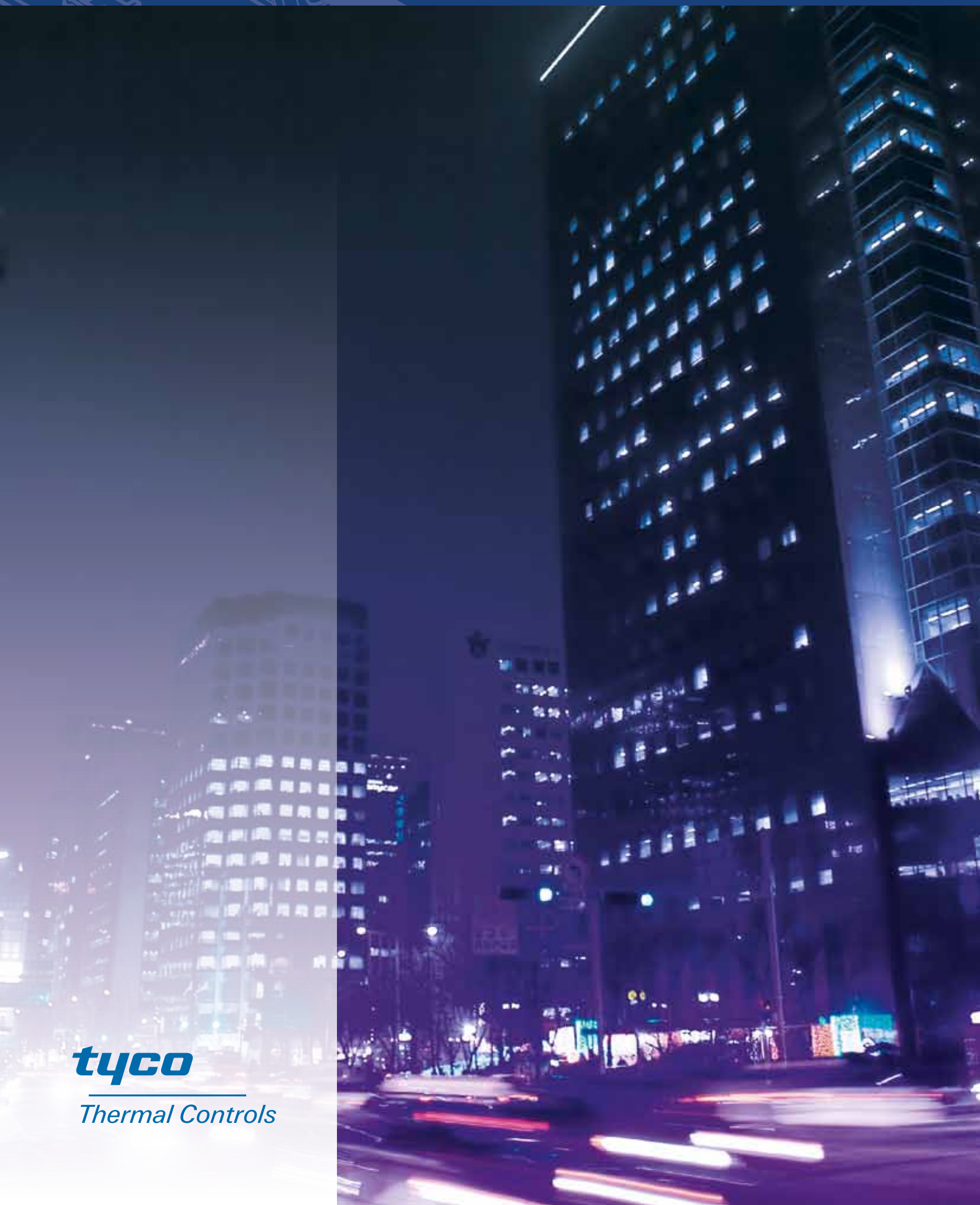
Raychem

Sustainable solutions, **full heat tracing capabilities**



tyco

Thermal Controls

Raychem

A SOLUTIONS COMPANY

Tyco Thermal Controls is the world leader in heat-tracing solutions for the industrial, commercial, and residental markets. Employing over 2500 people around the world, Tyco Thermal Controls is the global leader in heating solutions.

WORLDWIDE APPROACH

With operations in 48 countries and worldwide experience, Tyco Thermal Controls supports your project efforts anywhere, anytime. Whether it's for superior products or turnkey services, Tyco Thermal Controls has the solution.

THE MARKET DEMANDS – WE SUPPLY

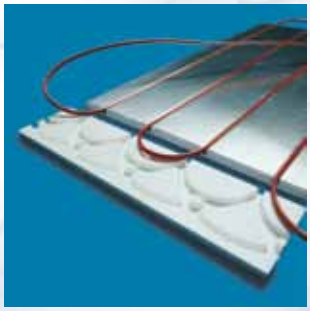
- Frost protection for pipes
- Snow melting for gutters, roofs, downpipes
- Snow melting for ramps, walkways and stairs
- Hot water temperature maintenance
- Underfloor heating
- Smart components
- Energy-efficient control and monitoring
- Industrial heat-tracing

Frost protection for pipes

Snow melting for gutters, roofs, downpipes

Snow melting for ramps, walkways and stairs

Hot water temperature maintenance



Underfloor heating

Smart components

Industrial heat-tracing

Control and Monitoring

Commited to **the environment**

Commited to **the environment**

Tyco International is committed to reducing greenhouse gas (GHG) emissions and, in 2009, has set a goal of reducing its carbon footprint, and water consumption by 25% over the next 5 years. This is no small undertaking as this includes greenhouse gas emissions from over 400 locations and a global fleet of 28,000 vehicles. These are ambitious targets that echo our belief that reducing our impact on the environment is good for business and, most importantly, the right thing to do.

