Installation and Assembly Guide

TABLE OF CONTENT

OPERATING CONDITION & SAFETY INSTRUCTIONS

OPERATING CONDITIONS

✓EQOfluids Pneumsys pipes and fittings are designed to convey compressed air and vacuum. The system can also be used for nitrogen, helium, argon, neon, xenon and krypton.

✓EQOfluids Pneumsys pipes and fittings must only be used within the pressure and temperature specifications referred to in the EQOfluids Pneumsys Component List.

✓EQOfluids Pneumsys fittings are sensitive to direct UV radiation. In case of direct exposure, shield the fittings. (EQOfluids Pneumsys pipes offer excellent resistance to UV radiation.)

✓EQOfluids Pneumsys pipes and fittings should be protected against rain, snow, and guano.

✓EQOfluids Pneumsys pipes and fittings must be appropriately protected against violent impacts.

✓EQOfluids Pneumsys pipes and fittings are not suitable for direct contact with soil.

✓EQOfluids Pneumsys pipes and fittings should not be used as support for electrical equipment or earth conductors.

✓EQOfluids Pneumsys pipes should never be connected directly to a source of vibrations (use hoses instead).

✓Ensure accessibility of the EQOfluids Pneumsys system for possible future expansion or maintenance.

✓Pressure relief valves must be installed where needed to ensure that the system working pressure cannot exceed the maximum working pressure of the EQOfluids Pneumsys system.

EQOFLUIDS PNEUMSYS INSTALLATIONS IN EXPLOSIVE ENVIRONMENTS

✓EQOfluids Pneumsys installations in explosive environments must always be earthed.

✓EQOfluids Pneumsys bonding and the earthing must be checked at frequent intervals to secure that the system cannot be electrically charged.

✓Cutting, deburring and assembly of EQOfluids Pneumsys pipes may create sparks. Necessary precautions in explosive atmospheres must be taken.

SAFETY INSTRUCTIONS

✓Installation, adjustments and repair work of an EQOfluids Pneumsys system must be performed by authorized trained personnel.

✓Installers must use the necessary protection means (PPMs). When working at heights, use a harness for personal protection, and ensure that tools are securely fastened to prevent them from falling.

✓Installers must comply to all local safety requirements related to the application(s) in scope. Special care must always be taken to prevent suffocation risks when working with other gases than air.

✓Before any installation, adjustment, repair work or other non-routine checks, relieve the EQOfluids Pneumsys system of pressure and effectively isolate the system from all sources of pressure.

✓Only genuine EQOfluids Pneumsys parts should be used when installing, adjusting or repairing an EQOfluids Pneumsys system.

✓All plugs and caps must be removed before installing the EQOfluids Pneumsys pipes.

✓Check the surface of the EQOfluids Pneumsys pipes before installing. There should be no relevant scratches, abrasions, dents etc.

✓Use only solvents or chemicals which do not damage the materials of EQOfluids Pneumsys.

✓Before using the EQOfluids Pneumsys system, installers must ensure that all necessary test controls and applicable rules for the specific installation are complied with.

✓At initial start up of the EQOfluids Pneumsys system, apply a test pressure of 1.5 bar to identify leakage or imperfect joints. After performing an inspection, increase the pressure gradually and constantly (max. 1 bar every 30 seconds) and perform a second inspection for leakages or imperfect joints at the final pressure.

TOOLS NEEDED FOR THE ASSEMBLY

Tools For Pipe Cutting :

Mitre saw

Band saw

Hand saw

Sabre saw

Tools For Pipe Drilling :

Drilling Machine

Hole saw

Masonry bit

Tools for the Internal Deburring of the pipe :

Blade Deburring Tool :

Tools for External Bevelling of the pipe :

Bevelling Machine

Flat File

Disk Sander

Lubricant :

Vaseline Grease

Soapy Water

in case of EQOoil Fittings

Marker :

Indelible Pen or Paint based Marker

Wrenches :

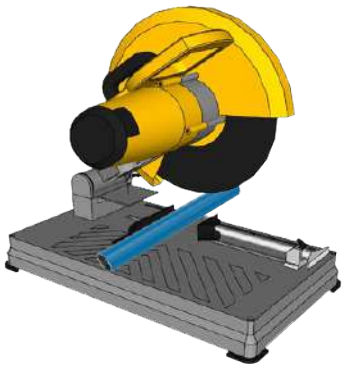
Dn20 - Dn90 FITTINGS ASSEMBLY

FITTINGS COMPONENTS

1. Nut
2. Clamping ring
3. Identification ring
4. O-ring
5. Body

PREPARATION

Verify the integrity of the pipe section to be inserted in the fitting.
Any scratches on the paint, if not deep, can be eliminated using 300÷600 fine emery paper.
Deep dents or scratches can be eliminated only by changing the branch position or by replacing the pipe section interested.



When necessary, cut the pipe with a neat 90° cut. Carefully deburring the internal and external sharp resulting edges and make an external bevel of 2÷4 mm length x 30° tapered.
In any case, the pipe bars used in the original supply length are to be deburred internally and externally, making also the external bevel.

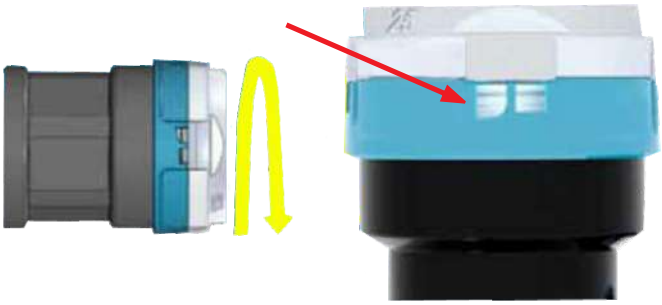
Mark the pipe so to have a reference for its correct insertion into the fitting to make sure it exceeds the gasket.
The following table shows the correct reference lengths.

DN	20	25	32	40	50	63	90
L(mm)	35	38	49	60	76	96	93

Lubricate the marked pipe section.

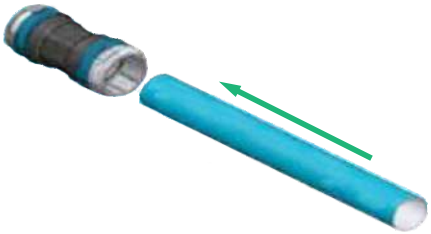
ASSEMBLY

Loosen the nut until the end surface of the fitting body is not longer visible through the two inspection slots.

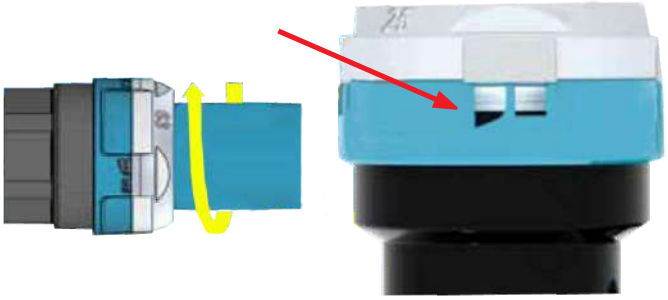


Pay attention pipes and fitting have to be in axis

Insert the pipe into the fitting up to align the reference mark with the external nut surface.



Tighten the nut by hand until the end surface of the fitting body is visible in both inspection slots. In this case, the water tightness and axial clamping are ensured.

