

John Guest®

The Push-In Solution for
Compressed Air Systems



 **John Guest USA Inc.**

May 2005

The John Guest Group has a long established reputation as a world leading manufacturer of push-in fittings, tube and other fluid control products. A reputation built on producing consistently high quality products with an ongoing commitment to value engineering and product development.



Assured Quality



Since 1989

A commitment to quality is at the heart of the John Guest philosophy.

Every aspect of the company's operation is characterized by the pursuit of total quality. Zero defect process controls are built into all design and manufacturing assembly processes to achieve optimum standards of long term product reliability.

John Guest has been an ISO 9001 Registered Company since 1989 and has received awards and approvals for quality manufacture from many leading international companies and approvals organizations.



The easy to use push-in system for Compressed Air

The John Guest range of push-in fittings and pipe provide the ideal connection from compressor receiver to air line service components through to complete ring main and take off points. A compressed air system can be installed quickly and easily, compared with other installation methods, time savings of at least 50% are easily achievable.

No need to prepare threaded pipe or solvent, all the connections can be made with a simple push-in action. The system is then immediately ready for use. Complex systems can be assembled much more rapidly than with traditional methods and because fittings are easy to disconnect, systems can be altered or expanded with much reduced production down time.

The fittings are produced in either a tough engineering plastics material or in brass in sizes 12mm to 28mm. They are intended for use with John Guest nylon pipe but can also be used with copper or aluminum pipe.



