GIRAIR®

Durapipe

System for compressed air

Technical Documentation

aliaxis

Contents

General recommendations
GIRAIR® System

General recommendations
GIRPI technical documentations are available for free to download and view, via our website **aliaxis.co.uk**
We recommend that you check the website to ensure you are working off the latest technical information. Specifically in relation to our:

- Chemical compatibility between GIRAIR® and specific additives or fluids
- Calculations and measures related to compensation for expansion affecting GIRAIR®
- Special parts and/or assemblies
- GIRAIR® installation training, please contact Aliaxis.

Technical Support 01622 852509 or by
e-mail technical.advice@aliaxis.com

This technical documentation refers to texts and regulations applicable on the day of publishing.

Technical recommendations
Please check chemical compatibility before using any additive or specific fluids with the GIRAIR® range.

- Refer to page 54 of this brochure, or call Aliaxis Technical Support **01622 852509** or e-mail **technical.advice@aliaxis.com**

General properties
Benefits

A COMPLETE SYSTEM FOR:
- Compressed air distribution networks.
- Non-combustable neutral gas networks
- Centralised vacuum networks (*).

CORROSION RESISTANT
GIRAIR® is generally neither attacked by atmospheric agents (humidity, aggressive environment), nor by condensates. This enables networks to remain sound and airtight throughout their long working lives. Furthermore, the cleanliness of the air or gas conveyed is maintained.

AIRTIGHTNESS
Thanks to its joining method based on solvent cementing, GIRAIR® networks remain perfectly airtight during their whole working life.

ENERGY SAVINGS
The smoothness of the pipe's inner surface and the design of the fittings, allowing for a full-bore, resulting in reduced load losses and therefore reduced energy requirements.

AIR QUALITY
Girair's corrosion and chemical resistance to most of the usual compressor oils (see page 52).

IMPACT RESISTANCE
GIRAIR® presents excellent ductile behaviour, in case of mechanical impacts, even at very low temperatures (-10°C). Should the pipe break under very high impacts, its ductile structure will prevent it from breaking into pieces and from projecting any dangerous splinters.

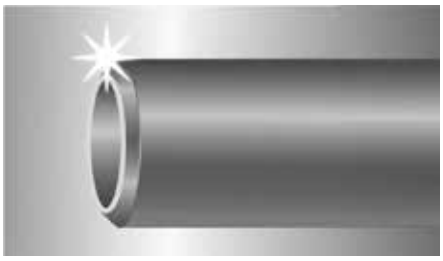
FIRE REACTION RATING
Girair meets B-s1,d0 rating according to Euroclasses, which is the best possible fire classification for synthetic materials. GIRAIR® contributes to improving fire safety. Indeed, even when directly submitted to flames, it remains non-flammable, does not produce any flaming drops that could start new fires, and thanks to its high thermal insulation properties, it does not propagate heat along the network.

EASY NETWORK IDENTIFICATION
It's specific blue colour (RAL 5012), GIRAIR® compressed air networks can be identified easily and quickly.

INSTALLATION TIMES UNDER CONTROL
Lightweight system, professional, quick and reliable installation methods, simple tools, no fire permit required for installation, installation times are kept under control with the GIRAIR® system.

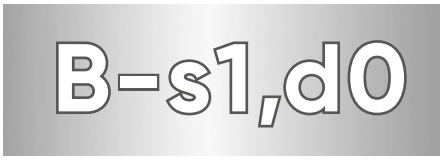
RECYCLING FRIENDLY
GIRAIR® is over 98% recyclable.

LIMITS OF USE
The GIRAIR® system is not compatible with medical air networks, flammable gases or silicon-free applications.

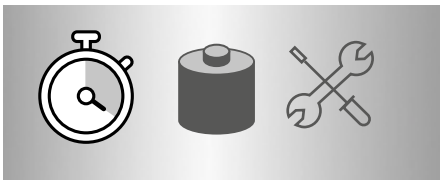


No corrosion clean air

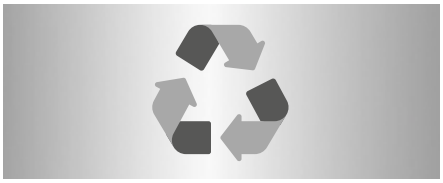
Jointing with solvent cement



Fire classification Euroclasses



Installation time under control



Recyclability (*)

Characteristics

The physical and mechanical properties below are measured on standard test samples before aging. As for all synthetic materials, these characteristics are likely to drop as the materials age, depending also on the conditions of use of the system.

1. PHYSICAL CHARACTERISTICS OF GIRAIR®

Characteristics	Standards	Units	Values
Density (volume mass)	EN ISO 1183-1	kg/m3	≈ 1300
Linear expansion coefficient α	ISO 11359-2	mm/m°C	0,095
VICAT softening temperature (5 daN load)	EN ISO 2507-2	°C	≥ 73
Fire classification	EN 13501-1	-	B-s1, d0
Thermal conductivity λ	ISO 22007-1	W/m.°K	0,17

2. MECHANICAL CHARACTERISTICS OF GIRAIR®

Characteristics	Standards	Units	Values
Resistance to static pressure			
Pipes Fittings time ≥ 1 h	EN ISO 1167-1	bar	≥ 52
Assemblies time ≥ 1 000 h	EN ISO 1167-1	bar	≥ 40
Resistance to alternating pressure			
(On fittings) Pressure: mini 20 bar/max 50 bar Diameters 16 to 90 = 1 Hz frequency Diameters 110 = 0.42 Hz frequency	 NF T 54-094 NF T 54-094	 cycle s cycle s	 ≥ 5000 ≥ 2500

1 MPa = 10 bar

3. PHYSICAL CHARACTERISTICS OF BRASS

The grades used are brass CW614N (CuZn39Pb3) for machined parts and CW617N (CuZn40Pb2) for forged/stamped parts.

Items containing brass	Grades
Items with inserts (GAEAL, GAEBL, GAMML, G4GL)	CW617
Nut (GA3G/L, GA3F/L, GAUR)	CW617N or CW614N

The user must verify whether the brass composition of our fittings complies with the applicable regulations in the country of use. Additionally, they must ensure that it is compatible with the operating temperature, the specifications of the fluid being carried, and any additives.

4. DIMENSIONAL CHARACTERISTICS

GIRAIR® pipes and fittings are manufactured and tested according to the dimensional requirements indicated in the following standards:

	Standards
Pipes	EN 1452
Fittings	NF T54-038

Operating conditions

NOMINAL PRESSURE

The notion of nominal pressure (PN) corresponds to the maximum operating pressure at 20°C of which the product was designed for continuous service. GIRAIR® is **PN 12.5** rated.

WORKING CONDITIONS

The **Maximum Working Pressure (MWP)** is the maximum pressure in continuous service for which the GIRAIR® system was designed.

It depends on the temperature of the fluid transported and/or on the ambient temperature that can be found in the direct surroundings of a GIRAIR® installation.

Temperature elevations reduce the modulus of the materials used to manufacture GIRAIR®, which in turn reduces its resistance to hydrostatic pressure.

The table below indicates the applicable Maximum Working Pressure according to temperatures:

Ambient or fluid temperature	Maximum working pressure
-10°C - 25°C	12.5
25°C - 40°C"	10

WARRANTY

Aliaxis UK warrants its products and tools against material and manufacturing defects for a period of five years from the date of purchase.

This warranty applies only when the products are specified, stored and installed when following Aliaxis technical documentation. Products produced by another manufacturer used in conjunction with our products will not be covered by this product warranty unless verified by Aliaxis. The use of another manufacture's product with Aliaxis will invalidate this product warranty.

The warranty covers the replacement of defective product at no extra costs, however, excludes any claims for incidental and consequential damages leading to the removal and reinstallation of them. Full warranty terms and conditions can be provided by our Aliaxis Sales and Care Teams or by visiting aliaxis.co.uk regarding Products, Systems and Solution Warranties.

Aliaxis does not assume responsibility for the hydraulic design of networks, particularly with regard to sizing.

GIRAIR® Range

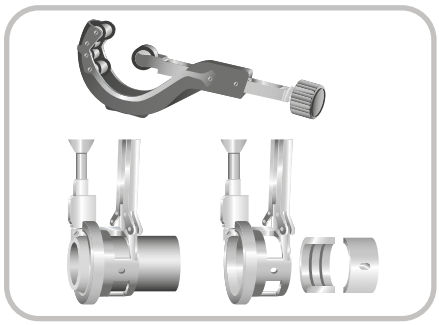
Range	Reference	16 (mm)	20 (mm)	25 (mm)	32 (mm)	40 (mm)	50 (mm)	63 (mm)	75 (mm)	90 (mm)	110 (mm)
Pipe	TUBGA	■	■	■	■	■	■	■	■	■	■
Elbows 90°	GA4M	■	■	■	■	■	■	■	■	■	■
Elbows 45°	GA8M	■	■	■	■	■	■	■	■	■	■
Serrated stub flanges	GACS						■	■	■	■	■
Bends 90°	GA4C						■	■	■	■	■
Couplings	GAMA	■	■	■	■	■	■	■	■	■	■
Caps	GABO	■	■	■	■	■	■	■	■	■	■
Reducing bushes long pattern	GARD			■	■	■	■	■	■	■	■
Equal tees 90°	GATE	■	■	■	■	■	■	■	■	■	■
Reducing tees 90°	GATR		■	■	■	■	■	■	■	■	■
Reducing bushes short pattern	GARS		■	■	■	■	■	■	■	■	■
Threaded adaptors	GAMML	■	■	■	■	■	■	■			
Adaptor nipples	GAEAL	■	■	■	■	■	■	■			
Threaded elbows 90°	GA4GL		■								
Adaptor nipples	GAEBL	■		■							
Threaded adaptors	GAMM	■	■	■	■	■	■	■			
Equal threaded tees 90°	GATG	■	■	■							
Threaded elbows 90°	GA4G	■	■	■							
Adaptor nipples	GAEA	■	■	■	■	■	■	■	■		
Reducing adaptor nipples	GAEB	■	■	■	■	■	■				
3 Piece unions	GA3P	■	■	■	■	■	■	■			
3 Piece unions girair® / brass	GA3GL	■	■	■	■	■	■	■			
3 Piece unions	GA3FP	■	■	■	■	■	■	■			
3 Piece unions girair® / brass	GA3FL	■	■	■	■	■	■	■			
Connectors	GAUR	■	■	■	■	■					
Wall plate elbow	GAAP	■	■	■							
Accessories	GHRR	■	■								
Quick adaptor	GHES	■									
Double union ball valves	GA2MBE	■	■	■	■	■	■	■			
Flanged socket ball valves	GA2MFE								■	■	■
Drop bends 180°	GA2C	■	■	■	■						
Drop bends	Q2S		■								
Wall plates with 2 or 3 outlets	GAAP		■	■							
Wall plates with 4 outlets	GAAPG4		■	■							
Wall plates with 4 outlets and drain	GAAPG4P		■	■							
Wall plates elbow with 1 female threaded outlet and 1 socket inlet	Q4GP		■	■							
Cobra pipe clips	HCK	■	■	■	■	■	■	■	■	■	■
Welding polymer	3FIX	■	■	■	■	■	■	■	■	■	■
Cleaner+	CLEANER+	■	■	■	■	■	■	■	■	■	■

Installation Guidance Rules
Tools

HANDLING AND STORAGE

The pipes and fittings will be stored separately on an even area, away from dust and sun. In all cases, take special care to avoid rough handling, impacts and especially with indenting, cutting or heavy objects, particularly in cold weather. Transport and store the pipes with their protection cover. Remove the cover and protection caps or plugs immediately before installation.

For any operation, please use the correct PPE workwear, which is recommended for the relevant building site for the installation.



CUTTING

- **The wheel-cutter**

Allows for neat, clean cuts to be carried out.

- **The chamfering pipe-cutter**

This type of tool cuts and chamfers pipes in one single operation. According to the model and size used, it can cut and chamfer pipes of all diameters, with the help of reducing half-shells.

- **It is strongly advised to avoid using disk saws or shears to cut the pipe.**

TRIMMING - CHAMFERING

⚠ **Not chamfering the pipe externally may cause leaks, both short term and longer term.**

After cutting, the pipe must be de-burred and a chamfer must be made on the outside of the pipe.

The recommended external chamfer is a 15° angle.
The dimensions of the chamfer must comply with the following table:

Ø Pipe	Chamfer length A
Ø 16	1 - 2 mm
Ø 20 - Ø 50	2 - 3 mm
Ø 63 - Ø 160	3 - 6 mm

These operations can be performed by means of the following tools:

- **Trimming and chamfering tool**

This tool can be used to trim the inside of the pipe, and when reversed, it chamfers the outside of the pipe.
Ref. GIRPI **CONE50U** for pipes up to 50 mm.

- **Chamfering tool** this tool chamfers the pipe.

Ref. GIRPI **FT 55 05 10** Ø32 to 110 mm.

- **Chamfering pipe-cutter** *(see "cutting" section).*
- **The use of tools including cutting or abrading disks to chamfer pipes is strictly prohibited.**

HOLDING TOOLS

- **Chain vice**

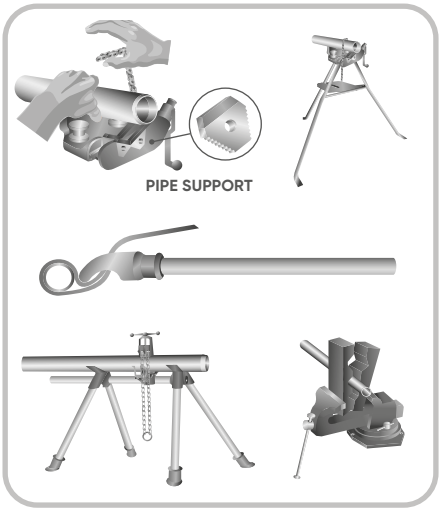
Polyurethane pipe-rests hold the pipe without any scratching.