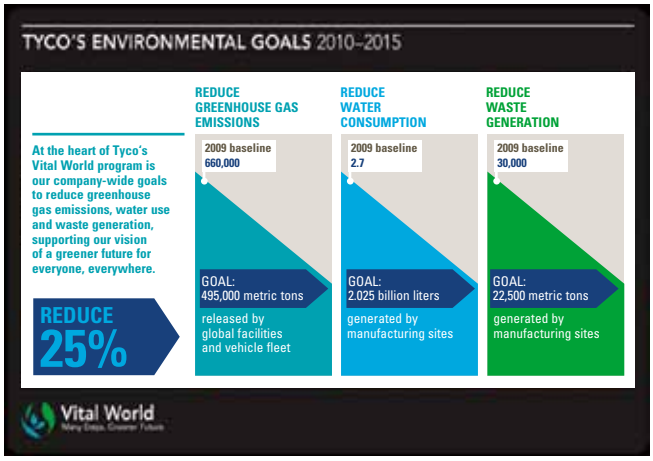
Tyco Thermal Controls is already proving its environmental calibre with ISO14001 certification for its production plant in Huzhou, China, with the expectation that other facilities will soon follow.

Tyco Thermal Controls' main production facility in Menlo Park, California has also taken steps to reduce its carbon emissions and has recently been recognised by the city of Menlo Park with an Environmental Quality Award, in recognition of its investment in "Green" technologies to reduce CO_2 emissions by 300 Metric tonnes per year.

In Europe, the newly built Headquarters of Tyco Thermal Controls has employed a number of smart systems and initiatives to reduce energy consumption and waste.

These include:

- Solar heating technology for hot water generation
- Rain water harvesting for the supply of all sanitary systems and fire suppression systems.
- Wash hand basin water supply is controlled by sensor to reduce water usage.
- Advanced HVAC control systems for increased energy efficiency.
- Smart lighting control with occupancy switching capability throughout all areas.
- Building construction incorporating system infrastructure for connection to photovoltaic electrical supply system. (TTC Leuven is "PV ready").
- The electricity consumed at the Headquarters is supplied 100% from green sources.



Tyco's commitment to the environment is demonstrable and is an absolute requirement of a market leading manufacturer. Our Environmental Steering committee, headed by the President of Tyco Flow Control, continues to co-ordinate and invest in programs to reduce greenhouse gas (GHG) emissions and waste.

Metric	2010 Milestone Improvement Goal
GHG Emissions	25% reduction by 2015
Water usage	25% reduction by 2015
Waste Generation	25% reduction by 2015

Tyco Thermal Controls' environmental commitment looks further than our own carbon footprint. We also strive to deliver products and systems for comfort and safety whilst consuming the minimum amount of energy. Whether new installations or in retrofit systems, our capabilities extend to offering energy efficient technologies to reduce carbon emissions. Such systems are included within this document.

Raychem

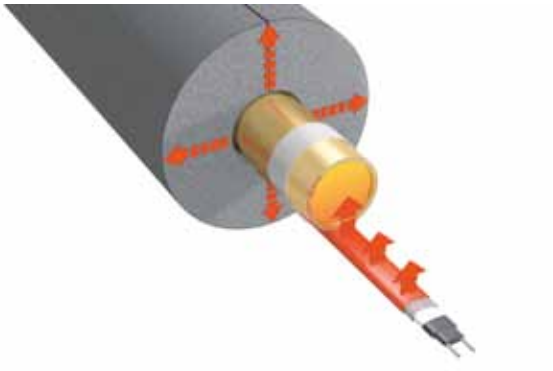
Energy savings.

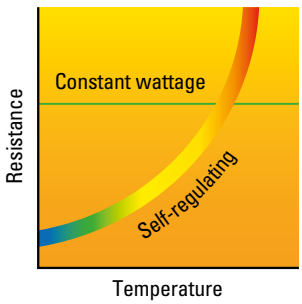
Energy savings.

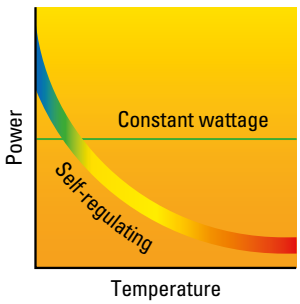
Nowadays, everybody needs to take responsibility with regard to the consumption of energy, in order to safeguard the future.
The selection of suppliers, systems and products that comply with the new standards has become a daily concern of architects, engineers and installers.
As a world leader in heat-tracing systems for various applications, Tyco Thermal Controls can offer you complete systems that will help realise energy savings up to 80%. Based upon proven, smart technology our heat-tracing solutions will help you to answer your customers' requirements.

SELF-REGULATING TECHNOLOGY ...

The heart of all our heat-tracing systems is the Raychem **self-regulating heating cable**. This 'intelligent' cable is the first step towards energy savings. As the name suggests, this cable - a Raychem invention - automatically regulates the heat it produces, all along its length. The cable provides exactly the heat that is needed at a given time and place. This of course results in **substantial energy savings** as compared to conventional cables, which have a constant heat output and energy consumption.







ENERGY EFFICIENT SYSTEMS ...

Additional energy savings are realised by combining the self-regulating cable with a range of **smart control units**. These allow for a dynamic management of the power output of the cable in function of various parameters such as ambient temperature or humidity.

