ART 22

DZR Balancing Valve



Flow Data
and
Installation Instructions

This datasheet is designed as a guide and should not be regarded as wholly accurate in every detail.We reserve the right to amend the specification of any product without notice.

Technical Data

The Albion ART 22 is a fixed orifice double regulating valve used to regulate and measure the flow passing through it.

Flow Coefficient

The flow rate can be calculated using the Kv value and a measured signal.

$$Kv = \frac{Q*36}{\sqrt{\Delta P}} \qquad Kvs = \frac{Q*36}{\sqrt{\Delta Ps}}$$

where Kv &Kvs = flow coefficient (m3/hr at 1 bar differential)

Q = flow rate (l/s)

ΔP = headloss attributable to valve (kPa)

ΔPs = differential pressure across tappings (signal) (kPa)

Kvs Values

Size	½″	¾″	1″	1¼″	1½″	2″
Kvs	2.3	5.3	9.2	19.0	22.1	42.3

Pressure Loss

The pressure loss across the fixed orifice double regulating valve is the combined loss attributable to the orifice plated and double regulating valve in the fully open position.

Kv Values

Size	½″	¾″	1″	1¼″	1½″	2″
Kv	2.00	3.88	7.28	13.39	18.69	30.10

Installation

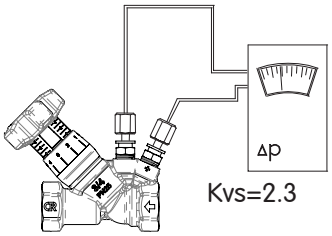
Fixed orifice double regulating valves must always be installed with a minimum of 5 pipe diameters of straight pipe, without intrusion, upstream of the orifice plate. Downstream of the valve a minimum of 2 pipe diameters of straight pipe are required.

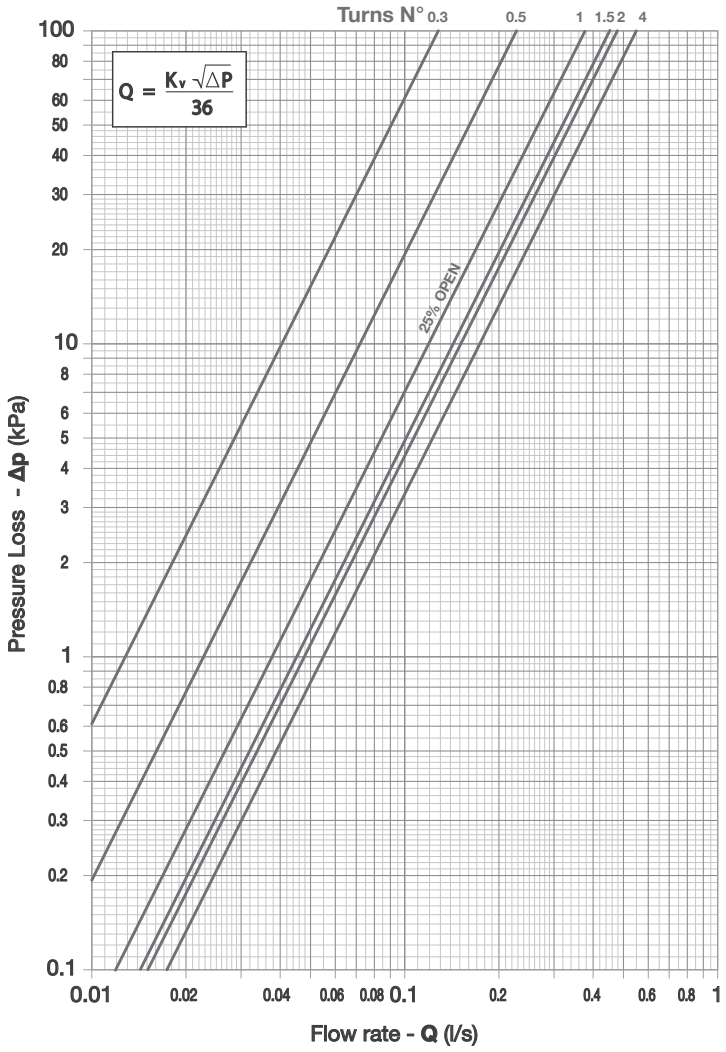
Sizing

Once the required flow rate has been calculated, the size of the fixed orifice double regulating valve can be determined based on the following:
The minimum signal at the design flow rate of 1 kPa.
For minimum pressure loss, a maximum signal of 4.7 kPa, which corresponds to the maximum differential pressure range of a fluorocarbon manometer.

