areas (gas and dust environments). The heating cable can be used for temperatures up to 260°C with an intermittent exposure up to 300°C. The inner insulation layer consists of a sandwich construction of high temperature fluoropolymers and PTFE and the outer jacket is made of PTFE, providing a highly flexible, easy to terminate robust heating cable with the highest chemical resistance and excellent mechanical strength (4 J impact resistance), particularly at elevated temperatures.



XPI-S

nVent RAYCHEM PI series heating cable for use in hazardous areas (gas and dust environments). The heating cable can be used for temperatures up to 260°C with an intermittent exposure up to 300°C. The inner insulation layer consists of an extra thick sandwich construction of high temperature fluoropolymers and PTFE and the outer jacket is made of PTFE, providing a highly flexible, easy to terminate very robust heating cable with the highest chemical resistance and most excellent mechanical strength (7 J impact resistance), particularly at elevated temperatures.

COMPONENTS AND ACCESSORIES

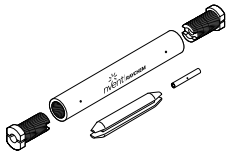


CS-150-UNI-PI

Universal under insulation connection kit for PI heating cables. Approved for use in hazardous areas, cold applied, using screw terminals.

For the splicing and the connection of PI heating cables to cold leads (max 32A) or a 3-core flexible power cable (max 25A).

Glands (M20) and appropriate insulation entry kits need to be ordered separately.

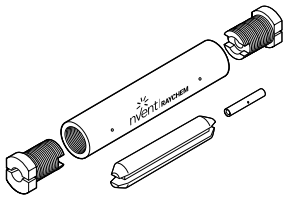


CS-150-2.5-PI

Under insulation splice/connection kit for PI heating cables.

Approved for use in hazardous areas, silicone filled, using crimp connectors.

For the splicing and the connection of PI heating cables to cold leads with a maximum cross section of 2.5 mm^2. Glands (M20) and appropriate insulation entry kits as well as the conductor crimp, need to be ordered separately.

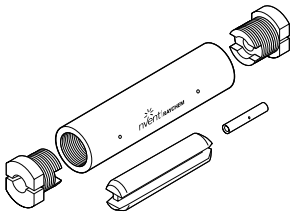


CS-150-6-PI

Under insulation splice/connection kit for PI heating cables.

Approved for use in hazardous areas, silicone filled, using crimp connectors.

For the splicing and the connection of PI heating cables to cold leads with a cross section from 4 to 6 mm^2. Glands (M20) and appropriate insulation entry kits as well as the conductor crimp, need to be ordered separately.

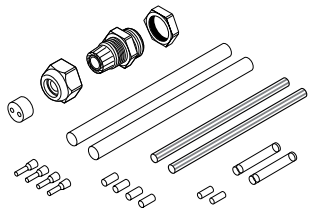


CS-150-25-PI

Under insulation splice/connection kit for PI heating cables.

Approved for use in hazardous areas, silicone filled, using crimp connectors.

For the splicing and the connection of PI heating cables to cold leads with a cross section from 10 to 25 mm^2. Glands (M20) and appropriate insulation entry kits as well as the conductor crimp, need to be ordered separately.

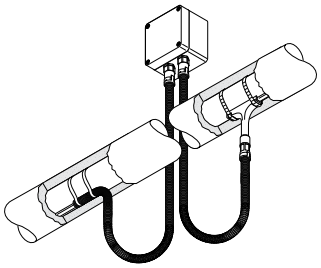


CS20-2.5-PI-NH

Non hazardous area under insulation splice/connection kit for PI heating cables.

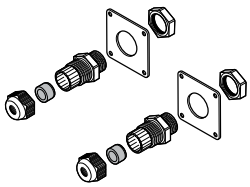
For use in non-hazardous areas only. Heat shrink technology, using crimp connectors.

For the splicing and the connection of PI heating cables to cold leads with a maximum cross section of 2.5 mm^2. Kit includes material for connection of two cold leads and a dual hole grommet/gland (M20).



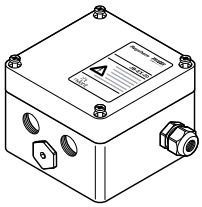
CCON2X.. AND ACCESSORIES

Conduit system for additional mechanical protection of PI heating cables. Designed to allow for usage in hazardous areas and to provide an additional mechanical protection of heating cables or cold lead cables between the junction box and entry into the insulation. Conduit system available in different materials for different temperatures and fully supported with all required accessories for different set ups.



IEK-20-PI

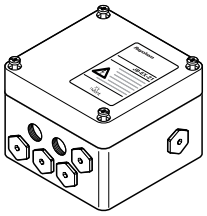
Insulation entry kit for two PI cold leads. Includes two cable glands (M20) with mounting plates. Diameter range: 5-13 mm.



JB-EX-20 (-EP)

Junction box, 3 x M20 entries and 1 x M25 with gland, approved for use in hazardous areas.

Typical use as power-box for PI/MI heating cables. Also available with earth plate (reference JB-EX-20-EP).



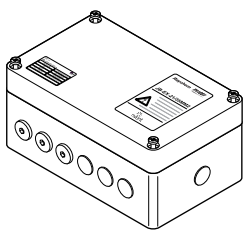
JB-EX-21 (-EP)

Junction box, 6 x M20 and 1 x M32 entries for use in hazardous areas.

Power cable gland (M32) must be purchased separately.

Typical use as power-, splice- and end-box for 3-phase systems with PI/MI heating cables.

Also available with earth plate (reference JB-EX-21-EP)

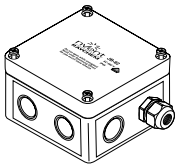


JB-EX-21/35MM2

High load junction box, 6 x M20 and 1 x M40 entries, approved for use in hazardous areas.

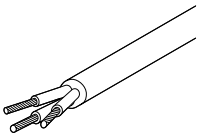
Power cable gland (M40) must be purchased separately.

Typical use as power-, splice- and end-box for 3-phase systems with| PI/MI heating cables.



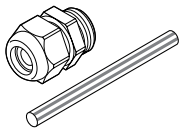
JB-82

Junction box, 4 x M20/M25 pre-punched holes and M25 cable gland for use in non-hazardous areas.



C-150-PC

3-core flexible power cable for connection to CS-150-UNI-PI, 3 x 2.5 mm^2, silicone insulation, temperature range: –40°C to +180°C, short term: 215°C.



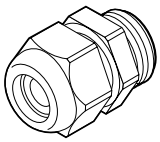
C20-PI-PA-KIT

Cable gland Ex e (M20), polyamide, for use with XPI cold leads up to -40°C. Also includes green/yellow sleeve for braid and locknut.

C20-PI-M0-KIT

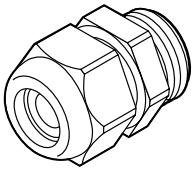
Cable gland Ex e (M20), nickel-plated brass, for use with XPI cold leads up to -55°C. Also includes green/yellow sleeve for braid and locknut.

To be used with metallic or earth plated junction boxes.



GL-45-M32

Cable gland Ex e (M32), up to-55°C, polyamide, for use with power cables with a diameter range of 14 - 21 mm.



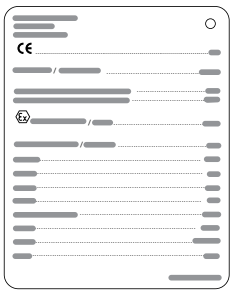
GL-51-M40

Cable gland Ex e (M40), up to -55°C, polyamide, for use with power cables with a diameter range of 19 - 28 mm.

HWA-PLUG-M20-EXE-PLASTIC

Stopping plug Ex e (M20), polyamide, spare part for various junction boxes.

Up to -55°C



PI-LABEL-EX

Circuit identification label for PI heating cables, aluminium, required for marking in hazardous area applications, includes cable tie.

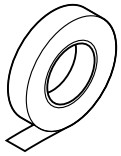
PI-LABEL-NH

Circuit identification label for PI heating cables, aluminium, strongly recommended for marking in non-hazardous area applications, includes cable tie.

LAB-I-01

Self adhesive warning label: For proper marking of electric heat-tracing systems.

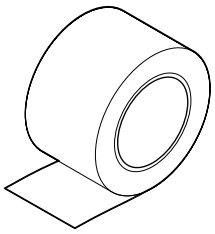
One label per 5 m of traced pipe.



GT-66 AND GS-54

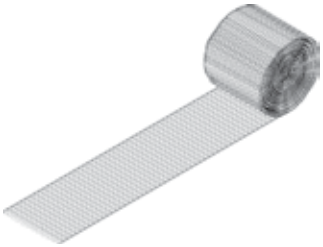
GT-66: Glass fibre fixing tape for polymer insulated heating cables on pipes. Not to be used on stainless steel. 20 m/roll, width: 12 mm.

GS-54: Glass fibre fixing tape for polymer insulated heating cables on stainless steel pipes. 16 m/roll, width: 12 mm.



ATE-180

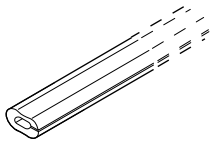
Aluminum adhesive tape, for polymer insulated cables on tanks and pipes, including stainless steel. 55 m/roll, width: 63.5 mm.



HWA-METAL-MESH-SS-50MM-10M

Stainless steel mesh for fixing heating cables on valves, pumps or other odd-shaped surfaces. This mesh provides optimum contact and heat transfer between heating cables and heated equipment and can be used for exposure temperatures of up to 400°C.

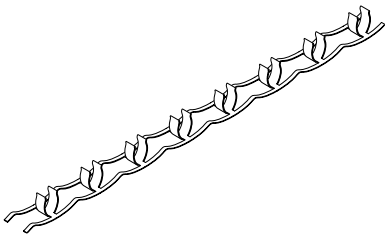
10 m/roll, width: 50 mm.



G-02

Silicone rubber sleeve, mechanically protects heating cables on edges, flanges, insulation cladding. Cut-to-length on-site.

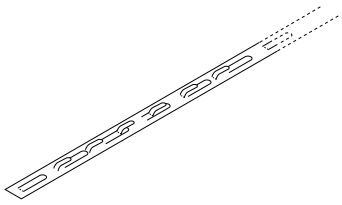
1 m long, temperature resistant up to 215°C.



HWA-PI-FIX-SS-XMM-10M

Stainless steel clip band to attach polymer insulated series heating cables to pipes. Clips at regular distances to allow for even heating cable spacing. Band available in two sizes for different diameter ranges.

Rolls of 10 m.



HARD-SPACER-SS-25MM-25M

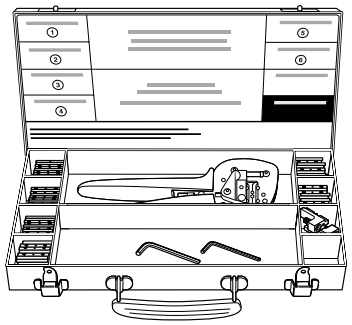
Pre-punched stainless steel strap, which allows fixed distances, when heating cables are attached to surfaces of bigger pipes and vessels.

Punch interval: 25 mm, length: 25 m.

TEMPERATURE CONTROLS

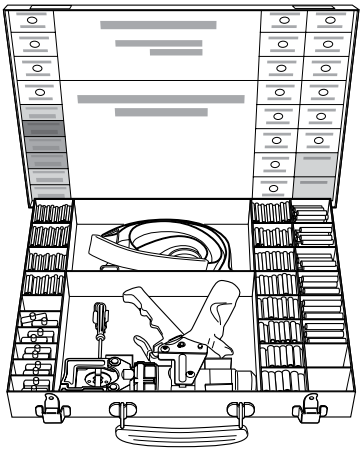
See control and monitoring product range.

SPECIAL TOOLS



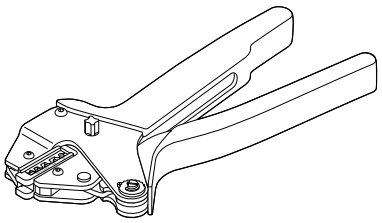
PI-TOOL-SET-01

Metal toolbox containing a mechanical crimp tool, crimping dies and the crimps required for the connection of PI heating cables and cold leads in conjunction with the connection/splice kit type CS-150-2.5-PI (cross section up to 2.5 mm^2). This tool is required for a reliable connection and is also recommended for maintenance purposes.



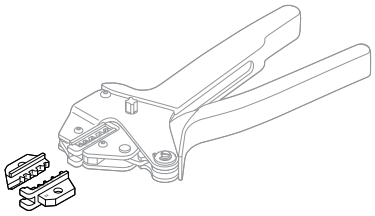
PI-TOOL-SET-02

Metal toolbox containing a hydraulic crimp tool, crimping dies and the crimps required for the connection of PI heating cables and cold leads in conjunction with the connection/splice kits type CS-150-6-PI (cross section 4 - 6 mm^2) and CS-150-25-PI (cross section 10 - 25 mm^2). This tool is required for a reliable connection and is also recommended for maintenance purposes.



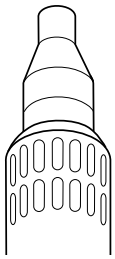
CW-CT-KIT

Crimp tool with dies for installation of crimps for the connection/splice kits type: CS-20-2.5-PI-NH.



CW-CT-DIE

Spare set of dies for crimp tool CW-CT-KIT and crimps of 2.5 mm^2.



CV-1983-220V-3060W

High power heat gun for heat shrink based components. Power output: 3 kW.

Mineral Insulated (MI) Series Heating Systems*

Innovation

Industries worldwide have been benefiting from the unique high-performance capabilities of nVent RAYCHEM MI heating cables for over 75 years. Over the past decade nVent customers have been able to take advantage of a range of innovative developments that have further enhanced the flexibility, reliability and cost-effectiveness of these industry-leading systems.

Alloy 825 sheathed MI heating cables exceed by far the corrosion resistance of standard materials and are most suitable for heat-tracing applications. The introduction of dual conductor heating cables offers economic advantages in particular for shorter circuits, as it requires only half of the length of the heating cable.

Factory terminated Heating units (Brazed or Laser welded) give customers the assurance of the highest integrity and reliability in their heating systems even at highest temperatures and wattages.

2003/04

Introduction of **Alloy 825** sheath material and dual conductor elements

2005

Introduction of **laser welding capabilities**

2014

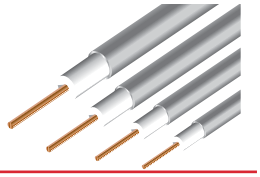
PYROTENAX Products rebranded to **RAYCHEM**

2015

IECEx approvals for entire range

2016

Extension of resistance range for **Alloy 825 cables**



2017

Introduction of formalized **Smart Adaptive Power Control** for MI and Improved brazed capabilities

SAPC

*Previously branded PYROTENAX

The installation of MI heating units requires adequate training and sufficient experience. In particular for hazardous area applications, factory termination of the MI heating units is strongly recommended. Our nVent TRACER team is widely regarded as the premier provider of industrial turnkey heat-tracing solutions. With our full suite of services, from front-end engineering and installation to maintenance and operation services, we are capable of handling heat-tracing projects of any size and scope.

Mineral Insulated (MI) Series Constant Watt Technology*

INTRODUCTION

nVent RAYCHEM MI heating systems provide the optimum solution when power outputs and/or temperatures exceed the limits of any polymeric heating cables.

Operating to voltages up to 600 V

Temperature maintenance up to 600°C

Exposure temperatures up to 1000°C

Circuit lengths up to several kilometres

CONSTRUCTION

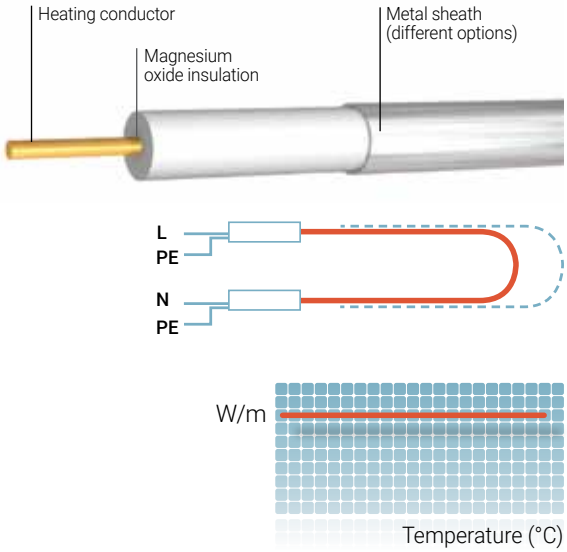
MI heating cables consist of one (single core) or two (dual core) conductors embedded in a highly dielectric magnesium oxide insulation surrounded by a seamless metal sheath. The cables are terminated at the extremities with a non-heating section and seal.

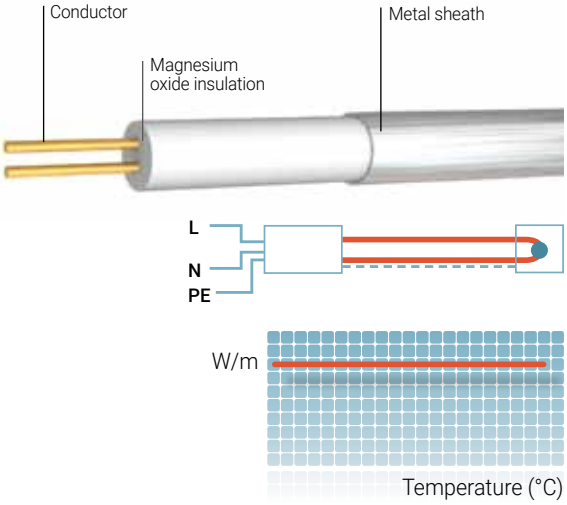
Heating elements are manufactured by brazing the heating cable with a cold lead, either on-site or at the factory.

HOW IT WORKS

Heat is generated in the conductor(s) through the principle of Ohmic resistance heating (Joule effect). A variety of central conductor materials is used, depending on the specific resistance requirements.

Power output and temperatures of a MI series heating system depend on the specific application. Design parameters including type/resistance used, circuit length, applied voltage and electrical configuration directly influence the performance of the heating system. Design and product selection has to be carried out by qualified personnel using appropriate software. Any change to these parameters can be critical and require a revalidation of the design.





*Previously branded PYROTENAX

BENEFITS

LARGE VARIETY OF SHEATH MATERIALS AND RESISTANCES

The extended range of sheath materials ensures that you will find the product which will fit your particular applications perfectly considering temperature withstand capabilities, desired power output as well as corrosion resistance. The wide range of resistances will allow you to design the right heating circuit based on your pipe length or equipment dimensions.

ADAPTABLE TO ALL SPECIFIC APPLICATIONS

Different available constructions and termination styles allow for a wide range of applications: from small instrument lines exposed to very high temperatures to long transfer lines or even specific equipment shapes. High power output provides the solution for melting or vaporizing processes.

FACTORY TERMINATED ELEMENTS FOR ENHANCED RELIABILITY (OPTIONAL WITH LASER WELDING)

Factory-terminated and fully tested units guarantee a consistently high level of quality, providing significant saving on installation time and eliminating risk of rework in the field.

The stainless steel (HSQ), Inconel 600 (HIQ) and Alloy 825 (HAx) heating cables can be delivered with:

- Brazed joints and/or end caps
- Laser welded joints and/or end caps.

We recommend the use of brazed joints and/or end caps if the load or exposure temperatures keep element temperatures below 550°C. For higher element temperatures, laser welded connections are the most suited connection technology.

When brazed connections are used, we recommend the use of Alloy 825 cold leads, regardless of the sheath material of the heating cable, to obtain maximum corrosion resistance on the exposed parts.

This option is also possible with laser welded joints if the exposure temperatures or element temperatures allow for it. (Alloy 825 should not be used at temperatures between 650°C and 750°C)

For use in hazardous areas, MI heating units need to be assembled by nVent or an authorized installer.

APPLICATIONS

Typical applications for mineral insulated cables require either high power, high maintain temperatures or resistance to high exposure temperatures.

Refining Crude Distillation	(Petro-) Chemical	Power Generation	General
Hydrocracking	Phtalic anhydride	High-pressure feedwater	Condensation prevention in filters
Coking	Benzene/Styrene	Blowdown lines	Phase changes (melting, vaporizing)
Wax	Polypropylene	Instrument lines	Salts
Sulphur	Polyethylene	Stream lines	Reactors
Asphalt	Chlorine/Glycol	De-aerator lines	Nuclear industry
Bitumen	Acrylic & adipic acids	High-pressure condensate	
Heavy residue	Dimethyl terephthalate		
Gas condensate prevention	Synthetic fiber components		

Characteristics of nVent RAYCHEM MI Cables*

Due to their particular construction, based on a resistive heating element and metallic sheath material, the design of an application and selection of a relevant heating cable follows some specific rules:

- Evaluation of corrosive agents potentially existing in the environment in order to check compatibility of heating cable outer sheath (see table 1).
- Estimation of maximum sheath temperature and maximum output based on cable family and methodology of fabricating elements, brazing or laser welding (see table 2).
- Determination of the actual output power based on applied voltage, length and resistance of heating elements.

The cables are terminated at the extremities with a non-heating section and seal, a so called 'cold lead'. The connections and seals are critical factors for safe and reliable operation. Although on-site terminations are possible, they can only be executed by personnel experienced and trained in brazing techniques. MI heating systems can be supplied as factory-terminated and tested units to guarantee a consistently high level of quality. (see Figure 1).

Stainless steel, Inconel 600 and Alloy 825 heating cables can be delivered with either brazed joints and/or end caps or laser welded joints and/or end caps. We recommend the use of brazed joints and/or end caps if the load or exposure temperatures keep element temperatures below 550°C. For higher element temperatures, laser welded connections are the most suited connection technology.

Heating cables with Alloy 825 sheath are also available in a dual conductor version, which offers a significant technical advantage when space is limited or when high resistances are required, such as for high temperature instrumentation lines or short branches. They also significantly reduce installation times, as only half of the length of the heating cable is required (see Figure 2).

Our unique design software TraceCalc Pro provide support for simplifying the design and selection process.

MI heating unit type B (single conductor)

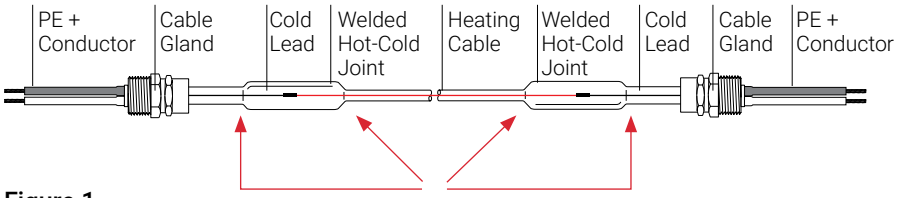


Figure 1

MI heating unit type D (dual conductor)

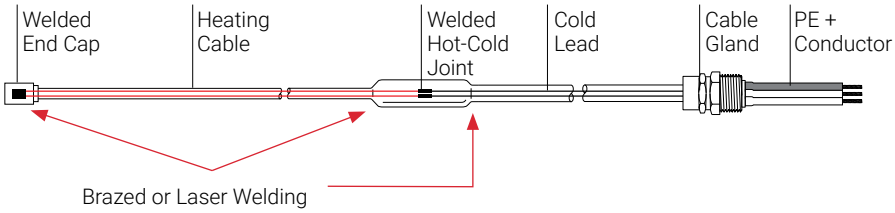


Figure 2

*Previously branded PYROTENAX

This table gives an indication of the corrosion resistance of the available sheath materials against different corrosive agents.

Table 1

nVent RAYCHEM MI heating cable type	Sulphuric acid	Hydrochloric acid	Hydrofluoric acid	Phosphoric acid	Nitric acid	Organic acids	Alkalis	Salts	Sea water	Chlorides
HCC	NR	NR	A	A	NR	A	A	X	NR	X
HCCH	GE	GE	A	A	A	NR	A	A	A	A
HDC/HDF	NR	X	X	X	X	X	X	X	GE	GE
HSQ	NR	NR	NR	NR	X	GE	A	A	NR	NR
HIQ	X	X	A	X	X	GE	GE	GE	A	GE
HAx	GE	GE	GE	GE	GE	GE	GE	GE	GE	GE

GE Good to excellent **A** Acceptable **X** Check for specific data **NR** Not recommended

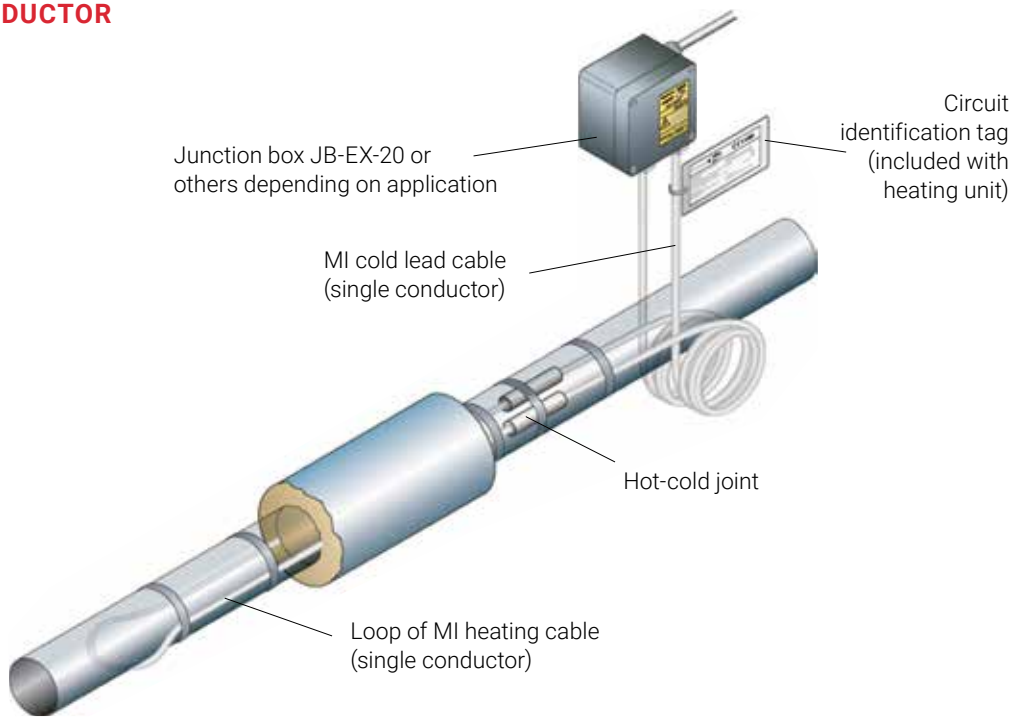
Table 2

MI Heating Cable Reference	Sheath Material	Max. Sheath Temperature	Max. Typical (1) Power Output
HCC (*)	Copper (*optional additional sheath "H" for HDEP)	200°C (limited to 80°C with HDPE)	50 W/m
HDC/HDF	Cupro-Nickel (70/30)	400°C	70 W/m
HSQ	Stainless Steel 321	450°C (ATEX) / 550°C (Ordinary) (700°C with laser welded joints)	150 W/m
HIQ	Inconel 600	450°C (ATEX) / 550°C (Ordinary) (700°C with laser welded joints)	300 W/m
HAx	Alloy 825	550°C (700°C with laser welded joints)	270 W/m

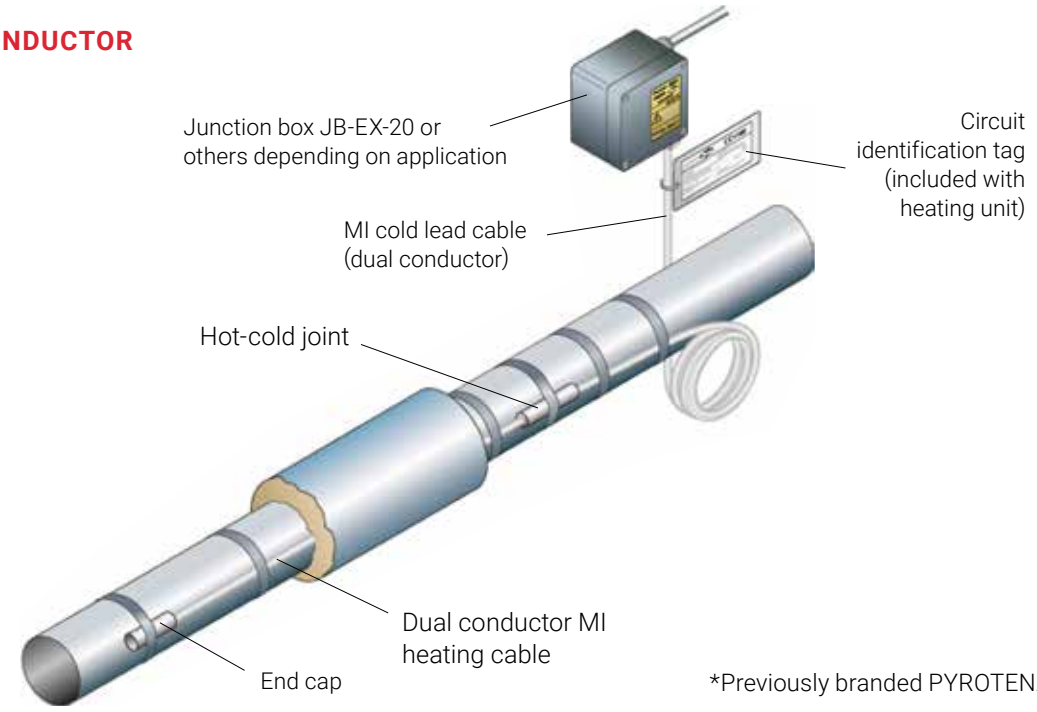
(*) Corrosion resistance data is dependent on temperature and concentration.
(1) Typical value, allowed max. power output dependent on the application. Consult nVent for more information.

Typical Configuration for nVent RAYCHEM MI Heating Cable Systems*

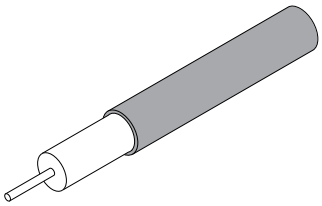
SYSTEMS WITH SINGLE CONDUCTOR



SYSTEMS WITH DUAL CONDUCTOR



*Previously branded PYROTENAX

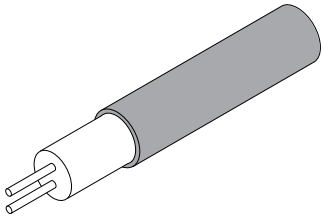


HCH/HCC

nVent RAYCHEM Copper sheathed MI cable approved for use in hazardous areas (gas and dust environments). The maximum exposure temperature s is 200°C and the typical maximum load is 50 W/m*. Copper cables are also available with an over-sheath in HDPE (max. 80°C) for enhanced corrosion protection.

HDF/HDC

Cupro-nickel (70/30) sheathed MI cable approved for use in hazardous areas (gas and dust environments). The maximum exposure temperature is 400°C and the typical maximum load is 70 W/m*.



HSQ

Stainless steel (321) sheathed Mineral Series (MI) heating cable approved for use in hazardous areas (gas and dust environments). The maximum exposure temperature is dependent on the technology used for the hot-cold joint assembly. Silver solder joints allow for exposure temperatures up to 450°C (ATEX) / 550°C (Ordinary) while laser welded joints can withstand 700°C. The typical maximum load is 150 W/m*.

HAx

Alloy 825 sheathed MI cable approved for use in hazardous areas (gas and dust environments) are available in both single and dual conductor versions. Dual conductor heating cables are available for voltage ratings of 300 Vac (HAx2M) and 600 Vac (HAx2N). The maximum exposure temperature is dependent on the technology used for the hot-cold joint (and end cap) assembly.

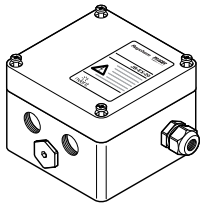
Silver solder joints (and end caps) allow for exposure temperature up to 550°C while laser welded joints (and end caps) can withstand 700°C. The typical maximum load for single conductor cables is 210 W/m while dual conductors can be powered up to 270 W/m*.

HIQ

Inconel 600 sheathed MI cable approved for use in hazardous areas (gas and dust environments). The maximum exposure temperature is dependent on the technology used for the hot-cold joint assembly. Silver solder joints allow for exposure temperature up to 450°C (ATEX) / 550°C (Ordinary) while laser welded joints can withstand 700°C. The typical maximum load is 300 W/m*.

* Typical power output dependent on the application and cable construction. Higher power outputs and/or higher exposure temperatures are possible. Contact nVent for more information.

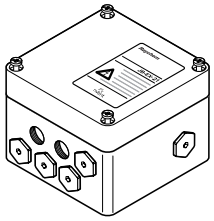
JUNCTION BOXES



JB-EX-20 (-EP)

Junction box, 3 x M20 entries and 1 x M25 with gland, approved for use in hazardous areas.

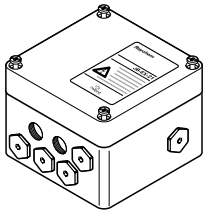
Typical use as powerbox for PI/MI heating cables. Also available with earth plate (reference JB-EX-20-EP).



JB-EX-21

Junction box, 6 x M20 and 1 x M32 entries for use in hazardous areas. Power cable gland (M32) must be purchased separately.

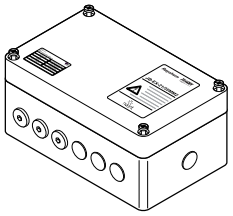
Typical use as power-, splice- and end-box for 3-phase systems with PI/MI heating cables.



JB-EX-21/35MM2

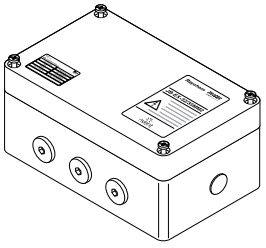
High load junction box, 6 x M20 and 1 x M40 entries, approved for use in hazardous areas. Power cable gland (M40) must be purchased separately.

Typical use as power-, splice- and end-box for 3-phase systems with PI/MI heating cables.



JB-EX-25/35MM2

High load junction box, 6 x M25 and 1 x M40 entries, approved for use in hazardous areas. Power cable gland (M40) must be purchased separately. Typical use as power-, splice- and end-box for 3-phase systems with MI heating cables.

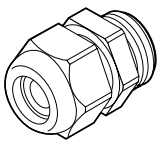


JB-EX-32/35MM2

High load junction box, 3 x M32 and 1 x M40 entries, approved for use in hazardous areas. Power cable gland (M40) must be purchased separately.

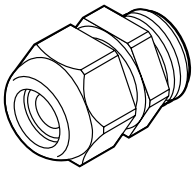
Typical use as power-, splice- and end-box for 3-phase systems with MI heating cables, in particular for dual conductor heating elements.

GLANDS



GL-45-M32

Cable gland Ex e (M32), polyamide, for use with power cables with a diameter range of 14 - 21 mm. Up to -55°C

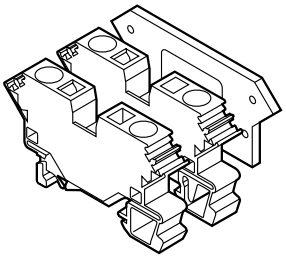


GL-51-M40

Cable gland Ex e (M40), polyamide, for use with power cables with a diameter range of 19 - 28 mm. Up to -55°C

HWA-PLUG-M25-EXE-PLASTIC

Stopping plug Ex e (M25), polyamide, spare part for various junction boxes.



HWA-WAGO-PHASE

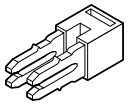
Phase/neutral terminal (Ex e), spare part for various junction boxes, max. 10 mm^2 solid/stranded.

HWA-WAGO-EARTH

Earth terminal (Ex e), spare part for various junction boxes, max. 10 mm^2 solid/stranded.

HWA-WAGO-ENDPLATE

End plate for terminals HWA-WAGO-..., 10 mm^2 terminals, spare part.



HWA-WAGO-JUMPER

Jumper to bridge terminals HWA-WAGO-..., 10 mm^2 terminals.

HWA-WDM-PHASE-35

Phase/neutral terminal (Ex e), spare part for various junction boxes, max. 35 mm^2 solid/stranded.

HWA-WDM-EARTH-35

Earth terminal (Ex e), spare part for various junction boxes, max. 35 mm^2 solid/stranded.

HWA-WDM-PLATE

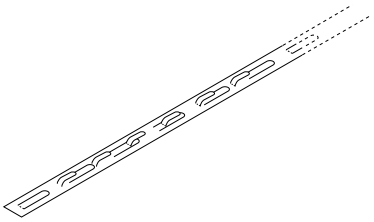
End plate for terminals HWA-WDM-..., 35 mm^2 terminals, spare part.

HWA-WDM-JUMPER-35-2

Jumper to bridge 2 terminals HWA-WDM-..., 35 mm^2 terminals, spare part.

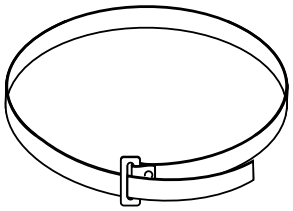
HWA-WDM-JUMPER-35-3

Jumper to bridge 3 terminals HWA-WDM-..., 35 mm^2 terminals, spare part.



HARD-SPACER-SS-25MM-25M

Pre-punched strap in stainless steel, which controls spacing distances when heating cables are attached to surfaces of bigger pipes and vessels. Punch interval: 25 mm.

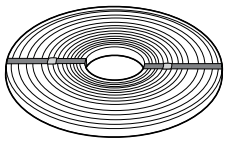


AVAILABLE PIPE STRAPS

Stainless steel pipe straps for holding MI cable onto pipe. Tighten with pliers.

Allow one strap per 30 cm of pipe

Part No.	Pipe Diameter	Packing Qty
PB 125	to 1 ¼" (32 mm)	50 pc
PB 300	1 ½" to 3" (38 - 75 mm)	35 pc
PB 600	3 ½" to 6" (89 - 150 mm)	25 pc
PB 1000	6" to 10" (150 - 250 mm)	1 pc
PB 1200	to 12" (300 mm)	1 pc
PB 2400	to 24" (600 mm)	1 pc
PB 3600	to 36" (900 mm)	1 pc

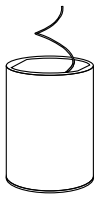


SNLS

Plain stainless steel banding/strip for holding MI cables in place on pipes. 30 m roll. Secured with buckles.

SNLK

Stainless steel buckles for use with metal banding strip type SNLS.



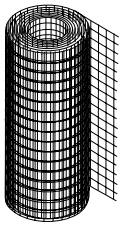
RMI-TW

Tie wire for fastening steel heating cables on pipes. Especially suitable for irregular shaped objects such as pumps, valves, flanges. Supplied in 50 m reels.

Do not use with copper or cupro nickel sheathed heating cables; use straps wherever possible.

Allowances for tie wire and banding on pipes.

Pipe Size (mm)	25	40	50	100	150	200	250	300	350	400	450	500	600	750	900	1200
Required length (m) per m of pipe	0.8	1.1	1.2	1.6	2.1	2.8	3.5	4.2	4.6	5.2	5.9	6.5	7.9	9.8	11.8	15.7



FT-19/FT-20

Zinc-plated metal mesh (FT-19) or stainless steel metal mesh (FT-20) for holding MI heating cables in place on pipes, tanks or other equipment.

Supplied in 25 m rolls (approx. width 1 m).

HWA-MESH-SS-50MM-10M

Stainless steel mesh for fixing heating cables on valves, pumps or other odd-shaped surfaces. This mesh provides optimum contact and heat transfer between heating cables and heated equipment and can be used for exposure temperatures of up to 400°C, width: 50 mm, rolls of 10 m.

WARNING LABELS

LAB-I-01

Self adhesive warning label: For proper marking of electrical trace heating systems. One label per 5 m of traced pipe.

Attach to outside of thermal insulation on both sides of pipe and also at equipment such as valves, pumps requiring periodic maintenance.

TEMPERATURE CONTROLS

See control and monitoring product range (p.41)

Control and Monitoring Systems

Innovation

Since the introduction of the MoniTrace 200 multi-circuit network system back in the last millennium, nVent has continued to lead the field in advanced control and monitoring technology. Ground fault and line current monitoring and alarms have made systems safer and reduced costs.

The ability to combine local and central control systems has enabled the optimisation of total installation and total operating costs.

The introduction and continuous development of our innovative nVent RAYCHEM NGC family, its associated software and touch-screen technology keeps us at the forefront of control and monitoring for industrial heat-tracing applications.

1995

MoniTrace 200 multi-circuit, networkable heat-tracing control and monitoring with PASC, line sensing etc.

2006

DigiTrace* NGC-30 adds a touchscreen and full integration with DigiTrace* Supervisory Software.

2008

DigiTrace* NGC-20-C-E first fully integrated EEx heat-tracing controller featuring **"local control-central monitoring".**

2008

DigiTrace* NGC-20-CL-E first EEx SIL2 heat-tracing safety limiter.

2011

DigiTrace* NGC-40 Advanced panel mounted modular control, monitoring and power distribution system with a single control module per heat-tracing circuit architecture.

2014

DigiTrace products rebranded to **RAYCHEM**

2015

Standard Control and Power Distribution panels

2017

Enhanced connectivity to customer DCS systems

*Rebranded to RAYCHEM

Discover the nVent RAYCHEM world that will change your vision on electrical heat tracing controls

A Variety of Systems to Serve your Particular Needs...

The nVent RAYCHEM product range completes nVent offering with a wide range of various systems for the control and monitoring particularly suited to electric heat-tracing (EHT) applications. nVent RAYCHEM control and monitoring systems encompass products that range from most proven and economical simple mechanical thermostats to the very latest innovations in local control and central monitoring systems.

Many aspects can influence the selection of the most appropriate control and monitoring solution for each project and application. The most effective solutions are most often a blend of various combined technologies to achieve a balance between total installed costs (TIC) and long-term benefits associated with the entire heat management system, total operating cost (TOC), during the life of the plant.

What you should Consider before Selecting your System

CHOOSE THE OBJECTIVE FOR YOUR CONTROL SYSTEMS

Each of our control systems provides its own level of technical features and benefits, depending on the process requirements and the number of circuits.

The objective of control in electrical heat-tracing can be:

FROST PROTECTION

Applied to fluids that must be kept above a minimum temperature - typically 5°C – e.g. for water lines and where moderate overheating of the fluid is not a major concern.

BROAD TEMPERATURE MAINTENANCE

Appropriate when the process temperature must be controlled within a moderate range. This is generally used for viscosity control to keep process fluids such as fuel oil flowing.

NARROW TEMPERATURE MAINTENANCE

Applied to fluids that must be kept within a narrow temperature range to maintain viscosity and prevent fluid or pipe degradation. Typical examples include sulphur and acrylic acid lines.

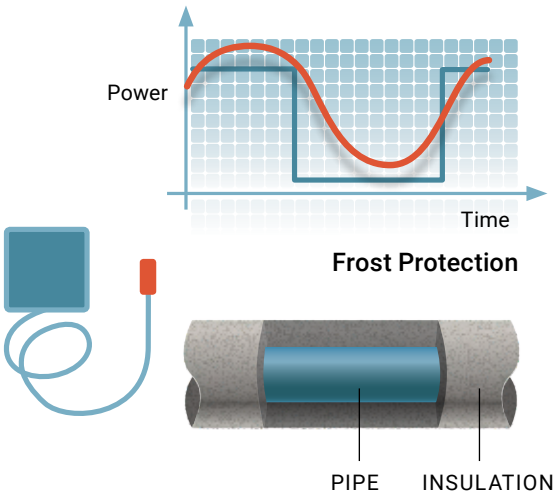
What you should Consider before Selecting your System

SELECT THE APPROPRIATE METHOD OF CONTROL

The choice of the controller depends on whether the system is required to be controlled on the basis of ambient or pipe/equipment surface temperature, which is dependent on the process requirements and, possibly, the equipment limitations.

There are three methods of control for EHT systems.

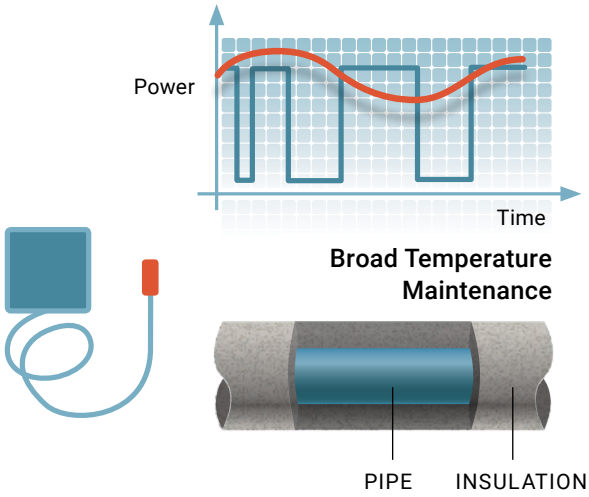
AMBIENT SENSING CONTROL



Uses a simple on-off algorithm based on ambient temperature. It is more energy efficient than just self-regulating control because the heating circuit is energised only when the temperature descend below the set point.

The control device can be either a mechanical thermostat or an electronic controller. Ambient thermostats are generally sufficiently accurate and reliable to provide an economical solution for most frost-protection applications.

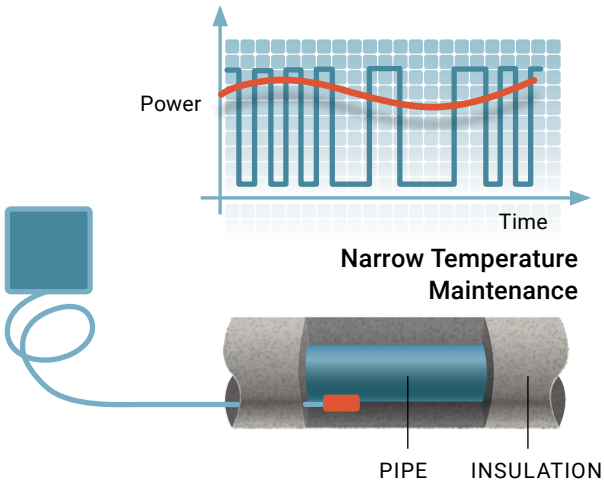
PROPORTIONAL AMBIENT SENSING CONTROL (PASC)



Uses an electronic controller that senses ambient temperature and continuously matches the heat input to the predicted heat loss that occurs due to changing ambient conditions.

A pre-programmed algorithm calculates the cycle time that the heating circuits will be energised to maintain the desired temperature. PASC is suitable for all broad temperature-control and many narrow temperature-control applications. Compared to line sensing, the use of PASC can significantly reduce the number of circuits, as flow paths don't need consideration and can help reducing total installed cost of a project whilst reducing energy consumption.

LINE SENSING CONTROL



Is based on the pipe/equipment temperature. With this option, each flow path has a separate circuit controlled by a mechanical line-sensing thermostat or electronic controller. The control unit turns on the heating circuit when the pipe temperature descend below the desired maintain temperature.

Line sensing offers the most accurate control for narrow temperature band applications.
Total installed cost of line sensing systems can be considerably higher than systems based on ambient temperature, as the average circuit length of the EHT system is typically significantly lower based on pipe lengths and possible flow paths.

Determine the Control and Monitoring Philosophy

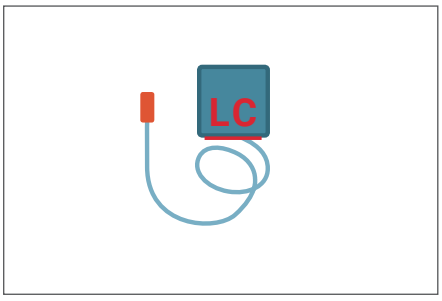
An overarching control and monitoring philosophy must be established for a project before any products can be selected. Types and methods of control and monitoring need to be chosen based on various aspects:

- Process requirements (temperatures, flow path considerations, alarm requirements, upset conditions)
- Maintenance strategy (simplicity, local or central monitoring, location of installation)
- Power distribution parameters (location of panels, substations, cabling requirements)
- Economical considerations (optimisation of TIC, TOC)

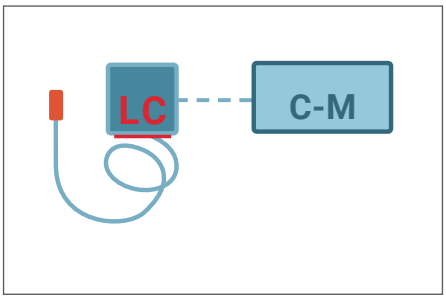
It is also worth considering incorporating a variety of monitoring options into the system design. The use of monitoring of the circuit integrity increases the overall system reliability as failures in the heating and power distribution systems can be reported to operations and maintenance personnel locally or at a central location.

There are 3 main philosophies, each with it's advantages and limitations:

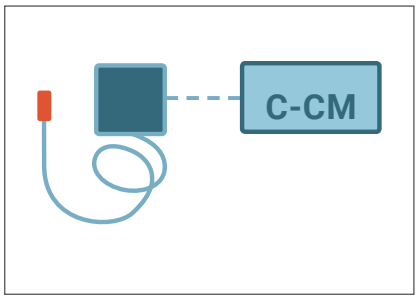
LOCAL CONTROLS



LOCAL CONTROLS WITH CENTRAL MONITORING



CENTRAL CONTROLS AND MONITORING



Select your System - for Lowest Installation Cost

LOCAL CONTROL

This employs locally-mounted thermostats that are installed in the field and typically directly switch the heat-tracing circuit. It offers the lowest installation cost but is limited in its applicability and makes a minimal contribution to lowering total operational costs (TOC). The cost and complexity of maintenance for this philosophy is high unless it is combined with the possibility of central monitoring.

There are mechanical and electronic options, depending on process requirements, each of which offers models for use in both hazardous and non-hazardous areas.

nVent RAYCHEM Mechanical thermostats are based on the bulb and capillary principle and are used for frost protection or temperature maintenance with a relatively narrow temperature band.

BENEFITS

Easy installation and commissioning

Low installation cost

Relatively accurate control

They are limited by: No temperature monitoring, imprecise setpoint setting, no maintenance information available , limited temperature range

nVent RAYCHEM Electronic thermostats measure temperature through an electronic circuit wired to a temperature sensor. More sophisticated models offer additional features such as a temperature display, high/low temperature alarms or proportional ambient sensing control. They are mainly used for temperature maintenance requiring a narrow temperature band.

BENEFITS

Easy installation and commissioning

Low installation cost

Accurate control

Sensor leads can be extended

They are limited by: Monitoring capabilities only in the field, no maintenance information centrally available, so maintenance can only be carried out reactively

Select your System - for Increased Reliability, Minimised Cabling and Reduced Total Operating Cost

LOCAL CONTROL - CENTRAL MONITORING

Advanced field-mounted controllers offer the option for direct switching locally in the field with the monitoring and configuration capabilities of a centralised control system. The controllers communicate via a bus system to a central location and can be configured and monitored in the field, via a hand-held device or remotely, via a touch-screen user interface and supervisory software.

This control and monitoring philosophy offers advantages for critical processes, small pipe networks and for high hold-temperature applications by minimising cabling costs, reducing total operating cost and the project schedule by standardising panel design.

nVent RAYCHEM NGC-20

BENEFITS

- **Increased reliability,** by permanent supervision of the integrity of the circuits.
- **Cost savings,** by reduction of power cabling, RTD wiring and simplified power distribution.
- **Easier to install.** By making direct heating cable connections you can reduce field junction boxes, lowering power cable cost, installation time and maintenance.
- **Efficient process follow-up,** by monitoring & alarming of temperatures, ground-fault currents, operating currents and voltages.
- **Increased personnel safety** and **simplified maintenance,** by detailed problem reporting and accurate history logs.
- **Simplified maintenance activities** with hand held device (= monitoring of the heat-tracing system in the field without opening the control unit)

Select your System - for Assured Reliability and Reduced Total Operating Cost

CENTRAL CONTROL - CENTRAL MONITORING

Central control and monitoring systems are typically installed in panels where they provide control and monitoring for several heat-tracing circuits or groups of circuits at the same time. They offer advanced features like measuring ground-fault levels, operating currents and provide a wealth of other maintenance-related information.

nVent has a family of panel controllers with advanced control and monitoring capabilities specifically designed to meet the demands of industrial heat management systems. The controllers can be installed in any combination to deliver an optimised system for specific applications.

nVent RAYCHEM NGC-40 panel

BENEFITS

- **Increased reliability,** by permanent supervision of the integrity of the circuits.
- **Highest control flexibility** via 1-phase or 3-phase controllers
- **Highest safety integrity** level with the intelligent SIL 2 safety temperature limiter
- **Cost savings,** by reduction of power cabling, RTD wiring and simplified power distribution.
- **Efficient process follow-up**, by monitoring & alarming of temperatures, ground-fault currents, operating currents and voltages.
- **Full heat-tracing control** via dedicated temperature, power and current control algorithms
- **Increased personnel safety** and **simplified maintenance,** by detailed problem reporting and accurate history logs.

Selection Charts*

Where permanent monitoring of a heat-tracing circuit's integrity is required, the initial selection can be made from the advanced nVent RAYCHEM controllers table.

Capabilities	nVent RAYCHEM NGC-20	nVent RAYCHEM NGC-30	nVent RAYCHEM NGC-40	nVent RAYCHEM HTC-915	nVent RAYCHEM TCONTROL-CONT-03	nVent RAYCHEM TCON-CSD/20
Location of controller						
Panel mounted		x	x	x	x	x
Field mounted	x					
Hazardous area	x					
Control						
Ambient sensing	x	x	x	x	x	x
PASC	x	x	x	x		
Line sensing	x	x	x	x	x	x
Proportional		x	x		x	
Safety temperature limiter	x *2		x *2	x		
Adaptive current control			x	x		
Monitoring						
Ambient temp	x	x	x	x	x	
Pipe temp	x	x	x	x	x	x
Ground fault	x	x	x	x		
1-phase current measurement	x	x	x	x		
3-phase current measurement			x			
Voltage	x	x		x		
Communication						
Local display	x	x	x	x	x	x
Hand held wireless	x					
Remote display	x	x	x			
Supervisor software	x	x	x	x		
DCS integration	x	x	x	x		
Temperature range controller	−80°C +700°C	−73°C +482°C	−80°C +700°C	−60°C +570°C	−200°C +2400°C	−200°C +500°C
Temperature range limiter	−60°C +599°C	-	+50°C +500°C	−20°C +450°C (T1 to T6)		
Number of circuits per controller						
1 circuit/controller	x	x	x	x	x	x
>1 circuit/controller		x	x			

***2: SIL2 certified**

*Previously branded DigiTrace

The controller selection table presents an overview of all basic product information enabling you to select the products that match your chosen control method and control philosophy.

Name	Field/Panel	Mechanical/ Electronic	Hazardous/ Non-Hazardous	Line Sensing	PASC	Ambient	Controller temperature setting	Sensor exposure temperature	Limiter temperature setting	Limiter Sensor Exposure Temperature
T-M-10-S/0+50C	Field	Mech.	Non-Haz.	*		*	0°C +50°C	−40°C +60°C		
T-M-10-S/0+200C	Field	Mech.	Non-Haz.	*			0°C +200°C	−20°C +230°C		
T-M-10-S/+50+300C	Field	Mech.	Non-Haz.	*			50°C +300°C	−20°C +345°C		
T-M-20-S/0+50C	Field	Mech.	Non-Haz.	*			0°C +50°C	−40°C +60°C	+20°C +150°C	−40°C +170°C
T-M-20-S/0+200C	Field	Mech.	Non-Haz.	*			0°C +200°C	−20°C +230°C	+130°C +200°C	−20°C +230°C
T-M-20-S/+50+300C	Field	Mech.	Non-Haz.	*			+50°C +300°C	−20°C +345°C	+20°C +400°C	−40°C +500°C
AT-TS-13	Field	Elec.	Non-Haz.	*		*	-5°C +15°C	−20°C +80°C		
AT-TS-14	Field	Elec.	Non-Haz.	*			0°C +120°C	0°C +160°C		
RAYSTAT-ECO-10	Field	Elec.	Non-Haz.		*		0°C +30°C	−40°C +150°C		
RAYSTAT-CONTROL-10	Field	Elec.	Non-Haz.	*			0°C +150°C	−40°C +150°C		
RAYSTAT-EX-02	Field	Mech.	Haz.	*			−4°C +163°C	−50°C +215°C		
RAYSTAT-EX-03	Field	Elec.	Haz.	*			0°C +499°C	−50°C +585°C		
RAYSTAT-EX-04	Field	Elec.	Haz.			*	0°C +49°C			
ETS-05-L2-E	Field	Elec.	Haz.	*		*	0°C +199°C			
ETS-05-H2-E	Field	Elec.	Haz.	*		*	0°C +499°C	−50°C +585°C		
T-M-20-S/+0+200C/EX	Field	Mech.	Haz.	*			+0°C +200°C	−40°C +230°C	+50°C +300°C	−40°C +345°C
T-M-20-S/+50+300C/EX	Field	Mech.	Haz.	*			+50°C +300°C	−40°C +345°C	+50°C +300°C	−40°C +345°C
NGC-20-C-E	Field	Elec.	Haz.	*	*	*	−80°C +700°C	(*1)		
NGC-20-CL-E	Field	Elec.	Haz.	*	*	*	−80°C +700°C	(*1)	−60°C +599°C (*2)	(*1)
NGC-30	Panel	Elec.	Haz. (*3)	*	*	*	−73°C +482°C	(*1)		
NGC-40	Panel	Elec.	Haz. (*3)	*	*	*	−80°C +700°C	(*1)	−50°C +500°C (*2)	
HTC-915	Panel	Elec.	Haz. (*3)	*	*	*	−60°C +570°C	(*1)	−20°C +450°C	(*1)
TCONTROL-CONT-03	Panel	Elec.	Haz. (*3)	*		*	−200°C +2400°C	(*1)		
TCON-CSD/20	Panel	Elec.	Haz. (*3)	*		*	−200°C +500°C	(*1)		

*1: Sensor dependent | *2: SIL2 certified | *3: in combination with hazardous area approved sensor
Mech.: Mechanical | Elec.: Electronic | Non-Haz.: Non-Hazardous | Haz.: Hazardous

nVent
RAYCHEM

Special Applications and Systems

nVent TRACER Trac-Loc Thermal Insulation for Pipes and Tanks

When time comes to propose innovative solutions for thermal insulating systems, nVent's 50 years of continuous innovation sets the standard. Trac-Loc for tanks and Trac-Loc for pipes are advanced thermal insulation solutions dedicated to large storage tanks and transfer piping systems.

No need for scaffolding and less required manpower in the field provides the basis for compressed schedule and improved safety records.

NVENT TRACER TRAC-LOC FOR TANKS

Vertical lock-seam innovative insulation systems.

The Trac-Loc advanced interlock panel system consists of prefabricated panels of insulation and jacketing material.

These panels, fabricated to the height of the storage tank, include mating seams that are mechanically joined (folded).

This innovative seam creates a homogenous jacket that not only secures the panels to the storage tank, but also reduces moisture ingress, has superior bend resistance, and has inherent expansion and contraction properties.

BENEFITS

Safe and cost effective

Eliminating the need for scaffolding results in a lower installed cost, less time spent on the construction site, and improved safety records.

Superior structure

Unique interlocking seams and closed cell insulation material structure provide a high rigidity, reduce moisture ingress and therefore minimise under –insulation corrosion.

High energy savings

By using non-fibrous materials with closed cell structure the thermal insulation is superior and energy costs can be reduced drastically.

Maintenance free

Interlocking panels eliminate the use of external horizontal bands that require maintenance over time. Screws are not required, so jacket penetrations are eliminated.

Unique design

Trac-Loc panels offer a wide range of colors for a clean finished look.

nVent TRACER Trac-Loc thermal insulation systems provide higher level of protection for large storage tanks and long transfer lines

Pipe supports installed over the cladding guarantee uniform thermal profile along the entire pipe length.

TRAC-LOC FOR PIPES

Pre-traced pre-insulated piping systems for transfer lines of sensitive products.

When the worst conditions are to be considered, you need to rely on one system which will protect your investment. Transfer pipelines are vital to transport your high value products from manufacturing plants to export facilities. Trac-Loc provides the level of protection you are looking for.

A seaming machine creates a continuous casing into which is slid the product pipe equipped with heat-tracing tubes. Injection of last developed PIR foams creates the necessary thermal barrier to limit heat losses. Robustness of external cladding and density of foam allow clamping of pipe support brackets on the outer casing. Therefore no water ingress can occur.

BENEFITS

Improved project schedule

By pre-fabricating the insulation on pipes the time on the construction site can be reduced drastically.

Improved safety records

By shifting the insulation works to a professional workshop, the operations on the construction site are reduced.

Superior structure

Multi-layer thermal insulation system with high temperature inner layer, load bearing out layer, and UV resistant out jacket. Engineered pipe supports, guide plates and anchors.

Uniform thermal profile

The rigid insulation structure allows the support brackets to be mounted on the outer cladding. This eliminates local thermal losses and moisture ingress.

Long life

By using superior closed cell insulation and unique seaming of the pipe sections moisture ingress is reduced drastically and internal corrosion can be eliminated. This guarantees a longer life of your equipment.

Frost Heave Prevention of Cryogenic Storage Tanks

nVent is the unquestionable leader in electrical heat-tracing systems. Since the 1970's we have been involved in the frost heave prevention (FHP) of cryogenic storage tanks and was the pioneer in using self-regulating heating cable.

Viability of electrical heating cables in frost heave prevention applications of cryogenic tanks highlights the necessity using a design software, taking into account not only the thermodynamic model of heat transfer for these tanks, but also the specific behaviour of each type of heating cable technology and their related output curves within conduits buried in concrete.

Every LNG system that is evaluated has an infinite number of equations that define it. Making logical assumptions allows a designer to determine the likely reaction of a system. The closer the system is to reality, the more equations that define it. nVent design tools includes from 2D steady state analysis up to 3D finite element analysis transient analysis.

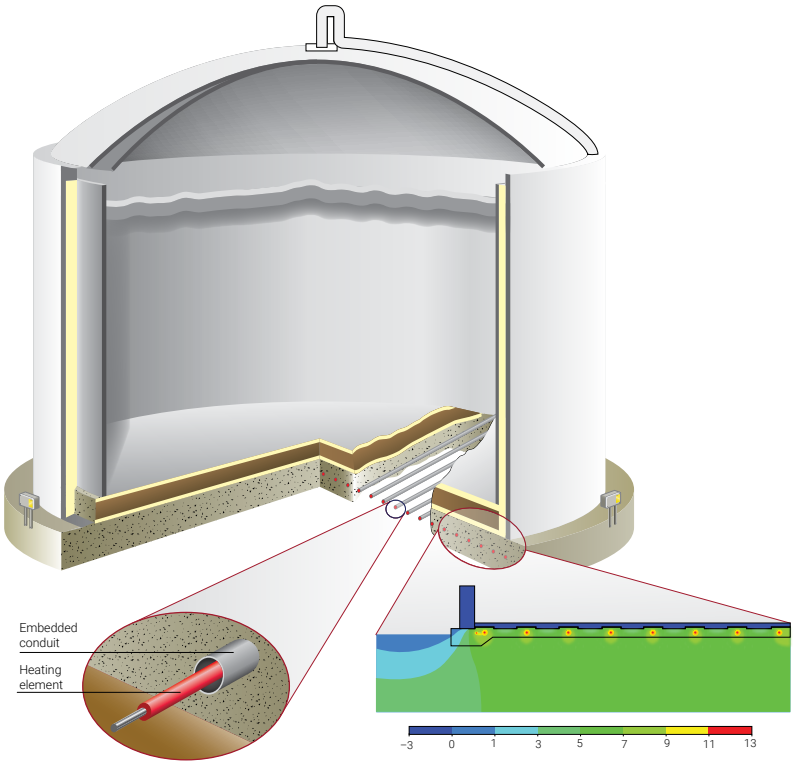
Thirty years experience creates the ground for evolution of heating products in order to adapt solutions to each specific client requirements. Depending on each application, numerous solutions can be evaluated based on the main three technologies that nVent proposes:

- Self-regulating heating system FHP
- Constant wattage zone heating cable type FHP-C
- Skin effect heating system type STS

In addition offers a broad range of control and monitoring systems, from simple thermostats to state of the art nVent proposes also several solutions for temperature control systems and heat management systems. This starts from the single point single measure up to full electrical power controlsand monitoring multiple points field bus based nVent RAYCHEM NGC systems.

Our design capabilities cover heat calculations, power distribution design, temperature control definition, etc. Documentation can cover a large field of requirements from the supply of data sheets up to a full manufacturer dossier dedicated to engineering contracting houses.

Services capabilities can include installation supervision, pre-commissioning, commissioning, start-up services but also full EPC scope of works from panelboard in sub-station to heating cable end caps on-site.



Embedded heating elements

Thermal profile for conditions 2D FEA with 82% duty cycle

STS - Skin-effect Tracing System

The nVent RAYCHEM STS System is a versatile engineered heat management system configured to deliver heat for medium to long pipelines.

Applications include: material transfer lines, snow and ice melting, tank foundation heating, subsea transfer lines and prefabricated, pre-insulated lines. The industry leader in offering single source responsibility in heat management, nVent and the nVent RAYCHEM brand are uniquely qualified to offer Skin-Effect Systems that combine system engineered expertise with proven procurement/ construction capabilities.

STS SYSTEMS CAN BE DESIGNED FOR:

- Circuit lengths up to 25 kilometers (15 miles)
- Power outputs up to 150 W/m (49.2 W/ft)
- Maintain temperatures up to 200°C (392°F)
- Exposure temperatures up to 250°C (482°F)

WHY STS?

Longline capability

Circuit lengths up to 25 kilometers (15 miles) from a single power source.

Flexibility

Ideal for either factory fabricated, pre-insulated or field installed system.

Maintainable

Pull/splice boxes simplify access to the system without disturbing insulation.

Safe

Fully grounded system with zero electrical potential on pipe surfaces.

Rugged and reliable

Entire circuit is encapsulated within rugged heat tubes and steel boxes.

Accurate control

A closed loop control system includes redundant temperature sensing.

Engineered

Systems are custom engineered in accordance with ANSI/IEEE 844, NEC 426/427 and plant standards.

Simulation studies

Temperature profile plotting capability.

Computerised design

Runaway temperature, dynamic static heat-up/cool-down calculations available.

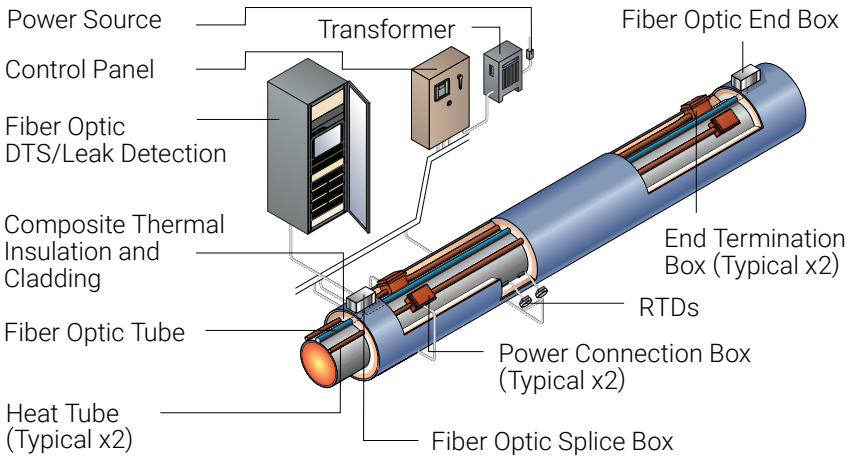
STS Technology

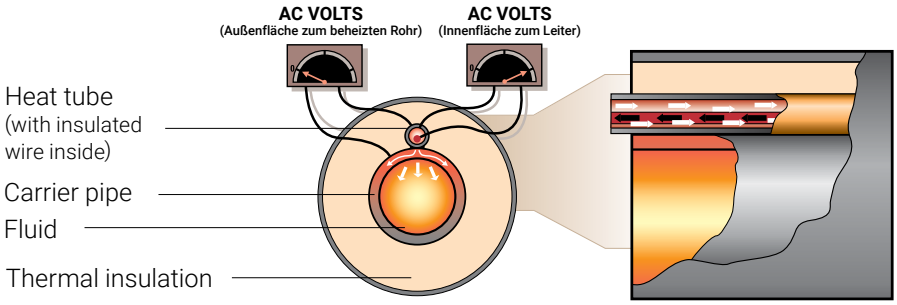
The nVent RAYCHEM STS System consists of a thermally rated, electrically insulated wire installed inside a ferromagnetic heat tube. The insulated wire is connected to the heat tube at the end termination, and an AC voltage source is connected between the heat tube and insulated wire at the power connection. AC current flows down the wire, returning on the inside surface of the tube.

The STS system is electrically safe and produces heat in the ferromagnetic tube through the effects of two well-known electrical phenomena:
Skin Effect and Proximity Effect. These phenomena cause the current flowing in the heat tube to be concentrated on the inner surface; the current concentration is so complete there is virtually no measurable voltage on the outer wall of the heat tube. Heat is also generated due to the resistance of the heat tube and STS wire, and through eddy currents and hysteresis in the heat tube. Since the heat tube is attached to the process pipe and completely within the thermal insulation system, heat is efficiently transferred into the process pipe.

Circuit lengths are determined by a combination of cable size, cable voltage, temperature rating, heat tube size and attachment method. It is feasible to heat up to 25 kilometers (15 miles) from a single source using supply voltages approaching 5,000 volts. With the cable inside the tube and pull/splice boxes located along the line, any field modifications, cable replacements, troubleshooting, etc... becomes very simple. All can be accomplished without disturbing the insulation.

These systems can be provided as a pre-fabricated and pre-insulated piping system in which the steel tube is factory attached to the carrier pipe.





nVent
RAYCHEM

Product Datasheets

Contents

Contents

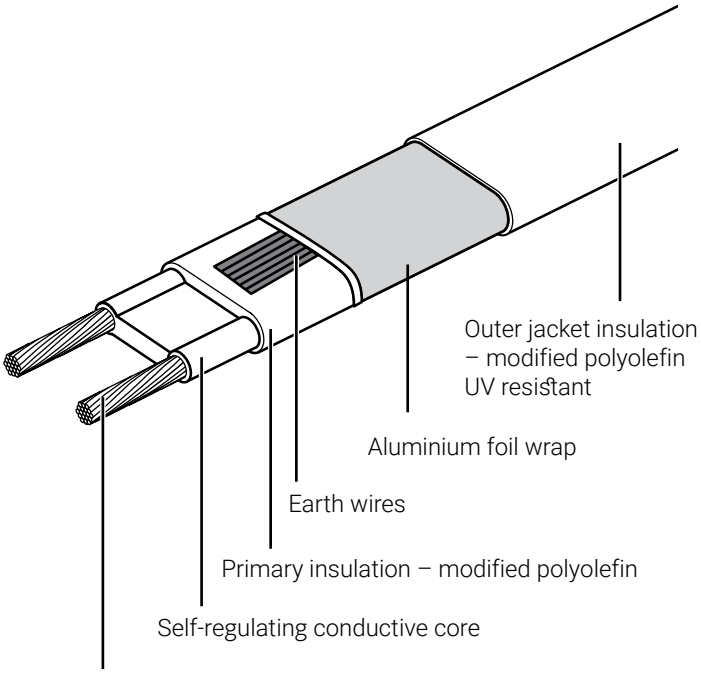
PRODUCT/TECHNOLOGY - SELECTION TABLE

Typical maintain temperature range (°C)	Product	Technology
65	BTV	Parallel self-regulating Field-terminated
110	QTVR	Parallel self-regulating Field-terminated
121	XTV	Parallel self-regulating Field-terminated
150	KTV	Parallel self-regulating Field-terminated
230	VPL	Parallel power-limiting Field-terminated
125	FMT	Parallel Constant Wattage Zone Field-terminated
200	FHT	Parallel Constant Wattage Zone Field-terminated
60	XPI-F	Polymer Insulated (PI) Series, Constant Wattage Field-terminated
200	XPI	Polymer Insulated (PI) Series, Constant Wattage Field-terminated
200	XPI-S	Polymer Insulated (PI) Series, Constant Wattage Field-terminated
40	HCHH/HCCH (HDPE)	Mineral Insulated (MI) Series, Constant Wattage Factory-terminated
120	HCH/HCC	Mineral Insulated (MI) Series, Constant Wattage Factory-terminated
250	HDF/HDC	Mineral Insulated (MI) Series, Constant Wattage Factory-terminated
	HSQ	Mineral Insulated (MI) Series, Constant Wattage Factory-terminated
	HAx	Mineral Insulated (MI) Series, Constant Wattage Factory-terminated
	HIQ	Mineral Insulated (MI) Series, Constant Wattage Factory-terminated
150	STS	Skin-effect Tracing System STS Engineered Product

Max. exposure temperature (°C)	Temperature classification	T Class design method			Preferred control method				Chemical exposure		Mechanical resistance		Typical pipe length range (m)
		Unconditional	Stabilised design	Use of temperature limiter	No control	Ambient sensing	Broad temperature range (+/−10°C)	Tight temperature control (+/−3°C)	Organic	None	Normal	High	
85	T6	■			■	■	■	■	■	■	■	■	0 - 400
110	T4	■			■	■	■	■	■	■	■	■	0 - 400
250	T2-T3	■	*T4		■	■	■	■	■	■	■	■	0 - 400
250	T2	■	**T3-T4		■	■	■	■	■	■	■	■	0 - 400
260	T2-T4		■	■		■	■	■	■	■	■	■	0 - 450
200	T2-T4		■	■			■	■	■	■	■		0 - 400
260	T2-T4		■	■			■	■	■	■	■		0 - 450
100	T4-T6		■	■			■	■	■	■	■		Up to 3000
260	T2-T6		■	■			■	■	■	■	■		Up to 5000
260	T2-T6		■	■			■	■	■	■	■	■	Up to 5000
80	T6		■	■			■	■	■	■	■	■	Up to 5000
200	T3-T6		■	■			■	■		■	■	■	Up to 5000
400	T1-T6		■	■			■	■	■	■	■	■	Up to 2500
700	T1-T6		■	■			■	■	■	■	■	■	Up to 500
700	T1-T6		■	■			■	■		■	■	■	Up to 5000
1000	T1-T6		■	■			■	■	■	■	■	■	Up to 500
250	T2-T6		■	■				■	■	■	■	■	400 - 30.000

BSA

SELF-REGULATING HEATING CABLE



HEATING CABLE CONSTRUCTION

The nVent RAYCHEM BSA self-regulating heating cable is designed for industrial pipe freeze protection without steam cleaning and moderate process temperature requirements. It can be used for indoor and outdoor installation in ordinary (non-hazardous) area applications.

The foil wrap /drain-wire construction provides a highly flexible cable, that is easy to install around complex or small pipe networks.

APPLICATION

Area classification	Ordinary (non-hazardous) area
Traced surface type	Carbon steel Stainless steel Painted or unpainted metal Plastic
Chemical resistance	Mild inorganic solutions

SUPPLY VOLTAGE

230 Vac

APPROVALS

Products are in compliance with IEC/EN 62395-1:2013
DNV approval pending

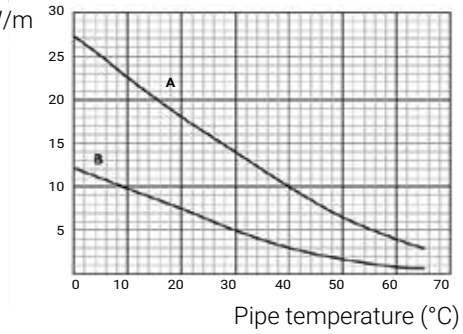
SPECIFICATIONS

Maximum maintain or continuous exposure temperature (power on/off)	65°C
Maximum intermittent exposure temperature (power on/off)	85°C Maximum cumulative exposure 1000 hours
Minimum installation temperature	-60°C
Minimum bend radius	at 20°C: 10 mm at -60°C: 35 mm

THERMAL OUTPUT RATING

Nominal power output at 230 Vac on insulated steel pipes

A 7BSA2-DR
B 3BSA2-DR



	3BSA2-DR	7BSA2-DR
Nominal power output (W/m at 10°C)	10W/m	23W/m

PRODUCT DIMENSIONS (NOMINAL) AND WEIGHT

	3BSA2-DR	7BSA2-DR
Thickness (mm)	6.2	6.2
Width (mm)	13.7	13.7
Weight (g/m)	130	130

MAXIMUM CIRCUIT LENGTH BASED ON TYPE 'C' CIRCUIT BREAKERS ACCORDING TO EN 60898

Electrical protection sizing	Start-up temperature	Maximum heating cable length per circuit (m)	
16 A	–20°C	150	72
	+10°C	150	111
20 A	–20°C	150	90
	+10°C	150	120
25 A	–20°C	150	112
	+10°C	150	120

The above numbers are for circuit length estimation only. For more detailed information please use nVent RAYCHEM TraceCalc software or contact your local nVent representative. nVent requires the use of a 30 mA residual current device to provide maximum safety and protection from fire. Where design results in higher leakage current, the preferred trip level for adjustable devices is 30 mA above any inherent capacitive leakage characteristic of the heater as specified by the trace heater supplier or alternatively, the next common available trip level for non adjustable devices, with a maximum of 300 mA. All safety aspects need to be proven.

ORDERING DETAILS

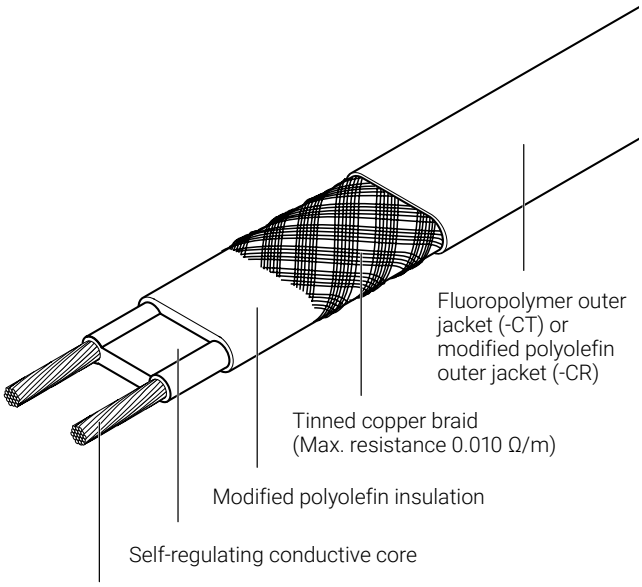
Part description	3BSA2-DR	7BSA2-DR
Part No.	P000002271	P000002272

COMPONENTS

nVent offers a full range of components for power connections, splices and end seals. As a minimum a connection kit and end seal must be used from the below list to ensure proper functioning of the product and compliance with electrical requirements.

Name	Part number	Description
JB-82	535679-000	Junction box , polycarbonate, 4 entries, non-hazardous
JB-NH2	1244-020910	Junction box , engineered polymer, 2 entries, non-hazardous
JB-NH4	1244-020911	Junction box , engineered polymer, 4 entries, non-hazardous
SB-100	192932-000	Support bracket
C25-01	1244-020909	Hot applied connection kit to the Junction Box, non hazardous
IEK-25-04	332523-000	Insulation entry kit
IEK-25-pipe	1244-001050	Insulation entry kit for pipe mounting
E-02-AL	1244-020913	Cold applied end seal kit, non hazardous

SELFREGULATING HEATING CABLE



HEATING CABLE CONSTRUCTION

Electrical heat-tracing for frost protection without steam cleaning.
The nVent RAYCHEM BTV-family of self-regulating, parallel circuit heating cables is used for frost protection of pipes and vessels. It can also be used for process temperature maintenance up to 65°C.

APPLICATION

Area classification	Hazardous, Zone 1, Zone 2 (Gas), Zone 21, Zone 22 (Dust) Ordinary
Traced surface type	Carbon steel Stainless steel Plastic Painted or unpainted metal
Chemical resistance	For organic corrosives: use -CT (fluoropolymer outer jacket) For mild inorganic solutions: use -CR (modified polyolefin outer jacket) For aggressive organics and corrosives consult your local nVent representative

SUPPLY VOLTAGE

230 Vac (Contact your local nVent representative for data on other voltages)

APPROVALS*

The BTV heating cables are approved for use in hazardous areas by PTB and Baseefa Ltd. PTB 09 ATEX 1115 X & Baseefa06ATEX0183X
Ⓔx II 2 G Ex e II T6 & Ⓔx II 2 D Ex tD A21 IP66 T80°C
IECEx PTB 09.0056X & IECEx BAS 06.0043X
Ex e II T6 & Ex tD A21 IP66 T80°C

The BTV heating cables are approved by DNV for use on ships and mobile offshore units.
DNV Certificate No. DNV-GL TAE00000TU

EAC Ex
TC RU C-BE.МЮ62.B.00054/18
1Ex e IIC T6 Gb X 1Ex e mb II C T6 Gb X
Ex tb IIIC T80°C Db X Ex tb mb IIIC T80°C Db X
Ta -60°C...+56°C IP66
ООО "ТехИмпорт"

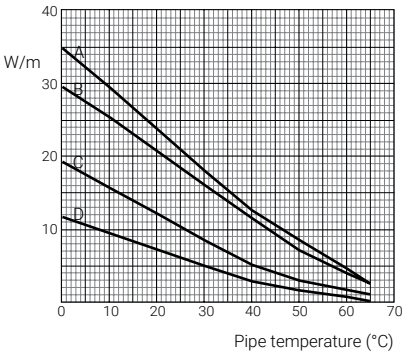
SPECIFICATIONS

Maximum maintain or continuous exposure temperature (power on/off)	65°C
Maximum intermittent exposure temperature (power on/off)	85°C Maximum cumulative exposure 1000 hours
Temperature classification	T6
Minimum installation temperature	–60°C
Minimum bend radius	at 20°C: 13 mm at –60°C: 35 mm

THERMAL OUTPUT RATING

Nominal power output at 230 Vac on insulated steel pipes

A **10BTV2-CT**
10BTV2-CR
B **8BTV-2-CT**
8BTV-2-CR
C **5BTV2-CT**
5BTV2-CR
D **3BTV2-CT**
3BTV2-CR



	3BTV2-CR 3BTV2-CT	5BTV2-CR 5BTV2-CT	8BTV-2-CR 8BTV-2-CT	10BTV2-CR 10BTV2-CT
Nominal power output (W/m at 10°C)	9	16	25	29

PRODUCT DIMENSIONS (NOMINAL) AND WEIGHT

Thickness (mm)	5.5	5.5	5.5	5.5
Width (mm)	10.5	10.5	15.4	15.4
Weight (g/m)	110	110	153	153

MAXIMUM CIRCUIT LENGTH BASED ON TYPE 'C' CIRCUIT BREAKERS ACCORDING TO EN 60898

Electrical protection sizing	Start-up temperature	Maximum heating cable length per circuit (m)			
16 A	–20°C	155	110	70	45
	+10°C	200	160	110	65
20 A	–20°C	195	140	90	55
	+10°C	200	160	125	85
25 A	–20°C	200	160	110	70
	+10°C	200	160	125	105
32 A	–20°C	200	160	125	90
	+10°C	200	160	125	110

The above numbers are for circuit length estimation only. For more detailed information please use the RAYCHEM TraceCalc software or Contact your local nVent representative. nVent requires the use of a 30 mA residual current device to provide maximum safety and protection from fire. Where design results in higher leakage current, the preferred trip level for adjustable devices is 30 mA above any inherent capacitive leakage characteristic of the heater as specified by the trace heater supplier or alternatively, the next common available trip level for non adjustable devices, with a maximum of 300 mA. All safety aspects need to be proven.

ORDERING DETAILS

Part description	3BTV2-CR	5BTV2-CR	8BTV-2-CR	10BTV2-CR
Part No. (*)	914279-000	414809-000	479821-000	677245-000
Part description	3BTV2-CT	5BTV2-CT	8BTV-2-CT	10BTV2-CT
Part No. (*)	469145-000	487509-000	008633-000	567513-000

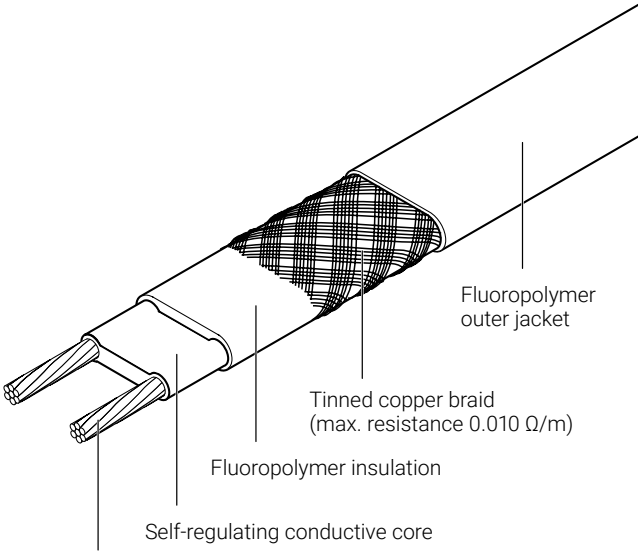
COMPONENTS

nVent offers a full range of components for power connections, splices and end seals. These components must be used to ensure proper functioning of the product and compliance with electrical requirements.

(*) Localized versions may exist with limited approvals and different part numbers. Contact your local sales representative

QTVR

SELF-REGULATING HEATING CABLE



1.4 mm² nickel plated copper conductors (10 and 15QTVR2-CT)
2.3 mm² nickel plated copper conductors (20QTVR2-CT)

HEATING CABLE CONSTRUCTION

Electrical heat-tracing for process temperature maintenance applications up to 110°C which are not subject to steam cleaning.

The nVent RAYCHEM QTVR family of self-regulating, parallel circuit heating cables is used for process temperature maintenance of pipes and vessels.

It can also be used for frost protection of large pipes and for applications requiring medium temperature exposure capability.

APPLICATION

Area classification	Hazardous, Zone 1, Zone 2 (Gas), Zone 21, Zone 22 (Dust) Ordinary
Traced surface type	Carbon steel Stainless steel Painted or unpainted metal
Chemical resistance	Organics and corrosives For aggressive organics and corrosives consult your local nVent representative

SUPPLY VOLTAGE

230 Vac (Contact your local nVent representative for data on other voltages)

APPROVALS

The QTVR heating cables are approved for use in hazardous areas by PTB and Baseefa Ltd.
PTB 09 ATEX 1116 X & Baseefa06ATEX0185X
Ⓔx II 2G Ex e II T4 & Ⓔx II 2D Ex tD A21 IP66 T130°C
IECEx PTB 09.0057X & IECEx BAS 06.0045X
Ex e II T4 & Ex tD A21 IP66 T130°C

The QTVR heating cables are approved by DNV for use on ships and mobile offshore units.
DNV Certificate No. DNV-GL TAE00000TU

EAC Ex

TC RU C-BE.МЮ62.B.00054/18
1Ex e IIC T4 Gb X 1Ex e mb IIC T4 Gb X
Ex tb IIIC T130°C Db X Ex tb mb IIIC T130°C Db X
Ta -60°C...+56°C IP66
ООО "ТехИмпорт"

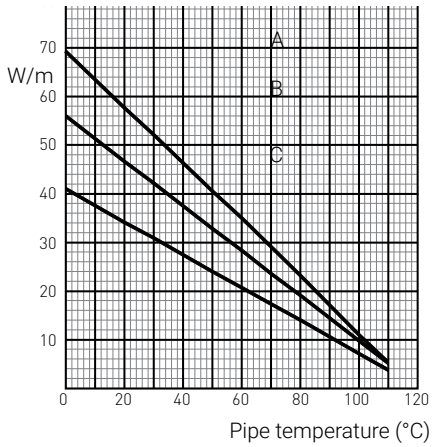
SPECIFICATIONS

Maximum maintain or continuous exposure temperature (power on/off)	110°C
Maximum intermittent exposure temperature (power on/off)	110°C
Temperature classification	T4
Minimum installation temperature	–60°C
Minimum bend radius	at 20°C: 13 mm at –60°C: 35 mm

THERMAL OUTPUT RATING

Nominal power output at 230 Vac on insulated steel pipes

A 20QTVR2-CT
B 15QTVR2-CT
C 10QTVR2-CT



	10QTVR2-CT	15QTVR2-CT	20QTVR2-CT
Nominal power output (W/m at 10°C)	38	51	64

PRODUCT DIMENSIONS (NOMINAL) AND WEIGHT

Thickness (mm)	4.5	4.5	5.1
Width (mm)	11.8	11.8	14.0
Weight (g/m)	126	126	180

MAXIMUM CIRCUIT LENGTH BASED ON TYPE 'C' CIRCUIT BREAKERS ACCORDING TO EN 60898

Electrical protection sizing	Start-up temperature	Maximum heating cable length per circuit (m)		
16 A	–20°C	65	63	47
	+10°C	80	63	47
25 A	–20°C	95	75	60
	+10°C	115	95	75
32 A	–20°C	115	100	75
	+10°C	115	100	95
40 A	–20°C	115	100	95
	+10°C	115	100	115

The above numbers are for circuit length estimation only. For more detailed information please use the nVent RAYCHEM TraceCalc software or contact your local nVent representative.

nVent requires the use of a 30 mA residual current device to provide maximum safety and protection from fire.
Where design results in higher leakage current, the preferred trip level for adjustable devices is 30 mA above any inherent capacitive leakage characteristic of the heater as specified by the trace heater supplier or alternatively, the next common available trip level for non adjustable devices, with a maximum of 300 mA. All safety aspects need to be proven.

