uponor

Uponor Ecoflex Supra

Technical Information

Pre-insulated pipes for cold water service

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System describtion and fields of use

System describtion

No welding, no special tools. The flexibility and the low weight of our pre-insulated pipes mean that they are easy to handle and that building work proceeds fast. They are also supported by a comprehensive range of accessories. From a variety of wall lead-throughs, insulation sets and the proven range of fittings. The high quality of the flexible, pre-insulated pipes from Uponor is a consequence of the strengths of the individual elements. The combination of stable yet flexible jacket pipes, ageing-resistant, crosslinked polyethylene insulating layers and robust, long-life media pipes creates system pipes that can be laid easily and quickly and that function reliably.

Your benefits

- Reliable transportation of cold water
- Excellent flexibility allows to install around any obstacles
- Robust pre-insulated pipe system
- Quick and simple connecting methods
- Excellent resistance against stress cracks, aggressive mediums, frost and micro-organism
- Ageing-resistant, permanently flexible insulation made of closed-cell PEX foam, water absorption less than 1%

Assured quality

Uncomprimising quality is top of our list of priorities. Consistent quality controls during the production process is just one element of our quality management system. We regularly have our products tested by independent organisations to make sure they comply with our stringent standards.

Static strength certification
The certificate, based on ATV DVWK-A127, demonstrates that our pipes, when laid in accordance with defined conditions, are suitable for loading by heavy traffic (SWL 60 = 60 t) according to worksheet ATV-A 127. The ring stiffness of the jacked pipe is proved according to EN ISO 9969.

Ageing of insulation
Investigations have shown that in varying installation conditions there are no signs of any significant increase in heat conductivity in our insulation – not even after years of service.

Insulation water absorption
Material tests according to EN 15632 at 80°C demonstrate that our insulation material absorbs less than 1% water by volume. This low water absorption means that the insulating properties are practically unchanged.

Fields of use

It is mark of a good pipe system that it offers professional solutions to a large number of possible uses with just a few components. The capabilities of the flexible, pre-insulated pipes from Uponor suit them to highly varied applications.

Uponor Ecoflex Supra

The HDPE service pipe used in Supra is approved for transporting potable water. In addition to cold tapwater applications, the preferred fields of use for Supra pipes are cooling water networks, for example in hotel complexes or industrial facilities.

Uponor Ecoflex Supra PLUS and Supra PLUS 16 bar

Supra PLUS is a insulated water pipe containing a self-regulating heating cable that protects it from freezing. It is suitable for use as a drinking water pipe or pressure sewage system for resort villages, holiday or family homes, farms, ski centres and other locations susceptible to freezing. The pipes enable a pipeline length of up to 150 m with a single power feed. If required, the Supra PLUS pipes can be laid on the snow. The connection between the Uponor Ecoflex Supra PLUS control unit, sensor and self-regulation heating cable is easy for qualified electricians. The sensor is installed into the small tube and controls the temperature near the medium pipe.

Uponor Ecoflex Supra Standard

Supra Standard is a versatile insulated water pipe. The standard resistance cable controlled by the regulator keeps the water pipe unfrozen. The standard resistance cable enables a pipeline length of up to 700 m with a single power feed. Supra Standard is particularly suitable for the construction of pipe networks for resort villages and other larger areas.

Uponor Ecoflex Supra Mantle

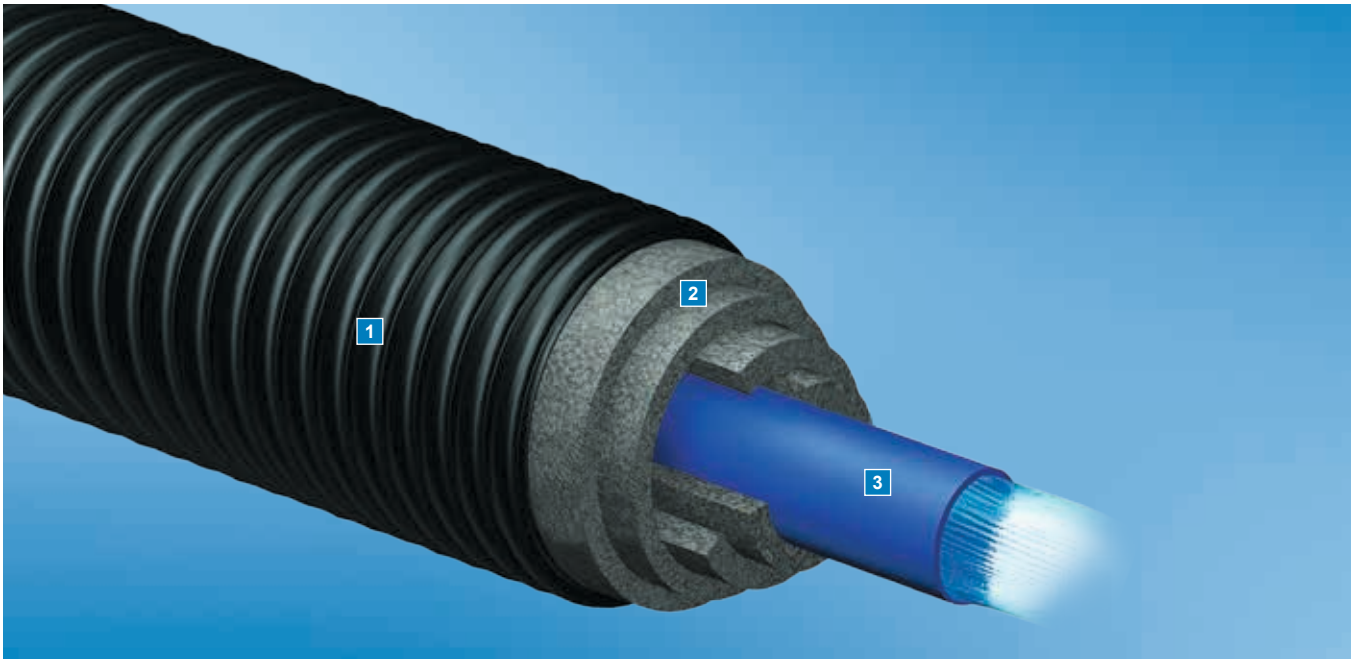
Supra Mantle protects the parts of a water pipe most susceptible to freezing, generally near the building foundation or inside a ventilated floor system. It can be used for new buildings as well as for renovations. There are two options to install the Supra Mantle pipe. You have the opportunity to install the Supra Mantle first and push the medium pipe through pipe casing. Or in case of an existing service pipe you push the Supra Mantle over it easily. The cable brings the required heat into the jacket and the insulation layer helps retain the heat in the casing pipe.

	Supra	**Supra PLUS**	**Supra PLUS 16 bar**	**Supra Standard**	**Supra Mantle**
					
Main Application					
Cooling	●				
Transport of cold water	●	●	●	●	
Freeze-protection		●	●	●	●
Other Applications					
Foodstuffs	on request	on request	on request	on request	
Chemicals	on request	on request	on request	on request	
Pressurized waste water	●	●	●	●	
Materials					
Medium pipe	PE 100 black/ blue Layer	PE 80/ PE 100 black	PE 100 black/ blue Layer	PE 80/ PE 100 black	
Insulation	cross-linked PE	cross-linked PE	cross-linked PE	cross-linked PE	cross-linked PE
Jacket pipe	HDPE	HDPE	HDPE	HDPE	HDPE
Cable		self-regulating cable	self-regulating cable	constant resistant cable	self-regulating cable with plug

Uponor Ecolfex Supra
Rigidity for cold liquid media

Refreshingly consistent for cold liquid media, Uponor Ecolfex Supra pipes are the preferred solution for cooling water networks in holiday resorts, hotel complexes or industrial facilities. Supra is optimized for use in medium temperature from -10°C to +20°C. Easy and fast installation and low need for maintenance ensure carefree and cost-efficient life cycle of the system. Cooling capacity is optimized by efficient thermal insulation and a securely tight construction of the pipes and joints. The optional antifreeze cable ensures frost-proof transport of potable water even at the lowest of ambient temperatures.

Pipe design



1 ***HDPE jacket pipe***

The jacket pipe of Uponor Ecoflex pipes are made of high impact-proof HDPE. A special corrugated rib profile provides high flexibility as well as high degree of static load resistance (ring stiffness according EN ISO 9969). The pipe is suitable for loading by heavy traffic (SWL 60 = 60 t) according to worksheet ***ATV-DVWK-A 127****.*

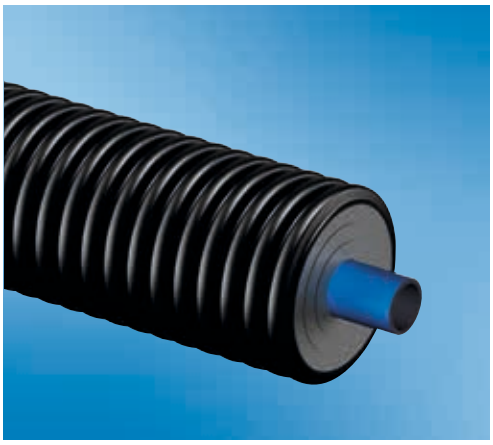
2 ***Insulation***

The insulation is made of crosslinked polyethylene foam. The closed-cell structure of the insulation prevents water absorption < 1 Vol.% and provides good insulation capacity. The foamed plastic density is 25 – 30 kg/m³ and thermal conductivity 0.038 W/mK at 40°C. The multi-layer insulation ensures high flexibility.

3 ***Service pipe***

The service pipe is produced of double layer PE 100 according DIN EN 12201 with maximum safety and service life. Referred to these standard, the pipes are approved to a pressure of 16 bars. The service pipes are resistant against many aggressive media.

Uponor Ecoflex Supra



20°C

16 bar

25 – 110 mm

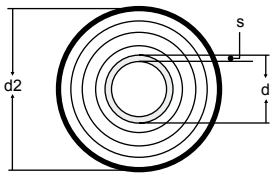
Main application
- Potable water, cold
- Cooling water

Other applications
- Sewage water

Medium pipe
- HDPE (PE 100), SDR 11

Insulating material
- PE-X foam

Material jacket pipe
- HDPE



Note!
Uponor Ecoflex Supra is optimized for use in medium temperatures from -10 to +20°C.

Uponor Ecoflex Supra offering

Item no.	Medium pipe d x s [mm]	DN [mm]	Jacket pipe d2 [mm]	Bending radius [m]	Weight [kg/m]	Max. length on delivery [m]
1018124	25 x 2.3	20	68	0.20	0.52	200
1018125	32 x 2.9	25	68	0.25	0.62	200
1018126	40 x 3.7	32	140	0.30	1.47	200
1018127	50 x 4.6	40	140	0.40	1.67	200
1018128	63 x 5.8	50	140	0.50	1.97	200
1018129	75 x 6.8	65	175	0.60	2.72	100
1018130	90 x 8.2	80	175	0.70	3.14	100
1018131	110 x 10.0	100	200	1.20	5.24	100

Uponor Supra PLUS
Carefree living even in cold temperatures

Supra PLUS is an insulated polyethylene pipe for locations susceptible to freezing. It is a good choice for one-family homes, farms and cottages situated in sparsely populated areas. Supra PLUS is supplied on a maximum 150 m pipe coil completely ready for installation. The self-regulating heating cable makes it possible to cut the Supra PLUS pipe at the required length. The service pipe sizes are Ø 25 – 110 mm. The maximum pressure for the PE 80 service pipe (25 – 63 mm) is 12.5 bar and 16 bar for the PE 100 service pipe (75 –110 mm). The service pipe can be connected with Uponor Wipex coupling, electro-fusion fittings or plastic screw fittings which are approved for PE 100, SDR 11 pipes from sources in the market worldwide.

Pipe design

1 *Service pipe PE 80/PE 100*

The service pipe has been developed for conveying cold tap water. The service pipes are made of PE 80 (25 – 63 mm) and PE 100 (75 – 110 mm).

2 *Heating cable*

The self-regulating heating cable has a nominal output of 10 W/m and supply voltage of 230V.

3 *Aluminium foil*

Aluminium foil intensifies power transmission from the cable to the service pipe.

4 *HDPE jacket pipe*

The HDPE jacket pipe of Uponor Ecoflex pipes are made of corrugated HD polyethylene. Corrugation makes the casing robust against heavy traffic load but keeps flexibility for the installation.

5 *Insulation*

The insulation is made of crosslinked polyethylene foam. The closed-cell structure of the insulation prevents water absorption and provides good insulation capacity. The foamed plastic density is 25 – 30 kg/m³ and thermal conductivity 0.038 W/mK at 40°C

6 *PE sensor pipe*

The PE sensor pipe for installing the control unit sensor.

Uponor Ecoflex Supra PLUS

20°C

12.5 or 16 bar

25 – 110 mm

Main application
- Transport of cold water
- Freeze-protection

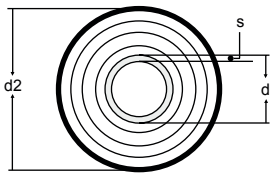
Other applications
- Sewage water

Medium pipe
- MDPE (PE 80, SDR 11, Dim. 25-63 mm)
- HDPE (PE 100, SDR 11, Dim. 75-110 mm)

Insulating material
- PE-X foam

Material jacket pipe
- HDPE

Cable
- Self-regulating



Uponor Ecoflex Supra PLUS offering

Item no.	Medium pipe d x s [mm]	DN [mm]	Jacket pipe d2 [mm]	Bending radius [m]	Weight [kg/m]	Max. length on delivery [m]
1048687	25 x 2.3	20	68	0.20	0.58	150
1048688	32 x 2.9	25	68	0.25	0.67	150
1048689	40 x 3.7	32	90	0.30	1.08	150
1048690	40 x 3.7	32	140	0.30	1.50	150
1048691	50 x 4.6	40	90	0.40	1.26	150
1048692	50 x 4.6	40	140	0.40	1.70	150
1048693	63 x 5.8	50	140	0.50	2.10	150
1048694	75 x 6.8	65	175	0.60	2.90	150
1048695	90 x 8.2	80	200	1.10	4.40	100
1048696	110 x 10.0	100	200	1.20	5.10	100

Uponor Supra PLUS 16 bar

20°C

16 bar

25 – 110 mm

Main application
- Transport of cold water
- Freeze-protection

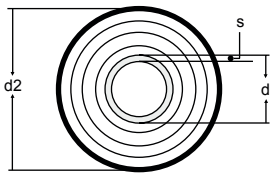
Other applications
- Sewage water

Service pipe
- HDPE (PE 100), SDR 11 (Dim. 25-110 mm)

Insulating material
- PE-X foam

Material jacket pipe
- HDPE

Cable
- Self-regulating



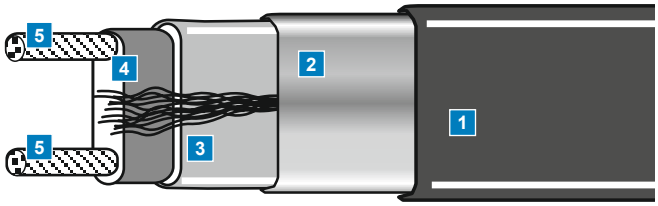
Uponor Ecoflex Supra PLUS 16 bar offering

Item no.	Medium pipe d x s [mm]	DN [mm]	Jacket pipe d2 [mm]	Bending radius [m]	Weight [kg/m]	Max. length on delivery [m]
1048902	25 x 2.3	20	68	0.20	0.52	150
1048903	32 x 2.9	25	68	0.25	0.62	150
1048904	40 x 3.7	32	140	0.30	1.62	150
1048905	50 x 4.6	40	140	0.40	1.82	150
1048906	63 x 5.8	50	140	0.50	2.12	150
1048907	75 x 6.8	65	175	0.60	2.87	100
1048908	90 x 8.2	80	175	0.70	3.29	100
1048909	110 x 10.0	100	200	1.20	5.39	100

Uponor Supra PLUS self-regulating cable and control unit

Design of self-regulating heating cable

The self-regulating heating cable has been designed particularly to prevent the pipes from freezing. This property combined with the insulation guarantees a frost free and safe solution. The heating part of the self-regulating heating cable is a conductive polymer extruded between two copper wires (phase and zero). In cold parts, a large current travels from one wire to another creating heat in the core material. In the warmer parts of the cable, the resistance of the material grows, the current slows down and the output is reduced. The heat production of the cable remains balanced and the heating capacity is regulated according to ambient conditions separately in each part of the pipe (see cross-section image). In low temperatures, Supra PLUS provides adequate power to prevent freezing. As the temperature increases, the power is reduced. The self-regulating nature of Supra PLUS pipes means its use is safe.

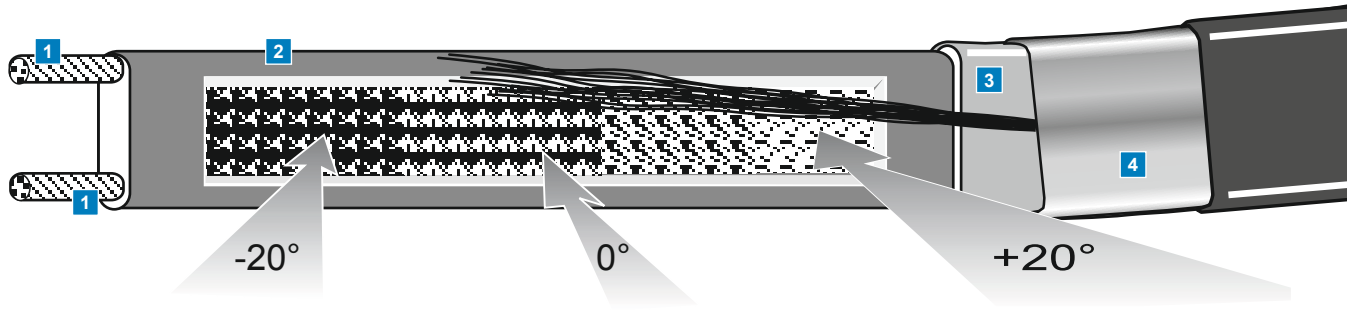


1 *Outer jacket*
2 *Aluminum folio and drain wires*
3 *Electrical insulation*
4 *Core*
5 *Conductors*

External dimensions	Width 12.5 mm, thickness 5.2 mm
Smallest bending radius	13 mm
Supply voltage	230 V
The maximum permissible operating temperature	Continuous 65°C Momentary 85°C
Max. installation length	100 m 10 A, 150 m 16 A
Nominal output (on the surface of an insulated metal pipe +5°C)	10 W/m

Operation

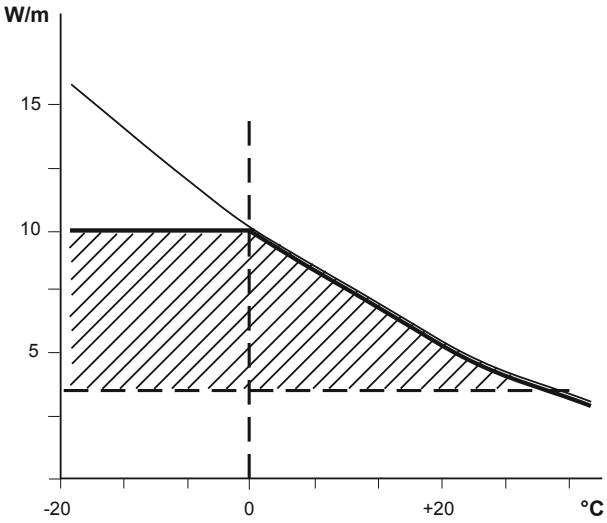
When the cable is cold, the resistor material contracts, opening several routes for power along the carbon crystals contained in the core material. The electrical current travelling through the core material creates the heat. In warm locations, the polymer in the resistor material expands and the number of routes for the electrical current is reduced. This makes the resistance increase and the heat transfer capacity to decrease. In “hot” locations, the core material expands so that only a few routes are left for the power current in the core material. The result is a large resistance reducing the power transmission capacity further.