Kv Values - DN 15

ART 22

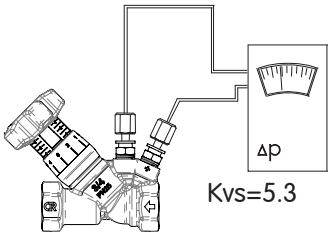


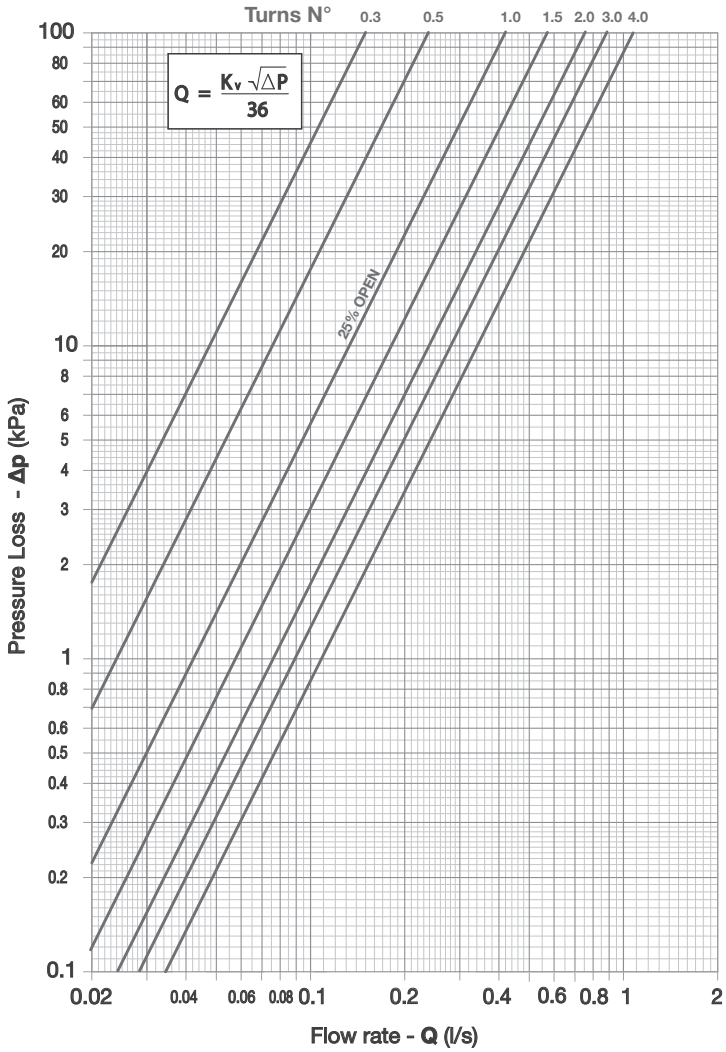


Kv (Flow rate in m³/h @ 1 bar pressure drop)										
Full turn		Tenths of turn								
	0.0	**0.1**	**0.2**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.9**
0	-	-	-	0.47	0.68	0.83	0.98	1.10	1.20	1.29
1	1.37	1.44	1.50	1.55	1.61	1.64	1.67	1.69	1.71	1.72
2	1.73	1.74	1.74	1.76	1.78	1.81	1.84	1.86	1.88	1.89
3	1.90	1.92	1.93	1.95	1.97	1.98	1.98	1.99	2.00	2.00
4	2.00									

