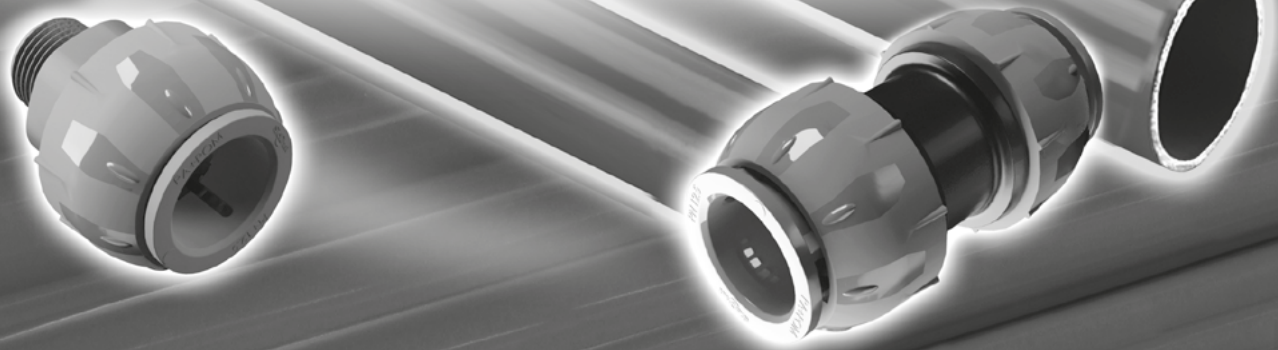
MASTER Q

MASTER QUICK



ALUMINIUM PIPING SYSTEM
AND PUSH-FIT FITTINGS
FOR COMPRESSED AIR

INSTALLATION AND MAINTENANCE MANUAL

MASTER Q

MASTER Q

1. THE SYSTEM

The experience acquired with MasterQ led to the development of the new line MASTERQuick, the safe and quick push fit solution for the compressed air distribution. The line, composed by Ø22, Ø28mm aluminium pipes, is assembled with nylon fittings. Tests show that MASTERQuick line demonstrates excellent resistance to stress generated by water hammer pressure changes and perfect duration in salty fog. The exterior coating gives MASTERQuick characteristics of low friction to air passage and brief installation time thanks to the coloration of lines in compliance with the fluids identification regulations.

MASTERQuick fittings are optimised for MASTERQuick pipe with which they guarantee the peak performance.

2. REFERENCE STANDARD

Directive 2014/68/EU of the European Parliament and of the Council, of 15 May 2014, on the harmonisation of the laws of the Member States relating to the making available on the market of pressure equipment.

3. WARRANTY CONDITIONS

1. MasterQ guarantees that its product is free from material and manufacturing faults under normal circumstances for a year from the delivery date of the goods for catalogue products, and for two years from the delivery date of the goods for products made according to specific instructions and/or based on a design from the Buyer.
2. The Buyer must report any faulty goods received to MasterQ in writing within a maximum of 7 working days from receiving the goods for sales of catalogue products, and within 60 days for sales of products made according to specific instructions and/or based on a design from the Buyer.
3. The warranty envisages the free replacement or repair of goods recognised as being faulty by MasterQ.
4. The transport costs for faulty goods to be returned to MasterQ are to be covered by the Buyer, while the transport costs of the replacement goods are to be covered by MasterQ.
5. In the event in which the Buyer is not able or does not wish to proceed directly with the disassembly and re-assembly of the goods considered faulty, he/she may request the intervention of a technician appointed by MasterQ, covering all the related costs including travel and transfer. The Buyer shall indicate the location in which the intervention is required if it is different from the original delivery address.
6. The warranty does not cover in any way standard consumables associated with the goods or used for repairing the goods themselves.
7. This warranty excludes all other types of indemnity and/or damage, including loss of production, loss of profit, loss of use, loss of contracts or any other economic or indirect loss, price reduction or termination of contracts. This warranty is not valid and is forfeited:

a) in the event of failure to comply with the time frames indicated in point 2) above by the Buyer for reporting the faults;
b) in the event of delayed payment by the Buyer in relation to the sums owed to MasterQ even for supplies other than the one in question;
c) if MasterQ discovers any interventions and/or changes of any kind on the goods that have been performed by people not specifically appointed by MasterQ or without the written consent from the company itself;
d) in the event of assembly or improper use of the goods that depart from the specific indications provided by MasterQ or specified in the use and maintenance manuals provided with the goods by MasterQ itself;
e) in the event of normal wear and tear on the goods;
f) in the event of impact and/or overloading;
g) in the event of incorrect maintenance and/or storage and unsuitable conservation.

8. This warranty and the related remedies are exclusive and replace any spoken, written, explicit, implicit or legal guarantee including, without limitations, any liability attributable to guarantees of saleability or unsuitability for a specific purpose.
9. In no case can MasterQ be held liable for any direct, special, accidental, indirect or incidental damage attributable to incorrect, improper or unauthorised use of the product or to product faults or to any breach of the warranty or other legal theory.
10. Please also refer to MasterQ's general Terms and Conditions of Sale.