ORDERING DETAILS

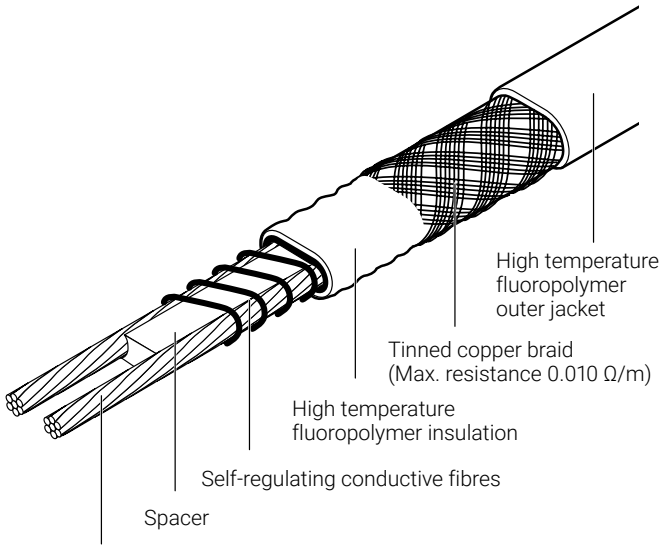
Part description	10QTVR2-CT	15QTVR2-CT	20QTVR2-CT
Part No.	391991-000	040615-000	988967-000

COMPONENTS

nVent offers a full range of components for power connections, splices and end seals.
These components must be used to ensure proper functioning of the product and compliance with electrical requirements.

XTV

SELF-REGULATING HEATING CABLE



HEATING CABLE CONSTRUCTION

Electrical heat-tracing for process temperature maintenance applications up to 121°C which may be subject to steam cleaning.

The nVent RAYCHEM XTV family of self-regulating, parallel circuit heating cables is used for process temperature maintenance of pipes and vessels.

It can also be used for frost protection of large pipes and for applications requiring high temperature exposure capability.

APPLICATION

Area classification	Hazardous, Zone 1, Zone 2 (Gas), Zone 21, Zone 22 (Dust) Ordinary
Traced surface type	Carbon steel Stainless steel Painted or unpainted metal
Chemical resistance	Organics and corrosives For aggressive organics and corrosives consult your local nVent representative

SUPPLY VOLTAGE

230 Vac (Contact your local nVent representative for data on other voltages)

APPROVALS (*)

The XTV heating cables are approved for use in hazardous areas by PTB and Baseefa Ltd.
PTB 09 ATEX 1118 X & Baseefa06ATEX0184X
Ⓔx II 2G Ex e II T* & Ⓔx II 2D Ex tD A21 IP66 T*
IECEx PTB 09.0059X & IECEx BAS 06.0044X
Ex e II T* & Ex tD A21 IP66 T*
*See approval schedule

The XTV heating cables are approved by DNV for use on ships and mobile offshore units.
DNV Certificate No. DNV-GL TAE00000TV

EAC Ex

TC RU C-BE.МЮ62.B.00054/18
1Ex e IIC T* Gb X 1Ex e mb IIC T* Gb X
Ex tb IIIC T* Db X Ex tb mb IIIC T* Db X
Ta -60°C...+56°C IP66
ООО "ТехИмпорт"

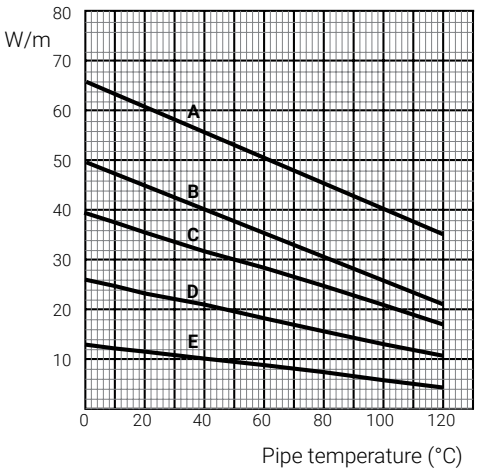
SPECIFICATIONS

Maximum maintain or continuous exposure temperature (power on)	121°C
Maximum intermittent exposure temperature (power on/off)	250°C (*) Maximum cumulative exposure 1000 hours (*) The 250°C rating applies to all products printed "MAX INTERMITTENT EXPOSURE 250C".
Temperature classification	T2: 20XTV2-CT-T2 T3: 4XTV2-CT-T3, 8XTV2-CT-T3, 12XTV2-CT-T3, 15XTV2-CT-T3
Based on systems approach*	T3-T6 * nVent RAYCHEM XTV heat-tracing cables are approved for the listed temperature classifications by using the principles of stabilized design (as per system classification approach) or the use of a temperature limiting device. Use TraceCalc design software or contact nVent.
Minimum installation temperature	–60°C
Minimum bend radius	at 20°C: 13 mm at –60°C: 51 mm

THERMAL OUTPUT RATING

Nominal power output at 230 Vac on insulated steel pipes

A 20XTV2-CT-T2
B 15XTV2-CT-T3
C 12XTV2-CT-T3
D 8XTV2-CT-T3
E 4XTV2-CT-T3



	4XTV2-CT-T3	8XTV2-CT-T3	12XTV2-CT-T3	15XTV2-CT-T3	20XTV2-CT-T2
Nominal power output (W/m at 10°C)	12	25	38	47	63

PRODUCT DIMENSIONS (NOMINAL) AND WEIGHT

Thickness (mm)	7.2	7.2	7.2	7.2	7.2
Width (mm)	11.7	11.7	11.7	11.7	11.7
Weight (g/m)	170	170	170	170	170

MAXIMUM CIRCUIT LENGTH BASED ON TYPE 'C' CIRCUIT BREAKERS ACCORDING TO EN 60898

Electrical protection sizing	Start-up temperature	Maximum heating cable length per circuit (m)				
16 A	–20°C	145	90	65	55	40
	+10°C	170	105	75	60	45
25 A	–20°C	225	145	105	85	65
	+10°C	245	165	120	95	70
32 A	–20°C	245	175	135	105	80
	+10°C	245	175	140	125	90
40 A	–20°C	245	175	140	135	110
	+10°C	245	175	140	135	110

The above numbers are for circuit length estimation only. For more detailed information please use the nVent TraceCalc software or Contact your local nVent representative. nVent requires the use of a 30 mA residual current device to provide maximum safety and protection from fire. Where design results in higher leakage current, the preferred trip level for adjustable devices is 30 mA above any inherent capacitive leakage characteristic of the heater as specified by the trace heater supplier or alternatively, the next common available trip level for non adjustable devices, with a maximum of 300 mA. All safety aspects need to be proven.

ORDERING DETAILS

Part description	4XTV2-CT-T3	8XTV2-CT-T3	12XTV2-CT-T3	15XTV2-CT-T3	20XTV2-CT-T2
Part No. (*)	P000001667	P000001670	P000001673	P000001675	P000001677

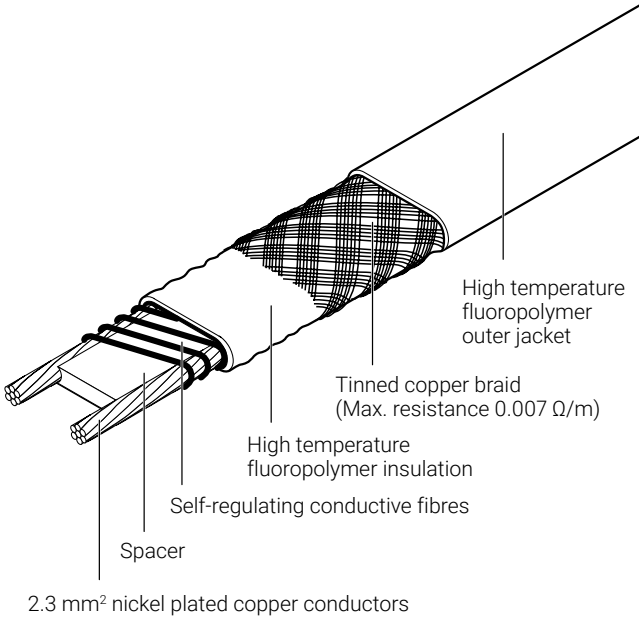
COMPONENTS

nVent offers a full range of components for power connections, splices and end seals.
These components must be used to ensure proper functioning of the product and compliance with electrical requirements.

(*) Localized versions may exist with limited approvals and different part numbers. Contact your local sales representative.

KTV

SELF-REGULATING HEATING CABLE



HEATING CABLE CONSTRUCTION

Electrical heat-tracing for process temperature maintenance applications up to 150°C which may be subject to steam cleaning.

The nVent RAYCHEM KTV family of self-regulating, parallel circuit heating cables is used for process temperature maintenance of pipes and vessels.

It can also be used for frost protection of large pipes and for applications requiring high temperature exposure capability.

APPLICATION

Area classification	Hazardous, Zone 1, Zone 2 (Gas), Zone 21, Zone 22 (Dust) Ordinary
Traced surface type	Carbon steel Stainless steel Painted or unpainted metal
Chemical resistance	Organics and corrosives For aggressive organics and corrosives consult your local nVent representative

SUPPLY VOLTAGE

230 Vac (Contact your local nVent representative for data on other voltages)

APPROVALS

The KTV heating cables are approved for use in hazardous areas by PTB and Baseefa Ltd.
PTB 09 ATEX 1117 X & Baseefa06ATEX0186X
Ⓔx II 2G Ex e II 226°C (T2) & Ⓔx II 2D Ex tD A21 IP66 T226°C
IECEx PTB 09.0058X & IECEx BAS 06.0046X
Ex e II 226°C (T2) & Ex tD A21 IP66 T226°C

The KTV heating cables are approved by DNV for use on ships and mobile off shore units.
DNV Certificate No. DNV-GL TAE00000TV

EAC Ex
TC RU C-BE.МЮ62.B.00054/18
1Ex e IIC 226°C (T2) Gb X 1Ex e mb IIC 226°C (T2) Gb X
Ex tb IIIC T226°C Db X Ex tb mb IIIC T226°C Db X
Ta -60°C...+56°C IP66
ООО "ТехИмпорт"

RAYCHEM-DS-EU1383-KTV-EN-1911

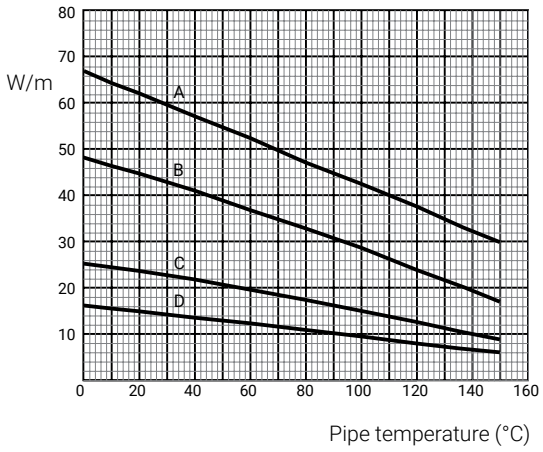
SPECIFICATIONS

Maximum maintain or continuous exposure temperature (power on)	150°C
Maximum intermittent exposure temperature (power on/off)	250°C (*) Maximum cumulative exposure 1000 hours (*) The 250°C rating applies to all products printed "MAX INTERMITTENT EXPOSURE 250C".
Temperature classification	T2
Based on systems approach*	T3-T6 * nVent RAYCHEM KTV heat-tracing cables are approved for the listed temperature classifications by using the principles of stabilized design (as per system classification approach) or the use of a temperature limiting device. Use TraceCalc design software or contact nVent.
Minimum installation temperature	–60°C
Minimum bend radius	at 20°C: 26 mm at –60°C: 51 mm

THERMAL OUTPUT RATING

Nominal power output at 230 Vac on insulated steel pipes

A 20KTV2-CT
B 15KTV2-CT
C 8KTV2-CT
D 5KTV2-CT



	5KTV2-CT	8KTV2-CT	15KTV2-CT	20KTV2-CT
Nominal power output (W/m at 10°C)	16	25	47	66

PRODUCT DIMENSIONS (NOMINAL) AND WEIGHT

Thickness (mm)	7.6	7.6	7.6	7.6
Width (mm)	13.3	13.3	13.3	13.3
Weight (g/m)	250	250	250	250

MAXIMUM CIRCUIT LENGTH BASED ON TYPE 'C' CIRCUIT BREAKERS ACCORDING TO EN 60898

Electrical protection sizing	Start-up temperature	Maximum heating cable length per circuit (m)			
16 A	–20°C	130	95	60	40
	+10°C	145	105	65	45
25 A	–20°C	205	150	90	65
	+10°C	230	165	100	75
32 A	–20°C	230	180	115	85
	+10°C	230	180	130	95
40 A	–20°C	230	180	130	105
	+10°C	230	180	130	110

The above numbers are for circuit length estimation only. For more detailed information please use the nVent RAYCHEM TraceCalc software or contact your local nVent representative. nVent requires the use of a 30 mA residual current device to provide maximum safety and protection from fire.
Where design results in higher leakage current, the preferred trip level for adjustable devices is 30 mA above any inherent capacitive leakage characteristic of the heater as specified by the trace heater supplier or alternatively, the next common available trip level for non adjustable devices, with a maximum of 300 mA. All safety aspects need to be proven.

ORDERING DETAILS

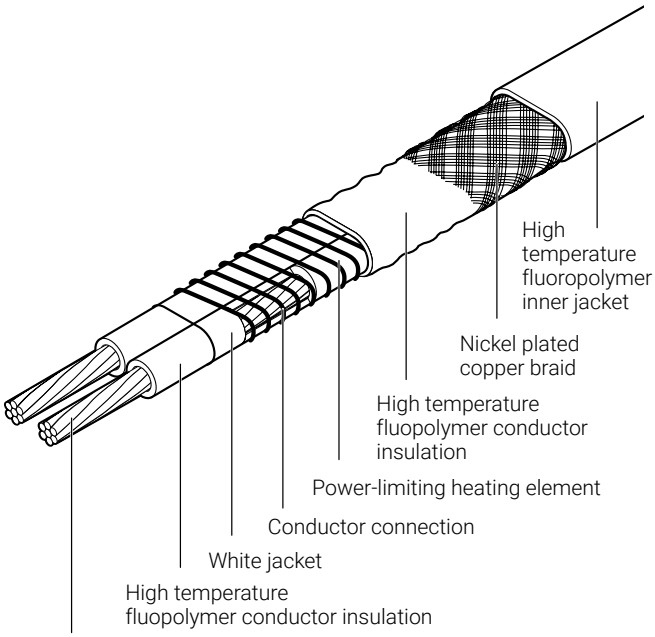
Part description	5KTV2-CT	8KTV2-CT	15KTV2-CT	20KTV2-CT
Part No.	P000001679	P000001681	P000001683	P000001685

COMPONENTS

nVent RAYCHEM offers a full range of components for power connections, splices and end seals.
These components must be used to ensure proper functioning of the product and compliance with electrical requirements.

VPL

HIGH-TEMPERATURE POWER-LIMITING HEATING CABLE



HEATING CABLE CONSTRUCTION

nVent RAYCHEM VPL is a family of power limiting heating cables designed for pipe and equipment heat-tracing in industrial applications.

VPL can be used for frost protection and process temperature maintenance requiring high power output and/or high temperature exposure. VPL can provide process temperature maintenance up to 235°C (depending on cable type) and can withstand routine steam purges and temperature exposure to 260°C with power off.

Power-limiting cables are parallel heaters formed by a coiled resistor alloy heating element wrapped around two parallel conductors. The distance between conductor contact points forms the heating zone length. This parallel construction allows it to be cut-to-length and terminated on-site. The power output of VPL heating cables decreases with increasing temperature. VPL heating cables can be overlapped once. The relatively flat power temperature curve of VPL ensures a low start-up current and high output at elevated temperatures. VPL cables are approved for use in hazardous areas. Approvals are listed below.

APPLICATION

Area classification	Hazardous, Zone 1, Zone 2 (Gas), Zone 21, Zone 22 (Dust) Ordinary
Traced surface type	Carbon steel Stainless steel Painted or unpainted metal
Chemical resistance	Organics and corrosives For aggressive organics and corrosives consult your local nVent representative

SUPPLY VOLTAGE

VPL2: 208-277 Vac
VPL4: 400-480 Vac

APPROVALS

The VPL heating cables are approved for use in hazardous areas by Baseefa Ltd.
Baseefa06ATEX0188X & IECExBAS06.0048X
Ⓔx II 2GD & Exe II T* (see schedule) Ex tD A21 IP66
Ex e II T* (see schedule) Ex tD A21 IP66
*By design. Temperature classification (T-rating) has to be established by using the principles of stabilized design or the use of a temperature limiting device. Use TraceCalc design software or contact nVent.

The VPL heating cables are approved by DNV for use on ships and mobile off-shore units.
DNV Certificate No. DNV-GL TAE00000SF

EAC Ex
TC RU C-BE.МЮ62.B.00054/18
1Ex e IIC T* Gb X 1Ex e mb IIC T* Gb X
Ex tb IIIC T* Db X Ex tb mb IIIC T* Db X
Ta -60°C...+56°C IP66
ООО "ТехИмпорт"

SPECIFICATIONS

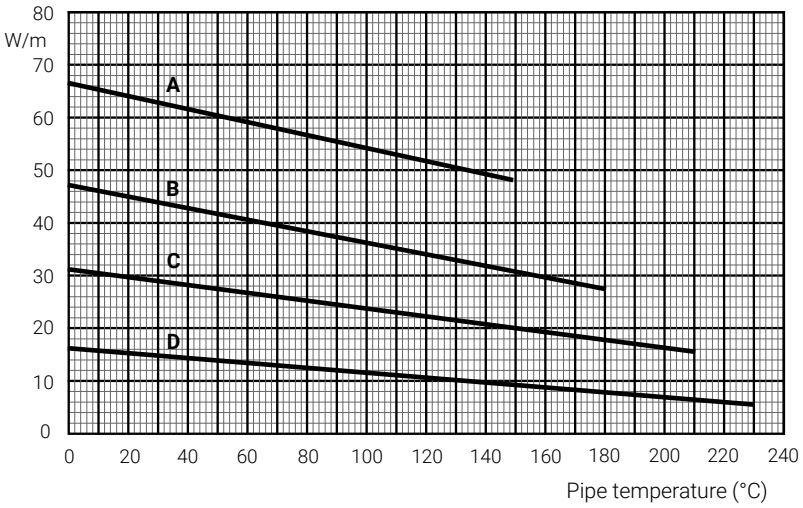
	Cable	208 V	230 V	254 V	277 V	400 V	480 V
Maximum maintain or continuous exposure temperature (power on)	5VPL2-CT	235°C	230°C	225°C	225°C	–	–
	10VPL2-CT	220°C	210°C	200°C	195°C	–	–
	15VPL2-CT	200°C	180°C	145°C	105°C	–	–
	20VPL2-CT	150°C	150°C	–	–	–	–
	5VPL4-CT	–	–	–	–	230°C	230°C
	10VPL4-CT	–	–	–	–	215°C	205°C
	15VPL4-CT	–	–	–	–	195°C	160°C
	20VPL4-CT	–	–	–	–	150°C	150°C
Maximum continuous exposure temperature (power off)	260°C						
Temperature classification	To be established using the principles of stabilized design or the use of a temperature limiting device. Use TraceCalc design software or contact nVent for assistance.						
Minimum installation temperature	–60°C						
Minimum bend radius	at –60°C: 20 mm | at +20°C: 20 mm						
Minimum clearance	15mm						

THERMAL OUTPUT RATING

Nominal power output rating on insulated steel pipes at 240 V and 480 V (power output of VPL4 at 400 V will be lower)

To choose the correct heating cable for your application use the TraceCalc design software.

A 20VPL-CT
B 15VPL-CT
C 10VPL-CT
D 5VPL-CT



ADJUSTMENT FACTORS

		5VPL2-CT	10VPL2-CT	15VPL2-CT	20VPL2-CT
254 V	Power output	1.20	1.19	1.19	Not allowed
	Circuit length	1.05	1.04	1.04	Not allowed
277 V	Power output	1.30	1.28	1.26	Not allowed
	Circuit length	1.13	1.11	1.09	Not allowed

		5VPL4-CT	10VPL4-CT	15VPL4-CT	20VPL4-CT
400 V	Power output	0.72	0.73	0.74	0.75
	Circuit length	0.86	0.87	0.89	0.90

Nominal power output (W/m at 10°C)	5VPLx-CT	10VPLx-CT	15VPLx-CT	20VPLx-CT
VPL2 at 230 V	15	30	45	61
VPL2 at 240 V/VPL4 at 480 V	16	33	49	65
VPL4 at 400 V	12	24	36	49

PRODUCT DIMENSIONS (NOMINAL) AND WEIGHT

Thickness (mm)	7.9	7.9	7.9	7.9
Width (mm)	11.7	11.7	11.7	11.7
Nominal cold lead/ heating zone length (m)	1.2 (VPL2) 2.4 (VPL4)	0.9 (VPL2) 1.7 (VPL4)	0.6 (VPL2) 1.3 (VPL4)	0.5 (VPL2) 1.1 (VPL4)
Weight (g/m)	200	200	200	200

MAXIMUM CIRCUIT LENGTH BASED ON TYPE 'C' CIRCUIT BREAKERS ACCORDING TO EN 60898

VPL2 at 230 V		5VPL2-CT	10VPL2-CT	15VPL2-CT	20VPL2-CT
Electrical protection sizing	Start-up temperature	Maximum heating cable length per circuit (m) at 230 Vac			
16 A	−20°C	195	100	70	50
	+10°C	215	110	75	55
25 A	−20°C	220*	155*	105	80
	+10°C	220*	155*	115	85
32 A	−20°C	220*	155*	130*	100
	+10°C	220*	155*	130*	110*
40 A	−20°C	220*	155*	130*	110*
	+10°C	220*	155*	130*	110*

VPL4 at 480 V and 400 V		5VPL4-CT	10VPL4-CT	15VPL4-CT	20VPL4-CT
Electrical protection sizing	Start-up temperature	Maximum heating cable length per circuit (m) at 480 Vac and (at 400 Vac)			
16 A	−20°C	390 (335)	195 (170)	130 (115)	100 (90)
	+10°C	425 (365)	210 (185)	140 (125)	105 (95)
25 A	−20°C	450* (450)	310 (265)	205 (185)	155 (140)
	+10°C	450* (450)	320* (290)	220 (195)	165 (150)
32 A	−20°C	450* (450)	320* (320)	260* (235)	200 (180)
	+10°C	450* (450)	320* (320)	260* (250)	210 (190)
40 A	−20°C	450* (450)	320* (320)	260* (260)	225* (225)
	+10°C	450* (450)	320* (320)	260* (260)	225* (225)

*The maximum heating cable length must not exceed these values, even when voltage adjustment factors are used.

The above numbers are for circuit length estimation only. For more detailed information please use the nVent RAYCHEM TraceCalc software or contact your local nVent representative.

nVent requires the use of a 30 mA residual current device to provide maximum safety and protection from fire.

Where design results in higher leakage current, the preferred trip level for adjustable devices is 30 mA above any inherent capacitive leakage characteristic of the heater as specified by the trace heater supplier or alternatively, the next common available trip level for non adjustable devices, with a maximum of 300 mA. All safety aspects need to be proven.

ORDERING DETAILS

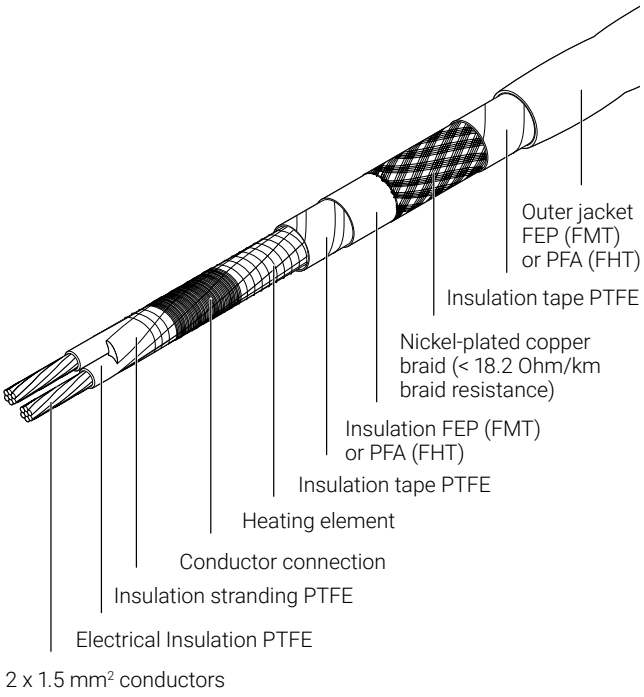
Part description	5VPL2-CT	10VPL2-CT	15VPL2-CT	20VPL2-CT
Part No.	451828-000	892652-000	068380-000	589252-000
Part description	5VPL4-CT	10VPL4-CT	15VPL4-CT	20VPL4-CT
Part No.	P000000678	P000000679	P000000680	P000000681

COMPONENTS

nVent offers a full range of components for power connections, splices and end seals.
These components must be used to ensure proper functioning of the product and compliance with electrical requirements.

FMT AND FHT

CONSTANT WATTAGE PARALLEL CIRCUIT HEATING CABLE



HEATING CABLE CONSTRUCTION

nVent RAYCHEM FMT and FHT are constant wattage parallel circuit heating cables designed for pipe and equipment heat-tracing in industrial applications. This family offers an economical alternative to our self-regulating heating cables but requires more skill for installation and also requires more advanced control and monitoring systems. Its unique round geometry provides excellent flexibility during installation as it allows for bending in every direction. The heating element which is the most fragile part of any constant wattage parallel circuit heating cable is protected by a PTFE insulation tape that eliminates shear stresses during flexing and also acts as a shock absorber, thereby providing a high level of protection. The heating cables can be used for frost protection and process temperature maintenance requiring high power output. The heating cables are zone parallel heaters constructed from a heating element wrapped around two parallel conductors. The distance between conductor contact points forms the heating zone length. The parallel construction allows it to be cut-to-length and terminated in the field.
FMT heating cables can withstand routine steam purges and temperature exposure to 200°C power off. They can be used to maintain temperatures up to 150°C (depending on cable type) and are only available in a 230 Vac version.

FHT heating cables can withstand routine steam purges and temperature exposure to 260°C power off. They can be used to maintain temperatures up to 230°C (depending on cable type) and are available for 230 Vac and 400 Vac supplies. The 400 Vac version offers a further advantage of long circuit lengths reducing the cost of the electrical installation.

APPLICATION

Area classification	Hazardous, Zone 1, Zone 2 (Gas), Zone 21, Zone 22 (Dust) Ordinary
Traced surface type	Carbon steel, Stainless steel, Painted or unpainted metal
Chemical resistance	Organics and corrosives For aggressive organics and corrosives consult your local nVent representative

APPROVALS

The FMT and FHT heating cables are approved for use in hazardous areas by Baseefa Ltd.
Baseefa08ATEX0050X & IECEx BAS 08.0019X
Ⓔx II 2GD Ex e II T* (See Schedule) Ex tD A21 IP66
Ex e II T* (See Schedule) Ex tD A21 IP66

*By design. Temperature classification (T-rating) has to be established by using the principles of stabilised design or the use of a temperature limiting device. Use TraceCalc design software or contact nVent.

SPECIFICATIONS

	FMT2	FHT2	FHT4
Supply voltage	190 - 277 Vac	190 - 277 Vac	385 - 415 Vac
Maximum continuous exposure temperature (power off)	200°C	260°C	260°C
Cold lead/heating zone length	1.5 m	1.5 m	2.5 m
Minimum installation temperature	–40°C	–60°C	–60°C
Size	∅ 7.5 mm	∅ 7.5 mm	∅ 7.5 mm
Minimum bend radius	25 mm	25 mm	25 mm
Minimum clearance	50 mm	50 mm	50 mm
Colour	White	Green	Violet

MAXIMUM CIRCUIT LENGTHS TABLE IN METERS

Maximum circuit length based on 16 A type 'C' circuit breakers according to EN 60898. The use of larger circuit breaker sizes (up to 40 A) is permitted provided that the lengths of individual continuous lengths do not exceed the numbers below.

Voltage/Heating cable	10FxT2	20FxT2	30FxT2	40FHT2	10FHT4	20FHT4	30FHT4
230 Vac	200	150	120	85	-	-	-
400 Vac	-	-	-	-	330	235	190

The above numbers are for circuit length estimation only. For more detailed information please use the nVent RAYCHEM TraceCalc software or contact your local nVent representative. nVent requires the use of a 30 mA residual current device to provide maximum safety and protection from fire.
Where design results in higher leakage current, the preferred trip level for adjustable devices is 30 mA above any inherent capacitive leakage characteristic of the heater as specified by the trace heater supplier or alternatively, the next common available trip level for non adjustable devices, with a maximum of 300 mA. All safety aspects need to be proven.

HAZARDOUS AREA DESIGN TABLES

(for other voltages or non-hazardous areas use TraceCalc Pro or contact nVent representative) The shaded temperature values listed in the table below represent the maximum design surface temperature permitted for a work piece for temperature classification T6, T5, T4, T3 and 260°C (FHT only).
Minimum clearance: 50 mm

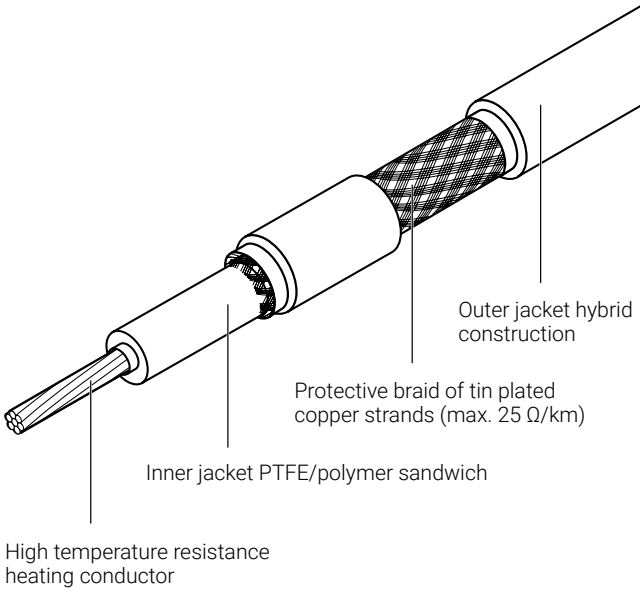
				Temperature classification				
Heating Cable	Voltage (Vac)	Nominal Power output (W/m)	Max.Power Output (W/m)	T6 (85°C)	T5 (100°C)	T4 (135°C)	T3 (200°C)	T2 (260°C)
10FxT2-CT	230	10	12.7	8°C	26°C	69°C	147°C	225°C
20FxT2-CT	230	20	25.5	-	-	19°C	109°C	200°C
30FxT2-CT	230	30	38.2	-	-	-	65°C	169°C
40FHT2-CT	230	40	51.0	-	-	-	8°C	131°C
10FHT4-CT	400	10	12.7	30°C	48°C	90°C	169°C	247°C
20FHT4-CT	400	20	25.5	-	-	30°C	121°C	212°C
30FHT4-CT	400	30	38.2	-	-	-	95°C	195°C

FxT2-CT	230 Vac	254 Vac	277 Vac	385 Vac	400 Vac	415 Vac
Circuit length	1.00	1.00	1.00	-	-	-
Power output	1.00	1.22	1.45	-	-	-
FHT4-CT						
Circuit length	-	-	-	1.00	1.00	1.00
Power output	-	-	-	0.93	1.00	1.08

ORDERING DETAILS

Part description & Part No.	Part description & Part No.	Part description & Part No.
10FMT2-CT: 1244-006057	10FHT2-CT: 1244-006060	10FHT4-CT: 1244-006064
20FMT2-CT: 1244-006058	20FHT2-CT: 1244-006061	20FHT4-CT: 1244-006065
30FMT2-CT: 1244-006059	30FHT2-CT: 1244-006062	30FHT4-CT: 1244-006066
	40FHT2-CT: 1244-006063	

POLYMER INSULATED (PI) SERIES RESISTANCE HEATING CABLE



HEATING CABLE CONSTRUCTION

nVent RAYCHEM XPI-F is a polymer insulated (PI) series heating cable, suitable for use in ordinary and hazardous areas. It has been designed for freeze protection and low temperature maintenance applications on pipes, tanks and other equipment.

XPI-F offers an economical solution for a wide variety of heat-tracing applications, in particular for pipe lengths beyond the maximum circuit lengths of parallel heating cables.

The inner insulation is a sandwich construction of PTFE and PE, the outer insulation is a hybrid PE construction. The use of PTFE in the construction makes it very easy to terminate, provides flexibility, eliminates internal mechanical and thermal stress and makes XPI-F a very safe and reliable product. The PE provides a good chemical withstand and excellent mechanical strength.

XPI-F heating cables can be used for temperatures up to 90°C (continuous) and 100°C (intermittent short-term exposure), making it a an ideal PI heating cable for transfer lines and large tanks with limited temperature requirements.

XPI-F is easy to install and has printed meter-marks. nVent offers XPI-F heating cables in a wide range of resistances, starting from 1.8 Ω/km up to 200 Ω/km as well as a complete range of components for connection and splicing.

APPLICATION

Area classification	Hazardous area, Zone 1 or Zone 2 (Gas) or Zone 21 or Zone 22 (Dust)Ordinary area
Chemical resistance	Organic corrosives

APPROVALS

Compliant to IEC EN 62395

System (heating units)	PTB 08 ATEX 1102X Ⓔx II 2 G Ex eb IIC T2…T6 Gb Ⓔx II 2 D Ex tb IIIC T260…T90°C Db IECEx PTB 08.0051X Ex eb IIC T2…T6 Gb Ex tb IIIC T260…T90°C Db EAC Ex TC RU C-BE.ИМ43.B.01854 ООО «ТехИмпорт» Ambient temp range: -60°C...+56°C 1Ex e IIC T4 Gb X Ex tb IIIC T110°C Db X Made in Germany
Bulk cable	Baseefa15ATEX0158U Ⓔx II 2 G Ex e IIC Gb IECEx BAS 15.0105U Ex II 2 G Ex e IIC Gb EAC Ex TC RU C-BE.ИМ43.B.01854 ООО «ТехИмпорт» Ambient temp range: -60°C...+56°C 1Ex e IIC T4 Gb X Ex tb IIIC T110°C Db X IP66 Made in Germany

* Temperature classification (T-rating) has to be established by using the principles of stabilised design or the use of a temperature limiting device. Use TraceCalc design software or contact nVent.

TECHNICAL DATA

Max. exposure temperature	90°C (power off, continuous), 100°C (power off, intermittent for max 1000 h)
Min. installation temperature	–60°C
Min. bending radius at –55°C	7.5 x cable diameter
Max. power output	20 W/m (typical value, depending on application)
Nominal voltage	Up to 300/500 Vac (U0/U)
Min. impact resistance	4 Joule (as per EN 60079-30-1)
Min. clearance	20 mm between heating cables

XPI-F HEATING CABLE REFERENCES

Order Reference	Nominal resistance [Ω/km @ 20°C]	Temp. coefficient [x 10^{-3}/ K]	Outer diameter [mm nom.]	Nom. Weight (kg/km)	Part Number PN
XPI-F-1.8	1.8	4.3	9,5	208	1244-018798
XPI-F-2.9	2.9	4.3	7,8	143	1244-018799
XPI-F-4.4	4.4	4.3	7,2	112	1244-018800
XPI-F-7	7	4.3	6,6	83	1244-018801
XPI-F-10	10	4.3	6,5	76	1244-018802
XPI-F-11.7	11.7	4.3	6,4	65	1244-018803
XPI-F-15	15	4.3	6,1	61	1244-018804
XPI-F-17.8	17.8	4.3	6	57	1244-018805
XPI-F-25	25	3	6	57	1244-018806
XPI-F-31.5	31.5	1.3	6,4	67	1244-018807
XPI-F-50	50	1.3	6	57	1244-018808
XPI-F-65	65	1.3	5,7	53	1244-018809
XPI-F-80	80	0.7	6,1	61	1244-018810
XPI-F-100	100	1.3	5,4	67	1244-018811
XPI-F-150	150	0.4	5,9	48	1244-018812
XPI-F-180	180	0.33	5,7	51	1244-018813
XPI-F-200	200	0.4	5,6	53	1244-018814

Resistance tolerance: +10/–5%. In particular for cables < 31.5 Ω/km the resistance of the conductor materials is a function of temperature and the change must be considered for design purposes.

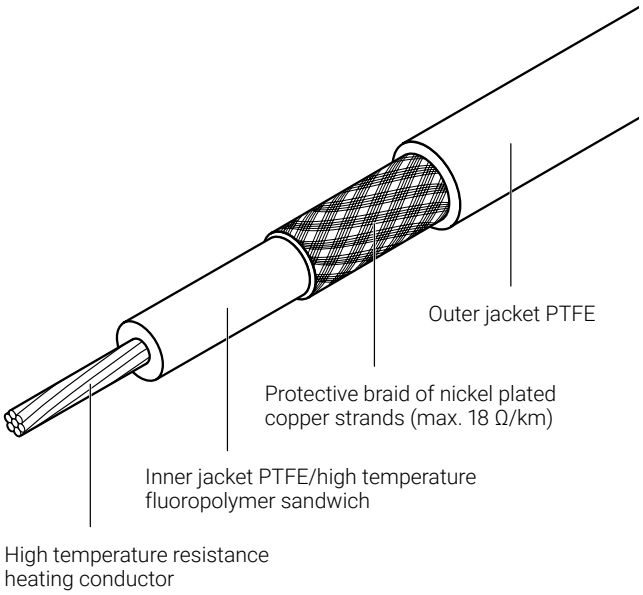
RECOMMENDED COLD LEAD CABLES FOR XPI-F (COLD LEAD CABLES FROM XPI CAN BE USED ALTERNATIVELY)

Nom. cross section [mm²]	Current rating [A]	Outer diameter [mm nom.]	Nominal resistance [Ω/km @ 20°C]	Temperature coefficient [x 10-3 /K]	Order reference	Part number PN
2.5	32	6.6	7.0	4.3	XPI-F-7	1244-018801
4	42	7.2	4.4	4.3	XPI-F-4.4	1244-018800
6	54	7.8	2.9	4.3	XPI-F-2.9	1244-018799
10	73	9.5	1.8	4.3	XPI-F-1.8	1244-018798

Notes: Delivery length depends on type of resistance and is limited by max. weight of 120 kg/spool, respectively 1000 m/run.
To ensure practical and safe on-site handling, it is strongly recommended to limit spool lengths to 25 - 30 kg. Not all resistances are standard items and as such may not be in stock. Contact nVent to confirm lead time. nVent requires the use of a 30 mA residual current device to provide maximum safety and protection from fire.

Where design results in higher leakage current, the preferred trip level for adjustable devices is 30 mA above any inherent capacitive leakage characteristic of the heater as specified by the trace heater supplier or alternatively, the next common available trip level for non adjustable devices, with a maximum of 300 mA. All safety aspects need to be proven.

POLYMER INSULATED (PI) SERIES RESISTANCE HEATING CABLE



HEATING CABLE CONSTRUCTION

nVent RAYCHEM XPI is a polymer insulated (PI) series heating cable, suitable for use in hazardous areas. It has been designed for use in freeze protection and temperature maintenance applications of pipes, tanks and other equipment. XPI offers an economical solution for a wide variety of heat-tracing applications, in particular for pipe lengths beyond the maximum circuit lengths of parallel heating cables.

The inner insulation is a sandwich construction of high temperature fluoropolymer and PTFE, the outer insulation is made of PTFE. This unique construction is very easy to terminate, highly flexible and makes XPI a very safe and reliable product. It provides highest chemical withstand and excellent mechanical strength, in particular at elevated temperatures.

XPI heating cables can be used for temperatures up to 260°C (continuous) and 300°C (intermittent short-term exposure). XPI is easy to install and has printed meter-marks. nVent RAYCHEM offers XPI heating cables in a very wide range of resistances, starting from 0.8 Ω/km up to 8000 Ω/km as well as a complete range of components for connection and splicing of the cables.

APPLICATION

Area classification	Hazardous area, Zone 1 or Zone 2 (Gas) or Zone 21 or Zone 22 (Dust) Ordinary area
Chemical resistance	Organic and inorganic corrosives

APPROVALS

System (heating units)	PTB 08 ATEX 1102X II 2G/D Ex e II T2...T6 / Ex tD A21 IP65 T290...T80°C IECEx PTB 08.0051X Ex II 2G/D Ex e II T2...T6 / Ex tD A21 IP65 T290...T80°C RU C-BE.ИМ43.B.01854 ООО «ТехИмпорт» Ambient temp range: -70°C...+56°C 1Ex e II T6 (80°C)...T2 (290°C) Gb X Ex tb IIIC T80°C...290°C Db X Made in Germany
Bulk cable	Baseefa15ATEX0158U II 2 G Ex e IIC Gb IECEx BAS 15.0105U Ex II 2 G Ex e IIC Gb RU C-BE.ИМ43.B.01854 ООО «ТехИмпорт» Ambient temp range: -70°C...+56°C 1Ex e II T6 (80°C)...T2 (290°C) Gb X Ex tb IIIC T80°C...290°C Db X IP66 Made in Germany

Temperature classification (T-rating) has to be established by using the principles of stabilised design or the use of a temperature limiting device. Use TraceCalc design software or contact nVent.

TECHNICAL DATA

Max. exposure temperature	260°C (power off, continuous), 300°C (power off, intermittent for max 1000 h)
Min. installation temperature	–70°C
Min. bending radius at –70°C	2.5 x cable diameter for cable diameter ≤ 6 mm 6 x cable diameter for cable diameter > 6 mm
Max. power output	35 W/m (typical value, depending on application)
Nominal voltage	Up to 450/750 Vac (U0/U)
Min. impact resistance	4 Joule (as per EN 60079-30-1)
Min. clearance	20 mm between heating cables

XPI HEATING CABLE REFERENCES

Order Reference	Nominal resistance [Ω/km @ 20°C]	Temp. coefficient [x 10-3/ K]	Outer diameter [mm nom.]	Nom. weight [kg/km]	Part Number PN
XPI-0.8	0.8	4.3	11.9	404	1244-000189
XPI-1.1	1.1	4.3	10.1	306	1244-000201
XPI-1.8	1.8	4.3	8.6	208	1244-000182
XPI-2.9	2.9	4.3	6.9	143	1244-000202
XPI-4.4	4.4	4.3	6.1	112	1244-000190
XPI-7	7.0	4.3	5.5	83	1244-000203
XPI-10	10.0	4.3	5.4	76	1244-000204
XPI-11.7	11.7	4.3	5.2	65	1244-000183
XPI-15	15.0	4.3	5.1	61	1244-000191
XPI-17.8	17.8	4.3	4.9	57	1244-000178
XPI-25	25.0	3.0	4.9	57	1244-000192
XPI-31.5	31.5	1.3	5.3	67	1244-000205
XPI-50	50	1.3	4.9	57	1244-000184
XPI-65	65	1.3	4.8	53	1244-000206
XPI-80	80	0.7	5.1	61	1244-000193
XPI-100	100	0.4	5.2	67	1244-000207
XPI-150	150	0.4	4.9	57	1244-000185
XPI-180	180	0.33	4.7	51	1244-000194
XPI-200	200	0.40	4.8	53	1244-000195
XPI-320	320	0.18	4.9	56	1244-000653
XPI-380	380	0.18	4.8	53	1244-000180
XPI-480	480	0.18	4.7	51	1244-000208
XPI-600	600	0.18	4.5	48	1244-000196
XPI-700	700	0.18	4.5	46	1244-000186
XPI-810	810	0.04	4.6	50	1244-000209
XPI-1000	1000	0.04	4.5	48	1244-000197
XPI-1440	1440	0.04	4.4	45	1244-000211
XPI-1750	1750	0.04	4.3	43	1244-000198
XPI-2000	2000	0.35	4.6	49	1244-000187
XPI-3000	3000	0.35	4.4	45	1244-000212
XPI-4000	4000	0.35	4.2	42	1244-000199
XPI-4400	4400	0.1	4.3	43	1244-000181
XPI-5160	5160	0.1	4.3	42	1244-000654
XPI-5600	5600	0.1	4.2	41	1244-000188
XPI-7000	7000	0.1	4.2	40	1244-000213
XPI-8000	8000	0.1	4.1	40	1244-000200

Resistance tolerance: +10/–5%. In particular for cables < 31.5 Ω/km the resistance of the conductor materials is a function of temperature and the change must be considered for design purposes.

RECOMMENDED COLD LEAD CABLES FOR XPI (COLD LEAD CABLES FROM XPI-S CAN BE USED ALTERNATIVELY)

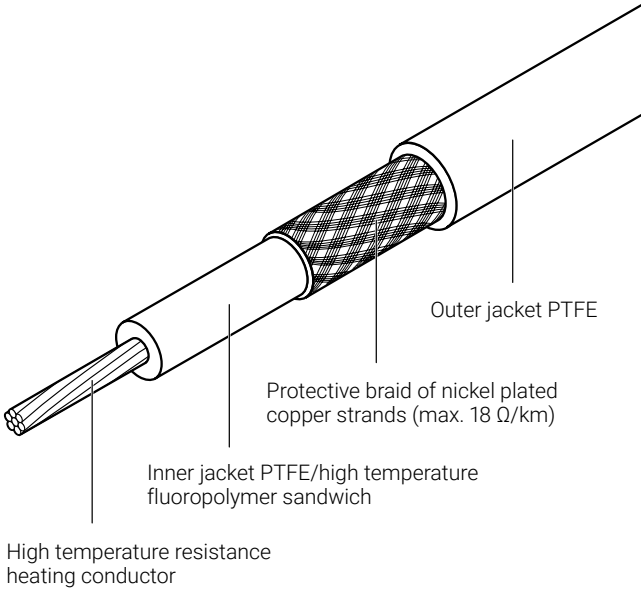
Nom. cross section [mm²]	Current rating [A]	Outer diameter [mm nom.]	Nominal resistance [Ω/km @ 20°C]	Temperature coefficient [x 10-3 /K]	Order reference	Part number PN
2.5	32	5.5	7.0	4.3	XPI-7	1244-000203
4	42	6.1	4.4	4.3	XPI-4.4	1244-000190
6	54	6.9	2.9	4.3	XPI-2.9	1244-000202
10	73	8.6	1.8	4.3	XPI-1.8	1244-000182
16	98	10.1	1.1	4.3	XPI-1.1	1244-000201
25	129	11.9	0.8	4.3	XPI-0.8	1244-000189

Notes: Delivery length depends on type of resistance and is limited by max. weight of 120 kg/spool, respectively 1000 m/run.
To ensure practical and safe on-site handling, it is strongly recommended to limit spool lengths to 25 - 30 kg.Not all resistances are standard items and as such may not be in stock. Contact nVent to confirm lead time. nVent requires the use of a 30 mA residual current device to provide maximum safety and protection from fire.

Where design results in higher leakage current, the preferred trip level for adjustable devices is 30 mA above any inherent capacitive leakage characteristic of the heater as specified by the trace heater supplier or alternatively, the next common available trip level for non adjustable devices, with a maximum of 300 mA. All safety aspects need to be proven.

XPI-S

POLYMER INSULATED (PI) SERIES RESISTANCE HEATING CABLE



HEATING CABLE CONSTRUCTION

nVent RAYCHEM XPI-S is a polymer insulated (PI) series heating cable, suitable for use in hazardous areas. It has been designed for use in freeze protection and temperature maintenance applications of pipes, tanks and other equipment. XPI-S is a re-enforced version of XPI, particularly suitable for areas with high demands on mechanical abuse of the heating cable. XPI-S offers an economical solution for a wide variety of heat-tracing applications, in particular for pipe lengths beyond the maximum circuit lengths of parallel heating cables (e.g. 250 m).

The inner insulation is a sandwich construction of high temperature fluoropolymer and PTFE, the outer insulation is made of PTFE. This unique construction is very easy to terminate, highly flexible and makes XPI a very safe and reliable product. It provides highest chemical withstand and most excellent mechanical strength, in particular at elevated temperatures.

XPI-S heating cables can be used for temperatures up to 260°C (continuous) and 300°C (intermittent short-term exposure). XPI-S is easy to install and has printed meter-marks. nVent RAYCHEM offers XPI-S heating cables in a very wide range of resistances, starting from 0.8 Ω/km up to 8000 Ω/km as well as a complete range of components for connection and splicing of the cables.

APPLICATION

Area classification	Hazardous area, Zone 1 or Zone 2 (Gas) or Zone 21 or Zone 22 (Dust) Ordinary area
Chemical resistance	Organic and inorganic corrosives

APPROVALS

System (heating units)	System (heating units) PTB 08 ATEX 1102X Ⓔx II 2G/D Ex e II T2...T6 / Ex tD A21 IP65 T290...T80°C IECEx PTB 08.0051X Ex II 2G/D Ex e II T2...T6 / Ex tD A21 IP65 T290...T80°C EAC Ex TC RU C-BE.ИМ43.B.01854 ООО «ТехИмпорт» Ambient temp range: -70°C...+56°C 1Ex e II T6 (80°C)...T2 (290°C) Gb X Ex tb IIIC T80°C...290°C Db X IP66 Made in Germany

APPROVALS

Bulk cable	Baseefa15ATEX0158U II 2 G Ex e IIC Gb IECEx BAS 15.0105U Ex II 2 G Ex e IIC Gb EAC Ex TC RU C-BE.ИМ43.B.01854 ООО «ТехИмпорт» Ambient temp range: -70°C...+56°C 1Ex e II T6 (80°C)...T2 (290°C) Gb X Ex tb IIIC T80°C...290°C Db X Made in Germany

Temperature classification (T-rating) has to be established by using the principles of stabilised design or the use of a temperature limiting device. Use TraceCalc design software or contact nVent.

TECHNICAL DATA

Max. exposure temperature	260°C (power off, continuous), 300°C (power off, intermittent for max 1000 h)
Min. installation temperature	–70°C
Min. bending radius at –70°C	2.5 x cable diameter for cable diameter ≤ 6 mm 6 x cable diameter for cable diameter > 6 mm
Max. power output	35 W/m (typical value, depending on application)
Nominal voltage	Up to 450/750 Vac (U_0/U)
Min. impact resistance	7 Joule (as per EN 60079-30-1)
Min. clearance	20 mm between heating cables

XPI-S HEATING CABLE REFERENCES

Order Reference	Nominal resistance [Ω/km @ 20°C]	Temp. coefficient [x 10^{-3}/ K]	Outer diameter [mm nom.]	Nom. weight [kg/km]	Part Number PN
XPI-S-0.8	0.8	4.3	11.9	405	1244-003047
XPI-S-1.1	1.1	4.3	10.1	307	1244-003048
XPI-S-1.8	1.8	4.3	8.6	209	1244-003049
XPI-S-2.9	2.9	4.3	7.1	149	1244-003050
XPI-S-4.4	4.4	4.3	6.5	116	1244-003051
XPI-S-7	7.0	4.3	5.9	88	1244-003052
XPI-S-10	10.0	4.3	5.8	84	1244-003053
XPI-S-11.7	11.7	4.3	5.6	76	1244-003054
XPI-S-15	15.0	4.3	5.5	71	1244-003055
XPI-S-17.8	17.8	4.3	5.3	68	1244-003056
XPI-S-25	25.0	3.0	5.5	72	1244-003057
XPI-S-31.5	31.5	1.3	5.9	82	1244-003058
XPI-S-50	50	1.3	5.5	72	1244-003059
XPI-S-65	65	1.3	5.4	66	1244-003060
XPI-S-80	80	0.7	5.7	75	1244-003061
XPI-S-100	100	0.4	5.8	79	1244-003062
XPI-S-150	150	0.4	5.8	78	1244-003063
XPI-S-180	180	0.33	5.6	71	1244-003064
XPI-S-200	200	0.40	5.7	72	1244-003065
XPI-S-320	320	0.18	5.8	76	1244-003066
XPI-S-380	380	0.18	5.7	73	1244-003067
XPI-S-480	480	0.18	5.6	70	1244-003068
XPI-S-600	600	0.18	5.4	67	1244-003069
XPI-S-700	700	0.18	5.4	65	1244-003070
XPI-S-810	810	0.04	5.5	69	1244-003071

Order Reference	Nominal resistance [Ω/km @ 20°C]	Temp. coefficient [x 10^{-3}/ K]	Outer diameter [mm nom.]	Nom. weight [kg/km]	Part Number PN
XPI-S-1000	1000	0.04	5.4	67	1244-003072
XPI-S-1440	1440	0.04	5.6	69	1244-003073
XPI-S-1750	1750	0.04	5.5	67	1244-003074
XPI-S-2000	2000	0.35	5.8	74	1244-003075
XPI-S-3000	3000	0.35	5.6	69	1244-003076
XPI-S-4000	4000	0.35	5.4	65	1244-003077
XPI-S-4400	4400	0.1	5.5	66	1244-003078
XPI-S-5160	5160	0.1	5.5	66	1244-003079
XPI-S-5600	5600	0.1	5.4	63	1244-003080
XPI-S-7000	7000	0.1	5.4	61	1244-003081
XPI-S-8000	8000	0.1	5.3	60	1244-003082

Resistance tolerance: +10/−5%. In particular for cables < 31.5 Ω/km the resistance of the conductor materials is a function of temperature and the change must be considered for design purposes.

RECOMMENDED COLD LEAD CABLES FOR XPI-S

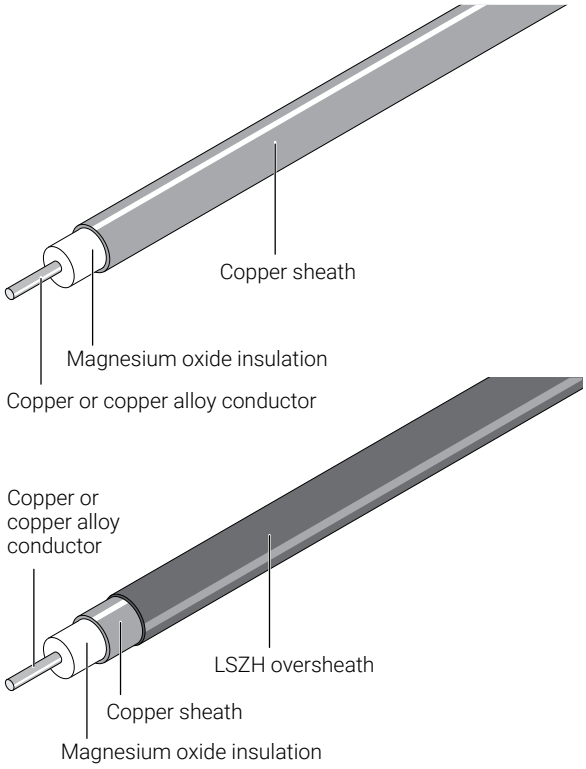
Nom. cross section [mm^2]	Current rating [A]	Outer diameter [mm nom.]	Nominal resistance [Ω/km @ 20°C]	Temperature coefficient [x10^{-3}/K]	Order reference	Part number PN
2.5	32	5.9	7.0	4.3	XPI-S-7	1244-003052
4	42	6.5	4.4	4.3	XPI-S-4.4	1244-z003051
6	54	7.1	2.9	4.3	XPI-S-2.9	1244-003050
10	73	8.6	1.8	4.3	XPI-S-1.8	1244-003049
16	98	10.1	1.1	4.3	XPI-S-1.1	1244-003048
25	129	11.9	0.8	4.3	XPI-S-0.8	1244-003047

Notes: Delivery length depends on type of resistance and is limited by max. weight of 120 kg/spool, respectively 1000 m/run. To ensure practical and safe on-site handling, it is strongly recommended to limit spool lengths to 25 - 30kg. Not all resistances are standard items and as such may not be in stock. Contact nVent to confirm lead time.

nVent requires the use of a 30 mA residual current device to provide maximum safety and protection from fire.

Where design results in higher leakage current, the preferred trip level for adjustable devices is 30 mA above any inherent capacitive leakage characteristic of the heater as specified by the trace heater supplier or alternatively, the next common available trip level for non adjustable devices, with a maximum of 300 mA. All safety aspects need to be proven.

MINERAL INSULATED (MI) COPPER SHEATHED HEATING CABLE



TYPICAL CABLE CONSTRUCTIONS

nVent RAYCHEM HCH/HCC mineral insulated (MI) Copper series heating cables are suited for use in hazardous areas. They are extensively used in a wide variety of industrial heat-tracing applications, such as long line heating or condensation prevention at low temperatures, and domestic applications, such as under floor or road and ramp heating applications. The copper heating cables with copper conductors (HCC) are available in very low resistances to allow for long line applications with a limited amount of supply points when the maximum operating sheath temperature does not exceed 200°C. The typical maximum power output goes up to 50 W/m. Cables are available with an optional LSZH (Low Smoke Zero Halogen) over-sheath for enhanced corrosion protection up to 80°C, usually applied when buried in concrete. The heating cables are offered as bulk cable as well as factory-terminated heating units to ensure optimum quality of the connections. The offering is completed with a full range of components for installation, connection and splicing of the heating cables.

APPLICATION

Area classification	Hazardous areas*, Zone 1 or Zone 2 (Gas) or Zone 21 or Zone 22 (Dust) Ordinary areas *Cable types HCH1L2000 and HCH1L1250 can only be used in ordinary areas

APPROVALS

System (heating units)	Baseefa 13ATEX0174X	II 2G Ex eb IIC T* Gb II 2D Ex tb IIIC T*°C Db (for * see schedule)
	IECEx BAS 13.0090X	Ex eb IIC T* Gb Ex tb IIIC T*°C Db (for * see schedule)
	EAC Ex № ЕАЭС RU C-BE.МЮ62.В.00879/19 ООО «ПРОММАШ ТЕСТ» Ambient temp range: −60°C...+70°C	1Ex e IIC T* Gb X Ex tb IIIC T* Db X *: by design Made in Germany or Poland
Bulk cable	Baseefa 13ATEX0173U	II 2G Ex e IIC Gb
	IECEx BAS 13.0091U	Ex e IIC Gb
	EAC Ex № ЕАЭС RU C-BE.МЮ62.В.00879/19 ООО «ПРОММАШ ТЕСТ» Ambient temp range: −60°C...+70°C	1Ex e IIC T* Gb X Ex tb IIIC T* Db X *: by design Made in Canada or Italy

Heating units are also approved for dust environments. Temperature classification (T-rating) has to be established by using the principles of stabilised design or the use of a temperature limiting device. Use TraceCalc design software or contact nVent

TECHNICAL DATA

Cable sheath material	Copper	
Conductor material	Copper (HCC) or Copper Alloy (HCH)	
Max. exposure temperature	200°C**	
Min. installation temperature	–60°C	
Min. bending radius	6 x outer diameter at –60°C	
Max. supply voltage and power	Voltage (U0/U)	Max. power output*
	300/500 Vac	50 W/m
		*typical value, depending on application
Earth leakage	3 mA/100 m (nominal at 20°C, 230Vac, 50 - 60Hz)	
Min. cable spacing	25 mm for hazardous areas	

** Note: Cables available with optional additional oversheath for corrosion protection:
– LSZH (Max Sheath temp 80°C) – add R to the ref. (HCHR...)
For LSZH add 1.8 mm to cable OD.

MI SERIES HEATING CABLES HCH/HCC

Order Reference	Nominal resistance (Ω/km @ 20°C)	Outer diameter (mm)	Temp. coefficient (x 10^{-3}/K)	Max. coil length [m]	Nom.weight (kg/km)
HCH1L2000(1)	2000	2.8	0.4	1200	31
HCH1L1250(1)	1250	2.8	0.4	1200	32
HCH1M800	800	3.5	0.4	900	50
HCH1M630	630	4.0	0.4	1100	65
HCH1M450	450	4.0	0.4	1000	67
HCH1M315	315	4.3	0.4	1000	77
HCH1M220	220	4.5	0.4	1000	85
HCH1M140	140	4.9	0.4	1000	102
HCH1M100	100	5.2	0.4	800	125
HCC1M63	63	3.2	3.9	2000	41
HCC1M40	40	3.4	3.9	2000	46
HCC1M25	25	3.7	3.9	1600	56
HCC1M17	17	4.6	3.9	500	85
HCC1M11	11	4.9	3.9	500	98
HCC1M7	7	5.3	3.9	400	118
HCC1M4	4	5.9	3.9	800	150
HCC1M2.87	2.87	6.4	3.9	650	170
HCC1M1.72	1.72	7.3	3.9	500	235
HCC1M1.08	1.08	8.3	3.9	400	326

(1) Not approved for hazardous areas, maximum 300 Vac.

RAYCHEM-DS-EU1388-HCHHCC-EN-1911

RECOMMENDED COLD LEADS FOR HCH/HCC MI SERIES HEATING CABLES

Cold Lead Code	Sheath Material	Current Rating (A)	Voltage Rating (Vac)	No of Conductors	Design*	Cable O.D. (mm)	Pigtail Size (mm²)	Gland Size
C31A	Copper	31	600	1	B	5.8	2.1	M25
C41A	Copper	41	600	1	B	7	3.3	M25
C54A	Copper	54	600	1	B	6.2	5.3	M25
C70A	Copper	70	600	1	B	7.6	8.4	M25
C94A	Copper	94	600	1	B	8.6	13.3	M25
C127A	Copper	127	600	1	B	10.2	21.1	M25

* For details on the different heating unit designs, refer to chapter MI heating Systems - MI heating Cables in the Databook (reference DOC-2210)

Nickel plated brass glands are standard on all copper sheathed heating units. Other materials are possible, contact nVent for more information. If a cold lead has an LSZH oversheath, the C in the order reference becomes an R. (example : C31A becomes R31A)

Delivery length of bulk cable on coil depends on type of resistance and is limited by max. coil length as indicated in the table on top. Factory terminated elements are limited by a max. weight of 50kg, however to ensure practical and safe on-site handling, it is strongly recommended to limit element lengths to 25 - 30kg. Not all resistances are standard items and as such may not be in stock.

Contact nVent to confirm lead time. nVent requires the use of a 30 mA residual current device to provide maximum safety and protection from fire.

Where design results in higher leakage current, the preferred trip level for adjustable devices is 30 mA above any inherent capacitive leakage characteristic of the heater as specified by the trace heater supplier or alternatively, the next common available trip level for non adjustable devices, with a maximum of 300 mA. All safety aspects need to be proven.

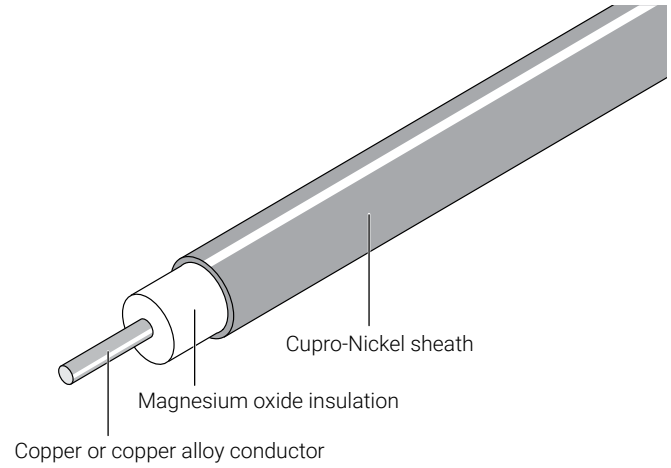
Also refer to the components section for more details on heating units, accessories and nomenclatures.

CHEMICAL RESISTANCE

Sheath Material	Maximum Cable Sheath Temp (°C)	Description	Sulphuric Acid	Hydro-chloric Acid	Hydro-fluoric Acid	Alkalis	Phosphoric Acid	Sea Water	Nitric Acid	Chloride	Organic Acid
Copper-LSZH	80	Copper with Low Smoke Zero Halogen oversheath	GE	GE	A	A	A	NR	A	A	
Copper	200	Copper	NR	NR	A	A	NR	A	A	NR	X

Note: NR Not recommended, A acceptable, GE Good to excellent, X Check for specific data.
Corrosion resistance data is dependent on temperature and concentration.

MINERAL INSULATED CUPRO-NICKEL SHEATHED HEATING CABLE



TYPICAL CABLE CONSTRUCTIONS

nVent RAYCHEM HDC/HDF mineral insulated (MI) Cupro-Nickel series heating cables are suited for use in hazardous areas. They are extensively used for a wide variety of industries, such as oil and gas, chemical and petrochemical, power generation, gas storage and many other industrial applications. Cupro-Nickel heating cables with copper conductors (HDC) are available in very low resistances to allow for long line applications with a limited amount of supply points, in particular for applications exceeding the capabilities of Polymer Insulated (PI) series heating cables. The heating cables can be used for exposure temperatures up to 400°C and a typical power output up to 70 W/m. The heating cables are offered as bulk cable as well as factory-terminated heating units to ensure optimum quality of the connections. The offering is completed with a full range of components for installation, connection and splicing of the heating cables.

APPLICATION

Area classification	Hazardous areas, Zone 1 or Zone 2 (Gas) and Zone 21 or Zone 22 (Dust) Ordinary areas

APPROVALS

System (heating units)	Baseefa 13ATEX0174X	II 2G Ex eb IIC T* Gb II 2D Ex tb IIIC T*°C Db (for * see schedule)
	IECEx BAS 13.0090X	Ex eb IIC T* Gb Ex tb IIIC T*ºC Db (for * see schedule)
	EAC Ex № ЕАЭС RU C-BE.МЮ62.B.00879/19 ООО «ПРОММАШ ТЕСТ» Ambient temp range: −60°C...+70°C	1Ex e IIC T* Gb X Ex tb IIIC T* Db X *: by design Made in Germany or Poland
Bulk cable	Baseefa 13ATEX0173U	II 2G Ex e IIC Gb
	IECEx BAS 13.0091U	Ex e IIC Gb
	EAC Ex № ЕАЭС RU C-BE.МЮ62.B.00879/19 ООО «ПРОММАШ ТЕСТ» Ambient temp range: −60°C...+70°C	1Ex e IIC T* Gb X Ex tb IIIC T* Db X *: by design Made in Canada or Italy

Heating units are also approved for Dust environments. Temperature classification (T-rating) has to be established by using the principles of stabilised design or the use of a temperature limiting device. Use TraceCalc design software or contact nVent.

TECHNICAL DATA

Cable sheath material	70/30 Cupro-Nickel	
Conductor material	Copper (HDC) or Copper Alloy (HDF)	
Max. exposure temperature	400°C	
Min. installation temperature	−60°C	
Min. bending radius	6 x outer diameter at −60°C	
Max. supply voltage and power	Voltage (U_0/U) 300/500 Vac	Max. power output* 70 W/m *typical value, depending on application
Earth leakage	3 mA/100 m (nominal at 20°C, 230Vac, 50 - 60Hz)	
Min. cable spacing	25 mm for hazardous areas	

MI SERIES HEATING CABLES HDF/HDC

Order Reference	Nominal resistance (Ω/km @ 20°C)	Outer diameter (mm)	Temp. coefficient (x 10^{-3}/K)	Max. coil length [m]	Nom.weight (kg/km)
HDF1M1600	1600	3.2	0.04	625	40
HDF1M1000	1000	3.4	0.04	550	45
HDF1M630	630	3.7	0.04	465	55
HDF1M400	400	4.0	0.04	400	67
HDF1M250	250	4.4	0.04	330	84
HDF1M160	160	4.9	0.04	265	108
HDC1M63	63	3.2	3.9	620	39
HDC1M40	40	3.4	3.9	550	44
HDC1M25	25	3.7	3.9	440	55
HDC1M17	17	4.6	3.9	300	84
HDC1M11	11	4.9	3.9	265	98
HDC1M7	7	5.3	3.9	225	119
HDC1M4	4	5.9	3.9	180	155

RECOMMENDED COLD LEADS FOR HDF/HDC MI SERIES HEATING CABLES

Cold Lead Code	Sheath Material	Current Rating (A)	Voltage Rating (Vac)	No of Conductors	Design*	Cable O.D. (mm)	Pigtail Size (mm²)	Gland Size
S33A	Alloy 825	33	600	1	B	5.5	3.3	M25
S55A	Alloy 825	55	600	1	B	6.4	8.4	M25
S76A	Alloy 825	76	600	1	B	8.1	13.3	M25
S123A	Alloy 825	123	600	1	B	10.2	21.1	M25

* For details on the different heating unit designs, refer to chapter MI heating Systems - MI heating Cables in the Databook (reference DOC2210)

Nickel plated brass glands are standard on all heating units. Other materials are possible, contact nVent for more information. Cold leads attached to cupro nickel sheathed heating cables are provided with an Alloy 825 outer sheath. As the cold lead is an exposed component, not protected by insulation, it can be subject to extremely variable corrosive environments. The Alloy 825 sheath provides enhanced life expectancy with a superior level of corrosion protection against a wide range of exposure conditions.

By default, all cold leads are supplied with M25 glands intended for use with a standardized range of Raychem MI junction boxes which include an integral earth plate.

Delivery length of bulk cable on coil depends on type of resistance and is limited by max. coil length as indicated in the table on top. Factory terminated elements are limited by a max. weight of 50kg, however to ensure practical and safe on-site handling, it is strongly recommended to limit element lengths to 25 - 30kg. Not all resistances are standard items and as such may not be in stock. Contact nVent to confirm lead time. nVent requires the use of a 30 mA residual current device to provide maximum safety and protection from fire.

Where design results in higher leakage current, the preferred trip level for adjustable devices is 30 mA above any inherent capacitive leakage characteristic of the heater as specified by the trace heater supplier or alternatively, the next common available trip level for non adjustable devices, with a maximum of 300 mA. All safety aspects need to be proven.

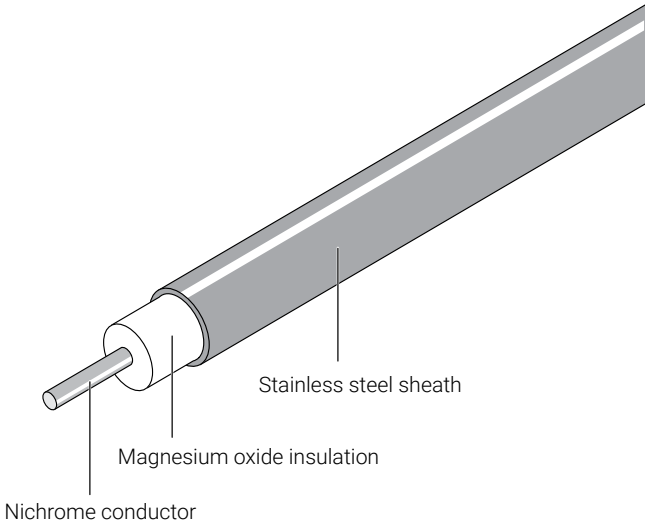
Also refer to the components section for more details on heating units, accessories and nomenclatures.

CHEMICAL RESISTANCE

Sheath Material	Maximum Cable Sheath Temp (°C)	Description	Sulphuric Acid	Hydrochloric Acid	Hydrofluoric Acid	Phosphoric Acid	Nitric Acid	Organic Acid	Alkalis	Sea Water	Chloride
Cupro-Nickel	400	Cupro-Nickel alloy 70% copper 30% nickel	NR	X	X	X	X	X	X	GE	GE

Note: NR Not recommended, A acceptable, GE Good to excellent, X Check for specific data
Corrosion resistance data is dependent on temperature and concentration.

MINERAL INSULATED (MI) STAINLESS STEEL SHEATHED HEATING CABLE



HEATING CABLE CONSTRUCTION

nVent RAYCHEM HSQ mineral insulated (MI) Stainless steel series heating cables are suited for use in hazardous areas. The Stainless steel sheath offers excellent corrosive properties against a wide range of organic acids and alkalis in combination with a high temperature withstand capability. HSQ cables are typically used in bitumen plants, gas plants, oil refineries, reactors and vessels, sodium loops and a wide variety of other heat-tracing applications where temperature resistance, power output and durability are paramount. The heating cables can be used for exposure temperatures up to 700°C and a typical power output up to 150 W/m. Higher temperatures and power outputs can be achieved, contact nVent for assistance. The heating cables are offered as bulk cables as well as factory-terminated heating units employing brazing or laser welding techniques to ensure optimum quality of the connections. The offering is completed with a full range of components for installation, connection and splicing of the heating cables.

APPLICATION

Area classification	Hazardous areas, Zone 1 or Zone 2 (Gas) or Zone 21 or Zone 22 (Dust) Ordinary areas

APPROVALS

System (heating units)	Baseefa 13ATEX0174X	II 2G Ex eb IIC T* Gb II 2D Ex tb IIIC T*°C Db (for * see schedule)
	IECEx BAS 13.0090X	Ex eb IIC T* Gb Ex tb IIIC T*°C Db (for * see schedule)
	EAC Ex № ЕАЭС RU C-BE.МЮ62.B.00879/19 ООО «ПРОММАШ ТЕСТ» Ambient temp range: −60°C...+70°C	1Ex e IIC T* Gb X Ex tb IIIC T* Db X *: by design Made in Germany or Poland
Bulk cable	Baseefa 13ATEX0173U	II 2G Ex e IIC Gb
	IECEx BAS 13.0091U	Ex e IIC Gb
	EAC Ex № ЕАЭС RU C-BE.МЮ62.B.00879/19 ООО «ПРОММАШ ТЕСТ» Ambient temp range: −60°C...+70°C	1Ex e IIC T* Gb X Ex tb IIIC T* Db X *: by design Made in Canada or Italy

Heating units are also approved for dust environments. Temperature classification (T-rating) has to be established by using the principles of stabilised design or the use of a temperature limiting device. Use TraceCalc design software or contact nVent.

TECHNICAL DATA

Cable sheath material	321 Stainless steel	
Conductor material	Nichrome	
Max. exposure temperature	550°C (brazed heating units) 700°C* (laser welded heating units) *Higher temperatures can be realized, contact nVent	
Min. installation temperature	–60°C	
Min. bending radius	6 x outer diameter at –60°C	
Max. supply voltage and power	Voltage (Uo/U) 300/500 Vac 460/600 Vac (laser welded heating units)	Max. power output* 150 W/m *typical value, depending on application
Earth leakage	3 mA/100 m (nominal at 20°C, 230 Vac, 50 - 60 Hz)	
Min. cable spacing	25 mm for hazardous areas	

MI SERIES HEATING CABLES HSQ

Order Reference	Nominal resistance (Ω/km @ 20°C)	Outer diameter (mm)	Temp. coefficient (x 10^{-3}/K)	Max. coil length [m]	Nom.weight (kg/km)
HSQ1M10K	10000	3.2	0.09	740	39
HSQ1M6300	6300	3.2	0.09	741	39
HSQ1M4000	4000	3.2	0.09	743	39
HSQ1M2500	2500	3.4	0.09	660	46
HSQ1M1600	1600	3.6	0.09	591	52
HSQ1M1000	1000	3.9	0.09	506	62
HSQ1M630	630	4.3	0.09	419	78
HSQ1M400	400	4.7	0.09	354	96
HSQ1M250	250	5.3	0.09	280	127
HSQ1M160	160	6.5	0.09	187	191

RECOMMENDED COLD LEADS FOR HSQ MI SERIES HEATING CABLES

Cold Lead Code	Sheath Material	Current Rating (A)	Voltage Rating (Vac)	No of Conductors	Design*	Cable O.D. (mm)	Pigtail Size (mm²)	Gland Size
S33A	Alloy 825	33	600	1	B	5.5	3.3	M25
S55A	Alloy 825	55	600	1	B	6.4	8.4	M25
SC33A	Stainless steel	33	600	1	B	5.5	3.3	M25
SC55A	Stainless steel	55	600	1	B	6.4	8.4	M25

* For details on the different heating unit designs, refer to chapter MI heating Systems - MI heating Cables in the Databook (reference DOC2210)

Nickle plated brass glands are standard on all heating units. Other materials are possible, contact nVent for more information.

Cold leads attached to HSQ heating cables are provided with an Alloy 825 outer sheath when the joint connection method is brazed or SS321 sheath when the connection method is laser welded. As the cold lead is an exposed component, not protected by insulation, it can be subject to extremely variable corrosive environments. The Alloy 825 sheath provides enhanced life expectancy with a superior level of corrosion protection against a wide range of exposure conditions.

By default, all cold leads are supplied with M25 glands intended for use with a standardized range of Raychem MI junction boxes which include an integral earth plate. Delivery length of bulk cable on coil depends on type of resistance and is limited by max. coil length as indicated in the table on top. Factory terminated elements are limited by a max. weight of 50kg, however to ensure practical and safe on-site handling, it is strongly recommended to limit element lengths to 25 - 30kg. Not all resistances are standard items and as such may not be in stock. Contact nVent to confirm lead time. nVent requires the use of a 30 mA residual current device to provide maximum safety and protection from fire.

Where design results in higher leakage current, the preferred trip level for adjustable devices is 30 mA above any inherent capacitive leakage characteristic of the heater as specified by the trace heater supplier or alternatively, the next common available trip level for non adjustable devices, with a maximum of 300 mA. All safety aspects need to be proven.

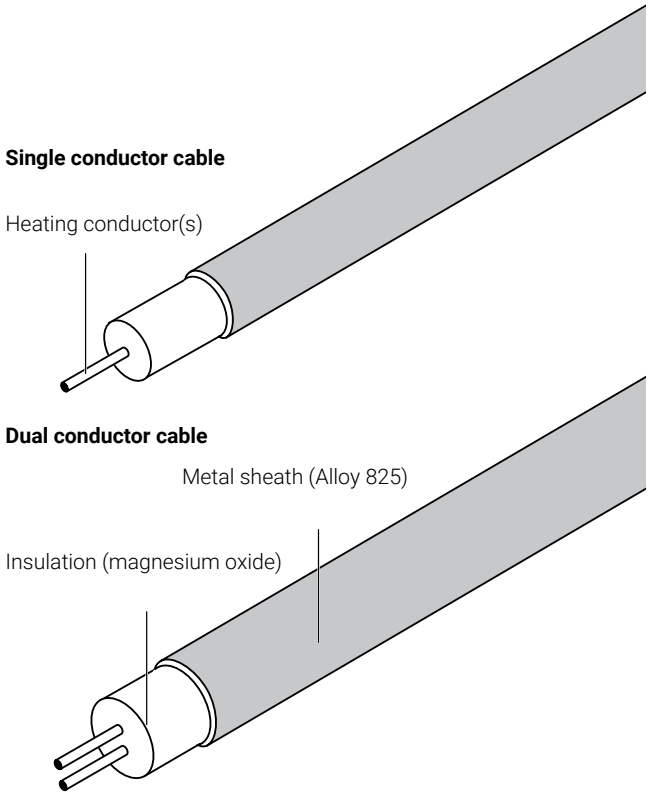
Also refer to the components section for more details on heating units, accessories and nomenclatures.

TABLE 3 CHEMICAL RESISTANCE

Sheath Material	Description	Sulphuric Acid	Hydrochloric Acid	Hydrofluoric Acid	Phosphoric Acid	Nitric Acid	Organic Acid	Alkalis	Sea Water	Chloride
Stainless Steel 321 DIN 1.4541	18/8 austenitic stainless steel with added titanium	NR	NR	NR	NR	X	GE	A	NR	NR

Note: NR Not recommended, A acceptable, GE Good to excellent, X Check for specific data
Temperature limitation based on construction of heating element.
Corrosion resistance data is dependent on temperature and concentration.

MINERAL INSULATED (MI) ALLOY 825 HEATING CABLE



TYPICAL CABLE CONSTRUCTIONS

nVent RAYCHEM HAx mineral insulated (MI) Alloy 825 series heating cables are suitable for use in hazardous areas. They have been designed for use in freeze protection and temperature maintenance applications of pipes, tanks and other equipment.

MI heating cables of the HAx-series offer an ideal combination of ruggedness, high temperature withstand capability and corrosion resistance and can therefore be used for a wide variety of heat-tracing applications, in particular for applications with high power requirements and for temperatures exceeding the capabilities of polymer insulated (PI) series heating cables.

The heating cables can be used for exposure temperatures of up to 700°C and a typical power output of up to 270 W/m. Higher temperatures and power outputs can be achieved, contact nVent for assistance.

HAx mineral insulated (MI) heating cables are available as single and dual conductor construction and in a very wide range of resistances. The use of dual conductor heating cables can significantly reduce total installed cost and simplifies installation, in particular for small pipes and instrument tubing.

The heating cables are offered as bulk cable as well as factory terminated heating units employing brazing and laser welding technology. The offering is completed with a full range of components for installation, connection and splicing of the heating cables.

APPLICATION

Area classification	Hazardous area, Zone 1 or Zone 2 (Gas) or Zone 21 or zone 22 (Dust) Ordinary

APPROVALS

System (heating units)	Baseefa 13ATEX0174X	II 2G Ex eb IIC T* Gb II 2D Ex tb IIIC T*°C Db (for * see schedule)
	IECEx BAS 13.0090X	Ex eb IIC T* Gb Ex tb IIIC T*ºC Db (for * see schedule)
	EAC Ex № ЕАЭС RU C-BE.МЮ62.B.00879/19 ООО «ПРОММАШ ТЕСТ» Ambient temp range: −60°C...+70°C	1Ex e IIC T* Gb X Ex tb IIIC T* Db X *: by design Made in Canada, Germany or Poland
Bulk cable	Baseefa 13ATEX0173U	II 2G Ex e IIC Gb
	IECEx BAS 13.0091U	Ex e IIC Gb
	EAC Ex № ЕАЭС RU C-BE.МЮ62.B.00879/19 ООО «ПРОММАШ ТЕСТ» Ambient temp range: −60°C...+70°C	1Ex e IIC T* Gb X Ex tb IIIC T* Db X *: by design Made in Canada or Italy

Heating units are also approved for dust environments. Temperature classification (T-rating) has to be established by using the principles of stabilised design or the use of a temperature limiting device. Use TraceCalc design software or contact nVent

TECHNICAL DATA

Cable sheath material	Alloy 825		
Conductor material	Various alloys and copper		
Max. exposure temperature	550°C (brazed heating units) 700°C* (laser welded heating units) *Higher temperatures can be realized, contact nVent		
Min. installation temperature	–60°C		
Min. bending radius	6 x OD (cable diameter) at –60°C		
Max. supply voltage and power	Voltage (U_0/U)	Max. power output*	Heating cable type
	600/600 Vac	210 W/m	HAx1N Single conductor cable, 600 V
	300/300 Vac	200 W/m	HAx2M Dual conductor cable, 300 V
	600/600 Vac	270 W/m	HAx2N Dual conductor cable, 600 V
		*typical value, depending on application	
Earth leakage	3 mA /100 m (nominal at 20°C, 230 Vac, 50 - 60 Hz)		
Min. cable spacing	25 mm for hazardous areas		

TABLE 1 MI SERIES HEATING CABLES HAX2M (DUAL CONDUCTOR CABLE, 300 V)

Order Reference	Nominal resistance (Ω/km @ 20°C)	Outer diameter (mm)	Temp. coefficient (x 10^{-3}/K)	Max. coil length [m]	Nom. weight (kg/km)	Part Number PN
HAF2M59K	59000	4.4	0.09	387	73	32SF1180
HAF2M36K	36000	4.0	0.09	483	60	32SF1110
HAF2M29.5K	29500	4.1	0.09	459	63	32SF2900
HAF2M24.5K	24500	4.0	0.09	477	61	32SF2750
HAA2M19.7K	19700	4.1	0.09	459	63	32SA2600
HAA2M13.2K	13200	3.7	0.09	554	54	32SA2400
HAA2M10.4K	10400	4.4	0.09	389	74	32SA2318
HAA2M9000	9000	3.9	0.09	505	60	32SA2275
HAA2M6600	6600	4.3	0.09	414	73	32SA2200
HAA2M5600	5600	4.2	0.09	425	72	32SA2170
HAB2M3750	3750	4.4	0.04	390	76	32SB2114
HAB2M3000	3000	4.1	0.04	451	67	32SB3914
HAB2M2300	2300	4.3	0.04	411	74	32SB3700
HAQ2M1560	1560	4.5	0.5	376	78	32SQ3472
HAQ2M1240	1240	4.6	0.5	352	82	32SQ3374
HAQ2M965	965	4.5	0.5	368	79	32SQ3293
HAQ2M660	660	4.1	0.5	457	66	32SQ3200
HAQ2M495	495	4.3	0.5	420	73	32SQ3150
HAQ2M330	330	4.7	0.5	348	89	32SQ3100
HAP2M240	240	4.4	1.3	391	78	32SP4734
HAP2M190	190	4.5	1.3	375	82	32SP4583
HAP2M150	150	4.8	1.3	337	62	32SP4458
HAC2M105	105	4.7	3.9	349	85	32SC4324

TABLE 2 MI SERIES HEATING CABLES HAX2N (DUAL CONDUCTOR CABLE, 600 V)

Order Reference	Nominal resistance (Ω/km @ 20°C)	Outer diameter (mm)	Temp. coefficient (x 10^{-3}/K)	Max. coil length [m]	Nom. weight (kg/km)	Part Number PN
HAF2N36K	36000	4.9	0.09	312	91	62SF1110
HAF2N29.5K	29500	4.9	0.09	312	91	62SF2900
HAF2N24.5K	24500	5.2	0.09	279	103	62SF2750
HAF2N19.7K	19700	5.8	0.09	222	128	62SF2600
HAA2N13.6K	13600	6.1	0.09	204	140	62SA2414
HAA2N9000	9000	5.7	0.09	232	125	62SA2275
HAF2N6600	6600	6.2	0.09	196	149	62SF2200

Order Reference	Nominal resistance (Ω/km @ 20°C)	Outer diameter (mm)	Temp. coefficient (x 10^{-3}/K)	Max. coil length [m]	Nom. weight (kg/km)	Part Number PN
HAA2N5600	5600	6.1	0.09	205	143	62SA2170
HAT2N3750	3750	5.5	0.18	254	113	62ST2115
HAB2N3000	3000	5.9	0.04	219	132	62SB3914
HAB2N2300	2300	6.7	0.04	168	174	62SB3700
HAT2N1670	1670	5.5	0.18	255	115	62ST3505
HAQ2N1240	1240	5.5	0.5	254	113	62SQ3374
HAQ2N940	940	5.6	0.5	239	121	62SQ3286
HAQ2N660	660	5.8	0.5	229	128	62SQ3200
HAQ2N495	495	5.8	0.5	229	128	62SQ3150
HAQ2N330	330	6.5	0.5	179	165	62SQ3100
HAP2N255	255	6.4	1.3	188	155	62SP4775
HAP2N185	185	6.7	1.3	171	173	62SP4561
HAP2N130	130	7.0	1.3	154	194	62SP4402
HAP2N92	92	7.4	1.3	139	219	62SP4281
HAC2N66	66	7.2	3.9	145	201	62SC4200
HAC2N43	43	7.7	3.9	128	233	62SC4130
HAC2N27	27	8.4	3.9	100	279	62SC5818
HAC2N17	17	9.2	3.9	90	343	62SC5516
HAC2N10.5	10.5	10.2	3.9	74	432	62SC5324
HAC2N6.6	6.6	12.6	3.9	48	653	62SC5204
HAC2N4.3	4.3	13.8	3.9	143	769	62SC5128

TABLE 3 MI SERIES HEATING CABLES HAX1N (SINGLE CONDUCTOR CABLE, 600 V)

Order Reference	Nominal resistance (Ω/km @ 20°C)	Outer diameter (mm)	Temp. coefficient (x 10-3/K)	Max. coil length [m]	Nom. weight (kg/km)	Part Number PN
HAA1N6565	6565	4.3	0.085	406	75	61SA2200
HAA1N5250	5250	4.1	0.085	443	66	61SA2160
HAA1N4300	4300	4.1	0.085	460	63	61SA2130
HAA1N3300	3300	4.1	0.085	460	64	61SA2100
HAA1N2800	2800	4.3	0.085	408	72	61SA3850
HAA1N2300	2300	4.1	0.085	462	64	61SA3700
HAA1N1640	1640	4.3	0.085	410	73	61SA3500
HAT1N920	920	4.3	0.18	408	72	61ST3280
HAB1N660	660	4.6	0.04	365	82	61SB3200
HAB1N500	500	4.3	0.04	412	76	61SB3150
HAQ1N390	390	4.4	0.5	384	75	61SQ3118
HAQ1N240	240	4.3	0.5	410	72	61SQ4732
HAQ1N190	190	4.4	0.5	399	75	61SQ4581
HAP1N155	155	4.3	1.3	408	72	61SP4467
HAP1N120	120	4.4	1.3	394	75	61SP4366
HAP1N95	95	4.5	1.3	377	79	61SP4290
HAP1N76	76	4.4	1.3	391	78	61SP4231
HAP1N60	60	4.3	1.3	411	75	61SP4183
HAP1N48	48	4.3	1.3	412	76	61SP4145
HAP1N37	37	4.7	1.3	345	91	61SP4113
HAC1N21.3	21.3	4.7	3.9	338	89	61SC5651
HAC1N13.5	13.5	4.9	3.9	326	95	61SC5409
HAC1N8.5	8.5	5.5	3.9	259	124	61SC5258
HAC1N5.3	5.3	6.8	3.9	166	192	61SC5162
HAC1N3.3	3.3	6.4	3.9	171	185	61SC5102
HAC1N2	2.0	8.1	3.9	119	294	61SC6640

TABLE 4 RECOMMENDED COLD LEAD CABLES FOR HAX MI SERIES HEATING CABLES

Cold Lead Code	Sheath Material	Current Rating (A)	Voltage Rating (Vac)	No of Conductors	Design*	Cable O.D. (mm)	Pigtail Size (mm²)	Gland Size
S33A	Alloy 825	33	600	1	B	5.5	3.3	M25
S55A	Alloy 825	55	600	1	B	6.4	8.4	M25
S76A	Alloy 825	76	600	1	B	8.1	13.3	M25
S123A	Alloy 825	123	600	1	B	10.2	21.1	M25
LS28A	Alloy 825	28	300	2	D or E	8.1	2.1	M25
S28A	Alloy 825	28	600	2	D or E	9	2.1	M25
S41A	Alloy 825	41	600	2	D or E	10.2	5.3	M25
S57A	Alloy 825	57	600	2	D or E	12.6	8.4	M25
S77A	Alloy 825	77	600	2	D or E	13.8	13.3	M25

* For details on the different heating unit designs, refer to the chapter MI Heating Systems - MI Heating Cables in the Databook.