Kv Values - DN 20

ART 22

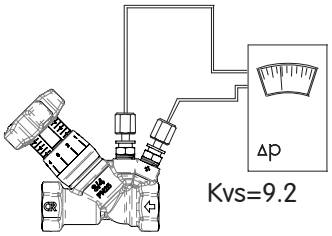


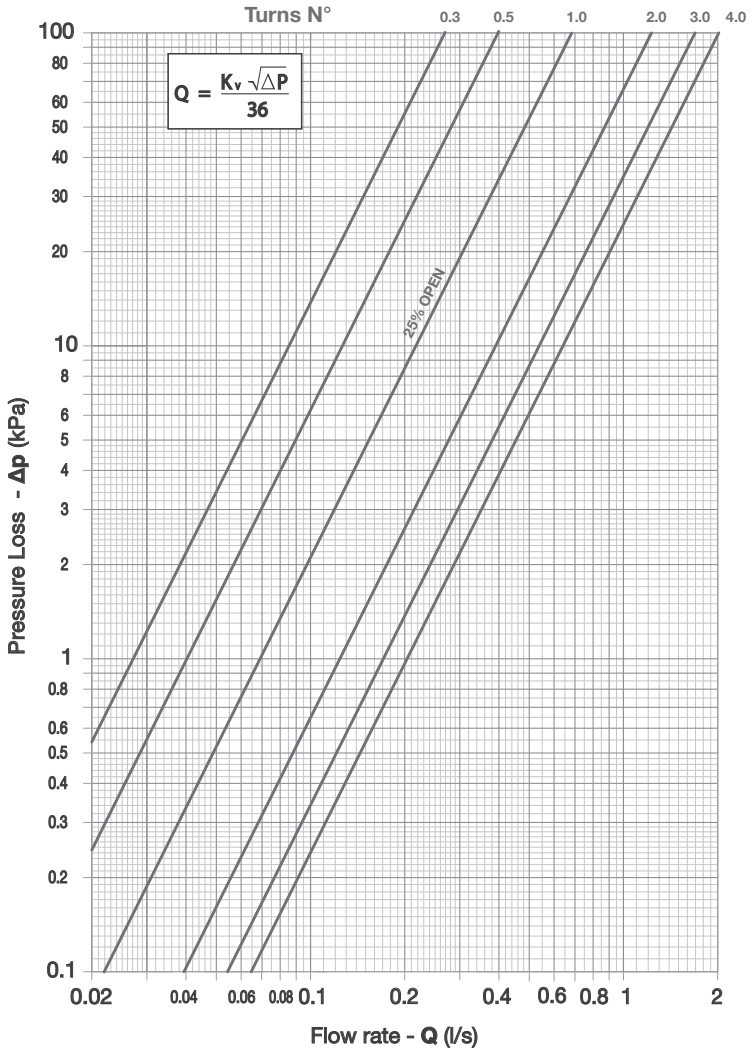


Kv (Flow rate in m³/h @ 1 bar pressure drop)										
Full turn		Tenths of turn								
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0	-	-	-	0.54	0.73	0.89	1.04	1.16	1.30	1.42
1	1.54	1.64	1.74	1.84	1.93	2.03	2.10	2.17	2.26	2.31
2	2.37	2.42	2.48	2.53	2.58	2.63	2.71	2.82	2.96	3.04
3	3.17	3.31	3.44	3.54	3.64	3.70	3.76	3.80	3.82	3.83
4	3.88									

