Installation Accessories

FILE NO:	6-2
DATE:	August 2007
SUPERSEDES:	6-2
DATE:	July 2007

The Smart Choice

Armstrong has selected a wide range of ancillary equipment to complement our high quality, finely engineered products.

Each item has been matched with our pumps and systems to ensure compatibility, optimum efficiency and reliability in use. The resulting combination of Armstrong products and our chosen ancillaries, along with the added advantage of a single-source supply, ensures the best functionality and durability possible and better service to our customers.

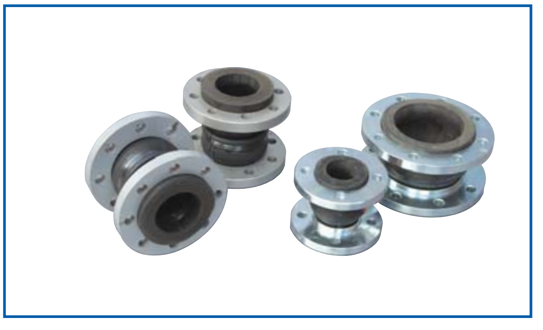
▶ Inertia Bases

Fabricated steel inertia bases specifically matched to the weights and characteristics of the Armstrong pumps, are designed to dampen and isolate structure-borne vibration.

The bases are concrete-filled, at site, to provide the necessary mass.

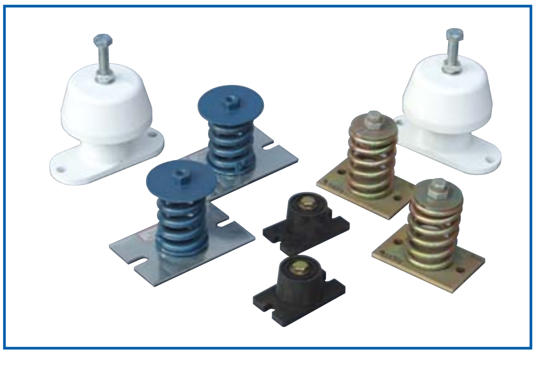
▶ Flexible Connectors

Flexible connectors isolate the equipment, reduce noise and vibration transmission through the pipework, and reduce stress on pump flanges. The connectors comprise two flanges or male BSP threaded fittings, bonded onto a convoluted reinforced rubber or stainless steel body.



▶ Anti-Vibration Mounts

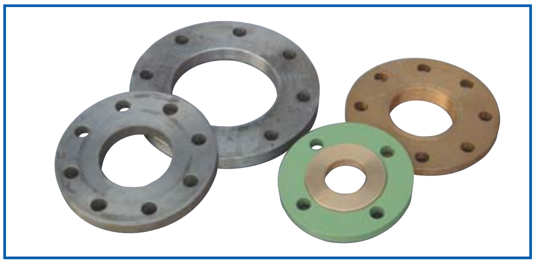
Designed for mounting under concrete-filled inertia bases and pumping-set frameworks, these mounts isolate the equipment from the building structure thereby reducing the transmission of noise and vibration.



The best functionality

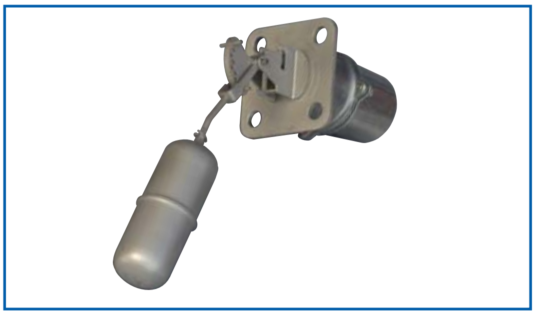
▶ Counter Flanges

Screwed or welded steel counter flanges can be supplied in all relevant flange table sizes to suit suction and discharge flanges for all Armstrong pumps and pumping sets. Different materials are available on request.



▶ Float Switches

Available in a variety of types to start and stop pumping equipment and initiate alarm functions by detecting water levels.



▶ Air Eliminators

We have selected a range of air separators and air vents which are purpose designed for air separation and automatic venting in heating and chilled water circuits.