4. OPERATING CONDITIONS

Allowable temperatures: - 20 °C / + 70 °C
Nominal operating pressure: PN 12,5
Carrier fluid: compressed air

Max. temperature [°C]	Max. operating pressure [bar]
30	12,5
50	9
70	5

5. TECHNICAL DETAILS

Specifications are only guaranteed with MASTERQuick components.

The MASTERQuick product consists of a Pipe in Primary aluminum EN AW-6060 T6 aluminum (Al Mg Si 0.5) having the following characteristics:

Chemical composition									
Alloy	Cu	Fe	Mn	Mg	Si	Zn	Cr	Ti	Al
6060	0,1	0,1-0,3	0,1	0,35-0,6	0,3-0,6	0,15	0,05	0,1	Remainder

Specific weight 2,70 Kg/dm^3

Chemical composition				
Alloy	Tensile strength	Limit yield	Elongation A%	Hardness HB
6060	R_m 215 N/mm^2	$R_{p0,2}$ 160 N/mm^2	8	75
Elasticity module 69000 N/mm^2 Electrical resistance 0,033 Ωmm^2/m Thermal conductivity of 210 W/mK Melting temperature 615-655 °C		Internal and extrenal chromate Calibrated extrusion Permitted tolerances on diameter +0,1 – 0,3 Coefficient of thermal expansion K = 0,000023		

The electrostatic coating of aluminium pipes, RAL 5015, is in accordance with Legislative Decree 81/08 Title V.

The pipes are marked as required by our quality assurance procedures and product guarantee to ensure the identification and traceability of the product.

The range of products available is shown in the table below:

DN (mm)	22	28	

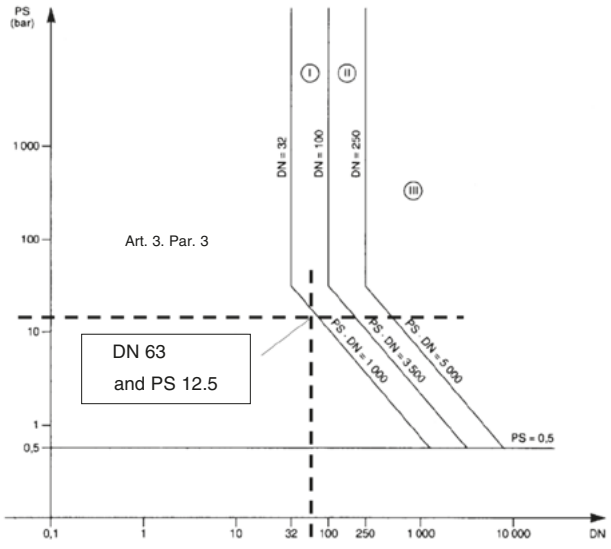
6. PED DIRECTIVE 2014/68/UE

The MASTERQuick product as indicated in the operating conditions can be used at working pressures of NP 12.5 bar and therefore is subject to a verification of the applicability of European Directive 2014/68/EU (PED) that must be applied when the NP is greater than 0.5 bar.
To check if the MASTERQuick product falls within the scope of Directive 2014/68/EU the following parameters need to be considered:
- Type of fluid: compressed air (fluid group 2)
- NP operating pressure: 12.5 bar (considered the maximum operating pressure)
- DN Nominal diameter: 63 mm (considered the maximum DN)

Article 4, Section 1. c - Directive 2014/68/UC
Piping intended for:
a) gases, liquefied gases, gases dissolved under pressure, vapours and also those liquids whose vapour pressure at the maximum allowable temperature is greater than 0.5 bar above normal atmospheric pressure, (1,013 mbar) within the following limits:
- for fluids in Group 2 with a DN greater than 32 and the product PS x DN greater than 1 000 bar (Annex II, table 7);

It shows the calculation of the product of PS and DN:
PSxDN = 12.5x63= 787.5 bar **< 1000 bar**

The values of PS and DN are shown on the graph.



Tab. 7

As can be seen from the calculation and Table 7 the MASTERQuick product is covered by paragraph 3 of Article 3 and, therefore, may not bear the EC marking referred to in Article 15 of Directive 2014/68/UE.
The MASTERQuick product is therefore provided with instructions for use and maintenance.

7. SAFETY ADVICE

⚠	**IMPORTANT** Please read this manual carefully as it provides important information and warnings about the safety, use and maintenance of the system. It will also be appropriate to store it for further consultation.

- After removing the packaging, check that all components are present; if in doubt do not use the components and contact MasterQ
- It is essential to follow the instructions contained in this manual.
- Any installation carried out in a manner inconsistent with the requirements specified in this manual may impair the safety of the user.
- The pipes and fittings shall not be installed in contact with sources of vibration and thermal shock that will lead to exceeding the limits given in section “OPERATING CONDITIONS”
- MasterQ declines any responsibility for damage to persons, animals or damage caused by improper installation or resulting from improper and unreasonable use.

⚠	**IMPORTANT** The MasterQ product MASTERQuick must **never** be used for direct assembly on compressors, dryers or tanks. In these applications there must **always** be a suitable hose fitted in between.”

8. STORAGE CONDITIONS

The components must be stored in a closed, clean and shaded location, not exposed to heat or direct sunlight.

