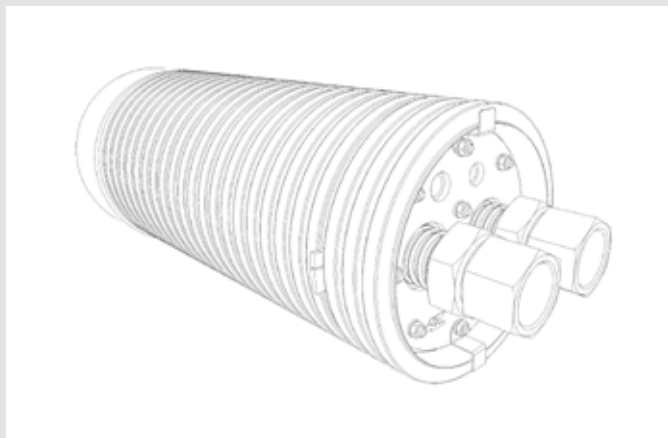


INSTALLATION NOTES

DOYMAfix® Connect

- DOYMAfix® Connect HP/P
- DOYMAfix® Connect HP/B



DOYMAfix® Connect HP/P und DOYMAfix® Connect HP/B

Dear Customer,

Thank you for choosing a quality product from our range.

Please read this message and the included installation instructions in full before installing or processing our products and keep both in a safe place after installation.

Safety instructions:

- Our products may only be installed by persons with the necessary specialist knowledge.
- For your own protection and the protection of third parties, the work area and any necessary pipe trenches must be properly constructed and secured in accordance with the applicable regulations.
- When installing our sealing and fire protection systems, the recognised rules of technology, the relevant regulations of the employers' liability insurance associations, the VDE regulations and the applicable safety and accident regulations must be observed. Parts of the body may be crushed or other serious injuries may occur when tensioning or fixing the products in place.
- The safety data sheets must be observed.
- Check that the delivered product is complete (the scope of delivery is listed separately in the installation instructions) and check all individual parts for any damage. Only undamaged parts may be installed.
- Check that the product is suitable for its intended use using the installation instructions. If there are any particular demands,

please clarify the use of the product with us in advance. Request our checklists for this purpose or download them from www.doyma.com.

Any liability on our part is excluded for misuse!

- Finally, please observe the instructions for the tools and equipment required for installation.

Industrial property rights:

- Our industrial property rights and those of third parties must be observed.

Disposal:

- Please observe the applicable regulations when disposing of components, accessories and packaging.

Terms and conditions of sale:

- The current version of our terms and conditions of sale and delivery shall prevail.

1) About this document

This document must be read before starting work. The specifications in this document must be adhered to. Failure to observe this will invalidate the warranty claim against DOYMA GmbH & Co.

1.1) Validity of the document

This document applies to the hydraulic connection sets.

1.2) Target group

This document is aimed at the skilled worker for water installation, heating technology, refrigeration technology and electrical engineering.

Skilled workers are qualified and instructed installers, electricians, etc.

Users are persons who have been instructed in the use of the heat generator by a competent person.

1.3) Applicable documents

- Assembly instructions for the included annual chamber seal Doyma.

The documents of the heat pump and all accessory modules used as well as other accessories also apply.

1.4) Retention of the documents

The handover is done by the skilled worker.

The documents must be stored in a suitable place and kept available at all times. The plant operator shall be responsible for the safekeeping of all documents.

The plant operator passes the documents on to the successor if necessary.

2) Safety

- Only allow work on the hydraulic connection sets to be carried out by qualified personnel.
- Only allow work on electrical components to be carried out by qualified electricians.
- For all service and repair work on the monobloc air/water heat pumps, observe the operating instructions for the specialist.

2.1) Intended use

The hydraulic connection sets are used for simple and safe building installation of the required hydraulic and electrical connection lines between the outdoor unit and the indoor unit of the monobloc air/water heat pumps.

2.2) Improper use

Any use other than the intended use is not permitted. Any other use or modification of the product, including assembly and installation invalidates all warranty claims. The risk is borne solely by the operator. The hydraulic connection sets are not intended to be used by persons (including children) with reduced physical, sensory or mental capabilities or lack of experience and/or knowledge. Unless they are supervised by a person responsible for their safety or have received instructions from them on how to use the hydraulic connection sets. The connection sets must not be routed across fire compartments.

2.3) Safety measures

Do not remove, bypass or in any way disable safety and monitoring devices.
Only use the hydraulic connection sets when they are in technically perfect condition. Immediately and professionally rectify faults and damages that impair or could impair safety.
Replace damaged components with original-Doyma spare parts.

2.4) General safety instructions



DANGER

Electrical voltage!

Fatalities due to electric shocks.
Have electrical work carried out by a specialist.



Combustible refrigerant in the outdoor units of the heat pumps!

Suffocation and danger of severe to life-threatening burns.
If there are leaks in the refrigerant circuit, disconnect the entire heating system from the power supply. Notify specialists.



High temperatures!

Scalding of the hands by hot water or hot components.
Before working on water-seated parts, allow the heat generator to cool down below 40 °C. Use safety gloves.



Overpressure on the water side!

Injuries to the body due to high overpressure at the heat generator, expansion vessels, sensors and probes.
Close all taps. Drain the heat generator if necessary. Use safety gloves.



Excess pressure on the cold side in the outdoor units of the heat pumps!

Injuries to the body due to high overpressure at the refrigeration circuit. Work on the refrigerant circuit only to be carried out by specialists.

2.5) Handover to the plant operator

Hand over these instructions and the applicable documents to the system operator. Point out the following points to the system operator:

- Repair work should be carried out only by qualified personnel.
- The sealing elements included are for single use only.
- Do not make any changes to the hydraulic connection sets except as explicitly stated in these instructions.
- Use only original-Doyma spare parts.
- Keep these instructions and the applicable documents carefully in a suitable place and keep them available at all times.

3) Description

The hydraulic connection sets are used for simple and safe building installation of the required hydraulic and electrical connection lines between the outdoor unit and the indoor unit of the monobloc air/water heat pumps. The following variants are available for this purpose:

Operating Instructions for Specialists

3.1) Basement lead-through type

Hydraulic connection set for simple facade lead-through when exposed to pressurised water. The sealing between the casing pipe and a wall penetration to be provided by the customer is carried out using Doyma „Curaflex Nova® Uno/breit“ (included in the set).

This wall penetration can consist of a cavity-free core borehole for waterproof concrete (white tank) or of a wall casing pipe with a diameter (DN) of 249 - 253mm.

