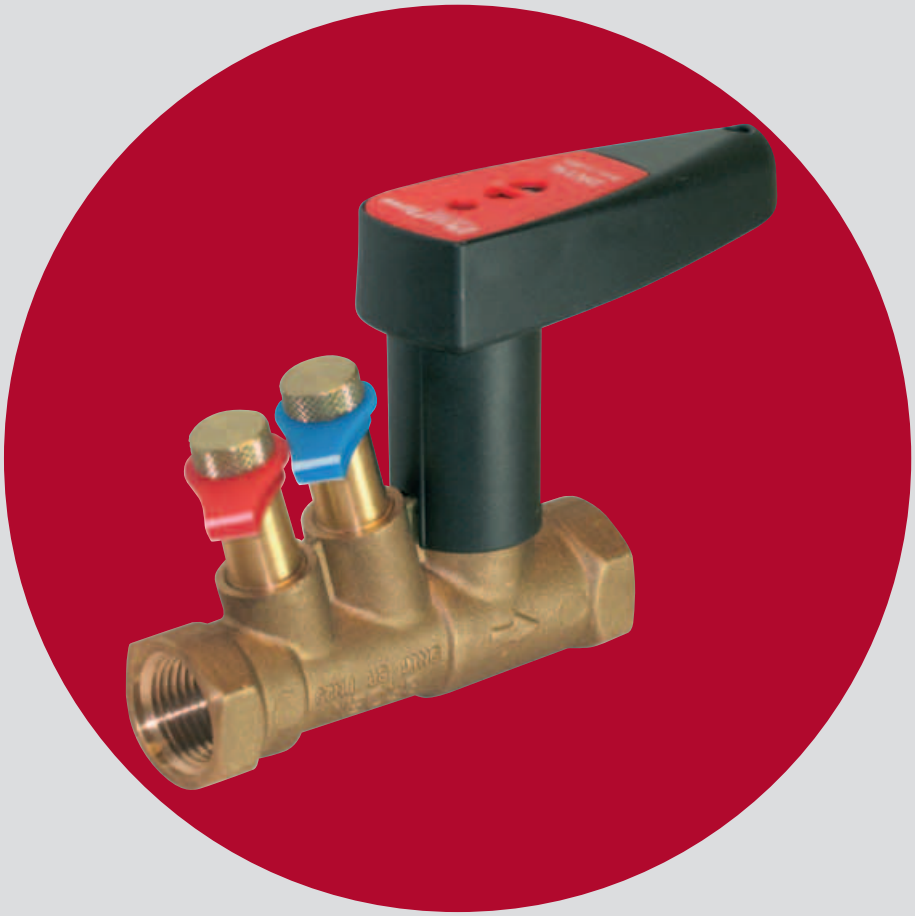
Proflow

Commercial Valves



Yorkshire

Introducing the Proflow range

CONTENTS

A comprehensive subject index incorporating page and paragraph numbers can be found on pages 38 and 39 of this databook. Quick-find reference points are as follows:

Proflow Venturi
PAGE 04 - 09

Proflow Modular
PAGE 10 - 13

Proflow Ballofix
PAGE 14

Proflow Ballomax
PAGE 15

Proflow Linevalves
PAGE 16 - 17

Proflow Mistral
PAGE 18 - 22

Proflow Suremix
PAGE 23 - 25

Working temperatures and pressures
PAGE 26 - 29

Standards and materials
PAGE 30 - 31

Quality and guarantees
PAGE 32

Tube and pipe compatibility
PAGE 32 - 33

Specification clauses
PAGE 34 - 35

Design considerations
PAGE 36 - 37

Subject index
PAGE 38 - 39

a **At Yorkshire we are constantly striving to develop system solutions that meet the changing needs of installers, contractors and specifiers alike. The Proflow range of valves comprises a number of products for a broad spectrum of applications across the commercial and domestic sectors.**

Presenting the range

b Proflow valves provide one of the most comprehensive ranges of products on the market today. Users of Proflow valves can be confident that they are purchasing an established product range with a proven reputation for quality and reliability. These two pages provide an overview of the Proflow range, with more detailed information available further on in this document.

Proflow VENTURI

c Proflow Venturi offers a unique solution to commissioning modern heating and chilled water systems. The concepts incorporated into Proflow Venturi provide significant benefits to consultants, contractors and commissioning engineers, enabling systems to be designed, installed and handed over without complications.

Proflow MODULAR

d Proflow Modular is an ideal solution for indoor climate control specification in commercial buildings. It is a bespoke system made up of interlinked multifunctional valves and components, factory assembled into a complete unit that provides connection, regulation, isolation, flushing and draining.

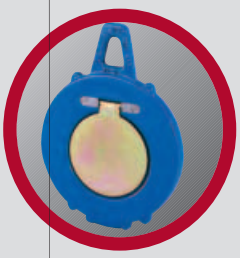
Proflow BALLOFIX®

e The Proflow Ballofix range offers the specifier a comprehensive choice of inline isolation valves for potable water systems, hot and cold water services, oil, compressed air and gas applications. Valves are particularly suited for specification in the commercial and high-end domestic markets.

Proflow BALLOMAX®

f Proflow Ballomax steel ball valves are designed to be used in heating systems, district heating and industrial applications to convey water, air, oil or other fluids.

Introducing the Proflow range



Proflow LINEVALVES

The Proflow Linevalves range incorporates butterfly valves for use in HVAC, commercial water and gas applications; check valves and strainers for use in HVAC and commercial water applications; and pressure reducing valves for domestic and commercial water applications.

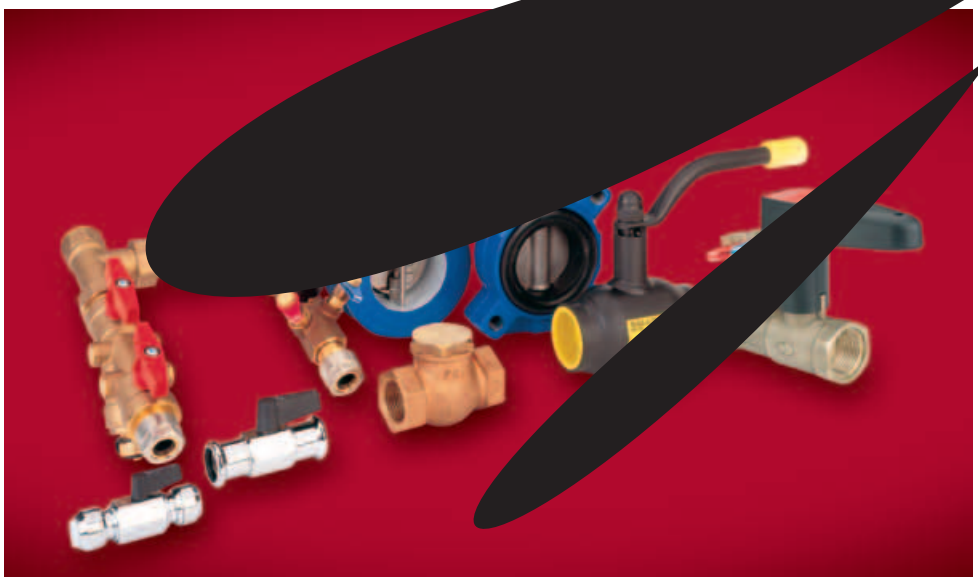
Proflow MISTRAL®

Proflow Mistral and Mistral Pro radiator valves provide the user with individual room temperature control through a comprehensive range of thermostatic, manual and lockshield radiator valves. Valve bodies are available with threaded, compression or push-fit connections.

Proflow SUREMIX®

The Proflow Suremix range of thermostatic mixing valves allows water to be delivered at a safe predetermined temperature for under basin, shower, bath and general mixing applications. All products in the range have union connectors and
ression or threaded ends.

full
com
XPress pr
our Yorkshire integral solder ring. End
and Kuterlite co



TUBE AND PIPE COMPATIBILITY

Proflow valves can be used with a variety of tubes and pipes. Further details can be found in the relevant product section, and specifications for tubes and pipes found on pages 32 and 33.

Proflow Venturi commissioning valves

GLOSSARY OF TERMS

a FIXED ORIFICE (FO)
The part of the flow measurement device which induces the pressure differential for flow measurement and is of a fixed dimension and geometry.

b DOUBLE REGULATING VALVE (DRV)
A valve for flow rate regulation with established characteristics, allowing a set point to be maintained independently of the isolation function.

c DIFFERENTIAL PRESSURE OR SIGNAL (Δp)
The difference in the pressure between the upstream and downstream pressure tapping points over the measurement device. Normally measured in kPa or mmH_2O.

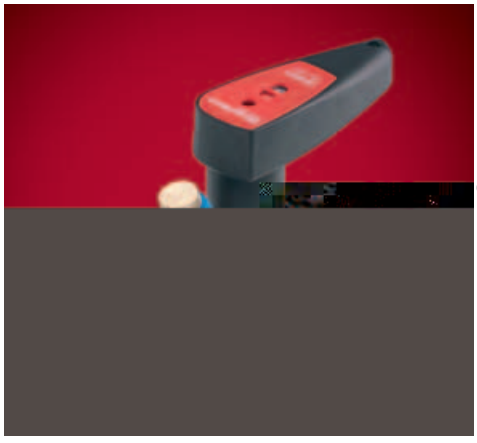
d LOSS FACTOR
The loss factor is a non-dimensional parameter which expresses the total head loss across the valve as a percentage of the signal when the valve is fully open.

e The Proflow Venturi valve provides an ideal solution for commissioning modern heating and chilled water systems in commercial applications. The range incorporates commissioning valves; steel commissioning stations, single and double regulating valves; and a variety of accessories.

f At the heart of all Proflow Venturi valves is the integrated fixed orifice venturi. The venturi principle was first demonstrated in 1797. Applied in the Proflow Venturi valve, water is accelerated through a waisted orifice which increases the velocity of the flow and the pressure differential, proportionally amplifying the signal generated. The signal from a venturi can be increased or decreased by enlarging or reducing the waisted orifice in relationship to the pipe diameter (Beta ratio). The benefit of the venturi over the traditional orifice plate is that the signal developed is not a direct loss. Significant pressure drop is recovered after the water has passed through the venturi nozzle.

g Benefits

- Higher signal range 0-100 kPa. Typical 10-60 kPa
- Built in upstream and downstream lengths
- May be fitted in any orientation
- Independent regulation and isolation functions
- Quarter turn isolation function
- “Quickset” digital precision handle
- Valve information easily visible when insulated
- Suitable for connecting to most steel, copper or plastic pipe systems
- Handle drilled to allow valve tagging and locking
- Accuracy +/-3%



h The Proflow Venturi uses a quarter turn ball valve for isolation and a needle valve for regulation in the same body. This unique design feature enables the valve to be used for isolation purposes without altering the setting on the regulation needle.

i The Proflow Venturi is easy to regulate, isolate install and operate.

j All commissioning stations require a certain length of straight pipeline, excluding fittings, upstream from the valve to ensure correct flow conditions for accurate flow measurement. This length varies between five and ten pipe diameters depending on the manufacturers’ recommended guidelines, eg if the valve size is 50mm, the length required is between 250mm and 500mm. The dimension is increased if the valve is fitted immediately after a pump. Some commissioning stations also require a downstream straight length.

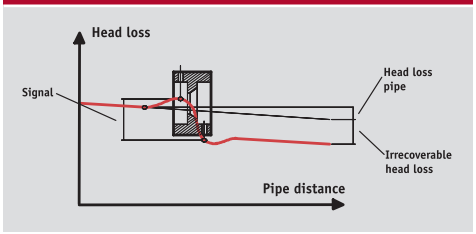
k The Proflow Venturi technology means that, except for immediately after a pump, no straight lengths are required up or down stream. This also applies to the steel Proflow Venturi 900XSL and 900SGL and is advantageous in a tight plant room.

l The Proflow Venturi is easy to use because the unique design enables it to be installed in any orientation, even with the test points facing down.

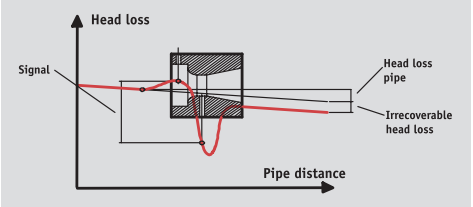
m The DRV (double regulating valve), which does not include test points, may be used in the system for bypass duties.

Comparison between headloss in fixed orifice and fixed venturi orifice

1 **Traditional orifice plate cartridge**



2 **Orifice venturi cartridge**



Steel Proflow Venturi dimensions

DIMENSIONS

a The building in dimensions for Steel Proflow Venturi valves can be seen in the tables on this page and opposite.

1 Steel Proflow Venturi commissioning station (FODRV) - Flanged

Cat No.	Size	Dimensions in mm A	B	C	D	No. of holes	Weight kg	Kvs m³/h	Kv m³/h	Loss Factor
Standard pattern										
900XSS	DN65	182	185	285	100	4	13.3	37.4	78.2	0.23
900XSS	DN80	249	200	295	100	8	16.2	72.9	169	0.19
900XSS	DN100	325	220	310	160	8	23.0	129	360	0.13
900XSS	DN125	341	250	325	160	8	30.0	190	502	0.14
900XSS	DN150	354	285	340	160	8	36.0	348	1010	0.12
900XSS	DN200	378	340	430	200	12	55.0	586	1910	0.09
900XSS	DN250	411	405	465	200	12	78.0	861	2540	0.11
900XSS	DN300	465	460	535	250	12	105	1513	4850	0.10
Extended pattern										
900XSL	DN65	455	185	285	100	4	16.8	37.4	78.2	0.23
900XSL	DN80	570	200	295	100	8	22.0	72.9	169	0.19
900XSL	DN100	735	220	310	160	8	34.0	129	360	0.13
900XSL	DN125	865	250	325	160	8	47.0	190	502	0.14
900XSL	DN150	1010	285	340	160	8	63.0	348	1010	0.12

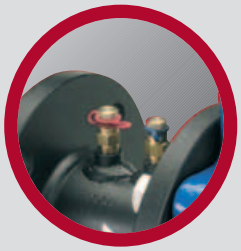
2 Steel Proflow Venturi commissioning station (FODRV) – grooved

Cat No.	Size	Dimensions in mm A	B	C	D	Weight kg	Kvs m³/h	Kv m³/h	Loss Factor
Standard pattern									
900SGS	DN65	284	76.1	285	100	14.2	37.4	78.2	0.23
900SGS	DN80	349	88.9	295	100	17.3	72.9	169	0.19
900SGS	DN100	425	114.3	310	100	25	129	360	0.13
900SGS	DN125	449	139.7	325	160	32	190	502	0.14
900SGS	DN150	462	165.1	340	160	39	348	1010	0.12
900SGS	DN200	494	219.1	430	200	59	586	1910	0.09
900SGS	DN250	535	273.1	465	200	83	861	2540	0.11
900SGS	DN300	587	323.8	535	250	112	1513	4850	0.10
Extended pattern									
900SGL	DN65	515	76.1	285	100	16.2	37.4	78.2	0.23
900SGL	DN80	630	88.9	295	100	21	72.9	169	0.19
900SGL	DN100	795	114.3	310	100	31	129	360	0.13
900SGL	DN125	930	139.7	325	160	42	190	502	0.14
900SGL	DN150	1075	165.1	340	160	55	348	1010	0.12

3 Steel Proflow Venturi Double Regulating Valve (DRV) - Flanged

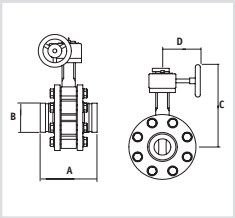
Cat No.	Size	Dimensions in mm A	B	C	D	No. of holes	Weight kg	Kvs m³/h	Kv m³/h	Loss Factor
901XS	DN65	45	185	285	100	4	6.1	-	148	-
901XS	DN80	46	200	295	100	8	6.3	-	237	-
901XS	DN100	52	220	310	160	8	10.6	-	603	-
901XS	DN125	55	250	325	160	8	12.6	-	888	-
901XS	DN150	56	285	340	160	8	14.1	-	2341	-
901XS	DN200	60	340	430	200	12	23.2	-	2845	-
901XS	DN250	68	405	465	200	12	33.7	-	4549	-
901XS	DN300	78	460	535	250	12	48.7	-	7761	-

Proflow Venturi system design



1 Steel Proflow Venturi Double Regulating Valve (DRV) – grooved

Cat No.	Size	Dimensions in mm A	B	C	D	Weight kg	Kvs m³/h	Kv m³/h	Loss Factor
901SG	DN65	165	76.1	285	100	13.1	-	148	-
901SG	DN80	166	88.9	295	100	15.2	-	237	-
901SG	DN100	172	114.3	310	160	21	-	603	-
901SG	DN125	185	139.7	325	160	26	-	888	-
901SG	DN150	186	165.1	340	160	31	-	2341	-
901SG	DN200	200	219.1	430	200	46	-	2845	-
901SG	DN250	218	273.1	465	200	64	-	4549	-
901SG	DN300	228	328.8	535	250	85	-	7761	-



Tube and pipe compatibility

a Proflow Venturi valves with compression ends can be used with copper tube to BS EN 1057, and, in sizes up to 28mm with PEX and PB pipe (with appropriate liner). Proflow Venturi valves with threaded ends can be used with steel tube to BS 1387 and male iron connection fittings. Steel Proflow Venturi valves should be assembled with the appropriate fittings/flanges and tube. For full details of tube and pipe specifications, please see pages 32 and 33.