▶ Expansion Vessels

The comprehensive selection of membrane vessels covers a range of applications including the accommodation of expanded water in heating and chilled-water sealed systems, domestic hot water, secondary expansion, cold water boosting drawdown and potable water applications. All vessels are WRAS listed.

▶ Automatic Air Vents

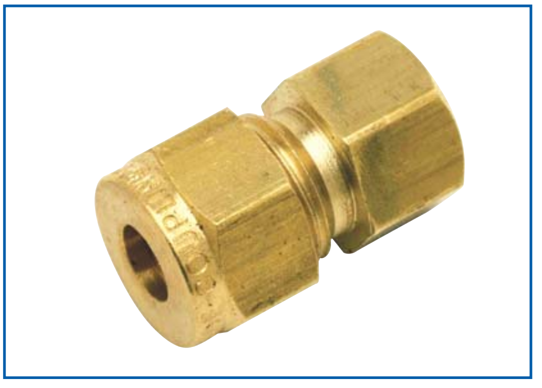
Armstrong Automatic Air Vents ensure proper venting of air automatically from any type of system, providing increased heating capacity, a more economical and much quieter operating system.

This range of Air Vents provides a maximum operating pressure of 6 Bar (87 psig) a maximum operating temperature of 110ÞC (230ÞF) and are simple to install in any part of an installation.
Connection Dia. $^3/_8$" BSP (male).

Automatic Air Vents are supplied complete with a standard system shut-off pocket, and carry a twelve month warranty.

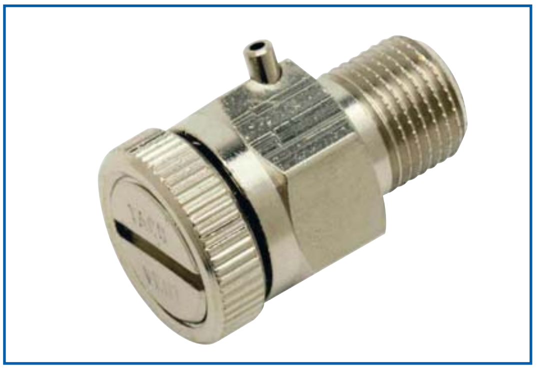
▶ Overflow Connectors No. 712

If it is desired to ensure the discharge of the air vent to a specific point the use of the overflow connector is recommended. Use 6mm O.D. soft copper tubing of desired length – not supplied by Armstrong.



▶ Automatic Radiator Vent No. 710

The vent operates on the expanding washer principle, air shrinks the washers, permitting the escape of trapped air, however the presence of water immediately expands the washers, closing the vent.
Connection size $^1/_8$". BSP (male)

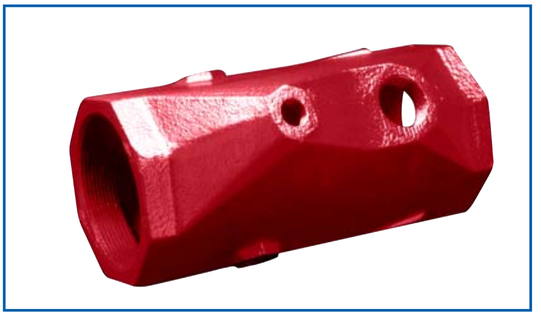


▶ Pressure Reducing Valves

Pilot operated and diaphragm reducing valves are designed to give constant down-stream pressure thus eliminating the closed-valve head generated by the pump. All Armstrong pilot operated PRVs are fitted with speed control devices to provide smooth operation.

▶ Air Purgers

The water that is used initially to fill a hot water heating system contains dissolved air. Make-up water subsequently added will similarly have a high air content. Heating this water releases the air and permits it to be circulated in the system, from which it must be vented, via the purger.

