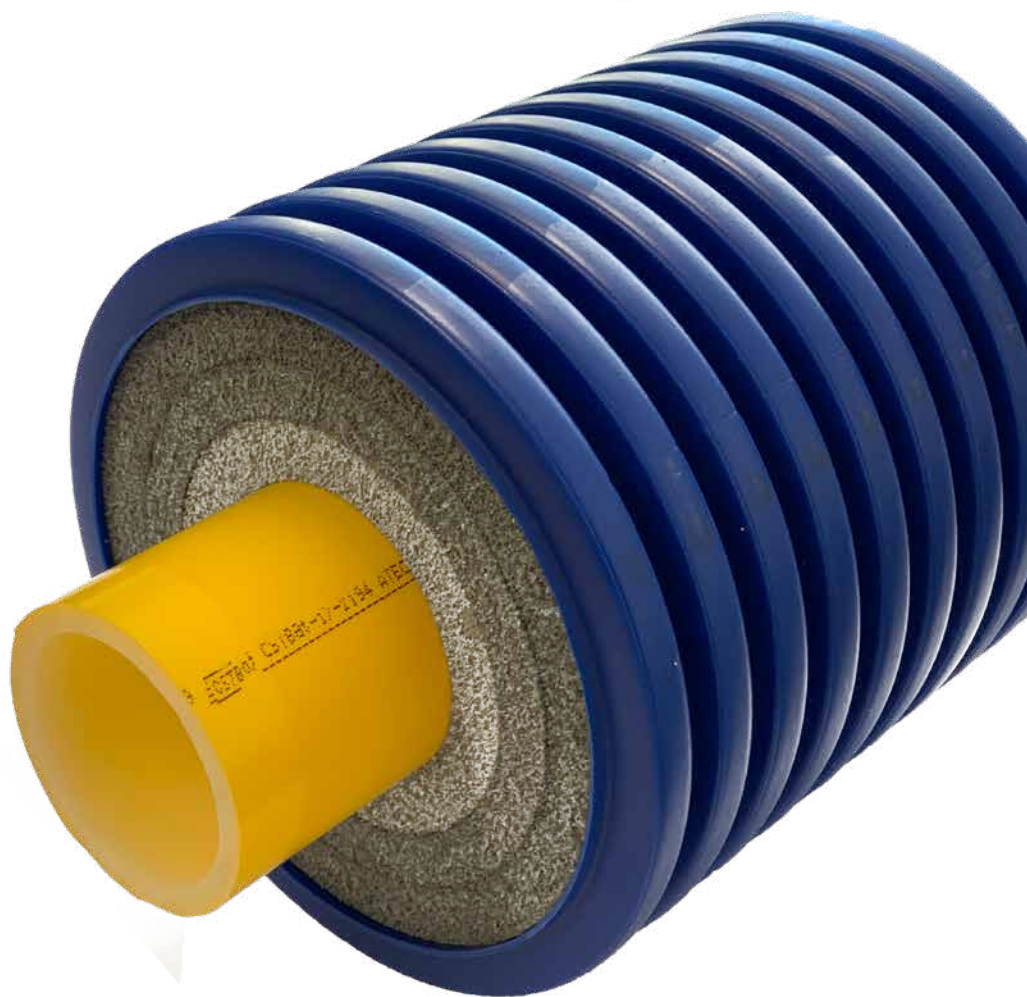


Microflex

Flexible pre-insulated pipe

Installation manual



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General information

Currentness of the Technical Information

For your own safety and for the correct application of our products please check at regular intervals whether a more recent version of your Technical Information is available. You can obtain the current Technical Information from your Watts sales office, specialist wholesaler.

Safety warnings and operating instructions

For your own safety and the safety of other people, please read through all safety warnings and operating instructions carefully and completely prior to commencing assembly.

- Keep the operating instructions safe and have them available.
- If you have not understood the safety instructions or the individual assembly guidelines or find them unclear, please contact your Watts sales office.
- Non-compliance with the safety information may lead to damage to property and personal injury.

Use in line with the specification

The Microflex pipe systems must only be designed, installed and operated as described in this Technical Information or in the assembly instructions associated with the individual components. Any other use is not in accordance with the specification and is therefore not permitted. Use in line with specification means compliance with all of the information in this Technical Information as well as the assembly, operating and maintenance instructions. No liability can be accepted for any use which is not in line with the specifications or inadmissible alterations to the product.

Legal information

Observe all applicable national and international regulations relating to laying, installation, safety and the prevention of accidents when installing pipe systems, as well as the instructions in this Technical Information. Also observe the applicable laws, standards, guidelines and regulations (e.g. DIN, EN, ISO, DVGW, TRGI, VDE and VDI) as well as regulations on environmental protection, regulations of the Employer's Liability Insurance Association and specifications of the local public utilities companies. Please note the relevant status of the guidelines, standards and regulations in each case. The design and assembly instructions relate directly to the Microflex product in each case. Some sections refer to generally applicable standards or regulations. More detailed standards, specifications and guidelines relating to the design, installation and operation of drinking water and heating systems or systems for building services must also be observed and do not form part of this Technical Information. Areas of application that are not included in this Technical Information (custom applications), require consultation with our technical department. Contact your Watts sales office.

**ATTENTION!**

Prerequisites for personnel

- Our systems must only be assembled by authorised and trained persons.
- Work on electrical installations or pipework components must only be carried out by trained and authorised persons.

General precautions

- Keep your workplace tidy and free from obstructions.
- Make sure there is always sufficient light in your workplace.
- Keep children, pets and unauthorised persons away from tools and the assembly areas. This applies particularly in the case of renovation work in an occupied area.
- Only use the components intended for the particular Microflex pipe system.

The use of components from other systems or the use of tools that are not from the relevant Microflex installation system can result in accidents or other hazards

Working clothing

- Wear protective goggles, suitable working clothes, safety shoes, a hard hat and a hairnet if you have long hair.
- Do not wear loosely fitting clothes or jewellery, these may get caught in moving parts.

Legal information

- Always read and follow the operating instructions for the Microflex assembly tool used.
- Incorrect handling of tools can cause serious cut injuries, crushing or removal of limbs.
- Incorrect handling of tools can damage connecting components or cause leaks.
- When cutting the pipes to length, keep a safe distance between the hand holding the pipe and the cutting tool.
- Never put your hand in the tool's cutting zone or tool or on moving parts during the cutting process.

System-specific safety warnings

- Deburr or remove edges on insulating sleeves, in order to prevent possible injuries.
- When working with tension belts to fix the pipes there is a crushing risk. Stand clear of the hazardous areas.

Material completeness

- Before begin the work check for material completeness and presence of all components



1. Points of Attention for Assembly

1.1 Transport and Storages

Do not remove protective end caps during transport or storage. Microflex pipelines must be transported upright.

PEX-a carrier pipe must be protected from sunlight and that no undesirable deformation of the coil is occurring.

Don't use sharp object.

Only nylon or textile straps should be used for fastening the coils during transport.

1.2 Pipe Cutting

Sharply cut the pipe end with appropriate PE-X scissors. Deburr pipe end with the appropriate tool.

1.3 Instructions for Laying Microflex Pipes in Soil

Utility Trench Profiling

Up to a trench depth of 120cm, we recommend digging a trench with vertical sidewalls; deeper than 120cm we recommend a V-shaped trench.

The profile of the utility trenches must conform to the Microflex guidelines for laying pipes. Particular attention must be paid to ground frost depth.

Excavation works must be carried out in the approved manner checking that no conflict may arise with existing and/or planned lines or structures.

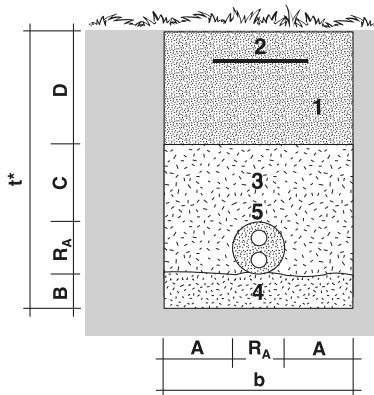


ATTENTION! Minimum laying temperature for Microflex pipes: -5°C .

Profiles of Utility Trenches

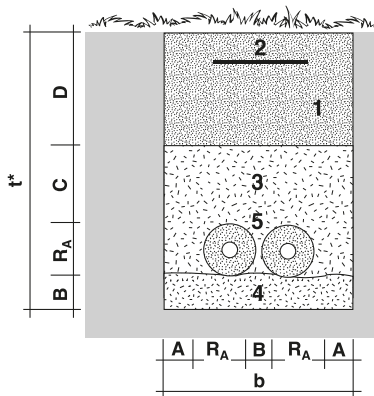
NB: Particular attention must be paid to ground frost depth.

Profile of trench for Microflex DUO pipe



R_A mm Casing \emptyset	A mm	B mm	C mm	D mm \geq	b mm Width	t^* mm Depth \geq
125	150	100	150	250	425	625
160	180	100	150	250	520	660
200	180	100	150	250	560	700

Profile of trench for 2 Microflex single pipes (2 x UNO) without underground connection



R_A mm Casing \emptyset	A mm	B mm	C mm	D mm \geq	b mm Width	t^* mm Depth \geq
75	150	100	150	250	550	575
90	150	100	150	250	580	590
125	150	100	150	250	650	625
160	180	100	150	250	780	660
200	180	100	150	250	860	700

- 1 Backfill
- 2 Warning Tape
- 3 Sand Fill
- 4 Sand Bed
- 5 Microflex Pipe

The minimum cover (C+D) is valid without having taking into account the traffic load. Loading up to SLW60 according to DIN 1072 when covered at minimum 900mm. The static calculations of buried pipes are according to ATV-DVWK-A127.

Laying Microflex Pipes in Soil



ATTENTION! Remove every strap sequentially to gradually release the inbuilt tension rather than removing them simultaneously.

Pipe should be laid by pulling the carrier pipes, never pull the casing.

Carefully place the Microflex pipeline on a compacted 10cm bed of sand on the bottom of the trench. The sand bed must be evenly laid to provide uniform support for the pipeline.

Take care that the pipe is not dragged along the ground or is damaged by sharp objects (in order to prevent damage to the outer casing). The bending radii must not fall below the prescribed minimum either during installation or in the final position of the pipeline.

Pipes must be laid in a serpentine course in order to minimise the expansion/contraction forces on the pipe. In order to keep the pipes in position during laying, cover them at regular intervals with sand.



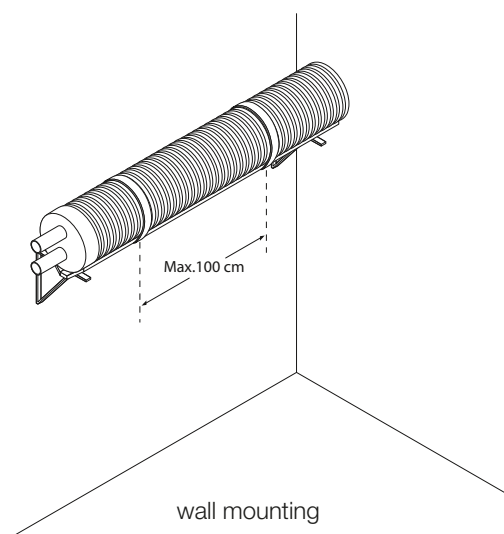
Horizontal Directional Boring (HDD)

For the correct process of Horizontal Directional Boring we refer to the guidelines of this technique.