Cold leads attached to HAx heating cables are provided with an Alloy 825 outer sheath. As the cold lead is an exposed component, not protected by insulation, it can be subject to extremely variable corrosive environments. The Alloy 825 sheath provides enhanced life expectancy with a superior level of corrosion protection against a wide range of exposure conditions.

By default, all cold leads are supplied with nickel plated brass M25 glands intended for use with a standardized range of Raychem MI junction boxes which include an integral earth plate.Other gland materials are possible, contact nVent for more information. Delivery length of bulk cable on coil depends on type of resistance and is limited by max. coil length as indicated in the table on top. Factory terminated elements are limited by a max. weight of 50kg, however to ensure practical and safe on-site handling, it is strongly recommended to limit element lengths to 25 - 30kg. Not all resistances are standard items and as such may not be in stock. Contact nVent to confirm lead time. nVent requires the use of a 30 mA residual current device to provide maximum safety and protection from fire.

Where design results in higher leakage current, the preferred trip level for adjustable devices is 30 mA above any inherent capacitive leakage characteristic of the heater as specified by the trace heater supplier or alternatively, the next common available trip level for non adjustable devices, with a maximum of 300 mA. All safety aspects need to be proven.

TABLE 5 CHEMICAL RESISTANCE

Alloy	Maximum Cable Sheath Temp (°C)	Description	Nominal chemical composition, % (major elements)				High temperature resistance (+540°C)		Corrosion resistance									
			Nickel (+Cobalt)	Iron	Chromium	Other	Oxidation	Carburization	Sulfuric acid	Hydrochloric acid	Hydrofluoric acid	Phosphoric acid	Nitric acid	Organic acid	Alkalis	Salts	Seawater	Chloride cracking
INCOLOY Alloy 825 nickel-iron-chromium	550°C*	Excellent resistance to a wide variety of corrosives. Resists pitting and intergranular type corrosion, reducing acids and oxidizing chemicals	42.0	30.0	21.5	Mo 3.0 Cu 2.2	G-E	G-E	G-E	G-E	G-E	G-E	G-E	G-E	G-E	G-E	G-E	G-E

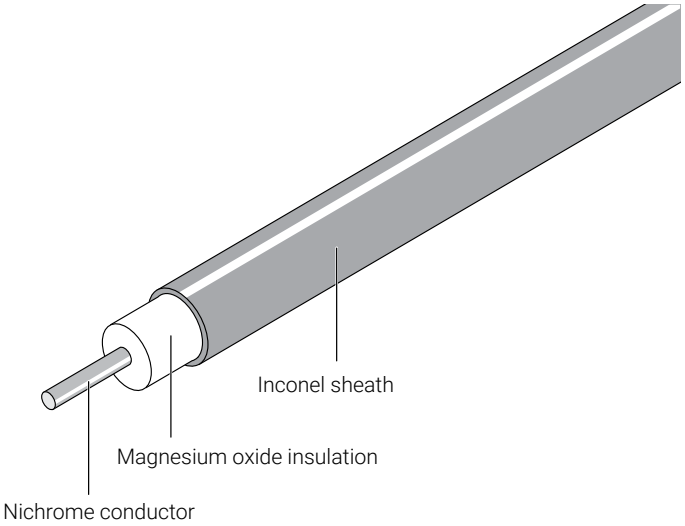
From Huntington Alloys Publication 78-348-2

Note: NR Not recommended, A acceptable, GE Good to excellent, X Check for specific data

* Temperature limitation based on construction of heating element.
Corrosion resistance data is dependent on temperature and concentration.

MINERAL INSULATED (MI) INCONEL SHEATHED HEATING CABLE

TYPICAL CABLE CONSTRUCTIONS



nVent RAYCHEM HIQ mineral insulated (MI) Inconel 600 series heating cables are suited for use in hazardous areas. The Inconel 600 sheath offers excellent corrosive properties against a wide range of organic acids and alkalis, as well as chloride stress-corrosion cracking, in combination with a high temperature withstand capability. HIQ cables are typically used in bitumen plants, gas plants, oil refineries, reactors and vessels, sodium loops and a wide variety of other heat-tracing applications where temperature resistance, power output and durability are required and exceed the limitations of stainless steel sheathed MI heating cables. The heating cables can be used for exposure temperatures up to 700°C and a typical power output up to 300 W/m. Higher temperatures and power outputs can be achieved, contact nVent for assistance. The heating cables are offered as bulk cables as well as factory-terminated heating units employing brazing or laser welding techniques to ensure optimum quality of the connections. The offering is completed with a full range of components for installation, connection and splicing of the heating cables.

APPLICATION

Area classification	Hazardous areas, Zone 1 or Zone 2 (Gas) or Zone 21 or zone 22 (Dust) Ordinary areas

APPROVALS

System (heating units)	Baseefa 13ATEX0174X	II 2G Ex eb IIC T* Gb II 2D Ex tb IIIC T*°C Db (for * see schedule)
	IECEx BAS 13.0090X	Ex eb IIC T* Gb Ex tb IIIC T*°C Db (for * see schedule)
	№ ЕАЭС RU C-BE. МЮ62.В.00879/19 ООО «ПРОММАШ ТЕСТ» Ambient temp range: −60°C...+70°C	1Ex e IIC T* Gb X Ex tb IIIC T* Db X *: by design Made in Germany or Poland
Bulk cable	Baseefa 13ATEX0173U	II 2G Ex e IIC Gb
	IECEx BAS 13.0091U	Ex e IIC Gb
	№ ЕАЭС RU C-BE. МЮ62.В.00879/19 ООО «ПРОММАШ ТЕСТ» Ambient temp range: −60°C...+70°C	1Ex e IIC T* Gb X Ex tb IIIC T* Db X *: by design Made in Canada or Italy

Heating units are also approved for dust environments. Temperature classification (T-rating) has to be established by using the principles of stabilised design or the use of a temperature limiting device. Use TraceCalc design software or contact nVent.

TECHNICAL DATA

Cable sheath material	Inconel 600	
Conductor material	Nichrome	
Max. exposure temperature	550°C (brazed heating units) 700°C* (laser welded heating units) *Higher temperatures can be realized, contact nVent	
=Min. installation temperature	−60°C	
Min. bending radius	6 x outer diameter at −60°C	
Max. supply voltage and power	Voltage (U_0/U) 300/500 Vac 460/600 Vac (laser welded heating units)	Max. power output* 300 W/m *typical value, depending on application
Earth leakage	3 mA/100 m (nominal at 20°C)	
Min. cable spacing	25 mm for hazardous areas	

MI SERIES HEATING CABLES HIQ

Order Reference	Nominal resistance (Ω/km @ 20°C)	Outer diameter (mm)	Temp. coefficient (x 10-3/K)	Max. coil length [m]	Nom.weight (kg/km)
HIQ1M10K	10000	3.2	0.09	772	39
HIQ1M6300	6300	3.2	0.09	774	39
HIQ1M4000	4000	3.2	0.09	776	39
HIQ1M2500	2500	3.4	0.09	689	46
HIQ1M1600	1600	3.6	0.09	617	52
HIQ1M1000	1000	3.9	0.09	528	62
HIQ1M630	630	4.3	0.09	437	78
HIQ1M400	400	4.7	0.09	368	96
HIQ1M250	250	5.3	0.09	292	127
HIQ1M160	160	6.5	0.09	194	191

RECOMMENDED COLD LEADS FOR HIQ MI SERIES HEATING CABLES

Cold Lead Code	Sheath Material	Current Rating (A)	Voltage Rating (Vac)	No of Conductors	Design*	Cable O.D. (mm)	Pigtail Size (mm²)	Gland Size
S33A	Alloy 825	33	600	1	B	5.5	3.3	M25
S55A	Alloy 825	55	600	1	B	6.4	8.4	M25

* For details on the different heating unit designs, refer to chapter MI heating Systems - MI heating Cables in the Databook (reference DOC2210)

Nickel plated brass glands are standard on all heating units. Other materials are possible, contact nVent for more information.
Delivery length of bulk cable on coil depends on type of resistance and is limited by max. coil length as indicated in the table on top.
Factory terminated elements are limited by a max. weight of 50kg, however to ensure practical and safe on-site handling, it is strongly recommended to limit element lengths to 25 - 30kg. Not all resistances are standard items and as such may not be in stock. Contact nVent to confirm lead time. nVent requires the use of a 30 mA residual current device to provide maximum safety and protection from fire.
Where design results in higher leakage current, the preferred trip level for adjustable devices is 30 mA above any inherent capacitive leakage characteristic of the heater as specified by the trace heater supplier or alternatively, the next common available trip level for non adjustable devices, with a maximum of 300 mA. All safety aspects need to be proven.
Also refer to the components section for more details on heating units, accessories and nomenclatures.

MI HEATING CABLE SHEATH CORROSION RESISTANCE AND TEMPERATURE DATA

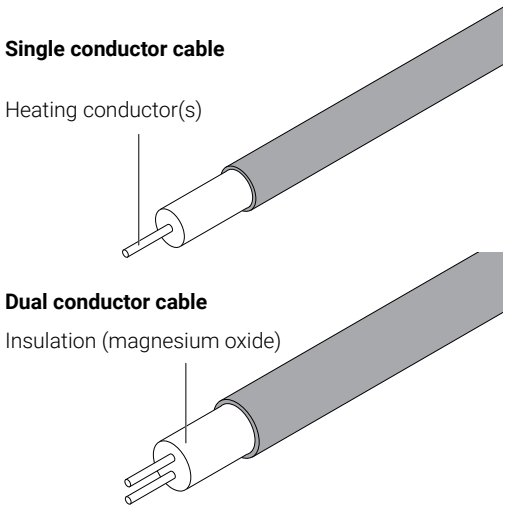
Sheath Material	Description	Sulphuric Acid	Hydrochloric Acid	Hydrofluoric Acid	Phosphoric Acid	Nitric Acid	Organic Acid	Alkalis	Sea Water	Chloride
Inconel 600 DIN 2.4816	High nickel, high chromium content inconel alloy 600	X	X	A	X	X	GE	GE	A	GE

Note: NR Not recommended, A acceptable, GE Good to excellent, X Check for specific data
Temperature limitation based on construction of heating element.
Corrosion resistance data is dependent on temperature and concentration.

MI HEATING SYSTEMS NOMENCLATURE

MI HEATING CABLES

TYPICAL CABLE CONSTRUCTIONS



nVent RAYCHEM MI heating cables are available for a wide range of applications.

For more details about the different MI heating cable types, also refer to the product datasheets.

VARIOUS CONSTRUCTIONS OF THE MI BULK HEATING CABLES ARE AVAILABLE:

HCC/HCH:	Copper sheathed MI heating cables
HDF/HDC:	Cupro-nickel sheathed MI heating cables
HSQ:	Stainless steel sheathed MI heating cables
HAx:	Alloy 825 sheathed MI heating cables
HIQ:	Inconel sheathed MI heating cables

MI BULK HEATING CABLES ARE SUPPLIED IN A RANGE OF DIFFERENT CONSTRUCTIONS, THE PRODUCT REFERENCES USE THE FOLLOWING NOMENCLATURE:

Example: HCHR1L2000-RD		
H	H denotes a heating cable	**H**=Heating Cable
C	Sheath material	**C**=Copper **D**=Cupro-Nickel **S**=Stainless steel **A**=Alloy 825 **I**=Inconel 600
H	Conductor material (examples)	**C**=Copper **H**=Copper Alloy and a variety of other metal alloys
R	Oversheath material (optional for copper cables only, oversheath colour is red)	**R**=LSZH
1	Number of conductors	1 or 2
L	Normal operating voltages	Refer to datasheets of individual heating cables
2000	Conductor resistance	in Ω/km - i.e. 2000=2000 Ω/km

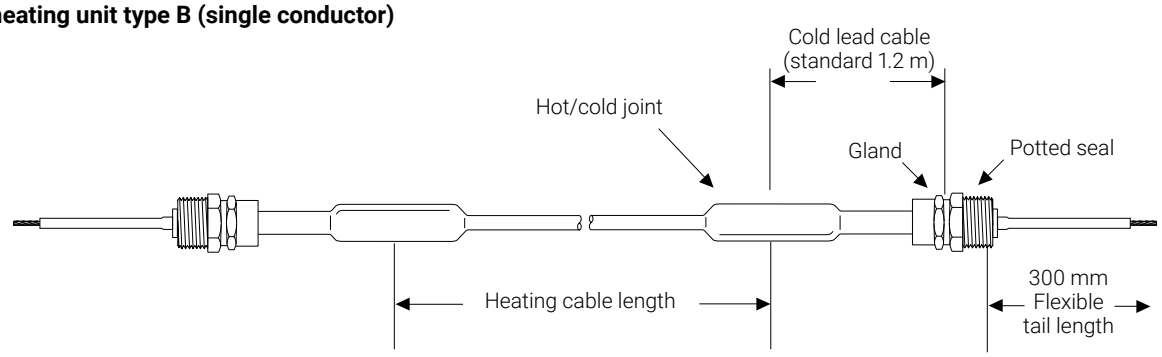
MI HEATING UNITS

MI heating units consist of a heating cable, the hot-cold joint as well as the cold lead cables with an appropriate seal and gland. The connection and sealing of an MI heating unit is critical for a safe and reliable operation.

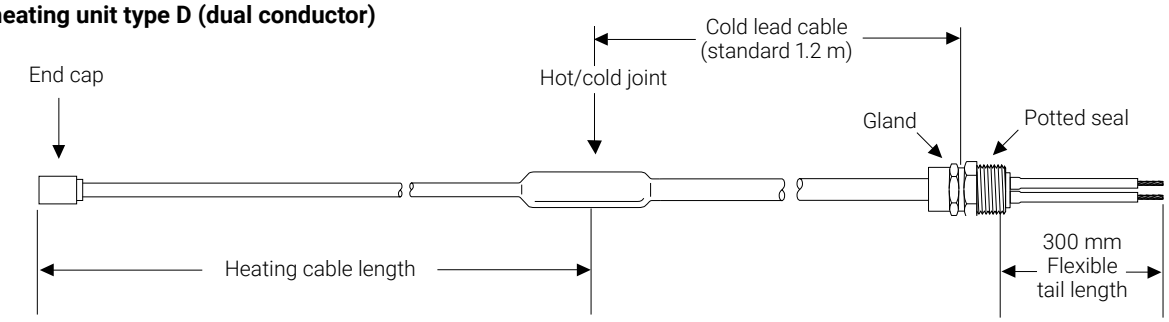
nVent strongly recommends the use of factory-terminated heating units, which guarantee a consistently high level of quality. The stainless steel (HSQ), Inconel 600 (HIQ) and Alloy 825 (HAx) can be delivered with either brazed joints and/or end caps or laser welded joints and/or end caps. We recommend the use of laser welded joints and/or end caps if the load or exposure temperatures cause element temperatures above 550°C.
Lower temperatures can be fulfilled with brazed connections. (Alloy 825 heating cables or cold leads should not be used at temperatures between 650°C and 750°C).
When brazed connections are used, nVent offers heating units with Alloy 825 cold leads regardless of the sheath material used to obtain maximum corrosion resistance on the exposed parts. (except copper heating cables which are offered with a copper cold lead) Brazed heating units also come with an additional strain relief for bending protection on the heating cable side.
When laser welded connections are used, we offer either stainless steel cold leads when stainless steel heating cables have been selected or Alloy 825 cold leads if Inconel or Alloy 825 heating cables are the choice.
The standard gland material is nickel plated brass but they are also available in stainless steel. The gland size is M25 for all cold lead sizes.
Appropriate earthing of the heating units is realized through the glands and use of junction boxes with integral earth plate or metallic junction boxes. Consult our product literature for more information on our junction box offering with integral earth plates.
For use in hazardous areas, MI heating units need to be assembled by nVent or an authorized installer.

MI HEATING UNITS ARE AVAILABLE IN DIFFERENT CONFIGURATIONS (UNIT TYPES)

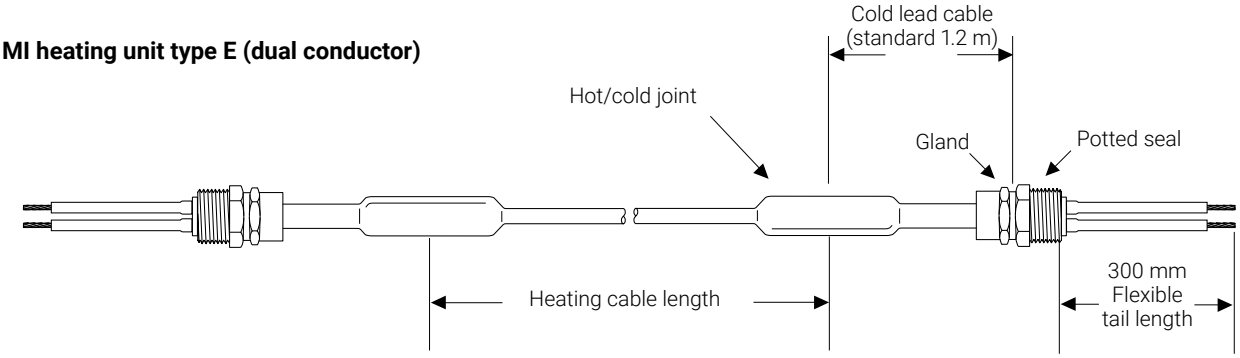
MI heating unit type B (single conductor)



MI heating unit type D (dual conductor)



MI heating unit type E (dual conductor)



The cold lead length includes 300 mm long flexible tails. Glands are fitted with washers and locknuts. Other configurations available on request.

THE ORDER REFERENCE OF MI HEATING UNITS USES THE FOLLOWING NOMENCLATURE

B/HSQ1M1000/43.0M/1217/230/1.2M/S33A/X/NPM25/EX

- Area classification – EX, ORD
- Gland size NPM25 (Nickel plated brass), SSM25 (stainless steel) etc.
- Hot/cold joint material type – X -stainless steel, Y - brass, LW - laser welded
- Cold lead rating and sheath type
- Cold lead length M for unit in metres (standard is 1.2 m)
- Heating unit – Operating voltage
- Heating unit – total wattage in W
- Unit length M or unit in metres
- Heating cable reference
- Heating cable unit type – Type B, D or E

When ordering, the complete order reference of the MI heating unit needs to be provided. For hazardous areas, information must also be provided about the T-rating and temperature data relevant to the application (max. sheath temperature data) to enable the correct representation of data on hazardous area tags attached to the completed heating unit in the factory.

Any missing detail may lead to potential delays in order processing.

SELECTION OF MI COLD LEADS

Standard cold leads consist of 1.2m of mineral insulated cold lead cable and 300mm of stranded flex tails. The glands are always M25 and the standard gland material nickel plated brass.
Earthing of the units is realized through the glands and use of junction boxes with earth plate or metallic junction boxes. The cold leads do not have an integrated earth wire.
(alternatively earth lugs can also be used if the junction boxes are in plastic without earth plate – contact nVent for more information)
Optionally stainless steel glands or different cold lead lengths are also available but will increase lead time. Contact nVent for more information for a specific request.

The reference of a cold lead always consists of one or 2 letters indicating the sheath material and a number followed by 'A' indicating the maximum continuous current rating.
And example : S 33A

- Cold lead rated up to 33A continuous
- Cold lead sheathed material Alloy 825

Raychem MI cold lead cables are available in different sheath materials:
- S…A : Alloy 825 sheathed cold lead
- SC…A : Stainless steel sheathed cold lead
- C…A : Copper sheathed cold lead

For selection of the MI cold lead, the environmental exposure (chemicals etc…), as well as the current rating need to be considered :

- nVent typically recommends using the same or superior sheath materials for the cold lead as used for the heating cable. When a unit is brazed, nVent default cold lead is in Alloy 825 to offer maximum corrosion protection on the most exposed part. (except for copper heating units for which the cold leads are also copper sheathed or overjacketed)
When a unit is laser welded (available for stainless steel, Alloy 825 and Inconel sheathed cables), nVent will offer an Alloy 825 cold lead on both Inconel and Alloy 825 heating units and a stainless steel cold lead on a stainless steel unit.

- Cold leads are normally selected based on the operating current of the heating unit at maintain temperature. For higher maintain temperatures, the current can be significantly higher during the transitional start-up phase.
If the application involves more frequent heat-up from lower temperatures, we recommend selecting the cold lead size based on the start-up

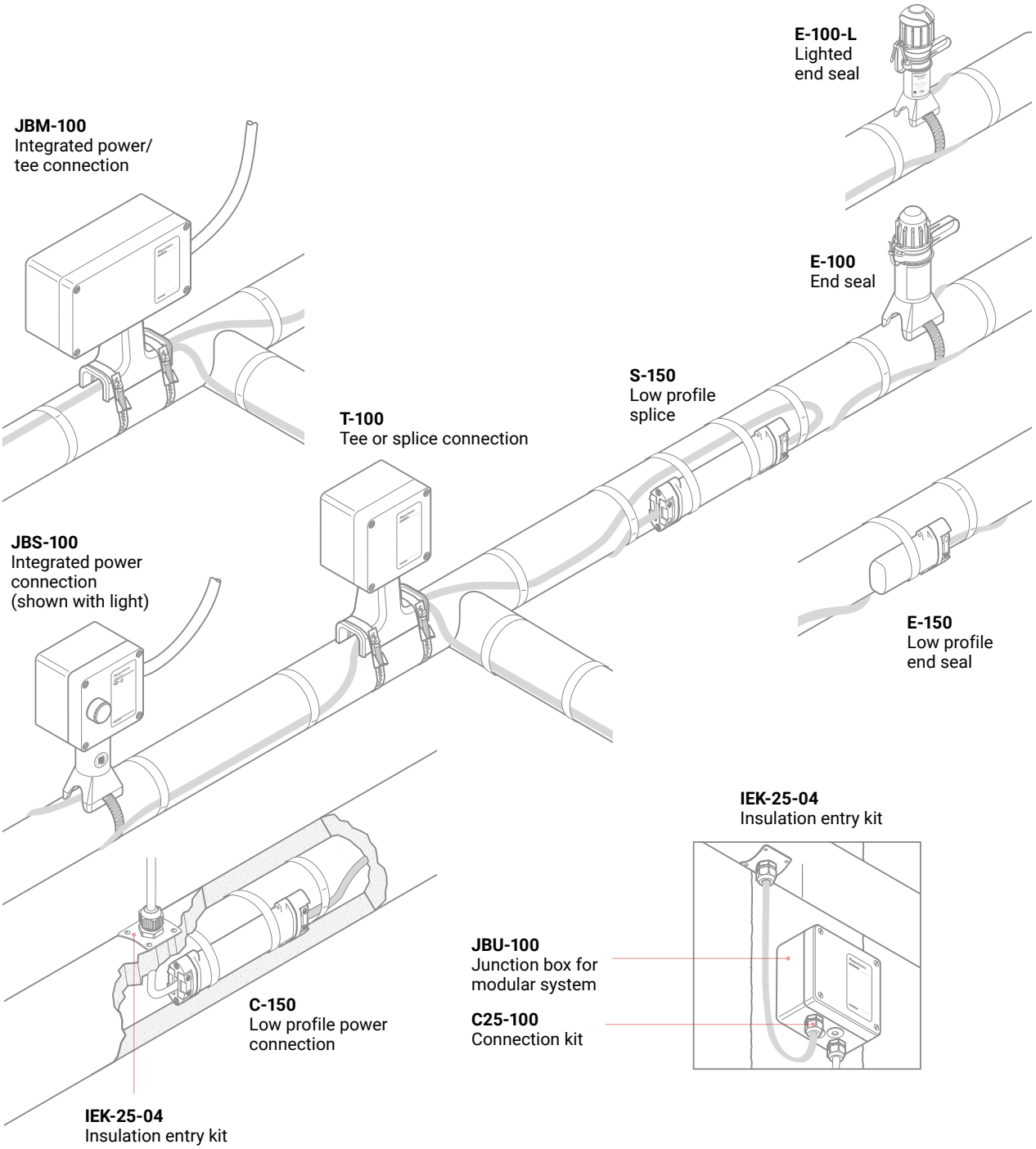
The option for laser welded units is not available for MI heating cables with a copper or cupro-nickel sheath.

COLD LEAD SELECTION TABLE

Number of conductors	Cross section of pigtail (mm²)	Cold lead order reference	Current rating (A)	Connection method (LW : Laser welded / B : Brazed)	Outer diameter (mm)	Sheath material	Gland size
1	3.3	C33A SC33A S33A	33	B LW B or LW	5.5	Copper Stainless steel Alloy 825	M25
	8.4	C55A SC55A S55A	55	B LW B or LW	6.4	Copper Stainless steel Alloy 825	
	13.3	C76A S76A	76	B B or LW	8.1	Copper Alloy 825	
	21.2	C123A S123A	123	B B or LW	10.2	Copper Alloy 825	
2	2.1	LS28A** S28A	28	B or LW B or LW	8.1 9	Alloy 825	M25
	5.3	S41A	41	B or LW	10.2	Alloy 825	
	8.4	S57A	57	B or LW	12.6	Alloy 825	
	13.3	S77A	77	B or LW	13.8	Alloy 825	

** Cold lead is limited up to 300Vac
For over jacketed cables (copper sheathed only), add 2mm to the outer diameter
Nickel plated brass glands are standard on all heating units. Optionally glands in stainless steel are also available.

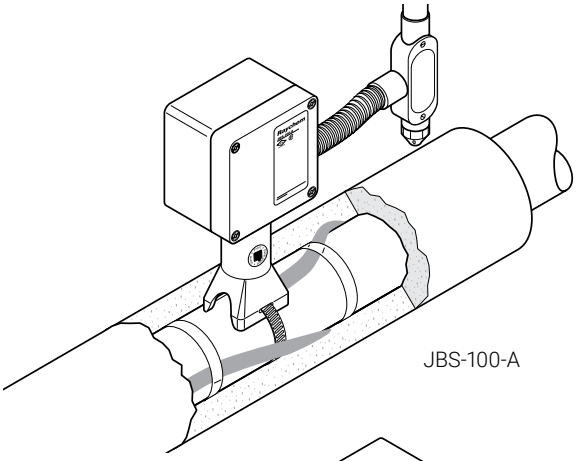
COMPONENT OVERVIEW OF SELF-REGULATING AND POWER-LIMITING HEATING CABLE SYSTEM



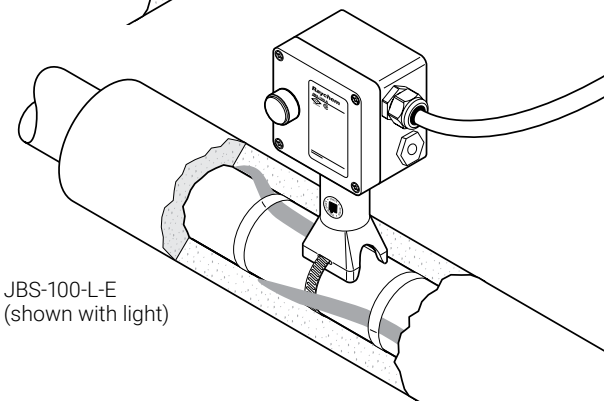
Note: S-150, E-150 & C-150 Not available for VPL

JBS-100

SINGLE-ENTRY POWER CONNECTION WITH JUNCTION BOX



JBS-100-A



JBS-100-L-E
(shown with light)

The nVent RAYCHEM JBS-100 kit is designed to connect power to one nVent RAYCHEM BTV, QTVR, XTV, KTV or VPL industrial parallel heating cable. It is approved by FM, CSA, and PTB for use in hazardous locations.

The JBS-100 integrates the functions of both connection kits and insulation entries. The rugged stand protects the heating cable and allows for up to 100 mm (4") of thermal insulation.

The core sealing boot does not require a heat gun or torch for the installation (no hot work permit necessary). The non-curing sealant (silicone free) in the boot allows easy installation and facilitates maintenance.

Spring-type terminals provide fast installation and safe, reliable, maintenance-free operation. This connection kit significantly reduces installation time. The kit is offered in three basic versions, customised for local installation practices. All kits are also available as a lighted version. These include a unique light module with a superbright LED that simply plugs into the terminals, and a lens in the lid. This provides indication that power is available in the box. There is also a connection kit with drain plug available.

DESCRIPTION

	JBS-100-A JBS-100-L-A	JBS-100-E JBS-100-L-E JBS-100-D-E	JBS-100-EP JBS-100-L-EP
	This kit is for use in North America and has one through-hole for use with 3/4" conduit.	This kit is for use in Europe and provides two M25 threaded entries, one stopping plug, and one plastic power cable gland.	This kit is for use in Europe and provides two M25 threaded entries, an earthing plate, and an external earthing stud. It is designed for use with armoured cables.

KIT CONTENTS

JBS-100-A JBS-100-L-A	JBS-100-E JBS-100-L-E JBS-100-D-E	JBS-100-EP JBS-100-L-EP
1 junction box with terminals 1 light module (for -L only) 1 stand 1 core sealer 1 green/yellow earthing sleeve 1 polywater sachet 1 cable tie	1 junction box with terminals 1 light module (for -L only) 1 stand 1 core sealer 1 green/yellow earthing sleeve 1 M25 gland for power cable 8-15 mm (temperature range -55°C / 70°C) in diameter 1 M25 stopping plug 1 polywater sachet 1 cable tie 1 ATEX/IECEx Certified drainplug (for JBS-100-D-E only)	1 junction box with terminals, earth plate, and stud 1 light module (for -L only) 1 stand 1 core sealer 1 green/yellow earthing sleeve 1 M25 stopping plug 1 polywater sachet 1 cable tie

RAYCHEM-DS-EU1395-JBS100-EN-1911

APPROVALS (**)

Hazardous locations

	Class I, Div. 2, Groups A, B, C, D Class II, Div. 1 & 2, Groups E, F, G Class III	PTB 09 ATEX 1059 U RU C-BE.ИМ43.B.01712 Ex 1Ex e IIC T* Gb X 1Ex e mb IIC T* Gb X Ex tb IIIC T* Db X Ex tb mb IIIC T* Db X Ta -60°C...+56°C IP66 IECEx PTB 09.0037U Ex eb mb IIC T* Gb Ex mb tb IIIC T* Db	PTB 09 ATEX 1059 U Ex eb mb IIC T* Gb Ex mb tb IIIC T* Db IECEx PTB 09.0037U Ex eb mb IIC T* Gb Ex mb tb IIIC T* Db
FM APPROVED SP -WS	Class I, Div. 2, Groups A, B, C, D Class II, Div. 1 & 2, Groups E, F, G Class III	PTB 09 ATEX 1059 U Ex II 2 G Ex eb mb IIC T* Gb Ex III 2 D Ex mb tb IIIC T* Db IECEx PTB 09.0037U Ex eb mb IIC T* Gb Ex mb tb IIIC T* Db	PTB 09 ATEX 1059 U Ex II 2 G Ex eb mb IIC T* Gb Ex <Ex> III 2 D Ex mb tb IIIC T* Db IECEx PTB 09.0037U Ex eb mb IIC T* Gb Ex mb tb IIIC T* Db
FM APPROVED (1)	CLI, ZN1, AEx e II T* CLI, ZN1, AEx em II T* (for -L only)	SP -WS Ex e II T* Ex em II T* (for -L only)	SP -WS Ex e II T* Ex em II T* (for -L only)
SP -WS	Ex e II T* Ex em II T* (for -L only)	DNV approval DNV-GL TAE00000TV and DNV-GL TAE00000TU	DNV approval DNV-GL TAE00000TV and DNV-GL TAE00000TU

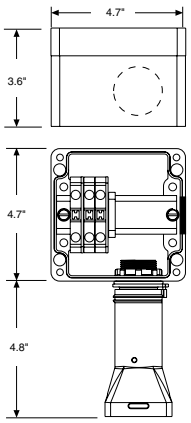
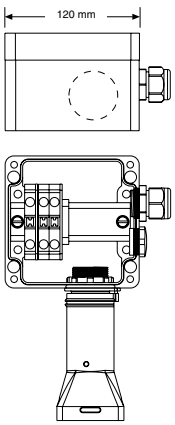
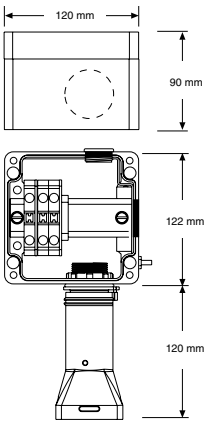
*For T-rating, see heating cable or design documentation

(1) Except VPL

(**) Localized versions may exist with limited approvals and different part numbers. Contact your local sales representative.

JBS-100-A JBS-100-L-A	JBS-100-E JBS-100-EP	JBS-100-L-E JBS-100-L-EP
	EAC Ex TC RU C-BE.МЮ62.B.00054/18 Ex e IIC Gb U Ex tb IIIC Db U Ex e mb IIC Gb U Ex tb mb IIIC Db U Ta -55°C...+56°C IP66 ООО "ТехИмпорт"	EAC Ex TC RU C-BE.МЮ62.B.00054/18 Ex e IIC Gb U Ex tb IIIC Db U Ex e mb IIC Gb U Ex tb mb IIIC Db U Ta -55°C...+40°C IP66 ООО "ТехИмпорт"

DIMENSIONS (NOMINAL)

JBS-100-A JBS-100-L-A	JBS-100-E JBS-100-L-E JBS-100-D-E	JBS-100-EP JBS-100-L-EP
		

PRODUCT SPECIFICATIONS

	JBS-100-A JBS-100-L-A	JBS-100-E JBS-100-L-E JBS-100-D-E	JBS-100-EP JBS-100-L-EP
Heating cable capability	BTV-CR, BTV-CT, QTVR-CT, XTV-CT, KTV-CT, VPL-CT		
Ingress protection	NEMA Type 4X	IP66/IP67	IP66/IP67
Entries	1 x 3/4"	2 x M25 including power cable gland for diameter 8 - 17 mm	2 x M25
Ambient temperature range	−50°C to +40°C	−50°C to +56°C* (JBS-100-E and JBS-100-D-E) −40°C to +40°C (JBS-100-L-E)	−50°C to +56°C* (JBS-100-EP) −40°C to +40°C (JBS-100-L-EP)
	*Extra conditions for safe use apply for ambient temperatures above +40°C. Please refer to the summary on page 136, the certificate or installation instructions for full details.		
Min. installation temperature	−50°C	−50°C	−50°C
Max. pipe temperature	Refer to heating cable specification		
Terminals	Spring-type terminals 2 line, 1 ground	Spring-type terminals 1 phase, 1 neutral, 1 earth	Spring-type terminals 1 phase, 1 neutral, 1 earth
Max. conductor size	8 AWG stranded	10 mm^2 stranded, 10 mm^2 solid	10 mm^2 stranded, 10 mm^2 solid
Max. operating voltage	277 Vac	480 Vac*	480 Vac*
	*JBS-100-L-E and JBS-100-L-EP are limited to 254 Vac. Extra conditions for safe use apply for voltages higher than 254 Vac. Please refer to the summary on page 136, the certificate or installation instructions for full details.		
Max. continuous operating current	50 A heating cable circuit	40 A heating cable circuit	40 A heating cable circuit

MATERIALS OF CONSTRUCTION

Enclosure, lid, and stand	electrostatic charge-resistant glass-filled engineered polymer, black	electrostatic charge-resistant glass-filled engineered polymer, black	electrostatic charge-resistant glass-filled engineered polymer, black
Lid screws	Stainless steel	Stainless steel	Stainless steel
Lid gasket	Silicone rubber	Silicone rubber	Silicone rubber
Earth continuity plate	N/A	N/A	Steel, zinc plated, and blue chromated

OPTIONAL LED INDICATOR LIGHT

Colour	Red	Green	Green
Voltage rating	100-277 Vac	100-254 Vac	100-254 Vac
Power consumption	< 1 W	< 1 W	< 1 W

Ordering details (**)

POWER CONNECTION

Part Description **(**)**	JBS-100-A	JBS-100-E	JBS-100-EP
PN (Weight)	085947-000 (2.5 lb)	829939-000 (1.2 kg)	158251-000 (1.3 kg)

POWER CONNECTION WITH LIGHT

Part Description	JBS-100-L-A	JBS-100-L-E	JBS-100-L-EP
PN (Weight)	944699-000 (3.5 lb)	054363-000 (1.6 kg)	075249-000 (1.7 kg)

POWER CONNECTION WITH DRAIN PLUG

Part Description	JBS-100-D-E
PN (Weight)	1244-021057 (1.4 kg)

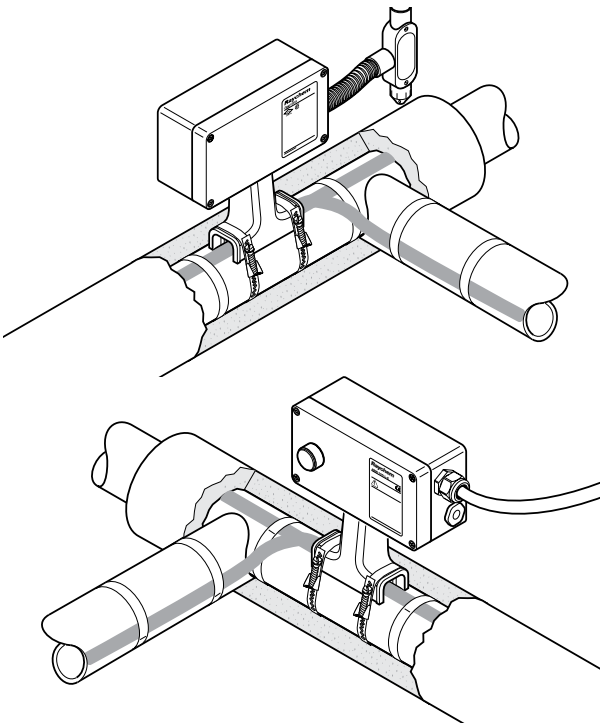
ACCESSORIES

Conduit drain 3/4”	JB-DRAIN-PLUG-3/4IN (prevents condensate from collecting in the box) ONLY FOR JBS-100-L-A
Small pipe adaptor	JBS-SPA, required for pipes ≤ 1" (DN 25) E90515-000 (bag of 5 adaptors)
Glands for power cables	GL-55-M25 hazardous area approved gland for cables 8-15 mm (temperature range -55°C/70°C) GL-36-M25 hazardous area approved gland for cables 8-17.5 mm (temperature range -20°C/70°C)

(**) Localized versions may exist with limited approvals and different part numbers. Contact your local sales representative.

JBM-100

MUTIPLE-ENTRY POWER/TEE CONNECTION WITH JUNCTION BOX



The nVent RAYCHEM JBM-100 kit is designed to connect power to up to three nVent RAYCHEM BTV, QTVR, XTV, KTV, or VPL industrial parallel heating cables and is approved by FM, CSA, and PTB for use in hazardous locations.

The JBM-100 integrates the functions of both connection kits and insulation entries. The rugged stand protects the heating cable and allows for up to 100 mm (4”) of thermal insulation.

The core sealing boot does not require a heat gun or torch for the installation (no hot work permit necessary). The non-curing sealant (silicone free) in the boot allows easy installation and facilitates maintenance.

Spring-type terminals provide fast installation and safe, reliable, maintenance-free operation. This connection kit significantly reduces installation time.

The kit is offered in three basic versions, customised for local installation practices. All kits are also available as a lighted version. These include a unique light module with a superbright LED that simply plugs into the terminals, and a lens in the lid. This provides indication that power is available in the box. There is also a connection kit with drain plug available.

DESCRIPTION

JBM-100-A JBM-100-L-A	JBM-100-E JBM-100-L-E JBM-100-D-E	JBM-100-EP JBM-100-L-EP
This kit is for use in North America and has one 3/4" through holes for use with 3/4" conduit. One stopping plug is supplied in the kit.	This kit is for use in Europe and provides two M25 threaded entries, one stopping plug, and one plastic power cable gland.	This kit is for use in Europe and provides two M25 threaded entries, an earthing plate, and an external earthing stud. It is designed for use with armoured cables.

KIT CONTENTS

- 1 junction box with terminals
- 1 light module (for -L only)
- 1 stand
- 3 core sealers
- 3 green/yellow earthing sleeve
- 1 3/4" stopping plug
- 1 polywater sachet
- 1 spanner
- 1 strain relief assembly
- 2 grommet plugs

- 1 junction box with terminals
- 1 light module (for -L only)
- 1 stand
- 3 core sealers
- 3 green/yellow earthing sleeve
- 1 M25 gland for power cable 8-15 mm (temperature range -55°C / 70°C) in diameter
- 1 M25 stopping plug
- 1 polywater sachet
- 1 spanner
- 1 strain relief assembly
- 2 grommet plugs
- 1 ATEX/IECEx Certified drainplug (for JBM-100-D-E only)

- 1 junction box with terminals, earth continuity plate, and stud
- 1 light module (for -L only)
- 1 stand
- 3 core sealers
- 3 green/yellow earthing sleeve
- 2 M25 stopping plugs
- 1 polywater sachet
- 1 spanner
- 1 strain relief assembly
- 2 grommet plugs

APPROVALS (**)

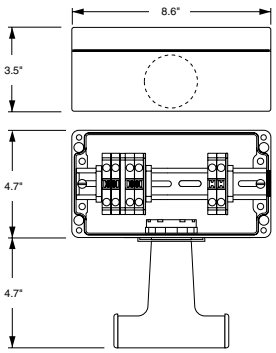
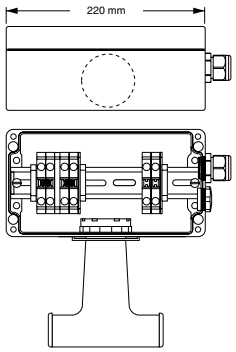
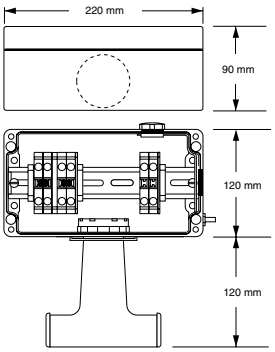
Hazardous locations

FM APPROVED SA -WS	Class I, Div. 2, Groups A, B, C, D Class II, Div. 1 & 2, Groups E, F, G Class III	PTB 09 ATEX 1056U RU C-BE.ИМ43.B.01712 Ex e IIC Gb U Ex tb IIIC Db U Ex e mb IIC Gb U Ex tb mb IIIC Db U Ta -55°C...+40°C IP66 IECEx PTB 09.0027U Ex eb mb IIC T* Gb Ex mb tb IIIC T* Db	PTB 09 ATEX 1056U Ex II 2 G Ex eb mb IIC T* Gb Ex III 2 D Ex mb tb IIIC T* Db IECEx PTB 09.0027U Ex eb mb IIC T* Gb Ex mb tb IIIC T* Db
FM APPROVED (1)	CLI, ZN1, AEx e II T* CLI, ZN1, AEx em II T* (for -L only)	SA -WS Ex e II T* Ex em II T* (for -L only)	SA -WS Ex e II T* Ex em II T* (for -L only)
SA -WS	Ex e II T* Ex em II T* (for -L only)	DNV approval DNV-GL TAE00000TV and DNV-GL TAE00000TU	DNV approval DNV-GL TAE00000TV and DNV-GL TAE00000TU

*For T-rating, see heating cable or design documentation
(1) Except VPL
(**) Localized versions may exist with limited approvals and different part numbers. Contact your local sales representative.

JBM-100-A JBM-100-L-A	JBM-100-E JBM-100-EP	JBM-100-L-E JBM-100-L-EP
	EAC Ex TC RU C-BE.МЮ62.B.00054/18 Ex e IIC Gb U Ex tb IIIC Db U Ex e mb IIC Gb U Ex tb mb IIIC Db U Ta -55°C...+56°C IP66 ООО "ТехИмпорт"	EAC Ex TC RU C-BE.МЮ62.B.00054/18 Ex e IIC Gb U Ex tb IIIC Db U Ex e mb IIC Gb U Ex tb mb IIIC Db U Ta -55°C...+40°C IP66 ООО "ТехИмпорт"

DIMENSIONS (NOMINAL)

JBM-100-A JBM-100-L-A	JBM-100-E JBM-100-L-E JBM-100-D-E	JBM-100-EP JBM-100-L-EP
		

PRODUCT SPECIFICATIONS

Heating cable capability	BTV-CR, BTV-CT, QTVR-CT, XTV-CT, KTV-CT, VPL-CT		
Ingress protection	NEMA Type 4X	IP66	IP66
Entries	1 x 3/4"	2 x M25 including power cable gland for diameter 8-17 mm	2 x M25
Ambient temperature range	−50°C to +40°C	−50°C to +56°C* (JBM-100-E and JBM-100-D-E) −40°C to +40°C (JBM-100-L-E)	−50°C to +56°C* (JBM-100-EP) −40°C to +40°C (JBM-100-L-EP)
	*Extra conditions for safe use apply for ambient temperatures above +40°C. Please refer to the summary on page 136, the certificate or installation instructions for full details.		
Min. installation temperature	−50°C	−50°C	−50°C
Max. pipe temperature	Refer to heating cable specification		
Terminals	Spring-type terminals line, 2 ground	Spring-type terminals 2 phase, 2 neutral, 2 earth	Spring-type terminals 2 phase, 2 neutral, 2 earth
Max. conductor size	8 AWG stranded	10 mm^2 stranded, 10 mm^2 solid	10 mm^2 stranded, 10 mm^2 solid
Max. operating voltage	277 Vac	480 Vac*	480 Vac*
	*JBM-100-L-E and JBM-100-L-EP are limited to 254 Vac. Extra conditions for safe use apply for voltages higher than 254 Vac. Please refer to the summary on page 136, the certificate or installation instructions for full details.		
Max. continuous operating current	50 A heating cable circuit	40 A heating cable circuit	40 A heating cable circuit

MATERIALS OF CONSTRUCTION

Enclosure, lid, and stand	Electrostatic charge-resistant glass-filled engineered polymer, black	electrostatic charge-resistant glass-filled engineered polymer, black	electrostatic charge-resistant glass-filled engineered polymer, black
Lid screws	Stainless steel	Stainless steel	Stainless steel
Lid gasket	Silicone rubber	Silicone rubber	Silicone rubber
Earth continuity plate	N/A	N/A	Steel, zinc plated, and blue chromated

OPTIONAL LED INDICATOR LIGHT

Colour	Red	Green	Green
Voltage rating	100-277 Vac	100-254 Vac	100-254 Vac
Power consumption	< 1 W	< 1 W	< 1 W

Ordering Details (**)

POWER CONNECTION

Part Description **(**)**	JBM-100-L-A	JBM-100-L-E	JBM-100-L-EP
PN (Weight)	179955-000 (4.3 lb)	831519-000 (1.9 kg)	986415-000 (2.1 kg)

POWER CONNECTION WITH LIGHT

Part Description	JBM-100-L-A	JBM-100-L-E	JBM-100-L-EP
PN (Weight)	656081-000 (5.3 lb)	395855-000 (2.3 kg)	300273-000 (2.5 kg)

POWER CONNECTION WITH DRAIN PLUG

Part Description	JBM-100-D-E
PN (Weight)	1244-021056 (2.1 kg)

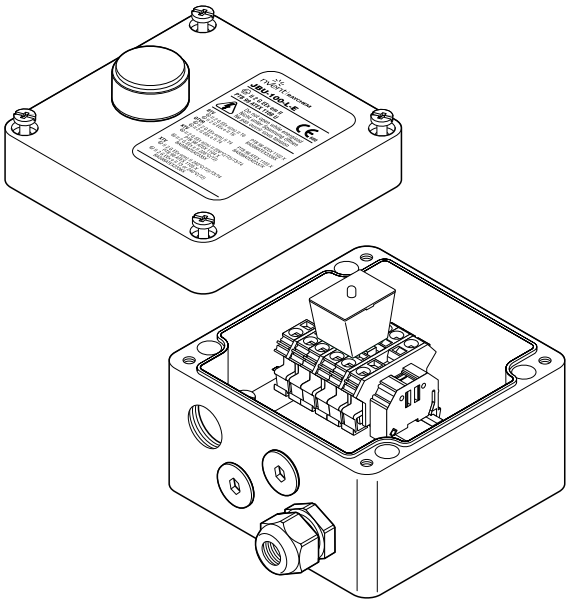
ACCESSORIES

Conduit drain 3/4"	JB-DRAIN-PLUG-3/4IN (prevents condensate from collecting in the box) ONLY FOR JBM-100-L-A
Small pipe adaptor	JBM-SPA, required for pipes ≤ 1" (DN 25) D55673-000 (bag of 5 adaptors)
Glands for power cables	GL-55-M25 hazardous area approved gland for cables 8-15 mm (temperature range -55°C/70°C) GL-36-M25 hazardous area approved gland for cables 8-17.5 mm (temperature range -20°C/70°C)

(**) Localized versions may exist with limited approvals and different part numbers. Contact your local sales representative.

JBU-100

JUNCTION BOX FOR MODULAR SYSTEM



(JBU-100-L-E shown with light)

The nVent JBU-100 kit is designed to connect power to up to three nVent RAYCHEM BTV, QTVR, XTV, KTV or VPL industrial parallel heating cables and is approved by PTB for use in hazardous locations.

Innovative Spring-type terminals provide fast installation and safe, reliable, maintenance-free operation.

The box is part of the modular component system, it allows for maximum flexibility and can be either wall or pipe mounted.

Connection kits (M25) and insulation entry kits have to be ordered separately. The box is offered in two basic versions customised to local installation practices.

All kits are also available as a lighted version (-L). These include a unique light module with a superbright green LED that simply plugs into the terminals, and a lens in the lid. This provides indication that power is available in the box.

DESCRIPTION

	JBU-100-E JBU-100-L-E	JBU-100-EP JBU-100-L-EP
	This box is for use in Europe and provides four M25 threaded entries, stopping plugs and one plastic power cable gland.	This box is for use in Europe and provides four M25 threaded entries, an earthing plate and an external earth stud. It is designed for use with armoured power cables.

KIT CONTENTS

JBU-100-E JBU-100-L-E	JBU-100-EP JBU-100-L-EP
1 junction box with terminals 1 light module (for -L only) 1 M25 gland for 8-15 mm (temperature range -55°C / 70°C) diameter power cable 2 M25 stopping plugs	1 junction box with terminals with earth plate and external earth stud 1 light module (for -L only) 2 M25 stopping plugs

APPROVALS (**)

Hazardous locations

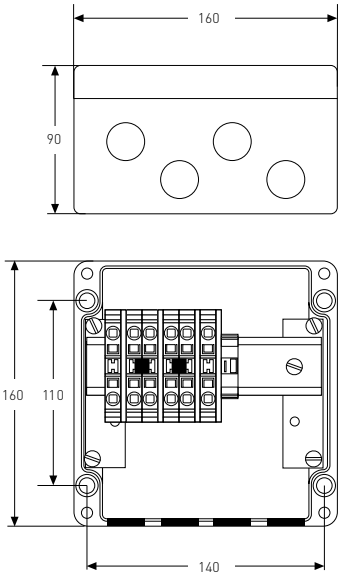
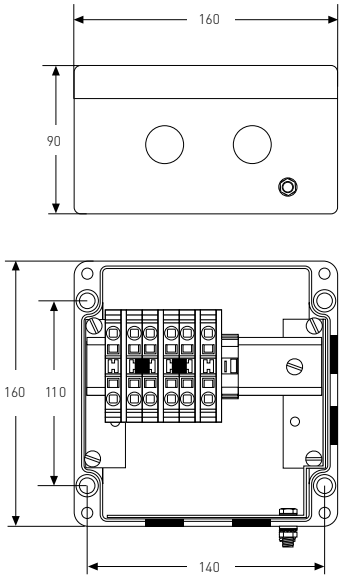
PTB 09 ATEX 1061 U Ⓔx II 2 G Ex eb mb IIC T* Gb Ⓔx III 2 D Ex mb tb IIIC T* Db IECEx PTB 09.0039U Ex eb mb IIC T* Gb Ex mb tb IIIC T* Db	PTB 09 ATEX 1061 U Ⓔx II 2 G Ex eb mb IIC T* Gb Ⓔx III 2 D Ex mb tb IIIC T* Db IECEx PTB 09.0039U Ex eb mb IIC T* Gb Ex mb tb IIIC T* Db
Ex e II T* Ex em II T* (for -L only)	ex e II T* Ex em II T* (for -L only)
DNV approval DNV-GL TAE00000TV and DNV-GL TAE00000TU	DNV approval DNV-GL TAE00000TV and DNV-GL TAE00000TU

*For T-rating, see heating cable or design documentation

TC RU C-BE.МЮ62.B.00054/18 Ex e IIC Gb U Ex tb IIIC Db U Ex e mb IIC Gb U Ex tb mb IIIC Db U Ta -55°C…+40°C IP66 ООО “ТехИмпорт”	TC RU C-BE.МЮ62.B.00054/18 Ex e IIC Gb U Ex tb IIIC Db U Ex e mb IIC Gb U Ex tb mb IIIC Db U Ta -55°C…+56°C IP66 ООО “ТехИмпорт”

(**) Localized versions may exist with limited approvals and different part numbers. Contact your local sales representative.

DIMENSIONS (NOMINAL)

	JBU-100-E JBU-100-L-E	JBU-100-EP JBU-100-L-EP
		

PRODUCT SPECIFICATIONS

Ingress protection	IP66	IP66
Entries	4 x M25	4 x M25
Ambient temperature range	−50°C to +56°C* (JBU-100-E) −40°C to +40°C (JBU-100-L-E) *Extra conditions for safe use apply for ambient temperatures above +40°C. Please refer to the the summary on page 136, the certificate or installation instructions for full details.	−50°C to +56°C* (JBU-100-EP) −40°C to +40°C (JBU-100-L-EP)
Terminals	Spring-type terminals	Spring-type terminals
	2 phase, 2 neutral, 2 ground	2 phase, 2 neutral, 2 ground
Max. conductor size	10 mm^2 stranded, 10 mm^2 solid	10 mm^2 stranded, 10 mm^2 solid
Max. operation voltage	480 Vac	480 Vac
Max. current rating	40 A	40 A

MATERIALS OF CONSTRUCTION

Enclosure, lid	Electrostatic charge-resistant glass-filled engineered polymer, black	Electrostatic charge-resistant glass-filled engineered polymer, black
Lid screws	Stainless steel	Stainless steel
Lid gasket	Silicone rubber	Silicone rubber
Earth continuity plate	N/A	Steel, zinc plated, and blue chromated

OPTIONAL LED INDICATOR LIGHT

Colour	Green	Green
Voltage rating	100-254 Vac	100-254 Vac
Power consumption	< 1 W	< 1 W

Ordering details (**)

JUNCTION BOX

Part Description **(**)**	JBU-100-E	JBU-100-EP
PN (Weight)	051976-000 (1.7 kg)	243948-000 (1.8 kg)

JUNCTION BOX WITH LIGHT

Part Description	JBU-100-L-E	JBU-100-L-EP
PN (Weight)	069262-000 (2.1 kg)	113974-000 (2.2 kg)

ACCESSORIES

Heating cable connection kits	C25-100, C25-21, CCON25-100	C25-100, C25-21, CCON25-100, C25-100-METAL
Insulation entry kit	IEK-25-04 or IEK-25-PIPE	IEK-25-04 or IEK-25-PIPE
Power cable gland	GL-55-M25 hazardous area approved gland for cables 8-15 mm (temperature range -55°C/70°C) GL-36-M25 hazardous area approved gland for cables 8-17.5 mm (temperature range -20°C/70°C)	GL-38-M25-METAL (optional)
Junction box support bracket (optional)	SB-100, SB-101	SB-100, SB-101

(**) Localized versions may exist with limited approvals and different part numbers. Contact your local sales representative.

SPECIAL CONDITIONS FOR SAFE USE

SUMMARY OF SPECIAL CONDITIONS FOR SAFE USE WHEN USING JBS, JBM, JBU AND E-100 AT AMBIENT TEMPERATURES ABOVE +40°C OR VOLTAGES ABOVE 254 VAC.

Type	Ambient temperature range and rated Voltage range	Special conditions of safe use
JBS-100-E JBM-100-E JBS-100-D-E JBM-100-D-E	–50°C to +40°C and/or rated voltages < 254 V	No additional requirements. Please refer to certificate.
JBS-100-L-E JBM-100-L-E	–40°C to +40°C and/or rated voltages <254 V	No additional requirements. Please refer to certificate: PTB9ATEX1059U
JBS-100-E JBM-100-E JBS-100-D-E JBM-100-D-E	–50°C to +56°C and/or rated voltages as per table below:	Additional conditions for use in environments with ambient temperatures exceeding +40°C and/ or rated voltages of 254 V • Use a power cable with continuous temperature resistance of minimum +90°C • Use a metallic power cable gland(s) (GL-33 or GL-34)

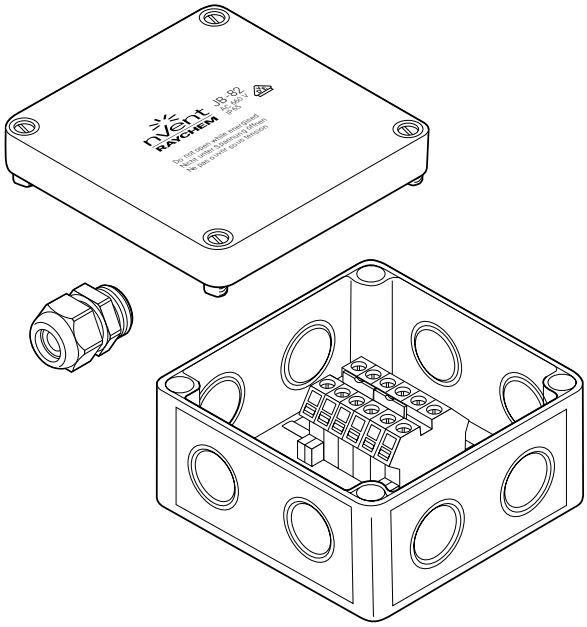
BTV, QTVR, XTV, KTV	Max. 277V
VPL1	Max. 110V
VPL2	Max. 230 / 254 V
VPL4	Max. 480 V

Type	Ambient temperature range and rated Voltage range	Special conditions of safe use
JBU-100-E	–50°C to +40°C and/or rated voltages < 254 V	No additional requirements. Please refer to certificate.
JBU-100-L-E	–40°C to +40°C and/or rated voltages <254 V	No additional requirements. Please refer to certificate.
JBU-100-E	–50°C to +56°C and/or rated voltages as per table below:	Additional conditions for use in environments with ambient temperatures exceeding +40°C and/ or rated voltages of 254 V • Use a power cable with continuous temperature resistance of minimum +90°C • Use a metallic power cable gland(s) (GL-33 or GL-34) • Use a metallic connection kit for heating cable connection

BTV, QTVR, XTV, KTV	Max. 277V
VPL1	Max. 110V
VPL2	Max. 230 / 254 V
VPL4	Max. 480 V

JB-82

JUNCTION BOX



The nVent RAYCHEM JB-82 is a standard, non-hazardous polycarbonate junction box.

It may be used to make a power connection, splice, powered splice, powered tee or simple tee, for use with nVent RAYCHEM industrial parallel heating cables.

Up to four heating cables or three heating cables and the appropriate size power cable can be accommodated through the four entries and connected to the rail mounted terminals.

For pipe mounting, it is recommended that this box is used with a nVent RAYCHEM support bracket.

ENCLOSURE

	JB-82
Area of use	Ordinary (indoors and outdoors)
Protection	IP66
Entries	4 M20/25
Exposure temperature	–35°C to +115°C
Base	Grey glass filled polycarbonate
Lid	Grey polycarbonate
Lid gasket	Foamed polyurethane

PHASE TERMINALS

Conta-Clip RK6-10	Din rail mounted
Voltage rating	750 Vac
Max. conductor size	0.5-10 mm^2 (solid and stranded)
Current rating	61 A
Quantity	Two cross-connected groups of two

EARTH TERMINALS

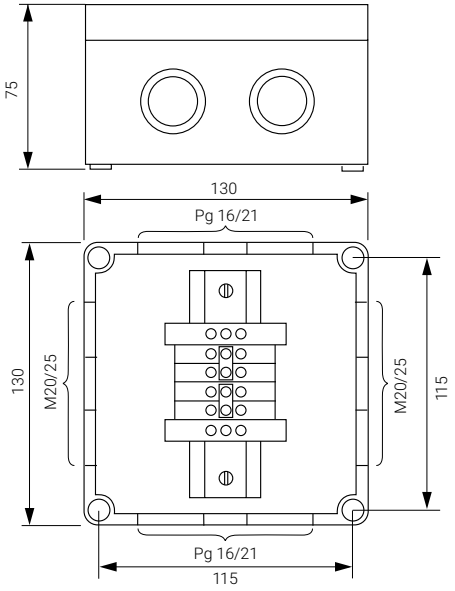
2 Conta-Clip SL10/35

APPROVALS

(Russia, Kazakhstan, Belarus)
For other countries contact your local nVent representative.

RAYCHEM-DS-EU1399-JB82-EN-1911

DIMENSIONS (IN MM)



MOUNTING

	JB-82
Through holes moulded in the base of the junction box	
Centres	115 x 115 mm
Size	5 mm diameter
Cable gland	Polyamide with locknut for cable diameters from 9 to 16 mm

ACCESSORIES

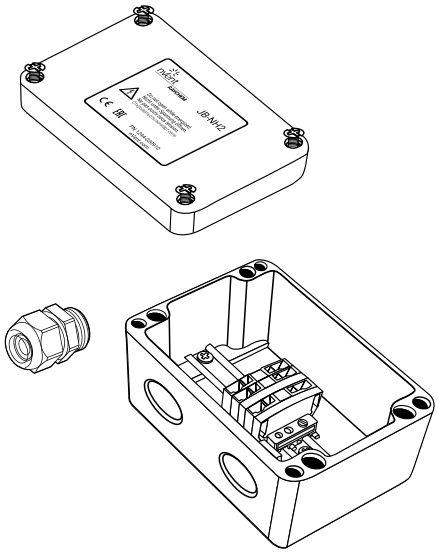
Junction box support bracket	SB-100, SB-101, SB-110, SB-111

ORDERING DETAIL

Part description	JB-82
PN (Weight)	535679-000 (0.47 kg)

JB-NH2

JUNCTION BOX FOR MODULAR SYSTEM



DESCRIPTION

The nVent RAYCHEM JB-NH2 is a non-hazardous junction box for use with various heating cable types with M25 connection kits.

It can be used to make a power connection, splice, or end seal. For use with nVent RAYCHEM industrial parallel self-regulating heating cables.

Through the two entries a heating cable and a power cable, or two heating cables can be accommodated and connected to the DIN-rail mounted terminals. A power cable (M25) gland is included.

The box can be wall mounted via the four holes moulded in the back of the box. For pipe mounting, it is recommended that this box is used with a nVent RAYCHEM support bracket.

ENCLOSURE

Area of use	Ordinary (non-hazardous)
Protection	IP66
Entries	2 x M25
Exposure temperature	-40 °C to +90°C
Base	Grey glass filled polymer
Lid	Grey glass filled polymer

TERMINALS

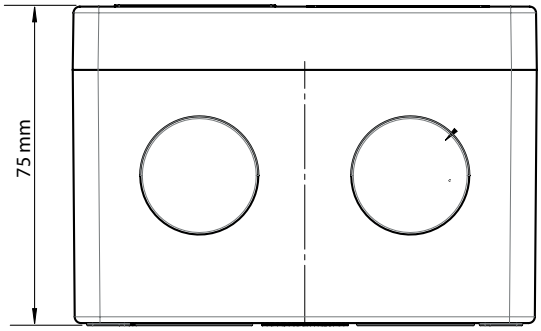
MSB 2.5	Din rail mounted, spring-type terminals
Voltage rating	800 Vac
Max. conductor size	Stranded: 2,5 mm² Solid: 4 mm²
Current rating	Nominal 24 A - Maximum 30 A with 4 mm² conductor cross section
Quantity	2 phase and 1 PE

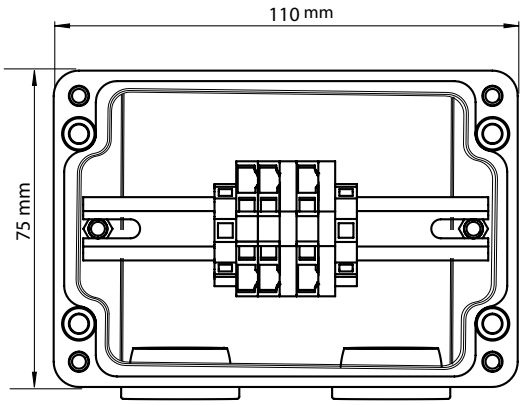
APPROVALS

Products are in compliance with IEC/EN 62395-1:2013
DNV approval pending

RAYCHEM-DS-EU1223-JBNH2-EN-1911

DIMENSIONS (IN MM)





ACCESSORIES

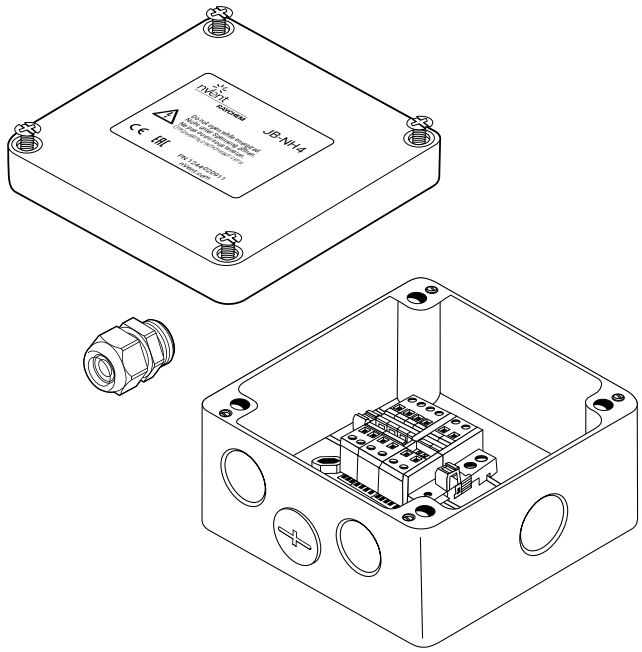
Junction box support bracket	SB-100, SB-101, SB-110, SB-111

ORDERING DETAIL

Part description	JB-NH2
PN (Weight)	1244-020910 (0.34 kg)

JB-NH4

JUNCTION BOX FOR MODULAR SYSTEM



DESCRIPTION

The nVent RAYCHEM JB-NH4 is a junction box for use with various heating cable types with M25 connection kits and suitable for use in ordinary (non-hazardous) areas. It can be used to make a power connection, splice, or end seal. For use with nVent RAYCHEM industrial parallel heating cables.

Up to four heating cables or three heating cables and the appropriate size power cable can be accommodated through the four entries and connected to the DIN-rail mounted terminals. A power cable gland (M25) included.

The box can be wall mounted via the four holes moulded in the back of the box. For pipe mounting, it is recommended that this box is used with a nVent RAYCHEM support bracket.

ENCLOSURE

Area of use	Ordinary (non-hazardous)
Protection	IP66
Entries	4 x M25
Exposure temperature	-40°C to +90°C
Base	Grey glass filled polymer
Lid	Grey glass filled polymer

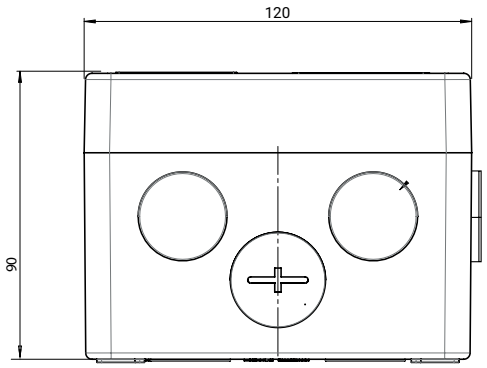
TERMINALS

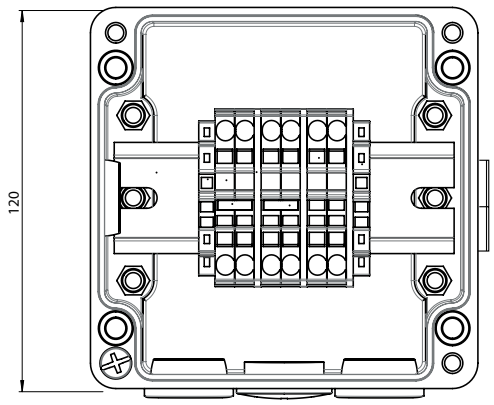
ST-4	Din rail mounted, spring-type terminals
Voltage rating	Max. 800 Vac
Max. conductor size	Stranded: 4 mm² Solid: 6 mm²
Current rating	Nominal 32 A - Maximum 40 A with 6 mm² conductor cross section
Quantity	4 phase terminals, bridged per 2 and 2 PE terminals

APPROVALS

Products are in compliance with IEC/EN 62395-1:2013
DNV approval pending

DIMENSIONS (IN MM)





ACCESSORIES (TO BE ORDERED SEPARATELY)

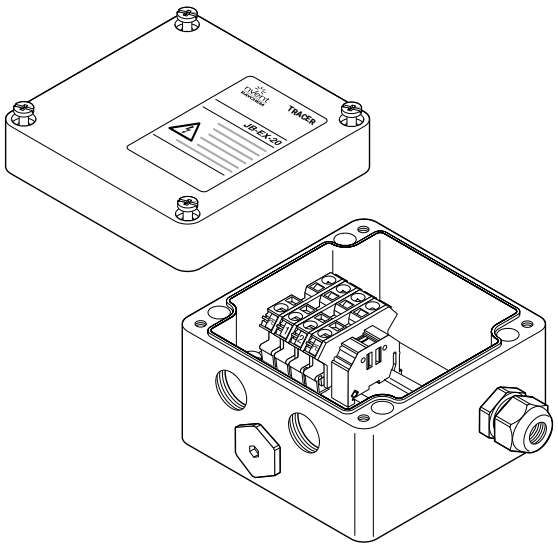
Junction box support bracket	SB-100, SB-101, SB-110, SB-111

ORDERING DETAILS

Part description	JB-NH4
PN (Weight)	1244-020911 (0.47 kg)

JB-EX-20 AND JB-EX-20-EP

MULTI PURPOSE JUNCTION BOX



Industrial junction box for use in hazardous areas with nVent RAYCHEM FMT, FHT, PI and MI heating cables. This box can be used to make connections between power cables, heating cables and cold lead cables. Depending on the configuration of the system, the box can accommodate heating cables, cold leads and a power cable. nVent RAYCHEM M20 connection kits have to be ordered separately depending on the type of heating cable being used.

Cable connection is via DIN rail mounted Spring-type terminals to provide fast installation and safe, reliable, maintenance-free operation.

The box can be either wall or pipe mounted via the four holes moulded in the base of the box. For pipe mounting, use one of the standard support brackets.

TYPICAL USE

JB-EX-20	JB-EX-20-EP
Power supply box for series heating cables (PI & MI) and constant wattage parallel heating cables (FMT & FHT) or end box (star) for series heating cables (PI & MI), when using M20 connection kits	

ENTRIES

3 x M20 1 x M25	3 x M20 1 x M25

KIT CONTENTS

Junction box with spring-type terminals on DIN rail	Junction box with spring-type terminals on DIN rail, earthing plate and an external earth stud
1 x M20 stopping plug 2 x M20 rain plugs (temporary) 1 x M25 Hazardous area approved cable gland for power cables with ø of 8-15mm 1 x terminal jumper allowing various wiring configurations (remove terminal plate)	1 x M20 stopping plug 2 x M20 rain plugs (temporary) 1 x M25 rain plug (temporary)

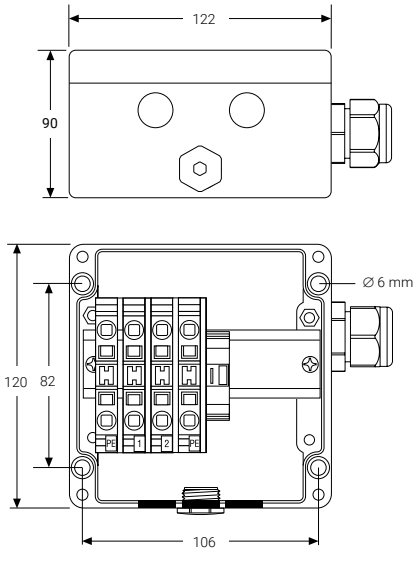
APPROVALS

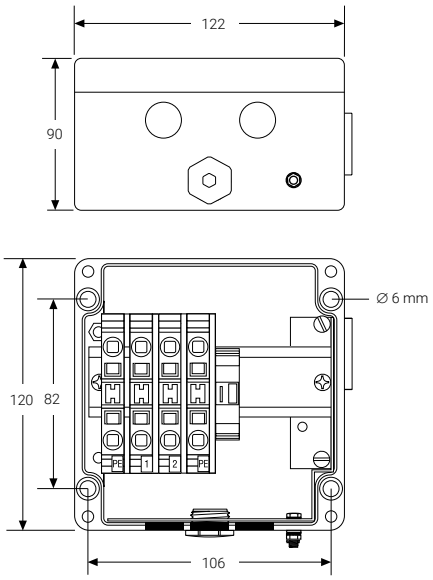
PTB 00 ATEX 1002	II 2G Ex edm ia [ia] IIC T6, T5 and T4 II 2D Ex tD A21 IP66 T85°C, T100°C and T135°C
IECEx PTB 08.0004	Ex e ia II, IIC T6, T5, T4 Ex tD A21 IP66 T 85°C, T 100°C, T 135°C
EAC Ex	ТС RU C-BE.ИМ43.B.01854 ООО «ТехИмпорт» Ambient temp range: -55°C...+55°C 1Ex d e mb ia (ia) IIC T6...T4 Gb Ex tb IIIC T85°C...T135°C Db Ta -55°C...+55°C IP66 Made in India

MATERIALS OF CONSTRUCTION

Box & lid	Electrostatic charge-resistant glass-filled engineered polymer, black	Electrostatic charge-resistant glass-filled engineered polymer, black
Sealing gasket	Silicone rubber	Silicone rubber
Lid fixing screws	Stainless steel (captive)	Stainless steel (captive)
Earthing plate	N.A.	Steel, zinc plated and blue chromated

	JB-EX-20	JB-EX-20-EP





INGRESS PROTECTION

IP66	IP66

AMBIENT TEMPERATURE RANGE

–55°C to +55°C	–55°C to +55°C

TERMINALS

Quantity	4 pcs, spring-type	4 pcs, spring-type
Labeling	1, 2 + 2 x PE	1, 2 + 2 x PE
Maximum conductor size	10 mm^2 (solid & stranded)	10 mm^2 (solid & stranded)
Maximum operating voltage	590 Vac	590 Vac
Maximum operating current	53 A	53 A

ACCESSORIES (TO BE ORDERED SEPARATELY)

Support bracket	SB-100, SB-101, SB-110, SB-111	SB-100, SB-101, SB-110, SB-111
Power cable gland	GL-55-M25 (included) up to -55°C, 8-15mm	GL-38-M25-METAL (optional) up to -60°C, inner diam. 10-13.5mm, outer diam. 13.5-21 mm
Loose terminals (*)	Phase/neutral terminal: Earth terminal: End plate: Terminal jumper:	HWA-WAGO-PHASE HWA-WAGO-EARTH HWA-WAGO-ENDPLATE HWA-WAGO-JUMPER
Connection kit for FMT and FHT heating cables	C20-01-F hot applied connection kit with plastic gland	C20-02-F cold applied connection kit with metal gland
Insulation entry kit for FMT and FHT heating cables	IEK-25-04 or IEK-25-PIPE	IEK-25-04 or IEK-25-PIPE
Gland for PI cold leads	C20-PI-PA-KIT Hazardous area approved gland, PA, up to -40°C	C20-PI-M0-KIT Hazardous area approved gland, Ni plated brass, up to -55°C (to be used with boxes with integral earth plate or with earth lug)
Insulation entry kit for PI cold leads	IEK-20-PI	IEK-20-PI
Gland for MI cold leads	Contact nVent or refer to DOC-606	Contact nVent or refer to DOC-606
Stopping plug	HWA-PLUG-M20-EXE-PLASTIC	HWA-PLUG-M20-EXE-PLASTIC

ORDERING DETAILS

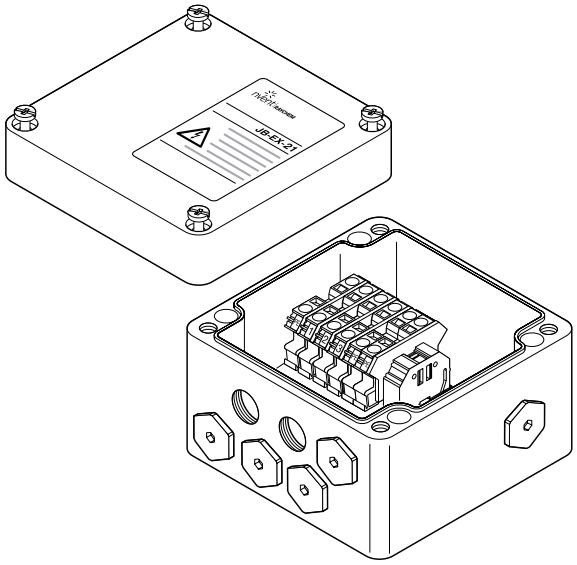
Order reference	JB-EX-20	JB-EX-20-EP
Part number (Weight)	1244-000590 (0.9 kg)	1244-006384 (1 kg)

(*) in total no more than 6 terminals of this type should be installed.

JB-EX-21

nVent RAYCHEM

MULTI PURPOSE JUNCTION BOX



Industrial polyester junction box for use in hazardous areas. This box can be used to make connections between power cables, heating cables and cold lead cables using M20 connection kits. Depending on the configuration of the system, the box can accommodate six heating cables/cold leads and a power cable. M20 connection kits have to be ordered separately depending on the type of heating cable being used. Cable connection is accomplished via DIN rail mounted spring-type terminals.

The box can be either wall or pipe mounted via the four holes moulded in the base of the box. For pipe mounting use one of the standard support bracket.

TYPICAL USE

Power supply box, end-box, splice box (3-phase and loop), marshalling box.

ENTRIES

6 x M20
1 x M32

KIT CONTENTS

1 x junction box with terminals on DIN rail

4 x M20 stopping plugs
2 x M20 rain plug (temporary)
1 x M32 stopping plug
1 x terminal jumper allowing various wiring configurations (remove terminal plate)

APPROVALS

PTB 00 ATEX 1002	II 2G Ex edm ia [ia] IIC T6, T5 and T4 II 2D Ex tD A21 IP66 T85°C, T100°C and T135°C
IECEx PTB 08.0004	Ex e ia II, IIC T6, T5, T4 Ex tD A21 IP66 T 85°C, T 100°C, T 135°C
	TC RU C-BE.ИМ43.B.01854 ООО «ТехИмпорт» Ambient temp range: -55°C...+55°C 1Ex d e mb ia (ia) IIC T6...T4 Gb Ex tb IIIC T85°C...T135°C Db Ta -55°C...+55°C IP66 Made in India

MATERIALS OF CONSTRUCTION

Box & lid	Electrostatic charge-resistant glass-filled engineered polymer, black
Sealing gasket	Silicone rubber
Lid fixing screws	Stainless steel (captive)

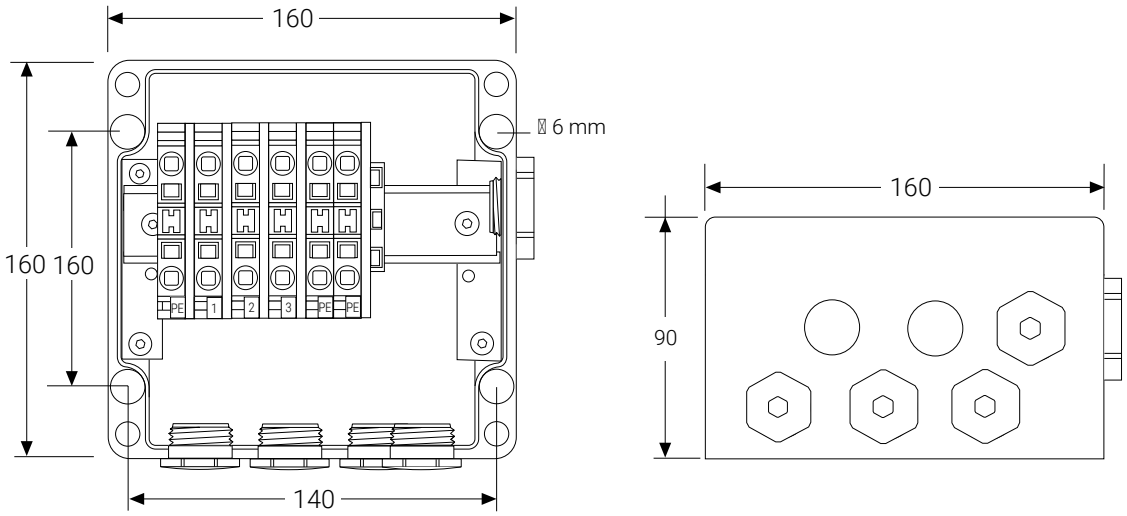
INGRESS PROTECTION

IP66

AMBIENT TEMPERATURE RANGE

–55°C to +55°C

DIMENSIONS (IN MM)



TERMINALS

Quantity	6 pc.
Type	Spring-type
Labeling	1, 2, 3, 3 x PE
Maximum conductor size	10 mm^2 (solid & stranded)
Maximum operating voltage	550 Vac
Maximum operating current	53 A

ACCESSORIES (TO BE ORDERED SEPARATELY)

Support bracket	SB-100, SB-101	
Gland for PI cold leads	C20-PI-PA-KIT Hazardous area approved gland, PA, up to -40°C C20-PI-M0-KIT Hazardous area approved gland, Ni plated brass, up to -55°C (to be used with boxes with integral earth plate or with earth lug)	
Gland for MI cold leads	Contact nVent or refer to DOC-606	
Gland for power cable	GL-45-M32 hazardous area approved gland for cables ø 14-21mm, up to -55°C	
Loose terminals (*)	Phase/neutral terminal: Earth terminal: End plate: Terminal jumper:	HWA-WAGO-PHASE HWA-WAGO-EARTH HWA-WAGO-ENDPLATE HWA-WAGO-JUMPER

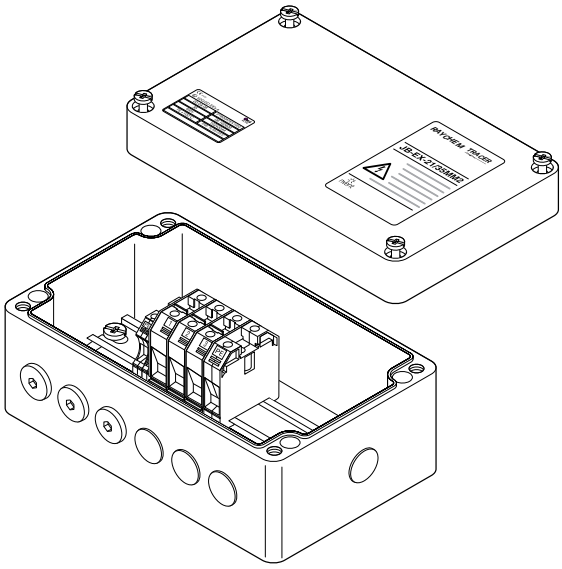
ORDERING DETAILS

Order reference	nVent RAYCHEM JB-EX-21
Part number (Weight)	1244-000579 (1.2 kg)

(*) in total no more than 10 terminals should be installed.

JB-EX-21/35MM2

MULTI PURPOSE JUNCTION BOX



Industrial junction box for use in hazardous areas with PI and MI heating cables when large terminal sizes are required. This box can be used to make connections between power cables, heating cables and cold lead cables. Depending on the configuration of the system, the box can accommodate multiple heating cables/cold leads and a power cable.

The M20 connection kits have to be ordered separately depending on the type of heating cable being used.

Cable connection is accomplished via DIN rail mounted screw terminals from Weidmuller to provide safe, reliable and maintenance-free operation.

The box can be wall mounted via the four holes moulded in the base of the box.

TYPICAL USE

Power supply box, end-box, splice box for series heating cables (PI & MI), when using M20 connection kits. Marshalling box for power cables.

ENTRIES

6 x M20
1 x M40

KIT CONTENTS

1 x Junction box with screw terminals on DIN rail
3 x M20 stopping plugs
3 x M20 rain plugs (temporary)
1 x M40 stopping plug

APPROVALS

PTB 00 ATEX 1002	II 2G Ex edm ia [ia] IIC T6, T5 and T4 II 2D Ex tD A21 IP66 T85°C, T100°C and T135°C
IECEx PTB 08.0004	Ex e ia II, IIC T6, T5, T4 Ex tD A21 IP66 T 85°C, T 100°C, T 135°C
	TC RU C-BE.ИМ43.B.01854 ООО «ТехИмпорт» Ambient temp range: -55°C...+55°C 1Ex d e mb ia (ia) IIC T6...T4 Gb Ex tb IIIC T85°C...T135°C Db Ta -55°C...+55°C IP66 Made in India

MATERIALS OF CONSTRUCTION

Box & lid	Electrostatic charge-resistant glass-filled engineered polymer, black
Sealing gasket	Silicone rubber
Lid fixing screws	Stainless steel (captive)

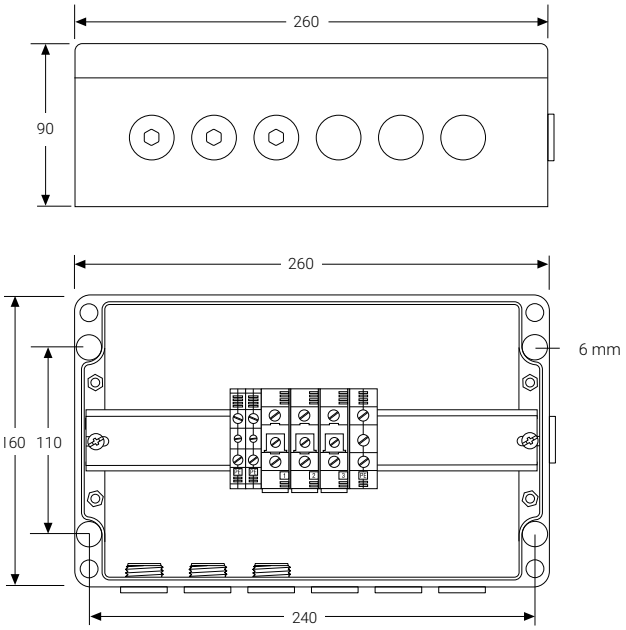
INGRESS PROTECTION

IP66

AMBIENT TEMPERATURE RANGE

–55°C to +55°C

DIMENSIONS (IN MM)



TERMINALS

Quantity & type	3 pcs WDU35 screw terminals 2 pcs WPE10 earth terminals for heating cable earth leads 1 pc WPE35 earth terminal for power cable Junction box can accomodate up to 6 fully loaded phase/neutral terminals (maximum 10 terminals in total)
Labelling	1, 2, 3 + 3 x PE
Minimum conductor size	2.5 mm^2 stranded & solid
Maximum conductor size	35 mm^2 stranded & 16 mm^2 solid
Maximum operating voltage	690 Vac
Maximum operating current	100 A

ACCESSORIES (TO BE ORDERED SEPARATELY)

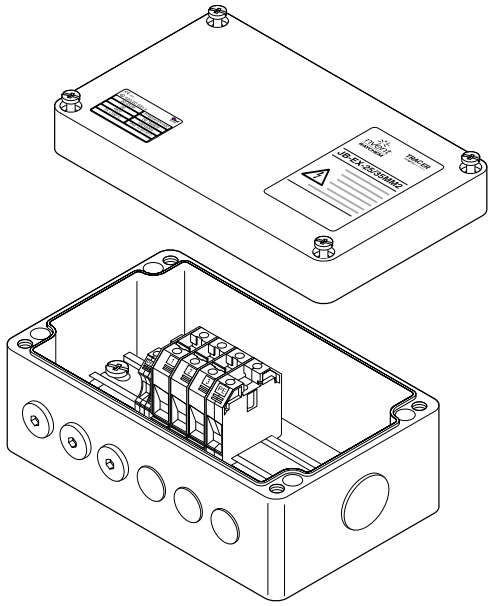
Glands for power cables	GL-51-M40 hazardous area approved gland for cables ø 19-28mm, up to -55°C GL-45-M32 hazardous area approved gland for cables ø 14-21mm, up to -55°C	
Reducer	REDUCER-M40/32-EEXE hazardous area M40 male to M32 female reducer	
Loose terminals	35 mm^2 phase/neutral terminal: 10 mm^2 earth terminal: 35 mm^2 earth terminal: Endplate: Terminal jumper (2): Terminal jumper (3):	HWA-WDM-PHASE-35 HWA-WDM-EARTH-10 HWA-WDM-EARTH-35 HWA-WDM-PLATE HWA-WDM-JUMPER-35-2 HWA-WDM-JUMPER-35-3
Gland for PI cold leads	C20-PI-PA-KIT Hazardous area approved gland, PA, up to -40°C C20-PI-M0-KIT Hazardous area approved gland, Ni plated brass, up to -55°C (to be used with boxes with integral earth plate or with earth lug)	
Insulation entry kit for PI cold leads	IEK-20-PI	
Gland for MI cold leads	In case of factory terminated units, already present. For on-site assemblies, contact nVent or refer to DOC-606	

ORDERING DETAILS

Order reference	nVent RAYCHEM JB-EX-21/35MM2
Part number (Weight)	1244-006653 (1.9 kg)

JB-EX-25/35MM2

MULTI PURPOSE JUNCTION BOX



Industrial junction box for use in hazardous areas with MI heating cables when larger terminal sizes are required. This box can be used to make connections between power cables, heating and cold lead cables. Depending on the configuration of the system, the box can accommodate multiple heating cables/ cold leads and a power cable. The M25 glands are already present in the case of factory terminated MI heating units. In case of on-site assemblies, refer to DOC-606 for detailed information about the required accessories.