Calculations

b **Pressure loss**

Dp FODRV = ΔDp x Loss factor

where

Dp FODRV = Head/pressure loss created by FODRV (kPa)

Dp = signal (kPa)

Loss factor for fully open valve – See values in the product tables

c **Calculation of flowrate, signal and size**

$$Q = \frac{Kvs \times \sqrt{\Delta p}}{36} \quad \text{or} \quad \Delta p = \left(36 \frac{Q}{Kvs}\right)^2$$

where
Q = flow rate (l/s)
Δp = signal (kPa)
Kvs = signal coefficient

Example:

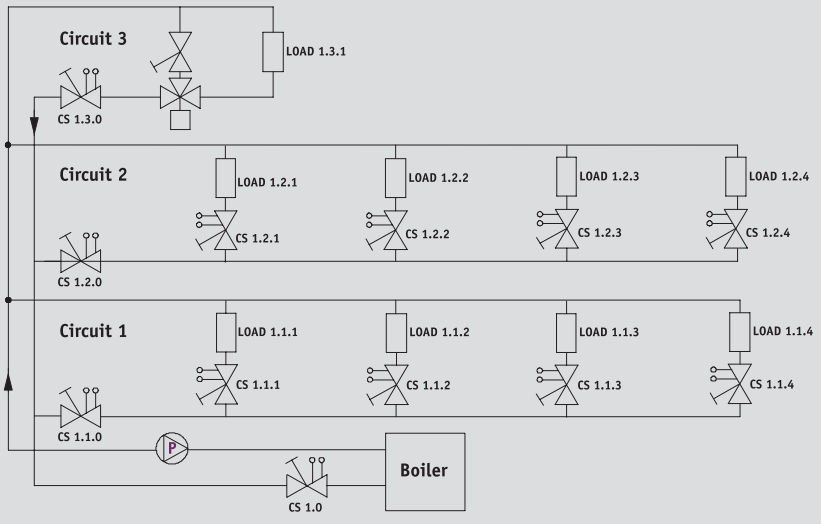
Given: Flow (Q) = 0,11 l/s
Pipe size = 15mm
E.g => Proflow Venturi DN15H female with Kvs = 0.746 and loss factor = 0.24

Wanted: Signal (Δp) and pressure loss (Δp fodrv)

Signal (Δp): $\Delta p = \left(36 \frac{0.11}{0.746}\right)^2$ =>Signal = 28.2kPa

Pressure loss: Δp FODRV = 28.2 x 0.24 (kPa) = 6.76
=>Pressure loss = 6.76 kPa

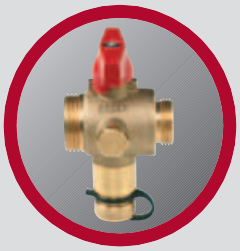
2 Typical installation



ACCESSORIES

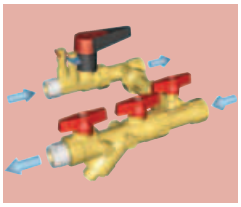
d **TEST POINT INSERTS**
Test point inserts are fitted as standard to all Proflow Venturi commissioning stations, and have a weight of 26g. The integral EPDM seals are resistant to glycol, alcohol, phosphates, esters, ketones and detergents.

e **EXTENSION TUBE**
Extension tubes are available to allow valves to be insulated to a thickness of 50mm without the test points being covered.

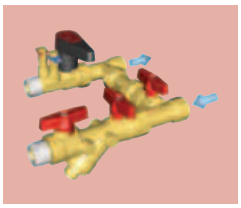


Introducing Proflow Modular

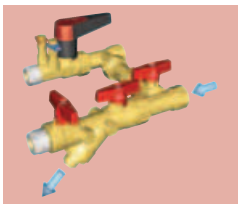
PRE-COMMISSIONING



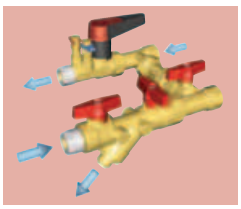
a NORMAL OPERATION



b BYPASS OPERATION



c FORWARD FLUSH OPERATION



d BACKFLUSH OPERATION

e Proflow Modular is a bespoke system made up of a variety of interlinked multifunctional valves and components manufactured from DZR brass. These are assembled into a complete unit that allows connection, regulation, isolation, flushing and draining.

f Connections are made via female BSP, Tectite Pro or compression joints to the main pipework system; and via compression fittings – suitable for copper or multilayer pipe systems – to the terminal unit.

Advantages of Proflow Modular

g The primary advantage of the Proflow Modular system is its ability to be supplied in a wide variety of configurations in line with the specifiers' particular needs. Any component combination can be requested, and will be assembled specifically to meet individual requirements.

Other advantages of Proflow Modular include:

h Operational capabilities

- Can carry out any water flow control function required by a terminal unit – forward flush, bypass or backflush.
- The flow rate can be adjusted and set through the Proflow Venturi commissioning valve.

i Installation

- Installation planning is straightforward as all functions are contained within one unit.
- Requires no on-site or in situ adaptation prior to installation.
- A compact system, due to the valves' multifunctional capabilities and the ability to specify the flow and return centre spacing.

j Maintenance and practicalities

- Valves with extended spindles contain a unique integral non-rotating outer spindle. This ensures that the vapour seal is maintained once insulation is applied and the valve opened or closed.
- Ball valve handles are colour coded red or blue to indicate heating or chilled water respectively.
- Colour coded test points throughout the unit allow temperature and pressure measurements to be taken.
- Strainers can easily be removed without the need to drain water from the installation.

Proflow Modular components

k Each Proflow Modular system is made up of a number of components, each with a particular function. Following specification these components are factory configured, tested and packaged as a complete unit.

Tube and pipe compatibility

l Proflow Modular valves can be used with copper tube to BS EN 1057, carbon steel tube to DIN 2394/NEN 1982, steel tube to BS 1387 and multilayer tube as indicated in column I opposite.

Installation instructions

m Each Proflow Modular unit is supplied pre-assembled or with the specified individual components for self-assembly. Jointing instructions for Proflow Modular can be downloaded from the Yorkshire Fittings website.

Pre-commissioning

n Pre-commissioning the Proflow Modular system can be carried out in three simple steps – bypass operation, forward flush operation and backflush operation. Together, these flushing operations clear any debris which could have potentially entered the system during its assembly (refer to the adjacent illustrations and handle positions).

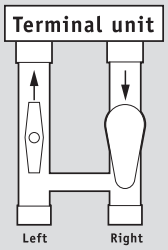
o The strainer basket will need to be emptied of debris following prolonged use of the forward flush operation. However, an in-built design feature means this is not necessary for the backflush operation.

Proflow Modular specification options

Simply select the required components from left to right. The corresponding codes will make up the unique order references as illustrated.

Column	A	B	C	D	E	F	G	H	I
Option	43	733	E	1-L	L	0	0	26	

- 26 — 22mm copper Eurocone compression to terminal unit
- H — ½" BSP female inlet
- G — Handle colour red
- F — Proflow Venturi left
- E — Proflow Venturi low flow
- D — Airvent left
- C — Ball valve with test point
- B — H module with 180mm centre distance
- A — DN15 unit size



A Size		B H module		C Valve module		D Accessory module		E Proflow Venturi		F Venturi left/right		G Handle colour		H Pipework connections		I Terminal unit connections	
43	DN15	730	H module 99mm	C	Ball valve	0-	None	U	Ultra low flow	L	Left	0	Red	0	½" BSP female	00	12 x 2.0 multilayer Eurocone compression
44	DN20	731	H module 145mm	D	Ball valve with extended spindle	1-	Airvent left	L	Low flow	R	Right	1	Blue	1	¾" BSP female	01	14 x 2.0 multilayer Eurocone compression
		732	H module 160mm	E	Ball valve with test point	2-	Test point left	S	Standard flow					2	15mm Tectite Pro	02	16 x 2.0 multilayer Eurocone compression
		733	H module 180mm	F	Ball valve with test points and extended spindles	3-	Drain left							3	22mm Tectite Pro	03	16 x 2.2 multilayer Eurocone compression
		734	H module 200mm	G	Ball valve with extended test points and extended spindles	4-	Airvent right							4	15mm compression	04	17 x 2.0 multilayer Eurocone compression
		735	H module 99mm hanger extension left	H	Y-Strainer	5-	Test point right							5	22mm compression	05	17 x 2.5 multilayer Eurocone compression
		736	H module 145mm hanger extension left	I	Y-Strainer with extended spindles	6-	Drain right									06	18 x 2.0 multilayer Eurocone compression
		737	H module 160mm hanger extension left	J	Y-Strainer with test points	7-	Airvent both									07	20 x 2.0 multilayer Eurocone compression
		738	H module 180mm hanger extension left	K	Y-Strainer with test points and extended spindles	8-	Test point both									08	20 x 2.25 multilayer Eurocone compression
		739	H module 200mm hanger extension left	L	Y-Strainer with extended test points and extended spindles	9-	Drain both									09	20 x 2.5 multilayer Eurocone compression
		740	H module 99mm hanger extension right													10	20 x 2.8 multilayer Eurocone compression
		741	H module 145mm hanger extension right													11	21 x 2.5 multilayer Eurocone compression
		742	H module 160mm hanger extension right													23	15mm copper Eurocone compression
		743	H module 180mm hanger extension right													26	22mm copper Eurocone compression
		744	H module 200mm hanger extension right													31	¾" male flat face
		745	H module 99mm hanger extension both														
		746	H module 145mm hanger extension both														
		747	H module 160mm hanger extension both														
		748	H module 180mm hanger extension both														
		749	H module 200mm hanger extension both														

Components of the Proflow Modular

The exploded photograph below illustrates a typical Proflow Modular combination. The basic H format is always retained and can be customised according to particular system design requirements. Where alternative components are available, the options have been illustrated to demonstrate the high level of flexibility provided by this system.

H module

Centre distances
For maximum flexibility any one of five different centre extensions can be selected to suit the flow and return pipework centre spacing. The following pipework centre spacings are available; 99mm, 145mm, 160mm, 180mm, 200mm.

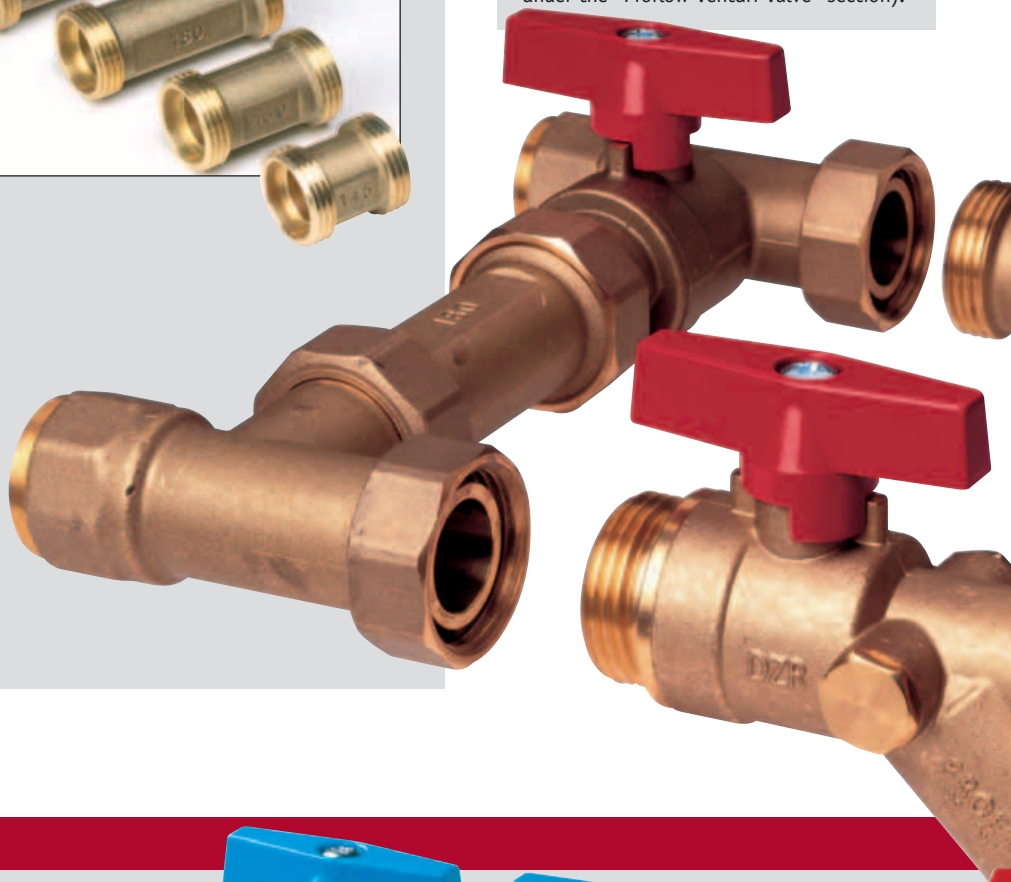
Hanger extensions
Optional hanger extensions (with a set length of 110mm) can be used on either side of the unit when there is a requirement for additional support.

Connections to main
The flow and return pipework connections are selected from the following options: female BSP in ½" and ¾", Tectite Pro and compression in 15mm and 22mm.

Ball valve
The H module quarter turn ball valve is available with either blue or red handles and with standard or extended spindles.

Size

The size is determined by the internal diameter of the Proflow Venturi and is available in either DN15 or DN20 nominal diameter (flow rate specified opposite, under the “Proflow Venturi Valve” section).



Valve module

Options
The valve module is available as either a quarter turn ball valve or a Y-Strainer.

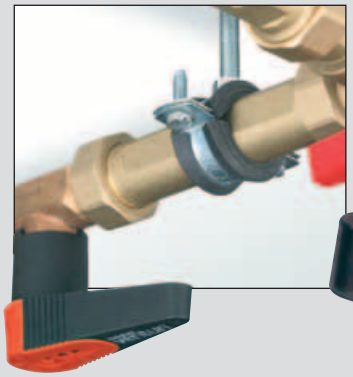
Ball valve
The quarter turn ball valve includes a drain off facility and can be selected with either red or blue handles with a further option for extended spindles. Test points can be added and extended if required.

Y-Strainer
The Y-Strainer is available with red or blue handles which can be closed to prevent water loss when cleaning the strainer. Extended spindles are available for use with the handles. The Y-Strainer contains an integral stainless steel mesh of 0.8mm diameter. The addition of test points on either side of the strainer provides an easy method of measuring the pressure differential and determine whether it is blocked. Test points can also be extended if required.

system

Hanger extension

The hanger extension is specified as a component of the H module.



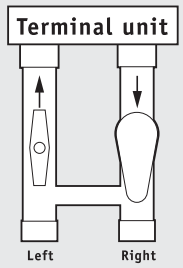
Proflow Venturi valve

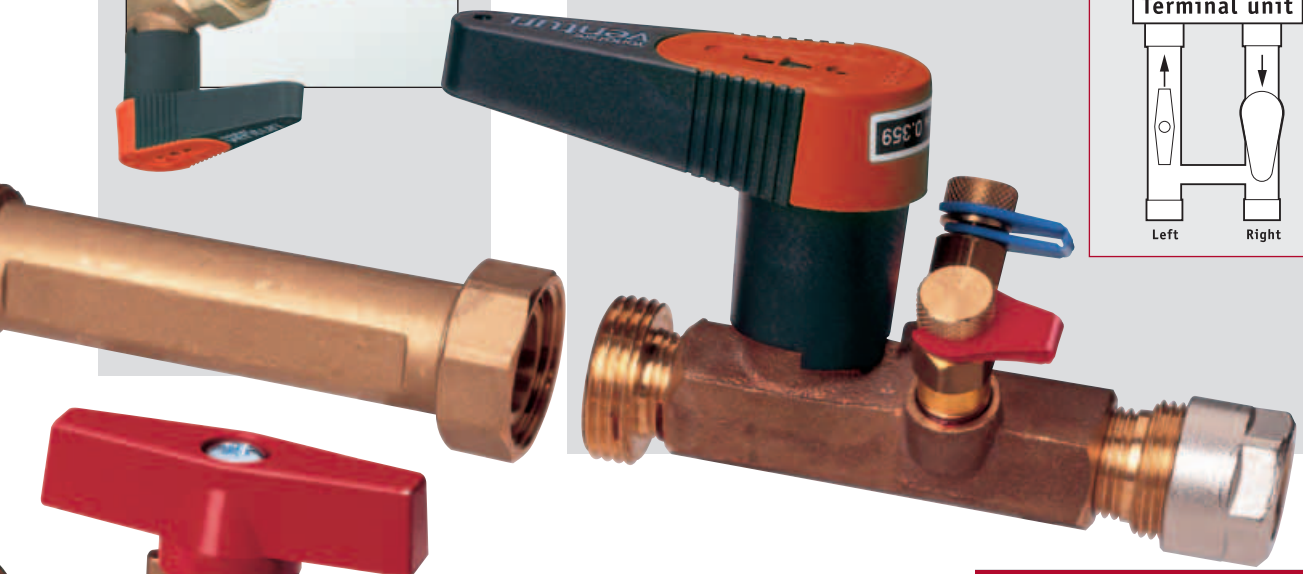
The unique Proflow Venturi commissioning valve is the key component within the module and precisely measures and regulates the flow.