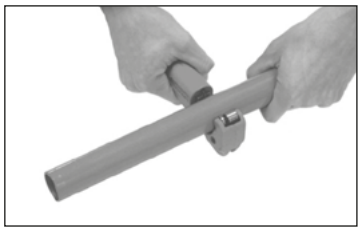
9. ASSEMBLY INSTRUCTIONS

9.1. Installation measure

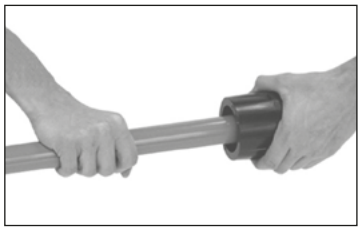
Check the compatibility of the carrier fluid (if different from compressed air) with Nylon 6, NBR and Aluminum, referring to the "Compatibility Table" obtainable from the MasterQ. Consider the thermal expansion by activating the most appropriate technical solutions to run the system.

9.2. Preparing the pipe

Use pipe cutter code R230.000.009.
Position the tool perpendicular to the pipe to be cut and start cutting.



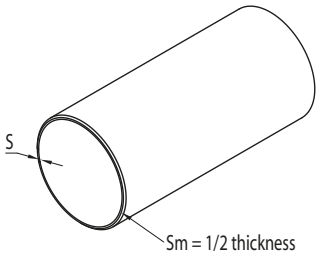
Use chamfering tool Code R230.000.008 and chamfering tool for interior Code R230.000.007 and operate according to the instructions in the literature accompanying the tool in use.
Bevel the pipe as evenly as possible without generating chips which are not completely detached from it as these could affect and damage the seal.



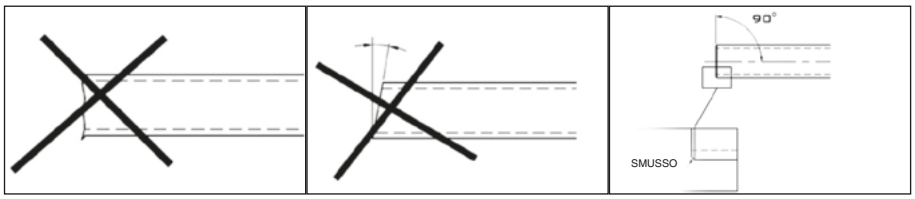
Cod. R230.000.008

Cod. R230.000.007

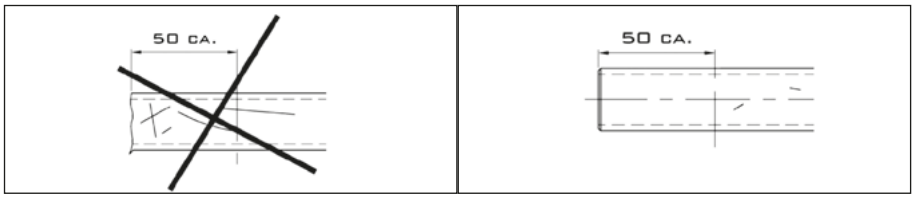
Chamfering operation, essential to avoid damaging the seal of the fitting, must follow the indications given in the following scheme.



IMPORTANT: For a perfect link between the pipes, it is recommended that the cut be perfectly perpendicular, remove any burrs and chamfer the edge in order to protect the seal during insertion.



During cutting and chamfering avoid damaging the painted surface of the sealing area (about 50 mm from the end of the tubes).



9.3. Assembling pipe - fitting

The tube is inserted into the fitting up against the setback, over the seal.
To ensure that this is done you can check by creating a mark on the tube starting from end to the measurement "L" shown in the table below.

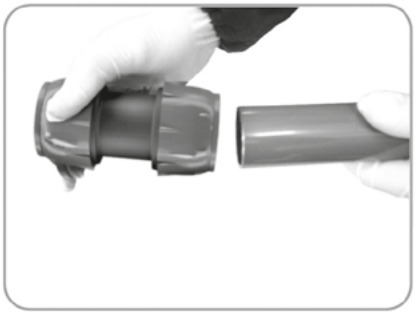
DN (mm)	22	28
L[mm]	35	45

To facilitate the insertion of the pipe into the fitting, we recommend that you lubricate the outside of the pipe and the inner seal of the fitting itself. Lubrication in addition to facilitating the insertion of the pipe into the fitting optimises the operation of the seal avoiding damage over time.

Use neutral grease or Vaseline

Lubricate the seal inside the fitting

Lubricate the outer part of the pipe

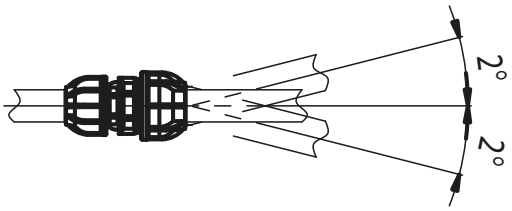


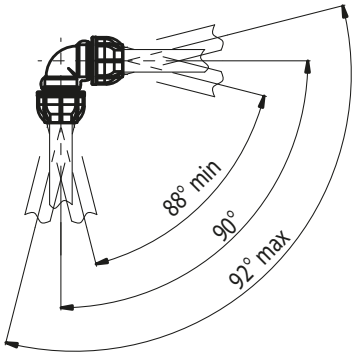
Perform the insertion

You can also use spray lubricants, as long as they are neutral or Vaseline.