Cable connection is accomplished via DIN rail mounted screw terminals from Weidmüller to provide safe, reliable and maintenance-free operation.

The box can be wall mounted via the four holes moulded in the base of the box.

TYPICAL USE

Power supply box, end-box, splice box for series heating cables (MI), when terminated with M25 glands. Marshalling box for power cables.

ENTRIES

6 x M25
1 x M40

KIT CONTENTS

Junction box with screw terminals on DIN rail
3 x M25 stopping plugs
3 x M25 rain plugs (temporary)
1 x M40 stopping plug

APPROVALS

PTB 00 ATEX 1002	II 2G Ex edm ia [ia] IIC T6, T5 and T4 II 2D Ex tD A21 IP66 T85°C, T100°C and T135°C
IECEx PTB 08.0004	Ex e ia II, IIC T6, T5, T4 Ex tD A21 IP66 T 85°C, T100°C, T135°C
	TC RU C-BE.ИМ43.B.01571 ООО «ТехИмпорт» Ambient temp range: -55°C...+55°C 1Ex d e mb ia (ia) IIC T6...T4 Gb Ex tb IIIC T85°C...T135°C Db Ta -55°C...+55°C IP66 Made in India

MATERIALS OF CONSTRUCTION

Box & lid	Electrostatic charge-resistant glass-filled engineered polymer, black
Sealing gasket	Silicone rubber
Lid fixing screws	Stainless steel (captive)

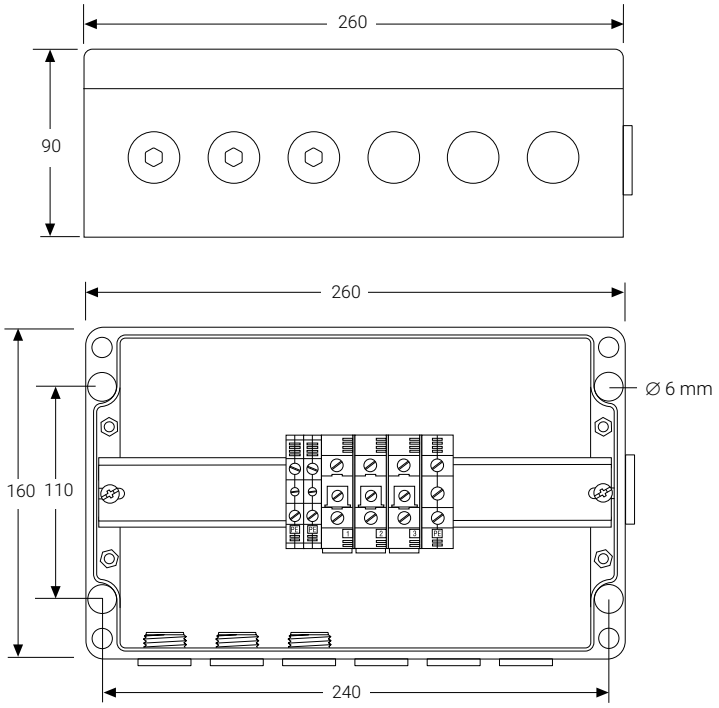
INGRESS PROTECTION

IP66

AMBIENT TEMPERATURE RANGE

–55°C to +55°C

DIMENSIONS (IN MM)



TERMINALS

Quantity & type	3 pcs WDU35 screw terminals 2 pcs WPE10 earth terminals for heating cable earth leads 1 pc WPE35 earth terminal for power cable Junction box can accomodate up to 6 fully loaded phase/neutral terminals (maximum 10 terminals in total)
Labelling	1, 2, 3 + 3 x PE
Minimum conductor size	2.5 mm^2 stranded & solid
Maximum conductor size	35 mm^2 stranded & 16 mm^2 solid
Maximum operating voltage	690 Vac
Maximum operating current	100 A

ACCESSORIES (TO BE ORDERED SEPARATELY)

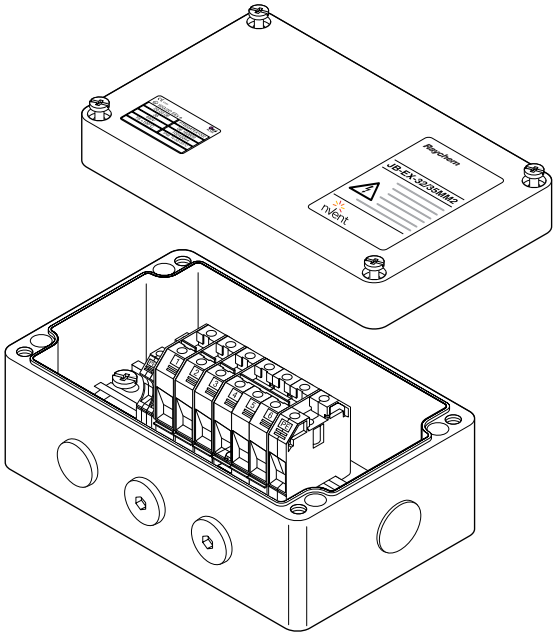
Glands for power cables	GL-36-M25 hazardous area approved gland for cables Ø 19-28mm, up to -55°C GL-51-M40 hazardous area approved gland for cables Ø 17-28 mm up to -55°C GL-45-M32 hazardous area approved gland for cables, 14-21mm, up to -55°C	
Reducer	REDUCER-M40/32-EEXE hazardous area M40 male to M32 female reducer	
Loose terminals	35 mm^2 phase/neutral terminal:	HWA-WDM-PHASE-35
	10 mm^2 earth terminal:	HWA-WDM-EARTH-10
	35 mm^2 earth terminal:	HWA-WDM-EARTH-35
	Endplate:	HWA-WDM-PLATE
	Terminal jumper (2):	HWA-WDM-JUMPER-35-2
	Terminal jumper (3):	HWA-WDM-JUMPER-35-3
Gland for MI cold leads	In case of factory terminated MI heating units, supplied with MI units. For on-site assemblies, contact nVent or refer to DOC-606	

ORDERING DETAILS

Order reference	nVent RAYCHEM JB-EX-25/35MM2
Part number (Weight)	1244-006654 (1.9 kg)

JB-EX-32/35MM2

MULTI PURPOSE JUNCTION BOX



Industrial junction box for use in hazardous areas with MI heating cables when large terminal sizes are required. This box can be used to make connections between power cables, heating cables and cold lead cables. Depending on the configuration of the system, the box can accommodate multiple heating cables/cold leads and a power cable.

The M32 glands are already present in the case of factory terminated heating units. In case of on-site assemblies, refer to DOC-606 for detailed information about the required accessories.

Cable connection is accomplished via DIN rail mounted screw terminals from Weidmüller to provide safe, reliable and maintenance-free operation.

The box can be wall mounted via the four holes moulded in the base of the box.

TYPICAL USE

Power supply box, end-box, splice box for series heating cables (MI), when terminated with M32 glands.
Marshalling box for power cables.

ENTRIES

3 x M32
1 x M40

KIT CONTENTS

Junction box with screw terminals on DIN rail
2 x M32 stopping plugs
1 x M32 rain plug (temporary)
1 x M40 stopping plug

APPROVALS

PTB 00 ATEX 1002	II 2G Ex edm ia [ia] IIC T6, T5 and T4 II 2D Ex tD A21 IP66 T85°C, T100°C and T135°C
IECEx PTB 08.0004	Ex e ia II, IIC T6, T5, T4 Ex tD A21 IP66 T 85°C, T 100°C, T 135°C
	TC RU C-BE.ИМ43.B.01571 ООО «ТехИмпорт» Ambient temp range: -55°C...+55°C 1Ex d e mb ia (ia) IIC T6...T4 Gb Ex tb IIIC T85°C...T135°C Db Ta -55°C...+55°C IP66 Made in India

MATERIALS OF CONSTRUCTION

Box & lid	Electrostatic charge-resistant glass-filled engineered polymer, black
Sealing gasket	Silicone rubber
Lid fixing screws	Stainless steel (captive)

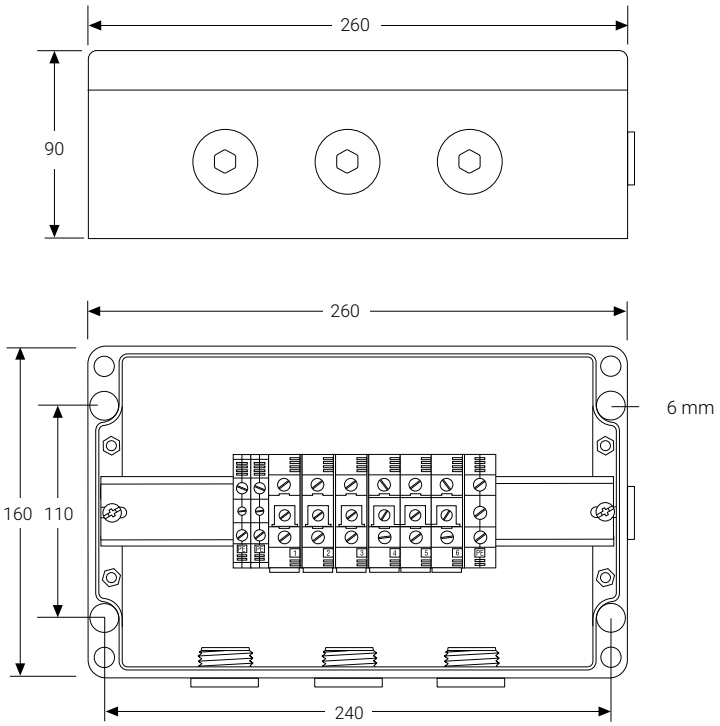
INGRESS PROTECTION

IP66

AMBIENT TEMPERATURE RANGE

–55°C to +55°C

DIMENSIONS (IN MM)



TERMINALS

Quantity & type	6 pcs WDU35 screw terminals, 3 separate and 3 bridged, 2 pcs WPE10 earth terminals for heating cable earth leads, 1 pc WPE35 earth terminal for power cable, Junction box can accomodate up to 6 fully loaded phase/neutral terminals (maximum 10 terminals in total)
Labelling	1, 2, 3, 4, 5, 6 + 3 x PE
Minimum conductor size	2.5 mm^2 stranded & solid
Maximum conductor size	35 mm^2 stranded & 16 mm^2 solid
Maximum operating voltage	690 Vac
Maximum operating current	100 A

ACCESSORIES (TO BE ORDERED SEPARATELY)

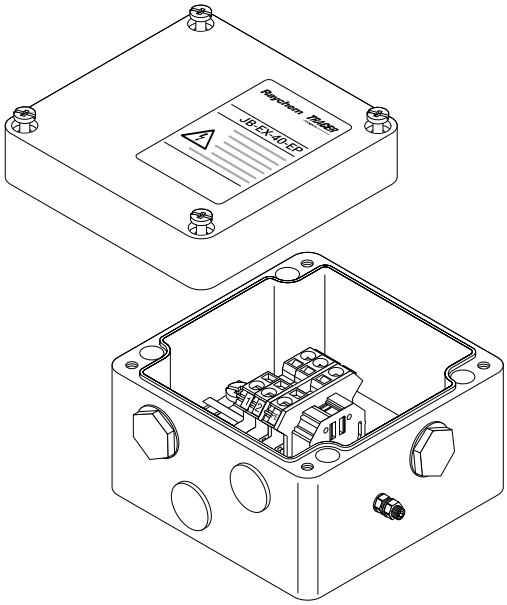
Glands for power cables	GL-51-M40 hazardous area approved gland for cables ∅ 19-28mm, up to -55°C GL-45-M32 hazardous area approved gland for cables ∅ 14-21mm, up to -55°C	
Reducer	REDUCER-M40/32-EEXE hazardous area M40 male to M32 female reducer REDUCER-M32/25-EEXE hazardous area M32 male to M25 female reducer	
Loose terminals	35 mm^2 phase/neutral terminal: 10 mm^2 earth terminal: 35 mm^2 earth terminal: Endplate: Terminal jumper (2): Terminal jumper (3):	HWA-WDM-PHASE-35 HWA-WDM-EARTH-10 HWA-WDM-EARTH-35 HWA-WDM-PLATE HWA-WDM-JUMPER-35-2 HWA-WDM-JUMPER-35-3
Gland for MI cold leads	In case of factory terminated units, already present. For on-site assemblies, contact nVent or refer to DOC-606	

ORDERING DETAILS

Order reference	nVent RAYCHEM JB-EX-32/35MM2
Part number (Weight)	1244-006655 (1.9 kg)

JB-EX-40-EP

MULTI PURPOSE JUNCTION BOX



Industrial polyester junction box with earth plate for use in hazardous areas. This box can be used to make connections between power cables, heating cables and cold lead cables using M25 metallic connection kits or glands. Earthing of the connections is realized via the earth plate

Depending on the configuration of the system, the box can accommodate 3 cold lead entries and/or a power cable.

M25 connection kits have to be ordered separately or are integrated in the heating unit (eg MI heating units), depending on the type of heating cable being used. Cable connection is accomplished via DIN rail mounted spring-type terminals.

The box can be either wall or pipe mounted via the four holes moulded in the base of the box. For pipe mounting use one of the standard support bracket.

TYPICAL USE

Power supply box, end-box (3-Phase),marshalling box.

ENTRIES

3 x M25
1 x M25

KIT CONTENTS

1 x junction box with terminals on DIN rail
2 x M25 stopping plugs
2 x M25 rain plug (temporary)

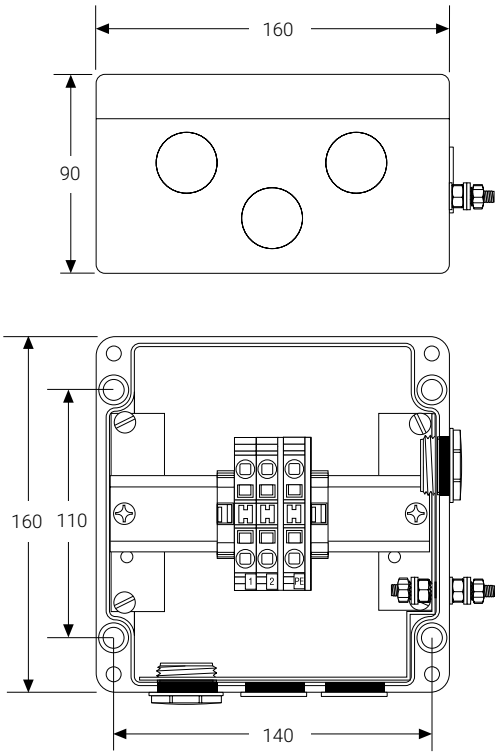
APPROVALS

PTB 00 ATEX 1002	II 2G Ex edm ia [ia] IIC T6, T5 and T4 II 2D Ex tD A21 IP66 T85°C, T100°C and T135°C
IECEx PTB 08.0004	Ex e ia II, IIC T6, T5, T4 Ex tD A21 IP66 T 85°C, T 100°C, T 135°C
	№ ЕАЭС RU C-BE.МЮ62.В.00879/19 ООО «ПРОММАШ ТЕСТ» 1 Ex e IIC T6 Gb Ex tb IIIC T85°C Db

MATERIALS OF CONSTRUCTION

Box & lid	Electrostatic charge-resistant glass-filled engineered polymer, black
Sealing gasket	Silicone rubber
Lid fixing screws	Stainless steel (captive)

DIMENSIONS (IN MM) — JB-EX-40



INGRESS PROTECTION

IP66

AMBIENT TEMPERATURE RANGE

−55°C to +55°C

TERMINALS

Quantity	3 pc
Type	Spring-type
Labeling	1, 2, PE
Maximum conductor size	10 mm^2 (solid & stranded)
Maximum operating voltage	550 Vac
Maximum operating current	53 A

ACCESSORIES (TO BE ORDERED SEPARATELY)

Support bracket	SB-100, SB-101, SB-130 (for fixation to cable tray)
Gland for MI cold leads	Integrated in MI heating unit or contact Thermal management for more information
Gland for power cable	GL-55-M25 (Polyamide) GL-38-M25-METAL (Ni plated brass)
Loose terminals (*)	Phase/neutral terminal: HWA-WAGO-PHASE Earth terminal: HWA-WAGO-EARTH End plate: HWA-WAGO-ENDPLATE Terminal jumper: HWA-WAGO-JUMPER

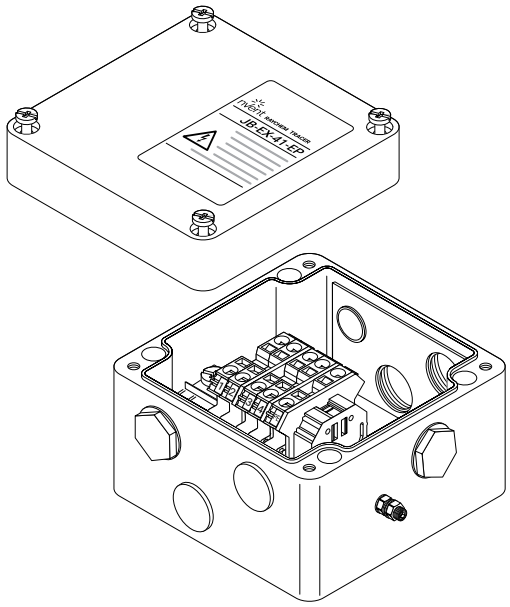
ORDERING DETAILS

Order reference	JB-EX-40-EP
Part number (Weight)	1244-020505 (1.6 kg)

(*) in total no more than 7 terminals should be installed.

JB-EX-41-EP

MULTI PURPOSE JUNCTION BOX



Industrial polyester junction box with earth plate for use in hazardous areas. This box can be used to make connections between power cables, heating cables and cold lead cables using M25 metallic connection kits or glands. Earthing of the connections is realized via the earth plate

Depending on the configuration of the system, the box can accommodate 6 cold lead entries and/or a power cable.

M25 connection kits have to be ordered separately or are integrated in the heating unit (eg MI heating units), depending on the type of heating cable being used. Cable connection is accomplished via DIN rail mounted spring-type terminals.

The box can be either wall or pipe mounted via the four holes moulded in the base of the box. For pipe mounting use one of the standard support bracket.

TYPICAL USE

Power supply box, (power) splice box, (power) tee box, marshalling box.

ENTRIES

6 x M25
1 x M25

KIT CONTENTS

1 x junction box with terminals on DIN rail
3 x M25 stopping plugs
4 x M25 rain plug (temporary)

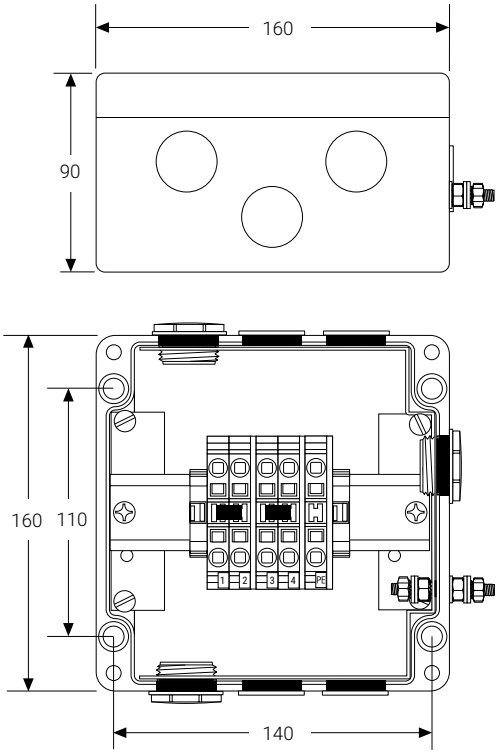
APPROVALS

PTB 00 ATEX 1002	II 2G Ex edm ia [ia] IIC T6, T5 and T4 II 2D Ex tD A21 IP66 T85°C, T100°C and T135°C
IECEx PTB 08.0004	Ex e ia II, IIC T6, T5, T4 Ex tD A21 IP66 T 85°C, T 100°C, T 135°C
EAC Ex	№ ЕАЭС RU C-BE.МЮ62.В.00879/19 ООО «ПРОММАШ ТЕСТ» 1 Ex e IIC T6 Gb Ex tb IIIC T85°C Db

MATERIALS OF CONSTRUCTION

Box & lid	Electrostatic charge-resistant glass-filled engineered polymer, black
Sealing gasket	Silicone rubber
Lid fixing screws	Stainless steel (captive)

DIMENSIONS (IN MM) JB-EX-41



INGRESS PROTECTION

IP66

AMBIENT TEMPERATURE RANGE

−55°C to +55°C

TERMINALS

Quantity	5 pcs, bridged per2
Type	Spring-type
Labeling	1, 2, 3, 4, PE
Maximum conductor size	10 mm^2 (solid & stranded)
Maximum operating voltage	550 Vac
Maximum operating current	53 A

ACCESSORIES (TO BE ORDERED SEPARATELY)

Support bracket	SB-100, SB-101, SB-130 (for fixation to cable tray)
Gland for MI cold leads	Integrated in MI heating unit or contact nVent for more information
Gland for power cable	GL-55-M25 (Polyamide) GL-38-M25-METAL (Ni plated brass)
Loose terminals (*)	Phase/neutral terminal: HWA-WAGO-PHASE Earth terminal: HWA-WAGO-EARTH End plate: HWA-WAGO-ENDPLATE Terminal jumper: HWA-WAGO-JUMPER

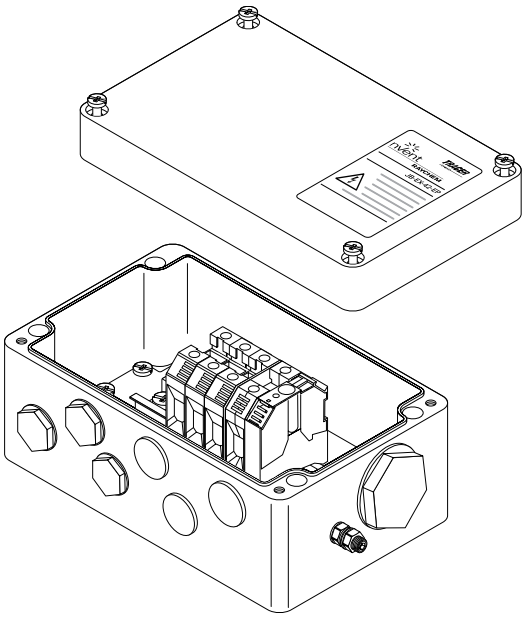
ORDERING DETAILS

Order reference	JB-EX-41-EP
Part number (Weight)	1244-020506 (1.9 kg)

(*) in total no more than 7 terminals should be installed.

JB-EX-42-EP

MULTI PURPOSE JUNCTION BOX



Industrial polyester junction box with earth plate for use in hazardous areas. This box can be used to make connections between power cables, heating cables and cold lead cables using M25 metallic connection kits or glands. Earthing of the connections is realized via the earth plate

Depending on the configuration of the system, the box can accommodate 6 cold lead entries and/or a power cable.

M25 connection kits have to be ordered separately or are integrated in the heating unit (eg MI heating units), depending on the type of heating cable being used. Cable connection is accomplished via DIN rail mounted spring-type terminals.

The box can be either wall or pipe mounted via the four holes moulded in the base of the box. For pipe mounting use one of the standard support bracket.

TYPICAL USE

Power supply box, end-box (3-Phase), (power) splice box, (power) tee box, marshalling box.

ENTRIES

6 x M25
1 x M40

KIT CONTENTS

1 x junction box with terminals on DIN rail
3 x M25 stopping plugs
3 x M25 rain plug (temporary)
1 x M40 stopping plug

APPROVALS

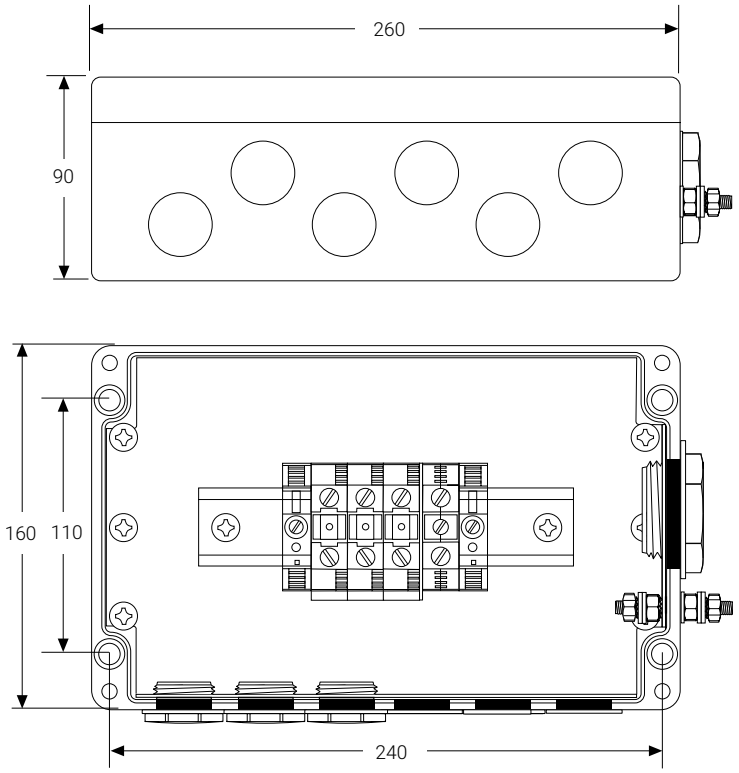
PTB 00 ATEX 1002	II 2G Ex edm ia [ia] IIC T6, T5 and T4 II 2D Ex tD A21 IP66 T85°C, T100°C and T135°C
IECEx PTB 08.0004	Ex e ia II, IIC T6, T5, T4 Ex tD A21 IP66 T 85°C, T 100°C, T 135°C
	№ ЕАЭС RU C-BE.МЮ62.B.00879/19 ООО «ПРОММАШ ТЕСТ» 1 Ex e IIC T6 Gb Ex tb IIIC T85°C Db

MATERIALS OF CONSTRUCTION

Box & lid	Electrostatic charge-resistant glass-filled engineered polymer, black
Sealing gasket	Silicone rubber
Lid fixing screws	Stainless steel (captive)

DIMENSIONS (IN MM)

JB-EX-42



INGRESS PROTECTION

IP66

AMBIENT TEMPERATURE RANGE

–55°C to +55°C

TERMINALS

Quantity and Type	3 pcs WDU35 screw terminals
	1 pc WPE35 earth terminal for power cable
	Junction box can accomodate up to 6 fully loaded phase/neutral terminals (maximum 8 terminals in total)
Labeling	1, 2, 3 + PE
Minimum conductor size	2.5 mm^2 (solid & stranded)
Maximum conductor size	35 mm^2 (solid & stranded)
Maximum operating voltage	690 Vac
Maximum operating current	100 A

ACCESSORIES (TO BE ORDERED SEPARATELY)

Support bracket	2 x SB-111	
Gland for MI cold leads	Integrated in MI heating unit or contact nVent for more information	
Gland for power cable	GL-51-M40 (Polyamide)	
Loose terminals (*)	35 mm^2 phase/neutral terminal:	HWA-WDM-PHASE-35
	35 mm^2 earth terminal:	HWA-WDM-EARTH-35
	Endplate:	HWA-WDM-PLATE
	Terminal jumper (2):	HWA-WDM-JUMPER-35-2
	Terminal jumper (3):	HWA-WDM-JUMPER-35-3
Gland for MI cold leads	In case of factory terminated units, already present.	

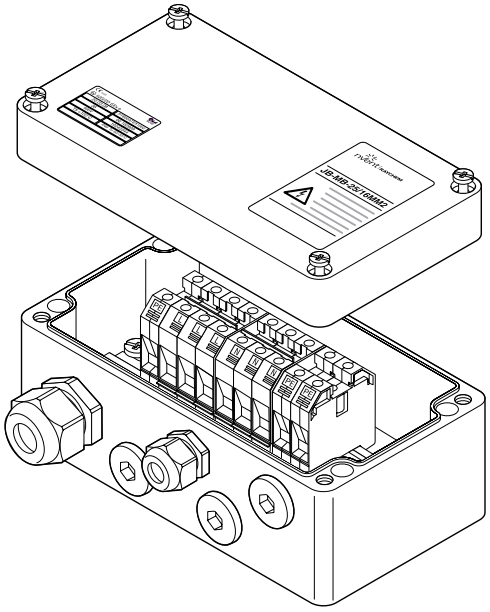
ORDERING DETAILS

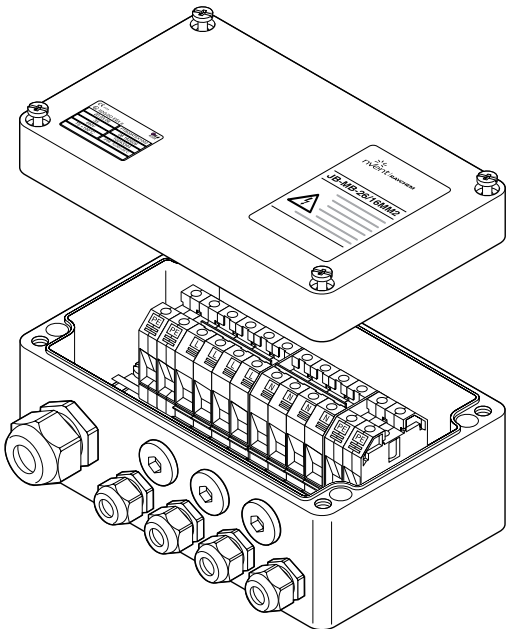
Order reference	JB-EX-42-EP
Part number (Weight)	1244-020507 (2 kg)

(*) in total no more than 8 terminals should be installed.

JB-MB-25/16MM2 AND JB-MB-26/16MM2

MARSHALLING BOX





Both connection boxes are ATEX approved polyester marshalling boxes that can be used in hazardous areas.

The nVent RAYCHEM JB-MB-25/16MM2 is intended to split a power cable into a maximum of four subsequent heat-tracing feeders, while the JB-MB-26/35MM2 allows the connection of maximum seven subsequent heat-tracing feeders. They are particularly suited for powering multiple short heat-tracing circuits from a single supply point, typically in instrumentation areas or where the power infrastructure is limited.

Cable connection is accomplished via DIN rail mounted screw terminals that allow the connection of a wide range of cable cross sections. The terminals are already equipped with the necessary terminal jumpers to minimize installation time.

Both boxes can be wall mounted via the four holes moulded in base of each box.

The JB-MB-25/16MM2 can also be pipe mounted with a standard support bracket.

TYPICAL USE

JB-MB-25/16MM2	JB-MB-26/16MM2
Marshalling box	Marshalling box

ENTRIES

1 x M32 4 x M25	1 x M32 7 x M25

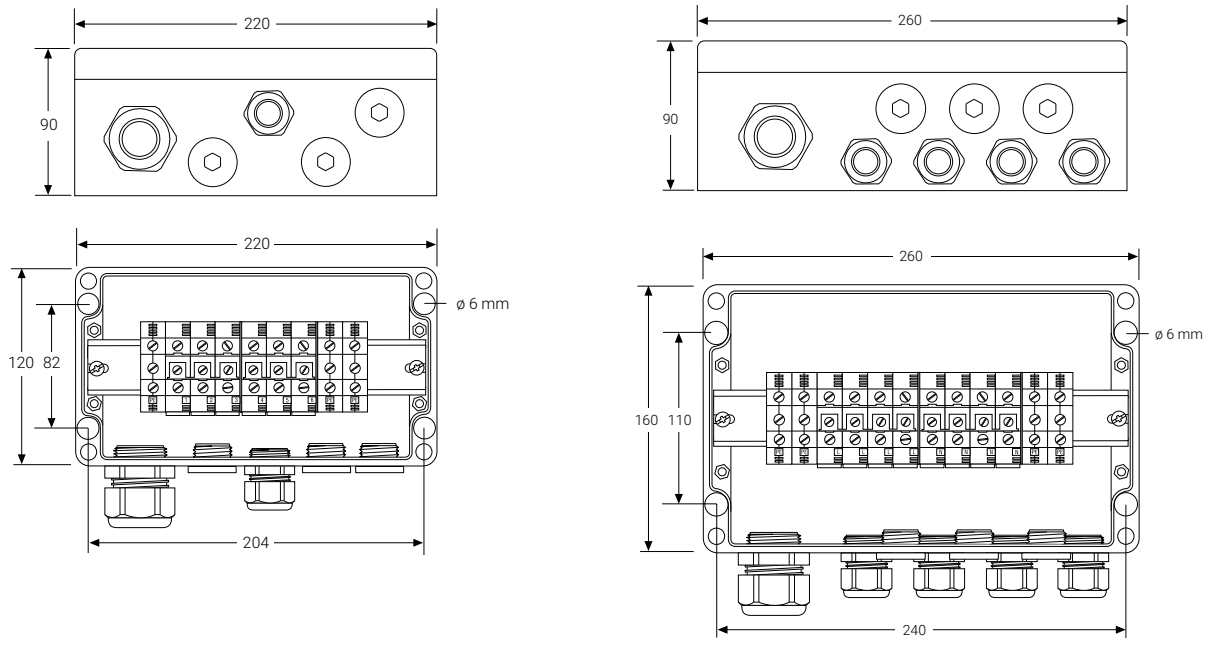
KIT CONTENTS

1 junction box with Weidmüller screw terminals on DIN rail, two sets bridged per three and three earth terminals, 1 M32 Hazardous area approved cable gland for power cables with ∅ of 14 to 21 mm, 1 M25 Hazardous area approved cable gland for power cables with ∅ of 8 to 15mm, 3 M25 stopping plugs	1 junction box with Weidmüller screw terminals on DIN rail,two sets bridged per four and four earth terminals, 1 M32 Hazardous area approved cable gland for power cables with ∅ of 14 to 21 mm, 4 M25 Hazardous area approved cable glands for power cables with ∅ of 8 to 15mm, 3 M25 stopping plugs

APPROVALS

PTB 00 ATEX 1002 Ex II 2G/D EEx e II T6 IP66 EAC Ex TC RU C-BE.МЮ62.B.00054/18 1Ex d e mb ia (ia) IIC T6...T4 Gb Ex tb IIIC T85°C...T135°C Db Ta -55°C...+55°C IP66 ООО "ТехИмпорт"	PTB 00 ATEX 1002 Ex II 2G/D EEx e II T6 IP66 EAC Ex TC RU C-BE.МЮ62.B.00054/18 1Ex d e mb ia (ia) IIC T6...T4 Gb Ex tb IIIC T85°C...T135°C Db Ta -55°C...+55°C IP66 ООО "ТехИмпорт"

DIMENSIONS (IN MM)



MATERIALS OF CONSTRUCTION

	JB-MB-25/16MM2	JB-MB-26/16MM2
Box & lid	Glass filled polyester	Glass filled polyester
Sealing gasket	Silicone rubber	Silicone rubber
Lid fixing screws	Stainless steel (captive)	Stainless steel (captive)

INGRESS PROTECTION

IP66	IP66	

AMBIENT TEMPERATURE RANGE

–55°C to +55°C	–55°C to +55°C	

TERMINALS

Quantity & type	9 pcs Weidmüller screw terminals, bridged per 3, 6 x WDU16, 3 x WPE16, Max. 8 fully loaded phase/neutral terminals; max. 12 terminals in total	12 pcs Weidmüller screw terminals, bridged per 4, 8 x WDU16 and 4 x WPE16, Max. 10 fully loaded phase/neutral terminals; max. 15 terminals in total
Labelling	1, 2, 3, 4, 5, 6 and PE	L, N and P.E.
Minimum conductor size	1.5 mm² stranded & solid	1.5 mm² stranded & solid
Maximum conductor size	25 mm² stranded, 16 mm² solid	25 mm² stranded, 16 mm² solid

MAXIMUM OPERATING VOLTAGE

690 V a.c.	690 V a.c.	

MAXIMUM OPERATING CURRENT

50A	50A	

ACCESSORIES (TO BE ORDERED SEPARATELY)

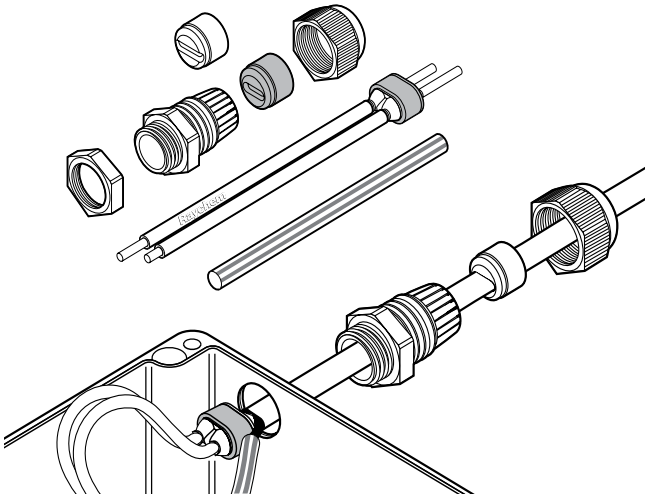
Support bracket PN	SB-125 165886-000	N.A. (wall mounting)
M25 Power cable gland PN	GL-55-M25 (1 included) 774424-000	GL-55-M20 (4 included) 774424-000
M32 Power cable gland PN	GL-45-M32 (included) 1244-000847	GL-45-M32 (included) 1244-000847
M25 Stopping plug PN	HWA-PLUG-M25-PLASTIC (3 included) 434994-000	HWA-PLUG-M25-PLASTIC (3 included) 434994-000
16 mm² Phase terminal PN	HWA-WDM-PHASE-16 (6 included) 1244-006992	HWA-WDM-PHASE-16 (8 included) 1244-006992
16 mm² Earth terminal PN	HWA-WDM-EARTH-16 (3 included) 1244-006993	HWA-WDM-EARTH-16 (4 included) 1244-006993
Terminal jumper for bridging 2 terminals PN	HWA-WDM-JUMPER-16-2 1244-006997	HWA-WDM-JUMPER-16-2 1244-006997
Terminal jumper for bridging 3 terminals PN	HWA-WDM-JUMPER-16-3 1244-006998	HWA-WDM-JUMPER-16-3 1244-006998
Terminal jumper for bridging 4 terminals PN	HWA-WDM-JUMPER-16-4 1244-006999	HWA-WDM-JUMPER-16-4 1244-006999
Endplate PN	HWA-WDM-PLATE 124-007004	HWA-WDM-PLATE 1244-007004

ORDERING DETAILS

Order reference	JB-MB-25/16MM2	JB-MB-26/16MM2
Part number (Weight)	1244-006656 (0.9 kg)	1244-006657 (1.9 kg)

C25-100

COLD APPLIED CONNECTION KIT



This connection kit is designed for terminating all nVent RAYCHEM BTV, QTVR, XTV, KTV and VPL industrial parallel heating cables to a junction box, whilst maintaining electrical insulation of the heating cable conductors and core. It is approved for use in hazardous areas.

The core sealing boot does not require a heat gun or torch for the installation (no hot work permit necessary). The non-curing sealant (silicone free) allows easy installation and facilitates maintenance purposes.

Two grommets supplied in this kit enable the gland to maintain optimum sealing under various ambient conditions. An additional locknut is provided for unthreaded entries.

APPLICATION

Connection kit for BTV, QTVR, XTV, KTV and VPL parallel heating cables.

KIT CONTENTS

1 gland, 2 grommets, 1 locknut, 1 core sealer, 1 green/yellow tube,
1 installation instruction (multilingual)

APPROVALS

PTB 09 ATEX 1063 U	II 2G Ex e II II 2D Ex tD A21 IP66
IECEx PTB 09.0040U	Ex e II Ex tD A21 IP66 DNV-GL TAE00000TV DNV-GL TAE00000TU
EAC Ex	TC RU C-BE.МЮ62.B.00054/18 1Ex e IIC Gb X Ex tb IIIC Db X Ta -55°C...+110°C IP66 ООО “ТехИмпорт”

PRODUCT SPECIFICATION

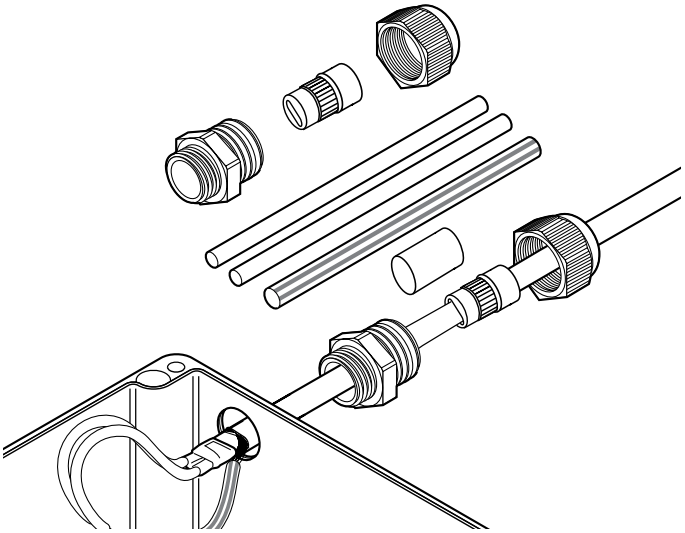
Area classification	Hazardous, Zone 1, Zone 2 (Gas), Zone 21, Zone 22 (Dust) Ordinary
Type	Cold applied
Thread size	M25 x 1.5
Min. ambient temperature	–50°C
Max. exposure temperature (gland)	110°C

ORDERING DETAILS

Part description	C25-100
PN (Weight)	263012-000 (0.07 kg)

C25-01

HEAT-SHRINK CONNECTION KIT



DESCRIPTION

This connection kit is designed for terminating all nVent RAYCHEM BSA and BTV-CR industrial parallel heating cables to a junction box in ordinary (non-hazardous) area applications, whilst maintaining electrical insulation of the heating cable conductors and core.

The sealing of the heating cable core is provided by heat-shrinkable sleeves. The grommet supplied in this kit enables the gland to maintain optimum sealing under various ambient conditions.

APPLICATION

Connection kit for BSA and BTV-CR parallel heating cables in ordinary (non-hazardous) area

KIT CONTENTS

- 1 gland with grommet
- 1 green/yellow tube and heat-shrinkable sleeves for core sealing
- 1 installation instruction (multilingual)

APPROVALS

Products are in compliance with IEC/EN 62395-1:2013
DNV approval pending

PRODUCT SPECIFICATION

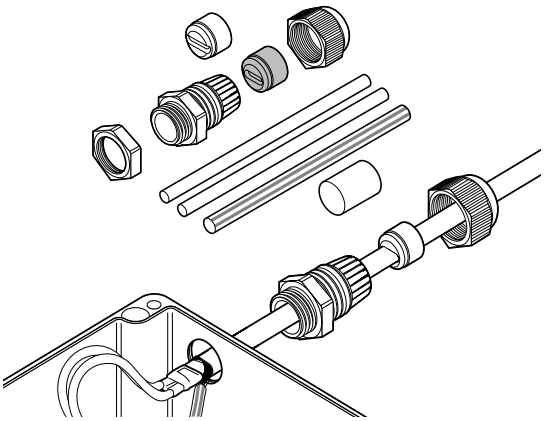
Type	Heat-shrinkable
Thread size	M25 x 1.5
Min. ambient temperature	-20°C
Max. exposure temperature (gland)	100°C
IP ingress protection rating	IP66

ORDERING DETAILS

Part description	C25-01
PN (Weight)	1244-020909 (0.06 kg)

C25-21

HEAT-SHRINK CONNECTION KIT



This connection kit is designed for terminating all nVent RAYCHEM BTV, QTVR, XTV, KTV and VPL industrial parallel heating cables to a junction box, whilst maintaining electrical insulation of the heating cable conductors and core.

The sealing of the heating cable core is provided by nVent RAYCHEM heat-shrinkable sleeves. Two grommets supplied in this kit enable the gland to maintain optimum sealing under various ambient conditions.

An additional locknut is provided for unthreaded entries.

APPLICATION

Connection kit for BTV, QTVR, XTV, KTV and VPL parallel heating cables

KIT CONTENTS

1 gland,
2 grommets,
1 locknut,
1 green/yellow tube, heat-shrinkable sleeves for core sealing,
1 installation instruction (multilingual)

APPROVALS

The kit is certified as part of the system approval of the various heating cables.

BTV	QTVR	XTV	KTV	VPL
Baseefa06ATEX0183X	Baseefa06ATEX0185X	Baseefa06ATEX0184X	Baseefa06ATEX0186X	Baseefa06ATEX0188X
IECEx BAS 06.0043X	IECEx BAS 06.0045X	IECEx BAS 06.0044X	IECEx BAS 06.0046X	IECEx BAS 06.0048X

Ex II 2G Ex e II II 2D Ex tD A21 IP66

Ex Ex e II Ex tD A21 IP66

EAC Ex
TC RU C-BE.МЮ62.B.00054/18 DNV-GL TAE00000TV
1Ex e IIC Gb X Ex tb IIIC Db X DNV-GL TAE00000TU
Ta -55°C...+110°C IP66
ООО "ТехИмпорт"

PRODUCT SPECIFICATION

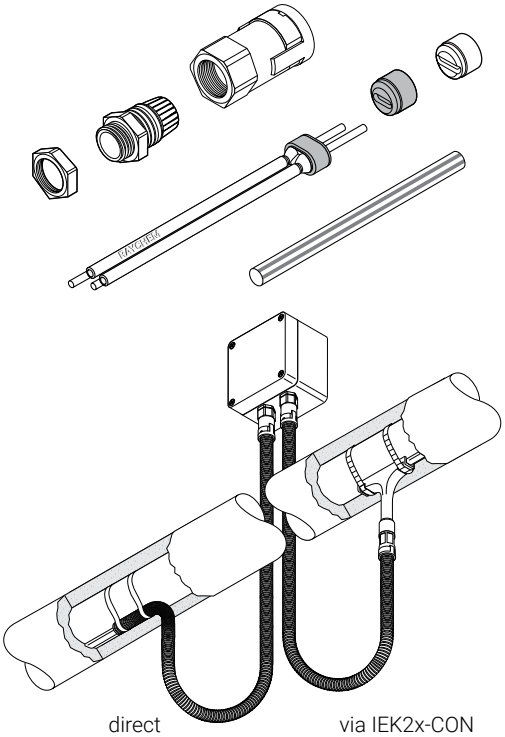
Area classification	Hazardous, Zone 1, Zone 2 (Gas), Zone 21, Zone 22 (Dust) Ordinary
Type	Heat-shrinkable
Thread size	M25 x 1.5
Min. ambient temperature	-55°C
Max. exposure temperature (gland)	110°C
IP ingress protection rating	IP66

ORDERING DETAILS

Part description	nVent RAYCHEM C25-21
PN (Weight)	311147-000 (0.06 kg)

CCON25-100

COLD APPLIED CONDUIT CONNECTION KIT



direct via IEK2x-CON

This connection kit is designed for terminating all nVent RAYCHEM BTV, QTVR, XTV, KTV and VPL parallel industrial heating cables to a junction box, whilst maintaining electrical insulation of the heating cable conductors and core as well as providing a reliable and sealed connection to a conduit system. It is approved for use in hazardous locations.

The conduit system will provide supplementary mechanical protection of the heating cable between a junction box and the entry into the insulation. The conduit connection is fast and reliable and allows simple installation whilst maintaining an IP66 seal. The kit can be used with various types of conduits which can be cut-to-length as required in the field. The core sealing boot for the heating cable does not require a heat gun or torch for the installation (no need for a hot work permit). The non-curing sealant (silicone free) allows easy installation and facilitates maintenance purposes.

The conduit and eventually required insulation entry kit needs to be purchased separately.

APPLICATION

Connection kit with conduit adaptor for BTV, QTVR, XTV, KTV and VPL parallel industrial heating cables

KIT CONTENTS

1 gland body,
1 conduit adaptor including safety retention clip,
2 grommets,
1 locknut,
1 core sealer,
1 green/yellow tube,
1 installation instruction (multilingual)

APPROVALS

SEV 05 ATEX 0147U
II 2G Ex e IIC Ta -55...+40°C
II 2D Ex tD A21 IP66 Ta - 55...+40°C

TC RU C-BE.МЮ62.B.00054/18
Ex e IIC Gb U Ex tb IIIC Db U
Ta -55°C...+40°C IP66
ООО "ТехИмпорт"

PRODUCT SPECIFICATION

Area classification	Hazardous, Zone 1, Zone 2 (Gas), Zone 21, Zone 22 (Dust)
Thread size	M25 x 1.5
Conduit compatibility	ND 23 mm, nVent RAYCHEM conduits type CCON25-C...
Ambient temperature	−55°C to +40°C
IP ingress protection rating	IP66
Surface resistance	< 1GΩ according to the requirements of EN 60079-0 and EN 61241-0 for use in hazardous areas

ORDERING DETAILS

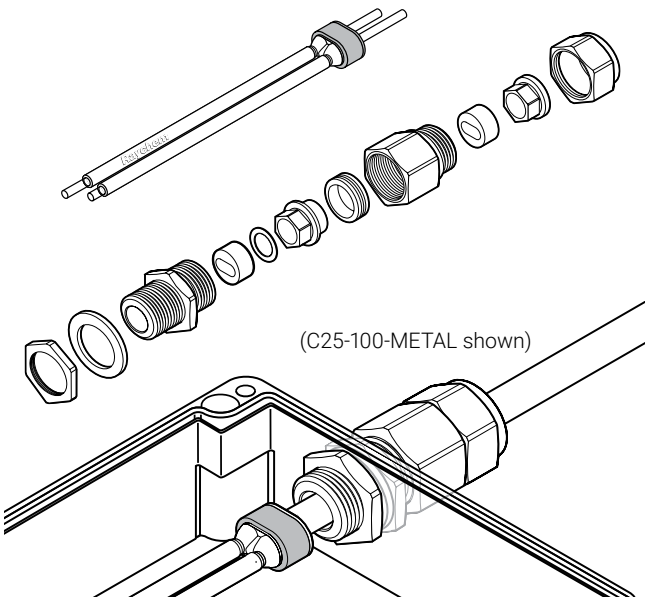
Part description	nVent RAYCHEM CCON25-100
PN (weight)	1244-003272 (0.075 kg)

ACCESSORIES

For suitable conduits and insulation entry kits refer to the datasheet for CCON2x-C...

C25-100-METAL AND C3/4-100-METAL

COLD APPLIED METAL CONNECTION KIT



These connection kits are designed for terminating all nVent RAYCHEM BTV, QTVR, XTV, KTV and VPL industrial parallel heating cables to a junction box, whilst maintaining electrical insulation of the heating cable conductors and core.

The braid is directly connected to the metal gland body. The connection kits can be used with metal boxes or plastic boxes with internal earthing plate. They are approved for use in hazardous areas.

The core sealing boot does not require a heat gun or torch for the installation (no hot work permit necessary). The non-curing sealant (silicone free) allows easy installation and facilitates maintenance purposes.

The C25-100-METAL kit is designed for use with M25 entries, the C3/4-100-METAL for 3/4" NPT entries.

A metal locknut is provided for earth bonding in plastic junction boxes.

APPLICATION

	nVent RAYCHEM C25-100-METAL	C3/4-100-METAL
	Connection kit for BTV, QTVR, XTV, KTV and VPL parallel heating cables	

KIT CONTENTS

1 gland,
2 grommets,
1 locknut and sealing washer (only M25),
1 core sealer,
1 installation instruction (multilingual).

APPROVALS

FOR METAL GLAND	Sira 01ATEX1270X Ⓔx II 2GD Ex d IIC Ex tD A21 IP68 Ⓔx II 2GD Ex e IIC Ex tD A21 IP68 IECEx SIR 05.0020X Ex d IIC Ex e II Ex tD A21 IP6X
FOR C25-100METAL AND C3/4-100-METAL	Baseefa16ATEX0039U Ⓔx II 2 GD Ex eb IIC Gb Ex tb IIIC Db IECEx BAS 16.0042U Ex eb IIC Gb Ex tb IIIC Db
	EAC Ex TC RU C-BE.МЮ62.B.00054/18 Ex e IIC Gb U Ex tb IIIC Db U Ta -60°C...+180°C IP68 ООО "ТехИмпорт"
	EAC Ex TC RU C-BE.МЮ62.B.00054/18 Ex e IIC Gb U Ex tb IIIC Db U Ta -60°C...+180°C IP68 ООО "ТехИмпорт"

SPECIFICATION FOR GLAND

	C25-100-METAL	C3/4-100-METAL
Area classification	Hazardous Zone 1 and 2 (Gas), Zone 21 and 22 (Dust), ordinary In- and outdoors	Hazardous Zone 1 and 2 (Gas), Zone 21 and 22 (Dust), ordinary In- and outdoors
Thread size	M25 x 1.5	3/4" NPT
Gland material	Brass	Brass
Min. ambient temperature	–60°C	–60°C
Max. exposure temperature	180°C	180°C

ORDERING DETAILS

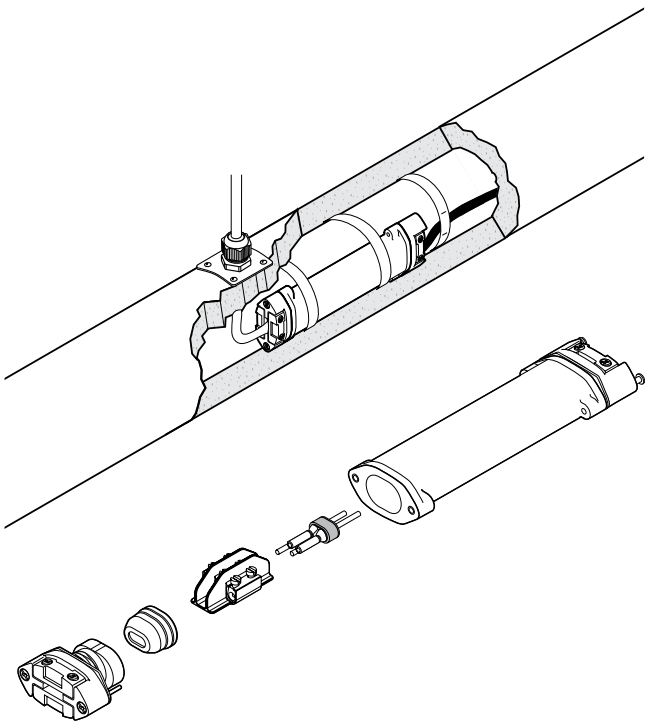
Part description	C25-100-METAL	C3/4-100-METAL
PN (Weight)	875016-000 (0.31 kg)	440588-000 (0.3 kg)

ALTERNATIVE MATERIALS

NICKEL PLATED		
Part description	C25-100-METAL-NP	C3/4-100-METAL-NP
PN (Weight)	1244-002296 (0.31 kg)	1244-001350 (0.3 kg)
STAINLESS STEEL		
Part description	C25-100-METAL-SS	-
PN (Weight)	1244-017869 (0.3kg)	

C-150-E

COLD APPLIED LOW PROFILE POWER CONNECTION



The nVent RAYCHEM C-150-E is a cold applied low profile power connection. The kit enables in line connection of nVent RAYCHEM industrial heating cables, BTV, QTVR, XTV and KTV, to a flexible power cable. It can be used in applications with temperature ratings from –50°C to 215°C. It is approved for use in hazardous areas.

A nVent RAYCHEM supplied power cable such as C-150-PC may be used or any suitable standard industrial power cable type 3 x 1.5 mm^2 or 3 x 2.5 mm^2 with stranded copper conductors and an outer insulation jacket. The power cable is connected by means of screw terminals to the conductors and the braid of the heating cable.

C-150-E is used as connector:

- where connection to a junction box is difficult e.g. because of space limitation
- on instrument lines or loading arms
- where installation of “under insulation” components is preferred
- as a cost effective solution for short heat-tracing lines as an alternative for JBS-100.

DESCRIPTION

Cold applied low profile splice for connection of BTV, QTVR, XTV and KTV heating cables to a power cable

KIT CONTENTS

1 splice housing assembly including
  • 1 sealing grommet assembly for heater
  • 1 pressure plate/strain relief assembly
1 core sealer for heater
1 spacer including screw terminal
1 sealing grommet assembly for the power cable
1 pressure plate/strain relief assembly for the power cable
1 identification label
1 installation instruction

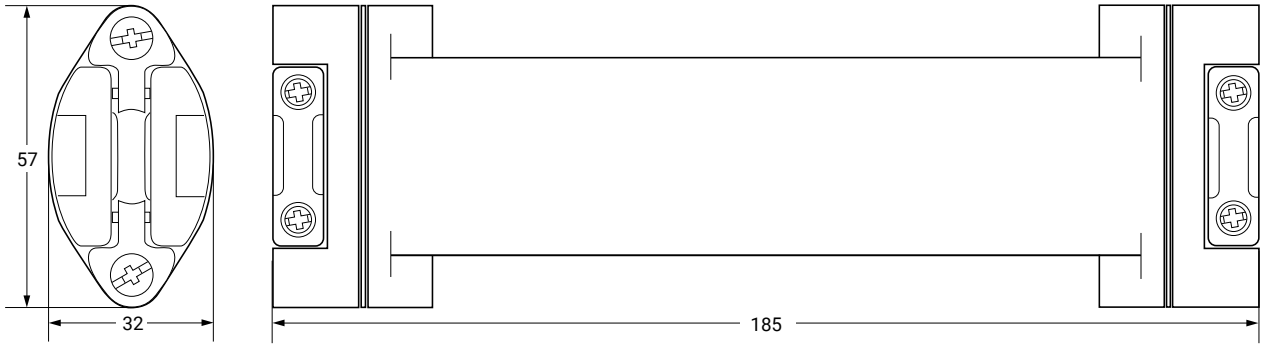
APPROVALS

PTB 09 ATEX 1068 U
Ⓔx II 2G Ex e II
Ⓔx II 2D Ex tD A21 IP66
IECEx

PTB 09.0043U
Ex e II
Ex tD A21 IP66
DNV approval
DNV Certificate No. E-11564 and E-11565

EAC Ex
TC RU C-BE.МЮ62.B.00054/18
Ex e IIC Gb U Ex tb IIIC Db U
Ta -55°C...+180°C IP66
ООО "ТехИмпорт"

DIMENSIONS (IN MM)



PRODUCT SPECIFICATIONS

Heating cable capability	BTV-CR, BTV-CT, QTVR-CT, XTV-CT, KTV-CT
Power cable capability	For use with nVent RAYCHEM's high temperature power cable C-150-PC or for use with other flexible cable such as: H07RN-F, Silicone insulated cables. Minimum and maximum installation and operating temperatures, given by cable manufacturer, have to be considered by designer and installer.
Power cable dimension	-> outer diameter range 7.8 mm - 12.5 mm -> 3 stranded copper conductors (3 x 2.5 mm^2 or 3 x 1.5 mm^2) -> temperature range depending on the application
Maximum power cable length	Depending on power cable voltage drop and maximum current for nVent RAYCHEM power cable C-150-PC (3 x 2.5 mm^2): CB 16 A — 40 m CB 20 A — 32 m CB 25 A — 25 m
Ingress protection	IP66
Minimum installation temperature	–50°C
Maximum pipe temperature	refer to heating cable specification
Maximum operating voltage	277 Vac
Maximum current rating	depending on the power cable used and maximum current

CONSTRUCTION MATERIALS

Housing, end plate, shim and spacer	Engineering polymers, black
Sealing grommets	Silicone rubber
Screws, compression spring	Stainless steel

ORDERING DETAILS

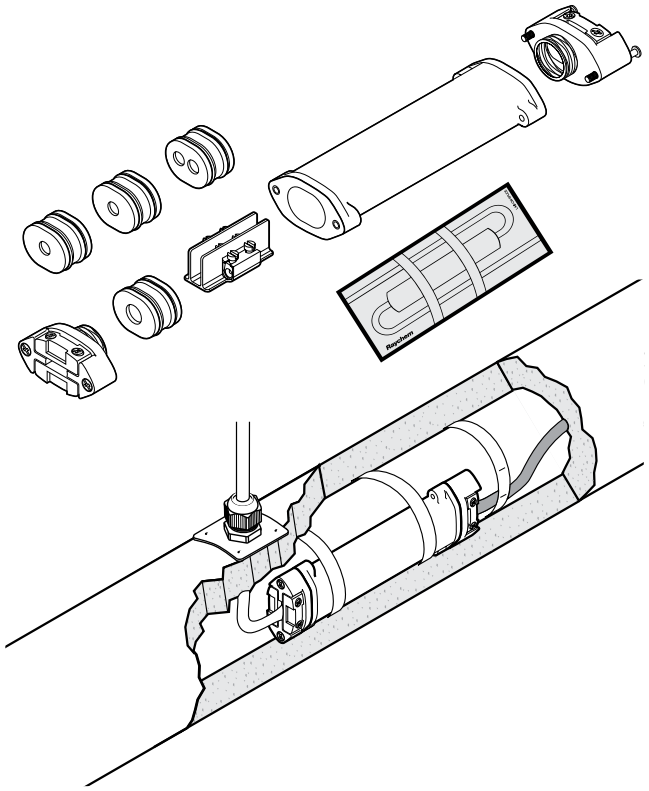
Part description	C-150-E
PN (Weight)	073704-000 (0.4 kg/0.8 lb)
Pack size	1 bag

ACCESSORIES

Power cable	C-150-PC 3-core flexible power cable for connection to C-150-E, 3 x 2.5 mm^2, silicone insulation, temperature range: –40°C to +180°C, short term: 215°C

CS-150-UNI-PI

COLD APPLIED LOW PROFILE POWER CONNECTION



The nVent RAYCHEM CS-150-UNI-PI is a universal low profile heating cable connector for the direct connection of single conductor Polymer Insulated (PI) series heating cables. It can be used in different configurations: for the connection of a cold lead to a heating cable (Variant C), as an under insulation connecting system for the connection of a three core power cable to a heating cable loop (Variant L), as well as for splicing two heating cables (Variant S).

The connector is certified for use in hazardous areas and doesn't require a hot work permit. The electrical connection is realized by means of screw terminals, so no special crimp tools are required. If used as a connection kit, an additional gland needs to be ordered separately.

APPLICATION

"Cold" applied connection/splice for a single conductor polymer insulated (PI) series heating cables with an external diameter between 3.2 and 6.4 mm. In hazardous area use only with ATEX approved heating cable.
The CS-150-UNI-PI can be used in different configurations:

- connection of a heating cable to a cold lead cable 1 x 2.5 mm^2 or 1 x 4 mm^2 (Variant C)
- connection of a heating cable to a power cable 3 x 2.5 mm^2 (Variant L)
- splice of two heating cables (Variant S)

KIT CONTENTS

1 x temperature resistant and impact proof body.
1 x screw terminal block
4 x rubber seals (to be used according to application)
2 x strain relieve clamps with screws
1 x identification label
1 x tube of lubricant
1 x installation instruction

APPROVALS

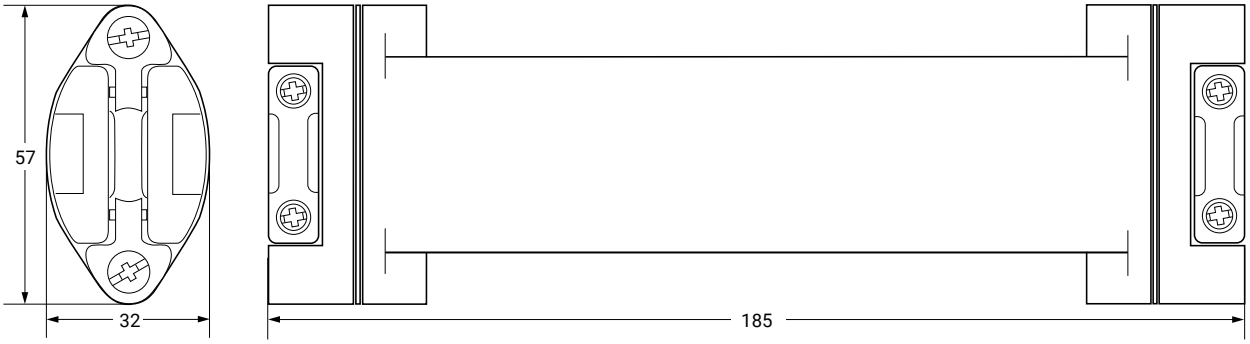
PTB 09 ATEX 1067U
Ⓔx II 2G Ex e II
Ⓔx II 2D Ex tD A21 IP66
IECEx PTB 09.0042U
Ex e II
Ex tD A21 IP 66

EAC Ex
TC RU C-BE.ИМ43.B.01854
ООО «ТехИмпорт»
Ambient temp range: -55°C...+180°C
Ex e II Gb U
Ex tb IIIC Db U
Made in USA

Particular measures to maintain the T-classification of polymer insulated heating cables are to be taken in accordance with the appropriate EC - Type examination certificate (also refer to installation instructions).

Type examination certification applies for the use of ATEX certified polymer insulated (PI) series heating cables.

DIMENSIONS (IN MM)



HEATING CABLE TYPES

Heating cable capability	XPI-NH, XPI and XPI-S polymer insulated (PI) series resistance cable, for other types contact nVent.

MATERIALS OF CONSTRUCTION

Housing, connection	Glass fibre reinforced temperature resistant engineering plastic
Support ring, spacer, screws and spring	Stainless steel
Cable seals	Silicon rubber

MAXIMUM OPERATING TEMPERATURE (*)

Power on: 180°C (may be limited by the temperature resistance of the supply cable)
Power off: 210°C (using variant L, dependent on the type of supply cable e.g. 200°C for silicon cables, unless the power cable connection is bent sufficiently far away from the heated surface).

MINIMUM INSTALLATION TEMPERATURE

–50°C

MAX. OPERATING VOLTAGE

Variant C and S = 750 Vac
Variant L = 420 Vac

MAX. ALLOWED WATTAGE

The max. allowed cable output is limited depending on the application. Refer to the installation instruction for details.

MAX. ALLOWED WATTAGE

The max. allowed cable output is limited depending on the application. Refer to the installation instruction for details.

MAX. PERMITTED NOMINAL CURRENT (*)

Variant S: 32 A
Variant C with 1 x 2.5 mm^2 supply cable: 25 A
Variant C with 1 x 4 mm^2 supply cable: 32 A
Variant L with 3 x 2.5 mm^2 supply cable up to 150°C: 25 A
Variant L with 3 x 2.5 mm^2 supply cable 151°C to 180°C: 20 A

SUPPLY CABLE DIMENSIONS

-> Multi-stranded copper conductors 3 x 2.5 mm^2, ∅ 7.8 -12.5 mm^2
-> Single conductor cold lead, max. 1 x 4 mm^2, ∅ 3.2 - 6.4 mm

SUPPLY CABLE REQUIREMENTS

The maximum permissible voltage drop is to be taken into consideration when selecting the cross-section of the power cable. The maximum working temperature of the CS-150-UNI-PI can be reduced through the maximum permitted continuous use temperature of the supply cable, unless the supply cable is laid (at a sufficient distance from the heated surface) so that the maximum permitted continuous use temperature will not be exceeded. A suitable power cable is the silicon insulated cable type C-150-PC.

ACCESSORIES

Cable gland	GL-55-M25 hazardous area approved gland for, 8-15mm, up to -55°C
Glands for PI heaters	C20-PI-PA-KIT Hazardous area approved gland, PA, up to -40°C C20-PI-M0-KIT Hazardous area approved gland, Ni plated brass, up to -55°C (to be used with boxes with integral earth plate or with earth lug)

ORDERING DETAILS

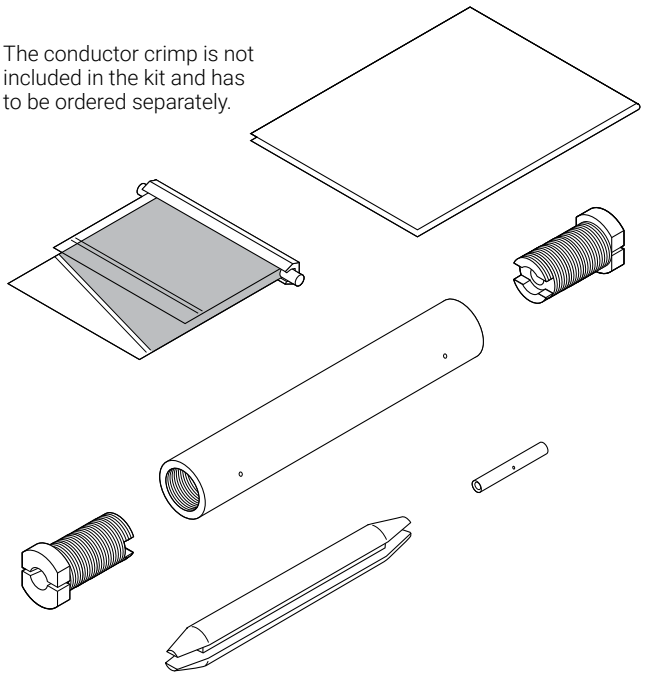
Order reference	CS-150-UNI-PI
Part number (Weight)	A45371-000 (0.4 kg)

(*) For the full range of technical design details of the CS-150-UNI-PI refer to the installation instructions (INSTALL-064)

CS-150-XX-PI

nVent RAYCHEM

COLD APPLIED CONNECTION AND SPLICE KIT WITH SILICONE SEALING FOR POLYMER INSULATED (PI) HEATING CABLES



The kits nVent RAYCHEM CS-150-xx-PI are designed to connect a PI cold lead cable to a polymer insulated (PI) series heating cable as well as to splice two PI heating cables. The kit employs a two component silicone compound to provide durable and flexible moisture proof encapsulation.

Electrical continuation is maintained via specially engineered crimps that provide a highly reliable electrical connection.

It is very important that the electrical crimp connections are performed with the correct crimp tool (PI-TOOL-xx).

Due to its low profile design, the connection can be easily installed under the insulation directly on the pipe. If used as a connection kit, a cable gland, an insulation entry kit as well as a crimp for the connection between the cold lead and the heating cable, need to be ordered separately. If used as a splice kit, just the heating cable conductor crimp is needed additionally.

For simplified installation- and maintenance work, we offer a crimp toolbox that contains the suitable installation tool, crimping dies and a variety of crimps exactly matching common cable types. For all details concerning the crimping system, refer to the datasheet of the electrical connection system for PI heating cables (PI-TOOL-SET-xx).

APPLICATION

Cold applied silicone sealed connection/splice for PI heating cables.

KIT CONTENTS

1 x PTFE body
2 x PTFE plugs
1 x PTFE crimp separator
1 x two component silicone compound in plastic bag (shelf life is 12 months)
2 x braid crimps
1 x identification label
1 x multilingual installation instruction

APPROVALS

PTB 08 ATEX 1101 U
II 2G Ex e II / II 2D EX tD A21 IP65
IECEx PTB 08.0050U
Ex e II 2G Ex e II / Ex tD A21 IP65
TC RU C-BE.ИМ43.B.01854
ООО «ТехИмпорт»
Ambient temp range: -55°C...+200°C
Ex e II Gb U
Ex tb IIIC Db U IP65
Made in Germany

RAYCHEM-DS-EU1415-CS150xxPI-EN-1911

DIMENSIONS

CS-150-2.5-PI: Overall length ~120 mm, Ø ~17 mm
CS-150-6-PI: Overall length ~120 mm, Ø ~26 mm
CS-150-25-PI: Overall length ~135 mm, Ø ~35 mm

TECHNICAL DATA

	CS-150-2.5-PI	CS-150-6-PI	CS-150-25-PI
Max. operating temperature	200°C continuous, (260°C intermittent)		
Max. operating voltage (U0/U)	450/750 Vac nominal		
Max. operating current	Only limited by heating cable used		
Cable/Cold leads	Up to 2.5 mm^2	4 to 6 mm^2	10 to 25 mm^2

ORDERING DETAILS

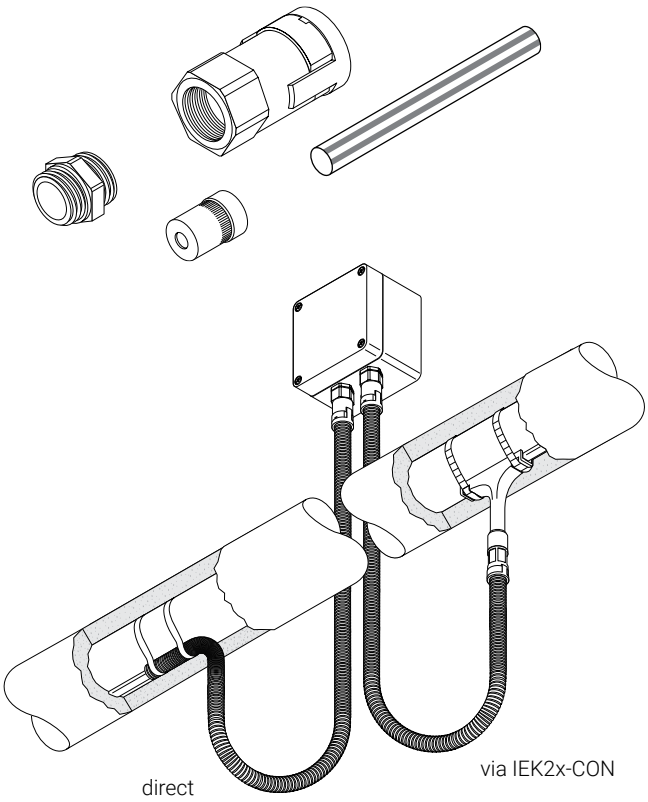
Order reference	CS-150-2.5-PI	CS-150-6-PI	CS-150-25-PI
Part number (Weight)	1244-000586 (0.1 kg)	1244-000588 (0.2 kg)	1244-000587 (0.3 kg)

ACCESSORIES

Cable gland for PI connection kit (one per piece of cold lead connection; to be ordered separately)	C20-PI-PA-KIT Hazardous area approved gland, PA, up to -40°C C20-PI-M0-KIT Hazardous area approved gland, Ni plated brass, up to -55°C (to be used with boxes with integral earth plate or with earth lug)

CCON20-100-PI

COLD APPLIED CONDUIT CONNECTION KIT



This connection kit is designed for terminating the full range of nVent RAYCHEM XPI polymer insulated series heating cables and cold leads in to a junction box, as well as providing a reliable and sealed connection to a conduit system.

It is approved for use in hazardous locations. The conduit system will provide supplementary mechanical protection of the heating cable or cold lead between a junction box and the entry into the insulation. The conduit connection is fast and reliable and allows simple installation whilst maintaining at all time an IP66 seal.

The kit can be used with various types of conduits which can be cut-to-length as required in the field. The kit exists in three different versions, depending on the outer diameter of the heating cable or cold lead to protect. The conduit and possibly required insulation entry kit need to be purchased separately.

APPLICATION

Connection kit with conduit adaptors for 2 PI series heating cables or cold lead cables

KIT CONTENTS

2 metal gland bodies,
2 conduit adaptors including safety retention clip,
2 grommets,
2 green/yellow tubes for braid,
1 installation instruction (multilingual)

APPROVALS

SEV 05 ATEX 0147U
II 2G Ex e IIC Ta −55...+40°C
II 2D Ex tD A21 IP66 Ta −55...+40°C

TC RU C-BE.ИМ43.B.01854
ООО «ТехИмпорт»
Ambient temp range: -55°C...+40°C
Ex e II Gb U
Ex tb IIIC Db U
Made in Switzerland

PRODUCT SPECIFICATION

Area classification	Hazardous, Zone 1, Zone 2 (Gas), Zone 21, Zone 22 (Dust)
Thread size	M20 x 1.5
Conduit compatibility	ND 17 mm, nVent RAYCHEM conduits type CCON20-C.....
Ambient temperature	–55°C to +40°C
IP ingress protection rating	IP66
Surface resistance	< 1GΩ according to the requirements of EN 60079-0 and EN 61241-0 for use in hazardous areas

TECHNICAL DATA

	nVent RAYCHEM CCON20-100-PI-A	CCON20-100-PI-B	CCON20-100-PI-C
PI cable diameter range	4.0 - 6.5 mm	6.5 – 9.5 mm	9.5 – 13 mm

ORDERING DETAILS

Part description	CCON20-100-PI-A	CCON20-100-PI-B	CCON20-100-PI-C
PN (Weight)	1244-003274 (0.1 kg)	1244-003276 (0.1 kg)	1244-003278 (0.1 kg)

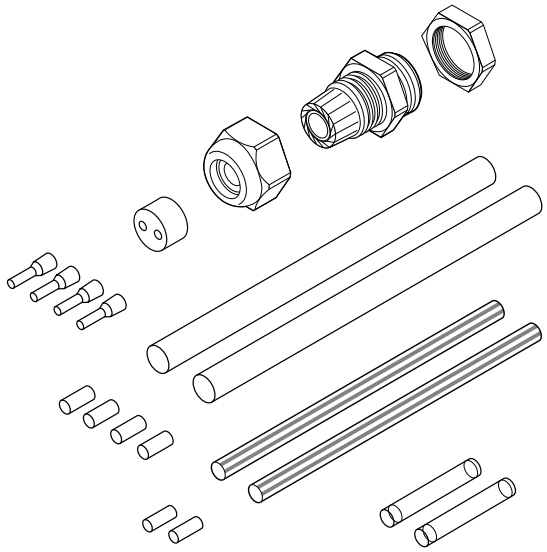
ACCESSORIES

For suitable conduits and insulation entry kits refer to the datasheet for CCON2x-C...

CS20-2.5-PI-NH

nVent RAYCHEM

HEAT-SHRINK CONNECTION OR SPLICE KIT FOR PI HEATING CABLES



The nVent RAYCHEM CS20-2.5-PI-NH kit is designed for terminating polymer insulated (PI) series resistance heating cables.

The CS20-2.5-PI-NH may be used in non-hazardous areas only. The kit contains components required for the installation of either: a connection of (2) cold leads- to a heating cable or for (2) splices between two heating cables. The splice kit employs easy to use heat shrinkable tubing that after installation forms a semi-flexible moisture proof encapsulation. Electrical continuation is maintained via crimps for both conductor and braid. Thanks to its low profile design the finished connection can be easily installed under the insulation directly on the pipe. The kit is designed for use with junction boxes with M20 entries.

Each CS20-2.5-PI-NH kit contains 2 connection sets. The crimps must be installed using an appropriate crimp tool (CW-CT-KIT or equivalent).

APPLICATION

Heat shrink based connection/splice kit for single core polymer series resistance heating cable. Only use with PTFE sheathed cables (XPI and XPI-S).

KIT CONTENTS

4 x Heat shrinkable tubes (PTFE/FEP)
2 x green/yellow tube for the braid.
6 x Crimp connectors (crimp for conductor and braid)
1 x polyamide gland with dual hole sealing grommet M20 threaded, suitable for cables ranging from 4.8 to 7 mm diameter.
1 x Installation instruction

APPROVALS

Suitable for non hazardous area installation only.

EAC (Russia, Kazakhstan, Belarus)
For other countries contact your local nVent representative.

DIMENSIONS

Overall length ~130 mm, ø ~10 mm

TECHNICAL DATA

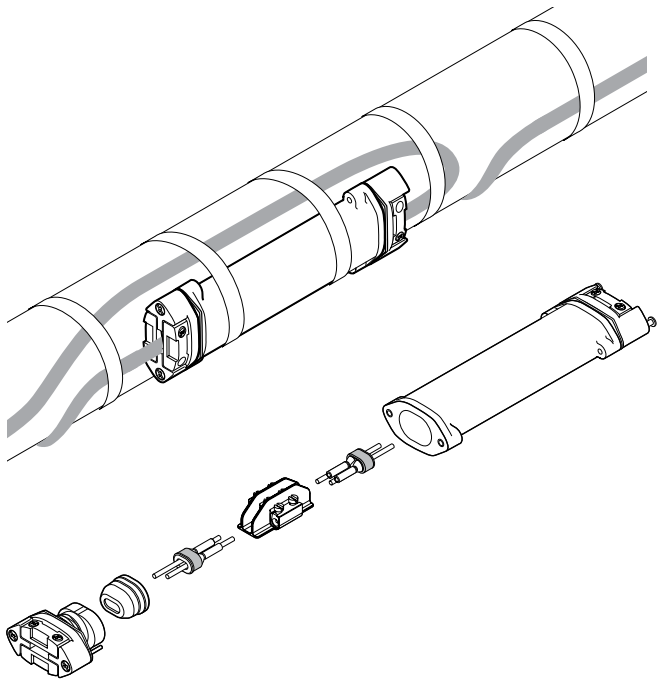
Max. cold lead size	2,5 mm^2
Max. operating temperature	205°C
Min. installation temperature	−50°C
Max. operating voltage	750 Vac
Max. operating current	25 A

ORDERING DETAILS

Order reference	CS20-2.5-PI-NH
Part number (Weight)	1244-000585 (0.1 kg)

S-150

COLD APPLIED UNDER INSULATION LOW PROFILE SPLICE



The nVent RAYCHEM S-150 is a cold applied low profile splice for in-line connection. This universal kit fits with all nVent RAYCHEM industrial heating cables, BTV, QTVR, XTV and KTV, meaning simplified product selection and reduced inventory to stock. It can be used in applications with temperatures ranging from –50°C to 215°C. It is approved for use in hazardous areas.

The unique design of the S-150 suits the demanding requirements of the industrial environment. The low profile housing can be installed on pipes and other surfaces. Spring loaded grommets make a first seal to maintain a water tight connection while the non-curing sealant (silicone free) used in nVent RAYCHEM's core sealer adds a second seal, providing additional protection. The rugged construction of the splice makes it resistant to impact and suitable for high temperature variations and aggressive chemical exposure. The connection is made using screw terminals. The splice is re-enterable. The S-150 is a safe under the insulation in-line splice that can be relied upon over time.

The splice requires no heat source for installation, making maintenance work fast and easy. Each kit contains all the necessary materials to do one in-line splice connection.

DESCRIPTION

Cold-applied in-line splice kit for use with BTV, QTVR, XTV and KTV heating cables.

KIT CONTENTS

1 splice housing
2 sealing grommets
2 core sealers
1 spacer including screw terminals
1 identification label

APPROVALS

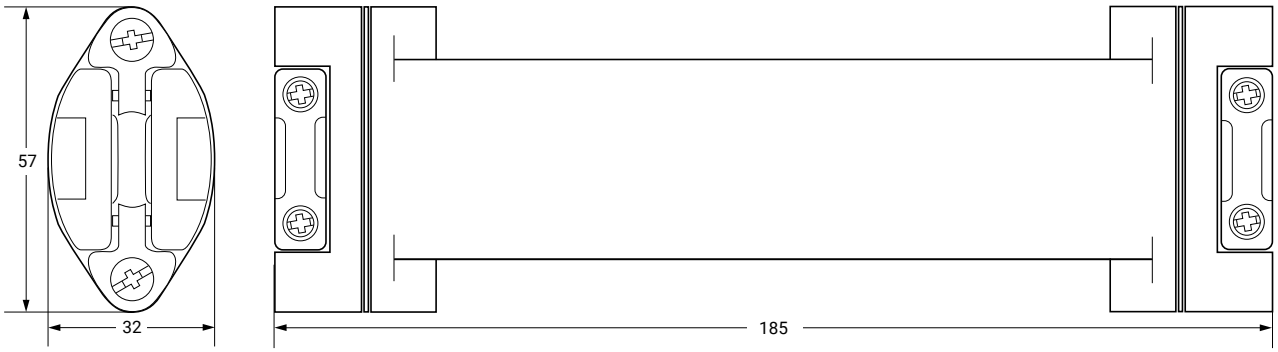
PTB 09 ATEX 1068 U
II 2G Ex e II
II 2D Ex tD A21 IP66

IECEx
PTB 09.0043U
Ex e II
Ex tD A21 IP66

DNV approval
DNV Certificate No. DNV-GL TAE00000TV and DNV-GL TAE00000TU

TC RU C-BE.МЮ62.B.00054/18
Ex e IIC Gb U Ex tb IIIC Db U
Ta -55°C...+150°C IP66
ООО "ТехИмпорт"

DIMENSIONS (IN MM)



PRODUCT SPECIFICATIONS

Heating cable capability	BTV-CR, BTV-CT, QTVR-CT, XTV-CT, KTV-CT
Ingress protection	IP66
Minimum installation temperature	–50°C
Maximum pipe temperature	Refer to heating cable specification
Connection method	Screw terminals
Maximum operating voltage	277 Vac
Maximum current rating	40 A heating cable circuit for PTB

MATERIALS OF CONSTRUCTION

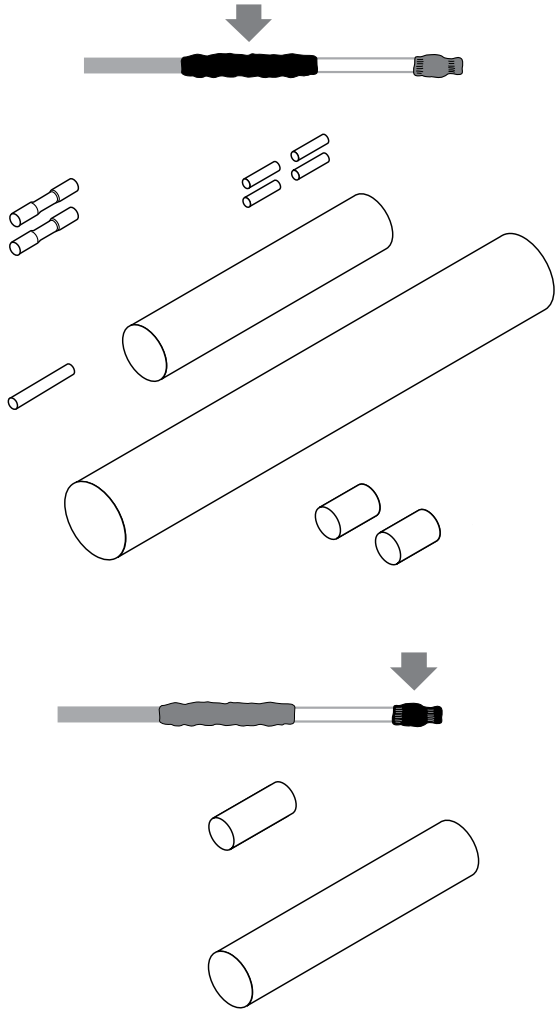
Housing, end plate, shim and spacer	Engineering polymers, black
Sealing grommets	Silicone rubber
Screws, compression spring	Stainless steel

ORDERING DETAILS

Splice connection	S-150
PN (Weight)	497537-000 (0.4 kg/0.8 lb.)

CSE-05-DR

COLD LEAD/SPLICE CONNECTION AND END SEAL KIT



The nVent RAYCHEM CSE-05-DR kit combines the following:

- in-line connection of a BSA heating cable to a flexible power cable, or in-line joining of 2 BSA heating cables, and
- end termination of the BSA heating cable.

This kit is designed for use in ordinary area (non hazardous).

It employs easy to use heat-shrinkable tubing with an adhesive, that when heated forms a semi-flexible moisture proof encapsulation.

Electrical continuation is maintained via crimps for the conductors and another crimp connection for the drainwire of the heating cable.

Due to its low profile design the finished power or splice connection and end seal can be installed under the insulation, directly on the pipe.

APPLICATION

In-line cold lead/splice connection
and end seal kit for BSA heating cable in ordinary area

KIT CONTENTS

Heat-shrinkable adhesive coated sleeves, insulation sleeves, crimps and installation instruction

PRODUCT SPECIFICATIONS

Max. exposure temperature during operation	85°C
Maximum current rating	32 A
Dielectric strength	1.3 – 3.5 MV/m
Volume resistivity	10^{12} Ω cm
Final dimensions	length approx. 200 mm
Minimum Installation Temperature	-10°C

INSTALLATION DETAILS

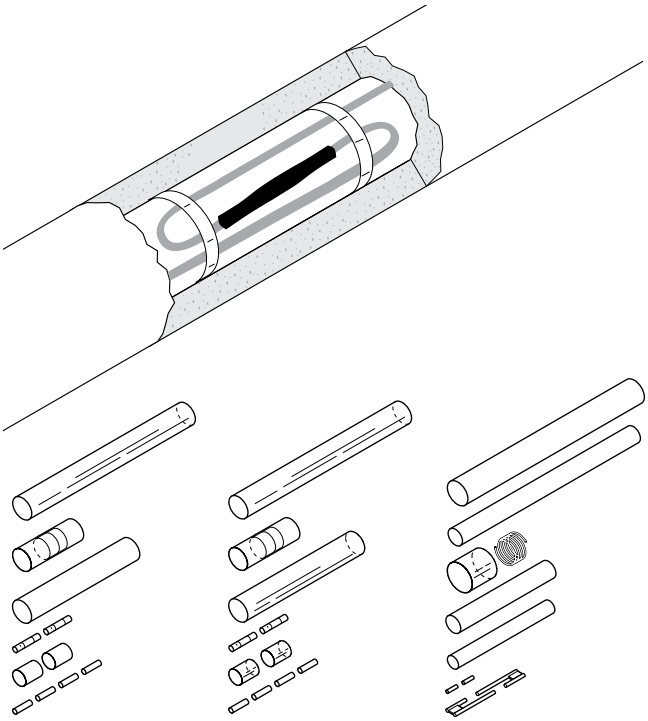
Heat shrinkable tubing	125°C
Gas torch or equivalent	min. 1460 W hot air gun

ORDERING DETAILS

Part description	CSE-05-DR
PN (Weight)	1244-021440 (0.05 kg)

S-19, S-21 AND S-69

HEAT-SHRINK UNDER INSULATION IN-LINE SPLICE KIT



These splice kits are designed for the in-line joining of nVent RAYCHEM selfregulating heating cables.

