Jentro

Axial compression joint system for PEX and STABIL pipes

QB

DVGW
CERT
CEN EN ISO 15875-3
CEN EN ISO 15875-5

DVGW
product

Technical information

Subject to modifications

Edition 06 - 2018

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product

1 Jentro system with compression sleeve joints for drinking water installations and radiator connection, for PEX and STABIL pipes

1.1 Field of application

This technical information applies to planning, installing and using in buildings. As basis for the rules regarding drinking water installation, the DIN 1988, part 1- 8, has to be complied with as well as the installation regulations described in this manual of the system with compression sleeve connections with the universal Jentro PEX and Jentro STABIL pipe, and Jentro compression connection accessories and with other system components according to the standards of the manufacturer.
The compression connection system can be used for both the distribution of drinking water as well as the connection of radiators, under a maximum operating overpressure of 10 bars and a maximum operating temperature of 70° C as prescribed by the DVGW according to the following operating parameters:

- **Continuous operating pressure: 10 bar**
- **Continuous operating temperature: 70° C**
- **Life cycle: 50 years**
- **Safety factor: > 1,5**

The Jentro compression system can be used if the water complies with the tolerance values as meant in the following standards:
DIN 2000, German drinking water ordinance (abbreviated in German: TrinkwV) and the European directive 98/83/EG of the Council of 3/11/98 regarding water quality for human consumption.

The universal Jentro pipes do not facilitate growth of Legionella bacteria. A thermal disinfection according to DVGW worksheet, and W 551 and W 552 is possible without problems.

The entire system with compression sleeve connections can be used for new installations, for sanitations and for restorations.
Possible applications are drinking water installations in buildings (such as residential buildings, buildings for public use, such as schools, nursery schools, sports halls, churches, care homes, supermarkets, motels, industrial buildings).

For applications with special requirements regarding drinking water hygiene, such as hospitals and food industry, the pipes have passed through an additional check according to worksheet W 270 of the DVGW.
Applications that are not discussed in this technical information (special applications) require consultation with our technical services. Consult the price list for more information on the article numbers, materials, dimensions, weights, versions and delivery units.

2 The PEX pipe

2.1 The material

The universal Jentro PEX pipe consists of high molecular high-density strong PE, cross-linked with peroxide. The cross-linkage above the crystallite melting point is characteristic for high-pressure cross-linkage.

The cross-linking reaction occurs during the pipe formation in the tool. This cross-linking procedure ensures a regular cross-linkage across the whole wall thickness, even in the case of thick-walled pipes.

The different molecules of the polyethylene link up to a three-dimensional network. The already excellent material properties still considerably improve during this process (principally the temperature and pressure resistance, the impact resistance at low temperatures and the stress crack resistance).

The co-extruded oxygen barrier consists of ethylene vinyl alcohol (EVAL), the best high barrier polymer.

The requirements in the area of oxygen permeation according to DIN 4726 are largely exceeded. In addition, the adhesive layer between the basic pipe and the barrier layer guarantees a very strong bond.

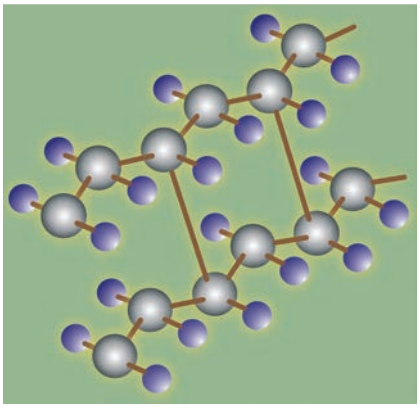
With regard to the wear resistance and weather stability, the water-insoluble EVAL layer offers a very large reserve, making the pipe resistant to the roughest building site circumstances.

Drinking water

The Jentro universal PEX pipe is used for drinking water transport in accordance with DIN2000 for cold and warm water, up to an operating overpressure of 10 bars and can be used continuously at a temperature of 70° C. Short-time (failure) up to 100° C.

Heating

For application in heating systems, the pipe can be used with a maximum flow temperature of 90° C. Short-time (failure), temperatures up to 100° C are possible.



▲ *Fig. 1: Cross-linked polyethylene*

2.2 Technical data

• Material	PE-Xa with EVAL coat
• Colour:	grey Ral 9006
• Density	0.93 g/cm³ (as per DIN 53497)
• Modulus of elasticity	approx. 600 N/mm²
• Notch impact resistance	
at 20° C	no rupture
at - 20° C	no rupture
• Average expansion Coefficient	0.15 mm/m°K
• Caloric conductibility	0.35 W/m°K
• Oxygen diffusion as per DIN 4726	oxygen tight
• Pipe roughness k	0.007 mm
• Material constant C	12
• Max operating temperature	90° C
• Short-time max temp. (failure)	100° C
• Minimum bend radius without tools	8 x d

2.3 Properties of PEX pipes

Thanks to the cross-linkage of PE, the main material properties are still considerably improved: The Jentro Universal PEX pipe has the following characteristics:

- Excellent durability, even at higher temperatures.
- Insensible to the formation of stress cracks.
- An ample choice of joints and accessories.
- Reliable connection technique:
  Permanent tight compression sleeve joint.
  No use of O-rings.
  Visual checking.
  Can be immediately put under pressure.
- Form stable.
- Same compression sleeve for PEX and STABIL.
- Optimum relation flexibility/ pressure resistance.
- Excellent resistance to ageing due to heat.
- Very good impact and notch impact resistance at temperatures under 50° C.
- High wear resistance and excellent notch resistance.
- No damage to the material as a result of buckling of the pipe.
- Excellent recovery capabilities (memory effect).
- Outstanding chemical resistance.
- Oxygen tight in conformity with DIN 4726, thanks to a barrier layer of ethylene vinyl alcohol (EVAL).
- High caloric stability.
- Resistant to ageing.
- Little flow noises inside the pipe.
- Little pressure loss.
- Free of heavy metal ions.
- Corrosion resistant.
- Free of incrustations, even after years of use.
- Flexible installation.
- Use of the same accessories for STABIL and PEX pipe: pipe series 2, SDR 7.4.
- Pipe dimensions PEX: 16 - 63 mm

Warning!
The values indicated in the contiguous specifications are reference values. Simultaneous loading up to the limit values of both pressure and temperature under operating conditions is NOT permitted!

2.4 Long term behaviour

When polymer materials are exposed to a certain mechanical load, the creep behaviour must be taken into account. This implies that the deformation and the strength depend on the temperature and the load duration.

In order to determine the permitted values under sustained load, one must therefore analyse the mechanical behaviour under loads for a longer period and at different temperatures. This also applies to pipes that are exposed to a high internal compression load. Based on more than twenty-five years of experience - in the laboratory and in practice - and on numerous experiments and tests with polyethylene pipes cross-linked at high pressure, the required parameters were determined.

The results of these durability/internal pressure tests are expressed in diagrams. For this purpose, an extrapolation procedure that has proven its usefulness for over 50 years is used to calculate the results on a longer term than the measurement period. This extrapolation procedure, which is also applied to the construction of steel installations with heated steam, is based on the projection of high test temperatures at low operating temperatures.

The results of the numerous durability/internal pressure tests are represented in a so-called durability/internal pressure diagram. In order to make this diagram applicable to all pipe dimensions, not the internal pressure load, but the so-called comparison stress is used as comparison value.

The relation between the internal pressure strength and the comparison stress can be calculated by means of the so-called "Ketelformule" (Ketel formula).

$$\sigma v = p \times \frac{(D-s)}{20 \times s}$$

σv = comparison stress in N/mm²
p = internal pressure in bar
D = outer diameter of the pipe in mm
s = wall thickness of diameter of pipe in mm

(see figure 2)

2.5 Operating circumstances according to DIN 1988, part 2 for PEX pipes and pipe joints

DRINKING WATER INSTALLATIONS

According to the DVGW directive, all pipelines of drinking water installations must be dimensioned for a permissible operating overpressure (PB) of 10 bars with a safety factor of ⩾ 1.5.

The Jentro pipes comply with DIN 16892 (quality requirements) and 16893 (dimensions). Permissible operating overpressures according to DIN 16893 for Jentro PE-Xa pipes

Operating Temperature	Operating Duration	Pipes series SDR 7.4 Nominal pressure PN 20 Operating overpressure
°C	Years	PB
20	50	20
70	50	11.2
95	10	8.6

▲ *Table 1*

CENTRAL HEATING

In conformity with the DIN 4726, all pipelines of drinking water installations must be dimensioned for a permissible operating overpressure (PB) of 3 bars with a safety factor of ⩾ 2.5.

Figure 2 shows the results for pipes of PE cross-linked at high pressure. These are minimum curves, and therefore the measured values lie above these curves. At 95° C, values of over 120,000 hours without buckling behaviour are observed (a typical value for cross-linked PE).

Additionally, it can be observed that a comparison stress of 5.3 N/mm² is reached for an operating duration of 50 years at 70° C. For a 16 x 2.2 PEX pipe (outer diameter 16 mm, wall thickness 2.2 mm), this value corresponds to an internal pressure of 16.9 bars. This means that even after an operating duration of 50 years at 70° C, the pressure strength of the pipe is still 5.6 times the max. operating pressure of 3 bars. This value is called the safety factor.

The safety factor required in accordance with DIN 4726 of > 2.5 at 70° C is therefore easily achieved by all Jentro PEX pipes.

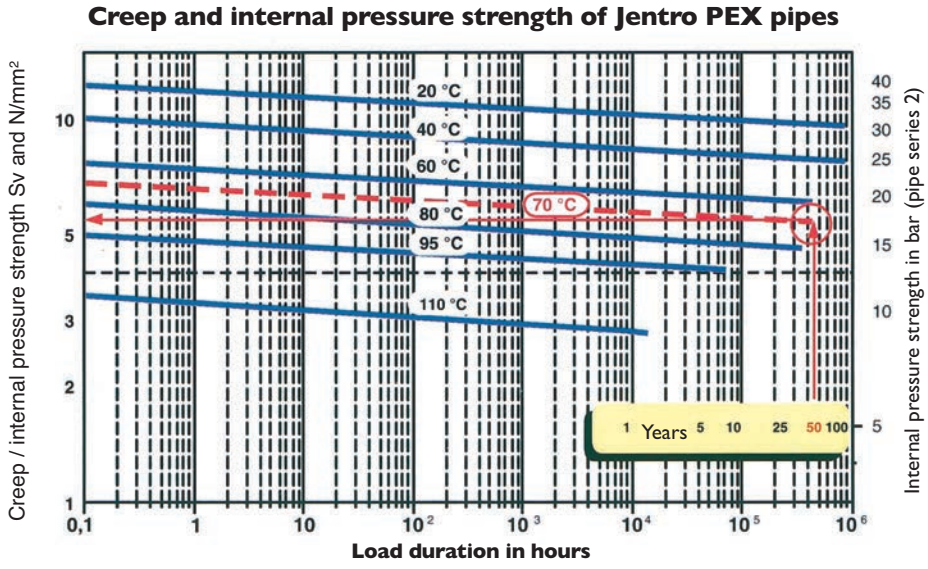
2.6 Dimensioning requirements of the DVGW

- Permanent operating pressure 10 bars
- Permanent operating temperature 70 °C
- Life cycle 50 years
- After that another safety factor ⩾ 1.5 times

The Jentro pipes comply with these requirements:
As from fig. 2, it results: 70°C, 50 years, 17 bars
Safety: 17 bars: 10 bars = 1.7 times

2.7 Dimensioning requirements according to DIN 4726

- **Permanent operating pressure of 3 bars**
- **Permanent operating temperature 70° C**
- **Life cycle 50 years**
- **After that another safety factor of > 2.5 times**



◀ *Fig. 2: Creep and internal pressure strength of Jentro PEX pipes.*

2.8 Pipe dimensions PEX

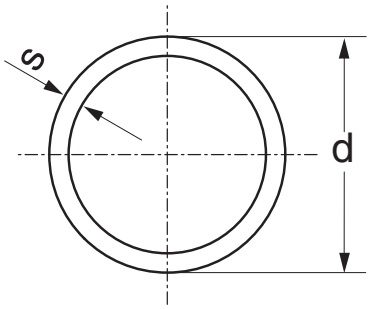
- Material: Polyethylene cross-linked at high pressure according to DIN 16892
- Colour: Aluminium grey, RAL 9006,
- Oxygen tight according to DIN 4726, thanks to the EVAL barrier layer.
- Suitable for drinking water.

Caution!
When making a compression sleeve joint, original Jentro fittings, compression sleeves, universal Jentro pipes and tools must always be used.

Pipe series 2 according to DIN 16892

DN DIN 1988	d mm	s mm	Weight kg/m	Content ℓ/m
12	16	2.2	0.098	0.10
15	20	2.8	0.153	0.16
20	25	3.5	0.238	0.25
25	32	4.4	0.382	0.42
32	40	5.5	0.594	0.66
40	50	6.9	0.926	1.03
50	63	8.7	1.470	1.63

▲ *Table 2*



2.9 Indications on the pipe

At an intermediate distance of 1 m, at least the following information is indicated on the pipes:

- Continuous meter indication
- Indication of manufacturer
- Base material of the pipe and cross-linking method
- Dimensions
- DIN number
- Max. permissible operating temperature and max. operating pressure
- Max. permissible temperature PEX
- Control mark of pipe with registry number DVGW
- Control mark Jentro system with registry number DVGW
- Russian approval
- Production no.
- No. of pipe manufacturer
- Manufacturing date

Example of an indication on a Jentro PEX pipe

M 25	Continuous meter indication: 25M
Logo Golan-Logo Jentro	Indication of pipe manufacturer – system supplier
PE-Xa	Base material of the pipe and cross-linking method
16 x 2,2	Dimensions
Universalrohr Sauerstoffdicht DIN 4726	DIN number for central heating pipe oxygen tight
70° C / 10 bar	Max. permissible operating temperature and max. operating pressure for drinking water DVGW
90° C max	Maximal permissible temp. for PEX
DW-8301AF2000	DVGW control mark and register number of pipe
DW-8501BQ0347	DVGW control mark of Jentro system (pipe + fitting)
PCT	Russian approval
No 1234	Production number
469	No. of pipe manufacturer
01.09.07	Manufacturing date

Example of an indication on a Jentro PEX pipe
M 25 / Golan-Jentro / PE-Xa / 16 x 2.2 / Universalrohr Sauerstoffdicht DIN 4726 / 70 ° C / 10 bar / (90max) / DW-8301AF2000 / DW-8501BQ0347 / PCT / Nr 1234 / 469 / 01.09.07

▲ *Fig. 3: Universal Jentro PEX pipes 16 - 63 mm.*

3.1 The material

The STABIL pipe is a metal-plastic pipe. The in-liner, the inner pipe in the universal STABIL pipe, that is in contact with the medium, consists of a cross-linked polyethylene. This is however cross-linked under influence of an electron beam after the actual pipe production. This irradiation cross-linking is called PE-Xc.

This pipe is used for the installation of sanitary and heating installations. The entire composure from the inside to the outside: in-liner of cross-linked polyethylene, adherent, oxygen diffusion tight aluminium layer, adherent and PE or cross-linked polyethylene outer layer.

The minimum processing temperature is -10° C.

The different molecules of the polyethylene link up to a three-dimensional network. The already excellent material properties still considerably improve during this process (principally the temperature and pressure resistance, the impact resistance at low temperatures and the stress crack resistance).

Drinking water

The Jentro universal STABIL pipe is used for drinking water transport in accordance with DIN2000 for cold and warm water, up to an operating overpressure of 10 bars and can be used continuously at a temperature of 70° C. Short-time (failure) up to 100° C.

Heating

For application in heating systems, the STABIL pipe can be used with a maximum flow temperature of 95° C. Short-time (failure), temperatures up to 100° C are possible.

3.2 Properties of STABIL pipe system

The Jentro Universal STABIL pipe system has the following properties:

- Excellent durability, even at higher temperatures.
- Insensitive to the formation of stress cracks.
- An ample choice of joints and accessories.
- Reliable connection technique:
  Permanent tight compression sleeve joint
  No use of O-rings
  Visual checking.
  Can be immediately put under pressure.
- Bending resistant and form stable.
- Outstanding resistance to ageing due to heath.
- Same compression sleeve for PEX and STABIL.
- Reduced temperature depending longitudinal reversion and increased clamp distance.
- Very good impact and notch impact resistance at temperatures under 50° C. High wear resistance and excellent notch resistance.
- Outstanding chemical resistance.
- Oxygen tight thanks to an aluminium barrier layer, in conformity with DIN 4726.
- High caloric stability.
- Resistant to ageing.
- Little flow noises inside the pipe.
- Little pressure loss.
- Free of heavy metal ions.
- Corrosion resistant.
- Free of incrustations, even after years of use.
- Use of the same accessories for STABIL and PEX, pipe series 2, SDR 7.4.
- Pipe dimensions STABIL: 16 - 40 mm.

3.3 Technical data

• Material	PE-Xc/Al/PEX or PE
• Colour:	light grey Ral 7035
• Notch impact resistance	
at 20° C	no rupture
at - 20° C	no rupture
• Average expansion Coefficient	0.026 mm/m°K
• Caloric conductibility	0.43 W/m°K
• Oxygen diffusion as per DIN 4726	oxygen tight
• Pipe roughness k	0.007 mm
• Material constant C	30
• Max operating temperature	95° C
• Short-time max temp. (failure)	100° C
• Minimum bend radius without tools	5 x d
• Minimum bending radius with bending tools	3 x d

3.4 Pipe dimensions STABIL

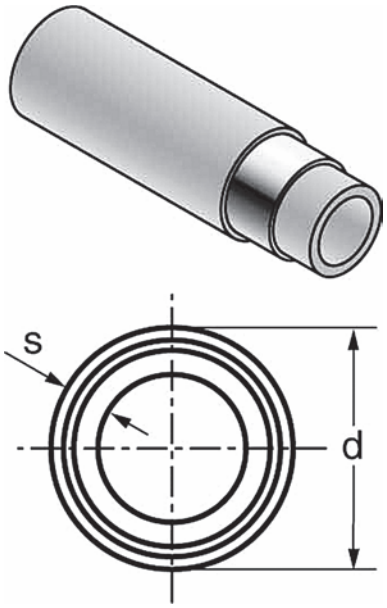
- Material: Polyethylene cross-linked at high pressure according to DIN 16892
- Colour: Light grey. Oxygen tight according to DIN 4726 due to aluminium barrier layer.
- Suitable for drinking water.

Caution!
When making a compression sleeve joint, original Jentro fittings, compression sleeves, universal Jentro pipes and tools must always be used.

Pipe data: STABIL

d mm	s mm	Weight kg/m	Content ℓ/m
16.2	2.6	0.139	0.095
20	2.9	0.181	0.158
25	3.7	0.294	0.243
32	4.7	0.459	0.401

▲ *Table 3*



3.5 Indications on the pipe

At an intermediate distance of 1 m, on the pipes at least the following information is mentioned:

- Continuous meter indication
- Indication of manufacturer
- Base material of the pipe and cross-linking method
- Dimensions
- Type of pipe
- Max. permissible operating temperature and max. operating pressure
- Max. permissible temperature STABIL
- Control mark Jentro system with registry number DVGW
- Russian approval
- Production no.
- No. of pipe manufacturer
- Manufacturing date

Example of an indication on a Jentro STABIL pipe

M 25	Continuous meter indication: 25M
Logo Golan-Logo Jentro	Indication of pipe manufacturer – system supplier
PE-Xc-Al-Pe-Xb	Base material of the pipe and cross-linking method
20 x 2,9	Dimensions
Universalrohr Sauerstoffdicht STABIL	Type of pipe
70°C/10 bar	Permissible max. operating temperature and max. operating pressure for drinking water in compliance with DVGW
95° C max	Maximal permissible temp for STABIL
DW-8501BQ0347	DVGW control mark of Jentro system (pipe + fitting)
PCT	Russian approval
No 1234	Production number
469	No. of pipe manufacturer
01.09.07	Manufacturing date

Example of an indication on a Jentro STABIL pipe
M 25 / Golan-Jentro / PE-Xc-Al-PE-Xb / 20 x 2.9 / UNIVERSALROHR Sauerstoffdicht STABIL / 70 ° C / 10 bar / (95max) / DW-8501BQ0347 / PCT / Nr 1234 / 469 / 01.09.07

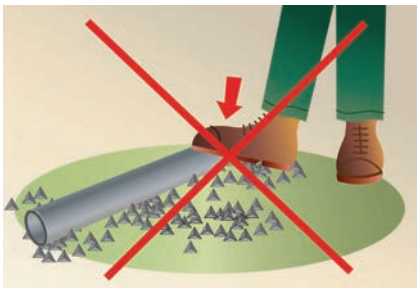
▲ *Fig. 4: Universal Jentro STABIL pipes 16 - 40 mm.*

3.6 Transport and storage

The Jentro pipes and all components of the system must be professionally loaded and unloaded, and transported and stored due to the characteristics of the material.

Unprotected pipes must not be dragged along the ground or concrete surfaces and must be stored on an even surface without sharp edges. In addition, the pipes must be protected from oils, greases and paints, and from a prolonged exposure to sunlight, for example by means of opaque foil.

Unprotected storage in the open air should never be longer than 3 months. When the Jentro pipes are protected, they can be stored without time limit.



▲ *Fig. 5: Avoid contact with sharp objects.*

▲ *Fig. 6: Protect pipes against U.V. radiation*

3.7 Norms, worksheets, control marks and registration numbers of the DVGW

- DVGW worksheet W 270 Multiplication of micro-organisms on material applied in drinking water supply systems.
- DVGW worksheet W 531 Manufacturing, quality control and testing of VPE pipes.
- DVGW worksheet W 532 Clamping joints of metal for VPE pipes.
- DVGW worksheet W 534 Joints for pipes in drinking water installations and test specifications.
- DVGW worksheet W 551 Technical measures for reducing the formation of Legionella bacteria.
- DIN 1988, part 1 - 8 Technical specifications for drinking water pipelines.
- DIN 2000
  Central drinking water supply.
- DIN 2001
  Central drinking water supply.
- DIN 4708, part 1 - 8 Central heating installations.
- DIN 44532, part 1 - 3 Water heating installations for drinking water.
- DIN 18380 VOB/ATV Heating installations and central heating installations.

3.8 Pressure surge behaviour

Thanks to the elastic behaviour of cross-linked polyethylene, the critical pressure surge amplitudes in drinking water installations with Jentro PEX pipes is limited to around 75% in comparison with installations with metal pipes.

4 Fittings

4.1 Material

Jentro system moulded components with press-fittings that are used for drinking water are made from standard brass.

4.2 UBA guidelines

The composition of the brass Jentrro fittings used in the SDR 7.4 programme for drinking water, comply with the requirements laid down in the UBA guidelines for materials that some into contact with drinking water. (guideline 01-12-2013)

4.3 Resistance to stress cracks

Brass fittings for compression joints are resistant to stress cracks in compliance with DIN 50916, part 2 (solution A: pH 10.0/22 ± 1° C; 7 days).

4.4 Indications

The fittings are provided with the following indications:

- Name of the manufacturer: Jentro
- Outer diameter and wall thickness: e.g. 16 x 2.2
- Internal thread: Rp (e.g. Rp 1/2")
- External thread: R (e.g. R 1/2")

4.5 Corrosion due to erosion

The universal Jentro PEX and STABIL pipes, and Jentro fittings are widened by means of the Jentro compression joint technique before being compressed. This way, the average flow of the fitting can be adapted as good as possible to the average flow of the pipe, which results in a constant flow rate, a reduced noise emission, and a better erosion resistance.

The Jentro compression system with compression sleeve joints takes optimal advantage of this principle, contrary to systems in which the pipes are not expanded. In the dimensioning in compliance with DIN 1988, one can therefore use the limit values.

4.6 Explanations regarding the compression fittings

Thread in conformity with DIN 2999: Cylindrical internal thread Rp, tapered external thread R, sealing in the thread.

Thread in conformity with DIN ISO 228: Cylindrical thread G, not sealing in the thread. To complete the system, threaded fittings of non-dezincifying brass or bronze are recommended.

The fittings naturally have an effect on the isolation of the pipelines. All welds, seams, joints and extremities must be wrapped. The insulation rules of DIN 1988 or the regulations for heating installations (HeizAnlV) must be observed.

For this, the fittings and pipes must be provided with a special corrosion resistant coating (see fig. 7).

In the case of hemp joints, thread sealing products (DIN/DVGW tested) must be used that are appropriate for plastic pipelines.

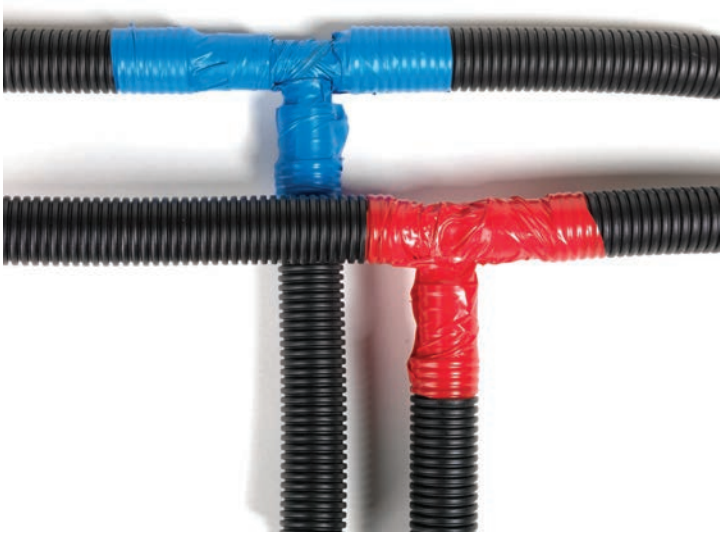
In the listing of the fittings on the price list, only the external diameter of the pipe to be connected is indicated.

Example:
T-piece 20-16-16
Joint of the dimensions
20 x 2.8 and 16 x 2.2.

The fittings have been indicated by the wall thickness of the PEX pipe in conformity with DIN 16892, pipe series 2, SDR 7.4 pipe standard.

The STABIL pipes with thicker walls perfectly fit these fittings!

16 x 2.2 for	**PEX 16 x 2.2 and STABIL 16.2 x 2.6**
20 x 2.8 for	**PEX 20 x 2.8 and STABIL 20 x 2.9**
25 x 3.5 for	**PEX 25 x 3.5 and STABIL 25 x 3.7**
32 x 4.4 for	**PEX 32 x 4.4 and STABIL 32 x 4.7**



▲ *Fig. 7: Protect fittings when covered in floors and walls.*

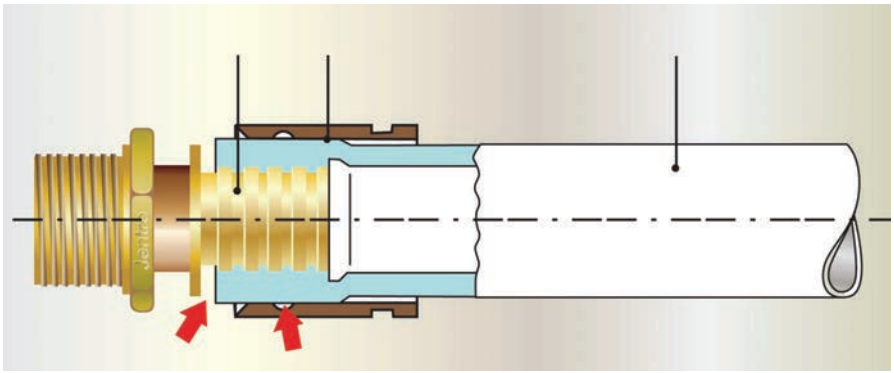
Caution!
Always protect the brass fitting with anti-corrosion tape, so that no contact occurs with mortar, cement, plaster, adhesives, aggressive media or other materials that cause corrosion!
The effect of humidity on the fittings and sleeves can always be avoided. (see Fig. 7)

5 Jointing technique with compression sleeves

5.1 Non-detachable joint

The Jentro compression sleeve joint cannot detach and can therefore, in conformity with DIN 18380 (VOB), be placed in the plaster or in the floor without manhole or other means of inspection.

The basis of this jointing technique is the so-called 'memory-effect' of the elastic shape recovery of the universal Jentro Pex pipe. The compression sleeve is pushed over the pipe with the inside chamfer pointing to the end of the pipe. The pipe is then cold expanded and pushed onto the fitting. Then the elastic shape recovery of the expanded pipe starts, thanks to which the expanded diameter of the PEX pipe becomes smaller again and the fitting starts to clamp. STABIL pipes have a considerably smaller memory-effect than PEX pipes. After aligning the fitting, the compression sleeve is then compressed.



▲ *Fig. 8: Sectional view of compression joint.*

5.1.1 Fitting a compression sleeve joint

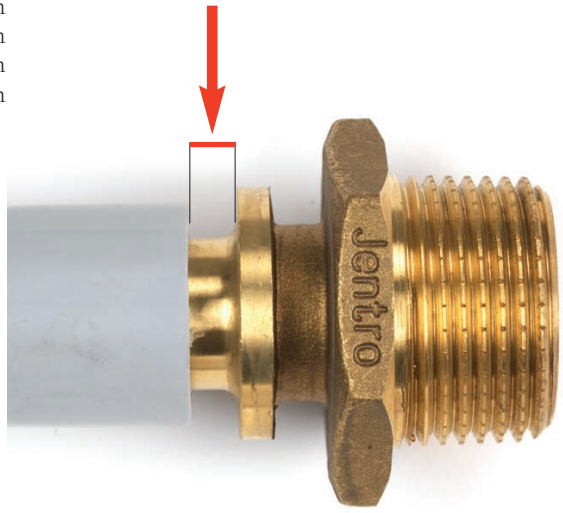
The jointing technique with compression sleeves is only allowed to be applied when using the fittings provided for this purpose and the universal Jentro PEX pipes 16 x 2.2 / 20 x 2.8 / 25 x 3.5 / 32 x 4.4 / 40 x 5.5 / 50 x 6.9 and 63 x 8.7 mm. or Jentro STABIL pipes 16.2 x 2.6 / 20 x 2.9 / 25 x 3.7 / 32 x 4.7

The joint must always be made by means of the Jentro tool for compression sleeve joints. After expanding and mounting onto the fitting, a space results between the pipe and the fitting before pressing on the sleeve. *(see table 4).*

Maximum space between pipe and fitting

	Ø	space
PEX	16	3,5 mm
	20	9 mm
	25	6,5 mm
	32	6 mm
	40	2 mm
	50	2 mm
	63	7 mm
STABIL	16	6 mm
	20	8 mm
	25	5,5 mm
	32	6,5 mm

▲ *Table 4*



▲ *Fig. 9: Space between pipe and fitting.*

6 Tools

6.1 Tools for compression sleeves

Jentro offers several tools for compression joints. The user can choose the ideal tool for a certain application from these different types.

The Jentro tools for compression joints are used in combination with the corresponding expansion sets for the compression jointing of both the PEX and the STABIL pipes.

All Jentro tools for compression joints have been designed in such a way that they perfectly meet the different requirements for the job at the building site. The user does have to decide which tool offers the best solution for the particular application.

◀ *Fig. 10: Jentro VT201 manual expander and clamping pliers for 16 to 32 mm. (see page 20 - 23).*

Jentro SBH203 consists of a powerful drive unit for expanding and compressing tubes and sleeves from 16 till 32 mm. Works on battery.

▲ *Fig. 11: Jentro SBH203 compressing and expander machine 16 - 32 mm. (see page 24 - 26).*

▲ *Fig. 12: Jentro SBH203 expander machine. 16 - 32 mm (see page 24 - 26).*

The Jentro clamping jaws SB205 are suitable in combination with the widely used compatible 32 KNm machines for radial clamping. The machines must have a minimum power of 30 KNm and a maximum of 34 KNm. Machines that develop more power can damage the compression sleeves!

The following machine manufacturers provide machines approved by us: **Novopress** (machine provider of the well-known Mannesmann clamping system, among others), **Rothenberger**, **Klauke**, **Rems**.

Installers that have one of the abovementioned machines can mount the Jentro SB205 clamping jaws without a problem.

◀ *Fig. 14: Jentro SB205 clamping jaws and expander tool for pipes of 40 - 50 and 63 mm. Works with all compatible drive units of 32KNm. (see page 27 - 30).*

6.2 Advantages of the Jentro clamping system

1 type of fitting

1 type of sleeve

For 2 types of pipes

	PEX	**STABIL**
Material:	at high-pressure cross-linked PE-Xa	PEX – Al – PEX
	16 x 2.2 20 x 2.8 25 x 3.5 32 x 4.4 40 x 5.5 50 x 6.9 63 x 8.7	16,2 x 2.6 20 x 2.9 25 x 3.7 32 x 4.7
Application:	Drinking water Central heating, cooling Compressed air pipes	Drinking water Central heating, cooling Compressed air pipes

1 Tool

▲ *Fig. 15: Expander blue for PEX pipe 16 - 63 mm.*

▲ *Fig. 16: Tools 16 - 63 mm.*

▲ *Fig. 17: Expander green for STABIL pipe 16 - 32 mm.*

6.3 Jentro Tool VT 201 16 – 32 mm

Jentro VT 201

Kit equipped with:

clamping pliers + ratchet (L+R)

expander pliers

clamping heads
16 - 20 - 25 - 32 mm

expanders
16 - 20 - 25 - 32 mm PEX

expanders
16 - 20 - 25 - 32 mm STABIL

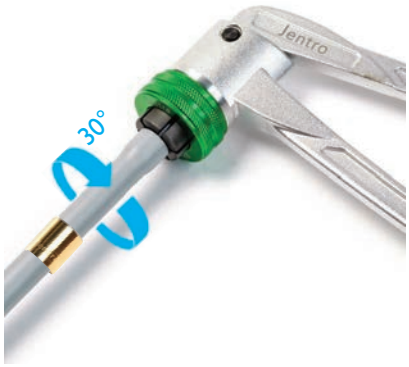
6.3.1 Fitting a compression sleeve joint with Jentro Tool VT 201.

▲ *Fig. 18: Cut the pipe to the requested length. Caution! Always cut the pipe in a square cut!*

▲ *Fig. 19: When expanding a STABIL pipe cut off slantwise, the aluminium coat can burst. This must absolutely be avoided!*

▲ *Fig. 20: Cut the bad part completely away in a square angle and start over!*

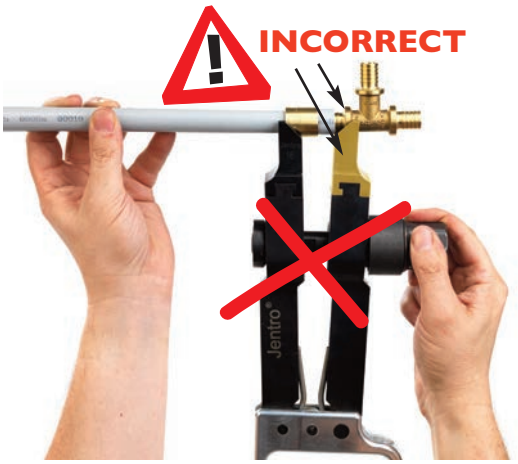
▲ *Fig. 21: Push the compression sleeve over the pipe. The inside chamfer has to point to the end of the pipe.*



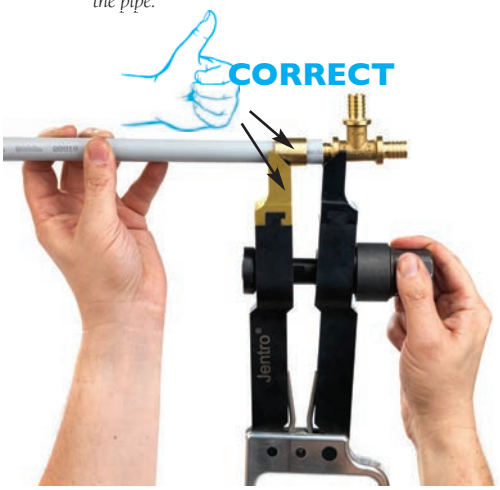
▲ *Fig. 22: Widen the pipe twice (first turn by 30°). The compression sleeve must not be over the section to be widened.*

▲ *Fig. 23: Push the fitting into the pipe. After a short period of time, the fitting has a tight fit in the pipe.*

▲ *Fig. 24: Caution: the clamping head behind the sleeve has a yellow chromed colour; use behind the flange edge the head with black colour!*



▲ *Fig. 25: The yellow clamping head has here been mounted incorrectly.*



▲ *Fig. 26: The yellow clamping head has a special shape on the inner side and it should always be pressed against the sleeve!*

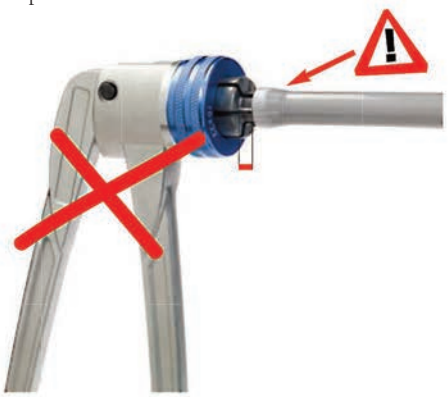
▲ *Fig. 27: Use the tool to push the compression sleeve right up to the fitting collar.*

▲ *Fig. 28: Turn the clamping jaws open again.*

▲ *Fig. 28-2: Compression joint ready, sleeve against the flange edge.*

6.3.2 Special points for expanding and compressing the pipe.

Push the pipe completely against the expander and make sure that the pipe is straight on the expander. Otherwise, expansion occurs slantwise.



▲ *Fig. 29: Pipe* **NOT** *until end of expander.*

▲ *Fig. 30: Pipe until end of expander.*

STABIL pipe is much more sensible for a bad expansion. When the pipe is cut slantwise, it will not be expanded over the entire circumference with the same force. This can result in rupture of the aluminium coat.

▲ *Fig. 31: Pipe cut slantwise.*

▲ *Fig. 32: Pipe cut straight.*

Expanding pipes is easier when the cone of the expander is 'lightly greased' at regular times. Do not use too much grease, because then the inner side of the pipe can become contaminated.

▲ *Fig. 33: Expand PEX pipe.*

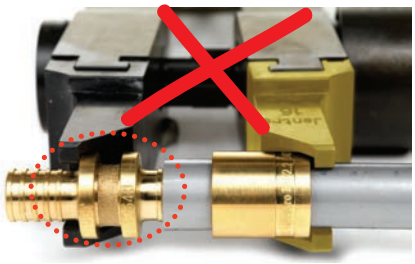
▲ *Fig. 34: Expand STABIL pipe.*

The clamping pliers have 2 different clamping heads for each diameter. Place the yellow head always **behind** the sleeve. Mount the black clamping head always behind the flange side of the fitting.