Before pulling the Microflex pipeline through the borehole there are some points of attention:

- Drill hole Diameter. Increase the reamer's diameter according to the outer diameter of the Microflex pipe to achieve an optimal result.
- Connecting. When coupling the Microflex pipe to the reamer, ensure that both the PEX-a carrier pipe and the outer casing are fastened.
- Pulling. It is important that the piping is ready in its entirety so that the pulling through can happen in one smooth, fluid movement. For this we recommend to remove every nylon strap and to unroll the pipe completely. Rotation or twisting of the pipe during the pulling operation must be avoided at all cost. This way no torsional forces will be exerted on the piping.
- Traction forces. The Maximum pulling forces for the different PEX-a medium pipes are given in the table below. Attention: these values are for UNO models only. For DUO models, please double the value.

Outer Pipe Diameter UNO	Maximum Traction Forces per Pipe (kg)
25	150
32	200
40	300
50	400
63	400
75	400
90	400
110	400
125	400



1.4 Mouting onto Walls or Ceilings

For this purpose, the pipe must be supported every meter along its entire length because of its inherent flexibility. To avoid sagging, the pipe must be tied with straps to a supporting structure.

1.5 Guidelines for Pipe Laying on the Ground Surface

Points of support must be provided to prevent slipping away when the pipeline is laid on the ground. On uneven ground, the pipe should be tied at intervals of about 25m. Pipes must be well supported.



ATTENTION! Our pipes have limited UV resistance, protect the pipe against UV-radiation when they are laid at their final above-ground placement. Please contact us for alternative options.

1.6 MICRO SEAL Wall Penetration Seal – NOT WATERPROOF

Drilled hole must have a smooth bore to obtain an optimal seal.



Micro Seal	Outside Casing d_{out}	Wall Opening	Torque Nm
Art. nr.	mm	mm	Maks.
9LS200	75	100 - 102	2
7LS300	100	110 - 115	6
8LS300	100	128 - 132	6
9LS315	100	134 - 136	6
7LS475	135	194 - 210	20
6LS325	125	175 - 180	6
7LS325	160	209 - 212	6
7LS400	160	240 - 245	20
13LS300	160	200 - 202	6
9LS325	200	250 - 255	6
8LS400	200	275 - 282	20
10LS575	200	301 - 320	50

No bends allowed a straight section of the outer casing of at least 100cm must be maintained before and after the feedthrough. Clean the Micro Seal and the outer casing before assembly. When applying the Micro Seal chains around the outer casing check the distance between the different pressure plates is uniform to ensure an even stress distribution on the pipe. For further information, refer to the Operating Instructions, section 2.1

1.7 MICRO PRESS Wall Penetration Seal – WATERPROOF

Drilled hole must have a smooth bore to obtain an optimal seal.

No bends allowed a straight section of the outer casing of at least 100cm must be maintained before and after the feedthrough.

Clean the Micro Press and the outer casing before assembly.

Insert Micro Press into the wall and lead medium pipe through. Mount sealing kit on the outside of the building to enable later retightening.

Medium pipe has to be supported on the inside wall with a MICRO-PRESS 1x40.

For further information, refer to the Operating Instructions, section 2.2

1



2



3



1. Stainless steel pressure plates Bolts S304 Rubber size 1 x 40 mm Rubber: EPDM	2. Stainless steel pressure plates. SPLIT version Bolts S304 Rubber size 1 x 40 mm Rubber: EPDM	3. Stainless steel pressure plates Bolts S304 Rubber size 2 x 40 mm Rubber: EPDM	Core hole/ wallsleeve	Outer casing d_{out} (mm)	
Art. No.	Art. No.	Art. No.	mm	min.	max.
M10527	M10627	M10701	125	70	78
M10532	M10632	M10705	150	69	78
M10534	M10634	M10706	150	85	94
M10540	M10641	M10709	200	88	103
M10543	M10643	M10711	200	119	128
M10553	M10653	M10718	250	156	165
M10557	M10657	M10722	250	197	202
M10567	M10667	M10727	300	198	207

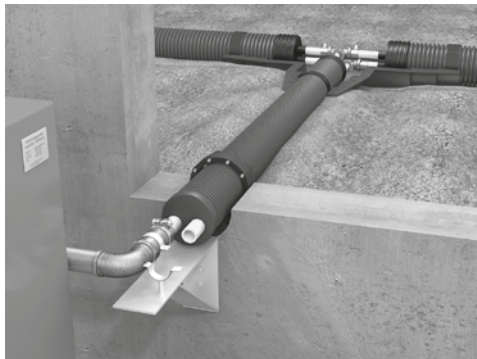
1.8 MMDV Wall Feedthrough (Surface/ Above Ground Use)



The corrugated HD-PE pipe can be either cemented into concrete or mortared into the wall opening. Approximately 100mm of the corrugated pipe must protrude to the outside in order to seal the pipe with the Microflex shrink sleeve. For further information, refer to operating instruction, section 2.3.



ATTENTION! the wall thickness must be less than or equal to 400mm. When heating the shrink sleeve, take care not to burn/ damage the outer casing or the shrink sleeve.



1.9 Securing the Pipe

A dust cap at the ends of a pipe provides for a dust tight closure of the pipe. It is necessary to anchor the pipe to a support system using fixing points (not available in our portfolio. Suggestion: Hilti, Würth). Non-usage of these fixing points can lead to serious damage to the pipe network and to the connection with the source or user



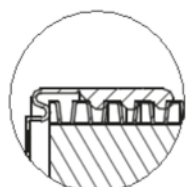
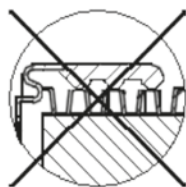
ATTENTION! The use of fixing points is mandatory for warranty eligibility.

1.10 Shrink Caps Type MK

Use a heat gun or mini torch to gently shrink the cap, prevents ingress of water between the outer casing and the insulated carrier pipe. For further information, refer to operating instruction, section 2.4.



ATTENTION! Using too high a temperature can damage the shrink cap or casing.



1.11 EPDM Rubber End-Caps Type MG

Use the correct tool for the cutting of the EPDM Rubber end-cap (sharp knife or scissors). Under no circumstances should the end-cap be sawn. The cut should be straight and neat. Damages, like splits or tears on the cut section, can cause leaks.

Use only water for cleaning or wetting the end-cap or pipe. The use of a lubricant (soap, grease or oil) can cause damage to the various parts.

The three seal ridges must grip into the ridges of the outer casing in order to obtain a watertight seal.

For further information, refer to operating instruction, section 2.5.

1.12 Couplings

A properly installed coupling is essential in the Microflex Pipe system. The following points need to be adhered to obtain a correct mounting:

-Cutting of the PEX-a Carrier Pipe. It is essential to cut the PEX-a pipe at a right angle with a pair of PE-X scissors or a pipe cutter. The PEX-a carrier pipe needs to touch the flange of the coupling completely in order to have a good seal. If this is not the case (because of a sloping cut or because the support pipe is not inserted sufficiently), a watertight seal cannot be guaranteed.

-Deburring of the Cut PEX-a Carrier Pipe. It is essential to deburr every cut carrier pipe with an appropriate tool. Residual burrs cause extra friction in the pipe during assembly of the couplings and swarf from inadequately cleaned pipe end-cuts may cause pressure loss through poor sealing. Other components, such as heat exchangers, may also encounter problems when deburring and swarf removal is not properly done.

-Pay Attention to the Direction of the Clamping Ring. Ensure that the notch on the inside of the clamping ring is facing the fitting. If not, the coupling won't be leak tight.

-Stainless Steel Bolt, Nut and Washer. Always use a stainless steel bolt, nut and washer for tightening the coupling and make sure that they are lubricated with copper grease (ART.N° Micro-lubri). Non-usage of copper grease can lead to galling of the bolts with leakage as a result of incomplete tightening.

-Watertight Sealing. After half an hour, one must again re-tighten the bolts in order to ensure a watertight seal.

-Pressure Test. The pressure test procedure is obligatory before closing the trench

For further information, refer to operating instruction, section 2.6.

1.13 Self-Regulating Heating Cable

Cable Preparations

Use a sharp cutter (Stanley knife) to score the outer insulation sheath of the heating cable to bare the conductor cables. Take care not to damage the conductor cables themselves.

The heat-shrink sleeves are applied with a heat source (hot air gun or equivalent). Ensure the heat is applied uniformly to obtain a good seal. Using too high a temperature can damage the cable insulation.

Always insulate the end of the cable. Under no circumstances should the two connectors be allowed to touch one another. A short-circuit will occur otherwise.

The operation of the heating cable is explained in the instruction coming with MVTH.

For further information, refer to operating instruction, section 2.7.



ATTENTION! Electricity must be turned off before connecting the various conductors. Heating cable must be connected to a 230VAC network. The circuit must be protected with a 16A fuse and a 30ma RCD.

Keep in mind that the MVTH can operate a heating cable with a maximum total length of 100m. If this length is exceeded, the operation of the thermostat can no longer be guaranteed.

Connect the corresponding conductors and earthing with each other inside the MVBOX.

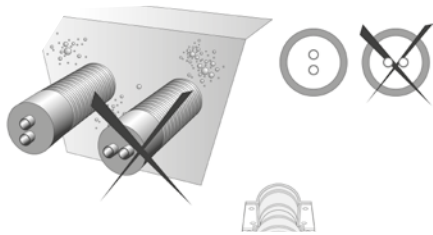
The attachment of the MVTH and MVBOX must be performed according to the included installation instructions.

1.14 Insulation Kits

The following insulation sets are available:

- Insulated Straight Coupling kit (MM)
- Insulated T-piece kit (MT)
- Insulated Double T-piece kit (MDT)
- Insulated Elbow 90° kit (MH)
- Insulated Y-Connection kit (MBR)

When connecting a Microflex DUO pipe with one of the above listed insulation kits, it is recommended to position the pipes in a vertical orientation. This method makes the assembly of the terminal connections in the casing much easier.



When supplying the insulation kits, both insulation halves are already connected via screw connections. Before separation, the shells can be cut along a chosen line to obtain the desired diameter. Cutting needs to be done in a straight line to avoid any chance of leakage.

The correct mounting of type MK or MG end shrink caps will minimise the chance of leakage. The use of shrinkable end caps (MG or MK) is compulsory to be eligible for the warranty.

Instructions for the assembly of the insulation kits can be found in sections 2.8 and 2.9.

Cut the bitumen strips to suit the pipe casing outer diameter. Before applying, check that the outer casing is dry to ensure a good contact. After cutting to the desired size, apply the bitumen strips around the carrier pipe. Make sure that the connections are properly covered.

Before placing a pipe in one of the shells, ensure sealant is applied to the grooves as described in the instructions in section 2.8. Apply the sealant uniformly along the flanges on the top and bottom of the casing before tightening the stainless steel bolts. It is extremely important that the insulation kits are properly sealed. Depending on the chemical composition of the soil, rising groundwater may be slightly acidic and therefore mildly corrosive. The ingress of this groundwater could eventually cause corrosion of couplings, sleeves, connections etc. and might lead to leakages.

1.15 Inspection Chamber

This inspection chamber unit can be used as an alternative to our insulation kits. After installing the chamber and completing the pipe connections it is recommended to remove the manhole cover and perform an internal inspection of the installation. It is also recommended to connect shut-off valves to allow for future alterations to the pipe network.