HWAT ECO

RAYSTAT-ECO-10

EMDR-10

VIA-DU-20

We do not merely offer you heating cables by the metre, but offer **complete heat-tracing solutions that were especially designed for energy efficiency and easy installation**.
This will help you and your customers to realise major energy savings and hence comply with today's governmental regulations.

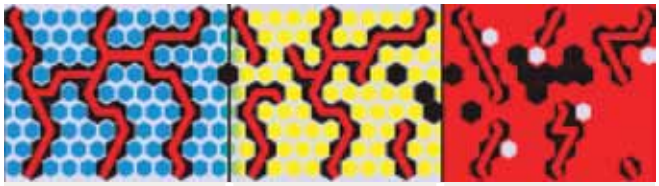
Your concern is ours.

... DESIGNED FOR EACH APPLICATION

Based on the technology of the self-regulating cables, we propose energy saving solutions for various applications that answer your customers' needs for comfort and safety:

- Frost protection for pipes
- Frost protection for gutters and drainpipes
- Snow melting for ramps, steps and footpaths
- Hot water temperature maintenance system
- Underfloor heating

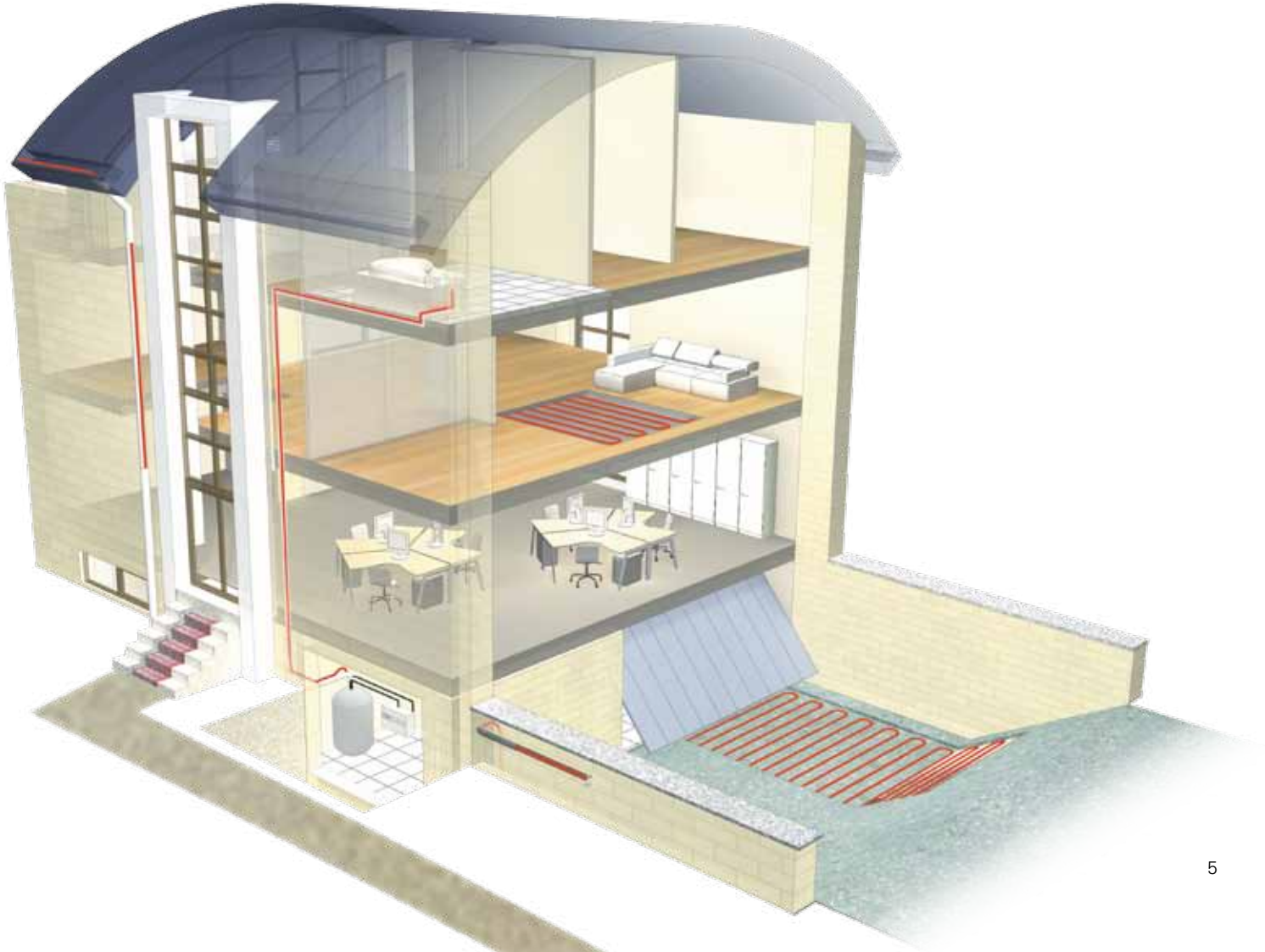
HOW SELF-REGULATION WORKS IN THE RAYCHEM CONDUCTIVE-POLYMER HEATERS:



At low temperature, there are many conducting paths, resulting in high output and rapid heat-up. Heat is generated only when it is needed and precisely where it is needed.

At moderate temperature, there are fewer conducting paths because the heating cable efficiently adjusts by decreasing output, eliminating any possibility of overheating.

At high temperature, there are few conducting paths and output is correspondingly lower, conserving energy during operation.



