HANDBOOK

# PIPING ACCESSORIES

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Castel®
Italian technology

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# INDEX



## THE NATURAL DEVELOPMENT OF QUALITY

Having achieved the goal of fifty-five years working in the Refrigeration and Air Conditioning Industry, Castel's range of quality products is well known and highly appreciated around the world. Quality is the product of our Company philosophy and marks every step of the production cycle. It is certified by the company's Quality Management System (certified by TUV SUD in accordance with the UNI EN ISO 9001:2008 standard), as well as by the various product certifications of compliance with European Directives and European and extra-European Quality Marks.

Product quality is connected with the quality of manufacturing. We produce on high-tech machinery and updated automatic production lines, operating in compliance with the current safety and environmental protection standards.

Castel offers the Refrigeration and Air Conditioning Market and Manufacturers tested certified products suitable for use with the HCF and HFO refrigerants currently used in the Refrigeration & Air Conditioning Industry.

Based on the experience gained in the refrigeration field using fluorinated fluids, Castel is proud to present the Refrigeration and Air Conditioning Market and Manufacturers two complete lines of products developed and proven for use in systems using natural refrigerants: hydrocarbons (HC fluids) and carbon dioxide (R744).

# PIPING ACCESSORIES

## DIRECTIVE 2014/68/EU ISSUED OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL OF 15 MAY 2014 ON PRESSURE EQUIPMENT

Directive 2014/68/EU (PED Recast) applies to the design, manufacture and evaluation of compliance of pressure equipment and assemblies with a maximum allowable pressure, PS, greater than 0.5 bar excluding the cases listed in Article 1, Paragraph 2 of the Directive.
Directive 2014/68/EU was transposed into the Italian legal system by Legislative Decree No. 26 dated 15 February 2016, published in the Official Journal of the Republic of Italy No. 53 of 4 March 2016.
The revised PED Recast Directive repeals previous Directive 97/23/EC. More specifically:
• Article 13 of the PED Recast Directive, regarding the classification of pressure equipment, came into force as of 1 June 2015, and repeals Article 9 of the previous PED Directive.
• All other articles of the PED Recast Directive are in force as of 19 July 2016, repealing all articles of the previous PED directive.
All the vibration absorbers and the valve cores illustrated in this technical handbook are considered "Pressure Accessories" according to the definition provided in Article 2, Point 5 of said Directive and are subject to the classification indicated in Article 4, Points 1.c) and 3 of the same Directive.
The threaded brass fittings and the access fittings shown in this chapter are excluded from the scope of said Directive, as specified in Guidelines 1/8 and 1/9, as they are piping components.

## EXTERNAL LEAKAGE

The allowable external leakage complies with the requirements of standards:
• EN 1736: 2009 – Refrigerating systems and heat pumps. Flexible pipe elements, vibration isolators, expansion joints and non-metallic tubes. - Requirements, design and installation.
• EN 14276-2: 2011 – Pressure equipment for refrigerating systems and heat pumps.
Part 2: Piping. General requirements.
•EN 378-2: 2016 – Refrigerating systems and heat pumps. Safety and environmental requirements. – Part 2: Design, construction, testing, marking and documentation.
Paragraphs 5.2.2.2 and 5.2.2.3
• EN 16084: 2011 – Refrigerating systems and heat pumps - Qualification of tightness of components and joints

## PRESSURE CONTAINMENT

All the products illustrated in this Handbook, if submitted to hydrostatic testing, guarantee a pressure strength at least equal to 1.43 x PS in compliance with Directive 2014/68/EU.
All the products illustrated in this Handbook, if submitted to burst test, guarantee a pressure strength at least equal to 3 x PS according to EN 378-2: 2016 Standard.

## WEIGHT

The weights of the items listed in this Handbook include packaging and are not binding.

## WARRANTY

All Castel products are covered by a 12-month warranty. This warranty covers all products or parts thereof that turn out to be defective within the warranty period. In this case, at his own expenses, the customer shall return the defective item with a detailed description of the claimed defects. The warranty does not apply if the defect of the Castel product is due to mistakes by the customer or by third parties, such as incorrect installation, use contrary to Castel instructions, or tampering. In the event of defects found in its products, Castel will only replace the defective goods and will not refund damages of any kind. Castel reserves the right to make changes or modifications to its products at any time without prior notice.
The products listed in this handbook are protected according to law.

# CHAPTER 1
# VIBRATION ABSORBERS
## FOR REFRIGERATION PLANTS THAT USE HCFC, HFC, HC, HFO, R744 REFRIGERANTS

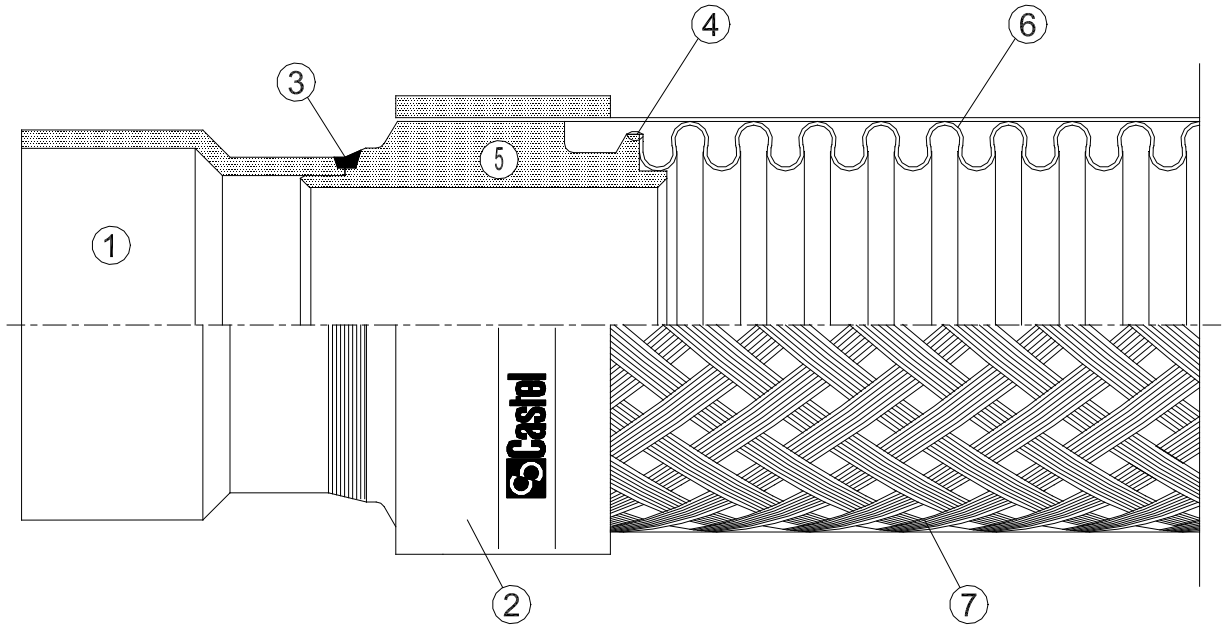
### APPLICATIONS
The vibration absorbers shown in this chapter are designed for installation on commercial refrigerating systems and on civil and industrial air conditioning plants. The function of this item is to avoid the transmission of compressor's vibrations to the refrigerating system pipes. They can also compensate small thermal expansion of the piping.
All vibration absorbers can be installed on systems that use the following refrigerant fluids:
- HCFC (R22)
- HFC (R134a, R404A, R407C, R410A, or R507)
- HFO and HFO/HFC mixtures (R1234ze, R448A, R449A, R450A, and R452A)

belonging to Group 2, as defined in Article 13, Chapter 1, Point (b) of Directive 2014/68/EU, with reference to EC Regulation No. 1272/2008.
Furthermore, vibration absorbers up to DN 25, that is model 7690/9, can also be installed on systems using the following refrigeration fluids:
- HFC (R32)
- HFO (R1234yf)
- HC (R290, R600, or R600a)

belonging to Group 1, as defined in Article 13, Chapter 1, Point (a) of Directive 2014/68/EU, with reference to EC Regulation No. 1272/2008.
For specific applications with refrigerant fluids not listed above, please contact Castel Technical Department.