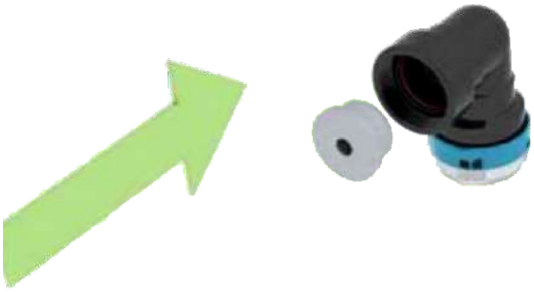


PLUGS ASSEMBLY

Remove the nut, clamping ring and identification ring where the plug will be insert.

Remove the clamping ring from the nut.

Insert the plug into the fitting.

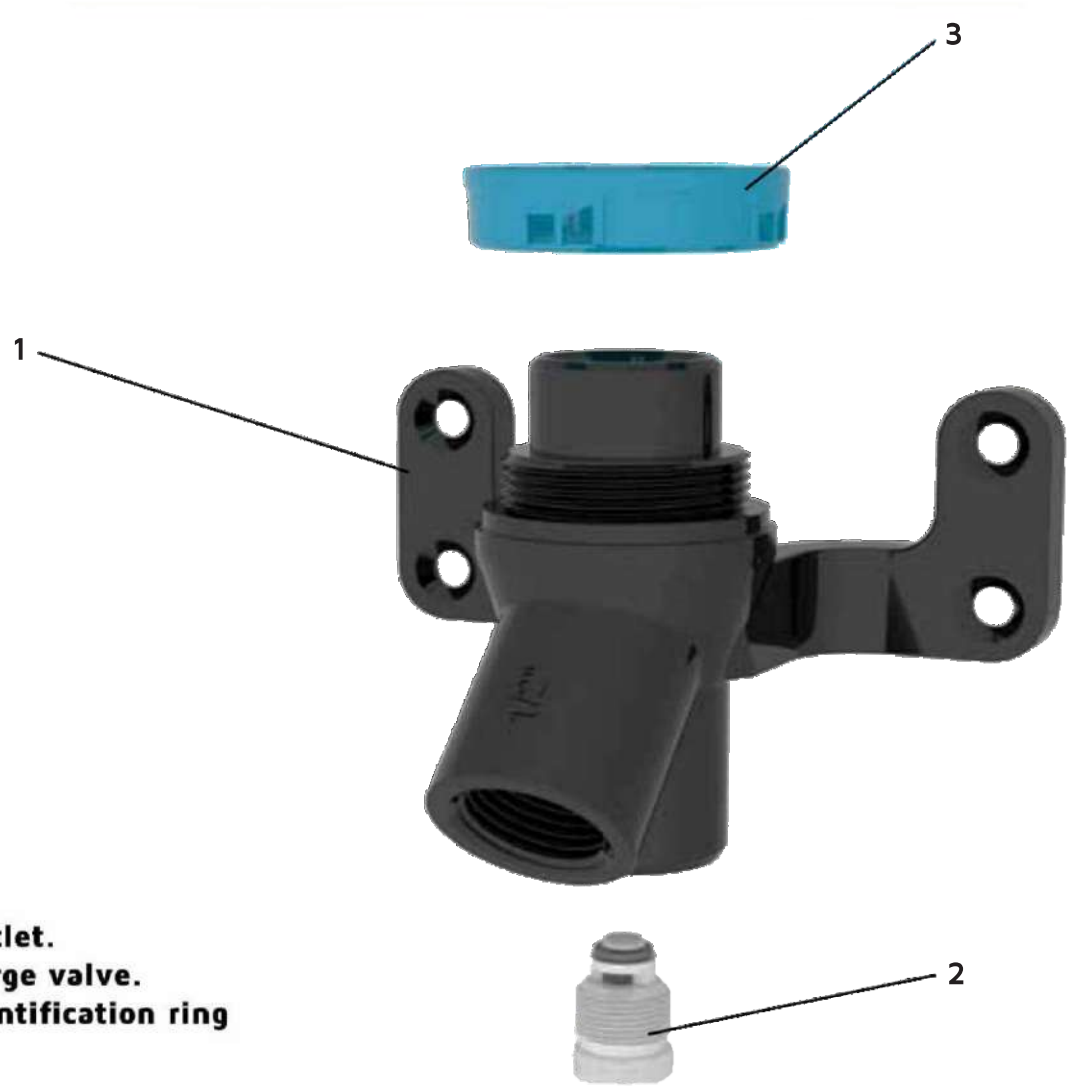


Insert and firmly tighten the nut inside the fitting.

Proceed with assembly of the fitting as indicated in pages 27-28.

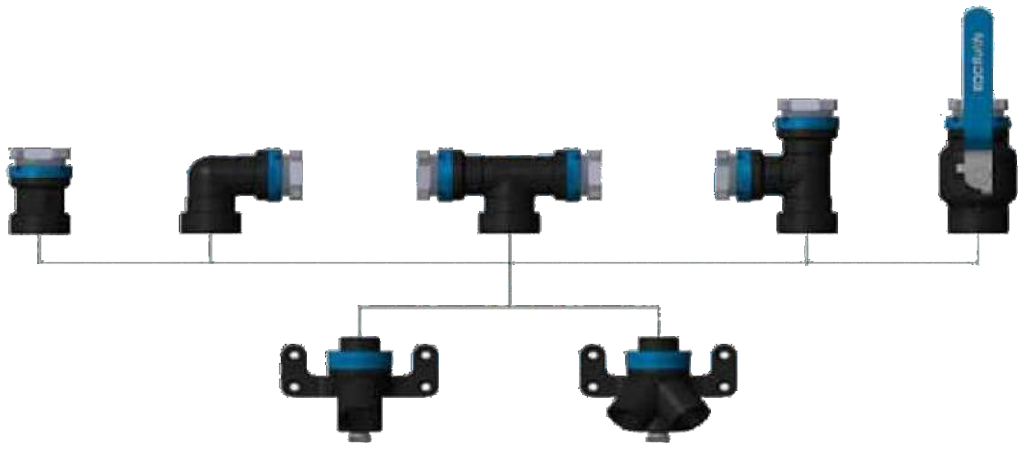
45 ° OUTLET WITH W/R ASSEMBLY

FITTINGS COMPONENTS



1. Outlet.
2. Purge valve.
3. Identification ring

Examples and Assembly Solutions



ASSEMBLY

Remove the nut, clamping ring and identification ring from the fitting where the outlet will be inserted.

Insert the outlet into the fitting.

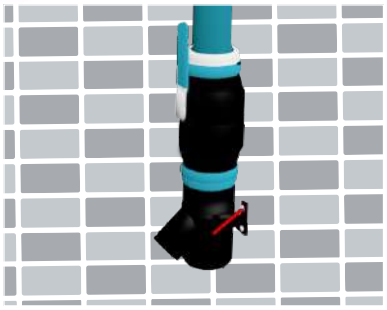
Tighten the outlet into the fitting.

Align valve and Outlet.