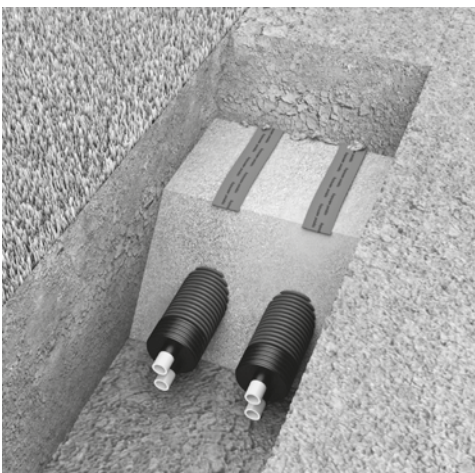
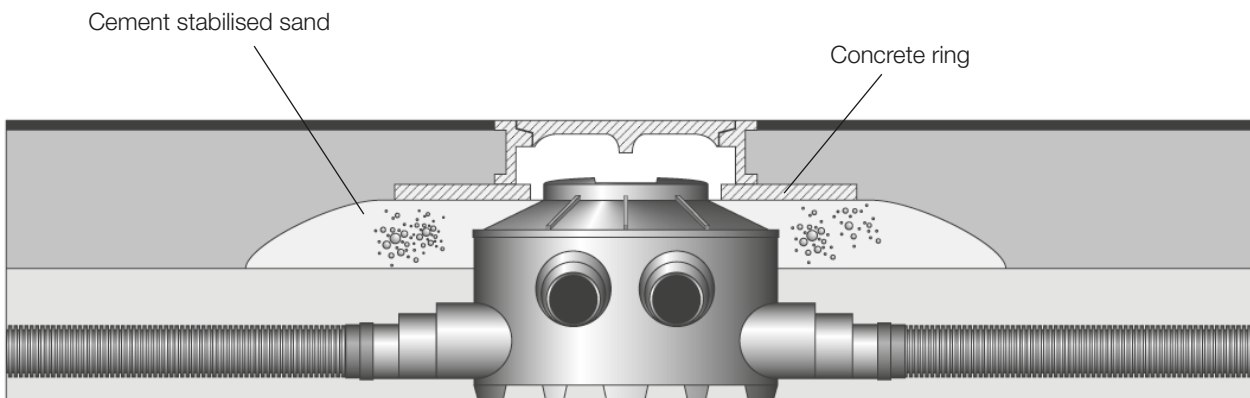
Shrink caps and couplings need to be installed in the proper way (see sections 2.4 and 2.6).

Before closing the inspection chamber, make sure that all pipe connections and fittings are secure. It is necessary to uniformly apply sealant to the upper edge of the chamber body part at a thickness of about 10mm by 10mm wide before affixing the cover. Do not damage the black gasket between body and top cover.

It is recommended to provide additional concrete reinforcement to the edges/sides of the chamber.

If the chamber is subject to a high traffic load, it is recommended to provide appropriate additional concrete reinforcement. These concrete slabs or rings must be placed on a bed of stabilised cement (see picture below).

For further information, refer to operating instruction, section 2.10.



1.16 Backfilling Guidelines

Before the trench can be filled, the entire pipe system with all its connections has to be **pressure tested**.

The correct implementation and documentation of the pressure test are requirements for the warranty to be valid.

Make sure that the pipes are fully covered with sand (granular range of 0-3 mm). Backfilling should be in layers of about 20 cm and compacted by hand. Care should be taken to remove any sharp objects from the backfill material. When the backfill depth is about 50cm above the top of the pipe, a vibrating tamper may be used to compact the remainder of the soil (measured from the top of the pipe). There should also be a warning tape bearing the legend "water pipe" laid directly above the buried piping.

1.17 Before Usage

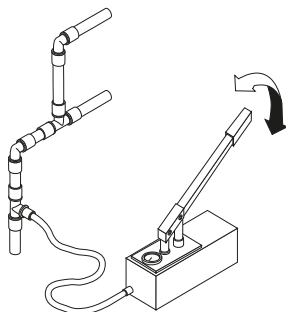
For hygiene reasons, we recommend rinsing all sanitary pipes for 15 minutes before use.

1.18 Pressure Test

Pressure test according to DIN 1988 Part 2



ATTENTION! The pressure test procedure is obligatory before closing the trench. The report of this test, fully completed and signed, has to be sent to local Watts sales org, to validate guarantee.



1. Pressure test. Constitute contractually agreed auxiliary work essential to the accomplishment of the contract and also form part of the contractor's performance without being stated in the performance specification. Prior to concealing, fill the finished pipework with water, taking care to avoid air locks. The pressure test must be conducted in two parts, starting with the preliminary test, followed by the main test.

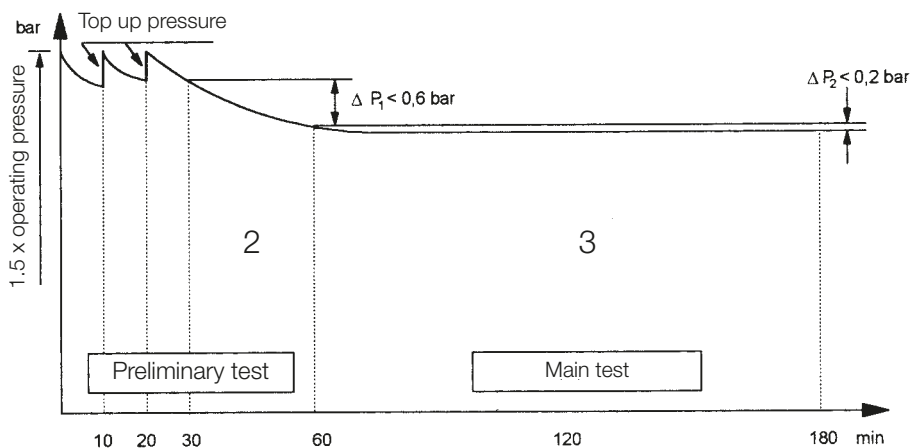
2. Preliminary test. The preliminary test involves applying a test pressure equal to 1.5 times the admissible operating pressure. This pressure must be regenerated twice within the space of 30 minutes at intervals of 10 minutes. Following a rest period of at least 30 minutes at full pressure, the test pressure must not have fallen by more than 0.6 bar (0.1 bar every 5 minutes). Leakages must not occur at any point in the system being tested.

3. Main test. The main test has to be conducted immediately after the preliminary test. The test takes 2 hours. At the end of this period, the test pressure recorded after the preliminary test must not have fallen by more than 0.2 bar. Leakages must not occur at any point in the system being tested.

In order to validate the pressure test, send the report to WATTS Sales Office.
See page 37

	bar / psi		bar / psi
2 Preliminary Test		3 Main Test	
2.1 Operating pressure x 1.5	<input type="text"/>	3.1.1	Beginning
2.2 After 10 min (restore 2.1)	<input type="text"/>	3.1.2	End
2.3 After 20 min (restore 2.1)	<input type="text"/>	3.2 Test pressure	<input type="text"/>
2.4 After 30min	<input type="text"/>	3.3 After 120 min	<input type="text"/>
2.5 After 60 min admissible pressure drop < 0.6 bar	<input type="text"/>	3.4 Admissible pressure drop < 0.2 bar	<input type="text"/>

Leakage Testing - DIN 1988



Test the finished pipe-work before concealing! The correct execution and documentation of the pressure test for the entire piping system are requirements for the warranty.



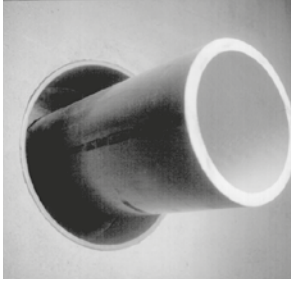
To ensure that the underground network is completely watertight, we advise you to heat the system at 85°C for one hour, regularly checking that the connections are secure. Let the system cool down to 20°C before conducting a final check of all pipe connections.





2. Operating Instructions

2.1 MICRO SEAL Wall Feedthrough (Subterranean Use)



Centre the pipe in wall opening or casing. Make sure the pipe will be adequately supported on both ends. Micro Seal feedthrough seals are not intended to support the weight of the pipe.



Loosen the pressure plate bolts just enough so the links can move freely. Connect both sections of the feedthrough around the pipe.



Ensure all bolt heads are facing the installer. Extra slack or sag is normal. Do not remove any links if extra slack exists. Note: On smaller diameter pipe, links may need to be stretched.



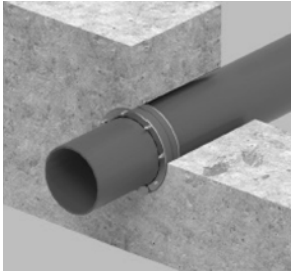
Slide the Micro Seal assembly into the annular space (ring-shaped cavity between the pipe and the wall). For larger size chains, start inserting the feedthrough at the 6 o'clock position and work both sides up toward the 12 o'clock position in the annular space.



Manually tighten using a spanner or wrench only. Do not tighten any bolt more than 4 turns at a time. Tighten the bolts in a crisscross pattern or sequence until all bolts have been uniformly secured. Repeat this after a couple of hours to ensure long-term tightness of the bolts.

2.2 MicroPress Wall Penetration Seals

The seals are produced of soft rubber and pressure plates of stainless steel. The MicroPress wall penetration seal is tight against pressing water.



Installations:

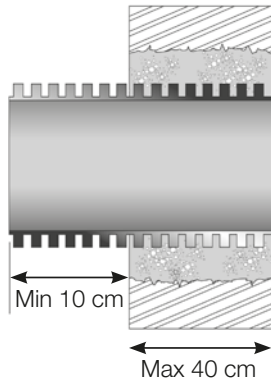
1. Clean casing pipe/core bore and pipe
2. Check casing pipe/core diameter and medium pipe diameter with the data on the sealing kit
3. Insert MicroPress into the wall and lead medium pipe through. Mount sealing kit on the outside of the building with direction of nuts inside to enable later retightening.
4. Use a torque wrench to tighten acc. to the next table.

Srew diameter	Max. torque tightening in Nm	
	Standard pipes	For thin walled plastic pipes
M 6	5 Nm	5 Nm
M 8	10 Nm	8 Nm
	20 Nm for Pressio Individual	15 Nm for Pressio Individual
M 10	30 Nm	22 Nm
M 12	36 Nm	26 Nm

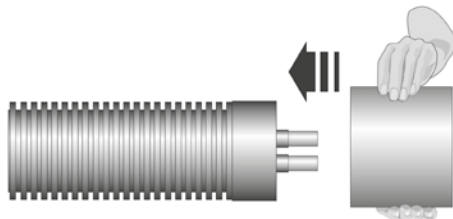
2.3 MMDV Wall Feedthrough (Above Ground/Surface Use)

This wall feedthrough consists of a corrugated pipe casing and a shrink sleeve.

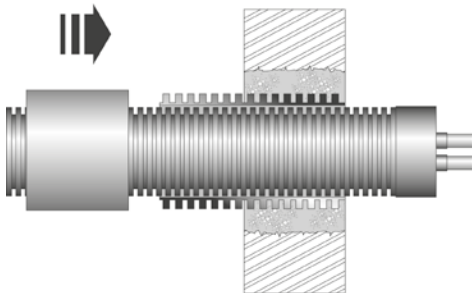
Brick the corrugated casing in so as to protrude about 10cm out from the wall.