1. Cut pipe square



2. Push pipe into fitting



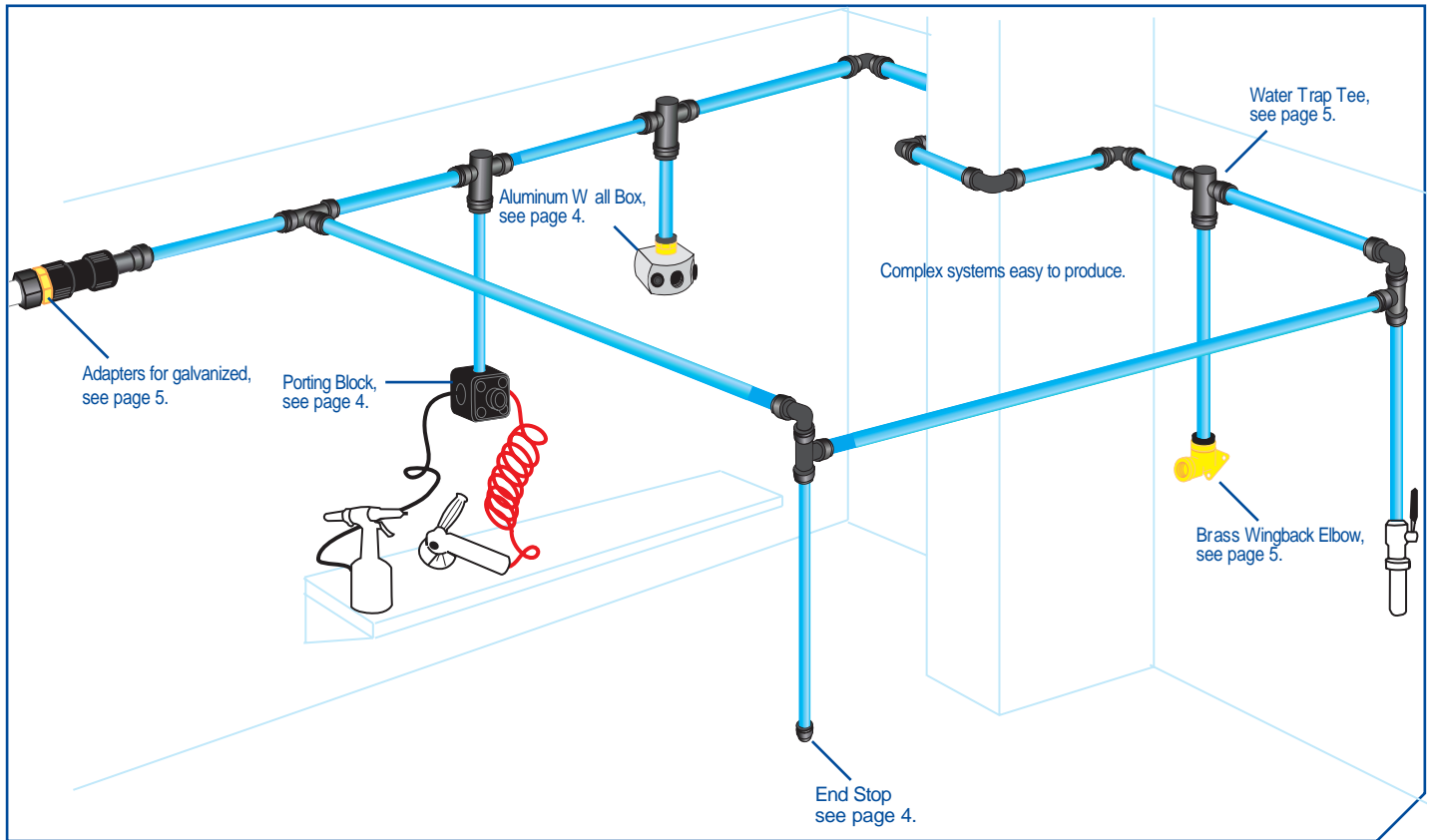
3. Easy to use in confined spaces



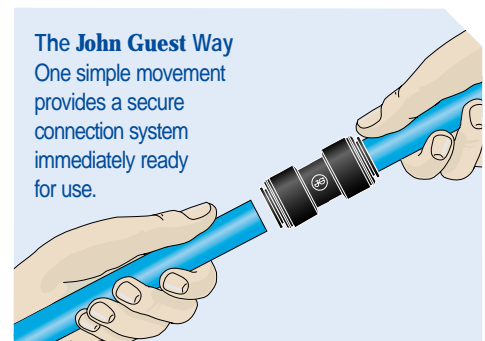
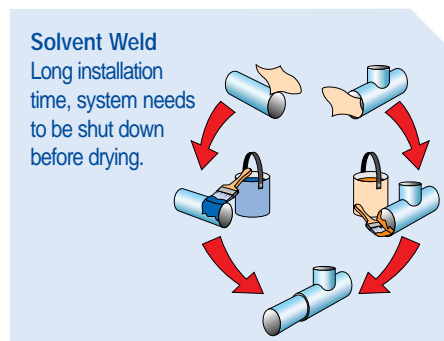
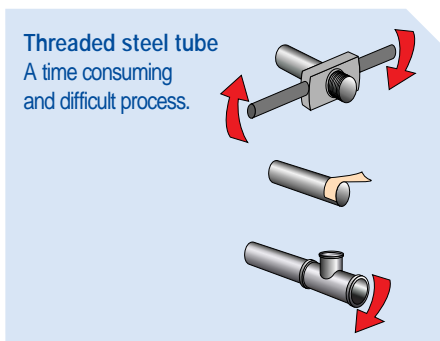
4. Complex systems easy to achieve



5. System complete in just hours



- Installation time reduced by at least 50%
 - Safe, secure, leakproof
 - Easy to alter or expand a system
 - Lightweight and easy to handle
- No corrosion, reduced maintenance



Plastic Fittings

Male Connector



PART NO.	PIPE OD	THREAD BSP
PM011213E	12	3/8
PM011214E	12	1/2
PM011514E	15	1/2
PM011814E	18	1/2
PM012216E	22	3/4

Elbow



PART NO.	PIPE OD
PM0312E	12
PM0315E	15
PM0318E	18
PM0322E	22
PM0328E	28

Union Connector



PART NO.	PIPE OD
PM0412E	12
PM0415E	15
PM0418E	18
PM0422E	22
PM0428E	28

Tee



PART NO.	PIPE OD
PM0212E	12
PM0215E	15
PM0218E	18
PM0222E	22
PM0228E	28

Reducing Tee



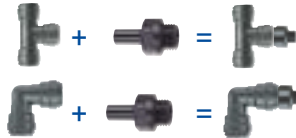
PART NO.	PIPE OD ENDS	PIPE OD BRANCH
PM3018AE	18	15
PM3022AE	22	15

Stem Adapter



PART NO.	STEM OD	THREAD BSP
PM051213E	12	3/8
PM051214E	12	1/2
PM051513E	15	3/8
PM051514E	15	1/2
PM051814E	18	1/2
PM052214E	22	1/2
PM052216E	22	3/4

Converts push fit end to male thread



John Guest Adaptability Standard
Super Speedfit® products can be coupled together to form integral new fittings.

Stem Elbow



PART NO.	PIPE OD	STEM OD
PM221212E	12	12
PM221515E	15	15
PM221818E	18	18
PM222222E	22	22

Designed to simplify pipe connections in restricted spaces, the Stem Elbow gives an instant stem fitting so a pipe can be orientated in any direction.



Can be used with an elbow to make 'U' turn connection.

Can be used with a Tee.

Please note a collet cover cannot be used on a Speedfit end assembled with the stem of a 22mm Stem Elbow.

Reducer



PART NO.	STEM OD	PIPE OD
PM061512E	15	12
PM061815E	18	15
PM062215E	22	15
PM062218E	22	18
PM062815E	28	15
PM062822E	28	22

Porting Block



PART NO.	SIZE BSP
JG-L-WSK	5 1/2" Connections

Aluminum Wall Box



PART NO.	SIZE BSP
JGWALLBOX 1/2	1/2
JGWALLBOX 3/4	3/4

1/2 or 3/4 female thread on the top.
Both products have 3 x 1/2" female threads on the side.

End Stop



PART NO.	PIPE OD
PM4615E	15
PM4622E	22

The End Stop can be used to provide a permanent connection but because it is easy to disconnect from the pipe it serves a useful purpose as a means of providing a temporary shut off which can be removed at a later date to allow a system to be expanded or modified.

Metric To Inch Adapter



PART NO.	STEM OD	TUBE OD
NC2164	15mm	3/8"
NC2173	1/2"	15mm
NC908	1/2"	18mm

U-Bend



PART NO.	TUBE OD
PMUB15E	15

SHUT OFF VALVE LONG HANDLE

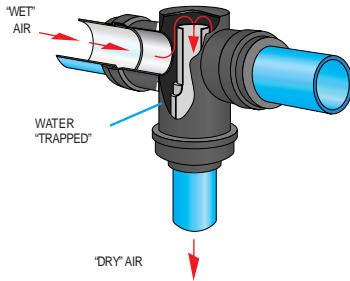


PART NO.	TUBE OD
PISV0412S	3/8
PISV0416S	1/2

Water Trap Tee



PART NO.	PIPE OD ENDS
PMITT22E	22



The new Water Trap Tee from John Guest solves the on-going problem of moisture in a compressed air system and provides the easy alternative to the need to install "Swan Necks".

The ingenious inside arrangement of the fitting allows air to flow, with minimum head loss, from the main to take-off point without allowing water to follow. The moisture is retained in the line to be drawn off at some suitable location.

Installation

It is of vital importance for the correct function of the Water Trap Tee that the air supply within which the Tee is installed is near horizontal and that the outlet port faces vertically downwards. Markings to indicate correct orientation have been molded onto the body to assist installation.

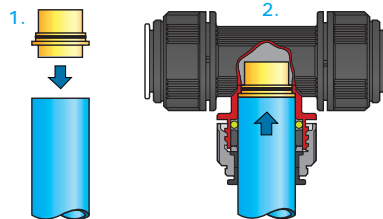


Complex systems are easy to achieve.