- **Strap wrench**

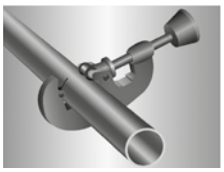
Maximum gripping power, with no risk of deforming the pipes or fittings (braided nylon strap).

- **Bench vice**

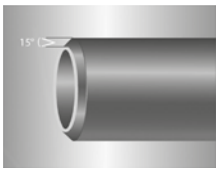
When using such traditional vices, it is mandatory to clamp the pipes by means of wooden notched pipe-rests.



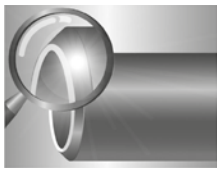
Welding procedure



Cutting

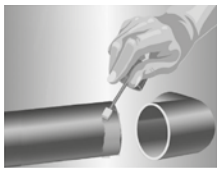


Chamfering



Checks

Priming



Solvent cement application

Push straight

CHECKS PRIOR TO WELDING

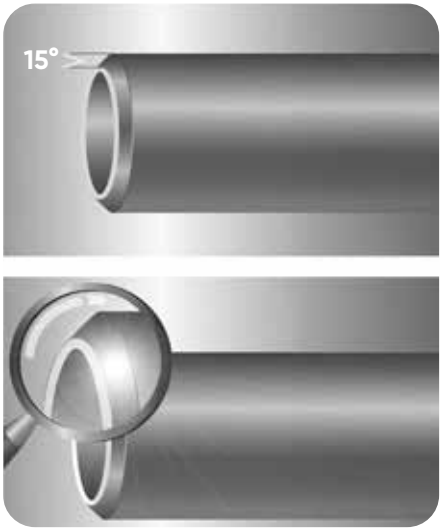
Abrading and priming operations are mandatory.
Pipes and fittings must be cleaned with a clean, lint-free cloth, and primed with CLEANER+ , in order to ensure optimal performances for each assembly. In all cases, pipes and fittings MUST be clean and free from any trace of humidity.

Before welding it is important to make certain checks:

- On the pipes: check that they are chamfered.

Extract chips produced during cutting or trimming operations, so as to avoid the obstruction of balancing valves and other similar equipment on the network.

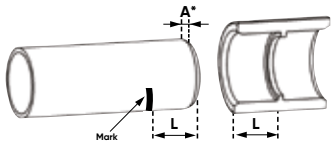
- On the fittings ensure that they contain no sign of damage or deep scratches.
- On the solvent cement: it must be fluid, homogeneous, check the maximum use by date on each pot.



MARKING OF THE SOCKET LENGTH

- Before applying the solvent cement, mark the socket depth.

This mark enables the application of the solvent cement over the necessary length, and helps the installer to check whether the penetration length of the male end in the socket is correct.



SURFACE PREPARATION

Abrading and priming operations are mandatory. Preparing the surfaces of the male and female parts to be joined is mandatory.
The priming operation shall be carried out using CLEANER+ and a clean, soft, lint-free cloth. Leave the cleaned surfaces to dry, or dry them up using another clean, soft, lint-free cloth.

WELDING POLYMER APPLICATION

- Once the checks and marking have been done, apply 3FIX solvent cement, available in 1 litre pots.
- Check the use by date on each pot.
- To apply the solvent cement, use the brush provided with the pot.

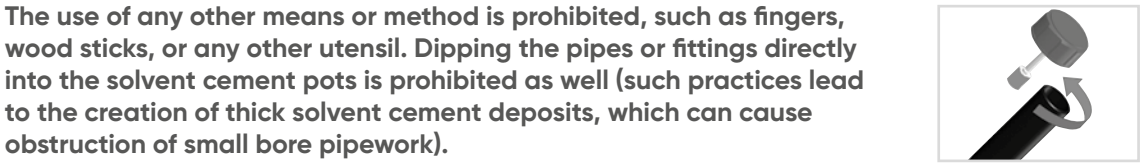
Brushes provided with: (Ref. GRERFIXB) 1 liter pots are fit for use with all sizes.

System Implementation
Specific recommendations

SOLVENT WELD APPLICATION

The use of any other means or method is prohibited, such as fingers, wood sticks, or any other utensil. Dipping the pipes or fittings directly into the solvent cement pots is prohibited as well (such practices lead to the creation of thick solvent cement deposits, which can cause obstruction of small bore pipework).

The use of unsuitable applicators may result in excess solvent cement inside or outside the pipe. This excess may cause local deterioration of the pipe. Any change in composition by dilution or any other process is prohibited. Apply the solvent cement moderately (in a thin coat) over the whole socket length (female) and over the whole length of the male end (marked on pipe). The solvent cement should be applied in rotation movements so as to obtain a uniform, homogeneous coat, well spread over the whole interlocked surface.



Ø Pipe	Rotations
Ø 16 - 40	4
Ø 50 - Ø 90	6
Ø 110	8

⚠ **Modifying the solvent cement composition by dilution or by any other means is prohibited.**

JOINTING

⚠ **Immediately after applying the solvent cement, joint the two elements right home (as far as the marks previously traced) by pushing longitudinally and without twisting.**

- Hold together for 5 to 10 seconds without any movement. In order to secure optimal welding performances, do not submit fresh joints to any mechanical effort during the first minutes that follow joining.
- A bead of solvent cement is formed after pushing the elements together. That bead helps check that the weld is done. Excess solvent cement can be wiped off with a clean, soft and lint-free piece of cloth.

Note: In certain cases it is necessary to mark the position of one element in relation to the other. On large sizes, greater than diameter d90, 2 fitters must operate simultaneously, i.e. one fitter will coat the male end, while the other fitter will be coating the female end with solvent cement. This method enables a quick jointing, needed for a strong weld.

PARTICULAR CLIMATIC CONDITIONS

⚠ Temperature range required for cold welding: +5°C to +35°C. If the solvent cement is stored at 20°C, welding is possible at 0°C.

The atmospheric conditions (temperature, humidity) considerably affect the curing drying time, (evaporation of solvents of the solvent cement).

Therefore:

- At low temperature, the parts when assembled should be held together for 20 to 30 seconds.
- In hot weather, the adhesive should be applied quickly, and the parts must be joined immediately. To prevent evaporation of the solvent cement, the container must be closed after each welding operation. Once opened, it should be used as quickly as possible, especially in warm climates.

DRYING TIMES the drying times of the 3FIX solvent cement are as follows:

Drying times before pressure tests:		6 bar	10 bar		
		Ø 16 - 63	Ø 75-Ø 110	Ø 16-Ø63	Ø 75-Ø 110
Ambient temperature	5 - 10°C	5 h	6 h	6 h	12 h
	11 - 35°C	2 h	2 h	3 h	4 h

The above figures were estimated based upon laboratory tests.They cannot truthfully reflect the possible variations encountered from one installation site to another, and must be considered as indicative.

General Rules of Installation
Recommendations

CONNECTIONS BETWEEN GIRAIR® AND THREADED METAL COMPONENTS

Connections between threaded metal components and GIRAIR® fittings with metal threaded inserts: excluding connection to wall plates (namely our reference GAAP), obtained by means of tap connectors (GAUR reference), connections between GIRAIR® and metal pipes, fittings and equipment featuring male or female threads (cylindrical/parallel) must be made by means of the GIRAIR® /metal couplings provided for this purpose. It is advised not to connect tapered (conical) male threads onto GIRPI's GIRAIR® fittings with female metal threaded inserts. Fittings that are equipped with threaded metal components: GAEAL, GAEBL, GAMML, GA4GL, can be used when high torque is required for connections to metal threaded components. The table below indicates maximum torque values.

Dia mm	16	20	25	32	40	50	63
Maximum torque (N.m)	45	50	60	75	90	110	135

Connections between threaded metal components and GIRAIR® fittings with plastic threads: for male or female plastic threaded fittings (GAEA, GAEB, GAMM, GATG, GA4G, GA3F/P), connections with cylindrical/ parallel threaded metal components is possible. When straight couplings, elbows, tees or other GIRAIR® fittings with plastic threads are used, they must be screwed by hand, the last ¼ turn only being tightened with a tool when required, preferably with a strap wrench. Under no circumstances should GIRAIR® pipes and fittings be threaded or tapped by machining.
The compatibility, strength and pressure-tightness of sealing pastes must be confirmed by the paste manufacturers.

SEALING

General recommendations related to sealing compounds: the use of anaerobic resins is forbidden. Applying excess anaerobic resin quantities on brass components may result in a contact between the anaerobic paste and the plastic components, and cause the plastic components to crack. Please contact the sealing paste manufacturers to get their confirmation as to the drying times, chemical/compatibility resistance and sealing capacity under pressure of their products.
Connections between threaded metal components and GIRAIR® fittings with metal threaded inserts: in our current state of our knowledge at the date of publication of this data sheet, the following compounds have proven to be satisfactory for connecting GIRAIR®/GIRAIR® parts and mixed GIRAIR®/metal parts: • Tangit (Loctite) plastic seal.
• Do not use anaerobic resins. In no case should GIRAIR® pipes and fittings be machine threaded inside or outside. **Connections between threaded metal components and GIRAIR® fittings with plastic threads:** the use of tallow, hemp or similar materials is forbidden, as excessive tightening can cause the fittings to break up. The following sealants will be preferred:
• Soft silicon paste. • PTFE (e.g. "Teflon") tape, preferably high density.

INDICATIVE QTY OF WELDING POLYMER FOR 100 WELDS ACCORDING TO THE PIPE Ø:

Ø pipe (mm)	16	20-25-32	40-50-63	75	90-110
Solvent cement quantity	125 ml	200 ml	1 litre	2 litres	3.5 litres

THERMOFORMING of GIRAIR® pipes is strictly prohibited on the work site and involves cancellation of GIRPI's guarantee. For all direction changes, make use of standard GIRPI fittings only. Contact GIRPI's Technical Assistance for particular problems to be solved.

General Rules of Installation

Commissioning and tests

GENERAL

The GIRAIR® system pipes and fittings are inspected throughout their manufacture and are guaranteed for a use complying with their design within the limits indicated. During the installation and before putting the GIRAIR® network into service, it is advisable to make a certain number of checks as with all other materials.

SPECIFIC ONSITE TESTING

It is suggested that the following test procedure be followed, after joints have been allowed to dry for the appropriate minimum time. The system should be divided conveniently into test sections. Fill the section with cold water making sure that no air pockets remain. Do not pressurise at this stage. Check the system for leaks. If no leaks are apparent check for and remove any remaining air. Increase pressure up to 50lbf/in2 or 3 bar. Do not pressurise further at this stage. Leave the section pressurised for 10 minutes. If the pressure decays, inspect for leaks and rectify as necessary. If the pressure remains constant, slowly increase the hydrostatic pressure to 1 1/2 times the nominal operating pressure. Leave the section pressurised for a period not exceeding 1 hour. During this time the pressure should not change.

INSPECTION

a) Visual inspection. During installation, the pipes and fittings should be inspected so as to eliminate doubtful elements containing abnormalities such as impacts and deep scores caused by unsuitable handling. Before the tests, the whole network will be visually inspected to eliminate any pipework section containing deep cuts or notches, large deformations due to sudden impacts, traces of blow torch burns, etc... Any damaged part should be replaced before putting into service. The aim of the visual inspection is also to ensure that the installation complies with the drawings and hence the correct installation of all the components (connection, supports, monitoring and safety mechanisms, etc...). GIRPI recommends carrying out a visual inspection to look for any low points not covered by the plans. If necessary, a purge device should be installed before commissioning.

b) Leak tests. After installation of the network, a hydrostatic pressure test will be made in order to detect possible leaks, at 1 bar (all parts of the network should be visible and accessible during the test). Valves must all be opened and closed several times. For a full pressure test, it is suggested that the following test procedure be followed, after joints have been allowed to dry for the appropriate minimum time. The system should be divided conveniently into test sections. Fill the section with cold water making sure that no air pockets remain. Do not pressurise at this stage. Check the system for leaks. If no leaks are apparent check for and remove any remaining air. Increase pressure up 1 bar. Do not pressurise further at this stage. Leave the section pressurised for 10 minutes. If the pressure decays, inspect for leaks and rectify as necessary. If the pressure remains constant, slowly increase the hydrostatic pressure to 11/2 times the nominal operating pressure. Leave the section pressurised for a period not exceeding 1 hour. During this time the pressure should not change.

OPERATING CONDITIONS

Whatever the use, the safety mechanisms necessary for the traditional protection of networks (regulation, pressure reduction and limitation, temperature regulation and limitation, shut off mechanisms, etc...), should be planned, installed and kept in perfect working order throughout operation.

a) Vibrations. Vibrations can be a source of disorders on both pipework and supports ; it is highly advisable to install a suitable system preventing vibrations from spreading.

b) Sources of heat and UV. Being made from thermoplastic material, GIRAIR® should in no case be installed close to a source of heat causing a rise in temperature greater than its limits of use, and must be protected from exposure to ultraviolet rays. For advice on pipe protection please contact Technical Support **technical.advice@aliaxis.com** or **01622 852509**.

c) Prevention of impacts. As with all networks conveying pressurised fluids, GIRAIR® pipework systems must be protected from impacts which might occur in passageways used by handling machinery or suspended loads in movement (use of safety barriers, railings, etc...).

d) Malfunction. Compliance with the operating Pressure/ Temperature conditions must be checked and ensured using regulation and safety devices, such as pressure reducers, safety valves, expansion tanks, anti-hammering or similar devices, in compliance with applicable codes of practice. Any malfunction must be noted in the maintenance logbook of the networks.

e) Insulation materials. To ensure the recommended design life of a system, consideration should be given to the ancillary agents applied to amorphous thermoplastics. These include but are not limited too - adhesive labels, intumescent mastics, rubber clips, paints, thread sealants, foil barrier tapes, thermal insulation and compressor oils.