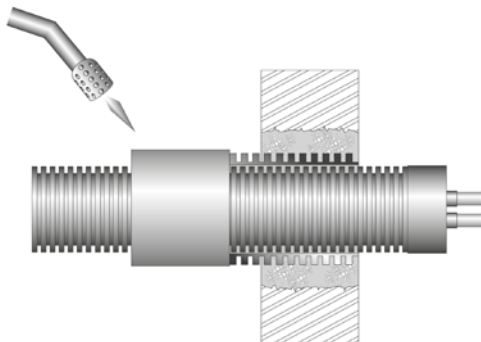
Slide the shrink sleeve over the Microflex pipe.
NEVER CUT THE SLEEVE LENGTHWISE.

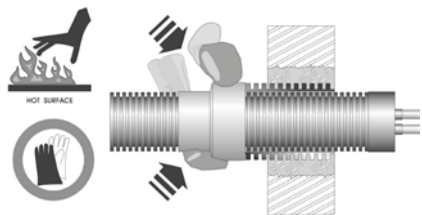


Push the Microflex pipe through the bricked in corrugated casing.

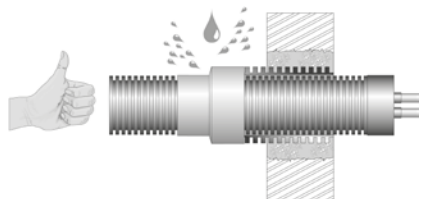


Use a heat gun to gently shrink the sleeve half onto the corrugated pipe and half onto the casing of the Microflex pipe.





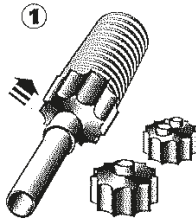
Manually press the sleeve onto the casing and corrugation whilst wearing protective gloves.



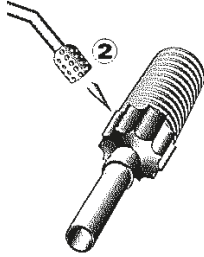
The wall feedthrough is now ready.

Art. No.	Microflex Pipe with Casing d_{out} mm	Wall Feedthrough Pipe d_{out} mm	Wall Hole mm
MMDV75/90	75 - 90	110	210
MMDV125	125	160	260
MMDV160	160	200	300
MMDV200	200	235	350

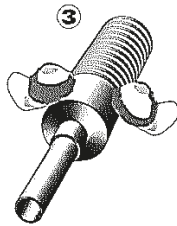
2.4 Shrink Caps Type MK



1. Slide the cap over the carrier pipe and the casing.



2. Use a heat gun or mini torch with soft yellow flame (do NOT use a blue flame) to gently shrink the cap



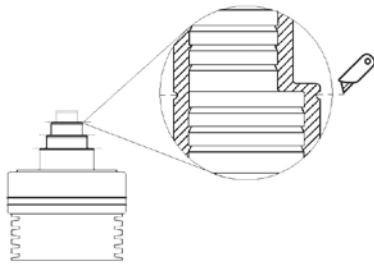
3. Press the cap onto the carrier pipe whilst wearing protective gloves.



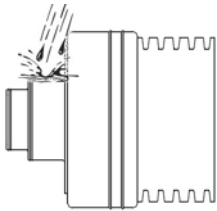
4. The tail end of the pipe is now sealed watertight.

2.5 EPDM Rubber End-Caps

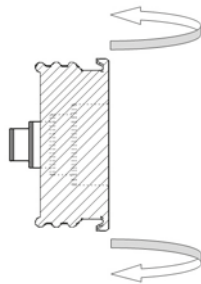
Cut the sleeve for the carrier pipe at the appropriate place (see expanded diagram). Use the correct tool for the cutting (sharp knife or scissors). The cut has to be straight and neat to ensure tightness of the rubber end-cap. Damages, like splits or tears on the cut section, can cause leaks.



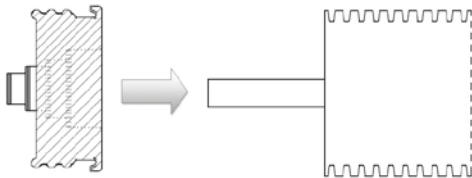
The pipe ends and the rubber end-caps must be cleaned only with water before installation.



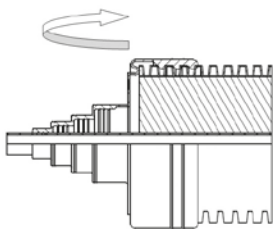
Fold the sealing sleeve back.



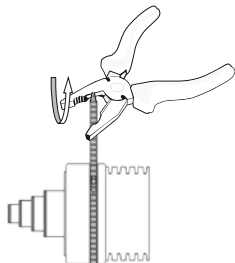
Put the rubber end-cap over the carrier pipe and push it against the insulation. If needed, wet the carrier pipe with water. Do not use soap, grease or oil for lubrication.



Pull the sealing ridges onto the outer casing of the pipe. The three seal ridges must grip into the ridges of the outer casing.



Insert the provided tie wrap between the two rings. Pull the end of the tie wrap with a rotating movement tight around the cap using universal pliers.



2.6 Microflex PE-X Couplings

Microflex PE-X connections are professional fittings for central heating and sanitary applications. They are available as a straight coupling with male thread:

- In 25 to 125 mm sizes for a maximum pressure of 6 bar (Central Heating)/16 bar (cooling)
- In 18 to 110 mm sizes for a maximum pressure of 10 bar (Sanitary)

Microflex PE-X terminal connections can be combined with a variety of threaded fittings to make tees, elbows and other ancillary connections.

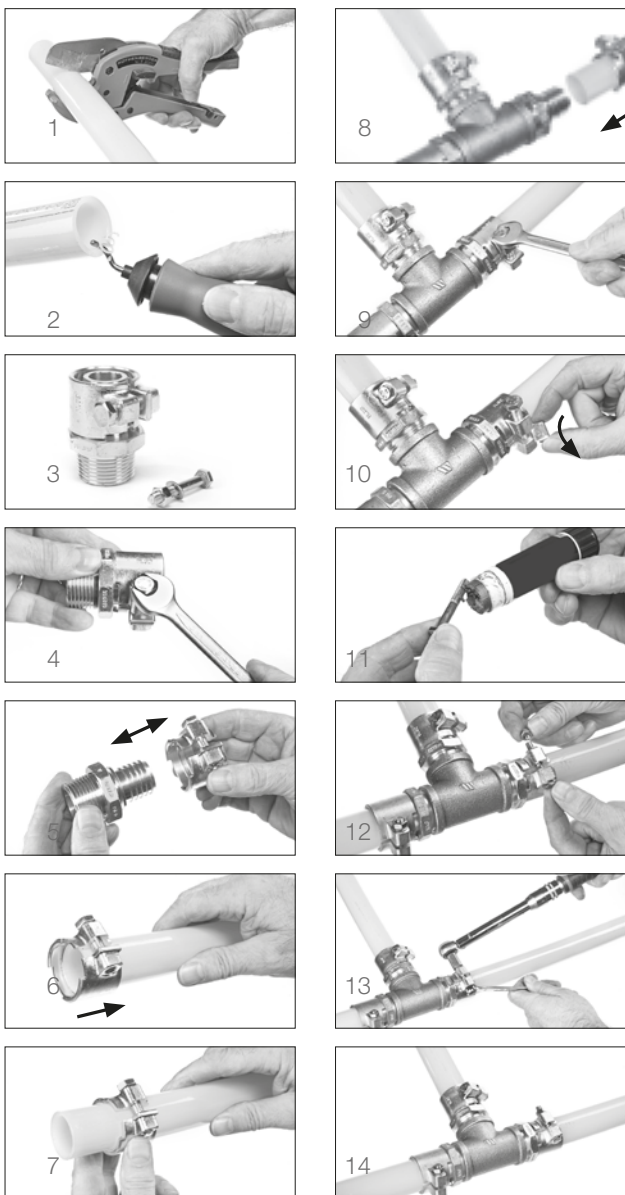


Assembly instructions

- 1 Cut the PE-X pipe at a right angle with a pair of PE-X scissors or a pipe cutter.
- 2 Deburr the pipe with an appropriate tool.
- 3 The clamping ring is loosely attached to the coupling.
- 4 Turn the bolt slightly clockwise in order to remove the clamping ring.
- 5 Remove the clamping ring.
- 6 Slide the clamping ring over the pipe. NB! DO NOT rotate the clamping ring.
- 7 Ensure that the notch on the inside of the clamping ring is facing the fitting.
- 8 Push the pipe COMPLETELY over the coupling. Slide the clamping ring back to COMPLETELY cover the fitting.
- 9 Loosen the bolt.
- 10 Remove the bolt and the steel plate.
- 11 Put copper grease (ART.N° Micro-lubri) on the threads of the stainless steel bolt and nut.
- 12 Assemble the bolt, washer, and nut provided and tighten the clamping ring until the two clamps are completely closed.
- 13 Retighten the bolt and nut after half an hour.
- 14 Inspect all fittings for security and correct positioning.

NB:

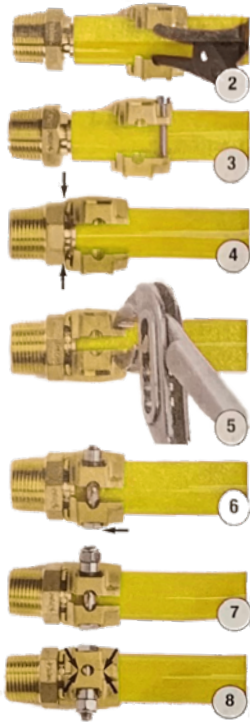
Please make sure to lubricate the threads on the bolt, as well as the nut, with some copper grease.



Assembly instructions - alternative solution



In the case of fittings such as those in the figure above:



- 1 Using a pair of PE-X scissors or pipe cutting pliers, cut the PE-X pipe at a right angle.
- 2 Remove any burrs with an appropriate tool.
- 3 Screw the smaller screw until there is a sufficient opening to slide the clamping piece on the PE-X pipe. Bring the clamping piece into the groove of the fitting
- 4 Press the clamping piece around the pipe, using pliers if necessary.
- 5 Insert the locking bolt(s), position the spacer and tighten the nut(s). Both fixing directions are possible.
- 6 Stop when the two brass edges touch properly.

Tightening torque:

Pipe diameter	Min	Max
20 x 2,8	9	12
22 x 3,0	9	12
25 x 3,5	10	14
28 x 4,0	12	15
32 x 4,4	14	17
40 x 5,5	30	37
50 x 6,9	40	52
63 x 8,6	52	65
63 x 8,6 *	30	37

Pipe diameter	Min	Max
20 x 2,0	9	12
25 x 2,3	10	15
32 x 2,9	17	18
40 x 3,7	30	37
50 x 4,6	35	52
63 x 5,8	70	80
63 x 5,8 *	30	37
75 x 6,9 *	80	90
90 x 8,2 *	45	70
110 x 10 *	55	70
125 x 11,4 **	55	70

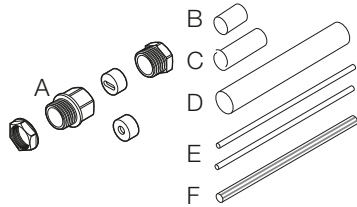
* = 2 bolts
 ** = 3 bolts

2.7 Self-Regulating Heating Cable



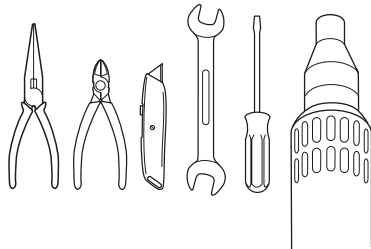
ATTENTION!

