FROST PROTECTION HEATING CABLE

AQUACABLE® with one connector, safety-plug and thermostat (5°C)

FROST PROTECTION AGAINST ICE, DEFROST METALIC OR PLASTIC PIPE

PLUG AND HEAT – RELIABLY FROST-PROOF

The AQUACABLE heating cable is conceived for heating water pipes made from metal or plastic, which are risk from frost, up to -20 °C. It is self-monitoring and prevents impermissible cooling, generally prevents frost damage and ensures a minimum temperature, e.g. when supplying drinking water to animals outside.
A thermostat monitors the part of the pipe presumed to have the lowest temperature. When protection against frost is required, the heating cable is activated at +5 °C and switches off again when the temperature increases.
The benefit: The electrical energy requirement is automatically reduced to the necessary minimum.
Fitted quickly and effortlessly
The AQUACABLE heating cable is loosely fitted with slight bends, ideally along the underside of the pipe. At places requiring additional energy, such as valves, some loosely fitted coils of the heating cable provide the energy needed.
The cable is fixed in place with adhesive aluminium tape or loosely fitted, temperature-resistant plastic cable ties. Plastic pipes have to be insulated with aluminium foil first. A normal layer of insulation with a thickness of at least 20 mm not only guarantees that the heating cable works, it also considerably reduces the heating needed. Now simply plug in to be frost-proof.

Reference	Power	Length
AQUACABLE-1	10 W	1m
AQUACABLE-2	20 W	2m
AQUACABLE-3	30 W	3m
AQUACABLE-4	40 W	4m
AQUACABLE-5	50 W	5m
AQUACABLE-6	60 W	6m
AQUACABLE-8	80 W	8m
AQUACABLE-10	100 W	10m
AQUACABLE-12	120 W	12m
AQUACABLE-14	140 W	14m
AQUACABLE-18	180 W	18m
AQUACABLE-22	220 W	22m
AQUACABLE-24	240 W	24m
AQUACABLE-28	280 W	28m
AQUACABLE-32	320 W	32m
AQUACABLE-36	360 W	36m
AQUACABLE-48	480 W	48m
AQUACABLE-50	500 W	50m
AQUACABLE-60	600 W	60m

PRODUCT QUALIFICATION
CE Certificate

In Accordance with NF C15-100

TECHNICAL DETAILS:
Nominal voltage: 230 Volt
Exterior diameter: approx. 9.00 mm
Smallest bending radius: 45 mm
Resistance tolerance: -5% / +10%
Nominal limit temperature: 65 °C (max)
Cold water supply tubing: 1 x 2.00 m
Minimum temperature for laying: 5°C
Cold / warm transition: seamless
Temperature regulator 16A: +5°C on / +15°C off
Protection: IPX7
Max. top surface heating: 10 W/m

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INSTALLATION INSTRUCTIONS

Antifreeze heating cables - AQUACABLE

IMPORTANT INSTALLATION INFORMATION

⇒ Faulty electrical installation can cause an electric shock or a short circuit. To ensure the best possible protection of people, animals andequipment it is categorically stipulated that a faulty current protectionswitch (FI) 30 mA is fitted. Observe the specific regulations of your country.

⇒ The heating cable and the connection lead (respectively plug) must not come into contact with water.

⇒ The antifreeze heating must only be used for water pipelines up to DN 40 (1½“) diameter.

⇒ Connecting up the heating cable must be done according to VDE 0100 and may only be carried out by authorized specialists.

⇒ The heating cable must be fitted horizontally on the underside of the tubing.

⇒ The heating cable must be the same length as the length of the tubing.

⇒ The thermostat at the end of theheating cable must not come under mechanical stress. Neither should the thermostat be bent or squeezed by hand or by any tool.

⇒ The thermostat is to be carefully fitted to the right and left of the tubing. Only lay the thermostat with temperature resistant cable binder in a distance of 600 mm.

⇒ The frost protection heating element is to be positioned at least 30 mm from flammable materials for fire prevention reasons.

⇒ A fireproof mineral wool or foaminsulation is to be mounted.