When selecting ancillary agents, it is the responsibility of the installer to check for chemical compatibility by referring to the product literature and/or checking with Aliaxis UK technical - **technical.advice@alaxis.com**

Expansion and Contraction Calculations

TECHNICAL ASSISTANCE:
GIRPI's installation guide and expansion slide rules will enable you to figure out expansion loop dimensions and bracket positioning in changes of direction.
For help in calculating expansion, producing the application drawings or training staff on site, contact Aliaxis Technical Support **technical.advice@aliaxis.com** or **01622 852509**

THE PHENOMENON

All materials subjected to thermal variations:

- Contract when temperatures fall.
- Expand when temperatures rise.

CALCULATION PARAMETERS FOR GIRAIR®

The implementation of the system must take account of the elongation or contraction of the pipe which is calculated using the following formula:

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

The linear expansion coefficient of GIRAIR® is:

α = 0.095 millimetre per metre per °C (mm/m.°C)

in which:

α = expansion - contraction coefficient (linear)
L = length of the pipe when installed, in s
ΔT = temperature deviation in degrees Celsius °C (difference between the maximum or minimum temperature in service and installation temperature)
ΔL = length deviation, in mm (difference in length between L on installation and L in operation, i.e. elongation or shrinkage length).

COMPRESSED AIR TEMPERATURE DURING OPERATION

Most of the time the air's temperature depends on the temperature of the air fed into by the compressor, and on the presence of dryers.

Without a dryer, the air produced by the compressor, can vary from 20° in winter to 40° in summer.

If a refrigerating dryer is used, the usual temperature obtained at the start of the network is 10°C.

Ex 1: Working network (without dryer)

Ø 63 mm

- Temperature of installation = 20°C
- Temperature of the air at compressor outlet = 40°C
- Length (during the installation) = 15 m

ΔT = 40 - 20 = 20°C

ΔL1 = 0.095 x 15 x 20 = 29 mm **expansion**.

Ex 2: Working network with a dryer

Ø 63 mm

- Temperature of installation = 25°C
- Temperature of the air at the start = 10°C
- Length (during the installation) = 25 m.

ΔT = 25 - 10 = 15°C

ΔL1 = 0.095 x 25 x 15 = 36 mm **contraction**.

Solutions

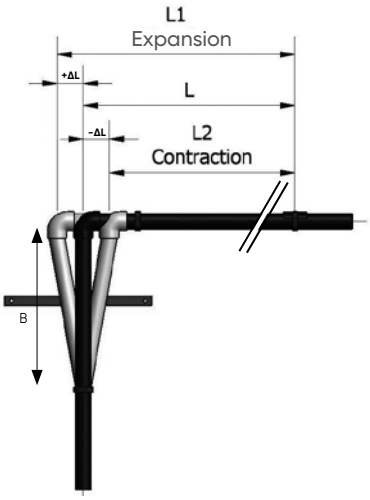
THE REMEDIES

In order to avoid the disorders subsequent to the movements of the pipes, it is necessary to let them expand and contract freely.
It is therefore necessary to:

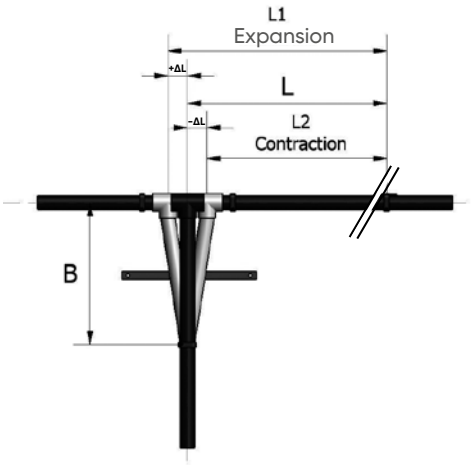
- Use pipe brackets allowing the longitudinal movements of the pipe to be guided.
- Ensure that there is never a straight length of pipe between 2 anchors without any expansion compensation, either by using a change in direction, or by making a loop (see illustrations below).

1 - LOOP ARMS

CHANGE OF DIRECTION



DERIVATION



L	Length of pipe section during installation
L1	Length at maximum temperature
L2	Length at minimum temperature (fluid or room)
ΔL	Length difference between L1 (or L2) and L
B	Length of loop's arm

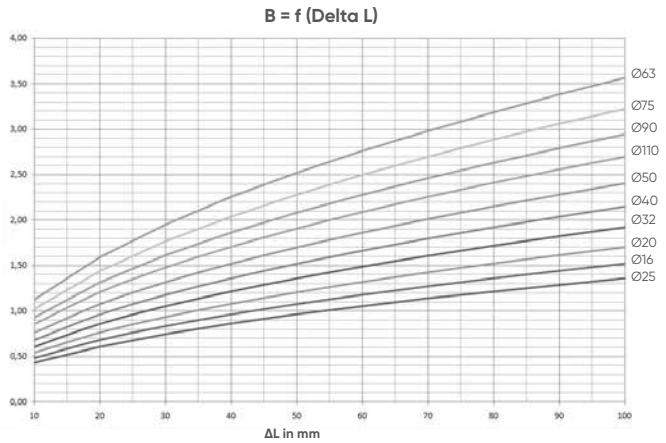
Change in direction
(which is generally efficient in most cases).

Using the following chart, it is possible to determine the loop arm length "B" required to absorb the calculated expansion.

$$B = 34 \sqrt{Ø \times \Delta L}$$

34 : constant
Ø : External diameter (mm)
Δ : Length deviation (in mm)
B : loop arm length (mm)

Example 1 :
B = 34 $\sqrt{63 \times 29}$ = 1450 mm = 1.45 m

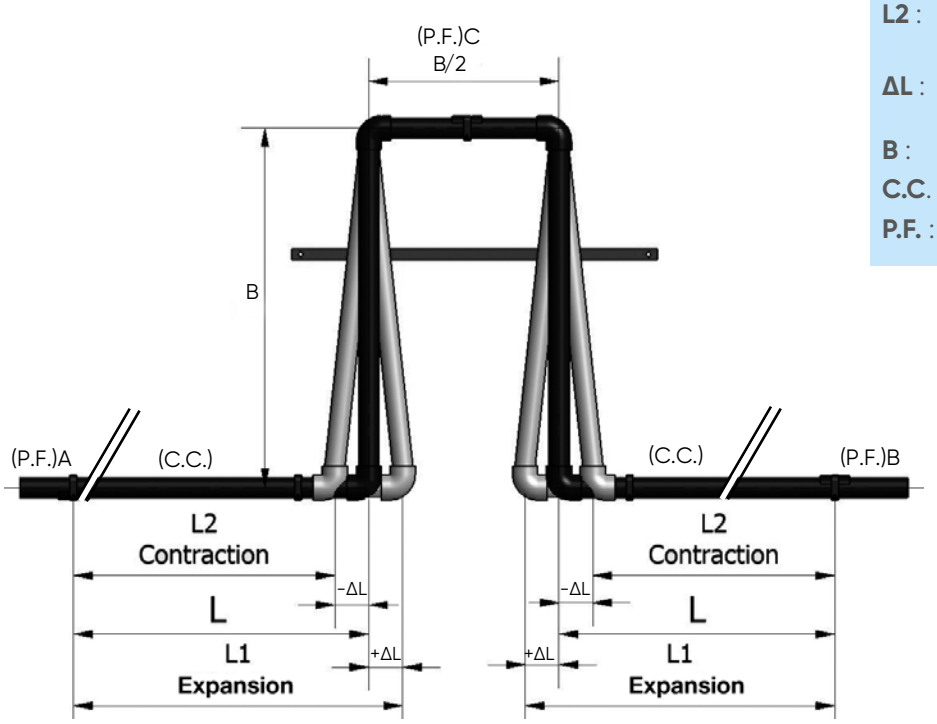


2 - EXPANSION LOOPS

Loops

Made from GIRAIR® pipes and fittings, they are generally used on long, straight sections of pipework.

L : Length of pipe section during installation
L1 : Length at maximum temperature
L2 : Length at minimum temperature (fluid or room)
ΔL : Length difference between L1 (or L2) and L
B : Length of loop's arm
C.C. : Guide (bracket)
P.F. : Anchor point

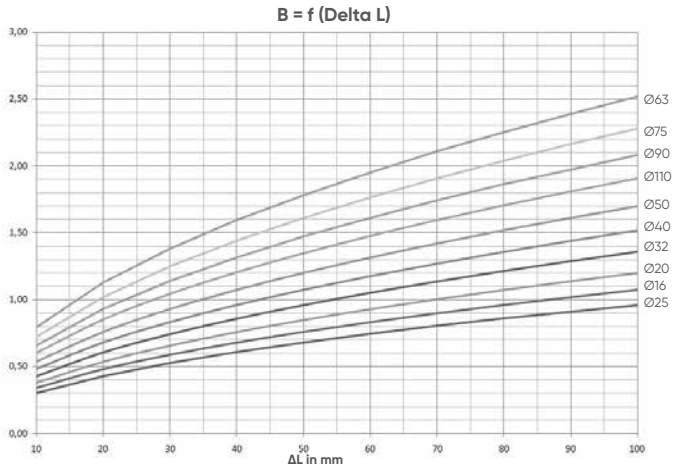


Using the following chart, it is possible to determine the loop arm length "B" required to absorb the calculated expansion.

$$B = 34 \sqrt{Ø \times (\Delta L/2)}$$

34 : constant
Ø : External diameter (mm)
ΔL : Length deviation (in mm)
B : loop arm length (mm)

Example 1 :
B = 34 $\sqrt{63 \times 36}$/2 = 1140 mm = 1.14m



Installation

Accessories and ancillaries

Cobra pipe clips

GENERAL DESCRIPTION

Cobra pipe clips have been especially designed to support the GIRAIR® pipe system. The pipe is allowed to move freely inside the bracket as it expands and contracts. The use of components of external origin will make the Aliaxis UK warranty null and void, especially regarding the use of brackets other than Cobra pipe clips.

Other brackets than Cobra pipe clips shall be used under the installer's entire responsibility. In all cases, the supports:

- Shall continue to support their load even under temperature variation effects.
- Shall allow the pipeworks to expand freely.
- Shall keep the pipeworks which they support at enough clearance from any wall or obstacle so as to allow for the expansion movements and also for the assembly and disassembly of the mechanical couplings and accessories (unions, flanges, valves, pressure limiters, etc...).
- Shall in no event either injure or damage the pipeworks.
- Shall be free from any chemical substance which could potentially damage the pipeworks (e.g.plasticisers).

SUPPORTS

Support Centres

In order to allow the pipes to expand and contract freely, Cobra clips must be used (with M4,M6, M6 and M8, bolts). The following support centres are recommended for GIRAIR. These should not be exceeded in horizontal lines, otherwise long-term sagging between supports may result. For vertical pipes, the support centres shown can be increased by 50%.

SUPPORT DESIGN

GIRAIR® pipes are light in weight, (approximately 1⁄8th the weight of steel), which means that the system supports can be of light construction.

If subject to temperature changes, GIRAIR® will expand more than metal. This expansion should be controlled by laterally constraining the pipes whilst allowing free axial movement.

Thus pipe supports should:

1. Be rigid in construction - To adequately support the pipe (fabricated mild steel angle is ideal).
2. Have a wide bearing area - To allow free transmission of pipe movement and to avoid localised stressing.
3. Be free from sharp burrs or edges - To avoid cutting into the pipe wall.
4. Allow free axial pipe movement - To avoid pipe snaking.
5. Provide lateral restraint - To avoid pipe snaking.

Cobra pipe clips should be used with GIRAIR®.
These allow free axial pipe movement and afford lateral restraint.

COBRA PIPE CLIP

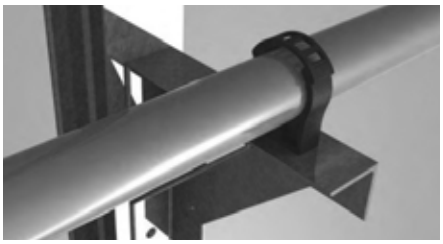
Size (mm)	Code
16	13 434 305
20	13 434 306
25	13 434 307
32	13 434 308
40	13 434 309
50	13 434 310
63	13 434 311
75	13 434 312
90	13 434 313
110	13 434 314

Outside dia (mm)	Support spacing (m) 20°C	Note
16	1.1	For each 10°C temperature rise reduce support spacing by 10%
20	1.2	
25	1.4	
32	1.5	
40	1.7	
50	1.9	
63	2.1	
75	2.3	
90	2.5	
110	2.8	

Cobra pipe clip

Support design

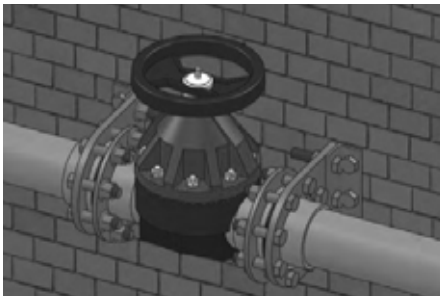
The diagrams illustrate the types of support that are ideally suited to the GIRAIR®. Support fixings can be via rawlbolts, set pins, lindaptors etc. as appropriate.



Long hanger rod type supports are not designed to provide lateral restraint to pipework and hence are not recommended for use with GIRAIR® systems where significant expansion is expected since pipe snaking may result. However, if it is not practical to support by any other method hanger rods can be used with rigid supports. In this case, hanger rods should be kept as short and rigid as possible and also must allow free axial pipe movement.