- Work on electrical installations or pipework components must only be carried out by trained and authorised persons.
- Electricity must be turned off before connecting the various conductors.



For Microflex COOL pipes with self-regulating heating cable you need a connection kit that consists of:

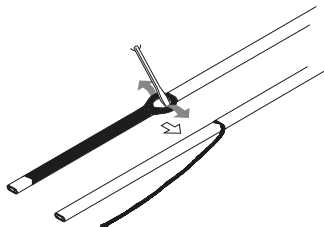
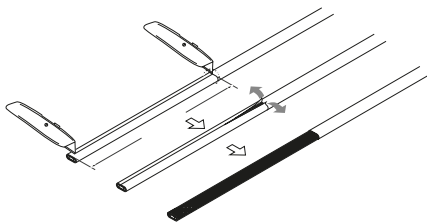
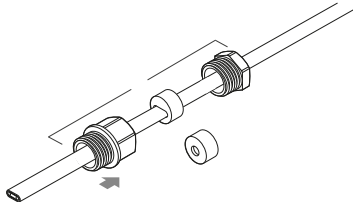
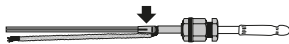
- MVKITGR10W/MVKITGR18W for the cable preparations
- MVTH and MVBOX for connecting to the mains power



Cable preparations

The contents of the MVKITGR10W/MVKITGR18W are necessary for the cable preparations. The kit contains:

- 1 cable gland for connection to the MVBOX (A)
- 2 short heat-shrinkable sleeves to insulate the end of the heating cable (B+C)
- 1 long heat-shrinkable sleeve to insulate the heating cable to the connection (D)
- 3 heat-shrinkable sleeves to insulate the two heating cables and earthing cable (E+F)



You also need to have the following tools at hand:

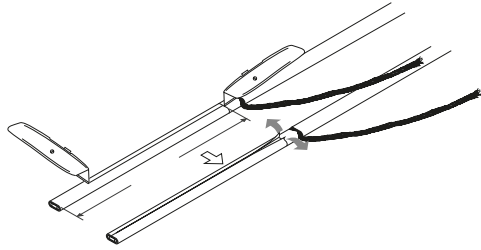
- Needle-nose pliers
- Side cutters
- Utility Knife
- Slot-head screwdriver
- Hot hair gun

Cable Preparation for Connection to the MVBOX

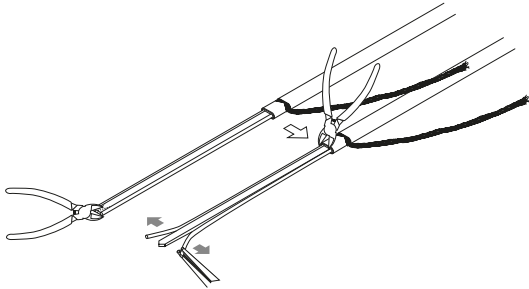
Slide the different parts of the cable gland over the heating cable (A). See picture for the correct order. Connect the parts together and make sure they are tight.

Score and remove the outer jacket over a length of 170mm. Take care not to damage the braiding.

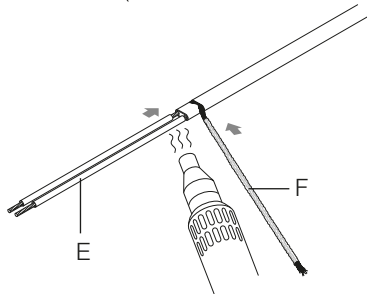
Use a slot-head screwdriver to unravel braiding and twist together.



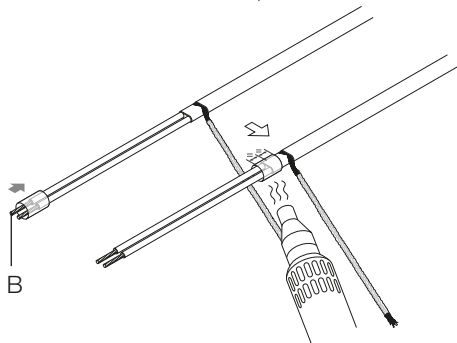
Score with a sharp utility knife and remove the electrical insulation over a length of 150mm. Take care not to damage the conductors.



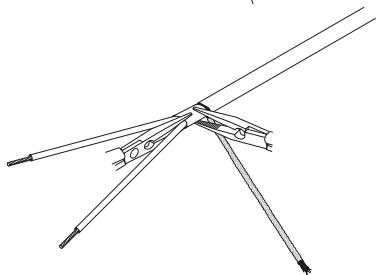
Use side cutters to expose the ends of both conductor cables from the core. Pull both conductors away from the insulated core using a needle-nose pliers. Remove the remaining core material. Take care not to damage the conductors.



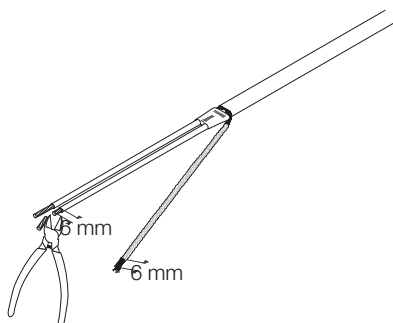
Slide the long heat-shrink sleeves (E) over the conductors and the twisted earthing braid (F). Carefully shrink with heat source (hot air gun or equivalent).



Place the short sleeve (B) over both conductors and outer jacket. Carefully shrink with heat source.



Pull both conductors outwards and squeeze the heat-shrink sleeve. If no adhesive appears re-heat and re-squeeze.

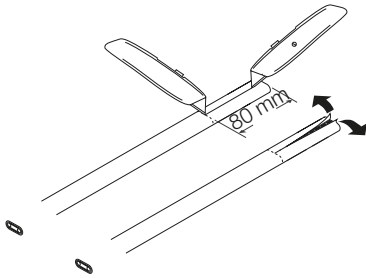


Trim conductors to leave 6mm exposed.

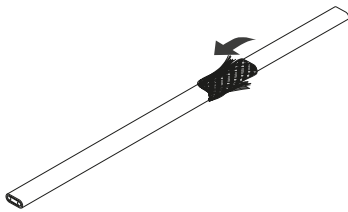


Unconnected heating cable end sealing

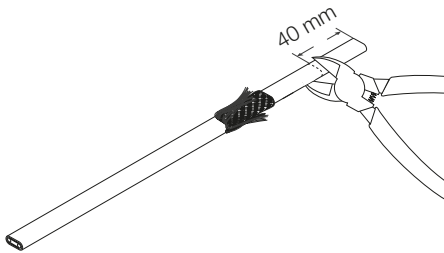
Score and remove the jacket sleeving over a length of 80mm. Take care not to damage the protective braid.



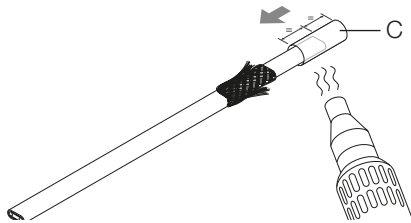
Push back the braid fully over outer jacket.



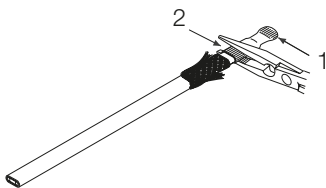
Cut off 40mm of the exposed heating cable.



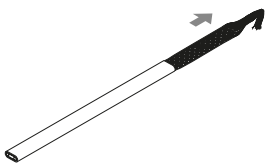
Slide the short heat-shrink sleeve (C) partly over the heating cable (see picture). Shrink with heat source (hot air gun or equivalent).

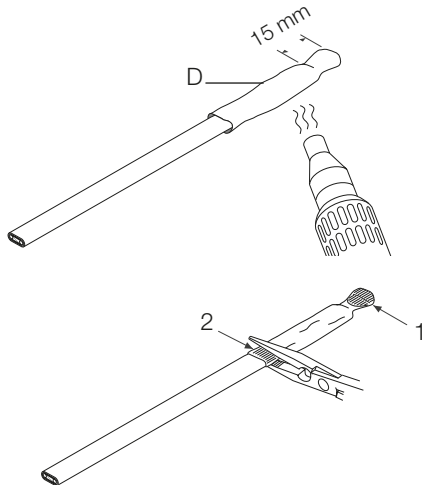


Immediately squeeze positions 1 and 2 for 5 seconds, so that molten adhesive appears at the edges.



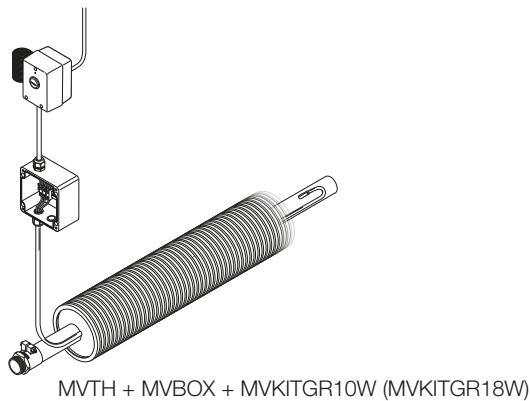
Pull braid back, gather strands and twist together. Bend the twisted end back over.





Place heat-shrink sleeve (D) over braid (leave 15mm sticking out) and shrink with heat source. Proceed immediately to the next step.

Squeeze positions 1 and 2 for 5 seconds so that molten adhesive appears at edges. If no adhesive appears reheat and re-squeeze.

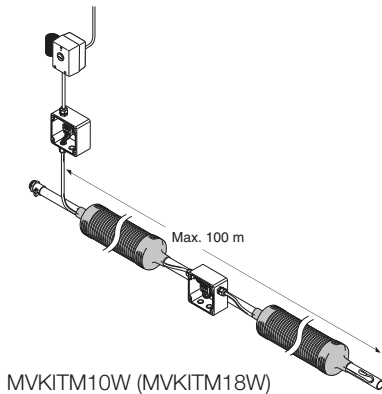


Connection to the Mains power

When all cable preparations are done, connection to the mains network can occur. A MVTH and MVBOX will be needed. For wiring diagram refer to instruction for MVTH inside the product box.



ATTENTION! Connection must be done by qualified personnel

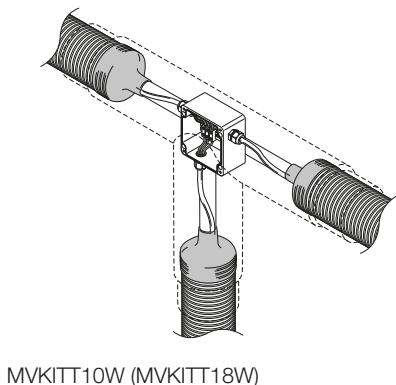


Connection between 2 Pipes

For the connection between two pipes, a MVKITM10W/MVKITM18W is needed. This kit consists of 1 x MVBOX and 2 x MVKITGR10W/MVKITGR18W. The MVKITGR10W/MVKITGR18W is used for the preparation of both heating cables. The MVBOX is placed in between both pipes. Connection of electrical cables and earthing takes place in this box.