⇒ Mineral wool insulation can absorb moisture, foam insulationdoes not normally absorb moisture.

⇒ The heating element is neitherto be shortened nor lengthened.A shortening can cause overheating and a lengthening results inthe required heat no longerbeing produced.

⇒ The frost protection heating ele-ment is never to be used whencoiled up as there is otherwise arisk that the insulation can bedamaged as a result of overhea-ting.

⇒ Heating cabling must not cross over itself or lie side by side.

⇒ If the heating cable is too longowing to a project planning mistake, it may not be woundaround the tube in narrowswirls. This would cause congestion heat. The standardtemperature limit is 65°C.

⇒ Protect the heating cable againstsharp edges, oil or heat. (See thediagram on the left)

⇒ Please make sure before installing the frost protectiontube heating that the area around the tube is freely accessible and not obstructed.Remove any sharp edges and flammable materials.

⇒ Power supply: The heating must only be operated by using a grounding-type receptacle and VDE-approved cables.

⇒ The frost protection tube heating should only be started at the beginning of the winter season. (Simply put the plug in a suitable receptacle.)

⇒ Please inspect the heating before using it, whether it shows any signs of damage.

Maintain the following insulation thicknesses:					
Pipe size (inch)	½	¾	1	1 ¼	1 ½
Nominal width (mm)	15	20	25	32	40
Insulation* (mm)	20	20	20	30	40

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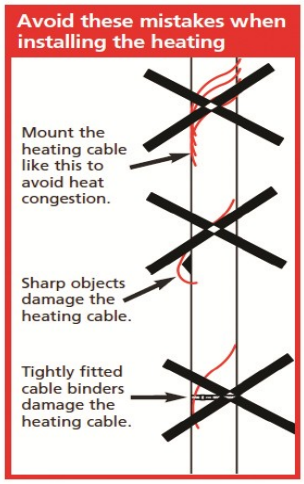
Safety Regulations



⇒ The heating cable may only be installed according to the specified installation plan.
⇒ The heating cable may only be connected up to a voltage supply of 230 volts.
⇒ The heating cable may under no circumstances be shortened or damaged.
⇒ The heating cable must be laid in such a manner that it is not accessible to animals or children.
⇒ Only use the heating cable for the purpose outlined in the installation instructions.
⇒ If you should discover that the heating cable is damaged then immediately switch off the 230 voltage supply and replace the heating cable.
⇒ Never place the heating cable in the vicinity of explosive substances, objects or gases.
⇒ It is stipulated that an FI-protection switch with 30 mA is fitted. Refer to the installation instructions.