Raychem

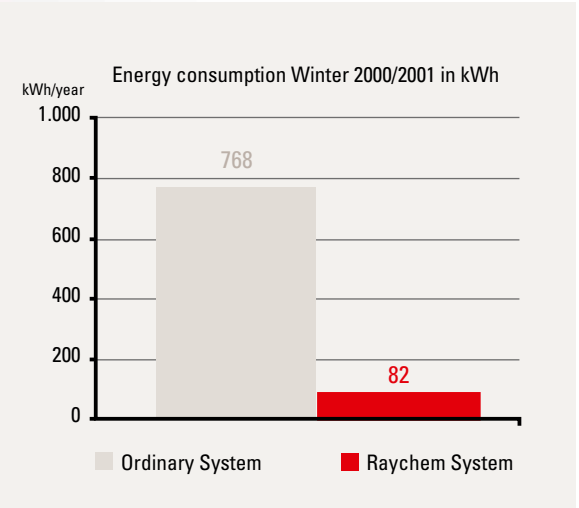
Saving up to 80% in energy consumption thanks to smart control.

The Pilatusbahn case.

THE FACTS

The car-park near the Pilatusbahn cable-lift in Kriens (Switzerland) is a covered, but open-sided construction. Because the water circuit of the fire lines is exposed to ambient temperature, it was equipped with heat-tracing controlled by a conventional thermostat. The existing installation on one of the circuits was replaced by a Raychem system controlled by a RAYSTAT-ECO-10 smart ambient control unit. During the winter of 2000/2001 the energy consumption of the two systems was compared.

As the chart indicates, the intelligent Raychem system consumed only just over 10% of the energy that the existing installation needed to get the water pipes through the winter.



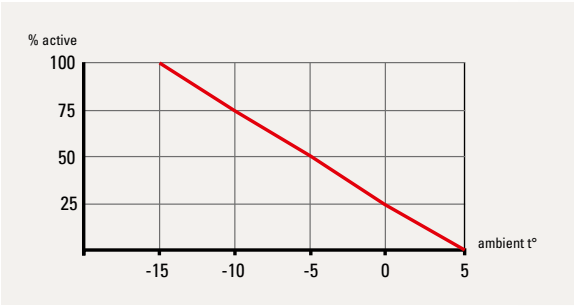
Frost protection **for pipes**

THE SOLUTION

The Pilatusbahn case is a good example of how our technology can help you cut energy costs for frost protection of pipes dramatically. As with all our solutions the heart of the system is the self-regulating cable, now controlled by the smart RAYSTAT-ECO-10 control unit.

RAYSTAT-ECO-10: proportional ambient temperature control

The RAYSTAT-ECO-10 is a unique intelligent control unit for frost protection. It is able to save up to 80% of energy, due to its **proportional ambient temperature control**, i.e. it calculates the optimum heat requirements as a function of the ambient temperature or the pipe temperature in line sensing applications (line sensing applications require RAYSTAT-CONTROL-10).



A conventional thermostat responds to temperature changes by switching the system on at full power. The RAYSTAT-ECO-10 however, calculates how much power is needed on the ambient conditions and powers the cable accordingly.

Other features include:

- Remote alarm facility.
- Clear display showing actual temperature, system set point and alarm message indication.
- Up to 25 A switching capacity.

THE ADVANTAGES

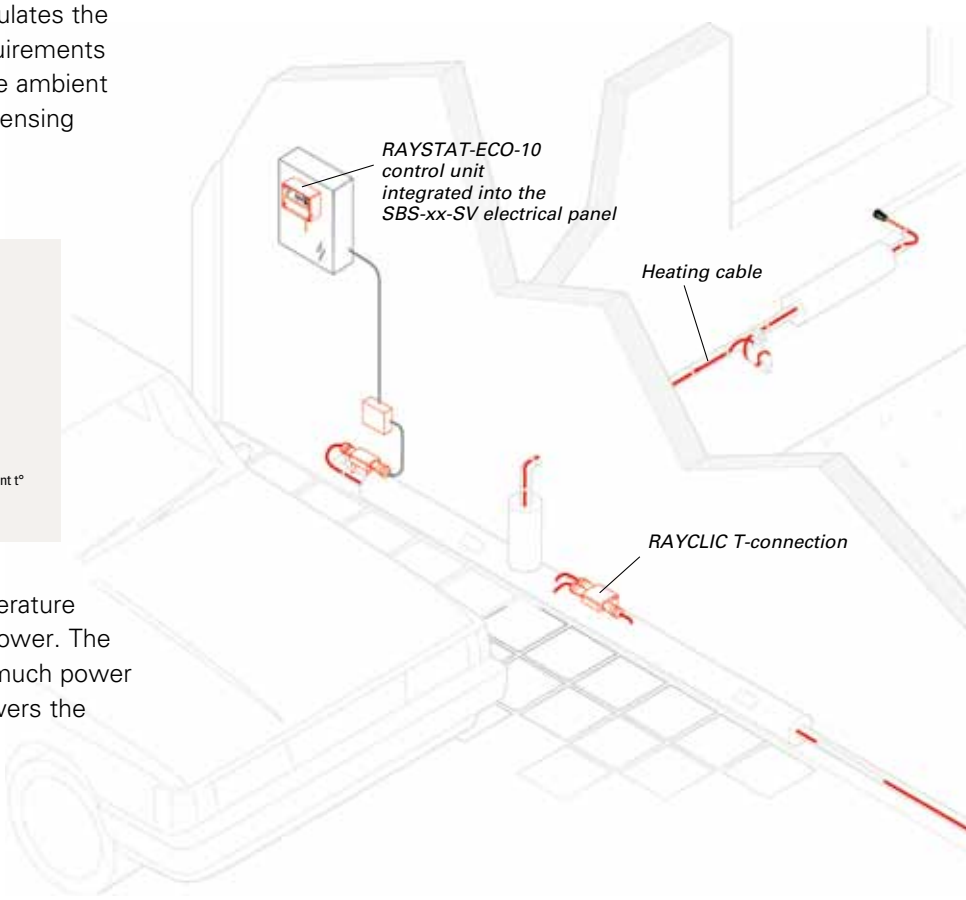
The Raychem frost protection system was developed to help you keep your installation and operating cost to a minimum.

