

GX SYSTEM



GIACOMINI
WATER E-MOTION

Technical documentation

0756EN

SUMMARY

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GX system (Giacomini eXpansion System)

Distribution system for domestic water and heating/cooling systems, both traditional and radiant, consisting in PEX-b **pipes** and brass **fittings** with a seal guaranteed by a **polymeric ring**. The system's water-tightness and reliability over its entire lifetime are guaranteed by the shape memory of its plastic components and the fittings' specific design.



VIDEO TUTORIAL

Advantages and features

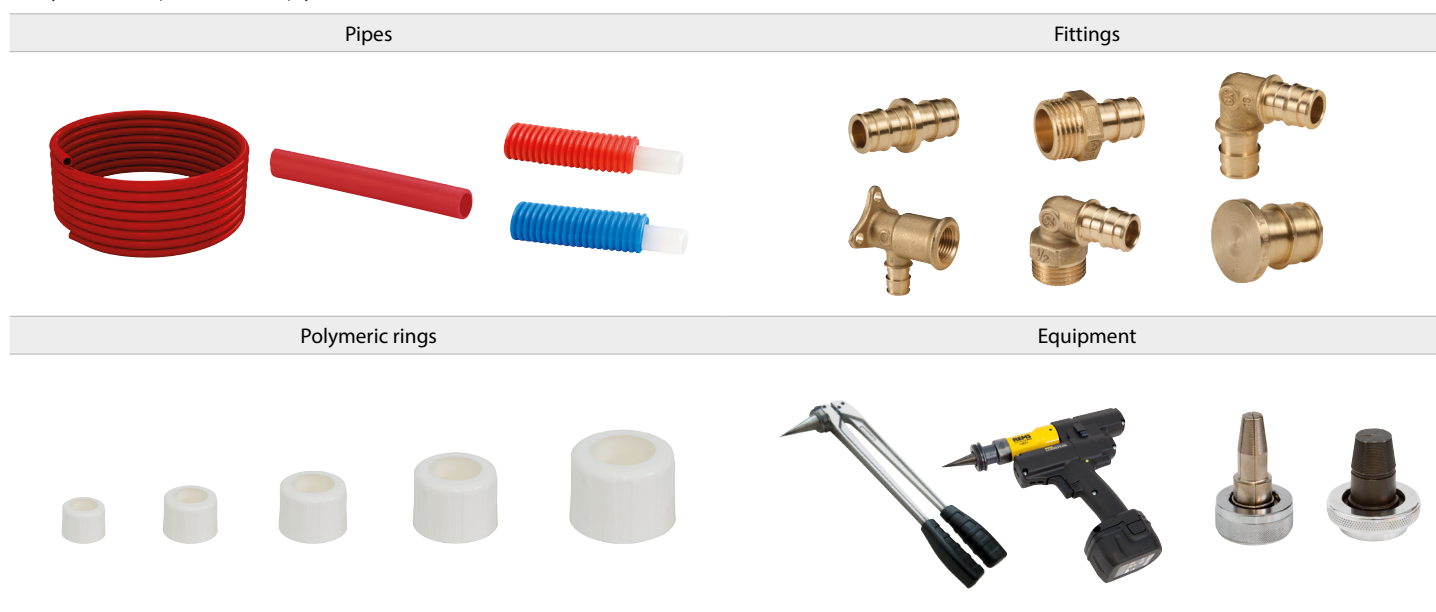
Pipes, made of plastic material (PEX-b), are designed to withstand corrosion and are manufactured in compliance with the most stringent standards in order to withstand the long-term effects of **high temperature** and **pressure** of a plumbing system, in compliance with the highest hygiene standards. The **polymeric ring** has been designed to withstand expansion-related stresses during the installation phase and to **guarantee component connection** over time.

The wide range of brass **fittings** is produced using materials that comply with the highest international standards as to reliability, duration and suitability to contact with domestic water. In order to guarantee the system under pressure, Giacomini has developed a fitting profile that does not require an O-Ring. Project optimisation has allowed the development of **single range of fittings** for all usage classes and pressures.

The range of threaded fittings complies with the international standard ISO 228. The system's features support **quick installation** and this, together with the fewer components required, contributes to the **reduction of overall system costs** and greater safety.

Moreover, the use of full-port fittings and PEX-b pipes with extremely low inner roughness characteristics also determines a reduction of pressure losses for the system as a whole, thus contributing to **reduce system management costs** over the system's life time.

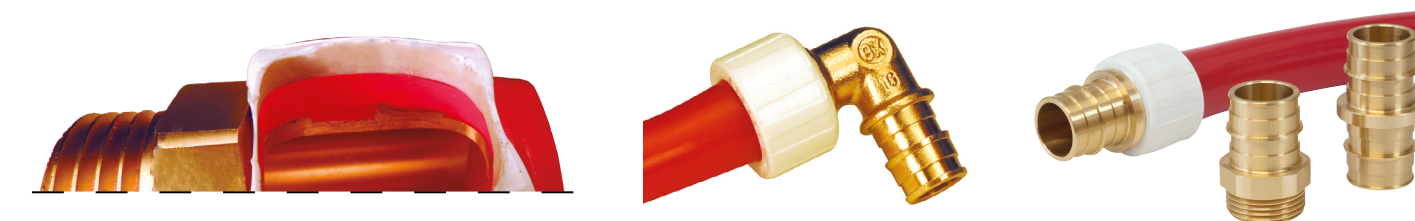
GX system components comply with all main standards on materials that come in contact with **domestic water**.



Technical features - GX connection

In order to create system connections, the GX system relies on the memory of the plastic materials of its components, maximizing their performance thanks to the special profile of the fitting. The gradual expansion of the pipe coupled with the ring enables installers to insert the fitting, which is very quickly clamped by the force generated while the polymer components shrink back to their original shape.

At the end of the procedure, the joint has higher mechanical characteristics compared to those of the pipe alone.









Technical features - Pipes

Description

The GX system high-density, cross-linked polyethylene pipes (PEX-b) enable the distribution of hot and cold domestic water and/or heating/cooling water. Water distribution via PEX-b pipes is a modern technique that offers notable advantages compared with traditional distribution systems based on iron or copper pipes including quick, easy installation with significant time savings, the possibility of avoiding welding or mechanical joints and chased mechanical joints that can result in leaks with the passing of time, as well as the long lifespan of the material that is not subject to encrustations and various electro-chemical phenomena. Other factors that cannot be ignored include the low thermal conductivity (about 100 times lower than iron and 700 times lower than copper), and the low distribution noise level thanks to the excellent acoustic insulation properties of cross-linked polyethylene.

The PEX-b pipe is particularly advantageous in water distribution systems with low pressure levels, because its limited roughness ensures low pressure losses and hence minimum flow rates in devices. The GX system also supports the creation of so-called "removable systems" using R993, R994 or R995 sleeved pipes. If the pipe is obstructed or perforated for accidental reasons, it can be quickly and easily replaced with a new one without damaging floors or walls.

Versions and product codes

| Series | Use | Product code | Dimensions [mm] | Package [m] | Anti-oxygen barrier | Pipe colour | Sleeve colour |
|---|---|--------------|-----------------|-------------|---------------------|-------------|---------------|
| R996  | Domestic plumbing systems | R996Y151 | 16 x 1,8 | 4 (in bar) | No | Neutral | No sleeve |
| | | R996Y150 | 16 x 1,8 | 100 | No | Neutral | No sleeve |
| | | R996Y193 | 16 x 1,8 | 100 | No | Blue | No sleeve |
| | | R996Y194 | 16 x 1,8 | 100 | No | Red | No sleeve |
| | | R996Y026 | 16 x 2,2 | 100 | No | Neutral | No sleeve |
| | | R996Y152 | 20 x 1,9 | 4 (in bar) | No | Neutral | No sleeve |
| | | R996Y143 | 20 x 1,9 | 50 | No | Neutral | No sleeve |
| | | R996Y197 | 20 x 1,9 | 100 | No | Blue | No sleeve |
| | | R996Y198 | 20 x 1,9 | 100 | No | Red | No sleeve |
| | | R996Y082 | 20 x 1,9 | 200 | No | White | No sleeve |
| | | R996Y032 | 20 x 2,8 | 50 | No | Neutral | No sleeve |
| | | R996Y153 | 25 x 2,3 | 4 (in bar) | No | Neutral | No sleeve |
| | | R996Y144 | 25 x 2,3 | 50 | No | Neutral | No sleeve |
| | | R996Y154 | 32 x 2,9 | 4 (in bar) | No | Neutral | No sleeve |
| | | R996Y146 | 40 x 3,7 | 4 (in bar) | No | Neutral | No sleeve |
| R996TW  | Domestic plumbing systems Heating and/or cooling systems | R996Y155 | 16 x 1,8 | 4 (in bar) | Si | Neutral | No sleeve |
| | | R996Y140 | 16 x 1,8 | 100 | Si | Neutral | No sleeve |
| | | R996Y141 | 16 x 1,8 | 240 | Si | Neutral | No sleeve |
| | | R996Y142 | 16 x 1,8 | 600 | Si | Neutral | No sleeve |
| | | R996Y130 | 16 x 2,2 | 100 | Si | Neutral | No sleeve |
| | | R996Y156 | 20 x 1,9 | 4 (in bar) | Si | Neutral | No sleeve |
| | | R996Y157 | 20 x 1,9 | 100 | Si | Neutral | No sleeve |
| | | R996Y131 | 20 x 2,8 | 100 | Si | Neutral | No sleeve |
| | | R996Y158 | 25 x 2,3 | 4 (in bar) | Si | Neutral | No sleeve |
| | | R996Y159 | 25 x 2,3 | 50 | Si | Neutral | No sleeve |
| | | R996Y132 | 25 x 3,5 | 50 | Si | Neutral | No sleeve |
| | | R996Y160 | 32 x 2,9 | 4 (in bar) | Si | Neutral | No sleeve |
| | | R996Y135 | 32 x 4,4 | 4 (in bar) | Si | Neutral | No sleeve |
| | | R996Y161 | 40 x 3,7 | 4 (in bar) | Si | Neutral | No sleeve |
| | | R996Y134 | 40 x 5,5 | 4 (in bar) | Si | Neutral | No sleeve |
| R996T  | Heating and/or cooling systems | R996TY227 | 16 x 2,0 | 100 | Yes | Red | No sleeve |
| | | R996TY219 | 16 x 2,0 | 240 | Yes | Red | No sleeve |
| | | R996TY264 | 16 x 2,0 | 600 | Yes | Red | No sleeve |
| | | R996TY221 | 20 x 2,0 | 100 | Yes | Red | No sleeve |
| | | R996TY222 | 20 x 2,0 | 240 | Yes | Red | No sleeve |
| R994  | Domestic plumbing systems | R994Y026 | 16 x 2,2 | 50 | No | Neutral | Red |
| | | R994Y032 | 20 x 2,8 | 50 | No | Neutral | Red |
| R993  | Domestic plumbing systems | R993Y026 | 16 x 2,2 | 50 | No | Neutral | Blue |
| | | R993Y032 | 20 x 2,8 | 50 | No | Neutral | Blue |
| R995  | Domestic plumbing systems | R995Y026 | 16 x 2,2 | 50 | No | Neutral | Black |
| | | R995Y056 | 16 x 2,2 | 75 | No | Neutral | Black |
| | | R995Y032 | 20 x 2,8 | 50 | No | Neutral | Black |
| | | R995Y062 | 20 x 2,8 | 75 | No | Neutral | Black |