Water Trap Tee Converter



PART NO.	SIZE
WTC28	28



The Water Trap Tee Converter is a simple convenient way of converting a standard John Guest 28mm Tee to a Water Trap Tee.

This will stop condensing water from entering the vertical take off spur.

The air supply needs to be installed with the correct fall and water drain points regularly vented.

To Assemble

Use either John Guest 28mm Nylon Pipe or 28mm copper pipe. The pipe must be cut square and be free of burrs.

Press the shorter spigot into the pipe. The fit on copper pipe will be loose, this will not affect the function.

Push the pipe and converter up to the pipe stop of the center leg of the tee.

Turn the screw cap approx 1/4 turn to lock the pipe in position.

Brass Wingback Elbow



PART NO.	PIPE OD	THREAD
PM15WB-1/2NPT	15	1/2 NPT

PART NO.	PIPE OD	THREAD
PM15WB	15	1/2 BSP
PM22WB	22	3/4 BSP

Brass Straight Connector



PART NO.	PIPE OD	THREAD
MM011504N	15	1/2 BSPT
MM012206N	22	3/4 BSPT
MM012808N	28	1 BSPT

Brass Male Stem Adapter



PART NO.	STEM OD	THREAD
MM052226N	22	3/4 NPT
MM052228N	22	1 NPT
MM052828N	28	1 NPT

MM051504N	15	1/2 BSPT
MM052206N	22	3/4 BSPT
MM052818N	28	1 BSP

Converts push fit end to male thread.

Brass Female Stem Adapter

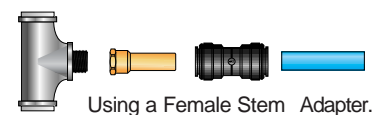


PART NO.	STEM OD	THREAD
MM501514N	15	1/2 BSP
MM502216N	22	3/4 BSP

Converts push fit end to female thread.

Easy to extend a galvanized system.

John Guest fittings and pipe can form a stand alone system or be used to modify or extend an existing galvanized system.



Rigid Nylon Pipe

John Guest's new rigid unplasticized nylon 12 pipe is especially suitable for compressed air situations. It is offered in BLUE in packs of 20 x 3 meter lengths (28mm in packs of 10 lengths). It can easily be cut to length using the John Guest pipe cutters and is capable of withstanding temperatures and pressures well in excess of normal working conditions.

Relevant sizes are to DIN 73378



Blue Rigid (unplasticized) Nylon 12 Pipe in 3 meter lengths

Part No.	Size OD - ID (mm)	Pack Quantity
PA-RM1209-3M-20B	12 x 9	20
PA-RM1512-3M-20B	15 x 12	20
PA-RM1814-3M-20B	18 x 14	20
PA-RM2218-3M-20B	22 x 18	20
PA-RM2823-3M-10B	28 x 23	10

Copper & Aluminum Pipe

While we recommend the use of John Guest Rigid Nylon Pipe, John Guest Fittings can also be used with copper or aluminum pipe.

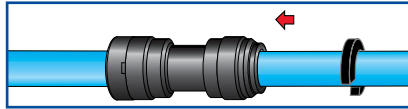


Accessories

Release Aid



PART NO.	PIPE OD
15RA	15
22RA	22

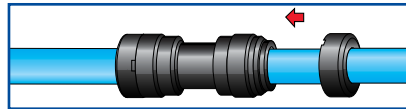


The action of pressure in a system could increase the grip of the collet. The Release Aid allows a firmer grip on the collet while removing the pipe.

Collet Covers



PART NO.	PIPE OD	COLORS
PM1912E	12	BLACK
PM1915E	15	BLACK
PM1918E	18	BLACK
PM1922E	22	BLACK



Collet Covers prevent accidental removal or tampering with piping. The pipe can be inserted with the Collet Cover already attached to the fitting or the cover can slide into position afterwards.

We recommend covers be fitted when pipework is hidden inside walls, ceilings etc.

Collet Covers can be removed to allow the pipe to be disconnected as and when required.