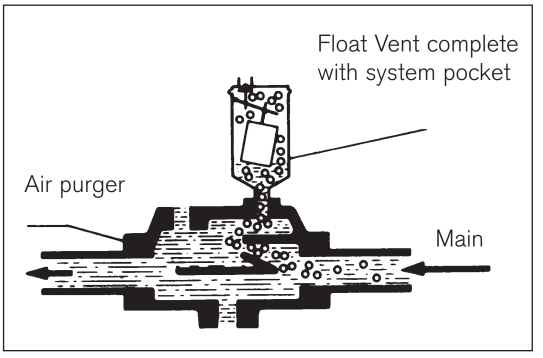


▶ Operating

Each Armstrong Air Purger is a one piece cast iron or malleable chamber with two passages through which boiler water flows; internal contours and baffles are designed for low flow resistance characteristics and efficient separation of air from water.

While the circulating pump is operating, system water continuously flows through the purger.

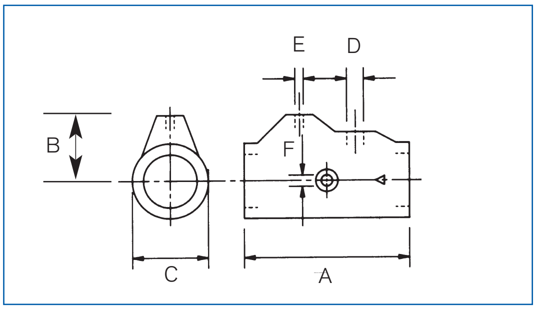
The more dense water flows at nearly maximum velocity through the lower passage of the purger and directly to the system piping. The less dense water, containing dissolved air moves in to the upper channel. This area is so designed to segregate the air or gases and to accumulate them in the upper dome for release through an automatic air vent. The water thus freed of its air content, rejoins the main flow. Spare tappings can be used for other accessories or plugged as required.



▶ Installation

Air Purgers should be installed on the flow main as close to the boiler/chiller as possible. These units must be installed so that water flow corresponds with the direction arrow on the face of the purger.

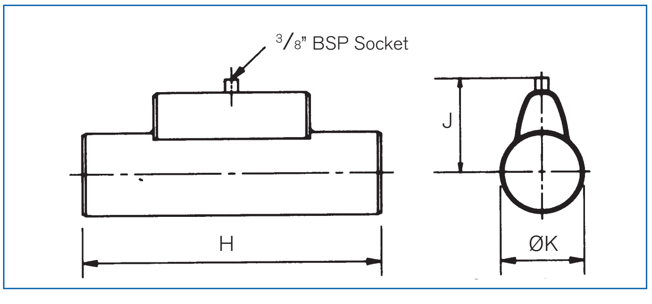
▶ Threaded Air Purgers



Size BSP	A	B	C	D bsp	E bsp	F bsp	Wt kg.
3/4"	110	45	42	n/a	3/8"	n/a	0.7
1"	150	50	70	1/2"	3/8"	1/2"	1.5
1 1/4"	150	50	70	1/2"	3/8"	1/2"	1.5
1 1/2"	150	50	70	1/2"	3/8"	1/2"	1.5
2"	185	70	90	3/4"	3/8"	1/2"	2.3
2 1/2"	230	95	115	1"	3/8"	1/2"	5.0
3"	230	95	115	1"	3/8"	1/2"	4.4

Maximum Working Pressure/Temperature 6 Bar - 110°C

▶ Threaded Air Purgers

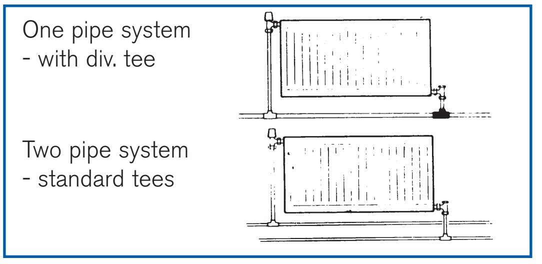


Nom. Bore	H	J	ØK	Wt.
4"	350	120	114	6Kg
5"	350	138	140	8Kg
6"	500	167	166	13Kg
8"	500	200	219	28Kg
10"	700	240	273	32Kg
12"	700	266	324	36Kg