1 *1.2 mm² copper wires copper wires*
2 *Self-regulation resistor material*
3 *Polyolefin insulation*
4 *Aluminum folio and drain wires*

The use of the cable

The heating cable of the Supra PLUS pipe is self-regulating and thus cannot overheat. The use of the heating cable is controlled using a control unit with timer and thermostat functions. Power supply to the heating cable is switched off from the operating switch when there is no risk of freezing. If the pipeline is in occasional use, the cable can also be used to defrost a frozen pipeline. The heating cable does not require maintenance. The heating cable must be switched off and protected from mechanical damage during any repairs to the pipeline. After repairs, the insulation resistance must be measured and entered in the test log.



The heating cable supplies full power in ice, cold water or in frozen pipeline. The ruled area in the image shows the input power W/m depending on the outdoor temperature when the heating cable is on continuously.

Uponor Ecoflex Supra PLUS control unit

The control unit is an electronic regulator designed for controlling the self-regulating Supra PLUS pipe equipped with a heating cable. The control unit has two different functions. You can either choose the thermostat function equipped with a temperature sensor or a fixed timer function (see on page 13).

Uponor Ecoflex Supra PLUS control unit	
Operating voltage	230 VAC
Rated power	1500 W
Operating temperature range	-20...+45°C
Housing class	IP23
Indication by idicator light	effective part
Adjustment range - with thermostat - with operation	 0...10°C 10 %...100 %

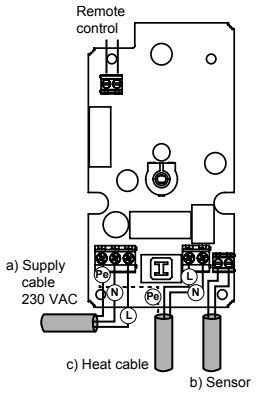
Installation instructions

Fix the base of the housing to the wall with screws (hole interval 60 mm, maximum screw head diameter 6.5 mm). The tightness class of the surface installation housing is IP23. The housing can also be mounted on top of an instrument box, in which case the tightness class is IP20. The fixing holes are dimensioned according to the most generally used instrument boxes. On the back cover of the housing, for installation on top of an instrument box, an area with reduced thickness has been provided, which can be pierced for the lead-through of cables. Fix the cover of the housing to the base part with M2.5 screws. If the lead-through seals to be used are any other than those supplied in the package, then they must be approved for the cable thickness to be used and for tightness class IP23. Install the sensor in the installation tube of the Supra PLUS pipe. The sensor is supplied ready installed inside the insulating sleeve. Lead the insulating sleeve into the installation tube of the Supra PLUS pipe. The sensor should be installed in the location most susceptible to freezing. If the sensor cannot be installed in the coldest location, this must be taken into account when setting the thermostat or the timer.

Connections

Remove the adjuster wheel, unscrew the mounting screw and remove the cover of the thermostat. Connect a 230V A/C supply cable (a), the sensor cable (b), the Supra PLUS heating cable (c) and the protective earthing on the incoming feed and heating cable protective braiding. The thickness of the connecting wires is determined according to the size of the main fuse. 10A -> 3 x 1.5 mm² and 16A -> 3 x 2.5 mm². The installations should be carried out in accordance with the fixed installation method.

Connections



Values of sensor

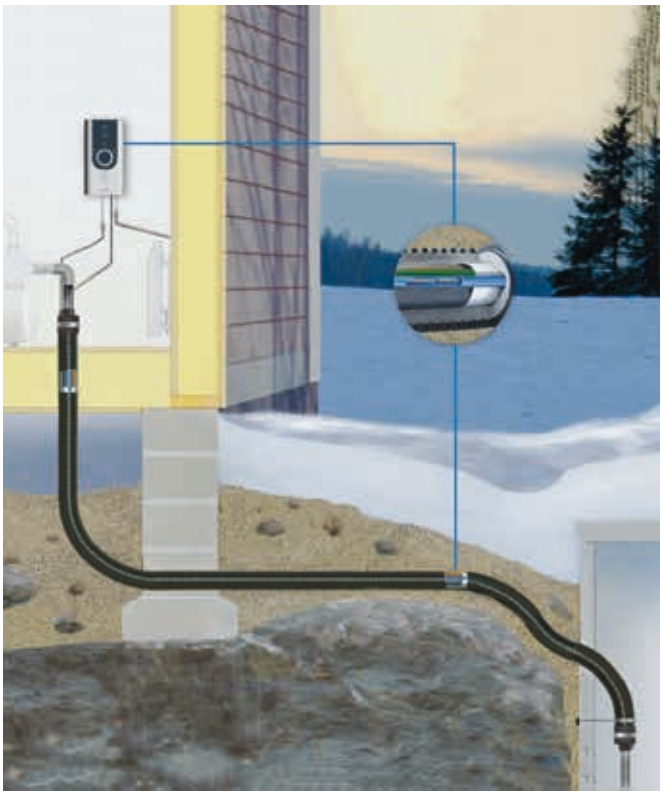
T [°C]	R [kΩ]
0	29
5	23
10	18
15	15
20	12
25	10

Timer function

The timer is used to regulate the power supply to the cable. It is an easy way to reduce power consumption and to prevent the harmful heating of the water in the pipeline. The timer regulation area corresponds to a 30 minute switching cycle. On the maximum setting at 100%, the heating cable is on during the entire switching cycle. On the minimum setting at 10%, the heating cable is on for 3 minutes and off for 27 minutes. The switching cycle must be selected on a case by case basis according to the prevailing conditions. When using a timer to defrost a frozen pipe, the dial is set at 100%.

Thermostat funtion

The thermostat function is used for controlling the cable when a certain pre-set temperature should not be exceeded. The temperature range controlled using the thermostat is 0 – 10°C and control takes place with the adjuster wheel on the thermostat unit. The thermostat sensor is installed in the pipe element inside the feed pipe. The sensor installation location should be the location most susceptible to freezing. If the sensor cannot be installed in the location most susceptible to freezing, this should be taken into account by setting the thermostat maintenance temperature higher.



Planning

Dimensioning and thermal losses

The table shows the Uponor Ecoflex Supra PLUS element thermal losses in different outdoor temperatures.

The temperature of the pipe contents has been assumed to be +2°C. When thermal loss is less than 10 W/m, the cable output is enough to keep the element from freezing.

Temp. outside the pipe	Pipe dimensions																	
	25/68	* 25/90	* 25/140	32/68	* 32/90	* 32/140	40/90	40/140	* 40/175	50/90	50/140	* 50/175	63/140	* 63/175	* 75/175	* 75/200	* 90/200	* 110/200
0 °C																		
-1	1	1	0	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1
-2	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2
-3	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	2
-4	2	1	1	2	1	1	2	1	1	2	1	1	2	1	2	1	2	2
-5	2	1	1	2	2	1	2	1	1	3	2	1	2	2	2	2	2	3
-6	2	1	1	3	2	1	2	1	1	3	2	1	2	2	2	2	2	3
-7	2	2	1	3	2	1	3	2	1	4	2	2	3	2	3	2	3	3
-8	3	2	1	4	2	2	3	2	2	4	2	2	3	2	3	2	3	4
-9	3	2	1	4	2	2	3	2	2	4	2	2	3	2	3	3	3	4
-10	3	2	2	4	3	2	3	2	2	5	3	2	3	3	3	3	3	5
-11	3	2	2	5	3	2	4	2	2	5	3	2	4	3	4	3	4	5
-12	4	3	2	5	3	2	4	3	2	5	3	3	4	3	4	3	4	5
-13	4	3	2	5	3	2	4	3	2	6	3	3	4	3	4	4	4	6
-14	4	3	2	6	4	2	5	3	2	6	4	3	5	3	5	4	5	6
-15	4	3	2	6	4	3	5	3	3	7	4	3	5	4	5	4	5	6
-16	5	3	2	6	4	3	5	3	3	7	4	3	5	4	5	4	5	7
-17	5	3	3	7	4	3	5	3	3	7	4	3	5	4	5	4	5	7
-18	5	4	3	7	4	3	6	4	3	8	4	4	6	4	5	5	6	8
-19	5	4	3	7	5	3	6	4	3	8	5	4	6	5	6	5	6	8
-20	6	4	3	8	5	3	6	4	3	9	5	4	6	5	6	5	6	8
-21	6	4	3	8	5	4	7	4	4	9	5	4	7	5	6	5	7	9
-22	6	4	3	8	5	4	7	4	4	9	5	4	7	5	6	6	7	9
-23	6	5	3	9	6	4	7	5	4	10	6	4	7	5	7	6	7	9
-24	7	5	3	9	6	4	7	5	4	10	6	5	7	6	7	6	7	10
-25	7	5	4	10	6	4	8	5	4	11	6	5	8	6	7	6	8	10
-26	7	5	4	10	6	4	8	5	4	11	6	5	8	6	7	7	8	11
-27	7	5	4	10	6	5	8	5	4	11	6	5	8	6	8	7	8	11
-28	8	5	4	11	7	5	9	5	5	12	7	5	9	7	8	7	9	11
-29	8	6	4	11	7	5	9	6	5	12	7	6	9	7	8	7	9	12
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-31	8	6	4	12	7	5	9	6	5	13	7	6	9	7	9	8	9	12
-32	9	6	5	12	8	5	10	6	5	13	8	6	10	7	9	8	10	13
-33	9	6	5	12	8	5	10	6	5	14	8	6	10	8	9	8	10	13
-34	9	7	5	13	8	6	10	7	6	14	8	6	10	8	10	8	10	14
-35	10	7	5	13	8	6	11	7	6	15	8	7	11	8	10	9	11	14
-36	10	7	5	13	8	6	11	7	6	15	8	7	11	8	10	9	11	14
-37	10	7	5	14	9	6	11	7	6	15	9	7	11	9	10	9	11	15
-38	10	7	5	14	9	6	11	7	6	16	9	7	11	9	11	9	11	15
-39	11	7	5	14	9	6	12	7	6	16	9	7	12	9	11	10	12	15
-40	11	8	6	15	9	7	12	8	6	16	9	8	12	9	11	10	12	16
-41	11	8	6	15	10	7	12	8	7	17	10	8	12	9	11	10	13	16
-42	11	8	6	16	10	7	13	8	7	17	10	8	13	10	12	10	13	17
-43	12	8	6	16	10	7	13	8	7	18	10	8	13	10	12	11	13	17
-44	12	8	6	16	10	7	13	8	7	18	10	8	14	10	12	11	13	17
-45	12	8	6	17	11	7	13	9	7	18	10	8	15	10	12	11	13	18
-46	12	9	6	17	11	7	14	9	7	19	11	9	13	10	13	11	14	18
-47	13	9	7	17	11	8	14	9	8	19	11	9	13	11	13	12	14	18
-48	13	9	7	18	11	8	14	9	8	20	11	9	14	11	13	12	14	19
-49	13	9	7	18	11	8	15	9	8	20	11	9	14	11	14	12	15	10
-50	13	9	7	18	12	8	15	10	8	20	12	9	15	11	14	12	15	20

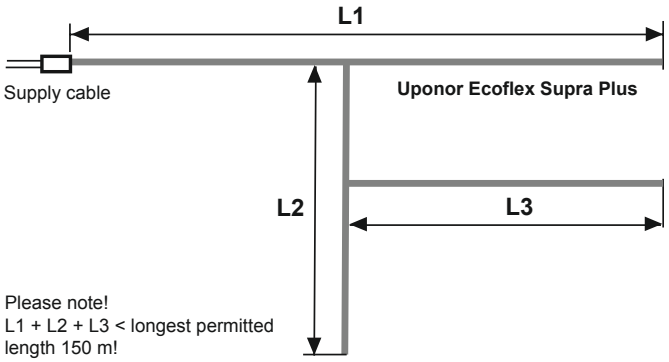
** Not in stock, only made to order*

Electrical Planning

Supra PLUS must be installed and protected according to local regulations. Due to the structure of parallel connections, the self-regulating heating cable also functions as a possible feed cable for branches and therefore the pipe network can consist of several branches. It is important to note that the total length of the pipe network supplied from one point must not exceed the longest permitted installation length for the heating cable. The longest permitted installation length:

- 100 m for a 10 A fuse
- 150 m for a 16 A fuse

Often it is best to group various short pipes into one circuit. Each circuit must have its own shielding.



Circuit length

The lengths of the pipes are summed up and 0.5 m is added for each connection and termination. 1.5 m is added per branch. Also reserve enough cable to wrap around additional sources of thermal loss (valves, feed-troughs, etc.).

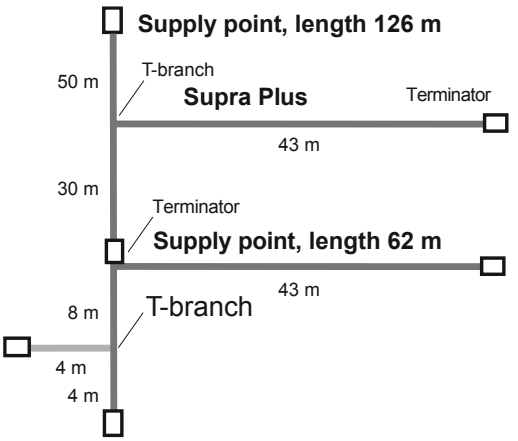
Protection

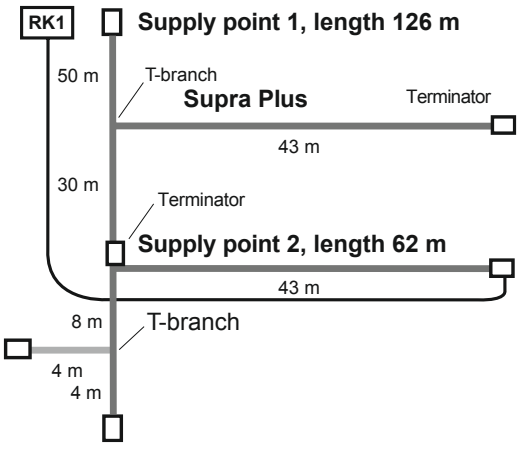
The total length of the heating cable is used to determine the number and size of safety devices and the number of independent pipe circuits. For example, the piping is 182 m long. The total length including branches and the reservation for connection is 188 m.
The following two cable circuits are selected as examples:

A) (50 + 43 + 30) m + (1.5 + 0.5 + 0.5 + 0.5) m = 126 m
a total of 126 m for a safety device of 16 A

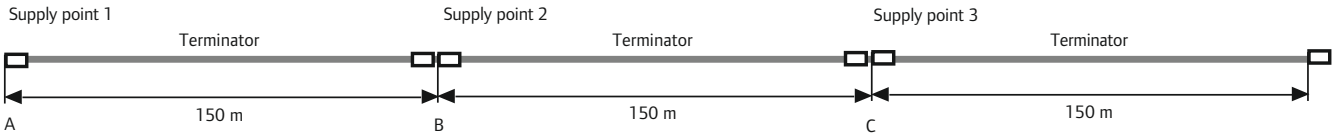
B) (43 + 8 + 4 + 4) m + (1.5 + 0.5 + 0.5 + 0.5) m = 62 m
a total of 62 m for a safety device of 10 A

If supply cannot be organised from two directions, from different fuse boxes, a ground cable must be installed in the trench for the second supply point when supply is from RK 1. Supply point 2 can also be transferred to point 3 and supply for the circuit can be organised through a centre feed. Use branch tees and supplies by changing one of the branches to a supply cable.





Example – connection for 450 m pipeline



Connection for 450 m pipeline, supply from point A.

The ground cable must be laid in the trench to supply points B and C. The circuits must be kept separate from each other, not protected by the same fuse (in this case 3 x 16 A).

The cable of Supra PLUS pipe is a parallel-fed heating cable. The conductors must not be connected at the cable ends, as this would short circuit the cable.

The Supra PLUS cable ends (each 150m) needs to be connected with a terminator.

Supra PLUS 1
Connection and terminal, control unit, required electrical accessories and end caps.

Supra PLUS 2
T-branching, required electrical accessories (branching + terminal) and separate T-section insulation sections.

Supra PLUS 3
Straight extension, required electrical accessories, a PE sleeve and shrink sleeves.

Each package includes detailed installation instructions for the installer and the electrician. Familiarise yourself with the instructions prior to the installation. The packages do not include the service pipe couplings.

Overcurrent protection devices
- Plug fuse 10 A or 16 A, slow
- Circuit breakers (automatic) G or K curve
- Residual-current device

The final circuit supplying the heating cable must be protected with a residual current operated device with a tripping current of 30 mA.

Supply cable dimensioning

The supply cables feeding Supra PLUS pipes must be dimensioned taking account of the general regulations, the ratings of the protection devices and any voltage losses. The cable cross section and structure must be selected and the cable installed in accordance with the regulations, as with any other electrical devices. The cable cross section area must be selected based on the protection device's rated value.

Control

The heating cable of a Supra PLUS element is controlled with a control unit included in the connection and ending package. The control unit is an electronic regulator designed for controlling the Supra PLUS water pipe equipped with a self-regulating heating cable. It includes a main switch with an indicator light, allowing the cable's power to be switched off. The control unit has two different functions. You can choose between thermostat control with a temperature sensor or a timer function based on a fixed time period. You can select the control method by lifting the control knob and turning it to the desired setting. In addition, you can use the thermostat control method when the pipeline has been installed completely underground or completely above-ground. The thermostat controls the cable based on sensor information, which means that the conditions must be the same throughout the entire pipeline length. Use the timer when the conditions vary over the pipeline length. Choose the 'on' periods according to the prevailing conditions.

Installation

General installation instructions

Supra PLUS should be dug and covered at the depth of at least 10 – 30 cm. Supra PLUS can withstand continuous freezing and if conditions so require, it can be installed directly on the ground or snow. When installing Supra PLUS freely on the ground, adequate mechanical protection must be ensured and the pipe must be protected from direct contact with sharp stones and tree stumps. If vehicles travel over the Supra PLUS, it must be adequately protected using a casing pipe that can withstand the weight of vehicles running over it.