The kit nVent RAYCHEM S-19 is designed for use with BTV heating cables, the S-21 for QTVR and the S-69 is for use with XTV and KTV heating cables.

All kits are approved for use in hazardous areas.

The splice kits employ easy to use heat-shrinkable tubing with an adhesive, that when heated forms a semi-flexible moisture proof encapsulation.

Electrical continuation is maintained via crimps for the conductors and a solder connection for the braid of the heating cable.

Due to its low profile design the finished splice can be installed under the insulation, directly on the pipe.

APPLICATION

	S-19	S-21	S-69
	In-line splice kit for BTV heating cables	In-line splice kit for QTVR heating cables	In-line splice kit for XTV and KTV heating cables

KIT CONTENTS

	heat-shrinkable adhesive coated sleeves insulation sleeves solder sleeves crimps	heat-shrinkable adhesive coated sleeves insulation sleeves solder sleeves crimps	heat-shrinkable sleeves adhesive liners insulation sleeves high temperature solder crimps

APPROVALS

II 2G/D Ex e II by PTB and Baseefa Ltd.
according to EN/IEC 60079-30-1
DNV Certificate No. DNV-GL TAE00000TU (S-19 & S-21)
DNV Certificate No. DNV-GL TAE00000TV (S-69)

EAC Ex TC RU C-BE.МЮ62.B.00054/18
ООО "ТехИмпорт"

PRODUCT SPECIFICATIONS

	S-19	S-21	S-69
Max. exposure temperature	85°C	135°C	160°C
Maximum current rating	40 A	40 A	40 A
Dielectric strength	1.3 – 3.5 MV/m	2.2 MV/m	> 6 MV/m
Volume resistivity	10^{12} Ω cm	10^{13} Ω cm	10^{10} Ω cm
Final dimensions	length approx. 180 mm	length approx. 180 mm	length approx. 300 mm diameter approx. 20 mm

INSTALLATION DETAILS

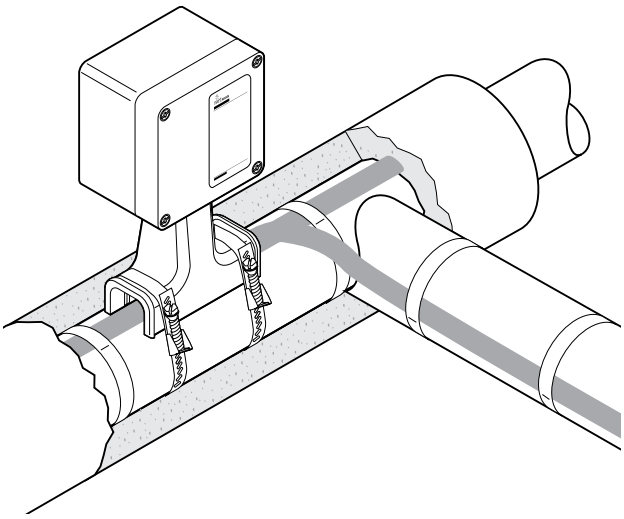
Heat shrinkable tubing	125°C and 175°C	125°C and 175°C	200°C
Solder	120°C	120°C	approx. 240°C
Gas torch or equivalent	min. 1460 W hot air gun	min. 1460 W hot air gun	min. 1460 W hot air gun

ORDERING DETAILS

Part description	S-19	S-21	S-69
PN (Weight)	669854-000 (0.05) kg	358745-000 (0.05 kg)	933309-000 (0.11 kg)

T-100

SPLICE OR TEE CONNECTION KIT



The nVent RAYCHEM T-100 is an above-insulation splice or tee kit, designed for use with up to three nVent RAYCHEM BTV, QTVR, XTV, KTV or VPL industrial parallel heating cables. It is approved for use in hazardous locations.

The rugged stand protects the heating cable and allows for up to 100 mm (4") of thermal insulation.
The core sealing boot does not require a heat gun or torch for the installation (no hot work permit necessary).

The non-curing sealant (silicone free) in the boot allows easy installation and facilitates maintenance.
The T-100 significantly reduces installation and maintenance time and effort.

DESCRIPTION

This kit is an above-insulation splice/tee, appropriate for use worldwide with no requirements for local customization.

KIT CONTENTS

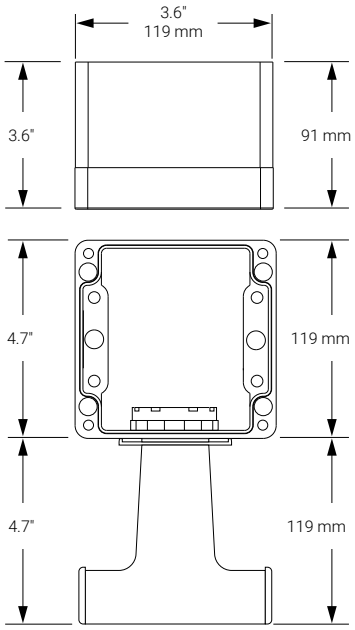
1 splice/tee enclosure and lid
1 stand assembly
3 core sealers
3 green/yellow earthing sleeve
3 compression crimps
3 crimping insulating tubes
1 polywater sachet
1 spanner
1 strain relief assembly
2 grommet plugs
1 installation instruction

APPROVALS

Hazardous locations

FM APPROVED, SP -WS Class I, Div. 2, Groups A, B, C, D Class II, Div. 1 & 2, Groups E, F, G Class III	PTB 09 ATEX 1043 U Ex II 2 G Ex eb IIC T* Gb Ex III 2 D Ex tb IIIC T* Db IECEx PTB 09.0023U Ex eb IIC T* Gb Ex tb IIIC T* Db
FM APPROVED Class I, Zone 1, AEx e IIC	DNV approval DNV-GL TAE00000TV and DNV-GL TAE00000TU
EAC Ex	TC RU C-BE.МЮ62.B.00054/18 Ex e IIC Gb U Ex tb IIIC Db U Ta -55°C...+56°C IP66/67 ООО "ТехИмпорт"

DIMENSIONS (IN MM)



PRODUCT SPECIFICATIONS

Heating cable capability	BTV-CR, BTV-CT, QTVR-CT, XTV-CT, KTV-CT, VPL
Ingress protection	NEMA Type 4X IP66 and IP67
Min. installation temperature	–50°C
Max. pipe temperature	Refer to heating cable specification
Ambient temperature range:	–50°C to +56°C
Max. operating voltage	277 Vac for FM, CSA, 480 Vac for PTB
Max. continuous operating current	50 A heating cable circuit for FM, CSA 40 A heating cable circuit for PTB

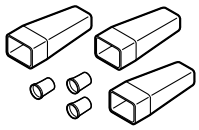
MATERIALS OF CONSTRUCTION

Enclosure, lid, and stand	Electrostatic charge-resistant glass-filled engineered polymer, black
Lid screws	Stainless steel
Lid gasket	Silicone rubber

ORDERING DETAILS

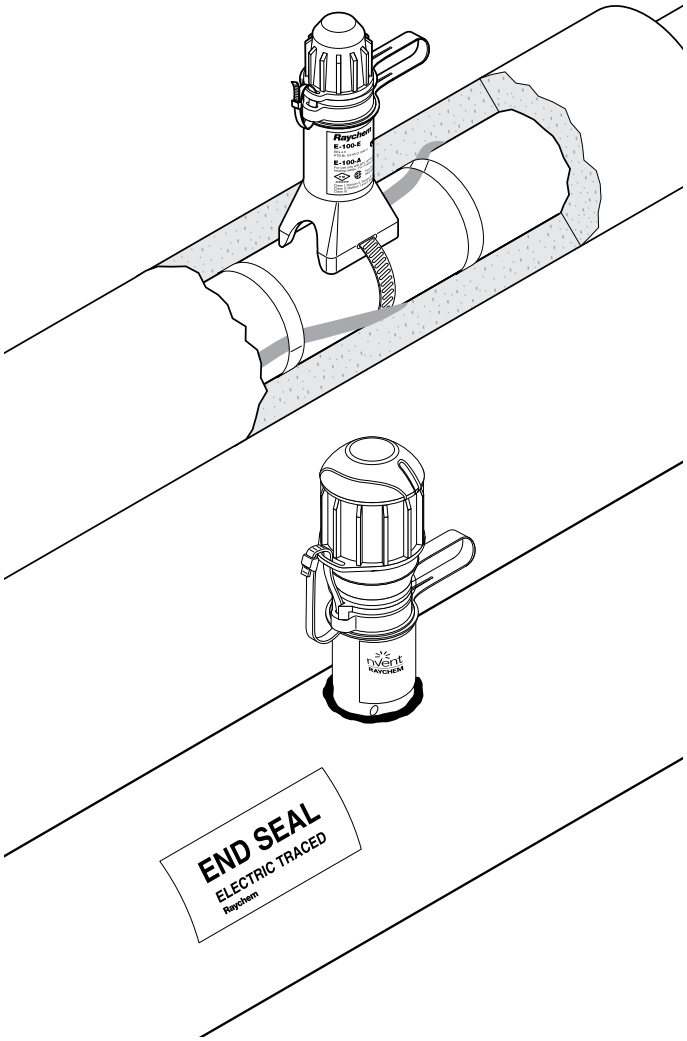
Part description	T-100
PN (Weight)	447379-000 (2.5 lb /1.2 kg)

ACCESSORIES

Crimp tool	T-100-CT (not included in the kit, equivalent to Panduit: CT-1570)
PN	954799-000
Spare crimps and insulating tubes	T-100-CRIMP-KIT (spare part only)
	
PN	577853-000
Small pipe adaptor	JBM-SPA, required for pipes ≤ 1" (DN 25), D55673-000 (bag of 5 adaptors)

E-100-E AND E-100-L-E

END SEAL AND LIGHTED END SEAL



Both the nVent RAYCHEM E-100-E and E-100-L-E are accessible, re-entrable end seals, the E-100-E without a light, the E-100-L-E with a signal light. Both end seals can be used with all nVent RAYCHEM BTV, QTVR, XTV, KTV or VPL industrial parallel heating cables. They are approved for use in hazardous areas. They are extremely rugged - made of a strong, moulded part with 4 mm wall thickness.

The heating cable is firmly kept in place by the integral strain relief.

Sealing is done twice. First a dry compartment for the heating cable is created, then a boot filled with a non-curing sealant (silicone free) is placed over the end of the heating cable inside the compartment.

The end seals are mounted on the pipe and project through the cladding.

The light module of the E-100-L-E uses an array of super-bright green LEDs for long life and excellent visibility from almost any angle. The robust industrial-grade electronics are encapsulated to reliably seal out moisture.

Extra sealant filled boots for the E-100-E end seal can be ordered separately.

KIT CONTENTS

	E-100-E	E-100-L-E
	1 end seal 1 cable tie 1 polywater sachet 1 installation instruction	1 end seal with indicator light 1 cable tie 1 polywater sachet 2 insulated parallel crimps 1 core sealer 1 installation instruction

APPROVAL DATA

Area of use	Hazardous or ordinary (indoors and outdoors)

APPROVALS

E-100-E	E-100-L-E
PTB 09 ATEX 1060 U Ⓔx II 2G Ex e II II 2D Ex tD A21 IP66 IECEx PTB 09.0038U Ex e II Ex tD A21 IP66 SP -WS Ex e II T*	Sira 14ATEX3015X Ⓔx II 2GD Ex e mb IIC T* Gb Ex tb IIIC T***°C Db Ta = -40°C to +40°C IECEx SIR 14.0007X Ex e mb IIC T* Gb Ex tb IIIC T***°C Db Ta = -40°C to +40°C FM APPROVED CLI, ZN1, AEx e mb IIC T* Gb (1) ZN21 AEx tb IIIC T* SP -WS Ex e mb IIC T* Gb Ex tb IIIC T***°C Db

DNV Certificate No. E-11564 and E-11565
*For T-rating, see heating cable or design documentation
(1) Except VPL

EAC Ex TC RU C-BE.МЮ62.B.00054/18
Ex e IIC Gb U Ex tb IIIC Db U
Ex e mb IIC Gb U
Ex tb mb IIIC Db U
Ta -55°C...+56°C IP66
ООО "ТехИмпорт"

EAC Ex TC RU C-BE.МЮ62.B.00054/18
Ex e IIC Gb U Ex tb IIIC Db U
Ex e mb IIC Gb U
Ex tb mb IIIC Db U
Ta -55°C...+56°C IP66
ООО "ТехИмпорт"

PRODUCT SPECIFICATIONS

	E-100-E	E-100-L-E
Max. pipe temperature	Refer to heating cable specification (absolute maximum is 260°C)	
Max. operating voltage	480 V*	277 V
	*Extra conditions for safe use apply for voltages above 277 V. Please refer to the certificate or installation instructions for full details.	
Ambient temperature range	–50°C to +56°C*	–40°C to +40°C
	*Extra conditions for safe use apply for ambient temperatures above +40°C. Please refer to the summary the certificate or installation instructions for full details.	
Min. installation temperature	–50°C	–40°C
Overall height	171 mm	197 mm
Outer diameter	46 mm Usable with up to 100 mm thermal insulation	66 mm
Ingress protection	IP66, Type 4X	IP66, Type 4X
Impact resistance	EN 60079-30-1, ≥ 7 joules	EN 60079-30-1, ≥ 7 joules
UV stability	No degradation after > 1000 h	No degradation after > 1000 h
Solvent resistance	Excellent	Excellent
Strain relief	> 250 N	> 250 N

LIGHT SOURCE

Type	Green LEDs
Voltage rating range	110-277 Vac, 50/60 Hz
Power consumption	< 2 W
Electromagnetic immunity/emissions	Complies with IEC61000-6 and IEC61000-4

INSTALLATION DATA

Tools required	Cable knife, wire cutters, screwdriver	Cable knife, wire cutters, screwdriver, crimp tool (Panduit-CT-100), long nose pliers

ORDERING DETAILS

End seal

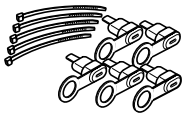
Part description	E-100-E	E-100-L-E
PN (Weight)	101255-000 (0.22 kg) Requires one pipe strap (not supplied)	P000001583 (0.63 kg) Requires one pipe strap (not supplied) PTB, DNV and EAC approved product

ACCESSORIES

Small pipe adaptor	JBS- SPA, required for pipes ≤ 1" (DN 25), E 90515-000 (bag of 5 adaptors)

SPARE PART

Boot pack for E-100-E



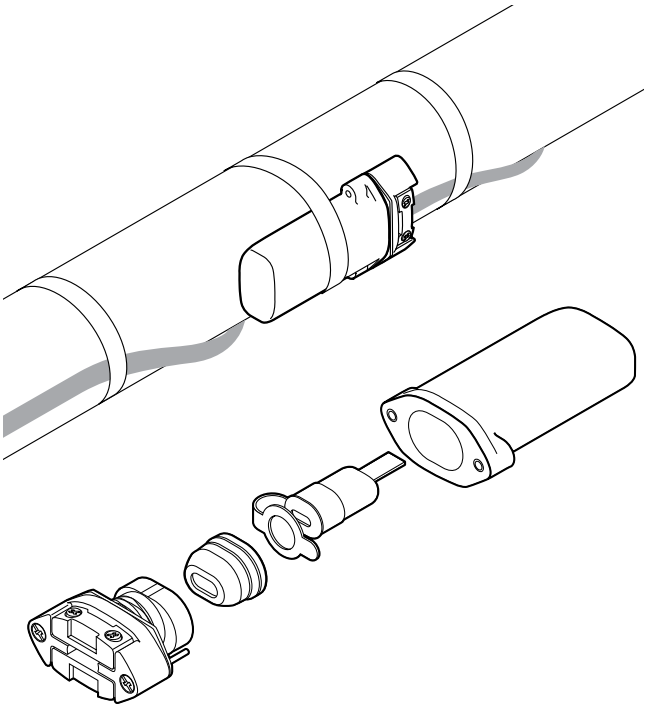
Part description	E-100-BOOT-5-PACK
PN (Weight)	281053-000 (140 g)
Pack size	5 sealant filled boots and 5 cable ties

Replacement indicator light for E-100-L

Part description:	E-100-LR-E
PN	P000001586

E-150

LOW PROFILE END SEAL -COLD APPLIED



The nVent RAYCHEM E-150 is a cold applied low profile end seal. This universal end seal is designed to fit with all nVent RAYCHEM industrial self-regulating heating cables; BTV, QTVR, XTV and KTV meaning simplified product selection and reduced inventory to stock. It can be used in applications with temperatures ranging from –50°C to 215°C. It is approved for use in hazardous areas.

The unique design of the E-150 suits the demanding requirements of the industrial environment. The low profile housing can be installed on pipes and other surfaces. A spring loaded grommet makes a first seal to maintain a water tight connection while the non-curing sealant (silicone free) used in nVent RAYCHEM's core sealing boot adds a second seal, providing additional protection. The rugged construction of the end seal makes it resistant to impact and suitable for high temperature variations and aggressive chemical exposure. The end seal is re-enterable. The E-150 design provides a safe under the insulation end seal that can be relied upon over time.

The end seal requires no heat source for installation, making maintenance fast and easy. Each kit contains all the necessary materials to do one end termination.

DESCRIPTION

Cold applied end seal for use with BTV, QTVR, XTV and KTV heating cables.

KIT CONTENTS

1 end seal enclosure housing
1 sealing grommet assembly
1 core sealing boot
1 identification label
1 installation instruction

APPROVALS

Hazardous locations

PTB 09 ATEX 1068 U
Ex II 2G Ex e II
Ex II 2D tD A21 IP66
IECEx PTB 09.0043U
Ex e II
Ex tD A21 IP66
DNV Certificates No. DNV-GL TAE00000TV and DNV-GL TAE00000TU

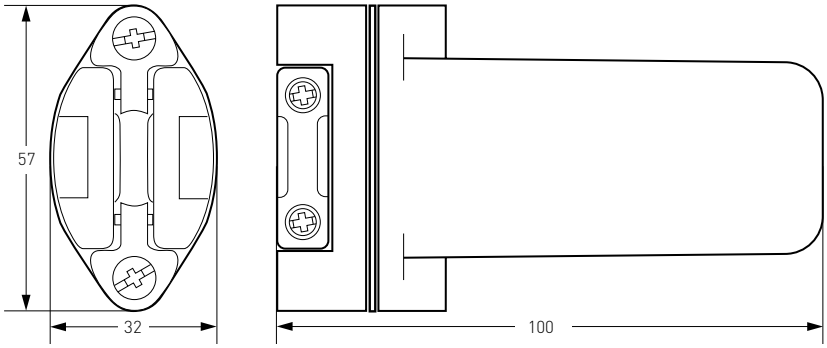
Class I, Div. 2, Groups A, B, C, D
Class II, Div. 2, Groups F, G
Class III

CLI, ZN2, AEx e II T(1)
Ex e II T(1)

(1) For T-rating, see heating cable or design documentation

TC RU C-BE.МЮ62.B.00054/18
Ex e IIC Gb U Ex tb IIIC Db U
Ta -55°C...+215°C IP66
ООО "ТехИмпорт"

DIMENSIONS (IN MM)



PRODUCT SPECIFICATIONS

Heating cable capability	BTV-CR, BTV-CT, QTVR-CT, XTV-CT, KTV-CT
Ingress protection	IP66
Minimum installation temperature	–50°C
Maximum pipe temperature	Refer to heating cable specification
Operating voltage	277 V

MATERIALS OF CONSTRUCTION

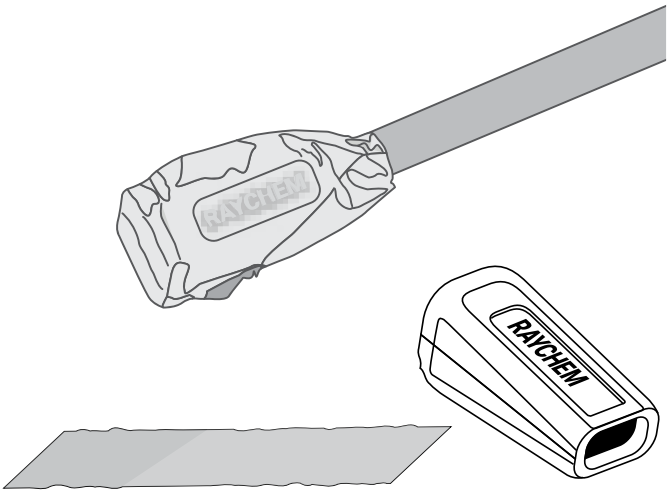
Enclosure, end plate, and shim	Engineering polymers, black
Sealing grommet and core sealer	Silicone rubber
Screws, compression spring, reinforcement plate	Stainless steel

ORDERING DETAILS

End seal	E-150
PN (Weight)	979099-000 (0.3 kg/0.6 lb.)

E-02-AL

COLD APPLIED END SEAL KIT



PRODUCT DESCRIPTION

nVent RAYCHEM End Seal E-02-AL is a cold applied end seal kit for termination of nVent RAYCHEM BSA heating cables in ordinary (non-hazardous) area.

This kit is quick and easy to install without the need of a heat gun.

KIT CONTENT

1 x end seal with gel filling
1 x protective aluminium tape

APPROVALS

Products are in compliance with IEC/EN 62395-1:2013
DNV approval pending

SPECIFICATIONS

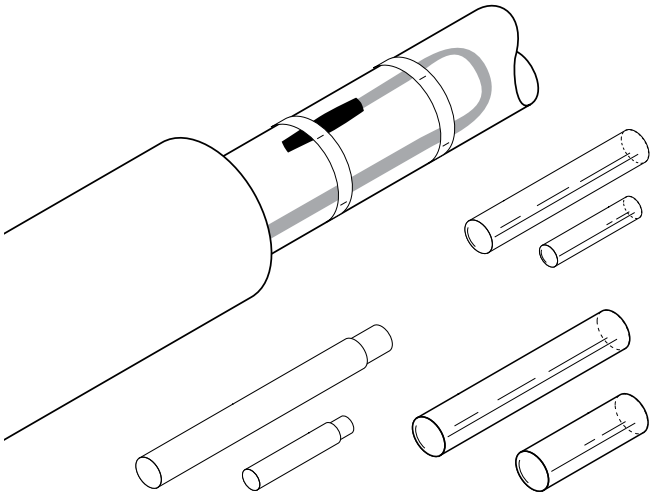
Rated voltage:	230Vac
Ingress protection	IP68
Min installation temp:	-20°C
Max maintain or continuous exposure T (power on):	65°C
Max exposure T (power off):	85°C
Material	Grey polymer

ORDER INFORMATION

Part Description	E-02-AL
Part number (weight)	1244-020913 (0.03 kg)

E-06, E-19 AND E-50

HEAT-SHRINK UNDER INSULATION END SEAL KITS



These end seal kits are designed for the termination of nVent RAYCHEM'S industrial heating cables.

The nVent RAYCHEM E-06 is designed for use with BTV- and QTVR heating cables, the nVent RAYCHEM E-19 is designed for use with XTV- and KTV heating cables, and the nVent RAYCHEM E-50 is for use with VPL heating cables. All kits are approved for use in hazardous areas.

The end seal kits E-06 and E-19 employ easy to use heat-shrinkable tubing with an adhesive, that when heated forms a semi-flexible moisture proof encapsulation. The end seal kit E-50 employs high temperature heat-shrinkable tubing with a plastic melt liner that when heated forms a semi-flexible moisture proof encapsulation. Due to the low profile design the finished termination can be installed directly on the pipe.

One end seal kit is required for each termination.

APPLICATION

E-06	E-19	E-50
End seal for BTV and QTVR self-regulating heating cables	End seal for XTV and KTV self-regulating heating cables	End seal for VPL power-limiting heating cables

KIT CONTENTS

Heat-shrinkable Adhesive coated sleeves Installation instruction	Heat-shrinkable sleeves Adhesive liners Installation instruction	Heat-shrinkable sleeves Installation instruction

APPROVALS

ATEX certified by Baseefa and PTB
II 2 GD Ex e II
Ex tD A21 IP66
The temperature class depends on the design and the type of heating cable the end seal is used with

DNV Certificate No. DNV-GL TAE00000TU (E-06)
DNV Certificate No. DNV-GL TAE00000TV (E-19)

TC RU C-BE.МЮ62.B.00054/18
ООО "ТехИмпорт"

PRODUCT SPECIFICATIONS

	E-06	E-19	E-50
Max. exposure temperature	175°C	200°C	260°C
Dielectric strength	2.2 MV/m	> 6 MV/m	> 40 MV/m
Volume resistivity	10^{13} Ω cm	10^{10} Ω cm	10^{18} Ω cm
Final dimensions	length approx. 120 mm	length approx. 135 mm	length approx. 120 mm

INSTALLATION DETAILS

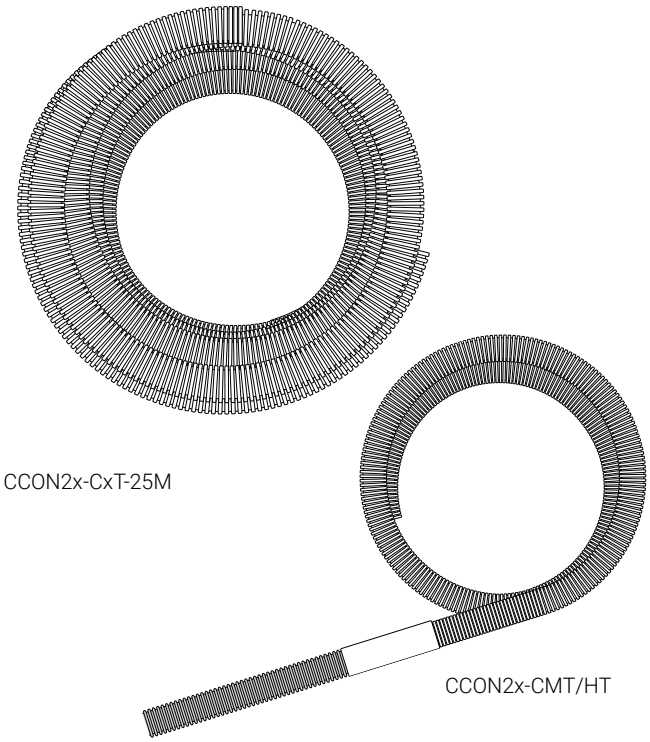
Heat shrinkable tubing	175 °C	200 °C	327 °C
Gas torch or equivalent	min. 1460 W hot air gun	min. 1460 W hot air gun	min. 3000 W hot air gun*

ORDERING INFORMATION

Part description	E-06	E-19	E-50
PN (Weight)	582616-000 (0.03 kg)	090349-000 (0.05 kg)	1244-002492 (0.06 kg)

*The installation of the E-50 requires a high power heat gun and an experienced installer.

CONDUIT FOR PROTECTION OF HEATING CABLES



CCON2x-CxT-25M

CCON2x-CMT/HT

These conduits have been designed for use in combination with the conduit connection kits nVent RAYCHEM CCON2x-100-... They provide supplementary mechanical protection of the heating cable or cold lead between a junction box and the entry into the insulation. The conduit materials have been selected to meet the requirements for use in hazardous locations.

The resistance of the conduits to fuels, mineral oils, fats, alkalies, acids and bases is excellent.

The conduits can be cut-to-length as required in the field and can either be entered in the insulation directly or by use of an insulation entry kit.

APPLICATION

Conduit for protection of heating cables

APPROVALS

Meets electrostatic requirements for ATEX in gas groups IIA and IIB.
For gas group IIC special marking required. (Do not clean with a dry cloth)

PRODUCT SPECIFICATION

	M20	M25
Medium temperature conduit (150°C)		
	CCON20-CMT-...	**CCON25-CMT-...**
Conduit size	ND 17 mm	ND 23 mm
Outer diameter (nominal)	21.2 mm	28.5 mm
Bending radius (static)	40 mm	45 mm
Weight (kg/100 m)	5.7	9.9
Material	Modified polyamide	
Temperature range (continuous)	–40°C to +135°C (compatible with surface temperature of all heating cables)	
Exposure temperature	150°C (3000 h intermittent, cumulative)	
Impact strength	Minimum 6 J @ –40°C (empty conduit), min. 7 J with all heating cables	
Flame class	HB as per UL 94	

	M20	M25

HIGH TEMPERATURE CONDUIT (260°C)

	CCON20-CHT-...	CCON25-CHT-...
Conduit size	ND 17 mm	ND 23 mm
Outer diameter (nominal)	21.1 mm	28.8 mm
Bending radius (static)	15 mm	26 mm
Weight (kg/100 m)	8.3	14.8
Material	PFA	
Temperature range	–200°C to +260°C	
Impact strength	Minimum 2.5 J (empty conduit), min. 7 J with all heating cables	
Flame class	V0 as per UL 94	

COMBINED MEDIUM AND HIGH TEMPERATURE CONDUIT

	CCON20-CMT/HT-1.67/0.33M	CCON25-CMT/HT-1.67/0.33M
Ideal for direct entry into cladding for high pipe temperatures	1.67 m length of medium temperature conduit for connection to the junction box connected to 33 cm of high temperature conduit for connection to the hot surface.	

ORDERING DETAILS

	M20	M25

CONDUIT SIZE

	ND 17 mm	ND 23 mm
Pack of 2 m of medium temperature conduit	CCON20-CMT-2M (PN: 1244-003286/Weight: 0.12 kg)	CCON25-CMT-2M (PN: 1244-003281/Weight: 0.20 kg)
Pack of 25 m of medium temperature conduit	CCON20-CMT-25M (PN: 1244-003285 Weight: 1.44 kg)	CCON25-CMT-25M (PN: 1244-003280/Weight: 2.25 kg)
Pack of 2 m of high temperature conduit	CCON20-CHT-2M (PN: 1244-003289/Weight: 0.16 kg)	CCON25-CHT-2M (PN: 1244-003284/Weight: 0.28 kg)
Pack of 25 m of high temperature conduit	CCON20-CHT-25M (PN: 124-003288/Weight: 2.24 kg)	CCON25-CHT-25M (PN: 1244-003283/Weight: 3.90 kg)
1 pc of combination med./high temperature conduit (1.67 m medium temperature with 0.33 m high temperature)	CCON20-CMT/HT-1.67/0.33M (PN: 1244-003475/Weight: 0.135 kg)	CCON25-CMT/HT-1.67/0.33M (PN: 1244-003474/Weight: 0.24 kg)

ACCESSORIES

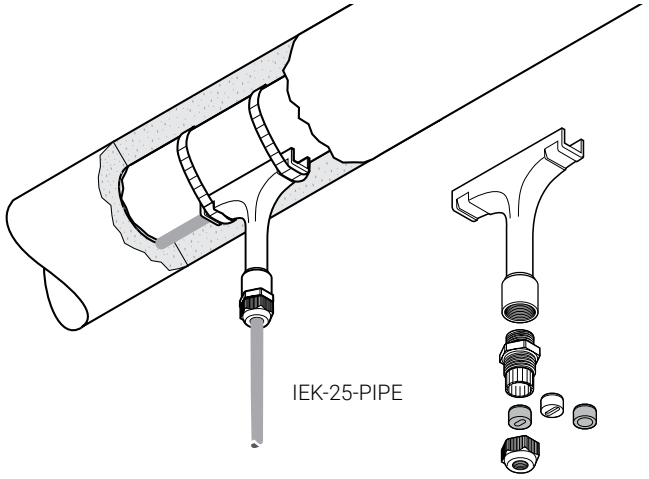
Insulation entry kit comprising of pipe stand with conduit connection system	IEK20-CON (PN: 1244-003291)	IEK25-CON (PN: 1244-003290)

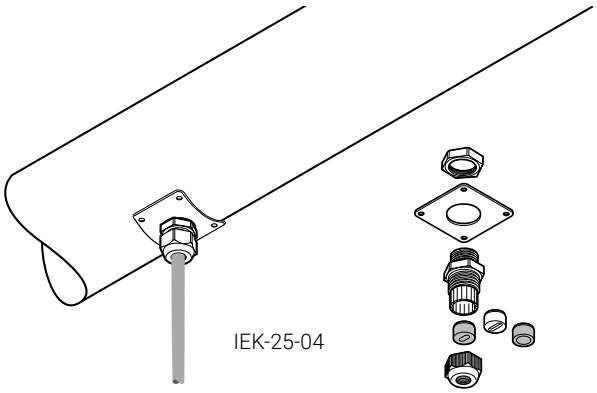
KIT CONTENT

2 pipe stands	1 pipe stand
2 conduit connectors	1 conduit connector
Pipe straps need to be ordered separately	Pipe straps need to be ordered separately

IEK-25-PIPE AND IEK-25-04

INSULATION ENTRY KIT





Insulation entry kits are designed to protect cables when passing through the thermal insulation cladding. The IEK´s are suitable for all type of parallel heating cables as well as power cables. Insulation entry kits may be used in hazardous and non hazardous areas.

The gland and the grommet provided in the kit provide strain relief and environmental sealing to avoid water ingress in the insulation.

The nVent RAYCHEM IEK-25-PIPE contains a protective guiding tube which is fixed to the pipe and allows the heat-tracing installation to be completed independently from the insulation work. The nVent RAYCHEM IEK-25-04 contains a stainless steel plate which can be screwed to the cladding.

Insulation entry kits can be used for installations on pipes, tanks and vessels etc.

APPLICATION

IEK-25-PIPE	IEK-25-04
Insulation entry kit for pipe mounting for heating- and power cables with an outside diameter in the range of 8 to 17 mm. Kit contains 1 pc.	Insulation entry kit for pipes, tanks and vessels. Usable for all types of polymer heating cables and power cables with an outside diameter in the range of 8 to 17 mm. Kit contains 1 pc.

KIT CONTENTS

1 x polymer “T” Tube 1 x plastic gland (M25) with round hole grommet for power cables 1 x bag with 2 silicon grommets for heating cables	1 x stainless steel fixing plate 1 x plastic gland (M25) with round hole grommet for power cables 1 x bag with 2 silicon grommets for heating cables 1 x locknut

RAYCHEM-DS-EU1425-IEK25PIPEIEK2504-EN-1911

PRODUCT SPECIFICATIONS

IEK-25-PIPE	IEK-25-04	
Max. exposure temp.		
gland	110°C	110°C
tube	260°C	–

APPROVALS

DNV Certificate No. E-11564 and E-11565

DIMENSIONS

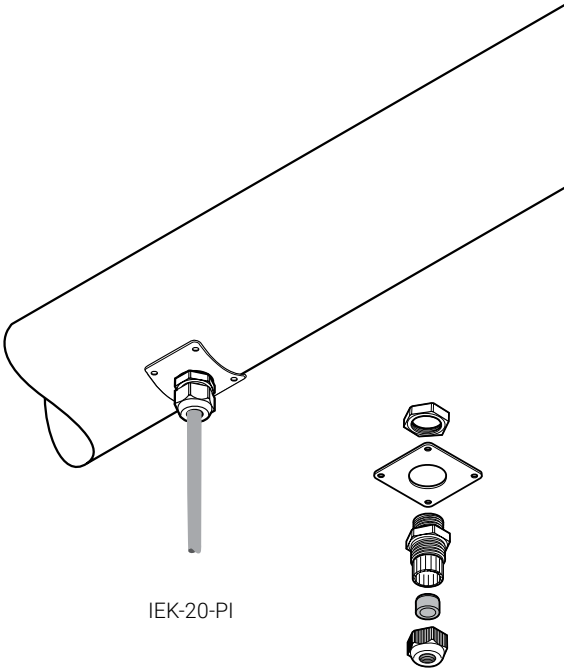
Height 135 mm, width 120 mm	Plate 60 x 60 mm (22SWG)	

ORDERING INFORMATION

Part number (Weight)	1244-001050 (0.13 kg)	332523-000 (0.06 kg)

IEK-20-PI

INSULATION ENTRY KIT



IEK-20-PI

Insulation entry kits are designed to protect cables when passing through the thermal insulation cladding.
The nVent RAYCHEM IEK-20-PI is suited for PI heating cables as well as for power cables.

Insulation entry kits may be used in hazardous and non hazardous areas.

The gland and the grommet included in the kit provide strain relief and environmental sealing to avoid water ingress in the insulation. They contain a stainless steel plate which can be screwed to the cladding. Insulation entry kits can be used for installations on pipes, tanks and vessels etc.

APPLICATION

IEK-20-PI

Two-pack insulation entry kit for pipes, tanks and vessels. Usable for all types of PI cold leads as well as all other round cables with an outer diameter in the range of 5 to 13 mm. Kit contains 2 pc.

KIT CONTENTS

2 x stainless steel fixing plates
2 x plastic glands (M20) with round hole grommet for power- or cold lead cables
2 x locknuts

PRODUCT SPECIFICATIONS

Max. exposure temp. gland	80°C

DIMENSIONS

Plate 60 x 60 mm (22 SWG)

ORDERING INFORMATION

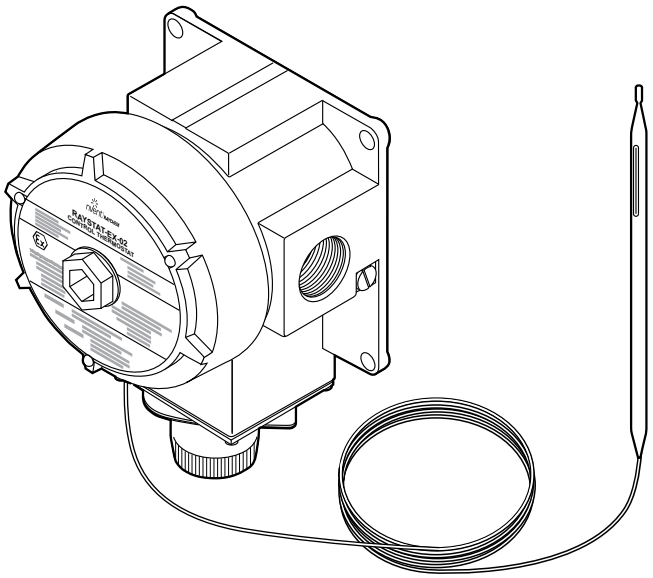
Part number (Weight)	1244-000689 (0.08 kg)

APPROVALS

EAC (Russia, Kazakhstan, Belarus)
For other countries contact your local nVent representative.

RAYSTAT-EX-02

SURFACE SENSING MECHANICAL THERMOSTAT



This EEx d approved surface sensing thermostat provides temperature control for all nVent RAYCHEM BTV, QTVR, KTV, VPL and XTV heating cables in hazardous areas. The switching temperature range is –4°C to +163°C and is adjustable externally to the Ex enclosure by a dial mounted under a bolted-on cover and seal.

The switching current capacity is 22 A. It has a single pole change-over switch with volt-free contacts.

Cable entry is through a single 3/4" NPT thread entry. nVent RAYCHEM cable glands are available to suit non-armoured and armoured cable.

The 3 m long stainless steel fluid filled bulb and capillary give freedom to locate the enclosure remote from the bulb. The bulb exposure range is –50°C to +215°C.

The cast aluminium construction with stainless steel fittings gives a lightweight unit which can be pipe mounted using nVent RAYCHEM support brackets or surface mounted.

THERMOSTAT

Area of use	Hazardous area: Zone 1, Zone 2 (Gas), Zone 21, Zone 22 (Dust)
	Ordinary

APPROVALS

LCIE 08 ATEX 6095 X
Ex II 2 G D
IECEx LCI 08.0036X
Ex d IIC T6
Ex tD A21 IP66 T80°C

TC RU C-BE.ИМ43.B.01764 ООО "ТехИмпорт"
1Ex d IIC T6 Gb X
Ex tb IIIC T80°C Db X
Ta -40°C...+60°C IP65
Made in USA

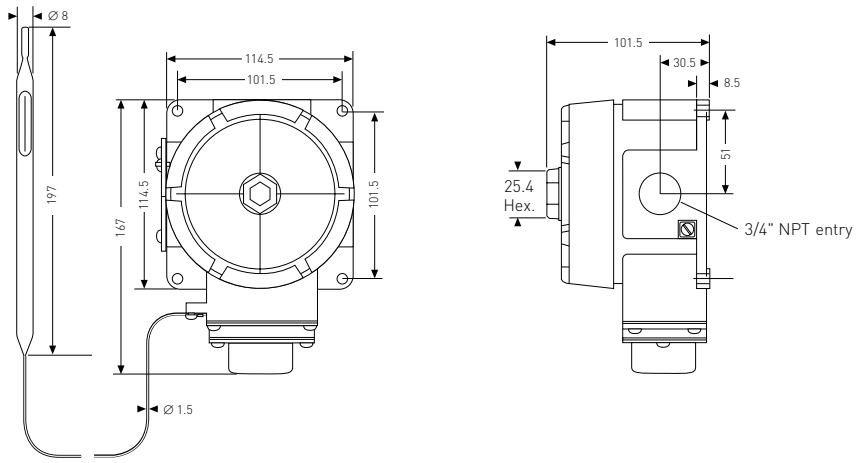
ENCLOSURE

Body and lid	Lacquer coated cast aluminium with stainless steel fittings and nitrile rubber internal lid seal
Protection	IP 65 if installed with nVent RAYCHEM cable glands GL-33 or GL-34
Lid fixing	Screw thread lid locked in place by a 2 mm hexagonal key grub screw
Entry	1 x 3/4" NPT
Ambient operating temperature	–40°C to +60°C

TEMPERATURE SENSING

Type	Fluid filled bulb and capillary
Dimensions	Capillary 3 m long, bulb 197 mm x 8 mm
Material	Stainless steel (Type 55316)
Exposure temperature	−50°C to +215°C
Minimum bend radius	Do not bend bulb, 15 mm for capillary

DIMENSIONS (IN MM)



SWITCHING

Type	Single pole change over volt free contacts (SPDT)
Rating	22 A at 480 Vac, switching (100.000 cycles)

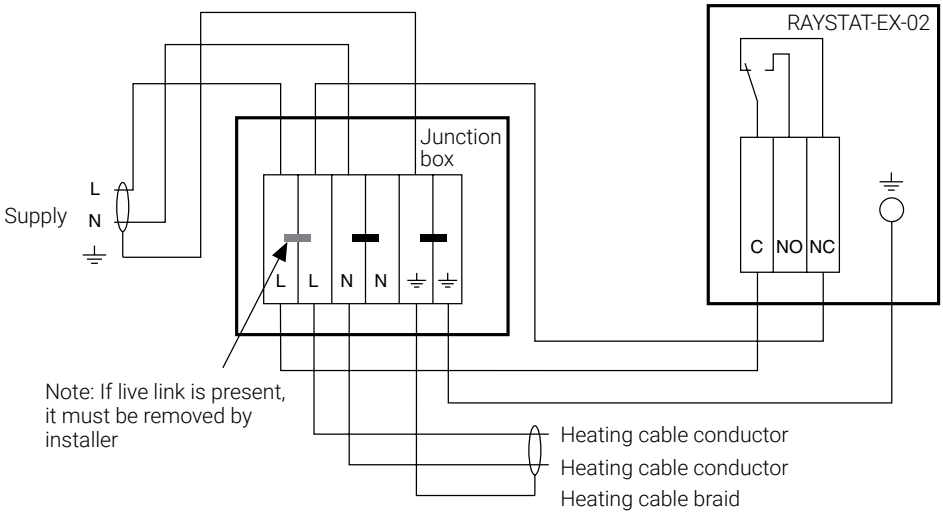
SETTING

Range	−4°C to +163°C
Repeatability	±1.7 K
Differential	5 K
Accuracy (switch on)	±4.5°C at 21°C ambient and 50°C sensor temperature
Method	External knob and dial

CONNECTION TERMINALS

Supply	3 terminals for 1 to 4 mm^2 conductors
Internal earth	Single bolt for 1 to 4 mm^2 conductors
External earth	Single bolt and clamp for 1 to 4 mm^2 conductors

CONNECTION DETAILS AND THERMOSTAT CONTROL SYSTEM



Maximum recommended heating cable lengths (230 V supply)

The maximum recommended heating cable length is restricted by the electrical protection sizing or the switching capacity of the RAYSTAT-EX-02.

For circuits and electrical protection rated up to and including 20 A

Use the maximum recommended heating cable lengths, mentioned in the cable datasheet.

For circuits and electrical protection rated above 20 A but less than or equal to 22 A

Use the shorter length of the values given in the cable datasheet and those given for your switching temperature in the table below.

For circuits and electrical protection rated above 22 A, RAYSTAT-EX-02 must NOT be connected for direct switching.

HEATING- CABLE REFERENCE

	3BTV2-CT/-CR	5BTV2-CT/-CR	8BTV2-CT/-CR	10BTV2-CT/-CR	10QTVR2-CT	15QTVR2-CT	20QTVR2-CT	4XTV2-CT-T3	8XTV2-CT-T3	12XTV2-CT-T3	15XTV2-CT-T3	20XTV2-CT-T2	5KTV2-CT	8KTV2-CT	15KTV2-CT	20KTV2-CT	5VPL2	10VPL2	15 VPL2	20VPL2
Switching temp. (°C)	**L max. (m) - Maximum recommended heating cable length**																			
5	200	165	120	105	110	85	65	230	145	105	85	65	200	145	90	65	220	145	95	70
10	200	165	120	105	110	90	65	235	150	110	85	65	205	145	90	65	220	150	95	70
15	200	165	120	105	115	90	70	245	155	110	85	65	210	150	95	65	220	150	95	70
20	200	165	120	105	115	95	75	250	160	115	90	65	215	155	95	70	220	150	100	70
25	200	165	120	105	115	95	75	250	165	120	90	70	220	160	100	70	220	155	100	75
30	200	165	120	105	115	95	80	250	170	125	95	70	225	160	100	70	220	155	100	75
35	200	165	120	105	115	95	85	250	180	130	95	75	225	165	105	75	220	155	100	75
40	200	165	120	105	115	95	90	250	180	135	100	75	225	170	105	75	220	155	105	75
45	200	165	120	105	115	95	95	250	180	140	100	75	225	175	110	80	220	155	105	75
50	200	165	120	105	115	95	105	250	180	145	105	80	225	180	115	80	220	155	105	75
55	200	165	120	105	115	95	110	250	180	145	110	80	225	180	115	85	220	155	105	80
60	200	165	120	105	115	95	110	250	180	145	110	85	225	180	120	85	220	155	110	80
65	200	165	120	105	115	95	110	250	180	145	115	85	225	180	125	90	220	155	110	80
70	--	--	--	--	115	95	110	250	180	145	120	90	225	180	130	95	220	155	110	80
75	--	--	--	--	115	95	110	250	180	145	120	90	225	180	130	95	220	155	115	80
80	--	--	--	--	115	95	110	250	180	145	125	95	225	180	130	100	220	155	115	85
85	--	--	--	--	115	95	110	250	180	145	130	100	225	180	130	105	220	155	115	85
90	--	--	--	--	115	95	110	250	180	145	130	100	225	180	130	110	220	155	120	85
95	--	--	--	--	115	95	110	250	180	145	130	105	225	180	130	110	220	155	120	85
100 to 110	--	--	--	--	115	95	110	250	180	145	130	110	225	180	130	110	220	155	120	85
115 to 120	--	--	--	--	--	--	--	250	180	145	130	110	225	180	130	110	220	155	125	90
125 to 150	--	--	--	--	--	--	--	--	--	--	--	--	225	180	130	110	220	155	125	95

MOUNTING METHOD

nVent RAYCHEM support bracket nVent RAYCHEM SB-100, SB-101, SB-110, SB-111, SB-125 or surface mounting with 4 fixing holes (M6) on 101.5 x 101.5 mm centres

SETTING

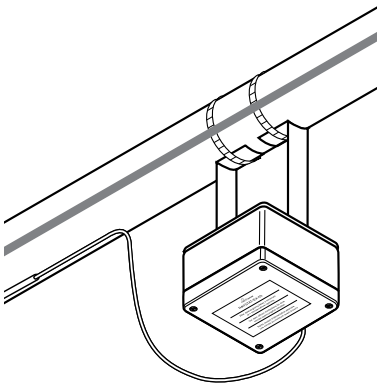
Power cable gland for armoured cable	GL-33	493217-000
Power cable gland for non-armoured cable (to be ordered separately)	GL-34	931945-000

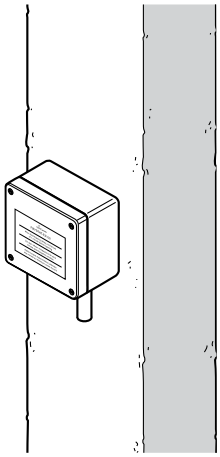
ORDERING DETAILS

Part description	RAYSTAT-EX-02
PN (Weight)	404385-000 (1.77 kg)

RAYSTAT-EX-03 AND RAYSTAT-EX-04

SURFACE AND AMBIENT SENSING, ELECTRONIC





These electronic surface sensing and ambient thermostats provide accurate temperature control for heating cables.

The units can be supplied at nominal voltages of either 110 V 50/60 Hz or 230 V 50/60 Hz and have a double pole switch rated at 16 A. The switch contacts can be arranged to be volt free. Temperature setting is accurate via digital thumb wheel switches inside the enclosure.

The surface sensing version is supplied with a Pt 100 sensor and a 2 m long stainless steel sheathed extension cable giving freedom to locate the electronics remote from the sensor. The ambient version is supplied with a local Pt 100 sensor and a wind shield.

The enclosure is manufactured from high impact resistant glass filled polyester offering IP66 protection.

For pipe temperatures up to 215°C, the units can be mounted on the pipe using a support bracket.

APPLICATION

nVent RAYCHEM RAYSTAT-EX-03	nVent RAYCHEM RAYSTAT-EX-04
Surface sensing	Ambient sensing

THERMOSTAT

Area of use	Hazardous area: Zone 1 or Zone 2 (Gas) or Zone 21 or Zone 22 (Dust) Ordinary

APPROVALS CERTIFICATION

Baseefa11ATEX0071X	IECEx BAS 11.0036X Ex II 2 GD When the unit is powered with a supply voltage ≥ 99 and ≤ 230 Va.c. Ex e mb ia IIC T6 Ta −50°C to +60°C Gb Ex tb IIIC T85°C Ta −50°C to +60°C Db IP66 When the unit is powered with a supply voltage > 230 ≤ 253 Va.c. Ex e mb ia IIC T5 Ta −50°C to +60°C Gb Ex tb IIIC T100°C Ta −50°C to +60°C Db IP66
EAC Ex	ТС RU C-BE.ИМ43.B.01764 ООО "ТехИмпорт" 1Ex e mb ia IIC T5 Gb X Ex tb IIIC T100°C Db X Ta -50°C...+60°C IP66 Made in GB

PRODUCT SPECIFICATION

Temperature range	0°C to 499°C	0°C to 49°C
Ingress protection	IP66	IP66
Switching accuracy	±1 K at 5°C ±1% of setpoint above 100°C	±1 K at 5°C
Switching differential (Hysteresis)	≈ 1°C at 100°C ≈ 2°C at 200°C ≈ 5°C at 499°C	≈ 1°C
Output relay	Dual pole change overtype (DPDT) (optional volt free)	Dual pole change over type (DPDT) (optional volt free)

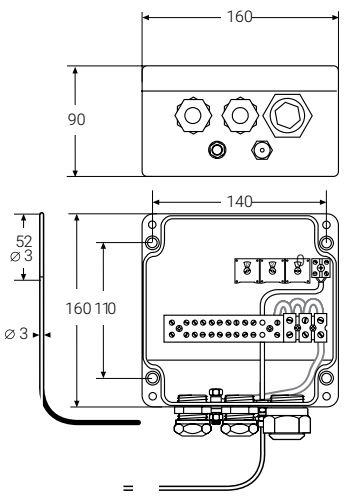
RAYCHEM-DS-EU1428-RAYSTATEX0304-EN-1911

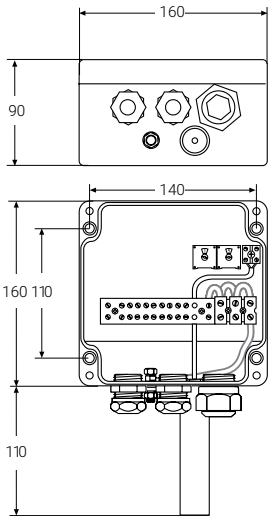
PRODUCT SPECIFICATION (CONTINUED)

Switching capacity	16 A 110 Vac ±10% 50/60 Hz 16 A 230/253 Vac ±10% 50/60 Hz resistive load	16 A 110 Vac ±10% 50/60 Hz 16 A 230/253 Vac ±10% 50/60 Hz resistive load
Ambient temperature range	–50°C to +60°C	–50°C to +60°C
Supply voltage	110 Vac ±10% 50/60 Hz 230/253 Vac ±10% 50/60 Hz	110 Vac ±10% 50/60 Hz 230/253 Vac ±10% 50/60 Hz
Internal power consumption	110 Vac ~ 4 VA, 230/253 Vac ~ 3 VA	
Terminal size	max. 4 mm^2	max. 4 mm^2

DIMENSIONS (IN MM)

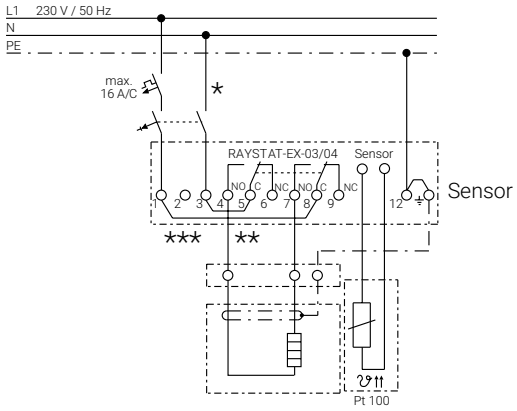
	RAYSTAT-EX-03	RAYSTAT-EX-04





TYPICAL WIRING DIAGRAM FOR DIRECT SWITCHING

* Circuit breaker configurations may vary according to local standards/requirements
** Link 1-8 and/or 3-5 can be removed to provide potential-free contacts
*** Terminal 2: 110 Vac input terminal



Cable entries	2 x M20 glands (cable ∅ 7.5 – 13 mm) 1 x M25 with M25(M)/M20(F) adaptor and (M20) plug	2 x M20 glands (cable ∅ 7.5 – 13 mm) 1 x M25 with M25(M)/M20(F) adaptor and (M20) plug
Sensor	2 wire Pt 100, stainless steel sensor, 2 m long	2 wire Pt 100, stainless steel sensor, complete with wind shield

MOUNTING METHOD

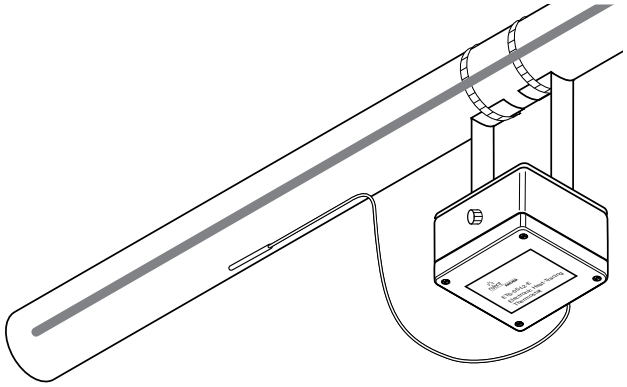
	nVent RAYCHEM support bracket SB-100 or SB-101, SB125 or surface mounting with 4 fixing holes on 110x140 mm centres	nVent RAYCHEM support bracket SB-100 or SB-101, SB125 or surface mounting with 4 fixing holes on 110x140 mm centres

ORDERING DETAILS

Part Description	RAYSTAT-EX-03	RAYSTAT-EX-04
PN (Weight)	333472-000 (3.0 kg)	462834-000 (3.1 kg)

ETS-05

SURFACE AND AMBIENT SENSING ELECTRONIC THERMOSTAT



PRODUCT OVERVIEW

The nVent RAYCHEM ETS-05 electronic surface and ambient sensing thermostat provides accurate temperature control for heating cables.

The ETS-05 is available in three versions. The ETS-05-L2-E is for temperatures up to 199°C, while the ETS-05-H2-E can be used for temperatures up to 499°C. The ETS-05-A2-E is an ambient sensing thermostat with a temperature setpoint in the range of 0°C to 49°C. The maximum nominal load is 32 A for the thermostats. Temperature setting is accurate via digital rotary switches inside the enclosure.

The ETS-05 has a LED indicator which indicates the status of the thermostat (powered on/off), the status of the heat-tracing cable (powered on/off) and the status of the sensor. In case of sensor failure the thermostat can switch to an on or off state, depending upon the users requirement.

PRODUCT CHARACTERISTICS

	ETS-05-L2-E (P)	ETS-05-H2-E (P)	ETS-05-A2-E
Application	Surface sensing	Surface sensing	Ambient sensing
Area of use	Hazardous area: Zone 1 or Zone 2 (Gas) or Zone 21 or Zone 22 (Dust) Ordinary		

APPROVALS CERTIFICATION

All units:
Ⓔx II 2(1)G II 2D
Ex e ia mb (Ga) IIC T5 Gb
Ex tb IIIC T100°C Db IP66
Ta–40 to +60°C Supply = 99-121V (ETS-05-x1-x) or 195-230V (ETS-05-x2-x)
IECEx BAS 13.0071
Baseefa13ATEX0137

ETS-05-L2-E(P)

EAC Ex

TC RU C-BE.ИМ43.B.01764
ООО "ТехИмпорт"
1Ex e ia mb [iaGa] IIC T5 Gb X
Ex tb IIIC T100°C
Db X IP66
Ta -52°C…+60°C

ETS-05-H2-E(P):

EAC Ex

TC RU C-BE.ИМ43.B.01764
ООО "ТехИмпорт"
1Ex e ia mb [iaGa] IIC T5 Gb
Ex tb IIIC T100°C Db IP66
Ta -60°C…+60°C

ETS-05-A2-E
No EAC Ex available yet

PRODUCT SPECIFICATION

No earth plate (standard)	Order ETS-05-L2-E	Order ETS-05-H2-E	Order ETS-05-A2-E
With earth plate (optional)	Order ETS-05-L2-EP	Order ETS-05-H2-EP	
Temperature setpoint range	0°C to 199°C	0°C to 499°C	0°C to 49°C
Temperature measurement range	−55°C to 260°C	−55°C to 585°C	−55°C to 260°C
Maximum sensor lead resistance	20 Ohm	20 Ohm	20 Ohm
Ingress protection	IP66	IP66	IP66
Switching accuracy	±1 K at 5°C	±1 K at 5°C, 2K at 499°C	±1 K at 5°C
Switching differential (Hysteresis)	≈ 3°C	≈ 3°C	≈ 3°C
Output relay	Single Pole change over type (SPST)	Single Pole change over type (SPST)	Single Pole change over type (SPST)
Switching capacity	32 A resistive load	32 A resistive load	32 A resistive load
Ambient temperature range	−40°C to + 60°C	−40°C to + 60°C	−40°C to + 60°C
Supply voltage	230 V +10% / -15% 50/60 Hz	230 V +10% / −15% 50/60 Hz	230 V +10% / −15% 50/60 Hz
Internal power consumption	3 VA	3 VA	3 VA
Terminal size	max. 6 mm^2	max. 6 mm^2	max. 6 mm^2

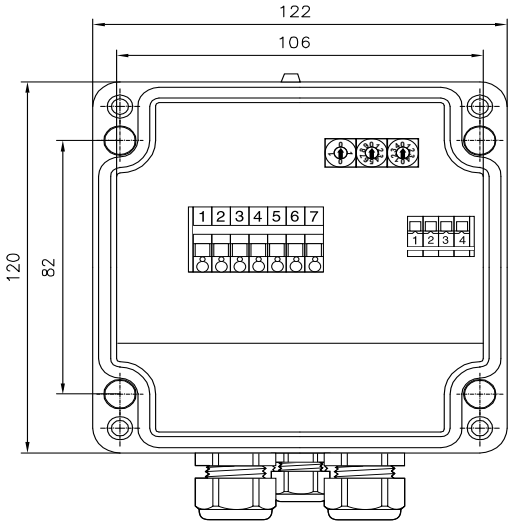
PRODUCT SPECIFICATION

Cable entries	2 x M25: 1 x M25 gland for power cable in 1 x M25 rain plug for heating cable out	2 x M25: 1 x M25 gland for power cable in 1 x M25 rain plug for heating cable out	2 x M25: 1 x M25 gland for power cable in 1 x M25 rain plug for heating cable out
Sensor	M16 gland with 3 wire PT100 flexible sensor, 2 m long	M16 gland with 3 wire PT100, stainless steel sensor, 2 m long,	MONI-PT100-EXE-AMB sensor

LED STATUS INDICATIONS

	Green: ETS-05 powered on, heat-tracing cable off	Green: ETS-05 powered on, heat-tracing cable off	Green: ETS-05 powered on, heat-tracing cable off
	Yellow: ETS-05 powered on, heat-tracing cable on	Yellow: ETS-05 powered on, heat-tracing cable on	Yellow: ETS-05 powered on, heat-tracing cable on
	Red flashing: Sensor failure - controller in fail safe mode	Red flashing: Sensor failure - controller in fail safe mode	Red flashing: Sensor failure - controller in fail safe mode

DIMENSIONS (IN MM)



Remark: The ETS-05-A2-E has two rotary switches for the temperature set point. Range is between 0°C and 49°C

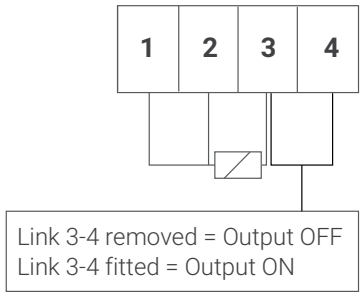
Power Terminals

1	2	3	4	5	6	7
Line Out	Neutral Out	Neutral Supply	230V Supply	Earth	Earth	Earth

Terminals 2 and 3 are joined electrically

Terminals 5, 6 and 7 are joined electrically

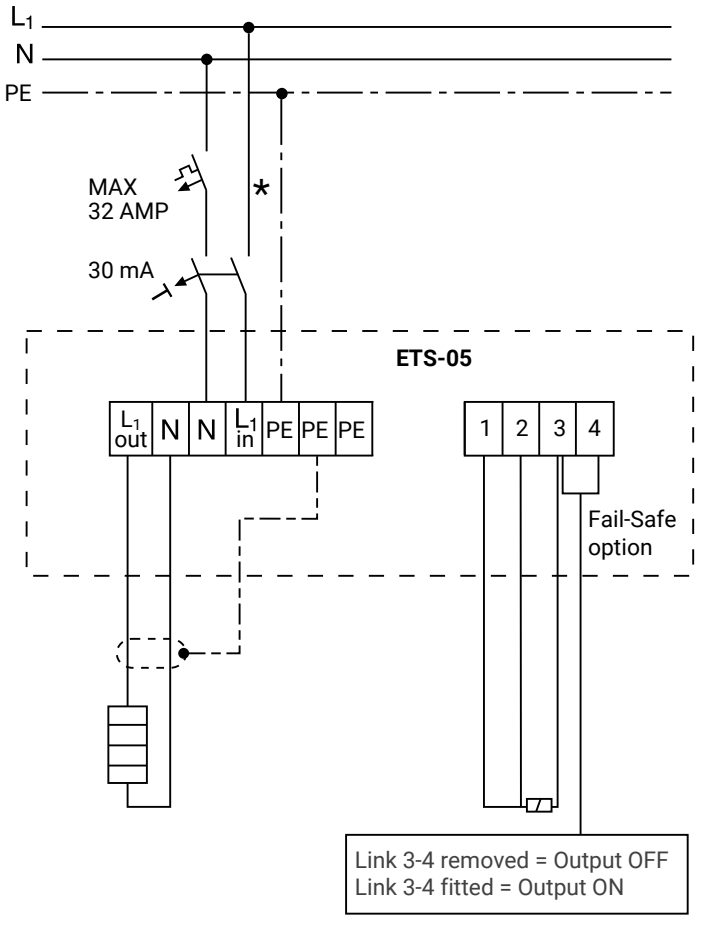
Sensor/Failure Mode Select Terminals



Terminals 1 to 3 allow for the connection of a three wire PT100 sensor.

Terminals 3 to 4 allow the user to select the default heating status on sensor error.
Without a link fitted the heating will turn OFF if a sensor error is detected (default)
With a link fitted the heating will turn ON if a sensor error is detected

TYPICAL WIRING DIAGRAM FOR DIRECT SWITCHING



* Circuit breaker configurations may vary according to local standards/requirements

MOUNTING METHOD

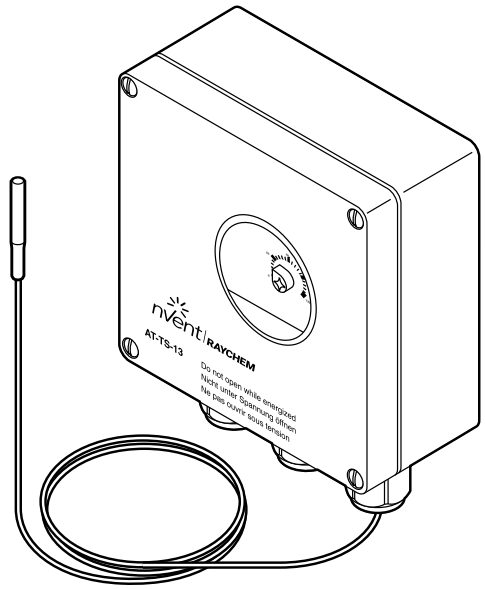
Support bracket SB-100, SB-101, SB-110, SB-111, SB-130 or surface mounting with 4 fixing holes on 106 x 82 mm centres	Support bracket SB-100, or SB-101, SB-110, SB-111, SB-130 or surface mounting with 4 fixing holes on 106 x 82 mm centres	To be mounted at representative location for correct ambient temperature measurement.	

ORDERING DETAILS

Product Name	ETS-05-L2-E	ETS-05-L2-EP	ETS-05-H2-E	ETS-05-H2-EP	ETS-05-A2-E
Part number	1244-014367	1244-017508	1244-014368	1244-017509	1244-022311

AT-TS-13 AND AT-TS-14

SURFACE SENSING THERMOSTAT, ELECTRONIC



nVent RAYCHEM AT-TS thermostats provide temperature control in safe area. The temperature set point can be checked through a window in the lid. LED´s are providing an indication when cables are energized (Heating ON) or when the temperature sensor is defect (sensor break or sensor short-circuit).

The temperature sensor has a length of 3 meter and can be shortened for ambient sensing operating. Direct connection of the heating cable is possible. Connection kits need to be ordered separately. The thermostat is available in 2 temperature ranges.

GENERAL

	nVent RAYCHEM AT-TS-13	nVent RAYCHEM AT-TS-14
Area of use	Ordinary area, outdoors	Ordinary area, outdoors
Supply voltage	230 Vac +10% –15% 50/60 Hz	230 Vac +10% –15% 50/60 Hz
Max. switching current	16 A, 250 Vac	16 A, 250 Vac
Max. conductor size	2.5 mm^2	2.5 mm^2
Switching differential	0.6 K to 1 K	0.6 K to 1 K
Switching accuracy	± 1 K at 5°C (calibration point)	2 K at 60°C (calibration point)
Switch type	SPST (normally open)	SPST (normally open)
Adjustable temperature range	–5°C to +15°C	0°C to +120°C

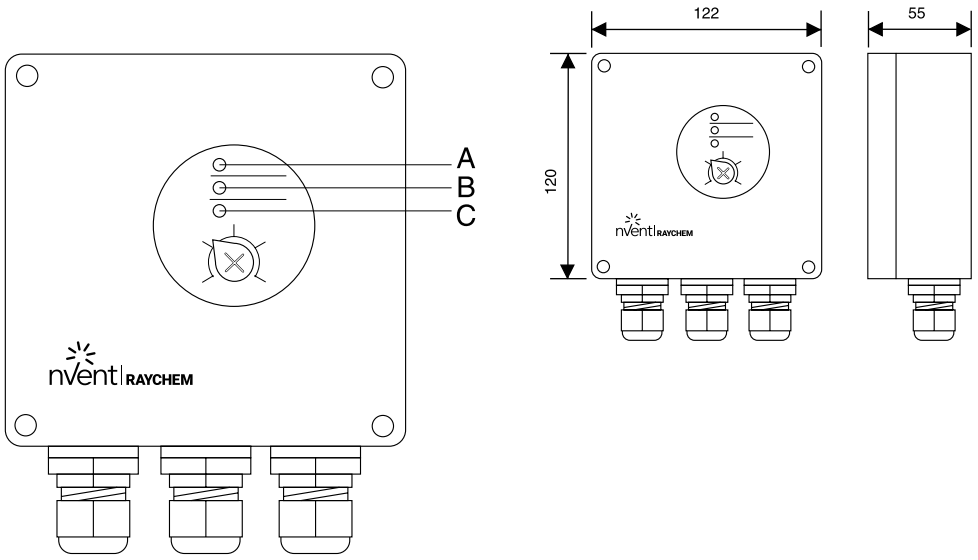
HOUSING

Temperature setting	inside	inside
Exposure temperature	–20°C to +50°C	–20°C to +50°C
Ingress protection	IP65 according to EN 60529	IP65 according to EN 60529
Entries	1 x M20 for supply cable (∅ 8-13 mm) 1 x M25 for heating element (∅ 11-17 mm) 1 x M16 for the sensor	1 x M20 for supply cable (∅ 8-13 mm) 1 x M25 for heating element (∅ 11-17 mm) 1 x M16 for the sensor
Material	ABS	ABS
Lid fixing	nickel-plated quick release screws	nickel-plated quick release screws
Mounting	SB-110 and SB-111 or surface mount	SB-110 and SB-111 or surface mount

APPROVALS

EAC C-BE.БЛ08.B.01634
Made in HU

DIMENSIONS (IN MM)



A Green LED Heating cable on
B Red LED Sensor break
C Red LED Sensor short-circuit

TEMPERATURE SENSOR

	AT-TS-13	AT-TS-14
Type	PTC KTY 83-110	PTC KTY 83-110
Length sensor cable	3 m	3 m
Diameter sensor cable	5.5 mm	5.5 mm
Diameter sensor head	6.5 mm	6.5 mm
Sensor material	PVC	Silicone
Max. exposure temperature sensor cable	80°C	160°C

The sensor cable may be extended to a maximum of 100 m using a 2-conductor wire with a cross-section of 1.5 mm^2. The sensor cable should be shielded if it is laid in cable ducts or in the vicinity of high-voltage carrying cables. The shield of the extension cable should be grounded at the controller end only.

OUTPUT PARAMETERS

Alarm on LED	Green LED: Heating Cable ON Red LED: Sensor break Red Led: Sensor short-circuit	Green LED: Heating Cable ON Red LED: Sensor break Red Led: Sensor short-circuit

ORDERING DETAILS

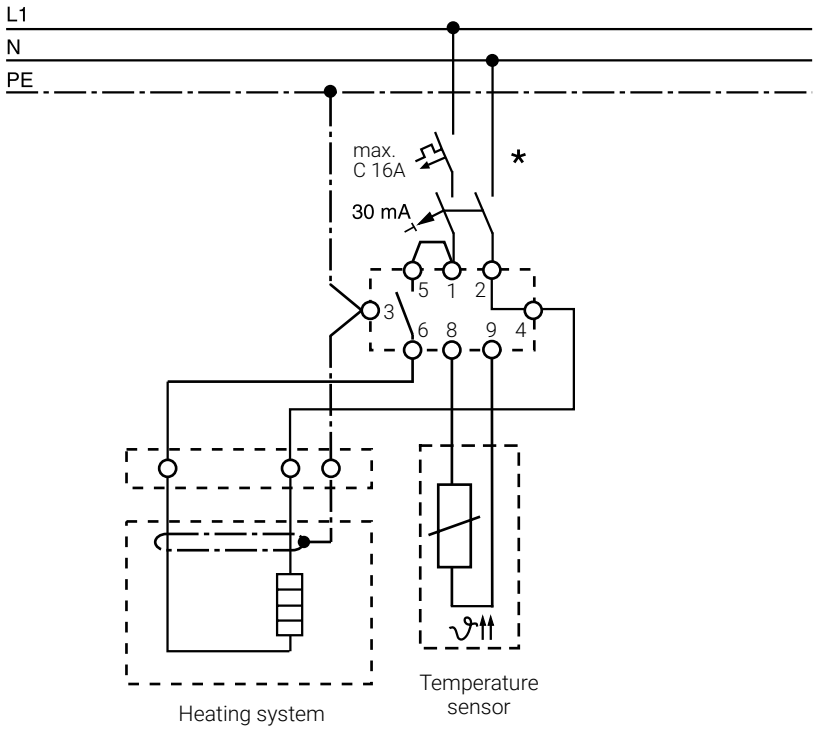
Part description	AT-TS-13	AT-TS-14
PN (Weight)	728129-000 (0.44 kg)	648945-000 (0.44 kg)

ACCESSORIES

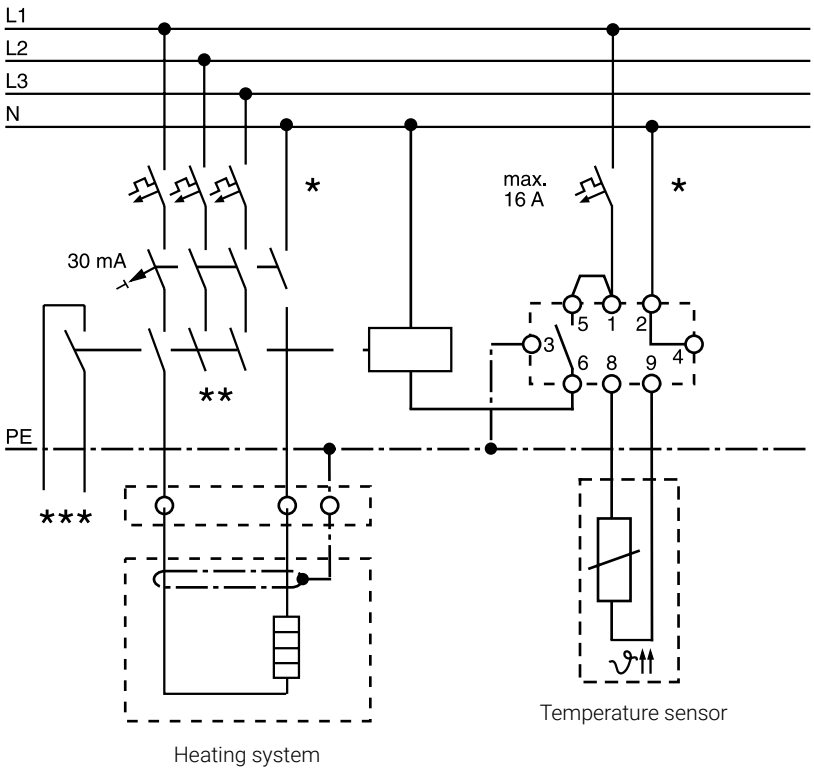
PA Reducer	Reducer M25 (M)/M20 (F)	Reducer M25 (M)/M20 (F)
PN	184856-000	184856-000
Spare temperature sensor	HARD-69	HARD-69
(AT-TS-13 and AT-TS-14)	(Max. exposure temperature 160°C)	
PN (Weight)	133571-000 (180 g)	133571-000 (180 g)

WIRING DIAGRAM FOR THERMOSTAT

AT-TS-13 or AT-TS-14



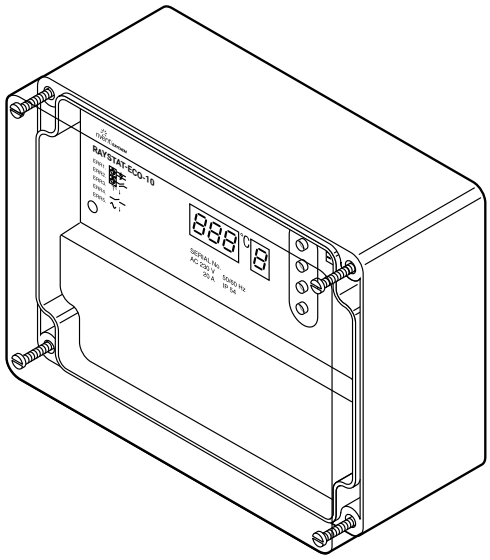
AT-TS-13/14 with contactor



* Two- or four-pole electrical protection by circuit-breaker may be needed for local circumstances, standards and regulations
** Depending on the application, one- or three-pole circuit-breakers or contactors may be used
*** Optional: Potential-free circuit-breaker for connection to the BMS

RAYSTAT-ECO-10

AMBIENT SENSING ENERGY SAVING FROST PROTECTION CONTROLLER



The nVent RAYCHEM RAYSTAT-ECO-10 temperature controller is designed to control heating cables used for frost protection applications. It continuously adjusts the heat-tracing output based on the ambient temperature. Using a proprietary algorithm, the RAYSTAT-ECO-10 controller measures ambient temperature and determines the appropriate cycle time during which the heating cables will be energised.

Since ambient temperatures in winter are often below freezing point, but well above the minimum designed ambient temperature, significant energy savings are realised. Parameters are displayed and can be set easily. The controller includes a 25 A relay which allows direct switching of the heating circuit. The enclosure can easily be installed outdoors. The unit includes a Pt 100 sensor for determining ambient temperature in ordinary area.

The RAYSTAT-ECO-10 controller is designed to provide trouble-free, long term operation. In addition to the display, the controller includes an alarm relay that switches either upon low supply voltage, upon output fault or upon RTD failure thus allowing remote indication of system status.

GENERAL

Area of use	Ordinary area, outdoors
Ambient operating temperature range	–20°C to +40°C
Supply voltage (nominal)	230 V +10% –10%, 50/60 Hz
Internal power consumption	≤ 14 VA

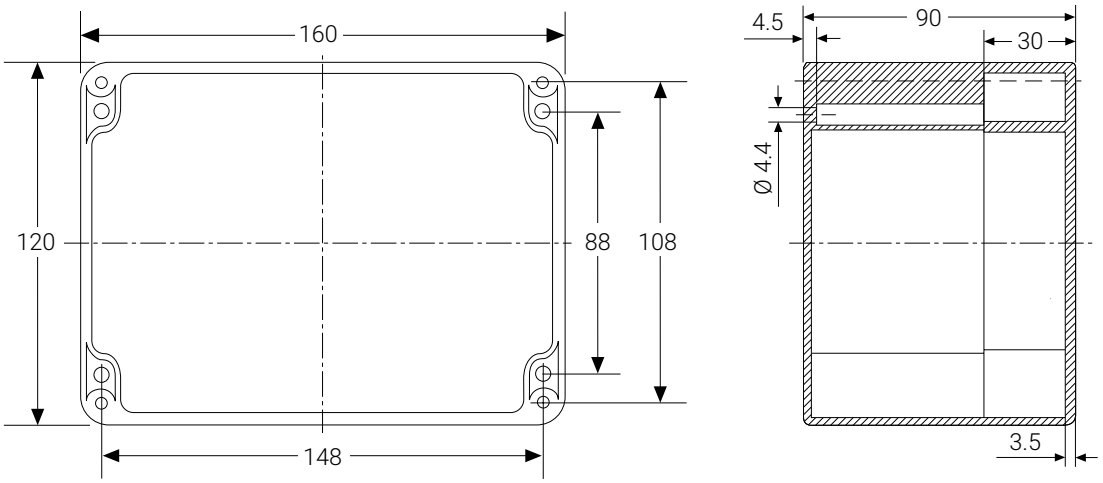
ENCLOSURE

Protection	IP65
Base and lid	Grey polycarbonate base Transparent lid
Lid fixing	4 captive screws
Entries	2 x M25, 1 x M20, 1 x M16 Direct entry of heating cable into unit with M25 connection kit
Gland plug	1 x M20

APPROVALS

EAC C-BE.БЛ08.B.01634
Made in GB

DIMENSIONS (IN MM)



TEMPERATURE SENSOR

Type	3-wire Pt 100 according to IEC Class B
Area of use	Ordinary area

Sensor can be extended with a 3-wire shielded cable of max. 20 Ω per conductor (max. 150 m with a 3 x 1.5 mm^2 cable). The sensor cable should be shielded if it is laid in cable ducts or in the vicinity of high-voltage carrying cables. The shield of the extension cable should be grounded at the controller end only.

OUTPUT RELAYS

Control relay	Single pole single throw relay, rating: 25 A at 250 Vac
Alarm relay	Single pole double throw relay, rating: 2 A at 250 Vac, voltfree

PARAMETER SETTINGS

Maintain temperature set point	0°C to + 30°C (heating 0% powered)
Minimum ambient temperature	–30°C to 0°C (heating 100% powered)
Heater Operation if Sensor Error	ON (100%) or OFF, user defined ON or OFF
Voltage Free Operation	YES or NO

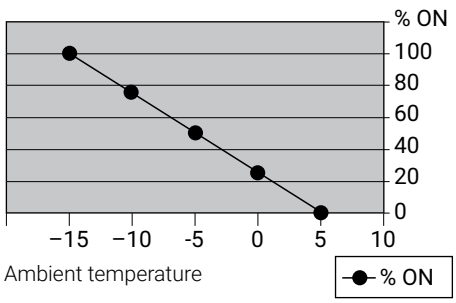
Parameters can be programmed without power supply (internal battery) and parameters are stored in non-volatile memory.

ENERGY SAVING WITH PROPORTIONAL AMBIENT SENSING CONTROL (PASC)

Duty cycle (power to heater ON) depends on the ambient temperature.

For example:
If minimum temperature= –15°C and if maintain temperature (set point)= +5°C

AMBIENT T°	% ON	
–15	100	Min. Ambient
–10	75	
–5	50	
0	25	
5	0	Set point

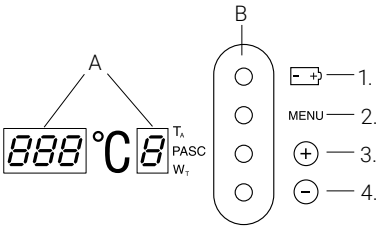


Result: At ambient temperature of –5°C, 50% energy is saved

DIAGNOSED ALARMS

Sensor errors	Sensor short/Sensor open circuit
Low temperature	Min. expected ambient temperature reached
Voltage errors	Low supply voltage/Output voltage fault

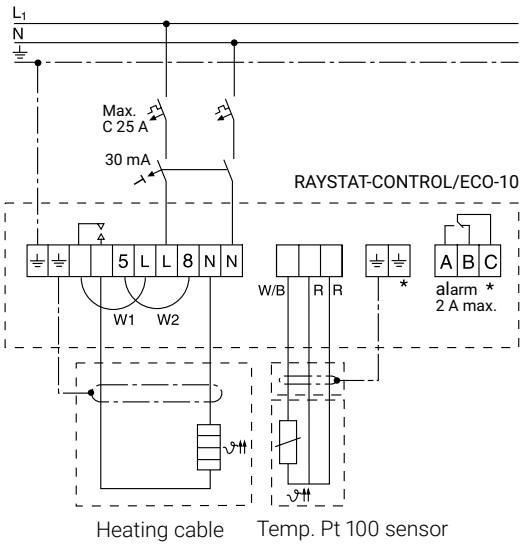
DISPLAY LAYOUT



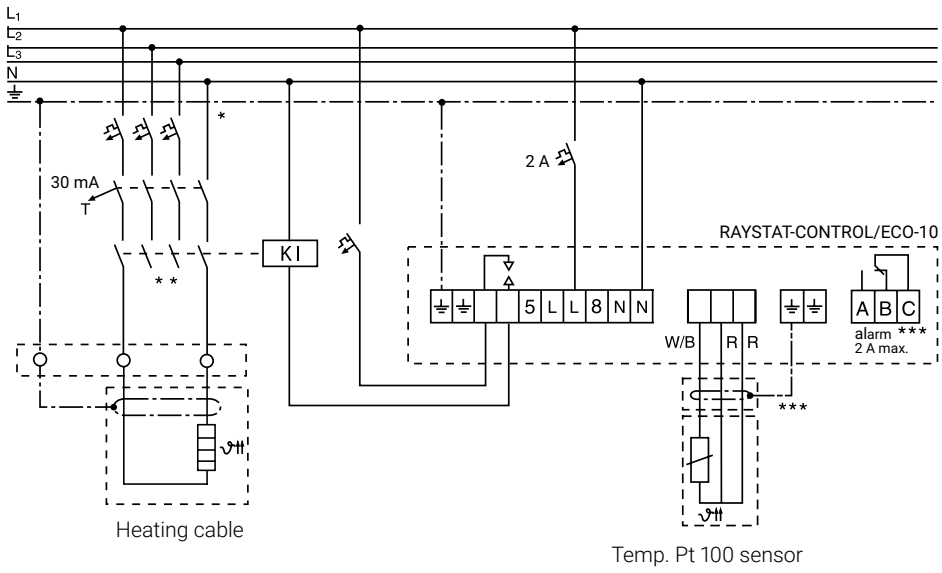
A. LED Display (parameter and error indications)
B. Push buttons
   1. Battery activation
   2. Parameter selection
   3. Increase value
   4. Decrease value

CONNECTION DETAILS

Normal operation



VOLTAGE FREE OPERATION: REMOVE LINKS W1 AND W2



* Electrical protection by circuit-breaker may be needed for local circumstances, standards and regulations.

** Depending on the application, one- or three-pole circuit-breakers or contactors may be used.

*** Optional

CONNECTION TERMINALS

Supply	3 terminals for 0.75 mm^2 to 4 mm^2
Pt 100 connection	4 terminals for 0.75 mm^2 to 2.5 mm^2
Control relay connection	3 terminals for 0.75 mm^2 to 4 mm^2
Alarm relay connection	3 terminals for 0.75 mm^2 to 2.5 mm^2

MOUNTING METHOD

	Surface mounting with 4 fixing holes on 148 x 108 mm centres, M4 clearance
Support bracket	SB-100, SB-101 (SB-110 or SB-111)

ORDERING DETAILS

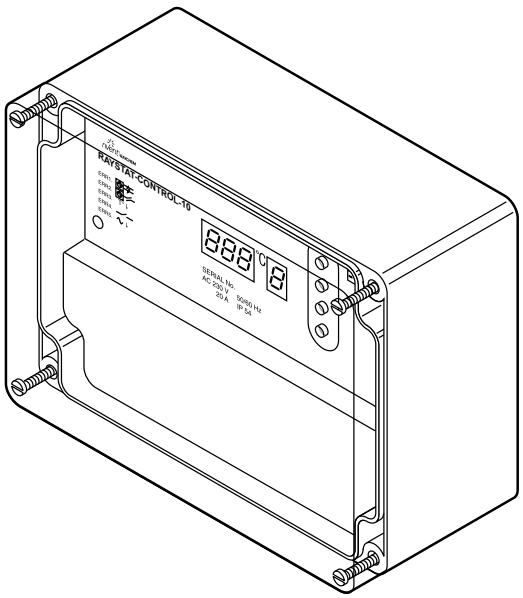
Part description	RAYSTAT-ECO-10
PN (Weight)	145232-000 (0.8 kg)

ACCESSORIES

PA Reducer	Reducer M25 (M)/M20 (F)
PN	184856-000

RAYSTAT-CONTROL-10

SURFACE SENSING PROGRAMMABLE THERMOSTAT WITH ALARM RELAY



The nVent RAYCHEM RAYSTAT-CONTROL-10 surface sensing thermostat is designed to provide user friendly measurement and control for heating cables. The thermostat has a 25 A control relay (that can be arranged to be volt free) and a 2 A volt free SPDT alarm relay.

Parameter and eventual alarm conditions are shown on the digital display and settings can be programmed easily, even without power supply.

The RAYSTAT-CONTROL-10 thermostat is supplied with a Pt100 sensor. This sensor has a 3 m long silicone extension cable giving freedom to locate the electronics remote from the sensor.

Two M25 entries allow for the power cable and heating cable to be connected directly into the unit. The units can be mounted on the pipe using the SB-100 or SB-101 support bracket.