### CONSTRUCTION
The main union between various parts, including the copper/stainless steel connections are TIG welded (figure 1). This solution makes the vibration absorbers particularly resistant to the overheating during connection to the piping.
The main parts of vibration absorbers are manufactured with the following materials:
- Copper pipe EN 12735-1 – Cu-DHP for connections
- Stainless steel EN 10088-1 – 1.4305/1.4301 for fittings
- Stainless steel EN 10028-7 – 1.4541/1.4404 for corrugate flexible
- Stainless steel EN 10028-7 – 1.4301 for net holder
- Stainless steel EN 10088-3 – 1.4301/1.406 for wire "braid"

### INSTALLATION
The vibration absorbers can be installed both on suction and discharge lines, as close as possible to the compressor. They are not designed to compensate possible piping misalignment.
Vibration absorbers should be installed perpendicularly to the direction of vibration. In the case of vertical and horizontal vibrations, two vibrations absorbers should be used perpendicular to each other, as shown in Fig. 2 and 3.
For the maximum absorption of vibrations, the refrigerant line should be anchored at the vibration absorber end, as shown in Fig. 2 and 3.
Castel vibration absorbers can be installed vertically too, because they are designed to avoid the retention of condensation in the wavy area near to the connections. There are no issues when employing them at temperatures below 0°C.
Vibration absorbers are not designed to absorb axial or torsional stress. Care should be taken to allow sufficient space to avoid compression or tension, after installation.
High-speed refrigerant fluid can produce vibrations and noise phenomena. In this case, it is recommended that a larger size vibration absorber be installed
The connection of the vibration absorbers to the piping is normally performed by brazing. The specific design and construction of vibration absorbers allows the installer to perform this operation without special protection to prevent overheating, generated in this phase.
It is given that best installation calls for the vibration absorber to be linear. A misalignment from the axis of no more than 3% of the length of the corrugated hose is allowed.
**WARNING! Ensure a gap corresponding to the 2% of the total length of the vibration absorber to compensate any extensions due to possible thermal expansion.**




1 - Copper connection
2 - Net holder
3 - Copper ends welding
4 - Corrugated flexible welding
5 - Fitting
6 - Corrugated flexible
7 - Stainless steel wire braid

Fig. 1

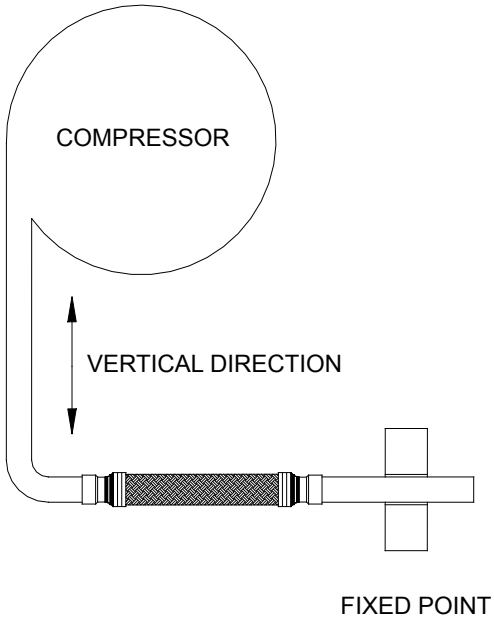



Fig. 2

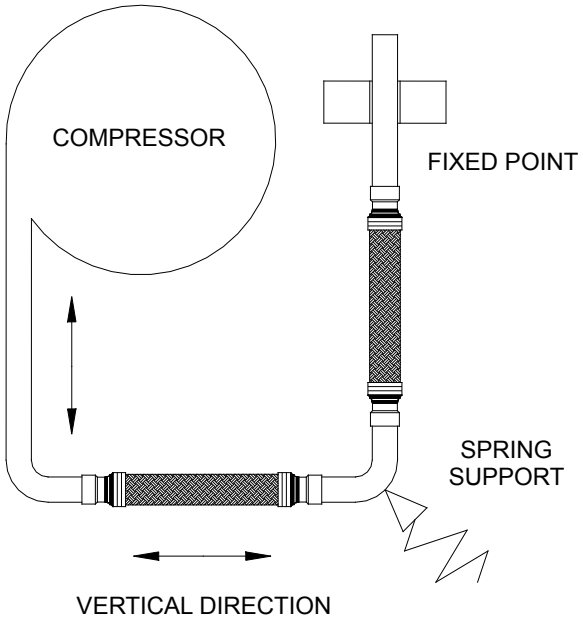
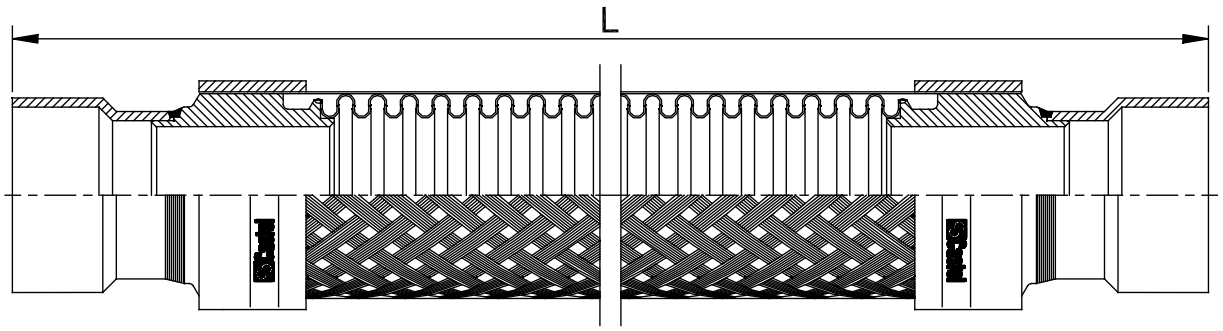



Fig. 3

## TABLE 1: General characteristics of vibration absorbers

| Catalogue Nr. | Connections ODS | | Length | Weight [g] | Working pressure (PS), depending on fluid temperature [bar] | | | TA [°C] | | Risk Category according to PED Recast |
|---|---|---|---|---|---|---|---|---|---|---|
| | [mm] | [inch] | [mm] | | -80 / +100 °C | + 120 °C | +140 °C | min | max | |
| 7690/3 | - | 3/8 | 230 | 91 | 45 | 44 | 43,5 | -40 | +50 | Art. 4.3 |
| 7690/M10 | 10 | - | | 98 | | | | | | |
| 7690/M12 | 12 | - | | 122 | | | | | | |
| 7690/4 | - | 1/2 | | 120 | | | | | | |
| 7690/M15 | 15 | - | 255 | 190 | | | | | | |
| 7690/5 | 16 | 5/8 | | 200 | | | | | | |
| 7690/M18 | 18 | - | | 180 | | | | | | |
| 7690/6 | - | 3/4 | | 180 | | | | | | |
| 7690/7 | 22 | 7/8 | 290 | 317 | | | | | | |
| 7690/M28 | 28 | - | 330 | 380 | | | | | | |
| 7690/9 | - | 1.1/8 | | 416 | | | | | | |
| 7690/11 | 35 | 1.3/8 | 375 | 846 | | | | | | |
| 7690/13 | - | 1.5/8 | 430 | 1088 | | | | | | 1 |
| 7690/M42 | 42 | - | | 1200 | | | | | | |
| 7690/17 | 54 | 2.1/8 | 510 | 2060 | 40 | 39 | 38,5 | | | |
| 7690/M64 | 64 | - | 690 | 3312 | 35 | 34,5 | 34 | | | |
| 7690/21 | 67 | 2.5/8 | | 3500 | | | | | | |
| 7690/24 | 76 | 3 | | 3610 | | | | | | |
| 7690/25 | 80 | 3.1/8 | 710 | 3660 | | | | | | |
| 7690/28 | 89 | 3.1/2 | | 4550 | 25 | 24,5 | 24 | | | |
| 7690/34 | 108 | 4.1/4 | | 4770 | | | | | | |



# CHAPTER 2
# THREADED BRASS FITTINGS
## FOR REFRIGERATION PLANTS THAT USE HCFC, HFC, HC, HFO, OR R744 REFRIGERANTS

### APPLICATIONS
The fittings illustrated in this chapter are designed for installation on commercial refrigeration systems and on civil and industrial air conditioning plants that use the following refrigerant fluids:
- HCFC (R22)
- HFC (R134a, R404A, R407C, R410A, or R507)
- HFO and HFO/HFC mixtures (R1234ze, R448A, R449A, R450A, and R452A)
- R744 subcritical and transcritical, limited to components with PS = 120 bar

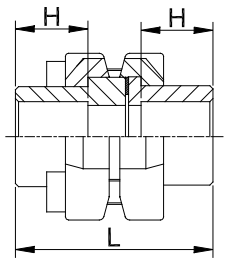
belonging to Group 2, as defined in Article 13, Chapter 1, Point (b) of Directive 2014/68/EU, with reference to EC Regulation No. 1272/2008.
Furthermore, fittings up to DN 25, they can also be installed on systems that use the following refrigeration fluids:
- HFC (R32)
- HFO (R1234yf)
- HC (R290, R600, or R600a)

belonging to Group 1, as defined in Article 13, Chapter 1, Point (a) of Directive 2014/68/EU, with reference to EC Regulation No. 1272/2008.
For specific applications with refrigerant fluids not listed above, please contact Castel Technical Department.