▲ *Fig. 35: Clamping head black. Can be used for tool VT 201 and SB 204.*

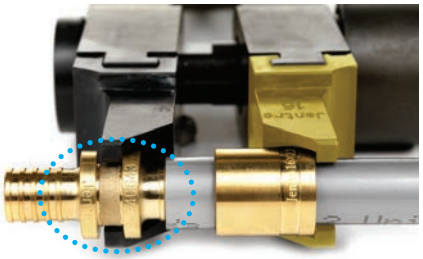
▲ *Fig. 36: Clamping head yellow. Can only be used for VT 201.*

INCORRECT

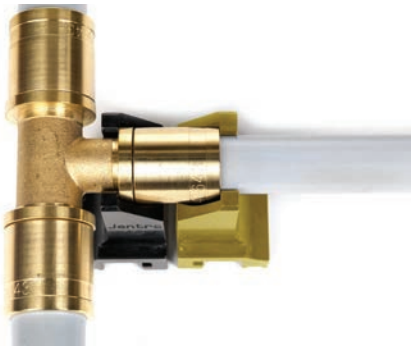


▲ *Fig. 37: Black clamping head placed incorrectly.*

CORRECT



▲ *Fig. 38: Black clamping head placed correctly.*



▲ *Fig. 39: Sleeve right up to the collar.. Stop compressing!*

6.3.3 Jentro Tool VT 201 • 16 – 32 mm : article numbers

Art. no.: 15000

Basic kit composed of: metal case with
- Preformed foam insert.
- Mechanical clamping pliers.
- Ratchet wrench (left/right)

Clamping heads:

Art. no.: 15001	16 mm colour black
Art. no.: 15011	16 mm colour yellow
Art. no.: 15002	20 mm colour black
Art. no.: 15022	20 mm colour yellow
Art. no.: 15003	25 mm colour black
Art. no.: 15033	25 mm colour yellow
Art. no.: 15004	32 mm colour black
Art. no.: 15044	32 mm colour yellow

Expander pliers

Art. no.: 13018	For expanding pipes 16 to 32 mm

Expanders for PEX pipe with blue marking

Art. no.: 13040	16 x 2,2 mm
Art. no.: 13041	20 x 2,8 mm
Art. no.: 13043	25 x 3,5 mm
Art. no.: 13045	32 x 4,4 mm

Expanders for STABIL pipe with green marking

Art. no.: 13140	16,2 x 2,6 mm
Art. no.: 13141	20 x 2,9 mm
Art. no.: 13143	25 x 3,7 mm
Art. no.: 13145	32 x 4,7 mm

Jentro SBH 203

Kit equipped with :

compact electro-hydraulic drive unit with battery 3 Ah

double clamping jaws 16/20 + 25/32

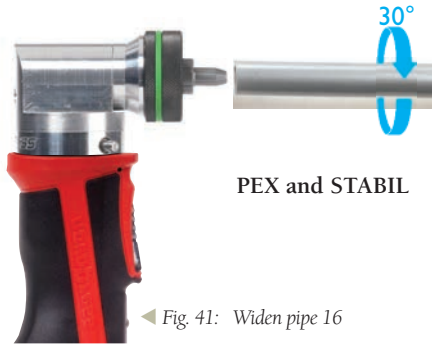
compact electro-hydraulic expander with battery 3 Ah

battery charger

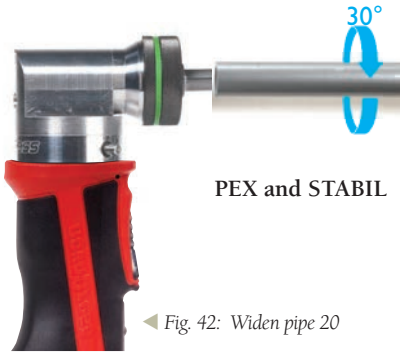
possible expanders PEX / STABIL

6.4.1 Expanding and compressing pipes with Jentro Tool SBH 203

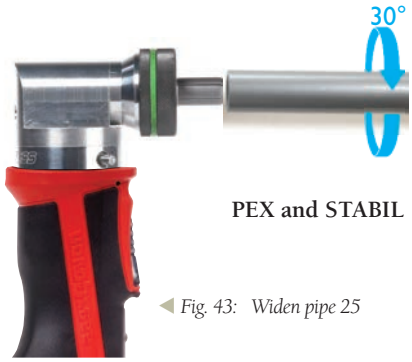
▲ Fig. 40: Expander tool SBH203



◀ Fig. 41: Widen pipe 16



◀ Fig. 42: Widen pipe 20



◀ Fig. 43: Widen pipe 25

◀ Fig. 44: Widen pipe 32

▲ Fig. 45: Tube 16 on T.

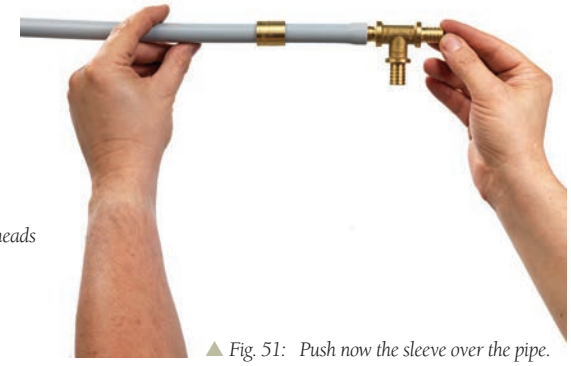
▲ Fig. 46: Tube 20 on T.

▲ Fig. 47: Tube 25 on T.

▲ Fig. 48: Tube 32 on T.

◀ Fig. 49: Compressing tool SBH203.

▲ Fig. 50: Double compression heads 16/20 and 25/32.

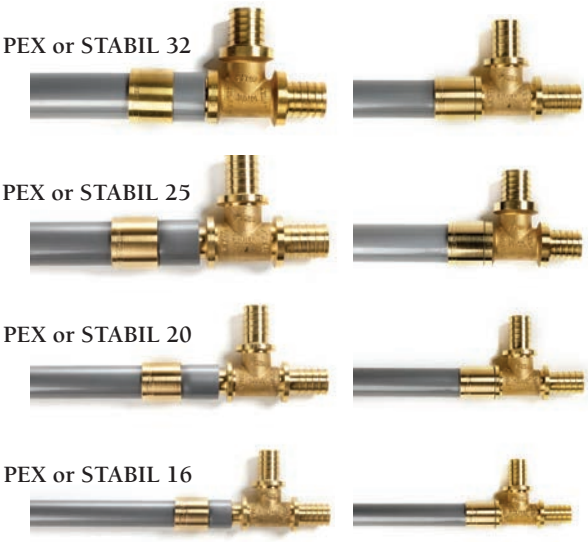


▲ Fig. 51: Push now the sleeve over the pipe.

▲ Fig. 54: Compress.

◀ Fig. 53: Compress.

◀ Fig. 52: Clamping machine is ready.



▲ Fig. 55 Pipes with T-piece and sleeve before and after compressing the sleeve.

GUARANTEE

Compression drive unit: 2 years guarantee after delivery. If the machine is yearly handed over for maintenance (paid), the guarantee is automatically extended to 3 years.

The guarantee on batteries and the battery charger is maximally 2 years, no prolongation is possible.

Clamping jaws: 2 years guarantee after delivery. If the jaws are yearly handed over for maintenance (paid), the guarantee is automatically extended to 5 years.

6.4.2 Jentro Tool SBH 203 • 16 – 32 mm : article numbers

Art. nr: 15700

Basic kit composed of:
- axial pres machine SBH203 16 - 32 mm
- battery 12V 1,5Ah Li-Ion + battery charger
- without clamping heads 15601 + 15602
- in solid plastic toolcase

Double clamping jaws for SBH203:

Art. nr: 15601	16 + 20 mm
Art. nr: 15602	25 + 32 mm
Art. nr: 15603	22 + 28 mm

Art. nr: 15750

- Electro-hydraulic expander 16 till 32 mm
- Battery 12V 1,5Ah Li-IOn

Expanders for PEX tube with blue marking

Art. nr: 13040	16 x 2,2 mm
Art. nr: 13041	20 x 2,8 mm
Art. nr: 13042	22 x 3,0 mm
Art. nr: 13043	25 x 3,5 mm
Art. nr: 13009	28 x 4,0 mm
Art. nr: 13045	32 x 4,4 mm

Expanders for STABIL tube with green marking

Art. nr: 13140	16,2 x 2,6 mm
Art. nr: 13141	20 x 2,9 mm
Art. nr: 13143	25 x 3,7 mm
Art. nr: 13145	32 x 4,7 mm

Art. nr: 15340 Battery 12V 1,5Ah Li-Ion

Jentro SB 205

Kit equipped with:

clamping jaws

clamping heads
40 - 50 - 63

expandertool

expanders PEX SDR 7,4
40 - 50 - 63

expanders PEX SDR 11
40 - 50 - 63

To be used
with compatible
drive unit

6.5.1 Fitting a compression sleeve joint with Jentro Tool SB205 • 40 to 63 mm

The Jentro Tool SB 205 consists of clamping jaws especially developed for the Jentro system that can be combined with the compatible drive unit available on the market.

Machines that have been approved for the SB205 jaws:

1) **Novopress:**
   very well-known as provider of Mannesmann and Geberit, among others.
2) **Rems:**
3) **Rothenberger:**
   various systems
4) **Klauke:**
   various systems

Attention!
The machines must develop a power of 32KNm!

◀ *Fig. 80: Novopress*

▲ *Fig. 81: Rothenberger*

◀ *Fig. 82: Ridgid*
NOT ALLOWED

◀ *Fig. 83: Klauke*

▶ *Fig 84: Expanding takes place quickly and simply with a special expander tool.*

art. 15250

\+

=

◀ *Fig. 86: Expander tool mounted..*

▶ *Fig. 85: Compatible drive unit of Novopress.*

▲ *Fig. 87: Cut the pipe to the requested length. Caution! Always cut the pipe in a square cut!*

▲ *Fig. 88: Mount the expander head on the drive unit.*

▲ *Fig. 89: Clamp the expander.*

▲ *Fig. 90: Mount the expander together with the nut (art. 15305).*

▲ *Fig. 91: Operate the drive unit. The pipe is widened. Repeat this at least twice (turn by 30°).*

▲ *Fig. 92: Push the fitting into the pipe. After a short period of time, the fitting has a tight fit in the pipe. (PEX has a larger "memory" effect than STABIL).*

▲ *Fig. 93: Click the clamping jaws on the compatible drive unit.*

▲ *Fig. 94: Operate the drive unit to push the compression sleeve right up to the fitting collar.*

▲ *Fig. 95: Compression joint ready. Sleeve right up to the flange edge.*

Attention!

It is recommended to hold the expander five seconds in the completely expanded position. Otherwise the pipe shrinks to quickly and sliding it onto the fitting will become too difficult!

Expand every time 2 to 3 times and turn the pipe 30°.

6.5.2 Jentro Tool SB205 • 40 to 63 mm : article numbers

Mechanical clamping jaws:

Art. no.: 15200 Basic kit composed of:
Clamping jaws for compressing fittings 40 - 50 - 63 mm in a plastic kit with preformed foam insert.

Suitable for compatible drive units of 32 KNm that are standard available on the market. (see list on page 28).

Clamping heads:

Art. nr: 15204	40 mm color black Type F
Art. nr: 15205	40 mm color silver Type S
Art. nr: 15206	50 mm color black Type F
Art. nr: 15207	50 mm color silver Type S
Art. nr: 15208	63 mm color black Type F
Art. nr: 15209	63 mm color silver Type S

Expander tool 40 - 63mm:

Art. no.: 15250 Expander tool for expanding pipes 40 - 50 - 63 mm.
Is simply placed on the compatible drive unit. (see list on page 28).

Expanders for SDR 7.4 PEX pipe with blue marking:

Art. no.: 15211	40 x 5,5 mm
Art. no.: 15213	50 x 6,9 mm
Art. no.: 15216	63 x 8,7 mm

Expanders for SDR 11 PEX pipe with red marking:

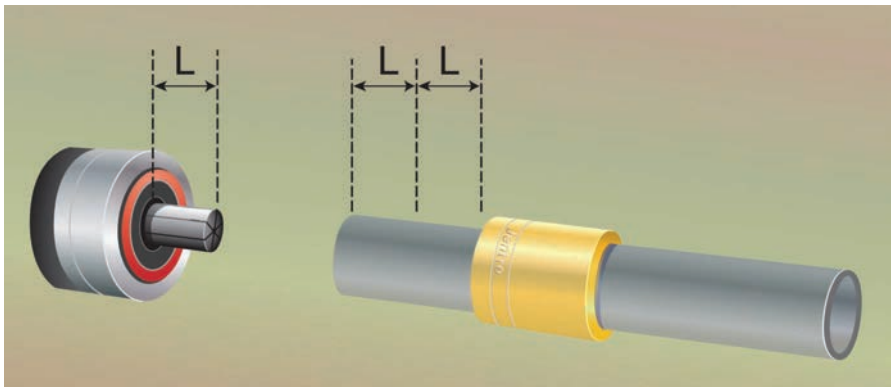
Art. no.: 15210	40 x 3,7 mm
Art. no.: 15213	50 x 4,6 mm
Art. no.: 15215	63 x 8,7 mm

Art. no.: 15305 Nut for all expanders 40 - 50 - 63 mm PEX

6.6 Additional directions for fitting a compression joint..

Always provide for the minimum distance from the compression sleeve to the pipe end (approx. twice length L of the expander pin (see fig. 96)) when expanding.
The compression sleeve may not be over the section to be expanded (risk of damaging the tool or the pipe).
Never expand the Jentro PEX or STABIL pipe with an incomplete or damaged (e.g. bent, broken) expander head.

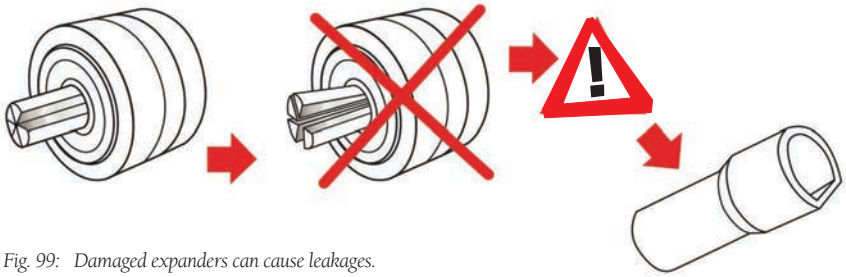
After all, that way the pipe would be expanded on one side, which can result in the over-expansion of the pipe material. An expander with a damaged segment will damage the interior of the pipe, possibly resulting in leakage.



▲ *Fig. 96:*

▲ *Fig. 97: Damaged expander.*

▲ *Fig. 98: STABIL pipe cut off slantwise and ruptured during expansion. Cut off the pipe straight and expand again.*



▲ *Fig. 99: Damaged expanders can cause leakages.*

6.7 Separating a compression sleeve joint

If a joint with a PEX or STABIL pipe has not been compressed correctly, the fitting can be recovered.
The compression sleeve joint can be separated again by means of uniformly heating it around the entire circumference using a hot air blower. When reaching a temperature of approx. 135°C, the Jentro PEX or STABIL pipe becomes transparent and the compression sleeve can be pulled off from the sleeve. Overheating the pipe (visible by the brownish colouring of the pipe) must be avoided.

After pulling the pipe off the sleeve, the fitting must be cleaned. Then it can be reused. The compression sleeve is not allowed to be reused and the expanded pipe end must be cut off and discarded.
Before expanding to make a new joint, the heated pipe end must be cooled down completely (lukewarm). This means that the pipe end may not be expanded in heated condition!

6.8 Mounting the compression sleeve in an existing PEX drinking water pipe

Thanks to the memory effect, it is possible to still install a fitting with the Jentro compression sleeve in an existing drinking water installation, even after years of use at high temperatures and operating pressures. When, in some cases and after years of permanent use, as a result of the high operating temperature, the compression sleeves cannot be slipped onto the pipe anymore, the original external diameter of the pipe must be reconstructed in the following way.

1. Cut off the PEX pipeline under a square angle and burr-free by means of an appropriate tool.

2. Then heat up uniformly along the entire circumference, a piece of pipe end that matches the length of the sleeve of the fitting, by means of a hot air blower with temperature control, until the heated section of the pipe has become "transparent", at approx. 130°C.
   By the heating, the PEX pipe recovers its original size accuracy (elastic shape recovery as a result of the memory effect).

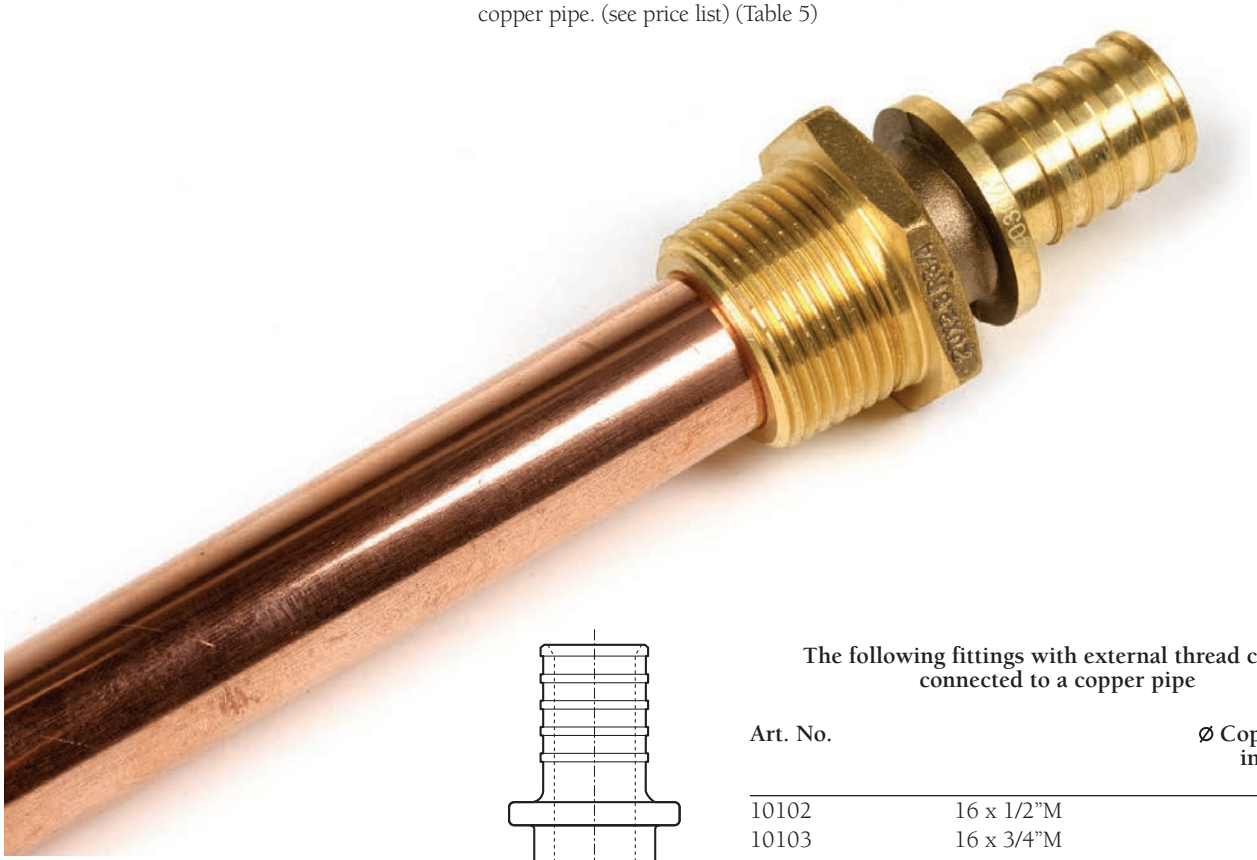
3. After the complete cooling down of the pipe end, the Jentro compression sleeve can be reinstalled in the usual way (see section 5.1.1 Fitting a compression sleeve joint).

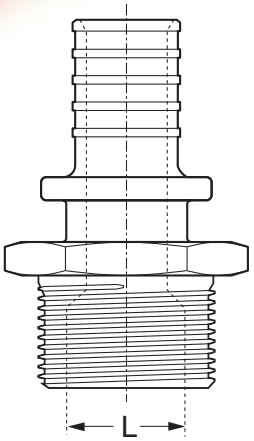
4. At the place where the PEX pipe has been heated to 130°C, the oxygen barrier will have been damaged!

5. This method is not possible for STABIL pipes!

Transition to other pipe materials:
Steel - Copper
In the case of repairs and extensions of the pipe system, a transition of a compression sleeve joint to pipes or fittings of a different material than PEX or STABIL can be necessary. In such case, threaded or welded joints, e.g. 25 x 3.5 / R 3/4" L 18 must be used.

Jentro has various fittings with external thread and the possibility to weld a copper pipe on the inside. This has been indicated by the letter L + the exterior size of the copper pipe. (see price list) (Table 5)





The following fittings with external thread can be connected to a copper pipe

Art. No.		Ø Copper pipe in mm L
10102	16 x 1/2"M	15
10103	16 x 3/4"M	18
10105	20 x 1/2"M	15
10106	20 x 3/4"M	18
10109	25 x 3/4"M	18
10110	25 x 4/4"M	22
10111	32 x 3/4"M	18
10112	32 x 4/4"M	22

▲ *Table 5*

7 Connections

7.1 Connections of devices

When connecting the universal Jentro PEX and STABIL pipes to inline electric or gas water heaters, the specifications of the manufacturer of the devices with regard to the connection of plastic pipes must be taken into account.

Not all inline electric or gas water heaters that are offered presently on the market are suitable according to the specifications of the manufacturer for combining with systems with plastic pipes. Too high peak temperatures can damage the pipes.

7.2 Inline gas water heaters

In many cases, inline gas water heaters are not suitable for direct connection to the compression system. In case of these devices, failures can cause overpressure and too high temperatures. It is absolutely necessary to observe the specifications of the manufacturers in these cases.

For safety reasons, we recommend to always install a minimum of 1 meter of copper or steel pipe between the boiler and plastic pipe.

7.3 Solar panels

For the connection of installations to solar panels, extreme caution must be observed as well.

Here too, very high peak temperatures can occur that can damage the pipe.

7.4 Wood and pellet boilers

For connection to wood and pellet boilers, a number of safety measures must necessarily be installed in order to avoid that peak temperatures damage the Jentro plastic pipe.

A connection of 2 meters of metal pipe between boiler and plastic pipe is highly recommended.

7.5 District heating

District heating systems sometimes work with very high and varying pressure and temperatures (130° C) ! When connecting to these systems, the necessary safety equipment must be installed in order to always limit the water temperature to max. 90° C.
A max. temperature of 85° C is recommended, in order to build in a safety margin.

7.6 Boiler systems

The Jentro compression joint system can be used without a problem for warm water boilers up to a maximum water temperature of 70° C and 10 bars

7.7 Equipotential contact

Jentro PEX and STABIL pipes may, in compliance with DIN VDI 0100, not be used as earth return for electric installations. In accordance with DIN VDI 0100, metal drinking water pipes and other metal pipeline systems must be connected by an equipotential connection.

This is not required for Jentro pipelines. When replacing existing installations with metal pipes by Jentro pipes, the correct grounding must be verified by an electrician.

7.8 Heater cables

When attaching heater cables to the Jentro pipes, the installation instructions prescribed by the manufacturer must be observed.

7.9 Circulation pipes

Circulation pipes in central installations for drinking water heating are installed in conformity with the DVGW worksheet W 553. For the dimensioning of the circulation systems, the DVGW worksheet W 551 (Technical Measures to reduce the stimulation of Legionella spp.) must also be observed. Circulation pipes are used to be able to quickly provide warm water at an outlet of a building and to increase the circulation of the water and thus avoid the formation of stagnant water. The latter is required to avoid the presence of Legionella. Circulation pipes must be dimensioned with pipes of at least 16 x 2.2 mm. In conformity with DVGW worksheet W 553, the flow velocity is not allowed to be more than 1 m/sec

7.10 Notes

8.1 Longitudinal reversion in function of the temperature: PEX pipes

Longitudinal reversions are the result of changes in the operating and environmental temperature. During assembly, the pipes must be provided with the necessary expansion possibilities.

Calculation of the longitudinal reversion:
For the calculation of the longitudinal reversion applies:

$\Delta l = \alpha \times L \times \Delta T$

where:
Δl = Longitudinal reversion in mm
α = Expansion coefficient (0.15 mm/mK)
L = Length of the pipe in m
ΔT = Temperature difference in K

When calculating the longitudinal reversion, the following points must be taken into account:

1. The temperature during installation.
2. The lowest and highest to be expected pipe wall temperature during operation and during installation standstill.

Calculation example:

The length of the pipe is 6 meters.
The temperature difference between minimum and maximum value is 60K.

How much is the longitudinal reversion?

$\Delta l = \alpha \times L \times \Delta T$
$= 0.15 \times 6 \times 60$
$= 54$ mm

Pipes under the floor covering can expand without a problem within the isolation or a PE sleeve and suffer no disadvantage from the bigger expansion. The forces that occur during expansion or shrinking are much smaller than for a STABIL pipe

The material constant for PEX is: 12

Longitudinal reversion in function of the temperature from Jentro PE-X pipes.
Average dilatation coefficient is approx. 0,15 mm (pro meter and pro °K)

example
If there is a change in temperature from the surface of the tube with 40°K, a 5 meter Jentro tube will shrink or expand with 30 mm.

Calculation:
40°K x 5 m x 0,15 = 30 mm

Lengt of tube in m	10°K	20°K	30°K	40°K	50°K	60°K	70°K	80°K	90°K	100°K	Temperature diff. in ° K
1	1,5	3,0	4,5	6,0	7,5	9,0	10,5	12,0	13,5	15,0	LENGHT VARIATION IN MM FROM A JENTRO PE-X TUBE
2	3,0	6,0	9,0	12,0	15,0	18,0	21,0	24,0	27,0	30,0	
3	4,5	9,0	13,5	18,0	22,5	27,0	31,5	36,0	40,5	45,0	
4	6,0	12,0	18,0	24,0	30,0	36,0	42,0	48,0	54,0	60,0	
5	7,5	15,0	22,5	30,0	37,5	45,0	52,0	60,0	67,5	75,0	
6	9,0	18,0	27,0	36,0	45,0	54,0	63,0	72,0	81,0	90,0	
7	10,5	21,0	31,5	42,0	52,5	63,0	73,5	84,0	94,5	105,0	
8	12,0	24,0	36,0	48,0	60,0	72,0	84,0	96,0	108,0	120,0	
9	13,5	27,0	40,5	54,0	67,5	81,0	94,5	108,0	121,5	135,0	
10	15,0	30,0	45,0	60,0	75,0	90,0	105,0	120,0	135,0	150,0	
12	18,0	36,0	54,0	72,0	90,0	108,0	126,0	144,0	162,0	180,0	
14	21,0	42,0	63,0	84,0	105,0	126,0	147,0	168,0	189,0	210,0	
16	24,0	48,0	72,0	96,0	120,0	162,0	168,0	192,0	216,0	240,0	
18	27,0	54,0	81,0	108,0	135,0	162,0	189,0	216,0	243,0	270,0	
20	30,0	60,0	90,0	120,0	150,0	180,0	210,0	240,0	270,0	300,0	

Lenght calculation from a deflection leg for Jentro PE-X tubes in mm.

example
If the average lenght of a tube placed in upper-works is +/- 6 meter, measured from a fixpoint, and submitted at ΔT from 50°K, then the lenght variation from the tube is 45 mm.

For a PE-X tube from Ø 25 mm, the lenght of the deflection leg = 402,5 mm.

Tube diameter in mm	till 10 mm	till 20 mm	till 30 mm	till 45 mm	till 50 mm	till 60 mm	till 70 mm	till 80 mm	till 90 mm	till 100 mm	Length variation PE-X tube in mm
16	151,8	214,7	262,9	322,0	339,4	371,8	401,6	429,3	455,4	480,0	Lb in mm
20	169,7	240,0	293,9	360,0	379,5	415,7	449,0	480,0	509,1	536,7	
25	189,7	268,3	328,6	402,5	424,3	464,8	502,0	536,7	569,2	600,0	
32	214,7	303,6	371,8	455,4	480,0	525,8	567,9	607,2	644,0	678,8	
40	240,0	339,4	415,7	509,1	536,7	587,9	635,0	678,8	720,0	758,9	
50	268,3	379,5	464,8	569,2	600,0	657,3	709,9	758,9	805,0	848,5	
63	301,2	426,0	521,7	638,9	673,5	737,8	796,9	851,9	9,3,6	952,5	

8.2 Longitudinal reversion in function of the temperature: STABIL pipes

Longitudinal reversions are the result of changes in the operating and environmental temperature.

During assembly, the pipes must be provided with the necessary expansion possibilities.

Calculation of the longitudinal reversion:
For the calculation of the longitudinal reversion applies:

$\Delta l = \alpha \times L \times \Delta T$

where:
Δl = Longitudinal reversion in mm
α = Expansion coefficient (0.026 mm/mK)
L = Length of the pipe in m
ΔT = Temperature difference in K

When calculating the longitudinal reversion, the following points must be taken into account:

1. The temperature during installation.
2. The lowest and highest to be expected pipe wall temperature during operation and during installation standstill.

Calculation example:

The length of the pipe is 6 meters.
The temperature difference between minimum and maximum value is 60K.
How much is the longitudinal reversion?

$\Delta l = \alpha \times L \times \Delta T$
$= 0.026 \times 6 \times 60$
$= 9{,}36$ mm

For pipelines in buildings, we recommend you to use STABIL pipes, because of the much smaller expansion. The expansion and shrinking forces that arise in a STABIL pipe are a lot bigger than for a PEX pipe, because of the aluminium layer that is processed in the PEX pipe.

The material constant for STABIL is: 30

Longitudinal reversion in function of the temperature from Jentro STABIL pipes.
Average dilatation coefficient is approx. 0,026 mm (pro meter and pro °K.

example
If there is a change in temperature from the surface of the tube with 40°K, a 5 meter Jentro tube will shrink or expand with 5,2 mm.

Calculation:
40°K x 5 m x 0,026 = 5,2 mm

Lenght of tube in m	10°K	20°K	30°K	40°K	50°K	60°K	70°K	80°K	90°K	100°K	Temperature diff. in ° K
1	0,26	0,52	0,78	1,04	1,30	1,56	1,82	2,08	2,34	2,60	LENGHT VARIATION IN MM FROM A JENTRO STABIL TUBE
2	0,52	1,04	1,56	2,08	2,60	3,12	3,64	4,16	4,68	5,20	
3	0,78	1,56	2,34	3,12	3,90	4,68	5,46	6,24	7,02	7,80	
4	1,04	2,08	3,12	4,16	5,20	6,24	7,28	8,32	9,36	10,40	
5	1,30	2,60	3,90	5,20	6,50	7,80	9,10	10,40	11,70	13,00	
6	1,56	3,12	4,68	6,24	7,80	9,36	10,92	12,48	14,04	15,60	
7	1,82	3,64	5,46	7,28	9,10	10,92	12,74	14,56	16,38	18,20	
8	2,08	4,16	6,24	8,32	10,40	12,48	14,56	16,64	18,72	20,80	
9	2,34	4,68	7,02	9,36	11,70	14,04	16,38	18,72	21,06	23,40	
10	2,60	5,20	7,80	10,40	13,00	15,60	18,20	20,80	23,40	26,00	
12	3,12	6,24	9,36	12,48	15,60	18,72	21,84	24,96	28,08	31,20	
14	3,64	7,28	10,92	14,56	18,20	21,84	25,48	29,12	32,76	36,40	
16	4,16	8,32	12,48	16,64	20,80	24,96	29,12	33,28	37,44	41,60	
18	4,68	9,36	14,04	18,72	23,40	28,08	32,76	37,44	42,12	46,80	
20	5,20	10,40	15,60	20,80	26,00	31,20	36,40	41,60	46,80	52,00	

Length calculation from a deflection leg for Jentro STABIL tubes in mm.

example
If the average lenght from a STABIL tube placed in upper-works is +/- 6 meter, measured from a fix-point bracket, and submitted at ΔT from 50°K, then the lenght variation from the tube is 7,8 mm.

For a STABIL tube from Ø 25 mm, the lenght of the deflection leg = 418,90 mm.

Tube diameter in mm	till 2,5 mm	till 5 mm	till 7,8 mm	till 9,36 mm	till 12,5 mm	till 15 mm	till 17,5 mm	till 20 mm	till 25 mm	till 30 mm	Length variation STABIL tube in mm
16	189,7	268,3	335,1	367,1	424,3	464,8	502,0	536,7	600,0	657,3	Lb in mm
20	212,1	300,0	374,7	410,5	474,3	519,6	561,2	600,0	670,8	734,8	
25	237,2	335,4	418,9	458,9	530,3	580,9	627,5	670,8	750,0	821,6	
32	268,3	379,5	474,0	519,2	600,0	657,3	709,9	758,9	848,5	929,5	

8.3 Assembly with deflection leg

Length variations can be provided for by means of a deflection leg. This length can be determined based on figure 101.
Fixed points and sliding brackets for plastic pipes must be installed, so that the pipe can expand in the appropriate lengthwise direction. Sliding brackets and fixed point brackets are commercially available.
Always follow the directions of the manufacturer!
The pipe brackets are NOT allowed to be installed on the compression sleeves.
For fixed points, a bracket must be installed before and after the compression sleeve! (see figure 100).

Determination of the length of the deflection leg: The minimum length Lb of the deflection leg is calculated as follows:

$$Lb = C \times \sqrt{Db \times \Delta l}$$

Lb= Length of the deflection leg in mm
Db = Outside diameter of the pipe in mm
Δl = Longitudinal reversion in mm
C = Constant (for PEX : C = 12)
C = Constant (for STABIL: C = 30)

Example:
We take as example the same parameters of page 36 +37, but for a PEX pipe of 25mm and a STABIL pipe of 25mm

PEX

$$Lb = 12 \times \sqrt{25 \times 54}$$
$$= 441 \text{ mm}$$

STABIL

$$Lb = 30 \times \sqrt{25 \times 9{,}36}$$
$$= 458 \text{ mm}$$

From this calculation example, it clearly results that the length of the deflection leg for STABIL is bigger than for PEX, due to the material constant C = 30, which is 250% higher than for PEX: C = 12!

Stabil has the advantage that the pipe is less susceptible to expansion and it is optically the best choice for upper-works.
The pipe length from the fixed point to the curve (e.g. branch), where the longitudinal reversion must be accommodated (length of the deflection leg), is 5 m.
The difference between min. and max. operating temperature is 60 K.
Which deflection leg length must be provided for a pipe with an external diameter of 40 mm?

$$\Delta l = 0{,}15 \times 5 \times 60$$
$$= 45$$
$$Lb = 12 \times \sqrt{40 \times 45}$$
$$= 509 \text{ mm}$$

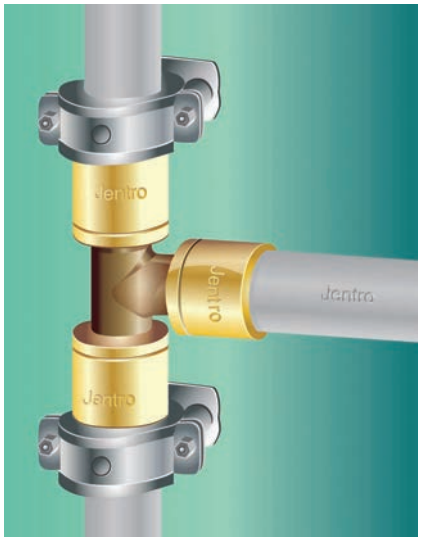
Choice of the brackets
The pipe brackets are not allowed to be installed on the compression sleeves, but they may so right before and after the sleeve!

8.4 Laying in ducts

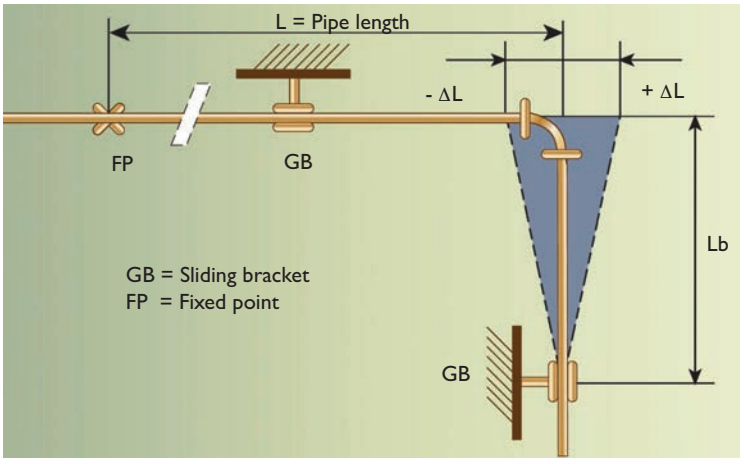
In the case of installation in closed ducts, the transverse expansion of the warm water pipes is not visible.

Fixed points must be installed at every floor, however.

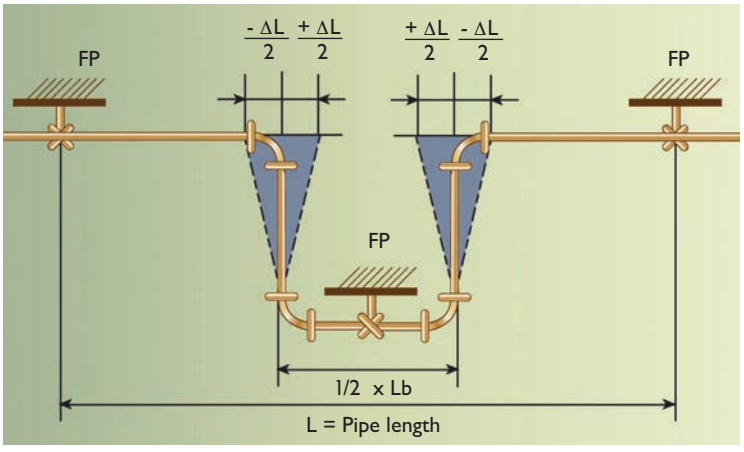
The pipes must be protected during their expansion from sharp objects that could be found in the duct.



▲ *Fig. 100: Fixed point brackets in ducts, for example.*



▲ *Fig. 101: Longitudinal reversion are provided for by means of deflection legs.*



▲ *Fig. 102: Longitudinal reversion in an expansion curve.*

8.5 Realisation of a fixed point

The next table shows the maximum length of threaded rods for mounting pipe brackets to ceilings and walls. For pipes until 32 mm, threaded rods can be used. For pipes of 40 to 63 mm, pipe nipples are recommended because of the considerably higher forces exercised on the brackets.

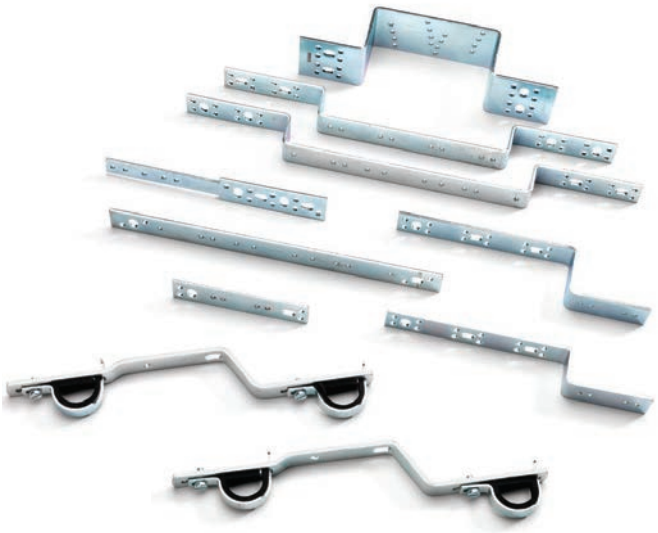
	Outside diameter of Jentro pipe						
	16	20	25	32	40	50	63
Threaded rod	length of threaded rod in mm						
M8	100						
M 10	150	100					
M 12	200	150	100				
M 16	300	250	200	100			
R 1/2				150	100		
R 3/4					150	100	
R 1/2					220	200	150
max pipe bracket distance in meter							
PEX	1	1	1	1,2	1,4	1,5	1,5
STABIL	1	1	1,2	1,4	1,5	1,5	1,5

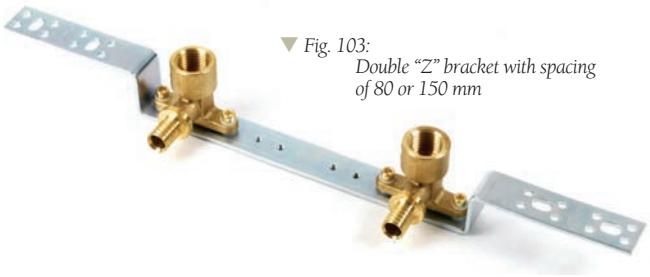
▲ *Table 6*

8.6 Fixing brackets

Jentro has an extensive collection of fixing brackets for the installation of wall corners.

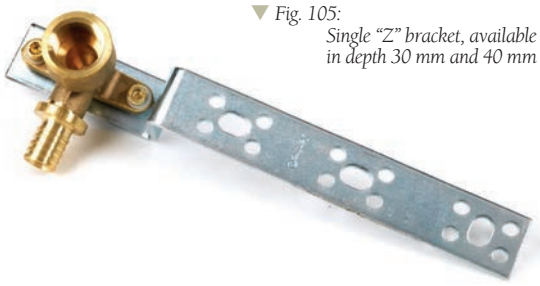
These brackets have been manufactured from galvanised sheet steel and guarantee a solid connection of faucets and various appendices.



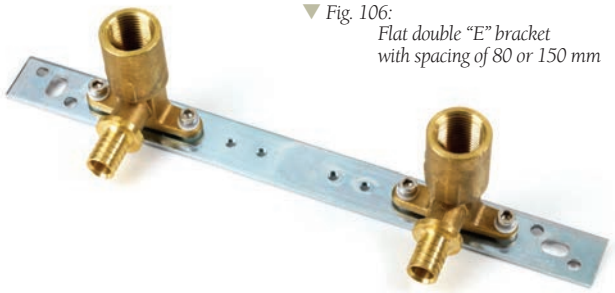


▼ *Fig. 103:*
Double "Z" bracket with spacing of 80 or 150 mm

▼ *Fig. 104:*
Double "Z" bracket with spacing of 80 to 100 mm

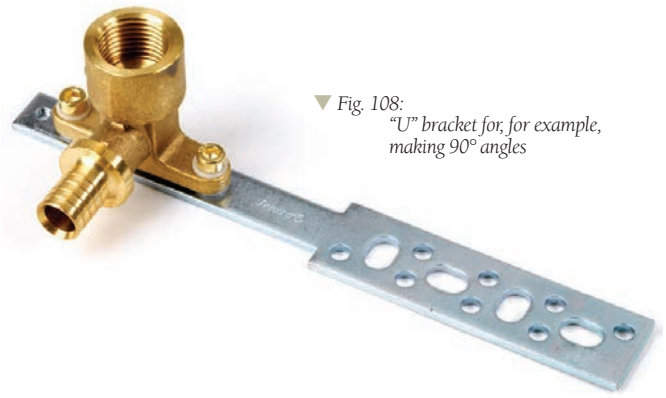


▼ *Fig. 105:*
Single "Z" bracket, available in depth 30 mm and 40 mm



▼ *Fig. 106:*
Flat double "E" bracket with spacing of 80 or 150 mm

▼ *Fig. 107:*
Flat "E" bracket for simple assembly



▼ *Fig. 108:*
"U" bracket for, for example, making 90° angles

▼ *Fig. 109:*
Radiator bracket. Allows mounting connection elbows for installation in the wall, with distance of 38, 40, 45 or 50 mm.