Function

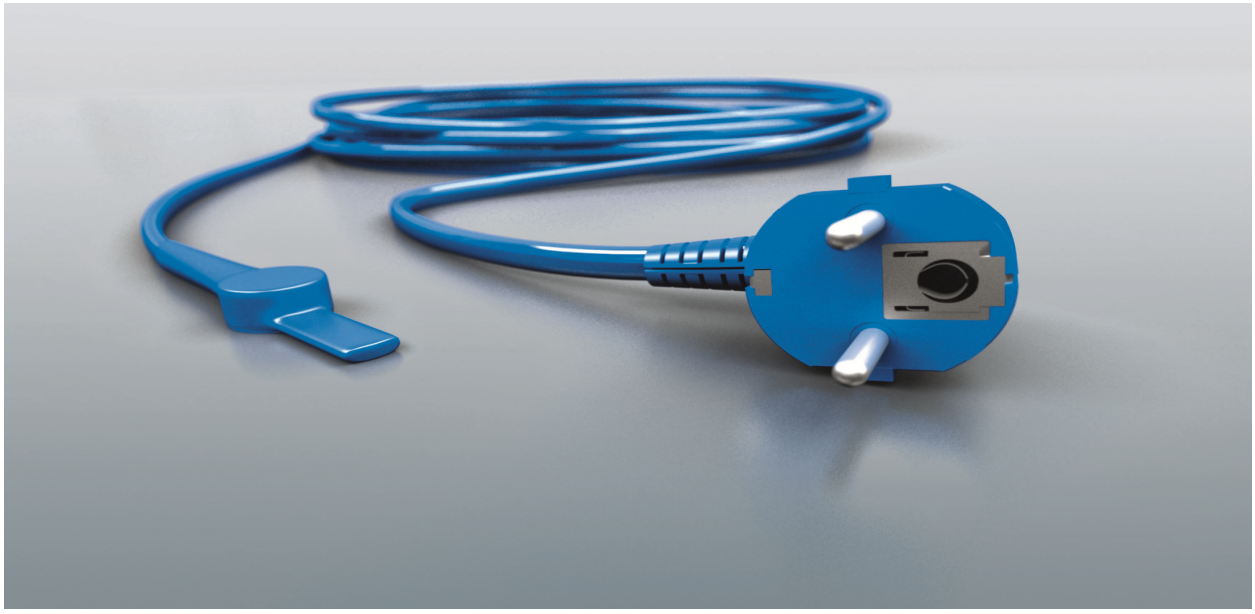
The heating cable is there to heat water supply leads down to -20°C and islaid with a 230 voltage alternating current according to protection class I.
The thermostat should assess and monitor the temperature at the position of the tube where the temperature is at its lowest.
The thermostat makes sure that the supply of electrical energy is reduced to the minimum amount required.
The minimum measuring area, the surface of the thermostat (see drawing below) is to be attached directly to the tubing with either adhesive tape next to the thermostat or two plastic cable binders around the tubing.
This binding must not exert any pressure on the thermostat.
This would cause a deformation of theconnection segment. For protection against frost set the designated thermostat to +5°C.
A relatively large switch hysteresis ensures the warming up of the entire tubing network, so that the energy supply will be first interrupted when the energy supply exceeds 15°C.
The hysteresis at the same time reduces the amount of switching on and off subsequently facilitating the thermostat to operate without any trouble over a long period of time.
Any remaining length of the heating cable will be used up be laying it along the length of the tubing in large loops. Nevertheless any criss-crossing of the heating cable must be avoided!
Fastening the heating cable is done with aluminium adhesive tape or with randomly placed plastic cable binders. If the cable binders are fitted tootightly they will damage the heating cable. Operating safely in frost conditions down to -20°C can only be guaranteed by using the insulation material we specify. Aluminium adhesive tape wound around the heating cable facilitates installation, prevents punctual heat extrusion off the tubing and distributes warmth evenly.

Environmental protection and waste disposal

The professional waste disposal of heating cables after they have completed their life span is the responsibility of the operator. Adhere tothe appertaining regulations of your country.

Declaration of conformity

This appliance conforms to the stipulations of the following EU guidelines. 89/336 / EEC. 91 / 263 / EEC. 92 / 31 / EEC.73 / 23 / EEC. 93 / 68 / EEC.



INSULATION

An insulation layer such as Armaflex with a minimum thickness of 20 mm which is quite usual for heating tubing reduces the heating energy requirements. At the same time when heating up and cooling down it allows the necessary shifting of the heating cable in relation to the water tubing. The thermostat must not be insulated from the water supply tubing and has to assess the water tubing temperature at any time.

SPECIFIC REGULATIONS

1. PURPOSE

The heating cable is exclusively made for heating water pipelines. Plastic pipes must be completely wrapped in aluminium foil before installation.

2. COMMISSIONING

The safety regulations have to be adhered to. The installation instructions are to be read through before you begin commissioning the heating cables.

TESTING AND HEATING-UP PROTOCOL

Object:			Date of laying:	
Authorized electrician:			Date of commissioning:	
Serial no.	Total resistance (Ohm)		Insulation resistance (k-Ohm)	
(heating cable):	Before installation	After installation	Before installation	After installation

Regular testing of the appliance has to be carried out by the user according to: BGV A3 and DIN VDE 0701/0702 (VDE 0701/0702):2008-06

THE FOLLOWING TESTS MUST BE PERFORMED:

Earth wire resistance
Insulation resistance
Replacement leakage current
Voltage test