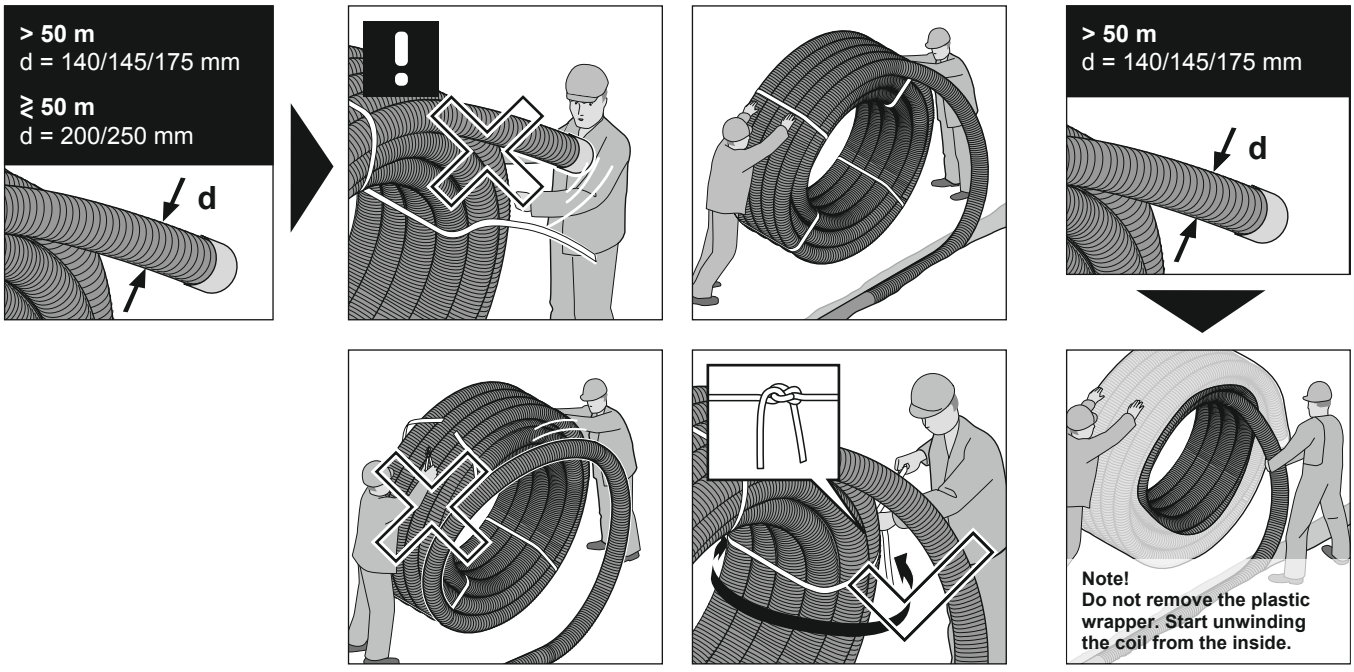
Supra PLUS can also be installed as an overhead line. It must be supported with adequate holders according to the manufacturer's instructions. The thermal expansion of the service pipe must be taken into account according to the prevailing installation conditions, for example
Δt = 10°C, l = 100 m => Δl = 18 cm.

When feeding the pipe through structures, Supra PLUS must be protected with, for example, a plastic casing pipe sealed into the structure. When joining service pipes, reserve approximately 0.5 m of free heating cable at the end of each pipe for connections. In locations with extra thermal loss (flanges, valves, etc.), some heating cables should be wrapped around the part in question to compensate for the larger thermal loss (cables may intersect).

The installation and assembly of Uponor Ecoflex Supra PLUS is not recommended in temperatures below -15°C. Before installation in cold conditions, the coil should be preheated, for example by storing it at room temperature. The installation must be carried out with care, because a pipe placed against the ground is easily frozen. The pressure pipe must be filled with water before the power is switched on to prevent damage to the service pipe. If the tube must be assembled in extremely cold temperatures, it must first be defrosted and bent on a larger coil. When the pipe has warmed up enough at room temperature, it can be wrapped on a smaller coil.

The coil is unwound by first cutting the binders inside the coil. The inner end of the pipe is tied up to the terrain and the coil is unwound by rolling it. The plastic wrapper prevents the coil from unwinding uncontrollably.

When storing the coil in conditions where the open end of the heating cable is susceptible to moisture, the end of the cable must be protected from the moisture.



General electrical installation instructions

- **Installation**
  General safety regulations must be complied with during the installation. The heating cable can only be connected by a qualified electrician. Do not demage the heating cable during installation!

- **Connections**
  Besides the heating cable, no other consumption is permitted on the final circuit protected with a residual current operated device. It must be possible to separate the heating cable installation from the network either with a common or circuit specific switch that can also be connected to the control circuit. The switch must bear position indicator markings and a label explaining the installation, for example, „Water pipe non-freeze heating“. The network connection takes place through the control unit. The protective earth metal cord on the heating cable must not be used as a neutral conductor. The supply cable must always be equipped with a separate shielded wire in the neutral conductor (General safety regulations).

  The insulation resistance of the heating cable must be measured before covering and commissioning the pipes. The measurement is conducted using direct-current voltage 500V – 2.5 kV D/C. The insulation resistance should be R > 20 MΩ. Connection must be made so that the insulation resistance of the heating cable can be easily measured later in an accessible location.

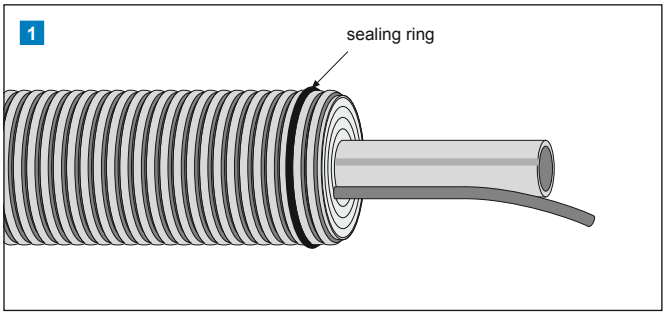
  The extension, tee branching and connection of the heating cable to the supply cable are conducted using approved shrinking plastic couplings. The cables can touch in the joints, because the self-regulating heating cable cannot overheat.

  Please note! In temperatures of under 0°C, the resistance of the cable is very small. When switching the cable on in low temperatures, the protection (fuse) may go off. The protection can be altered temporarily in order to increase the cable temperature and resistance and to keep the cable switched on.

- **Technical drawings**
  The technical drawings must include:
  - the type of heating cable
  - the number of heating cables
  - the placement of heating cables
  - the maximum permissible operating temperature for the cable

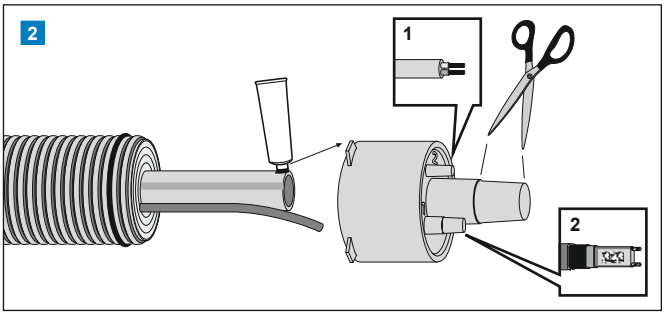
Uponor Supra PLUS connection and end set

Installation of the coupling

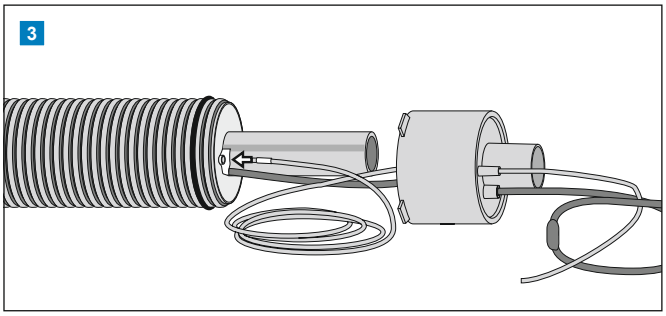


Peel off the casing pipe and remove the insulation taking into account the length of the end cap. Reserve 0.5 m of cable for the electrician. Cut the service pipe at the required length. Do not damage the cable or the service pipe. Clean thoroughly (including the casing pipe).

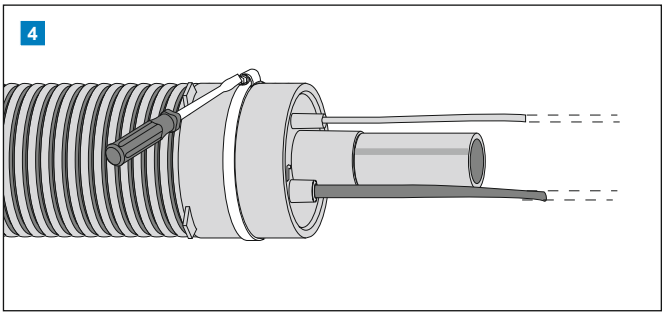
Place the seal in its place in the 2nd or 3rd groove. Cut the output for the flow pipe of the end cap at the correct dimension. Cut the sensor output (2) and cable output (1) at the correct locations (at the end of the output).



Install the sensor. Pull the end cap on top of the pipe using lubricant.

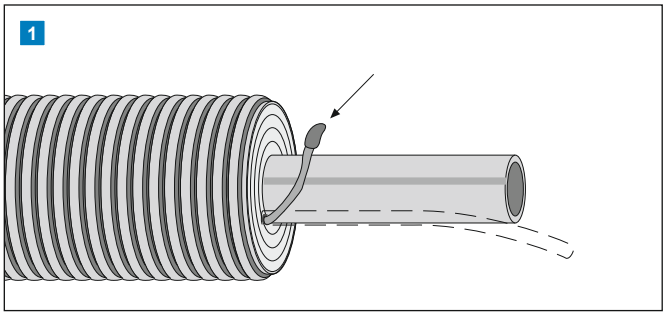


Carry out the extension using the heating cable - supply cable installation set Supra PLUS 1 (separate installation instructions for the electrician).

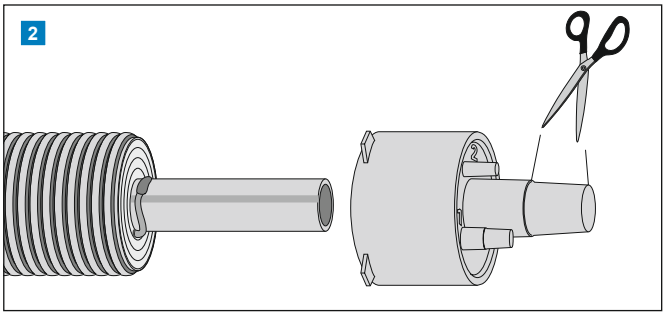


Place the clamping ring above the seal on the end cap and tighten.

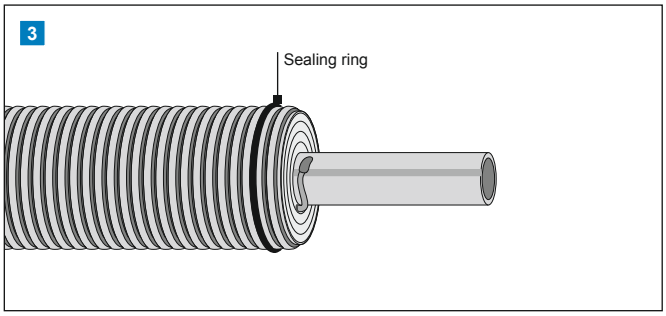
Installation of the terminal



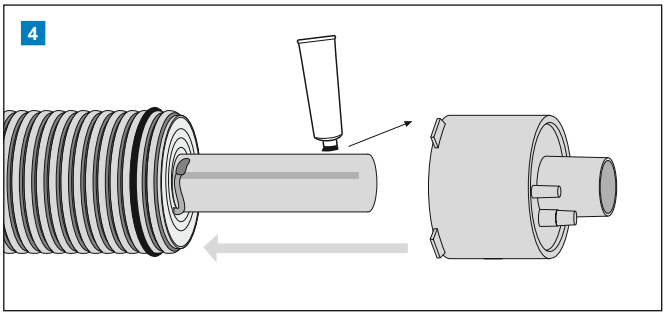
Peel off the casing pipe and remove the insulation taking into account the length of the end cap. Reserve 0.5 m of cable for the electrician. Cut the service pipe at the required length. Do not damage the cable or the service pipe. Clean thoroughly (including the casing pipe).



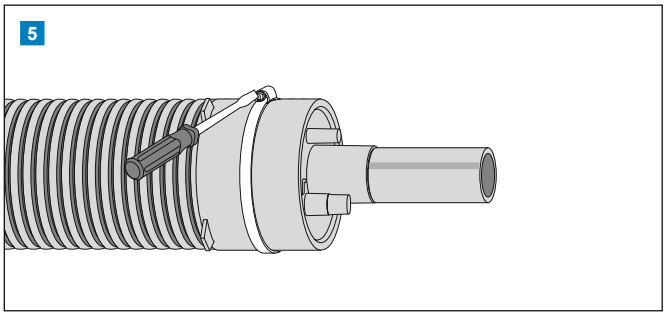
Carry out the termination using the installation set Supra PLUS 1 (separate installation instructions for the electrician).



Place the seal in its place in the 2nd or 3rd groove. Cut the output for the service pipe of the end cap at the correct dimension.



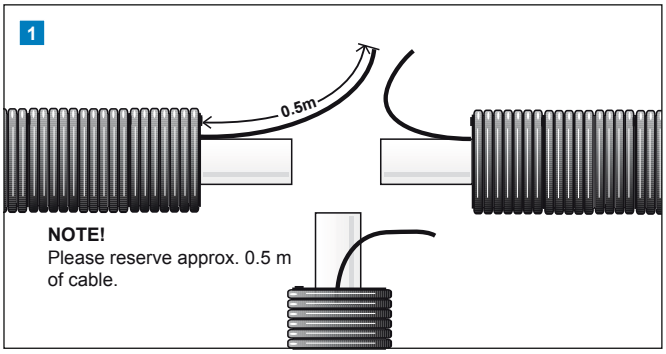
Pull the end cap on top of the pipe element using lubricant.



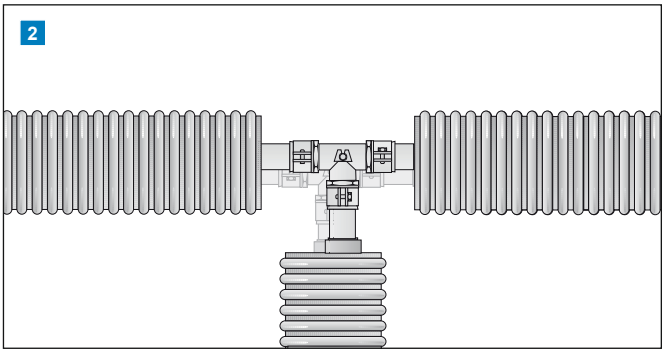
Place the seal in its place in the 2nd or 3rd groove. Cut the output for the service pipe of the end cap at the correct dimension.

Uponor Ecolfex Supra PLUS T-joint set

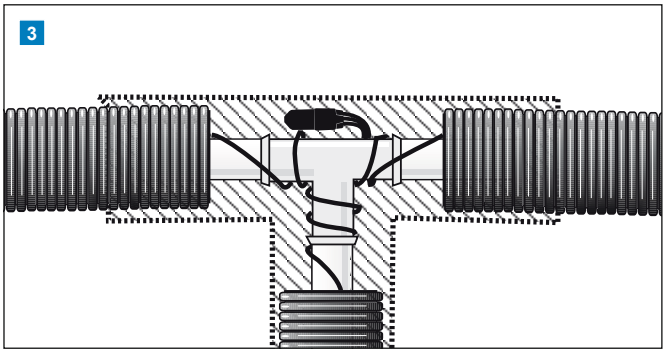
Installation of the branch tee



Peel off the casing pipe and remove the insulation taking into account the size of the branch tee. Only peel off what is absolutely required in order to connect the service pipe. Reserve approximately 0.5 m of cable for the electrician. Cut the service pipe at the required length. Please note! Do not damage the cable or the service pipe. Cut the service pipe so that the total length of uninsulated pipe ends and connectors is as small as possible. Thoroughly clean the pipe ends of all burr and dirt (including the casing pipe).

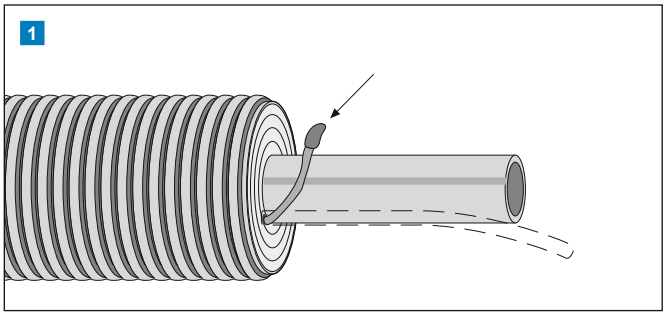


Join the service pipes with couplings (not included in the set). If required, the end caps are installed in place before joining the service pipes. Be careful not to damage the heating cable. Note the required shrinks for insulating the branch tee before installing the fasteners. Use the insulation that was peeled off as an additional insulation for the joint.

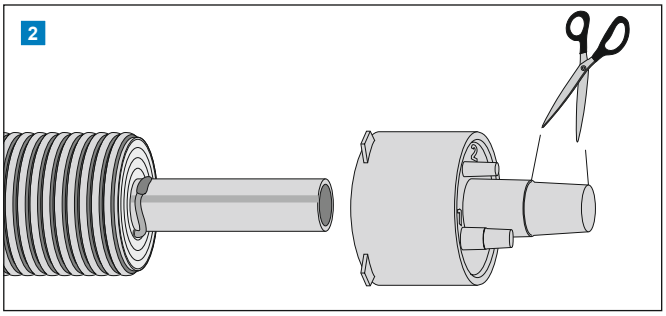


Join the ends of the heating cables with Supra PLUS 2 installation set equipment and wrap the heating cables on the branch with heatproof tape (electrician).

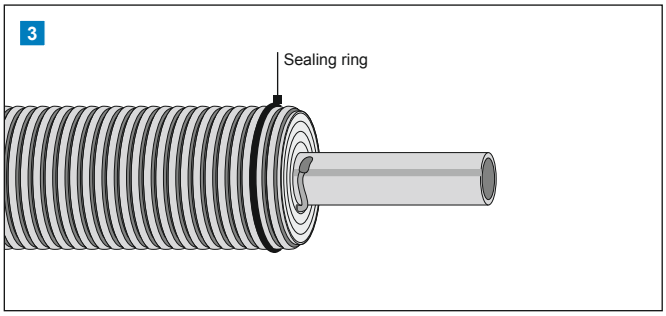
Installation of the branch tee terminal



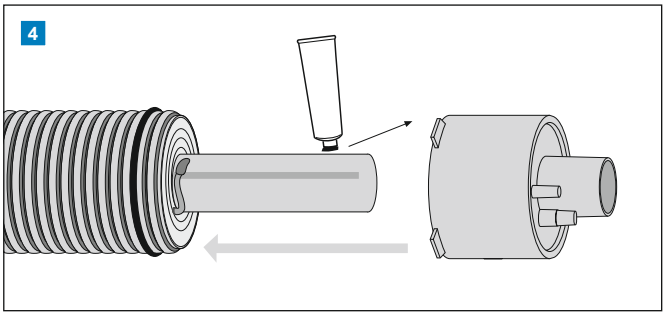
Peel off the casing pipe and remove the insulation taking into account the length of the end cap. Reserve 0.5 metres of cable for the electrician. Cut the service pipe tube at the required length. Do not damage the cable or the flow pipe. Clean thoroughly (including the casing pipe).



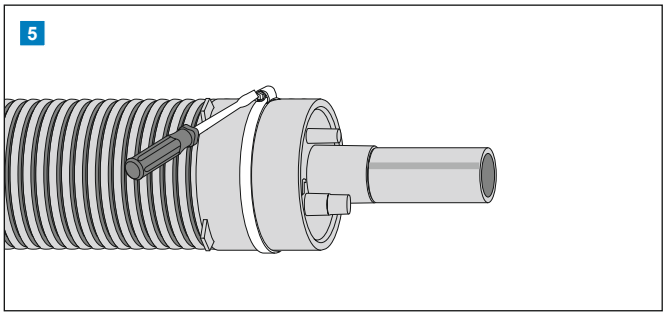
Carry out the termination using the installation set Supra PLUS 2 (separate installation instructions for the electrician).



Place the seal in its place in the 2nd or 3rd groove. Cut the output for the service pipe of the end cap at the correct dimension.



Pull the end cap on top of the pipe element using lubricant.