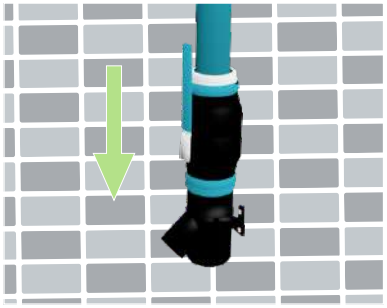
Tighten the Socket Allen screw

ASSEMBLY TO THE WALL

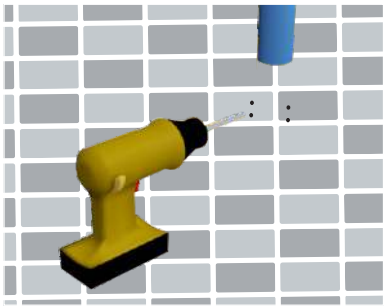
Assemble the outlet, with all the fittings and/or other components connected to it, to the outlet pipe, leaving the inlet fitting nut completely loose.
Mark the positioning of the holes keeping the elements assembled.



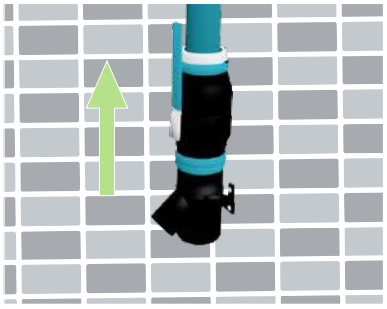
Completely detach the assembly from the outlet pipe



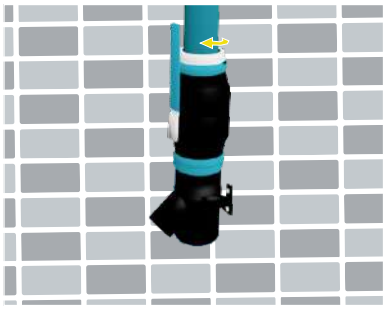
Carry out the holes and introduce the wall-plugs.



Completely insert inlet fitting into pipe, fix the outlet with bolts.



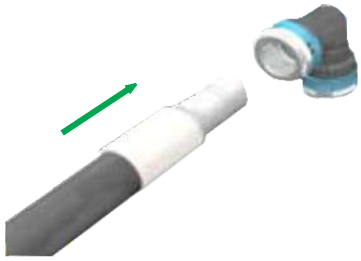
Tghten the nut following the DN20 - DN90 fittings assembly instructions.



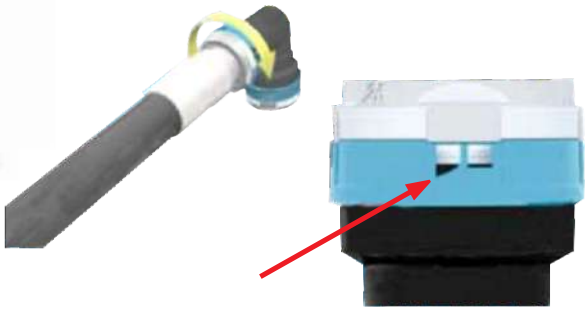
HOSE PIPE ASSEMBLY

Loosen the nut until the end surface of the fitting body is not longer visible through the two inspection slots.

Insert the pipe into the fitting.



Tighten the nut by hand until the end surface of the fitting body is visible in both inspection slots. In this case, the water tightness and axial clamping are ensured.

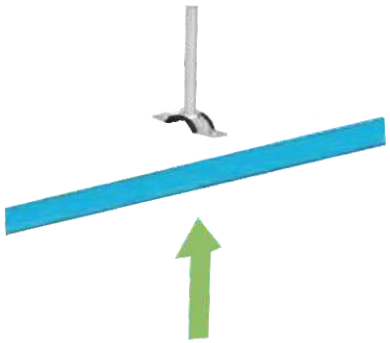


ø	Maximum working pressure	Minimum Banding Radius
D 20	105 Bar	240 mm
D 25	88 Bar	300 mm
D 32	63 Bar	420 mm
D 40	50 Bar	450 mm
D 50	40 Bar	475 mm
D 63	70 Bar	500 mm
D 90	20 Bar	350 mm
D 110	16 Bar	400 mm
D 160	25 Bar	600 mm

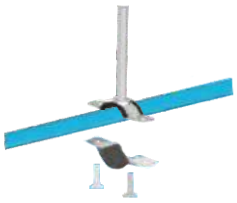
RUBBER LINED BRACKET ASSEMBLY

Fix firmly the bottom part of the rubber lined bracket. The resistance of it will depend of the surface where it

Place the pipe and the top part of the bracket in their position.



Screw and tighten the bolts of the bracket.

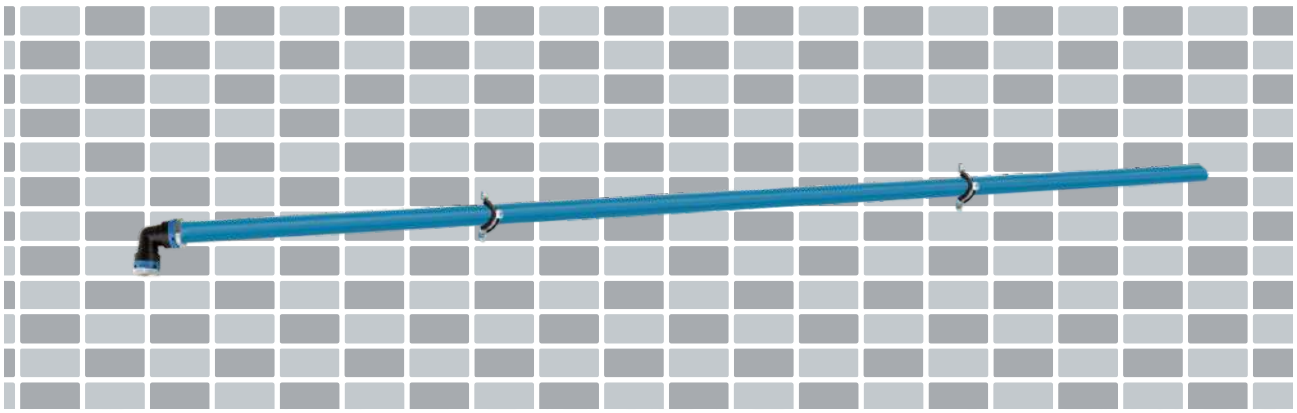


A bracket must be installed every x meters of pipe, leaving a 1 meter minimum gap between it and the fitting.