Maximum Working Pressure/Temperature 6 Bar - 110°C

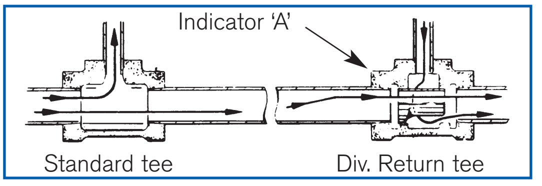
▶ Diversion Tees

Many years of research by Armstrong engineers brings you the Diversion Tee, with unique venturi insert, designed to simplify heating systems by using the one pipe principle and to ensure positive diversion of system water to each heating unit regardless of its type or location in the system. Other advantages using this now famous product are the ensuring of proper temperature drop, the use of economical pipe sizes and diversion characteristic found to an accurate degree by varying the velocity in the main. Careful examination of the performance data in applications using one or two fittings soon demonstrates the accuracy that can be accomplished with these precision engineered fittings.



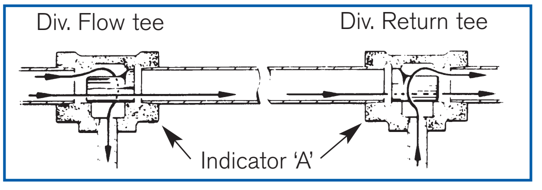
▶ For radiation above the main – normal resistance

For most installations where radiation is above the main, only one Diversion Fitting need be used for each heating unit. It can be installed on the flow or return riser, with outlet in an upright position.



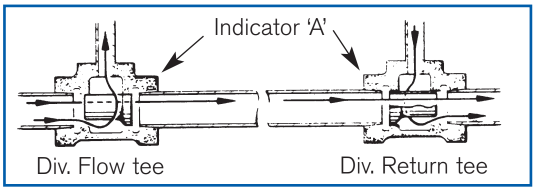
▶ For radiation below the main

Radiation below the main requires the use of both a flow and return Diversion Fitting. The increased diversion capacity provided by two fittings overcomes the difficulty of circulating through radiation below the main. Outlet on down-feed tees should be placed vertical, facing down.

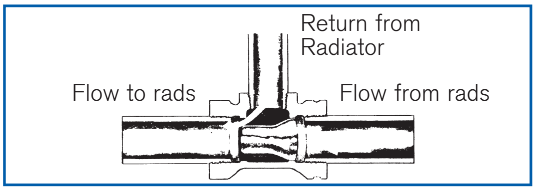


▶ For radiation above the main – high resistance

Where characteristics of the installation are such that resistance to circulation is high, two Diversion Fittings will supply the diversion capacity necessary.



The illustration opposite shows how the Diversion Fitting accomplishes its remarkable results. The main body of water passes through the Venturi shape tube of the fitting, yet a balanced distribution of water to each radiator is achieved without a power-wasting penalty on the pumps.



▶ Only one fitting required

In the majority of cases only one Diversion Tee is required to provide the correct capacity for up feed heating units, they can be installed either in the return or flow line with an ordinary tee at the other connection. Where particularly high resistance to flow occurs through the heating unit, a diversion tee can be installed on both the flow and return to ensure sufficient diversion force.

▶ Same fitting flow or return

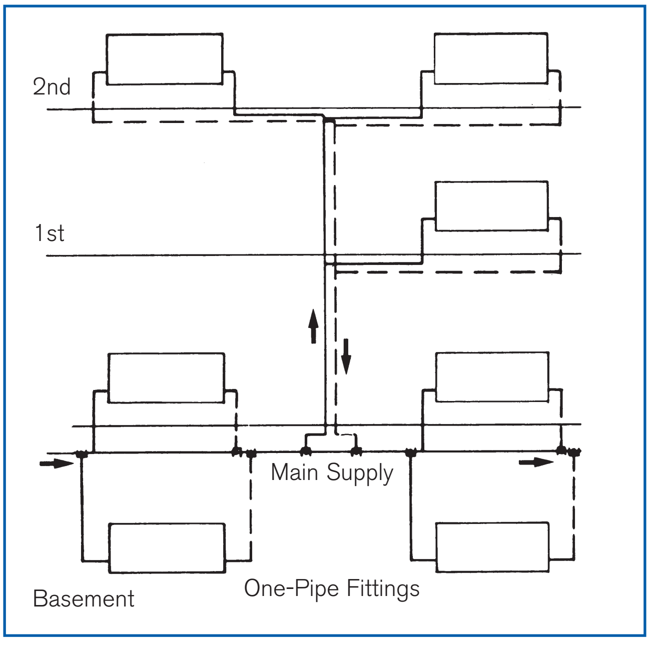
All Armstrong Diversion Tees have a raised letter 'A' on one end. The tee must be fitted such that this end is installed between the risers. Note: do not use more than 8-20x15 (3/4"x1/2") tees in series on any one circuit. Use 25mm (1") bore main when more than 8 diversion tees are required in series.