- **Up to 80% of energy savings**
- **For all pipe applications**

Versatile

- The cables go onto the pipes and are suited for plastic pipes as well.

For this application use cables FS-A-2X or FS-B-2X



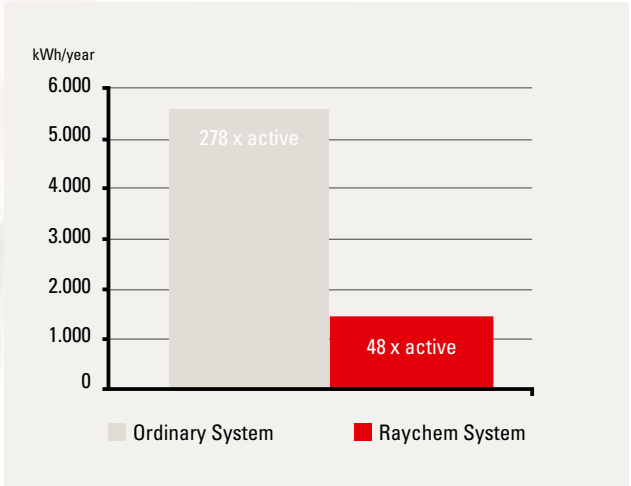
Raychem

Reducing electricity consumption with 75%.

The CKW power plant case.

THE FACTS

At the CKW power plant in Luzern (Switzerland), the waterflow in gutters is maintained by heat-tracing systems controlled by an ordinary ambient sensing thermostat. Part of the installation was retrofitted, using a **EMDR-10 control unit**. The activity and consumption of the respective cables was measured from December till March. The result was astonishing: it took the Raychem controlled installation only a quarter of the electricity the conventional installation needed to keep the gutters ice-free. This **energy saving of 75%** was due to the intelligent heat management by the EMDR-10 control unit.



Frost protection for **gutters and drainpipes**

THE SOLUTION

Raychem's self-regulating heating cables prevent the build up of ice & snow on roofs, atria, in gutters and drainpipes. The cable automatically increases its heat output in icy water and decreases its output in dry air. Its performance is at its best when controlled by a EMDR-10 unit. The Rayclic connection system allows for quick and easy installation, even outside. These elements make up a complete solution that combines longlasting performance with substantial energy savings.

EMDR-10: smart heat management

This intelligent control triggers the heating process of the selfregulating cables when and if necessary, which results in substantial energy savings. An ordinary ambient sensing thermostat starts the heating process based on the ambient temperature, dropping below the set value. **The EMDR-10 will start the heating process only after detection of low temperature and humidity**. The heating cable is deactivated when air temperature rises above the set value, or when moisture is below the set value.

Other features include:

- Secure and easy to monitor by means of LED display
- Alarm function
- Easy access for fast wiring
- Settings can be done easily on the front panel