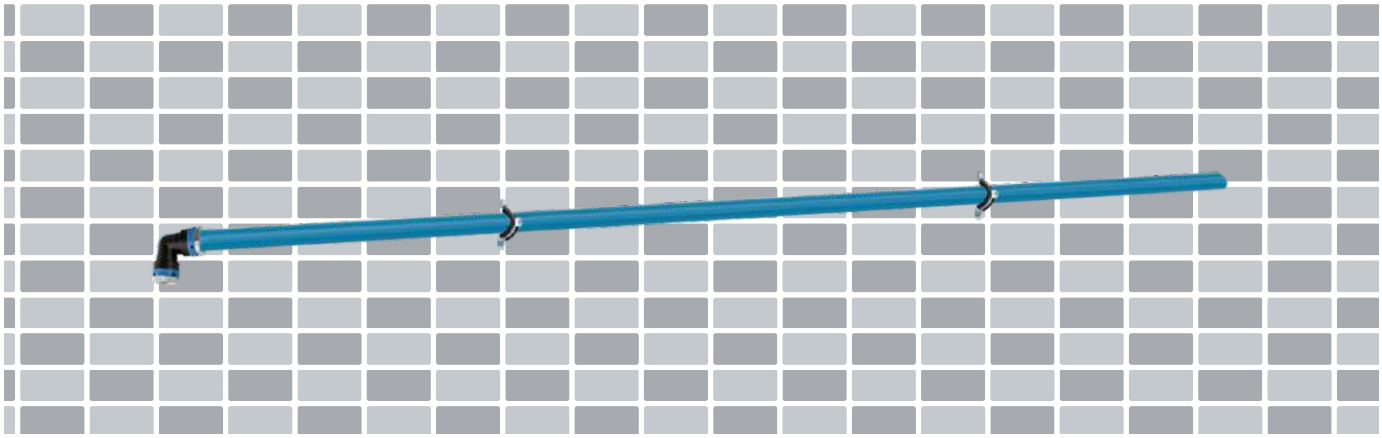
EXAMPLES & ASSEMBLY SOLUTIONS

fixed to the ceiling

fixed directly to the wall



fixed directly to the steel shelf



Any pipe have to be fixed with minimum two braket each one at one meter from the fitting

PRESSURE LOSS CHART

Dn = External Pipe Diameter in mm

p = Pressure Loss in bar

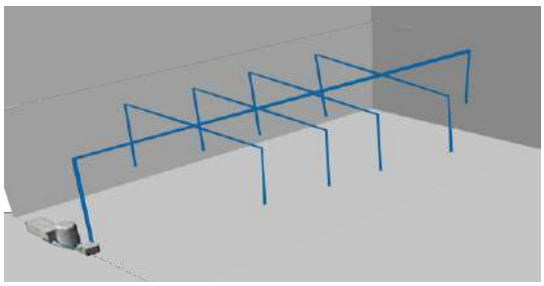
m/s = Flow Speed in meter/second

5,90 Speed lower than 6 m/s

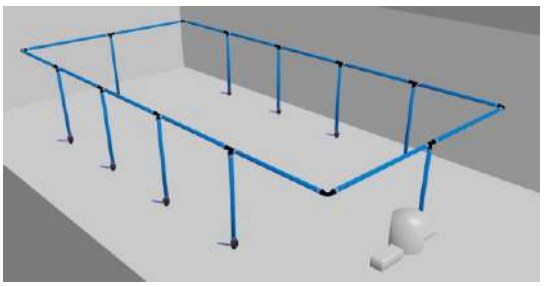
7,80 Speed Range from 6 up to 10 m/s

12,26 Speed Range from 10 up to 15 m/s

Linear Development
Desarrollo lineal



Ring Shape
Forma de anillo



1. Needed tools and materials

1.1. Tools to hole pipes
(Drilling machine and hole saw)

1.2 Tool for the internal deburring of the pipe
(Blade deburring tool)

1.1. Tool for tightening the "4" closing bolt and the "6" plug
(6 mm. ex. wrench or ratchet spanner with ex. wrench)

2. Assembly with correct components positioning

1. Offtake part
2. Bottom part
3. Washer
4. Cylinder head screw with internal hexagon
5. Plug O-ring gasket
6. Plug
7. Gasket
8. Washer (not present in all sizes
9. Clamping ring
10. Tightening nut

3. Examples and assembly solutions for branches

a

b

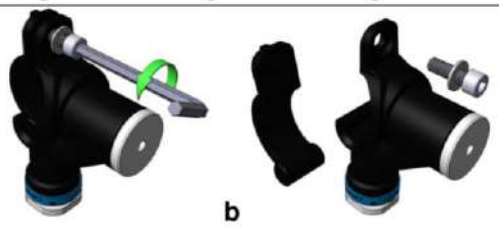
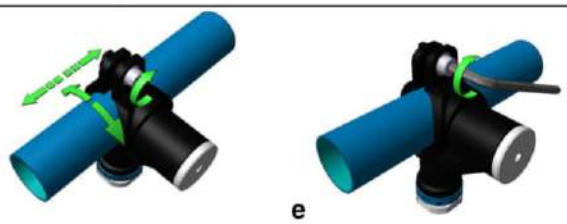
a. Example of a direct offtake : it is the simplest and more economic one, but it is not always feasible due to alignment problems between the masonry and the main pipe. When a gaseous fluid is transported, the condensate in the main pipe, if present, is conveyed directly into the offtake. Of course the main pipe has to be installed with such a weathering as to have its final section in a lower position (to collect and drain the condensate through suitable equipment and flow speeds cannot exceed 6 m/sec.

b. Example of an offtake obtained through a 90°elb ow. All problems of alignment are solved, but what said under point a is still to be considered.

4. ASSEMBLING

4.1 Verify the integrity of the pipe section where the gasket is to be positioned .
Any scratches on the paint, if not deep, can be eliminated using fine 300÷600 emery paper. Deep dents or scratches can be eliminated only by changing the branch position or by replacing the interested pipe section.

4.2. Verify the correct positioning of the components.
Branches are supplied assembled and have to be disassembled only for the installation.
In case of accidental disassembly, check the presence and the position of all components which has to be the one of the assembly figure at point 2 only.

4.3. Completely unscrew the screw 4 (a) and separate the bottom part 2 from the offtake part 1 by getting it sliding axially up to complete loosening (b).	 a b
4.4. Position the off-take part 1 on the pipe, close to its final position and insert the bottom part 2 by pushing it axially along the hinge, up to align the screw holes 4 (c).	 c
4.5. Screw the screw 4 without tightening it and place the branch in its final position (d). **4.6. Tighten the screw 4 finally (e).**	 d e
4.7 Totally unscrew the plug 6 (f)	 f
4.8. Hole the pipe with a milling cutter of a size adequate to the branch pipe diameter (g) **40= Ø19 (3/4")**  *This operation will not damage the thread on condition that the guide helix point is set in such a way that it does not protrude by more than 1÷1,5 mm (3/64"÷1/16") over the saw teeth.*	 g
4.9. Remove the burr after holing and carefully clean out all residues due to this operation (h).	 h
4.10. Screw the plug 6 again and tighten it with a 6 mm. Allen wrench (i) **Now the branch is ready for the assembling of the offtake pipe.**	 i

CLAMP-SADDLE-BRANCH-ASSEMBLING-INSTRUCTIONS-1

1. Needed tools and materials

1.1. Tools to hole pipes
(Drilling machine and hole saw)

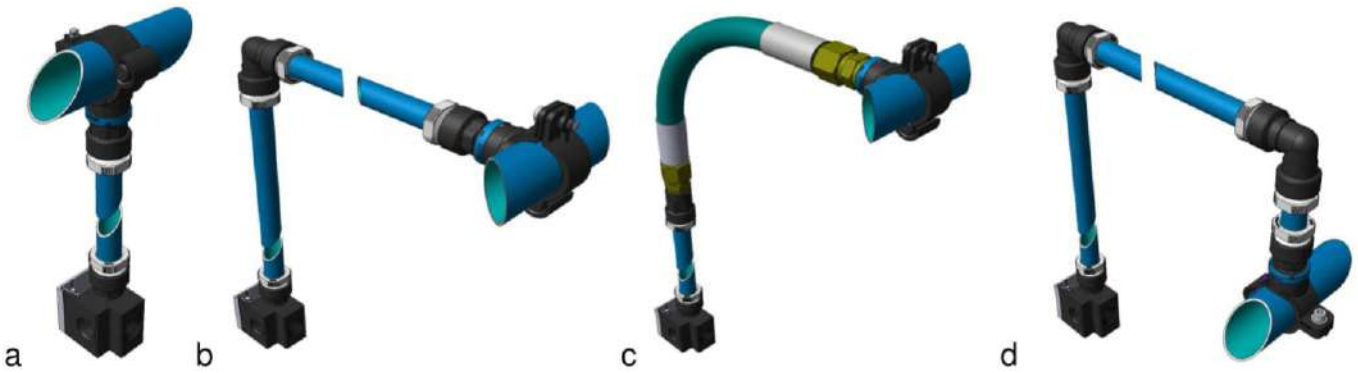
1.2. Tool for the internal deburring of the pipe
(Blade deburring tool)