8.7 Isolation of pipes

For the installation of cold and hot water pipes, the pipe must be isolated in compliance with the applicable standards. The pipes must be installed in conformity with the pipe installation for plastic pipes available on the market, e.g. PE isolation.

8.8 Sound insulation

For the insulation against contact sounds, the DIN 4109 can be applied. The pipes must be installed in conformity with the pipe installation for plastic pipes available on the market, e.g. PE isolation.

The Jentro PEX and STABIL pipes are standard available in diam. 16 and 20 mm with a PE ribbed outside casing or a PE isolation with a lambda of 0.038 Wm°K at 40° C.

8.9 Mechanical protection of pipes

Building-in of pipes without protection is expressly discouraged. A HDPE ribbed outside casing is necessary to guarantee free expansion without unnecessary load being exercised on the compression joints.
The PE ribbed outside casing also offers a good mechanical protection against damage at the building site and additionally isolates the pipe. Too high surface temperatures of stone floors are thus avoided.

Jentro PEX pipes are standard available in sizes 16, 20 and 25 mm with PE ribbed outside casing.
Jentro STABIL pipes are standard available in sizes 16 and 20 mm with PE ribbed outside casing.
.

9 Pressure drop test for drinking water installations

9.1 Pressure test and flushing according to DIN 1988, part 2

Drinking water installations must always be checked for the pressure drop. The pressure test protocol must be completed, dated and signed by the installer and the contractor or his representative, in order to be able to claim the Jentro guarantee.

The pressure test is carried out as described in the DIN 1988, it is a contract between the installer and the contractor, and it avoids discussions afterwards when the pipes are damaged by third parties on the building site.

A flushing for corrosion protection, with a mixture of air and water, is not necessary. The pipeline system is thoroughly flushed with water after installation, in order to remove impurities that have entered the pipelines during installation.

9.2 Execution of the pressure test

Important: The pipes and couplings must be exposed and visible, completely filled with water, and free of air. Vent all outlets for this until water without air is coming out.

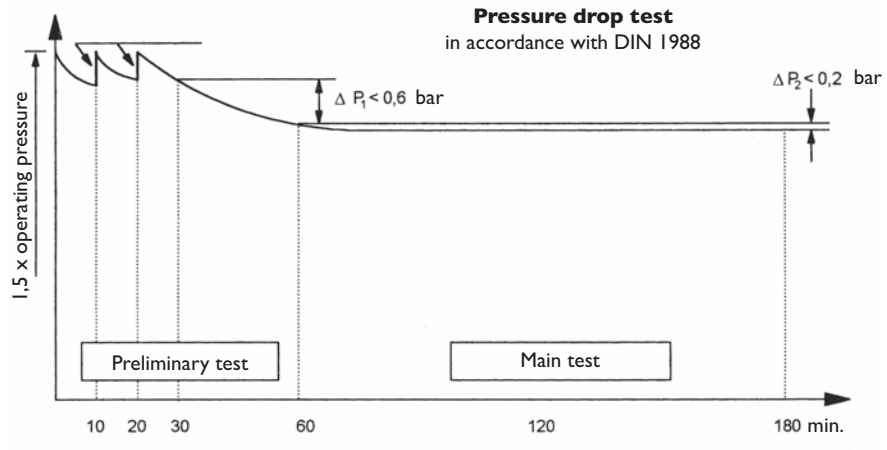
The test as described in the DIN 1988 consists of a preliminary and a main test.

Preliminary test:
During the preliminary test, a test pressure is applied corresponding to the permissible operating overpressure (10 bars) plus 5 bars, that must be regenerated twice within a period of 30 minutes at intervals of 10 minutes. After the next 30 minutes, the test pressure is not allowed to have dropped more than 0.6 bar and no leaks must have been detected.

Main test:
Immediately after the preliminary test, the main test must be carried out. The test duration is 2 hours. In this test, the pressure measured after the preliminary test must not have dropped more than 0.2 bar after two hours. No single part of the tested installation must display leaks.

Remarks:
The temperature difference between the pipe and the test medium can affect the test results as well, due to the high thermal expansion coefficient of plastic pipes. A temperature variation of 10 K corresponds to a pressure variation of 0.5 to 1 bar. During pressure tests of the installation components with plastic pipes, it is therefore necessary to strive for a test medium temperature as constant as possible.

It must be remarked here that, besides the pressure test, a visual check of all joints is very important. Small leaks cannot always be detected by means of the pressure gauge. After the pressure test, the drinking water pipelines must be thoroughly flushed.
.



▲ *Fig. 110: Pressure test diagram*

9.3 Pressure test for heating installation system with Jentro compression sleeve joints.

Building site details:

1.1 Address of site:……

Installation location:……

1.2 Client:……

1.3 Address of Client:……

1.4 Postal code, municipality:……

1.5 Country:……

1.6 Maximum operating temperature:……

1.7 Maximum operating pressure:……

1.8 Water head:……

Pressure drop test:

Steps to follow to test the pressure drop of heating pipes of the Jentro compression system

2.1 Disassemble all safety devices and meters, and position plugs instead.

2.2 Fill the installation with water and carefully vent the air.

2.3 Pressurise the installation. The test pressure must at least be equal to the pressure of the safety valve.

2.4 Re-pressurise the installation after two hours up to the original pressure to compensate for the pressure drop due to the pipe expansion.

2.5 Test duration: at least 4 hours.

2.6 If no single leakage is detected, the pipe is tight. Remember to check all fittings as well!

2.7 Bring the installation to the maximum water temperature (design value) and check whether the pipe remains water tight.

2.8 Comments regarding the performed pressure test.

……

……

……

Remark: the pipes must still be under the maximum operating pressure when the cover floor is laid, in order to detect any leaks immediately. Checking all joints is also very important!

3 Signing of the test report.

3.1 For the contractor, name……

Signature

3.2 For the installer, name:……

Signature

Date,……..

Any remarks or appendices:……

9.4 Pressure test according to DIN 1988 Part 2 for drinking water installation system with Jentro compression sleeve joints.

Building site details:

1.1 Address of site:……

Installation location:……

1.2 Client:……

1.3 Address of Client:……

1.4 Postal code, municipality:……

1.5 Country:……

Executing preliminary test at CONSTANT temperature.

2.1 Pressure test ……..bar (1.5 x the operating pressure = max. 15 bar test pressure)

2.2 Pressure measured after 10 min. …….. bar (afterwards restore test pressure)

2.3 Pressure measured after 20 min. …….. bar (afterwards restore test pressure))

2.4 Pressure measured after 30 min. …….. bar

2.5 Pressure measured after 60 min. …….. bar (permissible pressure loss < 0.6 bar)

Executing main test at CONSTANT temperature.

3.1 Test starts ……..hours End ……hours

3.2 Pressure test starts with …… bar (result of the preliminary test, see point 2.5)

3.3 Pressure after 2 hours …… bar (permissible pressure loss < 0.2 bar)

3.4 Comments regarding the performed pressure test.

……

……

……

Remark: the pipes must still be under the maximum operating pressure when the cover floor is laid, in order to detect any leaks immediately. Checking all joints is also very important!

4 Signing of the test report.

4.1 For the contractor, name…… 4.2 For the installer, name:……

Signature Signature

Date,……..

Any remarks or appendices:……

9.5 Notes

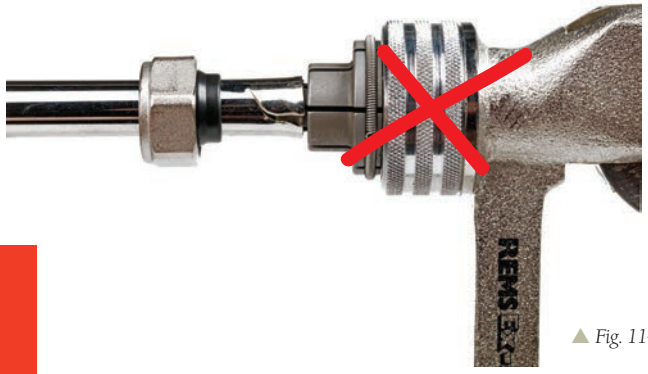
10 Connection variants for radiators

The Jentro L and T connection ensembles offer different possibilities for the connection of radiators.

▲ *Fig. 111: L connection ensembles in length of 25 and 100 cm. For pipe connection 16 and 20 mm.*

▲ *Fig. 112: T connection ensembles in length of 25 and 100 cm. For pipe connection 16 and 20 mm.*

▲ *Fig. 113: Connection of radiators with subdivision is perfectly possible aesthetically. Also subdivision belongs to the possibilities. (see next pages).*



▲ *Fig. 114: Do not expand connection ensembles.*

CAUTION!
Expanding the chromed L and T connection ensembles is not permitted!

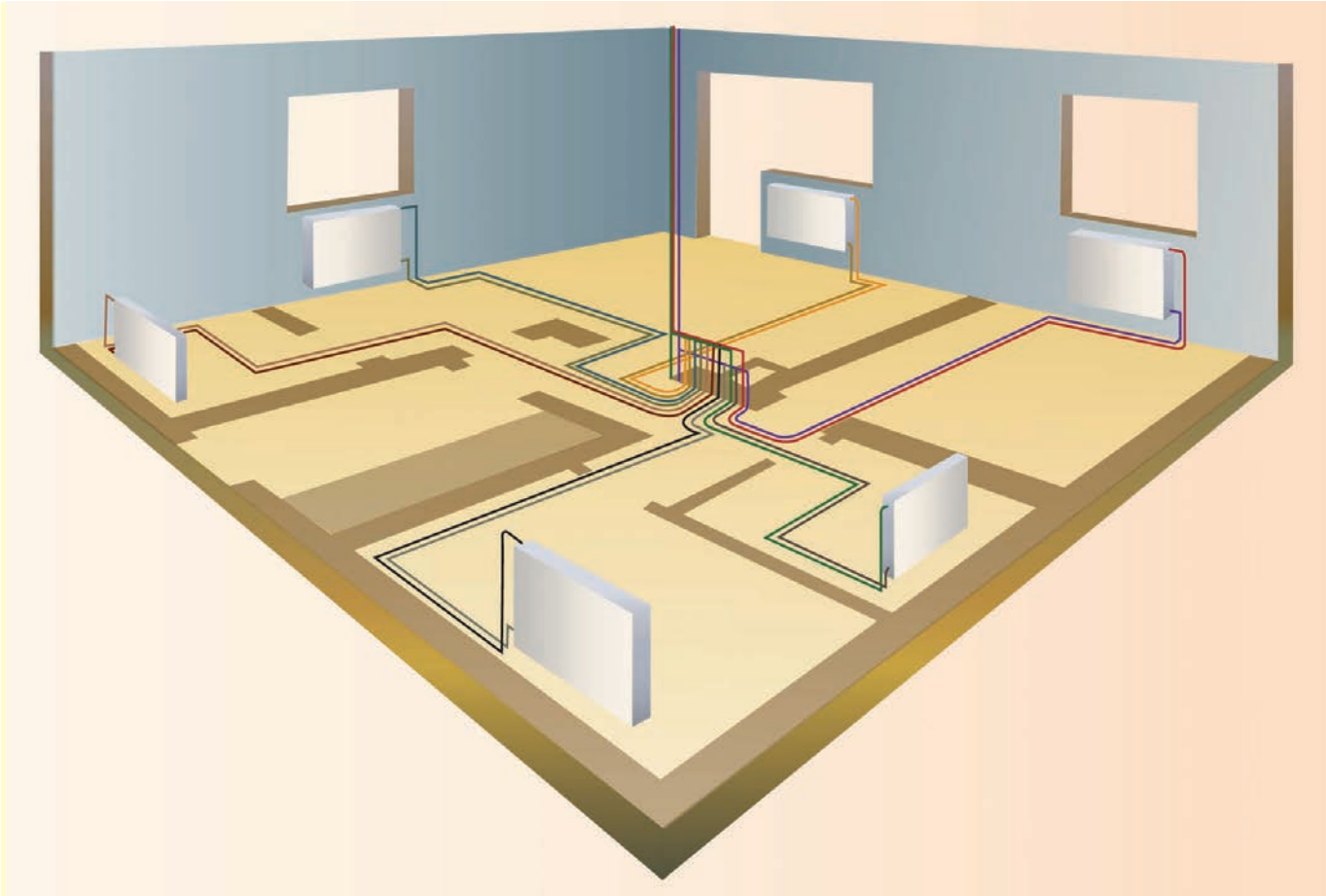
10.1 Two-pipe system with collector connection

In this case, each radiator is separately connected from a connector with a lead and return pipeline.

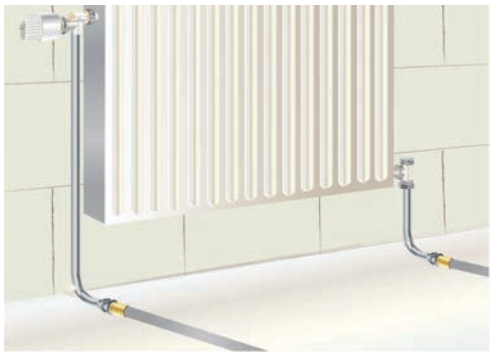
Isolating.
Pipelines for central heating must be isolated in compliance with the applicable norms or at least provided with a PE ribbed outside casing in order to avoid that the temperature of the floor surface increases too much.

CAUTION!
Take expansion measures! Do not connect the Jentro L angle connection ensembles for radiators and collectors in a straight line. Let the pipe always make an angle of 90° on 1 to 1.5 meters before the angle connection ensemble. This measure does not apply to T connection ensembles.

Always fix the L angle connection ensemble firmly to the ground, in order to compensate the varying load that results from expansion and retraction forces of the PEX or STABIL by the anchoring.
In case of connection in plasterboard walls, measures also have to be taken, so that the L connection ensemble cannot move anymore!
For example: fix the garniture with a fixed point.



▲ *Fig. 115: Connection with L ensembles twice at the bottom.*



▲ *Fig. 116: Connection with L ensembles, at the bottom and on top.*

10.2 Two-pipe system with branches

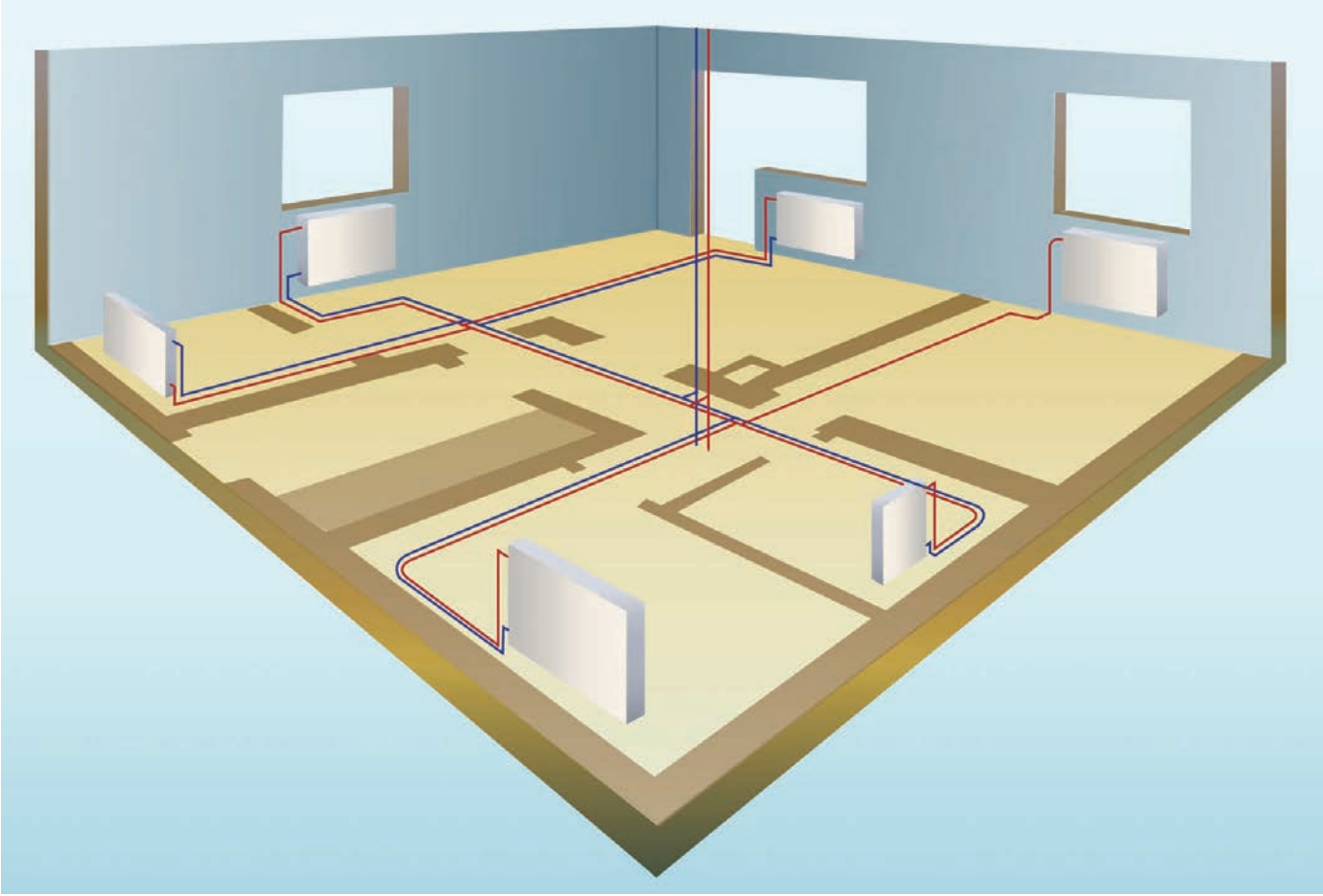
In this case, the system is separately connected from each radiator, leaving from a distribution pipe with underground branches.

Isolating.
Pipelines for central heating must be isolated in compliance with the applicable norms or at least provided with a PE ribbed outside casing in order to avoid that the temperature of the floor surface increases too much.

CAUTION!
Take expansion measures! Do not connect the Jentro L angle connection ensembles for radiators and collectors in a straight line.
Let the pipe always make an angle of 90° on 1 to 1.5 meters before the angle connection ensemble.
This measure does not apply to T connection ensembles.

Always fix the L angle connection ensemble firmly to the ground, in order to compensate the varying load that results from expansion and retraction forces of the PEX or STABIL by the anchoring.

In case of connection in plasterboard walls, measures also have to be taken, so that the L connection ensemble cannot move anymore!
For example: fix the garniture with a fixed point.



▲ *Fig. 117: Direct connection with STABIL pipe.*

▲ *Fig. 118: Connection with short and long L ensemble.*

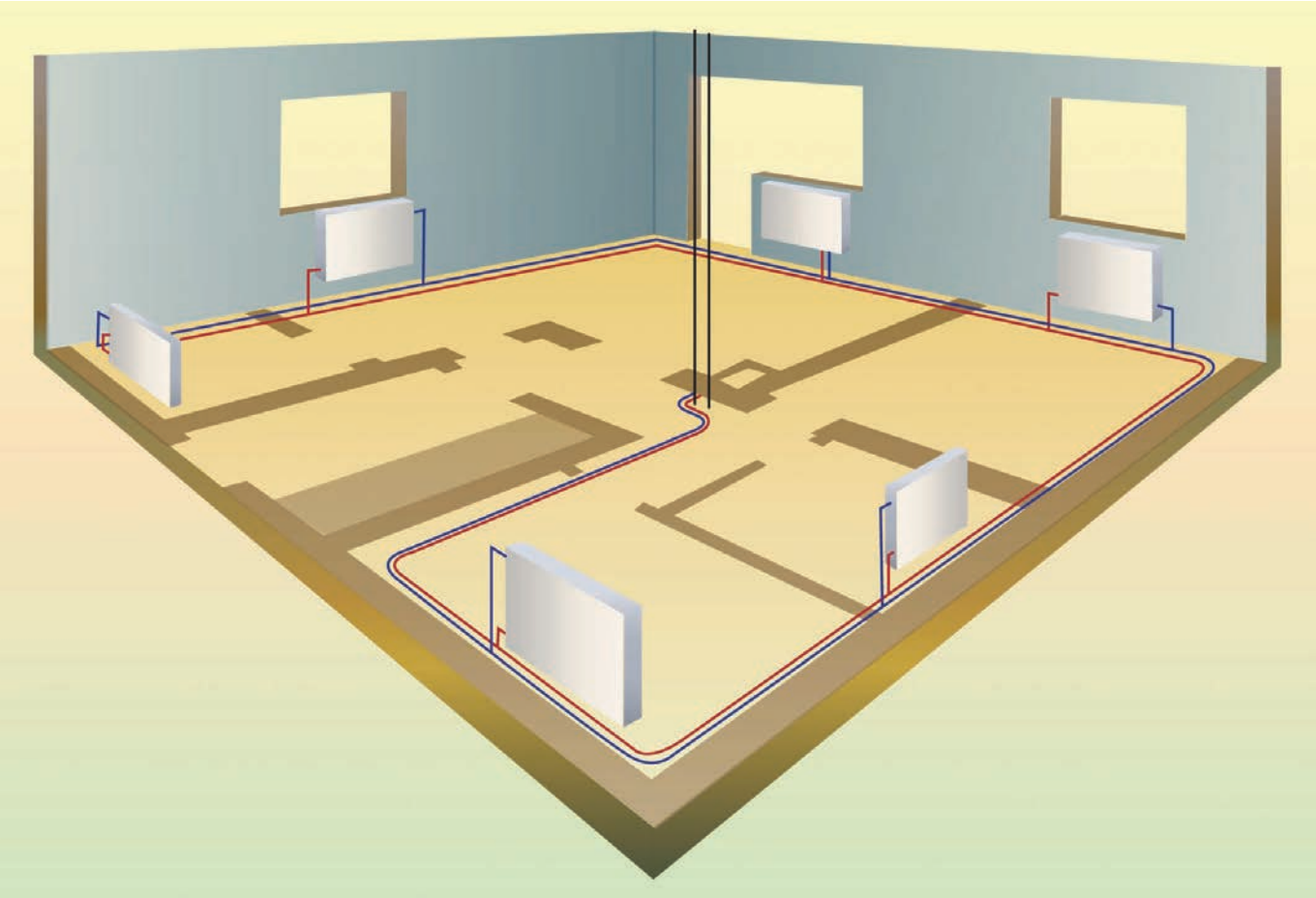
10.3 Two-pipe system with collection pipe

In this case, the system is connected departing from a collector or a standpipe connected to a collection pipe that serves various radiators.
For this, the T connection ensembles are used. The last radiator is connected to a angle connection ensemble.

Isolating.
Pipelines for central heating must be isolated in compliance with the applicable norms or at least provided with a PE ribbed outside casing in order to avoid that the temperature of the floor surface increases too much.

CAUTION!
Take expansion measures! Do not connect the Jentro L angle connection ensembles for radiators and collectors in a straight line. Let the pipe always make an angle of 90° on 1 to 1.5 meters before the angle connection ensemble. This measure does not apply to T connection ensembles.

Always fix the L angle connection ensemble firmly to the ground, in order to compensate the varying load that results from expansion and retraction forces of the PEX or STABIL by the anchoring. In case of connection in plasterboard walls, measures also have to be taken, so that the L connection ensemble cannot move anymore!
For example: fix the garniture with a fixed point.



▲ *Fig. 119: Connection with T ensemble, at the bottom and on top. PEX or STABIL.*

▲ *Fig. 120: Connection of T ensemble twice at the bottom PEX or STABIL.*

▲ *Fig. 121: Connection of T ensemble to subdivision with PEX or STABIl.*

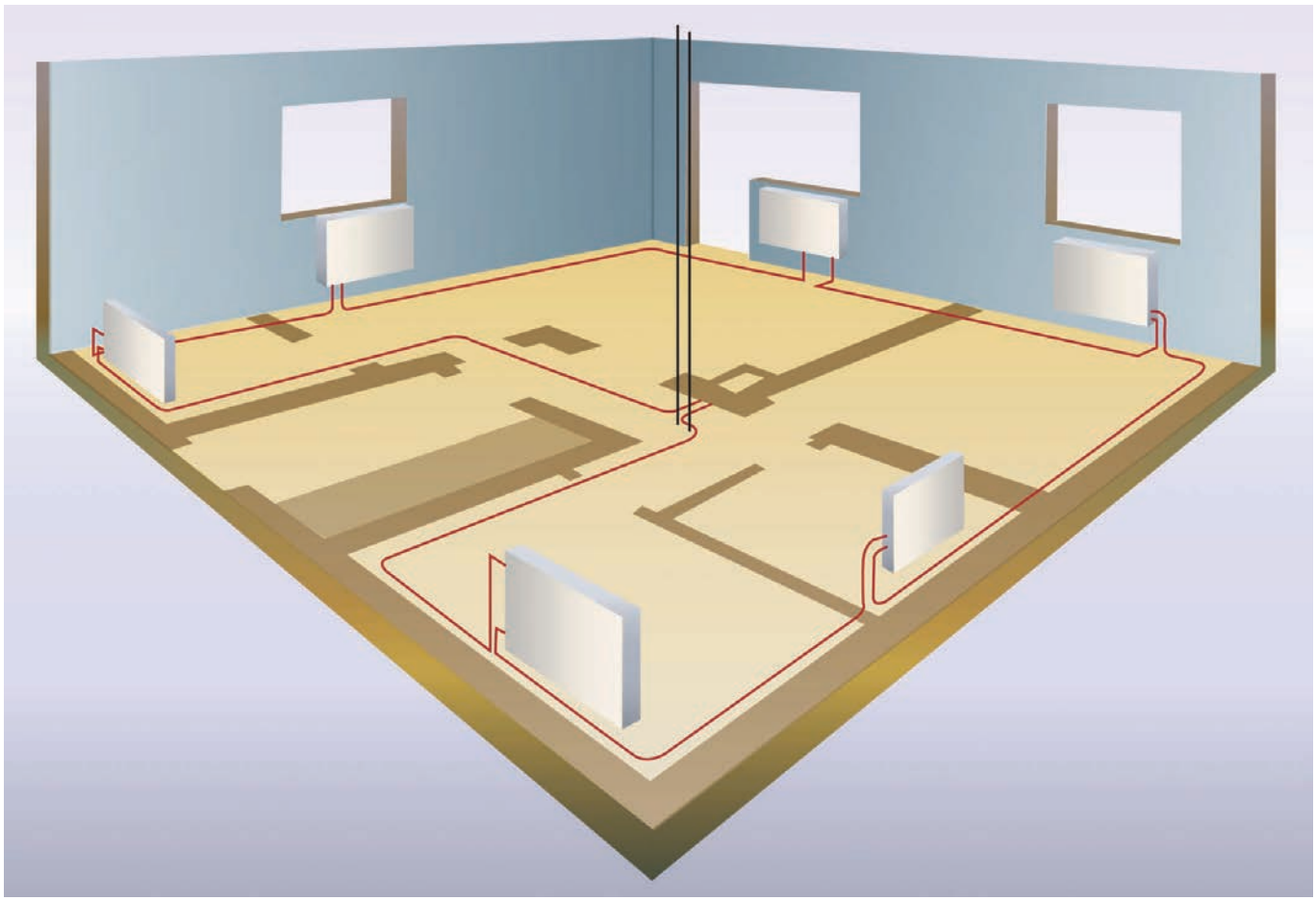
10.4 One-pipe system with collection pipe

In this case, various radiators are served after each other from a collector or a standpipe. For this, angle connection ensembles are used.

Isolating.
Pipelines for central heating must be isolated in compliance with the applicable norms or at least provided with a PE ribbed outside casing in order to avoid that the temperature of the floor surface increases too much.

CAUTION!
Take expansion measures! Do not connect the Jentro L angle connection ensembles for radiators and collectors in a straight line. Let the pipe always make an angle of 90° on 1 to 1.5 meters before the angle connection ensemble. This measure does not apply to T connection ensembles.

Always fix the L angle connection ensemble firmly to the ground, in order to compensate the varying load that results from expansion and retraction forces of the PEX or STABIL by the anchoring. In case of connection in plasterboard walls, measures also have to be taken, so that the L connection ensemble cannot move anymore!
For example: fix the garniture with a fixed point.



▲ *Fig. 122: Connection of L ensemble to subdivision with PEX or STABIL.*

▲ *Fig. 123: Connection with STABIL from the wall to subdivision.*

▲ *Fig. 124: Connection with L ensemble from the wall with PEX or STABIL.*

11.1 Dimensioning and pressure losses of a piping for drinking water installations with PEX pipes 16 – 25

PEX	16 x 2.2		20 x 2.8		25 x 3.5	
$\dot{V}_s$	DN12		DN15		DN20	
	R	v	R	v	R	v
l/s	mbar/m	m/s	mbar/m	m/s	mbar/m	m/s
1	2	3	4	5	6	7
0,01	0,3	0,1	0,1	0,1	0,0	0,04
0,02	0,8	0,2	0,3	0,1	0,1	0,08
0,03	1,6	0,3	0,6	0,2	0,2	0,12
0,04	2,6	0,4	0,9	0,2	0,3	0,16
0,05	3,9	0,5	1,4	0,3	0,5	0,20
0,06	5,3	0,6	1,9	0,4	0,7	0,24
0,07	6,9	0,7	2,5	0,4	0,9	0,28
0,08	8,7	0,8	3,1	0,5	1,1	0,31
0,09	10,7	0,9	3,8	0,6	1,3	0,35
0,10	12,8	0,9	4,6	0,6	1,6	0,4
0,15	26,1	1,4	9,3	0,9	3,2	0,6
0,20	43,5	1,9	15,4	1,2	5,3	0,8
0,25	64,8	2,4	22,8	1,5	7,8	1,0
0,30	89,9	2,8	31,6	1,8	10,8	1,2
0,35	118,8	3,3	41,6	2,1	14,2	1,4
0,40	151,3	3,8	52,9	2,5	18,0	1,6
0,45	187,4	4,3	65,4	2,8	22,2	1,8
0,50	227,2	4,7	79,1	3,1	26,8	2,0
0,55	270,5	5,2	94,0	3,4	31,8	2,2
0,60	317,3	5,7	110,1	3,7	37,2	2,4
0,65	367,7	6,2	127,3	4,0	43,0	2,6
0,70			145,8	4,3	49,2	2,8
0,75			165,3	4,6	55,7	2,9
0,80			186,1	4,9	62,6	3,1
0,85			208,0	5,2	69,9	3,3
0,90			231,0	5,5	77,5	3,5
0,95			255,2	5,8	85,5	3,7
1,00			280,5	6,1	93,9	3,9
1,05					102,7	4,1
1,10					111,8	4,3
1,15					121,3	4,5
1,20					131,1	4,7
1,25					141,3	4,9
1,30					151,8	5,1

▲ *Table 7: pressure losses due to friction in pipes with the PEX pipe 16-25.*

11.2 Dimensioning and pressure losses of a piping for drinking water installations with PEX pipes 32 – 63

PEX	32 x 4.4		40 x 5.5		50 x 6.9		63 x 8.6	
$\dot{V}_s$	DN 25		DN 32		DN 40		DN 50	
ℓ/s	R mbar/m	v m/s	R mbar/m	v m/s	R mbar/m	v m/s	R mbar/m	v m/s
1	2	3	4	5	6	7	8	9
0,1	0,5	0,2	0,2	0,2	0,1	0,1	0,0	0,1
0,2	1,6	0,5	0,5	0,3	0,2	0,2	0,1	0,1
0,3	3,2	0,7	1,1	0,5	0,4	0,3	0,1	0,2
0,4	5,3	0,9	1,8	0,6	0,6	0,4	0,2	0,2
0,5	7,9	1,2	2,7	0,8	0,9	0,5	0,3	0,3
0,6	10,9	1,4	3,7	0,9	1,3	0,6	0,4	0,4
0,7	14,4	1,7	4,9	1,1	1,7	0,7	0,6	0,4
0,8	18,3	1,9	6,2	1,2	2,2	0,8	0,7	0,5
0,9	22,6	2,1	7,7	1,4	2,7	0,9	0,9	0,6
1,0	27,3	2,4	9,3	1,5	3,2	1,0	1,1	0,6
1,1	32,5	2,6	11,0	1,7	3,8	1,1	1,3	0,7
1,2	38,0	2,8	12,9	1,8	4,4	1,2	1,5	0,7
1,3	44,0	3,1	14,9	2,0	5,1	1,3	1,7	0,8
1,4	50,3	3,3	17,0	2,1	5,8	1,4	1,9	0,9
1,5	52,0	3,5	19,3	2,3	6,6	1,5	2,2	0,9
1,6	64,2	3,8	21,7	2,4	7,4	1,6	2,4	1,0
1,7	71,7	4,0	24,2	2,6	8,3	1,7	2,7	1,0
1,8	79,6	4,3	26,8	2,7	9,2	1,7	3,0	1,1
1,9	87,9	4,5	29,6	2,9	10,1	1,8	3,3	1,2
2,0	96,5	4,7	32,5	3,0	11,1	1,9	3,6	1,2
2,1	105,6	5,0	35,5	3,2	12,1	2,0	4,0	1,3
2,2	115,0	5,2	38,6	3,3	13,2	2,1	4,3	1,3
2,3			41,9	3,5	14,3	2,2	4,7	1,4
2,4			45,3	3,6	15,4	2,3	5,0	1,5
2,5			48,8	3,8	16,6	2,4	5,4	1,5
2,6			52,4	3,9	17,8	2,5	5,8	1,6
2,7			56,2	4,1	19,1	2,6	6,2	1,7
2,8			60,1	4,2	20,4	2,7	6,7	1,7
2,9			64,1	4,4	21,7	2,8	7,1	1,8
3,0			68,2	4,5	23,1	2,9	7,5	1,8
3,1			72,4	4,7	24,5	3,0	8,0	1,9
3,2			76,8	4,8	26,0	3,1	8,5	2,0
3,3			81,2	5,0	27,5	3,2,	9,0	2,0
3,4			85,8	5,1	29,0	3,3	9,5	2,1
3,5					30,6	3,4	10,0	2,1
3,6					32,2	3,5	10,5	2,2
3,7					33,9	3,6	11,0	2,3
3,8					35,6	3,7	11,6	2,3
3,9					37,3	3,8	12,1	2,4
4,0					39,1	3,9	12,7	2,4
4,1					40,9	4,0	13,3	2,5
4,2					42,7	4,1	13,9	2,6
4,3					44,6	4,2	14,5	2,6
4,4					46,5	4,3	15,1	2,7
4,5					48,5	4,4	15,7	2,8
4,6					50,5	4,5	16,4	2,8
4,7					52,6	4,6	17,0	2,9
4,8					54,6	4,7	17,7	2,9
4,9					56,7	4,8	18,4	3,0
5,0					58,9	4,9	19,1	3,1

▲ *Table 8: pressure losses due to friction in pipes with the PEX pipe 32-63.*

11.3 Dimensioning and pressure losses of a piping for drinking water installations with STABIL pipes 16 – 40

STABIL	16.2 x 2.6		20 x 2.9		25 x 3.7		32 x 4.7		40 x 6.0	
$\dot{V}_s$ ℓ/s	$\dot{R}$ mbar/m	v m/s	R mbar/m	v m/s	R mbar/m	v m/s	R mbar/m	v m/s	R mbar/m	v m/s
1	2	3	4	5	6	7	8	9	10	11
0,01	0,3	0,1	0,1	0,1	0,04	0,04	0,01	0,02		
0,02	1,0	0,2	0,3	0,1	0,1	0,1	0,04	0,05		
0,03	2,1	0,3	0,6	0,2	0,2	0,1	0,1	0,1		
0,04	3,4	0,4	1,0	0,3	0,4	0,2	0,1	0,1		
0,05	5,0	0,5	1,5	0,3	0,5	0,2	0,2	0,1		
0,06	6,8	0,6	2,0	0,4	0,7	0,2	0,2	0,1		
0,07	8,9	0,7	2,6	0,4	1,0	0,3	0,3	0,2		
0,08	11,2	0,8	3,3	0,5	1,2	0,3	0,4	0,2		
0,09	13,7	0,9	4,1	0,6	1,5	0,4	0,5	0,2		
0,10	16,5	1,1	4,9	0,6	1,8	0,4	0,5	0,2	0,2	0,2
0.15	33,7	1,6	9,9	0,9	3,6	0,6	1,1	0,4	0,4	0,2
0,20	56,2	2,1	16,5	1,3	5,9	0,8	1,8	0,5	0,6	0,3
0,25	83,8	2,6	24,4	1,6	8,7	1,0	2,6	0,6	1,0	0,4
0,30	116,4	3,2	33,8	1,9	12,0	1,2	3,6	0,7	1,3	0,5
0,35	153,8	3,7	44,5	2,2	15,8	1,4	4,8	0,9	1,7	0,6
0,40	196,0	4,2	56,6	2,5	20,1	1,6	6,0	1,0	2,2	0,6
0,45	243,0	4,7	70,0	2,8	24,8	1,8	7,4	1,1	2,7	0,7
0,50	294,7	5,3	84,6	3,2	29,9	2,1	9,0	1,2	3,2	0,8
0.55	351,1	5,8	100,6	3,5	35,5	2,3	10,6	1,4	3,8	0,9
0,60	412,1	6,3	117,8	3,8	41,5	2,5	12,4	1,5	4,4	1,0
0,65	477,7	6,8	136,3	4,1	47,9	2,7	14,3	1,6	5,1	1,1
0,70			156,1	4,4	54,8	2,9	16,3	1,7	5,8	1,1
0.75			177,0	4,7	62,1	3,1	18,5	1,9	6,6	1,2
0,80			199,3	5,1	69,8	3,3	20,8	2,0	7,4	1,3
0,85			222,7	5,4	77,9	3,5	23,2	2,1	8,2	1,4
0,90			247,4	5,7	86,5	3,7	25,7	2,2	9,1	1,5
0,95			273,3	6,0	95,4	3,9	28,3	2,4	10,0	1,5
1,00			300,5	6,3	104,8	4,1	31,0	2,5	11,0	1,6
1,05					114,6	4,3	33,9	2,6	12,0	1,7
1,10					124,8	4,5	36,9	2,7	13,1	1,8
1,15					135,3	4,7	40,0	2,9	14,2	1,9
1,20					146,3	4,9	43,2	3,0	15,3	1,9
1.25					157,7	5,1	46,5	3,1	16,4	2,0
1,30					169,5	5,3	49,9	3,2	17,7	2,1
1,35							53,5	3,4	18,9	2,2
1,40							57,1	3,5	20,2	2,3
1,45							60,9	3,6	21,5	2,4
1,50							64,8	3,7	22,9	2,4
1,55							68,8	3,9	24,3	2,5
1,60							72,9	4,0	25,7	2,6
1,65							77,1	4,1	27,2	2,7
1,70							81,5	4,2	28,7	2,8
1,75							85,9	4,4	30,2	2,8
1,80							90,4	4,5	31,8	2,9
1,85							95,1	4,6	33,4	3,0
1,90							99,9	4,7	35,1	3,1
1,95							104,8	4,9	36,8	3,2
2,00							109,8	5,0	38,5	3,2
2,05							114,9	5,1	40,3	3,3
2,10							120,1	5,2	42,1	3,4
2.15									44,0	3,5
2,20									45,8	3,6
2,25									47,8	3,7
2,30									49,7	3,7
2,35									51,7	3,8
2,40									53,7	3,9
2,45									55,8	4,0
2,50									57,9	4,1
2,55									60,1	4,1
2,60									62,2	4,2
2,65									64,4	4,3
2,70									66,7	4,4
2,75									69,0	4,5
2,80									71,3	4,5
2,85									73,7	4,6
2,90									76,1	4,7
2,95									78,5	4,8
3,00									80,9	4,9
3.05									83,4	5,0
3,10									86,0	5,0
3,15									88,6	5,1
3,20									91,2	5,2