In the event the absence of any type of lubricant in the system is specifically required, the insertion of the pipe into the fitting can be performed without the help of lubricants.

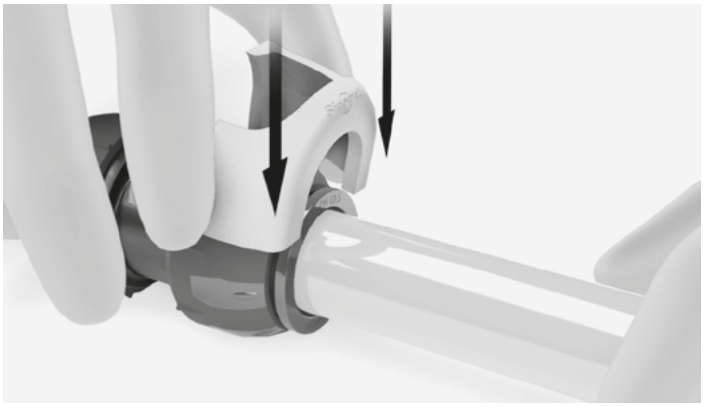
For proper installation and so as not to endanger the pneumatic seal fittings, offsets of more than 2° from the original are not allowed.

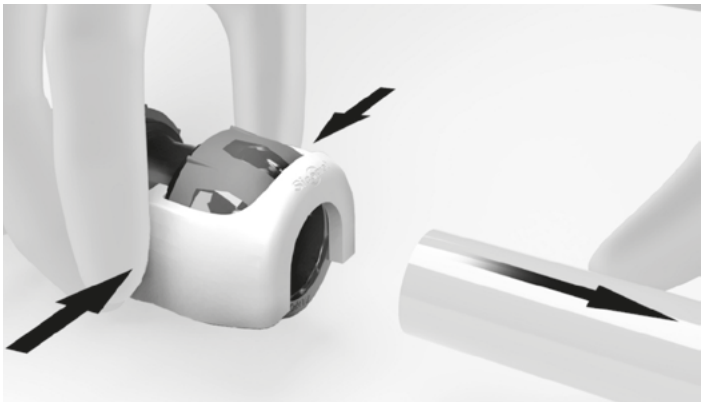




10. DEMOUNTING FITTINGS

MasterQUICK fittings must always be demounted using the dedicated safety tool.

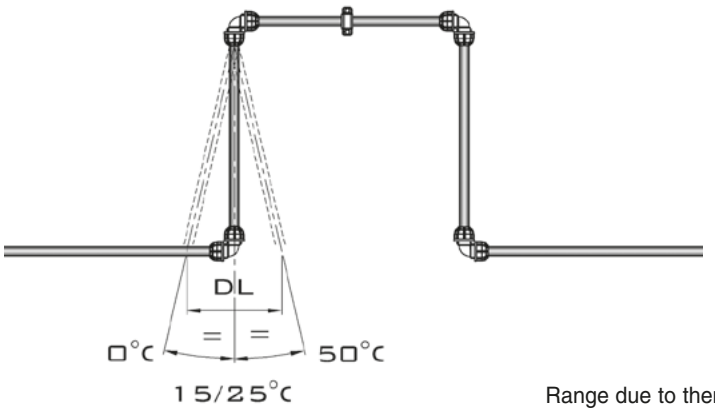




11. TECHNICAL STANDARDS FOR INSTALLATION

11.1. Preamble

All theoretical calculations and considerations contained in this manual are valid at an ambient temperature of installation between 15 and 25°C.



Range due to thermal expansion

	CAUTION In the event that the installation takes place at temperatures outside the range indicated above, necessary corrections will have to be made.

11.2. Clamping of the pipe

The minimum distance from the fitting of the bracket must be 100/150 mm to allow for the slipping of the pipe due to thermal expansion.
When the piping is longer than 30 metres, you must insert the appropriate means of compensation for expansion (expansion coefficient of the aluminum K = 0.000023).
When planning the system, you should consider the minimum clearances necessary to ensure the proper expansion of the pipe.

11.3. Calculation of bending points

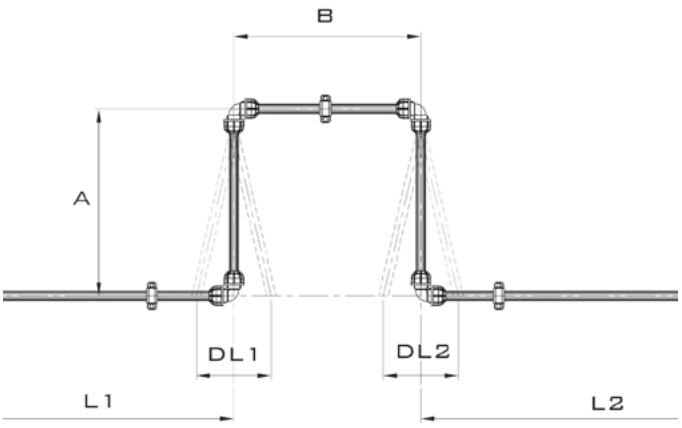
In order to allow the proper operation of the system, absorption points must be sized and prepared on long sections to take care of expansion caused by temperature changes.