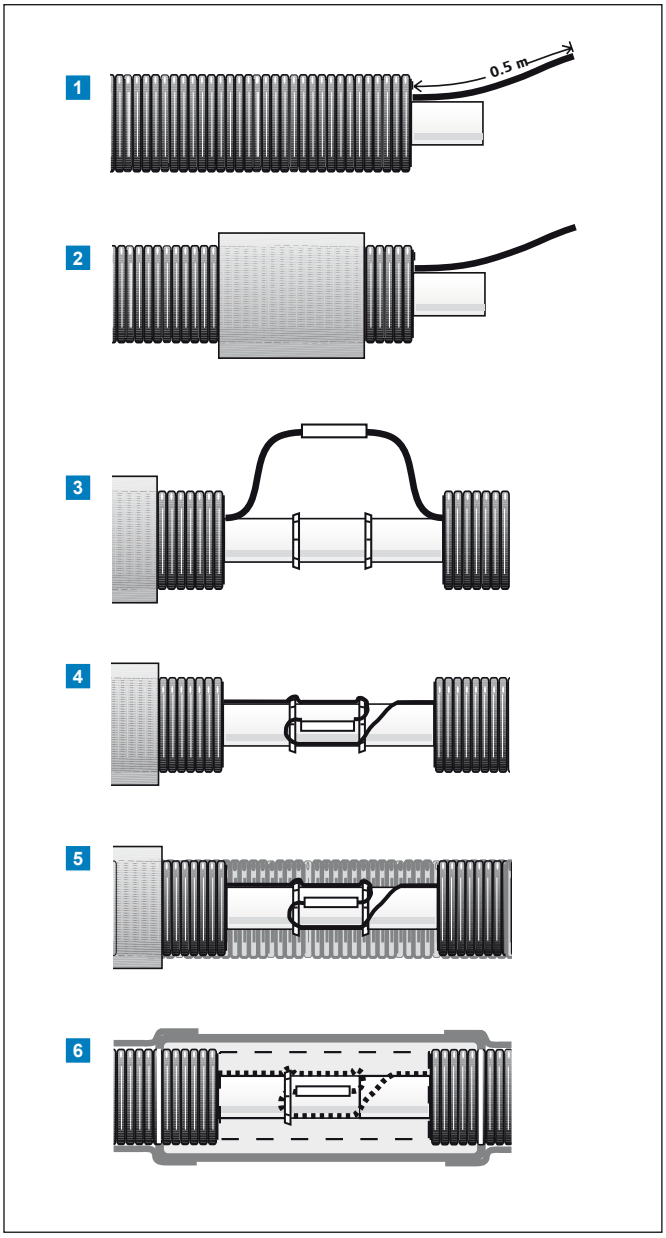


Place the clamping ring above the seal on the end cap and tighten.

Uponor Ecoflex Supra PLUS straight joint set

Note!
Remove the insulation in a way that allows you to use it later to insulate the connector. Cut the service pipe at the required length. Do not damage the cable or the service pipe. Cut the service pipe so that the total length of uninsulated pipe ends and fasteners do not exceed the length of the PE sleeve (400 mm). Clean the end of the pipe thoroughly (including the casing pipe).

Conducting the extension



1. Peel off the casing pipe and remove the thermal insulation taking into account the length of the PE sleeve 400 mm. Reserve 0.5 m of cable for the electrician.
2. Install the PE sleeve, length 400 mm and shrink sleeves on one pipe before installing the couplings.
3. Join the service pipes couplings (not included in the kit). Be careful not to damage the heating cable.

   Carry out the extension of the heating cable using the supplies in the installation set Supra PLUS 3 (separate installation instructions for the electrician).
5. Fasten the heating cable on the pipe extension using heatproof tape as shown in the picture. There must be no mechanical strain on the heating cable extension.
6. Install the insulation that was peeled off carefully on the extension. Fasten using tape.
7. Place the PE sleeve on the extension in a central position. Ensure that there is enough shrink sleeve on both casing pipes. Remove any protective paper left inside the shrink sleeve. Shrink using a yellow flame. Start the shrinking from the middle and heat evenly and slowly on all sides. First proceed to one end and then to the other. Be careful not to burn the shrink sleeve or the casing. When the surface of the shrink sleeve is smooth and adhesive is extruding from the ends of the shrink sleeve, the shrink sleeve has received enough warmth. Installation is ready when the extension has cooled down to the ambient temperature.

Uponor Ecoflex Supra Standard
Non-freeze water pipes for longer pipelines

Supra Standard is a versatile insulated water pipe. Regulator-controlled standard resistor heating cable keeps the pipe from freezing. The system can be connected to either 230V or 400V voltage. Supra Standard is an economical solution for the installation of long non-freezing water and waste water pipes as well as various industrial fluid pipes in conditions susceptible to freezing. Its power consumption is small, because the surface temperature of the cable is extremely carefully monitored. Thanks to the regulator, the pipe temperature can be retained exactly on the required level. The Supra Standard pipe is manufactured with two different standard resistor cables with a standard resistance throughout the length of the cable. The yellow cable 2 x 0.48 Ω/m is intended for pipe lengths 50-300 m and the white cable 2 x 0.05 Ω/m for lengths of 150-700 m. Longer pipelines require several power supply points. Supra Standard is supplied on coil and completely ready for installation. The system contains complete sets for joining, branching and extending a pipe (service pipe couplings are not contained in the sets).

Pipe design

1 ***HDPE jacket pipe***

The HDPE jacket pipe are made of corrugated HD polyethylene. Corrugation makes the casing robust against heavy traffic load but keeps flexibility for the installation.

2 ***Insulation***

The insulation is made of crosslinked polyethylene foam. The closed-cell structure of the insulation prevents water absorption and provides good insulation capacity. The foamed plastic density is 30 kg/m³ and thermal conductivity 0.038 W/mK.

3 ***Heating cable***

The heating cable is available in the colours white 2 x 0.05 Ω/m and yellow 2 x 0.48 Ω/m. Heating cable is constant resistant. Power supply 230V or 400V.

4 ***Service pipe PE 80/PE 100***

The service pipe has been developed for conveying cold tap water. The service pipes are made of PE 80 (25-63 mm) and PE 100 (75-110 mm).

Uponor Ecoflex Supra Standard with white cable

20°C

12.5 or 16 bar

25 – 110 mm

Main application
- Transport of cold water
- Freeze-protection

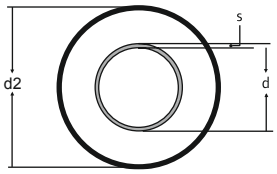
Other applications
- Sewage water

Medium pipe
- MDPE (PE 80, SDR 11, Dim. 25-63 mm)
- HDPE (PE 100, SDR 11, Dim. 75-110 mm)

Insulating material
- PE-X

Material jacket pipe
- HDPE

Cable
- Constant resistant (0.05 Ω/m)



Uponor Ecoflex Supra Standard with white cable offering

Item no.	Medium pipe d x s [mm]	DN [mm]	Jacket pipe d2 [mm]	Bending radius [m]	Weight [kg/m]	Max. length on delivery [m]
1034231	32 x 2.9	25	68	0.25	0.70	300
1034258	40 x 3.7	32	140	0.30	1.50	200
1034259	50 x 4.6	40	140	0.40	1.70	200
1034260	63 x 5.8	50	140	0.50	2.00	200
1034261	75 x 6.8	65	175	0.60	2.90	150
1034262	90 x 8.2	80	200	1.10	4.40	100
1034234	110 x 10.0	100	200	1.20	5.10	100

Note!
Make to order items. Please ask for delivery time.

Uponor Ecoflex Supra Standard with yellow cable

20°C

12.5 or 16 bar

25 – 110 mm

Main application
- Transport of cold water
- Freeze-protection

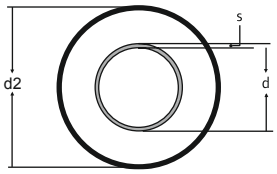
Other applications
- Sewage water

Medium pipe
- MDPE (PE 80, SDR 11, Dim. 25-63 mm)
- HDPE (PE 100, SDR 11, Dim. 75-110 mm)

Insulating material
- PE-X

Material jacket pipe
- HDPE

Cable
- Constant resistant (0.48 Ω/m)



Uponor Ecoflex Supra Standard with yellow cable offering

Item no.	Medium pipe d x s [mm]	DN [mm]	Jacket pipe d2 [mm]	Bending radius [m]	Weight [kg/m]	Max. length on delivery [m]
1034214	32 x 2.9	25	68	0.25	0.70	300
1034253	40 x 3.7	32	140	0.30	1.50	300
1034254	50 x 4.6	40	140	0.40	1.70	200
1034255	63 x 5.8	50	140	0.50	2.00	200
1034256	75 x 6.8	65	175	0.60	2.90	150
1034257	90 x 8.2	80	200	1.10	4.40	100
1034222	110 x 10.0	100	200	1.20	5.10	100

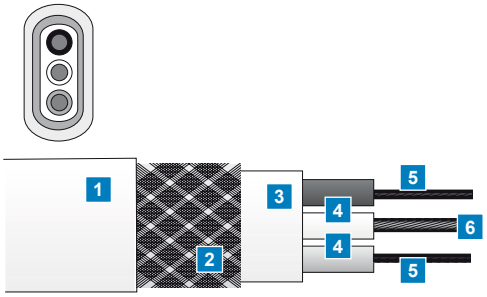
Note!
Make to order items. Please ask for delivery time.

Uponor Supra Standard constant resistant cable and regulator 600S

The constant restistant cable

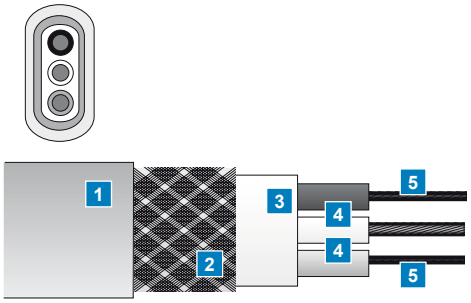
The heating power of the constant resistant cable on Supra Standard pipe is controlled using a regulator and an NTC sensor. The temperature sensor attached on the cable surface communicates any heating needs with the regulator and ensures that the cable cannot heat too much even in adverse temperature conditions. This retains the pressure proof qualities of the pipe and the plastic material is not damaged. The regulator switches the power on and off so that the cable surface temperature remains at the set standard value (0 – 30°C). Thanks to good insulation properties, the share of effective heating periods is approximately 40% of the total time, providing considerable savings in the consumption of power in comparison with continuous heating. The constant resistant cables of Supra Standard allow supply of electricity from one point to a 700 meter long line.

External dimensions	Width 12 mm, thickness 7 mm
Smallest bending radius	25 mm
Supply voltage	230/400V
The maximum permissible operating temperature	+ 70°C
Max. installation length	**White cable** (2 x 0.05 Ω/m + Cu) 400 m/230V or 700 m/400V **Yellow cable** (2 x 0.48 Ω/m + Cu) 180 m/230V or 300 m/400V
Nominal output (on the surface of an insulated metal pipe +5°C)	Max. 25 W/m



White cable
230V/400V, 2 x 0.05 Ω/m (min. 150 m – max. 700 m)

1 *Outer jacket 0.6 mm PVC*
2 *Copper braid*
3 *Mantle 0.4 mm*
4 *PVC Insulation 0.4 mm*
5 *Resistor wires 0.05 Ω/m*
6 *Copper wire 2.5 mm²*



Yellow cable
230V/400V, 2 x 0.48 Ω/m (min. 50 m – max. 300 m)

1 *Outer jacket 0.6 mm PVC*
2 *Copper braid*
3 *Mantle 0.4 mm*
4 *PVC Insulation 0.4 mm*
5 *Resistor wires 0.48 Ω/m*
6 *Copper wire 1.5 mm²*

Uponor Ecoflex Supra Standard regulator 600S

Supra Standard regulator 600S is an electrical heating regulator with a continuous time consistent triac regulation. When connecting a power supply to the system, a Supra Standard connection and termination set 1 is always required. It contains the Uponor Ecoflex regulator 600S and an NTC sensor equipped with a 4 m cord. The regulator is supplied in a splash water proof switch box (IP 54) that also functions as the connection box for external cabling. The regulator does not contain the operation switch required for the heating system, meaning that the switch must be separately installed. The regulator allows the maintenance of the cable surface temperature at the set value, reducing power consumption by up to 60% in comparison with continuously heated cables. Temperature regulation range 0 – 30°C.

Connections

- Supply; fasteners 1 and 2
- Polarity free
- Voltage 200 – 415V A/C, 50 – 60 Hz with an automatic current selection
- Maximum power 16 A
- Supply through a double-pole switch
- The regulator must always be grounded

Uponor Ecoflex Supra Standard regulator 600S	
Type designation	Uponor Eccoflex Supra Standard regulator 600S
Rated voltage	230/400V
Fan-in	min. 230 W/ 400 W max. 3680 W/ 6400 W
Control temperature	0 to + 30°C
Indicator lamp light	effective part of the cycle
Installation space requirement	box size 125 x 175 x 75 mm
Housing class	IP 54

Implementing of Uponor Supra Standard regulator 600S

Sensor

Connect the sensor wires to fasteners G1 and G3. The sensor has a high potential against the neutral and the ground (>200 V). The sensor installation must be carried out according to existing regulations concerning network installations. The temperature sensor cord may be extended if required (max. 50 m). The sensor can be tested by measuring the circuit resistance. The resistance value of an NTC sensor is approximately 15 kΩ at ±0°C and approximately 10 kΩ at +30°C.

Starting

1. Check the connections.

2. Measure the circuit resistance from between fasteners 3 and 4; 230V 14.4 Ω < R < 230 Ω; 400V 25 Ω < R < 400 Ω.

3. Switch on the power and turn the setting to the maximum value. The indicator light turns on or flashes and then burns continuously. Turn the setting to the minimum value. The indicator light turns off or flashes and then turns off completely.

Troubleshooting

1. Cut off the power and disassemble the sensor connections. Measure the resistance on the sensor and the setting potentiometer. The potentiometer resistance is 0 – 5 kW, the sensor resistance is 15 – 10 kΩ (15 kΩ 0°C and 10 kΩ + 30°C).

2. Do not connect the sensor and switch on the power. The regulator must supply the heating cable with continuous power and the indicator light must remain lit. Use a hook-on ampere meter to check that the heating cable is receiving power. If the indicator light is not lit and the heating cable is not receiving power, check the regulator supply on the voltage fasteners 1 and 2. If the voltage is correct, the regulator is most likely to be faulty. If the indicator light is lit, but the heating cable is not receiving power, check the resistance on the heating cable. If the resistance is correct, the regulator is most likely to be faulty.

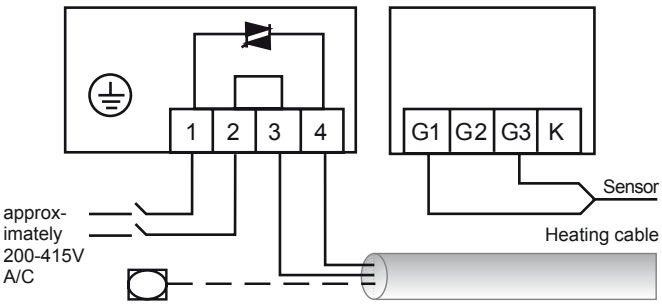
3. Cut off the power and short circuit fasteners G1 and G3. Switch the power on again. The indicator light must be off and no power should be passing through the regulator. Use a hook-on ampere meter to check that the heating cable is not receiving power. If the indicator light is off and the heating cable is not receiving power, the regulator is most likely to be faulty. If the indicator light is lit and fasteners G1 and G3 are short circuited, the regulator is most likely to be faulty.

Operating principle

The Uponor Ecoflex Supra Standard regulator 600S adapts the average voltage to the prevailing need for voltage steplessly by switching the power on and off in a fixed 60 second pulsating cycle (on + off = 60 seconds). The regulator operates with a zero-current switch (does not cause disturbance in the electric network).

Load	
Smallest functioning	230 W/230 W (1 A) 400 W/400 W (1 A)
The maximum permitted	3680 W/230 W (16 A) 6400 W/400 W (16 A)

Fasteners 3 and 4. Resistive single or dual-phase heater



Free voltage conductor, must be protected with a cap fastener

Wiring the supply, heating cable and sensor

Planning

Dimensioning and thermal losses

The service pipe is dimensioned according to normal pipe dimensions. Prevailing conditions must be taken into account when selecting the correct product, for example for ground installations, the temperature of the ground frost, which is approximately -10°C at the lowest. When installing on pipe bridges, the outdoor temperature and wind chill cause

Temp. outside the pipe	Pipe dimensions																		
	25/68	25/90	25/140	32/68	32/90	32/140	40/90	40/140	40/175	50/90	50/140	50/175	63/140	63/175	75/175	75/200	90/175	90/200	110/200
0 °C																			
-1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	1	1
-2	1	1	1	2	1	1	1	1	1	2	1	1	2	1	1	1	2	1	2
-3	1	1	1	2	1	1	2	1	1	3	1	1	2	1	2	1	3	2	2
-4	2	1	1	2	2	1	2	1	1	3	2	1	2	2	2	2	3	2	3
-5	2	1	1	3	2	1	2	2	1	4	2	2	3	2	3	2	4	2	3
-6	2	2	1	3	2	2	3	2	1	4	2	2	3	2	3	2	4	3	4
-7	3	2	1	4	2	2	3	2	2	5	3	2	4	3	3	2	5	3	4
-8	3	2	2	4	3	2	4	2	2	5	3	2	4	3	4	3	5	3	5
-9	3	2	2	5	3	2	4	3	2	6	3	2	4	3	4	3	6	4	5
-10	3	2	2	5	3	2	4	3	2	6	3	3	5	3	4	3	6	4	6
-11	4	3	2	5	3	2	5	3	2	7	4	3	5	4	5	4	7	5	6
-12	4	3	2	6	4	3	5	3	3	7	4	3	6	4	5	4	7	5	7
-13	4	3	2	6	4	3	5	3	3	8	4	3	6	4	5	4	8	5	7
-14	5	3	3	7	4	3	6	4	3	8	5	4	6	5	6	4	8	6	8
-15	5	4	3	7	4	3	6	4	3	9	5	4	7	5	6	5	9	6	8
-16	5	4	3	7	5	3	6	4	3	9	5	4	7	5	7	5	9	6	9
-17	6	4	3	8	5	4	7	4	4	10	6	4	8	5	7	5	10	7	9
-18	6	4	3	8	5	4	7	5	4	10	6	4	8	6	7	6	10	7	10
-19	6	4	3	9	6	4	7	5	4	11	6	5	8	6	8	6	11	7	10
-20	6	5	3	9	6	4	8	5	4	11	6	5	9	6	8	6	11	8	11
-21	7	5	4	10	6	4	8	5	4	12	7	5	9	7	8	6	12	8	11
-22	7	5	4	10	6	5	8	5	4	13	7	5	10	7	9	7	12	8	12
-23	7	5	4	10	7	5	9	6	5	13	7	6	10	7	9	7	13	9	12
-24	8	5	4	11	7	5	9	6	5	14	8	6	10	7	9	7	13	9	13
-25	8	6	4	11	7	5	9	6	5	14	8	6	11	8	10	7	14	9	13
-26	8	6	4	12	7	5	10	6	5	15	8	6	11	8	10	8	14	10	14
-27	8	6	5	12	8	5	10	7	5	15	8	6	12	8	10	8	15	10	14
-28	9	6	5	12	8	6	11	7	6	16	9	7	12	9	11	8	15	10	15
-29	9	6	5	13	8	6	11	7	6	16	9	7	12	9	11	9	16	11	15
-30	9	7	5	13	8	6	11	7	6	17	9	7	13	9	12	9	16	11	16
-31	10	7	5	14	9	6	12	8	6	17	10	7	13	9	12	9	17	12	16
-32	10	7	5	14	9	6	12	8	6	18	10	8	14	10	12	9	17	12	17
-33	10	7	6	14	9	7	12	8	6	18	10	8	14	10	13	10	18	12	17
-34	10	7	6	15	10	7	13	8	7	19	10	8	14	10	13	10	18	13	18
-35	11	8	6	15	10	7	13	8	7	19	11	8	15	11	13	10	19	13	18
-36	11	8	6	16	10	7	13	9	7	20	11	9	15	11	14	10	19	13	19
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-38	12	8	6	17	11	8	14	9	7	21	12	9	16	11	14	11	20	14	20
-39	12	9	6	17	11	8	14	9	8	21	12	9	16	12	15	11	21	14	20
-40	12	9	7	17	11	8	15	10	8	22	12	9	17	12	15	12	21	15	21
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-43	13	9	7	19	12	8	16	10	8	23	13	10	18	13	16	12	23	16	22
-44	13	10	7	19	12	9	16	10	9	24	13	10	19	13	17	13	23	16	23
-45	14	10	7	19	12	9	16	11	9	25	14	11	19	13	17	13	24	16	23
-46	14	10	8	20	13	9	17	11	9	25	14	11	19	14	17	13	24	17	24
-47	14	10	8	20	13	9	17	11	9	26	14	11	20	14	18	14	25	17	24
-48	14	10	8	21	13	9	18	11	9	26	14	11	20	14	18	14	25	17	25
-49	15	11	8	21	13	10	18	12	9	27	15	11	21	15	18	14	26	18	25
-50	15	11	9	21	14	10	18	12	10	27	15	12	21	15	19	14	26	18	26

Supra Standard is supplied upon order.

significantly more demanding conditions. The adjacent chart shows the Supra Standard thermal losses at various outdoor temperatures.