GENERAL

Application	Surface sensing
Area of use	Ordinary area (indoors, outdoors) Sensing in zone 1 or zone 2 possible with MONI-PT100-EXE (seperately available)
Ambient operating temperature range	–20°C to +40°C
Supply voltage (nominal)	230 V +10% –10%, 50/60 Hz
Internal power consumption	≤ 14 VA

ENCLOSURE

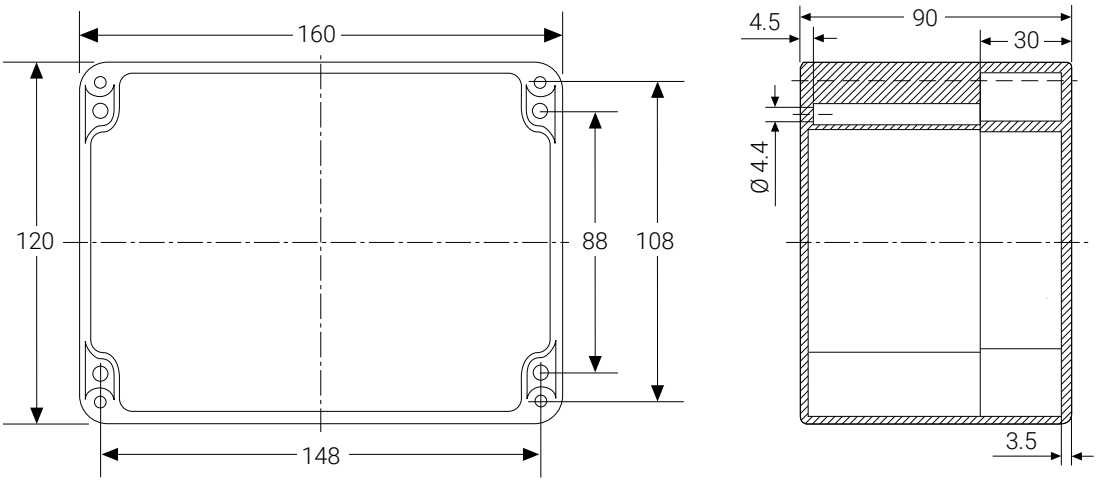
	IP65
Base and lid	Grey polycarbonate base Transparent lid
Lid fixing	4 captive screws
Entries	2 x M25, 1 x M20, 1 x M16 Direct entry of heating cable into unit with M25 connection kit
Gland plug	1 x M20

APPROVALS

EAC

C-BE.БЛ08.B.01634
Made in GB

DIMENSIONS (IN MM)



TEMPERATURE SENSOR

Type	3-wire Pt 100 according to IEC Class B
Maximum exposure temperature	200°C
Area of use	Ordinary area

Sensor can be extended with a 3-wire shielded cable of max. 20 Ω per conductor (max. 150 m with a 3 x 1.5 mm^2 cable).
Sensing in hazardous area zone 1 or zone 2 can be done with MONI-PT100-EXE.
The sensor cable should be shielded if it is laid in cable ducts or in the vicinity of high-voltage carrying cables. The shield of the extension cable should be grounded at the controller end only.

OUTPUT RELAYS

Control relay	Single pole single throw relay, rating: 25 A at 250 Vac
Alarm relay	Single pole double throw relay, rating: 2 A at 250 Vac, voltfree

PROGRAMMABLE PARAMETER SETTINGS

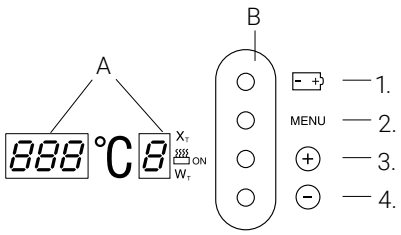
Temperature setting	0°C to +150°C
Hysteresis	1 K to 5 K
Low Temperature Alarm	−40°C to +148°C
High Temperature Alarm	+2°C to +150°C or switched OFF
Heater Operation if Sensor Error	ON or OFF
Volt Free Operation	YES or NO

Parameters can be programmed without power supply (internal battery) and parameters are stored in non-volatile memory.

DIAGNOSED ALARMS

Sensor errors	Sensor short/Sensor open circuit
Low temperature	High temperature/Low temperature
Voltage errors	Low supply voltage/Output voltage fault

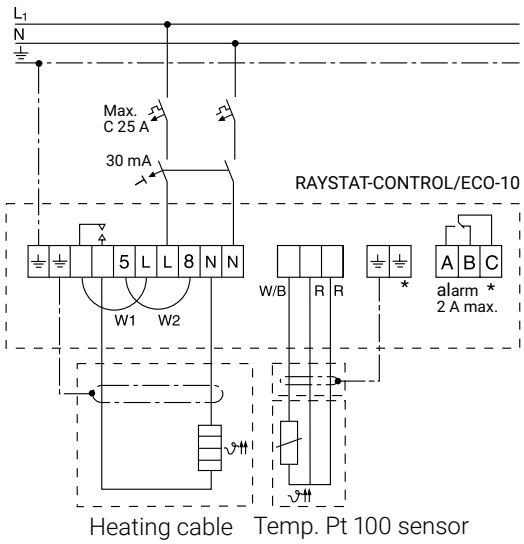
DISPLAY LAYOUT



A. LED Display (parameter and error indications)
B. Push buttons
1. Battery activation
2. Parameter selection
3. Increase value
4. Decrease value

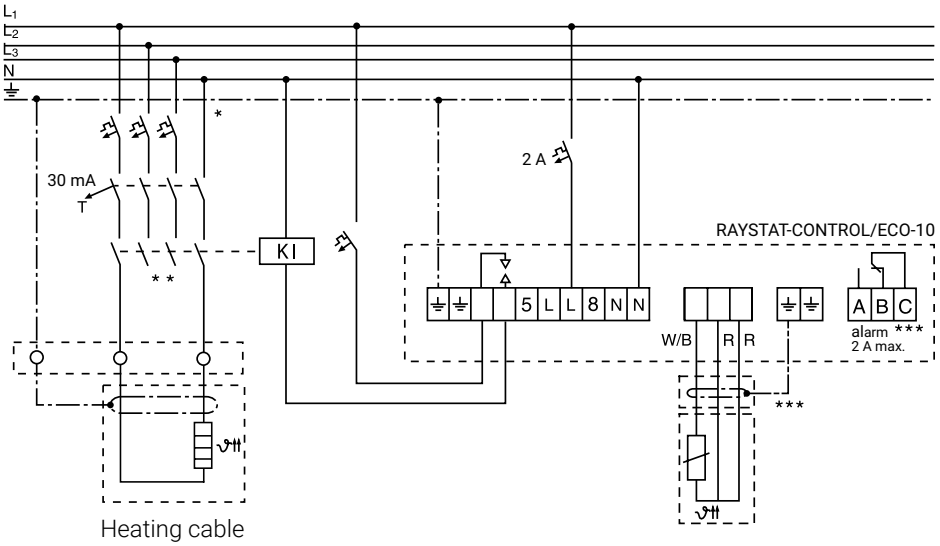
CONNECTION DETAILS

Normal operation



Heating cable Temp. Pt 100 sensor

VOLTAGE FREE OPERATION: REMOVE LINKS W1 AND W2



Heating cable

Temp. Pt 100 sensor

* Electrical protection by circuit-breaker may be needed for local circumstances, standards and regulations.

** Depending on the application, one- or three-pole circuit-breakers or contactors may be used.

*** Optional

CONNECTION TERMINALS

Supply	3 terminals for 0.75 mm^2 to 4 mm^2
Pt 100 connection	4 terminals for 0.75 mm^2 to 2.5 mm^2
Control relay connection	3 terminals for 0.75 mm^2 to 4 mm^2
Alarm relay connection	3 terminals for 0.75 mm^2 to 2.5 mm^2

MOUNTING METHOD

	Surface mounting with 4 fixing holes on 148 x 108 mm centres, M4 clearance
Support bracket	SB-100, SB-101

ORDERING DETAILS

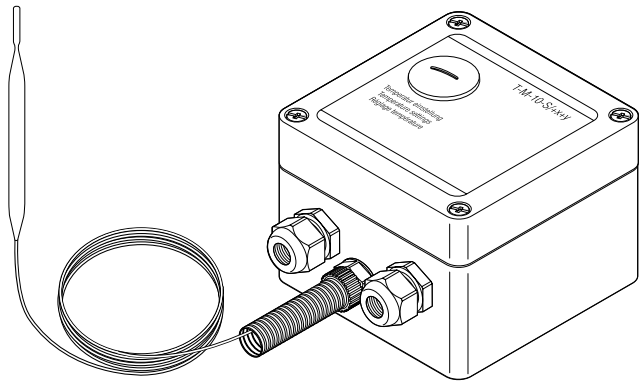
Part description	RAYSTAT-CONTROL-10
PN (Weight)	828810-000 0.8 kg)

ACCESSORIES

PA Reducer	Reducer M25 (M)/M20 (F)
PN	184856-000

T-M-10-S/+X+Y

SURFACE SENSING THERMOSTAT



A surface sensing thermostat providing temperature control in safe areas.

Temperature set point adjustment can be completed, without opening the enclosure, via a removable plug in the lid.
The 2 meter long stainless steel capillary is protected at the enclosure by a flexible conduit.

Direct connection of the heating cable is possible.

The thermostat is available in 3 temperature ranges: 0–50°C; 0–200°C; 50–300°C.

GENERAL

	T-M-10-S/+0+50C	T-M-10-S/0+200C	T-M-10-S/+50+300C
Area of use	Ordinary area	Ordinary area	Ordinary area

PRODUCT SPECIFICATION

Max rated voltage (nom)	230 Vac	230 Vac	230 Vac
Temperature setting	0°C to +50°C	0°C to +200°C	+50°C to +300°C
Switching type	Single pole change over (SPDT) 100,000 cycles at 16 A	Single pole change over (SPDT) 100,000 cycles at 16 A	Single pole change over (SPDT) 100,000 cycles at 16 A
Switching capacity	Max 16 A	Max 16 A	Max 16 A
Hysteresis/Differential	2.5% of temperature range	2.5% of temperature range	2.5%of temperature range
Accuracy	±1.5% of setpoint for temperature setting in upper third of range (measured at 22°C)		
Setting	Internal dial, through lid	Internal dial, through lid	Internal dial, through lid
Terminal size	4 mm^2	4 mm^2	4 mm^2
Ambient operating temp. range	–20°C to +80°C	–20°C to +80°C	–20°C to +80°C

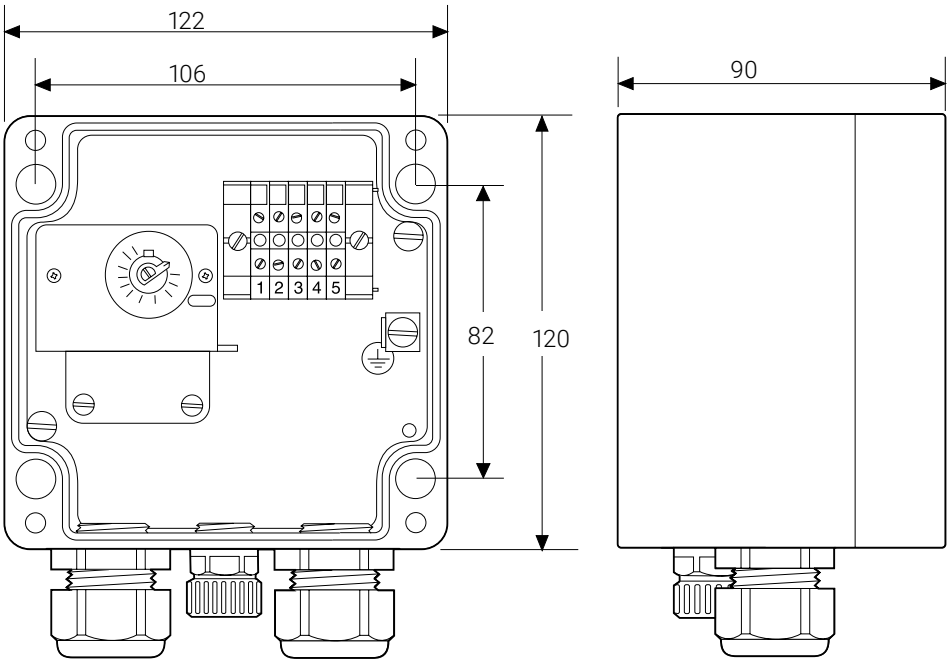
OUTPUT PARAMETERS

Control relay	Change-over switch	Change-over switch	Change-over switch

APPROVALS

EAC (Russia, Kazakhstan, Belarus)
For other countries contact your local nVent representative.

DIMENSIONS (IN MM)



ENCLOSURE

	T-M-10-S/0+50C	T-M-10-S/0+200C	T-M-10-S/+50+300C
Protection	IP65	IP65	IP65
Dimension	122 x 120 x 90 mm	122 x 120 x 90 mm	122 x 120 x 90 mm
Materials body and lid	Grey, polyester enclosure		
Lid fixing	4 captive screws, stainless steel		
Entries	2 entries: 1 x M25 Reducer M25 (M)/M20 (F) incl. M20 gland (ø 8-13 mm) 1 x M20 gland (ø 8-13 mm)		

TEMPERATURE SENSOR

Type		Fluid filled capillary, 2 m long		
Dimensions	ø	8 mm	8 mm	8 mm
	Length sensing element	166 mm	78 mm	56 mm
Material		V4A Stainless Steel		
Exposure temperature		–40°C to +60°C	–20°C to +230°C	–20°C to +345°C
Minimum bending radius		10 mm for capillary, the sensor cannot be bent		

MOUNTING METHOD

Support bracket	SB-110 or SB-111 or surface mount	SB-110 or SB-111 or surface mount	SB-110 or SB-111 or surface mount

ORDERING DETAILS

Ordering references	PN Number	Weight
T-M-10-S/0+50C	105336-000	1 kg
T-M-10-S/0+200C	337388-000	1 kg
T-M-10-S/+50+300C	607672-000	1 kg

MEANING OF REFERENCE: T-M-10-S/+X+Y

T = thermostat

M = mechanical thermostat

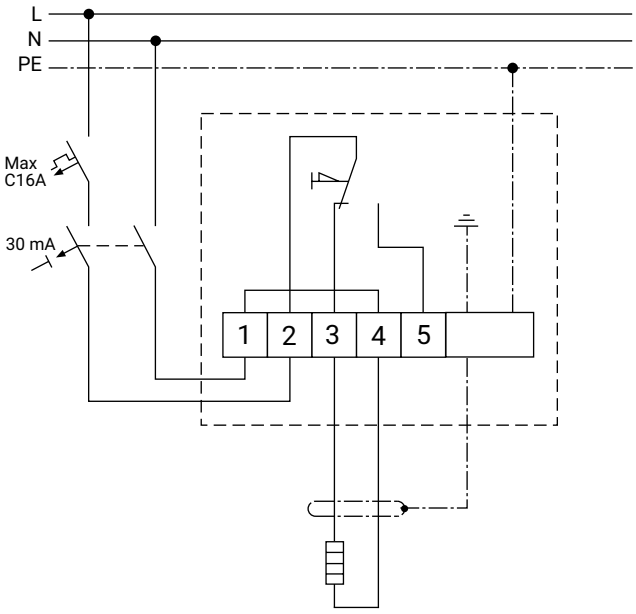
10 = control thermostat

S = surface sensing

x = min temperature of control range

y = max temperature of control range

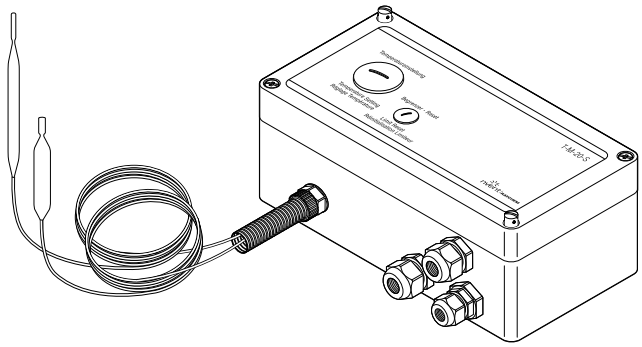
CONNECTION DETAILS



Heating system

T-M-20-S/+X+Y

SURFACE SENSING THERMOSTAT WITH LIMITER



A surface sensing thermostat providing temperature control and temperature limiter in safe areas. The high limit cut-out prevents the heating system exceeding a preset maximum temperature should the control function fail to operate or an unsafe process temperature occur.

Temperature set point adjustment and limiter reset can be completed, without opening the enclosure, via removable plugs in the lid.

Both 2 meter long stainless steel fluid filled bulb and capillary are protected at the enclosure by a flexible conduit.

Direct connection of the heating cable is possible.
The thermostat is available in 3 temperature ranges. 0–50°C; 0–200°C; 50–300°C.

GENERAL

		T-M-20-S/0+50C	T-M-20-S/0+200C	T-M-20-S/+50+300C
Area of use		Ordinary area	Ordinary area	Ordinary area

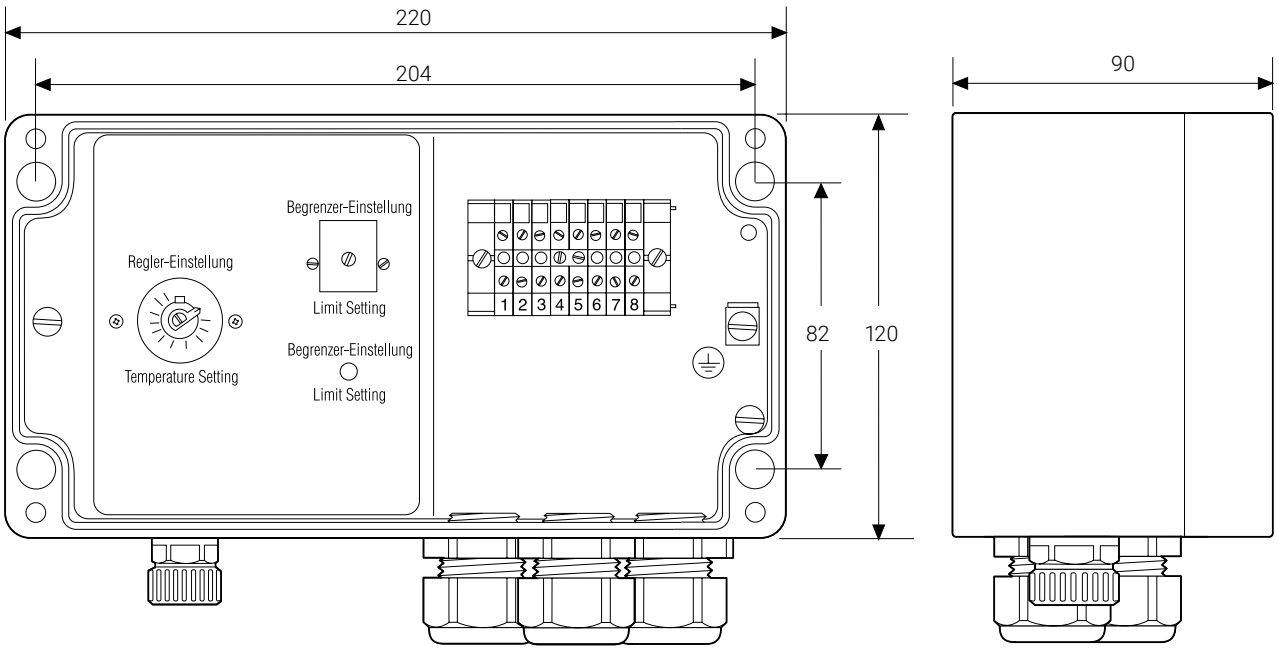
PRODUCT SPECIFICATION

Max rated voltage (nom)		230 Vac	230 Vac	230 Vac
Temperature setting	Controller	0°C to +50°C	0°C to +200°C	+50°C to +300°C
	Limiter	+20°C to +150°C	+130°C to +200°C	+20°C to +400°C
Switching type		Single pole change over (SPDT) 100,000 cycles at 16 A (controller) 500 cycles at 10 A (limiter)		
Switching capacity	Controller	Max 16 A at 230 Vac	Max 16 A at 230 Vac	Max 16 A at 230 Vac
	Limiter	Max 10 A at 230 Vac	Max 10 A at 230 Vac	Max 10 A at 230 Vac
Breaking capacity	Controller	3700 VA	3700 VA	3700 VA
	Limiter	2300 VA	2300 VA	2300 VA
Hysteresis/Differential		2.5% of temperature range	2.5% of temperature range	2.5% of temperature range
Accuracy		±0.5% of setpoint in upper third of temperature range (at 22°C ambient)		
Setting		Internal dial, through lid	Internal dial, through lid	Internal dial, through lid
Terminal size		4 mm^2	4 mm^2	4 mm^2
Ambient operating temp. range		–20°C to +80°C	–20°C to +80°C	–20°C to +80°C

APPROVALS

EAC (Russia, Kazakhstan, Belarus)
For other countries contact your local nVent representative.

DIMENSIONS (IN MM)



OUTPUT PARAMETERS

	T-M-20-S/0+50C	T-M-20-S/0+200C	T-M-20-S/+50+300C
Control relay	Change-over switch (SPDT)		
Limiter relay	Change-over switch with possibility for external alarm (SPDT)		

ENCLOSURE

Protection	IP65	IP65	IP65
Dimension	222 x 120 x 90 mm	222 x 120 x 90 mm	222 x 120 x 90 mm
Materials body and lid	Grey, polyester enclosure	Grey, polyester enclosure	Grey, polyester enclosure
Lid fixing	4 captive screws, stainless steel		
Entries	3 entries: 1 x M25 Reducer M25 (M)/M20 (F) incl. M20 gland (Ø 8–13 mm) 1 x M20 gland (∅ 8–13 mm) 1 x M20 gland (∅ 8–13 mm)		

TEMPERATURE SENSOR

Type		Fluid filled capillary, 2 meter long		
Dimensions				
Controller	∅	8 mm	8 mm	8 mm
	Length sensing element	166 mm	78 mm	56 mm
Limiter	∅	6 mm	6 mm	6 mm
	Length sensing element	80 mm	78 mm	176 mm
Material		V4A Stainless Steel	V4A Stainless Steel	V4A Stainless Steel
Exposure temperature	Controller	–40°C to +60°C	–20°C to +230°C	–20°C to +345°C
	Limiter	–40°C to +170°C	–20°C to +230°C	–40°C to +500°C
Minimum bending radius		10 mm for capillary, the sensor cannot be bent		

MOUNTING METHOD

Support bracket	SB-120 or surface mount

ORDERING DETAILS

Ordering references	PN Number	Weight
T-M-20-S/0+50C	260448-000	1.9 kg
T-M-20-S/0+200C	750502-000	1.9 kg
T-M-20-S/+50+300C	608706-000	1.9 kg

MEANING OF REFERENCE: NVENT RAYCHEM T-M-20-S/+X+Y

T= thermostat

M= mechanical thermostat

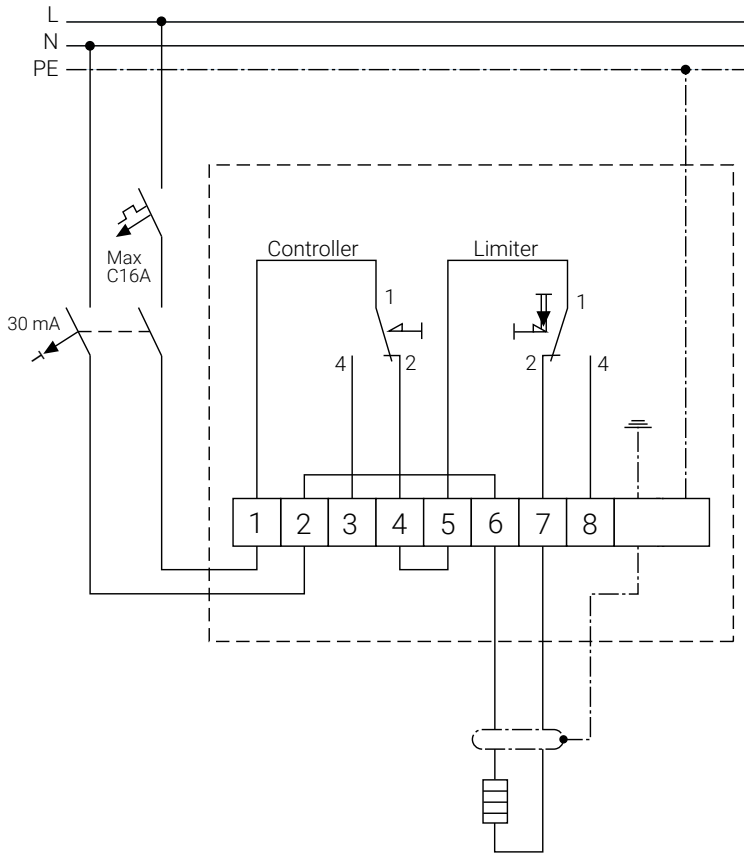
20= control thermostat + limiter

S= surface sensing

x= min temperature of control range

y= max temperature of control range

CONNECTION DETAILS

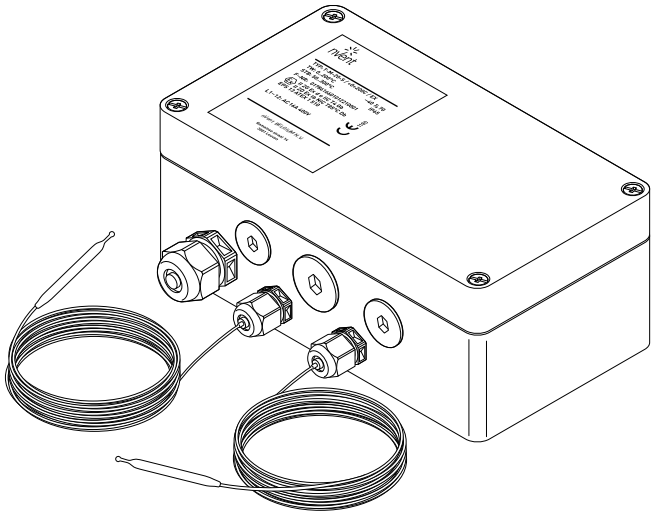


Heating system

T-M-20-S/+X+Y/EX

nVent RAYCHEM

SURFACE SENSING THERMOSTAT WITH SAFETY LIMITER FOR HAZARDOUS AREA



A surface sensing thermostat providing temperature control and temperature limit in hazardous areas.
The safety limiter prevents the heating system exceeding a preset maximum temperature should the control function fail to operate or an unsafe process temperature occur. The maximum rated voltage is 400 VAC. The switching current capacity is 16 A maximum via independent Ex d single pole change over micro switches with volt-free contacts.
The switches are mounted within an Ex e enclosure together with a spring-type terminal block for fast easy connection. The sensors are 3 meter long stainless steel fluid filled bulb and capillary.
The thermostat is delivered with Ex approved power cable glands and plugs and the entries offer the possibility for a variety of connections such as connecting M25 and M20 glands for direct heating cable entry or alarm output.
The thermostat with limiter is available in 3 temperature ranges: +0°C +120°C, +0°C +200°C and +50°C +300°C

GENERAL

	T-M-20-s/+0+120C/EX	T-M-20-S/+0+200C/EX	T-M-20-S/+50+300C/EX
Area of use	Hazardous area: Zone 1 or Zone 2 (Gas) or Zone 21 or Zone 22 (Dust)		
	Ordinary		

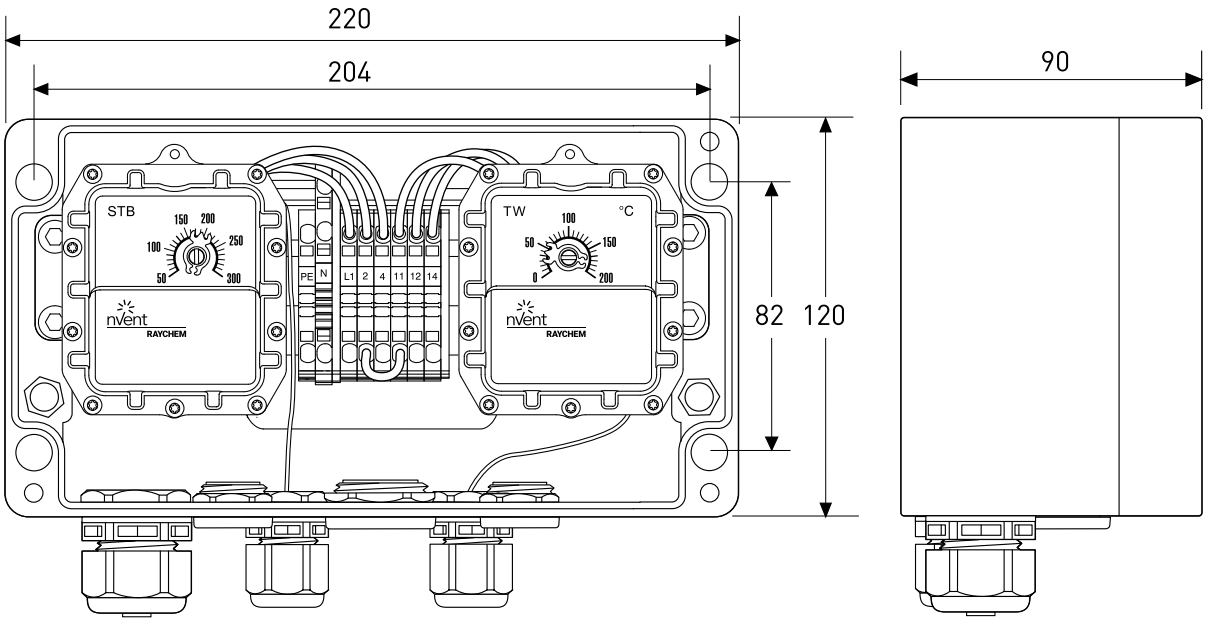
APPROVAL CERTIFICATION

	EPS 13 ATEX 1 510 II 2G Ex d e IIC T4/T5/T6 Gb II 2D Ex tb IIIC T85°C /T100°C/T130°C Db	EPS 13 ATEX 1 510 II 2G Ex d e IIC T4/T5/T6 Gb II 2D Ex tb IIIC T85°C /T100°C/T130°C Db	EPS 13 ATEX 1 510 II 2G Ex d e IIC T4/T5/T6 Gb II 2D Ex tb IIIC T85°C /T100°C/T130°C Db
	EAC Ex RU C-BE.ИМ43.B.01764 ООО "ТехИмпорт" 1Ex d e IIC T6/T5/T4 Gb Ex tb IIIC T85°C/T100°C/T130°C Db IP65 Ta -60°C...+70°C Made in GE	EAC Ex RU C-BE.ИМ43.B.01764 ООО "ТехИмпорт" 1Ex d e IIC T6/T5/T4 Gb Ex tb IIIC T85°C/T100°C/T130°C DbIP65 Ta -40°C...+70°C Made in GE	EAC Ex RU C-BE.ИМ43.B.01764 ООО "ТехИмпорт" 1Ex d e IIC T6/T5/T4 Gb Ex tb IIIC T85°C/T100°C/T130°C Db IP65 Ta -40°C...+70°C Made in GE

PRODUCT SPECIFICATION

Temperature setting	Controller Limiter	+0°C to +120°C +0°C to +120°C	+0°C to +200°C +50°C to +300°C	+50°C to +300°C +50°C to +300°C
Switching type		Single pole change over (SPDT) >100.000 cycles at I nom	Single pole change over (SPDT) >100.000 cycles at I nom	Single pole change over (SPDT) >100.000 cycles at I nom
Switching capacity		Maximum 16A at 400 Vac, resistive load	Maximum 16A at 400 Vac, resistive load	Maximum 16A at 400 Vac, resistive load
Hysteresis/ Differential	Controller Limiter	max. 2.5% range, calibrated downwards max 7% calibrated upwards	max. 2.5% range, calibrated downwards max. 7.5%, calibrated upwards	max. 2.5% range, calibrated downwards max. 7.5%, calibrated upwards
Setting		Inside enclosure	Inside enclosure	Inside enclosure
Reset limiter		Inside enclosure by means of a screwdriver		
Terminal size		4 mm^2	4 mm^2	4 mm^2
Terminal type		spring-type terminals	spring-type terminals	spring-type terminals
Ambient operating temp. range		–40°C to +70°C	–40°C to +70°C	–40°C to +70°C

DIMENSIONS (IN MM)



OUTPUT PARAMETERS

	T-M-20-S/+0+120C/EX	T-M-20-S/+0+200C/EX	T-M-20-S/+50+300C/EX
Control relay	Change-over switch	Change-over switch	Change-over switch
Limiter relay	Change-over switch with possibility for external alarm Capillary leakage detection system		

ENCLOSURE

Protection	IP65	IP65	IP65
Dimension	220 x 120 x 90 mm	220 x 120 x 90 mm	220 x 120 x 90 mm
Materials body and lid	Black, glass filled polyester enclosure	Black, glass filled polyester enclosure	Black, glass filled polyester enclosure
Lid fixing	4 captive screws, stainless steel	4 captive screws, stainless steel	4 captive screws, stainless steel
Entries	6 entries: 1 x M25 gland (∅ 8-17 mm): power supply 1 x M25 stopping plug: output to heating cables 2 x M20 stopping plug: output to heating cables (possibility to connect single conductor heating element) 2 x M20: capillary sensors		

TEMPERATURE SENSOR

Type		Fluid filled capillary, 3 m long	Fluid filled capillary, 2 m long	Fluid filled capillary, 2 m long
Dimensions	Controller	∅ 6 mm; length sensing element = 90 mm	∅ 6 mm; length sensing element = 72 mm	∅ 4 mm; length sensing element = 135 mm
	Limiter	∅ 6 mm; length sensing element = 58 mm	∅ 4 mm; length sensing element = 78 mm	∅ 4 mm; length sensing element = 78 mm
Material			stainless steel	stainless steel
Temperature exposure	Controller	−40°C +138°C	−40°C +230°C	−40°C +345°C
	Limiter	−40°C +138°C	−40°C +345°C	−40°C +345°C
Minimum bending radius		5 mm for capillary (not for sensor)	5 mm for capillary (not for sensor)	5 mm for capillary (not for sensor)

MOUNTING METHOD

Support bracket	SB-120, SB-125 or surface mounting via 4 fixing holes at 204 x 82 centres	
PN	SB-120	165886-000
	SB-125	1244-00603

ORDERING DETAILS

Ordering references:	PN Number	Weight
T-M-20-S/+0+200C/EX	1244-013410	2 kg
T-M-20-S/+50+300C/EX	1244-013411	2 kg
T-M-20-S/+0+120C/EX	1244-016536	2 kg

MEANING OF REFERENCE: NVENT RAYCHEM T-M-20-S/+X+Y/EX

T = thermostat

M = mechanical thermostat

20 = control thermostat + limiter

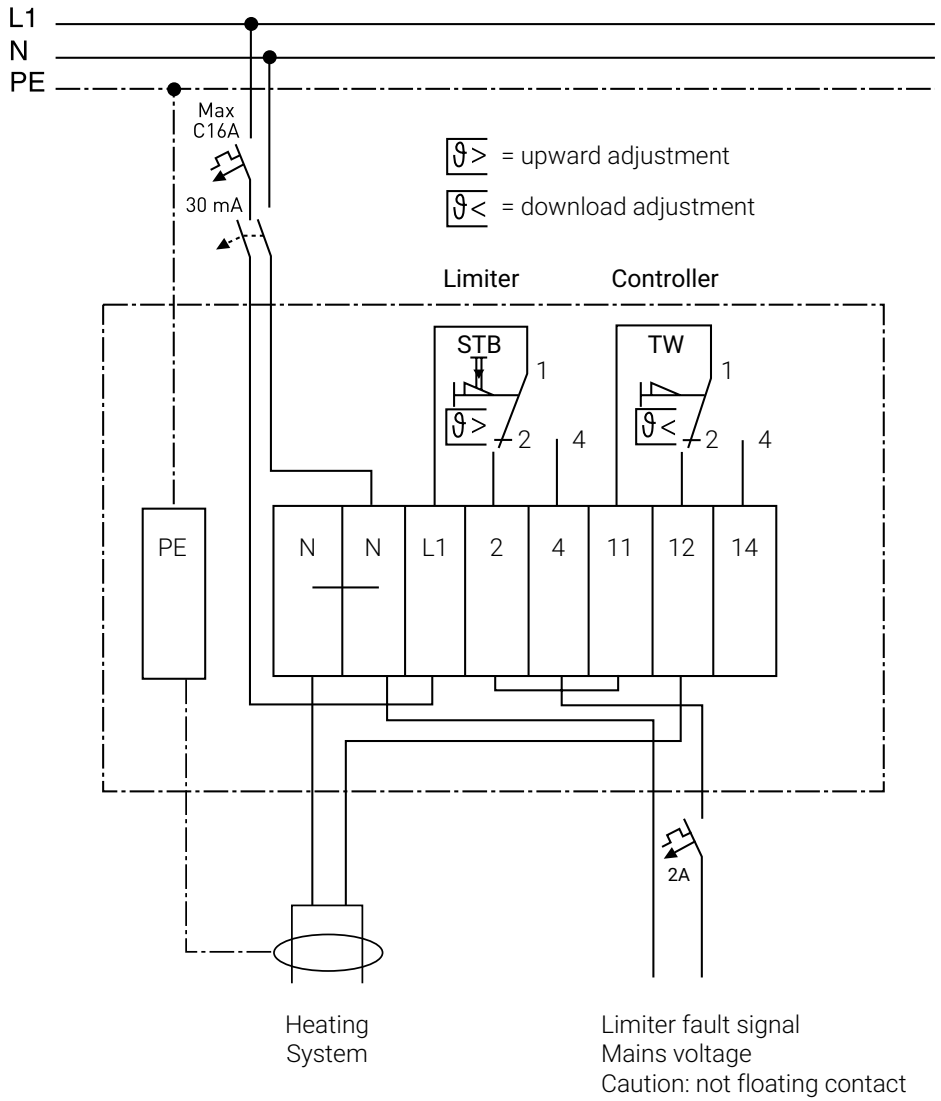
S = surface sensing

x = min temperature of control range

y = max temperature of control range

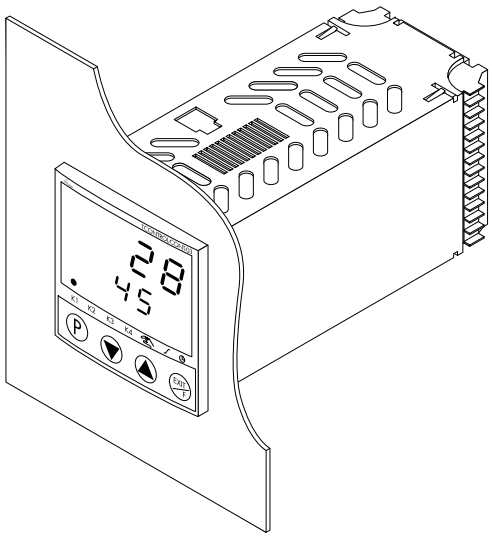
Ex = hazardous area

CONNECTION DETAILS



TCONTROL-CONT-03

SINGLE-CIRCUIT ELECTRONIC CONTROLLER WITH DUAL DISPLAY



The nVent RAYCHEM TCONTROL-CONT-03 family of electronic controllers provide accurate temperature control and centralized monitoring for individual heat-tracing circuits.

The compact panel mount TCONTROL-CONT-03 has two displays for indicating the process value and the set point. During programming these displays provide user guidance and visual aid to simplify commissioning.

Alternatively, the optional and easy to use nVent RAYCHEM TCONTROL-CONT-03/CONFIG software can be used for computer aided configuration.

nVent RAYCHEM TCONTROL-CONT-03 units are factory configured for ON/OFF control and are suitable for most heat-tracing applications. Other types of control algorithms can be configured by the user.

Different hardware configurations are available: Units with a relay output for controlling electro-mechanical relays or solid state relays and TCONTROL-CONT-03/MA units with an analog output for driving other types of actuators like thyristors.

The health of the temperature input sensor is permanently monitored for failures. An alarm will appear in the event of sensor break or short circuit. In the event of a sensor failure the control output switches to a user defined state (ON or OFF)

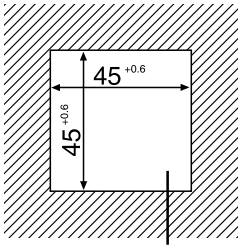
SPECIFIC FEATURES:

- Time delayed controller activation after initial power up (this can be used to avoid peak demands during start-up)
- Service counter included in order to count and eventually alarm on the number of relay operations.

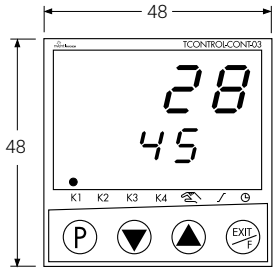
GENERAL

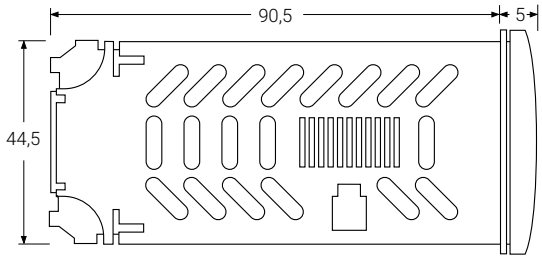
Application	nVent RAYCHEM TCONTROL-CONT-03 units are panel mount controllers and are typically used for providing tight temperature control of individual heat-tracing circuits.	
Area of use	Non hazardous area indoors (panel mount – through the panel)	
Approvals/Certification	Electrical Safety to DIN EN 61010-1 over voltage category III, pollution degree 2 EMC DIN EN 61326, Class B to industrial requirements.	
	EAC TC RU C-BE.БЛ08.B.01634 Made in GE	
Memory data backup	EEPROM based non-volatile memory. No loss of configuration data after power outage or long term shut down.	
Display	2 piece of 7-segment LED display with status indication LED´s (yellow/green)	
Supported control modes	ON/OFF, P, PI, PD or PID with auto-tuning are user selectable	
Measuring accuracy	Pt100 3-wire	error ≤ 0.1%,
	Pt100 2-wire	error ≤ 0.4%
	Thermocouples (incl. cold junction)	error ≤ 0.25%
	Voltage and current inputs	error ≤ 0.1%

DIMENSIONS (IN MM)

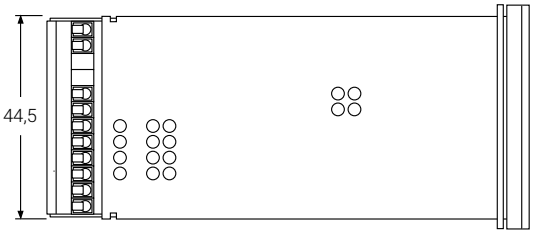


(2)





Minimum spacing in between panel cut-outs		Horizontal spacing	Vertical spacing
TCONTROL-CONT-03 (all types)	Without Space for configuration connector	> 8 mm	> 8 mm
	With Space for configuration connector	> 8 mm	> 65 mm



(1) Connector for optional programming interface

(2) Panel cut-out

ELECTRICAL PROPERTIES

Supply Voltage & own power consumption	110 Vac to 240 Vac –15/+10%, 48 to 63 Hz & ~15 VA
Electrical connections	Via screw terminals on the back of the unit. Terminals are suitable for wires ranging from 1 to maximum 1.3 mm^2 solid core or 1 mm^2 stranded with cable shoe. Terminal strips are pluggable.
Supported output types (depending on model)	TCONTROL-CONT-03: 3 relay outputs (SPST) + 1 logic output TCONTROL-CONT-03/MA: 2 relay outputs (SPST) + analog output TCONTROL-CONT-03/COM: 3 relay outputs (SPST) + 1 logic output + RS485 TCONTROL-CONT-03/COMA: 2 relay outputs (SPST) + analog output + RS485

INPUT OPTIONS (ALL TYPES)

Temperature sensor inputs	Pt 100, Pt 1000 RTD´s in 2- and 3 wire connection, KTY11-6 sensors Thermocouple types: L, J, U, T, K, E, N, S
Electrical input signals	0/4 .. 20 mA or 0/2 .. 10 V (Ri = 100 Kohm)
Temperature control range	From –200 to + 2400°C depending on the type of temperature sensor used

OUTPUT OPTIONS AND OUTPUT RATINGS (DEPENDING ON TYPE)

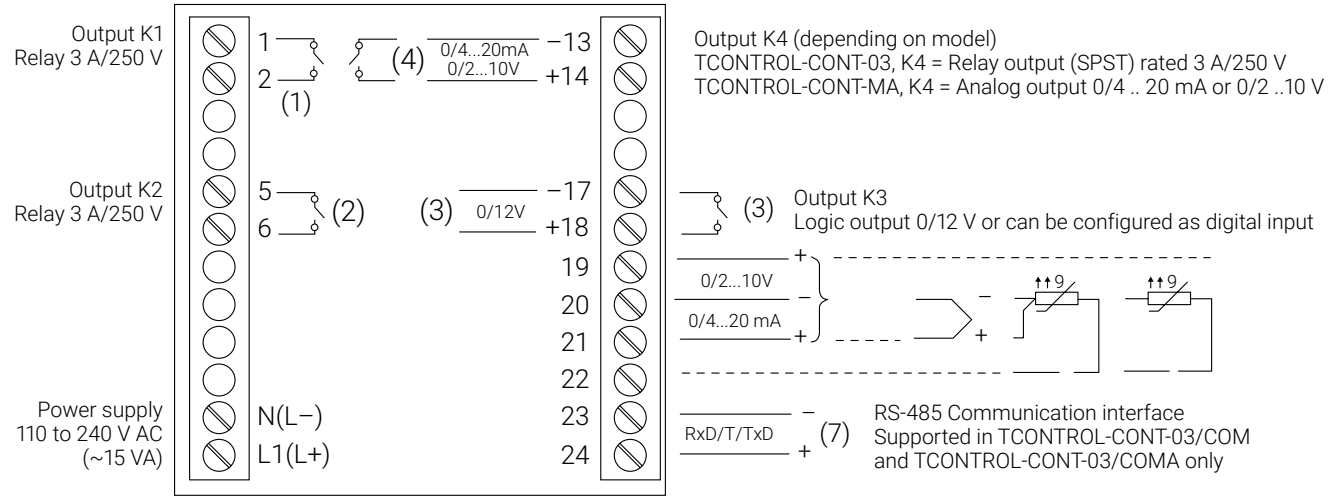
TCONTROL-CONT-03 TCONTROL-CONT-03/COM	Control and alarm relay contacts (SPST) are rated 3 A at 230 VAC. Expected lifetime: 350k operations at rated current or ~900K operations at 1 A Logic output 0 .. 12 V. Maximum current 20 mA
TCONTROL-CONT-03/MA TCONTROL-CONT-03/COMA	Control output, analog: 0/4 .. 20 mA Rload ≥ 500 Ohm Logic output 0 .. 12 V, maximum current 20 mA Alarm relay contacts (SPST) are rated 3 A at 230 VAC. Expected lifetime: 350k operations at rated current. 900k operations at 1 A
Communication options (*)	RS-485, Modbus at 9600, 19200 or 38400 BPS. Maximum up to 32 devices per network. (*)
Alarm options	2 independently configurable alarm relay outputs are provided. TCONTROL-CONT-03 units automatically alarm in case of sensor break or sensor short. On top of the input sensor driven alarms up to 8 different temperature triggered alarm functions can be defined. (see installation instructions for details)

ENCLOSURE

Housing type	Plastic enclosure approved to IEC 61554 (ABS) Suitable for installation in electrical distribution panels
Environmental protection	Front IP65, rear IP20 to DIN EN60529
Max. operating temperature	–5 to +55°C
Max. storage temperature	–40 to +70°C
Relative humidity	90% maximum, no condensation
Installation position	All positions allowed.

(*) supported on TCONTROL-CONT-03/COMx units only

CONNECTION DIAGRAM



WIRING EXAMPLE

Ordering details	Part description	Product Number	Weight
Control units	TCONTROL-CONT-03	1244-006829	~ 0.125 kg
	TCONTROL-CONT-03/MA	1244-006830	
	TCONTROL-CONT-03/COM	1244-006982	
	TCONTROL-CONT-03/COMA	1244-006981	

ACCESSORY SELECTION TABLE

Configuration and setup interface + software	TCONTROL-CONT-03/CONFIG	1244-006983	~ 0.120 kg

ACCESSORY SELECTION TABLE

Sensors for hazardous area	MONI-PT100-EXE (1), (2) MONI-PT100-4/20MA	967094-000 704058-000
Sensor for non-hazardous area	MONI-PT100-NH	140910-000
Support bracket for temperature sensors	JB-SB-26	338265-000

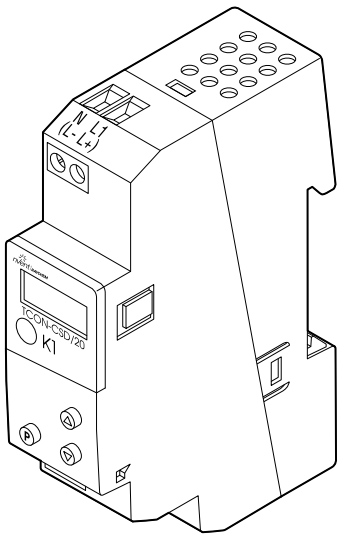
Note 1: Sensor can be extended with a 3-wire shielded cable of max 30 Ohms per conductor (max. 150 m with a 1.5 mm^2 cable).
The sensor cable should be shielded if it is laid in cable ducts or in the vicinity of high-voltage carrying cables.
The shield of the extension cable should be grounded at the controller end only.

Note 2: MONI-PT100-EXE temperature sensors can be directly connected to the TCONTROL-CONT-03 input terminals. There is no need to use current limiting devices such as zener barriers or isolators.

Note 3: Installed in ordinary area.

TCON-CSD/20

DIN RAIL MOUNTABLE ELECTRONIC THERMOSTAT WITH DISPLAY



The nVent RAYCHEM TCON-CSD/20 is a compact digital thermostat for simple ON/OFF temperature control.
The temperature is measured through a temperature sensor and shown on a LCD display. The actual status of the output relay is signaled via a LED.

The instrument is commissioned and operated via three soft key push buttons on the unit's front panel.
Through its compact design and robust construction the TCON-CSD/20 allows for simple and space-saving installation.

Specific features:

- Time-delayed controller activation after initial power up (can be used to avoid peak demands on power during start-up)
- Parameter level can be protected by means of a secret code
- Adjustable switching differential.
- Input sensors are permanently monitored for cable short or breakage.

GENERAL

Application	Usable for all applications requiring tight temperature control for either line sensing or ambient sensing control
Area of use	DIN rail mounting in panels or enclosures installed in non-hazardous area. Sensing temperature in hazardous area Zone 1 is possible when used in conjunction with nVent RAYCHEM MONI-PT100-EXE or nVent RAYCHEM MONI-PT100-EXE-SENSOR (separately available)
Temperature control range	–200°C to +500°C (accuracy 0.1%)
Ambient operating temperature	0°C to +55°C
Storage temperature	–40°C to +70°C
Climatic conditions	≤75% relative humidity, no condensation
LED indicator	The LED at the front of the unit lights up when the output relay is energized.

ENCLOSURE

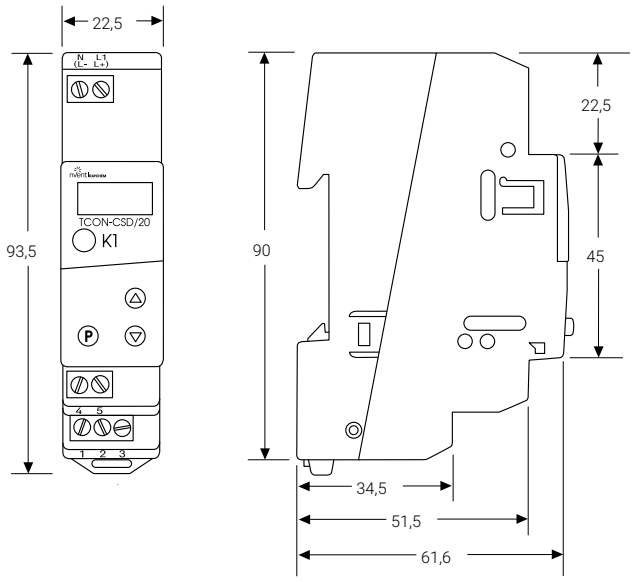
Protection	IP 20 to EN 60529
Material	Polycarbonate
Installation	On 35 x 7.5 mm DIN rail
Installation position	Any position allowed
Flammability class	UL 94 VO

APPROVALS

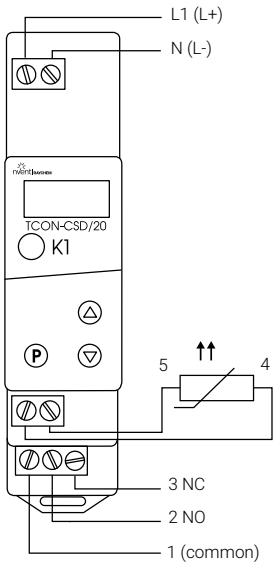
EAC ТС RU C-BE.БЛ08.B.01634
Made in GE

RAYCHEM-DS-EU1437-TCONCSD20-EN-1911

DIMENSIONS (IN MM)



WIRING DIAGRAM



Supply
230 Vac +10/–15%

Measurement input
Pt 100

Relay output
changeover (floating)
10 A/250 Vac

ELECTRICAL DATA

Power supply & own power consumption	230 Vac +10/–15%, 48 – 63 Hz < 1 VA
Connection terminals	Screw terminals for wires with a maximum cross-section of 2.5 mm^2
Relay output	10 A rated changeover contact (SPDT)
Contact lifetime	A minimum lifetime of 150 K operations at 10 A/250 Vac 50 Hz resistive load.

TEMPERATURE SENSOR

Pt100, Pt1000 or KTY2X-6 all connected in 2-wire circuit Sensor “open” and sensor “short” will be automatically detected and will cause the output to switch to the customer programmed default either permanently ON or OFF When using 2-wire temperature sensors there will be an error on the temperature readout of approximately 1°C per 0.39 Ohm lead resistance added.

TCON-CSD/20 units are equipped with an option to compensate for the cable resistance added in order to improve the accuracy. Refer to the installation instructions for more details.

When the sensor cable is laid in cable ducts or in the vicinity of high voltage carrying cables the sensor extension cable should be shielded. The shield of the extension cable should be grounded at the controller end only.

Switching point accuracy	±2% of range span
Switching differential	Adjustable from 0.25% to 5% (factory set at minimum value)
Zero point correction	Enables matching of the switching point and probe accuracy (offset)

ELECTROMAGNETIC COMPATIBILITY

To EN 61 326. Emission approved to Class B, immunity to industrial requirements

ELECTRICAL SAFETY

To EN 61 010, Part 1, over voltage category III, pollution degree 2

DATA BACKUP

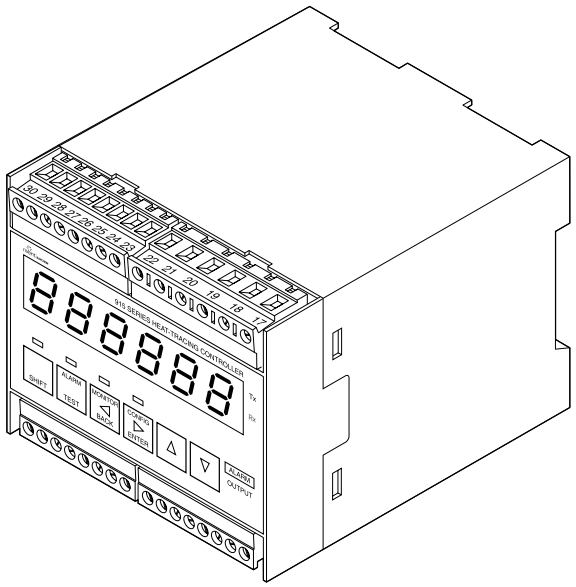
EEPROM (unit does not loose configuration settings after power outage)

ORDERING DETAILS

Order reference & weight	1244-001133 (0.11 kg)

HTC-915-CONT

HEAT-TRACE CONTROL SYSTEM



PRODUCT OVERVIEW

The nVent RAYCHEM HTC-915 system is a compact, full-featured microprocessor-based single-point heat-trace controller. The HTC-915-CONT provides control and monitoring of electrical heat-tracing circuits for both freeze protection and temperature maintenance and can be set to monitor and alarm for high and low temperature, high and low current, ground fault level, and voltage. The nVent RAYCHEM HTC-915-CONT is provided with two outputs: one to drive an external contactor coil, and the other to drive an external solid-state relay (SSR). Communications capability is included for remote control and configuration, complete with Supervisor software capability.

CONTROL

The nVent RAYCHEM HTC-915-CONT measures temperature via 3-wire platinum PT100 connected directly to the unit. When used with an Ex approved PT100 sensor (as is the MONI-PT100-EXE) the controller can measure temperatures in a hazardous area. Open, shorted, or out of range PT100 resistance is automatically detected. If an PT100 failure occurs, the control output trips open and an alarm is generated. The controller can be used in line sensing, ambient sensing, proportional ambient sensing, and power limiting mode.

MONITORING

A broad variety of parameters are measured including: temperature, voltage, power, contactor cycles, hours in use, load resistance, load current, and ground-fault current. To ensure system integrity, the system can be programmed to periodically check the heating cable for faults, alerting maintenance personnel of a heat-tracing problem. A potential free relay is provided for alarm annunciation back to a Distributed Control System (DCS) or alarm indicator.

GROUND-FAULT ALARMING

Optionally, the HTC-915-CONT can be programmed to measure ground-fault current. This option allows for the generation of early warnings before the ELCB trips. The trip level of the early alarm is user definable and can be set at any value between 10 and 250 mA. The ground fault alarms allow for preventive maintenance to be scheduled before the safety device trips and causes down time of important pipelines. Note that this alarm may only be used to generate a warning, it is not intended to replace the RCD (ELCB), which is mandatory for most applications.

OVERTEMPERATURE PREVENTION

In order to assure that T class temperatures inside hazardous areas are not being exceeded the HTC-915-CONT can be equipped with the temperature limiter HTC-915-LIM. The HTC-915-LIM is a compact microprocessor based temperature limiter that provides protection against overtemperature of heating cables. (Refer to the installation instructions of the HTC-915-LIM for the full list of details.)

RAYCHEM-DS-EU1438-HTC915CONT-EN-1911

INSTALLATION

The nVent RAYCHEM HTC-915-CONT comes ready to install, and the DIN rail mount plastic enclosure is approved for use in indoor locations. The HTC-915-CONT operator interface includes LED displays and function keys that make it easy to set-up and maintain - no additional devices are needed. Alarm conditions and program settings are easy to interpret on the full-text front panel. Settings are stored in nonvolatile memory in the event of power failure.

COMMUNICATIONS

Multiple nVent RAYCHEM HTC-915-CONT units may be networked to a host PC running Windows-based Supervisor software for central programming, status review, and alarm annunciation. The HTC-915-CONT supports the Modbus protocol and includes an RS-485 communications interface.

APPLICATION

Type	Surface sensing/ambient sensing
Area of use	Non-hazardous area indoors, typically panel mounted
Approval certification	CE marked EAC TC RU C-BE.БЛ08.B.01634 Made in CA

PRODUCT SPECIFICATION

Temperature range controller	–60°C to 570°C in steps of 1 K
Control algorithms	EMR: Line sensing on/off, proportional ambient SSR: Line sensing on/off, proportional, proportional ambient, power limiting, soft start
Switching accuracy	1 K

ELECTRICAL PROPERTIES

Connection terminals		Screw type terminals. All terminals suitable for stranded and solid core connection cables having a cross section between 0.5 and 2.5 mm2 (24 to 12 AWG)
Supply voltage		100 Vac to 250 Vac, +10% -10%, 50/60 Hz, 0.15 A to 0.06 A
Power consumption		Max 20 VA with limiter connected
Control output	Contactor control output	(EMR) Electromechanical relay rated 3 A/250 Vac, 50/60 Hz
	Solid-state relay control output	(SSR) 12 VDC, 75 mA. max. to drive normally open Solid state relays. Depending on the application, one, two or three phase switching elements have to be used. (Solid state relays are not included)
Switching capacity		Depends on the type of switch element used (The switch element is external)
Alarm output relay		Relay contact rated 3 A/250 Vac, 50/60 Hz Output is user programmable to open or to close on alarm.
Power output		12 Vdc, 200 mA max.

TEMPERATURE SENSOR

Type	100 Ω platinum Pt 100, 3-wire, α = 0.00385 Ω/°C. Can be extended with a three core shielded cable of maximum 20 Ω lead resistance per conductor.
Quantity	2 RTD inputs available

COMMUNICATIONS

Protocol	Modbus RTU or ASCII
Topology	Multidrop/daisychain
Cable	Single shielded twisted pair, 0.5 mm^2 (24 AWG) or larger
Length	Typical 2.7 km max @ 9600 Baud
Quantity	Up to 32 devices
Address	Programmable

PROGRAMMING AND SETTING

Method	Via programmable keypad or via RS485 interface
Units of measure	°C or °F
Digital display	Actual temperature, control temperature, heater current, load power, voltage, resistance, ground fault level, alarm status, programming parameter values.
LED indicators	LEDs available for: display mode, heater ON, alarm condition, receive/transmit data.
Memory	Nonvolatile, restore after power loss.
Stored parameters (measured)	Minimum and maximum process temperature. Maximum ground fault current, maximum heater current. Power accumulator. Contactor cycle counter. Time in use clock.
Alarm conditions	Low/high temperature, Low/high current, Low/high voltage. Low/high resistance. Groundfault alarm/trip. RTD failure, loss of programmed values, switch failure.
Other	Multi language support, password protection.

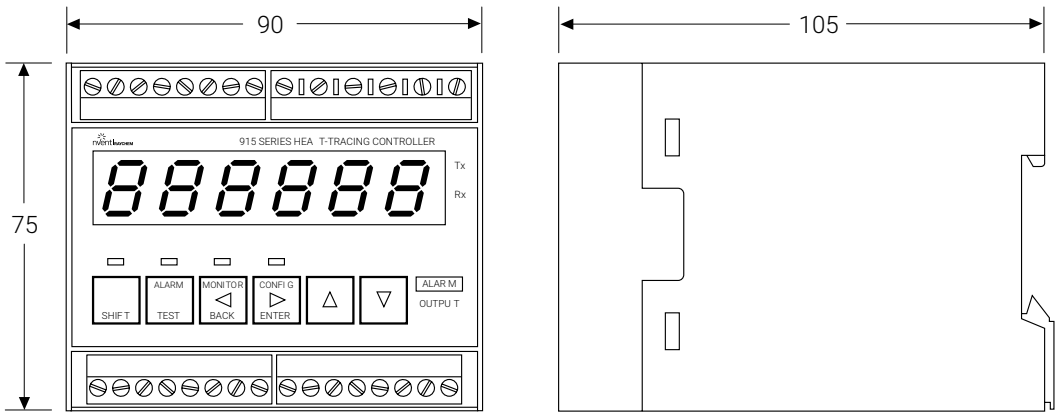
MONITORING

Temperature	Low/High alarm range –60°C to 570°C or OFF
Ground fault (via external CT, optional)	Alarm/Trip range 10 mA to 250 mA or OFF
Load current (via external CT, optional)	Low/High alarm range 0.3 A to 100 A or OFF (can be ajusted to match heater current)
Voltage	Low/High alarm range 10 Vac to 330 Vac or OFF
Resistance	Low resistance range 1 to 100% deviation (can be ajusted to match heater current) High resistance range 1 to 250% deviation
Power	Power limit 3 W to 33 KW
Auto cycle	Diagnostic test interval adjustable from 1 to 240 minutes or 1 to 240 hours

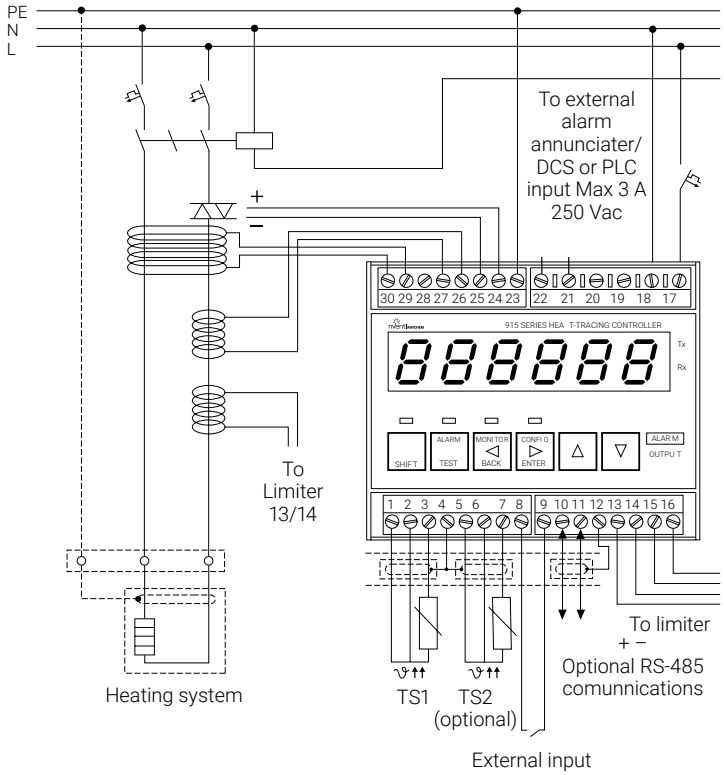
ENCLOSURE

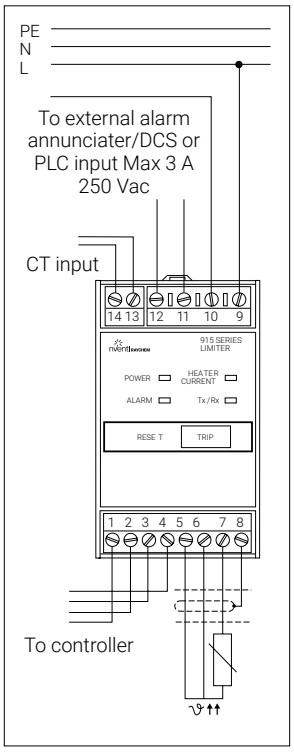
Ambient operating temperature range	–40°C to +50°C
Ambient storage temperature range	–40°C to +85°C
Relative humidity	0% to 90% Non condensing
Ingress protection	Housing: IP40, Terminals: IP20
Material	ASA-PC, color: green
Flammability class	V0 (UL94)
Mounting method	Panel mounting on 35 mm DIN rail

ENCLOSURE DIMENSIONS



WIRING DIAGRAM





Limiter is optional and not included

Terminal assignments for the controller

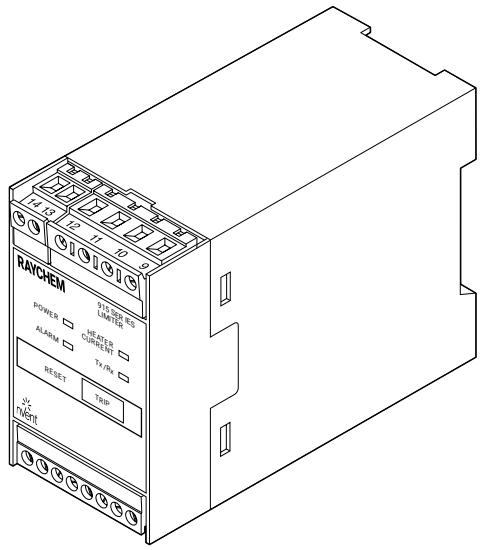
1. RTD 1 source
2. RTD 1 sense
3. RTD 1 common
4. Shield
5. RTD 2 source
6. RTD 2 sense
7. RTD 2 common
8. External Input + (Inhibit/override)
9. External Input – (Inhibit/override)
10. Communications (RS-485+)
11. Communications (RS-485 –)
12. Shield
13. Digital common (to Limiter 1)
14. +12 Vdc out (to Limiter 2)
15. TX data (to Limiter 3)
16. RX data (from Limiter 4)
17. Mains Input (L1)
18. Mains Input (L2/neutral)
19. Control relay output
20. Control relay output
21. Alarm relay output
22. Alarm relay output
23. PE
24. SSR control output +
25. SSR control output –
26. Load Current CT input
27. Load Current CT input
28. Shield
29. GF CT input
30. GF CT input

ORDERING DETAILS

Controller	Part description PN (Weight)	HTC-915-CONT 10275-001 (0.4 kg)	
Limiter	Part description PN (Weight)	HTC-915-LIM 10275-003 (0.2 kg)	
Current sensor (load current transformer)		HTC-915/CT	1244-000276 (0.15 kg)
Current sensor (earth leakage current transformer)		HTC-915/ELCT	1244-000277 (0.15 kg)
RTD for Hazardous area zone 1		MONI-PT100-EXE	967094-000 (0.44 kg)
RTD for non hazardous area		MONI-PT100-NH	140910-000 (0.22 kg)
RS485 Communication cable		See datasheet RS485-WIRE	
Solid state relays	20 A 230 Vac single phase 50 A 480 Vac single phase	DT-SSR-1-23-20 DT-SSR-1-48-50	1244-001468 (0.16 kg) 1244-001467 (0.75 kg)

HTC-915-LIM

TEMPERATURE LIMITER



PRODUCT OVERVIEW

The nVent RAYCHEM HTC-915-LIM is a compact, microprocessor-based temperature limiter that provides protection against over-temperature. The HTC-915-LIM has two output relays, one normally closed limiter relay (opening in occurrence of over temperature) and one alarm relay.
The HTC-915-LIM is available in two versions: the first one is the base unit for use in conjunction with the HTC-915-CONT (Heat-Trace control system). The lock out temperature of this device can be programmed and altered via the front panel of the HTC-915 control unit. The limiter can be set at any value between 20 and 450°C in steps of 1K.

A second version of the HTC-915-LIM has a preprogrammed lock out temperature. HTC-915-LIM limiters are available for T1, T2, T3, T4 and T5 classified areas as indicated in table at the bottom of next page (*).

OPERATION

The nVent RAYCHEM HTC-915-LIM measures temperature via a 3-wire PT100 connected directly to the input terminals of the unit. In order to assure the hottest temperature is being measured the measuring tip of the PT100 needs to be installed at a representative location. When used with an Ex approved sensor (as is the MONI-PT100-EXE), the HTC-915-LIM can measure temperatures in hazardous area. Open, shorted or out-of-range PT100 resistance is automatically detected. As a result of that the control output will trip open and an alarm will be generated. When in normal operation the set point temperature of the limiter is exceeded the control output will trip open. Once tripped, the control output will remain open even if the measured temperature drops below the set point. The unit will not restart until manually reset. The HTC-915-LIM can be reset via the front panel of the unit by pressing and holding the reset button for 2 seconds or via the alarm menu of the HTC-915-CONT when the limiter is used in conjunction with a HTC-915-CONT Heat-Trace control system. Another possibility to reset the limiter is via the remote input of the HTC-915-CONT controller or via the optional nVent RAYCHEM Supervisor software.

MONITORING

When the limiter is used in conjunction with the nVent RAYCHEM HTC-915-CONT, the combination can be used as a fully featured control and monitoring system that measures a broad variety of parameters such as: temperature, voltage, power, contactor cycles, hours in use, load resistance, load current, and ground-fault current. To ensure system integrity, the controller can be programmed to periodically check the heating cable for faults, alerting maintenance personnel of a heat-tracing problem. Additional alarm outputs are available on the controller (refer to the controller datasheet for the full list of features).

OVERTEMPERATURE ALLOWANCE

The nVent RAYCHEM HTC-915-LIM can be configured such that it will allow its setpoint temperature to be exceeded without tripping. In this instance, the unit is programmed to measure load current, and will allow a temporary over-temperature condition only when no current flows to the load. This feature shall only be used under certain, well-defined circumstances, such as when the process is heated by external heat sources, or when the installation is being steam cleaned.

INSTALLATION

The nVent RAYCHEM HTC-915-LIM can be used as a stand alone unit with a fixed preprogrammed lock-out temperature as well as in combination with a nVent RAYCHEM HTC-915-CONT control unit.
The DIN rail mount plastic enclosure is for use in safe area only.
The HTC-915-CONT operator interface includes all functions required to simplify set-up and integration of the limiter.

RAYCHEM-DS-EU1439-HTC915LIM-EN-1911

APPLICATION

Type	Surface sensing electronic
Area of use	Ordinary area locations, indoors
Approval certification	CE marked EAC (Russia, Kazakhstan, Belarus) For other countries contact your local nVent representative.

PRODUCT SPECIFICATION

Temperature range limiter	20°C to 450°C in steps of 1 K
Switching accuracy	1 K

ELECTRICAL PROPERTIES

Connection terminals	Screw type terminals. All terminals suitable for stranded and solid core connection cables having a cross section between 0.5 and 2.5 mm2 (24 to 12 AWG)
Power supply	12 Vdc to 24 Vdc, 100 to 50 mA. Max. (can be directly obtained from a nVent RAYCHEM HTC-915-CONT)
Control output	NC relay contact rated 3 A 250 Vac, 50/60 Hz
Alarm output relay	Relay contact rated 3 A 250 Vac, 56/60 Hz (N.C. in operation opening on alarm or power outage)

TEMPERATURE SENSOR

Type	100 Ω platinum RTD, 3-wire, α = 0.00385 Ω/°C.
Quantity	1 RTD input available
Cable extension	Can be extended with a three core shielded cable of maximum 20 Ω lead resistance per conductor. Open, shorted or out-of-range RTD resistance is detected. If an RTD failure is detected, the control output trips open.

COMMUNICATIONS (TO NVENT RAYCHEM 915 CONTROLLER)

Topology	Point-point (limiter >< controller)
Cable	Four conductor cable, 0.5 mm^2 (24 AWG) or larger
Length	3 m max.

PROGRAMMING AND SETTING

Method	Via the keypad of the nVent RAYCHEM HTC-915-CONT or Supervisory software
Units of measure	°C or °F, depending on the units setting of the programming device
Alarm conditions	Over-temperature, RTD failure, CT failure, loss of programmed values, limiter reset.

MONITORING

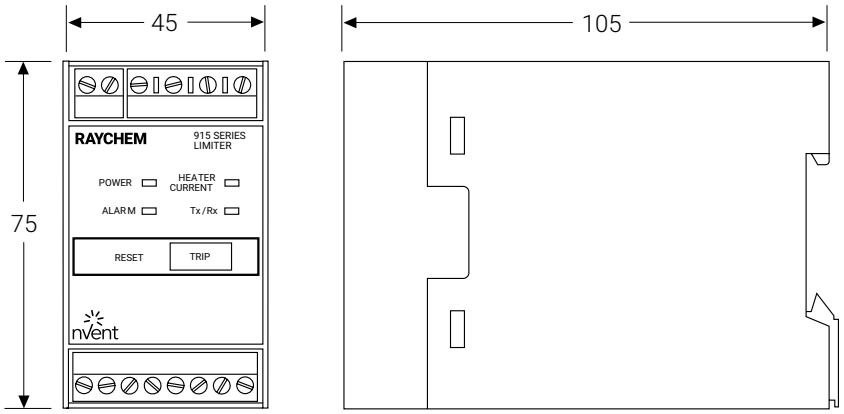
LED indicators	LEDs available for: power, presence of heater current, limiter trip, Tx/Rx, alarm
Current (via external CT, optional)	Presence of Heater current, 0.2 A min.

ENCLOSURE

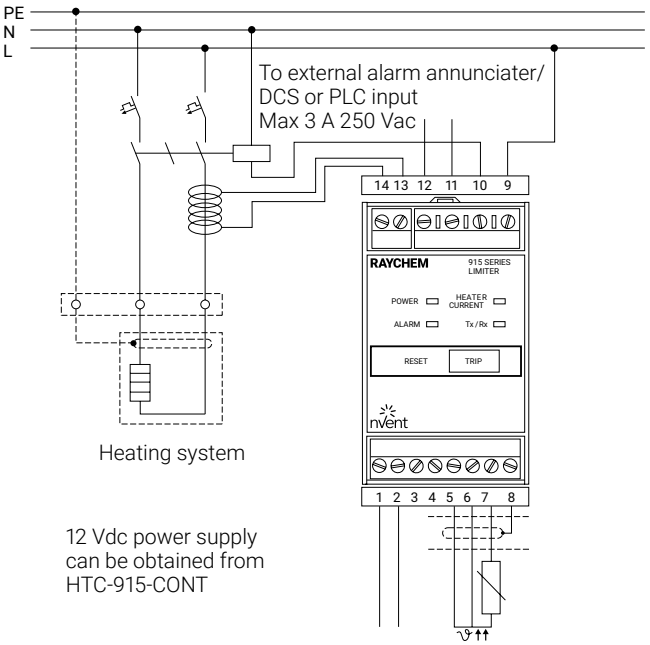
Ambient operating temperature range	–40°C to +50°C
Ambient storage temperature range	–40°C to +85°C
Relative humidity	0% to 90% Non condensing
Protection	Housing: IP40, Terminals: IP20
Materials	ASA-PC, color: green
Mounting	Panel mounting on 35 mm DIN rail

(*)	T1	T2	T3	T4	T5
Model	HTC-915-LIM-T1	HTC-915-LIM-T2	HTC-915-LIM-T3	HTC-915-LIM-T4	HTC-915-LIM-T5
Lock out temperature	450°C	300°C	200°C	135°C	100°C
When used in conjunction with the HTC-915-CONT (Heat-Trace control system) the pre programmed set point can be altered					

DIMENSIONS (IN MM)



WIRING DIAGRAM



Terminal assignments of the limiter

1. Digital common (from HTC 13)
2. +12 Vdc in (from HTC 14)
3. RX data (from HTC 15)
4. TX data (to HTC 16)
5. RTD 1 source
6. RTD 1 sense
7. RTD 1 common
8. Shield
9. Control relay output
10. Control relay output
11. Alarm relay output
12. Alarm relay output
13. Load Current CT input
14. Load Current CT input

* Wiring for Communications with HTC-915-CONT Controller omitted for clarity Refer to installation instructions for details.

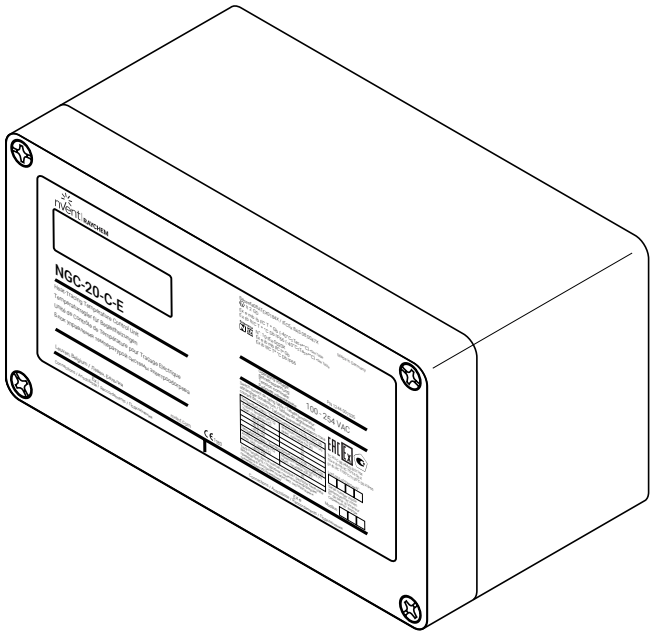
** Current sensor optional and not included

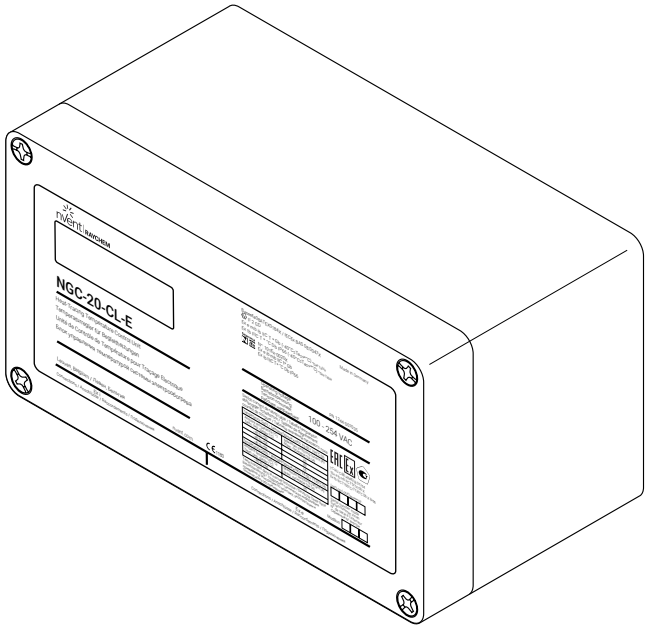
ORDERING DETAILS

Controller	Part description	HTC-915-CONT		
	PN (Weight)	10275-001 (0.4 kg)		
Limiter	Part description	HTC-915-LIM		
	PN (Weight)	10275-003 (0.2 kg)		
Limiter		HTC-915-LIM	base unit for use with HTC-915-CONT	10275-003
		HTC-915-LIM/T1	Preprogrammed to trip at 450°C (+0/−10°K)	10275-004
		HTC-915-LIM/T2	Preprogrammed to trip at 300°C (+0/−10°K)	10275-005
		HTC-915-LIM/T3	Preprogrammed to trip at 200°C (+0/−5°K)	10275-006
		HTC-915-LIM/T4	Preprogrammed to trip at 135°C (+0/−5°K)	10275-007
		HTC-915-LIM/T5	Preprogrammed to trip at 100°C (+0/−5°K)	10275-008
Current sensor (load current transformer)		HTC-915/CT		1244-000276 (0.15 kg)
RTD for Hazardous area zone 1		MONI-PT100-EXE		967094-000 (0.44 kg)

NGC-20-C-E AND NGC-20-CL-E

FIELD-MOUNTED ELECTRONIC HEAT-TRACING CONTROL UNIT





PRODUCT OVERVIEW

The nVent RAYCHEM NGC-20 is an electronic heat-tracing control unit featuring the benefits of local control and the capability for central monitoring. nVent RAYCHEM NGC-20 control unit can be used for single phase circuits up to 25 A and is approved for use in hazardous areas. The nVent RAYCHEM NGC-20 can provide tight temperature control and is available with an IEC 61508-SIL 2 classified safety temperature limiter on board (NGC-20-CL-E). It measures the temperature with up to two RTD(s) connected to the unit. The Safety temperature limiter has a dedicated temperature input.

CONTROL, MONITORING AND ALARM CAPABILITIES

The nVent RAYCHEM NGC-20 offers several different control algorithms including PASC for an optimised electrical heat-tracing control. The nVent RAYCHEM NGC-20 offers alarms for high and low temperature, high and low current, ground-fault current and voltage. The trip and warning level of the ground-fault current is user configurable and can be used as a warning and to isolate circuits. The nVent RAYCHEM NGC-20 control unit provides a dry contact relay for alarm annunciation.

AUTOMATED HEAT-TRACING SYSTEM CHECK

To ensure system integrity the nVent RAYCHEM NGC-20 control unit can be configured to periodically check dormant heating cables for faults. As a consequence maintenance is systematically informed about the status of the heat-tracing system and unexpected and usually expensive downtime of important pipelines can be reduced.

COMMUNICATIONS AND NETWORKING

The nVent RAYCHEM NGC-20 control unit is equipped with a RS-485 interface. Through this interface up to 247 nVent RAYCHEM NGC-20 units can be networked to a single nVent RAYCHEM NGC-UIT2 or to one serial port of standard PC running nVent RAYCHEM Supervisor software.

The nVent RAYCHEM NGC-20 control unit can as well be monitored and/or configured via the nVent RAYCHEM NGC-CMA wireless handheld device. This device is available for hazardous and non-hazardous areas.

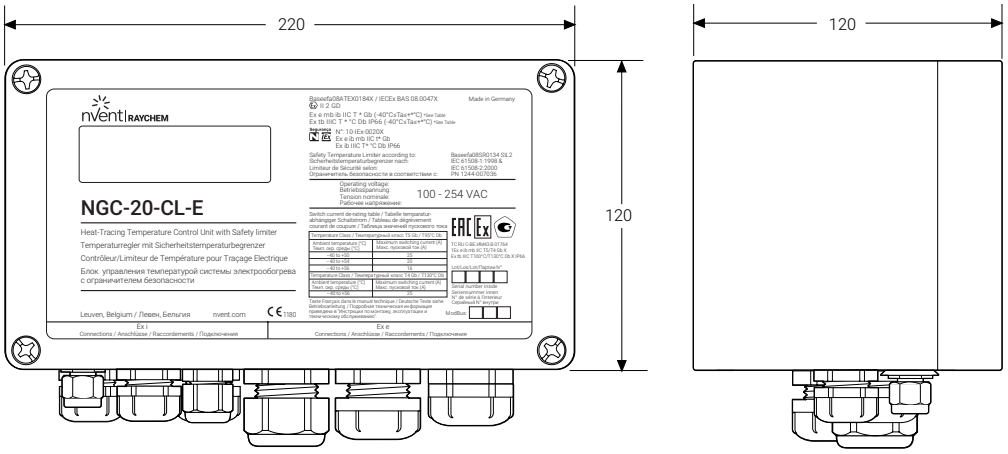
INSTALLATION

The nVent RAYCHEM NGC-20 control unit can be installed in the field near the heating application. The nVent RAYCHEM NGC-20 enclosures are manufactured from high impact-resistant, UV stabilized glass-filled polyester suitable for installation indoors or outdoors. One heating cable can be directly connected to the unit. The units can be mounted on the heated surface via an appropriate support bracket.

CONFIGURATION AND COMMISSIONING

The nVent RAYCHEM NGC-20 control unit can be commissioned locally by means of a handheld programming device (nVent RAYCHEM NGC-CMA) or from a central location using the nVent RAYCHEM NGC-UIT or nVent RAYCHEM Supervisor Software. After programming, all settings are permanently stored in the non-volatile memory of the nVent RAYCHEM NGC-20 control unit, avoiding loss of data in the event of power failure or after a long term power shutdown. The nVent RAYCHEM NGC-20 control unit allows the heating and power cable to be connected directly to the unit.

DIMENSIONS (IN MM)



Sample shown is nVent RAYCHEM NGC-20-CL-E Gland included in scoop of delivery - 1 x M25 x 1,5

GENERAL

Application type

nVent RAYCHEM NGC-20-C(L)-E units are approved for use in Hazardous area Zone 1 or Zone 2 (Gas) or Zone 21 or Zone 22 (Dust) and non hazardous areas

APPROVALS

Baseefa08ATEX0184X / IEC Ex BAS 08.004 7X
II 2 GD
Ex e mb ib IIC T * Gb (-40°C≤Ta≤+*°C)
*See Table
Ex tb IIIC T * °C Db IP66 (-40°C≤Ta≤+*°C)
*See Table

TC RU C-BE.ИМ43.B.01764 ООО "ТехИмпорт"
1Ex e ib mb IIC T5/T4 Gb X
Ex tb IIIC T100°C/T130°C Db X IP66 Made in GE
-60°C < Tamb < 60°C

Segurança

N°: 10-IEx-0020X
Ex e ib mb IIC T* Gb
Ex td IIIC T* °C Db IP66

T*: The switching capacity depends on the hazardous area temperature classification (T-Class) and the maximum expected use temperature. Ratings as shown in table below

Temperature Class T5		Temperature Class T4	
Maximum Ambient Temperature	**Maximum Switching Current**	**Maximum Ambient Temperature**	**Maximum Switching Current**
+50°C	25 A		
+54°C	20 A	Up to 56°C	25 A
+56°C	16 A		

All values as per hazardous area certification.
Current ratings are given for a supply voltage of 254 V +/-10%, 50/60 Hz and resistive loads only.

FUNCTIONAL SAFETY APPROVAL

Baseefa08SR0134 SIL2
IEC 61508-1:1998 & IEC 61508-2:2000

Conditions of Safe Use: Refer to Hazardous Area Certificate or installation instructions

ENVIRONMENTAL

Temperature range control unit	From –200°C to +700°C in steps of 1K
Temperature range limiter	From –60°C to +599°C in steps of 1K (NGC-20-CL-E only)
Ambient operating temperature	From –40°C to +56°C (ATEX, IEC Ex)
Storage temperature	From –55°C to +80°C (ATEX, IEC Ex)

ENCLOSURE

	nVent RAYCHEM NGC-20-C(L)-E units can be installed directly on the pipe via an appropriate support bracket as long as the maximum permitted ambient temperature is not exceeded. Alternatively, units can be mounted on any stable structure via the moulded holes in the enclosure.
Protection	IP 66 per IEC-60529
Material	Glass fibre reinforced enclosure with internal earth plate on the bottom
Entries	1 x M25 gland ∅ 8 – 17 mm: power IN/heating cable out 3 x M25: 1 x M25 stopping plug: daisy chaining of power 1 x M25 rain plug: daisy chaining of power 3 x M20: Digital communication IN/OUT and alarm (all with stopping plugs) 2 X M16: Temperature sensor(s) 1 with stopping plug one with rain plug
Mounting & installation	Installation on an appropriate support bracket directly on the heated surface up to temperatures of 230°C. When the temperature of the heated surface is above 230°C, install the control unit to a stable structure nearby the application.
Installation position	Any position allowed, typical use with glands facing down

1 EC-61508 Safety related information is published in the NGC-20 installation instructions INSTALL-130. A copy of the INSTALL-130 can be downloaded from the literature section on salesthermaluk@nvent.com or can be obtained via your local nVent representative.

ELECTRICAL DATA

Power supply & own power consumption	100 Vac to 254 Vac +/-10 % 50/60 Hz 20 VA max.
Connection terminals	Spring-type
L, N and PE terminals	9 pc (cables with cross section ranging from 0.2 to 6 mm^2)
Alarm output terminals	3 pc (cables with cross section ranging from 0.2 to 2.5 mm^2)
Pt 100 (RTD) terminals	12 pc (cables with cross section ranging from 0.2 to 1.5 mm^2)
RS-485 communication	7 pc (0.2 to 1.5 mm^2)
Internal Earth stud for RTD shield	1 pc (Cable cross section max 6 mm^2)
Contact lifetime main switch	500k operations at 25 A/250 Vac (resistive load)
Alarm output relay	Contact rated 250 Vac/3 A Relay output is software programmable to open, close or to toggle in case of alarm
Electromagnetic compatibility	EN 61000-6-2:2005 (Gen. Immunity standard for industrial environments) EN 61000-6-3:2007 (Gen. Emission standard for residential, commercial and light industrial) EN 61000-3-2-2006 (Limits for harmonic current emissions) EN 61000-3-3:1995+A1:2001+A2:2005 (limitation of voltage fluctuations and flicker)
Electrical safety	EN 61010-1, Category III, Pollution degree 2
Vibration & Shock	Shock to EN 60068-2-27: 1/2 sine wave of 11 ms duration, 15 g Vibration to EN 60068-2-6/sine wave 10 to 150 Hz (p-p), 2 g

TEMPERATURE SENSORS

Compatible types	100 Ω platinum, 3-wire, α = 0.00385 Ω/°C. Can be extended with a three core shielded or braided cable of maximum 20 Ω lead resistance per conductor.
Quantity	Two RTD inputs for the control unit plus one independent temperature input for the safety limiter. All temperature sensors are permanently monitored for “sensor short”, “sensor break”.