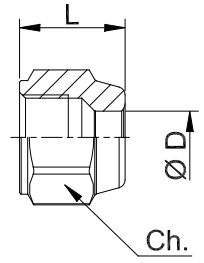
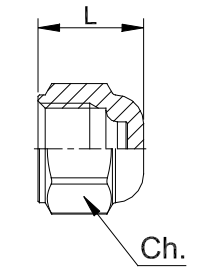
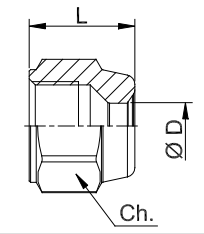
### OPERATION
The sealing system between the end of a male connection and a union in series 7010, 7020 and 7030 requires a special flaring of the end of copper pipe, the so-called flared connection.
The sealing system between the end of a male connection and a Flare-ODS adapter allows avoiding flaring the end of the copper pipe (national laws of some European countries do not accept this operation) as the end of the copper pipe is brazed into the adapter joint. We wish to remind our customers that perfect seal of the male connector / Flare-ODS adapter can only be ensured using the appropriate tapered gasket, 7580, supplied with the adapter.
The flange joints in series 7630 consist of two brass bushes for brazing to the copper pipes. Once this connection has been made, the joint seal is ensured by the compression of a gasket between the bushes. This compression occurs when the four flange screws are tightened.

### CONSTRUCTION
All nuts from series 7010 to series 7050, and all the elbows, T and cross fittings, from series 7210 to series 7410, are manufactured with hot forged brass EN 12420 – CW 617N.
All straight fittings, from series 7110 to series 7170, and all plugs, from series 7510 to series 7520, are machined from brass bars EN 12164 – CW 614N.
Caps in series 7560 and tapered gaskets in series 7580 are from copper Cu – ETP UNI 5649.
The main parts of the flanged joints in series 7630 are made with the following materials:
- Hot forged brass EN 12420 – CW 617N for bushes and flanges.
- Aramid fibres for flange gaskets.

## TABLE 2: General characteristics of flange joints

| | Catalogue Number | Connections ODS Ø [in.] | Connections ODS Ø [mm] | PS [bar] | TS [°C] min | TS [°C] max | TA [°C] min | TA [°C] max | Dimensions [mm] H | Dimensions [mm] L | Wrench torque min/max [Nm] | Weight [g] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | 7630/7 | 7/8" | – | 45 | -40 | +130 | -40 | +50 | 22 | 63 | 20 / 24 | 612 |
| | 7630/9 | 1.1/8" | – | | | | | | 23 | | | 490 |
| | 7630/11 | 1.3/8" | 35 | | | | | | | | 42 / 50 | 1100 |
| | 7630/13 | 1.5/8" | – | | | | | | 24 | 67 | | 1412 |
| | 7630/M42 | – | 42 | | | | | | | | | |
| | 7630/17 | 2.1/8" | 54 | | | | | | 25 | 71 | 68 / 80 | 2020 |

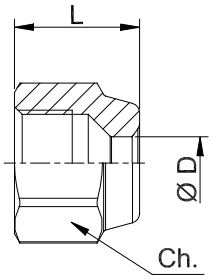
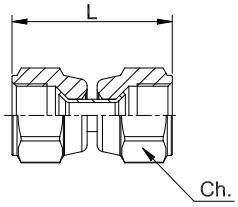
## TABLE 3: General characteristics of unions

| | Catalogue Number | International Reference | SAE Flare | Copper pipe Ø [in.] | Copper pipe Ø [mm] | PS [bar] | Dimensions [mm] Ø D | Dimensions [mm] L | Dimensions [mm] Ch | Wrench torque min / max [Nm] | Weight [g] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SAE-Flare nuts (inch tubing) | | | | | | | | | | | |
|  | 7010/22 | NS4–4 | 1/4" | 1/4" | 6 | 45 | 6,5 | 15,5 | 17 | 11 / 14 | 19 |
| | 7010/33 | NS4–6 | 3/8" | 3/8" | – | | 9,7 | 19,5 | 22 | 20 / 25 | 36 |
| | 7010/44 | NS4–8 | 1/2" | 1/2" | – | | 13 | 22,5 | 25 | 34 / 47 | 50 |
| | 7010/55 | NS4–10 | 5/8" | 5/8" | 16 | | 16,2 | 25 | 28 | 54 / 75 | 66 |
| | 7010/66 | NS4–12 | 3/4" | 3/4" | – | | 19,4 | 29,5 | 33 | 68 / 71 | 99 |
| | 7010/77 | NS4–14 | 7/8" | 7/8" | 22 | | 22,5 | 36,5 | 41 | 90 /120 | 194 |
| | 7010/88 | NS4–16 | 1" | 1" | – | | 25,6 | | | 120 / 150 | 150 |
| SAE-Flare cap nuts | | | | | | | | | | | |
|  | 7020/20 | N5–4 CAP NUT | 1/4" | blind | blind | 120 | – | 15 | 16 | 8,5 / 11,5 | 16 |
| | 7020/X02 | N5–5 CAP NUT | 5/16" | | | | | | | | 14 |
| | 7020/30 | N5–6 CAP NUT | 3/8" | | | | | | | | 14 |
| | 7020/40 | N5–58 CAP NUT | 1/2" | | | | | | | | 14 |
| SAE-Flare reducing nuts (inch tubing) | | | | | | | | | | | |
|  | 7020/32 | NRS4–64 | 3/8" | 1/4" | 6 | 45 | 6,5 | 19,5 | 22 | 20 / 25 | 38 |
| | 7020/43 | NRS4–86 | 1/2" | 3/8" | – | | 9,7 | 22,5 | 25 | 34 / 47 | 52 |
| | 7020/54 | NRS4–108 | 5/8" | 1/2" | – | | 13 | 25 | 28 | 54 / 75 | 71 |
| | 7020/65 | NRS4–1210 | 3/4" | 5/8" | 16 | | 16,2 | 29,5 | 33 | 68 / 71 | 104 |
| | 7020/87 | NRS4–1614 | 1" | 7/8" | 22 | | 22,5 | 36,5 | 41 | 120 / 150 | 160 |

(1) : shortened

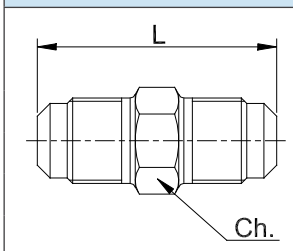
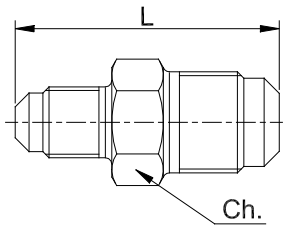
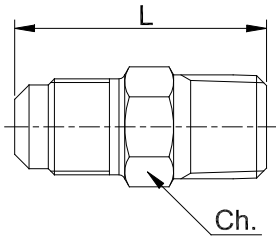
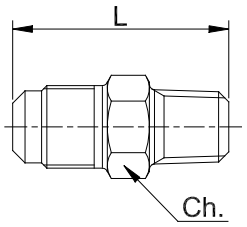
Continued