1.3. Tools for tightening the closing bolt
6 mm. ex. wrench or ratchet spanner with ex.wrench)

2. Ensemble with correct components positioning

1. Offtake piece
2. Bottom piece
3. Identification ring
4. O-ring gasket
5. Cylinder head screw with internal hexagon
6. Washer

3. Examples and assembly solutions for branches



a. Example of a direct offtake : it is the simplest and more economic one, but it is not always feasible due to problems of alignment between the masonry and the main pipe. When a gaseous fluid is transported, the condensate, if present, in the main pipe is conveyed directly into the offtake. In this case it is necessary to have adequate accessories for the water drainage.

b. Example of an offtake obtained through a 90°el bow. In this case all problems of alignment and condensate drainage are avoided. Of course the main pipe has to be installed with such a sufficient weathering as to convey the condensate down to a suitable drainage container.

c. Example of an offtake obtained through a hose. This condition, similar to the previous one, is particularly suitable in case main pipes are longer than 50 m. (164 ft.) and may therefore be subject to linear contractions and expansions due to temperature variations. With this solution length variations are not transmitted to off takes; moreover, the 90°offtake obtained with a large radius bend reduces pressure losses, thus increasing energy saving.

d. Example of an offtake derived from the upper side of the main pipe. This solution is advisable when the fluid speed (gaseous fluid) reaches so high values as to micronize the condensation or otherwise to convey it also in the upper part of the main pipe.

4. ASSEMBLING

4.1 Verify the integrity of the pipe section where the gasket is to be positioned .
Any scratches on the paint, if not deep, can be eliminated using fine emery paper 300÷600.
Deep dents or scratches can be eliminated only by moving the branch position or by replacing the pipe section interested.

4.2. Verify the correct positioning of the components.
Branches are supplied assembled and have to be disassembled only for the installation.
In case of accidental disassembly, check the presence and the position of all components which has to be the one of the ensemble figure at point 2 only.

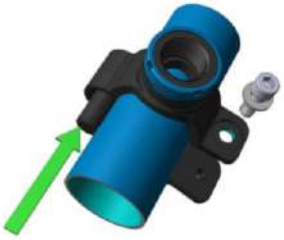
4.3. Completely unscrew the screw 6 (a) and separate the bottom part 2 from the offtake part 1 by getting it sliding axially up to complete loosening (b).

a

b

4.4. Position the off-take part 1 on the pipe, close to its final position and insert the bottom art 2 by pushing it axially a hinge up to align the screw holes (c).

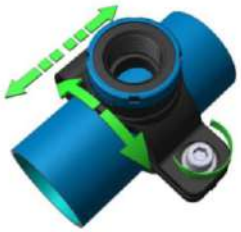
c



4.5. Screw the screw 6 without tightening it and place the branch in its final position (d).

4.6. Tighten the screw 6 finally (e).

d



e

4.7 Hole the pipe by using a hole saw of a size adequate to the offtake diameter (f) :

1/2" = Ø14 (9/16") **3/4 "= Ø19 (3/4")** **1" = Ø24 (15/16")**

This operation will not damage the thread on condition that the guide helix point is set in such a way that it does not protrude by more than 1÷1,5 mm (3/64"÷1/16") over the saw teeth.

f

4.8 Eliminate the burr after holing and carefully clean out all residues due to this operation (g).

g

1. Needed tools and materials

1.1. Tools for pipe cutting :
(Mitre saw – band saw – hand saw)

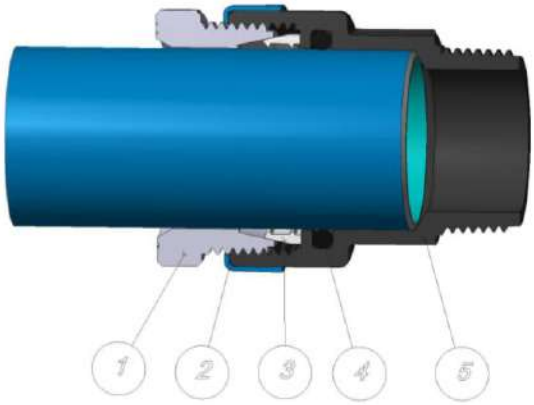
1.2 Tool for the internal deburring of the pipe :
(Blade deburring tool)

1.3 Tool for external deburring of the pipe :
(Deburring tool – flat file – disk sander)

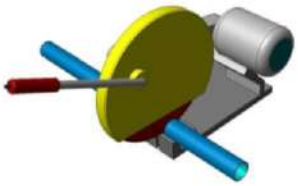
1.4 Lubricant :
(Vaseline grease – soapy water – oil (in case of EQOoil fittings))

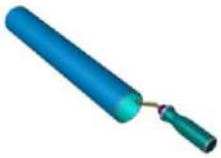
1.2. Marker :
(indelible pen or paint based marker)

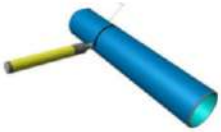
2. Assembly with correct components positioning



1. Nut
2. Identification ring
3. Clamping ring
4. O-ring gasket
5. Fitting body.







2. Preparation

3.1 Verify the integrity of the pipe section to be inserted in the fitting.
Any scratches on the paint, if not deep, can be eliminated using 300÷600 fine emery paper. Deep dents or scratches can be eliminated only by changing the branch position or by replacing the pipe section interested.

3.2. Verify the correct positioning of the components inside the pipe.
Fittings are supplied assembled and they have not to be disassembled. In case of accidental disassembly, check the correct assembly sequence and the position of all components which has to be the one of the ensemble figure at point 2 only. As the case may be :

a. loosen the nut while pulling the identification ring outwards until the lower side of the inspection slot lines up with the fitting end surface.

b. screw the nut, without tightening, up to observe a light resistance

3.3. If necessary, cut the pipe with a neat 90° cut, after carefully deburring both the internal and external sharp resulting edges.
In any case, the pipe bars used in the original supply length are to be deburred internally and externally.

3.4. Mark the pipe so to have a reference for its correct insertion into the fitting to make sure it exceeds the gasket.

The following table shows the correct reference lengths (in parenthesis, branch ones)

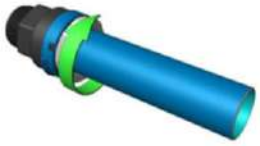
Dn	20	25	32	40	50	63
L(mm)	35 (31)	37 (35)	46	56	68	83

3.5 Lubricate the marked pipe section.
Use soapy water or any other lubricant compatible with the transported fluid.

1

2

3



4. Assembling

4.1. Deeply insert the pipe into the fitting up to align the reference mark with the external nut surface, as showed in fig.2.