Flow specifications
Proflow Venturi commissioning valves are available in ultra low flow, low flow and standard flow options.

Left hand or right hand options
The Proflow Venturi can be positioned on either side of the unit according to the requirements of the system. See diagram below for orientation definition.

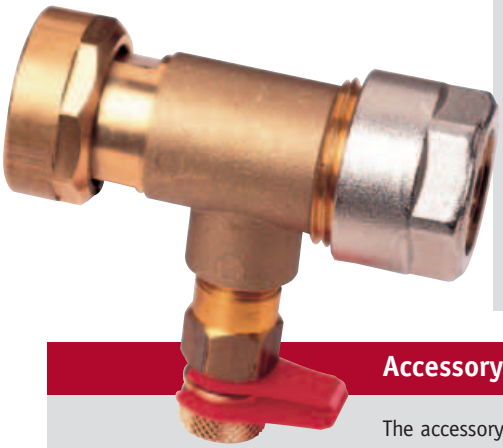
Proflow Modular orientation





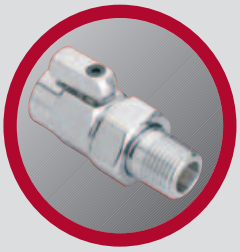
Connections to terminal unit

For connecting to the terminal unit, multilayer Eurocone compression, copper Eurocone compression or male flat face ends can be selected.



Accessory module

The accessory module is optional and provides the following additional features on one or both sides of the system if required: test point, drain off facility or airvent.



Introducing Proflow Ballofix

GAS FAMILIES

a **There are three gas families:**
- **1st Family – manufactured gas.**
- **2nd Family – natural gas.**
- **3rd Family – LPG, compressed propane and butane.**

b With over 140 patterns, the Proflow Ballofix range offers the specifier a comprehensive choice of inline isolation valves for potable water systems, hot and cold water services, oil, compressed air and gas applications.

c Proflow Ballofix valves are available in sizes from 8mm to 28mm and ¼" to 1¼" BSP. With threaded, compression, Tectite push-fit or XPress press-fit ends, Proflow Ballofix offers System compatibility. Valves are particularly suited for specification in the commercial and high-end domestic markets.

d All Proflow Ballofix valves operate through a proven reliable quarter-turn ball mechanism with an internal stop, which provides the user with a clear assurance that the valve is open or closed.

e Manufactured from DZR brass, Proflow Ballofix valves have the option of a commercial chrome finish. They are operated via a choice of allen key, plastic or metal handles.

f Such is the quality and established reputation of Proflow Ballofix - the genuine Broen Ballofix valve - that in many cases "Ballofix" has become the generic term for all isolating ball valves.

The Proflow Ballofix range

g The Proflow Ballofix range comprises:

h **Standard isolating ball valves** - available in straight and angle patterns.

i **Service valves** - allow sections of pipework to be isolated for repair or maintenance work without the need to drain the entire system.

j **Radiator valves** - for the regulation and isolation of radiators. Some have integral drain-offs.

k **Minibore valves** - for minibore central heating systems.

l **Double check valves** - used to prevent back syphonage.

m **Filter valves** - contain a built in filter.

n **Gas valves** - can be identified by their yellow colour, and are for use with 1st, 2nd and 3rd family gases.

o **Lockable valves** - provide total system and storage security.

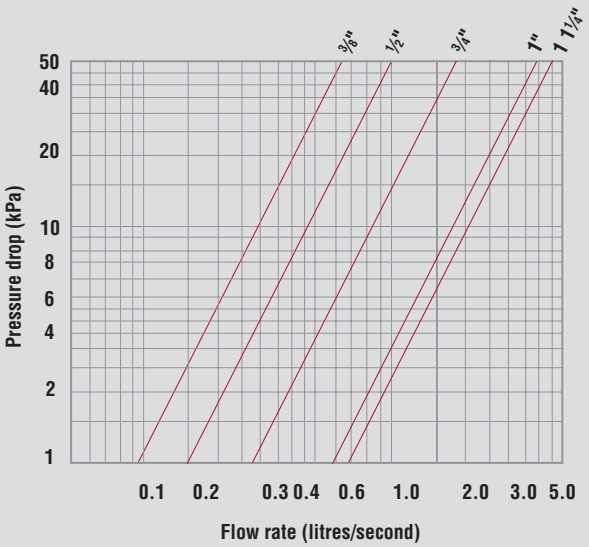
p **Wallfix valves** - used in connection with wash basins, toilets and mixer taps. The sealing plate behind the flange prevents water from running back into the wall.

q Standard isolating ball valves, double check valves, service valves, minibore valves, lockable valves and wallfix valves contain a Viton 'O' ring. Radiator and drain-offs contain an EPDM 'O' ring, and gas valves contain a nitrile rubber 'O' ring.

Tube and pipe compatibility

r Proflow Ballofix valves are designed for use with plain and chrome plated copper tube to BS EN 1057 R250 and R290. In water services they can also be used with PEX and PB pipe (with appropriate liner). For full details of tube and pipe specifications, refer to pages 32 and 33.

1 **Flow rate chart for Proflow Ballofix valves**



Introducing Proflow Ballomax

a Proflow Ballomax all-welded steel ball valves are designed as shut-off valves to convey water, air, oil or other fluids. They are primarily used in heating systems, district heating and industrial applications. Available with female threaded, welded and flanged connections, the range is available in sizes from ½" to 20". Proflow Ballomax valves can be buried directly underground and resist all stresses from the pipe system.

b The integral quarter turn ball within the Proflow Ballomax is self-centering, and the seat seals are spring-loaded to provide the necessary contact pressure between ball and seat.

Flow rates

c The flow rates of Proflow Ballomax valves are shown in Chart 1 below.

Dimensions

d Dimensions of Proflow Ballomax valves vary by product. These can be downloaded from the Yorkshire Fittings website.

Installation

e All Proflow Ballomax steel ball valves with welding ends can be electro- or autogenously welded. Excessive heating of the valve casing is to be avoided. The welding ends should not be shortened, since these have been tailored to the individual welding processes to ensure that the transmission of heat has no effect on the sealing material. The ball valves must be fully open during installation. Once installed, Proflow Ballomax valves are maintenance free.

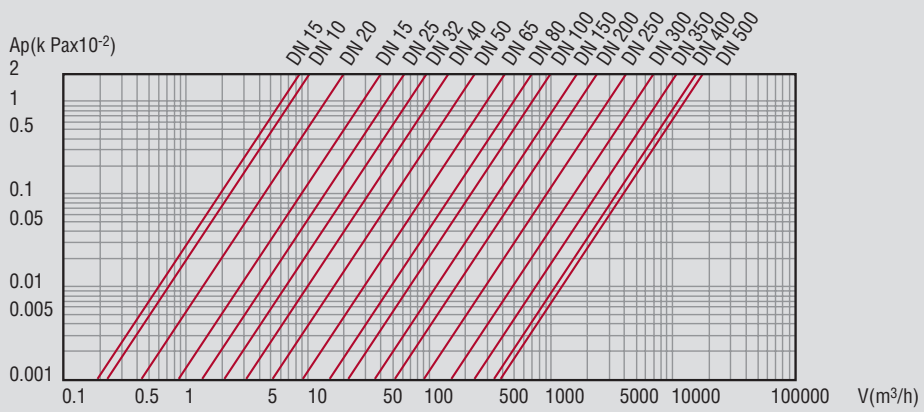
CONNECTORS

f The Proflow Ballomax range is available with female BSP, welded or flanged connectors.

ACCESSORIES

g The Proflow Ballomax range is complemented by a selection of hot tapping toolkits and electric or manual actuators.

1 Flow rate chart for Proflow Ballomax valves



Introducing Proflow Linevalves

TRACEABILITY

a All Proflow Linevalves butterfly valves can be traced throgh a riveted metal tag on the valve.

b The Proflow Linevalves range incorporates butterfly valves, check valves, strainers and pressure reducing valves.

Butterfly valves

c Butterfly valves are available in semi- and fully-lugged patterns in sizes from 65mm to 300mm. Manufactured from cast iron with stainless steel discs, butterfly valves are suitable for use in commercial water services, HVAC and gas applications in lever or gear-operated varieties. Butterfly valves have the following attributes:

- Spline driven one-piece shaft connected to a spherically machined disc allows high torque transmission (quick response and minimum backlash).
- Anti-friction bearings result in long term reliability.
- Blow out protection from a circlip allows safe maintenance.
- Interchangeability of all parts including discs, shafts and liners simplifies service and reduces maintenance costs.
- Vertical or horizontal operating position.
- Centering lugs, tapped lugs and flanged options.
- Hand lever can be padlocked.

Butterfly valves for water services

d Proflow Linevalves butterfly valves for water services are available in PN16 in fully lugged and semi lugged patterns. With an EPDM liner, they are WRAS approved and are designed for use in commercial water services.

Butterfly valves for gas services

e Proflow Linevalves butterfly valves for gas services are available in PN6 in fully lugged and semi lugged patterns. With a nitrile liner, they are Gaz de France approved and are designed for district or industry natural gas applications.

Check valves

f Heavy-duty check valves are available in sizes from 40mm to 300mm and ½" to 2". Manufactured from cast iron, bronze or stainless steel, check valves are suitable for use in commercial water services and HVAC applications.

Wafer pattern check valves

g These wafer pattern non-return check valves are available in cast iron (PN16) and stainless steel (PN10, PN16).

Swing check valves

h Swing check valves are available as cast iron PN16 or bronze PN25. All have metal to metal seat and disks.

Lift check valve

i Designated PN32, the bronze lift check valve has a metal to metal seat and disc with threaded BSP parallel ends.

Strainers

j Heavy-duty strainers are available in sizes from 50mm to 300mm and ½" to 2". Manufactured from cast iron or bronze, strainers are suitable for use in commercial water services and HVAC applications. Y-pattern strainers are available in cast iron (PN10/PN16), and bronze (PN 16).

Pressure reducing valves

Pressure reducing valves

a Pressure reducing valves are spring-loaded, and are suitable for use with water or compressed air in domestic and commercial applications where a reduced and stabilised pressure is required before it reaches the point of use. Available in sizes from ½" to 1", pressure reducing valves are manufactured from bronze and DZR brass. The valves have the following benefits:

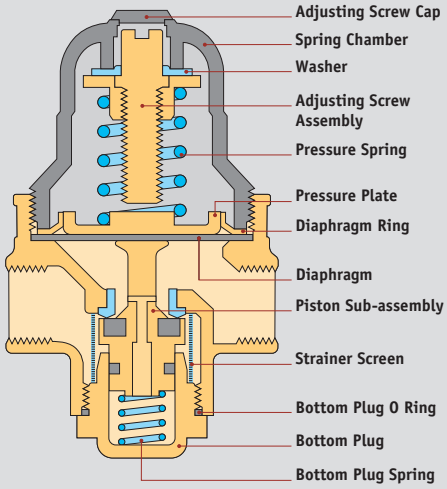
- Pressure balanced piston, delivering constant outlet pressure even where inlet pressure fluctuates severely.
- Non-rising adjustment screw for added safety and convenience.
- Adjusting mechanism blanking cap deters unwanted tampering after installation.
- In-line repair and serviceability with removable stainless steel strainer.
- All metal parts in contact with water are either bronze, DZR alloy, or stainless steel.
- WRAS approved.
- Centrally positioned pressure gauge tappings available both sides for ease of installation.
- DZR alloy pressure gauge connection blanking plugs resist blow out in the event of freezing.
- Compact and visually pleasing design, reflecting the high quality of the valve.
- Matching pressure gauges also available.

b Standard pressure reducing valve items are supplied with adjustable pressure ranges.

Flow rate and dimensions

c Flow rate and dimensions of Proflow Linevalves vary by product and can be downloaded from the Yorkshire Fittings website. The flow rates for pressure reducing valves can be seen here in Chart 2.

1 Pressure reducing valve components



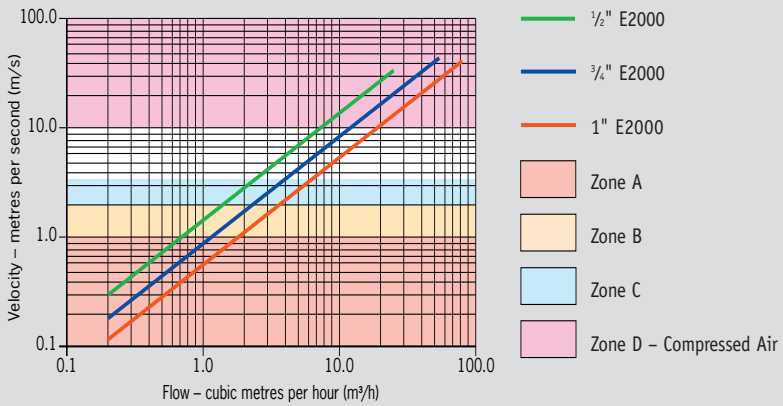
INSTALLATION EXAMPLES

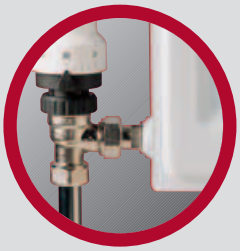
d **Here are a few examples where pressure reducing valves should be installed:**

- **In the rising main to a dwelling.**
- **Where sensitive and costly domestic equipment cannot withstand high pressure, or pressure surges.**
- **Where a constant pressure is required to safety critical equipment such as unvented hot water storage systems and instantaneous showers or multipoint water heaters.**
- **Where every dwelling or unit requires equal pressure distribution, such as in high-rise housing.**

N.B. E2000 pressure reducing valves can be used in most applications, but in the event that any component downstream of the E2000 cannot withstand the maximum potential inlet pressure applied, then adequate pressure relief protection should be provided upstream of such components.

2 Valve Sizing Chart

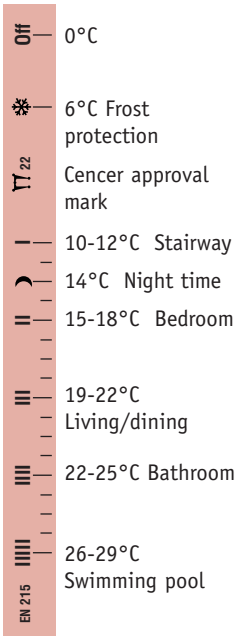




Introducing Proflow Mistral radiator valves

TEMPERATURE SETTINGS

a Mistral and Mistral Pro temperature settings, showing the relationship between the settings on the valve head and the approximate room temperature achieved.



b All Proflow Mistral TRVs are calibrated in controlled conditions with position III equal to approximately 20°C.

KV AND KVS VALVES

c The Kv value indicates the flow rate in m³/h for a pressure drop across the valve of 1 bar (100 kPa).

d The Kvs value is the Kv value when the valve is fully open.

FROST PROTECTION SETTING

e Provided the central heating boiler and pump remain operative, the frost protection setting allows heat to circulate within the system e.g. where properties are vacant over the winter months, to prevent freezing and consequent damage to the system.

f Proflow Mistral radiator valves comprise a comprehensive range of thermostatic, manual and lockshield radiator valves, valve bodies and headworks. The range uses specially formulated liquid-filled sensors to ensure quick response to changes in room temperature.

Proflow Mistral thermostatic radiator valves

g Proflow Mistral thermostatic radiator valves (TRVs) enable the user to set the desired temperature with ease in conventional two-pipe wet central heating systems.

h Manufactured from brass and supplied in a quality plated finish, Proflow Mistral TRVs are supplied complete with compression or push-fit ends and male iron tails. The Proflow Mistral manual lockshield valve should be used in conjunction with the Proflow Mistral TRV, and the two are available for sale in a set as a "pair".

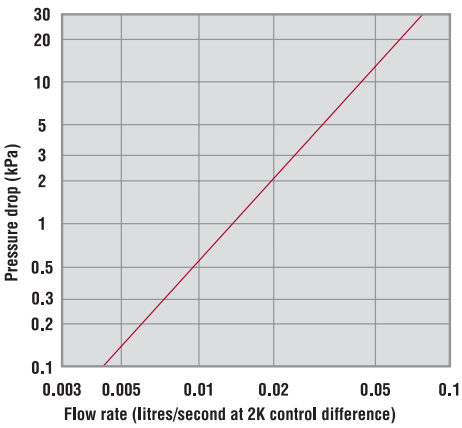
i The Proflow Mistral TRV is most effective when installed horizontally in the flow, although it can equally be installed vertically in the flow or return.

j Proflow Mistral TRVs control room temperature from 0°C to 28°C and incorporate a positive shut-off facility allowing the user to fully close down the TRV. An integral discreet locking and limiting facility allows users to set and lock a pre-determined temperature. Special temperature sensing liquid in the head enables all Proflow Mistral TRVs to accurately detect temperature variations.

Flow rates

k The Proflow Mistral TRV is a high performance valve which provides the following flow characteristics under the standard operating conditions.