KEYWORDS

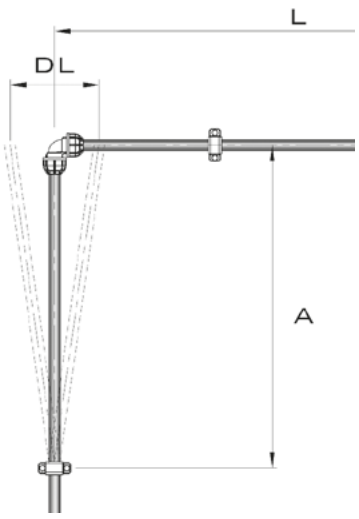
A-B*= UNIT (mm)
L-L1-L2 = LENGTHS (mt)
DL = EXPANSION (mm)
DT = TEMPERATURE RANGE (°C)

* The **B** unit is not binding for the operation

EXEMPLES:



L1 = 40 mt **L2** = 40 mt **DT** = 50°C
DL = DT x 0.02 x L = 50 x 0.02 x 40 = 40 mm
A = DL x 23 = 40 x 23 = 920 mm
B = 0.7 x A = 0.7 x 920 = 640 mm



DL = DT x 0.02 x L
A = DL x 23
B = 0.7 x A

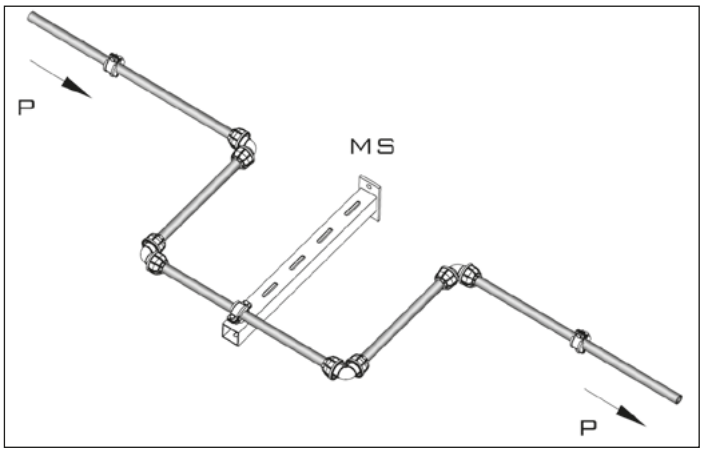
11.4. Types of bevel

Application examples of absorption of expansion.

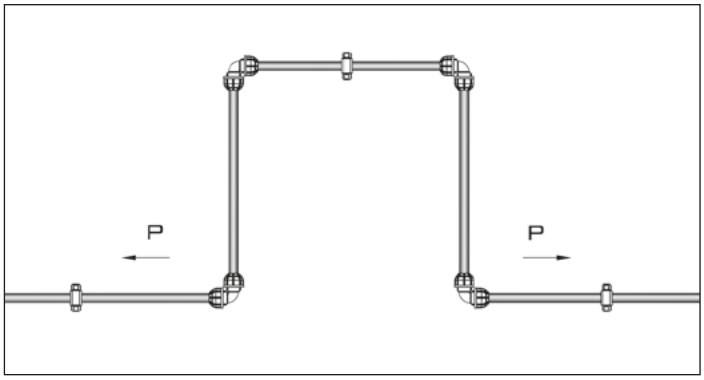
KEYWORDS

MS = BRACKET
P = GRADIENT
D = DESCENT

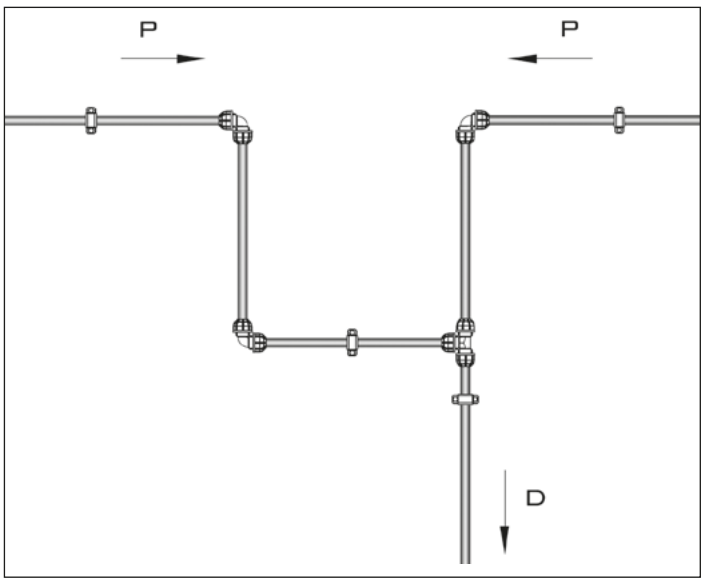
Flat bevel

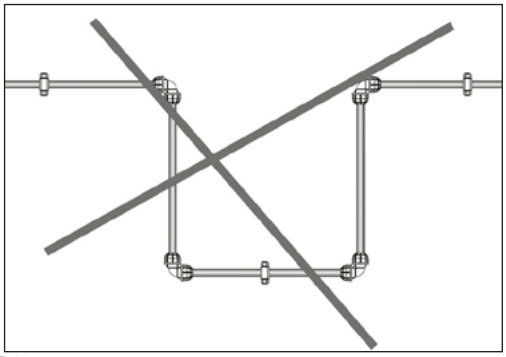


Vertical bevel (upward)