The inside temperature of the pipe has been assumed to be 2°C. Read the prevailing outdoor temperature on the first column and select the dimensions of the product on the top row. The chart shows the W/m value required for the pipe to remain unfrozen. Find a suitable connection option in the power curve with the voltage being 230V or 400V.

Example
A pipeline with a total length of 120 m and dimensions 32/90 is installed on a pipe bridge outside in a location susceptible to wind chill, where the dimensioning temperature must be – 50°C. The required power is then 14 W/m. Connection voltage is selected at 230V and cable 2 x 0.48 W/m (yellow cable). By connecting 2 x 0.48 W/m in parallel + Cu-return achieves a power of 15 W/m.

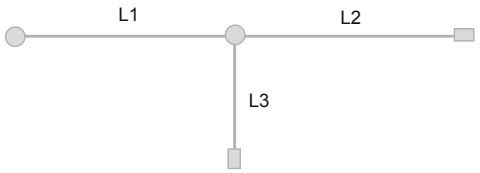
Electrical Planning

The system must be installed and protected according to valid electrical safety regulations. In order to ease planning and use, each circuit must only have one cable type connected to it. Due to the structure of parallel connections, the heating cable also functions as a possible feed cable for branches and therefore the pipe network can consist of several branches. An installation plan and technical drawings must be drawn for all heating cable installations.

Plans are drawn by a qualified electrical planner or contractor according to the manufacturer's instructions. The technical drawing must include the following information: the type of heating cable, its capacity, length, placement in the heated location, the number of heating cables in the installation location and the length and type of the supply cable.

Circuit length

The lengths of the pipes are added up. Add 0.5 m for both connection and termination and 1.5 m for each branching. Also add enough cable to wrap around additional sources of thermal loss (valves, feed-throughs, etc.). In extensive networks, lines should be grouped in suitable connection circuits so that the cable provides the required output per meter W/m (see the heating power charts with different options for connection). Different connection circuits can be controlled using the same regulator if the total output does not exceed the maximum load capacity P = 6,400 W. When controlling several different control circuits, the sensor is installed on one circuit. All circuits are then controlled based on the information provided by the sensor. The adequacy of the power must be taken into account for all circuits, if the temperature varies considerably from one circuit to the next.



NOTE!
L1 + L2 + L3 + 1.5 m + 0.5 m = L, circuit length used to determine the correct connection option.

Protection

The total length of the pipeline determines the number of independent connection circuits, the number of safety devices and their dimensioning. Protection takes place using a plug fuse 10 A or 16 A, a line protection switch (automatic fuse) G or K curve and residual current operated device 30 mA, also suitable for use as the residual current operated device on pipelines containing flammable fluids.

Supra Standard connection parts

The Supra Standard system contains complete connection sets for the connection, branching and extension of pipes. The sets do not contain connectors for the service pipes.

Connection and termination

- Uponor Ecoflex Supra Standard regulator 600S + sensor
- The required electrical parts
- End caps

T-branch and termination

- Branch tee insulation chute
- The required electrical parts

Straight extension

- The required electrical parts
- Shrink sleeves
- PE sleeve

Each set contains detailed installation instructions for the installer and electrician. Read the instructions carefully prior to the installation.

Dimensioning the supply cable

Supply cables for Uponor Ecoflex Supra Standard pipes must be dimensioned taking into account general regulations, the dimensioning of the safety devices and possible voltage drops. The selection and installation of the cable cross section and structure must be carried out according to regulations, as it is done with all other electrical equipment. The cable cross section must be selected according to the rated voltage of the safety device.

Controls

The Supra Standard is always controlled using the Uponor Ecoflex regulator 600S and an NTC sensor.

Operation, maintenance and pipeline repairs

The maximum permitted operation temperature of the heating cable must not be exceeded, continuous 70°C. The heating cable does not require maintenance. The heating cable must be switched off and protected from mechanical damage during any repairs to the pipeline. After repairs, a new test log must be filled in.

Installation

General installation instructions

Supra Standard should be installed in the ground at the depth of at least 10-30 cm, if conditions permit. The preliminary filling of the dug-out (around the pipe) must be completed with fine sand in order to prevent damage to the jacket pipe. A careful preliminary fill allows the pipe to withstand above-ground loading. If vehicles travel over the pipeline, it must be adequately protected using a jacket pipe or a concrete slab which can withstand the weight of vehicles running over. Before the pipeline is covered, circuit resistance and insulation resistance must be measured on the cable and they must be recorded in the test log (enclosed).

Supra Standard withstands freezing. It can be installed directly on the ground or snow. When installing the pipe freely on the ground, adequate mechanical protection must be ensured and the pipe must be protected from sharp rocks and tree stumps. When installing on a pipe bridge or shelf, it must be supported with holders in a case-specific manner.

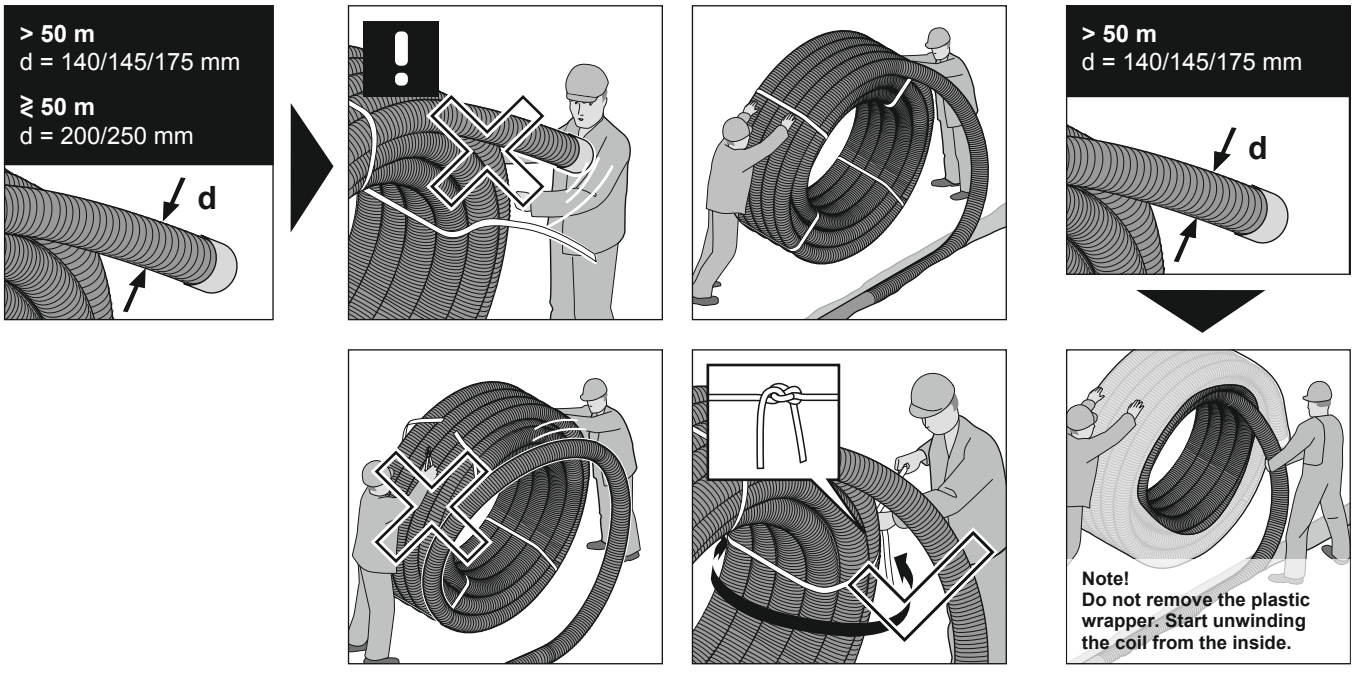
The thermal expansion of the service pipe must be taken into account according to the prevailing conditions, e.g. Δt 10°C, l = 100 m => Δl 18 cm. The service pipe must be anchored at the joints if no thermal movement is required to take place.

When feeding the pipe through structures, Supra Standard must be protected with a proper feed-through element, e.g. a plastic casing pipe sealed into the structure. The installation and assembly of Supra Standard is not recommended in temperatures below -15°C. Before installation in cold conditions, the coil should be preheated by storing it at room temperature. The installation must always be carried out with care, since a pipe placed against the ground is easily frozen. The pressure pipe must be filled with water before the power is switched on to prevent damage to the service pipe. If the pipe has to be assembled in extremely cold temperatures, it must first be defrosted and bent on a larger coil. When the pipe has warmed up enough at room temperature, it can be wound on a smaller coil.

The installation of the sensor on the cable surface must be taken into account in the pipe installation phase (see page 30). The sensor cord can be extended to 50 m.

Jacket pipe dimensions [mm]	Maximum support interval [m]
68	0.6
90	0.9
140	1.2
175	1.8
200	2.2

Maximum support intervals for different jacket pipe diameters in horizontal and vertical mounting. If required, the support interval can be shortened to prevent "hanging".



Electrical Installation

General safety regulations must be considered during the installation. Connections can only be made by a qualified electrician. The heating cable must not be damaged during installation. The heating cable and its connection box must usually placed on a class A structure so that, in normal use, they do not cause a temperature higher than 80°C in combustible construction materials or a temperature higher than 175°C when a fault occurs. In order to compensate for additional thermal loss, some heating cable is wrapped around flanges, metal connectors, valves etc. making sure that the cables do not touch. After installation, there must not be any tensile stress on the cable. Please take into consideration the Δl caused by the temperature of the plastic pipe in cable connections.

Connections

The Uponor Ecoflex Supra Standard regulator 600S is always connected to a final circuit protected with a residual current operated device. Besides the heating cable, no other consumption is permitted on the final circuit. It must be possible to separate the heating cable installation either with a common or circuit specific switch that can also be connected to the control circuit. The switch must bear position indicator markings or an indicator light and a label explaining the installation, for example, “Water pipe non-freeze heating”. The operation switch is not included in the delivery. The correct connection option must be checked from the cable length/ capacity chart and connection diagram (see next pages). The connection must be made so that the insulation resistance and the cable loop resistance can be easily measured later in an accessible location. Some connection options leave a free active conductor for the regulator because all three conductors, the resistor conductors and the Cu-return conductor are connected at the end of the cable. The free active conductor must always be equipped with the cap included in the delivery. The design length of the heating cable must not be altered without the planner’s permission. An earthed metal cord must always be connected to a (PE) protective earth terminal. The metal cord must not be used as a neutral conductor. The supply cable must always be equipped with a separate shielded wire in the neutral conductor (general safety regulations). Instructions contained in the connection sets must be complied with. The insulation and circuit resistance of the heating cable must be measured before covering and commissioning the pipes. The insulation level must comply with the requirement 1 kΩ/1V (general safety regulations).

During measuring, the test log supplied with the installation set must be filled in. The appropriately filled in test log is a prerequisite for safe operation.

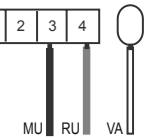
Cable connection options

Connection instructions for the yellow heating cable

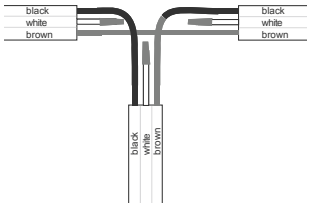
Cable type
2 x 0.48 Ω/m + 1.5 mm 2 Cu-return

1 For the 2 x 0.48 series, for lengths: 230V 50-80 m, 400V 80 – 140 m

Regulator connection



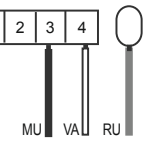
Branching connection



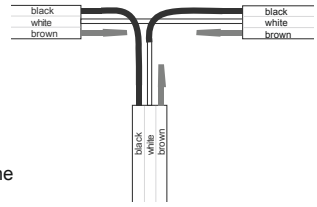
Note!
An active Cu-return conductor unrequired for the connection is connected to loose fastener.

2 0.48 + Cu-return, for lengths: 230V 70-120 m, 400V 120 – 220 m

Regulator connection



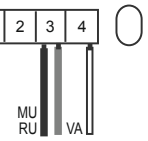
Branching connection



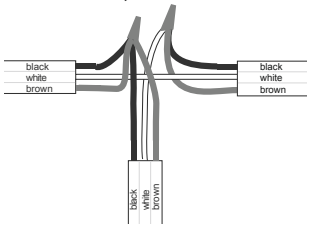
Note!
One of the active resistor conductors unrequired for the connection is connected to the loose fastener

3 2 x 0.48 parallel + Cu-return, for lengths: 230V 100 – 180 m, 400V 150 – 300 m

Regulator connection



Branching connection



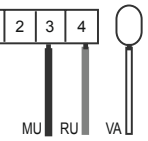
Note!
No loose fastener is used

Connection instructions for the white heating cable

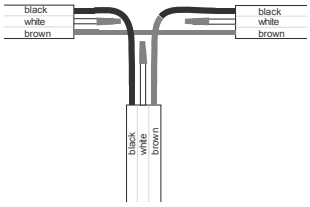
Cable type
2 x 0.05 Ω/m + 2.5 mm 2 Cu-return

4 For the 2 x 0.05 series, for lengths: 230V 150-260 m, 400V 250-450 m

Regulator connection



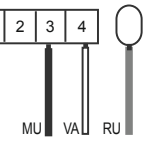
Branching connection



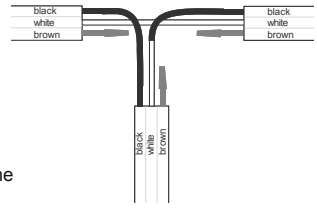
Note!
An active Cu-return conductor unrequired for the connection is connected to loose fastener.

5 0.05 + Cu-return, for lengths: 230V 290-400 m, 400V 500-700 m

Regulator connection



Branching connection

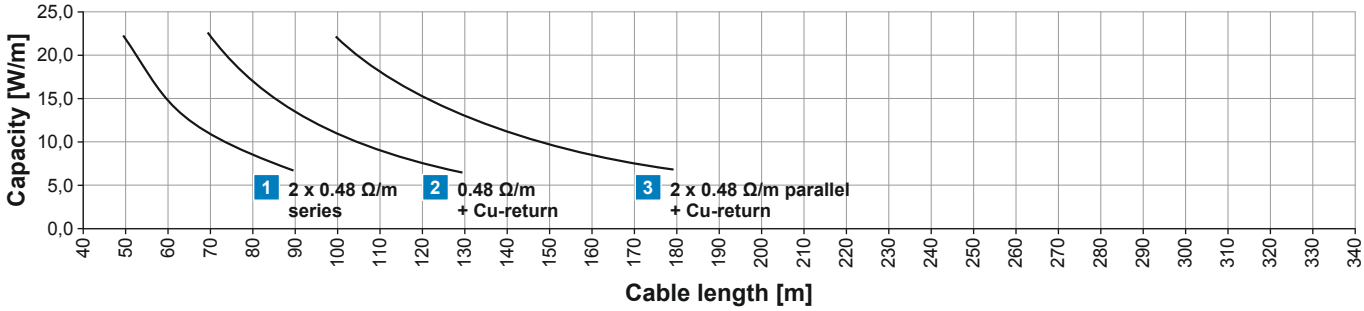


Note!
One of the active resistor conductors unrequired for the connection is connected to the loose fastener

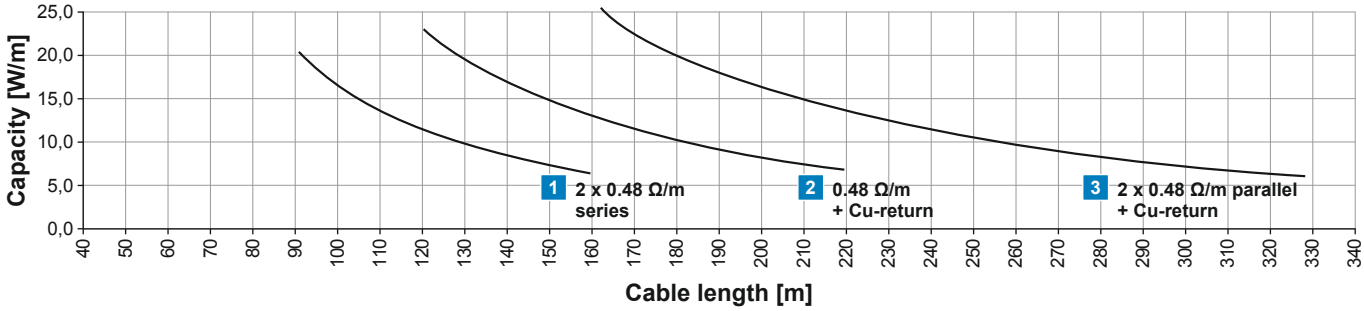
Heating capacity charts with various options for connections