Pressure Drops

The pressure drop across each tee can be calculated using the following equivalent lengths:-

Main Size	Equivalent Length	
20 mm 3/4" bsp	1.5 m	5 ft
25 mm 1" bsp	1.8 m	6 ft
32 mm 1 1/4" bsp	2.1 m	7 ft
40 mm 1 1/2" bsp	2.4 m	8 ft
50mm 2" bsp	3.0 m	10 ft
60 mm 2 1/2" bsp	3.7 m	12 ft

▶ Typical one-pipe circuits



▶ Horizontal one-pipe supply loops with standard riser connections

NOTE: Various combinations of horizontal supply loops with riser connections as illustrated, grouped or arranged in one or more zones are adaptable for use on all types of buildings ranging from residences, large low factories, to three storey office and apartment buildings.

USED ON: All types of buildings.

▶ Cast Iron

MAIN SIZE bsp	BRANCH SIZE (INCHES) bsp	DIMENSIONS mm (inches) OVERALL LENGTH	C.L. PIPE TO OUTLET	APPROX. SHIP WT. kg. (12 PER BOX)
3/4"	3/4 x 1/2	68 (2 11/16)	27 (1 1/16)	6.4 per box
1"	1 x 1/2 or 3/4	80 (3 3/16)	33 (1 5/16)	8.7 per box
1 1/4"	1 1/4" x 1/2, 3/4 or 1	88 (3 1/2)	41 (1 5/8)	15.0 per box
1 1/2"	1 1/2 x 1/2, 3/4 or 1	95 (3 3/4)	45 (1 3/4)	19.0 per box
2"	2 x 1/2, 3/4, 1 or 1 1/4	101 (4)	54 (2 1/8)	28.0 per box
2 1/2"	2 1/2 x 1/2, 3/4, 1 or 1 1/4	108 (4 1/4)	64 (2 1/2)	32.0 per box

Dimensions shown are for reference only.
Certified dimensions available on request.

MAXIMUM OPERATING TEMPERATURE 149PC (300PF)

MAXIMUM WORKING PRESSURE 8.3 BAR (125 p.s.i.g.)

Diversion Tees are manufactured to suit ring main sizes given in TABLE 1

i.e.: 3/4" - 1" - 1 1/4" - 1 1/2" - 2" - 2 1/2" bsp

Diversion Tee Radiator System Selection Chart

TABLE 1. Flow rate in main in Lts./Sec.

Ring main size	A	B	C	D	E	F	G	H	J
20-3/4" bsp	0.28	0.25	0.22	0.20	0.19	0.17	0.15	0.13	0.10
25-1"	0.50	0.45	0.40	0.37	0.33	0.30	0.27	0.23	0.20
32-1 1/4"	1.07	1.01	0.88	0.82	0.74	0.64	0.57	0.49	0.40
40-1 1/2"	1.64	1.52	1.33	1.17	1.10	0.98	0.88	0.76	0.59
50-2"	3.15	2.84	2.59	2.27	2.03	1.86	1.65	1.43	1.15
65-2 1/2"	5.11	4.73	4.23	3.85	3.48	3.30	2.90	2.43	1.96