Vertical bevel (downward)

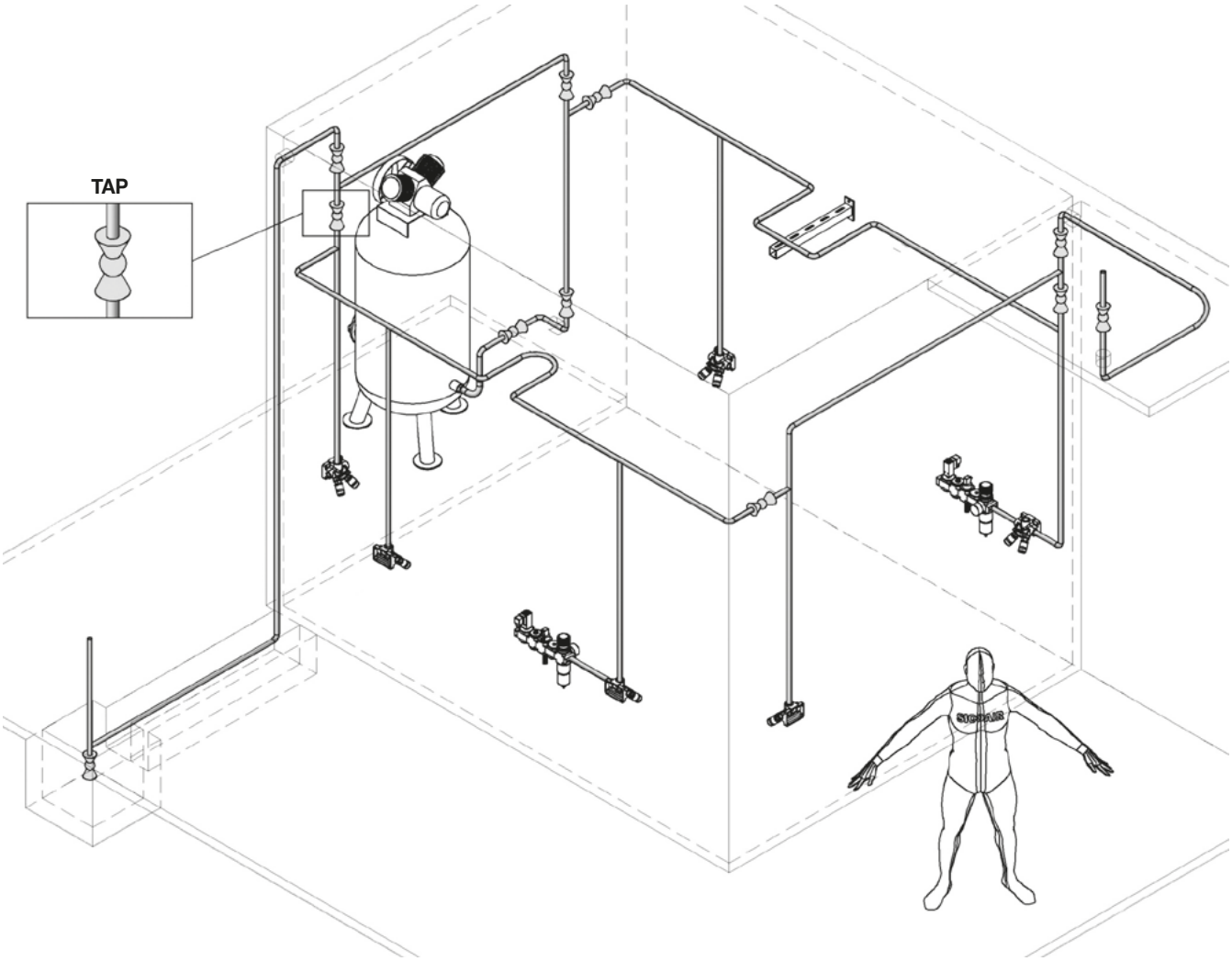


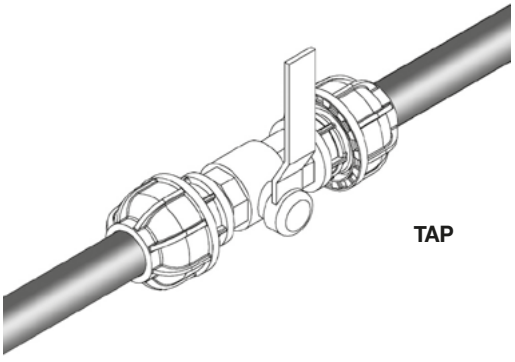


IMPORTANT:
In order to avoid the accumulation of condensate, the vertical bevel (downward) should not be used unless there is a condensate outlet.

11.5. Zones

To facilitate maintenance, they are fitted with ball valves designed to cut off the system for localised interventions.