## TABLE 3: General characteristics of unions

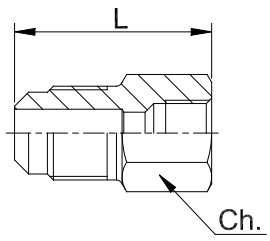
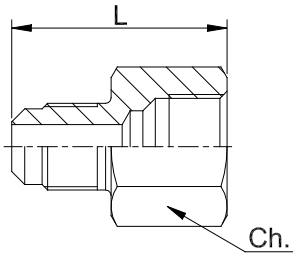
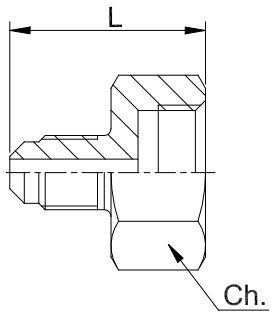
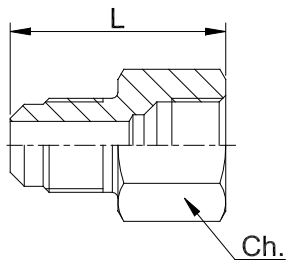
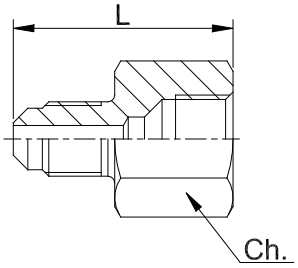
| | Catalogue Number | International Reference | SAE Flare | Copper pipe | | PS [bar] | Dimensions [mm] | | | Wrench torque min / max [Nm] | Weight [g] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Ø [in.] | Ø [mm] | | Ø D | L | Ch | | |
| SAE-Flare nuts (metric tubing) | | | | | | | | | | | |
|  | 7030/2M5 | – | 1/4" | – | 5 | 45 | 5,2 | 15,5 | 17 | 11 / 14 | 19 |
| | 7030/3M8 | | 3/8" | | 8 | | 8,2 | 19,5 | 22 | 20 / 25 | 35 |
| | 7030/3M10 | | | | 10 | | 10,2 | | | | 36 |
| | 7030/4M10 | | 1/2" | | 10 | | 10,2 | 22,5 | 25 | 34 / 47 | 52 |
| | 7030/4M12 | | | | 12 | | 12,2 | | | | 51 |
| | 7030/X04 (1) | | | | 12 | | 12,5 | 19,5 | | | 46 |
| | 7030/4M14 | | | | 14 | | 14,2 | 22,5 | | | 48 |
| | 7030/5M12 | | 5/8" | | 12 | | 12,2 | 25 | 28 | 54 / 75 | 71 |
| | 7030/5M14 | | | | 14 | | 14,2 | | | | 69 |
| | 7030/6M14 | | 3/4" | | 14 | | 14,2 | 29,5 | 33 | 68 / 71 | 107 |
| | 7030/6M18 | | | | 18 | | 18,2 | | | | 102 |
| SAE-Flare twin nuts | | | | | | | | | | | |
|  | 7050/2 | US4–4 | 1/4" | – | – | 45 | – | 32 | 17 | 11 / 14 | 39 |
| | 7050/3 | US4–6 | 3/8" | | | | | 40 | 22 | 20 / 25 | 75 |
| | 7050/4 | US4–8 | 1/2" | | | | | 46 | 25 | 34 / 47 | 105 |
| | 7050/5 | US4–10 | 5/8" | | | | | 51 | 28 | 54 / 75 | 140 |

(1) : shortened

## TABLE 4: General characteristics of unions

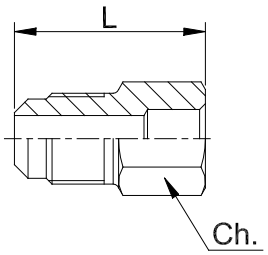
| | Catalogue Number | International Reference | Connections | | PS [bar] | Dimensions [mm] | | Weight [g] |
|---|---|---|---|---|---|---|---|---|
| | | | SAE Flare | NPT | | L | Ch | |
| **SAE-Flare unions** | | | | | | | | |
|  | 7110/2 | U2–4 | 1/4" | – | 120 | 38 | 12 | 23 |
| | 7110/3 | U2–6 | 3/8" | | | 44 | 17 | 46 |
| | 7110/4 | U2–8 | 1/2" | | | 50 | 20 | 73 |
| | 7110/5 | U2–10 | 5/8" | | | 58 | 23 | 113 |
| | 7110/6 | U2–12 | 3/4" | | | 63 | 27 | 164 |
| | 7110/8 | U2–16 | 1" | | | 72 | 36 | 304 |
| **Reducing SAE-Flare unions** | | | | | | | | |
|  | 7120/23 | UR2–64 | 1/4" x 3/8" | – | 120 | 42 | 17 | 38 |
| | 7120/24 | UR2–84 | 1/4" x 1/2" | | | 45 | 20 | 58 |
| | 7120/34 | UR2–86 | 3/8" x 1/2" | | | 48 | | 66 |
| | 7120/35 | UR2–106 | 3/8" x 5/8" | | | 52 | 23 | 89 |
| | 7120/45 | UR2–108 | 1/2" x 5/8" | | | 54 | 23 | 98 |
| | 7120/46 | UR2–128 | 1/2" x 3/4" | | | 57,5 | 27 | 136 |
| | 7120/56 | UR2–1210 | 5/8" x 3/4" | | | 61,5 | 27 | 150 |
| **SAE Flare / NPT unions** | | | | | | | | |
|  | 7130/2 | U1–4B | 1/4" | 1/4" | 120 | 38,1 | 14 | 32 |
| | 7130/3 | U1–6C | 3/8" | 3/8" | | 41,2 | 17 | 48 |
| | 7130/4 | U1–8D | 1/2" | 1/2" | | 49,8 | 22 | 92 |
| | 7130/6 | U1–12F | 3/4" | 3/4" | | 57,6 | 27 | 152 |
| | 7130/8 | U1–16H | 1" | 1" | | 68 | 36 | 277 |
| **SAE Flare / NPT reducing unions** | | | | | | | | |
|  | 7140/21 | U1–4A | 1/4" | 1/8" | 120 | 32,9 | 12 | 20 |
| | 7140/32 | U1–6B | 3/8" | 1/4" | | 41,1 | 17 | 39 |
| | 7140/34 | U1–6D | 3/8" | 1/2" | | 45,8 | 22 | 77 |
| | 7140/43 | U1–8C | 1/2" | 3/8" | | 45,2 | 20 | 63 |
| | 7140/54 | U1–10D | 5/8" | 1/2" | | 53,8 | 23 | 102 |

## TABLE 5: General characteristics of unions

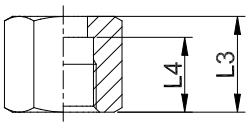
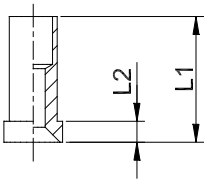
| | Catalogue Number | International Reference | Connections | | | | | | PS [bar] | Dimensions [mm] | | Weight [g] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SAE Flare | | NPT | GAS | ODS | | | | | |
| | | | m | f | | | Ø [in.] | Ø [mm] | | L | Ch | |
| **Male/female reducing unions (reduced female)** | | | | | | | | | | | | |
|  | 7150/21 | U3–4A | 1/4" | – | 1/8" f | – | – | – | 120 | 29 | 14 | 21 |
| | 7150/32 | UR3–46 | 3/8" | 1/4" | – | | | | | 33 | 17 | 38 |
| | 7150/42 | UR3–48 | 1/2" | 1/4" | | | | | | 35 | 22 | 75 |
| | 7150/43 | UR3–68 | 1/2" | 3/8" | | | | | | 38 | 22 | 66 |
| | 7150/54 | UR3–810 | 5/8" | 1/2" | | | | | | 45 | 25 | 99 |
| | 7150/64 | UR3–812 | 3/4" | 1/2" | | | | | | 46,5 | 27 | 132 |
| | 7150/65 | UR3–1012 | 3/4" | 5/8" | | | | | | 49,5 | 30 | 157 |
| **Male/female reducing unions (reduced male)** | | | | | | | | | | | | |
|  | 7150/X29 | – | – | 1/4" | 1/8" | – | – | – | 120 | 24 | 17 | 24 |
| | 7150/X27 | – | – | 1/4" | 1/4" | | | | | 30 | 17 | 35 |
| | 7150/23 | UR3–64 | 1/4" | 3/8" | – | | | | | 33 | 22 | 49 |
| | 7150/24 | UR3–84 | 1/4" | 1/2" | | | | | | 36 | 25 | 66 |
| | 7150/34 | UR3–86 | 3/8" | 1/2" | | | | | | 39 | | 74 |
| | 7150/45 | UR3–108 | 1/2" | 5/8" | | | | | | 44 | 30 | 125 |
| | 7150/46 | UR3–128 | 1/2" | 3/4" | | | | | | 45 | 34 | 142 |
| | 7150/56 | UR3–1210 | 5/8" | 3/4" | | | | | | 49 | 34 | 157 |
| **Cylinder adaptors** | | | | | | | | | | | | |
|  | 7154/2 | – | 1/4" | 20 – 14 left thread, female | | | | | 45 | 29 | 25 | 46 |
| | 7156/2 | | 1/4" | W 21,8 – 14 right thread, female | | | | | | | 27 | 52 |
| **Male/female unions** | | | | | | | | | | | | |
|  | 7160/2 | – | 1/4" | 1/4" | – | – | – | – | 45 | 30,5 | 17 | 31 |
| | 7160/3 | | 3/8" | 3/8" | | | | | | 36 | 22 | 57 |
| | 7160/4 | | 1/2" | 1/2" | | | | | | 41 | 25 | 84 |
| **Unions SAE-Flare to BSP** | | | | | | | | | | | | |
|  | 7164/2 | – | 1/4" | – | – | G1/4" f | – | – | 45 | 32,5 | 20 | 45 |
| | 7166/2 | | – | 1/4" | | G1/4" m | | | | 32 | 17 | 25 |