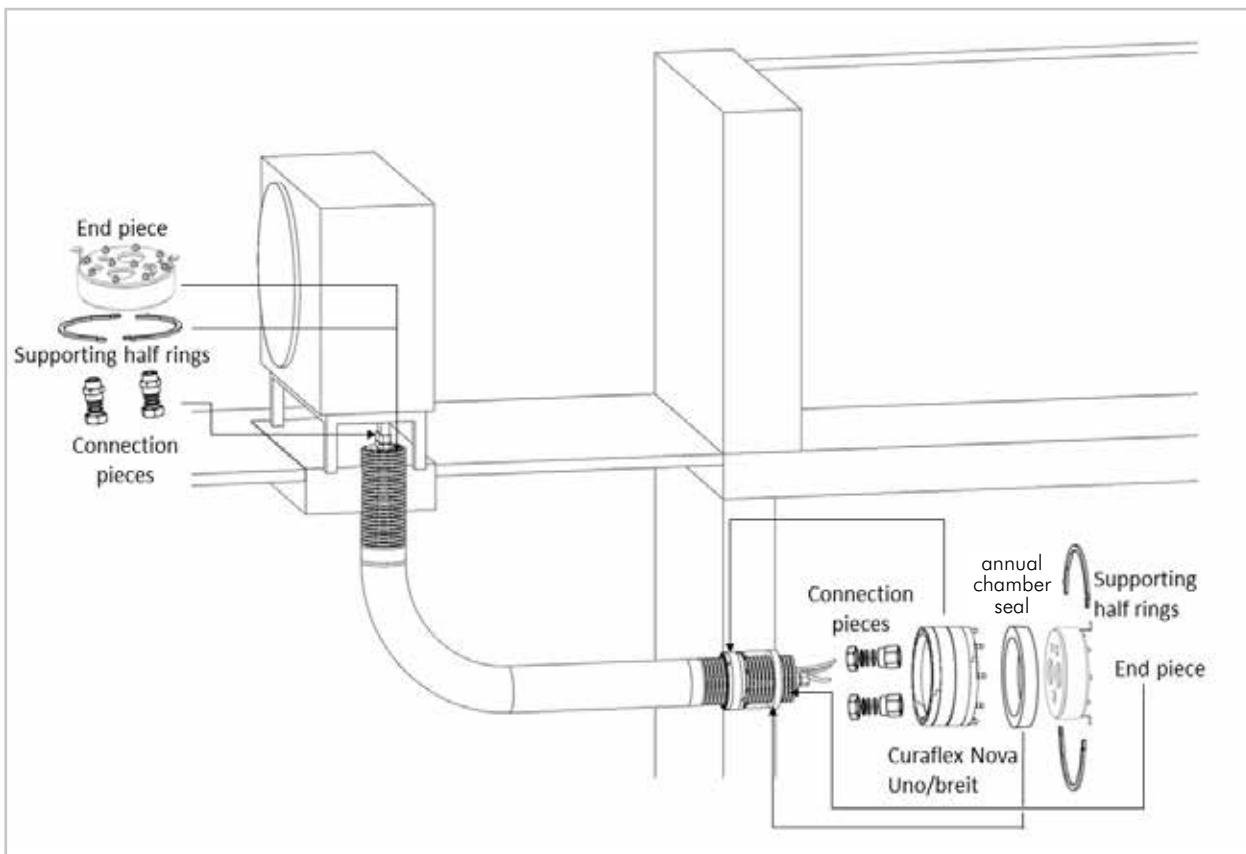


Figure. 3.1: Basement lead-through type

3.2) Base plate lead-through type

Hydraulic connection set for base plate lead-through even under pressurised water. This wall duct is cast into the waterproof concrete base plate on site.

The sealing between the casing pipe and the base plate is realised by means of the Doyma „HKD wall collar DN200“ (included in the set), which has been specially tested and approved in conjunction with the casing pipe.

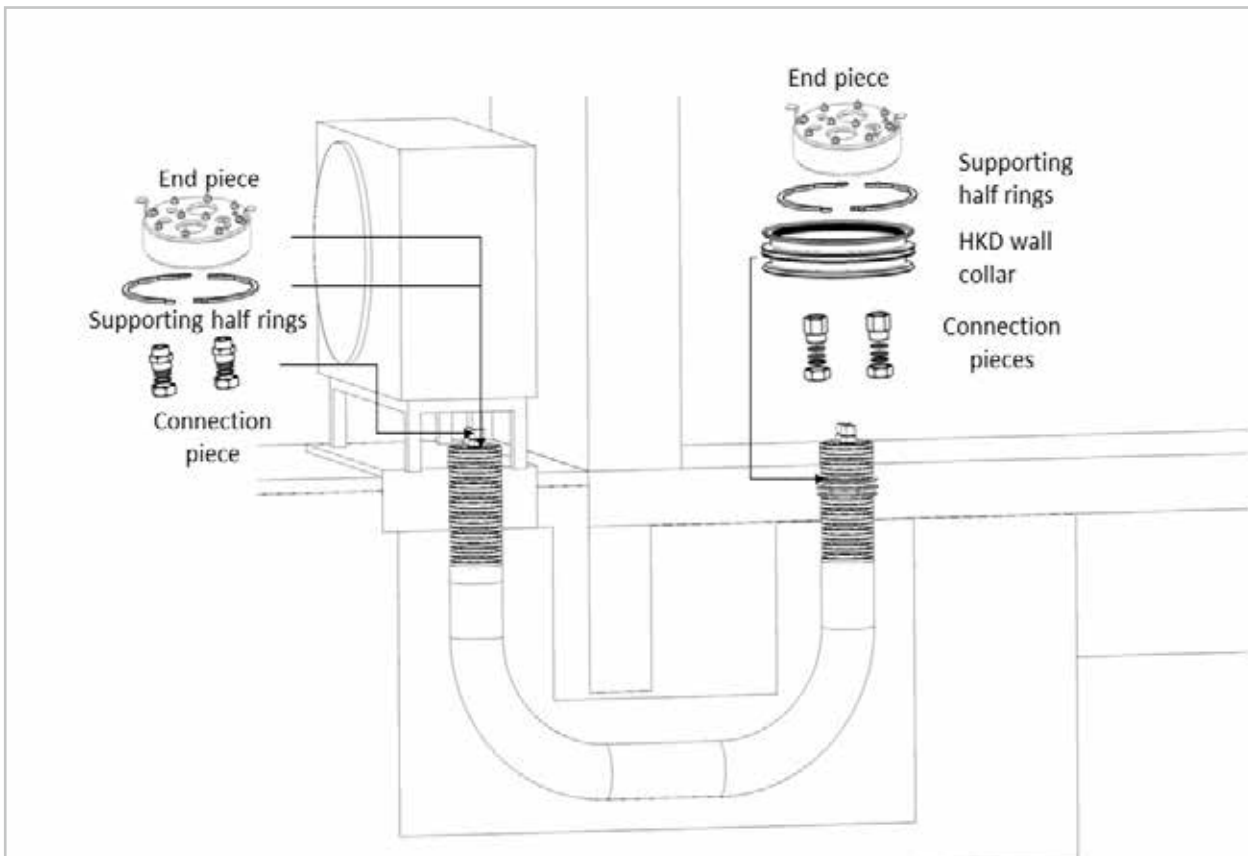


Figure. 3.2: Base plate lead-through type

4) Planning

4.1) Regulations

When installing and operating the hydraulic connection sets, the general, country-specific and local standards, regulations, rules and directives must be observed.