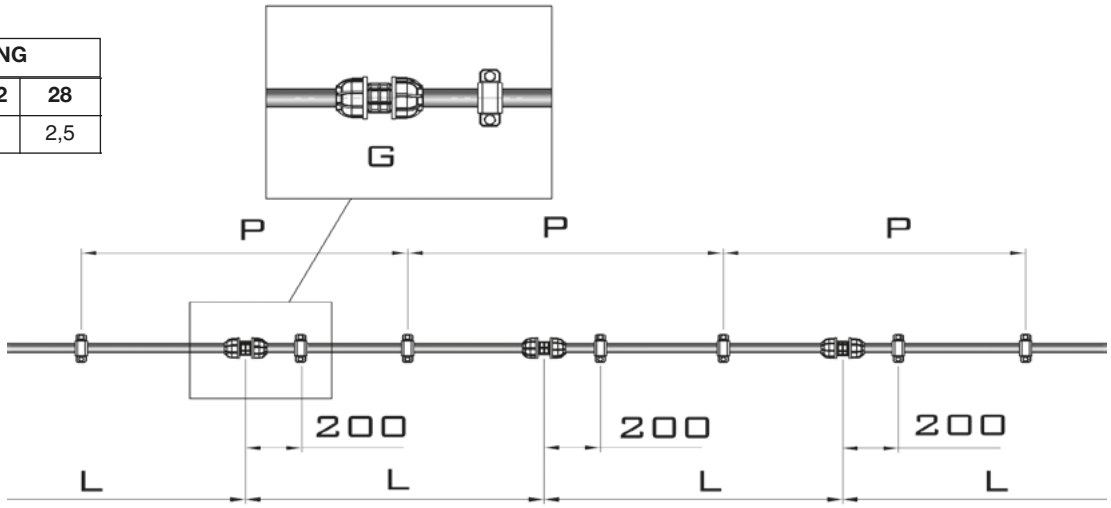




11.6. Bracket spacing

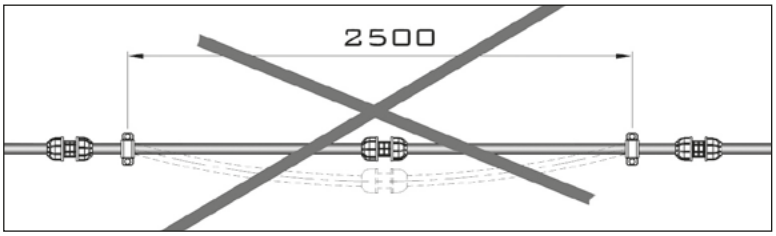
For good pipe stability, it is extremely important to measure carefully the spacing of the support brackets. To do this, use the table below.

SPACING		
DN	**18/22**	**28**
P	2	2,5

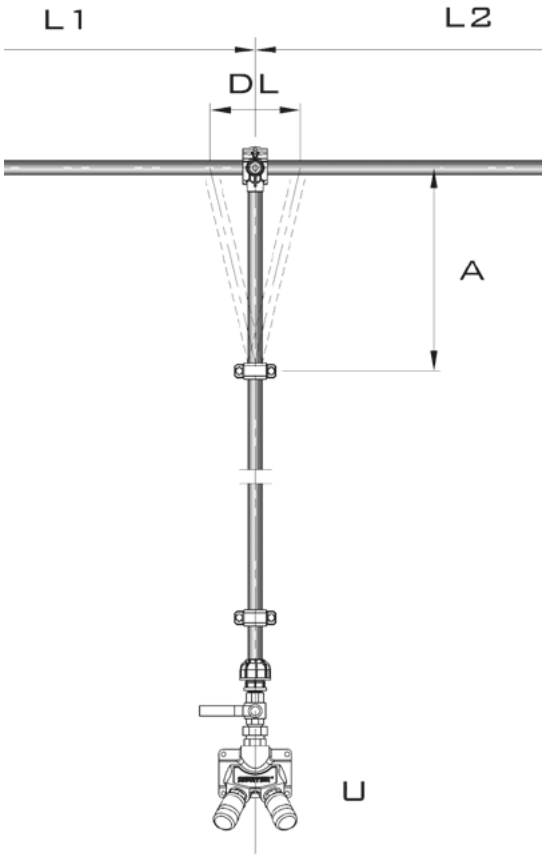


In the vicinity of the joints, in order to avoid unwanted flexing, it is always necessary to place a bracket even if the spacing "P" does not require it.

NO



11.7. Descent and drop



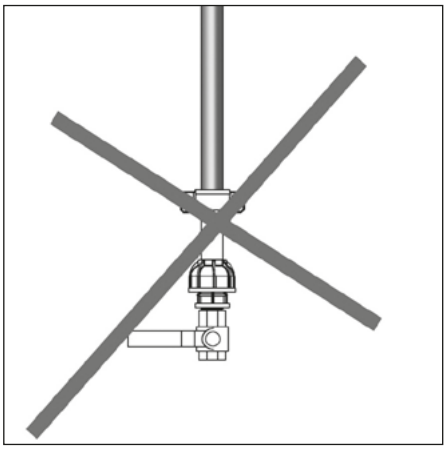
CALCULATION FACTOR Y		
DN	**18/22**	**28**
Y	20	25

DL = DT x 0,02 x L
A = DL x Y

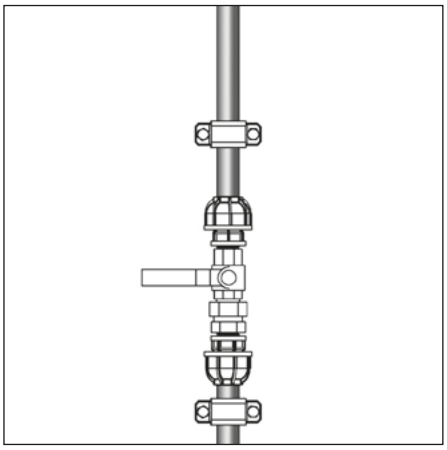
MASTER Q

In case of use of ball valves fix the end of the descent with good stability.