ONE TEE USED ON RADIATOR RETURN ONLY

TABLE 2. Diverted water flow L/Sec. for rads. above main on same floor

Tee branch size	A	B	C	D	E	F	G	H	J
15-1/2"	0.104	0.095	0.082	0.076	0.069	0.067	0.063	0.058	0.050
20-3/4"	0.183	0.170	0.157	0.151	0.133	0.120	0.114	0.107	0.095
25-1"	0.315	0.303	0.278	0.259	0.234	0.221	0.208	0.196	0.177
32-1 1/4"	0.600	0.556	0.492	0.480	0.436	0.391	0.351	0.303	0.253

TABLE 3. Diverted water flow L/Sec. for rads. One floor above main

Tee branch size	A	B	C	D	E	F	G	H	J
15-1/2"	0.070	0.063	0.057	0.051	0.046	0.043	0.039	0.035	0.025
20-3/4"	0.126	0.120	0.107	0.101	0.088	0.082	0.076	0.071	0.068
25-1"	0.215	0.202	0.183	0.177	0.158	0.152	0.139	0.133	0.114
32-1 1/4"	0.442	0.429	0.373	0.360	0.322	0.310	0.284	0.271	0.227

TABLE 4. Diverted water flow L/Sec. for rads. Two floors above main

Tee branch size	A	B	C	D	E	F	G	H	J
15-1/2"	0.057	0.051	0.044	0.044	0.038	0.038	0.038	0.032	0.025
20-3/4"	0.114	0.101	0.088	0.088	0.076	0.076	0.069	0.063	0.057
25-1"	0.196	0.183	0.177	0.170	0.152	0.139	0.133	0.126	0.114
32-1 1/4"	0.398	0.379	0.354	0.328	0.303	0.286	0.271	0.259	0.227

TWO TEES USED ON RADIATOR FLOW AND ON RETURN

TABLE 5. Diverted water flow L/Sec. for rads. above main on same floor

Tee branch size	A	B	C	D	E	F	G	H	J
15-1/2"	0.145	0.139	0.120	0.114	0.107	0.101	0.088	0.076	0.063
20-3/4"	0.271	0.259	0.235	0.208	0.189	0.177	0.164	0.139	0.126
25-1"	0.505	0.461	0.404	0.379	0.347	0.316	0.309	0.246	0.202
32-1 1/4"	1.136	0.884	0.758	0.694	0.631	0.587	0.505	0.467	0.392

TABLE 6. Diverted water flow L/Sec. for rads. One floor above main

Tee branch size	A	B	C	D	E	F	G	H	J
15-1/2"	0.101	0.095	0.088	0.082	0.069	0.063	0.063	0.051	0.044
20-3/4"	0.196	0.177	0.158	0.152	0.139	0.133	0.114	0.095	0.082
25-1"	0.366	0.328	0.284	0.271	0.234	0.208	0.202	0.177	0.158
32-1 1/4"	0.770	0.682	0.581	0.568	0.499	0.455	0.429	0.372	0.316

TABLE 7. Diverted water flow L/Sec. for rads. Two floors above main

Tee branch size	A	B	C	D	E	F	G	H	J
15-1/2"	0.088	0.076	0.069	0.063	0.057	0.051	0.051	0.044	0.038
20-3/4"	0.164	0.152	0.145	0.133	0.120	0.114	0.101	0.088	0.076
25-1"	0.297	0.271	0.240	0.227	0.215	0.196	0.183	0.177	0.158
32-1 1/4"	0.625	0.574	0.511	0.486	0.442	0.417	0.372	0.354	0.290

TABLE 8. Diverted water flow L/Sec. for rads. on floor below main

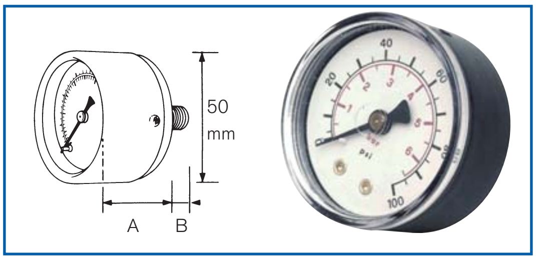
Tee branch size	A	B	C	D	E	F	G	H	J
15-1/2"	0.101	0.095	0.088	0.076	0.069	0.057	0.051	use smaller	
20-3/4"	0.208	0.189	0.164	0.152	0.126	0.114	0.088	main size to	
25-1"	0.366	0.328	0.271	0.259	0.215	0.183	0.158	increase	
32-1 1/4"	0.739	0.669	0.543	0.524	0.436	0.372	0.309	velocity.	