Advantages and features

- Pipes suitable for domestic plumbing systems (R996, R996TW, R993, R994, R995) and for heating/cooling systems (R996TW, R996T).
- Degree of cross-linking > 65 % because silanes cross-linking (PEX-b) is "three-dimensional" and, therefore, the molecular bond is stronger, so that the percentage required by the Standard is lower than that provided for PEX-a (> 70 %).
- Greater resistance to chlorine solutions compared to PEX-a thanks to greater density.
- Lower internal pipe roughness compared to PEX-a pipes (**lower pressure losses**).

Technical data

GX system pipes are cross-linked with the silane method (PEX-b) and compliant with the EN ISO 15875 Standard.

The chemical cross-linking process provides mechanical, chemical and thermal characteristics that make them suitable for use, with an optimum level of quality and reliability. This method creates a product that is entirely non-toxic, making it ideal for domestic water distribution as required by Ministerial Decree 174 of 06/04/2004 for Italy.

- Application range, depending on the series: class 1, 2, 4, 5 (EN ISO 15875)
- Density: 0,94 g/cm³
- Cross-linking degree > 65% (EN ISO 15875)
- Thermal conductivity of the pipe: 0,35 W/(m K) for R996, R993, R994, R995
0,38 W/(m K) for R996T
- Linear expansion coefficient: at 20 °C: $1,4 \times 10^{-4}$ m/(m · K)
at 100 °C: $2,0 \times 10^{-4}$ m/(m · K)
- Linear dispersion of the sleeved pipe in the air (sleeve 25 mm): 0,23 W/(m · K)
(30 mm sleeve): 0,21 W/(m · K)

Resistance to combined pressure and temperature stress with respect to regression curves

Series (S) of pipes

$$S = \frac{d-s}{2 \cdot s}$$

Standard Dimension Ratio (SDR)

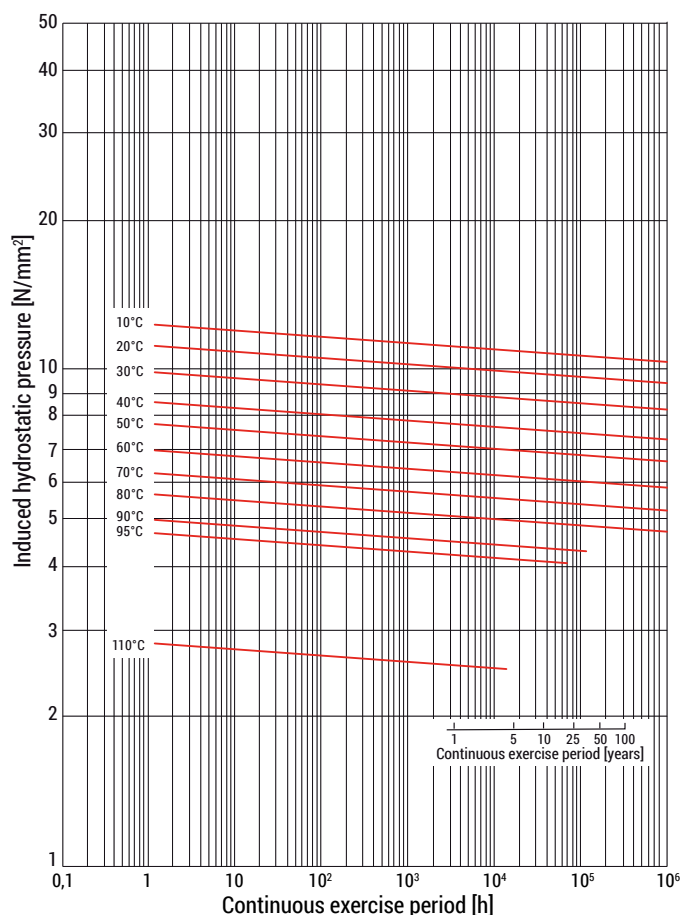
$$SDR = 2 \cdot S + 1 \approx \frac{d}{s}$$

Regression curves

$$\alpha = p \cdot \frac{d-s}{2 \cdot s}$$

where s is the nominal pipe thickness
 d is the nominal pipe diameter

where α is the hydrostatic stress
 p is the induced hydrostatic pressure



Pressure losses with 50 °C water

| Flow rate [l/h] | 16 x 1,8 (Øinn 12,4 mm) [kPa/m] | 16 x 2,2 (Øinn 11,6 mm) [kPa/m] | 20 x 1,9 (Øinn 16,2 mm) [kPa/m] | 20 x 2,8 (Øinn 14,4 mm) [kPa/m] | 25 x 2,3 (Øinn 20,4 mm) [kPa/m] | 25 x 3,5 (Øinn 18,0 mm) [kPa/m] | 32 x 2,9 (Øinn 26,2 mm) [kPa/m] | 32 x 4,4 (Øinn 23,2 mm) [kPa/m] | 40 x 3,7 (Øinn 32,6 mm) [kPa/m] | 40 x 5,5 (Øinn 29,0 mm) [kPa/m] |
|--------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| 36 | 0,013 | 0,024 | 0,003 | 0,008 | - | - | - | - | - | - |
| 72 | 0,044 | 0,064 | 0,012 | 0,024 | - | - | - | - | - | - |
| 108 | 0,090 | 0,128 | 0,023 | 0,049 | - | - | - | - | - | - |
| 144 | 0,151 | 0,209 | 0,040 | 0,072 | - | - | - | - | - | - |
| 180 | 0,225 | 0,313 | 0,059 | 0,113 | 0,019 | 0,035 | - | - | - | - |
| 216 | 0,313 | 0,425 | 0,082 | 0,152 | 0,027 | 0,049 | - | - | - | - |
| 252 | 0,413 | 0,554 | 0,109 | 0,201 | 0,036 | 0,063 | - | - | - | - |
| 288 | 0,526 | 0,698 | 0,139 | 0,248 | 0,046 | 0,081 | - | - | - | - |
| 324 | 0,656 | 0,858 | 0,171 | 0,305 | 0,056 | 0,100 | - | - | - | - |
| 360 | 0,787 | 1,027 | 0,207 | 0,369 | 0,069 | 0,120 | 0,019 | 0,036 | - | - |
| 720 | 2,736 | 3,490 | 0,723 | 1,236 | 0,237 | 0,416 | 0,067 | 0,123 | 0,023 | 0,042 |
| 1080 | 5,678 | 7,213 | 1,502 | 2,536 | 0,492 | 0,863 | 0,139 | 0,255 | 0,048 | 0,086 |
| 1440 | 9,531 | 12,139 | 2,523 | 4,245 | 0,825 | 1,449 | 0,232 | 0,429 | 0,080 | 0,146 |
| 1800 | 14,243 | 18,228 | 3,774 | 6,347 | 1,232 | 2,166 | 0,347 | 0,640 | 0,118 | 0,217 |
| 2160 | 19,777 | - | 5,243 | 8,834 | 1,712 | 3,010 | 0,481 | 0,889 | 0,164 | 0,302 |
| 2520 | 26,104 | - | 6,925 | 11,698 | 2,260 | 3,975 | 0,635 | 1,174 | 0,216 | 0,398 |
| 2880 | 33,196 | - | 8,811 | 14,931 | 2,877 | 5,059 | 0,081 | 1,494 | 0,275 | 0,506 |
| 3240 | 41,037 | - | 10,897 | - | 3,558 | 6,258 | 1,000 | 1,848 | 0,340 | 0,626 |
| 3600 | - | - | 13,178 | - | 4,305 | 7,572 | 1,210 | 2,235 | 0,412 | 0,757 |
| 3960 | - | - | 15,651 | - | 5,114 | 8,997 | 1,437 | 2,655 | 0,489 | 0,899 |
| 4320 | - | - | 18,311 | - | 5,986 | 10,531 | 1,681 | 3,107 | 0,572 | 1,051 |
| 5040 | - | - | 24,183 | - | 7,911 | - | 2,221 | 4,106 | 0,756 | 1,390 |
| 5760 | - | - | 30,771 | - | 10,076 | - | 2,829 | 5,228 | 0,962 | 1,769 |
| 6480 | - | - | 38,057 | - | 12,473 | - | 3,501 | 6,472 | 1,190 | 2,189 |
| 7200 | - | - | 46,025 | - | 15,099 | - | 4,236 | 7,833 | 1,440 | 2,649 |
| 7920 | - | - | - | - | 17,949 | - | 5,034 | 9,310 | 1,711 | 3,148 |
| 8640 | - | - | - | - | 21,020 | - | 5,895 | 10,902 | 2,003 | 3,685 |
| 9360 | - | - | - | - | 24,308 | - | 6,815 | - | 2,315 | 4,260 |
| 10080 | - | - | - | - | 27,811 | - | 7,796 | - | 2,648 | 4,873 |
| 10800 | - | - | - | - | 31,525 | - | 8,836 | - | 3,001 | 5,523 |
| 12600 | - | - | - | - | 41,725 | - | 11,689 | - | 3,969 | 7,306 |
| 14400 | - | - | - | - | 53,202 | - | 14,899 | - | 5,058 | 9,311 |
| 16200 | - | - | - | - | - | - | 18,458 | - | 6,264 | 11,533 |
| 18000 | - | - | - | - | - | - | 22,359 | - | 7,586 | - |
| 19800 | - | - | - | - | - | - | 26,595 | - | 9,022 | - |
| 21600 | - | - | - | - | - | - | 31,163 | - | 10,569 | - |
| 23400 | - | - | - | - | - | - | 36,057 | - | 12,226 | - |
| 25200 | - | - | - | - | - | - | - | - | 13,992 | - |
| 27000 | - | - | - | - | - | - | - | - | 15,866 | - |
| 28800 | - | - | - | - | - | - | - | - | 17,846 | - |
| 30600 | - | - | - | - | - | - | - | - | 19,932 | - |
| 32400 | - | - | - | - | - | - | - | - | 22,122 | - |
| 34200 | - | - | - | - | - | - | - | - | 24,415 | - |
| 36000 | - | - | - | - | - | - | - | - | 26,810 | - |