Plug



PART NO.	STEM OD	COLORS
PM0812R	12	RED
PM0815E	15	BLACK
PM0818E	18	BLACK
PM0822E	22	BLACK
PM0828E	28	BLACK

Pipe Clips and Spacers



CLIP PART NO.	PIPE OD	COLORS
PC15E	15	BLACK
PC22E	22	BLACK
PC28E	28	BLACK

SPACER PART NO.	COLORS
PCSE	BLACK

Pipe Cutter



PART NO.
JG-TS

For up to and including 22mm pipe

Heavy Duty Pipe Cutter



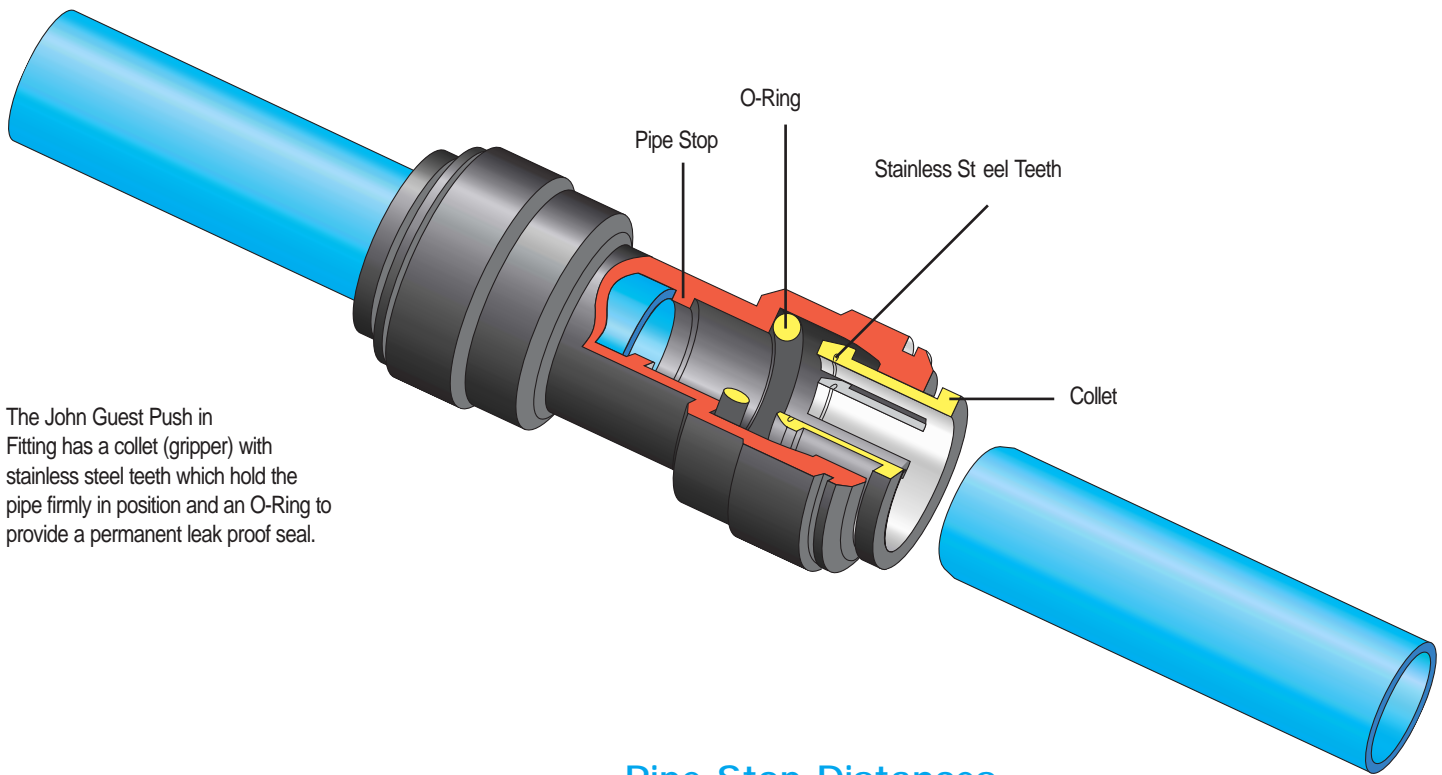
PART NO.
HDC BLADE JGHDC (Blade only)

For up to and including 28mm pipe



The John Guest System is light and easy to handle

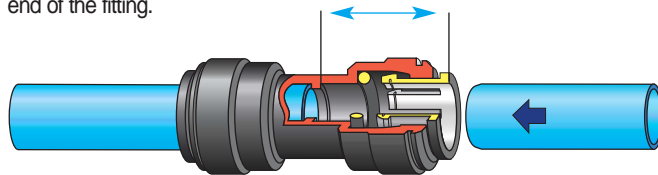
Easy to make a connection



The John Guest Push in Fitting has a collet (gripper) with stainless steel teeth which hold the pipe firmly in position and an O-Ring to provide a permanent leak proof seal.

Pipe Stop Distances

Stops are located at the following distances from the end of the fitting.



A line is molded onto the fitting to show the position of the pipe stop.

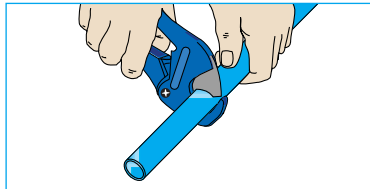


SIZE	STOP DISTANCES
12mm	26mm
15mm	30mm
22mm	35mm
28mm	44mm

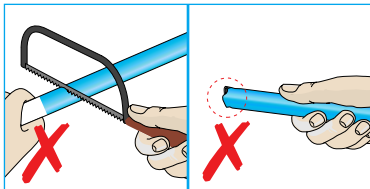
Three easy steps

Fittings and pipe should be kept clean and undamaged before use.

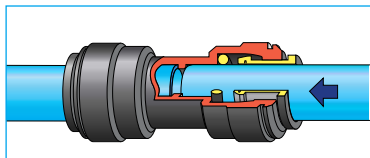
Cut the pipe square.
We recommend the use of the JG Pipe Cutter.



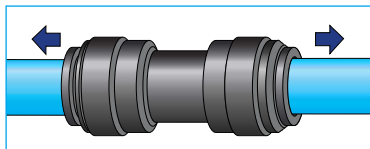
DO NOT use a hacksaw. To avoid damage to the O-ring remove burrs and sharp edges.



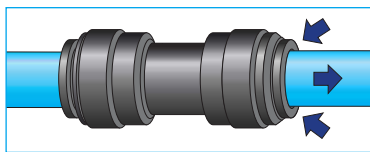
Push up to pipe stop.



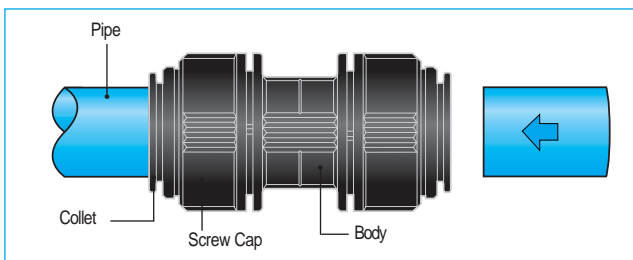
Pull to check secure.
Test the system before use.



To disconnect, ensure the system is depressurized. Push the collet towards the fitting and remove the pipe. The fitting can be reused.