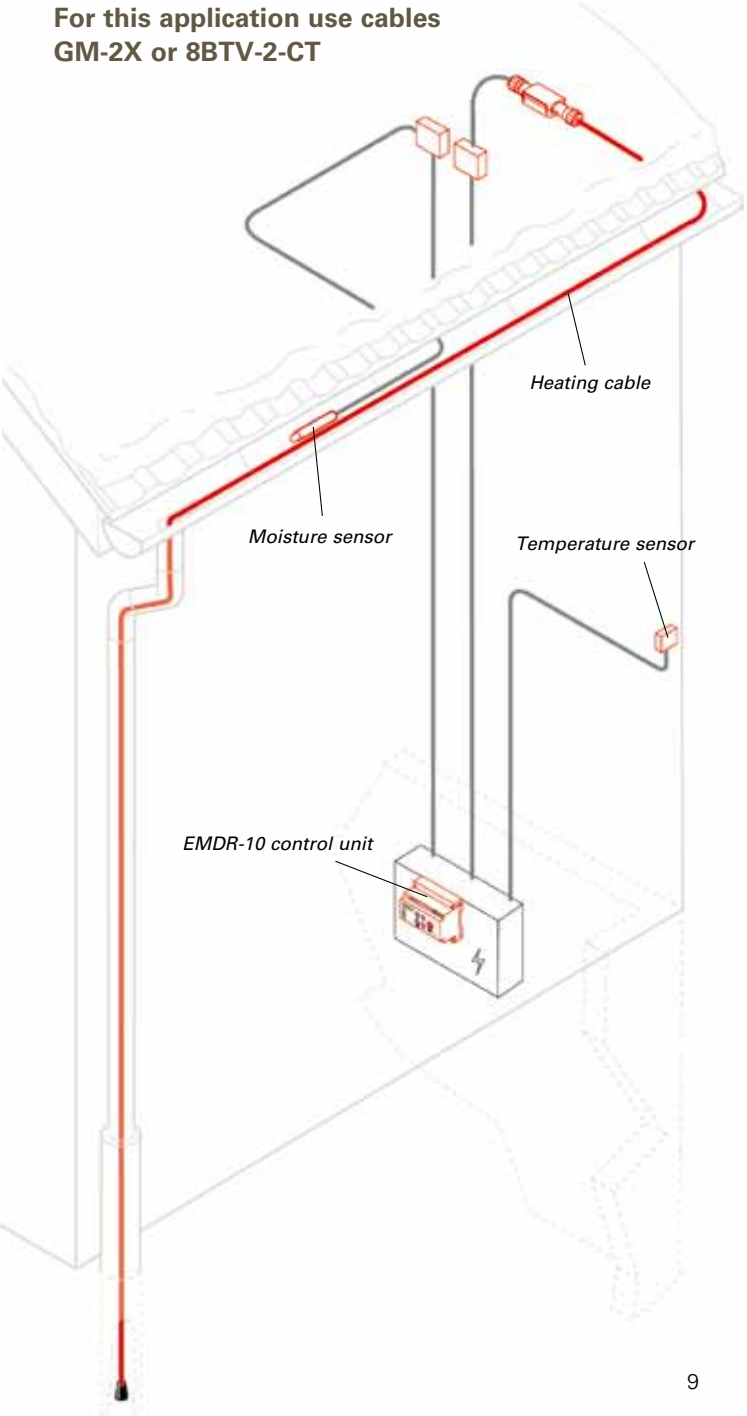
THE ADVANTAGES

- **Up to 75% of energy savings**

Versatile

- The Raychem self-regulating cable applies to all roof materials: wood, plastic, asphalt and metal, and for metal or plastic gutters.

For this application use cables GM-2X or 8BTV-2-CT

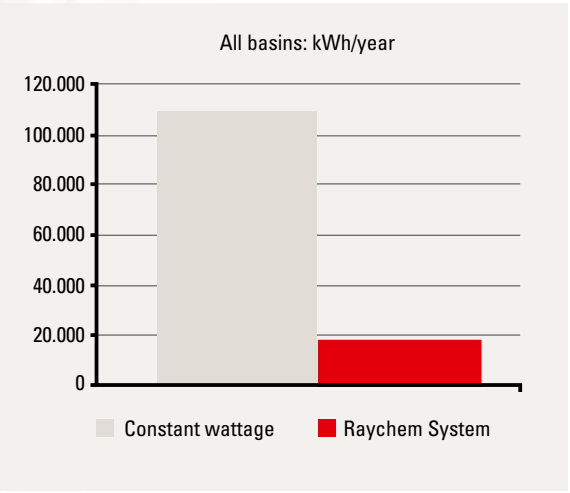


Cutting energy costs with 80%.

The Davos case.

THE FACTS

At the ARA Gadenstadt water treatment plant in Davos (Switzerland) basins'pathways were kept free of ice by a constant wattage heat-tracing system. The installation was retrofitted with a complete snow melting system consisting of self-regulating cables and a VIA-DU-20 control unit. As a result of this investment, electricity consumption dropped from 110.000 kWh/year to 19.000 kWh/year!



melting of **ramps, steps and paths**

Snow melting of **ramps, steps and paths**

THE SOLUTION

The system melts snow and ice on outdoor paths, steps and ramps. It consists of self-regulating heating cables which are embedded in the concrete or sand sub-surface. The sturdy cables are especially designed for application under tough installation conditions and can be cut-tolength in the field for maximum flexibility. The system is controlled by the smart **VIA-DU-20 control unit**.

VIA-DU-20 control unit: manages the heat you need

The combined moisture & temperature sensor of the unit activates the heating cable only when necessary.
Whenever the sensor measures a specific minimum temperature in combination with a high moisture value, it will trigger the heating cable to raise the temperature of the outside surface and thus prevent ice formation and snow accumulation.

Thanks to the combined sensing operation, the VIA-DU-20 reduces the cost of operating the snow melting system by up to 80%. Whereas conventional systems start working when temperature falls below set point, even without precipitation, the system is never activated in dry atmospheric conditions.

Other features:

- BMS-compatible
- Easy to programme
- Freezing rain warning
- Clear display showing actual temperature and set point
- Alarm message