Correction factor for temperatures other than 50 °C

| °C | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Factor | 1,208 | 1,174 | 1,144 | 1,115 | 1,087 | 1,060 | 1,039 | 1,019 | 1,000 | 0,982 | 0,965 | 0,954 | 0,943 | 0,928 | 0,923 | 0,907 | 0,896 | 0,878 |



NB.

For pressure losses values for 16 x 2,0 and 20 x 2,0 pipes, please refer to datasheet.

ANNEX: EN ISO 15875

Classification of operating conditions

Performance requirements for pipe systems complying with EN ISO 15875 are specified for an operating lifespan of 50 years.

| Application range | T _{oper} [°C] | Time at T _{oper} [years] | T _{max} [°C] | Time at T _{max} [years] | T _{mal} [°C] | Time at T _{mal} [h] |
|--|------------------------|-----------------------------------|-----------------------|----------------------------------|-----------------------|------------------------------|
| CLASS 1 Domestic hot water (60 °C) | 60 | 49 | 80 | 1 | 95 | 100 |
| CLASS 2 Domestic hot water (70 °C) | 70 | 49 | 80 | 1 | 95 | 100 |
| CLASS 4 Underfloor heating and low-temperature radiators | 20 | plus | 70 | 2,5 | 100 | 100 |
| | 40 | plus | | | | |
| | 60 | plus | | | | |
| CLASS 5 Radiator heating at a high temperature | 20 | plus | 90 | 1 | 100 | 100 |
| | 60 | plus | | | | |
| | 80 | plus | | | | |

- Operating temperature (T_{oper}): operating temperature envisaged for the application range, expressed in °C.
- Max. working temperature (T_{max}): the highest value of the operating temperature, only allowed for a short period of time.
- Malfunctioning temperature (T_{mal}): the highest temperature value that can occur when the control systems are not working (the time period possible and allowed for this value is 100 h over 50 years of continuous operation).

For each application class, maximum usage pressure can be evinced from the table below:

| SIZE | PN6 | CLASS 1 | CLASS 2 | CLASS 4 | CLASS 5 |
|----------|------|---------------|---------------|---------|---------|
| 16 x 1,8 | | 8 bar | 8 bar | 10 bar | 8 bar |
| 16 x 2,0 | | not available | not available | 10 bar | 8 bar |
| 20 x 2,0 | | not available | not available | | |
| 20 x 1,9 | | | | | |
| 25 x 2,3 | | 6 bar | 6 bar | 8 bar | 6 bar |
| 32 x 2,9 | | | | | |
| 40 x 3,7 | | | | | |
| SIZE | PN10 | CLASS 1 | CLASS 2 | CLASS 4 | CLASS 5 |
| 16 x 2,2 | | | | | |
| 20 x 2,8 | | | | | |
| 25 x 3,5 | | | 10 bar | | |
| 32 x 4,4 | | | | | |
| 40 x 5,5 | | | | | |



NB:

For the system pressure test, please refer to the relevant paragraph on system installation.

Technical features - Fittings

Description






Fittings are made of CW617N (CuZn40Pb2) brass in compliance with EN12164, EN12165 and DIN50930-6 Standards and the UBA list provided for by the 4MS Initiative, so that they can also be used in domestic plumbing systems. Cooling systems must be totally insulated.








In order to guarantee the system under pressure, Giacomini has developed a fitting profile that does not require an O-Ring.













Project optimisation has allowed the development of single range of fittings for all usage classes and pressures.

The range of threaded fittings complies with the international standard ISO 228.

Versions and product codes

| Series | Product code | Size | Type of fitting |
|--|--------------|----------------|---------------------------|
| GX102  | GX102Y003 | 16 x 16 | Straight |
| | GX102Y004 | 20 x 20 | |
| | GX102Y005 | 25 x 25 | |
| | GX102Y006 | 32 x 32 | |
| | GX102Y007 | 40 x 40 | |
| GX103  | GX103Y004 | 20 x 16 | Straight reducer |
| | GX103Y005 | 25 x 16 | |
| | GX103Y006 | 25 x 20 | |
| | GX103Y008 | 32 x 20 | |
| | GX103Y009 | 32 x 25 | |
| | GX103Y010 | 40 x 25 | |
| GX107  | GX107Y033 | 16 x G 1/2"M | Straight, male threaded |
| | GX107Y043 | 16 x G 3/4"M | |
| | GX107Y034 | 20 x G 1/2"M | |
| | GX107Y044 | 20 x G 3/4"M | |
| | GX107UY044 | 20 x 3/4"NPT-M | |
| | GX107Y054 | 20 x G 1"M | |
| | GX107Y035 | 25 x G 1/2"M | |
| | GX107Y045 | 25 x G 3/4"M | |
| | GX107Y055 | 25 x G 1"M | |
| | GX107UY055 | 25 x 1"NPT-M | |
| | GX107Y056 | 32 x G 1"M | |
| | GX107Y067 | 40 x G 1-1/4"M | |
| GX109  | GX107Y077 | 40 x G 1-1/2"M | Straight, female threaded |
| | GX109Y033 | 16 x G 1/2"F | |
| | GX109Y043 | 16 x G 3/4"F | |
| | GX109Y034 | 20 x G 1/2"F | |
| | GX109Y044 | 20 x G 3/4"F | |
| | GX109UY044 | 20 x 3/4"NPT-F | |
| | GX109Y045 | 25 x G 3/4"F | |
| | GX109Y055 | 25 x G 1"F | |
| | GX109UY055 | 25 x 1"NPT-F | |
| | GX109Y056 | 32 x G 1"F | |
| GX122  | GX109Y067 | 40 x G 1-1/4"F | 90° elbow |
| | GX109Y077 | 40 x G 1-1/2"F | |
| | GX122Y003 | 16 x 16 | |
| | GX122Y004 | 20 x 20 | |
| | GX122Y005 | 25 x 25 | |
| | GX122Y006 | 32 x 32 | |
| | GX122Y007 | 40 x 40 | |