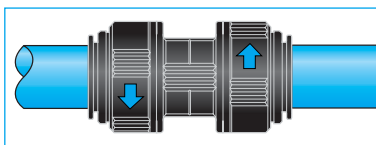


28mm Fittings

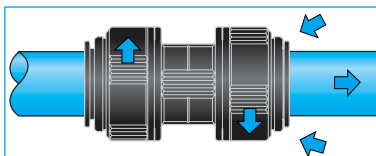


28mm fittings also have a collet with stainless steel teeth and an O-Ring.

After inserting the pipe, a screw cap is turned approx 1/4 turn. This locks the collet in place and reduces lateral and sideways movement of the pipe.

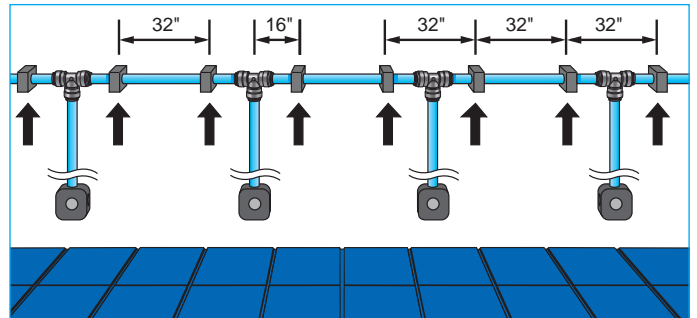


To disconnect, turn the screw cap 1/4 turn, push in the collet and remove the pipe. The fitting and pipe can be reused.

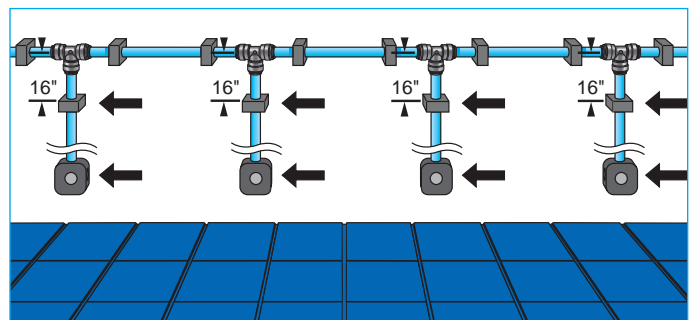


Installing a system

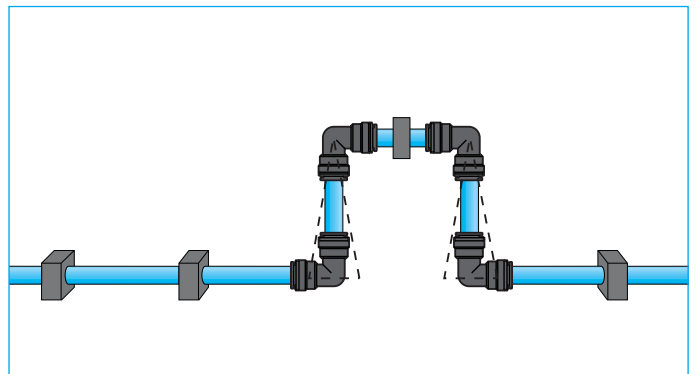
When installing a compressed air system, it is advisable to first attach only the horizontal pipe clips and only attach the clips to the vertical pipes after a small amount of pressure has been applied to the system. This will ensure that the vertical pipes have positioned themselves correctly before they are clipped.



Phase 1: System without pressure



Phase 2: System with pressure



On long pipe runs, it is advisable to install an expansion bend, as shown in the diagram.

Note: All compressed air systems should be equipped with an air line water trap, we recommend our PMTT22E Water Trap Tee for this purpose (as shown on page 5 of this catalog).

Technical Specification

Working Temperature Range

Minimum Working Temperature -4°F (-20°C)

Maximum Working Temperature +158°F (+70°C)

The above is for use with air. For below 0°C

please consult our Technical Service Department.

Working Pressure

The John Guest Compressed Air System is suitable for the following temperatures and pressures

Temperature	Pressure
+ 73°F	150 psi (10 BAR)
+ 158°F	100 psi (7 BAR)

The above ratings are for air. For use with other fluids or at other temperatures and pressures please consult our Technical Service Department.

Pipe Types

John Guest fittings are intended for use with John Guest nylon pipe but are also suitable for use with a wide range of plastic and soft metal pipes including UPVC, ABS, Polyethylene, nylon, mild steel and copper to the tolerances set out below. Soft plastic pipe, such as nylon to have a minimum wall thickness of 1.5mm. The pipe must have a good quality surface and be damage free.

Pipe Tolerances

The John Guest fittings featured in this catalog are intended for pipes with outside diameters to the following tolerances

Size	12mm to 28mm OD
Tolerance	+0.05 to -0.10mm OD

Maximum Torque Values

The following maximum torque values should be applied.

Size	3/8"	1/2"	3/4"	1"
Plastic threads	3.0Nm	3.0Nm	4.0Nm	N/A
Metal threads	N/A	4.0Nm	5.0Nm	N/A

It is recommended that all installations are checked prior to use to determine that a seal has been made. The maximum torque figures quoted for use with John Guest fittings are dependant on the mating thread conforming to the relevant British or International thread standard.

Material Specification

The fittings are made up of three components:

Bodies are produced in strong engineering plastic or in brass.

O-Rings are Nitrile rubber.

Collets are produce in acetal copolymer with stainless steel teeth.

Applications

Pipe and fittings should be kept clean and undamaged before use.

These products are designed for use with air. For other applications please contact our Technical Service Department.

The system is not recommended for use with explosive gases, petroleum spirits and other fuels or for central heating systems.

Installations - Our Recommendations

The pressure rating and installation guidelines of the tubing employed must also be considered during the design of compressed air system.

Pipe should be supported at minimum 32" to prevent excessive load being applied to the fitting. These supports should not be closer than 1" from the end of the fitting.