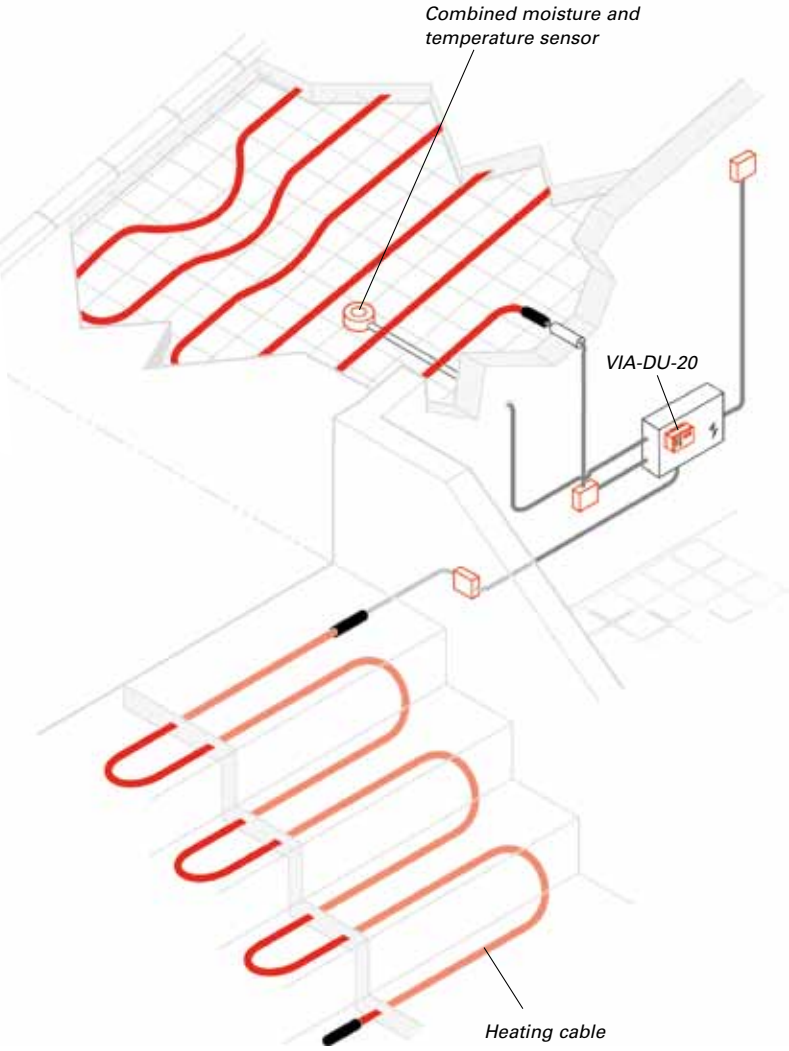
THE ADVANTAGES

- **Up to 80% of energy savings**
  (im Falle Davos bis zu 80%!)

Versatile

- Fine tuning for individual sites possible
- Also for retrofitting
- Robust cable construction allows for only 1 concrete pour

For this application use EM2-XR cable



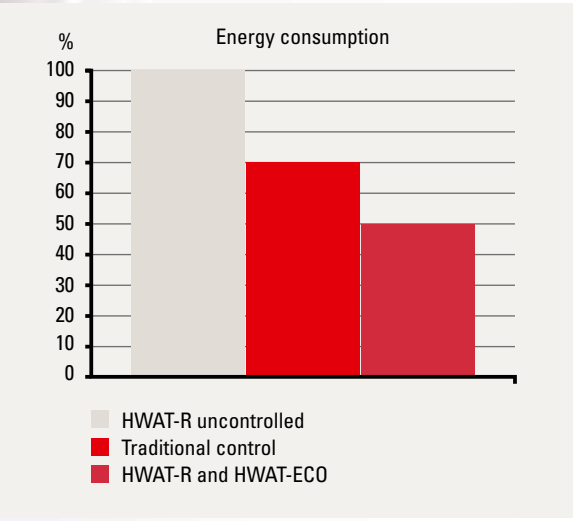
Raychem

Saving up to 50% in energy consumption.

THE FACTS

Raychem's hot water maintenance systems are installed in hundreds of hotels, hospitals and commercial buildings. The Eiffel Tower as well as the newest constructed terminal in Paris' international airport Charles de Gaulle have been equipped with this system. The performing system with the **HWAT-ECO control unit** reduces the running cost of the hot water maintenance system tremendously. Whereas traditional control equipment and timers might save up to 30% compared to an uncontrolled system, the implementation of a HWAT-ECO controlled system will **save up to 50% energy**.

A retrofit operation of an existing traced hot water system with HWAT-ECO control units is worthwhile and results in a short investment pay back period.



Hot water temperature maintenance

THE SOLUTION

The Raychem hot water temperature maintenance system offers an intelligent way to instantly supply hot water in hotel rooms, office buildings, ... The heating cable's flat construction allows design and installation flexibility. Engineered for direct application on hot water pipes the Raychem system does not require return pipes, valves or pumps. The intelligence of the system resides in the self-regulating cables and the Raychem HWAT-ECO control unit.

HWAT-ECO: avoid superfluous heat production and minimise energy consumption

The HWAT-ECO is a smart control unit that limits the heat output of the self-regulating cables according to the specific requirements of the building. It combines the clock time functions with the monitoring of the boiler temperature in order to ensure that the system is used solely for temperature maintenance. Thus avoiding superfluous heat production and minimising energy consumption.