ATTENTION! Connection must be done by qualified personnel



ATTENTION! At 0° degree heating cable must not be longer than 100m; if length is over 100m, more than one power source point should be foreseen; in anycase at least 1 each 100m length.

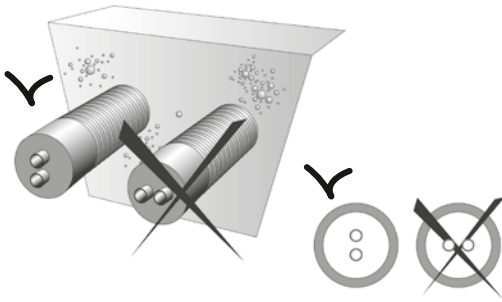
Tee Connection

For a Tee connection, a MVKITT10W/MVKITT18W is needed. This kit consists of 1 x MVBOX and 3 x MVKITGR10W/MVKITGR18W. The MNKITGR10W/MVKITGR18W kits are used for the preparation of all heating cables. The MVBOX is positioned in between the three pipes. Connection of electrical cables and earthing takes place in this box. The thermostat can control (a) heating cable(s) up to a maximum length of 100m.

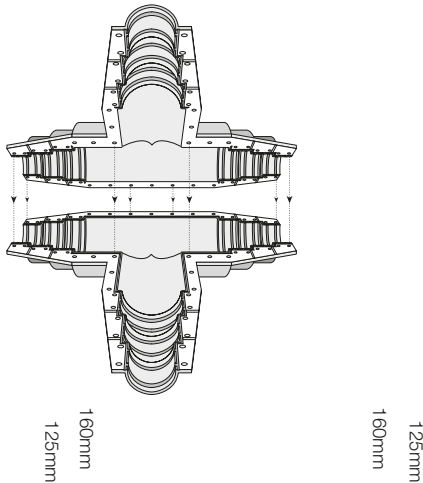


ATTENTION! Connection must be done by qualified personnel

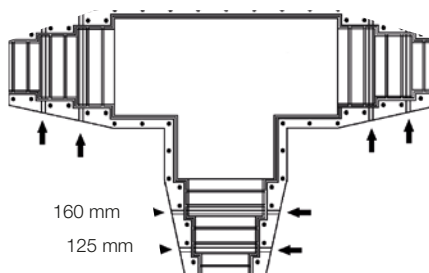
2.8 Insulation Kits



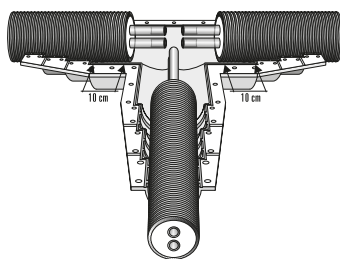
When a Microflex DUO pipe is to be connected in an insulated casing, we recommend positioning the pipes in a vertical orientation. This method makes the assembly of the terminal connections in the casing much easier.



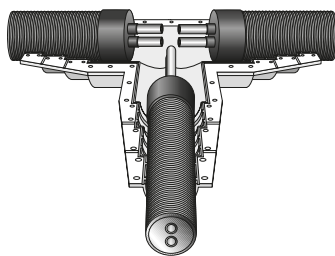
Holes in both shell-shaped casings (top and bottom are identical) are pre-drilled.



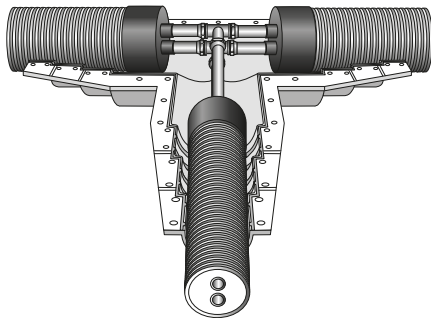
The casings are designed for enclosing pipe casings of either 125, 160 or 200mm in diameter or 75, 90 or 125mm. Shells can be cut along a chosen line thereby obtaining the desired diameter.



Strip a sufficient length of PEX-a pipes of their insulation and casings (be careful not to damage the pipes) so as to put the terminal connection in the centre. Make sure that the pre-insulated Microflex pipe passes the 200mm mark by 10cm.

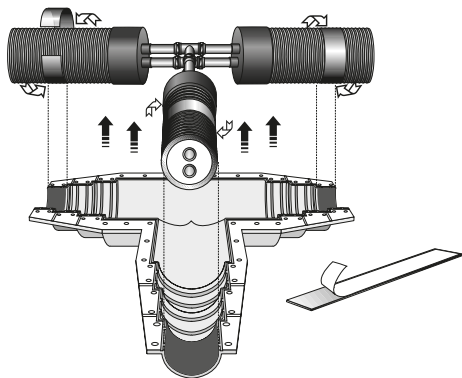


One of the two shells can be used as a template to define the desired distance between the carrier pipes.

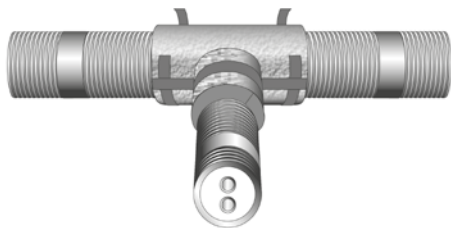
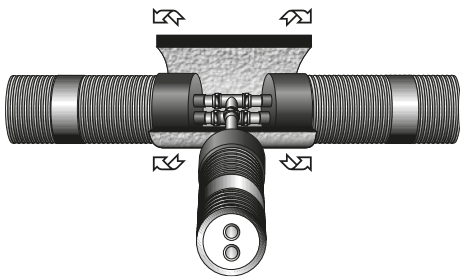


The use of MK heat shrinkable caps is mandatory to be eligible for the warranty.

Use a heat gun or mini torch with soft yellow flame (do NOT use a blue flame) to gently shrink the cap.



Cut the bitumen strips to suit the pipe casing outer diameter. Remove the protective layer and fit the bitumen strips to the inside of the insulation casings at the pipe entry points.

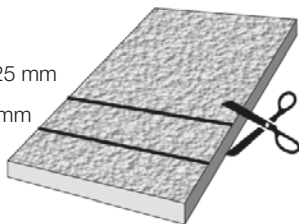


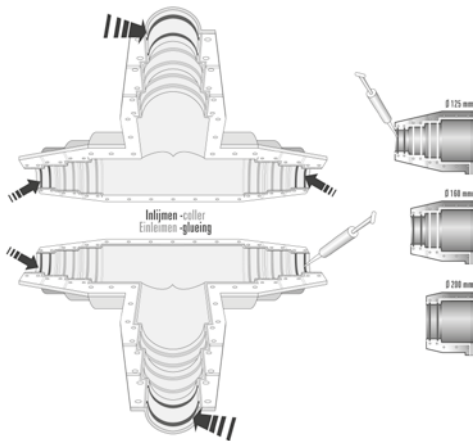
After the insulating blanket has been cut to the desired size, it can be wrapped around the carrier pipe so that the connections are properly covered. Tie with the supplied tape.

Cut the insulation

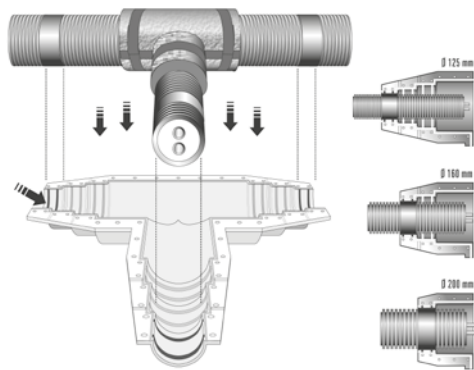
Ø 125 mm

Ø 160 mm

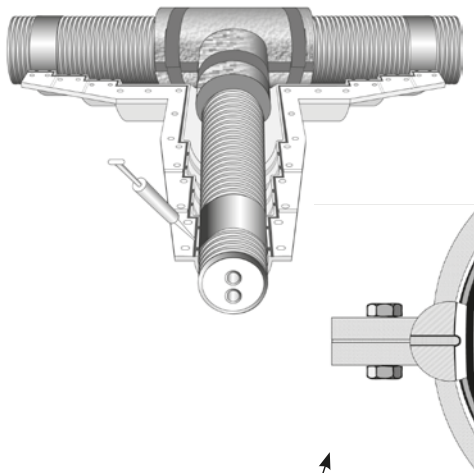




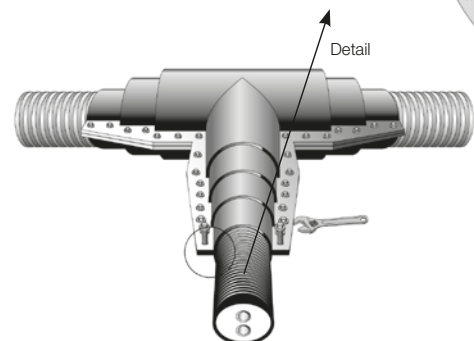
Apply the sealant uniformly to the grooves of both shell-shaped casings. We recommend a thickness of about 4mm and a width of 5mm.



Place the connected pipes into one shell-shaped casing.



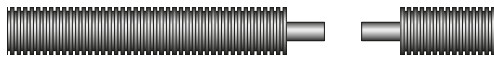
Then apply the sealant uniformly along the flanges of the top and bottom casing (next to the drilled holes) to a thickness of about 6mm.



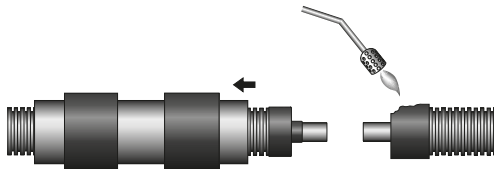
Take care to align the two shell-shaped casings correctly. Tighten the stainless steel bolts.

To ensure a watertight seal is made, check that the sealant is squeezed out through the lateral openings.

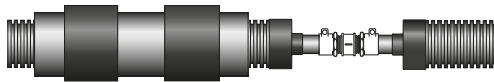
2.9 Insulated Straight Coupling Kit Type MM75 – MM200



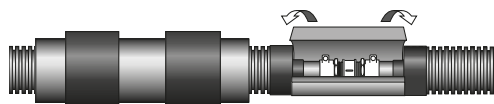
The set consists of 1 rigid sleeve and 2 heat shrinkable sleeves. Slide the rigid sleeve over the Microflex pipe.



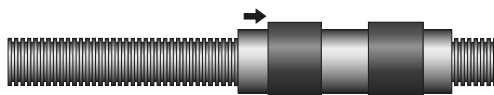
The use of MK heat shrinkable sleeves is mandatory to be eligible for the warranty.



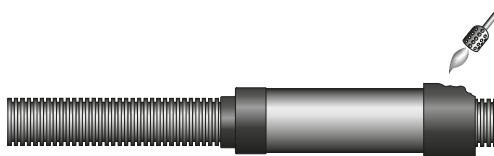
Secure the terminal connections.



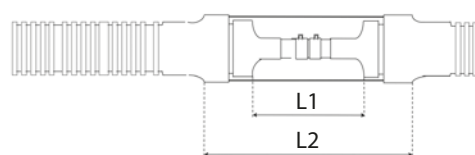
Wrap the insulating blanket around the carrier pipe so that the connections are properly covered. Tie with the supplied tape.



Slide the rigid sleeve back so as to enclose the connections.



Use a heat gun or mini torch with soft yellow flame (do NOT use a blue flame) to gently shrink both sleeves half onto the rigid sleeve and half onto the casing of the Microflex pipe.