Kv Values - DN 25

ART 22

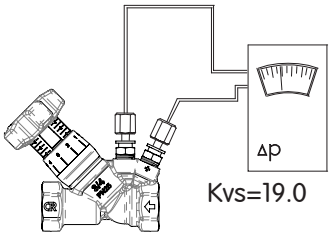




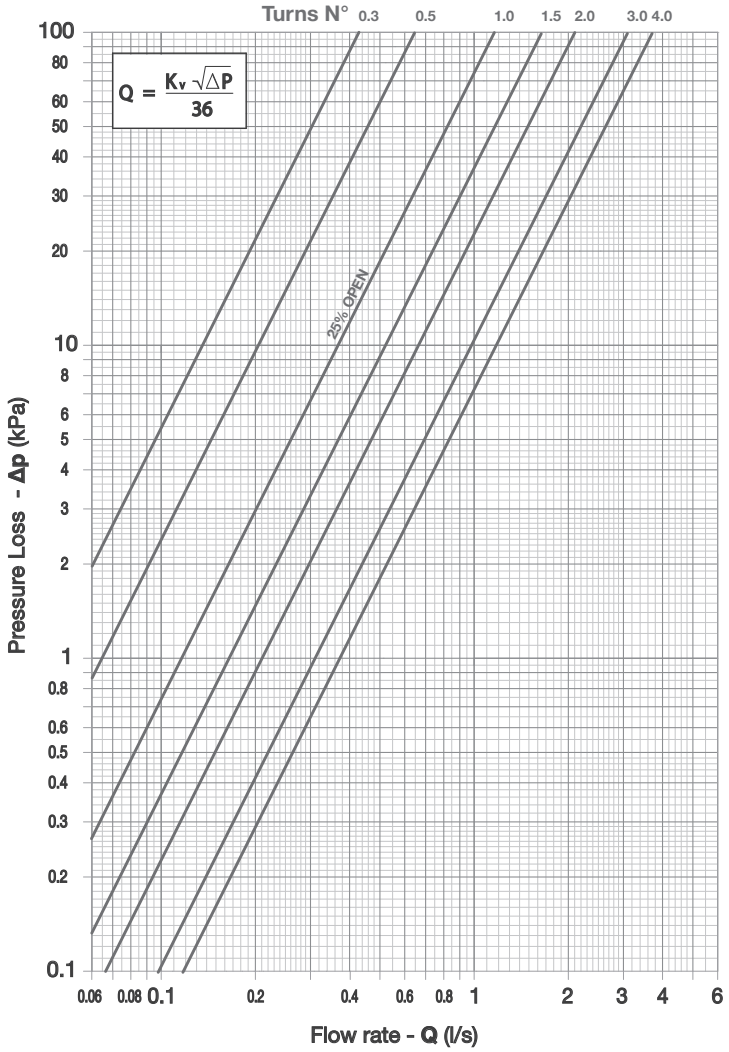
Kv (Flow rate in m³/h @ 1 bar pressure drop)										
Full turn		Tenths of turn								
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0	-	-	-	0.96	1.21	1.45	1.65	1.84	2.04	2.25
1	2.46	2.66	2.87	3.09	3.32	3.54	3.74	3.91	4.10	4.24
2	4.43	4.59	4.78	4.98	5.17	5.34	5.51	5.67	5.82	5.98
3	6.09	6.24	6.38	6.51	6.65	6.79	6.89	6.99	7.08	7.19
4	7.28									