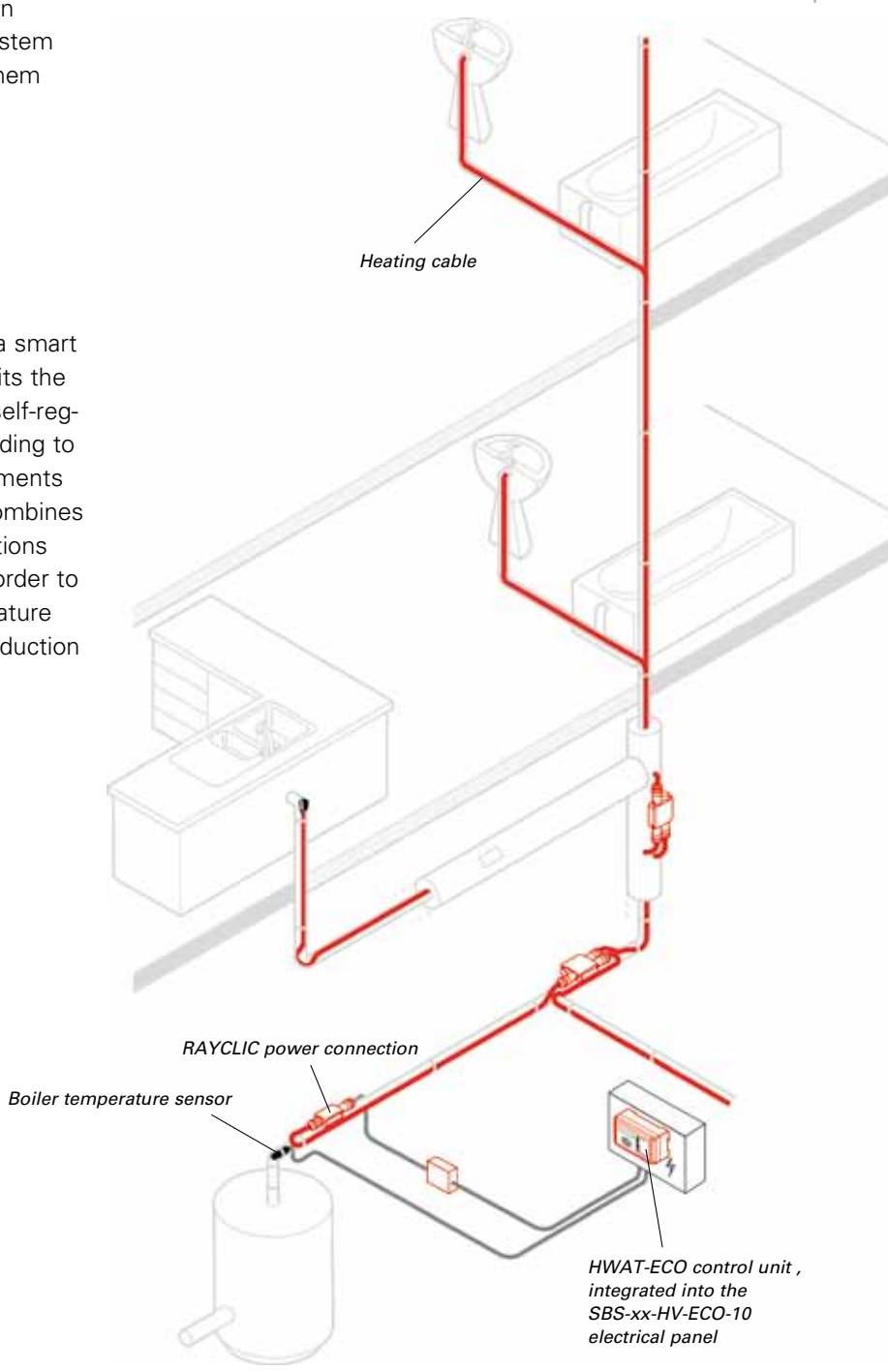
Other features include:

- Selectable temperature levels: Maintain or Economy temperature
- Thermal Legionella prevention programme
- BMS compatible
- Control units can be put in a network for fast programming
- Nine building-specific programmes
- Alarm relay for remote monitoring

THE ADVANTAGES

- **Up to 50% of energy savings**
- **Thermal legionella prevention**

For this application use cable HWAT-L/M/R



Raychem offers a set of tools and services that aim to simplify the professional´s life.
Not only do we offer the best quality products, we also support them with unrivalled services.

LARGE TECHNICAL SUPPORT TEAM

- Technical advice and product selection
- Design support
- Specification guidance
- Cost estimation
- Project specific support:
  - Complete materials "take-off" from building design drawings, bill of materials production and budgetary quotation.
  - Cost modelling & comparison for single pipe hot water systems versus traditional recirculation. (Capital and running costs.)

    SaveWatt™
- Engineering Toolbox

  The **"Engineering Toolbox"** is provided to engineers **free of charge** to support the building services engineers design process, it includes:
  - Technical design guides
  - Design overview-flow chart format
  - Design checklists
  - Typical schematic layouts
  - Specification guides
  - Engineering drawing notes

ONLINE DESIGN GUIDE

Design wizard TraceCalc Net

TraceCalc Net

- Online technical Support

  www.tycothermal.com

first class Services

first class Services

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- Fast order handling & shipment Europe-wide
- Free documentation service

APPROVED CPD TRAINING COURSES

Tyco Thermal Controls is also a proud industry supporter offering approved CPD courses via the Chartered Institute of Building Services Engineers. Courses include technical and application information for electrical underfloor heating and hot water temperature maintenance systems.

For further information, please consult the CIBSE Course Directory 2010 or contact Tyco Thermal Controls.

Extended warranty

5 years warranty

Proven track record

COMPLETE SYSTEMS = EXTENDED WARRANTY

We offer you an extended **product warranty of 5 years** on all complete heat-tracing systems where the right cable and control unit are combined.

- **Frost protection for pipes:**
  FS-A/B/C-2X cable + RAYSTAT-ECO-10 control unit
  FS-A/B/C-2X cable + RAYSTAT-CONTROL-10
- **Frost protection for gutters and drainpipes:**
  GM-2X cable + EMDR-10 control unit
  8BTV-2-CT cable + EMDR-10 control unit
- **Snow melting for ramps and footpaths:**
  EM-2XR cable + VIA-DU-20 control unit
- **Hot water temperature maintenance:**
  HWAT-L/M/R cable + HWAT-ECO control unit

A PROVEN TRACK RECORD

All Raychem for energy-efficient heattracing have a proven track record.

With more than 30 years of experience, we have delivered more than 200.000 km of heating cable for installations in more than 100 countries world wide. Architects, engineers and installers around the world have chosen Raychem to offer their customers optimum safety and comfort whilst keeping energy consumption to a minimum.

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