4.2. Tighten the nut.

Tightening have to be be done by hand; in this case both water tightness and axial clamping are ensured.
Spanner tightening limits possible light linear expansions due to settlements.
In case you want to tight with a tools with torque value please follow the below values:

Diameter	Torque Value	Description
D20	2,5 N - m	Nut
D25	3,0 N - m	Nut
D32	3,5 N - m	Nut
D40	4,0 N - m	Nut
D50	6,0 N - m	Nut
D63	8,0 N - m	Nut
D90	10,0 N - m	Nut
D110 - D160	18,0 N - m	Bolt

The up mentioned value are similar to the value used tightening by hands till the starting of rotation of the pipe.

In any case, after the initial pressure raising, it is advisable to check and tighten all the nuts of the installation

Warnings and recommendations

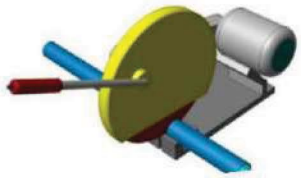
Assembling instructions contain images only referring to the **EQO*air*** line, but they refer to all
EQOfluids Pneumsys products, only keeping in mind the following details :

a. When using high pressure fittings (PN70) it is always advisable to tighten nuts by a spanner so to limit longer linear expansions due to natural settlements consequent to the higher specific load.

b. During the testing the applied pressure has to be at least 1,5 the value of the maximum service pressure in conditions of absolute safety for the staff and the equipments connected. Said equipments, having, in case, lower pressures than the pipes testing one, (for instance, safety valves, pneumatic tools, etc.) have to be duly isolated or disconnected from the installation.

c. After testing or after first putting under pressure, it is advisable to check and tighten all fitting nuts.

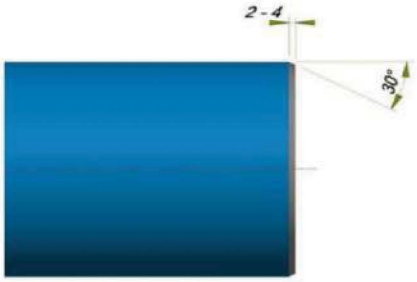
d. If using a lubricant to help the pipe insertion, its compatibility with the transported fluid is to be carefully checked.



3. Preparation

3.1 Verify the integrity of the pipe section to be inserted in the fitting.
Any scratches on the paint, if not deep, can be eliminated using 300÷600 fine emery paper. Deep dents or scratches can be eliminated only by changing the branch position or by replacing the pipe section interested.

3.2. Verify the correct positioning of the components inside the fitting.
Fittings are supplied assembled and they have not to be disassembled. In case of accidental disassembly, check the correct assembly sequence and the position of all components which has to be the one of the ensemble figure at point 2 only.



The bolts has to be kept loose.

3.3. When necessary, cut the pipe with a neat 90° cut. Carefully deburring the internal and external sharp resulting edges and make an external bevel of 2÷4 mm length x 30°tapered.
In any case, the pipe bars used in the original supply length are to be deburred internally and externally

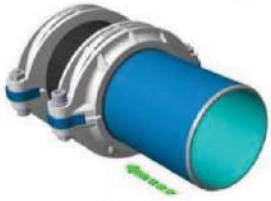
3.4. Mark the pipe so to have a reference for its correct insertion into the fitting to make sure it exceeds the gasket.
The following table shows the correct reference lengths

Dn	110	140	160
L(mm)	55		134

3.5 Lubricate the marked pipe section.
Use soapy water or any other lubricant compatible with the transported fluid.

1

2



3

4. Assembling

4.1. Deeply insert the pipe into the fitting up to align the reference mark with the external nut surface, as showed in fig.1 and 2.

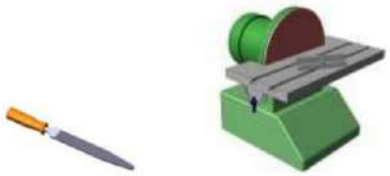
4.2. Tighten all the bolts at a torque value of 15 N/m

1. Needed tools and materials

1.1. Tools for pipe cutting :
Mitre saw – band saw – hand saw – sabre saw

1.2 Tool for the internal deburring of the pipe :
Blade deburring tool

1.3 Tool for external bevelling of the pipe :
Bevelling machine – flat file – disk sander



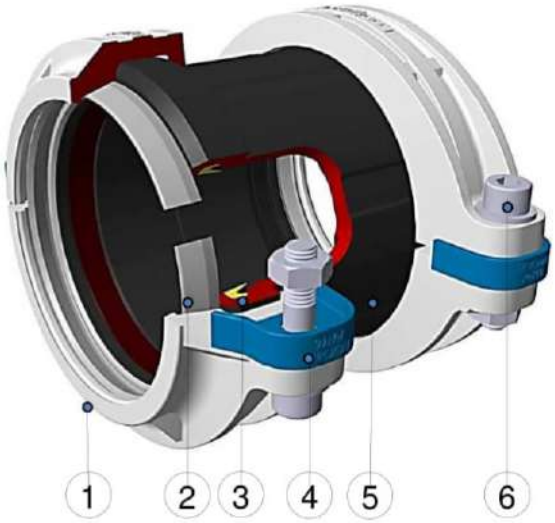
1.4 Lubricant :
Vaseline grease – soapy water – oil (in case of EQOoil fittings)

1.5 Marker :
indelible pen or paint based marker

1.6 Wrenches:

17 mm (2x DN 160 and 140) *8 mm (Dn 110 only)*

2. Assembly with correct component positioning



1. Half Blocking Ring
2. Clamping ring
3. Lip Seal
4. Identification Mark Holder (not always present)
5. Body
6. Bolts

Warnings and recommendations

Assembling instructions contain images only referring to the EQOair line, but they refer to all EQOfluids Pneumsys products, only keeping in mind the following details :

a. During the testing the applied pressure has to be at least 1,5 the value of the maximum service pressure. This has to be done in conditions of absolute safety for the staff and the equipments connected.
Said equipments, having, in case, lower pressures than the pipes testing one, (for instance, safety valves, pneumatic tools, etc.) have to be duly isolated or disconnected from the installation.

b. After testing or after first putting under pressure, it is advisable to check and tighten all fitting bolts.

c. If using a lubricant to help the pipe insertion, its compatibility with the transported fluid is to be carefully checked.