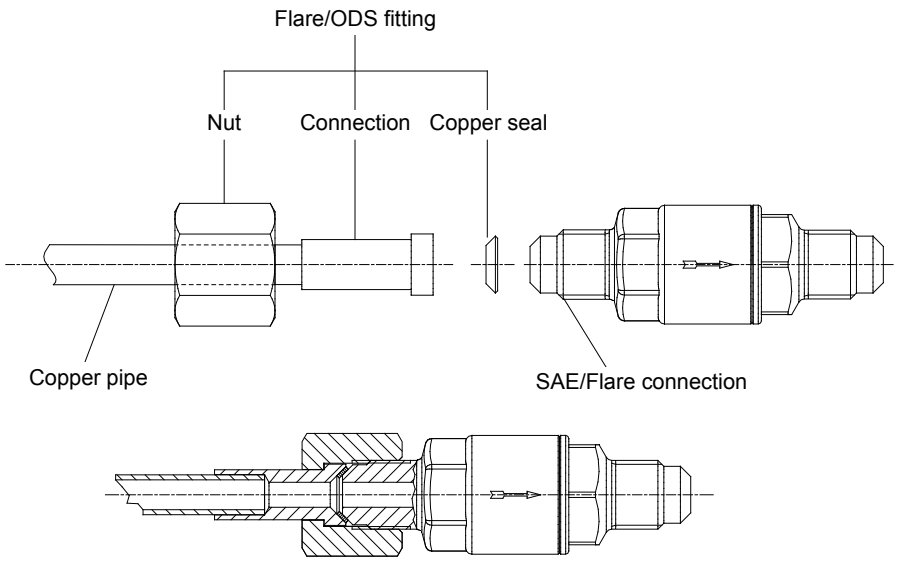
Continued

## TABLE 5: General characteristics of unions

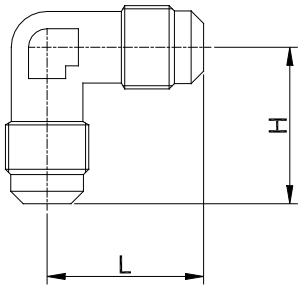
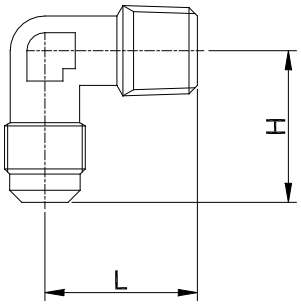
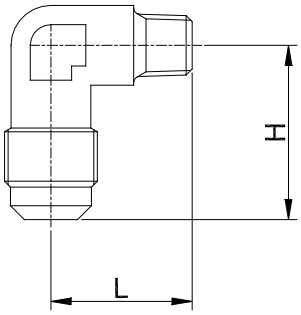
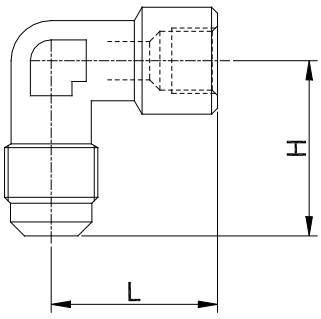
| | Catalogue Number | International Reference | Connections | | | | | | PS [bar] | Dimensions [mm] | | Weight [g] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SAE Flare | | NPT | GAS | ODS | | | | | |
| | | | m | f | | | Ø [in.] | Ø [mm] | | L | Ch | |
| Male SAE-Flare/solder unions | | | | | | | | | | | | |
|  | 7170/22 | US3–44 | 1/4" | – | – | – | 1/4" | – | 120 | 26,5 | 12 | 17 |
| | 7170/2M8 | – | | | | | – | 8 | | | | |
| | 7170/33 | US3–66 | 3/8" | | | | 3/8" | – | | 33 | 17 | 39 |
| | 7170/3M8 | – | | | | | – | 8 | | | | |
| | 7170/3M10 | – | | | | | – | 10 | | | | |
| | 7170/34 | US3–68 | | | | | 1/2" | – | | | | |
| | 7170/44 | US3–88 | 1/2" | | | | 1/2" | – | | 35 | 20 | 53 |
| | 7170/4M12 | – | | | | | – | 12 | | | | |
| | 7170/55 | US3–1010 | 5/8" | | | | 5/8" | 16 | | 42 | 23 | 82 |
| | 7170/6M18 | – | 3/4" | | | | – | 18 | | 45,5 | 27 | 123 |
| | 7170/65 | US3–1210 | | | | | 5/8" | 16 | | | | |
| | 7170/87 | US3–1614 | | | | | 7/8" | 22 | | 50 | 36 | 241 |

## TABLE 6: General characteristics of unions

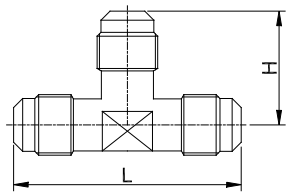
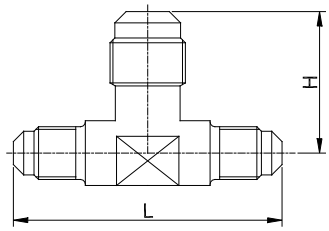
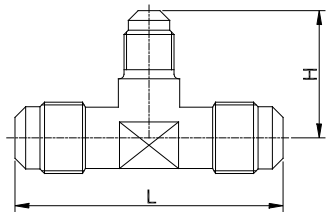
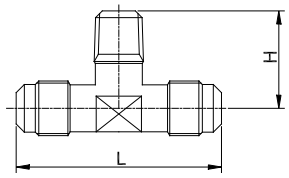
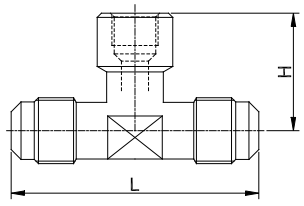
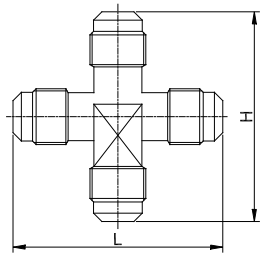
| | Catalogue Number | Item Position | Connections | | | PS [bar] | Dimensions [mm] | | | | | Wrench torque min / max [Nm] | Weight [g] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SAE Flare | ODS | | | | | | | | | |
| | | | | Ø [in.] | Ø [mm] | | $L_1$ | $L_2$ | $L_3$ | $L_4$ | Ch | | |
| Flare / ODS adapters | | | | | | | | | | | | | |
| POS.1   POS.2   POS.3  | 9901/X11 | 1 | 1/4" | – | 6 | 120 | – | – | 16 | 12,5 | 17 | 11 / 14 | 274 |
| | | 2 | | | | | 21 | 3,5 | – | – | – | – | |
| | | 3 | | | | | – | | | | | | |
| | 9901/X12 | 1 | 3/8" | – | 10 | | – | – | 18,5 | 14,7 | 22 | 20 / 25 | 393 |
| | | 2 | | | | | 23,5 | 4 | – | – | – | – | |
| | | 3 | | | | | – | | | | | | |
| | 9901/X13 | 1 | 1/2" | – | 12 | | – | – | 21 | 17 | 27 | 34 / 47 | 672 |
| | | 2 | | | | | 26 | 4,5 | – | – | – | – | |
| | | 3 | | | | | – | | | | | | |
| | 9901/X14 | 1 | 5/8" | 5/8" | 16 | | – | – | 22,5 | 18 | 30 | 54 / 75 | 511 |
| | | 2 | | | | | 27,5 | 5 | – | – | – | – | |
| | | 3 | | | | | – | | | | | | |
| | 9901/X15 | 1 | 3/4" | – | 18 | | – | – | 25 | 20 | 36 | 68 / 71 | 806 |
| | | 2 | | | | | 30 | 5 | – | – | – | – | |
| | | 3 | | | | | – | | | | | | |
| | 9901/X16 | 1 | 1/4" | 1/4" | – | | – | – | 16 | 12,5 | 17 | 11 / 14 | 274 |
| | | 2 | | | | | 21 | 3,5 | – | – | – | – | |
| | | 3 | | | | | – | | | | | | |
| | 9901/X17 | 1 | 3/8" | 3/8" | – | | – | – | 18,5 | 14,7 | 22 | 20 / 25 | 383 |
| | | 2 | | | | | 23,5 | 4 | – | – | – | – | |
| | | 3 | | | | | – | | | | | | |
| | 9901/X18 | 1 | 1/2" | 1/2" | – | | – | – | 21 | 17 | 27 | 34 / 47 | 672 |
| | | 2 | | | | | 26 | 4,5 | – | – | – | – | |
| | | 3 | | | | | – | | | | | | |
| | 9901/X19 | 1 | 3/4" | 3/4" | – | | – | – | 25 | 20 | 36 | 68 / 71 | 806 |
| | | 2 | | | | | 30 | 5 | – | – | – | – | |
| | | 3 | | | | | – | | | | | | |