| Series | Product code | Size | Type of fitting |
|---|--------------|--------------------------------------|--|
| GX127  | GX127Y003 | 16 x G 1/2"M | 90° elbow, male threaded |
| | GX127Y044 | 16 x G 3/4"M | |
| | GX127Y043 | 20 x G 1/2"M | |
| | GX127Y055 | 20 x G 3/4"M | |
| | GX127UY055 | 20 x 3/4"NPT-M | |
| | GX127Y045 | 25 x G 3/4"M | |
| | GX127Y056 | 25 x G 1"M | |
| | GX127UY056 | 25 x 1"NPT-M | |
| GX128  | GX128X013 | 16 x Ø15 - L = 250 mm | 90° elbow, chrome plated, with copper pipe Ø15 mm |
| | GX128X014 | 20 x Ø15 - L = 250 mm | |
| | GX128X073 | 16 x Ø15 - L = 750 mm | |
| | GX128X074 | 20 x Ø15 - L = 750 mm | |
| GX129  | GX129Y033 | 16 x G 1/2"F | 90° elbow, female threaded |
| | GX129UY033 | 16 x 1/2"NPT-F | |
| | GX129Y044 | 16 x G 3/4"F | |
| | GX129Y034 | 20 x G 1/2"F | |
| | GX129Y045 | 20 x G 3/4"F | |
| | GX129UY045 | 20 x 3/4"NPT-F | |
| | GX129Y055 | 25 x G 3/4"F | |
| | GX129Y056 | 25 x G 1"F | |
| GX139  | GX139Y023 | 16 x G 1/2"F - L = 45 mm | 90° elbow, female threaded, with wall support |
| | GX139Y003 | 16 x G 1/2"F - L = 52,5 mm | |
| | GX139UY003 | 16 x 1/2"NPT-F - L = 52,5 mm | |
| | GX139Y024 | 20 x G 1/2"F - L = 45 mm | |
| | GX139Y004 | 20 x G 1/2"F - L = 52,5 mm | |
| | GX139UY004 | 20 x 1/2"NPT-F - L = 52,5 mm | |
| | GX139Y005 | 20 x G 3/4"F - L = 52,5 mm | |
| | GX139Y006 | 25 x G 3/4"F - L = 52,5 mm | |
| R578C-2  | R578CY002 | Centre distance central holes 150 mm | Metal bracket for GX139 |
| GX150  | GX150Y003 | 16 x 16 x 16 | Tee  |
| | GX150Y004 | 20 x 20 x 20 | |
| | GX150Y005 | 25 x 25 x 25 | |
| | GX150Y006 | 32 x 32 x 32 | |
| | GX150Y007 | 40 x 40 x 40 | |

| Series | Product code | Size | Type of fitting |
|--|--------------|----------------------------|---|
|  <p>GX151</p> | GX151Y009 | 16 x 20 x 16 | <p>Tee reducer</p>  |
| | GX151Y014 | 20 x 16 x 16 | |
| | GX151Y015 | 20 x 16 x 20 | |
| | GX151Y016 | 20 x 20 x 16 | |
| | GX151Y017 | 20 x 25 x 20 | |
| | GX151Y021 | 25 x 16 x 16 | |
| | GX151Y022 | 25 x 16 x 20 | |
| | GX151Y023 | 25 x 16 x 25 | |
| | GX151Y025 | 25 x 20 x 20 | |
| | GX151Y026 | 25 x 20 x 25 | |
| | GX151Y028 | 25 x 25 x 16 | |
| | GX151Y027 | 25 x 25 x 20 | |
| | GX151Y032 | 32 x 20 x 20 | |
| | GX151Y033 | 32 x 20 x 25 | |
| | GX151Y034 | 32 x 20 x 32 | |
| | GX151Y035 | 32 x 25 x 25 | |
| | GX151Y036 | 32 x 25 x 32 | |
| | GX151Y037 | 32 x 32 x 20 | |
| | GX151Y038 | 32 x 32 x 25 | |
| | GX151Y044 | 40 x 20 x 40 | |
| | GX151Y045 | 40 x 25 x 40 | |
| | GX151Y047 | 40 x 32 x 32 | |
| | GX151Y048 | 40 x 32 x 40 | |
|  <p>GX152</p> | GX152Y041 | 20 x 20 x 16 x 16 | 4-way manifold |
|  <p>GX152-1</p> | GX152Y043 | 20 x 20 x 16 x 16 x 16 | 5-way manifold |
|  <p>GX153</p> | GX153Y033 | 16 x G 1/2" M x 16 | <p>Tee, male threaded</p>  |
| | GX153Y034 | 20 x G 1/2" M x 20 | |
| | GX153Y044 | 20 x G 3/4" M x 20 | |
| | GX153Y045 | 25 x G 3/4" M x 25 | |
| | GX153Y056 | 32 x G 1" M x 32 | |
|  <p>GX154</p> | GX154Y033 | 16 x G 1/2" F x 16 | <p>Tee, female threaded</p>  |
| | GX154Y034 | 20 x G 1/2" F x 20 | |
| | GX154Y044 | 20 x G 3/4" F x 20 | |
| | GX154Y045 | 25 x G 3/4" F x 25 | |
| | GX154Y056 | 32 x G 1" F x 32 | |
|  <p>GX158</p> | GX158X013 | 16 x Ø15 x 16 - L = 250 mm | <p>Inclined 45°, chrome plated, with copper pipe Ø15 mm</p> |
| | GX158X014 | 20 x Ø15 x 20 - L = 250 mm | |
| | GX158X073 | 16 x Ø15 x 16 - L = 750 mm | |
| | GX158X074 | 20 x Ø15 x 20 - L = 750 mm | |
|  <p>GX165</p> | GX165Y003 | 16 | <p>Plug</p> |
| | GX165Y004 | 20 | |
| | GX165Y005 | 25 | |
|  <p>GX179</p> | GX179Y023 | 16 x adaptor Base 16 | <p>Straight, with adaptor and nut</p> |
| | GX179Y033 | 16 x adaptor Base 18 | |
| | GX179Y043 | 16 x adaptor 1/2" | |
| | GX179Y053 | 16 x adaptor 3/4"E | |
| | GX179Y034 | 20 x adaptor Base 18 | |
| | GX179Y054 | 20 x adaptor 3/4"E | |
|  <p>GX651</p> | GX651Y003 | 16 | <p>Ball valve, red T-handle</p> |
| | GX651Y004 | 20 | |
| | GX651Y005 | 25 | |


Technical features - Rings

Description

The special polymeric rings were developed to both withstand expansion-related stresses during installation and guarantee component connection over time. The ring has been designed to facilitate insertion onto the pipe, whilst the upper edge has been shaped to ensure the correct positioning of the ring during installation.

The white colour enables the system to be used also in areas other than technical rooms.

Versions and product codes

| Series | Product code | Pipe Ø [mm] | Pipe thickness [mm] |
|--|--------------|-------------|---------------------|
|  GX61 | GX61Y013 | 16 | 1,8 |
| | | | 2,0 |
| | | | 2,2 |
| | GX61Y014 | 20 | 1,9 |
| | | | 2,0 |
| | | | 2,8 |
| | GX61Y015 | 25 | 2,3 |
| | | | 3,5 |
| | GX61Y016 | 32 | 2,9 |
| | | | 4,4 |
| | GX61Y017 | 40 | 3,7 |
| | | | 5,5 |

Technical data

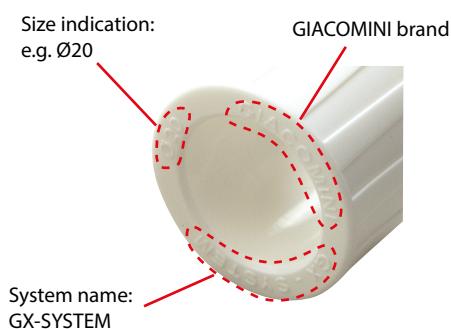
- Suitable for all GX system pipes
- Suitable both for domestic distribution systems and heating/cooling systems
- Guarantee system seal
- Shape upper edge for pipe positioning
- White

Materials

- Polymer material

Main features

Polymeric rings are marked with an indication of **size**, **system** and **manufacturer** (Giacomini) at the rear.



Technical features - Equipment

Description

GX system equipment allows the creation of all types of joints quickly and flexibly, minimising possible errors.

Moreover, all types of expanders (manual, battery-operated, electrical) and adaptors for different expansion heads are available.

Additionally, to reduce the effort required and ensure greater equipment life span, a dedicated lubricant for expansion cones is available.



Warning.

All batteries for GX system equipment must be recharged at a temperature higher than 0 °C.

Lubricant grease must be applied only to the expansion cone and absolutely must not get in touch with pipes during expansion.

Equipment choice

| Expansion type | Type of pipe | Expansion head to be used | Adaptor for expansion heads |
|---|--------------|---------------------------|---|
| GX200Y101 Manual expander tool | 16 x 1,8 | GX202Y001 | - |
| | 20 x 1,9 | GX202Y002 | |
| | 25 x 2,3 | GX202Y003 | |
| GX200Y102 o GX200Y103 Manual expander tool | 16 x 1,8 | GX202Y011 | - |
| | 16 x 2,0 | | |
| | 16 x 2,2 | GX202Y013 | |
| | 20 x 1,9 | GX202Y015 | |
| | 20 x 2,0 | | |
| | 20 x 2,8 | GX202Y016 | |
| | 25 x 2,3 | GX202Y017 | |
| | 25 x 3,5 | GX202Y018 | |
| GX200Y004 Battery powered expander tool 22 V | 16 x 1,8 | GX202Y011 | - |
| | 16 x 2,0 | | |
| | 16 x 2,2 | GX202Y013 | |
| | 20 x 1,9 | GX202Y015 | |
| | 20 x 2,0 | | |
| | 20 x 2,8 | GX202Y016 | |
| | 25 x 2,3 | GX202Y017 | |
| | 25 x 3,5 | GX202Y018 | |
| | 32 x 2,9 | GX202Y021 | |
| | 32 x 4,4 | GX202Y022 | |
| GX200Y002 Electric expander tool 230 V 50-60 Hz; 450 W; 1,8 A | 40 x 3,7 | GX202Y026 | GX203Y001 Adaptor for electric expander tool 230 V |
| | 16 x 1,8 | GX202Y011 | |
| | 16 x 2,0 | | |
| | 16 x 2,2 | GX202Y013 | |
| | 20 x 1,9 | GX202Y015 | |
| | 20 x 2,0 | | |
| | 20 x 2,8 | GX202Y016 | |
| | 25 x 2,3 | GX202Y017 | |
| | 25 x 3,5 | GX202Y018 | |
| | 32 x 2,9 | GX202Y021 | |
| | 32 x 4,4 | GX202Y022 | |
| | 40 x 3,7 | GX202Y026 | |
| | 40 x 5,5 | GX202Y027 | |





| | GX202Y001 | GX202Y002 | GX202Y003 | GX202Y011 | GX202Y015 | GX202Y017 | GX202Y013 | GX202Y016 | GX202Y018 | GX202Y021 | GX202Y022 | GX202Y026 | GX202Y027 | GX203Y001 | GX203Y002 |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| GX200Y101 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| GX200Y102 | ● | ● | ● | ● | ● | ● | ○ | ○ | ○ | ● | ● | ● | ● | ● | ● |
| GX200Y103 | ● | ● | ● | ○ | ○ | ○ | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| GX200Y002 | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| GX200Y004 | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● | ● | ○ |

● included with kit ○ optional ● not compatible



NB: To create systems with the GX system, apart from the aforementioned product codes, it is also possible to use compatible equipment already available on the market. Please, contact the Giacomini Technical Service to receive a list of compatible equipment.