John Guest fittings and pipe should only be connected after the air receiver and not direct to a compressor.

We recommend collet covers be fitted when pipework is hidden inside walls and ceilings.

It is recommended that all pipe and fittings installations are pressure tested after installation and before handing over to the final user.

Cleaners and Sanitizing Acetal Fittings

Our advice to customers is to use cleaners and sanitizing agents that are above pH4 and low in hypochlorite level. Acetal fittings and parts that are cleaned and/or sanitized should be rinsed immediately with copious amounts of clean tap water to remove all traces of the cleaners.

Details of which products are made from acetal are shown in our catalogs but generally John Guest products incorporating acetal are designated by the part number prefix PI, PM, CI, CM and RM. Polypropylene fittings offer greater resistance to aggressive chemicals than acetal fittings. Polypropylene does not have the same mechanical properties as acetal and John Guest polypropylene fittings are generally designated by the part number prefix PP. Our material suppliers recommend ECOLAB Oasis 133 as a suitable external cleaner for acetal products manufactured by John Guest.

Warranty

While we give a warranty against defects in manufacture or materials, it is the responsibility of the specifier to ensure that fittings and related products are suitable for their application. The installation must be carried out correctly in accordance with our recommendations, complying with recognized codes of practice and relevant national standards, and be properly maintained. Please refer to our terms and conditions of sale.

The fittings shown in this catalog are selected from John Guest's Range of **Super Speedfit®** Push-in Fittings.

The full range of fittings, all produced in tough engineering polymers, are offered in 4mm to 28mm sizes, in numerous different patterns. They are suitable for a wide variety of applications, but being manufactured in food grade materials, can be used in potable drinking water and drinks dispense, food and medical locations.

For further information on the John Guest Product Range, please consult our Technical Service Department.

The company has a policy of continuous research and development and reserve the right to amend without notice the specification and design of all products illustrated in this catalog.

Product Selection and Installation

John Guest fittings and related products are specifically designed and manufactured by John Guest to the Technical Specifications set out in the John Guest's Products Catalogs. All John Guest fittings and related products should be selected, installed, used and maintained in accordance with these Technical Specifications. It is the customer's/user's responsibility to ensure that John Guest fittings and related products are suitable for their intended applications, are properly installed and maintained, and are used in accordance with the Technical Specifications. It is also the customer's/user's responsibility to provide its customers with relevant technical information about John Guest products it supplies to them.

JOHN GUEST USA, INC. TERMS & CONDITIONS OF SALE

Terms and Conditions

The products described in this document are hereby offered for sale to be established by John Guest (USA) Inc., its subsidiaries and its authorized distributors. This offer and its acceptance by any customer (the "Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any item described in this document, when communicated to John Guest (USA) Inc., its subsidiaries or an authorized distributor (the "Seller") verbally or in writing, shall constitute acceptance of this offer.

1. Terms and Conditions of Sale. All descriptions, quotations, proposals, offers, acknowledgments, acceptances and sales of the Seller's products are subject to and shall be governed exclusively by the terms and conditions stated herein (the "Agreement"). The Buyer's acceptance of any offer to sell is limited to the terms and conditions in the Agreement. Any terms or conditions in addition to, or inconsistent with those stated in the Agreement, proposed by the Buyer in any acceptance of an offer by the Seller, are hereby objected to. No such additional, different or inconsistent terms and conditions shall become part of the agreement between the Buyer and the Seller unless expressly accepted in writing by the Seller. The Seller's acceptance of any offer to purchase by the Buyer is expressly conditioned upon the Buyer's assent to all the terms and conditions in this Agreement, irrespective of any terms in addition to, or in consistent with those contained in the Buyer's offer. Acceptance of the Seller's products shall in all events constitute such assent.

2. Documents. Unless provided otherwise in the Agreement, all catalog descriptions, illustrations, drawings and literature or independently submitted estimates of performance, weights and measurements or other specifications provided by the Seller are mere approximations and the Seller reserves the right to alter or amend the same at any time. The Seller reserves the right to correct clerical or technical errors in the contract documents. The Buyer shall furnish with his order all necessary specifications and information. The Seller takes no responsibility for goods manufactured, priced or delivered not in accordance with the order or the specifications unless the Buyer's order and specifications are clear and correct.

3. Prices. Unless otherwise provided, all prices contained in our quotations and written acceptances are ex works and do not include the cost of packing. All orders are accepted on the condition that all such prices are subject to revision by the Seller at any time before the goods are dispatched to take account of any price change. In the event that the Buyer does not place the entire order quoted by the Seller for the Buyer, the Seller reserves the right to revise its prices. The Seller also reserves the right to revise its prices if the Buyer modifies the specification or quantity of the goods, or the delivery requirements after the order has been accepted by the Seller.

4. Advice. All advice given in connection with the Seller's goods is provided without charge to the Buyer. Any advice and assistance given by the Seller to the Buyer is given at the Buyer's risk and the Seller shall not be liable for any loss, damage or claim arising therefrom.

5. Payment. (a) Unless otherwise provided in the Agreement, or explicitly agreed upon in writing by the Seller, payment is due in full 30 days from date of shipment of the items purchased herein under. (b) In the case of an installment contract, deliveries or parts, payment for each installment delivery or part shall be made under subclause (a) as if the same constituted a separate agreement. (c) Amounts not timely paid shall bear interest at the rate of 2-1/2% above the Seller's bank's prime rate from time to time in force. (d) In the event that the Buyer fails within one calendar month of the date for payment to effect any payment which may be due under the Agreement or any agreement with the Seller, or if the Buyer commits any breach of the Agreement, or if the Buyer becomes insolvent or commits any act of bankruptcy or contemplation of liquidation, the Seller will be entitled, without prejudice to the Seller's other rights, to terminate the Agreement or any unfulfilled part thereof, or at the Seller's option to make partial deliveries.