Support of heavy equipment

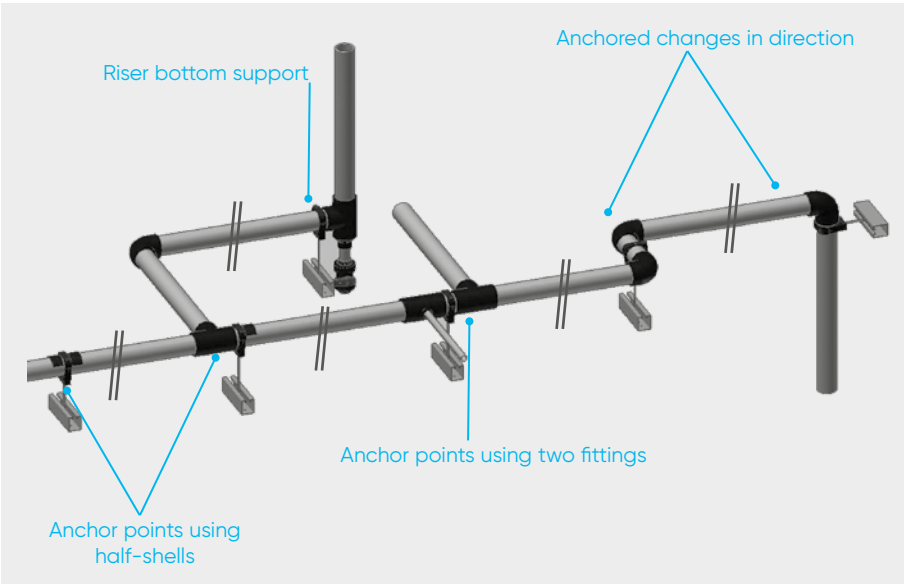
Large valves, filters and other equipment should always be independently supported and anchored to prevent undue loading and stress being transmitted onto the GIRAIR® system. Valve support plates can be used in place of flange backing rings to satisfy this requirement.



For smaller valves and equipment, two pipe clips situated immediately adjacent to either side of the equipment will prevent transmission of excess torque and other loadings to the GIRAIR® pipe.

EXAMPLES OF ANCHORS

Half-shell anchors are composed of sections cut from "GAMA" GIRAIR® straight couplings. Cut the couplings in two transversally and longitudinally, with their internal stops removed.
The resulting half-shells are then cleaned with CLEANER+ , coated with 3FIX solvent cement, and welded onto pipes of the same size, also coated with 3FIX solvent cement before contact.



Bracket which works as a guide to ensure free movement of the pipes.

Special cases

PASSING THROUGH PARTITIONS AND FLOORS

When a GIRAIR® pipe goes through a wall or a floor, it must be protected by a rigid sleeve made of synthetic material, and preferably GIRAIR®.
The sleeve internal diameter is chosen with enough tolerance to allow the pipes to expand and contract freely The sleeve must be long enough to protrude on both sides of the finished masonry element.

Pipe protection sheath

BUILT-IN OR EMBEDDED INSTALLATIONS

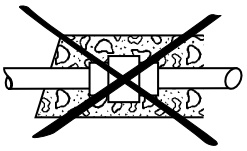
GIRAIR® can be cast into or embedded in masonry, with no mechanical fittings. The following precautions must be respected.

- The pipe must be made integral with the masonry either by means of the couplings making up the system or using half-shells onto the wall of the pipe.
- Each time the pipe enters the masonry it must be protected against shearing by a sleeve which protrudes from the finished surface of the masonry.
- The chase will be filled with a homogeneous material without sharp gravel which could damage the pipe.
- The commissioning tests must be carried out before filling the chase or pouring the concrete.
- Condensate drainage must be part of the design.

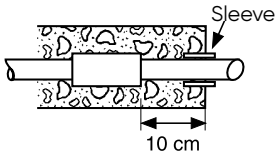
BURIED INSTALLATIONS

GIRAIR® pipeworks can be buried if the following precautions are respected:

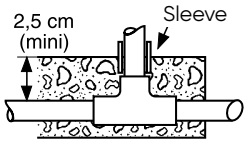
- The bottom of the excavation must be levelled and free of large grained materials and have no surface hard spots.
  A carefully compacted bed of 10 cm minimum will be made of clean sand 0/10 containing less than 10 % of fines.
- The backfill directly in contact with the pipe (comprised of sand containing less than 12 % of fines and free of gravel with diameter greater than 30 mm) will cover the pipe to a depth of 15 cm minimum and will be compacted.
- The covering backfill will be compacted in successive layers comprised of materials removed from the trench and which contain less than 30 % of elements greater than 20 mm.
- The minimum total height of the backfill above the pipe will be:
  - General case: 60 cm.
  - Under road/rail traffic: 80 cm.
  - Under concrete slab: 40 cm.



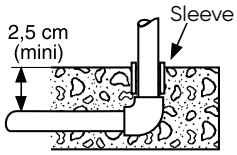
Mechanical coupling



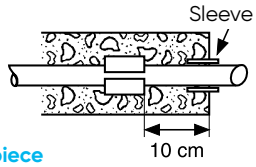
Socket



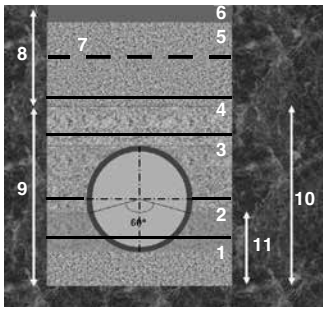
Tee



Elbow



Saddle piece



1 - Bedding
- 10 cm on normal ground
- 15 cm on hard or rocky ground
- Clean, lightly fillerised sand (< 5%)

2 - Base
- Clean sand with low fine element content (< 5%)
- Installation by mechanical clamping of the grains

3 - Lateral embankment

4 - Initial embankment
- ≥ 10 cm above the collar
- ≥ 15 cm above the top

5 - Roadway embankment or base
- Untreated gravel
- Granularity 0/20 and 0/40
- Minimum code: "Cb"
  (granulate standard XP P 18-545 march 2008)
- Warning mesh:
  (NF EN 12 613): 30 cm above pipes

6 - Finishing layer
- Topsoil, asphalt overlay, etc...

7 - Warning mesh

8 - Embankment

9 - Protective embankment

10 - Wrapping area

11 - Seating

Network Calculation

Network design aspects

GENERAL

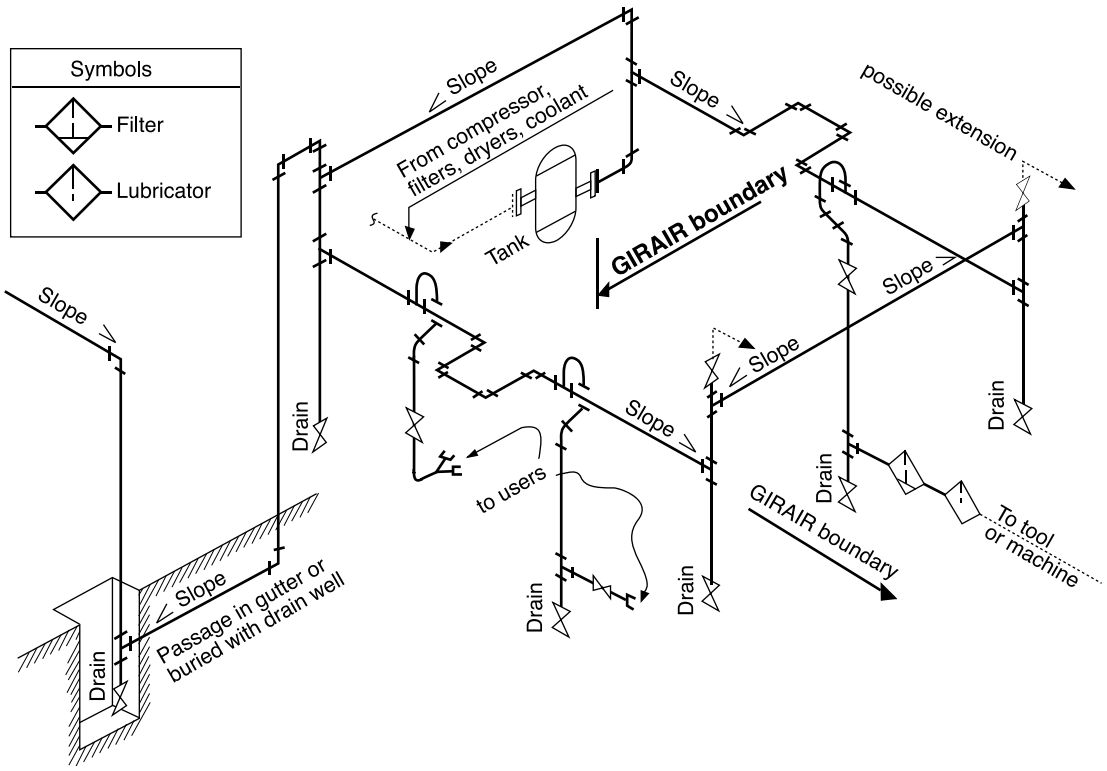
The evolution in compressed air production techniques and tools requires the design of innovative networks. In order to allow for extensions or new branches, the mains of such networks must be amply dimensioned.

Sectioning the network into closed loop circuits according to each workshop type and depending on various working pressures guarantees higher efficiency and optimal working pressures at all points in the network.

A shallow slope on the manifolds combined with the installation of a condensate trap made with fittings and pipes at each low point, together with the installation of all branches starting upward, will ensure the good quality of compressed air at each point of final distribution.

BASIC PATTERN

The isometric drawing below is an example and summarizes the basic principles to respect during the installation of compressed air network using the GIRAIR® system.
In case of any specific problem, please consult Aliaxis UK.



The GIRAIR® system can only be used after the tank, the coolers, etc..., and must not be directly connected to elements subject to strong vibrations.

Flow rate-pressure losses

NETWORK DESIGN ADVICE

- Have as many straight sections as possible.
- Compressed air speed should be around 7 m/s:

indeed, by exceeding this speed, pressure losses increase quickly, and so do energy costs. Nonetheless, a speed inferior to 5 m/s means that the diameter of the pipe is not fully used, which also enables to regulate air consumption peaks thanks to the amounts of air stored in the network.

- The network needs to be drained easily from its condensates at low points.
- Make branches start from the upper side of the pipe.
- Choose accessories and fittings that will cause less pressure losses.
- Design a network as simple as possible to have a better balance flow.
- Try to have an internal diameter of pipe as constant as possible.

Avoid pipe section reductions to limit pressure losses.

- Use enough valves to allow for network isolation by sections.

DRAINING

Condensation has no effect on the GIRAIR® system, but it can damage production tools. It is important to be able to evacuate condensation and even more if the system does not have a dryer upstream.

- Drains can be automatic or manual.
- The network requires a slope about 0.7 % to 1 %, directed toward the drain.
- Drains will be located at the lowest points of the circuit or at the end of straight lines.

BRANCHES

In order to avoid the presence of water in downpipes, branches are done with drop bends starting from the upper side of the network.
This technique enables condensation and impurities to be evacuated toward the drains without affecting the equipment or the manufacturing process (e.g. low pressure paint pistols).

THE FLOW: PRESSURE OF NETWORK

To determine the compressed air network dimensions some data needs to be known precisely:

- The equipments using compressed air:
- Quantity.
- The pressure recommended by the manufacturers.
- The volume of air consumed when machines are on.
- Number of machines working simultaneously.
- Kind of joints used to link the equipment to the compressed air network.
- Identify the accessories added to the compressed air network (filters).
- Incorporate network extension plans in the initial design.

The pressure of the network at the starting point shall be equal to the pressure of the machine needing the highest pressure added to the GIRAIR® system load losses, and to particular accessories pressure losses: filters, quick fittings (some of them may have a pressure loss of 1 bar or more, contact the manufacturer for exact information).

Examples :	- Pneumatic screwdriver	=	flow 25 Nm3/h	pressure	5 bar
	- Paint pistol	=	flow 14 Nm3/h	pressure	4 bar
	- Sandblaster	=	flow 35 Nm3/h	pressure	6 bar

In order to determine pipework sizes, start with the mains (starting from compressor outlet) and proceed by sections.

PRESSURE LOSSES AND PIPEWORK SIZE

The calculation of pipework dimensions is a direct function of the pressure loss (Δp) admitted between start point and end points. Oversized networks will lead to high pressure losses and may cause compressors to conserve too much energy.
This pressure loss takes into account the total length of pipe, and each fitting's specific influence figured out in equivalent runs of pipe, according to each fitting's shape.
The following table shows the equivalent pipe lengths corresponding to each type of fitting, per size.

EQUIVALENT LENGTH OF PIPE OF THE SAME DIAMETER (in s)

Pipe external Ø	Coupling Unions	Elbow 90°	Elbow 45°	Tee	Tee to branch	Reducing bush short pattern	Reducing double long pattern	Bends 90°	180° drop bends
16	0.10	0.30	0.15	0.10	0.70	0.45	0.20	0.10	0.25
20	0.15	0.40	0.20	0.15	0.85	0.55	0.25	0.15	0.35
25	0.20	0.50	0.25	0.15	1.05	0.70	0.30	0.15	0.45
32	0.25	0.60	0.30	0.20	1.35	0.90	0.40	0.20	0.55
40	0.30	0.80	0.40	0.25	1.70	1.10	0.45	0.25	-
50	0.40	0.95	0.50	0.35	2.15	1.35	0.60	0.35	-
63	0.50	1.25	0.60	0.45	2.70	1.70	0.75	0.45	-
75	-	1.50	0.75	0.55	3.70	2.40	1.10	0.55	-
90	-	1.85	0.95	0.70	4.55	3.10	1.35	0.75	-
110	-	2.50	1.35	0.95	6.05	3.50	1.55	1.00	-

It is common usage to consider that fittings account for an additional 15% of the total length of pipe.