Yellow cable

Yellow cable 2 x 0.48 Ω/m + Cu, connection 230V

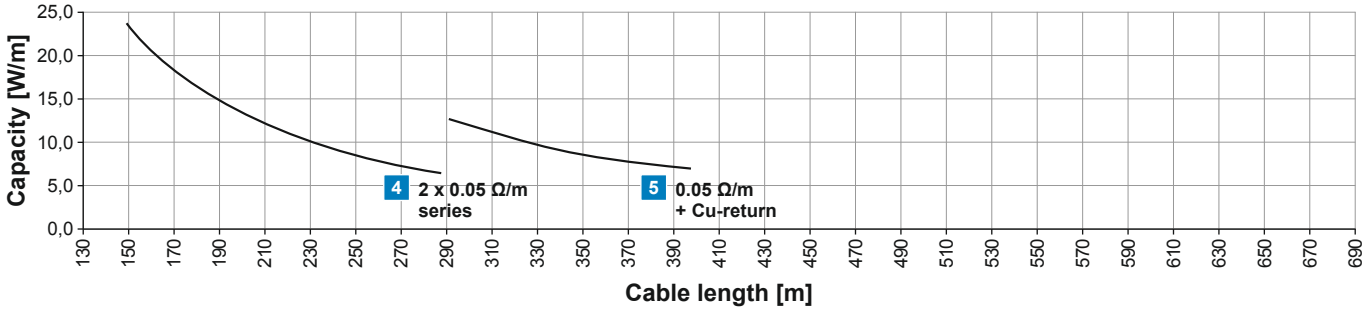


Yellow cable 2 x 0.48 Ω/m + Cu, connection 400V

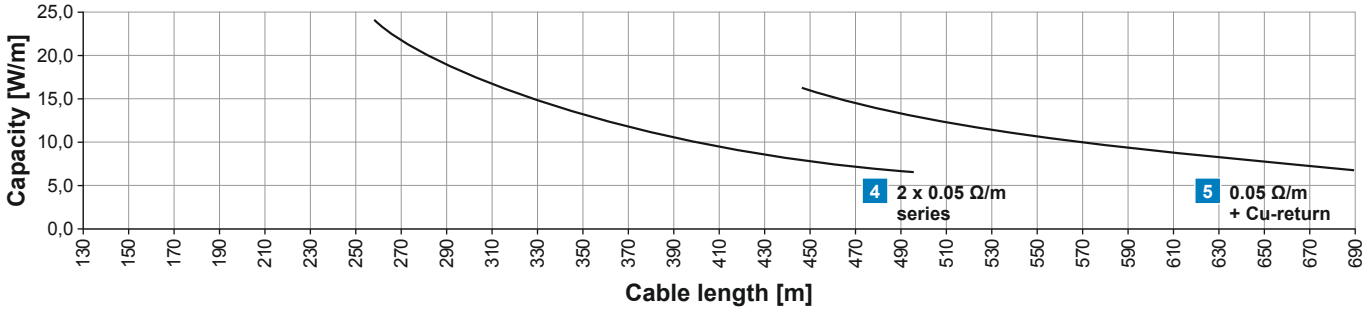


White cable

White cable 2 x 0.05 Ω/m + Cu, connection 230V



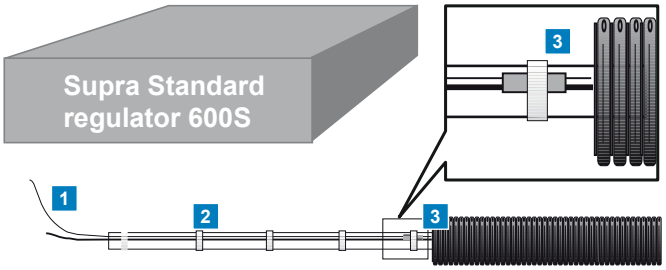
White cable 2 x 0.05 Ω/m + Cu, connection 400V



Installing the regulator

The Uponor Ecoflex Supra Standard regulator 600S is supplied in a splash water proof switch box (IP 54) installed on the surface of the structure and also functioning as the connection box for external cabling. The indicator lamp indicates the supply of electrical power. The fuse inside the regulator is a fast 5 A sand-filled glass-tube fuse. The regulator is supplied with an NTC temperature sensor equipped with a 4 m cord. The temperature sensor cord may be extended if required (max. 50 m). The sensor can be tested by measuring the circuit resistance. The resistance value of an NTC sensor is approximately 15 kΩ at ±0°C and approximately 10 kΩ at +30°C. The NTC temperature sensor is attached on the heating cable surface (please see image) The temperature sensor cable is protected with a casing in locations where it is susceptible to mechanical damage.

The regulator does not contain the operation switch required for the heating system, meaning that the switch must be separately installed. The regulator is connected to a final circuit protected with a 30 mA ground fault interrupter (on longer lines, a 300 mA ground fault interrupter may be used instead). The temperature in the regulator installation location must be room temperature or lower.

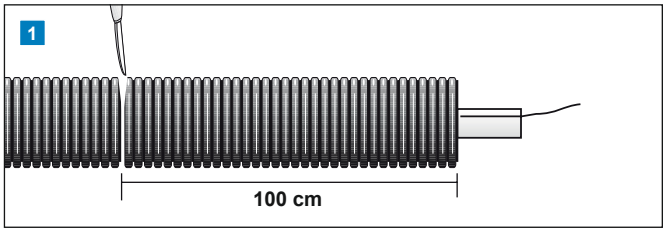


The regulator is connected to a final circuit protected with 30 mA ground fault interrupter

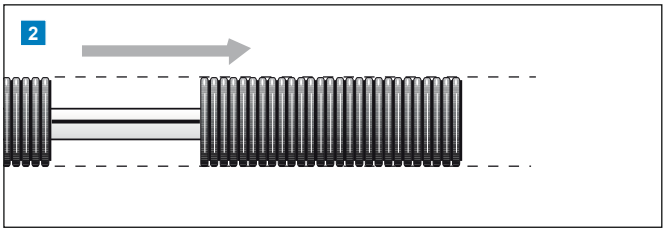
1 *Sensor cord*
2 *Tape*
3 *Sensor*

Uponor Ecoflex Supra Standard connection and end set

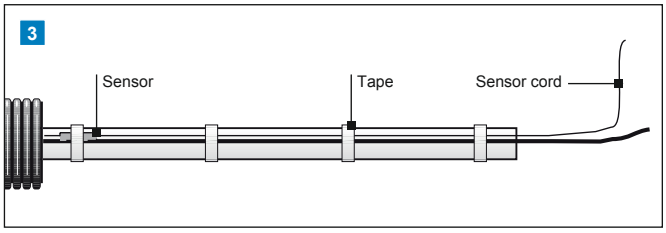
Installation of the coupling



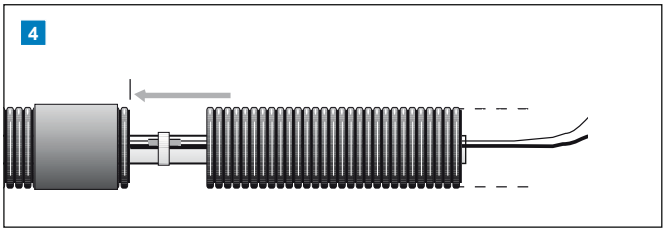
Cut the casing pipe and insulation with a sharp knife one metre from the end of the pipe. Do not press the knife all the way through the insulation to avoid damaging the cable.



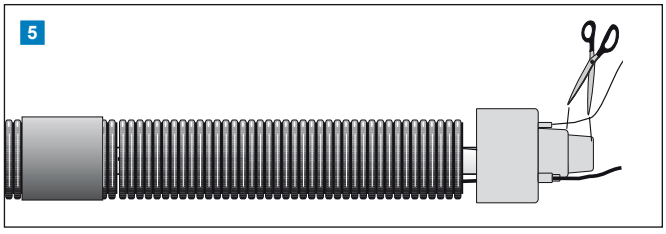
Pull the cut casing pipe and insulation off the service pipe.



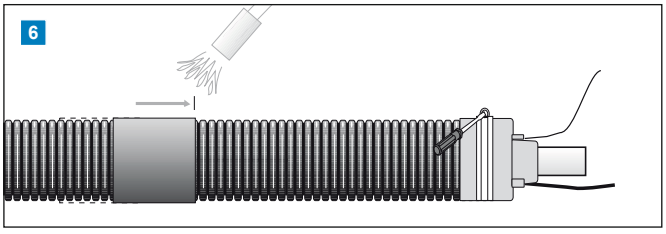
Attach the temperature sensor on the heating cable surface according to the electrical installation in-structions supplied in Supra Standard 1 installation set and tape the sensor cord on the pipe.



Place the peeled off insulation back in its place. Put a shrinking plastic pipe on the extension and heat it up.

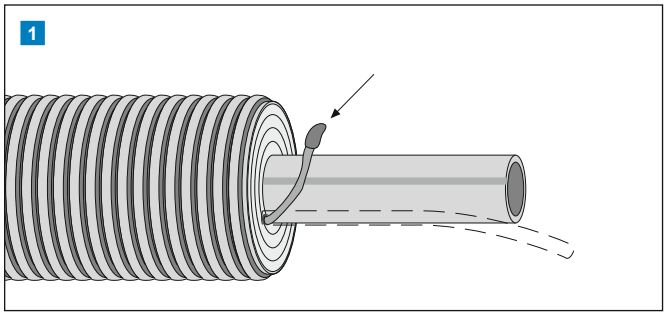


Place the seal in its place 2. at the 2nd or 3rd groove. Cut the output for the service pipe of the end cap at the correct dimension. Cut the sensor output (2) and cable output (1) at the correct location.

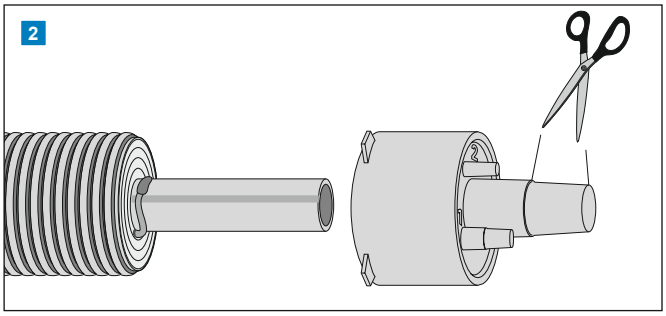


Fit the end cap in place. Join the heating cable with the supply cable using Supra Standard 1 installation set (separate installation instructions for the electrician). Place the clamping ring above the o-ring on the end cap and tighten.

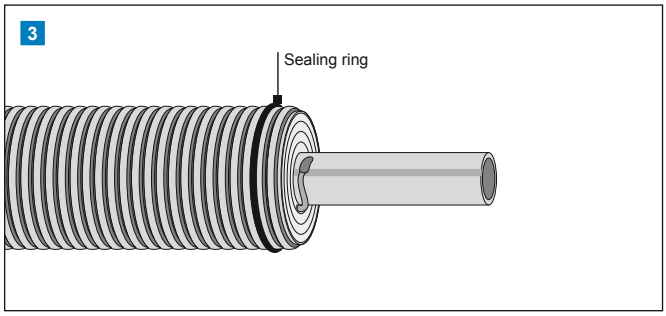
Installation of the terminal



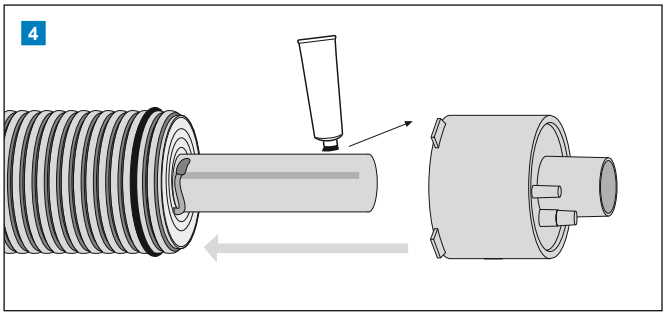
Peel off the casing pipe and remove the insulation taking into account the length of the end cap. Reserve 0.5 m of cable for the electrician. Cut the service pipe at the required length. Do not damage the cable or the service pipe. Clean thoroughly (including the casing pipe).



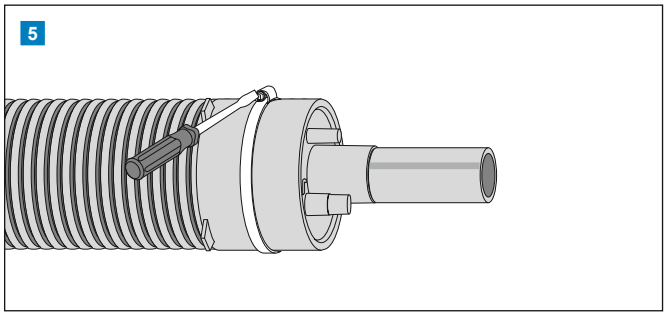
Carry out the termination using the installation set Supra Standard 1 (separate installation instructions for the electrician).



Place the seal in its place in the 2nd or 3rd groove. Cut the output for the service pipe of the end cap at the correct dimension.



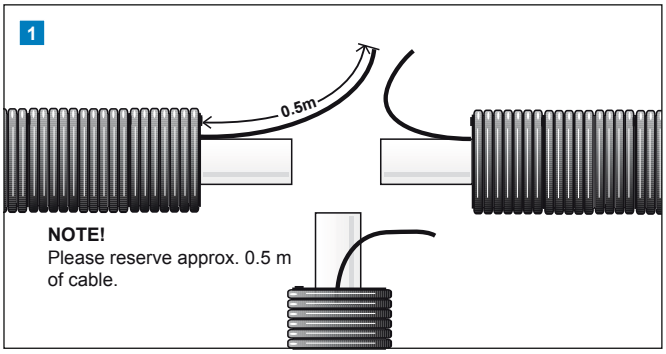
Pull the end cap on top of the pipe element using lubricant.



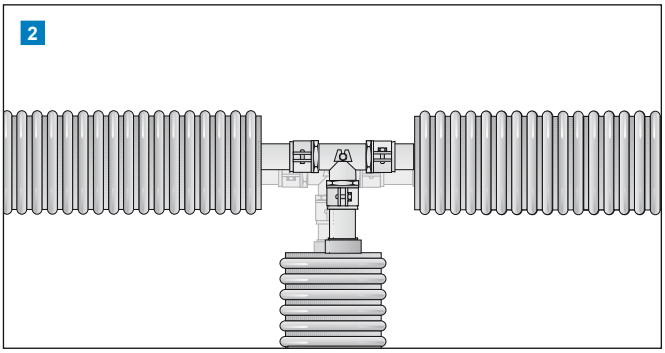
Place the clamping ring above the seal on the end cap and tighten.

Uponor Ecolfex Supra Standard T-joint set

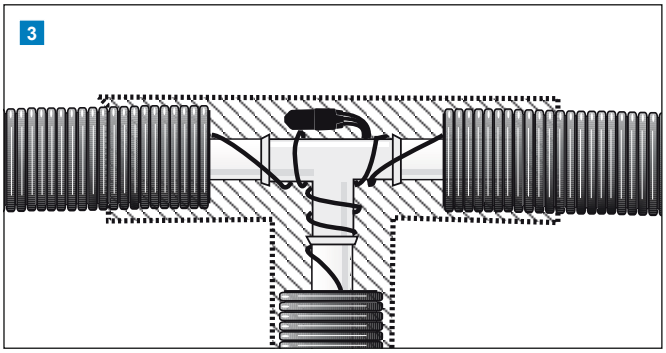
Installation of the branch tee



Peel off the casing pipe and remove the insulation taking into account the size of the branch tee. Only peel off what is absolutely required in order to connect the service pipe. Reserve approximately 0.5 m of cable for the electrician. Cut the service pipe at the required length. Please note! Do not damage the cable or the service pipe. Cut the service pipe so that the total length of uninsulated pipe ends and connectors is as small as possible. Thoroughly clean the pipe ends of all burr and dirt (including the casing pipe).

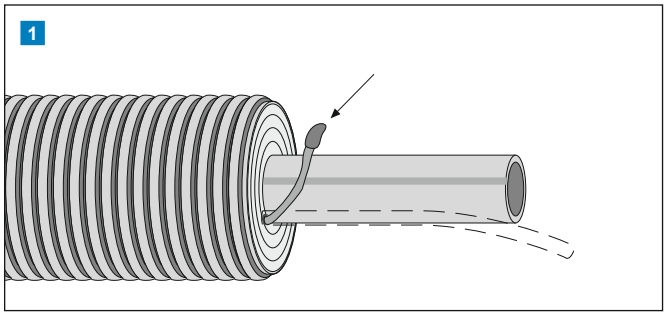


Join the service pipes with couplings (not included in the set). If required, the end caps are installed in place before joining the service pipes. Be careful not to damage the heating cable. Note the required shrinks for insulating the branch tee before installing the fasteners. Use the insulation that was peeled off as an additional insulation for the joint.

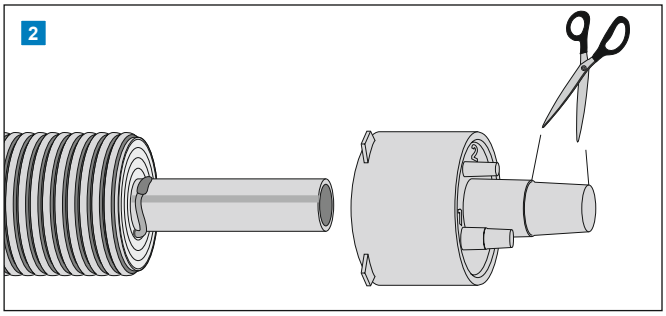


Join the ends of the heating cables with Supra Standard 2 installation set equipment and wrap the heating cables on the branch with heatproof tape (electrician).

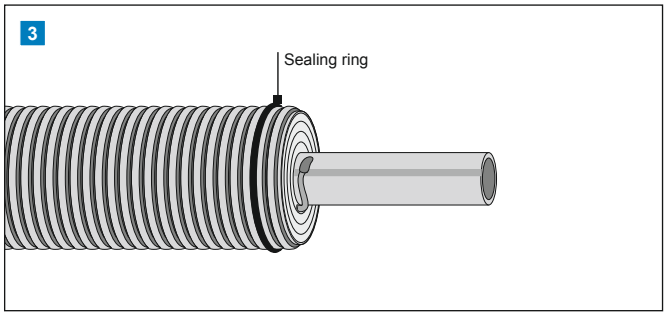
Installation of the terminal



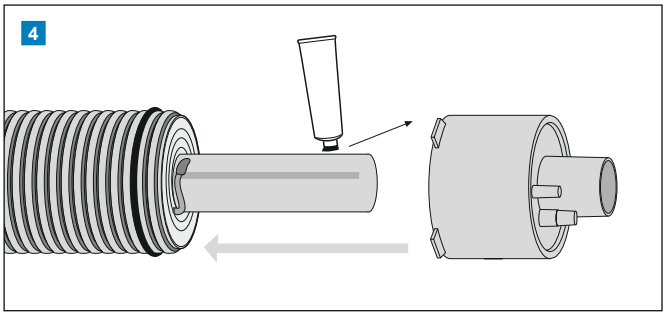
Peel off the casing pipe and remove the insulation taking into account the length of the end cap. Reserve 0.5 m of cable for the electrician. Cut the service pipe at the required length. Do not damage the cable or the service pipe. Clean thoroughly (including the casing pipe).



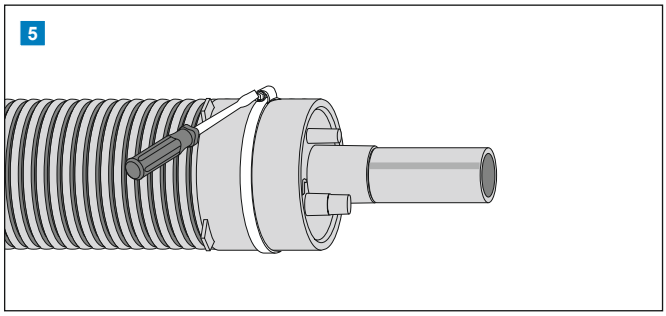
Carry out the termination using the installation set Supra Standard 2 (separate installation instructions for the electrician).



Place the seal in its place in the 2nd or 3rd groove. Cut the output for the service pipe of the end cap at the correct dimension.



Pull the end cap on top of the pipe element using lubricant.