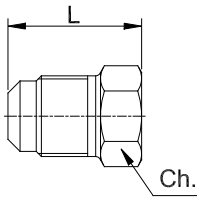
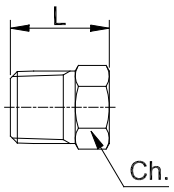
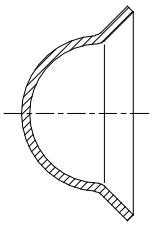
## TABLE 7: General characteristics of unions

| | Catalogue Number | International Reference | Connections | | | PS [bar] | Dimensions [mm] | | Weight [g] |
|---|---|---|---|---|---|---|---|---|---|
| | | | SAE Flare | | NPT | | | | |
| | | | m | f | | | H | L | |
| **SAE-Flare elbows** | | | | | | | | | |
|  | 7210/2 | E2–4 | 1/4" | – | – | 120 | 24,5 | 24,5 | 24 |
| | 7210/3 | E2–6 | 3/8" | | | | 29,5 | 29,5 | 60 |
| | 7210/4 | E2–8 | 1/2" | | | | 32,5 | 32,5 | 80 |
| | 7210/5 | E2–10 | 5/8" | | | | 36 | 36 | 116 |
| | 7210/6 | E2–12 | 3/4" | | | | 42,5 | 42,5 | 192 |
| **SAE-Flare / NPT elbows** | | | | | | | | | |
|  | 7220/2 | E1–4B | 1/4" | – | 1/4" | 120 | 26 | 24 | 33 |
| | 7220/3 | E1–6C | 3/8" | | 3/8" | | 29,5 | 28,5 | 54 |
| | 7220/4 | E1–8D | 1/2" | | 1/2" | | 32,5 | 32 | 91 |
| | 7220/6 | E1–12F | 3/4" | | 3/4" | | 42,5 | 39,5 | 183 |
| **SAE-Flare / reduced NPT elbows** | | | | | | | | | |
|  | 7230/21 | E1–4A | 1/4" | – | 1/8" | 120 | 24,5 | 23,5 | 25 |
| | 7230/32 | E1–6B | 3/8" | | 1/4" | | 29,5 | 29,5 | 46 |
| | 7230/43 | E1–8C | 1/2" | | 3/8" | | 32,5 | 31 | 97 |
| | 7230/54 | E1–10D | 5/8" | | 1/2" | | 36 | 35 | 112 |
| **Male/female SAE-Flare elbows** | | | | | | | | | |
|  | 7240/2 | – | 1/4" | 1/4" | – | 120 | 28,5 | 28 | 56 |
| | 7240/3 | | 3/8" | 3/8" | | | 32 | 31 | 80 |
| | 7240/4 | | 1/2" | 1/2" | | | 39,5 | 38 | 200 |

## TABLE 8: General characteristics of unions

| | Catalogue Number | International Reference | Connections | | | | | PS [bar] | Dimensions [mm] | | Weight [g] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SAE Flare | | | | NPT (3) | | | | |
| | | | (1) | (2) | (3) | (4) | | | H | L | |
| **SAE-Flare TEE** | | | | | | | | | | | |
|  | 7310/2 | T2–4 | 1/4" | 1/4" | 1/4" | – | – | 120 | 23,5 | 47 | 35 |
| | 7310/3 | T2–6 | 3/8" | 3/8" | 3/8" | | | | 29 | 58 | 70 |
| | 7310/4 | T2–8 | 1/2" | 1/2" | 1/2" | | | | 31,5 | 63 | 98 |
| | 7310/5 | T2–10 | 5/8" | 5/8" | 5/8" | | | | 36 | 72 | 150 |
| | 7310/6 | T2–12 | 3/4" | 3/4" | 3/4" | | | | 41,5 | 83 | 235 |
| **SAE-Flare reducing TEE ( reduced side connections)** | | | | | | | | | | | |
|  | 7320/223 | TR2–46 | 1/4" | 1/4" | 3/8" | – | – | 120 | 29 | 56 | 77 |
| | 7320/334 | TR2–68 | 3/8" | 3/8" | 1/2" | | | | 32,5 | 63 | 95 |
| | 7320/445 | TR2–810 | 1/2" | 1/2" | 5/8" | | | | 38 | 72 | 153 |
| | 7320/556 | TR2–1012 | 5/8" | 5/8" | 3/4" | | | | 41,5 | 83 | 228 |
| **SAE-Flare reducing TEE ( reduced central connection)** | | | | | | | | | | | |
|  | 7320/332 | TR2–64 | 3/8" | 3/8" | 1/4" | – | – | 120 | 28 | 58 | 77 |
| | 7320/443 | TR2–86 | 1/2" | 1/2" | 3/8" | | | | 32,5 | 63 | 101 |
| | 7320/554 | TR2–108 | 5/8" | 5/8" | 1/2" | | | | 38 | 72 | 149 |
| | 7320/665 | TR2–1210 | 3/4" | 3/4" | 5/8" | | | | 41,5 | 83 | 232 |
| **SAE-Flare / NPT TEE ( taper central connection)** | | | | | | | | | | | |
|  | 7330/221 | T1–4A | 1/4" | 1/4" | – | – | 1/8" | 120 | 21 | 47 | 33 |
| | 7330/222 | T1–4B | 1/4" | 1/4" | | | 1/4" | | 24 | 51 | 45 |
| | 7330/332 | T1–6B | 3/8" | 3/8" | | | 1/4" | | 28 | 58 | 65 |
| **Male/female SAE-Flare TEE (female central connection)** | | | | | | | | | | | |
|  | 7340/222 | T6–4 | 1/4" | 1/4" | 1/4" | – | – | 120 | 27,5 | 56 | 73 |
| **SAE-Flare / NPT TEE ( taper central connection)** | | | | | | | | | | | |
|  | 7410/2 | C1–4 | 1/4" | 1/4" | 1/4" | 1/4" | – | 120 | 52 | 52 | 72 |

## TABLE 9: General characteristics of unions

| | Catalogue Number | International Reference | Connections | | PS [bar] | Dimensions [mm] | | Wrench torque min/max [Nm] | Weight [g] |
|---|---|---|---|---|---|---|---|---|---|
| | | | SAE Flare | NPT | | L | Ch | | |
| **SAE-Flare plugs** | | | | | | | | | |
|  | 7510/2 | P2–4 | 1/4" | – | 120 | 23 | 12 | 11 / 14 | 19 |
| | 7510/3 | P2–6 | 3/8" | | | 26 | 17 | 20 / 25 | 40 |
| | 7510/4 | P2–8 | 1/2" | | | 30 | 20 | 34 / 47 | 67 |
| **NPT plugs** | | | | | | | | | |
|  | 7520/1 | 121–B–02 | – | 1/8" | 120 | 15,9 | 12 | 10 / 13 | 12 |
| | 7520/2 | 121–B–04 | | 1/4" | | 23,1 | 14 | 15 / 20 | 27 |
| | 7520/3 | 121–B–06 | | 3/8" | | 23,2 | 17 | 17 / 22 | 43 |
| | 7520/4 | 121–B–08 | | 1/2" | | 29,8 | 22 | 25 / 35 | 87 |
| | 7520/6 | 121–B–12 | | 3/4" | | 32,1 | 27 | 30 / 40 | 149 |
| | 7520/8 | 121–B–16 | | 1" | | 39 | 34 | 60 / 80 | 279 |
| **Copper seal caps** | | | | | | | | | |
|  | 7560/2 | B1–4 | 1/4" | – | 45 | – | – | – | 0,5 |
| | 7560/3 | B1–6 | 3/8" | | | | | | 1,1 |
| | 7560/4 | B1–8 | 1/2" | | | | | | 2,5 |
| | 7560/5 | B1–10 | 5/8" | | | | | | 2,6 |
| | 7560/6 | B1–12 | 3/4" | | | | | | 3,7 |
| | 7560/7 | B1–14 | 7/8" | | | | | | 5,3 |
| **Copper gaskets** | | | | | | | | | |
|  | 7580/2 | B2–4 | 1/4" | – | 45 | – | – | – | 0,2 |
| | 7580/3 | B2–6 | 3/8" | | | | | | 0,5 |
| | 7580/4 | B2–8 | 1/2" | | | | | | 0,7 |
| | 7580/5 | B2–10 | 5/8" | | | | | | 1,1 |
| | 7580/6 | B2–12 | 3/4" | | | | | | 1,2 |