Use the above formula to determine the diameter with an optimised fluid speed of **7m/s:**

$$Ø\ int. = 1.84 \sqrt[5.16]{\frac{Ø^2\ L1}{\Delta p1\ P}}$$

Aubery equation

Ø int. = inside diameter (mm)
Q = flow (m^3/h)
L1 = length (m)
Δp1 = pressure loss of the pipework section (bar)
P = pressure of the network (bar)

L1 = Length of pipe + sum of length of the equivalent fittings
Note: for a 300 m length circuit if we impose a 0.3 bar Δp
for a 70 m length section: $\Delta p = \frac{0.3 \times 70}{300} = 0.07$ bar

Reminder: GIRAIR® (mm) pipe dimensions

Ø Ext.	16	20	25	32	40	50	63	75	90	110
Ø Int. Maxi	12.4	15.4	19.4	26.2	32.6	40.8	51.4	61.4	73.6	90

THE FOLLOWING TABLES GIVE AN EVALUATION OF THE PIPE OUTSIDE DIAMETER REQUIRED ACCORDING TO THE PRESSURE LOSSES AND THE FLOW RATE, WITH A FLUID SPEED ABOUT 7M/S

Pressure = 7 bar

Δp ≤ 0.1

Q Flow m^3/h	L1 = Length (m) pipes length + equal length due to the fittings							
	10	25	50	75	100	125	150	200
25	16	20	20	25	25	25	25	25
50	20	25	25	32	32	32	32	32
75	25	32	32	32	32	40	40	40
100	25	32	32	40	40	40	40	40
200	32	40	40	50	50	50	50	50
300	40	50	50	50	63	63	63	63
400	40	50	63	63	63	63	75	75
500	50	50	63	63	75	75	75	75
600	50	63	63	75	75	75	90	90
700	50	63	75	75	75	90	90	90
800	50	63	75	75	90	90	90	90
900	63	63	75	90	90	90	90	110
1000	63	75	75	90	90	90	110	110
1500	75	90	90	110	110	110	110	110
2000	75	90	110	110	-	-	-	-

Δp ≤ 0.3

Q Flow m^3/h	L1 = Length (m) pipes length + equal length due to the fittings					
	300	400	500	600	800	1000
25	25	25	25	25	32	32
50	32	32	32	32	32	40
75	40	40	40	40	40	40
100	40	40	40	40	50	50
200	50	50	50	63	63	63
300	63	63	63	63	75	75
400	75	75	75	75	75	90
500	75	75	75	75	90	90
600	75	75	90	90	90	90
700	90	90	90	90	90	110
800	90	90	90	90	110	110
900	90	90	90	110	110	110
1000	90	90	110	110	110	110
1500	110	110	110	-	-	-
2000	-	-	-	-	-	-

Pressure = 12.5 bar

Δp ≤ 0.1

Q Flow m^3/h	L1 = Length (m) pipes length + equal length due to the fittings							
	10	25	50	75	100	125	150	200
25	16	16	20	20	20	25	25	25
50	20	20	25	25	32	32	32	32
75	25	25	32	32	32	32	32	32
100	25	32	32	32	32	32	40	40
200	32	32	40	40	50	50	50	50
300	32	40	50	50	50	50	63	63
400	40	50	50	50	63	63	63	63
500	40	50	63	63	63	63	75	75
600	40	50	63	63	63	75	75	75
700	50	63	63	63	75	75	75	75
800	50	63	63	75	75	75	90	90
900	50	63	75	75	75	90	90	90
1000	50	63	75	75	90	90	90	90
1500	63	75	90	90	90	110	110	110
2000	75	90	90	110	110	110	110	-

Δp ≤ 0.3

Q Flow m^3/h	L1 = Length (m) pipes length + equal length due to the fittings					
	300	400	500	600	800	1000
25	25	25	25	25	25	25
50	32	32	32	32	32	32
75	32	32	32	32	40	40
100	40	40	40	40	40	40
200	50	50	50	50	50	63
300	50	50	63	63	63	63
400	63	63	63	63	75	75
500	63	63	75	75	75	75
600	75	75	75	75	90	90
700	75	75	75	90	90	90
800	75	75	90	90	90	90
900	75	90	90	90	90	110
1000	90	90	90	90	110	110
1500	110	110	110	110	110	-
2000	110	110	110	-	-	-

PIPES AND FITTINGS

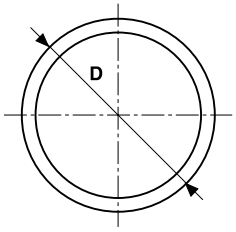
FOR COMPRESSED AIR

aliaxis

CAUTION:

- All the sizes indicated in the dimension sheets are in millimetres, when not specified.
- All the threaded fittings are BSP:
  - On GIRAIR®, male threads are conical (taper) and female threads are cylindrical (parallel).
  - On brass, all threads are cylindrical (parallel).

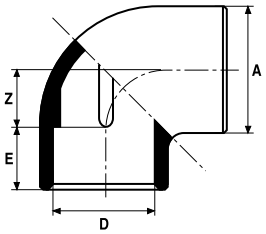
DIMENSION



GIRAIR® PIPES

Chamfered at both ends, in 4 lengths. Wrapped in plastic sleeves

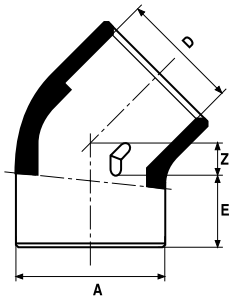
D mm	DN mm	Max. Pressure at 25°C	Min. Wall Thickness mm	Weight kg/m	Internal Ø mm	Capacity l/m	Reference
16	10	12.5	1.8	0.106	12.4	0.120	TUBGA16
20	15	12.5	2.3	0.168	15.4	0.186	TUBGA20
25	20	12.5	2.8	0.257	19.4	0.295	TUBGA25
32	25	12.5	2.9	0.340	26.2	0.538	TUBGA32
40	32	12.5	3.7	0.542	32.6	0.834	TUBGA40
50	40	12.5	4.6	0.842	40.8	1307	TUBGA50
63	50	12.5	5.8	1334	51.4	2074	TUBGA63
75	65	12.5	6.8	2090	61.4	2960	TUBGA75
90	80	12.5	8.2	3030	73.6	4250	TUBGA90
110	100	12.5	10	4480	90.0	6360	TUBGA110



ELBOWS 90°

Soc. x Soc.

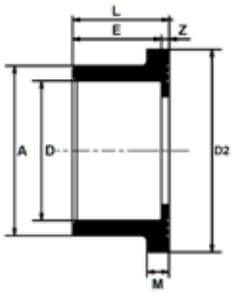
D mm	DN mm	Z mm	E mm	A mm	Reference
16	10	10	9	21	GA4M16
20	15	11	17	28.5	GA4M20
25	20	14	19.9	35.8	GA4M25
32	25	17	23	44	GA4M32
40	32	23	27	49	GA4M40
50	40	27	31.5	58	GA4M50
63	50	33	38	73	GA4M63
75	65	39	44	92.5	GA4M75
90	80	49	52.5	112	GA4M90
110	100	58	62	131.5	GA4M110



ELBOWS 45°

Soc. x Soc.

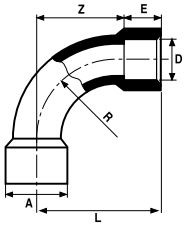
D mm	DN mm	Z mm	E mm	A mm	Reference
16	10	4.5	14.5	21	GA8M16
20	15	4.5	17	25.5	GA8M20
25	20	5.5	19.5	31.5	GA8M25
32	25	8	23	39.5	GA8M32
40	32	9.5	27	49	GA8M40
50	40	11	31.5	63.2	GA8M50
63	50	14	38	72.5	GA8M63
75	65	18	44	92	GA8M75
90	80	22	52	109	GA8M90
110	100	24	62	131.5	GA8M110



SERRATED STUB FLANGES

Soc.

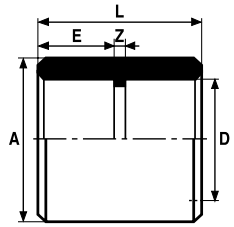
D mm	DN mm	Z mm	E mm	A mm	D2 mm	M mm	L mm	Reference
50	40	3	32	61	73	8	35	GACS50
63	50	3	38.5	76	90	9	41.5	GACS63
75	63	3	44	90	106	10	47	GACS75
90	80	5	52	108	125	11	57	GACS90
110	100	5	62	131	150	12	67	GACS110



BENDS 90°

Soc. x Soc.

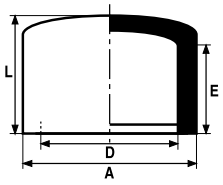
D mm	DN mm	Z mm	E mm	A mm	L mm	Reference
50	40	99	31	64	131	GA4C50
110	100	225	60	136	285	GA4C110



COUPLINGS

Soc. x Soc.

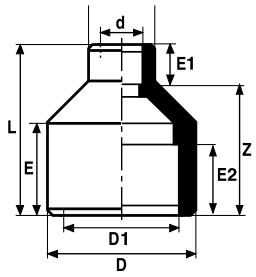
D mm	DN mm	Z mm	E mm	A mm	L mm	Reference
16	10	3	15	33	22	GAMA16
20	15	3	17	26	37	GAMA20
25	20	2.5	20	31.5	42.5	GAMA25
32	25	3.5	23	38	49.5	GAMA32
40	32	4	26.5	48	57	GAMA40
50	40	3	32	59.5	67	GAMA50
63	50	4	38	75.5	80.0	GAMA63
75	65	4	45	91	94	GAMA75
90	80	5	52	106.5	109	GAMA90
110	100	6	62	126.5	130	GAMA110



CAPS

Soc.

D mm	DN mm	E mm	A mm	L mm	Reference
16	10	14	24	20	GABO16
20	15	17.5	26	22	GABO20
25	20	19.5	31.5	25.5	GABO25
32	25	24	39.5	30	GABO32
40	32	28	48	36.5	GABO40
50	40	33	59.5	43	GABO50
63	50	40.5	75	52.5	GABO63
75	65	52	91	77	GABO75
110	100	66	129	109.5	GABO110

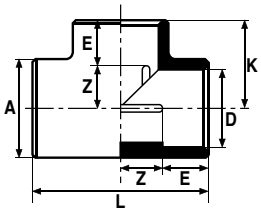


REDUCING BUSHES LONG PATTERN

Spig. (Ø) x Soc. (øR)

D-d mm	DN mm	D1 mm	Z mm	E mm	E1 mm	E2 mm	L mm	Reference
25-16	20-10	(*) 16.5	25.5	19	14.5	14	40	GARD2516
32-20	25-15	25	31	22.5	17	19.5	48	GARD3220
40-25	32-20	32	36.5	27	19.5	21.5	56	GARD4025
50-32	40-25	40	45	32	23	27.5	68	GARD5032
63-32	50-25	50	55.5	38.5	23	32	78.5	GARD6332
63-40	50-32	50	55.5	38.5	27	32	82.5	GARD6340
75-32	65-25	(*) 61	62	45	22.5	38	85	GARD7532
90-50	80-40	75	74.5	53	32	44	106.5	GARD9050
90-63	80-50	75	75	53	38.5	44.5	113.5	GARD9063
110-50	100-40	90	90.5	62	32	52.5	122.5	GARD1150
110-63	100-50	90	92	63.5	38	54	130	GARD1163

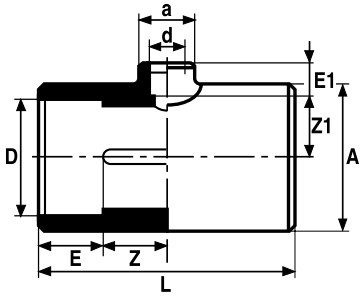
(*) - NB: GARD 32 to 110 are Male on the reference Ø (D) or Female with a difference Ø and Female on the reduced Ø (d), except GARD 7532



EQUAL TEES 90°

Soc. x Soc.

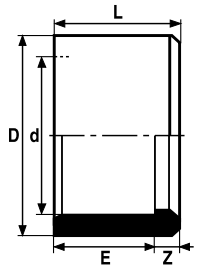
D mm	DN mm	Z mm	E mm	A mm	L mm	K mm	Reference
16	10	9	14	21	48	24	GATE16
20	15	11	17	26	56	28	GATE20
25	20	14	19	31.5	66.5	34	GATE25
32	25	17	22.9	45	81	40.1	GATE32
40	32	22	27	49.5	97.5	50	GATE40
50	40	26.5	31	61	115	58	GATE50
63	50	32.5	38.5	78	142	72	GATE63
75	65	39	44.5	91.5	166.5	83	GATE75
90	80	45	53	112	196.5	98	GATE90
110	100	55.5	62.5	132	236	119	GATE110



REDUCING TEES 90°

Soc. x Soc.