Art. No.	L1	L2
MM75	220	600
MM90	220	600
MM125	260	850
MM160	350	1000
MM200	400	1000

2.10 Inspection Chamber

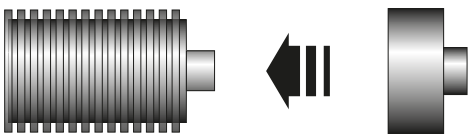
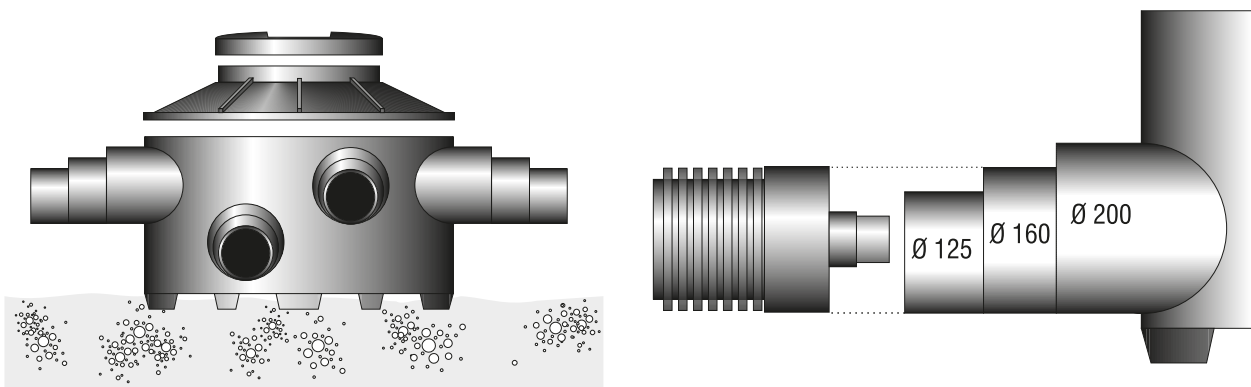
This inspection chamber unit can be used as an alternative to our MM, MT, MDT or MBR casings. It is equipped with 6 marked entries. Each of them can be cut off to suit various opening sizes (125, 160 or 200mm). Several connections can be made in this unit. It can even house shut-off valves.

The unit comes with a top lid, stainless steel bolts, a sealing kit and an instruction leaflet.

The following steps describe making a successful waterproof connection.

Installation

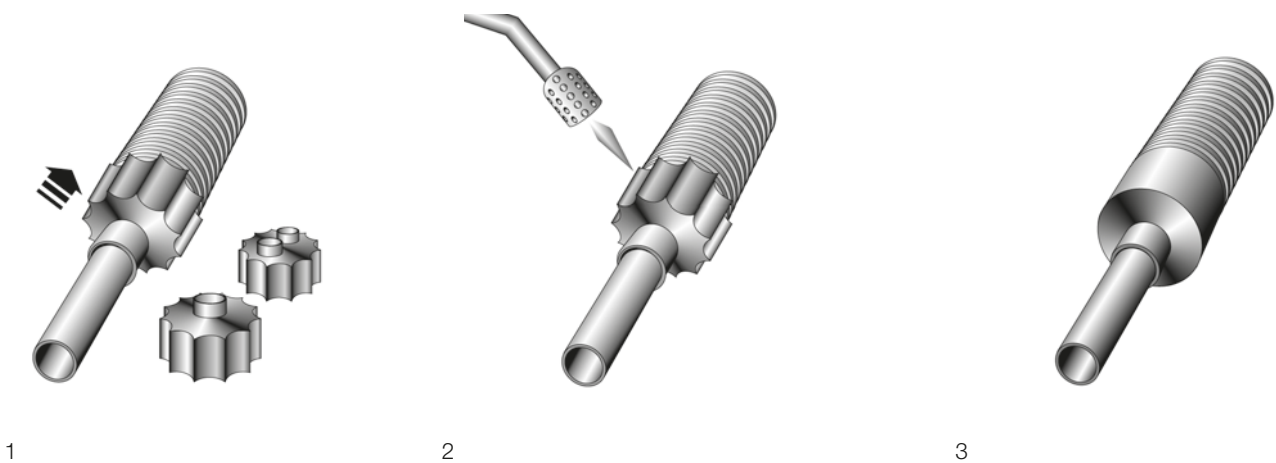
Entries are marked and are to be cut off to suit the desired opening sizes. Carefully lower the inspection chamber on a bed of sand, free of sharp objects.

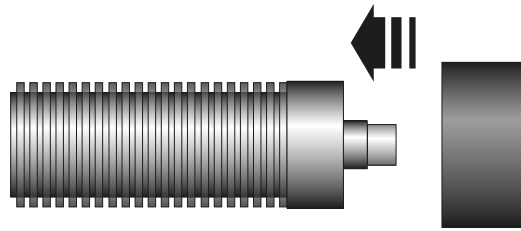


Connection

Before the pipes are connected in the inspection chamber, slide a shrink cap (MK or MG model) over the casing and the carrier pipe. Use a heat gun or mini torch with soft yellow flame (do NOT use a blue flame) to gently shrink the cap.

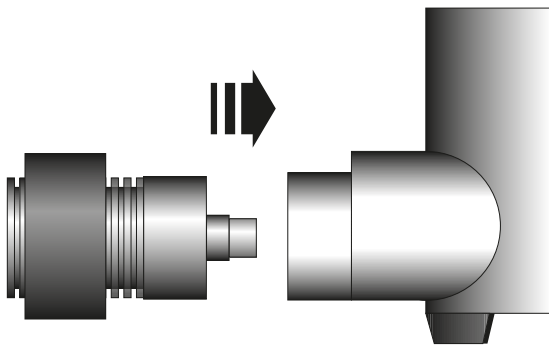
The use of MK or MG shrink caps is mandatory.





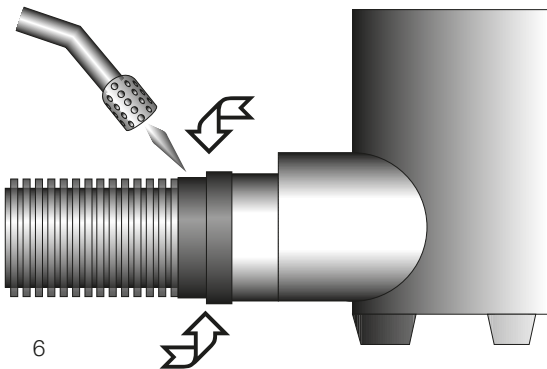
4

Slide a shrink sleeve (MHM model) over the casing prior to positioning the Microflex pipe in the inspection chamber.



5

Make all the necessary connections in the chamber.

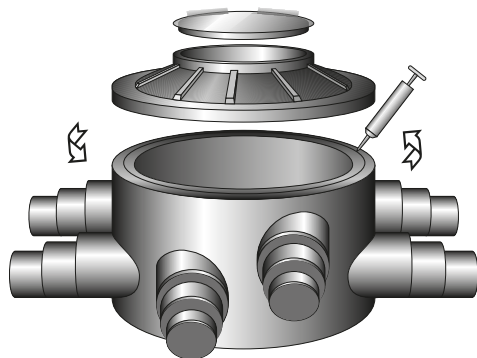


6

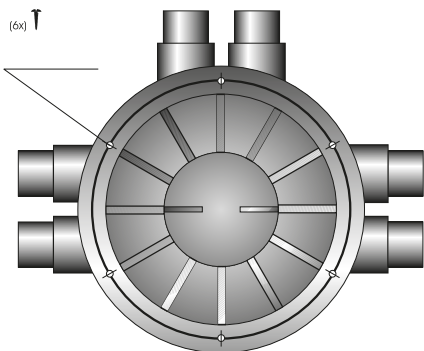
Gently shrink the MHM sleeve onto the casing using a heat gun or mini torch to ensure a waterproof connection between the casing and inspection chamber.

The use of MHM shrink sleeves is mandatory.

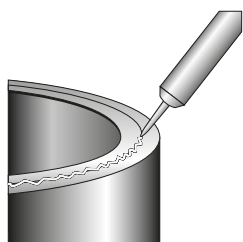
Sealing of Inspection Chamber



Apply sealant uniformly to the upper edge of chamber body part to a thickness of about 10mm and a width of 10mm.



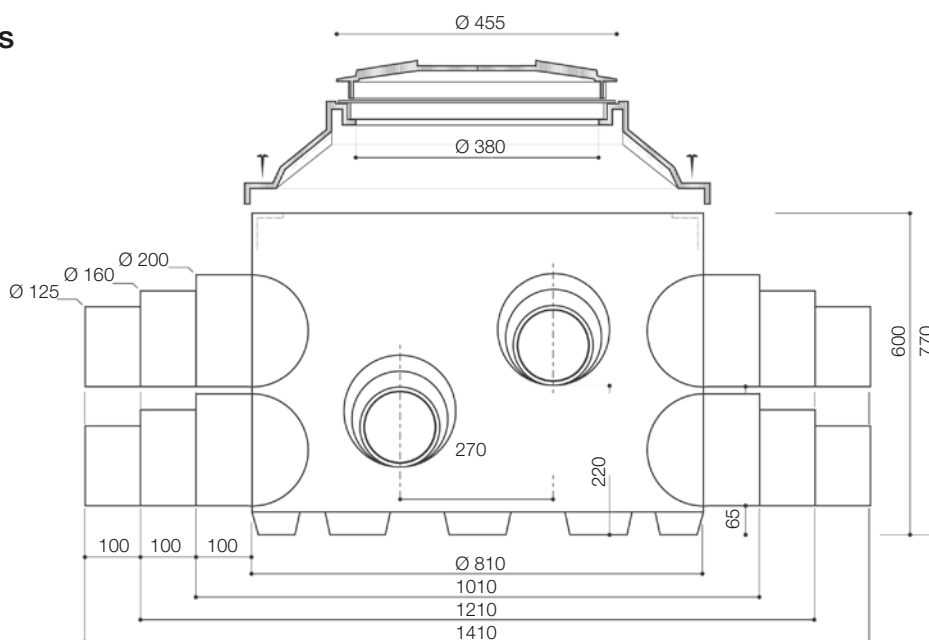
Place the pitched top on the body part. Tighten the 6 stainless steel bolts.



Carefully turn the lid clockwise. Do not damage the black gasket between body and top part.