In particular, the following points:

- Installation conditions of the heat pump.
- Stress on the structural waterproofing with regard to moisture and gases.
- Investigation and notification obligations before excavation work on buried pipelines.
- Regulations and standards on the safety equipment of the water heating system.
- Accident prevention regulations and occupational safety specifications of the employers' liability insurance associations must be observed.
- VDE regulations regarding live cables must be observed.

4.2) Installation site

Observe the operating instructions for the monobloc air/water heat pump for specialists. In particular, the following points:

- The heat pump outdoor unit requires a frost-proof foundation.
- It must be possible to drain off any condensate that accumulates.
- Specifications for sound insulation and structure-borne sound decoupling.
- Corrosion protection, especially near the coast.
- Note the mounting height, the outdoor unit must not exceed max. 3m above the indoor unit.
- Protected areas around the heat pump outdoor unit (free from ignition sources).

4.3) Wall penetration

The wall penetration must be provided by the customer. A prerequisite for the use of the „hydraulic connection sets“ is a wall casing pipe (not part of the scope of delivery) or a core drilling in waterproof concrete (white tank). An exception is the „base plate lead-through“ type, which is cast directly into the in-situ concrete. Particular attention must be paid to a professional execution of the wall penetration as well as a subsequent, suitable sealing, as errors in the sealing can result in major consequential damage.

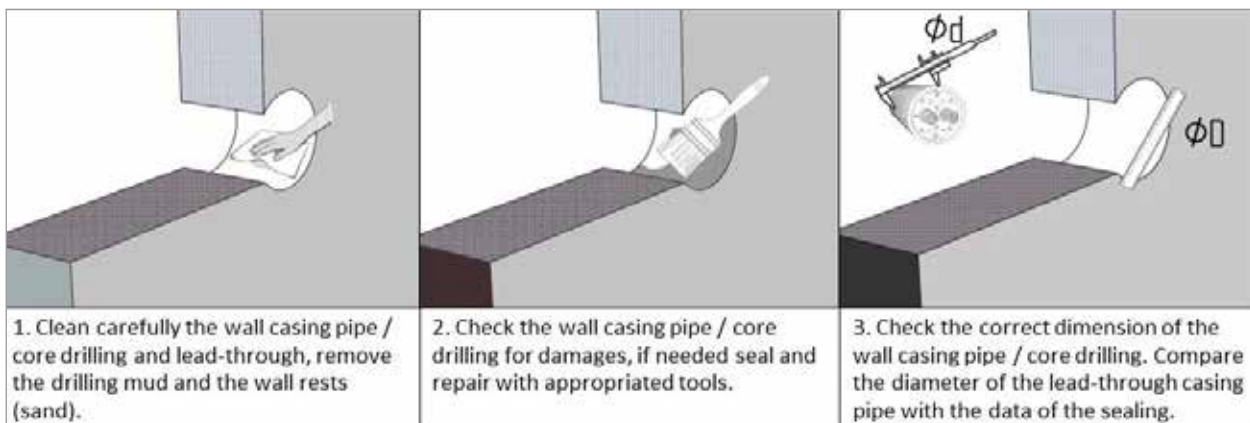


Figure. 4.3: Wall penetration

Hydraulic connection set	Core drill or wall casing pipe diameter (Ø D)	Sealing element
Basement lead-through DN200/32 and DN200/40	249 – 253mm	DOYMA „Curaflex Nova Uno/breit DN 200“ and annual chamber seal DN 200
Base plate lead-through set DN200/32 and DN200/40	Placement in the in-situ concrete	DOYMA „HKD wall collar DN 200“

Table. 4.3: Overview of the connection sets

The installation instructions for the annual chamber seal enclosed with the basement lead-through and base plate leadthrough sets Doyma „Curaflex Nova® Uno/breit“ or „HKD wall collar“ is an integral part of these instructions and can be viewed on the homepage: www.doyma.de

4.4) Embedding the casing pipe

The casing pipe used must be embedded and laid according to the following illustration in order to avoid any damage. The backfill material must be carefully compacted. With a correspondingly good compaction of $DPR \geq 95\%$ in conjunction with a cover of min. 0.8m, live loads of SLW 60 according to DIN 1072 are permissible. The path warning tape shown is included in the scope of delivery.