▲ *Table 9: pressure losses due to friction in pipes with the STABIL pipe.*

11.4 Pressure loss table for STABIL buis 16.2 x 2.6 (ΔT 10, 15 en 20K) Water temperature: 60°C

	Difference of 10K			Difference of 15K			Difference of 20K		
Heat input rate	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss
$\dot{Q}$	$\dot{m}$	v	R	$\dot{m}$	v	R	$\dot{m}$	v	R
W	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m
1	2	3	4	5	6	7	8	9	10
400	34,4	0,10	22,1	22,9	0,07	11,2	17,2	0,05	6,9
500	43,0	0,13	32,3	28,7	0,09	16,3	21,5	0,06	10,1
600	51,6	0,15	44,1	34,4	0,10	22,1	25,8	0,08	13,6
700	60,2	0,18	57,5	40,1	0,12	28,8	30,1	0,09	17,7
800	68,8	0,20	72,3	45,9	0,14	36,1	34,4	0,10	22,1
900	77,4	0,23	88,6	51,6	0,15	44,1	38,7	0,12	27,0
1000	86,0	0,26	106,4	57,3	0,17	52,9	43,0	0,13	32,3
1100	94,6	0,28	125,5	63,1	0,19	62,3	47,3	0,14	38,0
1200	103,2	0,31	146,0	68,8	0,20	72,3	51,6	0,15	44,1
1300	111,8	0,33	167,9	74,6	0,22	83,0	55,9	0,17	50,6
1400	120,4	0,36	191,1	80,3	0,24	94,4	60,2	0,18	57,5
1500	129,0	0,38	215,6	86,0	0,26	106,4	64,5	0,19	64,7
1600	137,6	0,41	241,4	91,8	0,27	119,0	68,8	0,20	72,3
1700	146,2	0,43	268,5	97,5	0,29	132,2	73,1	0,22	80,3
1800	154,8	0,46	296,9	103,2	0,31	146,0	77,4	0,23	88,6
1900	163,4	0,49	326,6	109,0	0,32	160,4	81,7	0,24	97,3
2000	172,0	0,51	357,5	114,7	0,34	175,5	86,0	0,26	106,4
2100	180,6	0,54	389,7	120,4	0,36	191,1	90,3	0,27	115,8
2200	189,2	0,56	423,1	126,1	0,38	207,3	94,6	0,28	125,5
2300	197,8	0,59	457,8	131,9	0,39	224,1	98,9	0,29	135,6
2400	206,5	0,61	493,7	137,6	0,41	241,4	103,2	0,31	146,0
2500	215,1	0,64	530,8	143,4	0,43	259,4	107,5	0,32	156,8
2600	223,7	0,66	569,1	149,1	0,44	277,9	111,8	0,33	167,9
2700	232,3	0,69	608,6	154,8	0,46	296,9	116,1	0,35	179,3
2800	240,9	0,72	649,3	160,6	0,48	316,6	120,4	0,36	191,1
2900	249,5	0,74	691,2	166,3	0,49	336,8	124,7	0,37	203,2
3000	258,1	0,77	734,3	172,0	0,51	357,5	129,0	0,38	215,6
3100	266,7	0,79	778,6	177,8	0,53	378,9	133,3	0,40	228,3
3200	275,3	0,82	824,0	183,5	0,55	400,7	137,6	0,41	241,4
3300	283,9	0,84	870,6	189,2	0,56	423,1	141,9	0,42	254,8
3400	292,5	0,87	918,4	195,0	0,58	446,1	146,2	0,43	268,5
3500	301,1	0,90	967,4	200,7	0,60	469,6	150,5	0,45	282,6
3600	309,7	0,92	1017,5	206,5	0,61	493,7	154,8	0,46	296,9
3700	318,3	0,95	1068,8	212,2	0,63	518,3	159,1	0,47	311,6
3800	326,9	0,97	1121,2	217,9	0,65	543,4	163,4	0,49	326,6
3900	335,5	1,00	1174,8	223,7	0,66	569,1	167,7	0,50	341,9
4000				229,4	0,68	595,3	172,0	0,51	357,5
4100				235,1	0,70	622,0	176,3	0,52	373,5
4200				240,9	0,72	649,3	180,6	0,54	389,7
4300				246,6	0,73	677,1	184,9	0,55	406,3
4400				252,3	0,75	705,4	189,2	0,56	423,1
4500				258,1	0,77	734,3	193,5	0,58	440,3
4700				269,5	0,80	793,6	202,2	0,60	475,6
4900				281,0	0,84	855,0	210,8	0,63	512,1
5100				292,5	0,87	918,4	219,4	0,65	549,8
5300				303,9	0,90	984,0	228,0	0,68	588,7
5500				315,4	0,94	1051,6	236,6	0,70	628,8
5700				326,9	0,97	1121,2	245,2	0,73	670,1
5900				338,4	1,01	1192,9	253,8	0,75	712,6
6100							262,4	0,78	756,3
6300							271,0	0,81	801,1
6500							279,6	0,83	847,2
6700							288,2	0,86	894,4
6900							296,8	0,88	942,8
7100							305,4	0,91	992,3
7300							314,0	0,93	1043,0
7500							322,6	0,96	1094,9
7700							331,2	0,98	1147,9
7900							339,8	1,01	1202,0

Dynamic viscosity: 0.000467 kg/(m-s) Density: 983.2 kg/m³

▲ *Table 10: pressure loss table for STABIL 16.*

11.5 Pressure loss table for STABIL pipe 20 x 2.9 (ΔT 10, 15 and 20K) Water temperature: 60°C

	Difference of 10K			Difference of 15K			Difference of 20K		
Heat input rate	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss
$\dot{Q}$	$\dot{m}$	v	R	$\dot{m}$	v	R	$\dot{m}$	v	R
W	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m
1	2	3	4	5	6	7	8	9	10
600	51,6	0,09	13,2	34,4	0,06	6,7	25,8	0,05	4,1
700	60,2	0,11	17,2	40,1	0,07	8,7	30,1	0,05	5,3
800	68,8	0,12	21,6	45,9	0,08	10,8	34,4	0,06	6,7
900	77,4	0,14	26,4	51,6	0,09	13,2	38,7	0,07	8,1
1000	86,0	0,15	31,7	57,3	0,10	15,8	43,0	0,08	9,7
1200	103,2	0,18	43,4	68,8	0,12	21,6	51,6	0,09	13,2
1400	120,4	0,21	56,6	80,3	0,14	28,1	60,2	0,11	17,2
1600	137,6	0,25	71,4	91,8	0,16	35,4	68,8	0,12	21,6
1800	154,8	0,28	87,7	103,2	0,18	43,4	77,4	0,14	26,4
2000	172,0	0,31	105,4	114,7	0,20	52,0	86,0	0,15	31,7
2200	189,2	0,34	124,5	126,2	0,23	61,4	94,6	0,17	37,3
2400	206,5	0,37	145,1	137,6	0,25	71,4	103,2	0,18	43,4
2600	223,7	0,40	167,0	149,1	0,27	82,1	111,8	0,20	49,8
2800	240,9	0,43	190,3	160,6	0,29	93,4	120,4	0,21	56,6
3000	258,1	0,46	214,9	172,0	0,31	105,4	129,0	0,23	63,8
3200	275,3	0,49	240,9	183,5	0,33	118,0	137,6	0,25	71,4
3400	292,5	0,52	268,2	195,0	0,35	131,2	146,2	0,26	79,4
3600	309,7	0,55	296,8	206,5	0,37	145,1	154,8	0,28	87,7
3800	326,9	0,58	326,7	217,9	0,39	159,5	163,4	0,29	96,7
4000	344,1	0,61	358,0	229,4	0,41	174,6	172,0	0,31	105,4
4200	361,3	0,64	390,4	240,9	0,43	190,3	180,6	0,32	114,8
4400	378,5	0,68	424,2	252,3	0,45	206,6	189,2	0,34	124,5
4600	395,7	0,71	459,2	263,8	0,47	223,5	197,8	0,35	134,6
4800	412,9	0,74	495,5	275,3	0,49	240,9	206,5	0,37	145,1
5000	430,1	0,77	533,1	286,7	0,51	259,0	215,1	0,38	155,9
5200	447,3	0,80	571,8	298,2	0,53	277,6	223,7	0,40	167,0
5400	464,5	0,83	611,9	309,7	0,55	296,8	232,3	0,41	178,5
5600	481,7	0,86	653,1	321,1	0,57	316,6	240,9	0,43	190,3
5800	498,9	0,89	695,6	332,6	0,59	337,0	249,5	0,45	202,5
6000	516,1	0,92	739,3	344,1	0,61	358,0	258,1	0,46	214,9
6200	533,3	0,95	784,3	355,6	0,63	379,5	266,7	0,48	227,8
6400	550,5	0,98	830,4	367,0	0,65	401,6	275,3	0,49	240,9
6600	567,7	1,01	877,8	378,5	0,68	424,2	283,9	0,51	254,4
6800				390,0	0,70	447,4	292,5	0,52	268,2
7000				401,4	0,72	471,2	301,1	0,54	282,4
7200				412,9	0,74	495,5	309,7	0,55	296,8
7400				424,4	0,76	520,4	318,3	0,57	311,6
7600				435,8	0,78	545,8	326,9	0,58	326,7
7800				447,3	0,80	571,8	335,5	0,60	342,2
8000				458,8	0,82	598,4	344,1	0,61	358,0
8200				470,3	0,84	625,5	352,7	0,63	374,0
8400				481,7	0,86	653,1	361,3	0,64	390,4
8600				493,2	0,88	681,3	369,9	0,66	407,2
8800				504,7	0,90	710,1	378,5	0,68	424,2
9000				516,1	0,92	739,3	387,1	0,69	441,6
9200				527,6	0,94	769,2	395,7	0,71	459,2
9400				539,1	0,96	799,5	404,3	0,72	477,2
9600				550,5	0,98	830,4	412,9	0,74	495,5
9800				562,0	1,00	861,9	421,5	0,75	514,1
10000							430,1	0,77	533,1
10200							438,7	0,78	552,3
10400							447,3	0,80	571,8
10600							455,9	0,81	591,7
10800							464,5	0,83	611,9
11000							473,1	0,84	632,3
11500							494,6	0,88	684,9
12000							516,1	0,92	739,3
12500							537,6	0,96	795,7
13000							559,1	1,00	854,0

Dynamic viscosity: 0.000467 kg/(m-s) Density: 983.2 kg/m³

▲ *Table 11: pressure loss table for STABIL 20*

11.6 Pressure loss table for STABIL pipe 25 x 3.7 (ΔT 10, 15 and 20K) Water temperature: 60°C

	Difference of 10K			Difference of 15K			Difference of 20K		
Heat input rate	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss
$\dot{Q}$	$\dot{m}$	v	R	$\dot{m}$	v	R	$\dot{m}$	v	R
W	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m
1	2	3	4	5	6	7	8	9	10
1000	86,0	0,10	11,5	57,3	0,07	5,8	43,0	0,05	3,6
1200	103,2	0,12	15,7	68,8	0,08	7,9	51,6	0,06	4,8
1400	120,4	0,14	20,5	80,3	0,09	10,2	60,2	0,07	6,3
1600	137,6	0,16	25,8	91,8	0,11	12,8	68,8	0,08	7,9
1800	154,8	0,18	31,6	103,2	0,12	15,7	77,4	0,09	9,6
2000	172,0	0,20	37,9	114,7	0,13	18,8	86,0	0,10	11,5
2200	189,2	0,22	44,8	126,2	0,15	22,2	94,6	0,11	13,5
2400	206,5	0,24	52,1	137,6	0,16	25,8	103,2	0,12	15,7
2600	223,7	0,26	59,9	149,1	0,17	29,6	111,8	0,13	18,0
2800	240,9	0,28	68,2	160,6	0,19	33,6	120,4	0,14	20,5
3000	258,1	0,30	77,0	172,0	0,20	37,9	129,0	0,15	23,0
3200	275,3	0,32	86,2	183,5	0,21	42,4	137,6	0,16	25,8
3400	292,5	0,34	95,9	195,0	0,23	47,2	146,2	0,17	28,6
3600	309,7	0,36	106,0	206,5	0,24	52,1	154,8	0,18	31,6
3800	326,9	0,38	116,6	217,9	0,25	57,2	163,4	0,19	34,7
4000	344,1	0,40	127,7	229,4	0,27	62,6	172,0	0,20	37,9
4200	361,3	0,42	139,2	240,9	0,28	68,2	180,6	0,21	41,3
4400	378,5	0,44	151,1	252,3	0,29	74,0	189,2	0,22	44,8
4600	395,7	0,46	163,5	263,8	0,31	80,0	197,8	0,23	48,4
4800	412,9	0,48	176,3	275,3	0,32	86,2	206,5	0,24	52,1
5000	430,1	0,50	189,5	286,7	0,33	92,6	215,1	0,25	55,9
5200	447,3	0,52	203,2	298,2	0,35	99,2	223,7	0,26	59,9
5400	464,5	0,54	217,3	309,7	0,36	106,0	232,3	0,27	64,0
5600	481,7	0,56	231,8	321,1	0,37	113,0	240,9	0,28	68,2
5800	498,9	0,58	246,8	332,6	0,39	120,3	249,5	0,29	72,5
6000	516,1	0,60	262,2	344,1	0,40	127,7	258,1	0,30	77,0
6200	533,3	0,62	277,9	355,6	0,41	135,3	266,7	0,31	81,5
6400	550,5	0,64	294,1	367,0	0,43	143,1	275,3	0,32	86,2
6600	567,7	0,66	310,8	378,5	0,44	151,1	283,9	0,33	91,0
6800	584,9	0,68	327,8	390,0	0,45	159,3	292,5	0,34	95,9
7000	602,2	0,70	345,3	401,4	0,47	167,7	301,1	0,35	100,9
7400	636,6	0,74	381,4	424,4	0,49	185,1	318,3	0,37	111,3
7800	671,0	0,78	419,2	447,3	0,52	203,2	335,5	0,39	122,1
8200	705,4	0,82	458,5	470,3	0,55	222,1	352,7	0,41	133,4
8600	739,8	0,86	499,5	493,2	0,57	241,8	369,9	0,43	145,1
9000	774,2	0,90	542,1	516,1	0,60	262,2	387,1	0,45	157,2
9400	808,6	0,94	586,3	539,1	0,63	283,3	404,3	0,47	169,8
9800	843,0	0,98	632,1	562,0	0,65	305,2	421,5	0,49	182,9
10200	877,4	1,02	679,5	584,9	0,68	327,8	438,7	0,51	196,3
10600				607,9	0,71	351,2	455,9	0,53	210,2
11000				630,8	0,73	375,3	473,1	0,55	224,5
11500				659,5	0,77	406,4	494,6	0,57	243,0
12000				688,2	0,80	438,6	516,1	0,60	262,2
12500				716,8	0,83	472,0	537,6	0,62	282,0
13000				745,5	0,87	506,5	559,1	0,65	302,4
13500				774,2	0,90	542,1	580,6	0,67	323,5
14000				802,9	0,93	578,9	602,2	0,70	345,3
14500				831,5	0,97	616,7	623,7	0,72	367,6
15000				860,2	1,00	655,6	645,2	0,75	390,7
15500							666,7	0,77	414,3
16000							688,2	0,80	438,6
16500							709,7	0,82	463,6
17000							731,2	0,85	489,1
17500							752,7	0,87	515,3
18000							774,2	0,90	542,1
18500							795,7	0,92	569,6
19000							817,2	0,95	597,6
19500							838,7	0,97	626,3
20000							860,2	1,00	655,6

Dynamic viscosity: 0.000467 kg/(m-s) Density: 983.2 kg/m³

▲ *Table 12: pressure loss table for STABIL 25.*

11.7 Pressure loss table for STABIL pipe 32 x 4.7 (ΔT 10, 15 and 20K) Water temperature: 60°C

	Difference of 10K			Difference of 15K			Difference of 20K		
Heat input rate	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss
$\dot{Q}$	$\dot{m}$	v	R	$\dot{m}$	v	R	$\dot{m}$	v	R
W	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m
1	2	3	4	5	6	7	8	9	10
1800	154,8	0,11	9,7	103,2	0,07	4,8	77,4	0,05	3,0
2000	172,0	0,12	11,6	114,7	0,08	5,8	86,0	0,06	3,5
2200	189,2	0,13	13,7	126,2	0,09	6,8	94,6	0,07	4,2
2400	206,5	0,15	15,9	137,6	0,10	7,9	103,2	0,07	4,8
2600	223,7	0,16	18,2	149,1	0,11	9,1	111,8	0,08	5,5
2800	240,9	0,17	20,7	160,6	0,11	10,3	120,4	0,08	6,3
3000	258,1	0,18	23,4	172,0	0,12	11,6	129,0	0,09	7,1
3200	275,3	0,19	26,2	183,5	0,13	12,9	137,6	0,10	7,9
3400	292,5	0,21	29,1	195,0	0,14	14,4	146,2	0,10	8,8
3600	309,7	0,22	32,1	206,5	0,15	15,9	154,8	0,11	9,7
3800	326,9	0,23	35,3	217,9	0,15	17,4	163,4	0,12	10,6
4000	344,1	0,24	38,6	229,4	0,16	19,1	172,0	0,12	11,6
4500	387,1	0,27	47,5	258,1	0,18	23,4	193,5	0,14	14,2
5000	430,1	0,30	57,2	286,7	0,20	28,1	215,1	0,15	17,0
5500	473,1	0,33	67,7	315,4	0,22	33,2	236,6	0,17	20,1
6000	516,1	0,36	78,9	344,1	0,24	38,6	258,1	0,18	23,4
6500	559,1	0,39	90,9	372,8	0,26	44,5	279,6	0,20	26,9
7000	602,2	0,42	103,7	401,4	0,28	50,7	301,1	0,21	30,6
7500	645,2	0,45	117,2	430,1	0,30	57,2	322,6	0,23	34,5
8000	688,2	0,48	131,4	458,8	0,32	64,1	344,1	0,24	38,6
8500	731,2	0,51	146,4	487,5	0,34	71,3	365,6	0,26	43,0
9000	774,2	0,55	162,1	516,1	0,36	78,9	387,1	0,27	47,5
9500	817,2	0,58	178,5	544,8	0,38	86,8	408,6	0,29	52,3
10000	860,2	0,61	195,7	573,5	0,40	95,1	430,1	0,30	57,2
10500	903,2	0,64	213,5	602,2	0,42	103,7	451,6	0,32	62,3
11000	946,2	0,67	232,1	630,8	0,44	112,6	473,1	0,33	67,7
11500	989,2	0,70	251,3	659,5	0,46	121,8	494,6	0,35	73,2
12000	1032,3	0,73	271,3	688,2	0,48	131,4	516,1	0,36	78,9
12500	1075,3	0,76	291,9	716,8	0,50	141,3	537,6	0,38	84,8
13000	1118,3	0,79	313,3	745,5	0,53	151,5	599,1	0,39	90,9
13500	1161,3	0,82	335,3	774,2	0,55	162,1	580,6	0,41	97,2
14000	1204,3	0,85	358,0	802,9	0,57	173,0	602,2	0,42	103,7
14500	1247,3	0,88	381,4	831,5	0,59	184,1	623,7	0,44	110,3
15000	1290,3	0,91	405,5	860,2	0,61	195,7	645,2	0,45	117,2
15500	1333,3	0,94	430,2	888,9	0,63	207,5	666,7	0,47	124,2
16000	1376,3	0,97	455,6	917,6	0,65	219,6	688,2	0,48	131,4
16500	1419,4	1,00	481,7	946,2	0,67	232,1	709,7	0,50	138,8
17000				974,9	0,69	244,8	731,2	0,51	146,4
17500				1003,6	0,71	257,9	752,7	0,53	154,1
18000				1032,3	0,73	271,3	774,2	0,55	162,1
18500				1060,9	0,75	285,0	795,7	0,56	170,2
19000				1089,6	0,77	299,0	817,2	0,58	178,5
19500				1118,3	0,79	313,3	838,7	0,59	187,0
20000				1147,0	0,81	327,9	860,2	0,61	195,7
20500				1175,6	0,83	342,8	881,7	0,62	204,5
21000				1204,3	0,85	358,0	903,2	0,64	213,5
21500				1233,0	0,87	373,5	924,7	0,65	222,7
22500				1290,3	0,91	405,5	967,7	0,68	241,6
23500				1347,7	0,95	438,6	1010,8	0,71	261,2
24500				1405,0	0,99	473,0	1053,8	0,74	281,5
25500				1462,4	1,03	508,5	1096,8	0,77	302,5
26500							1139,8	0,80	324,2
27500							1182,8	0,83	346,6
28500							1225,8	0,86	369,6
29500							1268,8	0,89	393,4
30500							1311,8	0,92	417,8
31500							1354,8	0,95	442,9
32500							1397,8	0,98	468,6
33500							1440,9	1,01	495,0

Dynamic viscosity: 0.000467 kg/(m-s) Density: 983.2 kg/m³

▲ *Table 13: pressure loss table for STABIL 32.*

11.8 Notes

11.9 Pressure loss table for PEX pipe 16 x 2.2 (ΔT 10, 15 and 20K)

Water temperature: 60°C

	Difference of 10K			Difference of 15K			Difference of 20K		
Heat input rate	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss
$\dot{Q}$	$\dot{m}$	v	R	$\dot{m}$	v	R	$\dot{m}$	v	R
W	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m
1	2	3	4	5	6	7	8	9	10
400	34,4	0,09	16,8	22,9	0,06	8,5	17,2	0,05	5,3
500	43,0	0,11	24,5	28,7	0,08	12,3	21,5	0,06	7,6
600	51,6	0,14	33,4	34,4	0,09	16,8	25,8	0,07	10,3
700	60,2	0,16	43,4	40,1	0,11	21,8	30,1	0,08	13,4
800	68,8	0,18	54,6	45,9	0,12	27,3	34,4	0,09	16,8
900	77,4	0,20	66,9	51,6	0,14	33,4	38,7	0,10	20,5
1000	86,0	0,23	80,2	57,3	0,15	39,9	43,0	0,11	24,5
1100	94,6	0,25	94,6	63,1	0,17	47,0	47,3	0,12	28,8
1200	103,2	0,27	110,1	68,8	0,18	54,6	51,6	0,14	33,4
1300	111,8	0,29	126,5	74,5	0,20	62,7	55,9	0,15	38,2
1400	120,4	0,32	143,9	80,3	0,21	71,2	60,2	0,16	43,4
1500	129,0	0,34	162,4	86,0	0,23	80,2	64,5	0,17	48,9
1600	137,6	0,36	181,8	91,7	0,24	89,7	68,8	0,18	54,6
1700	146,2	0,38	202,1	97,5	0,26	99,7	73,1	0,19	60,6
1800	154,8	0,41	223,5	103,2	0,27	110,1	77,4	0,20	66,9
1900	163,4	0,43	245,7	108,9	0,29	120,9	81,7	0,21	73,4
2000	172,0	0,45	268,9	114,7	0,30	132,9	86,0	0,23	80,2
2100	180,6	0,47	293,1	120,4	0,32	143,9	90,3	0,24	87,3
2200	189,2	0,50	318,1	126,1	0,33	156,1	94,6	0,25	94,6
2300	197,8	0,52	344,1	131,9	0,35	168,7	98,9	0,26	102,2
2400	206,4	0,54	371,0	137,6	0,36	181,8	103,2	0,27	110,1
2500	215,0	0,57	398,8	143,3	0,38	195,2	107,5	0,28	118,1
2600	223,6	0,59	427,5	149,1	0,39	209,1	111,8	0,29	126,5
2700	232,2	0,61	475,1	154,8	0,41	223,5	116,1	0,31	135,1
2800	240,8	0,63	487,6	160,5	0,42	238,2	120,4	0,32	143,9
2900	249,4	0,66	519,0	166,3	0,44	253,4	124,7	0,33	153,0
3000	258,0	0,68	551,2	172,0	0,45	268,9	129,0	0,34	162,4
3100	266,6	0,70	584,4	177,7	0,47	284,9	133,3	0,35	171,9
3200	275,2	0,72	618,4	183,5	0,48	301,3	137,6	0,36	181,8
3300	283,8	0,75	653,3	189,2	0,50	318,1	141,9	0,37	191,8
3400	292,4	0,77	689,1	194,9	0,51	335,4	146,2	0,38	202,1
3500	301,0	0,79	725,7	200,7	0,53	353,0	150,5	0,40	212,7
3700	318,2	0,48	801,5	212,1	0,56	389,4	159,1	0,42	234,5
3900	335,4	0,88	808,8	223,6	0,59	427,5	167,7	0,44	257,2
4100	352,6	0,93	963,5	235,1	0,62	467,2	176,3	0,46	280,9
4300	369,8	0,97	1049,5	246,5	0,65	508,4	184,9	0,49	305,5
4500				258,0	0,68	551,2	193,5	0,51	331,0
4700				269,5	0,71	595,6	202,1	0,53	357,4
4900				280,9	0,74	641,6	210,7	0,55	384,8
5100				292,4	0,77	689,1	219,3	0,58	413,1
5300				303,9	0,80	738,1	227,9	0,60	442,2
5500				315,3	0,83	788,6	236,5	0,62	472,2
5700				326,8	0,86	840,7	245,1	0,64	503,2
5900				338,3	0,89	894,3	253,7	0,67	535,0
6100				349,7	0,92	949,4	262,3	0,69	567,7
6300				361,2	0,95	1006,1	270,9	0,71	601,3
6500				372,7	0,98	1064,2	279,5	0,73	635,7
6700							288,1	0,76	671,1
6900							296,7	0,78	707,3
7100							305,3	0,80	744,3
7300							313,9	0,83	782,2
7500							322,5	0,85	821,0
7700							331,1	0,87	860,6
7900							339,7	0,89	901,1
8100							348,3	0,92	942,5
8300							356,9	0,94	984,7
8500							365,5	0,96	1027,7
8800							378,4	0,99	1093,8

Dynamic viscosity: 0.000467 kg/(m-s) Density: 983.2 kg/m³

▲ *Table 15: pressure loss table for PEX 16.*

11.10 Pressure loss table for PEX pipe 20 x 2.8 (ΔT 10, 15 and 20K) Water temperature: 60°C

	Difference of 10K			Difference of 15K			Difference of 20K		
Heat input rate	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss
$\dot{Q}$	$\dot{m}$	v	R	$\dot{m}$	v	R	$\dot{m}$	v	R
W	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m
1	2	3	4	5	6	7	8	9	10
600	51,6	0,09	12,0	34,4	0,06	6,1	25,8	0,04	3,8
700	60,2	0,10	15,6	40,1	0,07	7,9	30,1	0,05	4,9
800	68,8	0,12	19,6	45,9	0,08	9,9	34,4	0,06	6,1
900	77,4	0,13	24,0	51,6	0,09	12,0	38,7	0,07	7,4
1000	86,0	0,15	28,8	57,3	0,10	14,4	43,0	0,07	8,8
1100	94,6	0,16	33,9	63,1	0,11	16,9	47,3	0,08	10,4
1200	103,2	0,18	39,4	68,8	0,12	19,6	51,6	0,09	12,
1300	111,8	0,19	45,3	74,5	0,13	22,5	55,9	0,10	13,8
1400	120,4	0,21	51,4	80,3	0,14	25,6	60,2	0,10	15,6
1600	137,6	0,23	64,9	91,7	0,16	32,2	68,8	0,12	19,6
1800	154,8	0,26	79,6	103,2	0,18	39,4	77,4	0,13	24,0
2000	172,0	0,29	95,7	114,7	0,20	47,3	86,0	0,15	28,8
2200	189,2	0,32	113,0	126,1	0,22	55,8	94,6	0,16	33,9
2400	206,4	0,35	131,7	137,6	0,23	64,9	103,2	0,18	39,4
2600	223,6	0,38	151,6	149,1	0,25	74,5	111,8	0,19	45,3
2800	240,8	0,41	172,7	160,5	0,27	84,8	120,4	0,21	51,4
3000	258,0	0,44	195,0	172,0	0,29	95,7	129,0	0,22	58,0
3200	275,2	0,47	218,6	183,5	0,31	107,1	137,6	0,23	64,9
3400	292,4	0,50	243,3	194,9	0,33	119,1	146,2	0,25	72,1
3600	309,6	0,53	269,2	206,4	0,35	131,7	154,8	0,26	79,6
3800	326,8	0,56	296,3	217,9	0,37	144,8	163,4	0,28	87,5
4000	344,0	0,59	324,6	229,3	0,39	158,5	172,0	0,29	95,7
4200	361,2	0,62	354,0	240,8	0,41	172,7	180,6	0,31	104,2
4400	378,4	0,65	384,6	252,3	0,43	187,4	189,2	0,32	113,0
4600	395,6	0,67	416,4	263,7	0,45	202,7	197,8	0,34	122,2
4800	412,8	0,70	449,2	275,2	0,47	218,6	206,4	0,35	131,7
5000	430,0	0,73	483,2	286,7	0,49	234,9	215,0	0,37	141,5
5200	447,2	0,76	518,3	298,1	0,51	251,8	223,6	0,38	151,6
5400	464,4	0,79	554,6	309,6	0,53	269,2	232,2	0,40	162,0
5600	481,6	0,82	591,9	321,1	0,55	287,2	240,8	0,41	172,7
5800	498,8	0,85	630,4	332,5	0,57	305,6	249,4	0,43	183,7
6000	516,0	0,88	670,0	344,0	0,59	324,6	258,0	0,44	195,0
6200	533,2	0,91	710,6	355,5	0,61	344,1	266,6	0,45	206,6
6400	550,4	0,94	752,4	366,9	0,63	364,1	275,2	0,47	218,6
6600	567,6	0,97	795,3	378,4	0,65	384,6	283,8	0,48	230,8
6800	584,8	1,00	839,2	389,9	0,66	405,6	292,4	0,50	243,3
7000				401,3	0,68	427,2	301,0	0,51	256,1
7200				412,8	0,70	449,2	309,6	0,53	269,2
7400				424,3	0,72	471,8	318,2	0,54	282,6
7600				435,7	0,74	494,8	326,8	0,56	296,3
7800				447,2	0,76	518,3	335,4	0,57	310,3
8000				458,7	0,78	542,4	344,0	0,59	324,6
8200				470,1	0,80	566,9	352,6	0,60	339,2
8400				481,6	0,82	591,9	361,2	0,62	354,0
8600				493,1	0,84	617,5	369,8	0,63	369,2
8800				504,5	0,86	643,5	378,4	0,65	384,6
9000				516,0	0,88	670,0	387,0	0,66	400,3
9200				527,5	0,90	697,0	395,6	0,67	416,4
9600				550,4	0,94	752,4	412,8	0,70	449,2
9800				561,9	0,96	780,9	421,4	0,72	466,1
10000				573,3	0,98	809,8	430,0	0,73	483,2
10500							451,5	0,77	527,3
11000							473,0	0,81	573,1
11500							494,5	0,84	620,7
12000							516,0	0,88	670,0
12500							537,5	0,92	721,0
13000							559,0	0,95	773,7
13500							580,5	0,99	828,1

Dynamic viscosity: 0.000467 kg/(m-s) Density: 983.2 kg/m³

▲ *Table 16: pressure loss table for PEX 20.*

11.11 Pressure loss table for PEX pipe 25 x 3.5 (ΔT 10, 15 and 20K) Water temperature: 60°C

	Difference of 10K			Difference of 15K			Difference of 20K		
Heat input rate	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss
$\dot{Q}$	$\dot{m}$	v	R	$\dot{m}$	v	R	$\dot{m}$	v	R
W	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m
1	2	3	4	5	6	7	8	9	10
1000	86,0	0,09	10,0	57,3	0,06	5,0	43,0	0,05	3,1
1100	94,6	0,10	11,8	63,1	0,07	5,9	47,3	0,05	3,6
1200	103,2	0,11	13,7	68,8	0,08	6,9	51,6	0,06	4,2
1300	111,8	0,12	15,7	74,5	0,08	7,9	55,9	0,06	4,8
1400	120,4	0,13	17,9	80,3	0,09	8,9	60,2	0,07	5,5
1500	129,0	0,14	20,1	86,0	0,09	10,0	64,5	0,07	6,2
1600	137,6	0,15	22,5	91,7	0,10	11,2	68,8	0,08	6,9
1700	146,2	0,16	25,0	97,5	0,11	12,4	73,1	0,08	7,6
1800	154,8	0,17	27,6	103,2	0,11	13,7	77,4	0,08	8,4
1900	163,4	0,18	30,3	108,9	0,12	15,0	81,7	0,09	9,2
2000	172,0	0,19	33,1	114,7	0,13	16,4	86,0	0,09	10,0
2200	189,2	0,21	39,0	126,1	0,14	19,4	94,6	0,10	11,8
2400	206,4	0,23	45,4	137,6	0,15	22,5	103,2	0,11	13,7
2600	223,6	0,24	52,2	149,1	0,16	25,8	111,8	0,12	15,7
2800	240,8	0,26	59,5	160,5	0,18	29,4	120,4	0,13	17,9
3000	258,0	0,28	67,1	172,0	0,19	33,1	129,0	0,14	20,1
3200	275,2	0,30	75,1	183,5	0,20	37,0	137,6	0,15	22,5
3400	292,4	0,32	83,6	194,9	0,21	41,1	146,2	0,16	25,0
3600	309,6	0,34	92,4	206,4	0,23	45,4	154,8	0,17	27,6
3800	326,8	0,36	101,6	217,9	0,24	49,9	163,4	0,18	30,3
4000	344,0	0,38	111,2	229,3	0,25	54,6	172,0	0,19	33,1
4400	378,4	0,41	131,6	252,3	0,28	64,5	189,2	0,21	39,0
4800	412,8	0,45	153,5	275,2	0,30	75,1	206,4	0,23	45,4
5200	447,2	0,49	176,9	298,1	0,33	86,5	223,6	0,24	52,2
5600	481,6	0,53	201,8	321,1	0,35	98,5	240,8	0,26	59,5
6000	516,0	0,56	228,2	344,0	0,38	111,2	258,0	0,28	67,1
6400	550,4	0,60	256,0	366,9	0,40	124,7	275,2	0,30	75,1
6800	584,8	0,64	285,3	389,9	0,43	138,8	292,4	0,32	83,6
7200	619,2	0,68	316,0	412,8	0,45	153,5	309,6	0,34	92,4
7600	653,6	0,71	348,1	435,7	0,48	169,0	326,8	0,36	101,6
8000	688,0	0,75	381,6	458,7	0,50	185,1	344,0	0,38	111,2
8500	731,0	0,80	425,4	487,3	0,53	206,1	365,5	0,40	128,8
9000	774,0	0,84	471,5	516,0	0,56	228,2	387,0	0,42	137,0
9500	817,0	0,89	519,7	544,7	0,59	251,3	408,5	0,45	150,7
10000	860,0	0,94	570,0	573,3	0,63	275,4	430,0	0,47	165,1
10500	903,0	0,99	622,5	602,0	0,66	300,4	451,5	0,49	180,0
11000				630,7	0,69	326,5	473,0	0,52	195,5
11500				659,3	0,72	353,6	494,5	0,54	211,6
12000				688,0	0,75	381,6	516,0	0,56	228,2
12500				716,7	0,78	410,6	537,5	0,59	245,4
13000				745,3	0,81	440,6	559,0	0,61	263,2
13500				774,0	0,84	471,5	580,5	0,63	281,5
14000				802,7	0,88	503,4	602,0	0,66	300,4
14500				831,3	0,91	536,2	623,5	0,68	319,9
15000				860,0	0,94	570,0	645,0	0,70	339,9
15500				888,7	0,97	604,8	666,5	0,73	360,5
16000				917,3	1,00	640,5	688,0	0,75	381,6
16500							709,5	0,77	403,2
17000							731,0	0,80	425,4
17500							752,5	0,82	448,2
18000							774,0	0,84	471,5
18500							795,5	0,87	495,3
19000							817,0	0,89	519,7
19500							838,5	0,92	544,6
20000							860,0	0,94	570,0
20500							881,5	0,96	596,0
21000							903,0	0,99	622,5
21400							920,2	1,00	644,1

Dynamic viscosity: 0.000467 kg/(m-s) Density: 983.2 kg/m³

▲ *Table 17: pressure loss table for PEX 25*

11.12 Pressure loss table for PEX pipe 32 x 4.4 (ΔT 10, 15 and 20K)

Water temperature: 60°C

	Difference of 10K			Difference of 15K			Difference of 20K		
Heat input rate	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss
$\dot{Q}$	$\dot{m}$	v	R	$\dot{m}$	v	R	$\dot{m}$	v	R
W	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m
1	2	3	4	5	6	7	8	9	10
1800	154,8	0,10	8,3	103,2	0,07	4,1	77,4	0,05	2,5
2000	172,0	0,11	9,9	114,7	0,08	5,0	86,0	0,06	3,0
2200	189,2	0,12	11,7	126,1	0,08	5,8	94,6	0,06	3,6
2400	206,4	0,14	13,6	137,6	0,09	6,8	103,2	0,07	4,1
2600	223,6	0,15	15,6	149,1	0,10	7,8	111,8	0,07	4,7
2800	240,8	0,16	17,8	160,5	0,11	8,8	120,4	0,08	5,4
3000	258,0	0,17	20,0	172,0	0,11	9,9	129,0	0,08	6,1
3200	275,2	0,18	22,4	183,5	0,12	11,1	137,6	0,09	6,8
3400	292,4	0,19	24,9	194,9	0,13	12,3	146,2	0,10	7,5
3600	309,6	0,20	27,5	206,4	0,14	13,6	154,8	0,10	8,3
3800	326,8	0,21	30,3	217,9	0,14	14,9	163,4	0,11	9,1
4000	344,0	0,23	33,1	229,3	0,15	16,3	172,0	0,11	9,9
4200	361,2	0,24	36,1	240,8	0,16	17,8	180,6	0,12	10,8
4400	378,4	0,25	39,1	252,3	0,17	19,3	189,2	0,12	11,7
4600	395,6	0,26	42,3	263,7	0,17	20,8	197,8	0,13	12,6
4800	412,8	0,27	45,6	275,2	0,18	22,4	206,4	0,14	13,6
5000	430,0	0,28	49,0	286,7	0,19	24,1	215,0	0,14	14,6
5500	473,0	0,31	57,9	315,3	0,21	28,4	236,5	0,16	17,2
6000	516,0	0,34	67,5	344,0	0,23	33,1	258,0	0,17	20,0
6500	559,0	0,37	77,8	372,7	0,24	38,1	279,5	0,18	23,0
7000	602,0	0,40	88,7	401,3	0,26	43,4	301,0	0,20	26,2
7500	645,0	0,42	100,2	430,0	0,28	49,0	322,5	0,21	29,6
8000	688,0	0,45	112,4	458,7	0,30	54,9	344,0	0,23	33,1
8500	731,0	0,48	125,2	487,3	0,32	61,0	365,5	0,24	36,8
9000	774,0	0,51	138,6	516,0	0,34	67,5	387,0	0,25	40,7
9500	817,0	0,54	152,6	544,7	0,36	74,3	408,5	0,27	44,7
10000	860,0	0,57	167,2	573,3	0,38	81,3	430,0	0,28	49,0
10500	903,0	0,59	182,5	602,0	0,40	88,7	451,5	0,30	53,4
11000	946,0	0,62	198,3	630,7	0,41	96,3	473,0	0,31	57,9
11500	989,0	0,65	214,8	659,3	0,43	104,2	494,5	0,32	62,6
12000	1032,0	0,68	231,8	688,0	0,45	112,4	516,0	0,34	67,5
12500	1075,0	0,71	249,4	716,7	0,47	120,8	537,5	0,35	72,6
13000	1118,0	0,73	267,6	745,3	0,49	129,6	559,0	0,37	77,8
13500	1161,0	0,76	286,4	774,0	0,51	138,6	580,5	0,38	83,1
14000	1204,0	0,79	305,8	802,7	0,53	147,9	602,0	0,40	88,7
14500	1247,0	0,82	325,7	831,3	0,55	157,4	623,5	0,41	94,4
15000	1290,0	0,85	346,3	860,0	0,57	167,2	645,0	0,42	100,2
16000	1376,0	0,90	389,0	917,3	0,60	187,7	688,0	0,45	112,4
17000	1462,0	0,96	434,1	974,7	0,64	209,2	731,0	0,48	125,2
18000				1032,0	0,68	231,8	774,0	0,51	138,6
19000				1089,3	0,72	255,4	817,0	0,54	152,6
20000				1146,7	0,75	280,1	860,0	0,57	167,2
21000				1204,0	0,79	305,8	903,0	0,59	182,5
22000				1261,3	0,83	332,5	946,0	0,62	198,3
23000				1318,7	0,87	360,3	989,0	0,65	214,8
24000				1376,0	0,90	389,0	1032,0	0,68	231,8
25000				1433,3	0,94	418,8	1075,0	0,71	249,4
26000				1490,7	0,98	449,6	1118,0	0,73	267,6
27000							1161,0	0,76	286,4
28000							1204,0	0,79	305,8
29000							1247,0	0,82	325,7
30000							1290,0	0,85	346,3
31000							1333,0	0,88	367,4
32000							1376,0	0,90	389,0
33000							1419,0	0,93	411,3
34000							1462,0	0,96	434,1
35000							1505,0	0,99	457,5
35500							1526,5	1,00	469,4