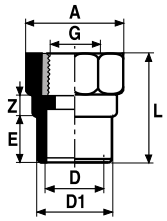
D-d mm	DN mm	Z mm	Z1 mm	E mm	E1 mm	A mm	a mm	L mm	Reference
20-16	15-10	11	11	17	15	26	21	56	GATR2016
25-16	20-10	14	14	18.5	14	31	21	66	GATR2516
25-20	20-15	13.5	13	19.5	16	31	26	66	GATR2520
32-16	25-15	17	18	23	14	44.5	24	82.5	GATR3216
32-20	25-15	17.5	18.5	23.5	16.5	39	26.5	82	GATR3220
32-25	25-20	18	20	23	19	39	31.5	82	GATR3225
40-20	32-15	22	23	27	17	49.5	26.5	97.5	GATR4020
40-25	32-20	22	23	27	19.5	49.5	31.5	97.5	GATR4025
40-32	32-25	22	22	27	23	49.5	39.5	97.5	GATR4032
50-25	40-20	26.5	28	31	20	60.5	33	114.5	GATR5025
50-32	40-25	26.5	28	31	23	61	41	115	GATR5032
63-25	50-20	33.5	35	38.5	20	80	37	144	GATR6325
63-32	50-25	33.5	35	38.5	23.5	80	45	144	GATR6332
63-40	50-32	33.5	36	38.5	27.5	80	54.5	144	GATR6340
75-25	65-20	39	40	44.5	19.5	92.5	37	167	GATR7525
75-32	65-25	38.5	38.5	44.5	23	92.5	45	166.5	GATR7532
90-25	80-20	46	46.5	52.5	19.5	114.5	37.5	197	GATR9025



REDUCING BUSHES SHORT PATTERN

Spig. (Ø) x Soc. (øR)

D-d mm	DN mm	Z mm	E mm	L mm	Reference
20-16	15	2.5	15.0	17.5	GARS20
25-20	20	3.5	17.0	20.5	GARS25
32-25	25	5	19.5	24.5	GARS32
40-32	32	6	23	29	GARS40
50-40	40	5	27	32	GARS50
63-50	50	7	31.5	38.5	GARS63
75-63	65	7.5	37	44.5	GARS75
90-75	80	8	44	52	GARS90
110-90	100	10.5	52	62.5	GARS110

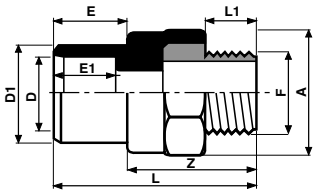


THREADED ADAPTORS

Soc. / Spig. x female brass thread

D-G mm-in	DN mm	Z mm	E mm	L mm	D1 mm	A mm	Reference
16-3/8"	10	5.5	14	32	20	23	GAMML16
20-1/2"	15	5.5	16	38.5	25	27.5	GAMML20
25-3/4"	20	5.5	19	43	32	34	GAMML25
32-1"	25	5	22	48	40	41	GAMML32
40-1 1/4"	32	7	27.5	58.5	50	55	GAMML40
50-1 1/2"	40	8.5	31	63.5	63	65	GAMML50
63-2"	50	10.5	40	78.5	75	76	GAMML63

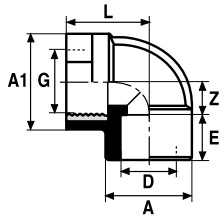
Assembling: see page 11



ADAPTOR NIPPLES

Soc. / Spig. x male brass thread

D-F mm-in	D1 mm	Z mm	E mm	E1 mm	A mm	L mm	L1 mm	Reference
16-3/8"	20	32.5	17	15	32.2	49.5	11	GAEAL16
20-1/2"	25	41	19	17	36	60	15	GAEAL20
25-3/4"	32	43	22.5	19.5	41	65	16	GAEAL25
32-1"	40	49	27	23	49.5	76	19.5	GAEAL32
40-1 1/4"	50	55	31	26	60	87	22	GAEAL40
50-1 1/4"	63	55	37.5	31	66	92	22	GAEAL50
63-2"	75	63	43.5	37.5	82	106	26	GAEAL63



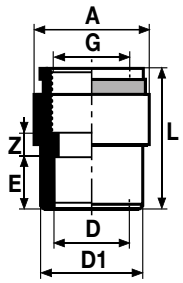
THREADED ELBOWS 90°

Soc. x Female brass thread

D-G mm-in	DN mm	Z mm	E mm	A mm	A1 mm	L mm	Reference
20-1/2"	15	16	16.5	29	36	32	GA4GL20

Especially adapted for connection with metal threaded fittings and high torque.

Assembling: see page 11

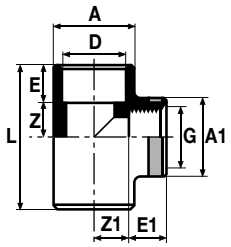


F-G THREADED SLEEVES TO SCREW (with brass insert)

With metal reinforcement ring - cylindrical thread

D-G mm-in	DN mm	Z mm	E mm	L mm	D1 mm	A mm	Reference
16-3/8"	10	5.5	14	32	20	23	GAMM16
20-1/2"	15	5.5	16	38.5	25	27,5	GAMM20
25-3/4"	20	5.5	19	43	32	34	GAMM25
32-1"	25	5	22	48	40	41	GAMM32
40-1 1/4"	32	7	27.5	58.5	50	55	GAMM40
50-1 1/2"	40	8.5	31	63.5	63	65	GAMM50
63-2"	50	10.5	40	78.5	75	76	GAMM63

Assembling: see page 11

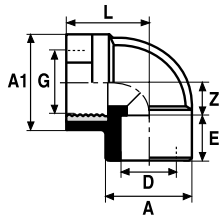


REDUCING TEES 90° (with metal reinforcing ring)

Soc. x Female thread branch

D-G mm-in	DN mm	Z mm	E mm	L mm	A mm	Z1 mm	E1 mm	A1 mm	Reference
20-1/2"	15	14	17	61.5	30.5	14.5	17	30	GATG2012
25-3/4"	20	13	20	66.5	35	15.5	20	40	GATG2534

Assembling: see page 11

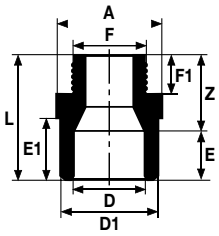


THREADED ELBOWS 90° (with metal reinforcing ring)

Soc. x Female thread

D mm	G in	DN mm	Z mm	E mm	A mm	A1 mm	L mm	Reference
20	1/2"	15	10	17	29	27	27	GA4G20
25	1/4"	20	14	19.5	36	34	33	GA4G25

Assembling: see page 11

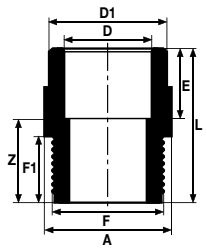


ADAPTOR NIPPLES

Soc. x Male thread

D mm	F in	D1 mm	Z mm	E mm	A mm	L mm	F1 mm	E1 mm	Reference
16	3/8"	20	24.5	15	25	39.5	12	17	GAEA16
20	1/2"	25	29	17	30	46	15	19	GAEA20
25	3/4"	32	33.5	19.5	36.5	53	17	23	GAEA25
32	1"	40	43.5	22.5	47	66	20	27	GAEA32
40	1 1/4"	50	45	26.5	55	71.5	21.5	32	GAEA40
50	1 1/2"	63	46	31.5	68	77.5	23	38.5	GAEA50
63	2"	75	49	38.5	78.5	87.5	27.5	44	GAEA63
75	2 1/2"	90	49.5	45	94	94.5	30.5	51.8	GAEA75

Assembling: see page 11



REDUCING ADAPTOR NIPPLES

Soc. x Male thread

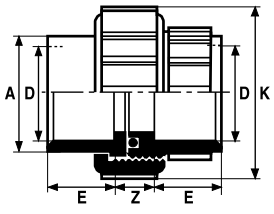
D mm	F in	D1 mm	Z mm	E mm	A mm	L mm	F1 mm	Reference
16	1/2"	20	27.5	15	24.5	42.5	15	GAEB16
20	3/4"	25	31.5	17	30	48.5	17	GAEB20
25	1"	32	35	21	36.5	56	19.5	GAEB25
32	1 1/4"	40	40	23	47	63	21.5	GAEB32
40	1 1/2"	50	42.5	27	48	69.5	22.5	GAEB40
50	2"	63	49.5	32.5	60	82	27	GAEB50

Soc. x Metal Male thread

D mm	F in	D1 mm	Z mm	E mm	A mm	L mm	F1 mm	Reference
16	3/8"	20	24.5	15	25	39.5	12	GAEBL16
20	1/2"	25	29	17	30	46	15	GAEBL20
25	3/4"	32	33.5	19.5	36.5	53	17	GAEBL25

The solvent welded ends of GAEA and GAEB adaptors are female (socket) only.
The male threaded ends of GAEA and GAEB adaptors can be assembled with GIRAIR® or metal threaded fittings (brass, iron, steel, stainless).
- Exclusively use PTFE tape or a sealing paste that is compatible with GIRAIR® (consult us).
- The male threaded ends of GAEA and GAEB adaptors are tapered (conical).

Assembling: see page 11

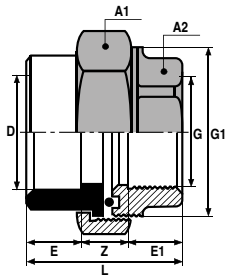


3 PIECE UNIONS (with EPDM gasket)

Soc. x Soc.

D mm	DN mm	Z mm	E mm	A mm	K mm	Reference
16	10	14	15	22	34.5	GA3P16
20	15	14	17	27	42	GA3P20
25	20	14	19	35.5	55	GA3P25
32	25	13.5	23	41.5	62.5	GA3P32
40	32	17	26,5	52.5	73.5	GA3P40
50	40	17.5	32.5	58.5	81.5	GA3P50
63	50	22	38.5	74	100.5	GA3P63

Assembling: see page 11

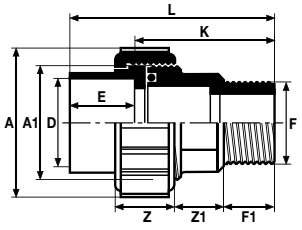


3 PIECE UNIONS GIRAIR® /BRASS (with EPDM gasket)

Soc. x Female brass thread

D mm	G in	DN mm	Z mm	E mm	E1 mm	G1 mm	A1 mm	A2 mm	L mm	Reference
16	3/8"	10	10	14	13	3/4"	30	27	37	GA3G/L16
20	1/2"	15	8	17	14	1"	36	27	39	GA3G/L20
25	3/4"	20	8	19.5	16	1 1/4"	46	32.5	43.5	GA3G/L25
32	1"	25	10.5	23	16.5	1 1/2"	51.5	38.5	50	GA3G/L32
40	1 1/4"	32	10	27.5	21	2"	67	47	58.5	GA3G/L40
50	1 1/2"	40	12	32.5	18.5	2 1/4"	72	53.5	63	GA3G/L50
63	2"	50	11	38.5	22	2 3/4"	89	65.5	71.5	GA3G/L63

Assembling: see page 11



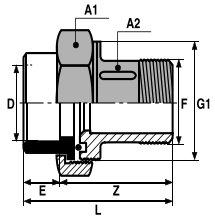
3 PIECE UNIONS (with EPDM gasket)

Soc. x Male thread

D mm	F in	Z mm	Z1 mm	F1 mm	L mm	A mm	A1 in	K mm	E mm	Reference
16	3/8"	19	11.5	11.5	52	36	3/4"	36.5	15.5	GA3F/P16
20	1/2"	23	11	16.5	61	42	1"	40	17	GA3F/P20
25	3/4"	25	17	18	72	55	1 1/4"	49	19	GA3F/P25
32	1"	26	17.5	20.5	80.5	62.5	1 1/2"	53.5	23	GA3F/P32
40	1 1/4"	30.5	17	23	88	73	2"	57.5	27	GA3F/P40
50	1 1/2"	34	21	27	109	81.5	2 1/4"	62	32	GA3F/P50
63	2"	38	22	31.5	125	99	2 3/4"	68	38	GA3F/P63

GA3F/P unions can be assembled with GIRAIR® or metal threaded fittings.
Use PTFE tape or a sealing paste that is compatible with GIRAIR® (please consult Aliaxis UK). Any other sealant is prohibited.
The male thread is tapered (conical).

Assembling: see page 11

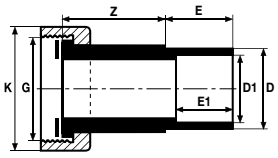


3 PIECE UNIONS GIRAIR® /BRASS (with EPDM gasket)

Soc. x Female brass thread

D mm	F in	DN mm	Z mm	E mm	A1 mm	G1 in	A2 mm	L mm	Reference
16	3/8"	10	35	14	30	3/4"	17	49	GA3F/L16
20	1/2"	15	34	17	36	1"	24.5	51	GA3F/L20
25	3/4"	20	50	19	46	1 1/4"	31.5	69	GA3F/L25
32	1"	25	54	23	52	1 1/2"	37.5	77	GA3F/L32
40	1 1/4"	32	53	27	67	2"	47	83	GA3F/L40
50	1 1/2"	40	63.5	32.5	72	2 1/4"	53	96	GA3F/L50
63	2"	50	70	38.5	89.5	2 3/4"	66	108.5	GA3F/L63

Assembling: see page 11

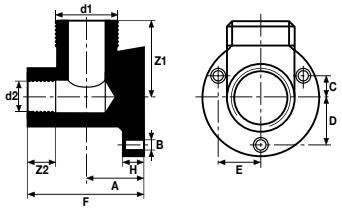


CONNECTORS
(with brass nuts for use with EPDM flat gasket)

Spig. x Female brass thread

D-G mm-in	DN mm	Z mm	E mm	D1 mm	E1 mm	Reference
16-1/2"	10	20	15	12	14	GAUR16
20-3/4"	15	22	17	16	15	GAUR20
25-1"	20	23	20	20	17	GAUR25
32-1 1/4"	25	26	23	25	19.5	GAUR32
40-1 1/2"	32	29	27	32	23	GAUR40

Assembling: see page 11



WALL PLATE ELBOW
(for jointing on pipe with GAUR brass connector)

Inlet male thread f - outlet female thread G

Pipe mm	DN mm	d1 in	d in	A mm	B mm	Z1 mm	Z2 mm	C mm	D mm	E mm	F mm	H mm	Reference
16	10	1/2"	3/8"	17	5	36	7.5	6	18	17	35.5	5.5	GAAP16
20	15	3/4"	1/2"	18.5	5	38	10	6	20	19	42.5	6	GAAP20
25	20	1"	3/4"	24.5	5	39.5	12	8	26	24	52.5	6	GAAP25

Assembling: see page 11

ACCESSORIES

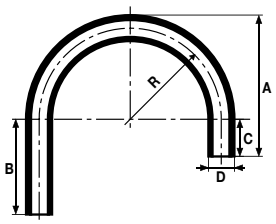
Male threaded instant fitting - profile: ISO C - inside Ø 6 mm

D-G in	Ø int. mm	Cond.	Reference
3/8''	6	1	GHRR38
1/2''	6	1	GHRR12

QUICK ADAPTOR

ISO C quick nipples for Ø 8 mm flexible pipes - inside Ø 6 mm

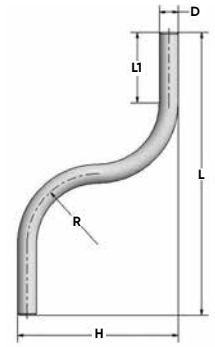
D-G mm	Ø int. mm	Cond.	Reference
8	6	1	GHES8



DROP BENDS 180°

Spig. x Spig. (profile P)