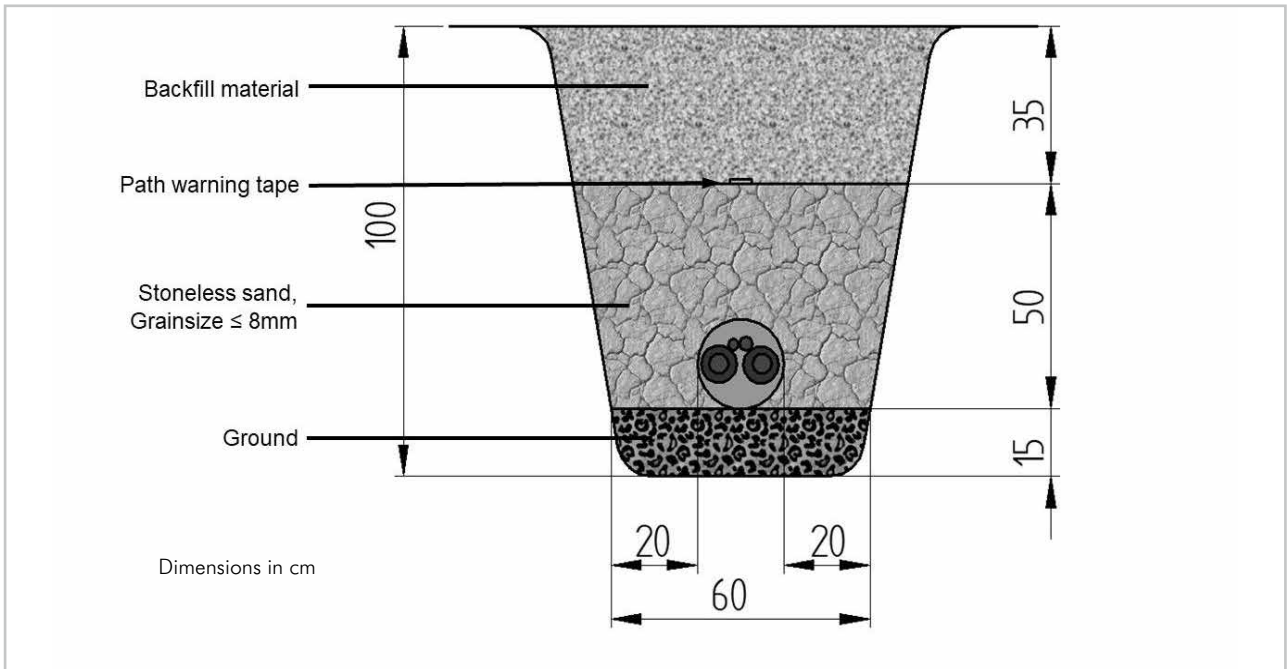


Figure. 4.4: Embedding the casing pipe

4.5) Overhang of the casing pipe

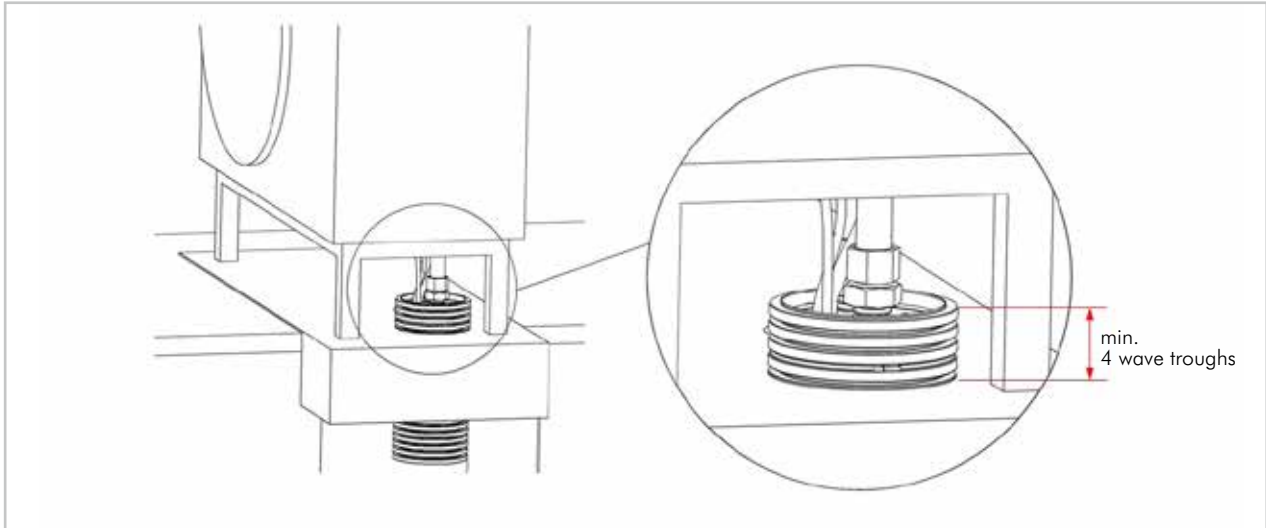


Figure. 4.5: Casing pipe in concrete foundation

4.6) Bending radius of the casing pipe

The casing pipe is made of high-quality PE-HD and can therefore also be processed at cold temperatures. However, the impact strength of any plastic decreases with temperature, which is why at temperatures of $< 5^{\circ}\text{C}$ the casing pipe must be handled with particular care.



Attention! A minimum bending radius of 0.5m must not be fallen below!

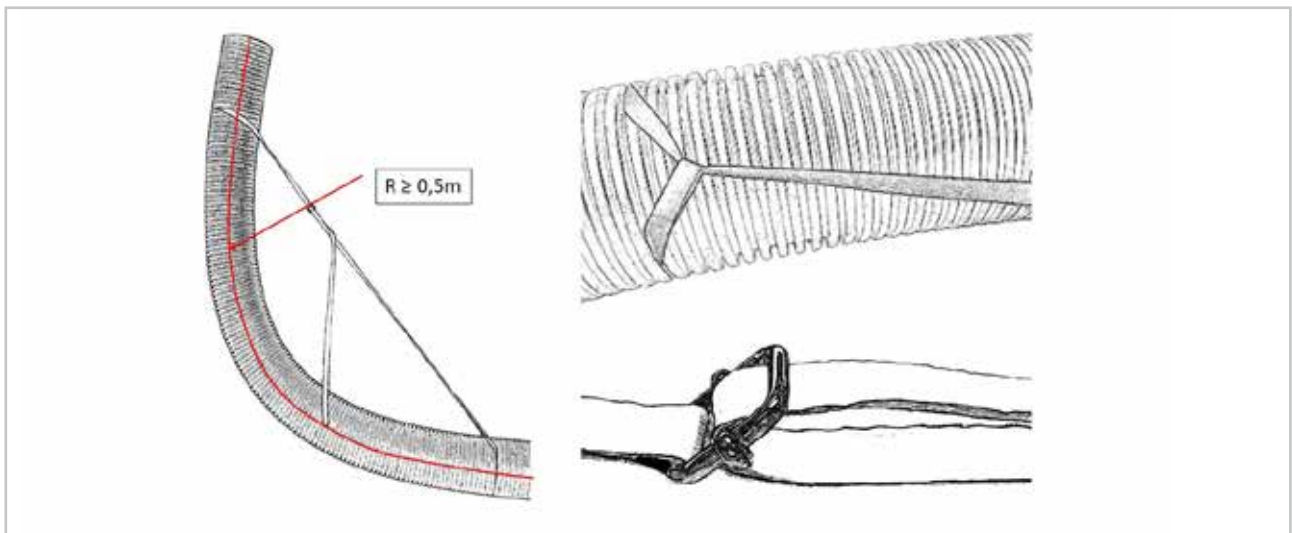


Abb. 4.6: Mindestbiegeradius und Bogenzug

The curving belt included in the sets helps to make a fixed bend. Ensure that the pipe ends are of sufficient length outside the bend, as the facade lead-through must be made with a straight piece of pipe. The distance between the loops is approx. 1.5m on the straight tube.

5) Transport

5.1) Checking the connection sets for transport damage

On receipt of the goods, the connection sets and their components must be checked for transport damage and completeness. If damage is suspected or present:

- Note any damage on the consignment note.
- Have the consignment note countersigned by the forwarder.
- The recipient of the goods must report the facts to DOYMA GmbH & Co without delay.

5.2) Unloading connection sets

The hydraulic connection sets are delivered in a transportable unit on a pallet.

Set	Weight
Sets with 3 m pipe	approx. 36 kg (with pallet)
Sets with 5 m pipe	approx. 45 kg (with pallet)
Sets with 10 m pipe	approx. 60 kg (with pallet)
Sets with 15 m pipe	approx. 80 kg (with pallet)
Sets with 20 m pipe	approx. 95 kg (with pallet)

Table 5.2: Delivery weight of the sets

**Warning! Special care must be taken when opening the packaging!
The free pipe ends can spring back!**



Attention! Make sure the surface is clean! Do not remove the protective caps from the casing pipe until immediately before connecting the pipes!