Kv Values - DN 32

ART 22



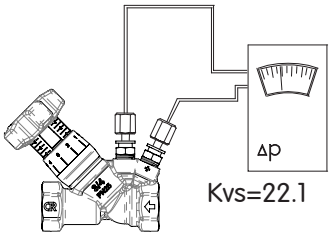
Kvs=19.0

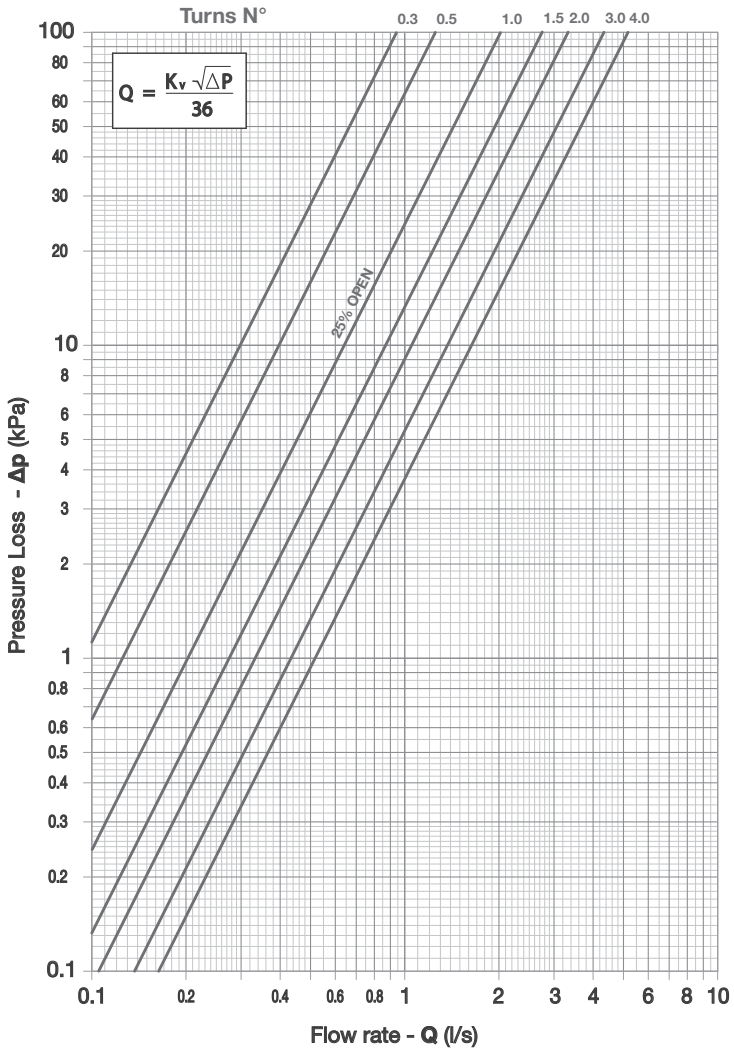


Kv (Flow rate in m³/h @ 1 bar pressure drop)										
Full turn		Tenths of turn								
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0	-	-	-	1.56	1.96	2.34	2.68	3.04	3.40	3.80
1	4.15	4.51	4.85	5.18	5.55	5.89	6.21	6.52	6.91	7.21
2	7.56	7.86	8.17	8.50	8.92	9.30	9.68	10.06	10.42	10.89
3	11.27	11.62	11.98	12.37	12.70	12.93	13.06	13.19	13.27	13.33
4	13.39									

Kv Values - DN 40

ART 22

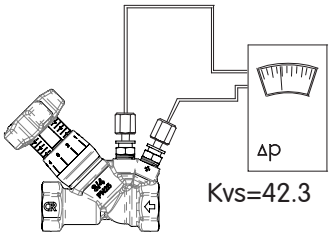




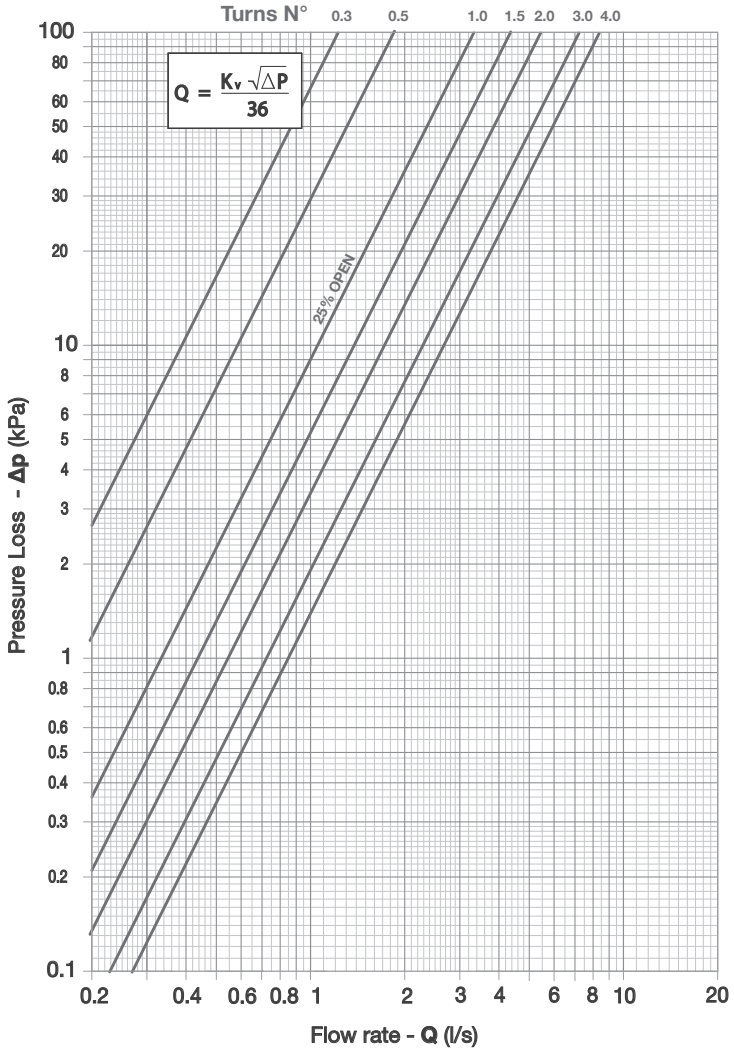
Kv (Flow rate in m³/h @ 1 bar pressure drop)										
Full turn		Tenths of turn								
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0	-	-	-	3.37	4.08	4.51	5.12	5.60	6.16	6.78
1	7.32	7.90	8.43	9.00	9.53	9.88	10.30	10.73	11.16	11.63
2	11.97	12.36	12.78	13.19	13.53	13.92	14.28	14.57	15.01	15.35
3	15.69	16.01	16.43	16.71	17.02	17.24	17.52	17.85	18.10	18.27
4	18.69									