Versions and product codes

| Series | Product code | Expansion type | Accessories supplied as standard | Optional accessories |
|--|--------------|---|--|--|
| GX200-M  | GX200Y101 | Manual expander tool | <ul style="list-style-type: none"> • Expansions heads GX202Y001, GX202Y002, GX202Y003 • Red plastic case • Lubricant grease GX203Y002 | - |
| | GX200Y102 | Manual expander tool | <ul style="list-style-type: none"> • Expansions heads GX202Y011, GX202Y015, GX202Y017 • Black plastic case • Lubricant grease GX203Y002 | • Expansions heads GX202Y013, GX202Y016, GX202Y018 |
| | GX200Y103 | Manual expander tool | <ul style="list-style-type: none"> • Expansions heads GX202Y016, GX202Y018 • Black plastic case • Lubricant grease GX203Y002 | • Expansions heads GX202Y011, GX202Y015, GX202Y017 |
| GX200   | GX200Y004 | Battery-powered expander tool 22 V | <ul style="list-style-type: none"> • Battery and charger 230 V • Metal case | <ul style="list-style-type: none"> • Expansions heads GX202Y013, GX202Y015, GX202Y016, GX202Y017, GX202Y018, GX202Y021, GX202Y022, GX202Y026 |
| | GX200Y002 | Electric expander tool 230 V | <ul style="list-style-type: none"> • Adaptor for expansion heads GX202Y027 • Metal case | <ul style="list-style-type: none"> • GX203Y001 adaptor for expansion heads GX202Y011, GX202Y013, GX202Y015, GX202Y016, GX202Y017, GX202Y018, GX202Y021, GX202Y022, GX202Y026 • Expansions heads GX202Y011, GX202Y013, GX202Y015, GX202Y016, GX202Y017, GX202Y018, GX202Y021, GX202Y022, GX202Y026, GX202Y027 |
| GX201 | GX201Y004 | Battery 22 V for expander GX200Y004 | - | - |
| GX203 | GX203Y001 | Adaptor for expansion heads GX202Y011, GX202Y013, GX202Y015, GX202Y016, GX202Y017, GX202Y018, GX202Y021, GX202Y022, GX202Y026 | • Cardboard box | - |
| | GX203Y002 | Lubricant grease | - | - |
| GX202  | GX202Y001 | Expansion head Ø 16 x 1,8 mm for GX200Y101 | | |
| | GX202Y011 | Expansion head Ø 16 x 1,8 mm and Ø 16 x 2,0 mm for GX200Y102, GX200Y002, GX200Y003 | | |
| | GX202Y013 | Expansion head Ø 16 x 2,2 mm for GX200Y102, GX200Y002, GX200Y003 | | |
| | GX202Y002 | Expansion head Ø 20 x 1,9 mm for GX200Y101 | | |
| | GX202Y015 | Expansion head Ø 20 x 1,9 mm and Ø 20 x 2,0 mm for GX200Y102, GX200Y002, GX200Y003 | | |
| | GX202Y016 | Expansion head Ø 20 x 2,8 mm for GX200Y102, GX200Y002, GX200Y003 | | |
| | GX202Y003 | Expansion head Ø 25 x 2,3 mm for GX200Y101 | | - |
| | GX202Y017 | Expansion head Ø 25 x 2,3 mm for GX200Y102, GX200Y002, GX200Y003 | | |
| | GX202Y018 | Expansion head Ø 25 x 3,5 mm for GX200Y102, GX200Y002, GX200Y003 | | |
| | GX202Y021 | Expansion head Ø 32 x 2,9 mm (type H) for GX200Y002, GX200Y003 | | |
| | GX202Y022 | Expansion head Ø 32 x 4,4 mm (type H) for GX200Y002, GX200Y003 | | |
| | GX202Y026 | Expansion head Ø 40 x 3,7 mm (type H) for GX200Y002, GX200Y003 | | |
| | GX202Y027 | Expansion head Ø 40 x 5,5 mm for GX200Y002 | | |
| R990 | R990Y001 | Cutter for Ø 16, 20, 25 mm plastic pipes | - | - |
| H201 | H201Y001 | Cutter for Ø 32, 40 mm plastic pipes | - | - |



NB: For cutting the pipes you can also use a standard roller pipe cutter.

System installation



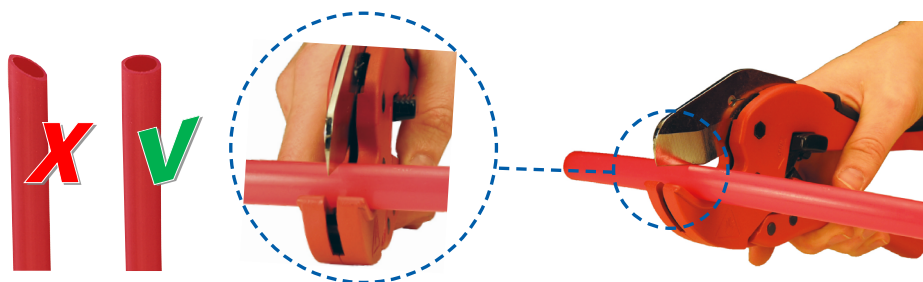
WARNING - READ CAREFULLY

- Pipe expansion and fitting insertion operations must be carried out at the same location, since fittings must be installed immediately after pipe expansion.
- Temperature during installation of the GX system must be higher than -15 °C. It is advisable to work between 5÷25 °C.
- The installation must be carried out by skilled, qualified personnel.

To install the GX system, proceed as follows:

1) Pipe cut

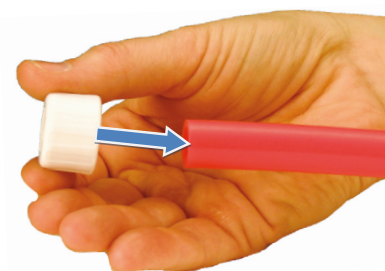
Square-cut the pipe perpendicularly to its axis, using the R990 cutter and taking care not to deform it **(1.1)**.



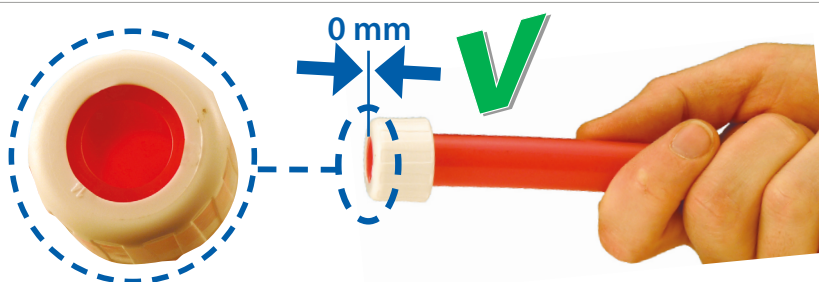
1.1

2) Ring insertion

Insert the plastic rings onto the pipe **(2.1)**, making sure that the pipe reaches the upper edge **(2.2)**.



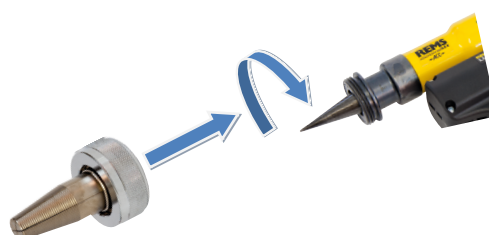
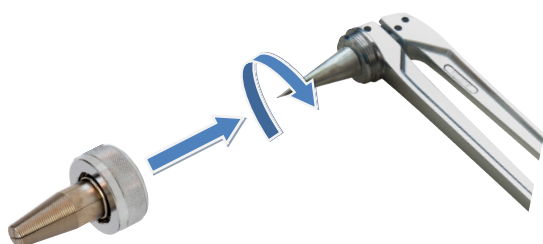
2.1



2.2

3) Expander tool preparation

Prepare the expander tool by screwing on the appropriate expansion head **(3.1)**, based on pipe diameter (for the choice of the right equipment, please refer to paragraph "Technical features - equipment").



3.1



WARNING - READ CAREFULLY

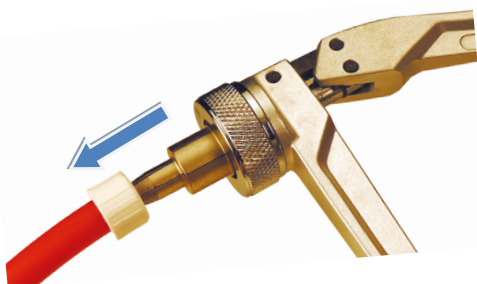
Before proceeding, you are advised to **read the entire text for steps 4 and 5**, since step 5 must be carried out **immediately** after step 4.