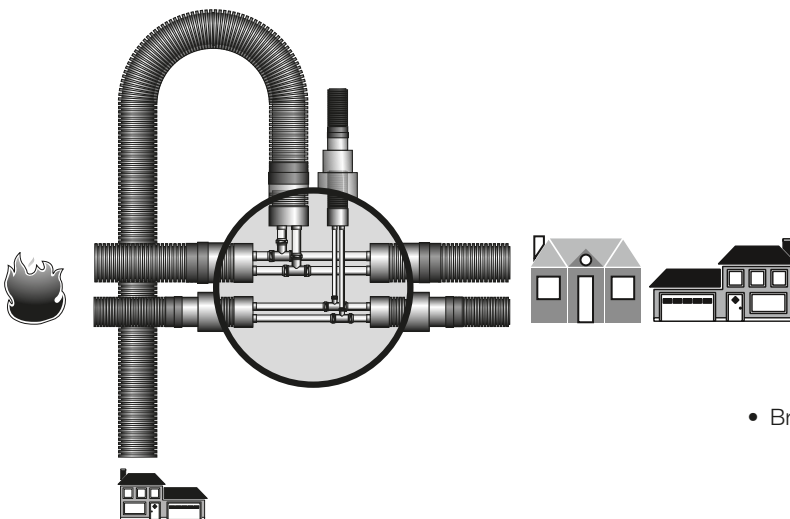
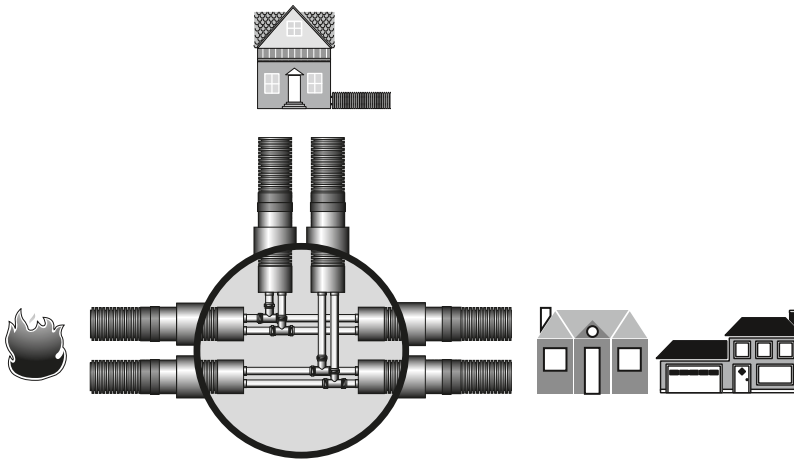
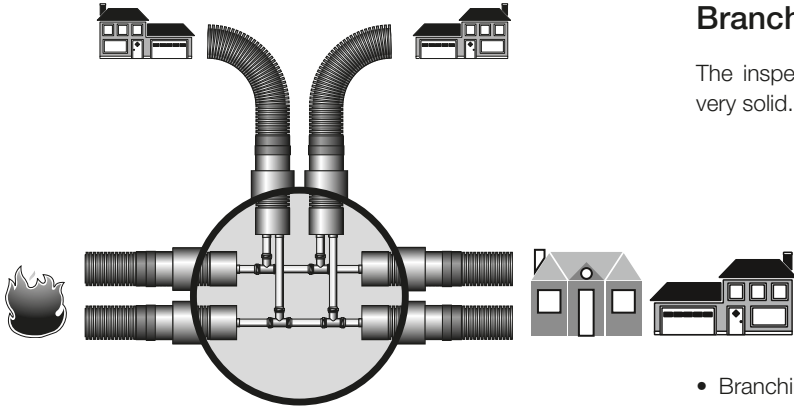
Do not use excessive force.

Dimensions

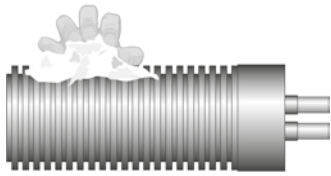
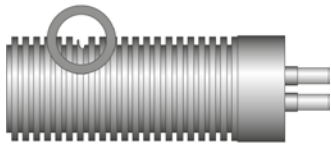


Branching Possibilities

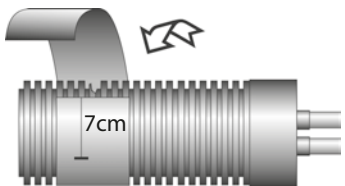
The inspection chamber, made of shock-resistant polyethylene, is very solid. It offers the possibility of:



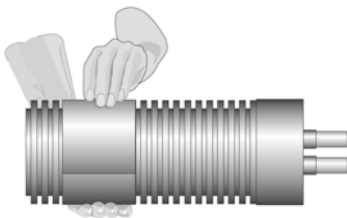
2.11 MHK 150 Cold-Applied Wrapping Tape



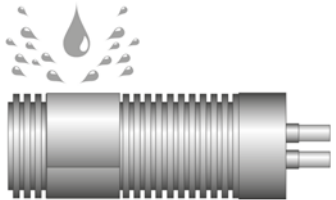
Make sure the casing of the pipe is dry and clean.



Wrap the tape around the damaged casing, overlapping each preceding layer by about 7cm (press slightly).



Press firmly around the pipe casing.



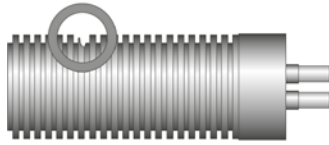
The damaged pipe casing is now repaired.



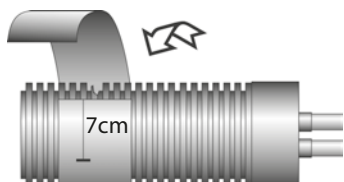
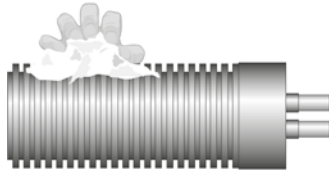
For an outer casing having

A diameter of		use a length of	
75 mm		305 mm	
90 mm		355 mm	
125 mm		465 mm	
160 mm		575 mm	
200 mm		700 mm	

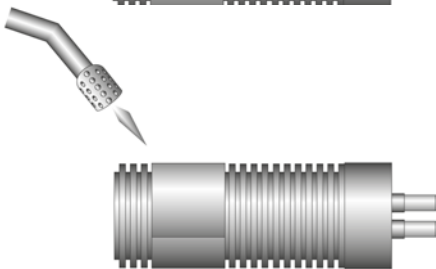
2.12 MHB 200 Heat-Shrinkable Wrapping Tape



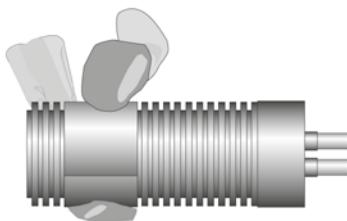
Make sure the casing of the pipe is dry and clean.



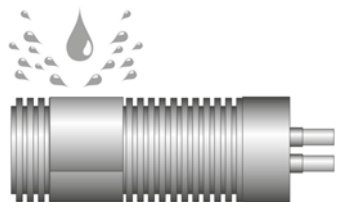
Wrap the repair tape around the damaged casing, overlapping each prece-ding layer by about 7cm.



Use a heat gun or mini torch with soft yellow flame (do NOT use a blue flame) to gently shrink the repair sleeve.



Press the sleeve onto the casing whilst wearing protective gloves.



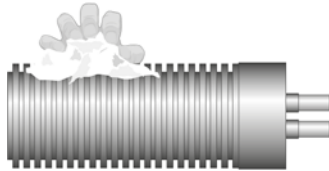
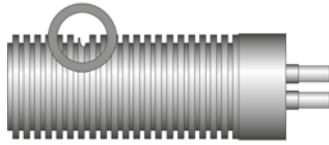
The damaged casing is now sealed watertight.



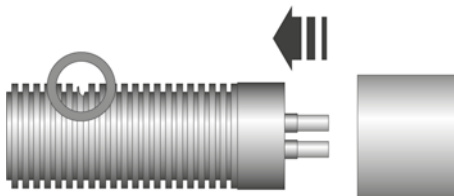
For an outer casing having

A diameter of	use a length of
75 mm	305 mm
90 mm	355 mm
125 mm	465 mm
160 mm	575 mm
200 mm	700 mm

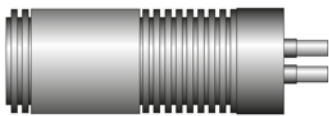
2.13 MHM Shrink Sleeve



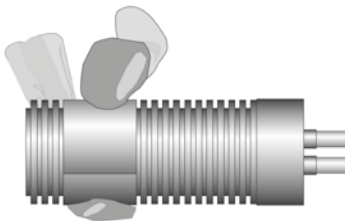
Make sure the casing of the pipe is dry and clean.



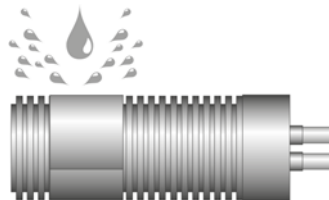
Slide the shrink sleeve over the damaged Microflex pipe. NEVER CUT THE SLEEVE LENGTHWISE!



Use a heat gun or mini torch with soft yellow flame (do NOT use a blue flame) to gently shrink the repair sleeve.



Press the sleeve onto the casing whilst wearing protective gloves.



The damaged casing is now sealed watertight.

MICROFLEX Products – Manufacturer’s guarantee

The Vendor in its quality as Manufacturer guarantees the Purchaser, and, in the event of a resale by such Purchaser, the end-user, hereinafter the “Customer”.

We, WATTS (i.e. the Watts Local Sales company, see the attached list), guarantee the Purchaser, and, in the event of a resale by such Purchaser, the Customer in accordance with the following provisions that the Microflex product delivered to the Customer in Europe are free from defects in material or workmanship within a period of ten (10) years from the installation date (“guarantee period”). Any defects claimed in accordance with these guarantee terms shall be remedied in our sole discretion at our expense by repair or delivery of replacement product.

The validity of the guarantee is subject to the use of fittings, accessories and other genuine Microflex components.

Other claims of the Customer against us, in particular, but not limited to damages of whatever nature (e.g. for any consequential damages, loss of profit etc.) or any expenses, are excluded. However, the contractual or legal rights of the Customer to the respective seller are not affected by this guarantee.

Claims under this guarantee only exist if:

- 1) The defect is not caused by
 - a) faulty installation and/or operation by the Customer or third parties contrary to supplied proper assembly and operating instructions manual
 - b) incorrect installation, the non-observance of existing guidelines and test specifications on installation of our Microflex products in complete systems,
 - c) any adaptations or changes to the Microflex product,
 - d) any repairs or other interferences by the Customer or by a third party,and
- 2) a pressure test was successfully undertaken after the installation in accordance with the installation manual and the results are communicated to us within 30 days to the following address and/or e-mail of the relevant Watts Local Sales Company (see the attached list);
and
- 3) the serial number has not been removed or defaced;
and
- 4) Following circumstances do not exist:
 - a) unsuitable and/or improper use and/or storage
 - b) faulty, forcible or negligent handling
 - c) excessive loads
 - d) unsuitable expendables,
 - e) components damaging to materials or excessive pollution of the water, gas, oil or other media used, contrary to supplied proper assembly and operating instructionsor
 - f) Influences contrary to their purpose or otherwise harmful.

Claims under this warranty assume that the Customer has contacted WATTS via telephone or via e-mail to the relevant Watts Local Sales Company (see the attached list), describes the defect and provide WATTS with the opportunity to conduct a defect analysis.

Further prerequisite of a guarantee claim is that the Customer grants access to the repairer instructed by WATTS at the agreed date and provides adequate and reasonable support services (such as accessibility and availability of adequate mechanical means to repair or replace the Microflex product). In addition, the Customer must submit the original invoice with the date of purchase.

The cost for the repair respectively for the replacement product shall be borne by us. If guarantee claims are asserted and if during testing of the Microflex product it becomes apparent that no fault has been found or that the guarantee claim does not exist due to non-compliance with the guarantee prerequisites, we are entitled to charge a service fee in the amount of EUR 1.000. This does not apply if the Customer proves that he could not see under the circumstances that the guarantee claim did not exist.

This guarantee is subject to the laws of Germany with the CISG being excluded.

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Società unipersonale del gruppo Watts Italy Holding Srl - soggetta a direzione e coordinamento ai sensi degli artt. 2497 e s.m.i. del C.C.