1



2

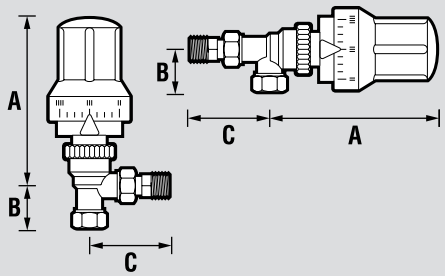
Size	Kv value (m³/h) Control difference (K)					Kvs
	1	1.5	2	2.5	3	
8mm	0.25	0.37	0.49	0.58	0.66	0.95
10mm	0.25	0.37	0.49	0.58	0.66	1.15
15mm	0.25	0.37	0.49	0.58	0.66	1.35

Dimensions

l Proflow Mistral TRVs are available in sizes 8mm x ½" BSP, 10mm x ½" BSP and 15mm x ½" BSP, making them suitable for use with most conventional central heating systems. The following table indicates the building in dimensions of Proflow Mistral TRVs.

3

All sizes	A	B	C
Fitted vertically	100mm	28mm	50mm
Fitted horizontally	100mm	32mm	47mm



Proflow Mistral Pro thermostatic radiator valves

m The Proflow Mistral Pro TRV is robust and suitable for installation in areas where high levels of adjustment are experienced. It is designed for use in conventional two-pipe wet central heating systems in industrial and commercial installations, such as office blocks, public buildings, nursing homes and student accommodation.

Proflow Mistral Pro TRVs and heads

a The Proflow Mistral Pro TRV has the same attributes and features as the Proflow Mistral TRV. In addition, Proflow Mistral Pro TRVs can be turned beyond the frost setting to reach Zero, thereby achieving a complete shut-down of the TRV at ambient room temperatures above 1°C.

Flow rates

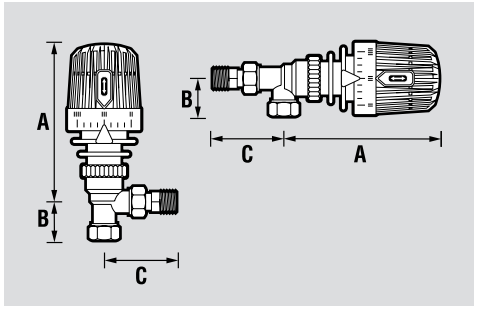
b The Proflow Mistral Pro TRV head, when used on a standard Proflow Mistral TRV body, has the flow characteristics indicated in Chart 1 opposite.

Dimensions

c Proflow Mistral Pro TRVs are available in 15mm x ½" BSP, making it suitable for most standard central heating systems.

1

All sizes	A	B	C
Fitted vertically	107mm	28mm	50mm
Fitted horizontally	107mm	32mm	47mm



Proflow Mistral Pro thermostatic heads

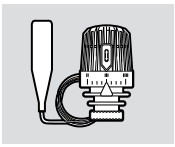
d Installers and specifiers can select from a range of complete valves, or choose from a wide selection of TRV heads and bodies to find the combination that best suits their needs.

e A standard Proflow Mistral Pro TRV head is suitable for use with all Proflow Mistral Pro bodies. Other Proflow Mistral Pro TRV heads are detailed below.

- **Proflow Mistral Pro remote sensor TRV head.** Recommended where curtains, furniture or radiator panels could distort the measurement of the ambient room temperature. The remote sensor should be placed in the room up to five metres from the installed valve.
- **Proflow Mistral Pro anti-theft head.** This head incorporates an anti-theft ring which prevents unauthorised removal of the thermostatic head.
- **Proflow Mistral Pro anti-tamper head.** Anti-tamper heads are recommended for use in situations where unauthorised and unwanted adjustment of TRVs may occur, such as schools, colleges and other public buildings. A special setting tool ensures only authorised personnel are able to adjust the valve.
- **Proflow Mistral Pro remote head.** Ideal for situations where installation on the radiator would prevent reasonable access, for example in the case of disabled or infirm users. The Proflow Mistral Pro remote heads can be installed up to fifteen metres away from the valve body, which is mounted on the radiator in the usual way.

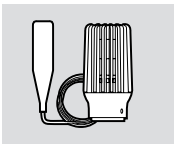
f The benefits of Proflow Mistral Pro TRV heads can be summarised in Table 2 below.

PROFLOW MISTRAL PRO TRV HEADS

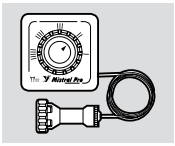


g Mistral Pro remote sensor TRV head

h Mistral Pro anti–theft TRV head



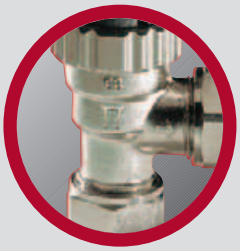
i Mistral Pro remote anti–tamper TRV head



j Mistral Pro remote TRV head

2

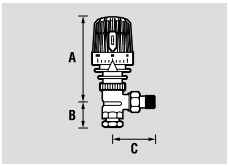
	Features				
	Mistral Pro head	Mistral Pro remote sensor	Mistral Pro remote head	Mistral Pro anti-tamper head	Mistral Pro anti-theft head
Temperature range	6°C - 28°C	6°C - 27°C	8°C - 27°C	8°C - 26°C	6°C - 28°C
Maximum sensor temperature	50°C	50°C	50°C	50°C	50°C
Sensor	Liquid	Liquid	Liquid	Liquid	Liquid
Range	0 – IIIII	0 – IIIII	I – IIIII	1 – 5	0 – IIIII
Night time setting	Yes	Yes	No	No	Yes
Frost setting	+6°C	+6°C	+8°C	+8°C	+6°C
Anti-theft device	No	No	No	Yes	Yes
Tamperproof temperature locking	Yes	Yes	Yes	Yes	Yes
Tamperproof temperature limiting	Yes	Yes	Yes	Yes	Yes
Economy clip	Yes	Yes	No	No	Yes
Positive shut off	Yes	Yes	No	No	Yes
Hysteresis	0.2K	0.2K	0.5K	0.2K	0.2K
Capillary length	No	2m	2m	No	No

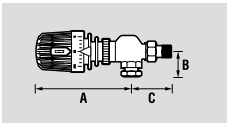


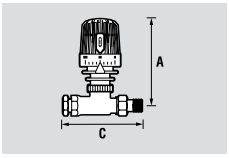
Proflow Mistral Pro thermostatic bodies

DIMENSIONS

a **Proflow Mistral Pro TRV bodies and Proflow Mistral Pro lockshield bodies have the building in dimensions shown in Table 5 on this page and Table 1 on the opposite page respectively.**







Proflow Mistral Pro thermostatic bodies

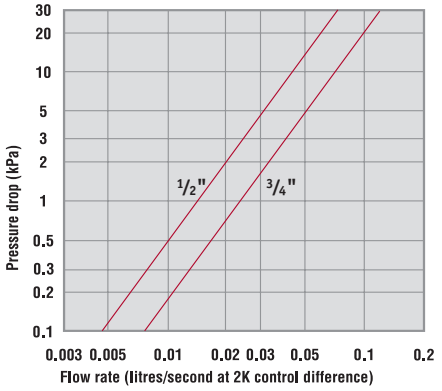
b Proflow Mistral Pro TRV bodies are compatible with Proflow Mistral Pro TRV heads. They can be used in two-pipe central heating systems, with special low-resistance versions available for single pipe systems. Proflow Mistral Pro TRV bodies are designed to maintain their orientation, following the flow arrow direction indicated on the valve body. They are supplied with compression ends – for use on steel or copper systems – and male iron tails – see tube compatibility on page 32. Proflow Mistral Pro lockshield valves should be used to complement the TRV range. All are manufactured from brass or gunmetal with a nickel plated finish.

c The following types of Proflow Mistral Pro bodies are available: Low resistance TRV angle/straight/axial body, angle/straight/axial TRV body, pre-set angle/straight body, lockshield angle/straight body.

Flow rate

d Proflow Mistral Pro valves provide the following flow characteristics under standard operating conditions.

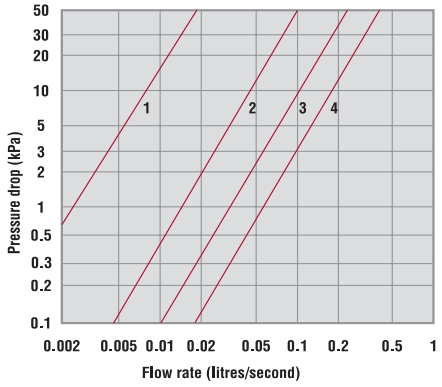
1 **Proflow Mistral Pro TRV head with Pro body**



2

Size	Kv value (m³/h)					Kvs
	Control difference (K)					
	1	1.5	2	2.5	3	
½"	0.25	0.37	0.49	0.58	0.66	1.35
¾"	0.40	0.60	0.79	0.98	1.26	2.50

3 **Proflow Mistral Pro lockshield body – manual**



4

Size	Kv value (m³/h)				Kvs
	Control difference (K)				
	1	2	3	4	
½"	0.09	0.52	1.15	1.79	2.09
¾"	0.09	0.52	1.15	1.89	2.34

5 **Building in dimensions for Proflow Mistral Pro TRV bodies**

Valve	Headwork														
	Proflow Mistral Pro			Proflow Mistral Pro anti-tamper head			Proflow Mistral Pro anti-theft head			Proflow Mistral Pro remote sensor			Proflow Mistral Pro remote head		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Vertical															
15mm x ½"	107mm	36mm	58mm	107mm	36mm	58mm	107mm	36mm	58mm	107mm	36mm	58mm	80mm	36mm	58mm
22mm x ¾"	107mm	39mm	66mm	107mm	39mm	66mm	107mm	39mm	66mm	107mm	39mm	66mm	80mm	39mm	66mm
Horizontal															
15mm x ½"	107mm	38mm	58mm	107mm	38mm	58mm	107mm	38mm	58mm	107mm	38mm	58mm	80mm	38mm	58mm
Straight															
15mm x ½"	107mm	N/A	105mm	107mm	N/A	105mm	107mm	N/A	105mm	107mm	N/A	105mm	80mm	N/A	105mm
22mm x ¾"	107mm	N/A	116mm	107mm	N/A	116mm	107mm	N/A	116mm	107mm	N/A	116mm	80mm	N/A	116mm
Reversible															
15mm vertical	107mm	28mm	50mm	107mm	28mm	50mm	107mm	28mm	50mm	107mm	28mm	50mm	107mm	28mm	50mm
15mm horizontal	107mm	32mm	47mm	107mm	32mm	47mm	107mm	32mm	47mm	107mm	32mm	47mm	107mm	32mm	47mm

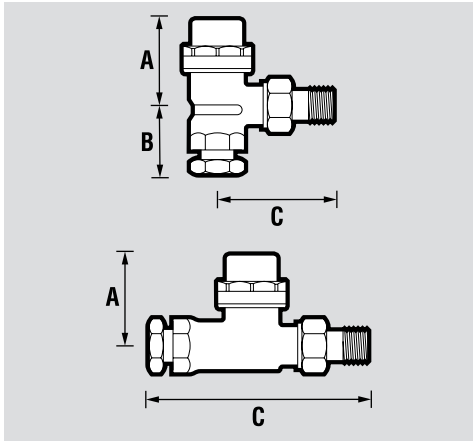
Proflow Mistral manual valves

Dimensions

a Sizes of Proflow Mistral Pro lockshield bodies are shown here in Table 1.

1

Sizes	A	B	C
Vertical pattern			
15mm x ½"	65mm	26mm	58mm
22mm x ¾"	68mm	29mm	66mm
Straight pattern			
15mm x ½"	42mm	N/A	80mm
22mm x ¾"	42mm	N/A	91mm



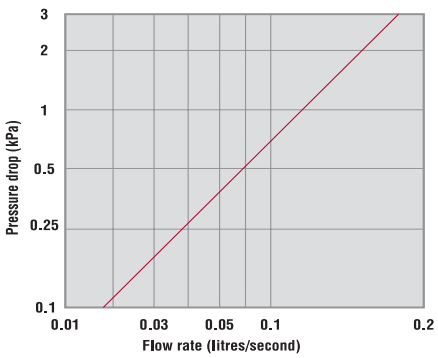
Proflow Mistral manual radiator valves

b Proflow Mistral manual radiator valves are a cost effective way of controlling and isolating water flow in open vented and most sealed pressurised hot water heating systems where individual thermostatic room temperature control is not required. The Proflow Mistral manual lockshield valve should be used in conjunction with the Proflow Mistral TRV, and the two can be purchased together as a set.

Flow rates

c The Proflow Mistral manual radiator valve is a high performance valve which provides the following flow characteristics.

2

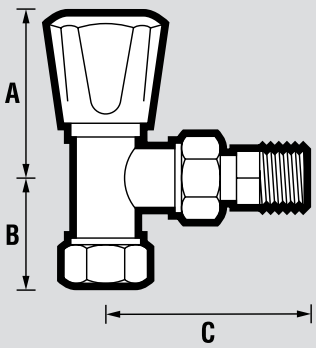


Dimensions

d Proflow Mistral manual radiator valves are available in sizes 8mm x ½" BSP, 10mm x ½" BSP and 15mm x ½" BSP, and are suitable for use with most conventional central heating systems. The following table indicates the building in dimensions of Proflow Mistral manual radiator valves.

3

Size	A	B	C
All sizes	59mm	30mm	54mm



REMOVAL OF MANUAL HEAD

e **Valves can be converted to lockshield by simply replacing the wheel head with the lockshield cap provided with every valve.**

Proflow Mistral ABVs and accessories

MISTRAL ABV

a Once installed the Mistral ABV automatically compensates for changes in differential pressure.

INSERT FITTING TOOL

b Used for removal and installation of valve insetts.

Proflow Mistral automatic bypass valves

c The Proflow Mistral Automatic Bypass Valve (ABV) should be used to maintain a constant pressure in pumped heating systems. With individual room temperature control, pump head pressure will increase where individual TRVs close down and flow within the system is reduced. This can over-stress the pump and cause slight system noise. The Proflow Mistral ABV prevents this.

Flow rates

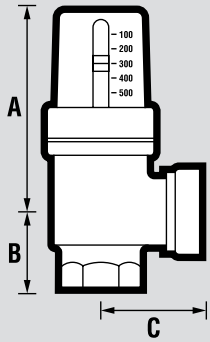
d Proflow Mistral ABVs have the flow characteristics shown in Chart 2 below.

Dimensions

e The Proflow Mistral ABV is available in sizes ¾", 1" and 1¼", and is suitable for a variety of central heating systems. The following table indicates the building in dimensions of Proflow Mistral ABVs.

1

Size	A	B	C
¾"	85mm	32mm	40mm
1"	90mm	37mm	48mm
1¼"	90mm	46mm	55mm



f Proflow Mistral accessories

The Proflow Mistral range is completed by a selection of accessories, namely:

- **Insert replacement tool.** For removal and installation of valve inserts.
- **Box spanner.** For loosening and tightening valve insert prior to/after removal.
- **Sensor cover removal tool.** To be used on Mistral Pro heads when setting or locking temperature.
- **Universal setting and adjustment key.** For use when adjusting temperature settings.
- **2mm allen key for anti-tamper head.** Used when attaching the anti-theft head to valve bodies.
- **Capillary reel storer.** Storage unit for excess capillary tube.
- **Blanking nuts.** Additional safety measure recommended when removing radiators.

Tube and pipe compatibility

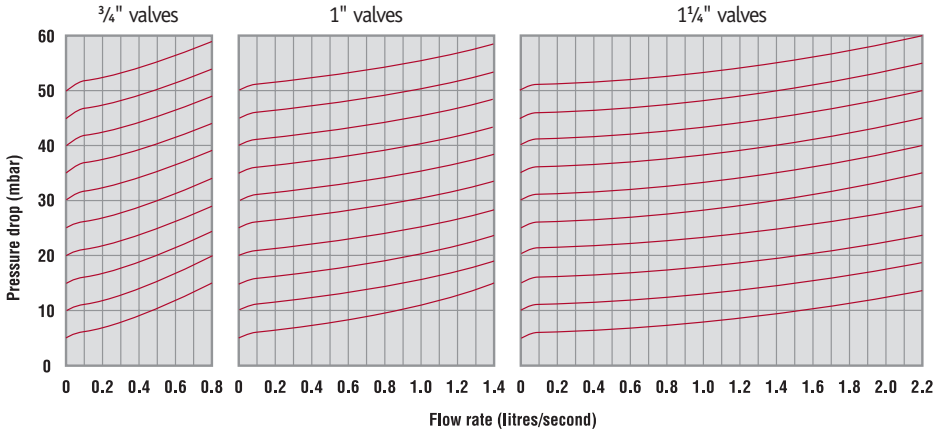
g All Proflow Mistral valves are compatible with copper tube to BS EN 1057, and with thin–walled stainless steel and carbon steel tubes, such as our XPress system tubes. In addition, standard Proflow Mistral valves can be used with PEX and PB pipes.

h Proflow Mistral valves are, by removing the nut and olive, compatible with steel tube to BS 1387. For tube and pipe specification details, refer to pages 32 and 33.

Installation

i For full installation and maintenance instructions for Proflow Mistral valves, refer to the instruction sheet available on the Yorkshire Fittings website.