Store the pipes on the transport pallets for as long as possible. Due to the limited UV resistance, outdoor storage should be limited to the time absolutely necessary, but to a maximum of 6 months. When transporting the pipes without transport packaging, protect them from damage.

- Use of nylon or cloth belts.
- Use fork protection when loading with a forklift.



Attention! A damaged casing pipe or a damaged seal can lead to water entering the building and thus to high consequential damage!

6) Installation

6.1) General procedure

The procedure depends on the type of facade lead-through and the construction site situation. The following general procedure is recommended.

6.1.1) Facade lead-through type and basement lead-through type

Group master-builder or shell construction work:

- Ensure that the workplace is clean and safe, especially when carrying out earthworks, make sure that the excavation is large enough.
- Check the condition of the wall casing pipe or the core bore (see chapter 4.3).
- Insert the casing pipe into the wall opening and position it.
- If necessary, cut the casing pipe to length. Make sure that no dirt can get into the casing pipe (chap.6.2).
Note: The cover caps supplied can be used for this purpose.
- Install annual chamber seal (chap. 6.3).
- Carry out work on site: e.g. fill in the pipe trench, create a base for the heat pump outdoor unit, plaster the wall up to the wall casing pipe or lead-through casing pipe.
Group heating or refrigeration engineer:
- Position the end pieces, insert corrugated pipes and conduits. Do not screw the end piece yet (chapter 6.3.1)!
- Position the corrugated pipes and cables, cut to length if necessary.
- Screw on the end piece.

6.1.2) Base plate lead-through type

Group master-builder or shell construction work:

- Ensure that the workplace is clean and safe, especially when carrying out earthworks, make sure that the excavation is large enough.
- Position the casing pipe. Observe the bending radius of the casing pipe. Guide the casing pipe vertically through the floor slab.
- Embed the casing pipe underneath the floor slab and strip foundations (chap. 4.4).
- Doyma HKD wall collar apply acc. to instructions and place in the centre of the floor slab.
The concrete mesh reinforcement of the base plate is to be kept as small as possible.
- If necessary, cut the casing pipe to length. Make sure that no dirt or water can penetrate into the casing pipe (chap. 6.2).
Note: The cover caps supplied can be used for this purpose.
The casing pipe must be protected against damage and prolonged UV radiation (max. 6 months).
- Carry out work on site: e.g. fill in the pipe trench, create a base for the heat pump outdoor unit, plaster the wall up to the wall casing pipe or lead-through casing pipe.

Group heating or refrigeration engineer:

- Position the end piece, insert the corrugated pipes and cables. Do not screw the end piece yet (chapter 6.3.1)!
- Position the corrugated pipes and cables, cut to length if necessary.
- Screw on the end piece.

6.2) Cutting the casing pipe to length

The casing pipe must have at least 4 complete corrugation grooves outside the finished wall in order to still be able to position the supporting half rings later.

Tip: Shorten the casing pipe to approx. 13cm (corresponds to 8 corrugation grooves) in the shell construction phase and only shorten it to final dimensions when inserting the end piece.

The casing pipe is not permanently UV-resistant (max. 6 months), which is why it must be protected outdoors. Especially for the facade lead-through type, it is recommended to shorten the casing pipe after the installation has been completed so that it can be plastered in afterwards.

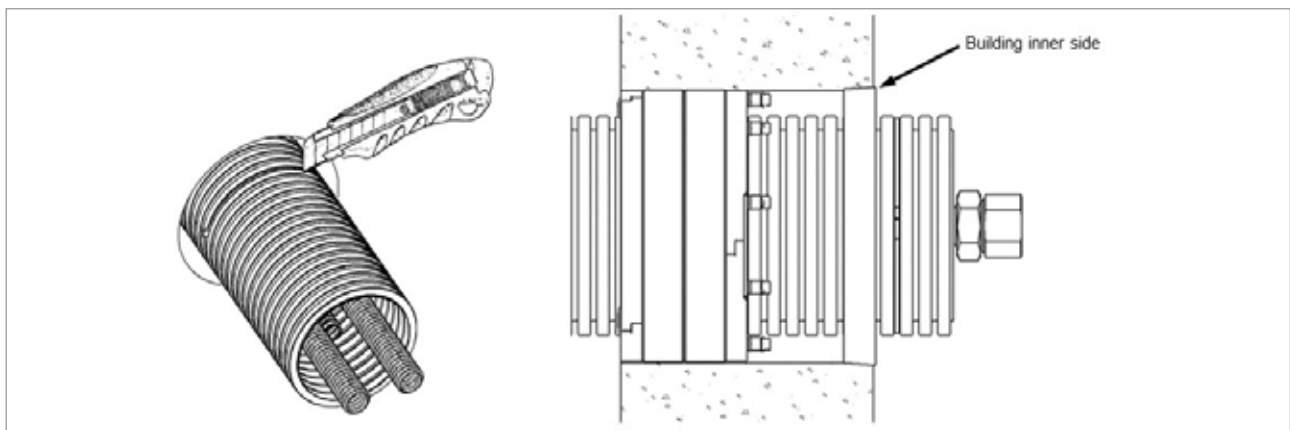


Figure. 6.3.1: Seal for facade lead-through type

- Ensure a clean and straight cut in the wave groove. The support ring can be used as a guide. If necessary, rework and deburr the pipe end.
- Cut the pipe to length using a cutter knife (with hook blade if necessary). Wear protective gloves.



Caution: Do not damage internal cables and lead-through pipes!

Depending on the situation, it may be necessary to roughly cut the insulation, corrugated pipes and lead-through pipes to length in advance. Make sure that you have enough in reserve for later installation.

Tip: The forward flow and return flow pipes are marked with an adhesive strip (blue, red). Re-label the pipes before cutting to length (Caution: Danger of confusion).

6.3) Inserting the annual chamber seal

The annular chamber seal serve exclusively to seal and centre the lead-through casing pipe in the wall casing pipe. No forces or movements must be allowed not to impact on the waterproofing, especially radial forces and radial displacement (e.g. when subsequently compacting the trench) can cause leaks in the system.

6.3.1) Basement lead-through type

The basement lead-through set includes a Doyma „Curaflex Nova® Uno/breit“ seal. The assembly is carried out according to the separate assembly instructions, which can be viewed on the homepage: www.doyma.de



The ring closure serves to close the annular gap between the wall casing pipe and the lead-through casing pipe on the inside.