# CHAPTER 3
# ACCESS FITTINGS AND VALVE CORES
## FOR REFRIGERATION PLANTS THAT USE HCFC, HFC, HC, HFO, OR R744 REFRIGERANTS

### APPLICATIONS
The access fittings illustrated in this chapter are designed for installation on commercial refrigeration systems and on civil and industrial air conditioning plants that use the following refrigerant fluids:
- HCFC (R22)
- HFC (R134a, R404A, R407C, R410A, or R507)
- HFO and HFO/HFC mixtures (R1234ze, R448A, R449A, R450A, and R452A)
- R744 subcritical and transcritical, limited to components with PS = 120 bar

belonging to Group 2, as defined in Article 13, Chapter 1, Point (b) of Directive 2014/68/EU, with reference to EC Regulation No. 1272/2008.
The access fittings illustrated in this chapter can be installed also on systems that use the following refrigerant fluids:
- HFC (R32)
- HFO (R1234yf)
- HC (R290, R600, or R600a)

belonging to Group 1, as defined in Article 13, Chapter 1, Point (a) of Directive 2014/68/EU, with reference to EC Regulation No. 1272/2008.
To use the valve cores with the various refrigerant fluids listed above, please refer to Table 14 in this chapter.
For specific applications with refrigerant fluids not listed above, please contact Castel Technical Department.

### OPERATION
The access fittings allow creating a loading or draining point rapidly and with a minimum expense. After completion of the filling or draining operations, use of the cap and gasket (p/n 8392/A or 8391/A) prevents any refrigerant leakage.
For special customer requirements, the cap 8392/A can be replaced by a blind union p/n 7020/20. The latter solution requires that the union be tightened using a torque wrench to 8.5 ÷ 11.5 Nm. **Note: it is not necessary to use a copper gasket between union 7020/20 and the filling connector chosen.**
For systems using refrigerant fluid R410A, Castel has developed three specific filling connectors with 5/16" SAE-Flare connection (p/n 8350/X09, 8351/X05 and 8351/X07) that must be used with the following parts:
- Valve core, p/n 8395/A1 or 8395/A3
- Blind union, p/n 7020/X02

This solution for R410A requires to the union to be tightened with a torque wrench to 8.5 ÷ 11.5 Nm. **Note: also in this case, it is not necessary to use a copper gasket between union 7020/X02 and the filling connector chosen.**
If a component other than the two blind unions in series 7020 must be tightened on the access fittings (for example a pressure gauge), a tapered gasket with tang (p/n 8580/2) must be positioned between the component and the chosen access fitting.

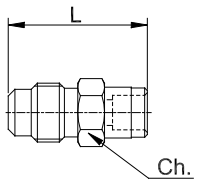
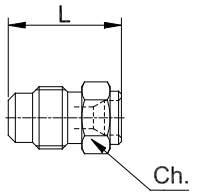
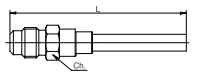
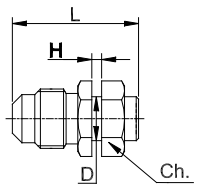
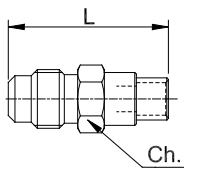
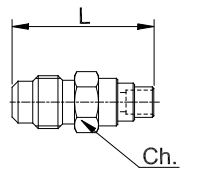
The access fittings have different shapes and sizes, according to varying customer requirements. For all access fittings, the valve core seat is manufactured according to the ARI STANDARD 720:1997.
After tightening the valve core inside the access fitting with the dedicated wrench, p/n 8390/A, to the indicated torque, the refrigerant passage, filling or draining is obtained simply by activating the needle on the valve core.

### CONSTRUCTION
The straight fittings are machined by hexagonal brass bar EN 12164 – CW 614N.

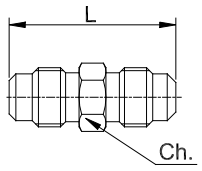
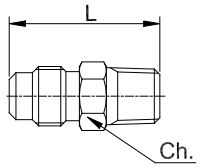
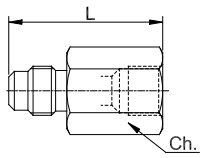
The T and cross fittings are hot forged in brass EN 12420 – CW 617N.
Cap 8391/A is moulded Nylon.
Caps 8392/A and 8392/B are machined from hexagonal brass bar EN 12164 – CW 614N, with chloroprene rubber (CR) gasket.
Valve core 8394/B is equipped with chloroprene rubber (CR) and PTFE gaskets

Valve core 8395/A1 is equipped with chloroprene rubber (CR) gaskets
Valve core 8395/A3 is equipped with hydrogenated nitrile rubber (HNBR) gaskets
Valve core 8395/A4 is equipped with ethylene propylene rubber (EPDM) gaskets
The tapered gasket with tang, 8580/2, is manufactured from copper Cu - ETP UNI 5649.

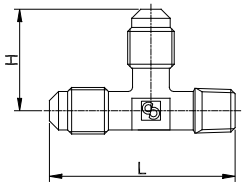
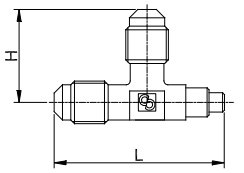
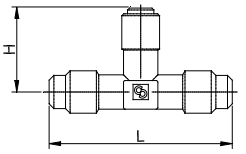
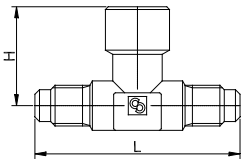
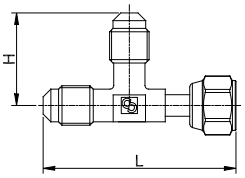
## TABLE 10: General characteristics of access fittings

| | Part number | Connections | | | | | | | | PS [bar] | Dimensions [mm] | | | | Weight [g] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SAE Flare | | | NPT | ODS | | IDS | | | L | Ch | D | H | |
| | | Valve core | m | f | | Ø [in.] | Ø [mm] | Ø [in.] | Ø [mm] | | | | | | |
| Straight access fittings | | | | | | | | | | | | | | | |
|  | 8350/22 | 1/4" | – | – | – | 1/4" | – | 3/8" | – | 120 | 26 | 11 | – | – | 12 |
| | 8350/X10 | 1/4" | – | – | – | 1/4" | – | – | 10 | | 26 | 11 | – | – | 12 |
|  | 8350/X01 | 1/4" | – | – | – | – | 6 | – | – | 120 | 20 | 11 | – | – | 10 |
|  | 8350/X03 | 1/4" | – | – | – | – | – | – | 6 | 45 | 90 | 11 | – | – | 23 |
| | 8350/X06 | 1/4" | – | – | – | – | – | 1/4" | – | | 126 | 11 | – | – | 28 |
| | 8350/X07 | 1/4" | – | – | – | – | – | 1/4" | – | | 326 | 11 | – | – | 58 |
| | 8350/X12 | 1/4" | – | – | – | – | – | – | 6 | | 180 | 11 | – | – | |
|  | 8350/X09 | 5/16" | – | – | – | 1/4" | – | – | – | 45 | 27 | 14 | 9,4 | 2,1 | 19 |
|  | 8351/2 | 1/4" | – | – | – | – | 6 | – | 8 - 10 | 120 | 30 | 11 | – | – | 13 |
| | 8351/X04 | 1/4" | – | – | – | – | – | | 6 | | 26 | 11 | – | – | 11 |
| | 8351/X05 | 5/16" | – | – | – | – | – | 3/8" | 7 | | 27 | 14 | – | – | 18 |
| | 8351/X07 | 5/16" | – | – | – | – | – | 3/8" | 6 | | 27 | 14 | – | – | 19 |
|  | 8351/X01 | 1/4" | – | – | – | – | 1/8" | – | 6 | 120 | 36 | 11 | – | – | 13 |
| | 8351/X02 | 1/4" | – | – | – | – | 5 | 1/4"<br>5/16"<br>3/8" | – | | 26 | 11 | – | – | 11 |
| | 8351/X06 | 1/4" | – | – | – | – | – | – | 6<br>8<br>10 | | 28 | 11 | – | – | 13 |