2 **Flow rates of ABV's**



Introducing Proflow Suremix

a Proflow Suremix thermostatic mixing valves (TMVs) are designed with user safety in mind. They allow water to be stored at a temperature above 60°C (which prevents the growth of bacteria such as legionella), and supply it to the point of use at a safe predetermined temperature, typically around 43°C. Proflow Suremix HCX valves are the ideal choice for schools, hospitals and recreational areas.

b Selected Proflow Suremix valves are compliant with the TMV3 scheme and the NHS Model Engineering Specification D08. They are available with union connections for under basin, mixing, shower and bath applications.

c The headwork of Proflow Suremix enables the desired water delivery temperature to be set and locked with ease. The specially formulated sensing elements ensure quick response to changes in supply temperature, providing a stable mixed water temperature at the point of use. Proflow Suremix TMVs incorporate a shut-off mechanism in the event of hot or cold water failure. This, combined with the anti-tamper locking mechanism, contributes to exceptional user safety.

d The Proflow Suremix range comprises:

- **Proflow Suremix UB.** A Type 2 TMV with an L-shape configuration, designed for installation under sinks and basins.
- **Proflow Suremix C.** A Type 2 TMV designed for general mixing applications.
- **Proflow Suremix HCX.** A Type 3 TMV which conforms to the NHS Model Engineering Specification D08 and is approved under the TMV 3 scheme. Designed for installation under basins, in showers and for baths. Available with quarter turn ball valve inlets.
- **Proflow Suremix D.** Dummy valves which enable pipework to be flushed through to remove any debris.

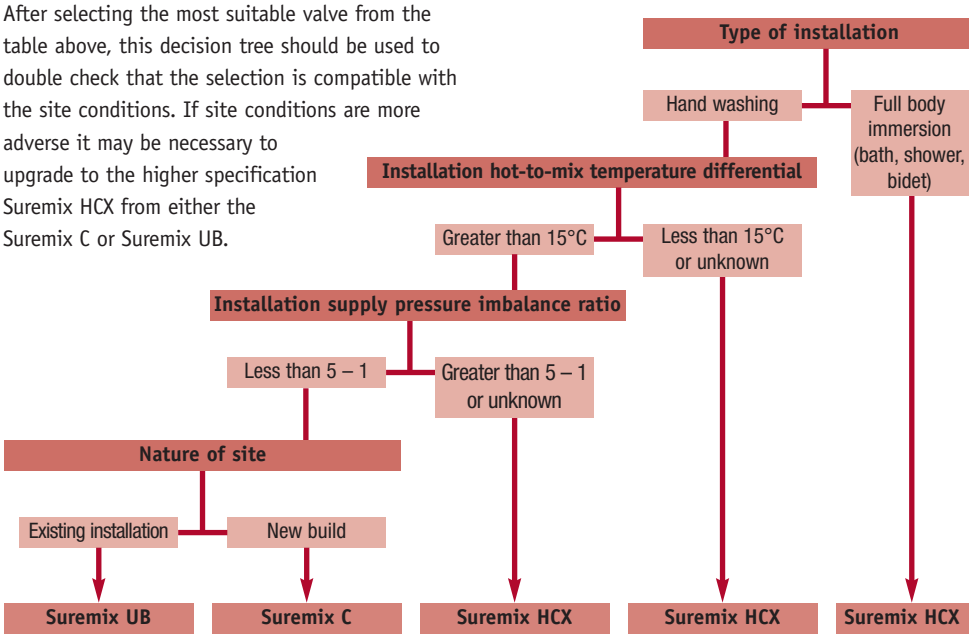
TMV 3 SCHEME

e **The Suremix HCX has undergone third party testing to the requirements of the NHS Model Engineering Specification D08. They have also been awarded a TMV3 license by the thermostatic mixing valve TMV scheme.**

1 **This table will aid the selection of the correct Proflow Suremix TMV**

Hospitals, Nursing homes, Care homes		Schools, Colleges, Universities		Clinics, Surgeries, Institutions	Other public places	Valve type
Patient & resident areas	Staff and visitor areas	Young children	Other			
✓		✓		✓		Suremix HCX
	✓		✓		✓	Suremix C
	✓		✓		✓	Suremix UB

After selecting the most suitable valve from the table above, this decision tree should be used to double check that the selection is compatible with the site conditions. If site conditions are more adverse it may be necessary to upgrade to the higher specification Suremix HCX from either the Suremix C or Suremix UB.



Proflow Suremix UB and C data

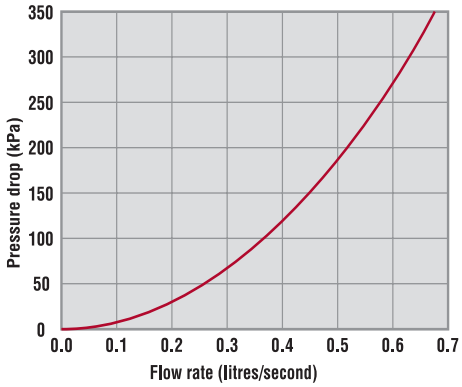
PROFLOW SUREMIX UB

a

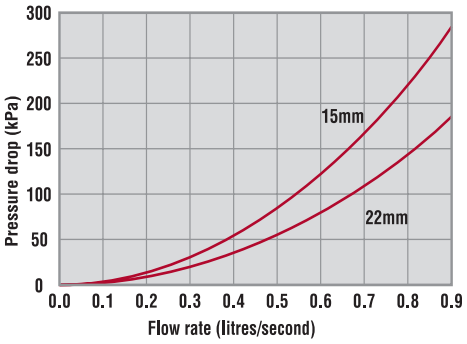
The Proflow Suremix UB is specifically designed for under basin applications. The L-shape connection configuration allows quick and simple installation.

Flow rates

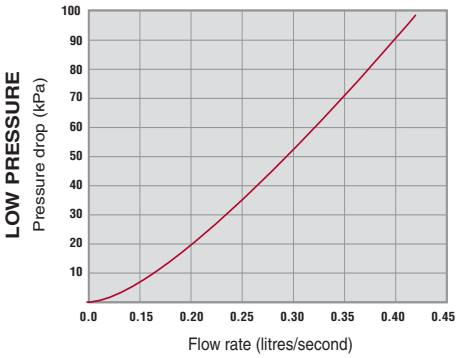
1 Proflow Suremix UB flow characteristics

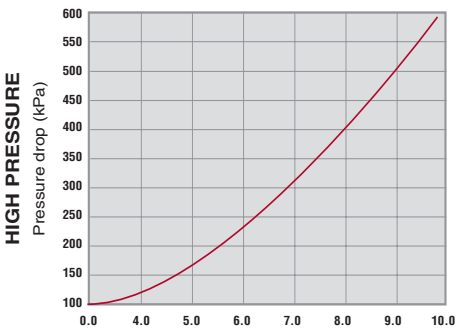


2 Proflow Suremix C flow characteristics



3 Proflow Suremix HCX flow characteristics



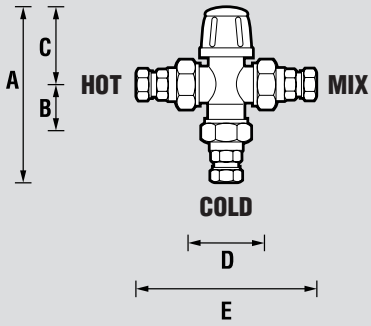


Dimensions

b The building in dimensions for Proflow Suremix TMVs are shown in the tables below.

4

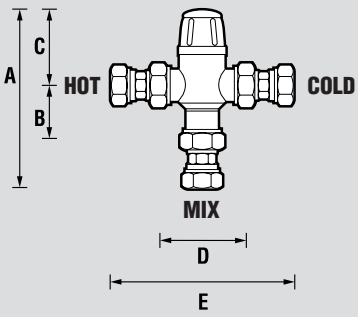
Dimensions for Proflow Suremix UB		15mm	22mm
A	Overall height	148mm	-
B	Centre line to bottom face	35mm	-
C	Centre line to top face	60mm	-
D	Face to face	77mm	-
E	Overall width	150mm	-



UKWFBS listings number 9704080

5

Dimensions for Proflow Suremix C		15mm	22mm
A	Overall height	150mm	150mm
B	Centre line to bottom face	52mm	25mm
C	Centre line to top face	58mm	58mm
D	Face to face	77mm	77mm
E	Overall width	160mm	170mm

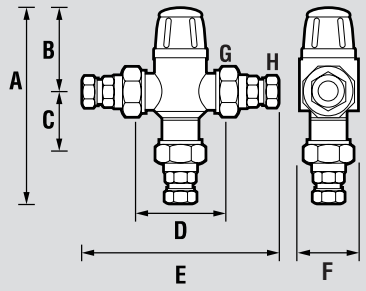


UKWFBS listings number 9704080

Proflow Suremix HCX data

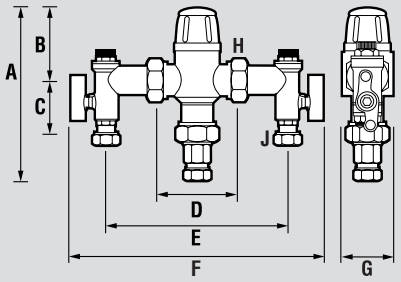
1 Dimensions for Proflow Suremix HCX

		15mm	22mm
A	Overall height	155mm	155mm
B	Centre line to top cover	50mm	50mm
C	Centre line to bottom face	50mm	50mm
D	Face to face	78mm	78mm
E	Overall width	160mm	160mm
F	Depth	40mm	40mm
G	Flat face union	1" BSP	1" BSP
H	Compression nut	15mm	22mm



2 Dimensions for Proflow Suremix HCX with right angled QTBV6

		15mm	22mm
A	Overall height	155mm	155mm
B	Centre line to top cover	50mm	50mm
C	Centre line to bottom face	50mm	50mm
D	Face to face	78mm	78mm
E	Centre line between QTBV	157mm	157mm
F	Overall width	220mm	220mm
G	Depth	40mm	40mm
H	Flat face union	1" BSP	1" BSP
J	Compression nut	15mm	22mm



Tube and pipe compatibility

a Proflow Suremix valves are compatible with copper tube to BS EN 1057. For tube specification details refer to page 32.

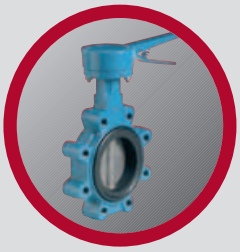
Installation

b Full installation and maintenance instructions for Proflow Suremix TMVs can be found in the instruction sheet on the Yorkshire Fittings website.

ACCESSORIES

c The Proflow Suremix range is complemented by a selection of accessories:

- Proflow Suremix dummy valves.
- Service kits.
- Strainer and check valve kits.
- 'O' ring kits.



Proflow Venturi and Modular performance

PERFORMANCE RATINGS

a **In all instances, the working temperature and pressure is dictated by the component with the lowest performance rating. An example for Proflow Modular is given below:**

b **Configuration: A Proflow Modular unit with a BSP female inlet connection to the pipework end, and a copper Eurocone connection to the terminal unit end, jointed to copper tube to BS EN 1057.**

c **The unit would perform to the component with the lowest performance rating. For operation at 110°C this would be the female BSP inlet, with a performance of 6 bar. However, for operation at 30°C it would be the copper Eurocone connection, with a performance of 10 bar.**

Proflow Venturi

d Proflow Venturi commissioning valves perform to the following working temperatures and pressures. The working temperature and pressure is dictated by the component with the lowest performance rating, so for example a Proflow Venturi (compression ends), connected with PEX or PB pipe would perform to a lower level than the figures indicated below for copper tube. Proflow Venturi valves are designed and manufactured to Article 3, Section 3, to Sound Engineering Practice (S.E.P.) under the P.E.D.

1 **Proflow Venturi (compression) valve performance when correctly assembled with copper tube to BS EN 1057**

Size	Service temperature	
	Min -1°C	Max 120°C
15mm to 54mm	5 bar	5 bar

2 **Proflow Venturi performance (female BSP connections), when correctly assembled with the appropriate union fittings and tube**

Size	Service temperature			
	Min -1°C	100°C	120°C	Max 135°C
½" to 2"	20 bar	20 bar	16 bar	16 bar

3 **Proflow Venturi steel valve performance (flanged and grooved connections) when correctly assembled with appropriate fittings/flanges and tube**

Size	Service temperature	
	Min -1°C	Max 105°C
65mm to 300mm	16 bar	16 bar

4 **Proflow Venturi test point performance when correctly assembled**

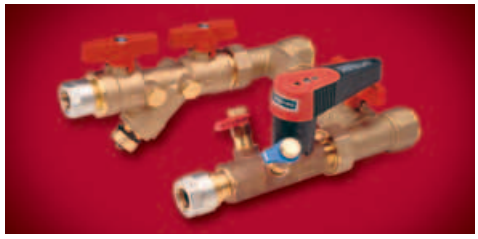
Size	Service temperature		
	Min -1°C	60°C	Max 120°C
All sizes	69 bar	69 bar	34 bar

Test pressures

e Test pressures for all Proflow Venturi valves comply with ISO 5208: 1993 E.

f For Proflow Venturi in sizes 15mm to 54mm and ½" to 2", both shell, seal and spindle perform at 6 bar (gas).

g For Steel Proflow Venturi in sizes 65mm to 300mm, the shell performs at 24 bar hydrostatically.



Proflow Modular

h The working temperature and pressure performance of Proflow Modular is dependent on the connection configuration selected.

i The tables below indicate the relevant working temperatures and pressures of Proflow Modular and the various connection options. In all instances, the working temperature and pressure capabilities of the connecting pipework should also be considered, by referring the to the relevant manufacturers specifications.

j Proflow Modular contains a Proflow Venturi commissioning valve. These are designed and manufactured to Article 3, Section 3, to Sound Engineering Practice (S.E.P.) under the P.E.D.

k The performance of the Proflow Modular unit is dictated by the part – the unit itself, the connections or the pipework – with the lowest performance rating.

Inlet connections performance

l The following Tables 5-7 indicate the performance of Proflow Modular inlet connections.

5 **BSP female connection performance**

Size	Service temperature			
	Min -40°C	30°C	65°C	Max 110°C
½" , ¾"	16 bar	16 bar	10 bar	6 bar

6 **Tectite Pro connection performance**

Size	Service temperature			
	Min -24°C	30°C	65°C	Max 114°C
15mm, 22mm	20 bar	20 bar	16 bar	10 bar

7 **Compression connection performance**

Size	Service temperature			
	Min -15°C	30°C	90°C	Max 120°C
15mm, 22mm	20 bar	20 bar	10 bar	7 bar

Proflow Ballofix and Linevalves performance

Terminal unit connections performance

a Multilayer Eurocone and copper Eurocone compression connections perform as shown in Table 1 below. This performance may be limited by the exact pipe used – please check with the pipe manufacturer.

1 **Multilayer and copper Eurocone connection performance**

Size	Service temperature Min -1°C	Max 130°C
All sizes	10 bar	10 bar

b Male flat face connections perform as shown in Table 2 below. However, the performance of the component used to connect the flat face connector to the pipework should also be considered.

2 **Male flat face connection performance**

Size	Service temperature Min -40°C	30°C	65°C	Max 110°C
3/4"	16 bar	16 bar	10 bar	6 bar

Test pressures

c Test pressures for all Proflow Modular valves comply with ISO 5208:1993E.

Proflow Ballofix

d Proflow Ballofix valves perform to the following service temperatures and pressures. They are designed and manufactured to Article 3, Section 3, to Sound Engineering Practice (S.E.P.) under the P.E.D.

3 **Proflow Ballofix isolating ball valves, service valves, radiator valves, minibore valves and filter valves performance for water services**

Size	Service temperature Min -15°C	Max 120°C
All sizes	16 bar	16 bar

4 **Proflow Ballofix double check valves performance for water services**

Size	Service temperature Min -15°C	Max 90°C
All sizes	16 bar	16 bar

5 **Proflow Ballofix lockable valves and wallfix valves performance for water services**

Size	Service temperature Min -15°C	Max 150°C
All sizes	16 bar	16 bar

6 **Proflow Ballofix performance for gas services**

Size	Service temperature Min -15°C	Max 60°C
All sizes	4 bar	4 bar

Proflow Linevalves

e Proflow Linevalves perform to the service temperatures and pressures given in the tables below. Butterfly valves are designed and manufactured to Article 3, Section 3, to Sound Engineering Practice (S.E.P.) under the P.E.D. Check valves, strainers and pressure reducing valves within the Proflow Linevalves range are exempt from P.E.D. requirements.

7 **Proflow butterfly valve performance when correctly assembled for water services**

Size	Service temperature Min -15°C	Max 105°C
65mm to 300mm	16 bar	16 bar

8 **Proflow butterfly valve performance when correctly assembled for gas services**

Size	Service temperature Min 5°C	Max 85°C
65mm to 300mm	6 bar	6 bar

9 **Check valve performance V909 and V910**

Size	Service temperature Min -20°C	Max 100°C
All sizes	16 bar	16 bar

10 **Stainless steel check valve performance V911**

Size	Service temperature Min -15°C	Max 110°C
65 DN to 150 DN	16 bar	16 bar
200 DN to 300 DN	10 bar	10 bar

11 **Cast iron swing check valve performance V914**

Size	Service temperature Min -10°C	Max 120°C
65 DN to 150 DN	16 bar	16 bar

PRESSURE EQUIPMENT DIRECTIVE (P.E.D.)

f **From 30th May 2002 most pressure equipment and assemblies on the market in the United Kingdom must comply with the Pressure Equipment Directive (P.E.D.) 1999. Selected Proflow valves are classified under the P.E.D. – details are given in the main text.**

g **For a detailed explanation of the P.E.D. visit our website www.yorkshirefittings.co.uk.**

ANTIFREEZE

h **For products used in water systems, working temperatures of less than 4°C can only be achieved if antifreeze is added to the system. Antifreeze should not be added to potable water systems.**

Proflow Linevalves and Ballomax performance

STRAINERS

a Strainers collect any debris, protecting valves and other sensitive equipment.