6. Modifications and Cancellations. This Agreement is not subject to oral modification or cancellation. A Buyer's request for modification or cancellation will not be incorporated into the Agreement unless the request is accepted by the Seller in a writing that amends the Agreement. Acceptance of any such requested modification or cancellation shall be at the Seller's discretion and shall be upon such terms and conditions as the Seller may require.

7. Handling Charge. Goods supplied in accordance with the Buyer's order may later be returned to the Seller at the Seller's discretion provided the return is pre-authorized, in writing and the merchandise is unused, in original packages, unaltered, clean and no older than 60 days from the date of shipment by the Seller. The Buyer will be required to pay to the Seller a handling charge of 15% of the purchase price of the returned goods. A copy of the original invoice for the merchandise must accompany all returns.

8. Delivery. (a) Any delivery dates quoted are approximate only and the Seller shall have no liability for any delays in delivery. (b) Unless provided otherwise, delivery of the goods shall be made when the Seller has notified the Buyer that the goods are ready for dispatch. Regardless of the method of delivery, delivery shall be made F.O.B. Seller's plant, where the risk of loss shall thereupon pass to the Buyer upon the Seller's delivery to a carrier. Notwithstanding that the Seller's prices are ex-works, the Seller is prepared by special contract to procure carriage or freight and insurance on behalf of the Buyer and at Buyer's cost in which event the Seller shall be under no liability for damage in transit or loss or damage to the goods beyond the point at which the Seller contracts to deliver the same. (c) Seller will not make drop shipments.

9. Inspection and Rejection. (a) The following provisions shall apply in relation to all deliveries of goods: the Seller shall not be held liable for any claims of damage in transit, shortage of delivery or loss of goods, unless in the case of shortage of delivery, a separate notice in writing is given to the carrier concerned and to the Seller within three (3) days of the receipt of the goods, followed by a complete claim in writing within five (5) days of receipt of the goods and in the case of loss of goods, a separate notice in writing is given to the carrier concerned and to the Seller and a complete claim in writing made within thirty (30) days of the date of consignment. The Buyer must inspect the goods on arrival from the carrier, however, where goods are accepted from the carrier concerned without being inspected, the delivery book of the carrier concerned must be signed "not examined". The Seller shall have the right to inspect the goods at the Buyer's premises in respect to any such claims made by the Buyer and the Buyer shall retain such goods until the Seller has inspected such goods or until the Seller has notified the Buyer that the Seller does not wish to inspect such goods. Any breach of these conditions in this provision shall serve as a waiver to any claim brought by the buyer. (b) Without prejudice to the Seller's other rights, should the Buyer fail for any reason to send the Seller forwarding instructions within ninety (90) days after the date of the Seller's notification that the goods are ready for dispatch or to accept delivery of the goods, the Seller shall be entitled at the Buyer's risk and expense to store the goods and/or to procure or effect storage of the goods elsewhere. Goods so stored shall be paid for as if they had been dispatched and/or accepted.

10. Special Tooling. Where it is necessary for the Seller to manufacture or to purchase special tooling, including without limitation tools, dies, jigs, mandrills, fixtures, molds, and patterns in order to execute a contract, the Buyer will be charged with a proportion of the cost of such special tools. Such special tooling shall be and remain the Seller's property notwithstanding payment of any charges made by the Buyer. In no event will the Buyer acquire any interest in apparatus belonging to the Seller which is utilized in the manufacture of the items sold hereunder, even if such apparatus has been specially converted or adopted for such manufacture and notwithstanding any charges paid by the Buyer therefor. Unless otherwise agreed, the Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

11. Test and Performance. (a) The Seller's goods are, where practicable, submitted to the Seller's standard test before delivery. If special tests are required, these shall be made at the Seller's premises unless otherwise agreed, and will be subject to an extra charge. (b) The Seller accepts no liability for failure to attain any performance figures quoted by the Seller unless the Seller specifically has guaranteed them with an agreed sum as liquidation damages and the Buyer has suffered actual loss by reason of the failure to attain the figures quoted. (c) Any particulars of weights and measurements, power and consumption, power output or performance relating to the goods and like matters furnished by the Seller to the Buyer in the Seller's catalogs, literature or otherwise, are approximate and are intended only to present a general idea of the goods to be supplied and unless previously agreed specifically in writing shall not form part of the Agreement.

12. Buyer's Property. Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished to the Seller by the Buyer, or any other items which become the Buyer's property, may be considered obsolete and may be destroyed by the Seller after two (2) consecutive years have elapsed without the Buyer placing an order for the items which are manufactured using such property. The Seller shall not be responsible for any loss or damage to such property while it is in the Seller's possession or control.

13. Taxes. Unless otherwise indicated, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by the Seller, or if the Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the item sold. The Buyer agrees to pay all such taxes or to reimburse the Seller therefor upon receipt of its invoice. If the Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, the Buyer shall promptly indemnify and hold the Seller harmless from and against any such tax, as well as any interest or penalties thereon which may be assessed if the items are held to be taxable.