Kv Values - DN 50

ART 22



Kvs=42.3



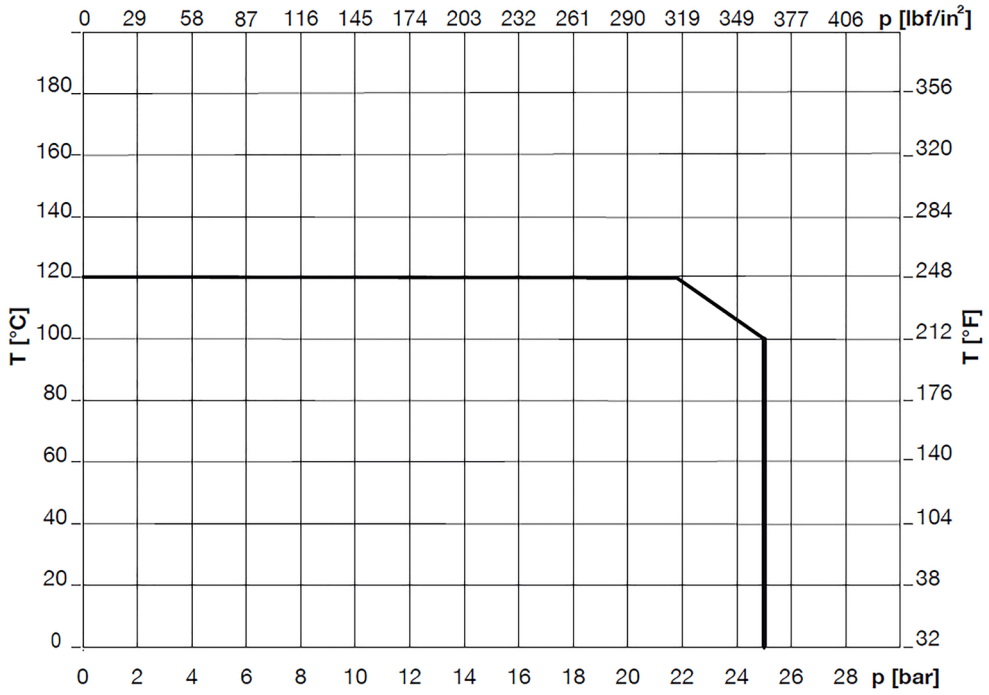
Kv (Flow rate in m³/h @ 1 bar pressure drop)										
Full turn		Tenths of turn								
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0	-	-	-	4.39	5.65	6.72	8.07	8.97	10.04	11.06
1	11.77	12.62	13.51	14.28	15.05	15.73	16.25	17.14	18.06	18.81
2	19.44	20.10	21.04	21.81	22.53	23.12	23.88	24.28	24.75	25.36
3	26.06	26.48	26.91	27.24	27.66	28.10	28.44	28.80	29.17	29.76
4	30.10									

DZR Fixed Orifice Double Regulating Valve

This fixed orifice double regulating valve is a precision manufactured product and should be handled, installed and used with care as detailed in these instructions.