COMMUNICATIONS

Physical network	RS-485 and Bluetooth Class 1
Protocol/topology	Modbus RTU or ASCII. Multi drop/Daisy chain
Cable and maximum length	Shielded twisted pair cable, 0.5 mm^2 (AWG 24) or larger maximum cable length between should be no more than 1200 m
Maximum quantity of control units in one network	Max. of 247 units per nVent RAYCHEM NGC-UIT or per serial communication port
(Modbus) Network address	Software programmable via nVent RAYCHEM NGC-CMA-NH, nVent RAYCHEM NGC-CMA-EX or nVent RAYCHEM Supervisor

PROGRAMMING AND SETTING

Method	Through handheld programming device nVent RAYCHEM NGC-CMA-NH, NGC-CMA-EX (hazardous area) and a wireless Bluetooth connection or via RS485 interface and nVent RAYCHEM Supervisor software or nVent RAYCHEM User Interface Terminal (NGC-UIT2-ORD) and nVent RAYCHEM software.
Units of measure	°C or °F, software selectable
Memory	Non-volatile, no loss of parameters after the event of power outage or long term shut down, data holding time ~10 years.
LED indicators	Status LEDS are available for:
NGC-20-C-E	Heater, Alarm, RS-485 communication, Bluetooth communication
NGC-20-CL-E	Heater, Alarm, Limiter Tripped, RS-485 communication and Bluetooth

MEASURING RANGES

Temperature range control unit	From –200°C to +700°C in steps of 1K
Temperature range limiter	From –60°C to +599°C in steps of 1K (NGC-20-CL-E only)
Voltage	From 50 Vac to 305 Vac
Load Current	From 0.3 A to 30 A
Ground-fault current	From 10 mA to 250 mA (RCD/ELCB required due to IEC and/or local regulations)
Heater time alarm	From 1 to 1 x 10^6 hours
Relay cycle alarm	From 0 to 2 x 10^6 cycl

Ordering information

NVENT RAYCHEM NGC-20 CONTROL UNITS

Name	Description	Part number	Approvals	Weight
NGC-20-C-E	Controller	1244-007035	ATEX, IEC Ex, Seguranca, EAC Ex, metrology certificate Russia	2.2 kg
NGC-20-CL-E	Controller + Limiter	1244-007036	ATEX, IEC Ex, Seguranca, EAC Ex, metrology certificate Russia	2.3 kg
NGC-20-C-E (for Russia)	Controller	1244-018772	EAC Ex, metrology certificate Russia	2.2 kg
NGC-20-CL-E (for Russia)	Controller + Limiter	1244-018773	EAC Ex, metrology certificate Russia SIL2 limiter	2.3 kg

TEMPERATURE SENSORS

Product name	MONI-PT100-260/2 or MONI-PT100-EXE-SENSOR

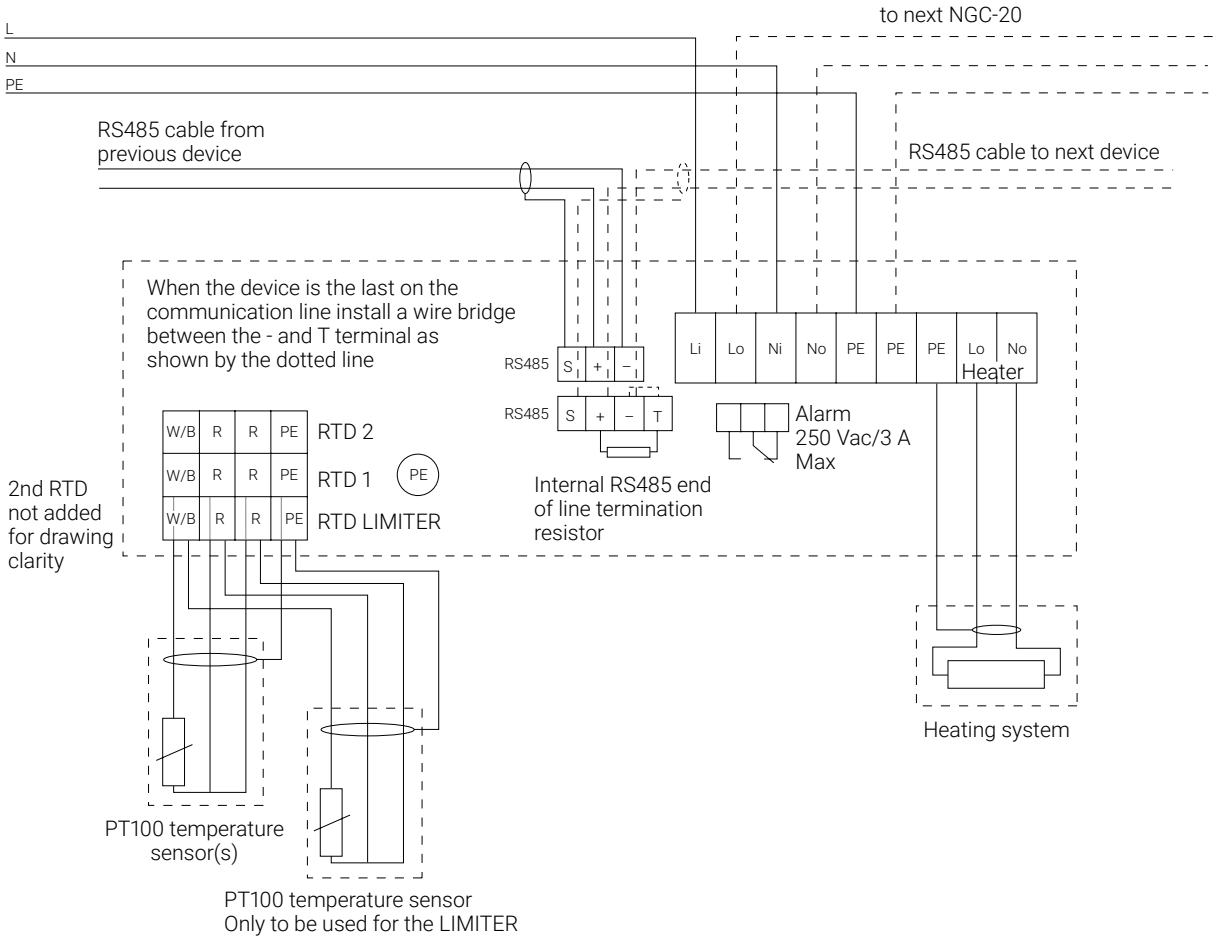
SUPPORT BRACKET FOR INSTALLATION ON PIPE

Product name	SB-125
Part number & (weight)	1244-06603 (0.5 kg)

BLUETOOTH ENABLED HANDHELD PROGRAMMING DEVICE WITH CUSTOMIZED NVENT RAYCHEM SOFTWARE

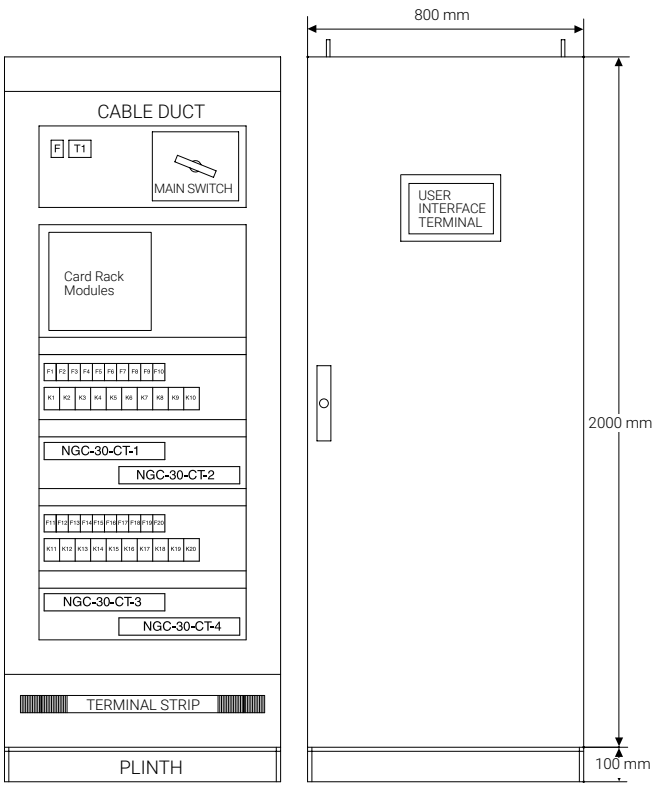
Product name	NGC-CMA2-ZONE1 (Hazardous area approved device for use in Zone 1, 21)
Part number & (weight)	1244-018988 (1.25 kg)
Product name	NGC-CMA2-ZONE2 (Hazardous area approved device for use in Zone 2, 22)
Part number & (weight)	1244-006606 (0.6 kg)

CONNECTION DIAGRAM (TYPICAL)



NGC-30

PANEL MOUNTED ELECTRONIC MULTI-CIRCUIT HEAT-TRACING CONTROL, MONITORING AND POWER DISTRIBUTION SYSTEM



PRODUCT OVERVIEW

The nVent RAYCHEM NGC-30 is a multi circuit electronic control, monitoring and power distribution system for heat-tracing used in process temperature maintenance and freeze protection applications. The system consists of multiple components covering a broad range of requirements from simple temperature monitoring to ground fault, voltage and current measurement, bringing valuable information about the status and health of the heat-tracing circuits from the field into a central location. The nVent RAYCHEM NGC-30 system can minimise routine checks by transforming field data into valuable information for maintenance and operations.

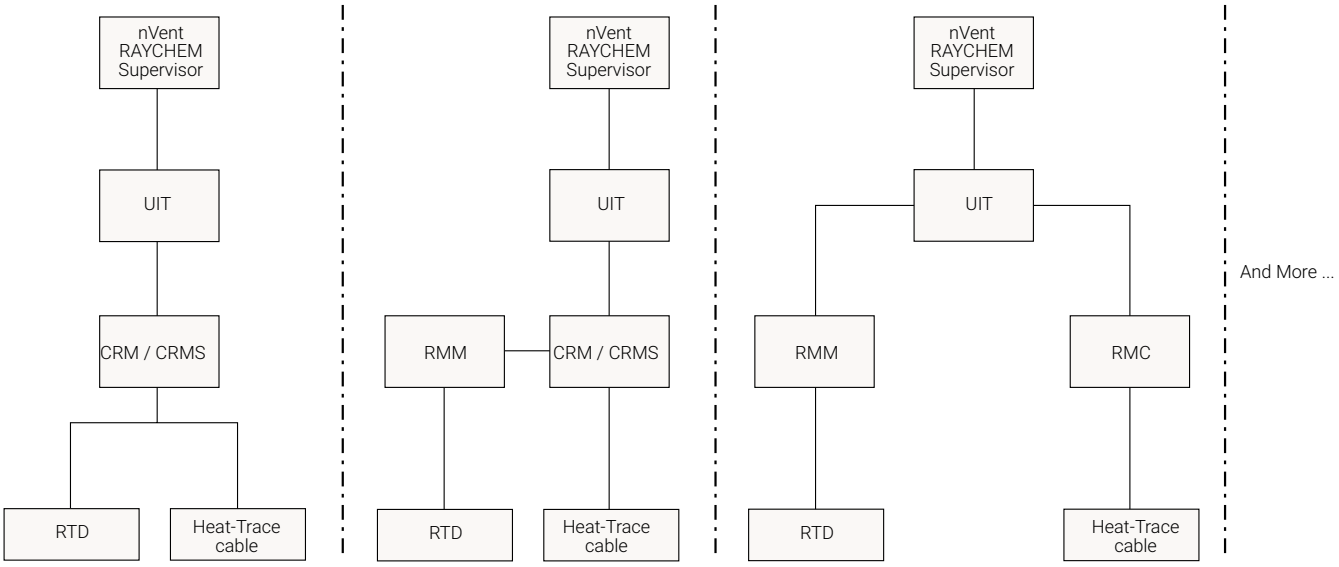
NVENT RAYCHEM NGC-30 PANEL

The nVent RAYCHEM NGC-30 is available as a complete distribution panel system. Typical characteristics for these panels are easy access, pre-wired and all wiring landed on easy accessible terminals. The enclosure is based on industrial standards while the wiring is optimised for maintenance purposes. The panels are equipped with earth leakage circuit breakers and a main circuit breaker. In addition to these standard features the customer can select additional options based upon the heat-tracing monitoring and control requirements. For example the options include types of contactors (solid state or mechanical), number of circuits plus spare required, voltage monitoring, alarm light indications, panel size, cable entry location and other parameters. A nVent RAYCHEM NGC-30 panel system can consist of multiple cabinets which are interlinked via a dedicated communication link. In general the master panel contains the User Interface Terminal (UIT), typically built into the door.

NVENT RAYCHEM NGC-30 COMPONENTS

Customers who wish to integrate the nVent RAYCHEM NGC-30 system into their own control panels can obtain the individual components separately. The nVent RAYCHEM NGC-30 system is configurable in different ways depending upon the requirements of the customer. The user interface for the nVent RAYCHEM NGC-30 is the User Interface Terminal (NGC-UIT2-EX). As soon as ground-fault measurement, line current measurements or distributed control requirements become important, the components Card Rack (CR), Card Rack Modules for mechanical relays (CRM) and/or solid state relays (CRMS), Current Transformer Modules (CTM) and Voltage Module (CVM) should be chosen. The nVent RAYCHEM NGC-30 system has two Remote Measurement Modules available. These modules are the RMM2 for temperature measurement and the RMM-DI for digital inputs. Users who want to build on the known and proven technology used in the MoniTrace 200N-E can continue using the fully compatible components; Remote Monitoring Module (RMM2) and Remote Modules for Control (RMC).

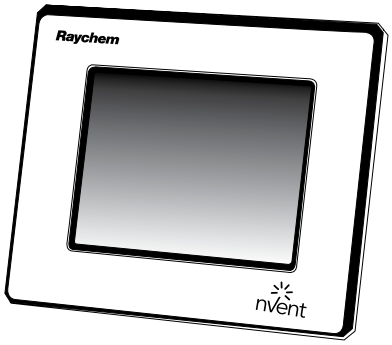
The powerful nVent nVent RAYCHEM Supervisor heat-tracing controller configuration and monitoring PC-software package completes the system. The Client - Server application enables the user to access all information from anywhere in the world, making nVent RAYCHEM Supervisor a strong management tool for the entire Heat Management System.



Examples of various nVent RAYCHEM NGC-30 configurations

The following section gives an overview of the different components used in the nVent RAYCHEM NGC-30 system.

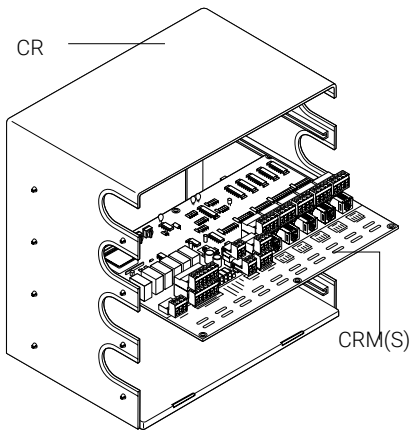
NVENT RAYCHEM USER INTERFACE TERMINAL (UIT)



The nVent RAYCHEM User Interface Terminal (NGC-UIT2-EX) is the central part of the nVent RAYCHEM NGC-30 communication. The UIT can be used as well with the nVent RAYCHEM NGC-20 (for more information see the nVent RAYCHEM NGC-20 datasheet). It covers heat-tracing monitoring, configuration and maintenance purposes.
The nVent RAYCHEM User Interface Terminal (NGC-UIT2-EX) consists of a 8.4" LCD colour display using touch screen technology. This provides an easy user interface for programming without the need for keyboards or cryptic labels.
The nVent RAYCHEM UIT communicates via RS-485 to the field and via RS-232/RS-485/Ethernet (selectable) to the nVent RAYCHEM Supervisory Software package as well as the plant process control system. The user interface terminal is available in two different models; the nVent RAYCHEM NGC-UIT2-ORD, ideal for indoor applications,
is for direct mounting on the nVent RAYCHEM NGC-30 panel door. The Remote User Interface Terminal (NGC-UIT2-ORD-R) is a panel mounted display (NGC-UIT2-EX) for use with the nVent RAYCHEM NGC-30 panel that allows for the user interface to be mounted remotely.

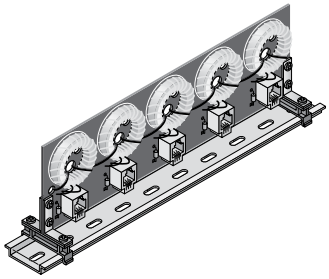
For detailed description see installation instruction NGC-UIT2-EX: INSTALL-168.

CARD RACK MODULE (CRM/CRMS)



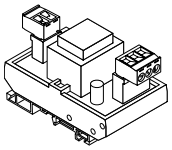
The nVent RAYCHEM Card Rack Module controls up to 5 heat-tracing circuits.
The Card Rack Modules are available in two versions, the nVent RAYCHEM NGC-30 CRM (for mechanical relays) and the nVent RAYCHEM NGC-30 CRMS (for solid state relays). Up to four of these Card Rack Modules can be installed in a panel mounted Card Rack. RTD's are either directly connected to the nVent RAYCHEM CRM(S) or alternatively collected via RMM's locally or centralized in the field (distributed architecture). The CRM/CRMS solution can control up to 260 individual heat-tracing circuits and monitor up to 388 temperature inputs (including 128 temperature inputs via RMMs).

CURRENT TRANSFORMER (CTM)



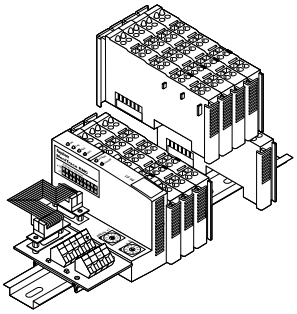
nVent RAYCHEM Current Transformers are an important part of the nVent RAYCHEM NGC-30 system. nVent RAYCHEM CRM in combination with current transformers offer the capability of monitoring and alarming on ground-fault and operating currents. Circuits can be tripped by the controller on high ground-fault currents.

VOLTAGE MODULE (CVM)



nVent RAYCHEM Voltage modules (CVM), used in combination with a nVent RAYCHEM CRM(S) offer the option to monitor the voltage in the panel. The nVent RAYCHEM CVM module uses one channel on one nVent RAYCHEM CRM board in a panel.

REMOTE MODULES FOR CONTROL (RMC)

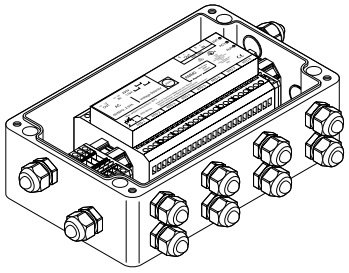


The nVent RAYCHEM NGC-30 system also includes integrated control functionality. Multiple relay outputs to operate contactors of each heat-tracing circuit will be provided by Remote Modules for Control (RMC). Temperature inputs will be provided by Remote Monitoring Modules (RMM) while the control is executed by the UIT.

nVent RAYCHEM RMC units are modular and may be configured with 2 to 40 relay outputs. Each RMC unit also includes two digital inputs (DI) to monitor the status of circuit breakers or power contactors. A single UIT control unit can communicate with up to 10 RMC modules via a single, twisted pair RS-485 cable to provide distributed control of up to 250 heating cable circuits with a maximum of 128 temperature inputs (see nVent RAYCHEM RMM below). For more information refer to the datasheet of nVent RAYCHEM MONI-RMC. Circuits controlled via RMCs, can't be combined with the current transformers (CTM).

The nVent RAYCHEM NGC-30 system also supports building mixed systems of relay outputs via CRM(S) and RMCs, individual circuits can therefore be configured in the most appropriate way.

REMOTE MONITORING MODULES (RMM2) FOR TEMPERATURE MEASUREMENT

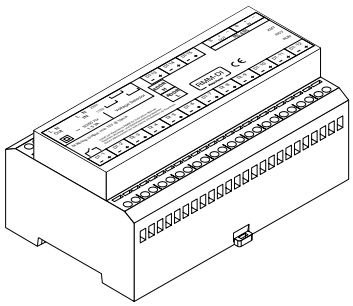


Remote Monitoring Modules (RMM2) provide temperature monitoring capability for the nVent RAYCHEM NGC-30 system.

The RMM accepts inputs up to eight Pt 100 temperature sensors that measure pipe or ambient temperatures in a heat-tracing system. Up to 16 RMMs for a total monitoring capacity of 128 temperatures can be connected to the NGC-30 system.

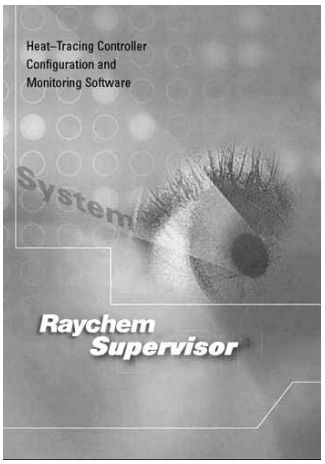
There are two versions available. The RMM2-E is without an enclosure.
The RMM2-EX-E is build into a Hazardous approved enclosure. For more details see the RMM2-E/RMM2-EX-E datasheet.

REMOTE MONITORING MODULES (RMM-DI) FOR DIGITAL INPUT



Remote Monitoring Module for Digital Inputs (RMM-DI) provides digital input monitoring capability for the nVent RAYCHEM NGC-30 system. The RMM-DI accepts inputs up to 15 digital inputs per module. Up to 247 RMM-DI modules can be connected to the nVent RAYCHEM NGC-30 system. The RMM-DI module can currently only be installed in safe area. For more details see the RMM-DI datasheet.

NVENT RAYCHEM SUPERVISORY SOFTWARE



The nVent RAYCHEM NGC-30 system integrates seamless with the nVent RAYCHEM Supervisor heat-tracing controller configuration and monitoring software. It provides a graphical user interface for nVent RAYCHEM communication and heat-tracing controller products. The software supports the latest nVent RAYCHEM control systems via ModBus® protocol. nVent RAYCHEM Supervisor is a powerful client-server software package that gives the possibility to configure and monitor controllers from almost anywhere in the world, using the latest connectivity technologies. In addition to this functionality nVent RAYCHEM Supervisor includes the following functions:

- Logging & trending,
- Configuration of alarms
- Batch & recipe processing,
- Scheduled events,
- Group displays for monitoring multiple controllers at the same time
- Virtual Private Network (VPN) functionality for monitoring possibility on global basis
- Plant Reference Model for structuring controller on a logical way
- Support of plant documentation reports like plant group, location, line/equipment number, breaker panel, controller panel, user and roles are included.

For more detailed information see nVent RAYCHEM Supervisor datasheet.

COMPATIBILITY WITH MONITRACE 200N-E

The nVent RAYCHEM NGC-30 is an upgrade of nVent RAYCHEM's very successful MoniTrace-200N-E system. It provides a state-of-the-art user interface and an opportunity for existing 200N-E installations to benefit from the new features of the nVent RAYCHEM Supervisor software.

Using the new nVent RAYCHEM NGC-30 UIT2, circuits in existing MoniTrace 200 installations can now be upgraded to include monitoring functionality of ground fault and operating current and many other features as described in this document.

Technical Details

APPLICATION

Type	Surface Sensing/Ambient Sensing/PASC (Proportional Ambient Sensing Control)
Area of use	Non-hazardous area indoors or outdoors typically panel mounted

APPROVAL CERTIFICATION

NGC-30	CE All components for ordinary areas.
	EAC (Russia, Kazakhstan, Belarus) For other countries contact your local nVent representative.
NGC-UIT2-EX	EAC Ex RU C-BE.ИМ43.B.01764 ООО "ТехИмпорт" 2Ex nA IIC T5 Gc IP54 Ta -40°C...+60°C Made in US

ELECTROMAGNETIC COMPATIBILITY

Immunity	All components tested for heavy industrial environments
Emissions	All components tested for residential/commercial/light industrial environments
Vibration	nVent RAYCHEM NGC-30 UIT: meets requirements of IEC-60068-2-6
Shock	nVent RAYCHEM NGC-30 UIT: meets requirements of IEC-60068-2-27

ENCLOSURE

Protection	UIT: IP 65 (NEMA 4) when mounted in a panel door.
Ambient operating temperature range	UIT: –30°C to 60°C CRM(S): –40°C to 60°C, storage temp –40°C to 75°C

ELECTRICAL PROPERTIES

Connection terminals	UIT and CRM both are equipped with 2.5 mm^2 Phoenix style connectors with retaining screws.
Power supply	The NGC-UIT2-EX requires supply voltage of 9-30 V DC, 3.6-1.2 A. The CRM's powered by 12 V DC @ 400 mA per board. For more information about RMC and RMM see datasheets of individual components
Power consumption	UIT: 36 W max, CRM/CRMS: 5 W max.
Power output	CRM and CTM are calibrated for a maximum load of 60 A
Control output	Wired directly to contactor or SSR CRM: SPST 3 A @ 277 V AC max 50/60 Hz CRMS: 12 V DC @ 30 mA max per output

Communications

HARDWARE (UIT)

Local port/ remote port; Communication port 1 UIT	Isolated RS232/RS-485, selectable. Ports may be used to communicate with (nVent RAYCHEM Supervisor Software) or DCS. The local RS-232 is a non-isolated, 9 pin D sub male; Remote RS-485 #2 is 2-wire isolated, 9 pin D sub male; Data rate is 9600 to 57600 baud; Maximum cable length for RS-485 not to exceed 1200 m (4000 ft). Cable to be shielded twisted pair. Max number of devices 247, Fail safe design with optional termination resistors Max length 1200 m, Data rate to 9600 baud.
Field port; communication port 2 UIT	RS485, used to communicate with external devices like RMM, RMC and NGC-30. typical max. cable length 1200 m, cable to be shielded twisted pair. Fail safe design with optional termination resistors
LAN UIT	10/100 Base-T Ethernet port with link and activity status LEDs. Protocol Modbus via TCP/IP; can be used to communicate to nVent RAYCHEM Supervisor
USB Port UIT	USB 2.0 Host port type A receptable

COMMUNICATIONS

Temperature (UIT)		
	Low alarm range	–73°C to 482°C or off
	High Alarm range	–73°C to 482°C or off
Ground fault monitoring (UIT, CRM, CT)		
	Alarm range	10 mA to 200 mA
	Trip range	10 mA to 200 mA or off
Operating current (UIT, CRM, CT)		
	Low alarm range	1 A to 60 A or off
	High alarm range	1 A to 60 A or off
Voltage (CRM, CVM; optional)	Displays supply voltage to heat-tracing (Note: requires one operating current input)	
Autocycle	Each loop can be programmed from 1 to 1000 or off	
Temperature sensor inputs	One input standard per control point on CRM, optional temperature inputs via max. 16 RMMs (8 RTDs per RMM)	

COMMUNICATIONS

Control modes	EMR: line sensing on/off, ambient on/off, PASC (proportional ambient sensing control) SSR: line sensing on/off, ambient on/off, PASC (proportional ambient sensing control), Proportional (includes soft start for all SSR control modes)
Units	°C or °F
Deadband	1°C to 10°C

ALARM OUTPUTS

UIT: 3 (3 open collector outputs, to be combined with external relays)

CONTROL OUTPUTS

Number of output relays	CRM: 3-pole mechanical CRMS: 1, 2 or 3 pole solid state, normally open (NO)
Current maximum, used in combination with CRM(S) and CTM	SSR: 60 A at 40°C EMR: 60 A at 40°C

NETWORK CONNECTION

Number of RMM's	Up to 16, individually addressable, each with up to 8, 3 wire Pt 100 inputs
Number of CRM/CTM's	Up to 52 NGC-30-CRM may be connected to one NGC-30-UIT in combination with repeaters. 1 CRM has 5 circuits. In total 260 circuits per NGC-30 system.

DISPLAY

Type	LCD is a XGA, colour TFT transflective device with integral LED backlight
Screen size	175 mm x 132 mm
Touchscreen	5-wire resistive touch screen interface for user entry, usable with gloved fingers

PROGRAMMING AND SETTINGS

Method	Via touch screen or nVent RAYCHEM Supervisor 2.1 or higher
Language(s)	English, Russian, French, German, Spanish, Czech, Chinese
Memory	Non-volatile, restores after power loss

ORDERING NGC-30 CONTROL SYSTEM

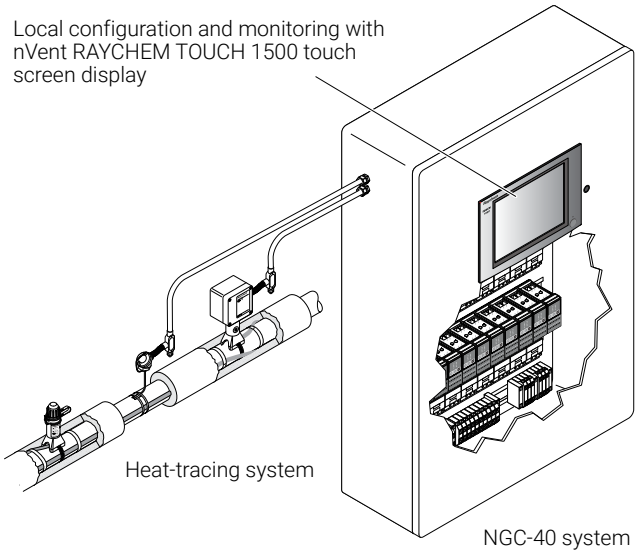
The NGC-30 is offered as a complete solution, where the control system is already integrated into fully engineered control and power distribution panels. Using standard industrial enclosures, specific care has been taken to design the systems to highest safety standards by enabling optimum access for easy maintenance, as well a clear layout of the functional blocks and terminals. Customers desiring to build their own systems, can use the individual components of the nVent RAYCHEM NGC-30 and integrate them into their own power distribution panels. Below both options are described how to order the NGC-30 system.

ORDERING DETAILS INDIVIDUAL COMPONENTS

Product name	Description	Part Number (Weight)
NGC-UIT2-EX	User Interface Terminal	10332-032 (1.78 kg)
NGC-UIT2-ORD-R	User Interface Terminal with enclosure	10332-016 (8.86 kg)
NGC-30-CRM-E	Card Rack Module (EMR)	10720-008 (0.68 kg)
NGC-30-CRMS-E	Card Rack Module (SSR)	10720-009 (0.50 kg)
NGC-30-CTM-E	Current Transformer Module	10720-010 (0.36 kg)
NGC-30-CVM-E	Voltage Monitoring Module (CVM)	10720-011 (0.20 kg)
NGC-30-CR-E	Card Rack	10720-012 (3.66 kg)
PS12	Transformer 12 V DC	1244-001505 (0.18 kg)

NGC-40

PANEL MOUNTED ADVANCED MODULAR HEAT-TRACING CONTROL SYSTEM

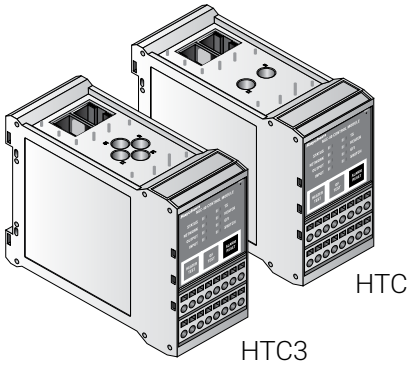


PRODUCT OVERVIEW

The nVent RAYCHEM NGC-40 is a multipoint electronic control, monitoring and power distribution system with a unique single-point controller architecture providing the most reliable central control and monitoring solution for your Heat Management System.

By taking advantage of innovative modular packaging techniques, the NGC-40 system provides configuration and component flexibility so that it may be optimised for a customer's project specific needs.

CONTROL MODULES: NGC-40-HTC & NGC-40-HTC3

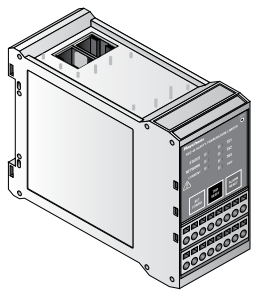


The NGC-40 uses a single controller module per heat-tracing circuit for maximum reliability. The NGC-40 control system can be powered between 100 to 240 Vac, while mechanical contactors (EMRs) or solid-state relays (SSRs) allow circuit switching up to 60 A at 600 Vac.

There are dedicated control modules available for single phase (NGC-40-HTC) and three-phase (NGC-40-HTC3) heat-tracing circuits. The NGC-40 control modules include ground-fault detection and protection. The control modules guarantee precise single phase and three-phase line current measurements. Up to eight (8) temperature sensors (RTDs) can be used for each heat-tracing circuit allowing a variety of temperature control, monitoring, and alarming configurations. The NGC-40 provides alarm outputs and digital inputs. The alarm output can be used to control an external annunciator.

The digital input is programmable and may be used for various functions such as forcing outputs on and off or generating alarms, making the system more flexible to match each customer's specific needs.

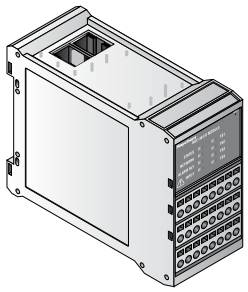
SIL2 SAFETY TEMPERATURE LIMITER: NGC-40-SLIM



The NGC-40 has a SIL2 certified safety temperature limiter module.
The module can be used with up to 3 temperature inputs for three phase heat-tracing circuits. The limiter can be associated with a NGC-40 controller and use current information for latching the trip functionality. The front panel of the limiter module has LED indicators for various status conditions. The front panel also provides a button to confirm new set trip point, a reset trip button and a reset alarm button. The module has one output for the contactor and one output for external alarm annunciation. The safety temperature limiter can be reset via the digital input, the user interface nVent RAYCHEM TOUCH 1500 and nVent RAYCHEM Supervisor.

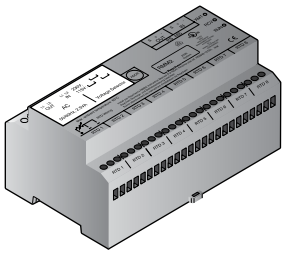
RAYCHEM-DS-EU1442-NGC40-EN-1911

IO MODULE: NGC-40-IO



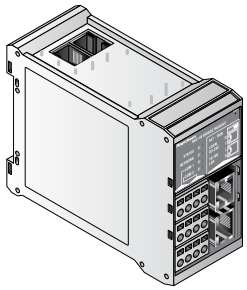
In addition to hardwiring an RTD directly into a Heat Trace Control module, RTDs can be wired to Input/output modules (NGC-40-IO) within the panel and assigned to heat-tracing circuits through software. This means that a NGC-40 system can be optimised for the specific application needs. Each IO module accepts up to four additional RTD inputs.

RMM2



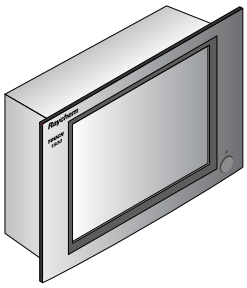
The NGC-40 works with the MONI-RMM2 module. Each RMM2 module installed in the field can accept up to 8 RTDs. 16 RMM2 Modules can be daisy chained together via RS-485 for a total of 128 temperature inputs. Since multiple RMM2s can be networked over a single cable to the NGC-40, the cost of RTD field wiring will be significantly reduced.

COMMUNICATION MODULE: NGC-40-BRIDGE



The NGC-40 system supports multiple communications ports, allowing serial interfaces (RS-485 and RS-232) and network connections (Ethernet) to be used with external devices. All communications with the NGC-40 panel are accomplished through the NGC-40-BRIDGE module which acts as the central router for the system, connecting the panel's control modules, IO modules, safety limiter modules, RMM2 Modules, as well as upstream devices such as TOUCH 1500 touch screen, Supervisor and Distributed Control System (DCS). Communications to devices external to the NGC-40 panel are done via Modbus® protocol over Ethernet, RS-485 or RS-232.

NVENT RAYCHEM TOUCH 1500



The nVent RAYCHEM TOUCH 1500 is a panel mounted display used in conjunction with nVent RAYCHEM NGC-20 and NGC-40 Control and Monitoring Systems devices. The TOUCH 1500 is rated IP 65 (NEMA 4) and can be mounted both indoors and outdoors. The TOUCH 1500 kit includes all hardware required for mounting in a suitable electrical panel. TOUCH 1500R, a remote version of TOUCH 1500, is also available as a standalone solution for applications in which the controllers are not in the same location as the user interface.

Make Your Systems Talk!

Now more than ever, open communication systems, data integration, easy configuration and real-time monitoring are critical components of running an industrial installation. With the latest TOUCH 1500 software, nVent offers the full data integration of its heat tracing systems with process control systems, allowing for the reduction of maintenance and energy costs and, consequently, increasing process productivity. TOUCH 1500 to DCS means "data a la carte." The heat tracing data you want, in your preferred format for your DCS system.

NVENT RAYCHEM SUPERVISOR SOFTWARE

The nVent RAYCHEM Supervisor software package provides a remote, graphic interface for the NGC-40. The software allows the user to configure and monitor various NGC systems from a central location. It also provides an audible alarm tone, acknowledges and clears alarms; and contains advanced features such as data logging, trending, implement changes in batches, and other useful functions. Users can access all information from anywhere in the world, making Supervisor a powerful management tool for the entire Heat Management System.

GENERAL NVENT RAYCHEM NGC-40 CONTROLLER MODULES

Application type	The NGC-40 units shall be installed in non-hazardous areas. approved sensors shall be used when the system is applied to heat-tracing circuits in hazardous areas.	Hazardous area
Approval certification	CE EAC TOUCH1500-R: TC RU C-BE.БЛ08.B.01634 Made in CN ETL not for NGC-40-SLIM module	

ELECTROMAGNETIC COMPATIBILITY

Emissions	EN 61000-6-3
Immunity	EN 61000-6-2
Supply voltage	24 Vdc +- 10%
Internal power consumption	< 2.4 W per module
Ambient operating temperature	–40°C to 65°C (–40°F to 149°F)
Ambient storage temperature	–40°C to 75°C (–40°F to 167°F)
Environment	PD2, CAT III
Maximum altitude	2,000 m (6,562 ft)
Humidity	5 – 90% non-condensing
Mounting	Din Rail – 35 mm

CAN NETWORKING PORT

Type	2-wire isolated CAN-based peer to peer network. Isolated to 24 Vdc – verified by 500 Vrms dielectric withstand test
Connection	Two 8-pin RJ-45 connectors (both may be used for Input or Output connections) Protocol Proprietary NGC-40
Topology	Daisy chain
Cable length	10 m (33 ft) maximum
Quantity	Up to 80 HTC/HTC3 and IO modules per network segment
Address	Unique, factory assigned

CONNECTION TERMINALS AND HOUSING

Wiring terminals	Spring-type, 0.5 to 2.5 mm^2 (24 to 12 AWG)
Housing Size	45.1 mm (1.78 in) wide x 87 mm (3.43 in) high x 106.4 mm (4.2 in) deep

NGC-40-HTC/NGC-40-HTC3

Temperature Sensors	Type 100 Ω platinum RTD, 3-wire,α = 0.00385 ohms/ohm/°C Can be extended with a 3-conductor shielded cable of 20 Ω maximum per conductor 100 Ω, Ni-Fe, 2-wire. Can be extended with a 2-wire shielded cable of 20 Ω maximum per conductor
Quantity Temperature sensors	One per NGC-40-HTC/HTC3 module
Measuring range	Temperature range from –80˚C to +700˚C (–112°F to 1292°F)
Current measurement	Internal to the module
Current measurement NGC-40-HTC	1 for single-phase line current measurements, 60A, +/- 2% of range
Current measurement NGC-40-HTC3	3 for three-phase line current measurements, 60A, +/- 2% of range
Ground-fault	1 for ground-fault measurements, 10-250 mA, +/- 2% of range
Alarm Relay	Dry contact relay (voltage free). Relay contact rated 250 V/3 A 50/60 Hz (EC) and 277 V/3 A 50/60 Hz (cCSAus). Alarm relay is programmable. N0 and NC contacts available.
Contactor Output Relay	Relay contact rated 250 V/3 A 50/60 Hz (EC) and 277 V/3 A 50/60 Hz (cCSAus).
SSR Output	12 Vdc @ 45 mA max per output
Digital Input	Multi-purpose input Multi-purpose input for connection to external dry (voltage-free) contact or DC voltage. May be user programmable for: not used/force off/force on functions. It can be configured to be active open or active closed.

NGC-40-SLIM

Functional Safety Approval	Functional safety according to Baseefa10SR0109 SIL 2 IEC 61508-1-1998 & IEC 61508-2-2000
Conditions of use	See installation instructions
Measuring range	Temperature range limiter from +50˚C to +500˚C (–22˚F to 932˚F)
Temperature Sensor	Type: 100 Ω platinum RTD, 3-wire, α = 0.00385 ohms/ohm/˚C. Can be extended with a 3-conductor shielded cable of 20 Ω maximum per conductor. Quantity: 3 per NGC-40-SLIM module.
Digital Input	Used for resetting the safety temperature limiter remotely. The Digital Input will be for connection to external dry (voltage free) contactor or DC voltage. The input shall be 5 – 24 VDC/1mA max with 100 ohms of loop resistance and configured as active low.

NGC-40-IO

Temperature Sensors	Type 100 Ω platinum RTD, 3-wire,α = 0.00385 ohms/ohm/ºC Can be extended with a 3-conductor shielded cable of 20 Ω maximum per conductor 100 Ω, Ni-Fe, 2-wire. Can be extended with a 2-wire shielded cable of 20 Ω maximum per conductor.
Quantity Temperature sensors	Up to four wired directly to each NGC-40-IO module
Alarm Relay	Dry contact relay (voltage free). Relay contact rated 250 V/3 A 50/60 Hz (EC) and 277 V/3 A 50/60 Hz (cCSAus). Alarm relay is programmable. N0 and NC contacts available.
Digital Input	Multi-purpose input Multi-purpose input for connection to external dry (voltage-free) contact or DC voltage. May be user programmable for: not used/force off/force on functions. It can be configured to be active open or active closed.

NGC-40-BRIDGE

Communications COM1, COM2	
Type	2-wire RS-485
Cable	One shielded twisted pair
Length	1,200 m (4,000 ft) maximum
Quantity	Up to 255 devices per port
Data rate	9600, 19.2K, 38.4K, 57.6K, 115.2K baud
Data bits	7 or 8
Parity	None, even, odd
Stop bits	0, 1, 2
Tx delay	0 – 5 sec.
Protocol	Modbus RTU or ASCII
Connection terminals	Spring-type terminals

COMMUNICATIONS COM3

Type	RS-232
Cable	Custom TTC# 10332-005
Length	15 m (50 ft) maximum
Data rate	9600, 19.2K, 38.4K, 57.6K, 115.2K baud
Data bits	7 or 8
Parity	None, even, odd
Stop bits	0, 1, 2
Tx delay	0 – 5 sec.
Protocol	Modbus RTU or ASCII
Connection terminals	RJ-11

ETHERNET

Type	10/100 BaseT Ethernet network
Length	100 m (328 ft)
Data rates	10 or 100 MB/s
Protocol	Connection terminals
Connection terminals	Shielded 8-pin RJ-45 connector on front of module

NGC-40-PTM

Connection terminals	Spring-type, 0.5 to 2.5 mm^2 (24 to 18 AWG). As the current to the modules require up to 2.05 A @ 24Vdc (20 modules - see CAN Bus connection diagrams) the minimum wire size to the module shall be 1.0 mm2 (AWG18)
CAN networking and module Power	Two RJ-45 connectors, one each IN and OUT. Provides CAN bus signals and 24 Vdc power.

TOUCH 1500

General	
Area of use	Nonhazardous, Indoors (IP65, NEMA 4)
Supply voltage	10 – 30 Vdc
Amperage rating	Steady state 1.8 A
Surge current	16 A
Operating temperature	0°C to 50°C (32°F to 122°F) w/o space heater, –30°C to 50°C (–22°F to 122°F) using space heater and screen cover
Storage temperature	–20°C to 60°C (–4°F to 140°F)
Dimensions	449.9 mm (W) X 315.6 mm (H) X 141.7 mm (D)
Relay outputs	One Form C relay rated at 12 A @ 250 Vac. Relay is used as a common alarm. To be ordered separately
Display	LCD is a 15-in XGA, color TFT transflective device with integral CCFL backlight Touch Screen 4-wire resistive touch screen interface for user entry

NETWORK CONNECTION

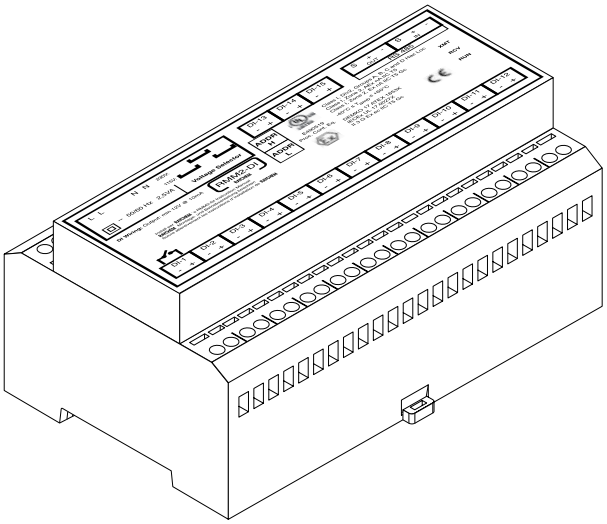
Local/Remote Port	RS-232/RS-485 ports may be used to communicate with host (nVent RAYCHEM Supervisor Software) or DCS 9 pin D sub male
Remote RS-485	2-wire isolated, 9 pin D sub male Data rate 9600 to 57600 baud Maximum cable length not to exceed 1200 m (4000 ft). Cable length to be shielded, twisted pair.
Field Port	RS-485, 2-wire isolated, used for communication with external devices, such as nVent RAYCHEM NGC-40-BRIDGE and nVent RAYCHEM NGC-20. Maximum cable length not to exceed 1200 m (4000 ft). Cable to be shielded twisted pair. Signals 2-wire isolated, 9 pin D sub male Data rate to 9600 baud
LAN	10/100 Base-T Ethernet port with Link and Activity Status LEDs (X2)
USB Ports	USB 2.0 Host port Type A receptacle (X4)

PART NUMBERS

Product name	Description	Part Number
NGC-40-HTC	NGC-40 single phase heat trace control module	10730-003
NGC-40-HTC3	NGC-40 three phase heat trace control module	10730-004
NGC-40-SLIM	NGC-40 Safety Temperature Limiter	1244-010700
NGC-40-IO	NGC-40 Input - Output Module	10730-001
NGC-40-BRIDGE	NGC-40 Communication Bridge Module	10730-002
NGC-40-PTM	NGC-40 Power Termination Module	10730-005
TOUCH1500	TOUCH1500 display kit– 15" Touch screen and Relay Output Module	10332-009
TOUCH1500R	Touch 1500 in enclosure for remote mounting on wall	10332-020
RELAY OUTPUT - TOUCH	Relay Output Module /w Modbus for Touch 1500	10332-017
NGC-40-CAN05	NGC-40 CAN Cable Length 5"	20578011-005
NGC-40-CAN48	NGC-40 CAN Cable Length 48"	20578011-048
NGC-40-TB	CANbus termination plug	10392-043
PS-24	24 Vdc Power supply	972049-000

RMM2-DI

REMOTE MONITORING MODULE FOR DIGITAL INPUTS



The Remote Monitoring Module for Digital Inputs (nVent RAYCHEM RMM2-DI) provides the capability for the nVent RAYCHEM NGC controller family to read the status of devices remotely and can link them back to the electrical heat-tracing circuits.

The RMM2-DI has in total 15 digital inputs. Multiple RMM2-DI units can communicate with a single User Interface providing centralized monitoring capabilities.

CONTROL AND MONITORING

A nVent RAYCHEM NGC network controls up to 260 heat-tracing circuits per system based on ambient or pipe temperatures. The RMM2-DI module can be used to collect circuit breaker status, contactor status or other digital information in the field. This information will be communicated back to a central location via one communication cable, reducing installation and wiring cost.

CIRCUIT BREAKER TRIP ALARMS

When monitoring the circuit breaker status with the RMM2-DI module, the information can be linked in the NGC control system to the associated electrical heat-tracing circuits. An alarm will be generated when a circuit breaker trips. As a result the User Interface will show in detail which circuit breaker tripped and the associated electrical heat-tracing circuit(s) effected. The alarms may be reported remotely through an alarm relay in the User Interface, via nVent RAYCHEM Supervisor and upstream to a Process Control system via a Modbus communication link.

CONFIGURATIONS

The RMM2-DI is an electronic device that clips to a DIN 35 rail. The complete kit for ordinary and hazardous areas (Zone 2) include an RMM2 mounted in a rugged polyester enclosure with appropriate terminals and cable glands. For other installation options, contact nVent.

GENERAL

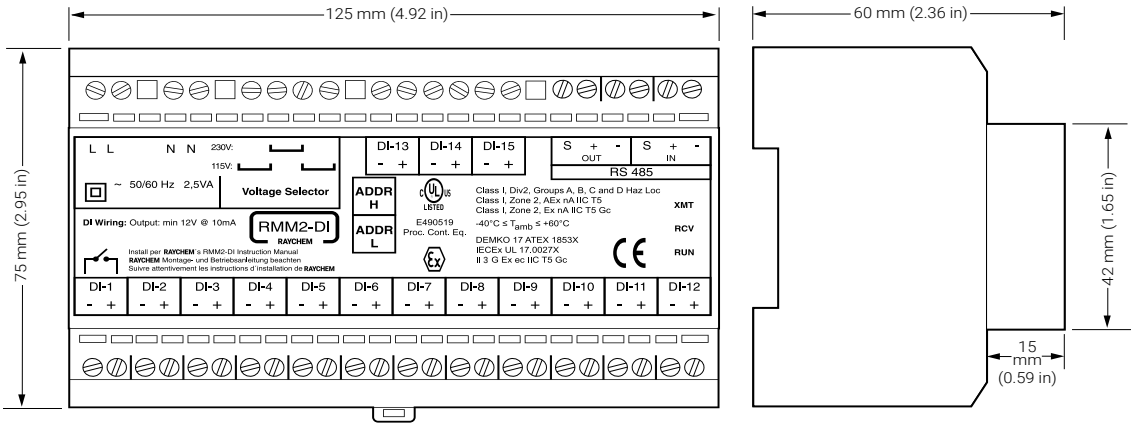
Area of use	Hazardous area when mounted in Ex-d enclosure RMM-DI panel mount, safe area

APPROVALS

RMM2-DI module	c UL us LISTED E490519 Proc. Cont Eq	Class I, Div2, Groups A, B, C and D Haz Loc Class I, Zone 2, AEx nA IIC T5 Class I, Zone 2, Ex nA IIC T5 Gc DEMKO 17 ATEX 1853X IECEx UL 17.0027 II 3 G Ex ec IIC T5 Gc
RMM2-DI-8GL-EX-E and RMM2-DI-15GL-EX-E System		DEMKO 17 ATEX 1760X IECEx UL 17.0026 II 3 G Ex ec IIC T5 Gc Ex tc IIIC T60°C Dc -40°C ≤ Tamb ≤ +60°C
	CE EAC	

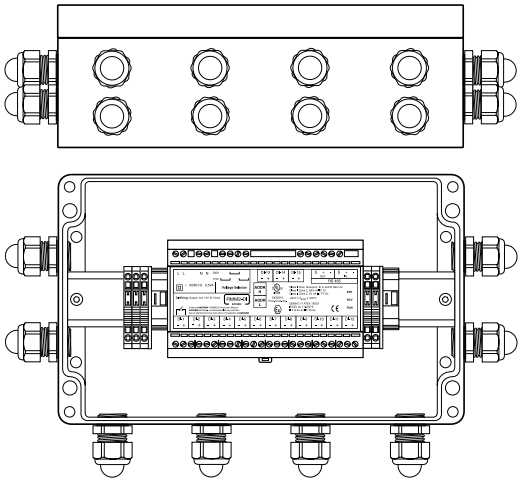
Ambient operating temperature range	–40°C to +60°C
Ambient storage temperature range	–51°C to +60°C
Relative humidity	max. 95%, noncondensing
Supply voltage	(nominal) 115/230 Vac +10% -10% 50/60 Hz (jumper selectable)

DIMENSIONS (IN MM)



DIMENSIONS AND MOUNTING

Dimensions	125 mm x 75 mm x 60 mm, see drawing
Mounting	DIN rail mountable



RMM2-DI-EX-E ENCLOSURE

RMM2-DI-8GL-EXE-E	RMM2-DI enclosure with 8 Glands for Digital input signals
Dimensions	260 mm x 160 mm x 91 mm
RMM2-DI-15GL-E	RMM2-DI enclosure with 15 Glands for Digital input signals
Dimensions	360 mm x 160 mm x 91 mm

DIGITAL INPUT

Type	2 wire digital input
Supplied power	Minimum power per DI connection supplied by RMM2-DI module 12V 10mA (Sink/source)
Number of signals	15 Digital inputs

COMMUNICATION TO NVENT RAYCHEM NGC CONTROL SYSTEM

Type	RS-485
Protocol	Modbus RTU
Cable type	Shielded twisted pair
Length cable	1200 m max.
Address switch	Selectable on RMM2-DI, address range: 1-255

CONNECTION TERMINALS

Supply (in-out)	4 terminals for cables 0.2 mm^2 to 4 mm^2
RS-485 connection	2 x 3 terminals for cables 0.2 mm^2 to 2.5 mm^2
DI connections	15 x 2 terminals for cables 0.2 mm^2 to 2.5 mm^2

ELECTROMAGNETIC COMPATIBILITY

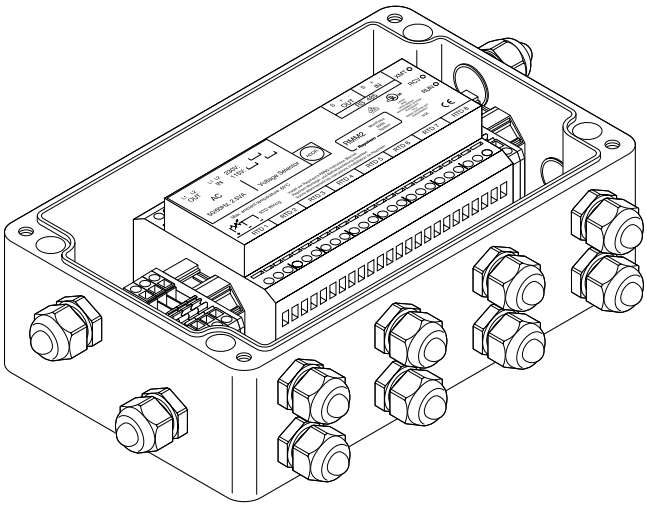
EN 60730-1: 2011	
EN 61000-6-3:2007+A1:2011	EN 61000-3-2:2006 +A1:2009+A2:2009
EN 61000-3-3:2008	
EN 61000-6-2:2005	

ORDERING DETAILS

Additional Details	Part Description	Product Number	EAN Number
RMM2-DI, no enclosure	RMM2-DI	1244-018083	5414506018479
With Zone 2 enclosure and 8 Glands for DI signals	RMM2-DI-8GL-EX-E	1244-018858	7350027271611
With Zone 2 enclosure and 15 Glands for DI signals	RMM2-DI-15GL-EX-E	1244-018859	7350027271628

MONI-RMM2-E

HEAT-TRACING REMOTE MONITORING MODULE



The Remote Monitoring Modules (RMM2) provide temperature monitoring capability for nVent RAYCHEM NGC controller family. The RMM2 accepts inputs from up to eight Pt 100 temperature sensors that measure pipe or ambient temperatures in a heat-tracing system. Multiple RMM2 units communicate with a single nVent RAYCHEM NGC User Interface Terminal (nVent RAYCHEM NGC-UIT) providing centralised monitoring of temperatures.

A single, twisted pair RS-485 cable connects up to 16 RMMs for a total monitoring capacity of 128 temperatures per nVent RAYCHEM NGC controller network.

CONTROL AND MONITORING

A nVent RAYCHEM NGC network controls up to 260 circuits of heat-tracing per system based on ambient or pipe temperatures. The RMM2 may be used to collect both ambient and pipe temperatures for control or for extensive monitoring of the heat-tracing system. The RMM2 units are placed near desired monitoring locations, even in hazardous areas (Zone 2). Multiple temperature sensor inputs are networked over a single cable, significantly reducing installation cost for temperature monitoring.

ALARMS

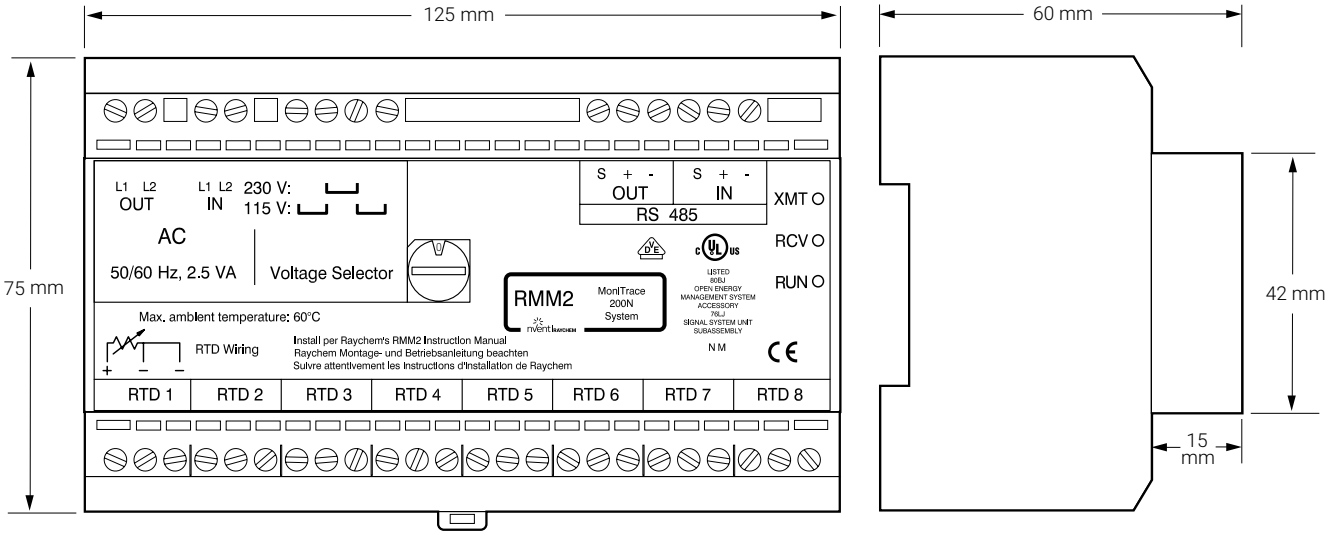
Low and high temperature alarms may be set for sensors connected to the nVent RAYCHEM NGC controllers via the RMM2. Alarm limits are set and alarm conditions are reported to the user. Additional alarms are triggered for failed temperature sensors and communication errors. Alarms may be reported remotely through an alarm relay in the nVent RAYCHEM NGC-UIT or via nVent RAYCHEM Supervisor.

CONFIGURATIONS

The RMM2 is an electronic device that clips to a DIN 35 rail. The complete kit for ordinary and hazardous areas (Zone 2) include an RMM2 mounted in a rugged polyester enclosure with appropriate terminals and cable glands. For other installation options, contact nVent.

RAYCHEM-DS-EU1444-MONIRMM2E-EN-1911

DIMENSIONS (IN MM)



GENERAL

Area of use	Hazardous area (Zone 2) or non-hazardous area RMM2-EX-E hazardous area zone 2 or non-hazardous area RMM2-E panel mount, safe area

APPROVALS

RMM2-EX-E only:	Baseefa03ATEX0739X Ⓔx II 3GD T70°C EEx nR II T6 (−20°C ≤ Ta ≤ 60°C)
	EAC Ex TC RU C-BE.ИМ43.B.01764 ООО "ТехИмпор 2Ex nR II T6 Gc IP66 Ta -55°C...+60°C Made in GE

Ambient operating temperature range	−40°C to +60°C
Ambient storage temperature range	−51°C to +60°C
Relative humidity	max. 95%, noncondensing
Supply voltage (nominal)	115/230 Vac +10% -10% 50/60 Hz (jumper selectable)
Internal power consumption	3 VA

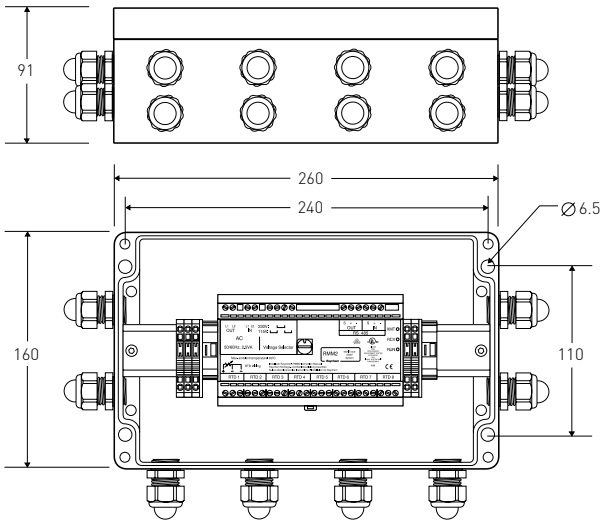
RMM2 Hazardous Area Enclosure	nVent RAYCHEM MONI-RMM2-EX-E
Protection	IP66
Base and lid	Material: glassfibre-reinforced polyester, lid seal: silicone
Colour	Black
Ambient temperature range	−20°C to +60°C
Lid fixing	4 x M6, cheese-head, captive, stainless steel
Entries	12 x M20 for cable diameters ranging from 6 to 12 mm
Glands provided (EEx e)	12 x M20 with integral stopping plugs
Mounting	Surface mounting with 4 fixing holes on 240 x 110 mm centres hole diameter: 5 mm

TEMPERATURE SENSORS

Type	3 wire Pt 100, temperature coefficient per IEC 751-1983
Quantity to be connected	Up to 8 Pt 100 per RMM2 The sensor cable may be extended with a 3 (+PE)-wire signal cable adding 20 Ohms lead resistance maximum. When using 1.5 mm^2 cable this equals to ±150 m of cable. When the sensor cable is laid in cable ducts or in the vicinity of highvoltage carrying cables the sensor extension cable should be shielded. The shield of the extension cable should be grounded at the controller end only.
Area of use	Use sensors with the appropriate approvals required for the area of use

ENCLOSURE DETAILS - HAZARDOUS AREA ENCLOSURE RMM2-EX-E

DIMENSIONS (IN MM)



COMMUNICATION TO NGC-30-UIT NVENT RAYCHEM NGC CONTROLLERS

Type	RS-485
Cable	1 shielded twisted pair
Length	1200 m max.
Quantity	Up to 16 RMM2 UIT per nVent RAYCHEM NGC network
Address	Switch-selectable on RMM2

CONNECTION TERMINALS

Supply (in-out)	4 terminals for cables 0.2 mm^2 to 4 mm^2
Earth	10 terminals for cables up to 4 mm^2 aside the RMM2 unit
Pt 100 connections	8 x 3 terminals for cables 0.2 mm^2 to 2.5 mm^2
RS-485 connection	2 x 3 terminals for cables 0.2 mm^2 to 2.5 mm^2

ELECTROMAGNETIC COMPATIBILITY

Immunity	Complies with EN 50 082-2 (heavy industrial)
Emissions	Complies with EN 50 081-1 (light industrial)

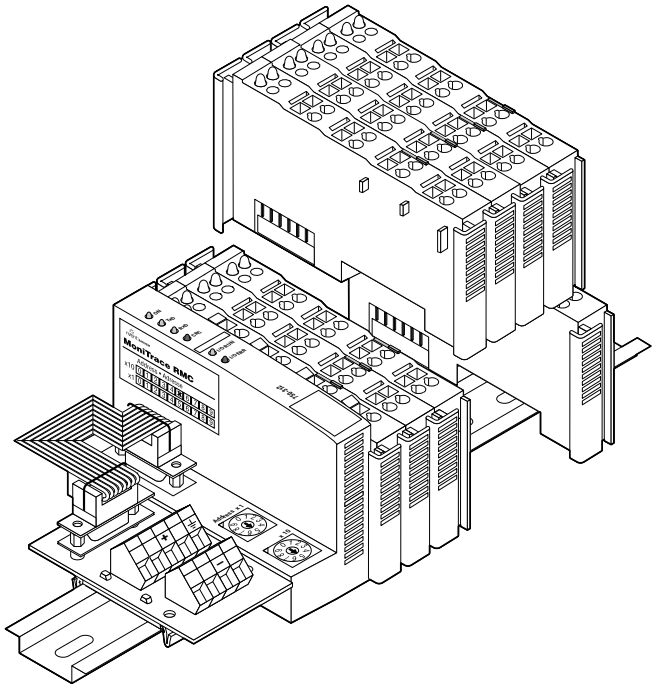
ORDERING DETAILS

RMM2	Part descriptions	Product Number	Weight
No enclosure, internal electronics module only	RMM2-E	307988-000	1.2 kg
With hazardous area enclosure	RMM2-EX-E	676040-000	3.2 kg

Pipe temperature sensors (Pt 100)			
Pt 100 temperature sensor for Zone 1	MONI-PT100-EXE	967094-000	0.6 kg
Pt 100 temperature sensor for ordinary areas	MONI-PT100-NH	140910-000	0.2 kg

MONI-RMC

HEAT-TRACING REMOTE MODULE FOR CONTROL



nVent RAYCHEM remote modules for control (RMC) provide multiple relay outputs for switching heating cable circuits controlled by the nVent RAYCHEM NGC User Interface Terminal (NGC-UIT). RMC units are modular and may be configured with 2 to 40 relay outputs. A single nVent RAYCHEM NGC-30-UIT can communicate with up to 10 RMC via a single, twisted pair RS-485 cable to provide distributed control of up to 260 heating cable circuits.

CONTROL AND MONITORING

The nVent RAYCHEM NGC-30 controls and monitors multiple heat-tracing circuits based on pipe or ambient temperatures. These temperatures can collected locally by nVent RAYCHEM remote monitoring modules (RMM2) connected on the same RS-485 network. Based on temperature inputs from the RMM2, the nVent RAYCHEM NGC-UIT determines which heating cable circuits are to be energised and sends this information to RMC, which then turn on or off the heating cable power contactors. Because temperature inputs and control outputs are located near equipment to be sensed or controlled, wiring costs are reduced significantly.

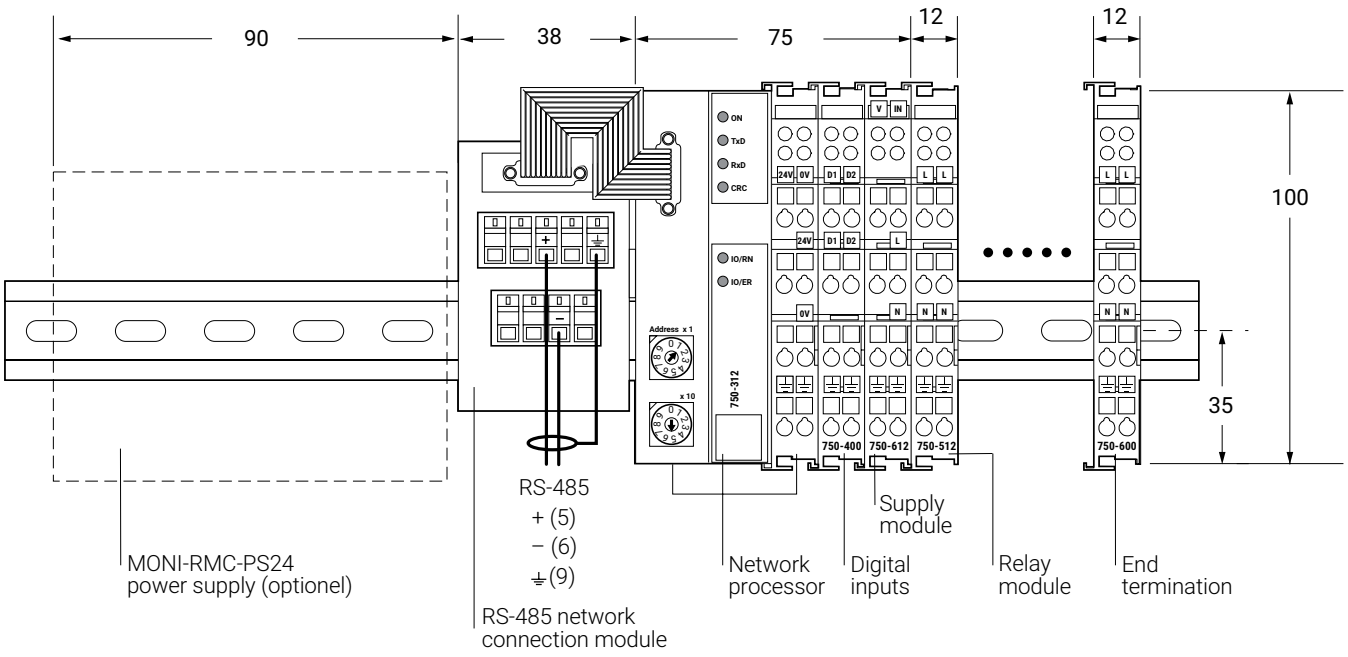
ALARM INPUTS

Each RMC unit includes two inputs to monitor the status of circuit breakers or power contactors. For example, one input may be used for a common circuit breaker trip alarm, providing an alarm indication at the nVent RAYCHEM NGC-UIT if any circuits fail due to earth fault or overcurrent events. Alarms may be reported remotely through an alarm relay in the nVent RAYCHEM NGC-UIT or through an RS-485 connection to nVent RAYCHEM Supervisor. Up to 20 MONI-RMC-2DI 2 channel digital input moduls can be added if required.

CONFIGURATIONS

The RMC are modular, electronic devices that mount on a DIN 35 rail. RMC units must be installed in panels or enclosures suitable for the area classification and environment. For each RMC installation, purchase one MONI-RMC-BASE kit, which includes the network processor, digital inputs, and end terminator; one MONI-RMC-PS24 24-Vdc power supply; and up to 16 MONI-RMC-2RO 2-channel relay output modules, as required.

CONNECTION DETAILS



GENERAL

Area of use	Ordinary areas EAC (Russia, Kazakhstan, Belarus) For other countries contact your local nVent representative.
Ambient operating temperature range	0°C to 55°C
Ambient storage temperature range	–40°C to 70°C
Relative humidity	Max. 95%, noncondensing
Protection	IP2X per IEC 529
Supply voltage	24 Vdc
Supply current	< 2 A

RELAY OUTPUTS

Quantity per RMC	1 to 20 two-channel modules (2 to 40 relay outputs)
Total relay outputs via RMCs	260
Type	Mechanical, normally open, non-floating
Voltage, maximum	250 Vac, 30 Vdc
Current, maximum	AC/DC 2 A
Maximum power	60 W/500 VA (resistive)
Isolation	4 kV
Life (operations)	1 x 10^6 at 0.35 A to 0.2 x 10^6 at 2 A
Connection terminals	0.08 mm^2–2.5 mm^2, Spring-type

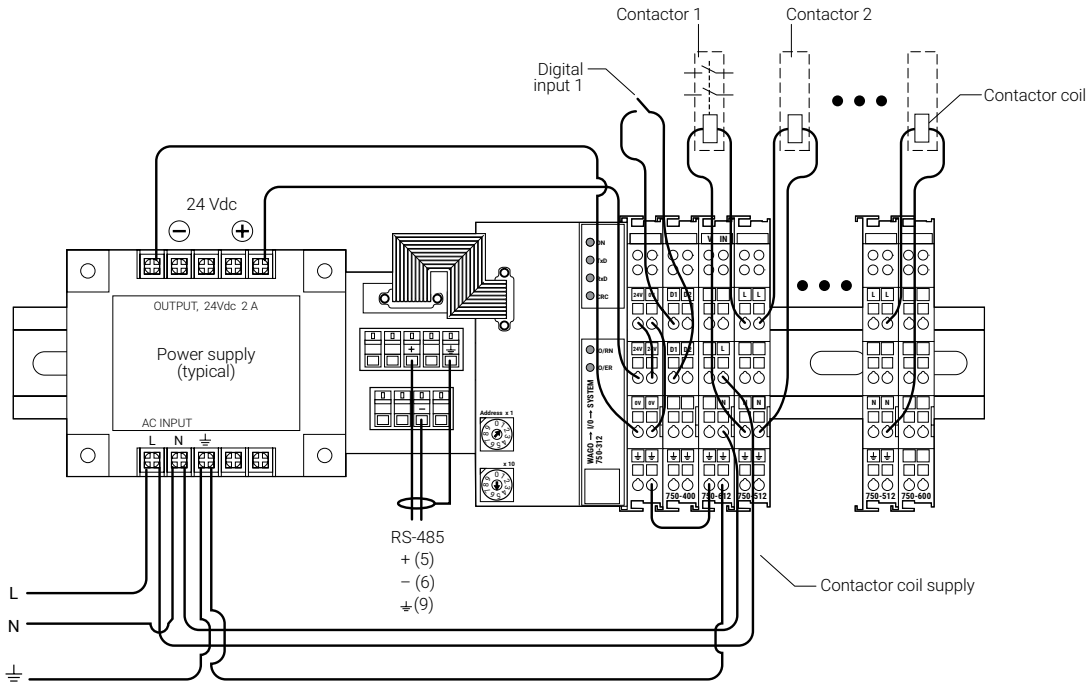
SUPPLY MODULE

Voltage	230 Vac/dc
Current	10 A
Connection terminals	Spring-type for cables from 0.08 mm^2 to 2.5 mm^2

DIGITAL INPUTS

Quantity per RMC	Up to 20 two-channel modules (2 to 40 digital inputs)
Type	Solid-state, 24 Vdc source
Current consumption	5 mA
Isolation	500 V
Connection terminals	0.08 mm^2–2.5 mm^2 (Spring-type)

DIMENSIONS (IN MM)



COMMUNICATION TO NVENT RAYCHEM NGC-UIT

Type	RS-485
Connection terminals	0.08 mm^2 to 2.5 mm^2 (Spring-type)
Cable	1 shielded twisted pair
Length	1200 m max.
Quantity	Up to 10 RMC may be connected to one nVent RAYCHEM NGC-UIT
Address	Switch-selectable on RMC, 10 addresses, 1-99

MOUNTING METHOD

Clips to DIN 35 rail

ELECTROMAGNETIC COMPATIBILITY

Immunity	Complies with EN 50 082-2 (heavy industrial)
Emissions	Complies with EN 50 081-2 (heavy industrial)

ORDERING DETAILS & WEIGHT

	Part description	Product Number	Weight
Remote module for control (RMC)			
Base unit*	MONI-RMC-BASE	309735-000	0.5 kg
Two-channel relay output module**	MONI-RMC-2RO	920455-000	0.05 kg
Two-channel digital input module***	MONI-RMC-2DI	062367-000	0.05 kg
24 Vdc power supply	MONI-RMC-PS24	972049-000	0.7 kg

* Purchase one base for each RMC installation. Includes network processor, two digital inputs, end termination, and RS-485 connection module with ribbon cable.

** Purchase one module for each set of two relay outputs required. Minimum of one module (2 relay outputs), maximum of 20 (40 relay outputs) per RMC base.

*** Purchase one module for each set of two digital inputs required. Minimum of one module (2 digital inputs), maximum of 20 (40 digital inputs) per RMC base. Additional module for each pair of digital inputs required. One MONI-RMC-2DI module is included in each MONI-RMC-BASE unit

NGC-CMA2

CONFIGURATION AND MONITORING ASSISTANT

NGC-CMA2-ZONE1

NGC-CMA2-ZONE2

PRODUCT OVERVIEW

The nVent RAYCHEM NGC-CMA2 is an easy-to-use wireless tablet for configuration and monitoring of nVent RAYCHEM NGC-20 control units. The tablet has an intuitive user interface eliminating the need for extensive training. The tablet is available in two versions: For Zone 2 (Zone 22) use the NGC-CMA2-ZONE2. For Zone 1 (Zone 21) use the NGC-CMA2-ZONE1.

HARDWARE DESIGN

The nVent RAYCHEM NGC-CMA2 devices are designed for high productivity in an industrial environment. They are protected against humidity, dust, corrosion and extreme ambient temperatures. The tablet has an 8" TFT display.

SOFTWARE

The nVent RAYCHEM NGC-CMA2 software is designed to provide full configuration and monitoring capabilities of the nVent RAYCHEM NGC-20 control units. The nVent RAYCHEM NGC-CMA2 allows wireless connectivity via Bluetooth® to any nVent RAYCHEM NGC-20 unit within range. The devices are based on Samsung technology and are running Android operating system.

GENERAL	NVENT RAYCHEM NGC-CMA2-ZONE2	NVENT RAYCHEM NGC-CMA2-ZONE1
Typical use	nVent RAYCHEM NGC-CMA2 units are used for the configuration and monitoring of nVent RAYCHEM NGC-20 of heat-tracing control units.	
Approvals/Certification	EPS 15 ATEX 1 793 X Ⓔx II 3G Ex ic IIC T5 Gc IECEx EPS 15.0003X Ex ic IIC T5 Gc	Sira 15ATEX1205X Ⓔx II 2GD Ex db ia op is IIC T5 Gb Ex tb IIIC T100°C Db Ta = -20°C to +50°C IECEx SIR 15.0075X Ex db ia op is IIC T5 Gb Ex tb IIIC T100°C Db Ta = -20°C to +50°C
EAC	In progress	In progress
Conditions	Refer to Hazardous Area Certification	Refer to Hazardous Area Certification
Environmental protection	IP67	IP64
Compatible control units	nVent RAYCHEM NGC-20-C-E and NGC-20-CL-E	
Operating Temperature	-20°C to +55°C	-20°C to +50°C
Dimensions	131,1 x 225,1 x 13,6 mm (incl. protective case)	162,1 x 256,0 x 33,3 mm (without stylus holder) 162,1 x 271,9 x 33,3 mm (with stylus holder)
Connectivity	Bluetooth, WiFi and USB connector	Bluetooth, WiFi and USB connector
Operating system	Android O.S.	Android O.S.

RAYCHEM-DS-EU0842-NGCCMA2-EN-1911

GENERAL	NVENT RAYCHEM NGC-CMA2-ZONE2	NVENT RAYCHEM NGC-CMA2-ZONE1
Processor	Quad core 1.2 GHz	Quad core 1.2 GHz
Bluetooth interface	Bluetooth SmartReady LE 4.0	Bluetooth SmartReady LE 4.0
Memory	RAM 1.5 GB, ROM 16GB with microSD up to 64 GB	RAM 1.5 GB, ROM 16GB with microSD up to 64 GB
Wireless LNA	WiFi 802.11 a/b/g/n	WiFi 802.11 a/b/g/n
Display	8" TFT with 1280 x 800 pixels	8" TFT with 1280 x 800 pixels
Charger	EU, UK, US and AU compatible	EU, UK, US and AU compatible
Software (included)	General Android apps	General Android apps
Keyboards & buttons	Touchscreen, buttons on the side	Touchscreen, buttons on the side
Captive pen	included	included

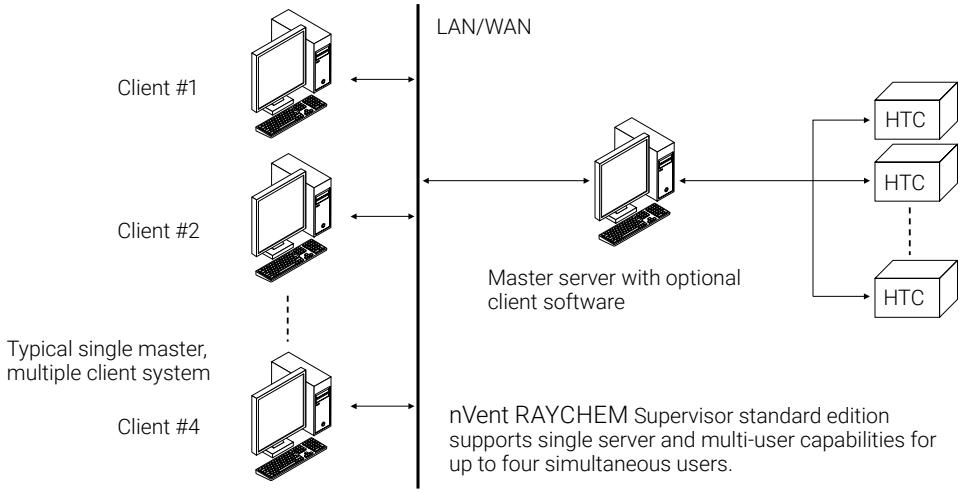
ORDERING INFORMATION AND WEIGHT	NGC-CMA2-ZONE2	NGC-CMA2-ZONE1
Part Number	1244-018987	1244-018988
Weight	562 g	1250 g

FOR RUSSIA: THE TABLETS WILL BE DELIVERED AS ORIGINAL DEVICE WITHOUT REBRANDING. IT MEETS ALL SPECIFICATIONS AS DESCRIBED ABOVE INCLUDING THE NGC-20 APP TO MONITOR AND CONFIGURE THE NGC-20 AND HAS EAC EX CERTIFICATION

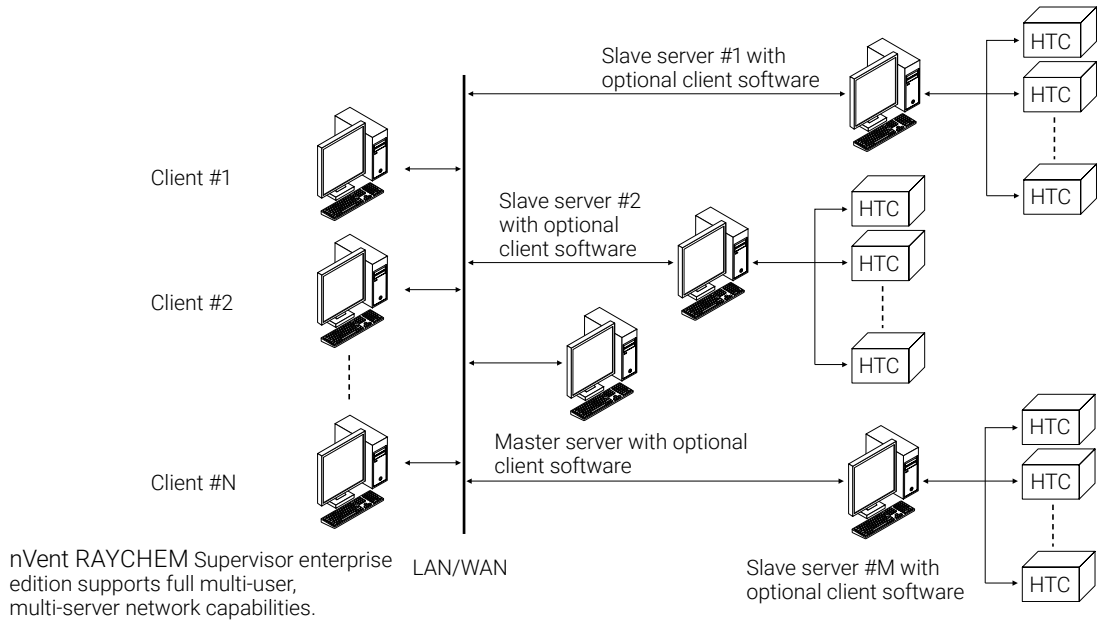
PRODUCT NAME	TAB-EX 01 DZ2 RUSSIA	TAB-EX 01 DZ1 WIFI RUSSIA
Hazardous Area	Zone 2	Zone 1
Part Number	1244-020604	1244-020603
EAC Ex certification	EAC Ex TC RU C-DE.AA87.B.00789 2Ex ic IIC T5 Gc X IP64	EAC Ex TC RU C-DE.AA87.B.00789 PB Ex db ia op is 1 Mb X 1Ex db ia op is IIC T5 Gb X 1Ex db ia op is IIB T5 Gb X Ex tb IIIC T100°C Db IP64

HEAT-TRACING CONTROLLER CONFIGURATION AND MONITORING SOFTWARE

NVENT RAYCHEM SUPERVISOR STANDARD EDITION



NVENT RAYCHEM SUPERVISOR ENTERPRISE EDITION



OVERVIEW

The nVent RAYCHEM Supervisor heat-tracing controller configuration and monitoring software provides a graphical user interface for nVent RAYCHEM heat-tracing communication and controller products. Heat-trace system information can be accessed and managed from almost anywhere in the world, making nVent RAYCHEM Supervisor a powerful management tool for the entire Heat Management System (HMS).

NETWORK AND CONNECTIVITY

By using the latest network technologies costs can be reduced. Devices are no longer limited to simple hard-wired serial communications, but take advantage of existing network infrastructures including Ethernet LANs (Local Area Networks) and Internet-based WANs (Wide Area Networks).

SCALABILITY

nVent RAYCHEM Supervisor is available in two versions. The standard edition is a single server multi-user version and provides connectivity to several hundreds of control units in the field and can support up to four simultaneous users. The standard edition is available for download at nVent.com The Enterprise edition offers unlimited multi-user, multi-server network capabilities.

NVENT RAYCHEM SUPERVISOR FUNCTIONALITY

Device configuration	Individual devices can be configured in either offline or online mode. After confirmation data will be uploaded into heat-tracing control devices.
Online monitoring	nVent RAYCHEM Supervisor is capable of monitoring online signals like temperature, ground-fault current, current, voltage of individual controllers or sets of controllers into user-defined groups.
Trending & historical data storage	A trending tool offers user defined trending of heat-tracing data which can be stored into the database on a user-defined time interval and storage mechanism.
Alarm and events	Alarms and events are displayed in a pop-up window on the screen. These can be individually acknowledged by the user. All alarms and events are stored in the database for post-event analyses.
Plant reference model	Heat-tracing circuits can be organised via a model which represents the layout of the plant. It enables easy heat-tracing circuit finding in the entire heat-tracing system.
Enhanced documentation link to device configuration & monitoring utilities	nVent RAYCHEM Supervisor offers the possibility to link heat-tracing circuits to design and construction documentation and makes it easily accessible to the user (examples: P&IDs, heat-tracing isometrics).
Data import & export	The Export function allows the user to export system devices and plant documentation, and save the data in an XML-format file which can also be imported.
Reports	Numerous pre-defined reports are available like device configurations, alarms and events (historical and current), user roles etc.
Batch, recipes and event scheduler	Multiple pre-defined heat-trace setting changes can be executed at the same time by using the batch and recipe tool. Batches can be launched manually or automatic at a scheduled date and time or at regular intervals.
System wide data synchronisation	nVent RAYCHEM Supervisor synchronises continuously with the controllers in the field. Local changes in the controller will reflect in nVent RAYCHEM Supervisor and vice versa.
E-mail on alarm notification	An E-mail service is available for sending notifications to selected users when alarms occur.
Internal user messaging	A build-in messaging tool offers the possibility to have instantaneous communication between nVent RAYCHEM Supervisor clients connected to the same nVent RAYCHEM Supervisor network.
Multi level security and individual user defined preferences	nVent RAYCHEM Supervisor security is based on plant groups, users and roles which offers differentiation between each end-user responsibility, rights and preferences.
Languages	English

CONTROLLER COMPATIBILITY

This software is compatible with any of the following controllers that have the appropriate communications interface installed:

- nVent RAYCHEM NGC-20 Direct
- nVent RAYCHEM NGC-20 via NGC-UIT2
- nVent RAYCHEM NGC-30
- nVent RAYCHEM NGC-40
- nVent RAYCHEM HTC-915 family

SYSTEM REQUIREMENTS

General	• CD-ROM drive • 1 or more available serial ports (for master or slave computers that connect to field devices) • A mouse or other compatible pointing device • SVGA display with 800x600 resolution • Microsoft Windows® XP Pro, XP Home or 2000 (slave & client computers) • Microsoft Windows® Server 2000 thru 2008 (SQL Masters) • Microsoft SQL Server 2000 thru 2008 (SQL Masters) • Microsoft Windows® XP Pro SP3 or newer • Microsoft .NET Framework version 4.0 • Microsoft Windows 7/Vista compatible (32 or 64 bit) • Network connectivity
Master server computer	• Pentium® 4 – 2.4 GHz or faster (recommended), Pentium® III – 500 MHz (minimum) PC • A hard disk with at least 500 MB of free space (recommended), 150 MB (minimum) • 1 gigabyte of RAM (recommended), 256 MB of RAM (minimum)
Slave server computer(s) (optional)	• Pentium® 4 – 1 GHz or faster (recommended), Pentium® III – 300 MHz (minimum) PC • A hard disk with at least 150 MB of free space (recommended), 50 MB (minimum) • 256 MB of RAM (recommended), 128 MB of RAM (minimum)
Client computer(s)	• Pentium® III – 500 MHz or faster (recommended), Pentium® II – 300 MHz (minimum) PC • A hard disk with at least 50 MB of free space • 256 MB of RAM (recommended), 128 MB of RAM (minimum)
nVent RAYCHEM Supervisor Database (included in license)	nVent RAYCHEM Supervisor Standard edition runs on MSDE. nVent RAYCHEM Supervisor Enterprise edition runs on SQL Server 2000

REGISTRATION

nVent RAYCHEM Supervisor will run in TRIAL mode for up to 14 days.