14. Warranty. (a) The Seller warrants that the items sold hereunder shall be free from defects in material or workmanship at the time of shipment by the Seller. The Seller warrants that if within 12 months of delivery of the goods to the Buyer the Buyer returns immediately to the Seller's premises any of the said goods which the Buyer believes to be defective, carrier paid, properly packed and clearly marked with the Buyer's full name and address and any other information such as serial numbers which may be necessary to enable the goods to be identified, together with a complete description of the respects in which it is alleged that the goods are defective, they will be repaired or new goods will be supplied in exchange and the goods so repaired or such new goods will be delivered to the Buyer free of charge at the Seller's premises provided that the foregoing warranty shall only be applicable if upon demand by the Buyer, the Buyer proves to the Seller's satisfaction: (i) that the defect was due solely to defective workmanship; (ii) that no alterations or repairs have been made to the goods except with the Seller's written consent; (iii) that the defect was not caused by any act of the Buyer or its agents; and (iv) that the defect was not caused by any matter beyond the reasonable control of the Seller, including, without limitation, accident or normal wear and tear. (b) All costs and expenses, including freight charges, customs duties, and insurance incurred in returning the goods to the Seller's premises in accordance with this provision shall be paid by the Buyer. The benefit of this warranty shall not be assignable by the Buyer. (c) The warranty contained in sub-paragraph (a) above does not extend to any goods not manufactured by the Seller even though supplied by the Seller nor does it extend to any second-hand or reconditioned goods nor does it extend to components manufactured by the Seller but installed, attached or welded by the Buyer or his customer on equipment not manufactured by the Seller. Goods not manufactured by the Seller carry only the warranty (if any) of their makers and the Buyer is entitled to the benefit thereof only so far as the Seller has the power to transfer it. (d) This warranty comprises the sole and entire warranty pertaining to items provided hereunder, the Seller makes no other warranty, guarantee, or representation of any kind whatsoever. All other warranties, including but not limited to, merchantability and fitness for purpose, whether expressed or implied, or arising by operation of law, trade usage, or course of dealing are hereby disclaimed. (e) Notwithstanding the foregoing, there are no warranties whatsoever on items built or acquired wholly or partially to the Buyer's designs or specifications.

15. Limited Remedy. The Seller's liability arising from or in any way connected with the items sold or this Agreement shall be limited exclusively to repair or replacement of the items sold. In no event shall the Seller be liable to the Buyer or any 3rd party for any incidental, consequential or special damages of any kind or nature whatsoever, including but not limited to lost profits arising from or in any way connected with this agreement or items sold hereunder, whether alleged to arise from breach of contract, express or implied warranty, or in tort, including without limitation, negligence, failure to warn or strict liability.

16. Indemnity for Infringement of Intellectual Property Rights. (a) The Buyer shall defend and indemnify the Seller against all actions, claims, demands, penalties and costs by 3rd parties in tort, or for infringement, or alleged infringement, of patents, trademarks, copyrights, trade dress, trade secret or other rights of any 3rd party resulting from the goods manufactured in accordance with the Buyer's specifications or based on any information provided by the Buyer. The Buyer will defend any action against the Seller for title, patent, trademark, copyright infringement, or other claimed by a 3rd party at the Buyer's sole cost and expense. (b) The Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this provision. The Seller will defend and indemnify the Buyer against allegations of infringement of US patents, US trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). The Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against the Buyer based on an allegation that an item sold pursuant to this contract infringes the Intellectual Property Rights of a 3rd party. The Seller's obligation to defend and indemnify the Buyer is contingent on the Buyer notifying the Seller within 10 days after sole control over the defense of any allegations or actions, including all negotiations for settlement or compromise. If an item sold hereunder is subject to a claim that it infringes the Intellectual Property Rights of a 3rd party, the Seller may, at its sole expense and option, procure for the Buyer the right to continue using said item, replace or modify said item so as to make it noninfringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, the Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to items delivered hereunder for which the designs are specified in combination or use in a system of any item sold hereunder. The foregoing in this provision shall constitute the Seller's sole and exclusive liability and the Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

17. Lien. In addition to any right of lien to which the Seller may by law be entitled, the Seller shall have a general lien on all goods of the Buyer in the Seller's possession (although such goods or some of them may have been paid for) for the unpaid price of any other goods sold and delivered to the Buyer by the Seller under the same or other contracts.

18. Waiver. The Seller's rights shall not be affected or restricted by any indulgence or forbearance granted to the Buyer. No waiver by the Seller of any breach shall operate as a waiver of any later breach.

19. Force Majeure. The Seller shall be excused from performing any of its obligations under this Agreement which are prevented or delayed by any occurrence not within the reasonable control of the Seller, including but not limited to, accidents, acts of God, destruction or damage to the goods or the Seller's manufacturing plant, delays or failures in delivery of carriers or suppliers, shortages of materials, strikes or other labor matters, floods, earthquakes, fire, riots, explosions, or any regulations, rules, ordinances or orders of any governmental authority, federal, state or local, whether such cause exists at the date of the order or not.

20. Buyer's Representation of Solvency. The Buyer hereby represents that as of the signing of this Agreement it was not insolvent within the meaning of the Uniform Commercial Code or the Bankruptcy Laws of the United States.

21. Assignment and Delegation. The rights and obligations of the parties under this Agreement may not be assigned or delegated, except on the express written consent of the other party to the assignment or delegation.

22. Integration. The rights and obligations of the parties and the terms and conditions set forth herein, together with any amendments, modifications and any different terms and conditions expressly accepted by the Seller in writing, shall constitute a complete and exclusive statement of the terms of this Agreement. This Agreement supersedes not only all prior agreements, but also oral agreements made contemporaneously with the execution of this Agreement. All such materials may not be used to supplement, explain, or contradict the terms of this Agreement.

23. Severability. If any of these conditions or any part thereof purports to exclude or restrict or limit any liability and such exclusion or restriction or limitation is prohibited or rendered void or unenforceable by any legislation to which it is subject, or is itself prohibited or rendered void or unenforceable by any legislation to which it is subject, then the exclusion restriction or limitation on the condition or part thereof in question shall be so prohibited or rendered void or unenforceable and the validity or enforceability of any other part of these provisions shall not thereby be affected.

24. Governing Law/Limitation on Actions. The terms, conditions, rights, and obligations under this Agreement shall be construed under the laws of the State of New York, without regard to principles of conflicts of laws. No actions arising out of the sale of the items sold hereunder or this Agreement may be brought by the Buyer more than two (2) years after such cause of action accrues.



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