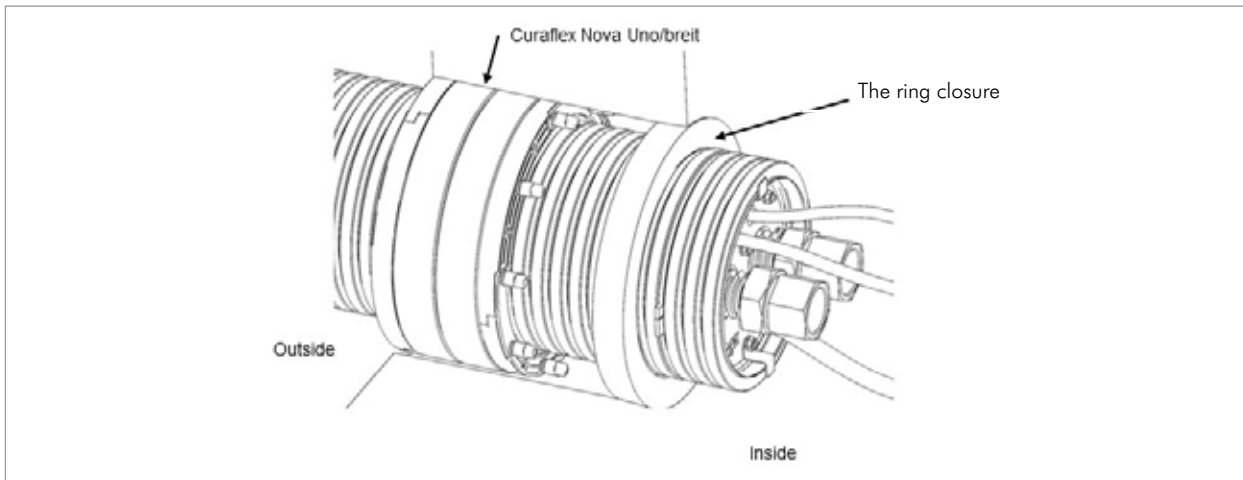


Figure. 6.3.1: Seals for basement lead-through type

6.3.2) Base plate lead-trough type

In the case of base plate lead-throughs, the hydraulic connection set must be planned precisely before the construction work begins. The lead-through casing pipe is embedded below the formation of the base plate and guided vertically upwards at the desired position. With the help of the enclosed Doyma „HKD wall collar“, the casing pipe is cast into the base plate made of waterproof concrete in a pressure-tight manner.

The following procedure should be followed:

- The concrete mesh reinforcement of the base plate is to be kept as small as possible.
- The wall collar is to be placed centrally in the base plate.
- The stainless-steel clamping bands of the wall collar must come to rest on a wave crest of the casing pipe and must be tightened moderately (1 Nm).

Excessive tightening torque will cause the stainless-steel tension band to slip into a wave groove.

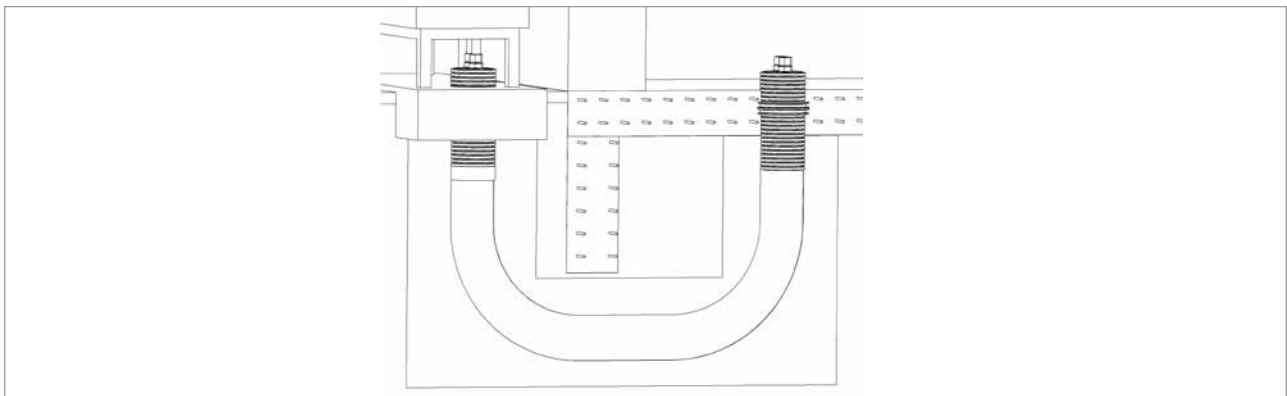


Figure. 6.3.2: Schematic diagram of a base plate lead-through

6.4) Mounting the end piece

The end pieces are used for the gas-tight and watertight sealing of the interior of the casing pipe, with simultaneous lead-through of the electrical cables and media pipes. It is imperative that the end pieces are fitted properly, e.g. to avoid moisture or refrigerant from entering the building in the event of a leak.

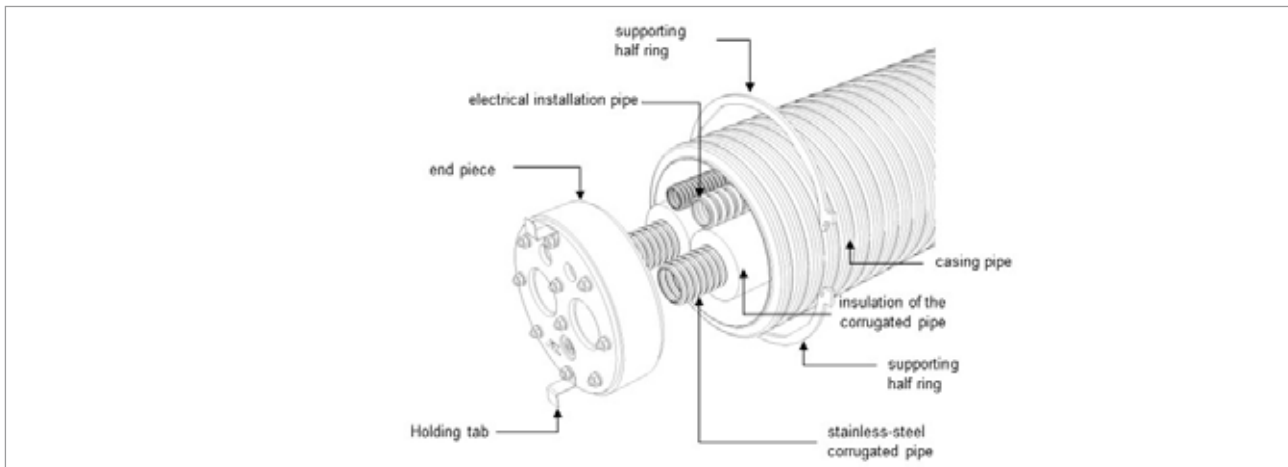


Figure 6.4: End piece of casing pipe



Please note

- End pieces are not fixed points or support bearings but are used exclusively for the elastic sealing of cables.
- Slight axial movements of the cables are admissible.
- When installing the sealing system, the relevant regulations of the professional associations, the VDE regulations, the nationally applicable safety and accident regulations and the guidelines of your company must be observed.
- Shorten the casing pipe to the final length and deburr (see chapter 6.2). At least four complete corrugation grooves must still protrude from the wall.
- Shorten the electrical installation pipe on both sides by approx. 100 mm and the insulation of the corrugated pipe by approx. 60-70 mm into the casing pipe.
- The hydraulic connection set can also be used for heat pumps with active cooling function. The insulation of the corrugated pipe must then be sealed airtight on site. For implementation details, see DIN 4140.
- Adjust the length of the corrugated pipe generously on both sides. Make sure that the end is cut off cleanly and at right angles in the corrugation groove and that there are no deformations.