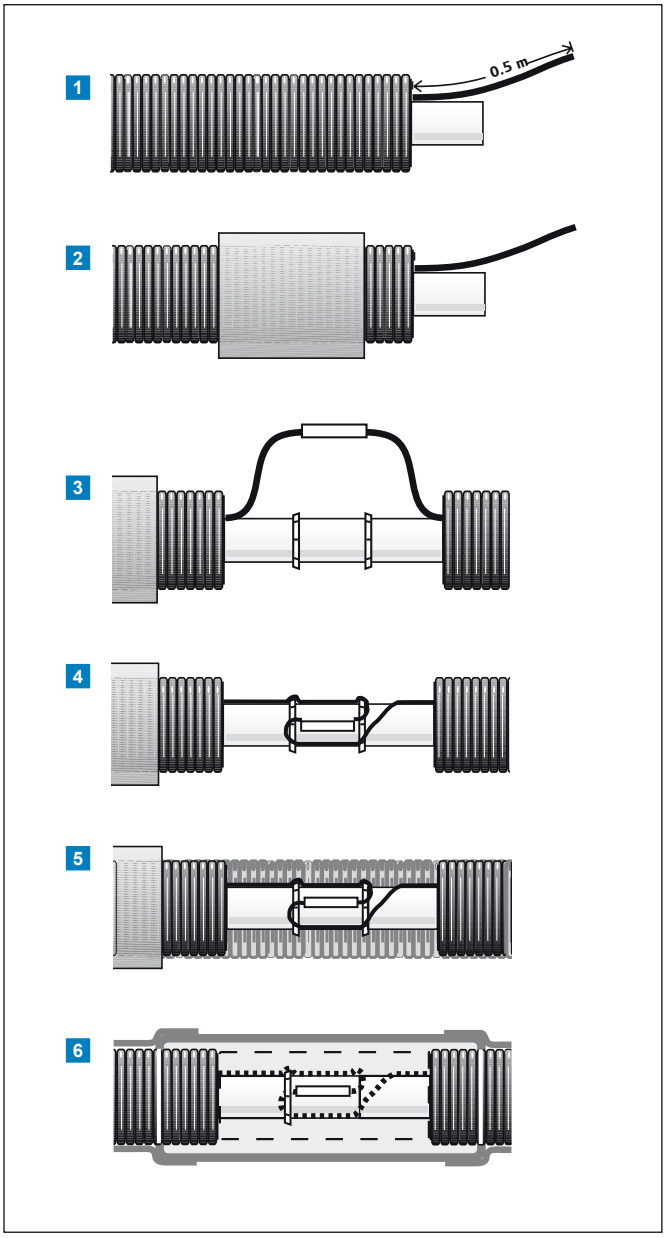


Place the clamping ring above the seal on the end cap and tighten.

Uponor Ecoflex Supra Standard straight joint set

Note!
Remove the insulation in a way that allows you to use it later to insulate the connector. Cut the service pipe at the required length. Do not damage the cable or the service pipe. Cut the service pipe so that the total length of uninsulated pipe ends and couplers do not exceed the length of the PE sleeve (400 mm). Clean the end of the pipe thoroughly (including the casing pipe).

Conducting the extension



1. Peel off the casing pipe and remove the thermal insulation taking into account the length of the PE sleeve 400 mm. Reserve 0.5 m of cable for the electrician.
2. Install the PE sleeve, length 400 mm and shrink sleeves on one pipe before installing the fastener.
3. Join the service pipes with couplers (not included in the set). Be careful not to damage the heating cable.

   Carry out the extension of the heating cable using the supplies in the Supra Standard 3 installation set (separate installation instructions for the electrician).
5. Fasten the heating cable on the pipe extension using heatproof tape as shown in the picture. There must be no mechanical strain on the heating cable extension.
6. Install the insulation that was peeled off carefully on the extension. Fasten using tape.
7. Place the PE sleeve on the extension in a central position. Ensure that there is enough shrink sleeve on both casing pipes. Remove any protective paper left inside the shrink sleeve. Shrink using a yellow flame. Start the shrinking from the middle and heat evenly and slowly on all sides. First proceed to one end and then to the other. Be careful not to burn the shrink sleeve or the casing. When the surface of the shrink sleeve is smooth and adhesive is extruding from the ends of the shrink sleeve, the shrink sleeve has received enough warmth. Installation is ready when the extension has cooled down to ambient temperature.

Uponor Ecoflex Supra Mantle
An insulated jacket for water pipe inlet

Uponor Ecoflex Supra Mantle protects the parts of a water pipe most susceptible to freezing, generally near the building foundation or inside a ventilated floor system. The jacket can be used for new buildings and renovation.

Supra Mantle is an insulated jacket pipe equipped with a heating cable that prevents the water pipe from freezing. Supra Mantle is an easy and effective way to protect the water pipes around the building from damage caused by freezing and, at the same time, it functions as a jacket pipe for the water pipe, enabling the exchanging of the water pipe in case damage occurs. The heat cable brings the required heat into the jacket pipe and the insulation layer helps retain the heat in the jacket pipe. Water remains unfrozen even in extremely cold temperatures in all locations susceptible to freezing. Passes under the foundations and ventilated floor systems are the most typical locations in which water pipes freeze.

The heating cable connections in the Supra Mantle jacket pipe are ready for use. Connection to the electrical network is with a plug and the power outlet used must be equipped with a fault current protection. In the connection end, there is approximately 1 m of extra heating cable, which can be used to protect the service pipe from freezing during winter construction. The plug is connected to the socket when there is a risk of water pipe freezing. The maximum capacity of the cable is 10 W/m, enough to retain a water pipe unfrozen in a temperature of -25°C.

Pipe design

1 ***HDPE jacket pipe***

The HDPE jacket pipe are made of corrugated HD polyethylene. Corrugation makes the casing robust against heavy traffic load but keeps flexibility for the installation.

2 ***Insulation***

The insulation is made of crosslinked polyethylene foam. The closed-cell structure of the insulation prevents water absorption and provides good insulation capacity. The foamed plastic density is 30 kg/m³ and thermal conductivity 0.038 W/mK.

3 ***Heating cable***

The self-regulating heating cable has a nominal output of 10 W/m and supply voltage of 230V.

4 ***Aluminium foil***

The heating cable is attached to the insulation layer with aluminium foil.

Uponor Ecoflex Supra Mantle

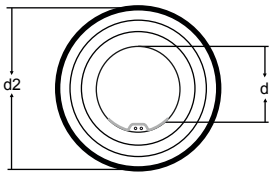
25 – 40 mm

Main application
- Freeze-protection

Insulating material
- PE-X

Material jacket pipe
- HDPE

Cable
- Self-regulating with plug

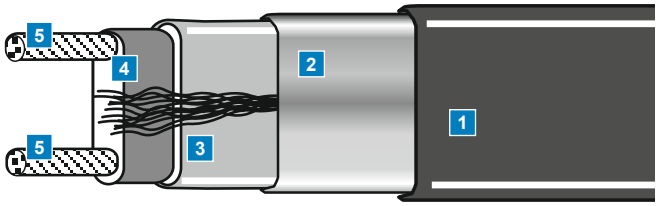


Uponor Ecoflex Supra Mantle offering

Item no.	Jacket pipe d2 [mm]	d [mm]	Weight [kg/m]	Max. length on delivery [m]
1034177	90	25 – 40	5.4	5

Uponor Ecoflex Mantle self-regulating heating cable

The self-regulating cable has been designed particularly to prevent the pipes from freezing. This property combined with the insulation guarantees a dependable and safe solution. The heating part of the self-regulating heating cable is a conductive polymer extruded between two copper wires (phase and zero). In cold parts, a large current travels from one wire to another creating heat in the core material. In the warmer parts of the cable, the resistance of the material grows, the current slows down and the output is reduced. The heat production of the cable remains balanced and the heating capacity is regulated according to ambient conditions separately in each part of the pipe (see cross-section image). In low temperatures, the Supra Mantle provides adequate power to prevent freezing. As the temperature increases, the power is reduced. The self-regulating nature of the Supra PLUS means its use is safe.

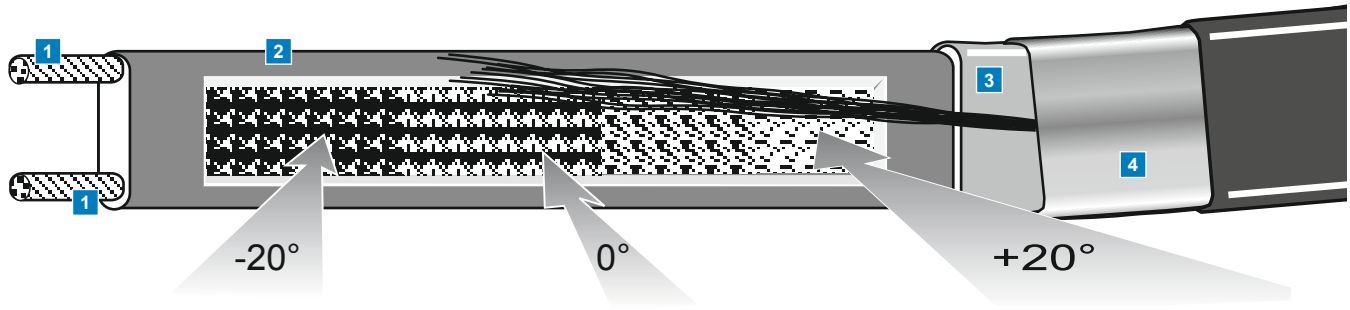


1 *Outer jacket*
2 *Aluminum folio and drain wires*
3 *Electrical insulation*
4 *Core*
5 *Conductors*

External dimensions	Width 12.5 mm, thickness 5.2 mm
Smallest bending radius	13 mm
Supply voltage	230 V
The maximum permissible operating temperature	Continuous 65°C Momentary 85°C
Max. installation length	100 m 10 A, 150 m 16 A
Nominal output (on the surface of an insulated metal pipe +5°C)	10 W/m

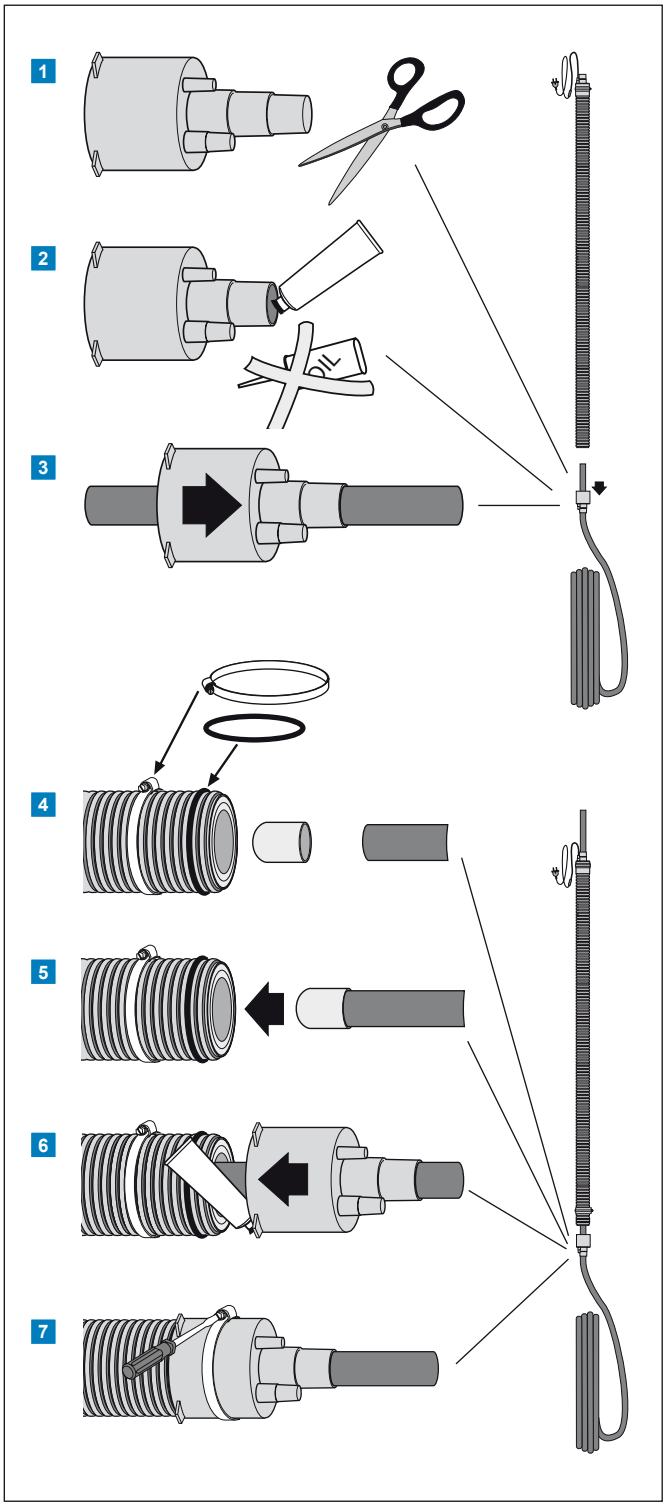
Self regulating cable 230V 10 W/m

When the cable is cold, the resistor material contracts, opening several routes for power along the carbon crystals contained in the core material. The electrical current travelling through the core material creates the heat. In warm locations, the polymer in the resistor material expands and the number of routes for the electrical current is reduced. This makes the resistance increase and the heat transfer capacity to decrease. In “hot” locations, the core material expands so that only a few routes are left for the power current in the core material. The result is a great resistance reducing the power transmission capacity further.



1 *1.2 mm² copper wires copper wires*
2 *Self-regulation resistor material*
3 *Polyolefin insulation*
4 *Aluminum folio and drain wires*

Installation



The installation of Supra Mantle is easiest when the water pipe is installed before any connectors are connected to the water pipe. The jacket is slid on the water pipe in the correct place and then the jacket containing the water pipe is installed in the correct location.

Installation steps

1. Open the end cap output according to the water pipe diameter. Also open an output corresponding to the water pipe diameter on the end cap already in the connection end.
2. Lubricate the end cap with a suitable lubricant.
3. Fit the end cap on the water pipe taking the length of the jacket (5 or 10 m) into account. The end cap is used to seal the end of the jacket left in the ground.
4. Place the clamping ring on the jacket and install the sealing ring in the third groove on the jacket.
5. Fit a push plug at the end of the water pipe and push the water pipe through the jacket. Ensure you have enough water pipe to make the connections.
6. Lubricate the end cap on the water pipe and fit it over the jacket.
7. Tighten the clamping ring on the end cap above the sealing ring.

Product line components

Uponor Wipex fitting range

The Wipex coupling is specifically designed for connecting cross-linked polyethylene pipes, produced by Uponor, for hot and cold water in domestic and district heating installations. The coupling is available for pipe dimensions 25 – 110 mm, in two series marked PN 6 and PN 10.

Benefits

- The Wipex coupling is patented, tested according to DVGW (Germany), NKB (Sweden), CSTB (France), KIWA (Holland) and approved.
- The main components of the fittings are made of DR brass (resistant to dezincification).
- O-rings are used to make a seal between the couplings and pipe fittings.
- Additional sealing using teflon or hemp is not required
- The Wipex fitting system allows for an extremely wide range of connection combinations.
- No special tools required – only two fixed wrenches and a plier.

The Wipex coupling is designed to give an excellent tight grip. The gripping strength is higher than the tensile strength of the pipe, and the sealing performance is unaffected by temperature fluctuations.

Wipex couplings are robust and simple in design, can be fitted very easily and quickly even in difficult locations and confined spaces. The ring spanners used when fitting the coupling are very small and convenient to use in relation to the size of the coupling.

Uponor Ecoflex Supra plastic coupling

The Uponor Ecoflex plastic coupling has been tried and proven over many years as the perfect connection for HDPE medium pipes. The simple handling of this clamping fitting provides, on the one hand, a safe connection and on the other hand rapid progress in installing Supra pipe systems.

Also the Supra pipes can be connected by electro-welding-fittings, which are approved for PE 100, SDR 11 pipes (not provided by Uponor flexible, pre-insulated systems).

Uponor Ecoflex Supra plastic coupling

Electro-welding-fitting

Uponor Ecoflex insulation sets

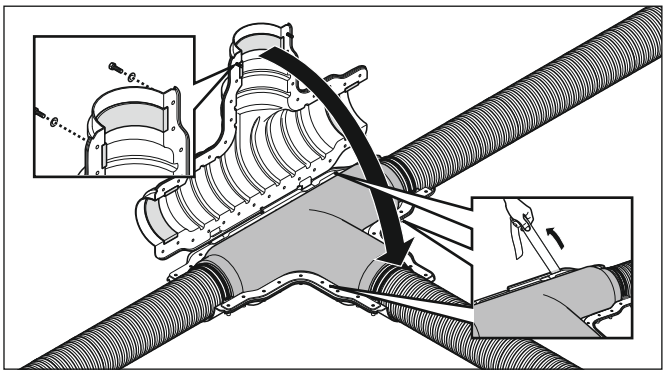
For all straight, elbowed and T-connections the matching insulating sets are available to insulate and seal jacket pipes. They fit onto both Single and Twin pipes and keep a heavy load of 60 tons. There is also an H-insulating set available for transition from single main lines to twin branch lines. The insulation sets comprise insulated half-shells which are first bonded with PU adhesive and finally screwed and dowelled. Pipes with a jacket pipe diameter less than 140 mm can be adapted using Uponor Ecoflex reducer rings.

Uponor Ecoflex T-insulation set

Uponor Ecoflex elbow insulation set

Uponor Ecoflex straight insulation set

Uponor Ecoflex H-insulation set



Mounting the T-insulation set

Note!
Joints should not be located underneath roads because this makes access difficult and heavy vehicles could damage the joint.
If the H-insulation set is installed underneath roads it is necessary to use a concrete slab above the joint to distribute the heavy traffic load.

Uponor Ecoflex chamber

Uponor Ecoflex chambers are designed for pipe joints that cannot be made with an Uponor Ecoflex insulation set. This includes, for instance, connections between single to two or more twin pipes. The rotationally moulded chamber has walls made of polyethylene and, on the inside, it is coated with a PE insulant. The insulative layer ensures minimized heat loss. The branching chamber enables the joining of other connections at a later date. The chamber has a water-tight structure and is suitable for all pipe dimensions (casing pipe size 140 – 200 mm).

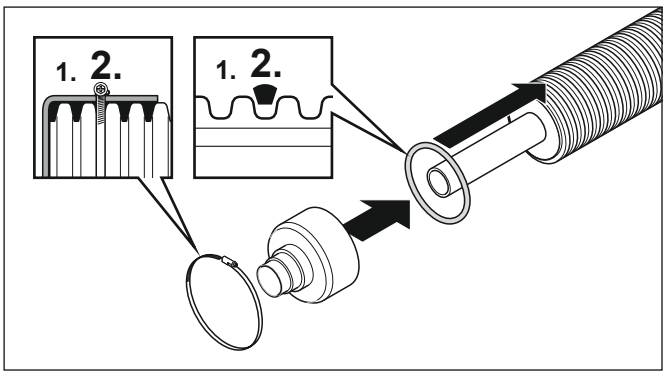
Exterior view – the walls of Uponor Ecoflex chamber are made of polyethylene.

Interior view – the inside of Uponor Ecoflex chamber is coated with PE insulant.

Uponor Ecoflex rubber end caps

Uponor Ecoflex rubber end caps protect the insulation at cut pipe ends and provide partitions between components. It is important to provide this protection against moisture ingress or damage, so that the whole system can fulfil its purpose optimally over many years. A sealing ring is also supplied to prevent the entry of water. The end caps can be assembled by easily and conveniently pulling them over the ends of the pipes, after which they are fully secured with a clamping ring.