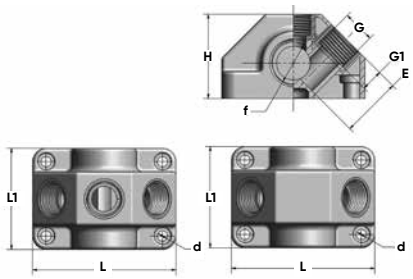
D mm	DN mm	R mm	A mm	B mm	C mm	Reference
16	10	64	89	90	17	GA2C16
20	15	70	100	90	20	GA2C20
25	20	75	110.5	90	23	GA2C25
32	25	95	138	140	27	GA2C32



DROP BENDS 180°

Spig. x Spig. (profile S)

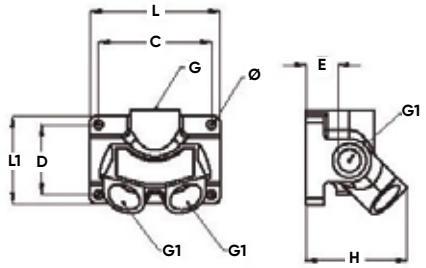
D mm	DN mm	R mm	H mm	L mm	L1 mm	Reference
20	15	75	170	300	75	Q2S20



WALL PLATES

with 2 or 3 outlets

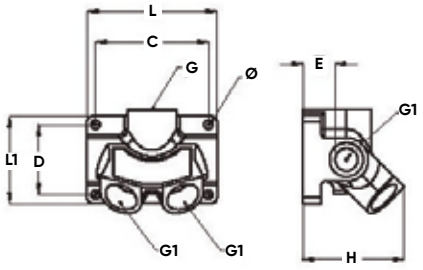
G-f in	DN mm	d mm	E mm	G1 mm	H mm	L mm	L1 mm	Reference
2 x 1/2"-1/2"	15	6	36	14	50	85	60	GAAP12G2
3 x 1/2"-3/4"	20	6	36	14	50	85	60	GAAP34G3



WALL PLATES

with 4 outlets and drain

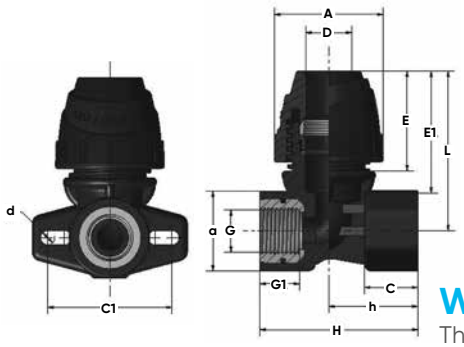
G in	G1 in	E mm	L mm	L1 mm	H mm	D mm	C mm	Ø mm	Reference
G 1/2"	4 x 1/2"	35	105	70	81.5	56	91	7	GAAP12G4P
G 3/4"	4 x 1/2"	35	105	70	81.5	56	91	7	GAAP34G4P



WALL PLATES

with 4 outlets

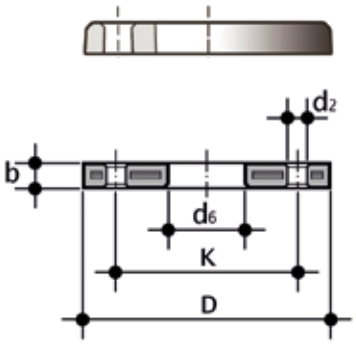
G in	G1 in	E mm	L mm	L1 mm	H mm	D mm	C mm	Ø mm	Reference
G 1/2"	4 x 1/2"	35	105	70	81.5	56	91	7	GAAP12G4
G 3/4"	4 x 1/2"	35	105	70	81.5	56	91	7	GAAP34G4



WALL PLATES ELBOW WITH ONE FEMALE

Threaded outlet and 1 socket inlet

D-G mm-in	DN mm	A-a mm	C mm	C1 mm	d mm	E mm	E1 mm	G1 mm	H-h mm	L mm	Reference.
20-1/2"	15	48-36.2	24	56	6.5	45	55	17	71-40	72	Q4GP20
25-3/4"	20	58-41.1	26	56	6.5	54	60	18	78-42	79	Q4GP25

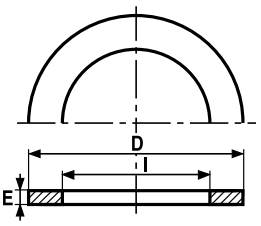


ODT/ODT-SW

Wedge profile backing ring, with metal core and a PP-GR coating
According to EN/ISO/DIN for stub QRNM. Drilling: PN 10/16

d mm	DN mm	*PMA (bar)	b mm	d_2 mm	d_6 mm	D mm	K mm	M	n	**Nm	gms	Reference
20	15	16	13	14.6	28	100	65	M12	4	10	215	ODT020
25	20	16	15	14.6	34	111	75	M12	4	15	308	ODT025
32	25	16	17	14.6	42	120,2	85	M12	4	15	449	ODT032
40	32	16	18	18.6	51	140	100	M16	4	20	682	ODT040
50	40	16	19	18.6	62	150	110	M16	4	25	808	ODT050
63	50	16	19	18.6	78	1654	125	M16	4	35	1100	ODT063
75	65	16	19	18.6	92	186	145	M16	4	35	1200	ODT075
90	80	16	20	18.6	109	200,8	160	M16	8	35	1430	ODT090
110	100	16	20	18.6	128	221	180	M16	8	35	1498	SWODT110DN100

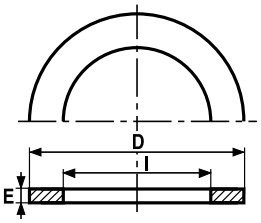
* PMA: maximum allowable pressure
**maximum recommended tightening torque
n = number of bolt



EPDM FLAT GASKETS

For GAUR

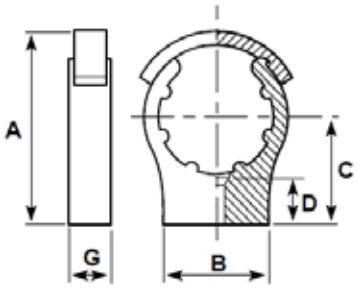
D mm	I mm	E mm	Reference
19	16	2	JPNUR16
24	20	2	JPNUR20
30	25	3	JPNUR25
38	32	3	JPNUR32
44	40	3	JPNUR40



EPDM FLAT GASKETS

For GACS

D mm	I mm	E mm	Reference
71	50	3	JPNCS50
88	63	3	JPNCS63
104	75	3	JPNCS75
123	90	3	JPNCS90
148	110	4	JPNCS110



Cobra pipe clips

with M6, 7x150, M8 metal threaded insert, or Ø5.5 drilled base

Size mm	A mm	B mm	C mm	D mm	G mm	Bolt/Screw	gms	Reference
*12	-	24	25	15	16	M4/3BA/No 8	5	13 434 304
*16	-	35	25	17	16	M4/3BA/No 8	7	13 434 305
*20	-	35	30	14	16	M5/1BA/No 10	8	13 434 306
*25	-	35	35	16	17	M5/1BA/No 10	11	13 434 307
32	65	45	40	17	17	M5/1BA/No 10	14	13 434 308
40	75	45	45	20	20	M5/1BA/No 10	21	13 434 309
50	85	50	50	22	21	M6/0BA/No 10	30	13 434 310
63	102	60	60	19	21	"M6/0BA/No 10	42	13 434 311
75	122	70	70	27	31	M8	94	13 434 312
90	148	80	90	39	31	M8	121	13 434 313
110	171	90	96	36	35	M8	184	13 434 314
125	204	144	132	40	40	M8	237	13 434 315
140	211	156	132	40	40	M8	252	13 434 316
160	243	170	150	40	40	M8	330	13 434 317

* Without retaining clips. Bolts/screws not supplied.

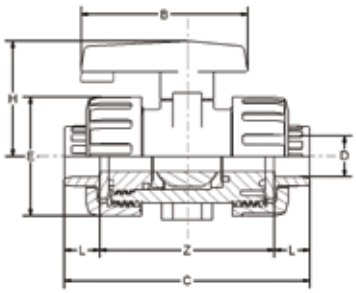
WELDING POLYMER AND CLEANER

Type	Content	Reference
3FIX (Solvent Cement)	1 litre (Jar)	GRERFIXB
CLEANER+ (Cleaner)	1 litre (Jar)	GD171P

VALVES

FOR COMPRESSED AIR

aliaxis



Ø16 to Ø63

DOUBLE UNION BALL VALVES (Ø16 ÷ Ø63)

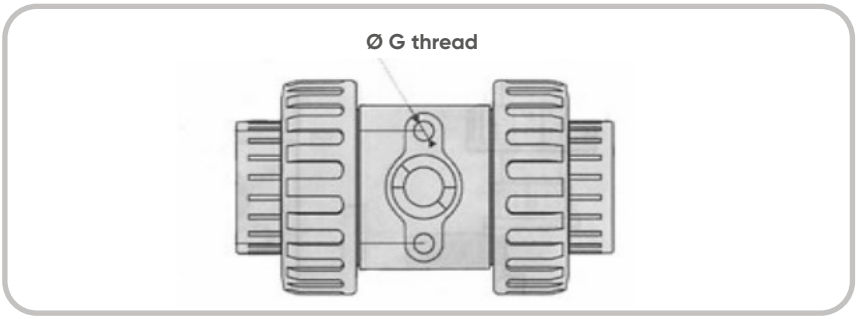
CEMENTED SOCKET ENDS

d mm	DN mm	L mm	Z mm	C mm	E mm	H mm	B mm	g	Ø mm	Reference
16	10	14	67	97	47	45	66	160	5.5	GA2MBE16
20	15	16	68	102	47	45	66	160	5.5	GA2MBE20
25	20	19	82	120	57	55	78	260	5.5	GA2MBE25
32	25	22	87	131	68	67	86	380	6.5	GA2MBE32
40	32	26	98	150	86	83	100	655	8	GA2MBE40
50	40	31	101	163	98	91	110	925	8	GA2MBE50
63	50	38	121	197	122	111	130	1695	8	GA2MBE63

FIELD OF APPLICATION:

- The same as that of GIRAIR® fittings.
- Max. working temperature: 40°C.
- The nominal pressure (PN) in normal use, i.e. for compressed air at 20°C maximum, is:
  - 12.5 bar for ø 16 to 63 mm.

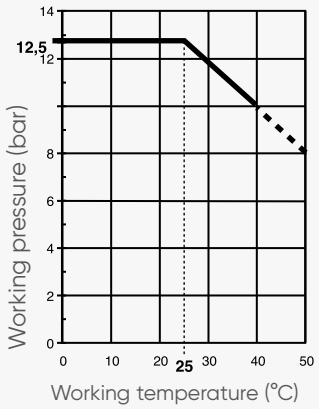
Ball valve Ø	G Thread
16	M4
20	M4
25	M4
32	M5
40	M6
50	M6
63	M6



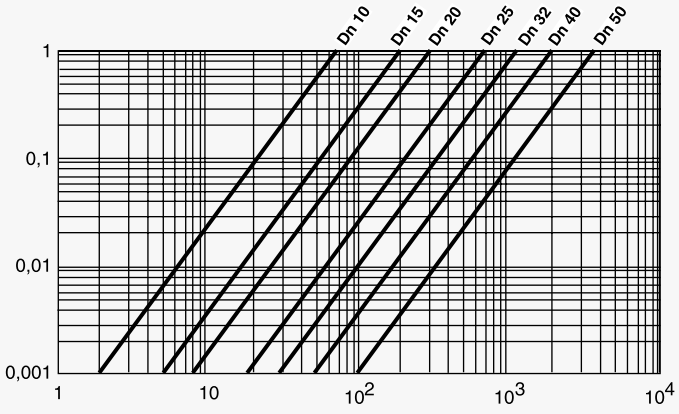
- These ball valves have a built-in anchoring system.
- There are two holes underneath fitted with threaded brass inserts (use screw in accordance with data below).
- These valves are solvent cemented to pipes, and can be dismantled thanks to their double union concept.
- Observe the flow direction.

Ø16 to Ø63

WORKING PRESSURE/ TEMPERATURE



PRESSURE LOSSES ACCORDING TO FLOW RATES

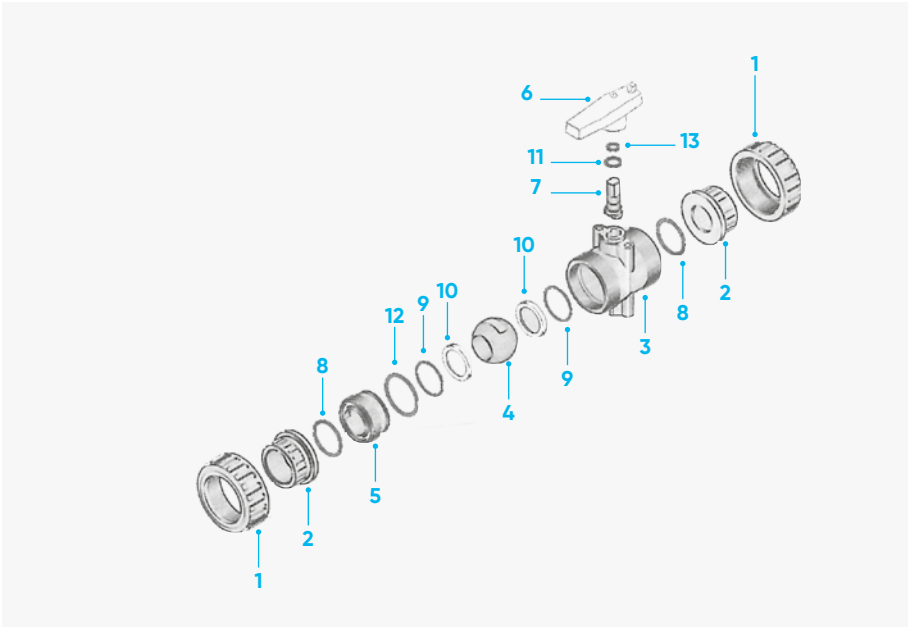


FLOW COEFFICIENT AT FULL OPENING

OPERATION TORQUE (PRESSURE 12.5 BAR)							
Ø	16	20	25	32	40	50	63
Torque Nm	2,0	3,0	3,0	5,0	6,0	9,0	9,0

COMPONENTS EXPLODED VIEW

1	Backing nut
2	Cemented stub socket
3	Body
4	Ball
5	Ball seat support
6	Handle
7	Spindle
8	Socket o-ring
9	Seat gasket
10	Ball seat
11	Spindle o-ring
12	Ball seat support o-ring
13	Spindle o-ring

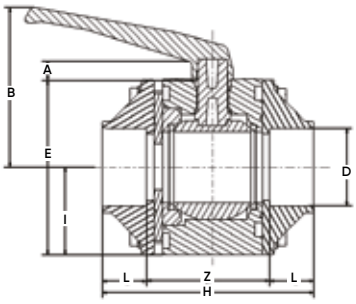


ASSEMBLY:

- Remove backing nuts (1) and slide them onto the pipes.
- Glue the sockets (2) on GIRAIR® pipes.
- Place valve body (3) between sockets with “ADJUST” end upstream if the flow direction needs to be respected.
- Use threaded inserts supplied with the valves for supporting.
- Tighten and block the nut (1) on the opposite side to the one marked “ADJUST”, then progressively tighten the nut (1) on the “ADJUST” side until complete airtightness is obtained.