Use a pipe cutter for cutting, not a saw or angle grinder!

To obtain an optimal cutting result, position the cutting wheel of the pipe cutter centrally in the corrugated pipe valley.

- The pipeline being sealed (cable or corrugated pipe) as well as the inside of the casing pipe must be cleaned in advance and must not have any axial cavities or bumps in the area of the sealing surface.
- Before fitting the end pieces, appropriate support rings must be fitted in the third groove of the Hekaplast casing pipe (approx. 45 mm from the pipe end) to ensure sufficient rigidity to absorb the compressive forces from the end piece.

Ensure that the support rings engage correctly!

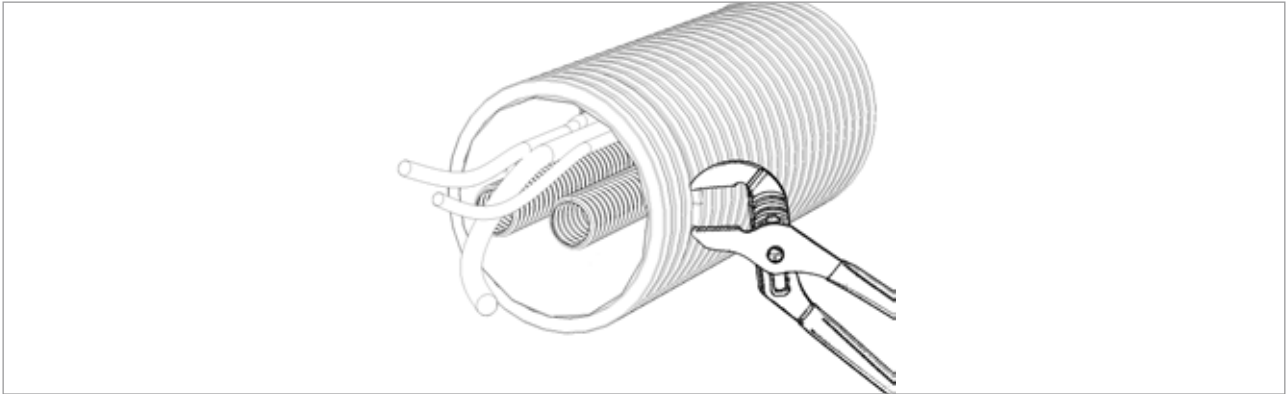


Figure 6.4.-1: Clamping of the support rings

For proper installation of the end piece, you will need the following tools and equipment in addition to the usual standard tools:

- Tools:
 - 1 torque spanner (8 Nm)
 - 1 extension (1/4" drive, at least 50mm)
 - 1 socket spanner insert external hex SW 10 for M6
- Resources:
 - Lubricant
 - Cleaner (solvent-free)
 - Caliper gauge
 - Cleaning cloth

Tip: The inflow and outflow pipes are marked with an adhesive strip (blue, red). Re-label corrugated pipes before cutting to length (caution: risk of confusion).

- Take measurements: Determine the diameter of the casing pipe and the pipes and compare it with the information on the product label.
- Install the support brackets: Mount the two support brackets on two opposite clamping bolts. To do this, remove the hexagon nuts and washers, slide the support bracket onto the bolt and refit the washer and hexagon nut. Tighten the hexagon nut hand tight.
- Insert the end piece:
Push the end piece over the cables into the casing pipe until the support brackets are in contact with the end of the casing pipe.

Assign the cables as follows

- Power cable in opening $\varnothing 21$ mm (cable lead-through)
- Control cable in opening $\varnothing 15$ mm (otherwise rubber core)
- Ebus/ModBus in opening $\varnothing 12$ mm

- Inserting of the cable lead-through:

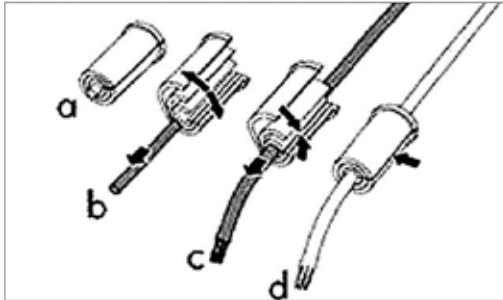


Figure 6.4-2: Cable lead-through

- a. Remove the plug (b) from the cable lead-through (a) and push the cable through (c). Remove as many layers as necessary by tearing them out until the dividing sections of the cable lead-through touch but do not overlap when enclosing the cable/pipe (d).

It may be necessary to cut the joint of the cable lead-through layers with a knife in order to simplify the tearing out!

- b. Apply lubricant to all inner surfaces and the dividing sections of the cable lead-through and cable.
- c. Fold the cable lead-through around the cable and push it into the corresponding opening up to the edge.

- Tightening the end piece

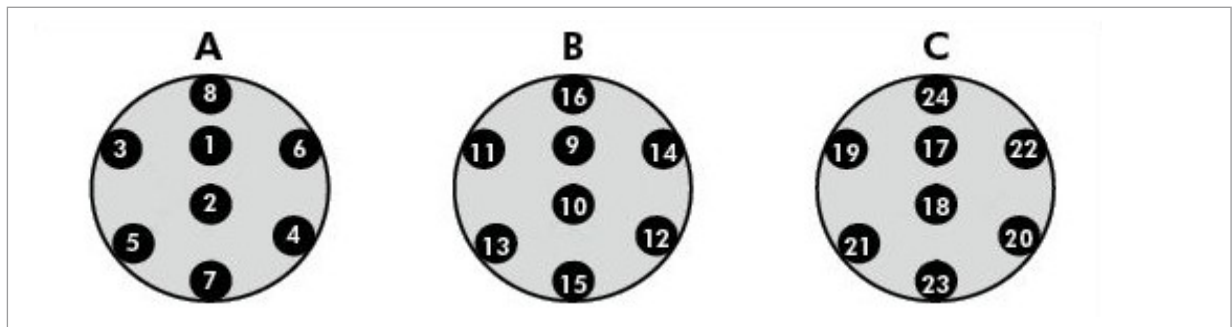


Figure 6.4-3: Tightening the end piece

For final assembly of the end piece, tighten the hexagon nuts alternately crosswise a few rotations each in at least 3 intervals (A>B>C) with 8 Nm.