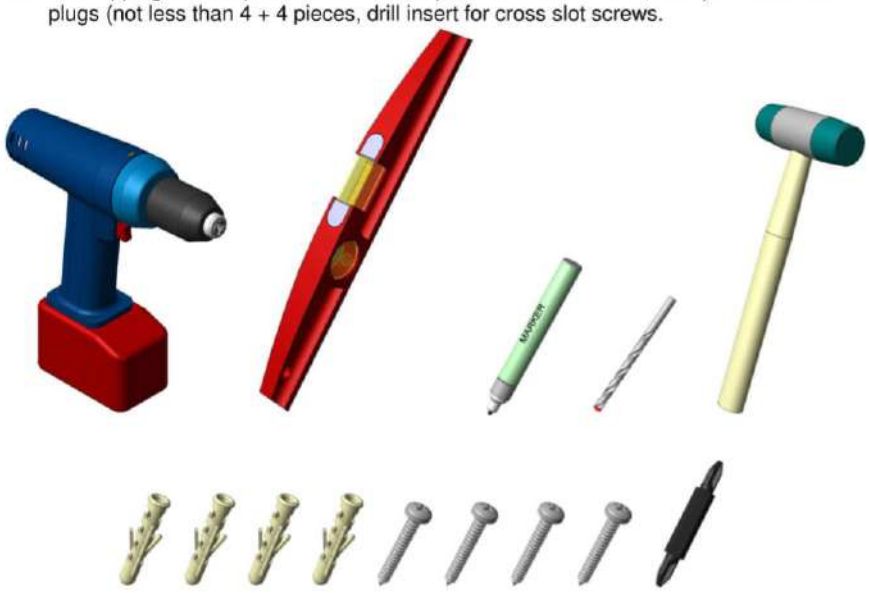
MANIFOLDS- ASSEMBLING - INSTRUCTIONS-1

1. Needed Tools and Materials

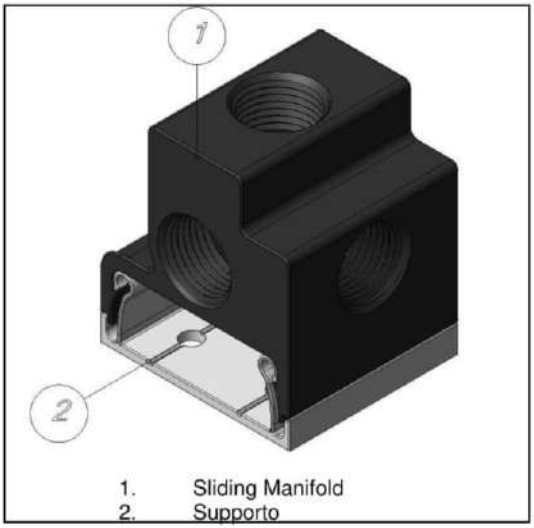
1.1. Manifold Fixing Tools

1.2. Drilling machine, spirit level, marker, masonry bit (If it is to be fixed on a wall), rubber or plastic mallet

1.3. Self-tapping screws (with cross slot head) of 5.5 maximum size, complete with wall-plugs (not less than 4 + 4 pieces, drill insert for cross slot screws.



2. Manifold components

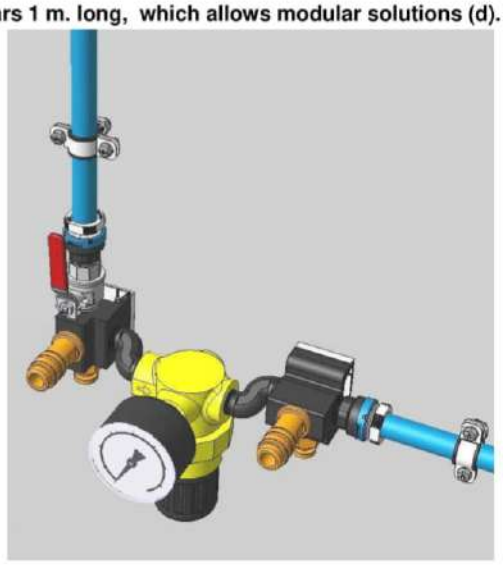


1. Sliding Manifold
2. Supporto

3. Some Assembly Examples and Solutions. The holder can be supplied in bars 1 m. long, which allows modular solutions (d).


a


b

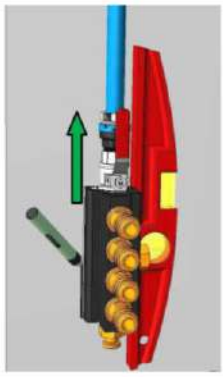

c


d

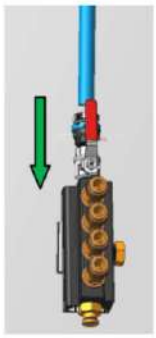

e

MANIFOLDS- ASSEMBLING - INSTRUCTIONS-2

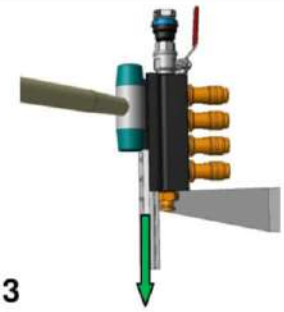
4.1 Assemble all the fittings + any valves and/or treatment group, connected to the manifold, to the outlet pipe (usually the drop pipe), leaving the inlet fitting nut completely loose.
Trace the positioning keeping the elements assembled and carefully check all alignments by using a spirit level.


1

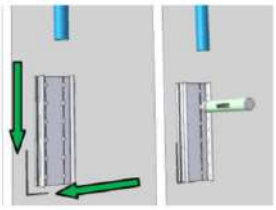
4.2 Completely detach the assembly from the branch pipe


2

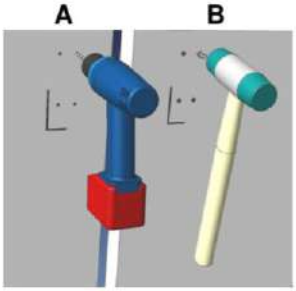
4.3 Completely slip the support off the manifold by forcing it axially. To avoid any hand injury it is advisable to put the manifold on a plane and use a rubber or plastic ends mallet.


3

4.4 Place the holder on the previously drawn sign again and mark the position of the holes.

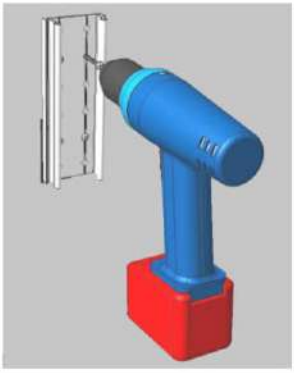

4

4.5 Carry out the holes (A) and introduce the wall-plugs (B)



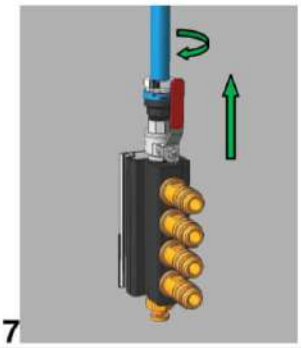
5

4.6 Fix the holder to the wall and carry out the final fixing according to the following different methods.


6

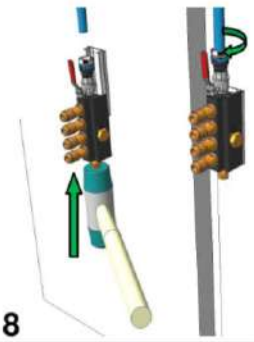
4.7 Vertical assembly 1 :

completely insert inlet fitting into pipe , tighten the nut and connect it as shown in figure 10.


7

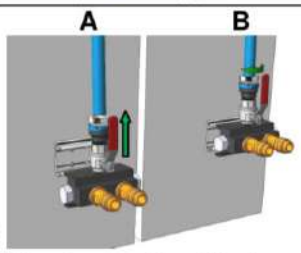
4.8 Vertical assembly 2 :

insert manifold partially into the holder, as shown in figure10.Then assemble it to the pipe, getting it sliding axially with the help of a soft ends mallet, if needed.
Tighten the inlet fitting nut.