ART 22 balancing valves are suitable for both heating (LPHW) and cooling applications at working pressures up to 25 bar.

Operating Pressure and Temperature



Limits of Use

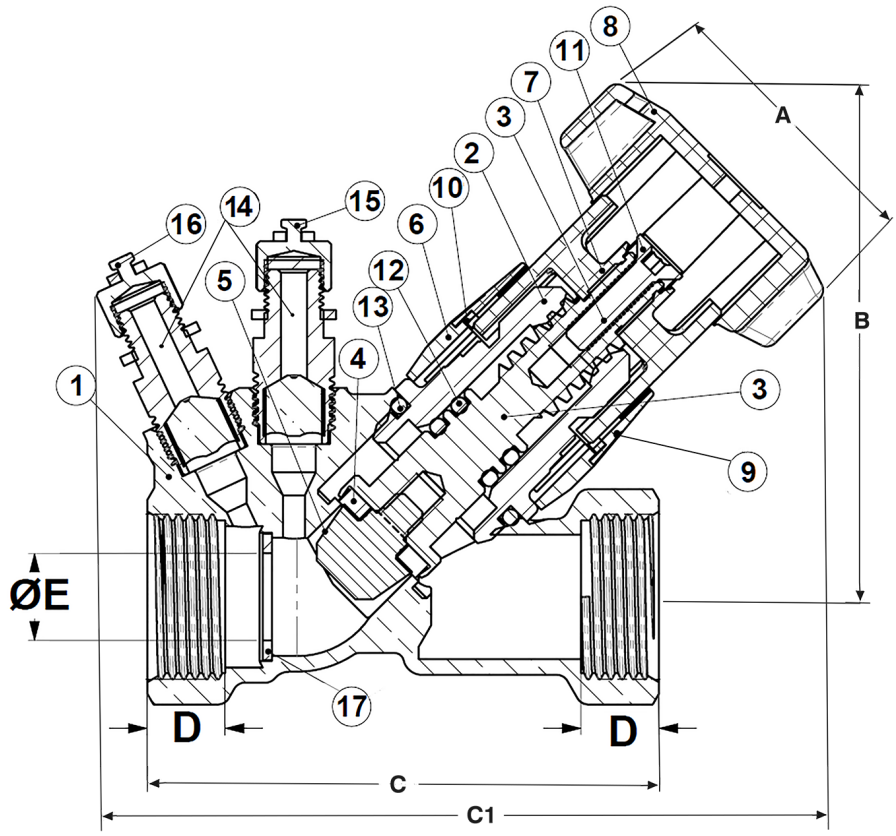
The valve is rated PN 25 and must be installed in a piping system where the normal pressure and temperature does not exceed the above ratings.

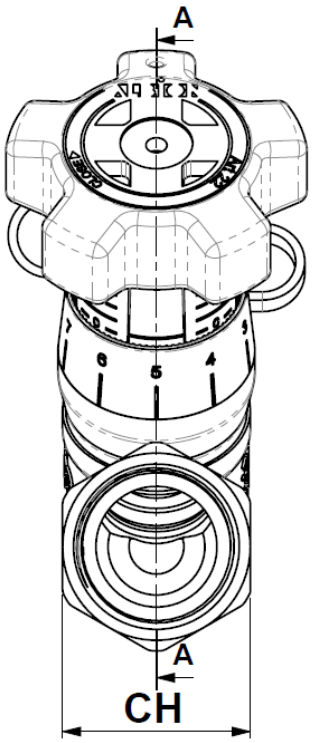
The upper temperature is restricted to 120°C due to the elastomeric seals in the test points.