1 **Bronze swing check valve performance V915**

Size	Service temperature Min -10°C	100°C	Max 186°C
All sizes	25 bar	25 bar	10.5 bar

2 **Bronze lift check valve performance V916**

Size	Service temperature Min -10°C	100°C	Max 198°C
All sizes	32 bar	32 bar	14 bar

3 **Cast iron strainer performance V912**

Size	Service temperature Min -20°C	Max 150°C
All sizes	16 bar	10 bar

4 **Bronze strainer performance V913**

Size	Service temperature Min 5°C	Max 110°C
All sizes	16 bar	10 bar

b Pressure reducing valves

Pressure reducing valves have the following temperature and pressure characteristics:

- The maximum continuous working pressure is 80°C.
- The maximum inlet pressure is 25 bar.
- The maximum inlet pressure should be at least 1.75 bar higher than the selected outlet pressure.

Test pressures

c When hydraulically testing Proflow Linevalves, the following maximum pressures should not be exceeded.

d Butterfly valves for water applications
Shell: 24 bar
Seat: 17.6 bar

e Butterfly valves for gas applications
Shell: 9 bar
Seat: 6.6 bar

f Check valves – wafer pattern V909, V910, V911
Shell: 25 bar

g Cast iron strainer V912
15 bar to 24 bar

h Bronze strainer V913
Shell: 24 bar

5 **Swing check valves test pressures**

	V914	V915	V916
Shell	24 bar	37.5 bar	48 bar
Seat	17.6 bar	27.5 bar	35.2 bar

Proflow Ballomax

i Proflow Ballomax valves perform to the following working temperatures and pressures. They are designed and manufactured to Module H Full Quality Assurance under Category III of the P.E.D.

6 **Proflow Ballomax performance when correctly assembled**

Size	Service temperature Min 0°C	100°C	140°C	Max 165°C*
DN15-50 PN 40†	40 bar	40 bar	25 bar	16 bar
DN65-500 PN 25††	25 bar	25 bar	25 bar	16 bar
DN65-500 PN 16	16 bar	16 bar	16 bar	16 bar

* For temperatures above 165°C, please contact us.

† Interpolate valves between 100°C and 140°C, and 140°C and 165°C, on a sliding scale.

†† Interpolate valves between 140°C and 165°C on a sliding scale.

Proflow Mistral and Suremix performance

Proflow Mistral

a Proflow Mistral valves perform to the following working temperatures and pressures.

1

Proflow Mistral radiator valve peformance	
Size	Service temperature Max 120°C
All sizes	16 bar

Proflow Suremix

b Proflow Suremix UB valves perform to the following temperatures and pressures.

2

Working temperatures – Proflow Suremix UB	
Factory temperature setting	43°C
Temperature setting range	35-55°C
Temperature of hot supply	60-85°C
Temperature of cold supply	5-25°C
Minimum temperature differential, hot to mix	15°C
Temperature stability (under normal supply variations)	± 2°C

3

Working pressures – Proflow Suremix UB	
Working pressure, static	10 bar max
Working pressure, dynamic	0.2 bar to 4 bar
Maximum pressure loss ratio (either supply)	5:1
Note: optimum performance is achieved with equal pressures	

c Proflow Suremix C valves perform to the following temperatures and pressures.

4

Working temperatures – Proflow Suremix C	
Factory temperature setting	43°C
Temperature setting range	35-55°C
Temperature of hot supply	60-85°C
Temperature of cold supply	5-25°C
Minimum temperature differential, hot to mix	15°C
Temperature stability (under normal supply variations)	± 2°C

5

Working pressures – Proflow Suremix C	
Working pressure, static	10 bar max
Working pressure, dynamic	0.2 bar to 6 bar
Maximum pressure loss ratio (either supply)	10:1
Note: optimum performance is achieved with equal pressures	

d Proflow Suremix HCX valves perform to the following temperatures and pressures.

6

Working temperatures – Proflow Suremix HCX	
Factory temperature setting (nominal)	38°C
Temperature setting range	35-48°C
Maximum presure loss ratio	10:1
Flow rate, mimimum (15 and 22mm)	0.07 litres/sec
Flow rate at 1 bar pressure loss(15mm)	0.48 litres/sec
Flow rate at 1 bar pressure loss(22mm)	0.5 litres/sec
Shut-off on cold supply failure (60°C hot 38°C mix. 0.5 bar equal pressures)	1.0-1.5 sec

UKWFBS listings number 002078

7

Operating pressure range – Proflow Suremix HCX	High pressure	Low pressure
Maximum static pressure	10 bar	10 bar
Flow pressure, hot and cold	1 to 5 bar	0.2 to 1 bar
Hot supply temperature	25 to 65°C	52 to 65°C
Cold supply temperature	5 to 20°C	5 to 20°C

7

Approved applications – Proflow Suremix HCX
LP-W, HP-W - Wash basin, low and high pressure – maximum set temperature 41°C
LP-S, HP-S - Shower, low and high pressure – maximum set temperature 41°C
HP-T44 Bath fill to 44°C, high pressure – maximum set temperature 44°C
HP-T46 Bath fill to 46°C, high pressure – maximum set temperature 46°C
LP-B, HP-B - Bidet, low and high pressure – maximum set temperature 38°C
Approval Number (15mm and 22mm HCX valves) – ETC/177/0602

Standards and approvals

a We at Yorkshire are dedicated to designing, developing and manufacturing products of the highest quality. We are members of numerous standards committees and take an active part in their development. Proflow valves all comply with the relevant British, European and International standards and approvals. The Proflow range meets the following standards:

Proflow Venturi

b Proflow Venturi sizes 15mm to 54mm – compression ends

BS EN 1254 Part 2 Specification for copper and copper alloy fittings with compression ends for copper tubes.

c Proflow Venturi sizes ½" to 2" – female threaded ends and test points

ISO 7/EN 10226-1 (formerly BS 21/ISO 7) Specification for tubes and fittings where pressure-tight joints are made on the threads (metric dimensions).

d Steel Proflow Venturi – flange connections

BS EN 1092-1 (formerly BS 4504-3.1) Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated. Steel flanges.

e Proflow Modular

Proflow Modular – compression ends

BS EN 1254 Part 2 Refer to Proflow Venturi.

Proflow Modular – female threaded ends

ISO 7/EN 10226-1 (formerly BS 21/ISO7) Refer to Proflow Venturi.

f Proflow Ballofix

WRAS Proflow Ballofix valves for water services meet the standards of WRAS.

DVGW Proflow Ballofix valves for water services meet the standards of the German approval authority.

Advantica (British Gas) Proflow Ballofix valves for gas services are verified by Advantica and meet the requirements of section 5(1) of The Gas Safety (Installation and Use) Regulations 1998.

BS EN 1254 Part 2 Refer to Proflow Venturi.

ISO 7/EN 10226-1 (formerly BS 21/ISO7) Refer to Proflow Venturi.

BS EN ISO 228 (formerly BS 2779/ISO 228/1) Specification for tubes and fittings where pressure tight joints are not made on the threads (metric dimensions).

Proflow Linevalves

g Butterfly valves

WRAS Butterfly valves for water services meet the standards of WRAS.

Gaz de France Butterfly valves for gas services meet the standards of the French approval authority.

BS EN 593 (formerly BS 5155) Specification for industrial metallic butterfly valves.

Butterfly valves also conform to ISO 5752 Class 20 and DIN 3202 Part 3 K1.

h Check valves – V909, V910, V911

BS EN 1092-2 (formerly BS 4504-1) Circular flanges for pipes, valves and fittings (PN designated). Specification for cast iron flanges.

WRAS The V909 cast iron non-return valve meets the standards of WRAS.

i Check valves – V914, V915, V916

BS EN 1092-2 (formerly BS 4504-1) See above.

BS 5154 Specification for copper alloy globe, globe stop and check, check and gate valves.

j Strainers

WRAS The V912 strainer meets the standards of WRAS.

ISO 7/EN 10226-1 (formerly BS 21/ISO 7) Refer to Proflow Venturi.

BS EN 1092-2 (formerly BS 4504-1) See check valves.

k Pressure reducing valves

WRAS Pressure reducing valves meet the standards of WRAS.

BS 6283 Part 4 Specification for drop-tight pressure reducing valves of nominal size up to and including DN 50 for supply pressures up to and including 12 bar.

BS EN ISO 228 (formerly BS 2779/ISO 228/1) Refer to Proflow Ballofix.

l Proflow Ballomax

BS EN 488 Preinsulated bonded pipe systems for directly buried hot water networks. Steel valve assembly for steel service pipes, polyurethane thermal insulation and outer casing of polyethylene.

m Proflow Mistral

BS EN 1254 Part 2 Refer to Proflow Venturi.

BS EN 215 (formerly BS 7556) Specification for thermostatic radiator valves. Requirements and test methods.

BS 2767 Specification for manually operated copper alloy valves for radiators.

ISO 7/EN 10226-1 (formerly BS 21/ISO 7) Refer to Proflow Venturi.

Proflow Mistral automatic bypass valves also meet the standards of DIN 2999.

n Proflow Suremix

WRAS Proflow Suremix valves meet the standards of WRAS.

BS EN 1111 General technical specification for thermostatic mixing valves (PN 10).

BS EN 1254 Part 2 Refer to Proflow Venturi.

BS EN 1287 (formerly BS 1415 Part 2) General technical specifications for low pressure thermostatic mixing valves.

BS 7942 Specification for thermostatic mixing valves for use in care establishments.

Material specifications

o Proflow Venturi

The materials used in Proflow Venturi valves are manufactured to the following specifications.

p Proflow Venturi sizes 15mm to 54mm and ½" to 2"

Venturi, ball, needle: Chrome plated DZR brass to BS EN 12163 (CW602N). Specification for copper and copper alloy rod for general purposes.

Valve body, spindle, compression rings, measure outlet: DZR brass to BS EN 12163 (CW602N).

Nuts: Brass to BS EN 12163 (CW602N).

Seals: PTFE.

"O" rings, rubber packings: EPDM.

Handles: PA6.6 (Nylon Polyamide), 30% glass reinforced.

q Steel Proflow Venturi

Valve body: Cast iron, fully lugged to ASTM A126 Class B.

Venturi: Carbon steel to St.37.

Disk: Stainless steel to ASTM A351 CFB.

Shaft: Stainless steel to ASTM 276 GR416.

Seat: EPDM, bonded.

Drive pin: Stainless steel to ASTM A276 GR316.

Material specifications

Shaft seal: Nitrile to NBR 1.
Bearing: Lubricated bronze to ASTM B62 (flanged) or ASTM B52 (grooved).

a Test points
Body, retaining ring, cap, extension tube: DZR brass to BS EN 12163 CZ 132.
Seal and cap seal: EPDM.
Tie: Polypropylene.

b Proflow Modular
The materials used in Proflow Modular are manufactured to the following specifications.
Body, pipe and components, nipples, spindles, ball, draining tap, measure outlet: DZR brass to BS EN 12163 CZ602N.
Strainer: AISI304, stitch size 0.8mm. tread 0.4mm.
Seals: PTFE.
"O" rings, rubber packings: EPDM.
Handle (red/blue): Die cast zinc BS1004A, ZA3
Spindle extension: PA6.6 (Nylon Polyamide), 10% glass reinforced; DZR brass to BS EN 12163 CZ602N.
Handle screw: Steel 4.8 electro-galvanised.

c The Proflow Modular valve system incorporates a Proflow Venturi commissioning valve. The materials in a Proflow Venturi valve are indicated opposite and above.

d Proflow Ballofix
The materials used in Proflow Ballofix valves are manufactured to the following specifications.
Body: DZR brass to BS EN 12163 CZ132.
Ball: Nickel plated DZR brass to BS EN 12163 CZ132.
"O" rings: Viton, EPDM or nitrile rubber.
Plastic handle: PA6.6 (Nylon), 30% glass reinforced.

e Proflow Linevalves
The materials used in Proflow Linevalves are manufactured to the following specifications.

f Butterfly valves
Body: Cast iron EN GJL 250.
Disc: Stainless steel grade 316.
Shaft: Stainless steel grade AISI 420.
Liner: EPDM (valves for water services), Nitrile (valves for gas services).

g V909 Cast iron wafer pattern check valve
Body: DN65-DN150 Cast iron EN-GJL-250; DN200-DN300 Cast iron EN-GJS-400, 15.
Plate: Stainless steel X5CrNi18-10.
Spring: Stainless steel X5CrNiMo17-12-2.
Seat: NBR.

h V910 Cast iron swing check valve
Body: Cast iron EN-GJS-400, 15.
Plate: 65mm to 150mm Galvanised steel; 200mm to 300mm Cast iron EN-GJS-400, 15.
Seat: NBR.

i V911 Stainless steel swing check valve
Body, plate: Stainless steel X5CrNiMo17-12-2
Seal: EPDM.

j V914 Cast iron swing check valve
Body, cap, disc assembly: Cast iron BS 1452 GR.220.
Hinge pin: Stainless steel grade AISI 416.
Disk facing ring, seat ring: Bronze BS 1400 LG2.
Disk nut: Brass BS 2874 CZ114.
Gasket: Asbestos-free.

k V915 Bronze swing check valve
Body, cap, hinge: Bronze BS 1400 LG2.
Disk: Brass BS 2872 CZ122.
Seat: Integral with body.

l V916 Bronze lift check valve
Body, stem, disk: Bronze BS 1400 LG2.
Bonnet: Brass BS 2872 CZ122.
Seat: Integral with body.

m V912 Cast iron strainer
Body, cap: Cast iron EN-GJL-250.
Strainer: Stainless steel X5CrNi18-10.
Plug: Brass CuZn40Pb3.
Seal: Fibre TesnitBA-U.
Screen data: DN65: 800 microns, DN80-DN200: 1250 microns, DN250-DN300: 1600 microns.

n V913 Bronze strainer
Body, cap: Gunmetal 1400 LG2.
Screen: Stainless steel 17440X2CrNi11810.
Gasket: Asbestos free (non-stick).

o Pressure reducing valves
Body: Bronze.
Seat ring, strainer: Stainless steel.
Diaphragms: EPDM.
Spring cover: Glass reinforced noryl plastic.
Components in contact with fluid: DZR brass.

p Proflow Ballomax
The following material specifications are common to all Proflow Ballomax valves where that component applies.
Welding end: Steel St37.0 DIN 2458/1626 (DN150-DN200 provided with bottom, steel; DN400 St37.0 DIN 2448/1629).
Ball: Stainless steel CF 8 AISI 304.
Seat: PTFE, 20% C.
Friction packing: PTFE, 20% C.
O-ring: EPDM, Viton.
The following material specifications are specific to the Proflow Ballomax valves indicated.

q PN40 valves, DN15 to DN50
Female end: Steel St 52.0 DIN 2448/1629 (DN 15-25 Steel ST37-2 K DIN 1652).
Flange: Steel C22 DIN 17243.
Back-up spring: Spring steel CF 8 AISI 304.
Back-up ring: Stainless steel AISI 304.
Neck ring, handle: Steel.
Intermediate ring: Stainless steel AISI 316.
Stop pin: Steel, hardened.
Cap nut: Steel, FZB DIN 1587.
Spindle guide: Steel St 37-2 K DIN 1652.
Spindle: Stainless steel W No. 1.4305 DIN 17440.

r PN 16/25 valves, DN65 to DN200
Flange: Steel R St 37-2 DIN 17100.
Back-up spring: Spring steel 50 Cr V4 DIN 17222.
Valve house: Steel St 37.0 DIN 2458/1626.
Back-up ring: Stainless steel AISI 304 (DN 125 – DN200 with back-up ring in steel).
Back-up ring: PTFE, 20% C.
Stop pin, seger circlip: Spring steel.
Cover disc: Steel ELZ DIN 125.
Intermediate ring: Stainless steel AISI 304 L.
Handle: Cast iron.
Spindle guide: Steel St 37-2 K DIN 1652.
Spindle: Stainless steel W No. 1.4305 DIN 17440.
Plain bearing: Steel bush with PTFE.

s PN 16/25 valves, DN250 to DN500
Flange: Steel C22 DIN 17243.
Valve house: Steel St 37.0 DIN 2448/1629 (DN 400 St 37.0 DIN 2458/1626).
Bottom, cover disc, key, back-up ring: Steel.
Plain bearing: Steel bush with PTFE.
Seger circlip: Spring steel.
Back-up ring, seat packing: PTFE, 20% C.
Spindle: Stainless steel W No. 1.4305 (DN 500 Stainless steel AISI 304).
Spindle guide: Steel St 37.0 DIN 2448/1629.
Spiral spring: W No. 1.4568 K + A DIN 17224.

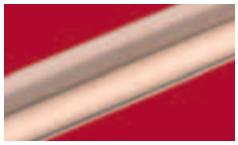
t Proflow Mistral
Valve body: Brass to BS 2872 CZ122.
ABV body: Gunmetal.

u Proflow Suremix
Body: DZR brass.