Uponor Ecoflex rubber end cap



Mounting the rubber end cap

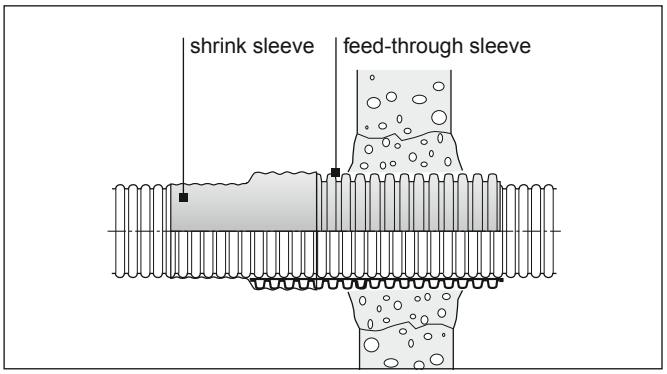
Uponor Ecoflex wall ducts

Wall sleeve set NPW (non-pressure-waterproof)

This wall sleeve can be used for the feed-through in building foundations wherever there is no pressurized water. The Wall sleeve is mounted in place when the foundations are cast or is bricked in a hole drilled afterwards. The shrink sleeve prevents water from leaking into the foundations from in between the pipe and the wall sleeve. The set contains a 400 – 550 mm long wall sleeve and a wide shrink sleeve.

Wall sleeve set NPW

Uponor Jacket pipe [mm]	Uponor Wall sleeve (da) [mm]
68	110
90	110
140	200
175	250
200	250



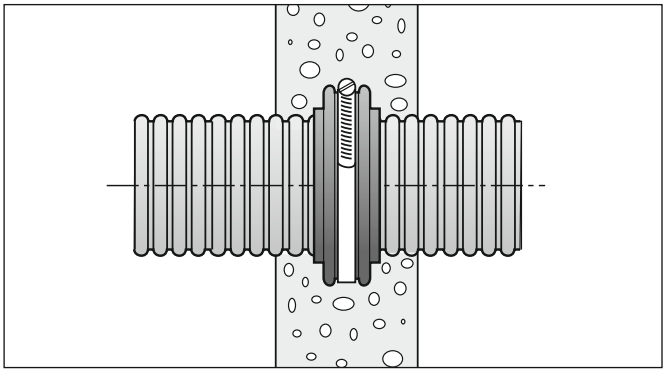
Mounting the wall sleeve set NPW

Wall through sealing NPW (non-pressure-waterproof)

Efficiently seals the feed-through in a concrete structure and prevents moisture from entering the building. Radon sealing has also been tested. The set contains the wall through sealing and the clamping ring.

Wall through sealing NPW

Uponor Jacket pipe [mm]	Uponor Through seal [da]
140	190
175	225
200	250

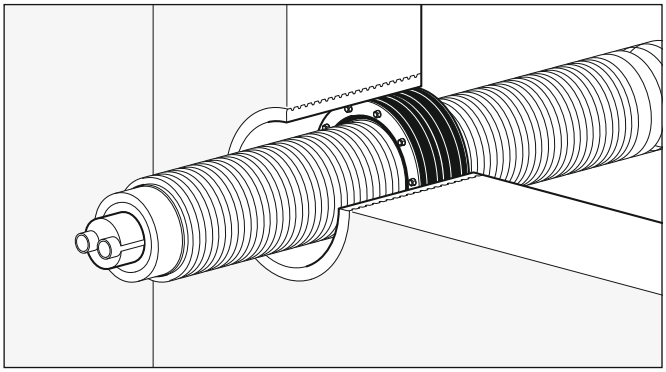


Mounting the wall through sealing NPW

Uponor Ecoflex wall seal PWP (pressure-waterproof)

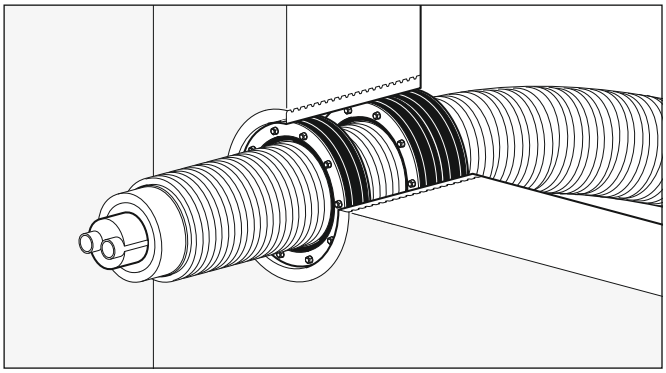
Wall seal PWP

An Uponor PWP wall seal must be used wherever water at pressure is to be expected. They can either be used directly in a coated tapping drill hole into waterproof concrete, or in a fibre cement pipe that is concreted or bricked into place.



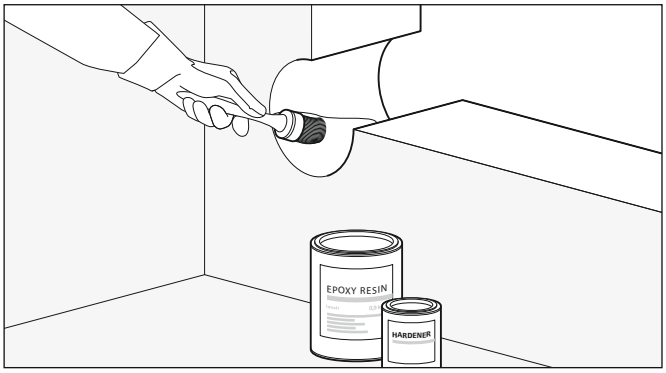
Additional insert PWP

If it is not possible to introduce the jacket pipe perpendicularly into the wall duct, we recommend that the Uponor Ecoflex additional insert PWP is used to disperse any possible stresses.



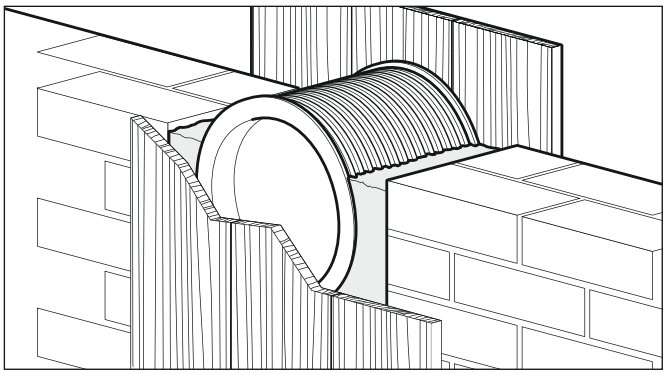
Epoxy resin set PWP

Before the wall seal PWP is fitted into a tapping drill hole, it must be coated with Epoxy resin!



Fibre cement pipe PWP

The wall seal PWP can also be mounted into an Uponor Ecoflex fibre cement pipe. Tjhe fibre cement pipe can be fixed in a brick wall or poured in a concrete wall.



Uponor Jacket pipe [mm]	Core hole [mm]
140	200
175	250
200	300

Additional accessories

Damaged jacket pipes can be repaired easily and reliably with a repair shrink sleeve from Uponor. The Uponor Line warning tape is laid above the flexible, pre-insulated pipe to mark and identify it.

Uponor Ecoflex repair sleeve for jacket pipes

Uponor Ecoflex trench warning tape

For supporting pipes exactly into place in base floor feed-throughs. Several bending fixture angles can be joined together side by side. The conduit angle is used as a casing pipe when leading insulated pipe elements into buildings. It is made of PVC plastic.

Uponor Ecoflex pipe bend support

Uponor Ecoflex conduit angle

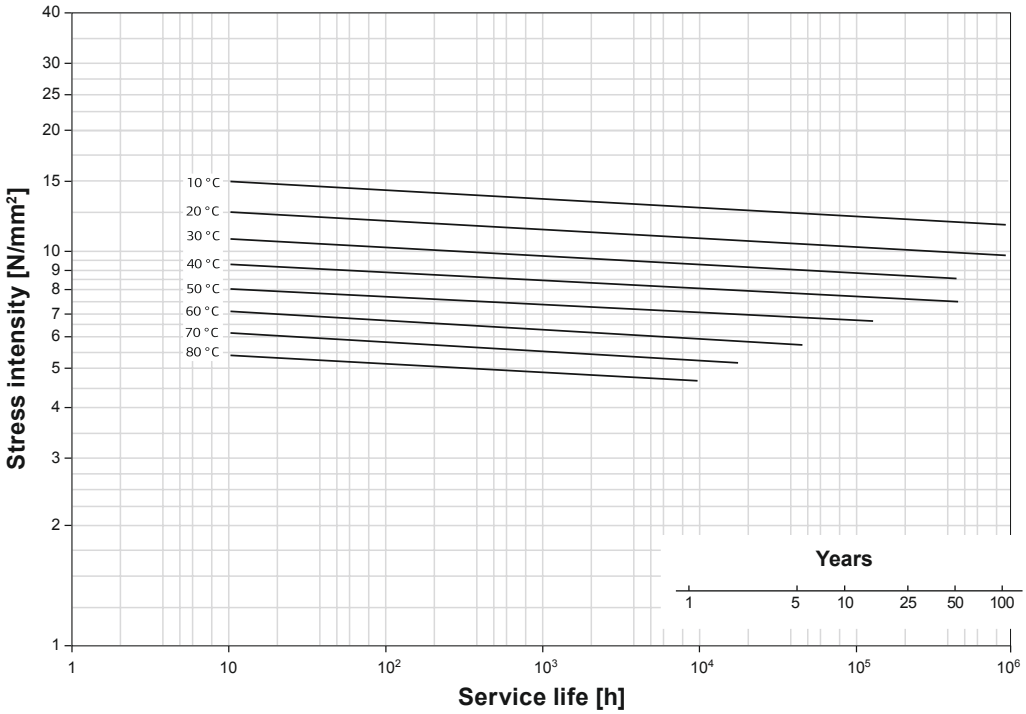
General information

PE 100 service pipe (applications up to 20°C)

The service pipe in our Uponor Ecoflex Supra pipes is produced either in HDPE (PE 100) or MDPE (PE 80) material. The pipes are designed especially for transporting cold potable water and/or for use in cooling water networks. The HDPE service pipe used in Supra and Supra PLUS 16 bar is DVGW-approved for transporting potable water. The black service pipes used in Supra PLUS and Supra Standard have an Insta-CERT certification for water supply.

Property	Standard	PE 100	P E80	Unit
Density at 23°C	DIN 53479 ISO 1183 ISO/R 1183	0.96	0.95	g/cm³
Strength at break	ISO 572-2	38		MPa
Elongation at break	ISO 572-2	> 600	> 800	%
Tensile stress at yield	ISO 572-2	25	19	MPa
Tensile modulus	ISO 572-2	1100 – 1200	800	MPa
Vicat softening tempertature VST-A/50 VST-B/50	DIN/ ISO 306	 127 77	NA	°C
Thermal conductivity at 20°C	DIN 52612	0.38	0.38	W/m K
Oxidation induction time (200°C)	EN 728	> 20	> 20	min
Operation temperature		- 10…+ 20 (16 bar)		°C
Thermal linear expansion coefficient	DIN 53752	1.8 x 10^{-4}	1.8 x 10^{-4}	1/ °C
Fire class	DIN 4102 part 2 EN 13501 part 1	B2 E	B2 E	

Service life: HDPE medium pipe

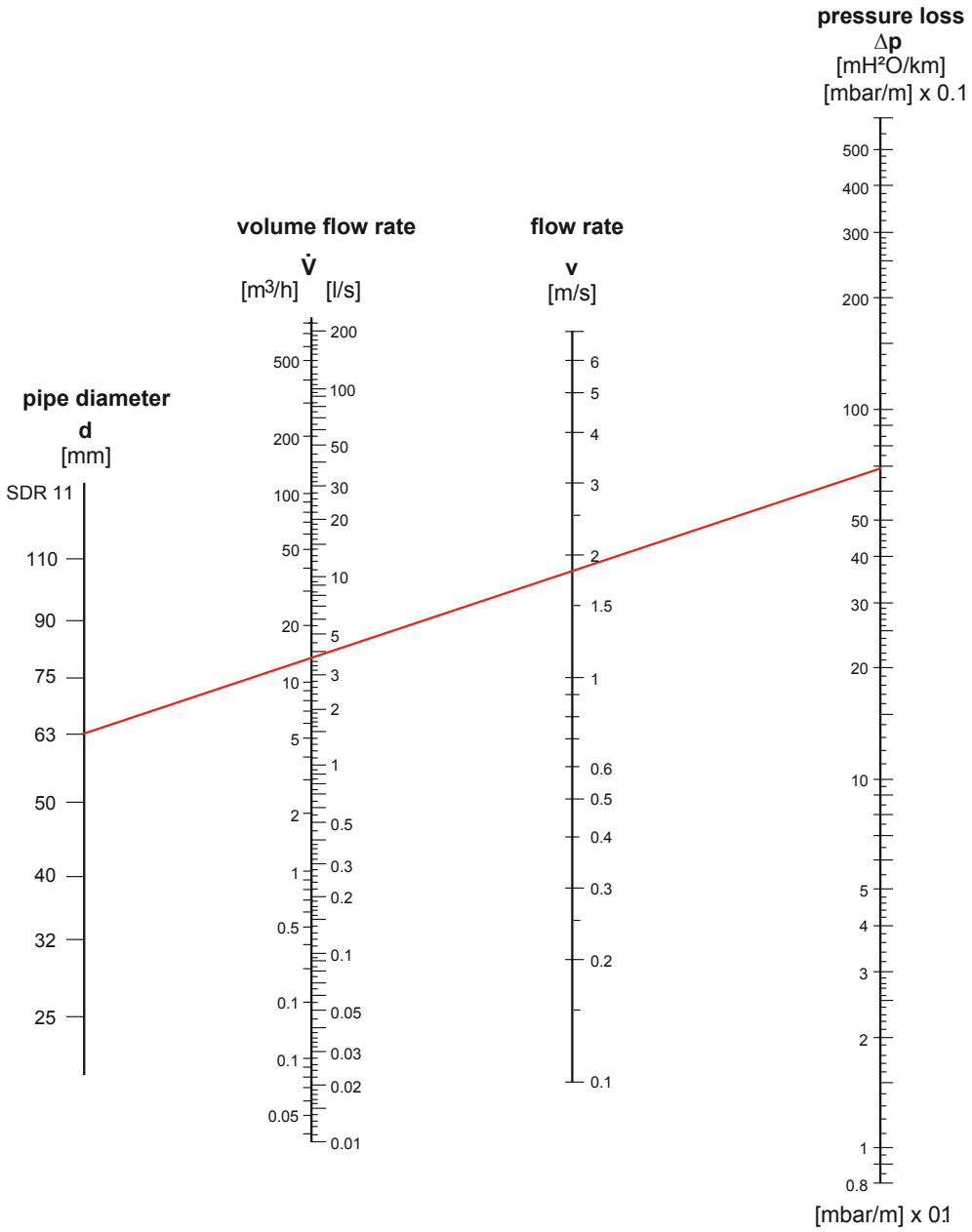


Pressure loss table for Uponor Ecoflex Supra pipes

Portable water/cooling water pipe: Basis 20°C water temperature

V	25 / 20.4 / 2.3		32 / 26.2 / 2.9		40 / 32.6 / 3.7		50 / 40.8 / 4.6		63 / 51.4 / 5.8		75 / 61.4 / 6.8		90 / 73.6 /8.2		110 / 90.0 / 10.0	
l/s	v l/s	Δp bar/ 100 m	v l/s	Δp bar/ 100 m	v l/s	Δp bar/ 100 m	v l/s	Δp bar/ 100 m	v l/s	Δp bar/ 100 m	v l/s	Δp bar/ 100 m	v l/s	Δp bar/ 100 m	v l/s	Δp bar/ 100 m
0.025	0.076	0.0086														
0.0315	0.096	0.0127	0.059	0.0041												
0.04	0.122	0.0189	0.075	0.0061												
0.05	0.153	0.0275	0.094	0.0088	0.060	0.0031										
0.063	0.193	0.0407	0.119	0.0130	0.075	0.0045										
0.08	0.245	0.0611	0.151	0.0195	0.096	0.0067	0.061	0.0024								
0.1	0.306	0.0895	0.188	0.0285	0.120	0.0098	0.076	0.0034								
0.125	0.382	0.1315	0.235	0.0417	0.150	0.0144	0.096	0.0050	0.060	0.0017						
0.16	0.490	0.2016	0.301	0.0638	0.192	0.0219	0.122	0.0076	0.077	0.0026	0.054	0.0011				
0.2	0.612	0.2974	0.377	0.0939	0.240	0.0321	0.153	0.0111	0.096	0.0037	0.068	0.0016				
0.25	0.765	0.4394	0.471	0.1384	0.300	0.0473	0.191	0.0163	0.120	0.0055	0.085	0.0024	0.059	0.0010		
0.315	0.964	0.6599	0.593	0.2072	0.377	0.0706	0.241	0.0244	0.152	0.0082	0.107	0.0036	0.074	0.0015		
0.4	1.224	10.068	0.753	0.3152	0.479	0.1071	0.306	0.0369	0.193	0.0123	0.136	0.0054	0.094	0.0023	0.063	0.0009
0.5	1.530	14.972	0.942	0.4672	0.599	0.1585	0.382	0.0544	0.241	0.0182	0.170	0.0079	0.118	0.0033	0.079	0.0013
0.63	1.927	22.631	1.187	0.7039	0.755	0.2381	0.482	0.0816	0.304	0.0272	0.214	0.0119	0.148	0.0049	0.099	0.0019
0.8	2.448	34.774	1.507	10.776	0.958	0.3634	0.612	0.1242	0.386	0.0413	0.272	0.0180	0.188	0.0075	0.126	0.0029
1.0	3.059	52.062	1.883	16.072	1.198	0.5405	0.765	0.1842	0.482	0.0611	0.340	0.0266	0.235	0.0111	0.157	0.0043
1,25			2.354	24.022	1.498	0.8053	0.956	0.2738	0.602	0.0906	0.425	0.0394	0.294	0.0163	0.196	0.0063
1,6			3.014	37.567	1.917	12.547	1.224	0.4253	0.771	0.1403	0.544	0.0609	0.376	0.0252	0.252	0.0097
2.0					2.396	18.774	1.530	0.6345	0.964	0.2088	0.680	0.0904	0.470	0.0374	0.314	0.0143
2,5					2.995	28.148	1.912	0.9483	1.205	0.3112	0.850	0.1345	0.588	0.0555	0.393	0.0212
3.15							2.409	14.406	1.518	0.4714	1.071	0.2033	0.740	0.0838	0.495	0.0320
4.0							3.059	22.247	1.928	0.7254	1.360	0.3123	0.940	0.1285	0.629	0.0489
5.0									2.410	10.873	1.700	0.4670	1.175	0.1917	0.786	0.0729
6.3									3.036	16.567	2.142	0.7098	1.481	0.2908	0.990	0.1103
8.0											2.720	10.965	1.880	0.4480	1.258	0.1695
10.0											3.399	16.493	2.350	0.6722	1.572	0.2537
12.5													2.938	10.104	1.965	13.804
16.0															2.515	0.5966
20.0															3.144	0.8977

Portable water/cooling water pipe: Basis 20°C water temperature



Example

General data: V̇ = 3.8 l/s
v = 1.8 m/s
pipe length = 120 m

Outcome: d = 63
Δp = 68 mH²O/1000 * 120 m
= 8.2 mH²O (0.82 bar)

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