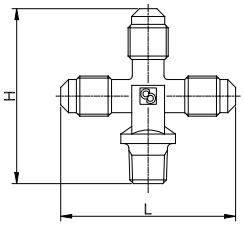
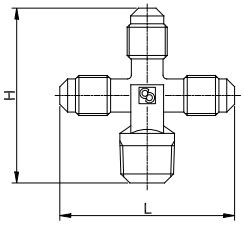
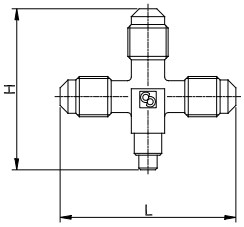
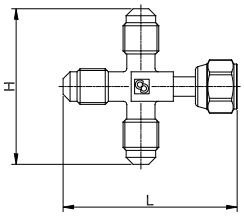
Continued

| TABLE 10: General characteristics of access fittings | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Part number | Connections | | | | | | | | PS [bar] | Dimensions [mm] | | | | Weight [g] |
| | | SAE Flare | | | NPT | ODS | | IDS | | | L | Ch | D | H | |
| | | Valve core | m | f | | Ø [in.] | Ø [mm] | Ø [in.] | Ø [mm] | | | | | | |
| Straight access fittings | | | | | | | | | | | | | | | |
|  | 8352/22 | 1/4" | 1/4" | – | – | – | – | – | – | 120 | 31 | 11 | – | – | 15 |
|  | 8354/21 | 1/4" | – | – | 1/8" | – | – | – | – | 120 | 28 | 11 | – | – | 13 |
| | 8354/22 | 1/4" | – | – | 1/4" | – | – | – | – | | 33 | 14 | – | – | 25 |
| | 8354/23 | 1/4" | – | – | 3/8" | – | – | – | – | | 38 | 17 | – | – | 41 |
|  | 8362/22 | 1/4" | – | 1/4" | – | – | – | – | – | 120 | 35 | 17 | – | – | 42 |

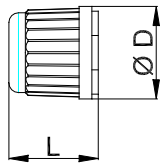
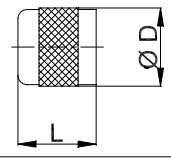
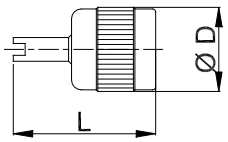
## TABLE 11: General characteristics of access fittings

| | Part number | Connections | | | | | PS [bar] | Dimensions [mm] | | | Wrench torque min / max [Nm] | Weight [g] | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SAE Flare | | NPT | IDS | | | L | Ch | H | | | |
| | | m | f | | Ø [in.] | Ø [mm] | | | | | | | |
| **TEE access fittings** | | | | | | | | | | | | | |
|  | 8380/122 | 1/4" | – | 1/8" | – | – | 120 | 45 | – | 24 | – | 31 | The valve core may be installed on each of the two 1/4" SAE Flare male connections |
| | 8380/222 | 1/4" | – | 1/4" | – | – | | 49,5 | – | 25,5 | – | 44 | |
|  | 8380/X01 | 1/4" | – | – | – | 6 | 120 | 43 | – | 24 | – | 28 | |
|  | 8380/X02 | 1/4" | – | – | – | 7 | 120 | 48 | – | 22 | – | 33 | |
|  | 8380/X09 | 1/4" | 1/4" | – | – | – | 120 | 56 | – | 27 | – | 70 | |
| **TEE access fittings with swivel nuts** | | | | | | | | | | | | | |
|  | 8380/X06 | 1/4" | 1/4" | – | – | – | 45 | 50 | – | 24 | 11/14 | 47 | With valve-core opening device on female connection. The valve core may be installed on each of the two 1/4" SAE Flare connections |
| | 8380/X08 | 1/4" | 1/4" | – | – | – | 45 | 49 | 17 | 24 | 11/14 | 49 | The valve core may be installed on each of the two 1/4" SAE Flare male connections |

## TABLE 12: General characteristics of access fittings

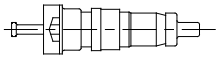
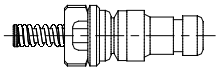
| | Part number | Connections | | | | | PS [bar] | Dimensions [mm] | | | Wrench torque min / max [Nm] | Weight [g] | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SAE Flare | | NPT | IDS | | | L | Ch | H | | | |
| | | m | f | | Ø [in.] | Ø [mm] | | | | | | | |
| **Cross access fittings** | | | | | | | | | | | | | |
|  | 8382/1222 | 1/4" | – | 1/8" | – | – | 120 | 48 | – | 50 | – | 49 | |
|  | 8382/X02 | 1/4" | – | 1/4" | – | – | 120 | 48 | – | 50 | – | 53 | The valve core may be installed on each of the three 1/4" SAE Flare male connections |
|  | 8382/X01 | 1/4" | – | – | – | 7-10 | 120 | 48 | – | 47 | – | 47 | |
| | 8382/X03 | 1/4" | – | – | – | 6 | | 48 | – | 44 | – | 42 | |
| **Cross access fittings with swivel nut** | | | | | | | | | | | | | |
|  | 8382/X04 | 1/4" | 1/4" | – | – | – | 45 | 50 | 17 | 46 | 11/14 | 35 | With valve-core opening device on female connection. The valve core may be installed on each of the three 1/4" SAE Flare connections |

## TABLE 13: General characteristics of caps with gasket

| | Part number | Connections | | PS [bar] | TS [°C] | | Dimensions [mm] | | Weight [g] |
|---|---|---|---|---|---|---|---|---|---|
| | | SAE Flare | | | min | max | L | D | |
|  | 8391/A | - | 1/4" | 35 | -20 | +100 | 14 | 14 | 1 |
|  | 8392/A | - | 1/4" | 80 | -20 | +100 | 13 | 13 | 7 |
|  | 8392/B (1) | - | 1/4" | 80 | -20 | +100 | 22 | 13 | 7 |

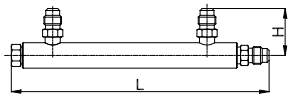
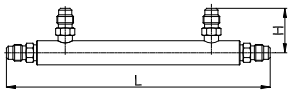
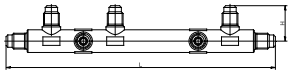
(1) The key needs to remove the valve core

## TABLE 14: General characteristics of valve cores

| | Part number | Spring | Gaskets | | Refrig-erant Fluids | Max Static Pres-sure [bar] | Operat-ing Pressure [bar] | Operating Temperature [°C] | | Peak Tem-pera-ture (1) [°C] | Dimensions [mm] | | Wrench torque min / max (2) [Nm] | Weight [g] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | body | seat | | | | min | max | | L | D | | |
|  | 8394/B | inside | PTFE | CR | R22 HFC (3) | 40 | 28 | -32 | +100 | 125 | 19,5 | 5,2 x 0,705 V0.07.1 | 0,30/0,35 Nm | 1 |
|  | 8395/A1 | outside | CR | CR | R22 HFC (3) HFO (4) | 140 | 60 | -32 | +100 | 125 | 16,3 | | 0,4/0,5 Nm | 0,7 |
| | 8395/A3 | | HNBR | HNBR | HFC (3) HFO (4) HC (5) | 140 | 60 | -25 | +130 | 150 | | | | |
| | 8395/A4 | | EPDM | EPDM | R744 | 140 | 80 | -35 | +120 | 140 | | | | |

Note:
(1) Permitted value for short periods
(2) To remove the valve core use the key code 8390/A
(3) R134a, R32, R404A, R407C, R410A, R507
(4) R1234yf, R1234ze, R448A, R449A, R450A, R452A
(5) R290, R600, R600a

## TABLE 15: General characteristics of manifolds with access fittings

| | Part number | Connections | PS [bar] | Dimensions [mm] | | Weight [g] | Note |
|---|---|---|---|---|---|---|---|
| | | SAE Flare | | L | D | | |
|  | 9900/X87 | 1/4" | 45 | 162 | 30 | 36 | N° 3 access fittings |
|  | 9900/X47 | 1/4" | 45 | 175 | 30 | 216 | N° 4 access fittings |
|  | 9900/X81 | 1/4" | 45 | 190 | 25 | 343 | N° 7 access fittings |

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