Quality and guarantees

COMPATIBLE TUBES AND PIPES

a **Selected Proflow valves are compatible with the following tubes and pipes. Refer to information on each product brand for further details.**



b **COPPER TUBE**
Copper tube to BS EN 1057.

c **PEX AND PB PIPE**
PEX pipe to BS 7291 Part 3 and PB pipe to BS 7291 Part 2 in sizes up to 28mm, in conjunction with the correct pipe support liner.

d **STAINLESS STEEL TUBE**
XPress Stainless System tube and other stainless steel tube to BS EN 10312, DVGW GW541.

e **CARBON STEEL TUBE**
XPress Carbon steel System tube and other carbon steel tubes to DIN 2394/ NEN 1982.

f **STEEL TUBE**
Steel tube to BS 1387.

Quality

g Quality is of paramount importance to Yorkshire. Our products conform to current British, European and International Standards where applicable and also meet our own rigorous internal quality approvals. The Company is at the forefront of standards development, and has members on a variety of relevant committees.

h Yorkshire operates a Quality Management System for the development, manufacture and supply of fittings, tube, valves and accessories which complies with the requirements of BS EN ISO 9001: 2000.

Guarantees

i Our policy of continuously and rigorously testing Proflow products means we are confident they will give you years of trouble free service. To demonstrate the total confidence we have in our products and our commitment to customer service, all Proflow valves carry extensive guarantees against manufacturing defects when installed in accordance with our instructions on specified tube materials and applications, as shown in Table 1 below.

1 **Proflow valves guarantees when correctly assembled with stated tubes and pipes**

Valve	Length of guarantee
Proflow Venturi	5 years
Proflow Modular	5 years
Proflow Ballofix	5 years
Proflow Linevalves	5 years
Proflow Ballomax	2 years
Proflow Mistral	5 years
Proflow Suremix	5 years

Tube and pipe compatibility

j Proflow valves are suitable for connecting a variety of tubes and fittings – refer to the information for each particular product for details. There are specific standards the tube and pipe must achieve to be suitable for connection with Proflow valves.

Copper tube

k Copper tubes used with Proflow valves must meet the requirements of BS EN 1057.

l **BS EN 1057** Specification for copper and copper alloy – seamless round copper tubes for water (and gas) in sanitary and heating applications.

m BS EN 1057 includes specified temper conditions (material strength) expressed as an "R" number. Quite simply, the higher the number, the harder the material. As a result, tube diameter, wall thickness, length and the material temper must all be specified for full product designation.

n **R220** Annealed condition with a tensile strength of 220N/mm² supplied in coils and suitable for connection by push-fit, capillary and compression fittings. Can be bent with suitable bending tools.

o **R250** Half hard condition with a tensile strength of 250N/mm² supplied in straight lengths and suitable for connection by push-fit, press-fit, capillary and compression fittings. Can be bent with suitable bending tools.

p **R290** Hard condition with a tensile strength of 290N/mm² supplied in straight lengths suitable for connection by push-fit, press-fit, capillary and non-manipulative compression fittings. Not suitable for bending.

Stainless steel System tube

q Yorkshire manufactures a thin-walled stainless steel System tube, available from our XPress range. It is compatible with a selection of our Proflow products – see the individual product pages for details. Stainless steel tube is available in 6m straight

2 **BS EN 1057 copper tube compatible with Proflow valves**

Outside diameter	Wall thickness (mm)								
	0.6	0.7	0.8	0.9	1.0	1.2	1.5	2.0	2.5
6mm	R220/ R250		R220/ R250						
8mm	R220/ R250		R220/ R250						
10mm	R250	R220	R220/ R250						
12mm	R250		R220/ R250						
15mm		R250			R220/ R250				
22mm				R250		R220/ R250			
28mm				R250		R220/ R250			
35mm					R290	R250	R250		
42mm					R290	R250	R250		
54mm					R290	R250		R250	
67mm						R220/ R250		R250	
76mm							R290	R250	
108mm							R290		R250

Tube and pipe compatibility

1 Stainless steel tube specification

Outside diameter	Wall thickness: 316 System tube	Wall thickness: EN 10312 Table 1 GW541 Table 2 (formerly BS 4127)	Wall thickness: EN 10312 Table 2 GW541 Table 3
15mm	0.5mm	0.6mm	1.0mm
18mm	0.6mm	0.7mm	1.0mm
22mm	0.6mm	0.7mm	1.2mm
28mm	0.8mm	0.8mm	1.2mm
35mm	1.0mm	1.0mm	1.5mm
42mm	1.0mm	1.1mm	1.5mm
54mm	1.0mm	1.2mm	1.5mm

2 Carbon steel System tube specification

Outside diameter	Wall thickness: Galvanised tube	Wall thickness: Including plastic coating
15mm	1.2mm	2.2mm
18mm	1.2mm	2.2mm
22mm	1.5mm	2.5mm
28mm	1.5mm	2.5mm
35mm	1.5mm	2.5mm
42mm	1.5mm	2.5mm
54mm	1.5mm	2.5mm
76mm	2.0mm	-
89mm	2.0mm	-
108mm	2.0mm	-

3 XPress System tube bends

Size	Minimum Radii: Stainless steel System tube	Minimum Radii: Carbon steel System tube
15mm	52.5mm	30mm
18mm	72mm	36mm
22mm	88mm	44mm
28mm	112mm	56mm

lengths in sizes from 15mm to 108mm. The tube is manufactured from BS 316 S31/DIN 1.4401 stainless steel strip conforming to BS 10088 Part 2 and thanks to its thin-walled geometry, is stiff, lightweight and easy to handle.

Carbon steel System tube

a Yorkshire manufactures galvanised carbon steel System tube, available in two different specifications from our XPress range. It is compatible with a selection of our Proflow products - see the individual product pages for details. Galvanised carbon steel System tube is available in sizes from 15mm to 108mm, and plastic (polypropylene) coated galvanised carbon steel System tube in sizes from 15mm to 54mm.

b Galvanised carbon steel System tube is manufactured in accordance with DIN 2394/NEN 1982 from material with a very low carbon content and has a thin walled profile resulting in a lightweight easier to hand product. The galvanised coating (external only) has a minimum thickness of 7 microns and is thermally applied, providing a superior bond to the tube.

c In sizes up to 28mm, carbon steel System tube is suitable for bending using proprietary bend formers.

PEX and PB pipes

d Selected Proflow valves (see individual product pages for details) are compatible with PB and PEX pipes to BS 7291 Parts 2 and 3 respectively. One such PEX pipe is our Tectite System PEX.

OTHER TUBES AND PIPES

e A small selection of other tubes and pipe are compatible with selected Proflow products. In many cases the appropriate adaptor should be used. Contact us for specific information.

Proflow specification clauses

a Once the appropriate Proflow product has been selected the use of one of the following specification clauses will provide the exact wording required to ensure that the correct product is used.

Proflow Venturi specification 15mm to 54mm – compression ends

b "Commissioning valves shall have a waisted venturi measuring section to provide minimum total headloss across the valve. They shall have integrated but independent regulating and isolating functions. Of DZR brass, they shall have connection ends to BS EN 1254 Part 2. They will be suitable for use with copper tube to BS EN 1057, and, in sizes up to 28mm, with PEX pipe to BS 7291 Part 3, PB pipe to BS 7291 Part 2 (both with liner). They shall be suitable for commissioning modern heating and chilled water systems. They will have a guarantee of 5 years against manufacturing defects and be drawn from the Proflow Venturi range from Yorkshire Fittings Limited."

Proflow Venturi specification 1/2" to 2" – female BSP ends

c "Commissioning valves shall have a waisted venturi measuring section to provide minimum total headloss across the valve. They shall have integrated but independent regulating and isolating functions. Of DZR brass, they shall have connection ends to ISO 7/ EN 10226-1. They will be suitable for use with steel tube to BS 1387 and male iron connection fittings. They shall be suitable for commissioning modern heating and chilled water systems. They will have a guarantee of 5 years against manufacturing defects and be drawn from the Proflow Venturi range from Yorkshire Fittings Limited."

Steel Proflow Venturi specification

d "Commissioning valves shall have a waisted venturi measuring section to provide minimum total headloss across the valve. They shall have integrated regulating and isolation functions with memory stop. Of cast iron, they shall have grooved/flanged ends to BS EN 1092-1. They will be suitable for use with the appropriate fittings/ flanges and tube. They shall be suitable for commissioning modern heating and chilled water systems. They will have a guarantee of 5 years against manufacturing defects and be drawn from the Proflow Venturi range from Yorkshire Fittings Limited."

Proflow Modular ball valve assembly specification

e "The terminal unit valve configuration shall be installed using the Proflow Modular system. The unit shall consist of a flushing bypass, flow isolation valve with integral drain and a Proflow Venturi commissioning station. Test points shall be installed on the flow isolation ball valve in accordance with the specification. The inlet and outlet connections shall be suitable for the pipe system installation. Chilled water Proflow Modular configurations shall be supplied with non-rotating extension spindles to maintain the thermal insulation vapour seal. The valve configuration will have a guarantee of 5 years against all manufacturing defects, and be drawn from the Proflow Modular range from Yorkshire Fittings Limited."

Proflow Modular strainer valve assembly specification

f "The terminal unit valve configuration shall be installed using the Proflow Modular system. The unit shall consist of a flushing bypass, strainer isolation valve with integral drain and a Proflow Venturi commissioning station. Test points shall be installed on the strainer isolation ball valve in accordance with the specification. The inlet and outlet connections shall be suitable for the pipe system installation. Chilled water Proflow Modular configurations shall be supplied with non-rotating extension spindles to maintain the thermal insulation vapour seal. The valve configuration will have a guarantee of 5 years against all manufacturing defects, and be drawn from the Proflow Modular range from Yorkshire Fittings Limited."

Proflow Ballofix for water applications

g "Quarter turn ball valves shall be of DZR brass material and be certified by WRAS. They will be suitable for use with copper tube to BS EN 1057, and with PEX pipe to BS 7291 Part 3 and PB pipe to BS 7291 Part 2 (both with liner). They shall be suitable for water services. They will have a guarantee of 5 years against all manufacturing defects, and be drawn from the Proflow Ballofix range from Yorkshire Fittings Limited."

Proflow Ballofix for gas applications

h "Quarter turn ball valves shall be of DZR brass material and be verified by Advantica. They will be suitable for use with copper tube to BS EN 1057 on gas services. They will have a guarantee of 5 years against all manufacturing defects, and be drawn from the Proflow Ballofix range from Yorkshire Fittings Limited."

Proflow Linevalves – butterfly valves for water services specification

i "Butterfly valves for water services shall be to BS EN 593, of cast iron with EPDM seals and stainless steel butterfly, and certified by WRAS. They will be suitable for commercial and HVAC water services applications. They will have a guarantee of 5 years against manufacturing defects and be drawn from the Proflow Linevalves range from Yorkshire Fittings Limited."

Proflow specification clauses

Proflow Linevalves – butterfly valves for gas services specification

a "Butterfly valves for gas services shall be to BS EN 593, of cast iron with nitrile seals and stainless steel butterfly, and certified by Gaz de France. They will be suitable for commercial gas applications. They will have a guarantee of 5 years against manufacturing defects and be drawn from the Proflow Linevalves range from Yorkshire Fittings Limited."

Proflow Linevalves – wafer pattern check valves specification

b "Non-return check valves shall be of cast iron or stainless steel. They will be suitable for commercial water applications. They will have a guarantee of 5 years against manufacturing defects and be drawn from the Proflow Linevalves range from Yorkshire Fittings Limited."

Proflow Linevalves – swing check valves specification

c "Swing check valves shall be to BS EN 1092-2 and of cast iron. They will be suitable for commercial water applications. They will have a guarantee of 5 years against manufacturing defects and be drawn from the Proflow Linevalves range from Yorkshire Fittings Limited."

Proflow Linevalves – bronze check valves specification

d "Bronze check valves shall be to BS 5154 and of bronze. They will be suitable for commercial water applications. They will have a guarantee of 5 years against manufacturing defects and be drawn from the Proflow Linevalves range from Yorkshire Fittings Limited."

Proflow Linevalves – cast iron strainer specification

e "Strainers shall be of cast iron and certified by WRAS. They will be suitable for commercial water applications. They will have a guarantee of 5 years against manufacturing defects and be drawn from the Proflow Linevalves range from Yorkshire Fittings Limited."

Proflow Linevalves – bronze strainer specification

f "Bronze strainers shall be of cast iron. They will be suitable for commercial water applications. They will have a guarantee of 5 years against manufacturing defects and be drawn from the Proflow Linevalves range from Yorkshire Fittings Limited."

Proflow Linevalves – pressure reducing valve specification

g "Pressure reducing valves shall be to BS 6283 Part 4, of bronze, and certified by WRAS. They will be suitable for water services and compressed air lines. They will have a guarantee of 5 years against manufacturing defects and be drawn from the Proflow Linevalves range from Yorkshire Fittings Limited."

Proflow Ballomax specification

h "Steel ball valves shall be to BS EN 488. They will be suitable for heating systems, district heating and other industrial applications. They will have a guarantee of 2 years against manufacturing defects and be drawn from the Proflow Ballomax range from Yorkshire Fittings Limited."

Proflow Mistral TRV specification

i "Thermostatic radiator valves shall be to BS EN 215, of brass with a nickel-plated finish. They will be suitable for central heating systems. They will have a guarantee of 5 years against manufacturing defects and be drawn from the Proflow Mistral range from Yorkshire Fittings Limited."

Proflow Mistral TRV bodies specification

j "Thermostatic radiator bodies shall be to BS EN 215, of brass with a nickel-plated finish. They will be suitable for central heating systems. They will have a guarantee of 5 years against manufacturing defects and be drawn from the Proflow Mistral range from Yorkshire Fittings Limited."

Proflow Mistral manual radiator valves specification

k "Thermostatic radiator bodies shall be to BS 2767, of brass with a nickel-plated finish. They will be suitable for central heating systems. They will have a guarantee of 5 years against manufacturing defects and be drawn from the Proflow Mistral range from Yorkshire Fittings Limited."

Proflow Mistral ABV specification

l "Automatic bypass valves shall have a guarantee of 5 years against manufacturing defects and be drawn from the Proflow Mistral range from Yorkshire Fittings Limited."

Proflow Suremix UB and C specification

m "Thermostatic mixing valves shall be to BS EN 1287 and certified by WRAS. They will be suitable for under basin and general mixing applications. They will have a guarantee of 5 years against manufacturing defects and be drawn from the Proflow Suremix range from Yorkshire Fittings Limited."

Proflow Suremix HCX specification

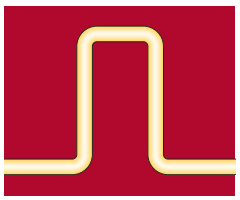
n "Thermostatic mixing valves shall conform to the NHS Estates Model Engineering Specification D08 and listed under the TMV 3 scheme, and certified by WRAS. They will be suitable for under basin, shower and bath applications. They will have a guarantee of 5 years against manufacturing defects and be drawn from the Proflow Suremix range from Yorkshire Fittings Limited."

System design considerations

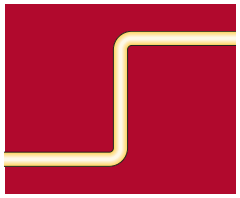
CHEMICALS

a Some contracts may require the use of proprietary chemicals to cleanse and flush pipework before full commissioning. Proflow valves are compatible with a selection of products – contact us to find out more.

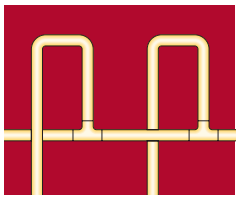
TECHNIQUES FOR EXPANSION STRESS RELIEF



b Horseshoe expansion link



c Offset



d Crossover tee arrangement Expansion loop.

e Here are details of some of the specific design considerations it is important to take account of when designing and installing pipework systems containing systems containing Proflow valves.

Pipeline supports

f Pipelines should always be constructed so that the joints are under neutral or compressive stress. Clipping to support the assembled pipeline is essential and tube manufacturer's recommendations should be adhered to. Our Yorkshire integral solder ring range offers a wide range of pipe clips and brackets to ensure safe and secure installations. Pipe joist clips are also available, and are designed to protect pipework against accidental piercing when nailing or screwing down floorboards. For the maximum spacing of supporting brackets refer to Table 1.

Stress corrosion cracking

g Stress corrosion cracking (SCC) is a phenomenon that occurs occasionally with brass components. It is almost always introduced during installation, either from over-tightening of fittings or contamination from a corrosive substance.

h The usual corrosive substance involved in SCC is ammonia or ammoniacal compounds, which can be found in cleaning fluids, refrigeration gases, sewage waste products, building materials, insulating materials (especially foams) and flame and smoke retarding treatments. An essential ingredient in the SCC process is moisture. Moisture on the fitting or pipework allows the corrosive substance to collect and become more concentrated. This is a particular problem in chilled water installations, where insulating materials allow the condensed moisture to be retained and kept in close contact with the fitting surface.