Dynamic viscosity: 0.000467 kg/(m-s) Density: 983.2 kg/m³

▲ *Table 18: pressure loss table for PEX 32.*

11.13 Pressure loss table for PEX pipe 40 x 5.5 (ΔT 10, 15 and 20K) Water temperature: 60°C

	Difference of 10K			Difference of 15K			Difference of 20K		
Heat input rate	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss
$\dot{Q}$	$\dot{m}$	v	R	$\dot{m}$	v	R	$\dot{m}$	v	R
W	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m
1	2	3	4	5	6	7	8	9	10
2800	240,8	0,10	6,2	160,5	0,07	3,1	120,4	0,05	1,9
3000	258,0	0,11	7,0	172,0	0,07	3,5	129,0	0,05	2,1
3200	275,2	0,12	7,8	183,5	0,08	3,9	137,6	0,06	2,4
3400	292,4	0,12	8,6	194,9	0,08	4,3	146,2	0,06	2,6
3600	309,6	0,13	9,5	206,4	0,09	4,7	154,8	0,07	2,9
3800	326,8	0,14	10,5	217,9	0,09	5,2	163,4	0,07	3,2
4000	344,0	0,14	11,5	229,3	0,10	5,7	172,0	0,07	3,5
4500	387,0	0,16	14,1	258,0	0,11	7,0	193,5	0,08	4,2
5000	430,0	0,18	16,9	286,7	0,12	8,3	215,0	0,09	5,1
5500	473,0	0,20	20,0	315,3	0,13	9,8	236,5	0,10	6,0
6000	516,0	0,22	23,3	344,0	0,14	11,5	258,0	0,11	7,0
6500	559,0	0,24	26,8	372,7	0,16	13,2	279,5	0,12	8,0
7000	602,0	0,25	30,5	401,3	0,17	15,0	301,0	0,13	9,1
7500	645,0	0,27	34,4	430,0	0,18	16,9	322,5	0,14	10,2
8000	688,0	0,29	38,6	458,7	0,19	18,9	344,0	0,14	11,5
8500	731,0	0,31	42,9	487,3	0,20	21,0	365,5	0,15	12,7
9000	774,0	0,33	47,5	516,0	0,22	23,3	387,0	0,16	14,1
9500	817,0	0,34	52,3	544,7	0,23	25,6	408,5	0,17	15,4
10000	860,0	0,36	57,2	573,3	0,24	28,0	430,0	0,18	16,9
10500	903,0	0,38	62,4	602,0	0,25	30,5	451,5	0,19	18,4
11000	946,0	0,40	67,8	630,7	0,27	33,1	473,0	0,20	20,0
11500	989,0	0,42	73,4	659,3	0,28	35,8	494,5	0,21	21,6
12000	1032,0	0,43	79,1	688,0	0,29	38,6	516,0	0,22	23,3
13000	1118,0	0,47	91,3	745,3	0,31	44,4	559,0	0,24	26,8
14000	1204,0	0,51	104,2	802,7	0,34	50,7	602,0	0,25	30,5
15000	1290,0	0,54	117,9	860,0	0,36	57,2	645,0	0,27	34,4
16000	1376,0	0,58	132,3	917,3	0,39	64,2	688,0	0,29	38,6
17000	1462,0	0,61	147,5	974,7	0,41	71,5	731,0	0,31	42,9
18000	1548,0	0,65	163,4	1032,0	0,43	79,1	774,0	0,33	47,5
19000	1634,0	0,69	180,1	1089,3	0,46	87,1	817,0	0,34	52,3
20000	1720,0	0,72	197,5	1146,7	0,48	95,5	860,0	0,36	57,2
21000	1806,0	0,76	215,7	1204,0	0,51	104,2	903,0	0,38	62,4
22000	1892,0	0,80	234,5	1261,3	0,53	113,2	946,0	0,40	67,8
23000	1978,0	0,83	254,1	1318,7	0,55	122,6	989,0	0,42	73,4
24000	2064,0	0,87	274,5	1376,0	0,58	132,3	1032,0	0,43	79,1
25000	2150,0	0,90	295,5	1433,3	0,60	142,3	1075,0	0,45	85,1
26000	2236,0	0,94	317,3	1490,7	0,63	152,7	1118,0	0,47	91,3
27000	2322,0	0,98	339,7	1548,0	0,65	163,4	1161,0	0,49	97,6
28000				1605,3	0,68	174,5	1204,0	0,51	104,2
29000				1662,7	0,70	185,8	1247,0	0,52	110,9
30000				1720,0	0,72	197,5	1290,0	0,54	117,9
31000				1777,3	0,75	209,5	1333,0	0,56	125,0
32000				1834,7	0,77	221,9	1376,0	0,58	132,3
33000				1892,0	0,80	234,5	1419,0	0,60	139,8
34000				1949,3	0,82	247,5	1462,0	0,61	147,5
35000				2006,7	0,84	260,8	1505,0	0,63	155,4
36000				2064,0	0,87	274,5	1548,0	0,65	163,4
37000				2121,3	0,89	288,4	1591,0	0,67	171,7
38000				2178,7	0,92	302,7	1634,0	0,69	180,1
39000				2236,0	0,94	317,3	1677,0	0,71	188,7
40000				2293,3	0,96	332,2	1720,0	0,72	197,5
42000							1806,0	0,76	215,7
44000							1892,0	0,80	234,5
46000							1978,0	0,893	254,1
48000							2064,0	0,87	274,5
50000							2150,0	0,90	295,5
52000							2236,0	0,94	317,3
55000							2365,0	0,99	351,2

Dynamic viscosity: 0.000467 kg/(m-s) Density: 983.2 kg/m³

▲ *Table 19: pressure loss table for PEX 40*

11.14 Pressure loss table for PEX pipe 50 x 6.9 (ΔT 10, 15 and 20K) Water temperature: 60°C

	Difference of 10K			Difference of 15K			Difference of 20K		
Heat input rate	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss
$\dot{Q}$	$\dot{m}$	v	R	$\dot{m}$	v	R	$\dot{m}$	v	R
W	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m
1	2	3	4	5	6	7	8	9	10
4500	387,0	0,10	4,9	258,0	0,07	2,4	193,5	0,05	1,5
5000	430,0	0,12	5,9	286,7	0,08	2,9	215,0	0,06	1,8
5500	473,0	0,13	7,0	315,3	0,09	3,4	236,5	0,06	2,1
6000	516,0	0,14	8,1	344,0	0,09	4,0	258,0	0,07	2,4
6500	559,0	0,15	9,3	372,7	0,10	4,6	279,5	0,08	2,8
7000	602,0	0,16	10,6	401,3	0,11	5,2	301,0	0,08	3,2
7500	645,0	0,17	11,9	430,0	0,12	5,9	322,5	0,09	3,6
8000	688,0	0,19	13,4	458,7	0,12	6,6	344,0	0,09	4,0
8500	731,0	0,20	14,9	487,3	0,13	7,3	365,5	0,10	4,4
9000	774,0	0,21	16,5	516,0	0,14	8,1	387,0	0,10	4,9
9500	817,0	0,22	18,1	544,7	0,15	8,9	408,5	0,11	5,4
10000	860,0	0,23	19,8	573,3	0,15	9,7	430,0	0,12	5,9
11000	946,0	0,26	23,4	630,7	0,17	11,5	473,0	0,13	7,0
12000	1032,0	0,28	27,3	688,0	0,19	13,4	516,0	0,14	8,1
13000	1118,0	0,30	31,5	745,3	0,20	15,4	559,0	0,15	9,3
14000	1204,0	0,32	35,9	802,7	0,22	17,5	602,0	0,16	10,6
15000	1290,0	0,35	40,6	860,0	0,23	19,8	645,0	0,17	11,9
16000	1376,0	0,37	45,5	917,3	0,25	22,2	688,0	0,19	13,4
17000	1462,0	0,39	50,7	974,7	0,26	24,7	731,0	0,20	14,9
18000	1548,0	0,42	56,2	1032,0	0,28	27,3	774,0	0,21	16,5
19000	1634,0	0,44	61,9	1089,3	0,29	30,1	817,0	0,22	18,1
20000	1720,0	0,46	67,8	1146,7	0,31	32,9	860,0	0,23	19,8
21000	1806,0	0,49	74,0	1204,0	0,32	35,9	903,0	0,24	21,6
22000	1892,0	0,51	80,4	1261,3	0,34	39,0	946,0	0,26	23,4
23000	1978,0	0,53	87,1	1318,7	0,36	42,2	989,0	0,27	25,4
24000	2064,0	0,56	94,0	1376,0	0,37	45,5	1032,0	0,28	27,3
25000	2150,0	0,58	101,1	1433,3	0,39	49,0	1075,0	0,29	29,4
26000	2236,0	0,60	108,5	1490,7	0,40	52,5	1118,0	0,30	31,5
27000	2322,0	0,63	116,1	1548,0	0,42	56,2	1161,0	0,31	33,7
28000	2408,0	0,65	124,0	1605,3	0,43	59,9	1204,0	0,32	35,9
29000	2494,0	0,67	132,0	1662,7	0,45	63,8	1247,0	0,34	38,2
30000	2580,0	0,70	140,4	1720,0	0,46	67,8	1290,0	0,35	40,6
32000	2752,0	0,74	157,7	1834,7	0,50	76,1	1376,0	0,37	45,5
34000	2924,0	0,79	176,0	1949,3	0,53	84,8	1462,0	0,39	50,7
36000	3096,0	0,84	195,1	2064,0	0,56	94,0	1548,0	0,42	56,2
38000	3268,0	0,88	215,2	2178,7	0,59	103,5	1634,0	0,44	61,9
40000	3440,0	0,93	236,2	2293,3	0,62	113,5	1720,0	0,46	67,8
42000	3612,0	0,97	258,1	2408,0	0,65	124,0	1806,0	0,49	74,0
44000				2522,7	0,68	134,8	1892,0	0,51	80,4
46000				2637,3	0,71	146,0	1978,0	0,53	87,1
48000				2752,0	0,74	157,7	2064,0	0,56	94,0
50000				2866,7	0,77	169,8	2150,0	0,58	101,1
52000				2981,3	0,80	182,2	2236,0	0,60	108,5
54000				3096,0	0,84	195,1	2322,0	0,63	116,1
56000				3210,7	0,87	208,4	2408,0	0,65	124,0
58000				3325,3	0,90	222,1	2494,0	0,67	132,0
60000				3440,3	0,93	236,2	2580,0	0,70	140,4
62000				3554,7	0,96	250,7	2666,0	0,72	148,9
64000				3669,3	0,99	265,5	2752,0	0,74	157,7
66000				561,9	0,96	780,9	2838,0	0,77	166,7
68000				573,3	0,98	809,8	2924,0	0,79	176,0
70000							3010,0	0,81	185,4
73000							3139,0	0,85	200,1
75000							3225,0	0,87	210,1
77000							3311,0	0,89	220,4
80000							3440,0	0,93	236,2
83000							3569,0	0,96	252,5
86000							3698,0	1,00	269,3

Dynamic viscosity: 0.000467 kg/(m-s) Density: 983.2 kg/m³

▲ *Table 20: pressure loss table for PEX 50*

11.15 Pressure loss table for PEX pipe 63 x 8.6 (ΔT 10, 15 and 20K) Water temperature: 60°C

	Difference of 10K			Difference of 15K			Difference of 20K		
Heat input rate	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss	Mass flow	Velocity	Pressure loss
$\dot{Q}$	$\dot{m}$	v	R	$\dot{m}$	v	R	$\dot{m}$	v	R
W	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m	kg/h	m/s	Pa/m
1	2	3	4	5	6	7	8	9	10
7000	602,0	0,10	3,5	401,3	0,07	1,7	301,0	0,05	1,1
8000	688,0	0,12	4,5	458,7	0,08	2,2	344,0	0,06	1,3
9000	774,0	0,13	5,5	516,0	0,09	2,7	387,0	0,07	1,6
10000	860,0	0,15	6,6	573,3	0,10	3,2	430,0	0,07	2,0
11000	946,0	0,16	7,8	630,7	0,11	3,8	473,0	0,08	2,3
12000	1032,0	0,18	9,1	688,0	0,12	4,5	516,0	0,09	2,7
13000	1118,0	0,19	10,4	745,3	0,13	5,1	559,0	0,10	3,1
14000	1204,0	0,20	11,9	802,7	0,14	5,8	602,0	0,10	3,5
15000	1290,0	0,22	13,4	860,0	0,15	6,6	645,0	0,11	4,0
16000	1376,0	0,23	15,1	917,3	0,16	7,4	688,0	0,12	4,5
18000	1548,0	0,26	18,6	1032,0	0,18	9,1	774,0	0,13	5,5
20000	1720,0	0,29	22,4	1146,7	0,20	10,9	860,0	0,15	6,6
22000	1892,0	0,32	26,5	1261,3	0,21	12,9	946,0	0,16	7,8
24000	2064,0	0,35	31,0	1376,0	0,23	15,1	1032,0	0,18	9,1
26000	2236,0	0,38	35,7	1490,7	0,25	17,4	1118,0	0,19	10,4
28000	2408,0	0,41	40,8	1605,3	0,27	19,8	1204,0	0,20	11,9
30000	2580,0	0,44	46,1	1720,0	0,29	22,4	1290,0	0,22	13,4
32000	2752,0	0,47	51,8	1834,7	0,31	25,1	1376,0	0,23	15,1
34000	2924,0	0,50	57,7	1949,3	0,33	28,0	1462,0	0,25	16,8
36000	3096,0	0,53	63,9	2064,0	0,35	31,0	1548,0	0,26	18,6
38000	3268,0	0,56	70,5	2178,7	0,37	34,1	1634,0	0,28	20,4
40000	3440,0	0,59	77,3	2293,3	0,39	37,4	1720,0	0,29	22,4
42000	3612,0	0,61	84,4	2408,0	0,41	40,8	1806,0	0,31	24,4
44000	3784,0	0,64	91,8	2522,7	0,43	44,3	1892,0	0,32	26,5
46000	3956,0	0,67	99,4	2637,3	0,45	48,0	1978,0	0,34	28,7
48000	4128,0	0,70	107,4	2752,0	0,47	51,8	2064,0	0,35	31,0
50000	4300,0	0,73	115,6	2866,7	0,49	55,7	2150,0	0,37	33,3
52000	4472,0	0,76	124,1	2981,3	0,51	59,7	2236,0	0,38	35,7
54000	4644,0	0,79	132,9	3096,0	0,53	63,9	2322,0	0,39	38,2
56000	4816,0	0,82	141,9	3210,7	0,55	68,3	2408,0	0,41	40,8
58000	4988,0	0,85	151,3	3325,3	0,57	72,7	2494,0	0,42	43,4
60000	5160,0	0,88	160,9	3444,0	0,59	77,3	2580,0	0,44	46,1
62000	5332,0	0,91	170,7	3554,7	0,60	82,0	2666,0	0,45	48,9
64000	5504,0	0,94	180,9	3669,3	0,62	86,8	2752,0	0,47	51,8
66000	5676,0	0,97	191,3	3784,0	0,64	91,8	2838,0	0,48	54,7
68000	5848,0	0,99	202,0	3898,7	0,66	96,8	2924,0	0,50	57,7
70000				4013,3	0,68	102,0	3010,0	0,51	60,8
72000				4128,0	0,70	107,4	3096,0	0,53	63,9
74000				4242,7	0,72	112,8	3182,0	0,54	67,2
76000				4357,3	0,74	118,4	3268,0	0,56	70,5
78000				4472,0	0,76	124,1	3354,0	0,57	73,8
80000				4586,7	0,78	129,9	3440,0	0,59	77,3
82000				4701,3	0,80	135,9	3526,0	0,60	80,8
84000				4816,0	0,82	141,9	3612,0	0,61	84,4
86000				4930,7	0,84	148,1	3698,0	0,63	88,0
80000				5045,3	0,86	154,4	3784,0	0,64	91,8
90000				5160,0	0,88	160,9	3870,0	0,66	95,6
94000				5389,3	0,92	174,1	4042,0	0,69	103,4
98000				5618,7	0,96	187,8	4214,0	0,72	111,4
102000				5848,0	0,99	202,0	4386,0	0,75	119,8
106000							4558,0	0,78	128,5
110000							4730,0	0,80	137,4
114000							4902,0	0,83	146,6
118000							5074,0	0,86	156,0
122000							5246,0	0,89	165,8
127000							5461,0	0,93	178,3
132000							5676,0	0,97	191,3
137000							5891,0	1,00	204,7

Dynamic viscosity: 0.000467 kg/(m-s) Density: 983.2 kg/m³

▲ *Table 21: pressure loss table for PEX 63*

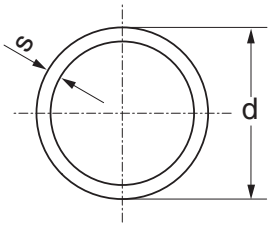
12.1 Field of application

Jentro has a separate fitting programme for district heating and this both in brass as well as weld version from 25 mm to 160 mm for pipe dimensions according to the SDR 11 - ISO Series: 5. *(see table no. 22)*

DVGW CERT CEN EN ISO 15875-3 CEN EN ISO 15875-5

QB QUALITÉ POUR LE BÂTIMENT

Outer diameter d	Wall s	Volume l/m	Weightt Kg/m
* 25	2,3	0,327	0,180
* 32	2,9	0,539	0,285
* 40	3,7	0,835	0,450
* 50	4,6	1,307	0,680
* 63	5,7	2,090	1,040
* 75	6,8	2,961	1,485
* 90	8,2	4,250	2,138
* 110	10	6,362	3,175
125	11,4	8,183	4,127
140	12,7	10,31	5,02
160	14,6	13,43	6,60



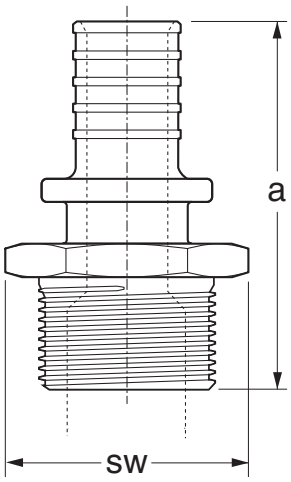
* Approval EN-ISO 15875-3 and CSTB

▲ *Table 22*

12.2 Brass accessories

Line N°	Art. Nr.			a	sw	kg		
1	20109	25/2,3 x 3/4"	B	63,5	32	0,120	50	10
2	20110	25/2,3 x 4/4"	B	68	42	0,185	50	10
3	20111	32/2,9 x 3/4"	B	68,5	32	0,155	30	3
4	20112	32/2,9 x 4/4"	B	73	42	0,232	30	3
5	20113	40/3,7 x 5/4"	B	83	36	0,360	10	1
6	20114	50/4,6 x 5/4"	B	90	43	0,480	10	1
7	20115	50/4,6 x 6/4"	B	90	51	0,544	10	1
8	20116	63/5,8 x 2"	B	106	74	0,818	10	1
9	20117	75/6,9 x 21/2"	B	110	74	1,200	10	1
10	20118	90/8,2 x 3"	B	108	95	1,433	10	1
11	20119	110/10 x 4"	B	118	122	2,345	10	1
12	20120	125/11,4 x 5"	B	120	120	6,064	1	1

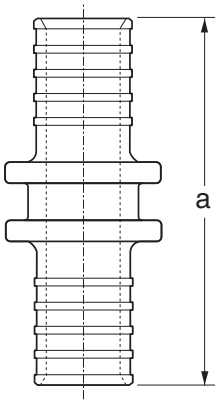
B = Brass



12.2.2 Coupling

Line N°	Art. Nr.			a	kg		
1	20304	25 - 25/2,3	B	74,5	0,096	50	10
2	20305	32 - 32/2,9	B	85	0,194	30	3
3	20306	40 - 40/3,7	B	94	0,430	60	1
4	20307	50 - 50/4,6	B	106	0,608	42	1
5	20308	63 - 63/5,8	B	126	0,998	26	1
6	20309	75 - 75/6,9	B	129	1,356	17	1
7	20310	90 - 90/8,2	B	128	1,665	12	1
8	20311	110 - 110/10	B	130	2,733	9	1
9	20312	125 - 125/11,4	S	133	3,576	1	1
10	20314	140 - 140/12,7	S	139	5,85	1	1
11	20316	160 - 160/11,4	S	140	7,78	1	1

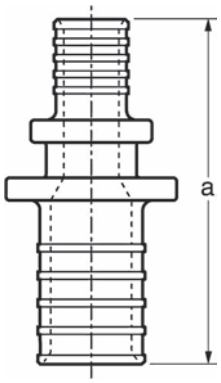
B = Brass
S = Steel 37



12.2.3 Reducer

Line N°	Art. Nr.			a	kg		
1	20405	32 - 25	B	73	0,128	30	3
2	20408	40 - 32	B	88	0,286	20	1
3	20410	50 - 40	B	101	0,538	42	1
4	20411	63 - 50	B	117	0,795	30	1
5	20412	75 - 63	B	128	1,191	20	1
6	20413	90 - 75	B	129	1,632	13	1
7	20414	110 - 90	B	130	2,375	9	1

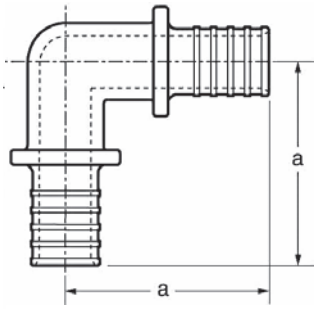
B = brass



12.2.4 Elbow 90°

Line N°	Art. Nr.			a	kg		
1	20604	25 - 25	B	52	0,145	50	10
2	20605	32 - 32	B	64	0,253	30	3
3	20606	40 - 40	B	76	0,648	40	1
4	20607	50 - 50	B	89	0,881	28	1
5	20608	63 - 63	B	105	1,610	14	1
6	20609	75 - 75	B	115	2,023	8	1
7	20610	90 - 90	B	124	3,096	5	1
8	20611	110 - 110	B	137	5,043	4	1

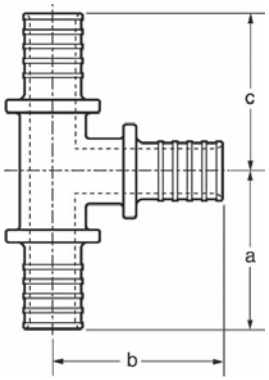
B = brass



12.2.5 Tee equal

Line N°	Art. Nr.			a	b	c	kg		
1	21004	25 - 25 - 25	B	48,4	52	48,4	0,164	50	10
2	21005	32 - 32 - 32	B	60,3	64	60,3	0,346	30	3
3	21006	40 - 40 - 40	B	71,5	76	71,5	0,822	24	1
4	21007	50 - 50 - 50	B	84,5	89	84,5	1,160	16	1
5	21008	63 - 63 - 60	B	100	105	100	2,002	9	1
6	21009	75 - 75 - 75	B	115	115	115	2,950	5	1
7	21010	90 - 90 - 90	B	124	124	124	4,000	4	1
8	21011	110 - 110 - 110	B	135	120	135	6,750	3	1

B = brass

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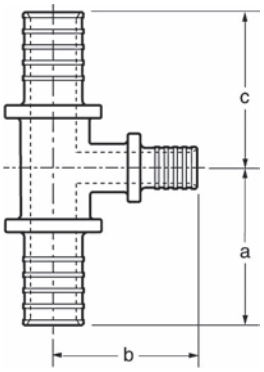
12.2.6 Tee, outlet with reduction

Line N°	Art. Nr.			a	b	c	kg		
1	21102	32 - 25 - 32	B	56	58	56	0,335	30	3
2	21104	40 - 25 - 40	B	63	64	63	0,610	40	1
3	21106	40 - 32 - 40	B	65	71	65	0,690	30	1
4	21108	50 - 25 - 50	B	70	70	70	0,865	28	1
5	21110	50 - 32 - 50	B	72	77	72	0,891	24	1
6	21112	50 - 40 - 50	B	76	82	76	1,021	20	1
7	21114	63 - 25 - 63	B	79	77	79	1,308	20	1
8	21116	63 - 32 - 63	B	81	83	81	1,396	18	1
9	21118	63 - 40 - 63	B	85	89	85	1,535	16	1
10	21120	63 - 50 - 63	B	89	96	89	1,657	12	1
11	21122	75 - 25 - 75	B	81	86	81	1,731	10	1
12	21124	75 - 32 - 75	B	83	92	83	1,832	12	1
13	21126	75 - 40 - 75	B	87	98	87	1,970	10	1
14	21128	75 - 50 - 75	B	91	105	91	2,114	10	1
15	21130	75 - 63 - 75	B	97	114	97	2,438	9	1
16	21132	90 - 32 - 90	B	83	102	83	2,316	8	1
17	21134	90 - 40 - 90	B	87	108	87	2,474	6	1
18	21136	90 - 63 - 90	B	97	124	97	3,988	5	1
19	21138	110 - 32 - 110	B	85	116	85	3,660	5	1
20	21140	110 - 50 - 110	B	93	128	93	4,128	5	1
21	21142	110 - 63 - 110	B	99	137	99	4,575	4	1

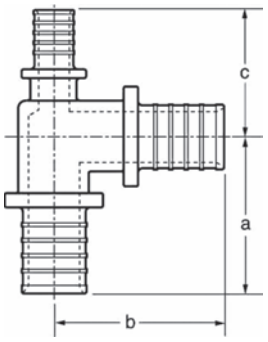
B = brass



12.2.7 Tee, side outlet with reduction

Line N°	Art. Nr.			a	b	c	kg			
1	21206	32 - 32 - 25	B	58	64	52	0,361	30	3	
2	**21207**	**40 - 32 - 25**	**B**	**72**	**77**	**60**	**0,69,8**	**10**	**1**	*NEW
3	**21208**	**40 - 40 - 32**	**B**	**72**	**77**	**66**	**0,737**	**10**	**1**	*NEW
4	21306	32 - 25 - 25	B	56	58	50	0,288	30	3	
5	**30004**	**40 - 25 - 25**	**B**	**64**	**65**	**58,5**	**0,480**	**15**	**1**	*NEW
6	**30006**	**40 - 32 - 25**	**B**	**67**	**71**	**55**	**0,535**	**15**	**1**	*NEW
7	21307	40 - 32 - 32	B	65	71	60	0,576	44	1	
8	30010	50 - 40 - 40	B	79	82	72	0,967	10	1	
9	21308	63 - 40 - 40	B	88	89	72	1,289	18	1	
10	21309	63 - 50 - 50	B	90	96	81	1,469	16	1	
11	21310	75 - 63 - 63	B	97	114	96	2,276	10	1	

B = brass

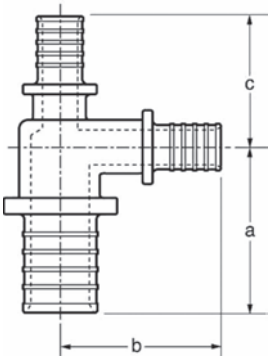


*** Compact version**
can be used for DUO 75 mm insulated PEX pipes

12.2.8 Tee, outlet+side outlet with reduction

Line N°	Art. Nr.			a	b	c	kg		
1	30005	40 - 25 - 32	B	64	65	58	0,497	15	1
2	21407	50 - 25 - 40	B	71	70	64	0,723	36	1
3	21408	50 - 32 - 40	B	73	77	66	0,793	30	1
4	30020	63 - 25 - 50	B	81	77	72	1,114	9	1
5	21409	63 - 32 - 50	B	82	83	73	1,140	15	1
6	21410	63 - 40 - 50	B	86	89	77	1,365	15	1
7	21411	75 - 32 - 63	B	84	92	83	1,611	12	1
8	21412	75 - 50 - 63	B	91	105	90	1,974	10	1

B = Brass

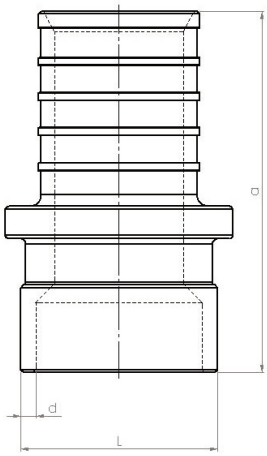


12.3 Joint fittings

12.3.1 Adapter with welding end

Line N°	N° Art			a	L	d	kg		
1	15109	25 x 3,5 SDR 7,4	S	54	26,9	2,3	0,085	50	10
2	15111	32 x 4,4 SDR 7,4	S	62	33,7	2,6	0,141	50	10
3	15113	40 x 5,5 SDR 7,4	S	70	42,4	2,6	0,300	10	1
4	16109	25 x 2,3 SDR 11	S	54	26,9	2,3	0,077	50	10
5	16111	32 x 2,9 SDR 11	S	62	33,7	2,6	0,140	30	3
6	16113	40 x 3,7 SDR 11	S	70	42,4	2,6	0,311	10	1
7	16115	50 x 4,6 SDR 11	S	85	48,3	2,6	0,393	10	1
8	16116	63 x 5,7 SDR 11	S	85	60,3	2,9	0,575	10	1
9	16117	75 x 6,8 SDR 11	S	94	76,1	2,9	0,830	1	1
10	16118	90 x 8,2 SDR 11	S	93	88,9	3,2	1,077	1	1
11	16119	110 x 10 SDR 11	S	88	114,3	3,6	1,634	1	1
12	16120	125 x 11,4 SDR	S	108	139,7	3,6	2,480	1	1
13	16121	140 x 12,7 SDR	S	112,5	132,5	3,6	4,116	1	1
14	16122	160 x 14,6 SDR	S	112,5	168,3	4,0	5,010	1	1

S = Steel 37



12.4 Ball valve

Line N°	Art. Nr.	∅	kg		
1	21525	25 x 25	0,462	1	1
2	21532	32 x 32	0,736	1	1

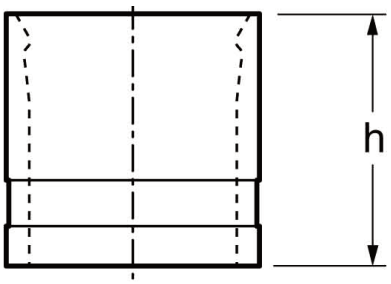
12.5 Ball valve with male thread

Line N°	Art. Nr.	∅	kg		
1	21526	4/4M - 25	0,456	1	1
2	21533	4/4M - 32	0,620	1	1

12.6 Brass sleeves for SDR11 PEX tubes

Materiaal: MS 58

Line N°	Art. Nr.	∅	h	kg	
1	20004	25 x 2,3	29	0,042	100
2	20005	32 x 2,9	34	0,096	100
3	20006	40 x 3,7	37	0,134	50
4	20007	50 x 4,6	44	0,258	25
5	20008	63 x 5,8	53	0,405	25
6	20009	75 x 6,8	53	0,664	10
7	20010	90 x 8,2	53	0,854	1
8	20011	110 x 10	53	1,110	1
9	20012	125 x 11,4	53	1,528	1
10	20014	140 x 12,7	53	1,870	1
11	20016	160 x 14,6	53	2,319	1



CAUTION!

Always protect the brass fittings with anti-corrosion tape, so that no contact occurs with mortar, cement, plaster, adhesives, aggressive media or other materials that cause corrosion!
Joint fittings must be treated with anti-corrosion paint after welding. Then protect with anti-corrosion tape.

13 COMBI Fittings for SDR 7.4 PEX pipes

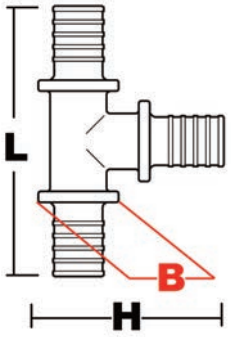
13.1 Field of application

Outside the normal extensive standard programme of fittings, Jentro manufactures all possible combinations that are not available as standard from sizes 25 x 125 mm.

These both in T-pieces, coupling elements, elbows, all possible reducers and combinations with female thread.

The pieces are normally available for transport within 24 hours following order.

A selection from the programma can be found below.



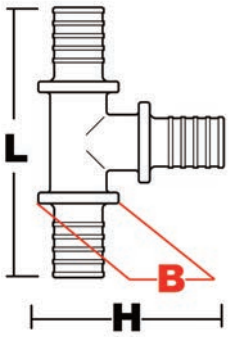
13.1.1 COMBI-T with reduced branching

Line N°	Art. Nr.	1	2	3	L	B	H	kg			
1	T322532	32	25	32	212,2	81	139,2	2,53			Standard art. 21102
2	T402540	40	25	40	239	81	139,2	2,95			Standard art. 21104
3	T403240	40	32	40	239	81	142,6	3,07			Standard art. 21106
4	T502550	50	25	50	243	81	139,2	3,25			Standard art. 21108
5	T503250	50	32	50	243	81	142,6	3,36			Standard art. 21110
6	T504050	50	40	50	243	81	156	3,58			Standard art. 21112
7	T632563	63	25	63	251	81	139,2	3,92			Standard art. 21114
8	T633263	63	32	63	251	81	142,6	4,04			Standard art. 21116
9	T634063	63	40	63	251	81	156	4,25			Standard art. 21118
10	T635063	63	50	63	251	81	158	4,4			Standard art. 21120
11	T752575	75	25	75	251	89,5	139,2	4,86			Standard art. 21122
12	T753275	75	32	75	251	89,5	142,6	4,98			Standard art. 21124
13	T754075	75	40	75	251	89,5	156	5,19			Standard art. 21126
14	T755075	75	50	75	251	89,5	158	5,34			Standard art. 21128
15	T756375	75	63	75	251	89,5	162	5,68			Standard art. 21130
16	T902590	90	25	90	255	131	185,7	7,43	1	3	
17	T903290	90	32	90	255	131	189,1	7,54			Standard art. 21132
18	T904090	90	40	90	255	131	202,5	7,76			Standard art. 21134
19	T905090	90	50	90	255	131	204,5	7,9	1	3	
20	T906390	90	63	90	255	131	208,5	8,24			Standard art. 21136
21	T907590	90	75	90	255	131	208,5	8,71	1	3	*NEW
22	T11025110	110	25	110	259	131	185,7	8,94	1	3	
23	T11032110	110	32	110	259	131	189,1	9,05			Standard art. 21138
24	T11040110	110	40	110	259	131	202,5	9,27	1	3	
25	T11050110	110	50	110	259	131	204,5	9,41			Standard art. 21140
26	T11063110	110	63	110	259	131	208,5	9,75			Standard art. 21142
27	T11075110	110	75	110	259	131	208,5	10,22	1	3	*NEW
28	T11090110	110	90	110	305	131	210,5	12,24	1	3	
29	T12525125	125	25	125	265	145	185,7	11,08	1	3	
30	T12532125	125	32	125	265	145	189,1	11,2	1	3	
31	T12540125	125	40	125	265	145	202,5	11,41	1	3	
32	T12550125	125	50	125	265	145	204,5	11,56	1	3	
33	T12563125	125	63	125	265	145	208,5	11,89	1	3	
34	T12575125	125	75	125	265	145	208,5	12,36	1	3	*NEW
35	T12590125	125	90	125	311	145	210,5	14,39	1	3	
36	T125110125	125	110	125	311	145	212,5	15,14	1	3	

*** Compact version**
can be used for DUO 75 mm insulated PEX pipes

13.1.2 COMBI-T with reduced flow

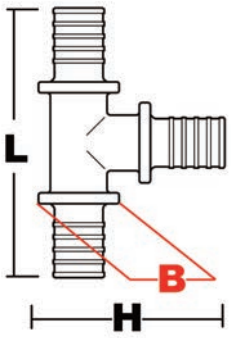
Line N°	Art. Nr.	1	2	3	L	B	H	kg			
1	T323225	32	32	25	208,8	81	142,6	2,53			Standard art. 21206
2	T404025	40	40	25	222,2	81	156	2,95			Standard art. 21207
3	T404032	40	40	32	225,6	81	156	3,07			Standard art. 21208
4	T505025	50	50	25	224,2	81	158	3,25	1	3	
5	T505032	50	50	32	227,6	81	158	3,36	1	3	
6	T505040	50	50	40	241	81	158	3,58	1	3	
7	T636325	63	63	25	228,2	81	162	3,92	1	3	
8	T636332	63	63	32	231,6	81	162	4,04	1	3	
9	T636340	63	63	40	245	81	162	4,25	1	3	
10	T636350	63	63	50	247	81	162	4,4	1	3	
11	**T757525**	**75**	**75**	**25**	**228,2**	**89,5**	**162**	**4,86**	**1**	**3**	*NEW
12	**T757532**	**75**	**75**	**32**	**231,6**	**89,5**	**162**	**4,98**	**1**	**3**	*NEW
13	**T757540**	**75**	**75**	**40**	**245**	**89,5**	**162**	**5,19**	**1**	**3**	*NEW
14	**T757550**	**75**	**75**	**50**	**247**	**89,5**	**162**	**5,34**	**1**	**3**	*NEW
15	**T757563**	**75**	**75**	**63**	**251**	**89,5**	**162**	**5,68**	**1**	**3**	*NEW
16	T909025	90	90	25	288,7	131	210,5	9,11	1	3	
17	T909032	90	90	32	292,1	131	210,5	9,23	1	3	
18	T909040	90	90	40	305,5	131	210,5	9,44	1	3	
19	T909050	90	90	50	307,5	131	210,5	9,59	1	3	
20	T909063	90	90	63	311,5	131	210,5	9,92	1	3	
21	T909075	90	90	75	311,5	131	210,5	10,39	1	3	
22	T11011025	110	110	25	290,7	131	212,5	10,62	1	3	
23	T11011032	110	110	32	294,1	131	212,5	10,74	1	3	
24	T11011040	110	110	40	307,5	131	212,5	10,95	1	3	
25	T11011050	110	110	50	309,5	131	212,5	11,1	1	3	
26	T11011063	110	110	63	313,5	131	212,5	11,43	1	3	
27	T11011075	110	110	75	313,5	131	212,5	11,9	1	3	
28	T11011090	110	110	90	303	131	212,5	12,24	1	3	
29	T12512525	125	125	25	293,7	145	215,5	12,76	1	3	
30	T12512532	125	125	32	297,1	145	215,5	12,88	1	3	
31	T12512540	125	125	40	310,5	145	215,5	13,09	1	3	
32	T12512550	125	125	50	312,5	145	215,5	13,24	1	3	
33	T12512563	125	125	63	316,5	145	215,5	13,58	1	3	
34	T12512575	125	125	75	316,5	145	215,5	14,05	1	3	
35	T12512590	125	125	90	306	145	215,5	14,39	1	3	
36	T125125110	125	125	110	308	145	215,5	15,14	1	3	