4a) Pipe expansion... ...with **MANUAL EXPANDER TOOL**

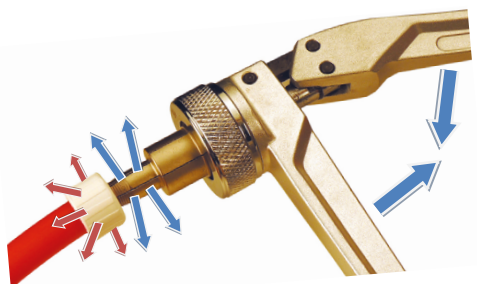
Insert the open expander tool, complete with expansion head, into the pipe up until possible, without forcing it **(4a.1)**.

Close the expander tool to widen the pipe. The expansion head will perform some expansion steps that will widen the pipe **(4a.2)**. At the end of each expansion of the expansion head, manually rotate the pipe/or the expander tool by min. 10° - max. 45° and insert it deeper into the head **(4a.3)**.

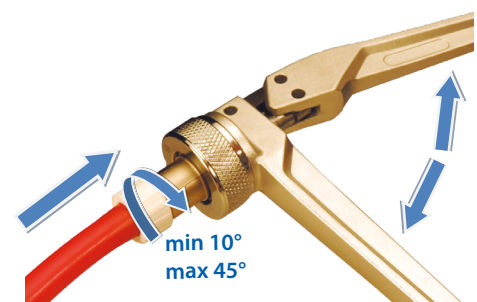
Follow these steps until the expansion head is completely inside the pipe **(4a.4)**, then perform at least further 2 expansions.



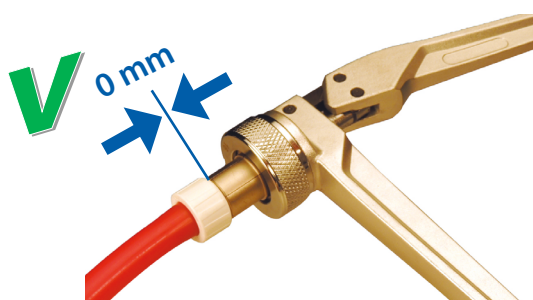
4a.1



4a.2



4a.3



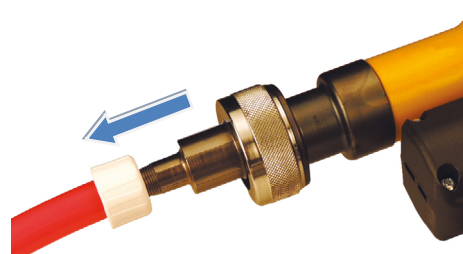
4a.4

4b) Pipe expansion... ...with **ELECTRIC OR BATTERY EXPANDER TOOL**

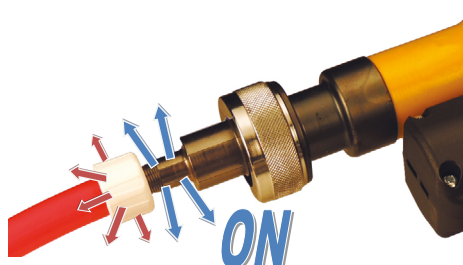
Insert the open expander tool, complete with expansion head, into the pipe up until possible, without forcing it **(4b.1)**.

Start the expander tool. The expansion head will perform some expansion steps that will widen the pipe **(4b.2)**. At the end of each expansion step of the expansion head, manually rotate the pipe/or the expander tool by min. 10° - max. 45° and insert it deeper into the head **(4b.3)**.

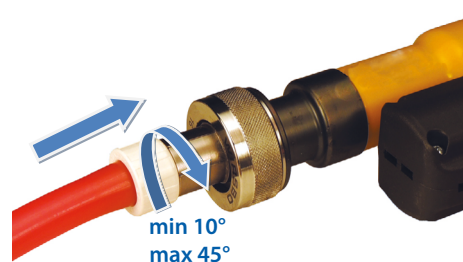
Follow these steps until the expansion head is completely inside the pipe **(4b.4)**, then perform at least further 2 expansions (for Ø 32 x 4,4 mm and 40 x 5,5 mm pipes, perform at least further 6 expansions).



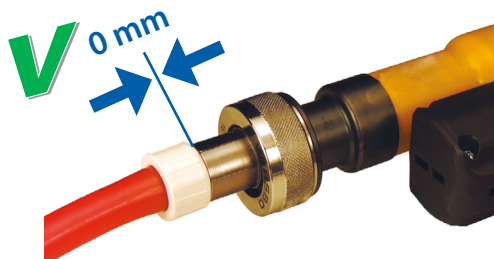
4b.1



4b.2



4b.3

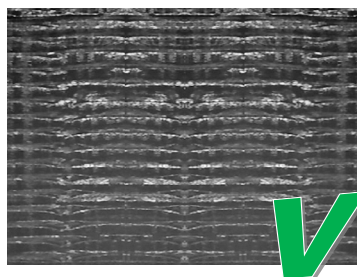


4b.4

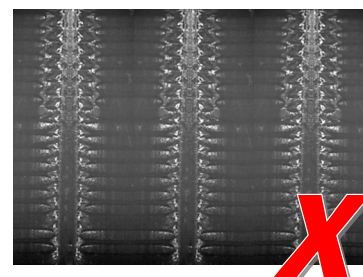

WARNING - READ CAREFULLY

During the **4a.3/4b.3** step, it is important to remember to rotate the pipe or the expander tool by min. 10° - max. 45°. This to prevent irregular expansion of the pipe.

REGULAR EXPANSION



IRREGULAR EXPANSION

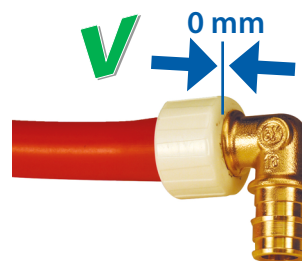
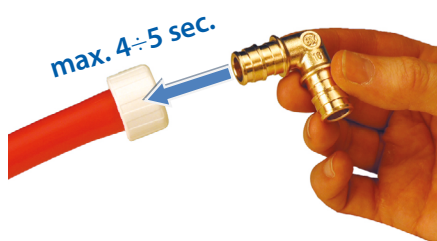

Warning.

If, during the expansion stage, the process is interrupted, the part of the pipe and the ring used **must** be cut. To make a new connection make sure to avoid using damaged or deformed components. You should use new ring and pipe length.

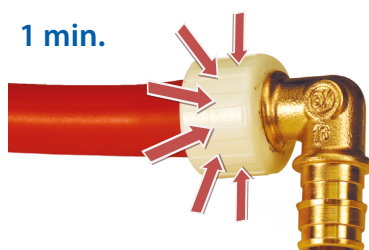
5) Fitting insertion

Immediately insert the GX fitting inside the pipe that has just been widened. Make sure that the ring is flush with the fitting's shoulder (**5.1**).

The previously widened ring and pipe will start to shrink on the fitting. After 1 minute the joint will be complete and it will be possible to move on to the following connection (**5.2**).



5.1

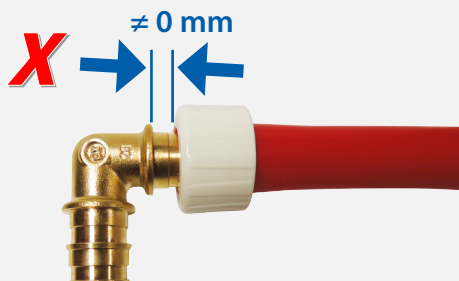


5.2

Fitting recovery

If the fitting was not correctly inserted **(a)**, it is possible to reuse it after removing the ring and the pipe, following the procedure below:

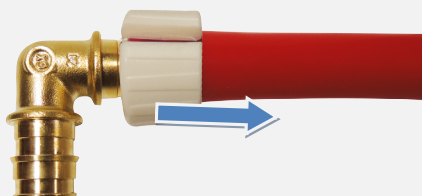
- Cut the ring with a Stanley knife, making sure to avoid cutting the pipe **(b)**.
- Remove the ring from the pipe, manually widening it **(c)**.
- Make longitudinal cuts on the pipe, at a distance of approx. 1 cm from each other **(d)**, paying attention **not to damage the brass fitting** underneath it.
- Remove the pipe by flexing it manually, so as to widen it sufficiently to slide it away **(e)** (it is possible to heat the pipe with hot air to facilitate its removal).
- If you need to insert the fitting again in the same pipe, make sure that the previously deformed pipe length is removed.



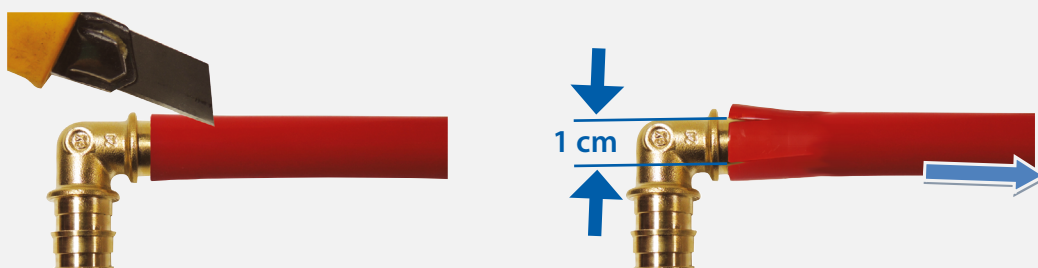
a



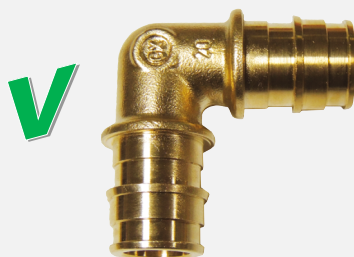
b



c



d



e



Warning.
Do not execute joints on pipe lengths that have been deformed or damaged.