1 **Maximum spacing of support brackets for internal fixing of copper tube to BS EN 1057 R250 and R290**

Sizes	Wall thickness	Horizontal pitch	Vertical pitch
6mm	0.6mm	0.40m	0.60m
8mm	0.6mm	0.60m	0.90m
10mm	0.6mm	0.80m	1.20m
12mm	0.6mm	1.00m	1.50m
15mm	0.7mm	1.20m	1.80m
22mm, 28mm	0.9mm	1.80m	2.40m
35mm, 42mm	1.2mm	2.40m	3.00m
54mm	1.2mm	2.70m	3.00m
67mm	1.2mm	3.00m	3.60m
76mm, 108mm	1.5mm	3.00m	3.60m

i Yorkshire Fittings Ltd does not recommend the use of highly stressed brass components in chilled water applications. Instead, we recommend fittings made from SCC resistant or immune materials, such as copper or gunmetal. Fittings from our XPress, Tectite, Yorkshire or Endex ranges are the preferred products for chilled water applications. If compression fittings are used then they should be assembled exactly in accordance with our published instructions and securely bound by a moisture barrier such as Densotape® to prevent moisture build up on the fitting.

j The following installation practices should be adhered to when installing compression fittings in order to avoid SCC:

1. Do not overtighten brass components.
2. Use correctly fitting spanners.
3. Use a drop or two of light oil on the threads of fittings of sizes 35mm and above.
4. Avoid contaminating the threads or nuts with jointing compounds.
5. Use parallel threaded adaptors to avoid stressing the female threaded ends.

k Minimise the risk of contamination from a potential corrosive substance. Wrapping susceptible fittings in a vapour barrier or applying impermeable paints can be helpful in preventing contact with a corrosive substance.

Insulation

l For all installations, we recommend you adhere to the insulation requirements as specified by The Water Supply (Water Fittings) Regulations 1999. These can be downloaded from www.hmso.gov.uk.

Phenolic foam

m When using rigid phenolic foam (or other thermal insulation) to lag pipework, always refer to the lagging manufacturer's fixing instructions. To avoid the risk of external corrosion of copper pipework the European Phenolic Foam Association recommends that such insulation products be installed with a moisture barrier, such as Densopaste or a plastic covering applied by the tube manufacturer. If you need to add a barrier product, we recommend that all Yorkshire fittings are fully installed and are completely coated before these are applied.

Thermal movement

n Thermal movement is a major consideration when designing and installing plumbing and heating

System design considerations

systems, and should be taken into account. Pipework systems expand and contract with changes in temperature. If they are fixed too rigidly and their movement restricted the installation will be subject to stress. Stress concentrations between "fixed points" - typically found at radiators, valves and other fittings - should be avoided.

Tube and pipe expansion

a Tubes and pipes compatible with selected Proflow valves have linear expansion as detailed in the text and Tables 1 to 4 below.

- Copper has a coefficient in linear expansion of 17 x 10-6/°C. Refer to Table 1.
- Tectite System PEX has a coefficient of linear expansion of 1.5 x 10-4/°C at 20°C to approximately 2.8 x 10-4/°C at 82°C. Refer to Table 2.
- For details of the expansion of PB pipe refer to the manufacturers instructions.
- Stainless steel tube has a coefficient of linear expansion of 16 x 10-6/°C. Refer to Table 3.
- Carbon steel System tube has a coefficient of linear expansion of 12 x 10-6/°C. Refer to Table 4.

Covered pipework

b Making provision for thermal movement is vital where pipework of any material is installed under screed or plaster, or passes through brick or blockwork.

c The preferred practice is to pass tubes and pipes through sleeves or conduits or to lay them in ducts surrounded by loose, non-rigid material such as vermiculite or glass wool. For further information, consult the standard BS 6700:1997.

CORRECT ANCHORING

d Always ensure the spur used to anchor the branch of a tee or connect to a radiator is long enough to allow normal thermal movement. Not doing this can lead to installation failure.

PIPEWORK ACCESSIBILITY

e It's wise to take advice from the local water authority when it comes to pipework accessibility.

1 **Copper tube expansion**

Temperature change	Tube length 3m	4m	5m	6m	7m	8m	9m	10m
10°C	0.5mm	0.7mm	0.9mm	1.0mm	1.2mm	1.4mm	1.5mm	1.7mm
20°C	1.0mm	1.4mm	1.7mm	2.0mm	2.4mm	2.7mm	3.0mm	3.4mm
40°C	2.0mm	2.7mm	3.4mm	4.1mm	4.8mm	5.4mm	6.1mm	6.8mm
60°C	3.1mm	4.1mm	5.1mm	6.1mm	7.1mm	8.2mm	9.2mm	10.2mm
80°C	4.1mm	5.4mm	6.8mm	8.2mm	9.5mm	10.9mm	12.2mm	13.6mm

2 **Tectite System PEX expansion**

Upper working temperature	Lower working temperature 0°C	10°C	20°C	40°C	60°C	80°C
80°C	15.0mm	13.8mm	12.5mm	9.0mm	4.8mm	0.0mm
60°C	10.2mm	9.0mm	7.7mm	4.2mm	0.0mm	
40°C	6.0mm	4.8mm	3.5mm	0.0mm		
20°C	2.5mm	1.3mm	0.0mm			
10°C	1.2mm	0.0mm				
0°C	0.0mm					

3 **Stainless Steel System tube expansion**

Temperature change	Tube length 3m	4m	5m	6m	7m	8m	9m	10m
10°C	0.5mm	0.6mm	0.8mm	1.0mm	1.1mm	1.3mm	1.4mm	1.6mm
20°C	1.0mm	1.3mm	1.6mm	1.9mm	2.2mm	2.6mm	2.9mm	3.2mm
40°C	1.9mm	2.6mm	3.2mm	3.8mm	4.5mm	5.1mm	5.8mm	6.4mm
60°C	2.9mm	3.8mm	4.8mm	5.8mm	6.7mm	7.7mm	8.6mm	9.6mm
80°C	3.8mm	5.1mm	6.4mm	7.7mm	9.0mm	10.2mm	11.5mm	12.8mm

4 **Carbon Steel System tube expansion**

Temperature change	Tube length 3m	4m	5m	6m	7m	8m	9m	10m
10°C	0.4mm	0.5mm	0.6mm	0.7mm	0.8mm	1.0mm	1.1mm	1.2mm
20°C	0.7mm	1.0mm	1.2mm	1.4mm	1.7mm	1.9mm	2.2mm	2.4mm
40°C	1.4mm	1.9mm	2.4mm	2.9mm	3.4mm	3.8mm	4.3mm	4.8mm
60°C	2.2mm	2.9mm	3.6mm	4.3mm	5.0mm	5.8mm	6.5mm	7.2mm
80°C	2.9mm	3.8mm	4.8mm	5.8mm	6.7mm	7.7mm	8.6mm	9.6mm

Proflow range data finder A to P

Use the index to find the precise location of specific information about the Proflow range. Pages, paragraphs and tables are numbered or lettered throughout the document to help you find the detail you require.

A

	PAGE	SECT
Advantica	30	f
Accessibility	37	e
Anchoring	37	d
Antifreeze	27	h
Applications		
Central heating	18	g
	18	m
Chilled water	2	c
	4	e
Climate control	2	d
	10	e
Commercial water	3	a
	16	d
	16	f
	16	j
	17	a
Commissioning	4	e
Compressed air	2	e
	14	b
District heating	2	f
	15	a
Domestic water	17	a
Gas	2	e
	3	a
	14	b
	16	e
Heating	2	c
	2	f
	15	a
Hot and cold water	2	e
	14	b
HVAC	3	a
	16	f
	16	j
Oil	2	e
	2	f
	14	b
Potable water	2	e
	14	b
Approvals	30	
Automatic Bypass Valve (ABV)	22	

B

	PAGE	SECT
Broen	14	f
Butterfly valves	16	c

C

	PAGE	SECT
Carbon steel tube (DIN 2394/NEN 1982)	10	l
	33	e
	33	a
	33	2-3
	37	a
	37	4
Central heating	18	g
	18	m
Check valves	16	f
Chemicals	36	a
Chilled water	2	c
	4	e
Climate control	2	d
	10	e
Commercial chrome	14	e
Commercial water	3	a
	16	d
	16	f
	16	j
	17	a
Commissioning	2	c
	4	e
	10	n
Commissioning station (FODRV)	4	j
	5	a
	5	c
	6	a
	6	c
Compressed air	2	e
	14	b
Compatibility		
System	3	d
Tube and pipe	3	e
Copper tube (BS EN 1057)	9	a
	10	l
	14	r
	32	b
	32	k
	32	2
	37	a
	37	1
R220	32	n
R250	32	o
R290	32	p
Covered pipework	37	b

D

	PAGE	SECT
Differential pressure	4	c
Dimensions	5	3-4
	6	1-2
	8	1-3
	9	1
	15	d
	17	c
	18	l
	18	3
	19	c
	19	1
	20	a
	20	5
	21	a
	21	1
	21	d
	21	3
	22	e
	22	1
	24-25	
District heating	2	f
	15	a
Domestic water	17	a
Double Regulating Valve (DRV)	4	b
	5	a
	5	d
	6	a

E

	PAGE	SECT
Expansion	37	
Expansion stress relief	36	b

F

	PAGE	SECT
Flow measurement	4	a
Flow rates	5	1-2
	6	3
	9	c
	10	h
	14	1
	15	1
	17	c
	17	2
	18	k
	18	1-2
	19	b
	20	d
	20	1-4
	21	c
	21	1-2
	22	2
	23	1-3

G

	PAGE	SECT
Gas	2	e
	3	a
	14	b
	16	e
Gas families	14	a
Gas valves	14	n
	16	e
Guarantees	32	I
	32	1

H

	PAGE	SECT
Head loss	4	d
	4	1
	4	2
Heating	2	c
	2	f
	15	a
Hot and cold water	2	e
	14	b
HVAC	3	a
	16	f
	16	j

I

	PAGE	SECT
Isolating ball valves	14	
Installation	10	m
	15	e
	22	I
	25	b
Insulation	36	l
ISO	3	h

K

	PAGE	SECT
kPa	4	c
	5	c
Kv/Kvs	5	k
	18	c

L

	PAGE	SECT
Loss factor	4	d

M

	PAGE	SECT
Male iron	9	a
Manual radiator valves	21	
Material specifications	31	
Multilayer tube	10	l

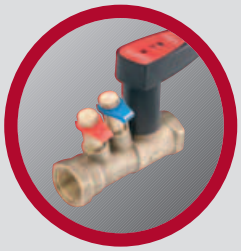
O

	PAGE	SECT
Oil	2	e
	2	f
	14	b
Orifice	4	a
	5	c

P

	PAGE	SECT
PB pipe	9	a
	14	r
	32	c
	33	d
	37	a
Performance	26-29	
PEX pipe	9	a
	14	r
	32	c
	33	d
	37	a
	37	2
Phenolic foam	36	m
Pipeline supports	36	h
	36	1
Potable water	2	e
	14	b
Pressure Equipment Directive (P.E.D.)	26	d
	26	j
	27	d
	27	e
	27	f
	28	I
Pressure reducing valves	17	a
Proflow Ballofix		
Applications	14	b
Commercial chrome	14	e
Connections	10	c
Double check valves	14	l
Filter valves	14	m
Flow rates	14	1
Gas valves	14	n
Internal stop	14	d
Isolating ball valves	14	h
Lockable valves	14	o
Minibore valves	14	k
"O" rings	14	q
Overview	2	e
	14	b
Performance	27	
Quarter turn	14	d
Radiator valves	14	j
Service valves	14	i
Sizes	14	c
Specification	34	g
Tectite	14	c
Tube and pipe compatibility	14	r
Wallfix valves	14	p
XPress	14	c
Proflow Ballomax		
Accessories	15	g
Applications	15	a
Connections	15	f
Dimensions	15	d

Proflow range data finder P to Z



Flow rates	15	1
Hot tapping	15	g
Installation	15	e
Overview	2	f
	15	a
Performance	28	i
	28	6
Quarter turn	15	b
Specification	35	h
Proflow Linevalves		
Applications	16	c
	16	f
	16	j
	17	a
Butterfly valves	16	c
Check valves	16	f
Components	17	1
Dimensions	17	c
Flow rates	17	c
	17	2
Gas services	16	e
Installation	17	d
Lift check valve	16	i
Overview	3	a
	16	b
Performance	27-28	
Pressure reducing valves	17	a
Sizes	16	c
	16	f
	16	j
	17	a
Specification	34	i
	35	a
Strainers	16	j
	28	a
Swing pattern	17	h
Traceability	16	a
Wafer pattern	16	g
Water services	16	d
Proflow Mistral		
Accessories	22	f
Applications	18	g
	18	m
Automatic Bypass Valve (ABV)	22	
Bodies	20	b
Calibration	18	b
Connections	18	h
Dimensions	18	1
	18	3
	19	c
	19	1
	20	a
	20	5
	21	1
	21	d
	21	3
	22	e
	22	1
Flow rates	18	k
	18	1-2
	19	b
	20	d
	20	1-4
	21	c
	21	2
	22	2
Frost protection	18	e
Insert fitting tool	22	b
	22	f
Installation	22	i
Kv/Kvs	18	c
Liquid sensor	18	f
	18	j
Lockshield bodies	20-21	
Manual radiator valves	21	
Overview	3	b
	18	f
Performance	29	a
	29	1
Specification	35	i
Temperature settings	18	a
Thermostatic heads	16	e
	16	g
	16	2
Tube and pipe compatibility	22	g
Proflow Modular		
Advantages	10	g
Back flush	10	d
	10	h
	10	n
Bypass	10	b
	10	h
	10	n
Components	10	k
	12-13	
Connections	10	f
Draining	10	e
Flow rate	10	h
Forward flush	10	c
	10	h
	10	n
Installation	10	m
Isolation	10	e
Maintenance	10	j
Normal operation	10	a
Overview	2	d
Performance	26-27	
Pre-commissioning	10	n
Proflow Venturi	10	h
Regulation	10	e
Specification	11	
	34	e
Spindles	10	j
Strainer basket	10	o
Strainers	10	j
Test points	10	j
Tube and pipe compatibility	10	l
Vapour seal	10	j
Proflow Suremix		
Accessories	25	c
Capabilities	23	1
Dimensions	24	1-3
Flow rates	24-25	
Installation	25	b
Overview	3	c
	23	a
Performance	29	
Specification	35	m
Suremix C	23	d
	24	2
	24	5
	29	4-5
Suremix HCX	23	d
	29	6-8
Suremix UB	23	d
	24	a
	24	1
	24	4
	29	2-3
TMV 3 scheme	23	b
	23	e
Tube and pipe compatibility	25	a
Proflow Venturi		
Applications	4	e
Benefits	4	g
Calculations	9	b
Commissioning station (FODRV)	4	j
	5	c
	6	a
Connections	6	c
Cross section	5	a
Differential pressure	5	1
Dimensions	4	b
	5	3-4
	6	1-2
	8	1-3
	9	1
Double Regulating Valve (DRV)	4	b
	5	d
	6	a
Extension tubes	9	e
Flow rates	5	1-2
	6	3
	9	c
Handles	5	f
	5	i
Head loss	4	d
	4	1
	4	2
Installation	9	2
Isolation	4	h
	5	b
kPa	5	c
Kv/Kvs	5	k
Loss factor	4	d
Memory stop	6	b
Orifice	4	a
	4	f
	5	c
Overview	2	c
	4	e
Performance	26	
Pressure loss	9	b
Regulating valve	6	a
	6	c
Regulation	4	h
	5	b
	5	g
Security	5	j
Signal	4	c
	9	c
Specification	34	b
Test points	4	l
	5	c
	9	d
Tube and pipe compatibility	9	a
Upstream lengths	5	c
	6	f
Venturi	4	f
	5	e
	26	j
	27	d
Specification clauses	34-35	
Stainless steel tube	32	d
	32	q
	33	1
	33	3
	37	a
	37	3
Standards	30	f
Advantica	9	a
BS 1387	10	l
	30	m
BS 2767	30	i
BS 5154	30	k
BS 6283 Part 4	30	n
BS 7942	9	a
BS EN 1057	30	d
BS EN 1092-1	30	h
BS EN 1092-2	30	i
	30	j
	30	n
BS EN 1111	30	b
BS EN 1254 Part 2	30	e
	30	f
	30	m
	30	n
BS EN 1287	30	n
BS EN 215	30	m
BS EN 488	30	l
BS EN 593	30	g
BS EN ISO 228	30	f
	30	k
DIN 2394/NEN 1982	10	l
DVGW	30	f
Gaz de France	30	g
ISO	3	h
ISO 7/EN 10226-1	30	c
	30	e
	30	f
	30	j
	30	m
Steel Proflow Venturi	6	a
Steel tube	9	a
	10	l
	32	f
Strainers	16	j
Stress corrosion cracking	36	g
Supports (pipeline)	36	f
	36	1
System design	36-37	

Q

	PAGE	SECT
Quality	3	f
	30	g

R

	PAGE	SECT
Radiator valves	3	b
	14	j
	18-22	
Regulating valve	6	a
	6	c

S

	PAGE	SECT
Set point	4	b
Signal	4	c
	9	c
Sound Engineering Practice (S.E.P.)	26	d

T

	PAGE	SECT
Temperature control	3	b
Test pressures	26	e
	27	c
	28	c
Thermal movement	36	n
TMV 3 scheme	23	b
	23	e
Tube and pipe compatibility	3	e
	9	a
	10	l
	14	r
	22	g
	25	a
	32-33	
Tube and pipe expansion	37	

W

	PAGE	SECT
Working temperatures and pressures	26-29	

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