*** Compact version**
can be used for DUO 75 mm insulated PEX pipes

13.1.3 COMBI-T with EQUALLY reduced branching and flow

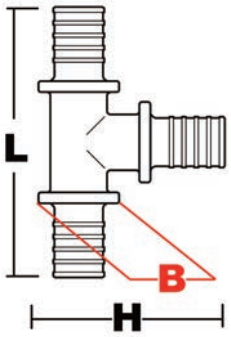
Line N°	Art. Nr.	1	2	3	L	B	H	kg			
1	T322525	32	25	25	208,8	81	139,2	2,41			Standard art. 21306
2	T402525	40	25	25	222,2	81	139,2	2,63			Standard art. 30004
3	T403232	40	32	32	225,6	81	142,6	2,86			Standard art. 21307
4	T502525	50	25	25	224,2	81	139,2	2,77	1	3	
5	T503232	50	32	32	227,6	81	142,6	3	1	3	
6	T504040	50	40	40	241	81	156	3,43			Standard art. 30010
7	T632525	63	25	25	228,2	81	139,2	3,11	1	3	
8	T633232	63	32	32	231,6	81	142,6	3,34	1	3	
9	T634040	63	40	40	245	81	156	3,77			Standard art. 21308
10	T635050	63	50	50	247	81	158	4,06			Standard art. 21309
11	**T752525**	**75**	**25**	**25**	**228,2**	**89,5**	**139,2**	**3,58**	**1**	**3**	*NEW
12	**T753232**	**75**	**32**	**32**	**231,6**	**89,5**	**142,6**	**3,81**	**1**	**3**	*NEW
13	**T754040**	**75**	**40**	**40**	**245**	**89,5**	**156**	**4,24**	**1**	**3**	*NEW
14	**T755050**	**75**	**50**	**50**	**247**	**89,5**	**158**	**4,53**	**1**	**3**	*NEW
15	T756363	75	63	63	251	89,5	162	5,21			Standard art. 21310
16	T902525	90	25	25	230,2	131	185,7	5,2	1	3	
17	T903232	90	32	32	233,6	131	189,1	5,43	1	3	
18	T904040	90	40	40	247	131	202,5	5,86	1	3	
19	T905050	90	50	50	249	131	204,5	6,15	1	3	
20	T906363	90	63	63	253	131	208,5	6,83	1	3	
21	**T907575**	**90**	**75**	**75**	**253**	**131**	**208,5**	**7,77**	**1**	**3**	*NEW
22	T1102525	110	25	25	232,2	131	185,7	5,95	1	3	
23	T1103232	110	32	32	235,6	131	189,1	6,19	1	3	
24	T1104040	110	40	40	249	131	202,5	6,61	1	3	
25	T1105050	110	50	50	251	131	204,5	6,91	1	3	
26	T1106363	110	63	63	255	131	208,5	7,58	1	3	
27	**T1107575**	**110**	**75**	**75**	**255**	**131**	**208,5**	**8,52**	**1**	**3**	*NEW
28	T1109090	110	90	90	303	131	210,5	11,49	1	3	
29	T1252525	125	25	25	235,2	145	185,7	7,03	1	3	
30	T1253232	125	32	32	238,6	145	189,1	7,26	1	3	
31	T1254040	125	40	40	252	145	202,5	7,68	1	3	
32	T1255050	125	50	50	254	145	204,5	7,98	1	3	
33	T1256363	125	63	63	258	145	208,5	8,65	1	3	
34	**T1257575**	**125**	**75**	**75**	**258**	**145**	**208,5**	**9,59**	**1**	**3**	*NEW
35	T1259090	125	90	90	306	145	210,5	12,56	1	3	
36	T125110110	125	110	110	308	145	212,5	14,07	1	3	



*** Compact version**
can be used for DUO 75 mm insulated PEX pipes

13.1.4 COMBI-T with reduced branching > reduced flow

Line N°	Art. Nr.	1	2	3	L	B	H	kg			
1	T403225	40	32	25	222,2	81	142,6	2,74			Standard art. 30006
2	T503225	50	32	25	224,2	81	142,6	2,89	1	3	
3	T504025	50	40	25	224,2	81	156	3,1	1	3	
4	T504032	50	40	32	227,6	81	156	3,22	1	3	
5	T633225	63	32	25	228,2	81	142,6	3,23	1	3	
6	T634025	63	40	25	228,2	81	156	3,44	1	3	
7	T634032	63	40	32	231,6	81	156	3,56	1	3	
8	T635025	63	50	25	228,2	81	158	3,59	1	3	
9	T635032	63	50	32	231,6	81	158	3,7	1	3	
10	T635040	63	50	40	245	81	158	3,92	1	3	
11	**T753225**	**75**	**32**	**25**	**228,2**	**89,5**	**142,6**	**3,7**	**1**	**3**	*NEW
12	**T754025**	**75**	**40**	**25**	**228,2**	**89,5**	**156**	**3,91**	**1**	**3**	*NEW
13	**T754032**	**75**	**40**	**32**	**231,6**	**89,5**	**156**	**4,02**	**1**	**3**	*NEW
14	**T755025**	**75**	**50**	**25**	**228,2**	**89,5**	**158**	**4,06**	**1**	**3**	*NEW
15	**T755032**	**75**	**50**	**32**	**231,6**	**89,5**	**158**	**4,17**	**1**	**3**	*NEW
16	**T755040**	**75**	**50**	**40**	**245**	**89,5**	**158**	**4,38**	**1**	**3**	*NEW
17	**T756325**	**75**	**63**	**25**	**228,2**	**89,5**	**162**	**4,39**	**1**	**3**	*NEW
18	**T756332**	**75**	**63**	**32**	**231,6**	**89,5**	**162**	**4,51**	**1**	**3**	*NEW
19	**T756340**	**75**	**63**	**40**	**245**	**89,5**	**162**	**4,72**	**1**	**3**	*NEW
20	**T756350**	**75**	**63**	**50**	**247**	**89,5**	**162**	**4,87**	**1**	**3**	*NEW
21	T903225	90	32	25	230,2	131	189,1	5,32	1	3	
22	T904025	90	40	25	230,2	131	202,5	5,53	1	3	
23	T904032	90	40	32	233,6	131	202,5	5,64	1	3	
24	T905025	90	50	25	230,2	131	204,5	5,68	1	3	
25	T905032	90	50	32	233,6	131	204,5	5,79	1	3	
26	T905040	90	50	40	247	131	204,5	6	1	3	
27	T906325	90	63	25	230,2	131	208,5	6,01	1	3	
28	T906332	90	63	32	233,6	131	208,5	6,13	1	3	
29	T906340	90	63	40	247	131	208,5	6,34	1	3	
30	T906350	90	63	50	249	131	208,5	6,49	1	3	
31	**T907525**	**90**	**75**	**25**	**230,2**	**131**	**208,5**	**6,48**	**1**	**3**	*NEW
32	**T907532**	**90**	**75**	**32**	**233,6**	**131**	**208,5**	**6,6**	**1**	**3**	*NEW
33	**T907540**	**90**	**75**	**40**	**247**	**131**	**208,5**	**6,81**	**1**	**3**	*NEW
34	**T907550**	**90**	**75**	**50**	**249**	**131**	**208,5**	**6,96**	**1**	**3**	*NEW
35	**T907563**	**90**	**75**	**63**	**253**	**131**	**208,5**	**7,3**	**1**	**3**	*NEW
36	T1103225	110	32	25	232,2	131	189,1	6,07	1	3	
37	T1104025	110	40	25	232,2	131	202,5	6,28	1	3	
38	T1104032	110	40	32	235,6	131	202,5	6,4	1	3	
39	T1105025	110	50	25	232,2	131	204,5	6,43	1	3	
40	T1105032	110	50	32	235,6	131	204,5	6,55	1	3	
41	T1105040	110	50	40	249	131	204,5	6,76	1	3	
42	T1106325	110	63	25	232,2	131	208,5	6,77	1	3	
43	T1106332	110	63	32	235,6	131	208,5	6,88	1	3	
44	T1106340	110	63	40	249	131	208,5	7,1	1	3	
45	T1106350	110	63	50	251	131	208,5	7,24	1	3	
46	**T1107525**	**110**	**75**	**25**	**232,2**	**131**	**208,5**	**7,24**	**1**	**3**	*NEW
47	**T1107532**	**110**	**75**	**32**	**235,6**	**131**	**208,5**	**7,35**	**1**	**3**	*NEW
48	**T1107540**	**110**	**75**	**40**	**249**	**131**	**208,5**	**7,57**	**1**	**3**	*NEW
49	**T1107550**	**110**	**75**	**50**	**251**	**131**	**208,5**	**7,71**	**1**	**3**	*NEW
50	**T1107563**	**110**	**75**	**63**	**255**	**131**	**208,5**	**8,05**	**1**	**3**	*NEW
51	T1109025	110	90	25	290,7	131	210,5	9,87	1	3	
52	T1109032	110	90	32	294,1	131	210,5	9,98	1	3	
53	T1109040	110	90	40	307,5	131	210,5	10,19	1	3	
54	T1109050	110	90	50	309,5	131	210,5	10,34	1	3	
55	T1109063	110	90	63	313,5	131	210,5	10,68	1	3	
56	T1109075	110	90	75	313,5	131	210,5	11,15	1	3	
57	T1253225	125	32	25	235,2	145	189,1	7,14	1	3	
58	T1254025	125	40	25	235,2	145	202,5	7,36	1	3	
59	T1254032	125	40	32	238,6	145	202,5	7,47	1	3	
60	T1255025	125	50	25	235,2	145	204,5	7,5	1	3	
61	T1255032	125	50	32	238,6	145	204,5	7,62	1	3	
62	T1255040	125	50	40	252	145	204,5	7,83	1	3	
63	T1256325	125	63	25	235,2	145	208,5	7,84	1	3	
64	T1256332	125	63	32	238,6	145	208,5	7,96	1	3	



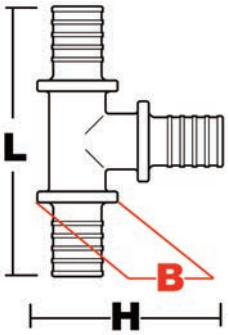
*** Compact version**
can be used for DUO 75 mm insulated PEX pipes

Line N°	Art. Nr.	1	2	3	L	B	H	kg			
54	T1256340	125	63	40	252	145	208,5	8,17	1	3	
66	T1256350	125	63	50	254	145	208,5	8,32	1	3	
67	T1257525	125	75	25	235,2	145	208,5	8,31	1	3	*NEW
68	T1257532	125	75	32	238,6	145	208,5	8,43	1	3	*NEW
69	T1257540	125	75	40	252	145	208,5	8,64	1	3	*NEW
70	T1257550	125	75	50	254	145	208,5	8,79	1	3	*NEW
71	T1257563	125	75	63	258	145	208,5	9,12	1	3	
72	T1259025	125	90	25	293,7	145	210,5	10,94	1	3	
73	T1259032	125	90	32	297,1	145	210,5	11,05	1	3	
74	T1259040	125	90	40	310,5	145	210,5	11,27	1	3	
75	T1259050	125	90	50	312,5	145	210,5	11,41	1	3	
76	T1259063	125	90	63	316,5	145	210,5	11,75	1	3	
77	T1259075	125	90	75	316,5	145	210,5	12,22	1	3	
78	T12511025	125	110	25	293,7	145	212,5	11,69	1	3	
79	T12511032	125	110	32	297,1	145	212,5	11,81	1	3	
80	T12511040	125	110	40	310,5	145	212,5	12,02	1	3	
81	T12511050	125	110	50	312,5	145	212,5	12,17	1	3	
82	T12511063	125	110	63	316,5	145	212,5	12,51	1	3	
83	T12511075	125	110	75	316,5	145	212,5	12,98	1	3	
84	T12511090	125	110	90	306	145	212,5	13,31	1	3	

*** Compact version**
can be used for DUO 75 mm insulated PEX pipes

13.1.5 COMBI-T with reduced branching < reduced flow

Line N°	Art. Nr.	1	2	3	L	B	H	kg			
1	T402532	40	25	32	225,6	81	139,2	2,74			Standard art. 30005
2	T502532	50	25	32	227,6	81	139,2	2,89	1	3	
3	T502540	50	25	40	241	81	139,2	3,1			Standard art. 21407
4	T503240	50	32	40	241	81	142,6	3,22			Standard art. 21408
5	T632532	63	25	32	231,6	81	139,2	3,23	1	3	
6	T632540	63	25	40	245	81	139,2	3,44	1	3	
7	T632550	63	25	50	247	81	139,2	3,59			Standard art. 30020
8	T633240	63	32	40	245	81	142,6	3,56	1	3	
9	T633250	63	32	50	247	81	142,6	3,7			Standard art. 21409
10	T634050	63	40	50	247	81	156	3,92			Standard art. 21410
11	**T752532**	**75**	**25**	**32**	**231,6**	**89,5**	**139,2**	**3,7**	**1**	**3**	*NEW
12	**T752540**	**75**	**25**	**40**	**245**	**89,5**	**139,2**	**3,91**	**1**	**3**	*NEW
13	**T752550**	**75**	**25**	**50**	**247**	**89,5**	**139,2**	**4,06**	**1**	**3**	*NEW
14	**T752563**	**75**	**25**	**63**	**251**	**89,5**	**139,2**	**4,39**	**1**	**3**	*NEW
15	**T753240**	**75**	**32**	**40**	**245**	**89,5**	**142,6**	**4,02**	**1**	**3**	*NEW
16	**T753250**	**75**	**32**	**50**	**247**	**89,5**	**142,6**	**4,17**	**1**	**3**	*NEW
17	T753263	75	32	63	251	89,5	142,6	4,51			Standard art. 21411
18	**T754050**	**75**	**40**	**50**	**247**	**89,5**	**156**	**4,38**	**1**	**3**	*NEW
19	**T754063**	**75**	**40**	**63**	**251**	**89,5**	**156**	**4,72**	**1**	**3**	*NEW
20	T755063	75	50	63	251	89,5	158	4,87			Standard art. 21412
21	T902532	90	25	32	233,6	131	185,7	5,32	1	3	
22	T902540	90	25	40	247	131	185,7	5,53	1	3	
23	T902550	90	25	50	249	131	185,7	5,68	1	3	
24	T902563	90	25	63	253	131	185,7	6,01	1	3	
25	**T902575**	**90**	**25**	**75**	**253**	**131**	**185,7**	**6,48**	**1**	**3**	*NEW
26	T903240	90	32	40	247	131	189,1	5,64	1	3	
27	T903250	90	32	50	249	131	189,1	5,79	1	3	
28	T903263	90	32	63	253	131	189,1	6,13	1	3	
29	**T903275**	**90**	**32**	**75**	**253**	**131**	**189,1**	**6,6**	**1**	**3**	*NEW
30	T904050	90	40	50	249	131	202,5	6	1	3	
31	T904063	90	40	63	253	131	202,5	6,34	1	3	
32	**T904075**	**90**	**40**	**75**	**253**	**131**	**202,5**	**6,81**	**1**	**3**	*NEW
33	T905063	90	50	63	253	131	204,5	6,49	1	3	
34	**T905075**	**90**	**50**	**75**	**253**	**131**	**204,5**	**6,96**	**1**	**3**	*NEW
35	**T906375**	**90**	**63**	**75**	**253**	**131**	**208,5**	**7,3**	**1**	**3**	*NEW
36	T1102532	110	25	32	235,6	131	185,7	6,07	1	3	
37	T1102540	110	25	40	249	131	185,7	6,28	1	3	
38	T1102550	110	25	50	251	131	185,7	6,43	1	3	
39	T1102563	110	25	63	255	131	185,7	6,77	1	3	
40	**T1102575**	**110**	**25**	**75**	**255**	**131**	**185,7**	**7,24**	**1**	**3**	*NEW
41	T1102590	110	25	90	257	131	185,7	8,18	1	3	
42	T1103240	110	32	40	249	131	189,1	6,4	1	3	
43	T1103250	110	32	50	251	131	189,1	6,55	1	3	
44	T1103263	110	32	63	255	131	189,1	6,88	1	3	
45	**T1103275**	**110**	**32**	**75**	**255**	**131**	**189,1**	**7,35**	**1**	**3**	*NEW
46	T1103290	110	32	90	257	131	189,1	8,3	1	3	
47	T1104050	110	40	50	251	131	202,5	6,76	1	3	
48	T1104063	110	40	63	255	131	202,5	7,1	1	3	
49	**T1104075**	**110**	**40**	**75**	**255**	**131**	**202,5**	**7,57**	**1**	**3**	*NEW
50	T1104090	110	40	90	257	131	202,5	8,51	1	3	
51	T1105063	110	50	63	255	131	204,5	7,24	1	3	
52	**T1105075**	**110**	**50**	**75**	**255**	**131**	**204,5**	**7,71**	**1**	**3**	*NEW
53	T1105090	110	50	90	257	131	204,5	8,66	1	3	
54	**T1106375**	**110**	**63**	**75**	**255**	**131**	**208,5**	**8,05**	**1**	**3**	*NEW
55	T1106390	110	63	90	257	131	208,5	9	1	3	
56	**T1107590**	**110**	**75**	**90**	**257**	**131**	**208,5**	**9,46**	**1**	**3**	*NEW
57	T1252532	125	25	32	238,6	145	185,7	7,14	1	3	
58	T1252540	125	25	40	252	145	185,7	7,36	1	3	
59	T1252550	125	25	50	254	145	185,7	7,5	1	3	
60	T1252563	125	25	63	258	145	185,7	7,84	1	3	
61	**T1252575**	**125**	**25**	**75**	**258**	**145**	**185,7**	**8,31**	**1**	**3**	*NEW
62	T1252590	125	25	90	260	145	185,7	9,25	1	3	
63	T12525110	125	25	110	262	145	185,7	10,01	1	3	
64	T1253240	125	32	40	252	145	189,1	7,47	1	3	



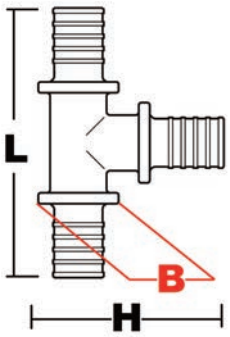
*** Compact version**
can be used for DUO 75 mm insulated PEX pipes

Line N°	Art. Nr.	1	2	3	L	B	H	kg			
65	T1253250	125	32	50	254	145	189,1	7,62	1	3	
66	T1253263	125	32	63	258	145	189,1	7,96	1	3	
67	**T1253275**	**125**	**32**	**75**	**258**	**145**	**189,1**	**8,43**	**1**	**3**	*NEW
68	T1253290	125	32	90	260	145	189,1	9,37	1	3	
69	T12532110	125	32	110	262	145	189,1	10,12	1	3	
70	T1254050	125	40	50	254	145	202,5	7,83	1	3	
71	T1254063	125	40	63	258	145	202,5	8,17	1	3	
72	**T1254075**	**125**	**40**	**75**	**258**	**145**	**202,5**	**8,64**	**1**	**3**	*NEW
73	T1254090	125	40	90	260	145	202,5	9,58	1	3	
74	T12540110	125	40	110	262	145	202,5	10,34	1	3	
75	T1255063	125	50	63	258	145	204,5	8,32	1	3	
76	**T1255075**	**125**	**50**	**75**	**258**	**145**	**204,5**	**8,79**	**1**	**3**	*NEW
77	T1255090	125	50	90	260	145	204,5	9,73	1	3	
78	T12550110	125	50	110	262	145	204,5	10,48	1	3	
79	**T1256375**	**125**	**63**	**75**	**258**	**145**	**208,5**	**9,12**	**1**	**3**	*NEW
80	T1256390	125	63	90	260	145	208,5	10,07	1	3	
81	T12563110	125	63	110	262	145	208,5	10,82	1	3	
82	**T1257590**	**125**	**75**	**90**	**260**	**145**	**208,5**	**10,54**	**1**	**3**	*NEW
83	**T12575110**	**125**	**75**	**110**	**262**	**145**	**208,5**	**11,29**	**1**	**3**	*NEW
84	T12590110	125	90	110	308	145	210,5	13,31	1	3	

*** Compact version**
can be used for DUO 75 mm insulated PEX pipes

13.1.6 COMBI-T with increased branching

Line N°	Art. Nr.	1	2	3	L	B	H	kg			
1	T253225	25	32	25	205,4	81	142,6	2,41	1	3	
2	T254025	25	40	25	205,4	81	156	2,63	1	3	
3	T255025	25	50	25	205,4	81	158	2,77	1	3	
4	T256325	25	63	25	205,4	81	162	3,11	1	3	
5	T257525	25	75	25	205,4	89,5	162	3,58	1	3	*NEW
6	T259025	25	90	25	276,4	131	210,5	7,49	1	3	
7	T2511025	25	110	25	276,4	131	212,5	8,24	1	3	
8	T2512525	25	125	25	276,4	145	215,5	9,32	1	3	
9	T324025	32	40	25	208,8	81	156	2,74	1	3	
10	T324032	32	40	32	212,2	81	156	2,86	1	3	
11	T325025	32	50	25	208,8	81	158	2,89	1	3	
12	T325032	32	50	32	212,2	81	158	3	1	3	
13	T326325	32	63	25	208,8	81	162	3,23	1	3	
14	T326332	32	63	32	212,2	81	162	3,34	1	3	
15	T327525	32	75	25	208,8	89,5	162	3,7	1	3	*NEW
16	T327532	32	75	32	212,2	89,5	162	3,81	1	3	*NEW
17	T329025	32	90	25	279,8	131	210,5	7,61	1	3	
18	T329032	32	90	32	283,2	131	210,5	7,72	1	3	
19	T3211025	32	110	25	279,8	131	212,5	8,36	1	3	
20	T3211032	32	110	32	283,2	131	212,5	8,48	1	3	
21	T3212525	32	125	25	279,8	145	215,5	9,43	1	3	
22	T3212532	32	125	32	283,2	145	215,5	9,55	1	3	
23	T405025	40	50	25	222,2	81	158	3,1	1	3	
24	T405032	40	50	32	225,6	81	158	3,22	1	3	
25	T405040	40	50	40	239	81	158	3,43	1	3	
26	T406325	40	63	25	222,2	81	162	3,44	1	3	
27	T406332	40	63	32	225,6	81	162	3,56	1	3	
28	T406340	40	63	40	239	81	162	3,77	1	3	
29	T407525	40	75	25	222,2	89,5	162	3,91	1	3	*NEW
30	T407532	40	75	32	225,6	89,5	162	4,02	1	3	*NEW
31	T407540	40	75	40	239	89,5	162	4,24	1	3	*NEW
32	T409025	40	90	25	293,2	131	210,5	7,82	1	3	
33	T409032	40	90	32	296,6	131	210,5	7,93	1	3	
34	T409040	40	90	40	310	131	210,5	8,15	1	3	
35	T4011025	40	110	25	293,2	131	212,5	8,57	1	3	
36	T4011032	40	110	32	296,6	131	212,5	8,69	1	3	
37	T4011040	40	110	40	310	131	212,5	8,9	1	3	
38	T4012525	40	125	25	293,2	145	215,5	9,65	1	3	
39	T4012532	40	125	32	296,6	145	215,5	9,76	1	3	
40	T4012540	40	125	40	310	145	215,5	9,97	1	3	
41	T506325	50	63	25	224,2	81	162	3,59	1	3	
42	T506332	50	63	32	227,6	81	162	3,7	1	3	
43	T506340	50	63	40	241	81	162	3,92	1	3	
44	T506350	50	63	50	243	81	162	4,06	1	3	
45	T507525	50	75	25	224,2	89,5	162	4,06	1	3	*NEW
46	T507532	50	75	32	227,6	89,5	162	4,17	1	3	*NEW
47	T507540	50	75	40	241	89,5	162	4,38	1	3	*NEW
48	T507550	50	75	50	243	89,5	162	4,53	1	3	*NEW
49	T509025	50	90	25	295,2	131	210,5	7,97	1	3	
50	T509032	50	90	32	298,6	131	210,5	8,08	1	3	
51	T509040	50	90	40	312	131	210,5	8,29	1	3	
52	T509050	50	90	50	314	131	210,5	8,44	1	3	
53	T5011025	50	110	25	295,2	131	212,5	8,72	1	3	
54	T5011032	50	110	32	298,6	131	212,5	8,84	1	3	
55	T5011040	50	110	40	312	131	212,5	9,05	1	3	
56	T5011050	50	110	50	314	131	212,5	9,2	1	3	
57	T5012525	50	125	25	295,2	145	215,5	9,79	1	3	
58	T5012532	50	125	32	298,6	145	215,5	9,91	1	3	
59	T5012540	50	125	40	312	145	215,5	10,12	1	3	
60	T5012550	50	125	50	314	145	215,5	10,27	1	3	
61	T637525	63	75	25	228,2	89,5	162	4,39	1	3	*NEW
62	T637532	63	75	32	231,6	89,5	162	4,51	1	3	*NEW
63	T637540	63	75	40	245	89,5	162	4,72	1	3	*NEW
64	T637550	63	75	50	247	89,5	162	4,87	1	3	*NEW



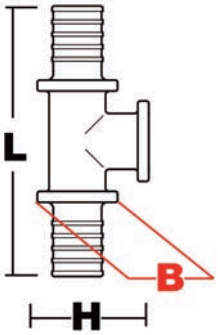
*** Compact version**
can be used for DUO 75 mm insulated PEX pipes

Line N°	Art. Nr.	1	2	3	L	B	H	kg			
65	T637563	63	75	63	251	89,5	162	5,21	1	3	*NEW
66	T639025	63	90	25	299,2	131	210,5	8,3	1	3	
67	T639032	63	90	32	302,6	131	210,5	8,42	1	3	
68	T639040	63	90	40	316	131	210,5	8,63	1	3	
69	T639050	63	90	50	318	131	210,5	8,78	1	3	
70	T639063	63	90	63	322	131	210,5	9,12	1	3	
71	T6311025	63	110	25	299,2	131	212,5	9,06	1	3	
72	T6311032	63	110	32	302,6	131	212,5	9,17	1	3	
73	T6311040	63	110	40	316	131	212,5	9,39	1	3	
74	T6311050	63	110	50	318	131	212,5	9,53	1	3	
75	T6311063	63	110	63	322	131	212,5	9,87	1	3	
76	T6312525	63	125	25	299,2	145	215,5	10,13	1	3	
77	T6312532	63	125	32	302,6	145	215,5	10,25	1	3	
78	T6312540	63	125	40	316	145	215,5	10,46	1	3	
79	T6312550	63	125	50	318	145	215,5	10,61	1	3	
80	T6312563	63	125	63	322	145	215,5	10,94	1	3	
81	T759025	75	90	25	299,2	131	210,5	8,77	1	3	
82	T759032	75	90	32	302,6	131	210,5	8,89	1	3	
83	T759040	75	90	40	316	131	210,5	9,1	1	3	
84	T759050	75	90	50	318	131	210,5	9,25	1	3	
85	T759063	75	90	63	322	131	210,5	9,59	1	3	
86	T759075	75	90	75	322	131	210,5	10,06	1	3	
87	T7511025	75	110	25	299,2	131	212,5	9,53	1	3	
88	T7511032	75	110	32	302,6	131	212,5	9,64	1	3	
89	T7511040	75	110	40	316	131	212,5	9,86	1	3	
90	T7511050	75	110	50	318	131	212,5	10	1	3	
91	T7511063	75	110	63	322	131	212,5	10,34	1	3	
92	T7511075	75	110	75	322	131	212,5	10,81	1	3	
93	T7512525	75	125	25	299,2	145	215,5	10,6	1	3	
94	T7512532	75	125	32	302,6	145	215,5	10,72	1	3	
95	T7512540	75	125	40	316	145	215,5	10,93	1	3	
96	T7512550	75	125	50	318	145	215,5	11,08	1	3	
97	T7512563	75	125	63	322	145	215,5	11,41	1	3	
98	T7512575	75	125	75	322	145	215,5	11,88	1	3	
99	T9011025	90	110	25	288,7	131	212,5	9,87	1	3	
100	T9011032	90	110	32	292,1	131	212,5	9,98	1	3	
101	T9011040	90	110	40	305,5	131	212,5	10,19	1	3	
102	T9011050	90	110	50	307,5	131	212,5	10,34	1	3	
103	T9011063	90	110	63	311,5	131	212,5	10,68	1	3	
104	T9011075	90	110	75	311,5	131	212,5	11,15	1	3	
105	T9011090	90	110	90	301	131	212,5	11,49	1	3	
106	T9012525	90	125	25	288,7	145	215,5	10,94	1	3	
107	T9012532	90	125	32	292,1	145	215,5	11,05	1	3	
108	T9012540	90	125	40	305,5	145	215,5	11,27	1	3	
109	T9012550	90	125	50	307,5	145	215,5	11,41	1	3	
110	T9012563	90	125	63	311,5	145	215,5	11,75	1	3	
111	T9012575	90	125	75	311,5	145	215,5	12,22	1	3	
112	T9012590	90	125	90	301	145	215,5	12,56	1	3	
113	T11012525	110	125	25	290,7	145	215,5	11,69	1	3	
114	T11012532	110	125	32	294,1	145	215,5	11,81	1	3	
115	T11012540	110	125	40	307,5	145	215,5	12,02	1	3	
116	T11012550	110	125	50	309,5	145	215,5	12,17	1	3	
117	T11012563	110	125	63	313,5	145	215,5	12,51	1	3	
118	T11012575	110	125	75	313,5	145	215,5	12,98	1	3	
119	T11012590	110	125	90	303	145	215,5	13,31	1	3	
120	T110125110	110	125	110	305	145	215,5	14,07	1	3	

*** Compact version**
can be used for DUO 75 mm insulated PEX pipes

13.1.7 COMBI-T with female threaded branching

Line N°	Art. Nr.	1	2	3	L	B	H	kg			
1	T253425	25	3/4"	25	205,4	81	92	2,35	1	2	
2	T323425	32	3/4"	25	208,8	81	92	2,46	1	2	
3	T403425	40	3/4"	25	222,2	81	92	2,68	1	2	
4	T503425	50	3/4"	25	224,2	81	92	2,82	1	2	
5	T633425	63	3/4"	25	228,2	81	92	3,16	1	2	
6	T753425	75	3/4"	25	228,2	89,5	92	3,63	1	2	*NEW
7	T903425	90	3/4"	25	230,2	131	138,5	5,25	1	2	
8	T1103425	110	3/4"	25	232,2	131	138,5	6,01	1	2	
9	T1253425	125	3/4"	25	235,2	145	138,5	7,08	1	2	
10	T254425	25	4/4"	25	205,4	81	92	2,3	1	2	
11	T324425	32	4/4"	25	208,8	81	92	2,42	1	2	
12	T404425	40	4/4"	25	222,2	81	92	2,63	1	2	
13	T504425	50	4/4"	25	224,2	81	92	2,78	1	2	
14	T634425	63	4/4"	25	228,2	81	92	3,11	1	2	
15	T754425	75	4/4"	25	228,2	89,5	92	3,58	1	2	*NEW
16	T904425	90	4/4"	25	230,2	131	138,5	5,2	1	2	
17	T1104425	110	4/4"	25	232,2	131	138,5	5,96	1	2	
18	T1254425	125	4/4"	25	235,2	145	138,5	7,03	1	2	
19	T255425	25	5/4"	25	205,4	81	92	2,21	1	2	
20	T325425	32	5/4"	25	208,8	81	92	2,33	1	2	
21	T405425	40	5/4"	25	222,2	81	92	2,54	1	2	
22	T505425	50	5/4"	25	224,2	81	92	2,69	1	2	
23	T635425	63	5/4"	25	228,2	81	92	3,02	1	2	
24	T755425	75	5/4"	25	228,2	89,5	92	3,49	1	2	*NEW
25	T905425	90	5/4"	25	230,2	131	138,5	5,11	1	2	
26	T1105425	110	5/4"	25	232,2	131	138,5	5,87	1	2	
27	T1255425	125	5/4"	25	235,2	145	138,5	6,94	1	2	
28	T256425	25	6/4"	25	205,4	81	92	2,13	1	2	
29	T326425	32	6/4"	25	208,8	81	92	2,24	1	2	
30	T406425	40	6/4"	25	222,2	81	92	2,46	1	2	
31	T506425	50	6/4"	25	224,2	81	92	2,6	1	2	
32	T636425	63	6/4"	25	228,2	81	92	2,94	1	2	
33	T756425	75	6/4"	25	228,2	89,5	92	3,41	1	2	*NEW
34	T906425	90	6/4"	25	230,2	131	138,5	5,03	1	2	
35	T1106425	110	6/4"	25	232,2	131	138,5	5,78	1	2	
36	T1256425	125	6/4"	25	235,2	145	138,5	6,86	1	2	
37	T323432	32	3/4"	32	212,2	81	92	2,58	1	2	
38	T403432	40	3/4"	32	225,6	81	92	2,79	1	2	
39	T503432	50	3/4"	32	227,6	81	92	2,94	1	2	
40	T633432	63	3/4"	32	231,6	81	92	3,28	1	2	
41	T753432	75	3/4"	32	231,6	89,5	92	3,75	1	2	*NEW
42	T903432	90	3/4"	32	233,6	131	138,5	5,37	1	2	
43	T1103432	110	3/4"	32	235,6	131	138,5	6,12	1	2	
44	T1253432	125	3/4"	32	238,6	145	138,5	7,19	1	2	
45	T324432	32	4/4"	32	212,2	81	92	2,53	1	2	
46	T404432	40	4/4"	32	225,6	81	92	2,75	1	2	
47	T504432	50	4/4"	32	227,6	81	92	2,89	1	2	
48	T634432	63	4/4"	32	231,6	81	92	3,23	1	2	
49	T754432	75	4/4"	32	231,6	89,5	92	3,7	1	2	*NEW
50	T904432	90	4/4"	32	233,6	131	138,5	5,32	1	2	
51	T1104432	110	4/4"	32	235,6	131	138,5	6,07	1	2	
52	T1254432	125	4/4"	32	238,6	145	138,5	7,15	1	2	
53	T325432	32	5/4"	32	212,2	81	92	2,44	1	2	
54	T405432	40	5/4"	32	225,6	81	92	2,65	1	2	
55	T505432	50	5/4"	32	227,6	81	92	2,8	1	2	
56	T635432	63	5/4"	32	231,6	81	92	3,14	1	2	
57	T755432	75	5/4"	32	231,6	89,5	92	3,61	1	2	*NEW
58	T905432	90	5/4"	32	233,6	131	138,5	5,23	1	2	
59	T1105432	110	5/4"	32	235,6	131	138,5	5,98	1	2	
60	T1255432	125	5/4"	32	238,6	145	138,5	7,06	1	2	
61	T326432	32	6/4"	32	212,2	81	92	2,36	1	2	
62	T406432	40	6/4"	32	225,6	81	92	2,57	1	2	
63	T506432	50	6/4"	32	227,6	81	92	2,72	1	2	
64	T636432	63	6/4"	32	231,6	81	92	3,06	1	2	



*** Compact version**
can be used for DUO 75 mm insulated PEX pipes

Line N°	Art. Nr.	1	2	3	L	B	H	kg			
65	T756432	75	6/4"	32	231,6	89,5	92	3,53	1	2	*NEW
66	T906432	90	6/4"	32	233,6	131	138,5	5,15	1	2	
67	T1106432	110	6/4"	32	235,6	131	138,5	5,9	1	2	
68	T1256432	125	6/4"	32	238,6	145	138,5	6,97	1	2	
69	T403440	40	3/4"	40	239	81	92	3,01	1	2	
70	T503440	50	3/4"	40	241	81	92	3,15	1	2	
71	T633440	63	3/4"	40	245	81	92	3,49	1	2	
72	T753440	75	3/4"	40	245	89,5	92	3,96	1	2	*NEW
73	T903440	90	3/4"	40	247	131	138,5	5,58	1	2	
74	T1103440	110	3/4"	40	249	131	138,5	6,33	1	2	
75	T1253440	125	3/4"	40	252	145	138,5	7,41	1	2	
76	T404440	40	4/4"	40	239	81	92	2,96	1	2	
77	T504440	50	4/4"	40	241	81	92	3,11	1	2	
78	T634440	63	4/4"	40	245	81	92	3,44	1	2	
79	T754440	75	4/4"	40	245	89,5	92	3,91	1	2	*NEW
80	T904440	90	4/4"	40	247	131	138,5	5,53	1	2	
81	T1104440	110	4/4"	40	249	131	138,5	6,29	1	2	
82	T1254440	125	4/4"	40	252	145	138,5	7,36	1	2	
83	T405440	40	5/4"	40	239	81	92	2,87	1	2	
84	T505440	50	5/4"	40	241	81	92	3,01	1	2	
85	T635440	63	5/4"	40	245	81	92	3,35	1	2	
86	T755440	75	5/4"	40	245	89,5	92	3,82	1	2	*NEW
87	T905440	90	5/4"	40	247	131	138,5	5,44	1	2	
88	T1105440	110	5/4"	40	249	131	138,5	6,2	1	2	
89	T1255440	125	5/4"	40	252	145	138,5	7,27	1	2	
90	T406440	40	6/4"	40	239	81	92	2,78	1	2	
91	T506440	50	6/4"	40	241	81	92	2,93	1	2	
92	T636440	63	6/4"	40	245	81	92	3,27	1	2	
93	T756440	75	6/4"	40	245	89,5	92	3,74	1	2	*NEW
94	T906440	90	6/4"	40	247	131	138,5	5,36	1	2	
95	T1106440	110	6/4"	40	249	131	138,5	6,11	1	2	
96	T1256440	125	6/4"	40	252	145	138,5	7,19	1	2	
97	T503450	50	3/4"	50	243	81	92	3,3	1	2	
98	T633450	63	3/4"	50	247	81	92	3,64	1	2	
99	T753450	75	3/4"	50	247	89,5	92	4,11	1	2	*NEW
100	T903450	90	3/4"	50	249	131	138,5	5,73	1	2	
101	T1103450	110	3/4"	50	251	131	138,5	6,48	1	2	
102	T1253450	125	3/4"	50	254	145	138,5	7,55	1	2	
103	T504450	50	4/4"	50	243	81	92	3,25	1	2	
104	T634450	63	4/4"	50	247	81	92	3,59	1	2	
105	T754450	75	4/4"	50	247	89,5	92	4,06	1	2	*NEW
106	T904450	90	4/4"	50	249	131	138,5	5,68	1	2	
107	T1104450	110	4/4"	50	251	131	138,5	6,43	1	2	
108	T1254450	125	4/4"	50	254	145	138,5	7,51	1	2	
109	T505450	50	5/4"	50	243	81	92	3,16	1	2	
110	T635450	63	5/4"	50	247	81	92	3,5	1	2	
111	T755450	75	5/4"	50	247	89,5	92	3,97	1	2	*NEW
112	T905450	90	5/4"	50	249	131	138,5	5,59	1	2	
113	T1105450	110	5/4"	50	251	131	138,5	6,34	1	2	
114	T1255450	125	5/4"	50	254	145	138,5	7,42	1	2	
115	T506450	50	6/4"	50	243	81	92	3,08	1	2	
116	T636450	63	6/4"	50	247	81	92	3,42	1	2	
117	T756450	75	6/4"	50	247	89,5	92	3,89	1	2	*NEW
118	T906450	90	6/4"	50	249	131	138,5	5,51	1	2	
119	T1106450	110	6/4"	50	251	131	138,5	6,26	1	2	
120	T1256450	125	6/4"	50	254	145	138,5	7,33	1	2	
121	T633463	63	3/4"	63	251	81	92	3,98	1	2	
122	T753463	75	3/4"	63	251	89,5	92	4,44	1	2	*NEW
123	T903463	90	3/4"	63	253	131	138,5	6,06	1	2	
124	T1103463	110	3/4"	63	255	131	138,5	6,82	1	2	
125	T1253463	125	3/4"	63	258	145	138,5	7,89	1	2	
126	T634463	63	4/4"	63	251	81	92	3,93	1	2	
127	T754463	75	4/4"	63	251	89,5	92	4,4	1	2	*NEW
128	T904463	90	4/4"	63	253	131	138,5	6,02	1	2	
129	T1104463	110	4/4"	63	255	131	138,5	6,77	1	2	

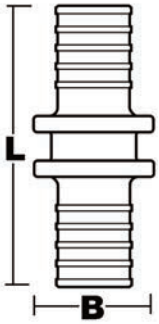
*** Compact version**
can be used for DUO 75 mm insulated PEX pipes

Line N°	Art. Nr.	1	2	3	L	B	H				
130	T1254463	125	4/4"	63	258	145	138,5	7,84	1	2	
131	T635463	63	5/4"	63	251	81	92	3,84	1	2	
132	T755463	75	5/4"	63	251	89,5	92	4,31	1	2	*NEW
133	T905463	90	5/4"	63	253	131	138,5	5,93	1	2	
134	T1105463	110	5/4"	63	255	131	138,5	6,68	1	2	
135	T1255463	125	5/4"	63	258	145	138,5	7,75	1	2	
136	T636463	63	6/4"	63	251	81	92	3,75	1	2	
137	T756463	75	6/4"	63	251	89,5	92	4,22	1	2	*NEW
138	T906463	90	6/4"	63	253	131	138,5	5,84	1	2	
139	T1106463	110	6/4"	63	255	131	138,5	6,6	1	2	
140	T1256463	125	6/4"	63	258	145	138,5	7,67	1	2	
141	T753475	75	3/4"	75	251	89,5	92	4,91	1	2	*NEW
142	T903475	90	3/4"	75	253	131	138,5	6,53	1	2	*NEW
143	T1103475	110	3/4"	75	255	131	138,5	7,29	1	2	*NEW
144	T1253475	125	3/4"	75	258	145	138,5	8,36	1	2	*NEW
145	T754475	75	4/4"	75	251	89,5	92	4,87	1	2	*NEW
146	T904475	90	4/4"	75	253	131	138,5	6,49	1	2	*NEW
147	T1104475	110	4/4"	75	255	131	138,5	7,24	1	2	*NEW
148	T1254475	125	4/4"	75	258	145	138,5	8,31	1	2	*NEW
149	T755475	75	5/4"	75	251	89,5	92	4,78	1	2	*NEW
150	T905475	90	5/4"	75	253	131	138,5	6,4	1	2	*NEW
151	T1105475	110	5/4"	75	255	131	138,5	7,15	1	2	*NEW
152	T1255475	125	5/4"	75	258	145	138,5	8,22	1	2	*NEW
153	T756475	75	6/4"	75	251	89,5	92	4,69	1	2	*NEW
154	T906475	90	6/4"	75	253	131	138,5	6,31	1	2	*NEW
155	T1106475	110	6/4"	75	255	131	138,5	7,07	1	2	*NEW
156	T1256475	125	6/4"	75	258	145	138,5	8,14	1	2	*NEW
157	T903490	90	3/4"	90	255	131	138,5	7,48	1	2	
158	T1103490	110	3/4"	90	257	131	138,5	8,23	1	2	
159	T1253490	125	3/4"	90	260	145	138,5	9,3	1	2	
160	T904490	90	4/4"	90	255	131	138,5	7,43	1	2	
161	T1104490	110	4/4"	90	257	131	138,5	8,19	1	2	
162	T1254490	125	4/4"	90	260	145	138,5	9,26	1	2	
163	T905490	90	5/4"	90	255	131	138,5	7,34	1	2	
164	T1105490	110	5/4"	90	257	131	138,5	8,09	1	2	
165	T1255490	125	5/4"	90	260	145	138,5	9,17	1	2	
166	T906490	90	6/4"	90	255	131	138,5	7,26	1	2	
167	T1106490	110	6/4"	90	257	131	138,5	8,01	1	2	
168	T1256490	125	6/4"	90	260	145	138,5	9,08	1	2	
169	T11034110	110	3/4"	110	259	131	138,5	8,99	1	2	
170	T12534110	125	3/4"	110	262	145	138,5	10,06	1	2	
171	T11044110	110	4/4"	110	259	131	138,5	8,94	1	2	
172	T12544110	125	4/4"	110	262	145	138,5	10,01	1	2	
173	T11054110	110	5/4"	110	259	131	138,5	8,85	1	2	
174	T12554110	125	5/4"	110	262	145	138,5	9,92	1	2	
175	T11064110	110	6/4"	110	259	131	138,5	8,77	1	2	
176	T12564110	125	6/4"	110	262	145	138,5	9,84	1	2	
177	T12534125	125	3/4"	125	265	145	138,5	11,13	1	2	
178	T12544125	125	4/4"	125	265	145	138,5	11,08	1	2	
179	T12554125	125	5/4"	125	265	145	138,5	10,99	1	2	
180	T12564125	125	6/4"	125	265	145	138,5	10,91	1	2	