6) Pipe laying

GX system pipes enable the creation of plumbing systems with extreme ease and speed.
During the laying process, some simple precautions must be observed with respect to pipe connection thanks to special fittings and adaptors, pipe bends, protection against UV rays and against any possible damage involving the pipe or its protective sleeve.

- The connection of pipes to distribution manifolds or elbows for tap coupling must be executed using fittings and adaptors of the right size for that specific pipe.
- Pipe laying, fixing and connections have to be realized thus to avoid permanent mechanical stress on components.
- All materials used to manufacture pipes expand when they are heated and shrink when they are cooled: for this reason longitudinal change (ΔL) generated by temperature change should always been considered during installation.

The difference in temperature and pipe length are the two parameters that determine longitudinal change (ΔL).

Longitudinal change can be calculated with the following formula: $\Delta L = L \times \alpha \times \Delta T$ where:

ΔL = pipe longitudinal change in mm

L = pipe length in mm

α = linear expansion coefficient (the linear expansion coefficient is $1,4 \times 10^{-4} \text{ m}/(\text{m} \cdot \text{K})$, independently from pipe diameter)

ΔT = maximum temperature difference in the system in °C

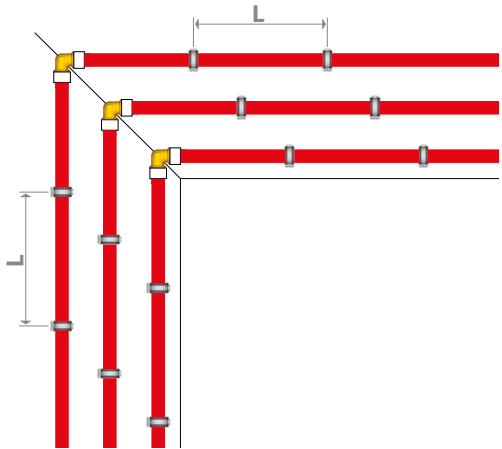
Example: L = 5 m

$\alpha = 1,4 \times 10^{-4} \text{ m}/(\text{m} \cdot \text{K})$

$\Delta T = 63 \text{ }^{\circ}\text{C}$ (where $T_{\text{min}} = 7 \text{ }^{\circ}\text{C}$ and $T_{\text{max}} = 70 \text{ }^{\circ}\text{C}$)

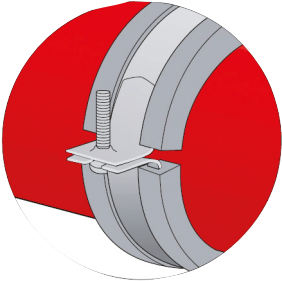
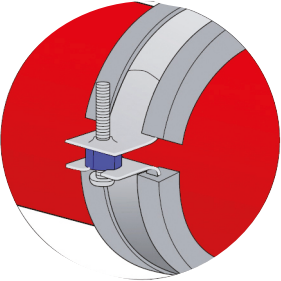
$\Delta L = 5000 \times 0,00014 \times 63 = 44 \text{ mm}$


- For surface installation, pipe length must be calculated on the basis of system requirements and distances between pipe supports must be carefully evaluated. Maximum distance between each support (L) depends on the diameter of the pipe used.



| Pipe external Ø | Max. distance between supports (L) |
|-----------------|------------------------------------|
| 16 mm | 80 cm |
| 20 mm | 120 cm |
| 25 mm | 150 cm |
| 32 mm | 160 cm |
| 40 mm | 170 cm |

- Supports used in surface installations have the two key functions of supporting the pipe and allowing its thermal expansion. Supports can be **fixed**, clamping the pipe; or **sliding**, permitting the pipe to slide as a result of thermal expansion.

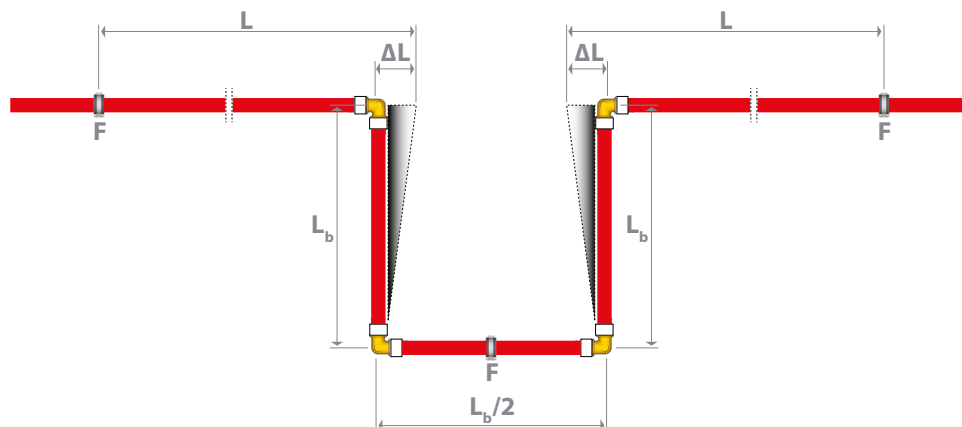
| Fixed support | Sliding support |
|---|---|
|  |  |



Warning.

Secure the pipe with the aid of plastic ties. Avoid using metal ties without protection, as they could damage the pipe.

- In long straight pipe stretches, to absorb any length changes, it is advisable to insert at least one expansion bend **every 10 m**. For pipes with a diameter equal to or greater than 32 mm, expansion bends are mandatory.



Legend

| | | | |
|----|---|----------------|------------------------------|
| L | Distance between fixed support and expansion bend | F | Fixed support |
| ΔL | Pipe longitudinal change | L _b | Length of the expansion bend |

Minimum length of expansion bend (L_b) can be calculated with the following formula: $L_b = C \times \sqrt{(\varnothing_e \times \Delta L)}$ where:

L_b = minimum length of the expansion bend in mm

C = constant of material (for PEX pipe the value is 33)

\varnothing_e = pipe external diameter in mm

ΔL = pipe longitudinal change in mm

Example: $L = 5 \text{ m}$

$\varnothing_e = 25 \text{ mm}$

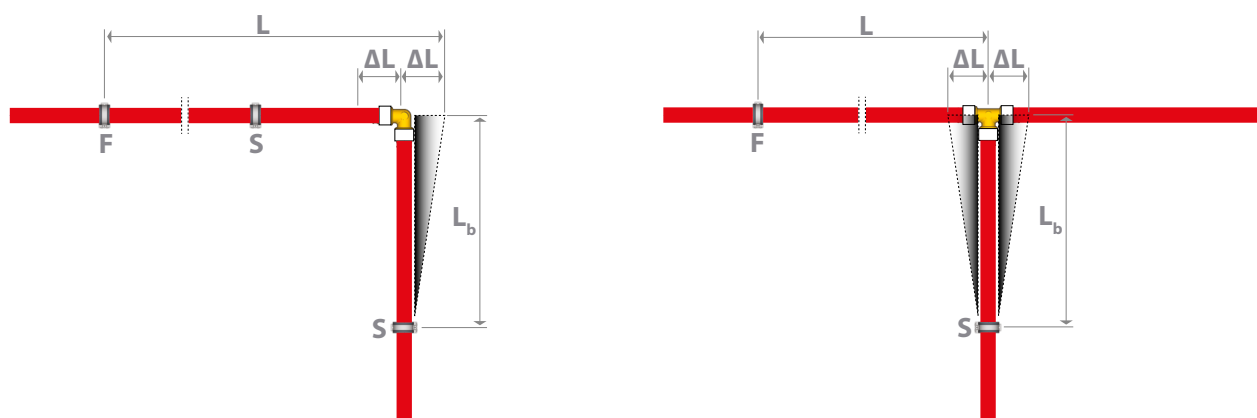
$\alpha = 1,4 \times 10^{-4} \text{ m}/(\text{m} \cdot \text{K})$

$\Delta T = 63 \text{ }^\circ\text{C}$ (dove $T_{\min} = 7 \text{ }^\circ\text{C}$ e $T_{\max} = 70 \text{ }^\circ\text{C}$)

$\Delta L = 5000 \times 0,00014 \times 63 = 44 \text{ mm}$

$L_b = 33 \times \sqrt{25 \times 44} = 1094,5 \text{ mm}$

- When bends are required, it is fundamental to use fittings and fix/sliding supports correctly, as per the following drawing. It is advisable to fit an expansion bend each time the pipe changes direction also considering to have clearance around.



Legend

| | | | |
|----------------|---|---|-----------------|
| L | Distance between fixed support and expansion bend | F | Fixed support |
| ΔL | Pipe longitudinal change | S | Sliding support |
| L _b | Length of the expansion bend | | |

- The bend radius during the installation of pipes with $\varnothing 16, 20$ and 25 mm must be greater than 8 times the pipe's outer diameter; such value can drop to 5 times the pipe's outer diameter only if the dedicated **R549P** bend support is used.
- The bend radius during the installation of pipes with $\varnothing 32$ and 40 mm must be greater than 15 times the pipe's outer diameter;
- The bend can be applied either with the cold or the hot method, with the aid of hot air (max $100 \text{ }^\circ\text{C}$).
- Pipes must not be heated with a naked flame or heat sources with temperatures so high to cause the pipe melting.