Layout and Siting

It should be considered at the design stage where valves will be located to give access for operation, regulation and setting to the required position.

ART 22





DN	½"	¾"	1"	1¼"	1½"	2"
A	50	50	50	50	50	50
B	83	82	84	87	107	103
C	72.5	82	95	122	138	161
C1	113	116.5	130	131	149	164
D	12.5	12.5	14.5	16	16	19
CH	25	31	38	47	55	66
Kv	2.00	3.88	7.28	13.39	18.69	30.10
Kvs	2.3	5.3	9.2	19.0	22.1	42.3
ØE	9	14	17.5	25	27	36.7
Kgs	0.78	0.43	0.52	0.86	1.34	1.47

N.	Part Name	Materials
1	Body	DZR Brass
2	Bonnet	DZR Brass
3	Stem	DZR Brass
4	Gasket	EPDM
5	Shutter	DZR Brass
6	Index	POM
7	Entrainer Blue	Nylon 6
8	Knob Blue	Nylon 6
9	1/10 Turn index blue	POM
10	Ring	Brass
11	Screw	Steel
12	O-Ring	EPDM
13	O-Ring	EPDM
14	Binder Point	Brass
15	Cup Blue	Brass
16	Cup Red	Brass
17	Fixed Orifice	DZR Brass

Installation

Valves are precision manufactured products and should not be subjected to misuse. Careless handling, allowing foreign particles to enter the valve through the end ports, lack of cleaning both valve and system before operation should be avoided. Excessive force during pipe tightening and handwheel operation should be avoided.

Valves must be provided with adequate support. Adjoining pipework must be supported to avoid the imposition of pipeline strain onto the valve, which would impair its performance.

Immediately prior to installation, the adjacent pipework should be checked for cleanliness and freedom from debris.

Confirm that the pipe threading is correct to avoid excessive penetration of the pipe into the valve, which may cause damage.

Thread sealing compounds appropriate to the application must be used but excessive use should be avoided, since this increases thread interference and may cause overstressing of the body ends and may cause thread seal to extrude into the bore, disturbing the flow condition.

Ensure the threads are properly engaged before proceeding to tighten the valve onto the pipe.

The wrench must only be located on the valve end into which the pipe is being threaded to avoid distortion of the valve.

Fixed orifice double regulating valves should be installed with a minimum of 5 diameters equivalent of straight pipe upstream and 2 diameters downstream having the same nominal diameter as the valve and should not include any reducers or any other intrusions into the bore within these specified lengths.

It is important to ensure that the flow arrow on the valve is coincident with the direction of flow in the pipeline.

Operating

When used for balancing water distribution systems, valves will always be in the fully open position at commencement of any commissioning or flushing exercise.

Regulation is accomplished by rotating the handwheel clockwise when viewed from the top of the handwheel.

The valve is opened by anti-clockwise rotation of the handwheel to a positive stop. Further effort is not necessary. When fully open it is advantageous to rotate the handwheel clockwise 1/2 turn.

To close the valve, the handwheel is rotated clockwise to a positive stop.

Test points

Valves are supplied with test points fitted.

Operation

The commissioning stage is the only time that the valve will normally have any attention. During this stage, all entrained air must be removed from the system before accurate measurements of differential pressure signals can be taken from the test points.

There are two test points, each fitted with a coloured strap and captive cap.

- Upstream (HP) – Red
- Downstream (LP) - Blue

For safety reasons, all manometer probe insertions must be carried out with the system cold.

The measurements are taken by directly inserting the test probe into the test point. A silicone oil or grease should be lightly applied to the shaft of the probe prior to insertion. No other type of lubricant should be used.

Valve Setting

When the regulated position is achieved, the double regulating feature is set as follows:

- The inner spindle is adjusted through the central hole in the handwheel, using a 3mm Allen key.
- Rotate the inner spindle anti-clockwise until a stop is felt.
- The double regulating feature is now set which enables the valve to be fullyclosed for isolation and re-opened to the previously set position. It is recommended to record this set position for reference later if necessary.

Maintenance

The Albion Art 22 does not require any routine maintenance.