*** Compact version**
can be used for DUO 75 mm insulated PEX pipes

13.1.8 COMBI-M reducer

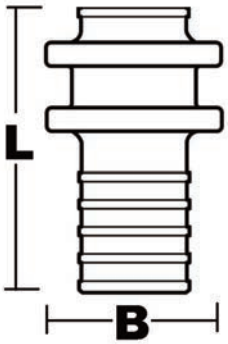
Line N°	Art. Nr.	1	2	L	B	kg			
1	M2525	25	25	149,4	81	1,37			Standard art. 20304
2	M3225	32	25	152,8	81	1,48			Standard art. 20405
3	M4025	40	25	166,2	81	1,7	1	2	
4	M5025	50	25	168,2	81	1,84	1	2	
5	M6325	63	25	172,2	81	2,18	1	2	
6	**M7525**	**75**	**25**	**172,2**	**89,5**	**2,65**	**1**	**2**	*NEW
7	M9025	90	25	186,7	131	4,57	1	2	
8	M11025	110	25	188,7	131	5,32	1	2	
9	M12525	125	25	191,7	145	6,39	1	2	
10	M3232	32	32	156,2	81	1,6			Standard art. 20305
11	M4032	40	32	169,6	81	1,81			Standard art. 20408
12	M5032	50	32	171,6	81	1,96	1	2	
13	M6332	63	32	175,6	81	2,3	1	2	
14	**M7532**	**75**	**32**	**175,6**	**89,5**	**2,77**	**1**	**2**	*NEW
15	M9032	90	32	190,1	131	4,68	1	2	
16	M11032	110	32	192,1	131	5,44	1	2	
17	M12532	125	32	195,1	145	6,51	1	2	
18	M4040	40	40	183	81	2,03			Standard art. 20306
19	M5040	50	40	185	81	2,17			Standard art. 20410
20	M6340	63	40	189	81	2,51	1	2	
21	**M7540**	**75**	**40**	**189**	**89,5**	**2,98**	**1**	**2**	*NEW
22	M9040	90	40	203,5	131	4,9	1	2	
23	M11040	110	40	205,5	131	5,65	1	2	
24	M12540	125	40	208,5	145	6,72	1	2	
25	M5050	50	50	187	81	2,32			Standard art. 20307
26	M6350	63	50	191	81	2,66			Standard art. 20411
27	**M7550**	**75**	**50**	**191**	**89,5**	**3,13**	**1**	**2**	*NEW
28	M9050	90	50	205,5	131	5,04	1	2	
29	M11050	110	50	207,5	131	5,8	1	2	
30	M12550	125	50	210,5	145	6,87	1	2	
31	M6363	63	63	195	81	3			Standard art. 20308
32	M7563	75	63	195	89,5	3,47			Standard art. 20412
33	M9063	90	63	209,5	131	5,38	1	2	
34	M11063	110	63	211,5	131	6,14	1	2	
35	M12563	125	63	214,5	145	7,21	1	2	
36	M7575	75	75	195	89,5	3,93			Standard art. 20309
37	M9075	90	75	209,5	89,5	5,85			Standard art. 20413
38	M11075	110	75	211,5	89,5	6,61	1	2	
39	M12575	125	75	214,5	145	7,68	1	2	
40	M9090	90	90	199	131	6,19			Standard art. 20310
41	M11090	110	90	201	131	6,94			Standard art. 20414
42	M12590	125	90	204	145	8,02			
43	M110110	110	110	203	131	7,7			Standard art. 20311
44	M125110	125	110	206	145	8,77	1	2	
45	M125125	125	125	209	145	9,84			Standard art. 20312



*** Compact version**
can be used for DUO 75 mm insulated PEX pipes

13.1.9 COMBI- reducer with female thread

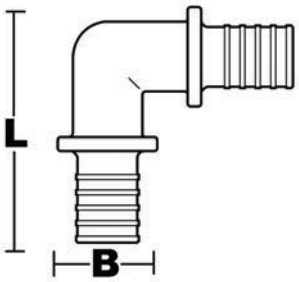
Line N°	Art. Nr.	1	2	L	B	kg			
1	M2534	25	3/4"	102,2	81	1,42	1	1	
2	M2544	25	4/4"	102,2	81	1,37	1	1	
3	M2554	25	5/4"	102,2	81	1,28	1	1	
4	M2564	25	6/4"	102,2	81	1,2	1	1	
5	M3234	32	3/4"	105,6	81	1,54	1	1	
6	M3244	32	4/4"	105,6	81	1,49	1	1	
7	M3254	32	5/4"	105,6	81	1,4	1	1	
8	M3264	32	6/4"	105,6	81	1,31	1	1	
9	M4034	40	3/4"	119	81	1,75	1	1	
10	M4044	40	4/4"	119	81	1,7	1	1	
11	M4054	40	5/4"	119	81	1,61	1	1	
12	M4064	40	6/4"	119	81	1,53	1	1	
13	M5034	50	3/4"	121	81	1,9	1	1	
14	M5044	50	4/4"	121	81	1,85	1	1	
15	M5054	50	5/4"	121	81	1,76	1	1	
16	M5064	50	6/4"	121	81	1,67	1	1	
17	M6334	63	3/4"	125	81	2,23	1	1	
18	M6344	63	4/4"	125	81	2,19	1	1	
19	M6354	63	5/4"	125	81	2,1	1	1	
20	M6364	63	6/4"	125	81	2,01	1	1	
21	**M7534**	**75**	**3/4"**	**125**	**89,5**	**2,7**	**1**	**1**	*NEW
22	**M7544**	**75**	**4/4"**	**125**	**89,5**	**2,66**	**1**	**1**	*NEW
23	**M7554**	**75**	**5/4"**	**125**	**89,5**	**2,56**	**1**	**1**	*NEW
24	**M7564**	**75**	**6/4"**	**125**	**89,5**	**2,48**	**1**	**1**	*NEW
25	M9034	90	3/4"	139,5	131	4,62	1	1	
26	M9044	90	4/4"	139,5	131	4,57	1	1	
27	M9054	90	5/4"	139,5	131	4,48	1	1	
28	M9064	90	6/4"	139,5	131	4,4	1	1	
29	M11034	110	3/4"	141,5	131	5,37	1	1	
30	M11044	110	4/4"	141,5	131	5,33	1	1	
31	M11054	110	5/4"	141,5	131	5,24	1	1	
32	M11064	110	6/4"	141,5	131	5,15	1	1	
33	M12534	125	3/4"	144,5	145	6,45	1	1	
34	M12544	125	4/4"	144,5	145	6,4	1	1	
35	M12554	125	5/4"	144,5	145	6,31	1	1	
36	M12564	125	6/4"	144,5	145	6,22	1	1	



*** Compact version**
can be used for DUO 75 mm insulated PEX pipes

13.1.10 COMBI Knee 90°

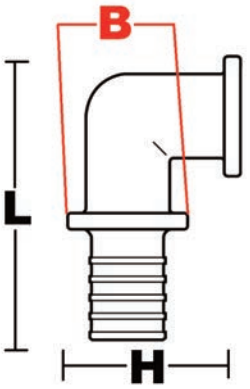
Line N°	Art. Nr.	1	2	L	B	H	kg			
1	K2525	25	25	139,2	81	139,2	1,6			Standard art. 20604
2	K3225	32	25	142,6	81	139,2	1,71	1	2	
3	K4025	40	25	156	81	139,2	1,93	1	2	
4	K5025	50	25	158	81	139,2	2,07	1	2	
5	K6325	63	25	162	81	139,2	2,41	1	2	
6	**K7525**	**75**	**25**	**162**	**89,5**	**139,2**	**2,88**	**1**	**2**	*NEW
7	K9025	90	25	223	131	185,7	6	1	2	
8	K11025	110	25	225	131	185,7	6,76	1	2	
9	K12525	125	25	228	145	185,7	7,83	1	2	
10	K3232	32	32	142,6	81	142,6	1,83			Standard art. 20605
11	K4032	40	32	156	81	142,6	2,04	1	2	
12	K5032	50	32	158	81	142,6	2,19	1	2	
13	K6332	63	32	162	81	142,6	2,53	1	2	
14	**K7532**	**75**	**32**	**162**	**89,5**	**142,6**	**3**	**1**	**2**	*NEW
15	K9032	90	32	223	131	189,1	6,12	1	2	
16	K11032	110	32	225	131	189,1	6,87	1	2	
17	K12532	125	32	228	145	189,1	7,94	1	2	
18	K4040	40	40	156	81	156	2,26			Standard art. 20606
19	K5040	50	40	158	81	156	2,4	1	2	
20	K6340	63	40	162	81	156	2,74	1	2	
21	**K7540**	**75**	**40**	**162**	**89,5**	**156**	**3,21**	**1**	**2**	*NEW
22	K9040	90	40	223	131	202,5	6,33	1	2	
23	K11040	110	40	225	131	202,5	7,09	1	2	
24	K12540	125	40	228	145	202,5	8,16	1	2	
25	K5050	50	50	158	81	158	2,55			Standard art. 20607
26	K6350	63	50	162	81	158	2,89	1	2	
27	**K7550**	**75**	**50**	**162**	**89,5**	**158**	**3,36**	**1**	**2**	*NEW
28	K9050	90	50	223	131	204,5	6,48	1	2	
29	K11050	110	50	225	131	204,5	7,23	1	2	
30	K12550	125	50	228	145	204,5	8,3	1	2	
31	K6363	63	63	162	81	162	3,23			Standard art. 20608
32	**K7563**	**75**	**63**	**162**	**89,5**	**162**	**3,7**	**1**	**2**	*NEW
33	K9063	90	63	223	131	208,5	6,82	1	2	
34	K11063	110	63	225	131	208,5	7,57	1	2	
35	K12563	125	63	228	145	208,5	8,64	1	2	
36	K7575	75	75	162	89,5	162	4,16			Standard art. 20609
37	K9075	90	75	223	131	208,5	7,28	1	2	
38	K11075	110	75	225	131	208,5	8,04	1	2	
39	K12575	125	75	228	145	208,5	9,11	1	2	
40	K9090	90	90	210,5	131	210,5	7,62			Standard art. 20610
41	K11090	110	90	212,5	131	210,5	8,38	1	2	
42	K12590	125	90	215,5	145	210,5	9,45	1	2	
43	K110110	110	110	212,5	131	212,5	9,13			Standard art. 20611
44	K125110	125	110	215,5	145	212,5	10,2	1	2	
45	K125125	125	125	215,5	145	215,5	11,28	1	2	



*** Compact version**
can be used for DUO 75 mm insulated PEX pipes

13.1.11 COMBI- Knee 90° with female thread

Line N°	Art. Nr.	1	2	L	B	H	kg			
1	K2534	25	3/4"	139,2	81	92	1,65	1	1	
2	K2544	25	4/4"	139,2	81	92	1,6	1	1	
3	K2554	25	5/4"	139,2	81	92	1,51	1	1	
4	K2564	25	6/4"	139,2	81	92	1,43	1	1	
5	K3234	32	3/4"	142,6	81	92	1,77	1	1	
6	K3244	32	4/4"	142,6	81	92	1,72	1	1	
7	K3254	32	5/4"	142,6	81	92	1,63	1	1	
8	K3264	32	6/4"	142,6	81	92	1,54	1	1	
9	K4034	40	3/4"	156	81	92	1,98	1	1	
10	K4044	40	4/4"	156	81	92	1,93	1	1	
11	K4054	40	5/4"	156	81	92	1,84	1	1	
12	K4064	40	6/4"	156	81	92	1,76	1	1	
13	K5034	50	3/4"	158	81	92	2,13	1	1	
14	K5044	50	4/4"	158	81	92	2,08	1	1	
15	K5054	50	5/4"	158	81	92	1,99	1	1	
16	K5064	50	6/4"	158	81	92	1,9	1	1	
17	K6334	63	3/4"	162	81	92	2,46	1	1	
18	K6344	63	4/4"	162	81	92	2,42	1	1	
19	K6354	63	5/4"	162	81	92	2,33	1	1	
20	K6364	63	6/4"	162	81	92	2,24	1	1	
21	K7534	75	3/4"	162	89,5	92	2,93	1	1	*NEW
22	K7544	75	4/4"	162	89,5	92	2,89	1	1	*NEW
23	K7554	75	5/4"	162	89,5	92	2,79	1	1	*NEW
24	K7564	75	6/4"	162	89,5	92	2,71	1	1	*NEW
25	K9034	90	3/4"	223	131	138,5	6,05	1	1	
26	K9044	90	4/4"	223	131	138,5	6,01	1	1	
27	K9054	90	5/4"	223	131	138,5	5,91	1	1	
28	K9064	90	6/4"	223	131	138,5	5,83	1	1	
29	K11034	110	3/4"	225	131	138,5	6,81	1	1	
30	K11044	110	4/4"	225	131	138,5	6,76	1	1	
31	K11054	110	5/4"	225	131	138,5	6,67	1	1	
32	K11064	110	6/4"	225	131	138,5	6,59	1	1	
33	K12534	125	3/4"	228	145	138,5	7,88	1	1	
34	K12544	125	4/4"	228	145	138,5	7,83	1	1	
35	K12554	125	5/4"	228	145	138,5	7,74	1	1	
36	K12564	125	6/4"	228	145	138,5	7,66	1	1	



*** Compact version**
can be used for DUO 75 mm insulated PEX pipes

13.2 Pressure los tables PEX pipes SDR11 20 - 40 mm
Power in W ΔT 20° C

Water temperature: 80°C

		PEX-a-pipe							
		20 x 2		25 x 2.3		32 x 2.9		40 x 3.7	
l/s	Δt: 20°C watt	R m/s	W Pa/m	R m/s	W Pa/m	R m/s	W Pa/m	R m/s	W Pa/m
1	2	3	4	5	6	7	8	9	10
0,030	2512,0	0,15	23,7	0,09	7,5				
0,035	2930,7	0,17	31,0	0,11	9,8				
0,040	3349,4	0,20	39,1	0,12	12,3				
0,045	3768,1	0,22	48,1	0,14	15,1				
0,050	4186,8	0,25	57,9	0,16	18,2	0,09	5,5		
0,055	4605,5	0,27	66,4	0,17	21,5	0,10	6,5		
0,060	5024,1	0,30	79,7	0,18	25,0	0,11	7,6		
0,065	5442,8	0,32	91,8	0,20	28,7	0,12	8,7		
0,070	5861,5	0,35	104,7	0,21	32,7	0,13	9,9		
0,075	6280,2	0,37	118,3	0,23	36,9	0,14	11,2	0,09	4,0
0,080	6698,9	0,40	132,6	0,24	41,4	0,15	12,5	0,10	4,4
0,085	7117,5	0,42	147,7	0,26	46,0	0,16	13,9	0,10	4,9
0,090	7536,2	0,45	163,5	0,28	50,9	0,17	15,4	0,11	5,4
0,095	7954,0	0,47	180,0	0,29	56,0	0,18	16,9	0,11	6,0
0,100	8373,6	0,50	197,3	0,31	61,4	0,19	18,5	0,12	6,5
0,120	10048,3	0,60	273,3	0,37	84,8	0,22	25,6	0,14	9,0
0,140	11723,0	0,70	360,6	0,43	111,5	0,26	33,6	0,17	11,8
0,160	13397,7	0,80	458,8	0,49	141,6	0,30	42,5	0,19	14,9
0,180	15072,4	0,90	567,8	0,55	174,9	0,33	52,4	0,22	18,4
0,200	16747,0	0,99	887,5	0,61	211,3	0,37	63,2	0,24	22,1
0,220	18421,9	1,09	817,7	0,67	250,9	0,41	74,9	0,26	26,2
0,240	20096,6	1,19	958,5	0,73	239,5	0,45	87,5	0,29	30,6
0,260	21771,3	1,29	1109,6	0,80	339,3	0,48	101,0	0,31	35,3
0,280	23446,0	1,39	1271,2	0,86	388,1	0,52	115,4	0,34	40,3
0,300	25120,8	1,49	1443,0	0,92	439,9	0,56	130,7	0,36	45,5
0,320	26795,5	1,59	1625,0	0,98	494,7	0,59	146,8	0,38	51,1
0,340	28470,2	1,69	1817,3	1,04	552,4	0,63	163,7	0,41	57,0
0,360	30144,9	1,79	2019,8	1,10	613,2	0,67	181,5	0,43	63,1
0,380	31819,6	1,89	2232,4	1,16	676,9	0,70	200,2	0,46	69,5
0,400	33494,4	1,99	2455,1	1,22	743,5	0,74	219,6	0,48	76,3
0,420	35169,1			1,28	813,1	0,78	240,0	0,50	83,2
0,440	36843,8			1,35	885,6	0,82	261,1	0,53	90,5
0,460	38518,5			1,41	961,0	0,85	283,1	0,55	98,1
0,480	40193,2			1,47	1039,3	0,89	305,8	0,58	105,9
0,500	41868,0			1,53	1120,5	0,93	329,4	0,60	114,0
0,550	46054,8			1,68	1336,0	1,02	392,0	0,66	135,4
0,600	50241,6			1,84	1569,5	1,11	459,6	0,72	158,6
0,650	54428,4			1,99	1820,8	1,21	532,2	0,78	183,4
0,700	58615,2					1,30	609,8	0,84	209,8
0,750	62802,0					1,39	692,3	0,90	237,9
0,800	66988,8					1,48	779,8	0,96	267,7
0,850	71175,6					1,58	872,2	1,02	299,0
0,900	75362,4					1,67	969,4	1,08	332,0
0,950	79549,2					1,76	1071,5	1,14	366,6
1,000	83736,0					1,85	1178,5	1,20	402,8
1,050	87922,8					1,95	1290,3	1,26	440,6
1,100	92109,6					2,04	1406,9	1,32	480,0
1,150	96296,4							1,38	521,0
1,200	100483,2							1,44	563,5
1,250	104670,0							1,50	607,6
1,300	108856,8							1,56	653,3
1,350	113043,6							1,62	700,6
1,400	117230,4							1,68	749,4
1,450	121417,2							1,74	799,8
1,500	125604,0							1,80	851,7
1,550	129790,8							1,86	905,2
1,600	133977,6							1,92	960,3
1,650	138164,4							1,98	1016,9
1,700	142351,2							2,04	1075,0

Conversion: 1 Watt = 0.860 Kcal
Roughness of the pipe: 0.007
Density of water: 971.9 kg/m³

▲ *Table 23*

13.3 Pressure los tables PEX pipes SDR11 50 - 110 mm
Power in W ΔT 20° C

Water temperature: 80°C

		PEX-a-pipe						PEX-a-pipe						PEX-a-pipe	
		50 x 4.6		63 x 5.7				75 x 6.8		90 x 8.2				110 x 10	
ℓ/s	Δt: 20°C Watt	W m/s	R Pa/m	W m/s	R Pa/m	ℓ/s	Δt: 20°C Watt	W m/s	R Pa/m	W m/s	R Pa/m	ℓ/s	Δt: 20°C Watt	W m/s	R Pa/m
11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
0,100	8373,6	0,08	2,3	0,05	0,7	0,30	25116	0,10	2,2	0,07	0,9	0,40	33488	0,06	0,6
0,150	12560,4	0,11	4,6	0,07	1,5	0,35	29302	0,12	2,9	0,08	1,2	0,50	41860	0,08	0,9
0,200	16747,2	0,15	7,6	0,10	2,5	0,40	33488	0,14	3,7	0,09	1,5	0,60	50233	0,09	1,2
0,250	20934,0	0,19	11,2	0,12	3,7	0,45	37674	0,15	4,5	0,11	1,9	0,70	58605	0,11	1,6
0,300	25120,8	0,23	15,5	0,14	5,0	0,50	41860	0,17	5,4	0,12	2,3	0,80	66977	0,13	2,0
0,350	29307,6	0,27	20,4	0,17	6,6	0,55	46047	0,19	6,4	0,13	2,7	0,90	75349	0,14	2,5
0,400	33494,4	0,31	25,9	0,19	8,4	0,60	50233	0,20	7,5	0,14	3,1	1,00	83721	0,16	3,0
0,450	37681,2	0,34	31,9	0,22	10,3	0,65	54419	0,22	8,6	0,15	3,6	1,20	100465	0,19	4,1
0,500	41868,0	0,38	38,6	0,24	12,5	0,70	58605	0,24	9,9	0,16	4,1	1,40	117209	0,22	5,4
0,550	46054,8	0,42	45,8	0,26	14,8	0,75	62791	0,25	11,2	0,18	4,7	1,60	133953	0,25	6,9
0,600	50241,6	0,46	53,5	0,29	17,3	0,80	66977	0,27	12,5	0,19	5,2	1,80	150698	0,28	8,5
0,650	54428,4	0,50	61,8	0,31	19,9	0,85	71163	0,29	14,0	0,20	5,8	2,00	167442	0,31	10,3
0,700	58615,2	0,54	70,7	0,33	22,8	0,90	75349	0,30	15,5	0,21	6,5	2,40	200930	0,38	14,3
0,750	62802,0	0,57	80,1	0,36	25,8	0,95	79535	0,32	17,0	0,22	7,1	2,80	234419	0,44	18,9
0,800	66988,8	0,61	90,0	0,38	28,9	1,00	83721	0,34	18,7	0,24	7,8	3,20	267907	0,50	24,1
0,850	71175,6	0,65	100,4	0,41	32,3	1,05	87907	0,35	20,4	0,25	8,5	3,60	301395	0,57	29,8
0,900	75362,4	0,69	111,4	0,43	35,8	1,10	92093	0,37	22,2	0,26	9,3	4,00	334884	0,63	36,2
0,950	79549,2	0,73	122,9	0,45	39,4	1,15	96279	0,39	24,0	0,27	10,0	4,40	368372	0,69	43,0
1,000	83736,0	0,76	134,9	0,48	43,2	1,20	100465	0,41	25,9	0,28	10,8	4,80	401860	0,75	50,5
1,050	87922,8	0,80	147,4	0,50	47,2	1,30	108837	0,44	30,0	0,31	12,5	5,20	435349	0,82	58,4
1,100	92109,6	0,84	160,5	0,53	51,4	1,40	117209	0,47	34,3	0,33	14,3	5,60	468837	0,88	66,9
1,150	96296,4	0,88	174,0	0,55	55,7	1,50	125581	0,51	38,8	0,35	16,2	6,00	502326	0,94	76,0
1,200	100483,2	0,92	188,1	0,57	60,1	1,60	133953	0,54	43,6	0,38	18,2	6,40	535814	1,01	85,6
1,250	104670,0	0,96	202,7	0,60	64,7	1,70	142326	0,57	48,7	0,40	20,3	6,80	569302	1,07	95,7
1,300	108856,8	0,99	217,8	0,62	69,5	1,80	150698	0,61	54,0	0,42	22,5	7,20	602791	1,13	106,3
1,350	113043,6	1,03	233,4	0,65	74,4	1,90	159070	0,64	59,6	0,45	24,8	7,50	627907	1,18	114,6
1,400	117230,4	1,07	249,5	0,67	79,5	2,00	167442	0,68	65,4	0,47	27,2	8,00	669767	1,26	129,2
1,450	121417,2	1,11	266,1	0,69	84,8	2,10	175814	0,71	71,5	0,49	29,7	8,40	703256	1,32	141,4
1,500	125604,0	1,15	283,2	0,72	90,2	2,20	184186	0,74	77,9	0,52	32,3	8,80	736744	1,38	154,1
1,550	129790,8	1,19	300,8	0,74	95,7	2,30	192558	0,78	84,4	0,54	35,0	9,20	770233	1,45	167,4
1,600	133977,6	1,22	318,8	0,77	101,4	2,40	200930	0,81	91,3	0,56	37,9	9,40	786977	1,48	174,2
1,650	138164,4	1,26	337,4	0,79	107,3	2,50	209302	0,84	98,3	0,59	40,8	9,60	803721	1,51	181,1
1,700	142351,2	1,30	356,5	0,81	113,3	2,60	217674	0,88	105,7	0,61	43,8	9,80	820465	1,54	188,2
1,750	146538,0	1,34	376,1	0,84	119,4	2,70	226047	0,91	113,2	0,63	46,9	10,00	837209	1,57	195,4
1,800	150724,8	1,38	396,2	0,86	125,8	2,80	234419	0,95	121,0	0,66	50,1	10,50	879070	1,65	214,0
1,900	159098,4	1,45	437,8	0,91	138,8	2,90	242791	0,98	129,1	0,68	53,4	11,00	920930	1,73	233,4
2,000	167472,0	1,53	481,3	0,96	152,5	3,00	251163	1,01	137,4	0,71	56,8	11,50	962791	1,81	253,5
2,100	175845,6	1,61	526,9	1,00	166,8	3,20	267907	1,08	154,7	0,75	63,9	12,00	1004651	1,89	274,5
2,200	184219,2	1,68	574,3	1,05	181,6	3,40	284651	1,15	172,9	0,80	71,4	12,50	1046512	1,96	296,3
2,300	192592,8	1,76	623,8	1,10	197,1	3,60	301395	1,22	192,2	0,85	79,3	13,00	1088372	2,04	318,8
2,400	200966,4	1,84	675,1	1,15	213,1	3,80	318140	1,28	212,3	0,89	87,6	13,50	1130233	2,12	342,2
2,500	209340,0	1,91	728,4	1,20	229,8	4,00	334884	1,35	233,4	0,94	96,2	14,00	1172093	2,20	366,3
2,600	217713,6	1,99	783,6	1,24	247,0	4,20	351628	1,42	255,5	0,99	105,3	14,50	1213953	2,28	391,2
2,700	226087,2			1,29	264,8	4,40	368372	1,49	278,5	1,03	114,7	15,00	1255814	2,36	416,9
2,800	234460,8			1,34	283,2	4,60	385116	1,55	302,4	1,08	124,4	15,50	1297674	2,44	443,4
2,900	242834,4			1,39	302,2	4,80	401860	1,62	327,3	1,13	134,6	16,00	1339535	2,52	470,7
3,000	251208,0			1,43	321,8	5,00	418605	1,69	353,1	1,18	145,1	16,50	1381395	2,59	498,8
3,100	259581,6			1,48	341,9	5,20	435349	1,76	379,8	1,22	156,0	17,00	1423256	2,67	527,6
3,200	267955,2			1,53	362,6	5,40	452093	1,82	407,5	1,27	167,3	17,50	1465116	2,75	557,2
3,300	276328,8			1,58	383,9	5,60	468837	1,89	436,1	1,32	178,9	18,00	1506977	2,83	587,7
3,400	284702,4			1,63	405,8	5,80	485581	1,96	465,6	1,36	190,9	18,50	1548838	2,91	618,8
3,500	293076,0			1,67	428,2	6,00	502326	2,03	496,0	1,41	203,3	19,00	1590698	2,99	650,8
3,600	301449,6			1,72	451,2	6,20	519070	2,09	527,4	1,46	216,0	19,50	1632558	3,07	683,6
3,700	309823,2			1,77	474,8	6,40	535814	2,16	559,6	1,50	229,1	20,00	1674419	3,14	717,1
3,800	318196,8			1,82	498,9	6,60	552558	2,23	592,8	1,55	242,6	20,50	1716279	3,22	751,4
3,900	326570,4			1,86	523,7	6,80	569302	2,30	626,9	1,60	256,5	21,00	1758140	3,30	786,5
4,000	334944,0			1,91	549,0	7,00	586047	2,36	661,9	1,65	270,7	21,50	1800000	3,38	822,3
4,100	343317,6			1,96	574,8	7,20	602791	2,43	697,9	1,69	285,2	22,00	1841860	3,46	858,9
4,200	351691,2			2,01	601,3	7,40	619535	2,50	734,7	1,74	300,2	22,50	1883721	3,54	896,3

Conversion: 1 Watt = 0.860 Kcal
Roughness of the pipe: 0.007
Density of water: 971.9 kg/m³

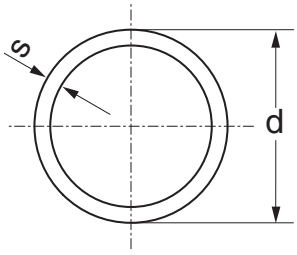
▲ *Table 24*

14 COMBI Fittings 22 x 3.0 and 28 x 4.0 for PEX pipes SDR 7.4

14.1 Field of application

Jentro has a special fittings programme for SDR 7.4 pipe sizes 22 x 3.0 and 28 x 4.0 and this, in combination with all possible SDR 7.4 pipe diameters from 25 to 63 mm.

Outside diameter d	Wall thickness s	Content ℓ/m	Weight Kg/m
22	3,0	0,20	0,261
25	3,5	0,25	0,238
28	4,0	0,314	0,347
32	4,4	0,42	0,382
40	5,5	0,66	0,594
50	6,9	1,03	0,926
63	8,7	1,63	1,470

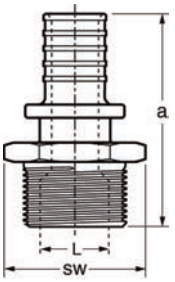


14.2 Brass fittings

14.2.1 Adapter with male thread

Line N°	Art. Nr.	dimension			a	sw	kg		
1	10099	22	3/4	B	51	27	0,107	50	10
2	10100	28	3/4	B	58,8	27	0,128	30	10

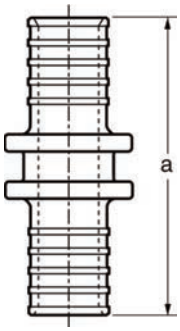
B= Brass



14.2.2 Coupling

Line N°.	Art. Nr.	dimension			a	sw	kg		
1	10300	22	22	B	51		0,071	50	10
2	10301	28	28	B	66,9		0,127	30	3

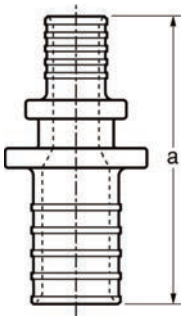
B= Brass



14.2.3 Coupling reducer

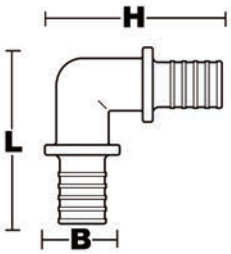
Line N°	Art. Nr.	dimension			a	sw	kg		
1	10400	28	22	B	58,7		0,096	30	3
2	10401	32	28	B	74,1		0,150	30	3

B= Brass



14.2.4 COMBI Knee 90°

Line N°	Art. Nr.	dimension		L	B	H	kg		
1	KS2222	22	22	81	34	81	0,397	1	2
2	KS2828	28	28	89,2	34	89,2	0,519	1	2
3	KS2522	25	22	90,25	34	81	0,447	1	2
4	KS2822	28	22	89,2	34	81	0,458	1	2
5	KS2825	28	25	89,2	34	90,25	0,508	1	2
6	KS2828	28	28	89,2	34	89,2	0,519	1	2
7	KS3222	32	22	95,9	39	81	0,515	1	2
8	KS3228	32	28	95,9	39	89,2	0,576	1	2
9	KS4022	40	22	152	73	128	2,011	1	2
10	KS4028	40	28	152	73	136,2	2,072	1	2
11	KS5022	50	22	156	73	128	2,264	1	2
12	KS5028	50	28	156	73	136,2	2,325	1	2
13	KS6322	63	22	160	74	128	2,559	1	2
14	KS6328	63	28	160	74	136,2	2,620	1	2

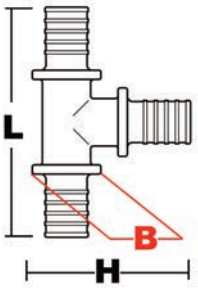


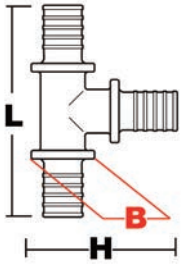
14.2.5 COMBI-T equal

Line N°	Art. Nr.	dimension			L	B	H	kg		
1	TS222222	22	22	22	128	34	92	0,562	1	3
2	TS282828	28	28	28	144	34	100	0,745	1	3

14.2.6 COMBI-T outlet with reduction

Line N°	Art. Nr.	dimension			L	B	H	kg			
1	TS252225	25	22	25	146,5	34	79,5	0,66	1	3	
2	TS282228	28	22	28	144,4	34	79,5	0,68	1	3	
3	TS282528	28	25	28	144,4	34	88,75	0,73	1	3	
4	TS322232	32	22	32	157,8	39	79,5	0,81	1	3	
5	TS322532	32	25	32	157,8	39	88,75	0,86			Standard art. 11107
6	TS322832	32	28	32	157,8	39	87,7	0,87	1	3	
7	TS402240	40	22	40	197	52	98,5	1,59	1	3	*NEW
8	TS402540	40	25	40	197	52	107,75	1,64			Standard art. 11109
9	TS402840	40	28	40	197	52	106,7	1,66	1	3	*NEW
10	TS403240	40	32	40	197	52	113,4	1,72			Standard art. 11110
11	TS502250	50	22	50	205	73	114,5	2,61	1	3	
12	TS502550	50	25	50	205	73	123,75	2,66	1	3	
13	TS502850	50	28	50	205	73	122,7	2,67	1	3	
14	TS503250	50	32	50	205	73	129,4	2,74			Standard art. 11111
15	TS504050	50	40	50	239	52	152	3,65	1	3	
16	TS632263	63	22	63	213	74	114,5	3,2	1	3	
17	TS632563	63	25	63	213	74	123,75	3,25	1	3	
18	TS632863	63	28	63	213	74	122,7	3,26	1	3	
19	TS633263	63	32	63	213	74	129,4	3,33			Standard art. 11112
20	TS634063	63	40	63	247	52	152	4,24			Standard art. 11113
21	TS635063	63	50	63	247	74	156	4,49			Standard art. 11114

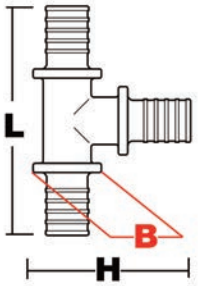




*** Compact version**
can be used for DUO 40 mm insulated PEX pipes

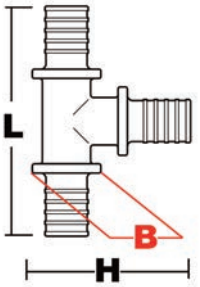
14.2.7 COMBI-T with reduced flow

Line N°	Art. Nr.	dimension			L	B	H	kg			
1	TS252522	25	25	22	137,25	34	88,75	0,66	1	3	
2	TS282822	28	28	22	136,2	34	87,7	0,68	1	3	
3	TS282825	28	28	25	145,45	34	87,7	0,73	1	3	
4	TS323222	32	32	22	142,9	39	94,4	0,81	1	3	
5	TS323225	32	32	25	152,15	39	94,4	0,86			Standard art. 11206
6	TS323228	32	32	28	151,1	39	94,4	0,87	1	3	
7	TS404022	40	40	22	207	52	152	2,85	1	3	
8	TS404025	40	40	25	216,25	52	152	2,9	1	3	
9	TS404028	40	40	28	215,2	52	152	2,91	1	3	
10	TS404032	40	40	32	221,9	52	152	2,98	1	3	
11	TS505022	50	50	22	211	73	156	3,36	1	3	
12	TS505025	50	50	25	220,25	73	156	3,41	1	3	
13	TS505028	50	50	28	219,2	73	156	3,42	1	3	
14	TS505032	50	50	32	225,9	73	156	3,48	1	3	
15	TS505040	50	50	40	235	73	156	3,65	1	3	
16	TS636322	63	63	22	215	74	160	3,95	1	3	
17	TS636325	63	63	25	224,25	74	160	4	1	3	
18	TS636328	63	63	28	223,2	74	160	4,01	1	3	
19	TS636332	63	63	32	229,9	74	160	4,07	1	3	
20	TS636340	63	63	40	239	74	160	4,24	1	3	
21	TS636350	63	63	50	243	74	160	4,49	1	3	



14.2.8 COMBI-T with outlets equally reduced

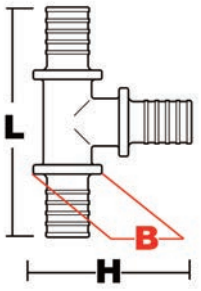
Line N°.	Art. Nr.	dimension			L	B	H	kg			
1	TS252222	25	22	22	137,25	34	79,5	0,61	1	3	
2	TS282222	28	22	22	136,2	34	79,5	0,62	1	3	
3	TS282525	28	25	25	145,45	34	88,75	0,72	1	3	
4	TS322222	32	22	22	142,9	39	79,5	0,69	1	3	
5	TS322525	32	25	25	152,15	39	88,75	0,79			Standard art. 11306
6	TS322828	32	28	28	151,1	39	87,7	0,81	1	3	
7	TS402222	40	22	22	164,5	52	94	1,09	1	3	*NEW
8	TS402525	40	25	25	173,75	52	103,25	1,19	1	3	*NEW
9	TS402828	40	28	28	172,7	52	102,2	1,21	1	3	*NEW
10	TS403232	40	32	32	179,4	52	108,9	1,34			Standard art. 11307
11	TS502222	50	22	22	168,5	73	114,5	1,67	1	3	
12	TS502525	50	25	25	177,75	73	123,75	1,77	1	3	
13	TS502828	50	28	28	176,7	73	122,7	1,8	1	3	
14	TS503232	50	32	32	183,4	73	129,4	1,92	1	3	
15	TS504040	50	40	40	235	52	152	3,39	1	3	
16	TS632222	63	22	22	172,5	74	114,5	1,97	1	3	
17	TS632525	63	25	25	181,75	74	123,75	2,07	1	3	
18	TS632828	63	28	28	180,7	74	122,7	2,09	1	3	
19	TS633232	63	32	32	187,4	74	129,4	2,22	1	3	
20	TS634040	63	40	40	239	52	152	3,69	1	3	
21	TS635050	63	50	50	243	74	156	4,19	1	3	



*** Compact version**
can be used for DUO 40 mm insulated PEX pipes

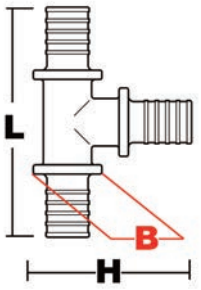
14.2.9 COMBI-T reduced with branch < flow