NO



OK



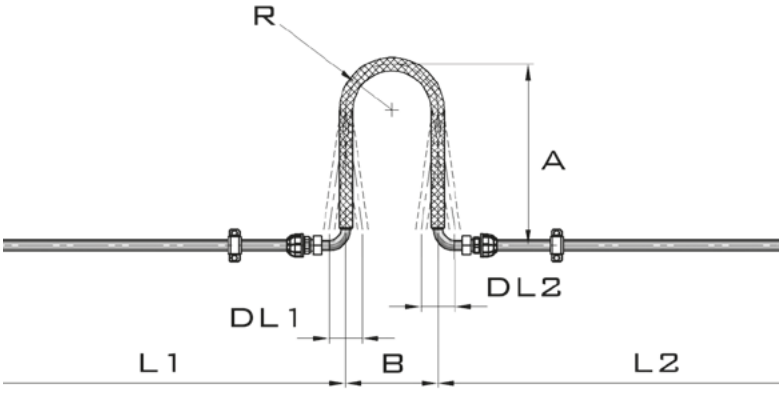
11.8. Bevel with hose

As an alternative to “standard” bevels it is possible to use hoses by following the instructions below.

DL = DT x 0,02 x L
B = (2xR) + DL1 + DL2 Y

KEYWORDS

L1-L2 = LENGTHS (mt)
DL1-DL2 = EXPANSIONS (mm)
DT = TEMPERATURE RANGE (°C)
R = RADIUS
A-B = UNITS (mm)



UNITS R-A (mm)		
DN	**18**	**22/28**
R (mm)	70	85
A (mm)	370	390

CAUTION

For flexible hoses, refer to the manufacturer's data.

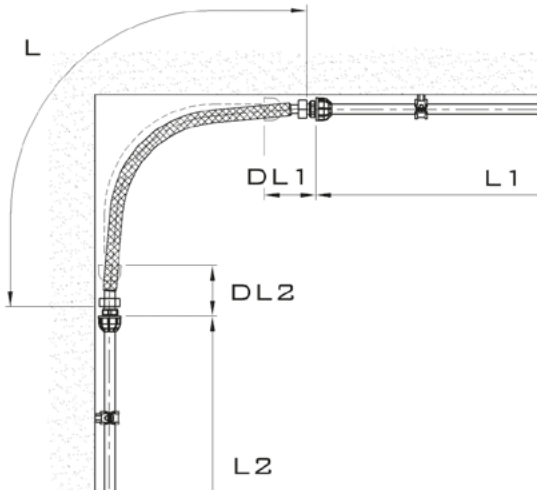
11.9. Curve with hose

It is possible with the use of the hose to manage the change of direction and simultaneously compensate for the thermal expansion.

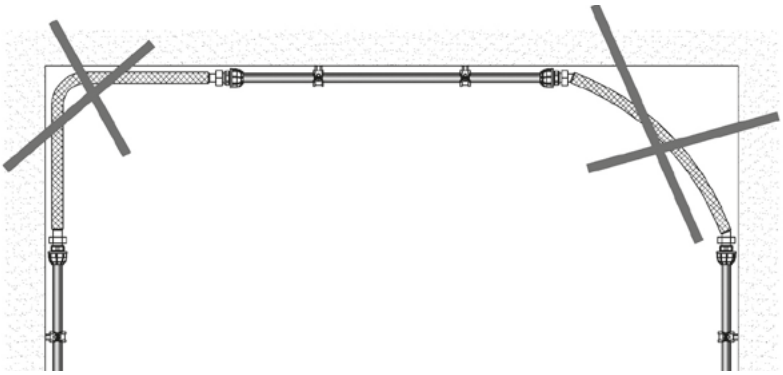
L min = 1000 mm

KEYWORDS

L1-L2 = LENGTHS (mt)
DL1-DL2 = EXPANSION (mm)
R = RADIUS
L = FLEXIBLE DEVELOPEMENT (mm)



Avoid curves which are too "closed" and too "stretched".



12. RESIDUAL RISKS

The pipes and fittings can generate the following residual risks in case of non-compliance with safety information and requirements provided in these operating instructions:

- Risk of fluid ejections under pressure in case of disconnection of connections caused by inadequate tightening.
- Risk of ejections of fluids under pressure in the event of damage to the pipe caused by shocks.
- Risk of ejections of fluid under pressure caused by operating pressures higher than the maximum allowable pressure of 12.5 bar.

13. MAINTENANCE

⚠	**IMPORTANT** Any type of intervention should be performed on the system when it has been depressurised.

The table below shows a list of checks and controls recommended by MasterQ:

- Annually review the status of the systems
- In case of shock, check the status of the pipeline; in case of damage replace the damaged parts.

MASTER Q

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