▶ Pressure Switches

Model	Range Bar	Differential Bar
SB0 74	0 to 6	.55 - 2.7
RT 200	0.2 to 6	0.2 - 1.2
RT 116	1 to 10	0.2 - 1.3
RT 5	4 to 17	1 - 4
KP 135	0.2 to 8	0.4 - 1.5
KP 136	4 to 12	0.5 - 1.6

▶ Pressure Gauges

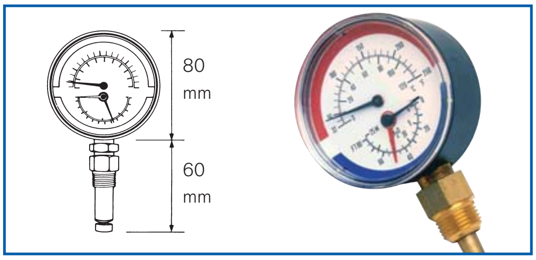
Model	Pressures	A mm	B mm
SBO 2/160	0-11 Kg/cm² (0-160 psig)	30	25
SB0 2	0-7 Kg/cm² (0-100 psig)	30	25
SB0 3	0-4 Kg/cm² (0-60 psig)	30	25



▶ Combined Altitude & Temperature Gauge

80mm dia. ½" b.s.p. male

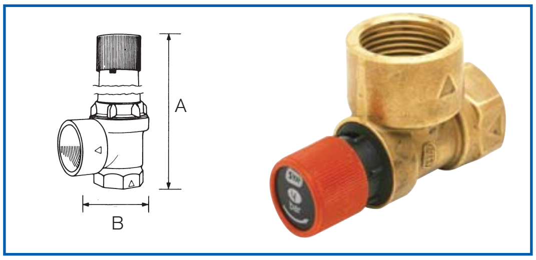
Model	Temperature Graduations	Altitude Graduations
SB0 72 (illus.)	0-120 C (250 F)	0-40 MWS (130 ft)
SB0 73 back conn	0-120 C (250 F)	0-40 MWS (130 ft)



▶ Safety Relief Valves (1900 Series)

All bronze construction. Spring loaded. Non adjustable.

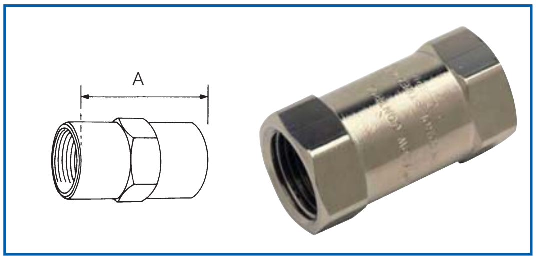
Size	Pressure rating bar	Heat generator output	A	B
½" (15 mm)	2, 3 or 4	78 kW	90	50
¾" (20 mm)	2, 3 or 4	138 kW	90	50
1" (25 mm)	3, 4 or 5	176 kW	130	70
1½" (40 mm)	3, 4 or 5	348 kW	240	105



▶ Flo-regulators

Will accurately control flow of water at any pressure from 1 BAR (15 psig) to 10 BAR (125 psig) max. temperature not to exceed 71ÞC (160ÞF)

Size	A	Model No. and Flow rate. Galls. (Litres)			
		11/2 G	2G	3G	4G
½" b.s.p. (15mm)	50	12 (55)	16 (70)	25 (11)	3.3 (15)
		6G	8G	10G	
¾" b.s.p. (20mm)	50	50 (22.5)	65 (30)	80 (40)	
		15 G			
1" b.s.p. (25mm)	55	120 (55)			



Our policy is one of continuous improvement and we reserve the right to alter our dimensions and specifications without notice

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