6.5.1) C-Clip for DN32 and DN40

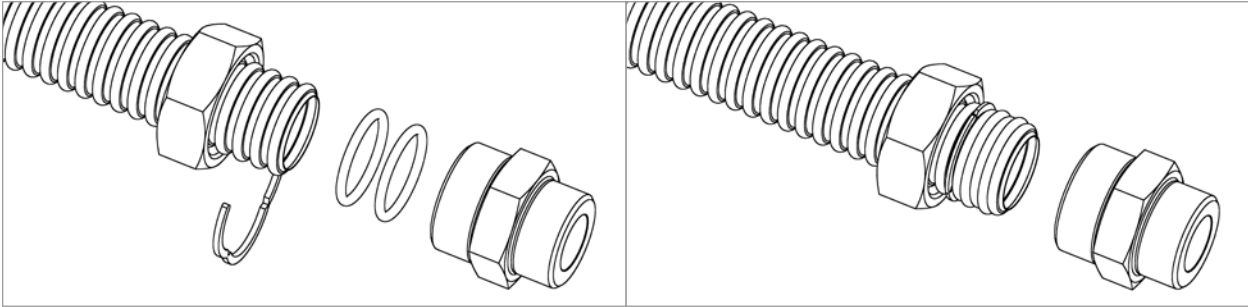


Figure. 6.5.1: Pipe connection C-Clip

- Cut the corrugated pipe at the exact length.
- The first 4 waves for the connection must not have any deformations!
- Make sure that the sealing surfaces are clean.
- Insert the union nut (threaded side towards the end of the pipe).
- Mount the o-rings into the first two wave grooves.
- The use of lubricant for sanitary installation or fitting grease on the o-rings is recommended! Pay attention to cleanliness.
- Place the 3/3 ring in the third wave groove and close it.
- Place the push-in connector on the corrugated pipe with O-rings and 3/3 ring.
- Screw on the union nut with the plug-in connection (approx. 20 Nm).

6.6) Completing the installation

- A leak test must be carried out by the installer of the system, during which the connections must be checked.
- The black casing pipe is only UV-resistant to a limited extent (max. 6 months), which is why the projection on the outer wall must be protected on site, e.g. by a metal rosette, a suitable paint or by covering the façade.

7) Use and Disposal

7.1) Commissioning

Note: Improper commissioning of the heat pumps can cause damage to the heat pumps itself and the entire heating system!

Commissioning of the hydraulic connection sets is not necessary. For commissioning of the heat pumps, the valid instructions must be observed.

7.2) Maintenance

The hydraulic connection sets are maintenance-free.

Seals are not suitable for reuse. If seals have to be opened and removed, replace them with new seals (Doyma original spare parts).

7.3) Recycling and Disposal



Electrical voltage!

Fatalities due to electric shocks.

Only have the heat generator disconnected from the mains by a specialist.



NOTE

Leaking water!

Water damage can occur.

Collect residual water from the heat generator and the heating system.

In accordance with the Waste Disposal Act, the following components must be disposed of and recycled in an environmentally sound manner via appropriate collection points:

- Old device
- Parts subject to wear
- Defective components
- Electrical or electronic scrap
- Environmentally hazardous liquids and oils

Environmentally compatible means separated according to material groups in order to achieve the maximum possible reusability of the basic materials with the lowest possible environmental impact.

Dispose of cardboard packaging, recyclable plastics and plastic filling materials in an environmentally friendly manner via appropriate recycling systems or recycling centres.

Observe any country-specific or local regulations.

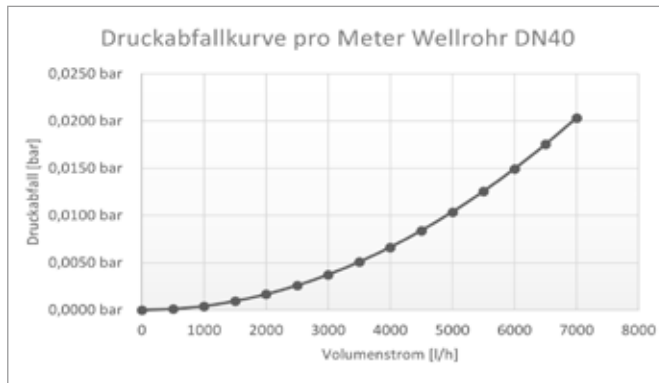
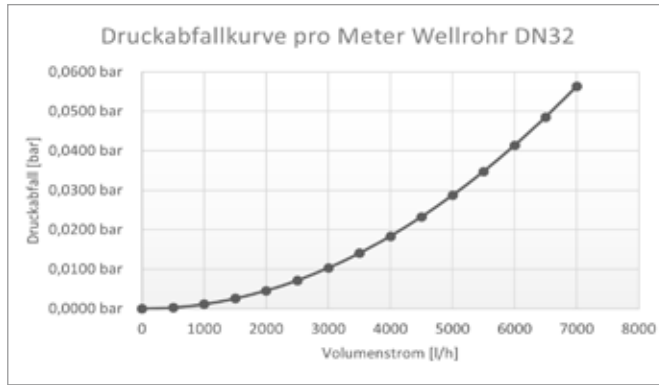
8) Appendix

8.1) Technical Data

Corrugated stainless steel pipe	DN32	DN40
Max. perm. operating pressure at 20°C	5 bar	5 bar
Max. perm. operating pressure at 95°C	3,7 bar	3,7 bar
Max. perm. pressure for leakage control	6 bar	6 bar
Outer diameter	41 mm	47,7 mm
Liquid volume in the corrugated tube (per double meter)	2,010 l/m	2,884 l/m
Lead-through casing pipe		
Outer diameter	200 mm	200 mm
Inner diameter	173 mm	173 mm
Minimum bending radius	500 mm	500 mm
Ring stiffness according to DN 16961 (pipe series 4)	≥ 16,0 kN/m ²	≥ 16,0 kN/m ²
Electrical installation pipe DN25		
Outer diameter	25 mm	25 mm
Innendurchmesser	19,3 mm	19,3 mm
Electrical installation pipe DN32		
Outer diameter	32 mm	32 mm
Innendurchmesser	24,9 mm	24,9 mm
EPDM insulation material		
Thermal conductivity at +40°C	0,038 W/mK	0,038 W/mK
Thermal conductivity at 0°C	0,036 W/mK	0,036 W/mK
Insulation thickness forward/return flow	19 mm	19 mm
seal end piece		
Outer diameter	172 mm	172 mm
Thickness	40 mm	40 mm
Material	EPDM-50 Shore	EPDM-50 Shore
Cable lead-through		
Power line (outer diameter)	11, 12, 13, 14, 15, 16, 17 mm	
Control line (outer diameter)	10, 11, 12, 13, 14 mm	
Ebus / ModBus (outer diameter)	9,5 , oder 11 mm	

Table 8.1 Technical data

8.2) Pressure drop curve



DOYMA products are continuously being further developed. Technical changes will be performed without prior notice.
25 year warranty on all DOYMA products. **More information at www.doyma.de**

DOYMA GmbH & Co

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