DISMANTLING:

- Close valve.
- Unscrew nuts completely (1).
- Remove handle (6) by pulling it off.
- Insert the handles’ notches into the ball support (5) and unscrew by rotating handle anticlockwise.
- Remove ball (4).
- Depress stem (7) and extract from the inside of the valve body (3).
- Remove PTFE ball seats from ball supports (5) and body (3).
- Replace o-rings if needed.
- Re-assemble by repeating the above steps in reverse sequence.



Ø75 to Ø110

FLANGED BALL VALVES (Ø75 ÷ Ø110)

CEMENTED SOCKET ENDS

d mm	L mm	Z mm	H mm	E mm	B mm	C mm	A mm	I mm	Weight (Kg)	Reference
75	43	148	234	211	177	210	25	105	7	GA2MFE75
90	52	148	252	211	177	210	25	105	7	GA2MFE90
110	63	174	300	252	220	255	30	121	11	GA2MFE110

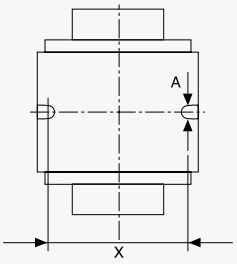
The weight of the ball valve and its correct use require its anchoring on a convenient support.

There are two holes underneath the valve body which allow to hang it with bolts on the correct support.
The table above gives the width of the holes and their spacing.

- Valves in Ø 75 to 110 are carefully assembled in our workshops. It is strongly recommended NOT to dismantle the counterplates which ensure good valve operation. The flanged sockets may be dismantled.
- Observe the flow direction.

ANCHORING SYSTEM

Ball valve Ø	A	X (mm)
75	11	110
90	11	110
110	11	135

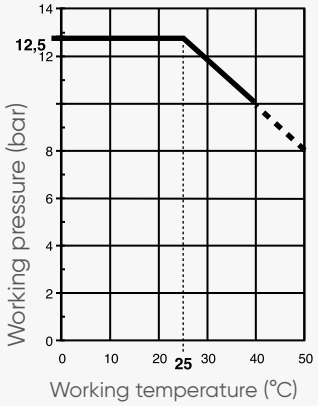


FIELD OF APPLICATION:

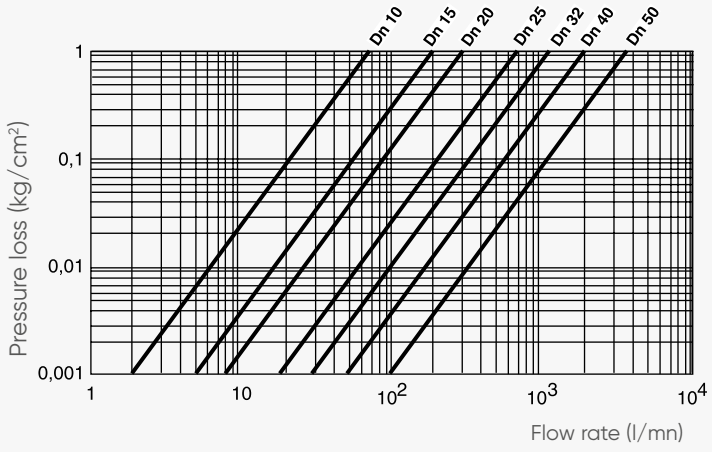
- The same as that of GIRAIR® fittings.
- Max. working temperature: 40°.C
- The nominal pressure (PN) in normal use, i.e. for compressed air at 20°C maximum, is:
  - 12.5 bar for Ø 75 to 110 mm.

Ø75 to Ø110

WORKING PRESSURE/ TEMPERATURE



PRESSURE LOSSES ACCORDING TO FLOW RATES



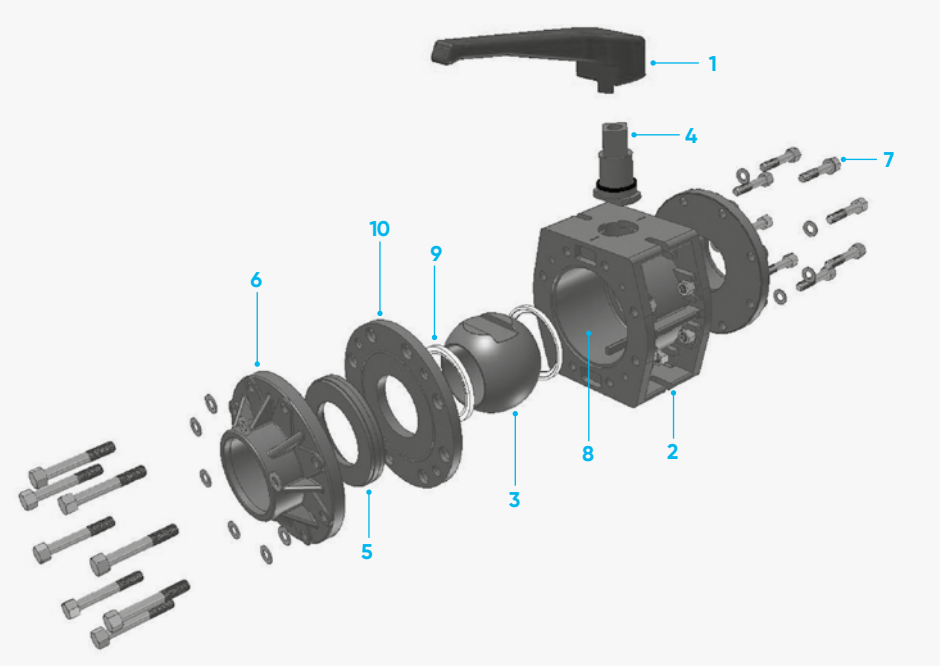
FLOW COEFFICIENT AT FULL OPENING

d-G	75-2 1/2"	90-3"	110-4"
Dn-G	65	80	100
KV	5000	7000	12000

OPERATION TORQUE (PRESSURE 12.5 BAR)			
Ø	75	90	110
Torque Nm	65.0	65.0	110.0

COMPONENTS EXPLODED VIEW

1	Handle
2	Body
3	Ball
4	Spindle
5	Support
6	Flanged socket
7	Bolt
8	Ball seat
9	O ring
10	Counterplate



ASSEMBLY:

N.B.: there is an arrow on the valve's body showing the direction of flow (the arrow's head is located close to the fixed ball seat support).

- Insert o-ring (9) and PTFE ball seat (8) into their own seats inside the body.
- Insert spindle (4) through body, equipped with one o-ring in groove, two PTFE bearings and one o-ring at bottom.
- The spindle's pivot being located in alignment of the valve, place the ball (3).
- Fit the moving ball seat support (5) with the O-ring (9) and the PTFE ball seat (8).
- Place the equipped moving ball seat support inside the body (2).
- Place the flange socket's o-ring into the groove located between the body and the moving ball seat support.
- Screw flange socket with 8 stainless steel bolts (each bolt contains a hexagonal head screw + washer + nut). Attention: there is a mark on the body of the valve and an other one on the flange end to know the right position of assembly.
- Assemble the handle (1), taking care to put it correctly with regard to the ball (on spindle's top, a furrow shows the direction of the pipe).

DISMANTLING:

N.B.: there is an arrow on the valve's body showing the direction of flow (the moving ball seat support is located upstream of the arrow).

- Put the handle (1) in closed position.
- Unscrew the screws (7).
- Remove the flange socket (6).
- Extract moving ball seat support by pulling or by pushing it with the ball, using a tool that cannot damage the ball (beware not to lose the flange socket's o-ring).
- Take the ball out (3).
- Take the spindle out (4) after removing the handle (1), by pushing it towards the inside of the body (2).

Chemical Resistance

The table below lists some compressor oils whose formulation was tested at the mentioned dates. The compatibility of those oils with GIRAIR® was established based upon those tests.

It must be noted that the nature of chemical elements, the way they are mixed, the presence of impurities can significantly influence the indications below. Reliable results can only be obtained by carrying out concrete tests. It is the installation owner's responsibility to ensure that the chemical agents composing its formulation have not been changed since the testing year below, by consulting his supplier.

Those tests were carried out on the plastic components of the GIRAIR® system.

For any question concerning compatibility with other components of the GIRAIR® system (brass, gaskets, etc.), contact the oil manufacturers.

The indications below shall in no case engage our responsibility. The chemical agents are classified in alphabetical order.

Aliaxis Chemist **chemist@aliaxis.com**

Never use oils or any fluids containing esters, ethoxyls or amines, as they may be incompatible with GIRAIR®.

Concerning oils or fluids that are not listed in the table above, Aliaxis Technical Support team can be consulted at **technical.support@aliaxis.com** or **01622 852509**, or **chemist@aliaxis.com**

OILS		
BRAND	**REFERENCE**	**TESTING YEAR**
ANDEROL	ANDEROL 3046	1996
	ANDEROL 500	2000
ATLAS COPCO	ROTOINJECTFLUID	2001
CASTROL	AIRCOL PD 68	1989
	CRD30	1989
	HYSPIN AWS 46	1989
	MAGNA 68	1989
ELF	BARELF SM 46	2002
	DACNIS P 100	1990
	ELFOLNA DS 46	2002
	DACNIS VS 46	1990
ESSO	COMPRESSOR OIL RS32	1994
	COMPRESSOR OIL RS68	1994
	TERESSO 46	1988
HAFA	STATEX	1992
INGERSOLL RAND	FOOD GRADE COOLANT	1989
KAESER	SIGMA-FLUID PLUS	2003
	SIGMA-FLUID MOL	2008
KLUBER-SUMMIT	HYSYN FG100	1998
	HYSYN FG46	1998
MATTEI	ROTOROIL 2000	1993
MOBIL	RARUS SHC 924	1989
MOTUL	SAFCO CPS 100	1993
SHELL	COMPTELLA 46	1989
	TONNA T220	1990
TOTAL	AZOLLA ZS 32	1989
	EQUIVIS ZS 46	1989
	PRESLIA 46	1989
	RUBIA H10	1989
	RUBIA H30	1989
	CORTUSA SY150	1989

Description for Specification

PVC PIPE SYSTEM MADE FROM A DUCTILE VINYL BASED COMPOSITE MATERIAL FOR THE CONSTRUCTION OF COMPRESSED AIR DISTRIBUTION NETWORKS.

FIELD OF APPLICATION:

Compressed air distribution networks.

IDENTIFICATION – RANGE:

The system shall consist of:

- Pipes and fittings of one same origin, made from a ductile vinyl based alloy, all of blue colour (incorporated in the mass of its resin).
- Pipes that shall be delivered in plastic bags, in order to ensure a good level of cleanliness until installation.
- A large range of fittings with brass threaded inserts, in order to enable safe connections with metallic threads.
- Drop bends and wall plates allowing for drop pipes and top-down connections to ensure good air quality.
- A dedicated solvent cement that can be used as a welding indicator thanks to its colour (dark blue), in order to simplify the execution of installation works and avoid errors on building sites.
- A dedicated range of supporting brackets enabling expansion and contraction factors to be accounted for, whilst respecting the manufacturer's recommendation.

QUALITY - CERTIFICATIONS:

The system shall come from an ISO 9001, ISO 14001 certified company.
The system shall have a test report proving its Euroclasses fire reaction B-s1,d0 rating according to EN 13501-1 standard.
The product's quality certifications shall be marked on the pipes, as well as the information enabling its production traceability.
The pipe sizes shall range from diameter 16 to 110 mm with a PN 12.5 nominal pressure rating (with a safety coefficient of 2.5 for 50 years).
Those pipes shall be designed to withstand 1 hour pressure tests amounting to 4.2 times that PN rating.

Beyond those tests, fittings shall be submitted to static pressure tests, and to pressure cycling tests of 20/50 bar, at a rate of:

- 5,000 cycles at a 1 hertz frequency for diameters 16 to 90 v2,500 cycles at a 0.42 hertz frequency for diameter 110 according to NF T 54-094 standard.

TECHNICAL SUPPORT:

The manufacturer shall be able to:

- Propose professional training sessions on the building site or on its own premises, to help with the implementation of its product.

IMPORTANT NOTE:

With the constant concern to improve the range and quality of its products within the context of the standards used at present, Aliaxis reserves the right to modify the dimensional characteristics of its pipes and fittings together with the scope of its ranges, without prior notice.

TRANSLATION

This English translation of our GIRAIR® technical documentation has been made in good faith, but the original French version shall prevail under all circumstances.

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V1 08.25