For more information about how to register within this period, see the nVent RAYCHEM Supervisor Heat-Tracing Controller Configuration and Monitoring Software Installation and Operating Instructions (INSTALL-118) or visit nVent.com.

COMMUNICATION

ModBus protocol via:

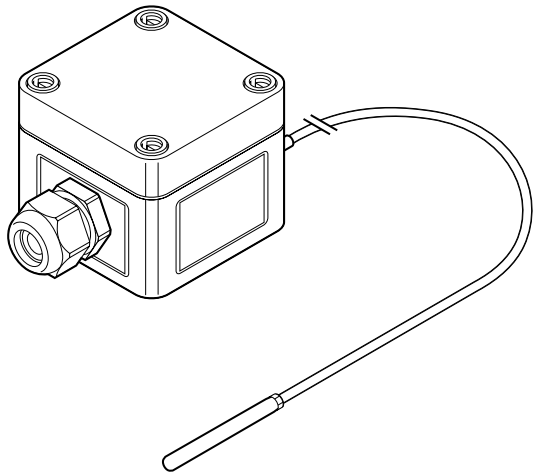
- TCP/IP
- RS-232
- RS-485

ORDERING DETAILS

Product Name	Description	Part Number	Remarks
DT2-Std	nVent RAYCHEM Supervisor V2.x – Standard Edition	1244-004645	registration required after 14 days
DT2-Enterprise	nVent RAYCHEM Supervisor V2.x – Enterprise - base package (master + 2 slaves + 5 users)	10391-010	license required
DT2-Upgrade/Slv	nVent RAYCHEM Supervisor V2.x – Slave server upgrade (two additional slave servers)	10391-011	license required
DT2-Upgrade/Usr	nVent RAYCHEM Supervisor V2.x – User upgrade (five additional users)	10391-012	license required

MONI-PT100-NH

TEMPERATURE SENSOR FOR ORDINARY AREA



2 wire nVent RAYCHEM PT 100 sensor with glass fiber reinforced polycarbonate junction box for installation in ordinary area.

AREA OF USE

Ordinary area

SENSOR

Type	Pt 100 (2 wire) DIN IEC 751, Class B
Material	Tip: stainless steel Extension cable: silicone
Temperature measuring range	−50°C to +180°C
Temperature range extension cable	−50°C to +180°C (+215°C maximum 1000 hrs), max. exposure temp. tip: +400°C
Length	2 m
Diameter	Extension cable ca 4.6 mm, tip ca 6.0 mm
Minimum bending radius	Extension cable: 5 mm, the measuring tip should not be bent

ENCLOSURE

Ingress protection	IP66
Material	Glass fiber reinforced polycarbonate (gray)
Dimensions	With = 65 mm Height = 65 mm Depth = 57 mm
Cable gland	M20 (polyamide) suitable for cable diameters ranging from 10 mm to 14 mm
Operating temperature	−30°C to +80°C
Lid sealing gasket material	CFC-free Polyurethane
Cover screws	Plastic
Mounting	For pipe mount use JB-SB-26 wall mount surface mount via moulded holes at 50 x 50 mm

INSTALLATION AND CONNECTION

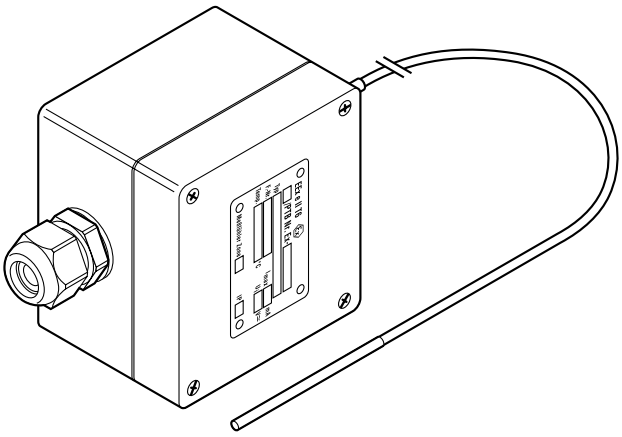
Terminals	3 front entry spring-type terminals (terminals 2 and 3 are bridged)
Terminal sizing	Terminals suitable for cables from 0.15 mm to 2.5 mm^2

ORDERING DETAILS

Part Description	MONI-PT100-NH
PN (Weight)	140910-000 (0.22 kg)

MONI-PT100-EXE

TEMPERATURE SENSOR FOR HAZARDOUS AREAS



3 wire nVent RAYCHEM Pt 100 sensor connected to a black glass fiber reinforced polyester junction box with 4 front entry spring-type terminals.

M20 EEx e cable gland preinstalled.

AREA OF USE

Hazardous environment Zone I

APPROVALS

Baseefa11ATEX0068X
Ⓔx II 2 GD
Ex e IIC T6 Ta –50°C to + 60°C Gb
Ex tb IIIC T85°C Ta –50°C to +60°C Db IP66
IECEx BAS 11.0033X
Ex e IIC T6 Ta –50°C to +60°C Gb
Ex tb IIIC T85°C Ta –50°C to +60°C Db IP66

EAC Ex
TC RU C-BE.ИМ43.B.01764
ООО "ТехИмпорт"
1Ex e IIC T6 Gb X
Ex tb IIIC T85°C Db X
IP66 Ta -60°C...+60°C
Made in GB

SENSOR

Type	Pt 100 (3 wire) DIN IEC 751, Class B.
Material	extension cable and tip both stainless steel (MI)
Temperature measuring range	–100°C to +500°C
Maximum exposure temp. tip	+585°C
Length	2 m
Diameter	ca 3 mm
Minimum bending radius	extension cable: 20 mm, the measuring tip should not be bent

ENCLOSURE

Material	Glass fiber reinforced polyester (black)
Ingress protection	IP66
Dimensions	With = 80 mm Height = 75 mm Depth = 55 mm
Cable entry	M20 (EEx e) suitable for cable diameters ranging from 10 mm to 14 mm
Operating temperature	–50°C to +60°C
Sealing gasket material	tongue and groove system with silicone seal
Cover screws	Stainless steel M4 threaded
Mounting	For pipe mount use JB-SB-26 wall mount surface mount via moulded holes at 68 x 45 mm

INSTALLATION AND CONNECTION

Terminals	4 front entry spring-type terminals
Terminal sizing	suitable for cables from 0.5 mm^2 to 2.5 mm^2

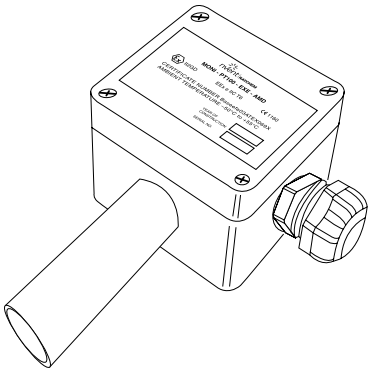
ORDERING DETAILS

Part Description	nVent RAYCHEM MONI-PT100-EXE
PN (Weight)	967094-00 (0.44 kg)

MONI-PT100-EXE-AMB

nVent RAYCHEM

AMBIENT SENSING TEMPERATURE SENSOR FOR HAZARDOUS AREA (PT100)



PRODUCT OVERVIEW

The nVent RAYCHEM MONI-PT100-EXE-AMB 3-wire Pt 100 temperature sensor connected to glass fiber reinforced polyester junction box. The sensor is approved for hazardous area and can be used in safe area.

The protection tube not only mechanically protects the actual temperature sensor it also prevents the sensor from sudden temperature changes caused by direct sunlight and or wind.

GENERAL FEATURES

Area of use	Hazardous area Zone 1 or Zone 2 Gas (Zone 21, Zone 22 Dust)

APPROVALS

II2GD
Ex e IIC T6 Ta-50°C TO +60°C Gb
Ex tb IIIC T185°C Ta–50°C TO +60°C Db IP66
Baseefa 11ATEX0068X
IECEx BAS 11.0033X

EAC Ex
ТС RU C-BE.ИМ43.B.01764
ООО "ТехИмпорт"
1Ex e IIC T6 Gb X
Ex tb IIIC T85°C Db X
IP66 Ta -50°C...+60°C
Made in GB

SENSOR

Type	Pt 100 (3-Wire) acc. DIN IEC 751, Class B
Material	Sensor: stainless steel (MI) Protection tube: brass
Temperature measuring range	Assembly –50°C to +60°C (Sensor measuring range from –100°C to +500°C)

ENCLOSURE

Material	Glass fiber reinforced box (Black) M4 captive stainless steel cover screws.
Ingress protection	IP66
Dimensions	Box: With = 80 mm Height = 75 mm Depth = 55 mm Installed: with = ~110 Height = ~200 mm
Cable entry	M20 (Ex e) suitable for cable diameters ranging form 10 mm to 14 mm
Operating temperature	–50°C to +60°C
Mounting	Surface mount via molded holes centered at 68 x 45 mm. Any installation position is allowed.

INSTALLATION AND CONNECTION

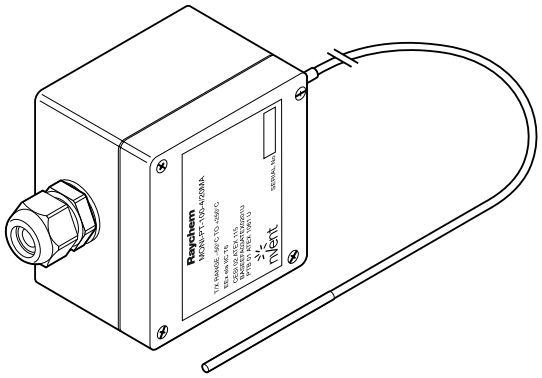
Terminals	4 front entry cage clamp terminals suitable for cables from 0.5- to 2.5 mm^2

ORDERING DETAILS

Part number	1244-004451

MONI-PT100-4/20MA

3 WIRE PT 100 SENSOR WITH 4 TO 20 MA TRANSMITTER FOR HAZARDOUS AREA



nVent RAYCHEM Pt 100 sensor connected to a 4-20 mA transmitter built in a black glass fiber reinforced polyester junction box with M20 cable gland (Blue).

AREA OF USE

Hazardous environment Zone I

APPROVALS

CESI 02 ATEX 115, II 1G EEX eia IIC T6 CE 0722
Baseefa03ATEX0201U, II 2G EEx eII CE 1180
PTB 01 ATEX 1061U, II 2G EEx eII T6 CE 0123

EAC Ex
ТС RU C-BE.ИМ43.B.01764
ООО "ТехИмпорт"
1Ex e IIC T6 Gb
Ex tb IIIC T85°C Db
IP66 Ta -40°C...+60°C
Made in GB

SENSOR

Type	Pt 100 (3 wire) DIN IEC 751, Class B.
Material	extension cable and tip both stainless steel (MI).
Temperature measuring range:	−50°C to +250°C (transmitter)
Maximum exposure temp. tip	+585°C
Length	2 m
Diameter	ca 3 mm
Minimum bending radius	extension cable: 20 mm, the measuring tip should not be bent

RAYCHEM-DS-EU1450-MONIPT100420MA-EN-1911

ENCLOSURE

Ingress protection	IP66
Material	Glass fiber reinforced polyester (black)
Dimensions	Width = 80 mm Heigth = 75 mm Depth = 55 mm
Cable gland	M20, blue (EEx e) suitable for cable diameters ranging from 10 mm to 14 mm
Operating temperature	–20°C to +55°C
Sealing gasket material	tongue and groove system with silicone seal
Cover screws	Stainless steel M4 threaded
For pipe mounting use	JB-SB-26

INSTALLATION AND CONNECTION

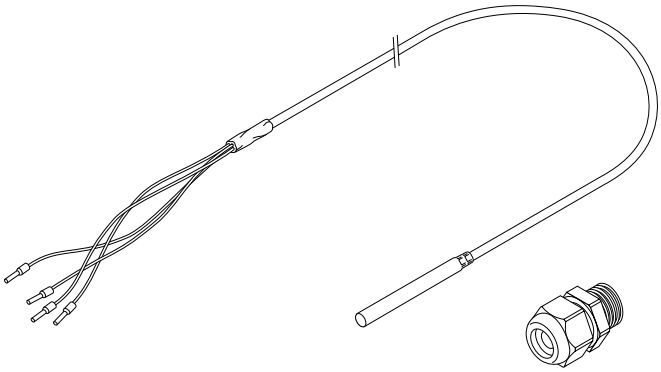
Terminals	2 screw terminals
Terminal sizing	suitable for cables from 0.5 mm^2 to 1.5 mm^2

ORDERING DETAILS

Part Description	MONI-PT100-4/20MA
PN (Weight)	704058-000 (0.46 kg)

MONI-PT100-260/2

TEMPERATURE SENSOR WITH M16 GLAND



PRODUCT OVERVIEW

nVent RAYCHEM MONI-PT100-260/2 temperature sensor is designed for providing accurate temperature measurements.

The MONI-PT100-260/2 sensor exhibits excellent mechanical, electrical and thermal properties what makes the sensor extremely useful for a broad range of applications. The sensor can be connected to the control device using 3-wire technology for providing highest accuracy and measuring stability.

AREA OF USE

Non hazardous area or hazardous area Zone 1, Zone 21 or Zone 2, Zone 22 when connected to intrinsic safe circuits

SENSOR

Type	Pt 100 (3 wire) DIN IEC 751, Class B
Jacket/Sheath Material	Extension cable PTFE (Fluoropolymer) Measuring tip stainless steel (316 Ti)
Cable construction	Braided
Measuring range	–50°C to 260°C
Maximum exposure temp. tip	400°C
Length	Total sensor length 2 m (other lengths are available on request) Length of the measuring tip ca 50 mm
Nominal Diameter (OD)	Diameter of the sensor cable 4.8 mm
	Diameter of the tip 6 mm.
Conductors	4 x 0.5 mm^2 (Red, Red, White and braid) PTFE insulated
Minimum bending radius	Sensor cable minimum 20 mm, The measuring tip should not be bent

CABLE GLAND

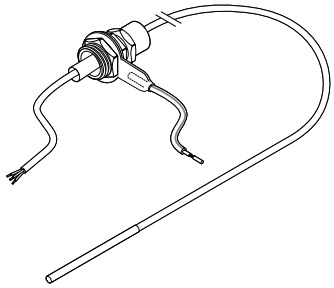
Approvals	II 2GD EEx e II PTB 05 ATEX 1068 X
Thread size (color)	M16 (Black)
Material	Polyamide (PA) Halogen-free
Temperature range	–40°C to +75°C
Cable acceptance size	Suitable for cables from 4 to 9 mm diameter

ORDERING DETAILS

Part number	1244-006615

MONI-PT100-EXE-SENSOR

TEMPERATURE SENSOR FOR HAZARDOUS AREA (WITHOUT JUNCTION BOX)



Certified EEx e II cable gland preinstalled on the sensor lead (M16, Brass, inclusive sealing washer, locknut and earth tag

AREA OF USE

Hazardous environment Zone I

APPROVALS

Baseefa11ATEX0070X
II 2 GD
Ex e IIC T6 Ta –50°C to +60°C Gb
Ex tb IIIC T85°C Ta –50°C to +60°C Db IP66
IECEx BAS 11.0035X
Ex e IIC T6 Ta –50°C to +60°C Gb
Ex tb IIIC T85°C Ta –50°C to + 60°C Db IP66

EAC Ex
TC RU C-BE.ИМ43.B.01764
ООО "ТехИмпорт"
1Ex e IIC T6 Gb X
Ex tb IIIC T85°C Db X
IP66 Ta -60°C...+60°C
Made in GB

SENSOR

Type	Pt 100 (3 wire) DIN IEC 751, Class B.
Material	Stainless steel (MI).
Temperature measuring range	–100°C to +500°C
Maximum exposure temperature	+585°C
Length	2 m
Diameter	ca 3 mm
Minimum bending radius	extension cable: 20 mm, the measuring tip should not be bent

INSTALLATION AND CONNECTION

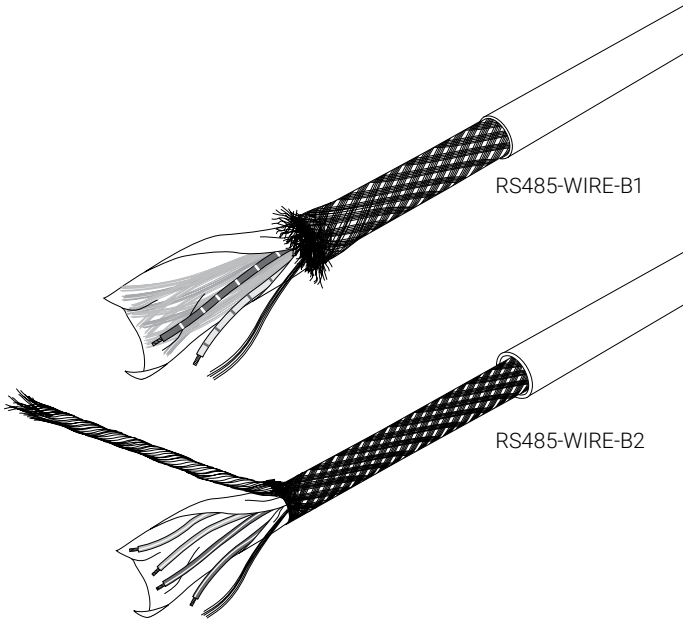
M16 (Brass) compression gland pre-installed on the sensor.	
Sealing washer, earth tag and locknut included.	
Maximum operating temperature (for the gland)	–50°C to +60°C

ORDERING DETAILS

Part Description	nVent RAYCHEM MONI-PT100-EXE-SENSOR
PN (Weight)	529022-000 (0.11 kg)

RS485-WIRE

RS485 COMMUNICATION CABLES



PRODUCT OVERVIEW

nVent RAYCHEM RS485-WIRE are braided and shielded type cables suitable for RS485 data transmission. Screen continuity and polarity must be maintained throughout the entire communication network. Connections must be made at each panel in accordance with the details provided in the appropriate product manual. Do not share communication cables with other signals or power. Keep data cables away from fluorescent lights, power cables and heavy duty machinery.

Zero Halogen (Low Smoke) cables of the same construction are available on request. (Flame retardant to IEC 60332-3C).

Type	RS485-WIRE-B1 (Single pair construction)	RS485-WIRE-B2 (Dual Pair construction)
GENERAL	**CABLES SUITABLE FOR IEA RS-485 COMMUNICATIONS.**	
Typical use	RS485 communications, In- and outdoors	
Approvals/Certification	UL 2919, VW-1	UL 2919, VW-1
	EAC (Russia, Kazakhstan, Belarus) For other countries contact your local nVent representative.	
CONSTRUCTION		
Conductors	Two tinned Copper conductors 24AWG (7 x 0.20 mm)	Four tinned Copper conductors 24AWG (7 x 0.20 mm)
Insulation	Polyethylene (PE)	Polyethylene (PE)
Pairing	One single twisted Pair	Two twisted pairs
Identification	Blue/white + White/blue	Pair 1: Blue/white + White/blue Pair 2: White/Orange + Orange/White
Screening	Aluminium polyester tape Tinned Copper Braid (90% coverage)	Aluminium polyester tape Tinned Copper Braid (90% coverage)
Jacket Type	RS485-WIRE-B1- and RS485-WIRE-B2 made of PVC (Polyvinylchloride) RS485-WIRE-ZHB1- and RS485-WIRE-ZHB2 made of LSOH	
Colour	All type Grey	

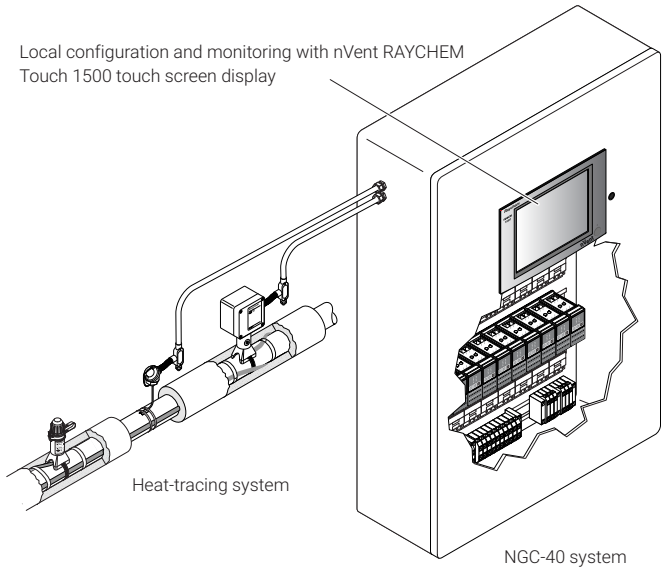
ELECTRICAL PROPERTIES

Max operating voltage	300 V RMS	300 V RMS
Capacitance	45 Pf/m (measured between conductors)	45 Pf/m (measured between conductors)
Conductor resistance	80 Ohm/km ∅ 20°C	80 Ohm/km ∅ 20°C
Nominal Impedance	120 Ohm	120 Ohm
Velocity of Propagation	66%	66%
Max allowed Current	2.10 A @ 25°C	2.10 A @ 25°C

PHYSICAL PROPERTIES

Nominal Diameter (OD)	5.90 mm (±0.2 mm)	8.64 mm (±0.2 mm)
Temperature range	–30°C to +80°C	–30°C to +80°C
Minimum Bend radius	63 mm	89 mm
Max continuous length	1000 m	1000 m
Polyvinylchloride types	RS485-WIRE-B1	RS485-WIRE-B2
Part number (Weight)	1244-006598 (55 kg/km)	1244-006599 (90 kg/km)
Zero Halogen types	RS485-WIRE-ZHB1	RS485-WIRE-ZHB2
Part number (Weight)	1244-006600 (55 kg/km)	1244-006601 (90 kg/km)

NVENT RAYCHEM CONTROL, MONITORING AND POWER DISTRIBUTION PANELS



PRODUCT OVERVIEW

nVent RAYCHEM distribution panels are specially designed to power, control and monitoring electrical heat tracing circuits. The system offers a complete standard set of configurations, serving most heat-tracing applications. The panels vary from simple power distribution panels up to systems with full control and monitoring capability. The panels are available with a combined incomer or with a separate incomer section.

The power distribution panels with control and monitoring functionality are equipped with the advanced nVent RAYCHEM control and monitoring systems like the nVent RAYCHEM NGC-40. Multiple panels can be combined and optionally supervised by means of the TOUCH1500 interface.

STANDARD PANEL ADVANTAGES

Standard control, monitoring and power distribution panels have the following advantages:

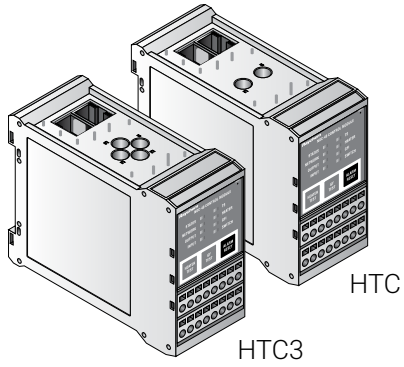
- No surprises or unpredictable cost increases
  - All dimensions and features known during quotation stage so full clarity at the moment of ordering
  - Proven design
- High Quality:
  - Design optimized for electrical heat-tracing and based on years of experience in the industry
  - Repeatedly build and pre-tested at the panel shop so no need for FAT
- Optimized scheduling:
  - No need to spend time on detailed panel design
  - Reduced time spend for the client leading to cost reduction
  - Short lead times

PANELS ARE AVAILABLE AS:

- Incomer sections: Power Supply System (PSS)
- Outgoing sections: Power Distribution System (PDS)
- Combination of incomer and outgoing in one panel enclosure

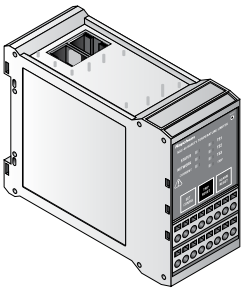
CONTROL SYSTEM POWER DISTRIBUTION PANELS: NVENT RAYCHEM NGC-40

The nVent RAYCHEM NGC-40 is a multipoint electronic control and monitoring system with unique single-point controller architecture for heat-tracing used in process temperature maintenance and freeze protection applications. By taking advantage of innovative modular packaging techniques, the nVent RAYCHEM NGC-40 system provides configuration and component flexibility so that it may be optimized for specific applications needs. The nVent RAYCHEM NGC-40 system consists out of the following components:



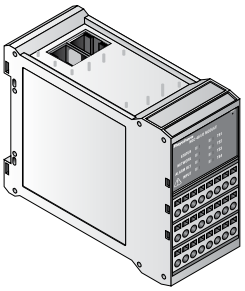
CONTROL MODULES: NGC-40-HTC & NGC-40-HTC3

The nVent RAYCHEM NGC-40 system uses a single controller module per heat-tracing circuit for maximum reliability. There are dedicated control modules available for single phase (NGC-40-HTC) and three-phase (NGC-40-HTC3) heat-tracing circuits. The nVent RAYCHEM NGC-40 control modules include ground-fault detection and protection while guaranteeing precise single phase and three-phase line current measurements. Up to eight (8) temperature sensors (RTDs) can be used for each heat-tracing circuit allowing a variety of temperature control, monitoring, and alarming configurations. The temperature sensors can be connected via the NGC-40-HTC and -HTC3, NGC-40-IO and the field mounted RMM2 module. The nVent RAYCHEM NGC-40 control modules provides digital inputs as well as alarm outputs that can be used to control an external annunciator. The digital input is programmable and may be used for various functions such as forcing heat-tracing outputs on or off or generating CB trip alarms, making the system more flexible to match each customer's specific needs.



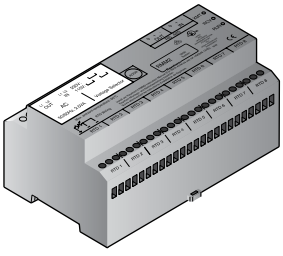
SIL2 SAFETY TEMPERATURE LIMITER: NGC-40-SLIM

The nVent RAYCHEM NGC-40 includes an optional SIL2 certified safety temperature limiter module. The module can be used with up to 3 temperature inputs for three phase heat-tracing circuits. The limiter can be associated with a nVent RAYCHEM NGC-40 control module and use the heater current information to manage the trip functionality. The front panel of the limiter module has LED indicators, like the other modules, for various status conditions and provides buttons to confirm a new trip setpoint, and reset trip or alarm conditions. The module has one output for the contactor and one output for external alarm annunciation. The safety temperature limiter can also be reset via the digital input, the user interface Touch 1500 and nVent RAYCHEM Supervisor.



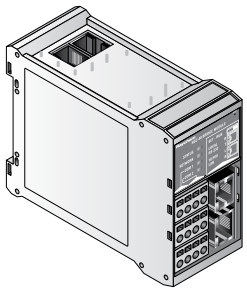
IO MODULE: NGC-40-IO

In addition to hardwiring an RTD directly into a Heat Trace Control module, RTDs can be wired to Input/Output modules (NGC-40-IO) within the panel and assigned to heat-tracing circuits through software. This means that a nVent RAYCHEM NGC-40 system can be optimised for the specific application needs. Each IO module accepts up to four additional RTD inputs. The alarm output can be used to control an external annunciator. The digital input is programmable and may be used for various functions such as forcing heat-tracing outputs on or off or generating CB trip alarms.



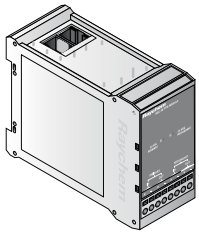
RMM2

The nVent RAYCHEM NGC-40 system works with the MONI-RMM2 module and each RMM2 can accept up to 8 RTDs. 16 RMM2 Modules can be daisy chained together via RS-485 for a total of 128 temperature inputs per NGC-40-BRIDGE. This will significantly reduce the cost of RTD field wiring.



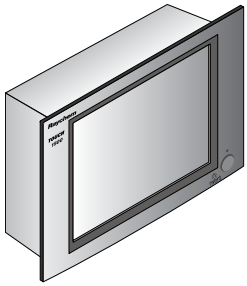
COMMUNICATION MODULE: NGC-40-BRIDGE

The nVent RAYCHEM NGC-40 system supports multiple communications ports, allowing serial interfaces (RS-485 and RS-232) and network connections (Ethernet) to be used with external devices. All communications with the NGC-40 panel are accomplished through the NGC-40-BRIDGE module which acts as the central router for the system, connecting the panel's control modules, IO modules, safety limiter modules, RMM2 modules, as well as upstream devices such as nVent RAYCHEM Touch 1500 touch screen, nVent RAYCHEM Supervisor and Distributed Control System (DCS). Communications to devices external to the NGC-40 panel use the Modbus protocol over Ethernet, RS-485 or RS-232.



POWER TERMINATION MODULE: NGC-40-PTM

The NGC-40-PTM distributes power to the NGC-40 modules. Each NGC-40-PTM can provide power to a maximum of 10 NGC-40 modules and supports redundant power supply connections.



NVENT RAYCHEM TOUCH 1500

The nVent RAYCHEM Touch 1500 user interface has easy-to-navigate displays, with intuitive screens for use with the nVent RAYCHEM NGC-40 and nVent RAYCHEM NGC-20 control panels. The nVent RAYCHEM Touch 1500 is to be installed where the physical heat-tracing hardware is located to assist with system commissioning, setup, troubleshooting and on-site monitoring and control. The nVent RAYCHEM Touch 1500 has a 15-inch LCD color display with touch-screen technology, and provides an easy user interface for programming without using keyboards. It has RS-485, RS-232, and 10/100Base-T Ethernet communications ports that allow communication with the Bridge Module (NGC-40-BRIDGE). An USB interface is included for configuration and software upgrades.

NVENT RAYCHEM SUPERVISOR SOFTWARE

The nVent RAYCHEM Supervisor software package provides a remote, graphic interface for the nVent RAYCHEM NGC-family. The software allows the user to configure and monitor various NGC systems from a central location. It also provides an audible alarm tone, acknowledges and clears alarms; and contains advanced features such as data logging, trending, batched change management, and other useful functions. Users can access all information from anywhere in the world, making nVent RAYCHEM Supervisor a powerful management tool for the entire Heat Management System.

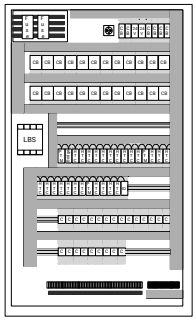
For more detailed specifications of the modules see the nVent RAYCHEM NGC-40 datasheet.

TECHNICAL INFORMATION PANELS

- Area classification: non EX, indoors
- Colour: RAL 7035
- Protection degree: IP55
- Cable entry: bottom panel, split bottom plate
- Power: 3 Phase + Neutral
- phase-to-phase: 400V
- Incomer: 3P+N+PE
- Earthing: TN-S
- Short circuit protection: 10 kA / 25 kA depending upon panel selection
- Load break switch: 160 A, 250 A, 400 A depending upon panel selection
- Outgoing circuits:
  - ELCB 1-phase circuits: 16 A, 2P, 30 mA or 25 A, 2P, 30 mA depending upon panel selection
  - ELCB 3-phase circuits: 40 A, 4P, 30 mA
- Terminal size outgoing circuits: 10 mm^2
- Panel dimensions: depending upon configuration. See section panel combinations

STANDARD PANEL COMBINATIONS

The following table shows typical combinations of panels usable in different applications, followed by a list showing individual panels including their part number.

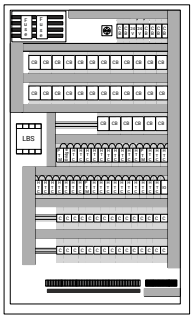


PSS-160A/10KA-PDS-40-24HTC/16A

- nVent RAYCHEM NGC-40 control & monitoring system
- Incomer: rated 160 A, 3P+N, 10 kA short circuit
- Outgoing circuits: 24 * 1-Phase controller, 2P EMR, ELCB 16 A (2P), 30 mA
- Size: 1200 (w) * 2200 (h) * 400 (d) including plinth

PSS-160A/10KA-PDS-40-24HTC/16A–T

- Including User Interface TOUCH1500

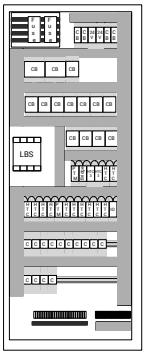


PSS-160A/10KA-PDS-40-30HTC/16A

- nVent RAYCHEM NGC-40 control & monitoring system
- Incomer: rated 160 A, 3P+N, 10 kA short circuit
- Outgoing circuits: 30 * 1-Phase controller, 2P EMR, ELCB 16 A (2P), 30mA
- Size: 1200 (w) * 2200 (h) * 400 (d) including plinth

PSS-160A/10KA-PDS-40-30HTC/16A-T

- Including User Interface TOUCH1500

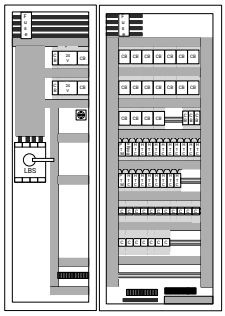


PSS-160A/10KA-PDS-40-12HTC/25A-2HTC3/40A

- nVent RAYCHEM NGC-40 control & monitoring system
- Incomer: rated 160 A, 3P+N, 10kA short circuit
- Outgoing circuits:
  - 12* 1-Phase controller, 2P EMR, ELCB 25 A (2P), 30 mA
  - 2 * 3-Phase controller, 4P EMR, ELCB 40 A (4P), 30 mA
- Size: 800 (w) * 2200 (h) * 400 (d) including plinth

PSS-160A/10KA-PDS-40-12HTC/25A-2HTC3/40A-T

- Including User Interface TOUCH1500

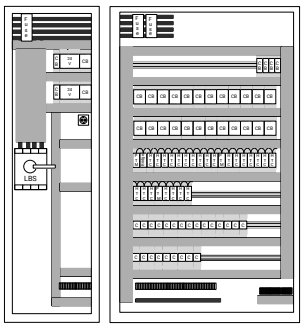


INCOMER SECTION: PSS-250A/25KA (-T)

- 250 A, 3P+N, 25 kA short circuit
- Size: 600 (w) * 2200 (h) * 400 (d) including plinth
- Optional: User Interface TOUCH1500

OUTGOING SECTION: PDS-40R-18HTC/25A

- 18 * 1-Phase controller, 2P EMR, ELCB 25 A (2P), 30 mA
- Size: 800 (w) * 2200 (h) * 400 (d) including plinth

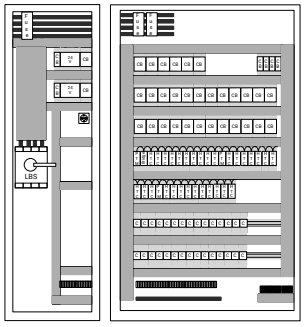


INCOMER SECTION: PSS-250A/25KA (-T)

- 250 A, 3P+N, 25 kA short circuit
- Size: 600 (w) * 2200 (h) * 400 (d) including plinth
- Optional: User Interface TOUCH1500

OUTGOING SECTION: PDS-40R-24HTC/25A

- 24 * 1-Phase controller, 2P EMR, ELCB 25 A (2P), 30 mA
- Size: 1200 (w) * 2200 (h) * 400 (d) including plinth

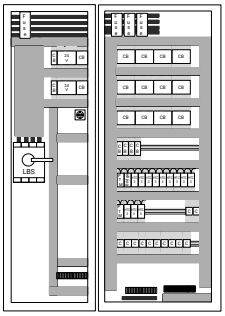


INCOMER SECTION: PSS-250A/25KA (-T)

- 250 A, 3P+N 25 kA short circuit
- Size: 600 (w) * 2200 (h) * 400 (d) including plinth
- Optional: User Interface TOUCH1500

OUTGOING SECTION: PDS-40R-30HTC/25A

- 30 * 1-Phase controller, 2P EMR, ELCB 25 A (2P), 30 mA
- Size: 1200 (w) * 2200 (h) * 400 (d) including plinth

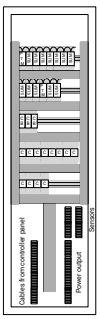


INCOMER SECTION: PSS-400A/25KA (-T)

- 400 A, 3P+N, 25 kA short circuit
- Size: 600 (w) * 2200 (h) * 400 (d) including plinth
- Optional: User Interface TOUCH1500

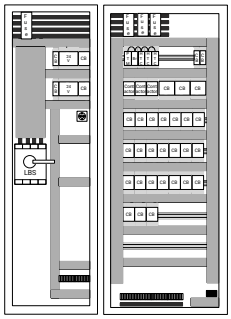
OUTGOING SECTION: PDS-40R-12HTC3/40A

- 12 * 3-Phase controller, 4P EMR, ELCB 40 A (4P), 30 mA
- Size: 800 (w) * 2200 (h) * 400 (d) including plinth



OUTGOING SECTION: PDS-40-12SLIM

- 12 * Safety Temperature Limiter, 40 A 4P EMR
- Up to 3 sensors per NGC-40-SLIM device
- To be combined with all other nVent RAYCHEM NGC-40 power distribution panels (PDS)
- Size: 600 (w) * 2200 (h) * 400 (d) including plinth

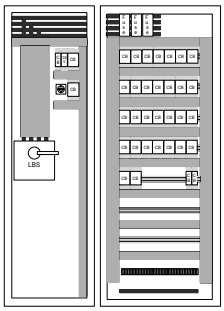


INCOMER SECTION: PSS-250A/25KA (-T)

- 250 A, 3P+N, 25 kA short circuit
- Size: 600 (w) * 2200 (h) * 400 (d) including plinth
- Optional: User Interface TOUCH1500

OUTGOING SECTION: PDS-40R-3PASC-24CB/25A

- 3 PASC controlled groups, 3 * EMR, 4P, 80 A
- CB: 24 * 25 A (1-Phase, 2P), 30 mA
- Size: 800 (w) * 2200 (h) * 400 (d) including plinth



INCOMER SECTION: PSS-250A/25KA

- 250 A, 3P+N, 25 kA short circuit
- Size: 600 (w) * 2200 (h) * 400 (d) including plinth

OUTGOING SECTION: PDS-R-30CB/25A

- ELCB 30 * 25 A (2P), 30 mA
- No controllers
- Auxiliary contacts CBs to terminals
- Size: 800 (w) * 2200 (h) * 400 (d) including plinth

For a more detailed description of the panels please ask your local representative.

STANDARD PANEL DESCRIPTION AND PART NUMBERS

Product name	Description	Part Number
PSS-160A/10kA-PDS-40-24HTC/16A–T	Incoming section 160 A, 10kA, Outgoing section 24 * NGC-40-HTC 16A circuits with TOUCH1500	1244-014348
PSS-160A/10kA-PDS-40-24HTC/16A	Incoming section 160 A, 10kA, Outgoing section 24 * NGC-40-HTC 16A circuits. No TOUCH1500	1244-014349
PSS-160A/10kA-PDS-40-30HTC/16A-T	Incoming section 160 A, 10kA, Outgoing section 30 * NGC-40-HTC 16A circuits with TOUCH1500	1244-014350
PSS-160A/10kA-PDS-40-30HTC/16A	Incoming section 160 A, 10kA, Outgoing section 30 * NGC-40-HTC 16A circuits. No TOUCH1500	1244-014351
PSS-160A/10kA-PDS-40-12HTC/25A-HTC3/40A-T	Incoming section 160 A, 10kA, Outgoing section 12 * NGC-40-HTC 25A and 2 * NGC-40-HTC3 40A circuits with TOUCH1500	1244-014352
PSS-160A/10kA-PDS-40-12HTC/25A-2HTC3/40A	Incoming section 160 A, 10kA, Outgoing section 12 * NGC-40-HTC 25A and 2 * NGC-40-HTC3 40A circuits. No TOUCH1500	1244-014353
PSS-250A/25kA-T	Incomer panel 250A, 25kA with TOUCH1500 User Interface	1244-014354
PSS-250A/25kA	Incomer panel 250A, 25kA, No TOUCH1500 User Interface	1244-014355
PSS-400A/25kA-T	Incomer panel 400A, 25kA with TOUCH1500 User Interface	1244-014356
PSS-400A/25kA	Incomer panel 400A, 25kA, No TOUCH1500 User Interface	1244-014357

STANDARD PANEL DESCRIPTION AND PART NUMBERS

Product name	Description	Part Number
PDS-40L-18HTC/25A	nVent RAYCHEM NGC-40 Outgoing panel, 18 HTC circuits, 25A CB, positioned on left side of PSS panel.	1244-014358
PDS-40R-18HTC/25A	nVent RAYCHEM NGC-40 Outgoing panel, 18 HTC circuits, 25A CB, positioned on right side of PSS panel.	1244-014359
PDS-40L-24HTC/25A	nVent RAYCHEM NGC-40 Outgoing panel, 24 HTC circuits, 25A CB, positioned on left side of PSS panel.	1244-014360
PDS-40R-24HTC/25A	nVent RAYCHEM NGC-40 Outgoing panel, 24 HTC circuits, 25A CB, positioned on right side of PSS panel.	1244-014361
PDS-40L-30HTC/25A	nVent RAYCHEM NGC-40 Outgoing panel, 30 HTC circuits, 25A CB, positioned on left side of PSS panel.	1244-014362
PDS-40R-30HTC/25A	nVent RAYCHEM NGC-40 Outgoing panel, 30 HTC circuits, 25A CB, positioned on right side of PSS panel.	1244-014363
PDS-40L-12HTC3/40A	nVent RAYCHEM NGC-40 Outgoing panel, 12 HTC3 circuits, 40A CB, positioned on left side of PSS panel.	1244-014364
PDS-40R-12HTC3/40A	nVent RAYCHEM NGC-40 Outgoing panel, 12 HTC3 circuits, 40A CB, positioned on right side of PSS panel.	1244-014365
PDS-40-12SLIM	nVent RAYCHEM NGC-40 outgoing panel, 12 * Safety Temperature Limiter panel.	1244-014476
PDS-40L-3PASC-24CB/25A	nVent RAYCHEM NGC-40 outgoing panel, 3 PASC circuits feeding 24 outgoing Circuits, 25A each, positioned on right side of PSS panel.	1244-014477
PDS-40R-3PASC-24CB/25A	nVent RAYCHEM NGC-40 outgoing panel, 3 PASC circuits feeding 24 outgoing Circuits, 25A each, positioned on right side of PSS panel.	1244-014478
PDS-L-30CB/25A	Outgoing panel, 30 uncontrolled circuits, 25A each, positioned on right side of PSS panel.	1244-014479
PDS-R-30CB/25A	Outgoing panel, 30 uncontrolled circuits, 25A each, positioned on right side of PSS panel.	1244-014480

PRODUCT NAME DEFINITION

	PSS-***A/**kA-T
PSS	Power Supply System
***A	250: 250A incomer switch 400: 400A incomer switch
**kA	10: 10 kA short circuit protection 25: 25 kA short circuit protection
T	Touch1500 (optional)

	PDS-40*-**HTC/*A-**HTC3/*A-*PASC-**CB/*A	
	Power Distribution System	
40*	40: L: R:	Panel equipped with nVent RAYCHEM NGC-40 controllers. The panel is positioned on left side of PSS panel. The panel is positioned on right side of PSS panel.
****HTC/*A**	**: *:	Number of nVent RAYCHEM NGC-40-HTC controllers CB rating of electrical heat tracing circuits
****HTC3/*A**	**: *:	Number of nVent RAYCHEM NGC-40-HTC3 controllers CB rating of electrical heat tracing circuits (per phase)
***PASC**	*:	number of PASC controllers
****CB/*A**	**: *:	Number on uncontrolled/PASC outgoing circuits CB rating of uncontrolled/PASC circuits.
	PSS-***A/**kA-PDS-40-**HTC/**A	
	Panel including incoming and outgoing sections in one enclosure. For individual description of components see explanation text above.	

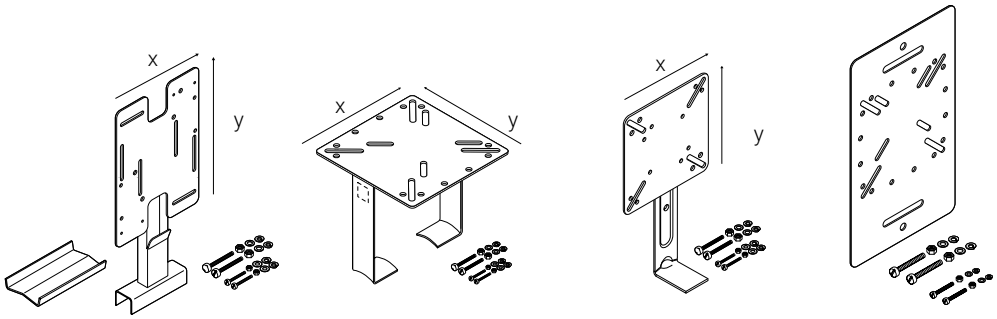
ACCESSORIES

SUPPORTS

Support brackets are used to fix equipment such as thermostats or junction boxes on pipes or cable trays. Support brackets require additional pipe straps which have to be ordered separately.

They include a set of M6 and/or M4 fixing screws, nuts, washers and spring lock washers for the fixation of one junction box or thermostat. They are fabricated in stainless steel (SS304, and passivation)

The table below outlines the typical compatibility of each bracket with relevant equipment, for other equipment please contact nVent representative.

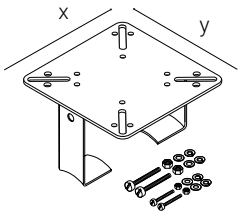


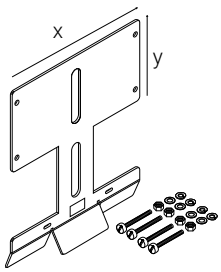
	SB-100 192932-000	SB-101 990944-000	SB-110 707366-000	SB-130** 1244-006602
AT-TS-13	x	x	x	x
AT-TS-14	x	x	x	x
JB-82	x	x	x	x
JB-EX-20(-EP)	x	x	x	x
JB-EX-21	x	x		x
JB-EX-21/35MM2				
JB-EX-25/35MM2				
JB-EX-32/35MM2				
JBU-100(-L)-E(P)	x	x		x
MONI-PT100-EXE		x		x
MONI-PT100-NH		x		x
MONI-PT100-4/20mA		x		x
RAYSTAT-CONTROL-10	x	x		x
RAYSTAT-ECO-10	x	x		x
RAYSTAT-EX-02	x	x	x	x
RAYSTAT-EX-03	x	x		x
RAYSTAT-EX-04	x	x		x
NGC-20-C(L)-E				
T-M-10-S/+x+y	x	x		x
T-M-20-S/+x+y(/EX)			x	

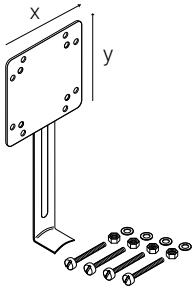
**Support bracket for fixation to cable trays

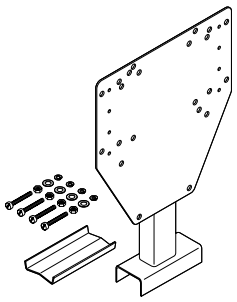
TECHNICAL DATA

	SB-100 192932-000	SB-101 990944-000	SB-110 707366-000	SB-130** 1244-006602
Plate size (mm) X x Y	160 x 230	160 x 160	130 x 130	180 x 315
Distance pipe-plate (mm)	100	160	100	N.A.
Number of pipe straps required	2	2	1	2
Max. pipe temperature (°C)	230	230	230	N.A.
Weight (kg)	0.70	0.59	0.40	0.62









	SB-111 579796-000	SB-120 165886-000	JB-SB-26 338265-000	SB-125 1244-00603
AT-TS-13	x			
AT-TS-14	x			
JB-82	x			x
JB-EX-20(-EP)	x			
JB-EX-21				
JB-EX-21/35MM2	x*			
JB-EX-25/35MM2	x*			
JB-EX-32/35MM2	x*			
JBU-100(-L)-E(P)				x
MONI-PT100-EXE	x		x	
MONI-PT100-NH	x		x	
MONI-PT100-4/20mA	x		x	
RAYSTAT-CONTROL-10				x
RAYSTAT-ECO-10				x
RAYSTAT-EX-02	x			x
RAYSTAT-EX-03				x
RAYSTAT-EX-04				x
NGC-20-C(L)-E		x		x
T-M-10-S/+x+y	x			
T-M-20-S/+x+y(/EX)		x		x

* Use 2 brackets per junction box

TECHNICAL DATA

Plate size (mm) X x Y	130 x 130	220 x 120	80 x 80	220 x 232
Distance pipe-plate (mm)	100	120	100	100
Number of pipe straps required	2	2	1	2
Max. pipe temperature (°C)	230	230	230	230
Weight (kg)	0.48	0.66	0.20	0.90

LABELS AND TAGS

Warning labels indicate the presence of electrical heat-tracing under the insulation of the pipe or other equipment. (min. of 1 label per 5 m of heat-tracing line). Also suitable for stainless steel pipes.

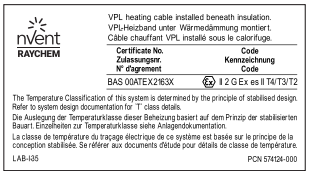
Language	EHT label reference	Product number
Arabian	LAB-ETL-AR	036236-000
Bulgarian	LAB-ETL-BG	1244-002183
Czech	LAB-ETL-CZ	731605-000
Danish	LAB-ETL-DK	C97690-000
Dutch	LAB-ETL-NL	749153-000
English	LAB-I-01	938947-000
Estonian/English	LAB-ETL-EN/EE	1244-001415
Finnish/Swedisch	LAB-ETL-SE/FI	756479-000
French	LAB-I-05	883061-000
German/French/Italian (230V)	LAB-ETL-DE/FR/IT	148648-000
German	LAB-ETL-DE	597779-000
Hungarian	LAB-ETL-HU	623725-000
Italian	LAB-ETL-IT	C97688-000
Latvian	LAB-ETL-LV	841822-000
Lithuanian	LAB-ETL-LT	105300-000
Norwegian	LAB-ETL-NO	C97689-000
Norwegian/English	LAB-ETL-EN/NO	165899-000
Polish	LAB-ETL-PL	258203-000
Portugese	LAB-ETL-PT	945960-000
Romanian	LAB-ETL-RO	902104-000
Russian	LAB-ETL-RU	574738-000
Russian/English	LAB-ETL-EN/RU	1244-001060
Russian/English/Azeri	LAB-ETL-AZ/RU/EN	1244-012283
Russian/English/Uzbek	LAB-ETL-UZ/RU/EN	1244-022143
Spanish	LAB-ETL-ES	C97686-000
Swedish	LAB-ETL-SE	691703-000
Turkish/English	LAB-ETL-EN/TR	1244-014860

Language	Component label reference	Product number
English	LAB-I-02	774499-000
Russian/English	LAB-I-02/E/R LAB-ENDSEAL	1244-001059 146909-000
English	ETL-END-SEAL LAB-SPLICE	103405-000 007063-000

STABILIZED DESIGN LABELS

If compliance to the T-class or A.I.T. cannot be achieved by the unconditional T-rating of the heating cable, the hazardous area regulations require that cable sheath temperature is determined by the rules of stabilized design as per EN 60079-30 and the heating circuit is marked accordingly. The following labels are available for this purpose (min.1 label per heating circuit)

LAB-I-35



Stabilized design sticker. To be installed when power-limiting VPL heating cables are used in hazardous areas.

PN: 574124-000 Weight: 0,0015 kg

LAB-EX-XTV-KTV

Aluminum tag plate for XTV and KTV self-regulating heating cables. To be installed if T-class compliance was proven by stabilized design and not by unconditional T-rating.

PN: 1244-011961 Weight: 0.04 kg

LAB-EX-FXT

Aluminum tag plate. To be installed when parallel constant wattage FMT or FHT heating cables are used in hazardous areas.

PN: 1244-006953 Weight: 0.04 kg

PI-LABEL-EX

Aluminum tag plate. To be installed when series polymer insulated XPI & XPI-S heating cables are used in hazardous areas.

PN: 1244-006940 Weight: 0.04 kg

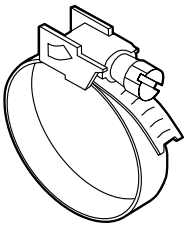
PI-LABEL-NH

Aluminum tag plate. To be installed when series polymer insulated XPI & XPI-S heating cables are used non hazardous areas. This label is not mandatory but highly recommended for future reference.

PN: 1244-006941 Weight: 0.04 kg

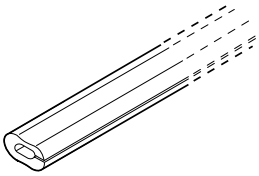
PIPE STRAPS

Metal straps for pipe mounting of integrated power connections, above the insulation tees and end seals as well as support brackets and the tubular insulation entry. Banding: stainless steel



Pipe outer diameter in mm	(inches)	Pipe strap	PN (Weight)
20 - 47	(1/2" - 11/4")	PSE-047	700333-000 (0.017 kg)
40 - 90	(11/4" - 3")	PSE-090	976935-000 (0.024 kg)
60 - 288	(2" - 10")	PSE-280	664775-000 (0.052 kg)
60 - 540	(2" - 20")	PSE-540	364489-000 (0.052 kg)

PROTECTIVE GROMMET



G-02

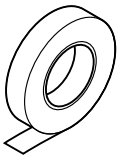
Silicone grommet that protects the heating cable at sharp edges such as endplates of insulation cladding, flanges etc. It can be cut-to-length and resists temperatures up to 215°C.

Sold in pieces of 1 m.

PN: 412549-000 Weight: 0.37 kg/m)

FIXING MATERIALS

Self-adhesive tape for fixing the heating cables on pipes or other equipment.



GT-66

Glass cloth tape for attaching heating cable to pipe.
Not for stainless steel pipes or for installation temperatures below 5°C.

20 m per roll, 12 mm width.

PN: C77220-000 Weight: 0.053 kg

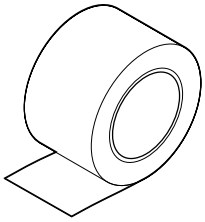
GS-54

Glass cloth tape for attaching heating cable to pipe.

For stainless steel pipes or for any installation below 5°C.

16.5 m per roll, 12 mm width.

PN: C77221-000 Weight: 0.048 kg



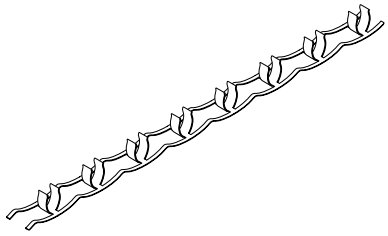
ATE-180

Aluminium tape* for attaching heating cables and thermostat sensors to pipes and tanks. Minimum installation temperature: 0°C. Also suitable for stainless steel pipes.
55 m per roll, 63.5 mm width.
PN: 846243-000 Weight: 0.84 kg

*Power output of selfregulating heating cables might increase when installed with aluminium tape or other heat transfer aids. Please use TraceCalc or contact nVent representative for further details.

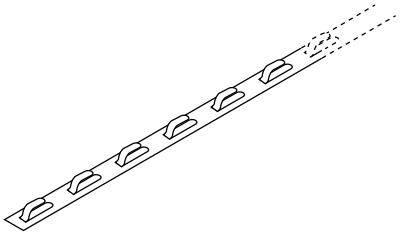
HWA-METAL-MESH-SS-50MM-10M

Stainless steel mesh for fixation of heating cables on valves, pumps or other odd-shaped surfaces. This mesh provides optimum contact and heat transfer between heating cables and heated equipment and can be used for exposure temperatures up to 400°C.
10 m per roll, 50 mm width.
PN: 1244-005772 Weight: 0.36 kg



HWA-PI-FIX- SS-XMM-10M

Stainless steel clip band to attach Polymer Insulated series heating cables to pipes. Clips at regular distances to allow for even heater spacing. Band available in two sizes for different diameter ranges.
10 m per roll.
For diameters up to 5 mm, HWA-PI-FIX-SS-5MM-10M
PN: 1244-007768 Weight: 0.32 kg
For diameters up to 8 mm, HWA-PI-FIX-SS-8MM-10M
PN: 1244-007769 Weight: 0.52 kg

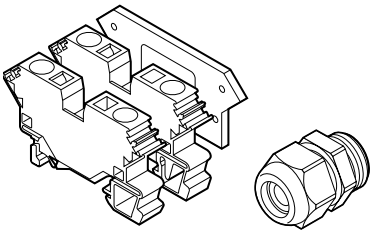


HARD-SPACER-SS-25MM-25M

Stainless steel spacer for fixing the heating cable on walls, tanks and vessels, etc.
Width spacer: 12.5 mm.
Fixing distance for cables: each 25 mm.
25 m per roll.
PN: 107826-000 Weight: 1.10 kg

EAC (Russia, Kazakhstan, Belarus) For other countries contact your local nVent representative.
Valid for following terminals, glands, plugs, adaptors and reducers.

TERMINALS



HWA-WAGO-TSTAT-KIT

Thermostat kit with supplementary terminals to connect thermostats of type RAYSTAT-EX-02 to the junction boxes JBS, JBM and JBU.
The kit includes 2 terminals Spring-type terminals (1 x L, 1 x PE),
1 power cable gland GL-36-M25, 1 end plate and 1 installation instruction.
PN: 966659-000 Weight: 0.073 kg

PTB 98 ATEX 3133 U (Terminal) — Ex II 2G Ex e II; Ex II 2D
and
PTB 99 ATEX 3128 X (Gland) — Ex II 2G Ex e II; Ex II 2D Ex tD A21 IP66

HWA-WAGO-PHASE

Phase/neutral terminal (Ex e), spare part for various junction boxes, max. 10 mm² solid/stranded.
PN: 633476-000 Weight: 0.019 kg

PTB 98 ATEX 3133 U — Ex II 2G Ex e II; Ex II 2D

HWA-WAGO-EARTH

Earth terminal (Ex e), spare part for various junction boxes, max. 10 mm² solid/stranded.
PN: 911505-000 Weight: 0.027 kg

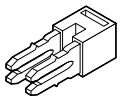
PTB 98 ATEX 3133 U — Ex II 2G Ex e II; Ex II 2D

HWA-WAGO-ENDPLATE

End plate for HWA-WAGO-..., 10 mm² terminals, spare part.
PN: 983674-000 Weight: 0.003 kg

PTB 98 ATEX 3133 U — Ex II 2G Ex e II; Ex II 2D

HWA-WAGO-JUMPER



Jumper to bridge HWA-WAGO-..., 10 mm² terminals, spare part.
PN: 550942-000 Weight: 0.0004 kg

PTB 98 ATEX 3133 U — Ex II 2G Ex e II; Ex II 2D

HWA-WDM-PHASE-35

Phase/neutral screw terminal (Ex e), spare part for JB-EX-xx/35MM2 junction boxes, max. 35 mm² solid/stranded.
PN: 1244-006990 Weight: 0.052 kg

KEMA 98 ATEX 1683 U — Ex II 2G Ex e II; Ex II 2D

HWA-WDM-EARTH-35

Earth screw terminal (Ex e), spare part for JB-EX-xx/35MM2 junction boxes, max. 35 mm² solid/stranded.
PN: 1244-006992 Weight: 0.077 kg

KEMA 98 ATEX 1683 U — Ex II 2G Ex e II; Ex II 2D

HWA-WDM-EARTH-10

Earth screw terminal (Ex e), spare part for JB-EX-xx/35MM2 junction boxes, max. 10 mm² solid/stranded.
PN: 1244-006992 Weight: 0.030 kg
KEMA 98 ATEX 1683 U II 2G Ex e II
II 2D

HWA-WDM-JUMPER-35-2

Jumper to bridge two HWA-WDM-... 35 mm² terminals, spare part
PN: 1244-006995 Weight: 0.013 kg
KEMA 98 ATEX 1683 U II 2G Ex e II
II 2D

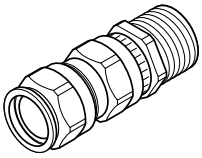
HWA-WDM-JUMPER-35-3

Jumper to bridge three HWA-WDM-... 35 mm² terminals, spare part
PN: 1244-006996 Weight: 0.020 kg
KEMA 98 ATEX 1683 U II 2G Ex e II
II 2D

HWA-WDM-PLATE

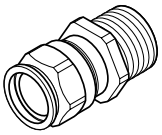
End plate for HWA-WDM-... 35 mm² terminals, spare part
PN: 1244-007004 Weight: 0.005 kg

GLANDS



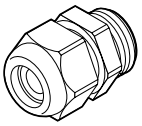
GL-33

3/4" NPT power cable gland for RAYSTAT-EX-02 (Ex d IIC)
Nickel plated brass, silicone grommet.
For use with armoured power cables with outer sheath diameter of 13.5 - 21 mm and inner sheath diameter of 10 - 15.5 mm.
PN: 1244-017517 Weight: 0.14 kg



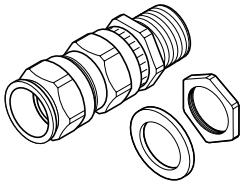
GL-34

3/4" NPT power cable gland for RAYSTAT-EX-02 (Ex d IIC)
Nickel plated brass, silicone grommet.
For use with non-armoured power cables with outer sheath diameter of 10 - 15.5 mm.
PN: 1244-017518 Weight: 0.08 kg



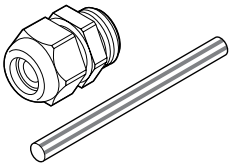
GL-36-M25

M25 power cable gland (Ex e)
Polyamide.
For use with non-armoured power cables with outer diameter range 8-17,5 mm.
Temperature range: -20°C/+70°C.
Spare part for JBS-100, JBM-100 and JBU-100.
PN: 1244-019082 Weight: 0.016 kg



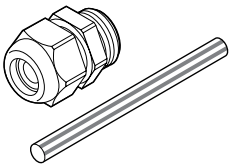
GL-38-M25-METAL

M25 power cable gland (Ex e II and Ex d IIC) for use with junction boxes with internal earth plate (-EP) or metal boxes.
Nickel plated brass, silicone grommet.
For use with armoured power cables with sheath diameter of 13.5 - 21 mm and inner sheath diameter 10 - 15.5 mm.
PN: 056622-000 Weight: 0.15 kg



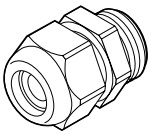
C20-PI-PA-KIT

cable gland (Ex e), polyamide for use with PI cables with a diameter range of 4-13mm, up to -40°C. With green/yellow sleeve.
PN: 1244-019669 Weight: 0.02kg



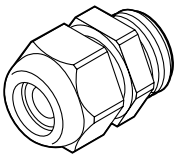
C20-PI-M0-KIT

cable gland (Ex e), Ni plated brass for use with PI cables with a diameter range of 5-14mm in conjunction with junction boxes with earth plate or with polymer junction boxes and an earth lug, up to -55°C. With green/yellow sleeve.
PN: 1244-019670 Weight: 0.71kg



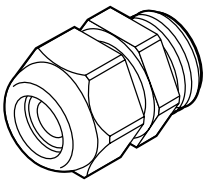
GL-45-M32

M32 cable gland (Ex e), polyamide for use with power cables with a diameter range of 12 - 21 mm.
PN: 1244-000 847 Weight: 0.028 kg



GL-51-M40

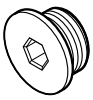
M40 cable gland (Ex e), polyamide for use with power cables with a diameter range of 17 - 28 mm.
PN: 1244-007003 Weight: 0.045 kg



GL-55-M25

M25 power cable gland (Ex e) Polyamide.
For use with non-armoured power cables with outer diameter range 8 - 15 mm.
Temperature range: -55°C/+70°C
Spare part for JBS-100, JBM-100, JBU-100, JB-EX-20(-EP), JB-MB-25/16MM2 and JB-MB-26/16MM2
PN 1244-019083 Weight: 0.016 kg

PLUGS

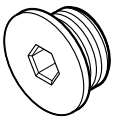


HWA-PLUG-M20-EXE-PLASTIC

M20 stopping plug Ex e, up to -55°C.
Polyamide.
Spare parts for various junction boxes.
PN: 1244-000 845 Weight: 0.003 kg

PTB 98 ATEX 3130 II 2G Ex e II
II 2D Ex tD A21 IP66

IECEx PTB 03.0000



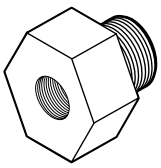
HWA-PLUG-M25-EXE-PLASTIC

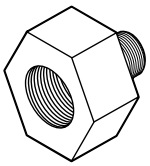
M25 stopping plug Ex e, up to -55°C.
Polyamide.
Spare parts for various junction boxes.
PN: 434994-000 Weight: 0.007 kg

PTB 98 ATEX 3130 II 2G Ex e II
II 2D Ex tD A21 IP66

IECEx PTB 03.0000

ADAPTORS/REDUCERS





Prod Description	Male	Female	Hazardous area approved	Material	Extra accessories	Product Number (Weight)
REDUCER-M25/ M20-EEXE	M25	M20	Ex e	Polyamide	None	1244-002089 (0.021 kg)
REDUCER-M32/ M25-EEXE	M32	M25	Ex e	Polyamide	None	1244-000859 (0.009 kg)
REDUCER-M40/M32	M40	M32	Ex e	Polyamide	O-ring	1244-007007 (0.016 kg)
ADPT-PG16-M25-EEXE	M25	PG16	Ex e	Polyamide	O-ring	541892-000 (0.020 kg)
REDUCER-M25/20-EEXD	M25	M20	Ex d	Brass	O-ring	404287-000 (0.07 kg)
REDUCER-M25/20	M25	M20	Ex d	Brass	Locknut, Fibre washer, O-ring	630617-000 (0.07 kg)
REDUCER-M25/ M20-EEXD-SS	M25	M20	Ex d	Stainless steel	O-ring	1244-002090 (0.028 kg)
REDUCER-1NPT/ PG16-EEXD	1" NPT	PG16	Ex d	Stainless steel	None	414478-000 (0.10 kg)
REDUCER-1NPT/M25	1" NPT	M25	Ex d	Stainless steel	None	1244-000953 (0.55 kg)
REDUCER-M25/ PG16-EEXE	PG16	M25	Ex e	Polyamide	O-ring	953780-000 (0.03 kg)
ADAPTOR-M20/25	M20	M25	Ex d	Brass	Locknut and O-ring	492799-000 (0.092 kg)
ADPT-M20/25-EEXD	M20	M25	Ex d	Brass	O-ring	684953-000 (0.09 kg)

APPROVALS

REDUCER-M25/20-EEXD

SIRA 00ATEX1094 — Ⓔx I M2 II 2GD
Ex d I/IIC Mb Gb Ex e I/IIC Mb Gb
Ex tb IIIC Db IP6X

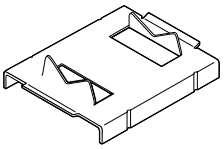
IECEx SIR 05.0042U

REDUCER-M25/PG16-EEXE

SIRA00ATEX3091 — Ⓔx II 2GD
Ex e IIC Gb
Ex tb IIIC Db IP 6X

IECEx SIR 05.0042U

SMALL PIPE ADAPTORS



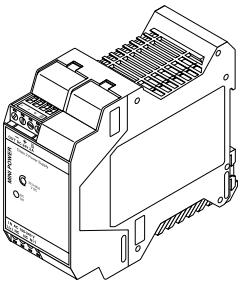
JBS-SPA

Small pipe adaptor required for pipes ≤ 1" (DN25), applicable for JBS-100, E-100, E-100-L
E90515-000 (bag of 5 adaptors) Weight: 0.14 kg

JBM-SPA

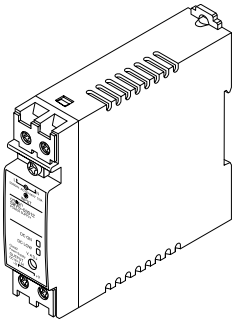
Small pipe adaptor required for pipes ≤ 1" (DN25), applicable for JBM-100, T-100
D55673-000 (bag of 5 adaptors) Weight: 0.40 kg

POWER SUPPLY



MONI-RMC-PS24

24 Vdc stabilized power supply
Wide range input (100 - 240 Vac) power supply to provide
24 Vdc input for MONI- RMC-BASE.
Surface or DIN 35 rail mounted.
PN: 972049-000 Weight: 0.28 kg

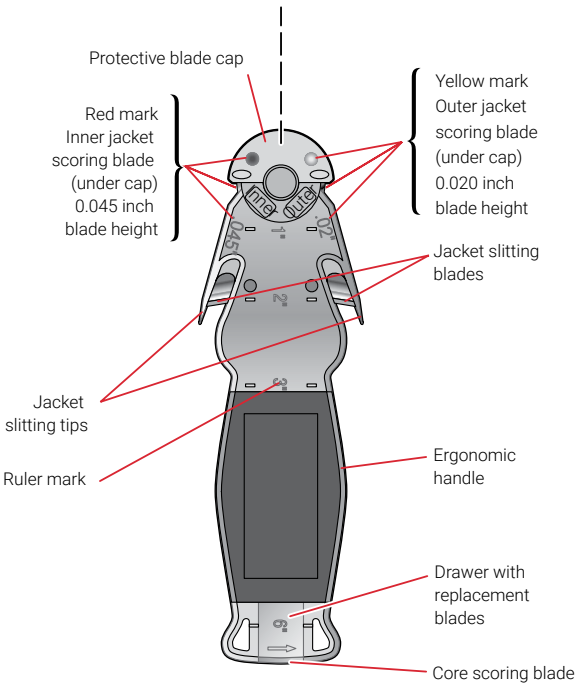


MONI-PS12

12 Vdc stabilized power supply
Wide range input (100 - 240 Vac) power supply to provide 12 Vdc input for the nVent RAYCHEM NGC-30-CRM-E and nVent RAYCHEM NGC-30-CRMS-E cards.
DIN 35 rail mountable.
PN: 1244-001505 Weight: 0.18 kg

STRIPPING-TOOL-SR-CABLE

STRIPPING TOOL FOR NVENT RAYCHEM SELF-REGULATING CABLES



PRODUCT OVERVIEW

The nVent RAYCHEM STRIPPING-TOOL-SR-CABLE is designed for use with nVent RAYCHEM BTV-CR, BTV-CT, QTVR-CT, XTV-CT, KTV-CT, HWAT, XL-Trace, IceStop and RaySol self-regulating heat-tracing cables. The tool is designed for faster, safer and more reliable cable terminations.

The tool has two sets of blades designed for precise scoring of the outer and inner jackets of the cables mentioned above. The scoring blades are protected by a spring-loaded cap that rotates automatically. For safety, the cap rotates back to its original position automatically after the cutting operation is performed.

The tool also includes a unique core scoring feature that prevents damage to the conductors. The tool has a robust metallic body, ergonomic contour and replaceable blades.

PRODUCT SPECIFICATIONS

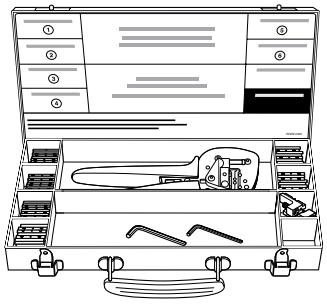
Body	Symmetric and Ergonomic Aluminum A380 Metallic Body with TPE soft sleeve.
Jacket scoring blades	A pair of jacket scoring stainless steel blades with depth ranges of 0.04–0.06 inch and 0.01–0.03 inch.
Blade cover	Spring loaded Zinc alloy cap that covers both the blades when the tool is not in use.
Core scoring feature	Core scoring blade which will prevent damage to the conductors. The blade height should be 0.01–0.04 inch.
Replaceable blades	All blades can be replaced with a screwdriver. Replaceable blades are provided with the tool.
Coating	Metallic body coated with electrostatic epoxy powder 0.002–0.005 inch thick.

ORDERING DETAILS

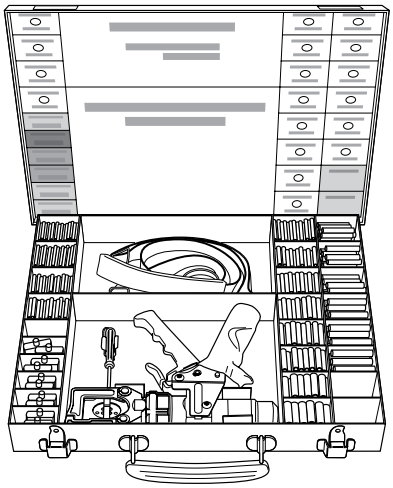
	Catalog number	Part number
Stripping tool	STRIPPING-TOOL-SR-CABLE	P000001126
Replacement jacket scoring blade	Techni Edge® #10 Hobby blade TE01-103	Should be ordered directly from Techni Edge.
Replacement jacket slitting blade	Techni Edge 3/8 inch 13 point blade TE01-333	Should be ordered directly from Techni Edge.

PI-TOOL-SET-XX

TOOLBOX FOR ELECTRICAL CONNECTION SYSTEM FOR PI HEATING CABLES



PI-TOOL-SET-01



PI-TOOL-SET-02

The nVent RAYCHEM PI-TOOL-SET-xx is a handy metal box containing all materials required to connect Polymer Insulated (PI) heating cables to a suitable cold lead and also to splice two PI heating cables. Electrical continuation is maintained via specially engineered crimps, which provide a highly reliable electrical (gas tight) connection.

In order to assure consistently reliable connections, the crimp is to be performed with the specified crimp tool (PI-TOOL-xx) equipped with the appropriate crimping dies (CD-PI-xx). Different tools are available: a mechanical tool for connecting small size cables (up to 2.5 mm^2) and an hydraulic tool for large size cables (from 4 to 25 mm^2).

Apart from the crimp tool and dies, the kit contains a variety of crimps (CRP-PI-xx). The tables on this datasheet are providing an overview of the possible combinations of tools, dies and crimps for various PI heating cables. Packs containing 10 pc of crimps are available as spare parts. Connection kits providing the insulation of the connection, have to be ordered separately.

APPLICATION

Electrical connection system for Polymer Insulated (PI) heating cables.

KIT CONTENTS

	PI-TOOL-SET-01	PI-TOOL-SET-02
Crimp tool	PI-TOOL-01	PI-TOOL-02
Crimping dies	CD-PI-02	CD-PI-03, CD-PI-04, CD-PI-05, CD-PI-06
Crimps	PI-CRP-01N, PI-CRP-02N, PI-CRP-03N, PI-CRP-04 to PI-CRP-06 (50 pcs each)	PI-CRP-07 to PI-CRP-017 (50 pcs each) PI-CRP-18 to PI-CRP-24 (25 pcs each)

ORDERING DETAILS

Part number (Weight)	1244-000583 (2.5 kg)	1244-000584 (12.5 kg)

APPROVALS

EAC (Russia, Kazakhstan, Belarus)
For other countries contact your local nVent representative.

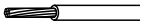
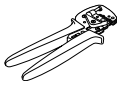
GENERAL ACCESSORIES

Crimp tool set with various inserts and crimps	Part number	
PI-TOOL-SET-01	1244-000583	Complete set for cold leads/heating cables up to 2.5 mm^2
PI-TOOL-SET-02	1244-000584	Complete set for cold leads/heating cables from 4 to 25 mm^2

Crimp tools (spare part)	Part number	Crimping dies (spare part)	Part number
PI-TOOL-01	1244-000549	CD-PI-02	1244-000554
PI-TOOL-02	1244-000551	CD-PI-03	1244-000552
		CD-PI-04	1244-000553
		CD-PI-05	1244-000555
		CD-PI-06	1244-000556

COMPATIBILITY- AND SELECTION CHART AND SELECTION FOR CRIMPS, DIES AND TOOLS

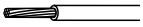
Table 1: **PI-TOOL-SET-01 for conductor size ≤ 2,5 mm^2**

Kit	Possible combinations for all XPI (XPI-NH, XPI, XPI-S) heating cables (Ω/km)	Crimp type	Part number		Spare tool & crimping dies	
	FROM	TO	(10 pieces per pack)		Die	Tool
						
CS-150-2.5-PI	65 / 100 (only XPI-F) / 180 / 200 / 380 / 480 / 600 / 700 / 810 / 1000 / 1440 / 1750 /2000 / 3000 / 4000 4400 / 5600 / 7000 / 8000	65 / 100 (only XPI-F) / 180 / 200 / 380 / 480 / 600 / 700 / 810 / 1000 / 1440 / 1750 / 2000 / 3000 / 4000 / 4400 / 5600 / 7000 / 8000	PI-CRP-01N	1244-016256	CD-PI-02 (black)	PI-TOOL-01
	11.7	65 / 100 (only XPI-F) / 180 / 200 / 380 / 480 / 600 / 700 / 810 / 1000 / 1440 / 1750 / 2000 / 3000 / 4000 / 4400 / 5600 / 7000 / 8000	PI-CRP-02N	1244-016257		
	11.7 / 15 / 17.8 / 25 / 50 / 80 / 100 (only XPI & XPI-S) / 150 / 320	11.7 / 15 / 17.8 / 25 / 50 / 80 / 100 (only XPI & XPI-S) / 150 / 320	PI-CRP-03N	1244-016258		
	7 / 10 / 11.7 / 31.5 / 100 (only XPI & XPI-S)	65 / 100 (XPI-F only) 180 /200 / 380 / 480 / 600 / 700 / 810 / 1000 / 1440 / 1750 / 2000 / 3000 / 4000 / 4400 / 5600 / 7000 / 8000	PI-CRP-04	1244-016259		
	7 / 10 / 11.7 / 31.5 / 100 (only XPI & XPI-S)	11.7/ 15 / 17.8 / 25 / 50 / 80 / 100 (XPI & XPI-S only) 150 / 320	PI-CRP-05	1244-016260		
	7 / 10 / 11.7 / 31.5 / 100(only XPI & XPI-S)	7 / 10 / 11.7 / 31.5 / 100 (only XPI & XPI-S)	PI-CRP-06	1244-016261		

Important: The electrical insulation for the crimp connection has to be ordered separately (CS-150-xx-PI).
If the inscriptions on crimps PI-CRP-01N, PI-CRP-02N and PI-CRP-03N do not contain 'N', please do no longer use.
Contact nVent for more information.

CRIMP SELECTION AND INSTALLATION TABLE

Table 2: PI-TOOL-SET-02 for conductor size 4 to 25 mm²

Kit	Possible combinations for all XPI (XPI-NH, XPI, XPI-S) heating cables (Ω/km)	Crimp type	Part number		Spare tool & crimping dies	
	FROM	TO	(10 pieces per pack)		Die	Tool
						
CS-150-6-PI	4.4	11.7 / 15	PI-CRP-07	1244-016262	CD-PI-03 (Grey)	PI-TOOL-02
	4.4	7 / 10	PI-CRP-08	1244-016263		
	4.4	4.4	PI-CRP-09	1244-016264		
	2.9	11.7 / 31.5 / 100 (only XPI & XPI-S)	PI-CRP-10	1244-016265	CD-PI-04 (Blue)	
	2.9	7 / 10	PI-CRP-11	1244-016266		
	2.9	4.4	PI-CRP-12	1244-016267		
	2.9	2.9	PI-CRP-13	1244-016268		
CS-150-25-PI	1.8	7	PI-CRP-14	1244-016269		
	1.8	7 / 4.4	PI-CRP-15	1244-016270		
	1.8	2.9	PI-CRP-16	1244-016271		
	1.8	1.8	PI-CRP-17	1244-016272		
	1.1	4.4	PI-CRP-18	1244-016273	(Red) V + N	
	1.1	2.9	PI-CRP-19	1244-016274		
	1.1	1.8	PI-CRP-20	1244-016275		
	1.1	1.1	PI-CRP-21	1244-016276		
	0.8	2.9	PI-CRP-22	1244-016277	CD-PI-06 (Yellow) V + N	
	0.8	1.8	PI-CRP-23	1244-016278		
	0.8	1.1	PI-CRP-24	1244-016279		

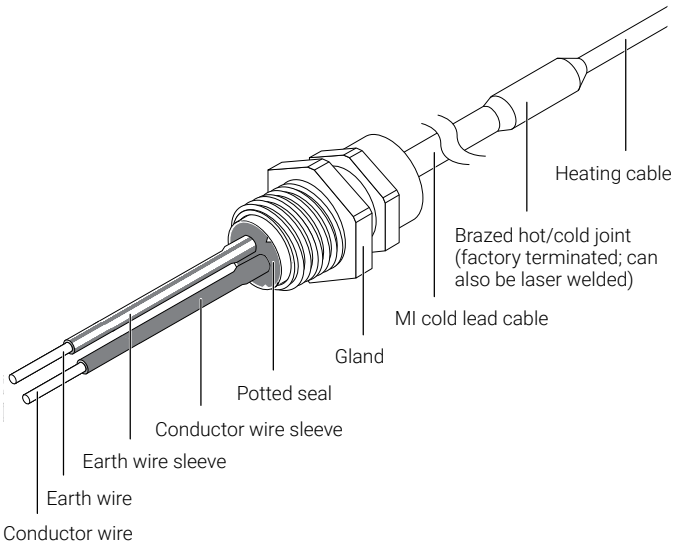
Important: The electrical insulation for the crimp connection has to be ordered separately. (CS-150-xx-PI)

THE CRIMP FOR THE ELECTRICAL CONNECTION OF THE BRAID IS INCLUDED IN THE CS-150-XX-PI KIT

Table 3: CS-150-xx-PI braid crimps

Kit	Cable Family used in kit	Braid crimp to use	Part number	Die	Tool
CS-150-2.5-PI	XPI-F	BR-CRP-1.5	1244-018980	CD-PI-02	PI-TOOL-01
	XPI	BR-CRP-2.5	1244-016304	CD-PI-02	PI-TOOL-01
	XPI-S	BR-CRP-2.5	1244-016304	CD-PI-02	PI-TOOL-01
CS-150-6-PI	XPI-F	BR-CRP-2.5	1244-016304	CD-PI-02	PI-TOOL-01
	XPI	BR-CRP-6	1244-016305	CD-PI-03	PI-TOOL-02
	XPI-S	BR-CRP-6	1244-016305	CD-PI-03	PI-TOOL-02
CS-150-25-PI	XPI-F	BR-CRP-2.5	1244-016304	CD-PI-02	PI-TOOL-01
	XPI	BR-CRP-25	1244-016306	CD-PI-04	PI-TOOL-02
	XPI-S	BR-CRP-25	1244-016306	CD-PI-04	PI-TOOL-02

ACCESSORIES FOR THE TERMINATION OF MI HEATING UNITS



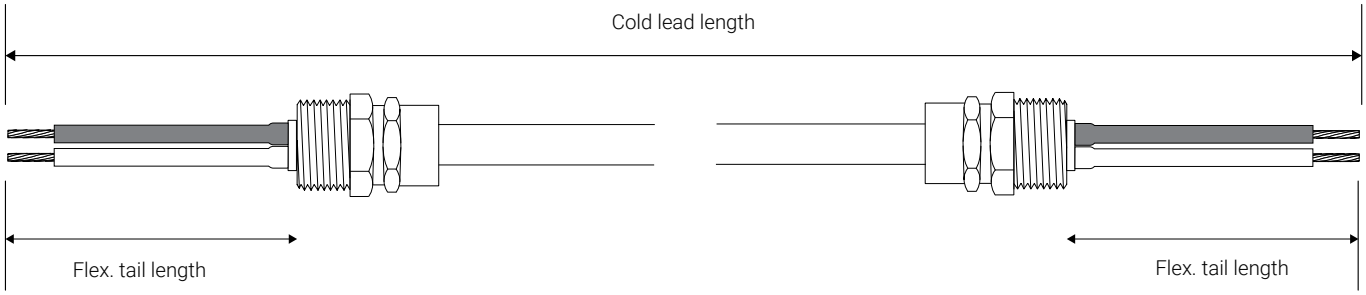
TYPICAL TERMINATION OF MI HEATING CABLE

For the termination of bulk MI heating cables, a range of accessories is available. The termination of MI heating units requires adequate training and sufficient experience. In particular for hazardous area applications, factory termination of the MI heating units is strongly recommended.

For possible combinations and detailed order information of glands, seals, joints and other accessories also refer to datasheet for **MI Termination Accessories** (reference DOC-606), available on our website at nVent.com or contact nVent.

PRE-TERMINATED MI DOUBLE COLD ENDS

PCE/"cold lead type"/"cold lead length"/"flex. Tail length"/"gland type"
Example: PCE/SC1H2.5/4M/300MM/M20



To facilitate occasional on-site termination and eventual repairs, nVent offers Pre-terminated MI double Cold Ends (PCE).

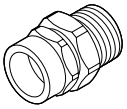
The standard PCEs consist of 4m of cold lead cable of the appropriate type which ends are pre-terminated with a factory seal, gland assembly and insulated flexible tails. The use of Pre-terminated Cold Ends (PCE) significantly increases the reliability of field-termination and repairs of cold leads since they are fully factory tested and assembled in a controlled manufacturing environment.

A PCE with a single conductor cable includes two terminations, sufficient for the termination of an MI heating unit type B.
A PCE with dual conductor cable includes two terminations, sufficient for the termination of two MI heating unit type D or for one MI heating unit type E.

Any ingress of moisture is minimized, if the PCE is cut (typically in the middle) just before the connection to a heating cable. Unused ends can be sealed for storage using wax or other appropriate sealing methods. More details on the available types can be found in MI Termination Accessoiries (reference DOC-606).

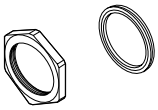
GLANDS, SEALS, JOINTS, FERRULES

RGM



Metric brass glands are standard – more details on accessories for mineral insulated heating cables, refer to datasheet for MI Termination Accessories (reference DOC-606).

RLM20



M20 brass lock nuts for securing glands

RLM25

M25 brass lock nuts for securing glands

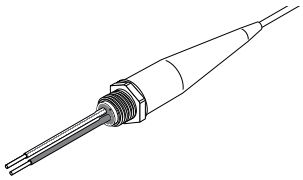
SATP20

Fibre washers for glands, M20

SATP25

Fibre washers for glands, M25

RHG20

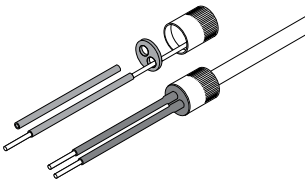


M20 gland shrouds for enhanced gland protection

RHG25

M25 gland shrouds for enhanced gland protection

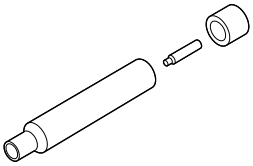
RPAL/RPSL



Hazardous and ordinary area seals are supplied with 300 mm tails including earth tail.

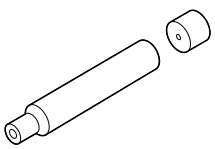
More details on mineral insulated accessories, refer to datasheet for MI Termination Accessories (reference DOC-606).

SJK



Joint types SJK are made of brass, types SJKAS are made of stainless steel. For more details such as compatibility with various heating cables and order references, refer to datasheet for MI Termination Accessories (reference DOC-606).

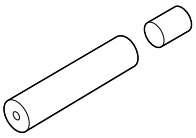
SJK-PILOT-...



Universal hot/cold or hot/hot joint for brazed connection of MI heating cables and/or cold leads. Universal joints have two pilot holes (one for the joint body and one for the joint bush) that must be drilled to match the exact diameter of the heating cable and/or cold lead during the termination operation or field repair. Joint types SJK are made of brass, types SJKAS are made of stainless steel. For more details such as compatibility with various heating cables and order references, refer to datasheet for MI Termination Accessories (reference DOC-606).

The preferred solution to join two heating cables includes a short section of cold lead joined between the two MI heating cables with two hot/cold joints. Contact nVent for more information.

SPOT...-PILOT



End cap for the termination of dual conductor MI heating cables. The end caps have a pilot hole that must be drilled to match the exact diameter of the heating cable during the termination operation. End cap types SPOT are made of brass, types SPOTAS are made of stainless steel. For more details such as compatibility with various heating cables and order references, refer to data-sheet for MI Termination Accessories (reference DOC-606).

SJKF

Ferrules (copper) for reliable connection of MI conductors in hot/cold joints. More details, refer to datasheet for MI Termination Accessories (reference DOC-606).

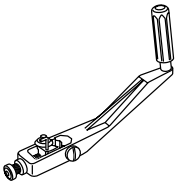
FABRICATION CONSUMABLES

SABAG13	Silver solder for brazed joints, use for conductor
SABAG14	Silver solder for brazed joints, use for joint body
SABF	Brazing flux (250g)
SMP-300	Magnesium oxide powder (250g)
RMX	Grey potting compound

SMH Wax for temporary sealing of bulk MI heating cable ends or cold leads.
Minimum order quantity: 500 g, higher quantities per multiples of 100g.

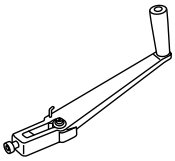
TOOLS

ZSU



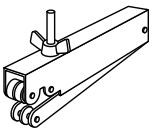
Large stripping tool – all cable sizes, spare blades ZSUB.
For Copper and Cupro-Nickel cables.

ZSUS



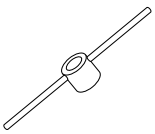
Small stripping tool – cable Ø < 9 mm, spare blades ZSUSB.
For Copper and Cupro-Nickel cables.

ZR



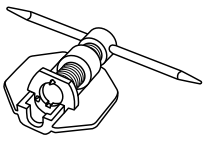
Ringing tool for cable ∅ < 9 mm.

ZPM20, ZPM25



Potting tool, ensures quick and accurate screwing on of the brass pot and is used in conjunction with the appropriate RGM cable gland (M20 or M25).

ZDC20, ZDC25



Crimping tool for 20 and 25 mm seals.

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