8

4.9 Horizontal assembly 3 :

completely assemble the inlet fitting to the pipe.
Tighten the nut and carry out the connection as shown in figure 11



9

4.10 Revolving connection; it is advisable following conditions 7 and 8.

10

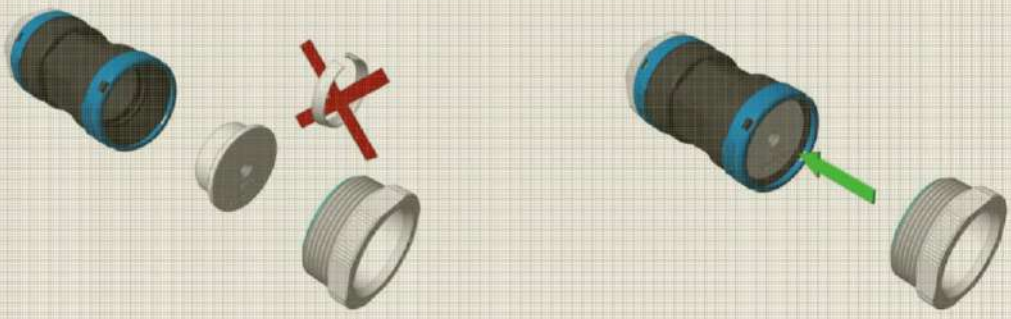
4.11 Level connection; following condition 9.

11

Svitare completamente la ghiera della bocca del raccordo, che si intende utilizzare come tappo, fino a liberare completamente l'anello spaccato.

Sostituire l'anello spaccato con il tappo, che deve essere inserito a fondo nel calettamento del raccordo come indicato (il diametro maggiore del tappo e la filettatura verso l'esterno).

Si consiglia di conservare l'anello spaccato, che potrà essere successivamente riutilizzato, nel caso si rendesse necessario prolungare la tubazione.



Completare l'avvitamento della ghiera facilitando così l'inserimento definitivo del tappo.

L'eventuale estrazione del tappo, dopo aver svitato la ghiera del raccordo, è facilitato dall'utilizzo di un bullone o un tronchetto di barra filettata come indicato.

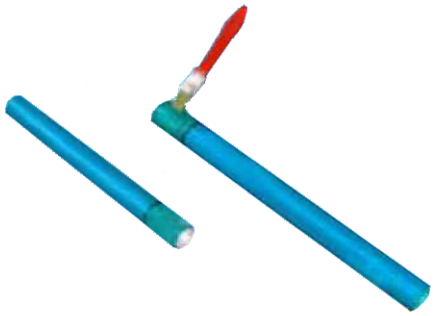
Quando si procede a questa operazione su un raccordo collocato in un impianto in esercizio, si raccomanda di verificare che la pressione sia stata completamente scaricata.

SLIP-SOCKET-1

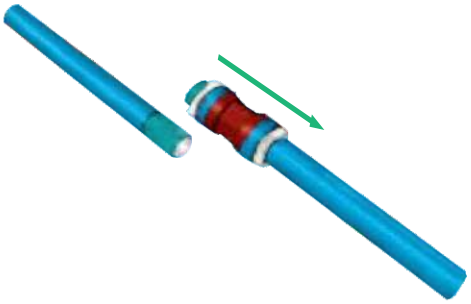
First consult the DN20 - DN90 fittings assembly instruction.

Mark the pipe so to have a reference for its correct insertion into the fitting to make sure it exceeds the gasket.
Use the fitting or the following table of correct reference lengths.

DN	20	25	32	40	50	63	90
L(mm)	35	38	49	60	76	96	93



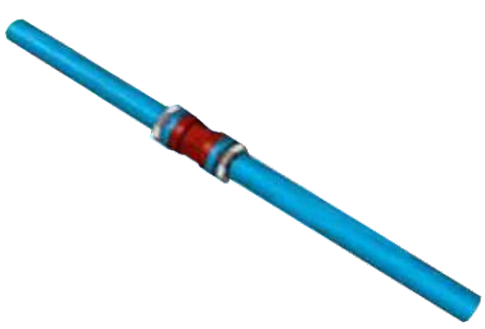
Lubricate the marked pipe section.

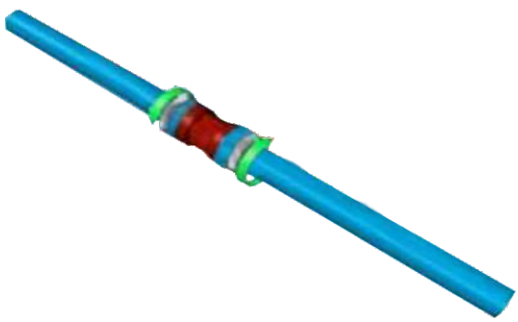


Insert one of the two pipes inside the fitting, until it comes out from the other end.

Aling the two pipes and slide the fitting until the reference marks are visible.

Tighten the nuts to fix the fitting, following the DN20 - DN90 fittingss assembly instructions.





DIRECTIONS & SUGGESTIONS AT THE 1ST START OF A PLANT

Pipelines of compressed air and other gasses.

Before starting a plant conveying compressed air (or other gasses), it must be taken in account the potential danger of a high speed expansion of such fluids. It can be due to a sliding off or to the burst of one pipeline component.

These drawbacks are extremely dangerous for the safety of the people moving or staying near the plant and may cause serious damages to the facilities and the surrounding equipment.
The effect caused by a breakage or slipping is comparable to a violent explosion, with a projection of the involved materials and any related system's component.

The reason of such drawback can be related to: a faulty joint, wrong evaluation of the working conditions, wrong installation practices, wrong starting operations, choice of wrong material.

Some examples:

a. Wrong position of the clamping ring in the fitting, reversed side (in previous versions with shorter flat-shaped nut only).
The present version includes an assembly made of: nut + plastic ring + clamping ring. These are delivered assembled and they do not have to be parted.
b. Mistakes in machining or assembling the fitting
c. A pipe out of the allowed tolerance field, undersized (*)
d. Nuts (or bolts of the largest fittings) not tightened.

Following Pressure Test directions can avoid the dangerousness of the above mentioned drawbacks.

The plant design must foresee enough valves to cut gradually the pipelines. It helps to gradually increase the pressurized volume. Rubber hose connections are recommended in case of big ambient temperature changes in long pipelines.

According to some standard (ASME codes and European pressure directive) the plants should be tested at a pressure value up to 1.5 times the MAWP (Maximum Allowed Working Pressure).
The ASME code B31.1 advises to use water during the pressure test, but it is not always possible. Most of people obtain the needed pressure using an air compressor.

At the first start it is advisable to apply the following procedure; it is a good practice to reach the maximum pressure value gradually and slowly:

1. Verify that all the people are far from the interested installation area.
2. In a big plant, use a small separate compressor unit.
3. Check the correct tightening of the nuts (bolts for the biggest fittings).
4. Increase the pressure by minimum steps of 0,5 bar.
5. At every pressure step, wait at least for one minute before going on to the next value.
6. At every pressure step, check that no axial movement occurs.
7. After reaching the maximum pressure, wait for pressure value stabilization.
8. Maintain this maximum pressure for at least 15 minutes.
9. Drop down the pressure completely.
10. Check again the correct tightening of the joints.
11. Increase again the pressure to the needed value and check for any possible leak.

(*) Our connections can be guaranteed only if fittings are jointed to our pipes.