- The "removability" of R993, R994 and R995 series pipes is only guaranteed if the bends have a minimum radius greater than 8 times the outer pipe diameter.
- Pipes and fittings have already been assembled must not be bent.
If bending cannot be avoided for technical reasons, the area of the pipe near the fitting must not be subjected to permanent stresses.
- Two consecutive fittings must be installed at such a distance so as not to generate reciprocal stresses on all components, both during system installation and operation.
- In installations pipe must always be protected from UV rays and fluorescent lights that could alter its chemical-physical properties.
- Make sure the pipe is not exposed to solar radiation or fluorescent lights for long periods.
- If the pipe is chased without a protective sleeve, it has to be covered with at least 15 mm thick screed to prevent cracking of the plaster due to thermal expansion.
- Avoid chasing fittings as much as possible. If this is not possible, make sure the fitting can be inspected or protect it from contact with building material and make a note of its position in the project documentation.
- After installing the pipes and before covering them, it is advisable to test the system under pressure, so as to immediately identify any leaks (see paragraph "Pressure test").
- Following the pressure test, the sleeves must be protected by encasing them with cement so that the pipes cannot be crushed or moved.
- Do not allow ice to form, as the expansion caused by the change of status could damage the pipe.
- If a damaged pipe must be replaced, use the dedicated **R576** series joint, following the steps in the relevant instructions.

Storage precautions

- Store the pipe in a dry, protected area to avoid dampness-related damage to the packaging.
- Keep the pipe in its packaging, avoiding any exposure to direct sunlight.
- Pay special attention during the transport and installation stages.
- Make sure the pipe does not come into contact with sharp objects that could scratch it.
- Do not allow ice to form, as the expansion caused by the change of status could damage the pipe.
- Make sure the pipe does not come into contact with a naked flame or heat source with a temperature over 100 °C.
- Make sure the pipe does not come into contact with chemical solvents or paints.

7) Pressure test

The pressure test must be carried out for all GX system installations before commissioning.

The system can be put under water pressure after 30 minutes at $\geq 5^\circ\text{C}$ temperatures (for lower temperatures, see table 1).

Maximum test pressure, which cannot be exceeded, is 15 bar (1,5 MPa; 200 psi).

After 24 h, at 23°C the joint has a strength equal to that of the pipe.

The pressure test procedure is:

- 1) Remove the air from the system and put it under water pressure at 0,5 bar.
- 2) If there are no leaks after 15 minutes, increase the pressure to 1,5 times the operating pressure and keep it at this level for 30 minutes, visually inspecting the joints.
- 3) Reduce the pressure to 0,5 times the operating pressure and keep it at this level for 90 minutes:
 - if the pressure remains constant or increases slightly, it means that the systems does not leak;
 - if the pressure decreases, it means there is a leak in the system.

| Temperature range | Waiting time before pressure test |
|------------------------------|-----------------------------------|
| $> 5^\circ\text{C}$ | 0,5 h |
| $0 \div 5^\circ\text{C}$ | 1,5 h |
| $0 \div -5^\circ\text{C}$ | 3,0 h |
| $-5 \div -10^\circ\text{C}$ | 4,0 h |
| $-10 \div -15^\circ\text{C}$ | 10,0 h |

Table 1

Examples of pressure tests

Example for Class 1, 2, 5 system

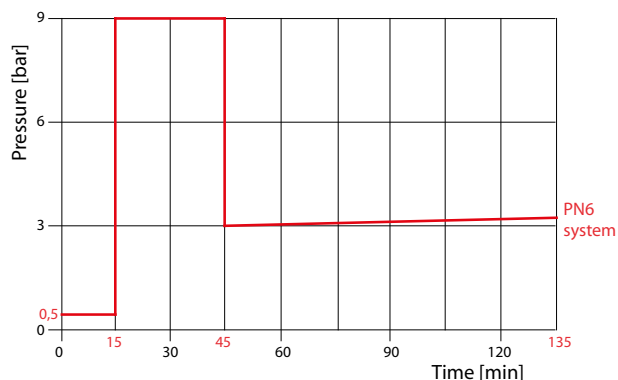
Operating pressure = 6 bar

Initial test pressure: 0,5 bar [for 15 min.]

Test pressure after 15 min.: $6 \cdot 1,5 = 9$ bar [for 30 min.]

Test pressure after 45 min.: $6 \cdot 0,5 = 3$ bar [for 90 min.]

Pressure ≥ 3 bar ($6 \cdot 0,5$) = the system does not leak



Example for Class 1, 2, 4, 5 system

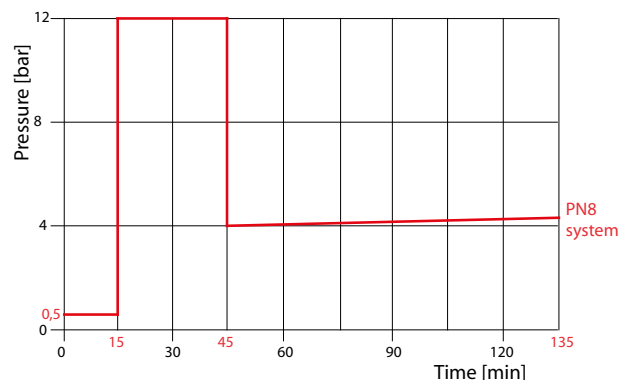
Operating pressure = 8 bar

Initial test pressure: 0,5 bar [for 15 min.]

Test pressure after 15 min.: $8 \cdot 1,5 = 12$ bar [for 30 min.]

Test pressure after 45 min.: $8 \cdot 0,5 = 4$ bar [for 90 min.]

Pressure ≥ 4 bar ($8 \cdot 0,5$) = the system does not leak



Example for Class 1, 2, 4, 5 system

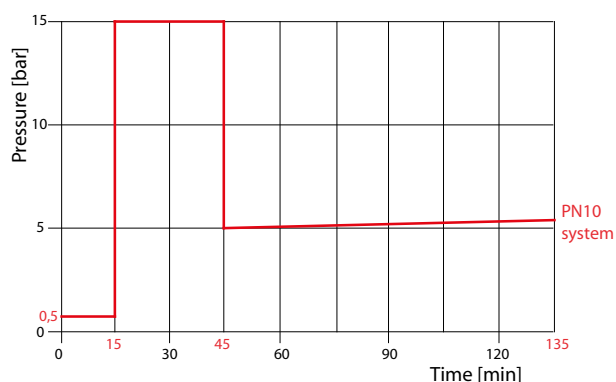
Operating pressure = 10 bar

Initial test pressure: 0,5 bar [for 15 min.]

Test pressure after 15 min.: $10 \cdot 1,5 = 15$ bar [for 30 min.]

Test pressure after 45 min.: $10 \cdot 0,5 = 5$ bar [for 90 min.]

Pressure ≥ 5 bar ($10 \cdot 0,5$) = the system does not leak



NB:

For system classes, refer to Annex EN ISO 15875, paragraph "Technical features - Pipes".

System warranty

All products and components supplied by Giacomini are subjected to numerous tests in order to guarantee the high quality in compliance with UNI EN ISO 9001 certification of the Company's Quality Management System.

All products and components supplied by Giacomini are covered by the warranty and liabilities provided for in Directives 1994/44/EC, 2001/95/EC and 85/374/EEC.

The warranty does not apply to the following cases:

- 1) if the GX system is used to distribute fluids that are not compatible with its materials;
- 2) if there are any visible faults at the time of installation or during the system's pressure test;
- 3) if installation instructions are not carefully followed;
- 4) if the pipes connected to the fittings are made of non-compatible materials or have non-compatible dimensions;
- 5) if the GX system is installed using components or equipment not compatible or not manufactured by Giacomini.

Reference Standards

- **EN ISO 15875** Plastic piping systems for hot and cold water installations.
- **DIN 16892** Plastic piping systems - Technical requirements.
- **DIN 4726** Plastic piping systems - Technical requirements.

Product specifications

Distribution system for domestic water and/or heating/cooling systems, both traditional and radiant, consisting in PEX-b **pipes** and brass **fittings** with a seal guaranteed by a **polymeric ring**.

GX system pipes are cross-linked with the silane method (PEX-b) and compliant with the EN ISO 15875 Standard; the pipes indicated as suitable for the distribution of domestic water are in compliance with Ministerial Decree 174 of 06/04/2004 for Italy; application range: class 1, 2, 4 and 5 (EN ISO 15875) depending on the series.

Fittings are made of CW617N (CuZn40Pb2) brass in compliance with EN12164, EN12165 and DIN50930-6 Standards and the UBA list provided for by the 4MS Initiative, so that they can also be used in domestic water systems. Cooling systems must be totally insulated. The range of threaded fittings complies with the international standard ISO 228. Polymeric rings are suitable for all GX system pipes, both for domestic distribution systems and heating/cooling systems; the ring design is characterised by an upper edge shaped in such a way as to ensure the correct positioning on the pipe during installation. The system is completed by a wide range of dedicated equipment (manual, battery-operated and electric expander tools; expansion heads).

**NB:**

The product codes mentioned in this technical document may be changed without any notice.
Check available product codes in the most up-to-date product catalogue.

Additional information

For additional information please check the website: www.giacomini.com or contact the technical service: ☎ +39 0322 923372 📠 +39 0322 923255 ✉ consulenza.prodotti@giacomini.com
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⚠ Safety Warning. Installation, commissioning and periodical maintenance of the product must be carried out by qualified operators in compliance with national regulations and/or local standards. A qualified installer must take all required measures, including use of Individual Protection Devices, for his and others' safety. An improper installation may damage people, animals or objects towards which Giacomini S.p.A. may not be held liable.

♻ Package Disposal. Carton boxes: paper recycling. Plastic bags and bubble wrap: plastic recycling.

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🗑 Product Disposal. Do not dispose of product as municipal waste at the end of its life cycle. Dispose of product at a special recycling platform managed by local authorities or at retailers providing this type of service.