Line N°	Art. Nr.	dimension			L	B	H	kg			
1	TS282225	28	22	25	145,45	34	79,5	0,67	1	3	
2	TS322225	32	22	25	152,15	39	79,5	0,74	1	3	
3	TS322228	32	22	28	151,1	39	79,5	0,75	1	3	
4	TS322528	32	25	28	151,1	39	88,75	0,8	1	3	
5	TS402225	40	22	25	173,75	52	94	1,14	1	3	*NEW
6	TS402228	40	22	28	172,7	52	94	1,15	1	3	*NEW
7	TS402232	40	22	32	179,4	52	94	1,22	1	3	*NEW
8	TS402528	40	25	28	172,7	52	103,25	1,2	1	3	*NEW
9	TS402532	40	25	32	179,4	52	103,25	1,27	1	3	*NEW
10	TS402832	40	28	32	179,4	52	102,2	1,28	1	3	*NEW
11	TS502225	50	22	25	177,75	73	114,5	1,72	1	3	
12	TS502228	50	22	28	176,7	73	114,5	1,74	1	3	
13	TS502232	50	22	32	183,4	73	114,5	1,8	1	3	
14	TS502240	50	22	40	201	73	114,5	2,36	1	3	
15	TS502528	50	25	28	176,7	73	123,75	1,79	1	3	
16	TS502532	50	25	32	183,4	73	123,75	1,85	1	3	
17	TS502540	50	25	40	201	73	123,75	2,41	1	3	
18	TS502832	50	28	32	183,4	73	122,7	1,86	1	3	
19	TS502840	50	28	40	201	73	122,7	2,42	1	3	
20	TS503240	50	32	40	201	73	129,4	2,48			Standard art. 11408
21	TS632225	63	22	25	181,75	74	114,5	2,02	1	3	
22	TS632228	63	22	28	180,7	74	114,5	2,03	1	3	
23	TS632232	63	22	32	187,4	74	114,5	2,09	1	3	
24	TS632240	63	22	40	205	74	114,5	2,65	1	3	
25	TS632250	63	22	50	209	74	114,5	2,91	1	3	
26	TS632528	63	25	28	180,7	74	123,75	2,08	1	3	
27	TS632532	63	25	32	187,4	74	123,75	2,14	1	3	
28	TS632540	63	25	40	205	74	123,75	2,7	1	3	
29	TS632550	63	25	50	209	74	123,75	2,96	1	3	
30	TS632832	63	28	32	187,4	74	122,7	2,16	1	3	
31	TS632840	63	28	40	205	74	122,7	2,71	1	3	
32	TS632850	63	28	50	209	74	122,7	2,97	1	3	
33	TS633240	63	32	40	205	74	129,4	2,78	1	3	
34	TS633250	63	32	50	209	74	129,4	3,03			Standard art. 11409
35	TS634050	63	40	50	243	52	152	3,94	1	3	



14.2.10 COMBI-T reduced with branch > flow

Line N°	Art. Nr.	dimension			L	B	H	kg			
1	TS282522	28	25	22	136,2	34	88,75	0,67	1	3	
2	TS322522	32	25	22	142,9	39	88,75	0,74	1	3	
3	TS322822	32	28	22	142,9	39	87,7	0,75	1	3	
4	TS322825	32	28	25	152,15	39	87,7	0,8	1	3	
5	TS402522	40	25	22	164,5	52	103,25	1,14	1	3	*NEW
6	TS402822	40	28	22	164,5	52	102,2	1,15	1	3	*NEW
7	TS402825	40	28	25	173,75	52	102,2	1,2	1	3	*NEW
8	TS403222	40	32	22	164,5	52	108,9	1,22	1	3	*NEW
9	TS403225	40	32	25	173,75	52	108,9	1,27	1	3	*NEW
10	TS403228	40	32	28	172,7	52	108,9	1,28	1	3	*NEW
11	TS502522	50	25	22	168,5	73	123,75	1,72	1	3	
12	TS502822	50	28	22	168,5	73	122,7	1,74	1	3	
13	TS502825	50	28	25	177,75	73	122,7	1,79	1	3	
14	TS503222	50	32	22	168,5	73	129,4	1,8	1	3	
15	TS503225	50	32	25	177,75	73	129,4	1,85	1	3	
16	TS503228	50	32	28	176,7	73	129,4	1,86	1	3	
17	TS504022	50	40	22	211	52	152	3,1	1	3	
18	TS504025	50	40	25	220,25	52	152	3,15	1	3	
19	TS504028	50	40	28	219,2	52	152	3,16	1	3	
20	TS504032	50	40	32	225,9	52	152	3,23	1	3	
21	TS632522	63	25	22	172,5	74	123,75	2,02	1	3	
22	TS632822	63	28	22	172,5	74	122,7	2,03	1	3	
23	TS632825	63	28	25	181,75	74	122,7	2,08	1	3	
24	TS633222	63	32	22	172,5	74	129,4	2,09	1	3	



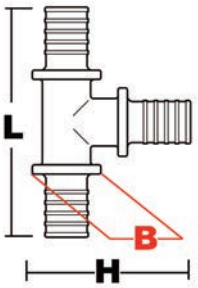
*** Compact version**
can be used for DUO 40 mm insulated PEX pipes

Line N°	Art. Nr.	dimension			L	B	H	kg		
25	TS633225	63	32	25	181,75	74	129,4	2,14	1	3
26	TS633228	63	32	28	180,7	74	129,4	2,16	1	3
27	TS634022	63	40	22	215	52	152	3,4	1	3
28	TS634025	63	40	25	224,25	52	152	3,45	1	3
29	TS634028	63	40	28	223,2	52	152	3,46	1	3
30	TS634032	63	40	32	229,9	52	152	3,52	1	3
31	TS635022	63	50	22	215	74	156	3,65	1	3
32	TS635025	63	50	25	224,25	74	156	3,7	1	3
33	TS635028	63	50	28	223,2	74	156	3,71	1	3
34	TS635032	63	50	32	229,9	74	156	3,78	1	3
35	TS635040	63	50	40	239	74	156	3,94	1	3

14.2.11 COMBI-T with increased branching

Line N°	Art. Nr.	dimension			L	B	H	kg		
1	TS222522	22	25	22	128	34	88,75	0,61	1	3
2	TS222822	22	28	22	128	34	87,7	0,62	1	3
3	TS223222	22	32	22	128	39	94,4	0,69	1	3
4	TS224022	22	40	22	183	52	152	2,56	1	3
5	TS225022	22	50	22	183	73	156	2,81	1	3
6	TS226322	22	63	22	183	74	160	3,11	1	3
7	TS252822	25	28	22	137,25	34	87,7	0,67	1	3
8	TS252825	25	28	25	146,5	34	87,7	0,72	1	3
9	TS253222	25	32	22	137,25	39	94,4	0,74	1	3
10	TS253225	25	32	25	146,5	39	94,4	0,79		
11	TS254022	25	40	22	192,25	52	152	2,61	1	3
12	TS254025	25	40	25	201,5	52	152	2,66	1	3
13	TS255022	25	50	22	192,25	73	156	2,86	1	3
14	TS255025	25	50	25	201,5	73	156	2,91	1	3
15	TS256322	25	63	22	192,25	74	160	3,16	1	3
16	TS256325	25	63	25	201,5	74	160	3,21	1	3
17	TS283222	28	32	22	136,2	39	94,4	0,75	1	3
18	TS283225	28	32	25	145,45	39	94,4	0,8	1	3
19	TS283228	28	32	28	144,4	39	94,4	0,81	1	3
20	TS284022	28	40	22	191,2	52	152	2,62	1	3
21	TS284025	28	40	25	200,45	52	152	2,67	1	3
22	TS284028	28	40	28	199,4	52	152	2,68	1	3
23	TS285022	28	50	22	191,2	73	156	2,88	1	3
24	TS285025	28	50	25	200,45	73	156	2,93	1	3
25	TS285028	28	50	28	199,4	73	156	2,94	1	3
26	TS286322	28	63	22	191,2	74	160	3,17	1	3
27	TS286325	28	63	25	200,45	74	160	3,22	1	3
28	TS286328	28	63	28	199,4	74	160	3,23	1	3
29	TS324022	32	40	22	197,9	52	152	2,69	1	3
30	TS324025	32	40	25	207,15	52	152	2,74	1	3
31	TS324028	32	40	28	206,1	52	152	2,75	1	3
32	TS324032	32	40	32	212,8	52	152	2,81	1	3
33	TS325022	32	50	22	197,9	73	156	2,94	1	3
34	TS325025	32	50	25	207,15	73	156	2,99	1	3
35	TS325028	32	50	28	206,1	73	156	3	1	3
36	TS325032	32	50	32	212,8	73	156	3,06	1	3
37	TS326322	32	63	22	197,9	74	160	3,23	1	3
38	TS326325	32	63	25	207,15	74	160	3,28	1	3
39	TS326328	32	63	28	206,1	74	160	3,3	1	3
40	TS326332	32	63	32	212,8	74	160	3,36	1	3
41	TS405022	40	50	22	207	52	156	3,1	1	3
42	TS405025	40	50	25	216,25	52	156	3,15	1	3
43	TS405028	40	50	28	215,2	52	156	3,16	1	3
44	TS405032	40	50	32	221,9	52	156	3,23	1	3
45	TS405040	40	50	40	231	52	156	3,39	1	3
46	TS406322	40	63	22	207	52	160	3,4	1	3
47	TS406325	40	63	25	216,25	52	160	3,45	1	3

Standard art. 11507



Line N°	Art. Nr.	dimension			L	B	H	kg		
48	TS406328	40	63	28	215,2	52	160	3,46	1	3
49	TS406332	40	63	32	221,9	52	160	3,52	1	3
50	TS406340	40	63	40	231	52	160	3,69	1	3
51	TS506322	50	63	22	211	74	160	3,65	1	3
52	TS506325	50	63	25	220,25	74	160	3,7	1	3
53	TS506328	50	63	28	219,2	74	160	3,71	1	3
54	TS506332	50	63	32	225,9	74	160	3,78	1	3
55	TS506340	50	63	40	235	74	160	3,94	1	3
56	TS506350	50	63	50	239	74	160	4,19	1	3

14.3 Tools for tubes 22 x 3.0 and 28 x 4.0

14.3.1 Jentro double compression heads 22/28

Art. nr: 15603 22 + 28 mm

14.3.2 Expander for PEX pipes 22 en 28 mm

Art. nr: 13042 22 x 3.0 mm
Art. nr: 13009 28 x 4.0 mm

15 COMBI Fittings for SDR 7.4 PEX pipes

15.1 Field of application

Outside the normal extensive standard programme of fittings, Jentro manufactures all possible combinations that are not available as standard from sizes 22 to 63 mm.

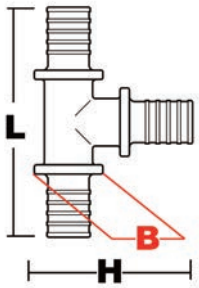
These both in T-pieces, coupling elements, elbows, all possible reducers and combinations with female thread.

The pieces are normally available for transport within 24 hours following order.

A selection from the programme can be found below.

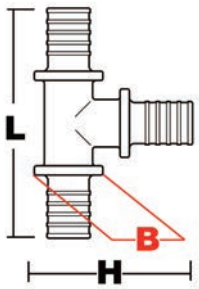
15.1.1 COMBI-T with reduced branching

Line N°	Art. Nr.	dimension			L	B	H	kg			
1	TS252225	25	22	25	146,5	34	79,5	0,66	1	3	
2	TS282228	28	22	28	144,4	34	79,5	0,68	1	3	
3	TS282528	28	25	28	144,4	34	88,75	0,73	1	3	
4	TS322232	32	22	32	157,8	39	79,5	0,81	1	3	
5	TS322532	32	25	32	157,8	39	88,75	0,86			Standard art. 11107
6	TS322832	32	28	32	157,8	39	87,7	0,87	1	3	
7	TS402240	40	22	40	197	52	98,5	1,59	1	3	*NEW
8	TS402540	40	25	40	197	52	107,75	1,64			Standard art. 11109
9	TS402840	40	28	40	197	52	106,7	1,66	1	3	*NEW
10	TS403240	40	32	40	197	52	113,4	1,72			Standard art. 11110
11	TS502250	50	22	50	205	73	114,5	2,61	1	3	
12	TS502550	50	25	50	205	73	123,75	2,66	1	3	
13	TS502850	50	28	50	205	73	122,7	2,67	1	3	
14	TS503250	50	32	50	205	73	129,4	2,74			Standard art. 11111
15	TS504050	50	40	50	239	52	152	3,65	1	3	
16	TS632263	63	22	63	213	74	114,5	3,2	1	3	
17	TS632563	63	25	63	213	74	123,75	3,25	1	3	
18	TS632863	63	28	63	213	74	122,7	3,26	1	3	
19	TS633263	63	32	63	213	74	129,4	3,33			Standard art. 11112
20	TS634063	63	40	63	247	52	152	4,24			Standard art. 11113
21	TS635063	63	50	63	247	74	156	4,49			Standard art. 11114



15.1.2 COMBI-T with reduced flow

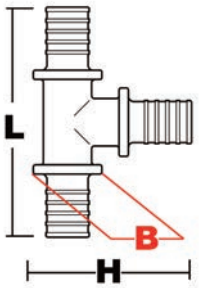
Line N°	Art. Nr.	dimension			L	B	H	kg			
1	TS252522	25	25	22	137,25	34	88,75	0,66	1	3	
2	TS282822	28	28	22	136,2	34	87,7	0,68	1	3	
3	TS282825	28	28	25	145,45	34	87,7	0,73	1	3	
4	TS323222	32	32	22	142,9	39	94,4	0,81	1	3	
5	TS323225	32	32	25	152,15	39	94,4	0,86			Standard art. 11206
6	TS323228	32	32	28	151,1	39	94,4	0,87	1	3	
7	TS404022	40	40	22	207	52	152	2,85	1	3	
8	TS404025	40	40	25	216,25	52	152	2,9	1	3	
9	TS404028	40	40	28	215,2	52	152	2,91	1	3	
10	TS404032	40	40	32	221,9	52	152	2,98	1	3	
11	TS505022	50	50	22	211	73	156	3,36	1	3	
12	TS505025	50	50	25	220,25	73	156	3,41	1	3	
13	TS505028	50	50	28	219,2	73	156	3,42	1	3	
14	TS505032	50	50	32	225,9	73	156	3,48	1	3	
15	TS505040	50	50	40	235	73	156	3,65	1	3	
16	TS636322	63	63	22	215	74	160	3,95	1	3	
17	TS636325	63	63	25	224,25	74	160	4	1	3	
18	TS636328	63	63	28	223,2	74	160	4,01	1	3	
19	TS636332	63	63	32	229,9	74	160	4,07	1	3	
20	TS636340	63	63	40	239	74	160	4,24	1	3	
21	TS636350	63	63	50	243	74	160	4,49	1	3	



*** Compact version**
can be used for DUO 40 mm insulated PEX pipes

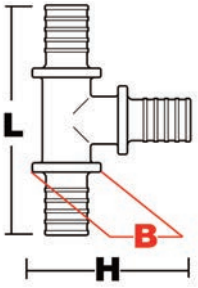
15.1.3 COMBI-T with EQUALLY reduced branching and flow

Line N°	Art. Nr.	dimension			L	B	H	kg			
1	TS252222	25	22	22	137,25	34	79,5	0,61	1	3	
2	TS282222	28	22	22	136,2	34	79,5	0,62	1	3	
3	TS282525	28	25	25	145,45	34	88,75	0,72	1	3	
4	TS322222	32	22	22	142,9	39	79,5	0,69	1	3	
5	TS322525	32	25	25	152,15	39	88,75	0,79			Standard art. 11306
6	TS322828	32	28	28	151,1	39	87,7	0,81	1	3	
7	**TS402222**	**40**	**22**	**22**	**164,5**	**52**	**94**	**1,09**	**1**	**3**	*NEW
8	**TS402525**	**40**	**25**	**25**	**173,75**	**52**	**103,25**	**1,19**	**1**	**3**	*NEW
9	**TS402828**	**40**	**28**	**28**	**172,7**	**52**	**102,2**	**1,21**	**1**	**3**	*NEW
10	TS403232	40	32	32	179,4	52	108,9	1,34			Standard art. 11307
11	TS502222	50	22	22	168,5	73	114,5	1,67	1	3	
12	TS502525	50	25	25	177,75	73	123,75	1,77	1	3	
13	TS502828	50	28	28	176,7	73	122,7	1,8	1	3	
14	TS503232	50	32	32	183,4	73	129,4	1,92	1	3	
15	TS504040	50	40	40	235	52	152	3,39	1	3	
16	TS632222	63	22	22	172,5	74	114,5	1,97	1	3	
17	TS632525	63	25	25	181,75	74	123,75	2,07	1	3	
18	TS632828	63	28	28	180,7	74	122,7	2,09	1	3	
19	TS633232	63	32	32	187,4	74	129,4	2,22	1	3	
20	TS634040	63	40	40	239	52	152	3,69	1	3	
21	TS635050	63	50	50	243	74	156	4,19	1	3	



15.1.4 COMBI-T with reduced branching > reduced flow

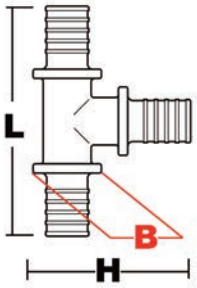
Line N°	Art. Nr.	dimension			L	B	H	kg			
1	TS282225	28	22	25	145,45	34	79,5	0,67	1	3	
2	TS322225	32	22	25	152,15	39	79,5	0,74	1	3	
3	TS322228	32	22	28	151,1	39	79,5	0,75	1	3	
4	TS322528	32	25	28	151,1	39	88,75	0,8	1	3	
5	**TS402522**	**40**	**25**	**22**	**164,5**	**52**	**103,25**	**1,14**	**1**	**3**	*NEW
6	**TS402822**	**40**	**28**	**22**	**164,5**	**52**	**102,2**	**1,15**	**1**	**3**	*NEW
7	**TS402825**	**40**	**28**	**25**	**173,75**	**52**	**102,2**	**1,2**	**1**	**3**	*NEW
8	**TS403222**	**40**	**32**	**22**	**164,5**	**52**	**108,9**	**1,22**	**1**	**3**	*NEW
9	**TS403225**	**40**	**32**	**25**	**173,75**	**52**	**108,9**	**1,27**	**1**	**3**	*NEW
10	**TS403228**	**40**	**32**	**28**	**172,7**	**52**	**108,9**	**1,28**	**1**	**3**	*NEW
11	TS502225	50	22	25	177,75	73	114,5	1,72	1	3	
12	TS502228	50	22	28	176,7	73	114,5	1,74	1	3	
13	TS502232	50	22	32	183,4	73	114,5	1,8	1	3	
14	TS502240	50	22	40	201	73	114,5	2,36	1	3	
15	TS502528	50	25	28	176,7	73	123,75	1,79	1	3	
16	TS502532	50	25	32	183,4	73	123,75	1,85	1	3	
17	TS502540	50	25	40	201	73	123,75	2,41	1	3	
18	TS502832	50	28	32	183,4	73	122,7	1,86	1	3	
19	TS502840	50	28	40	201	73	122,7	2,42	1	3	
20	TS503240	50	32	40	201	73	129,4	2,48			Standard art. 11408
21	TS632225	63	22	25	181,75	74	114,5	2,02	1	3	
22	TS632228	63	22	28	180,7	74	114,5	2,03	1	3	
23	TS632232	63	22	32	187,4	74	114,5	2,09	1	3	
24	TS632240	63	22	40	205	74	114,5	2,65	1	3	
25	TS632250	63	22	50	209	74	114,5	2,91	1	3	
26	TS632528	63	25	28	180,7	74	123,75	2,08	1	3	
27	TS632532	63	25	32	187,4	74	123,75	2,14	1	3	
28	TS632540	63	25	40	205	74	123,75	2,7	1	3	
29	TS632550	63	25	50	209	74	123,75	2,96	1	3	
30	TS632832	63	28	32	187,4	74	122,7	2,16	1	3	
31	TS632840	63	28	40	205	74	122,7	2,71	1	3	
32	TS632850	63	28	50	209	74	122,7	2,97	1	3	
33	TS633240	63	32	40	205	74	129,4	2,78	1	3	
34	TS633250	63	32	50	209	74	129,4	3,03			Standard art. 11409
35	TS634050	63	40	50	243	52	152	3,94	1	3	



*** Compact version**
can be used for DUO 40 mm insulated PEX pipes

15.1.5 COMBI-T with reduced branching < reduced flow

Line N°	Art. Nr.	dimension			L	B	H	kg			
1	TS282225	28	22	25	145,45	34	79,5	0,67	1	3	
2	TS322225	32	22	25	152,15	39	79,5	0,74	1	3	
3	TS322228	32	22	28	151,1	39	79,5	0,75	1	3	
4	TS322528	32	25	28	151,1	39	88,75	0,8	1	3	
5	TS402225	40	22	25	173,75	52	94	1,14	1	3	*NEW
6	TS402228	40	22	28	172,7	52	94	1,15	1	3	*NEW
7	TS402232	40	22	32	179,4	52	94	1,22	1	3	*NEW
8	TS402528	40	25	28	172,7	52	103,25	1,2	1	3	*NEW
9	TS402532	40	25	32	179,4	52	103,25	1,27	1	3	*NEW
10	TS402832	40	28	32	179,4	52	102,2	1,28	1	3	*NEW
11	TS502225	50	22	25	177,75	73	114,5	1,72	1	3	
12	TS502228	50	22	28	176,7	73	114,5	1,74	1	3	
13	TS502232	50	22	32	183,4	73	114,5	1,8	1	3	
14	TS502240	50	22	40	201	73	114,5	2,36	1	3	
15	TS502528	50	25	28	176,7	73	123,75	1,79	1	3	
16	TS502532	50	25	32	183,4	73	123,75	1,85	1	3	
17	TS502540	50	25	40	201	73	123,75	2,41	1	3	
18	TS502832	50	28	32	183,4	73	122,7	1,86	1	3	
19	TS502840	50	28	40	201	73	122,7	2,42	1	3	
20	TS503240	50	32	40	201	73	129,4	2,48			Standard art. 11408
21	TS632225	63	22	25	181,75	74	114,5	2,02	1	3	
22	TS632228	63	22	28	180,7	74	114,5	2,03	1	3	
23	TS632232	63	22	32	187,4	74	114,5	2,09	1	3	
24	TS632240	63	22	40	205	74	114,5	2,65	1	3	
25	TS632250	63	22	50	209	74	114,5	2,91	1	3	
26	TS632528	63	25	28	180,7	74	123,75	2,08	1	3	
27	TS632532	63	25	32	187,4	74	123,75	2,14	1	3	
28	TS632540	63	25	40	205	74	123,75	2,7	1	3	
29	TS632550	63	25	50	209	74	123,75	2,96	1	3	
30	TS632832	63	28	32	187,4	74	122,7	2,16	1	3	
31	TS632840	63	28	40	205	74	122,7	2,71	1	3	
32	TS632850	63	28	50	209	74	122,7	2,97	1	3	
33	TS633240	63	32	40	205	74	129,4	2,78	1	3	
34	TS633250	63	32	50	209	74	129,4	3,03			Standard art. 11409
35	TS634050	63	40	50	243	52	152	3,94	1	3	

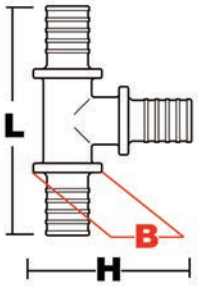


*** Compact version**
can be used for DUO 40 mm insulated PEX pipes

15.1.6 COMBI-T with increased branching

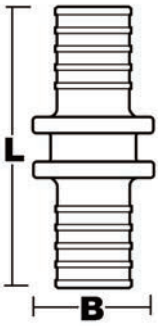
Line N°	Art. Nr.	dimension			L	B	H	kg		
1	TS222522	22	25	22	128	34	88,75	0,61	1	3
2	TS222822	22	28	22	128	34	87,7	0,62	1	3
3	TS223222	22	32	22	128	39	94,4	0,69	1	3
4	TS224022	22	40	22	183	52	152	2,56	1	3
5	TS225022	22	50	22	183	73	156	2,81	1	3
6	TS226322	22	63	22	183	74	160	3,11	1	3
7	TS252822	25	28	22	137,25	34	87,7	0,67	1	3
8	TS252825	25	28	25	146,5	34	87,7	0,72	1	3
9	TS253222	25	32	22	137,25	39	94,4	0,74	1	3
10	TS253225	25	32	25	146,5	39	94,4	0,79		
11	TS254022	25	40	22	192,25	52	152	2,61	1	3
12	TS254025	25	40	25	201,5	52	152	2,66	1	3
13	TS255022	25	50	22	192,25	73	156	2,86	1	3
14	TS255025	25	50	25	201,5	73	156	2,91	1	3
15	TS256322	25	63	22	192,25	74	160	3,16	1	3
16	TS256325	25	63	25	201,5	74	160	3,21	1	3
17	TS283222	28	32	22	136,2	39	94,4	0,75	1	3
18	TS283225	28	32	25	145,45	39	94,4	0,8	1	3
19	TS283228	28	32	28	144,4	39	94,4	0,81	1	3
20	TS284022	28	40	22	191,2	52	152	2,62	1	3
21	TS284025	28	40	25	200,45	52	152	2,67	1	3
22	TS284028	28	40	28	199,4	52	152	2,68	1	3
23	TS285022	28	50	22	191,2	73	156	2,88	1	3
24	TS285025	28	50	25	200,45	73	156	2,93	1	3
25	TS285028	28	50	28	199,4	73	156	2,94	1	3
26	TS286322	28	63	22	191,2	74	160	3,17	1	3
27	TS286325	28	63	25	200,45	74	160	3,22	1	3
28	TS286328	28	63	28	199,4	74	160	3,23	1	3
29	TS324022	32	40	22	197,9	52	152	2,69	1	3
30	TS324025	32	40	25	207,15	52	152	2,74	1	3
31	TS324028	32	40	28	206,1	52	152	2,75	1	3
32	TS324032	32	40	32	212,8	52	152	2,81	1	3
33	TS325022	32	50	22	197,9	73	156	2,94	1	3
34	TS325025	32	50	25	207,15	73	156	2,99	1	3
35	TS325028	32	50	28	206,1	73	156	3	1	3
36	TS325032	32	50	32	212,8	73	156	3,06	1	3
37	TS326322	32	63	22	197,9	74	160	3,23	1	3
38	TS326325	32	63	25	207,15	74	160	3,28	1	3
39	TS326328	32	63	28	206,1	74	160	3,3	1	3
40	TS326332	32	63	32	212,8	74	160	3,36	1	3
41	TS405022	40	50	22	207	52	156	3,1	1	3
42	TS405025	40	50	25	216,25	52	156	3,15	1	3
43	TS405028	40	50	28	215,2	52	156	3,16	1	3
44	TS405032	40	50	32	221,9	52	156	3,23	1	3
45	TS405040	40	50	40	231	52	156	3,39	1	3
46	TS406322	40	63	22	207	52	160	3,4	1	3
47	TS406325	40	63	25	216,25	52	160	3,45	1	3
48	TS406328	40	63	28	215,2	52	160	3,46	1	3
49	TS406332	40	63	32	221,9	52	160	3,52	1	3
50	TS406340	40	63	40	231	52	160	3,69	1	3
51	TS506322	50	63	22	211	74	160	3,65	1	3
52	TS506325	50	63	25	220,25	74	160	3,7	1	3
53	TS506328	50	63	28	219,2	74	160	3,71	1	3
54	TS506332	50	63	32	225,9	74	160	3,78	1	3
55	TS506340	50	63	40	235	74	160	3,94	1	3
56	TS506350	50	63	50	239	74	160	4,19	1	3

Standard art. 11507



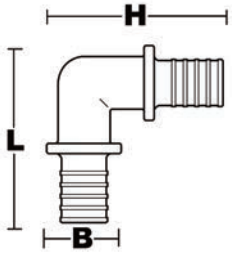
15.1.7 COMBI- reducer

Line N°	Art. Nr.	1	2	L	B	kg			
1	MS2222	22	22	98	34	0,35			Standard art. 10300
2	MS2522	25	22	107,25	34	0,4	1	2	
3	MS2525	25	25	116,5	34	0,45			Standard art. 10304
4	MS2822	28	22	106,2	34	0,41			Standard art. 10400
5	MS2825	28	25	115,45	34	0,46	1	2	
6	MS2828	28	28	114,4	34	0,47			Standard art. 10301
7	MS3222	32	22	112,9	39	0,47	1	2	
8	MS3225	32	25	122,15	39	0,52			Standard art. 10405
9	MS3228	32	28	121,1	39	0,54			Standard art. 10401
10	MS3232	32	32	127,8	39	0,6			Standard art. 10305
11	MS4022	40	22	151	52	1,64	1	2	
12	MS4025	40	25	160,25	52	1,69			Standard art. 10407
13	MS4028	40	28	159,2	52	1,7	1	2	
14	MS4032	40	32	165,9	52	1,76			Standard art. 10408
15	MS4040	40	40	175	52	1,93			Standard art. 10306
16	MS5022	50	22	155	73	1,89	1	2	
17	MS5025	50	25	164,25	73	1,94	1	2	
18	MS5028	50	28	163,2	73	1,95	1	2	
19	MS5032	50	32	169,9	73	2,02			Standard art. 10409
20	MS5040	50	40	179	52	2,18			Standard art. 10410
21	MS5050	50	50	183	73	2,43			Standard art. 10307
22	MS6322	63	22	159	74	2,19	1	2	
23	MS6325	63	25	168,25	74	2,24	1	2	
24	MS6328	63	28	167,2	74	2,25	1	2	
25	MS6332	63	32	173,9	74	2,31	1	2	
26	MS6340	63	40	183	52	2,47	1	2	
27	MS6350	63	50	187	74	2,73			Standard art. 10411
28	MS6363	63	63	191	74	3,02			Standard art. 10308



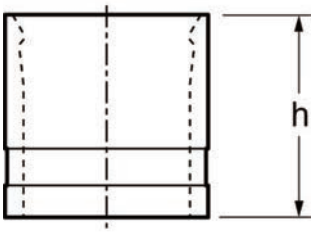
15.1.8 COMBI Knee 90° reduced

Line N°	Art. Nr.	1	2	L	B	H	kg			
1	KS2222	22	22		81	34	81	0,4	1 2	
2	KS2522	25	22		90,25	34	81	0,45	1 2	
3	KS2525	25	25		90,25	34	90,25			Standard art. 10604
4	KS2822	28	22		89,2	34	81	0,46	1 2	
5	KS2825	28	25		89,2	34	90,25	0,51	1 2	
6	KS2828	28	28		89,2	34	89,2	0,52	1 2	
7	KS3222	32	22		95,9	39	81	0,52	1 2	
8	KS3225	32	25		95,9	39	90,25	0,57	1 2	
9	KS3228	32	28		95,9	39	89,2	0,58	1 2	
10	KS3232	32	32		95,9	39	95,9			Standard art. 10605
11	KS4022	40	22		160,5	52	119,5	1,86	1 2	
12	KS4025	40	25		160,5	52	128,75	1,91	1 2	
13	KS4028	40	28		160,5	52	127,7	1,92	1 2	
14	KS4032	40	32		160,5	52	134,4	1,98	1 2	
15	KS4040	40	40		152	52	152			Standard art. 10606
16	KS5022	50	22		156	73	119,5	2,11	1 2	
17	KS5025	50	25		156	73	128,75	2,16	1 2	
18	KS5028	50	28		156	73	127,7	2,17	1 2	
19	KS5032	50	32		156	73	134,4	2,24	1 2	
20	KS5040	50	40		156	52	152	2,4	1 2	
21	KS5050	50	50		156	73	156			Standard art. 10607
22	KS6322	63	22		160	74	119,5	2,41	1 2	
23	KS6325	63	25		160	74	128,75	2,46	1 2	
24	KS6328	63	28		160	74	127,7	2,47	1 2	
25	KS6332	63	32		160	74	134,4	2,53	1 2	
26	KS6340	63	40		160	52	152	2,7	1 2	
27	KS6350	63	50		160	74	156	2,95	1 2	
28	KS6363	63	63		160	74	160			Standard art. 10608

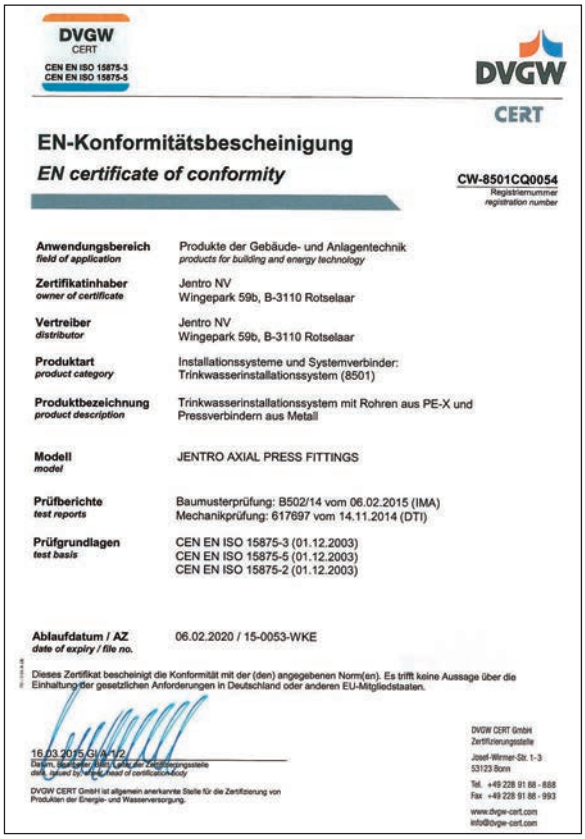


15.1.9 Brass sleeves for SDR 7.4

Line N°	Art. Nr.	Ø	h	kg	
1	10022	16	24	0,026	100
2	10033	20	25	0,029	100
3	10034	22	23	0,031	100
4	10044	25	29	0,045	100
5	10045	28	26	0,059	100
6	10005	32	34	0,09	50
7	10006	40	37	0,145	50
8	10007	50	44	0,277	25
9	10008	63	53	0,408	20



14.1 Jentro system certificates



DVGW CERT
CEN EN ISO 15875-3
CEN EN ISO 15875-5

DVGW CERT

EN-Konformitätsbescheinigung

EN certificate of conformity

CW-8501CQ0054
Registriernummer
registration number

Anwendungsbereich *field of application*	Produkte der Gebäude- und Anlagentechnik *products for building and energy technology*
Zertifikatinhaber *owner of certificate*	Jentro NV Wingepark 59b, B-3110 Rotselaar
Vertreiber *distributor*	Jentro NV Wingepark 59b, B-3110 Rotselaar
Produktart *product category*	Installationssysteme und Systemverbinder: Trinkwasserinstallationssystem (8501)
Produktbezeichnung *product description*	Trinkwasserinstallationssystem mit Rohren aus PE-X und Pressverbindern aus Metall
Modell *model*	JENTRO AXIAL PRESS FITTINGS
Prüfberichte *test reports*	Baumusterprüfung: B502/14 vom 06.02.2015 (IMA) Mechanikprüfung: 617697 vom 14.11.2014 (DTI)
Prüfgrundlagen *test basis*	CEN EN ISO 15875-3 (01.12.2003) CEN EN ISO 15875-5 (01.12.2003) CEN EN ISO 15875-2 (01.12.2003)
Ablaufdatum / AZ *date of expiry / file no.*	06.02.2020 / 15-0053-WKE

Dieses Zertifikat bescheinigt die Konformität mit der (den) angegebenen Norm(en). Es trifft keine Aussage über die Einhaltung der gesetzlichen Anforderungen in Deutschland oder anderen EU-Mitgliedstaaten.

16.03.2015 Gl/A-1/2

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DVGW CERT

DVGW-Baumusterprüfzertifikat

DVGW type examination certificate

DW-8501BQ0345
Registriernummer
registration number

Anwendungsbereich *field of application*	Produkte der Wasserversorgung *products of water supply*
Zertifikatinhaber *owner of certificate*	Jentro NV Wingepark 59b, B-3110 Rotselaar
Vertreiber *distributor*	Jentro NV Wingepark 59b, B-3110 Rotselaar
Produktart *product category*	Installationssysteme und Systemverbinder: Trinkwasserinstallationssystem (8501)
Produktbezeichnung *product description*	Trinkwasserinstallationssystem bestehend aus Schiebehülsenverbindern (Metall) sowie Kunststoffrohren (PE-Xa)
Modell *model*	Jentro Pressverbinder
Prüfberichte *test reports*	Kontrollprüfung Labor: B317/15.1 vom 12.06.2015 (IMA) Baumusterprüfung: B34.2/5 vom 16.08.2005 (IMA)
Prüfgrundlagen *test basis*	DVGW W 534-(P) (01.07.2015) UBA KTW (07.10.2008) DVGW W 270 (01.11.2007)
Ablaufdatum / AZ *date of expiry / file no.*	16.08.2020 / 16-0003-WNV

16.02.2016 Gl/A-1/2

DAkkS Deutsche Akkreditierungsstelle D-ZE-16028-01-05

DVGW CERT GmbH
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CSTB
le futur en construction
Organisme certificateur

CSTBat

CERTIFICAT

Systèmes de canalisations de distribution d'eau
Chauffage et distribution sanitaire
Raccords JENTRO

Le CSTB atteste que le(s) produit(s) ci-dessus est (sont) conforme(s) à des caractéristiques décrites dans le référentiel de certification n° 15.1 en vigueur, après évaluation selon les modalités de contrôle définies dans ce référentiel.

Le CSTB accorde à :

La société **JENTRO NV**
Wingepark 59b
BE - 3110 ROTSELAAR
Usine de **BE - 3110 ROTSELAAR**

le droit d'usage de la marque CSTBat Systèmes de canalisations de distribution d'eau pour le(s) produit(s) objet(s) de cette décision, pour toute sa durée de validité et dans les conditions prévues par les exigences générales de la marque CSTBat et le référentiel mentionné ci-dessus.

Décision d'admission n° 3139-252-2255 du 6 février 2017

CSTBat -252-2255

Sauf retrait, suspension ou modification, ce certificat est valable jusqu'au 31/12/2018. Le certificat en vigueur peut être consulté sur le site internet www.evaluation.cstb.fr pour en vérifier sa validité.

CARACTÉRISTIQUES CERTIFIÉES

Conformité à l'Avis Technique n°14/16-2255
NATURE DU SYSTEME : Raccords métalliques à glissement pour tubes en matériaux de synthèse

- Caractéristiques dimensionnelles
- Résistance à la pression

Ce certificat comporte 1 page.

Correspondant
Philippe PEREIRA
Tél. : 01 64 68 89 61
Fax : 01 64 68 84 44

Pour le CSTB
Pour le Directeur Technique
Yannick LEMOIGNE

cofrac

CENTRE SCIENTIFIQUE ET TECHNIQUE DU BATIMENT
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MARNE-LA-VALLÉE | PARIS | GRENOBLE | NANTES | SOPHIA-ANTIPOLIS

СИСТЕМА СЕРТИФИКАЦИИ ГОСТ Р
ГОССТАНДАРТ РОССИИ

СЕРТИФИКАТ СООТВЕТСТВИЯ

№ РОСС RU.АЕ95.Н01137

Срок действия с 17.01.2006 по 16.01.2007

0583449

ОРГАН ПО СЕРТИФИКАЦИИ рег. № РОСС RU.0001.11АЕ95
ПРОДУКЦИИ ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ "НИИ-ТЕСТ"
Юридический адрес: 127591, Москва, ул. Дубнинская, д. 44а
Фактический адрес: 119121, Москва, Ружейный пер., д. 6, стр. 1, тел. (095) 241-51-36, факс (095) 241-51-36

ПРОДУКЦИЯ Фитинги латунные
Серийный выпуск . Контракт б/н от декабря 2005 г.
код ОК 005 (ОКП): 48 3400

СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ НОРМАТИВНЫХ ДОКУМЕНТОВ
ГОСТ 15763-91
код ТН ВЭД: 7412 20 000 0

ИЗГОТОВИТЕЛЬ Фирма "Jentro NV"
Wingepark 59, B-3110, Rotselaar, Бельгия

СЕРТИФИКАТ ВЫДАН Фирма "Golan Plastic Products Ltd."
Kibbutz Shaar Hagolan, Jordan Valley, 15145, Израиль

НА ОСНОВАНИИ Протокола испытаний № 28-261 от 13.01.2006 г. испытательной лаборатории продукции машиностроения ЗАО "Региональный орган по сертификации и тестированию" "РОСТЕСТ-МОСКВА", рег. № РОСС RU.0001.21М909, адрес: 117418, Москва, Каховский пр., д. 31, санитарно-эпидемиологического заключения № 77.ОМ.05.483.П.000046.01.06 от 13.01.2006 г. Московского территориального отдела территориального управления Федеральной службы по надзору в сфере защиты прав потребителей и благополучия человека по железнодорожному транспорту

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ Схема сертификации 2

Руководитель органа Т.В. Заболотная
Эксперт В.В. Вильдин

Сертификат не применяется при обязательной сертификации

14.2 Jentro PEX pipe certificates

The data and figures in this manual are only provided for information.

It is up to the user to decide whether the product is suitable for his application.

Jentro cannot be held liable for an incorrect use or for injuries or material damage that result from an incorrect use.

Applications that are not described in this technical information are beyond our responsibility.

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