Installation & Operating Manual

ART 28 / ART 28DP
Variable Orifice Double Regulating Valve

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ART 28 / 28DP Rev 1

Contents

1. Introduction

- Albion Valves (UK) Ltd ART 28 & ART 28 DP are used for regulating the flow in cooling and heating systems.
- The ART 28 DP can be used in conjunction with ART 24, ART 24C & ART 24F DPCV.
- The ART 28 & ART 28 DP have been classified in accordance with PED 2014/68/EU.

2. Technical Data

Valve Type	Size Range	Connection Type	Temperature Rating	Pressure Rating (Max)
ART 28	DN 15 – DN 50	ISO 7/1	-10°C – 120°C	25 bar
ART 28 DP	DN 15 – DN 50	ISO 7/1	-10°C – 120°C	25 bar

Flow Coefficient

Kv, represents the flow in m3/h of water at a temperature of 20°C (density =998 kg/m3) which causes a pressure drop of 1 bar.
It is possible to calculate the pressure drop across a valve with a given flow rate where:

Δp = Pressure Drop
Q = Flow Rate
Kv = pressure drop of 1 bar / 100 Kpa across the valve.
r = fluid density

$$\Delta p = r\,(Q/Kv)2$$

Kvs Values

Size	½”	¾”	1”	1 ¼”	1 ½”	2”
Kvs	0.42 – 1.75	0.44 – 2.87	0.52 – 4.08	0.7-6.71	0.82 – 10.40	1.14 – 15.06

3. Valve Features

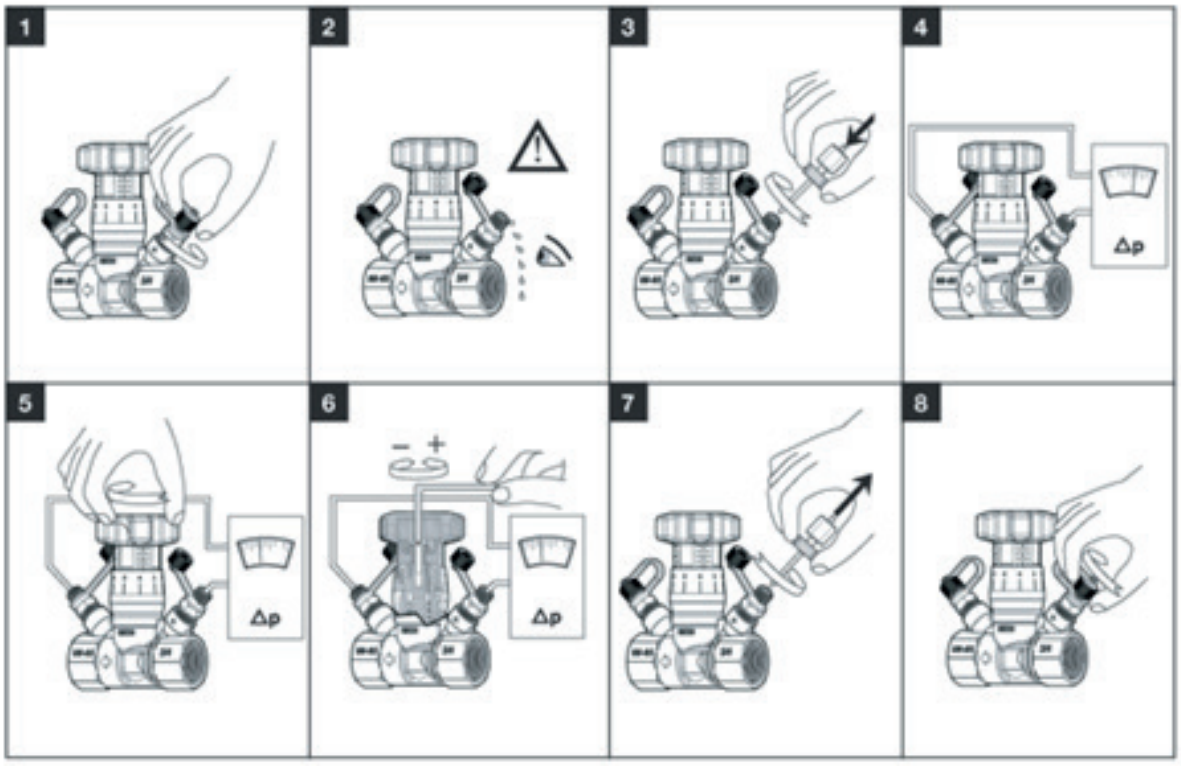
- The ART 28 & ART 28 DP is manufactured in accordance with BS 7350.
- Handwheel with shut off function and 360° reading.

4. Valve Installation

- The valve should be sited to ensure ease of access.
- It is the responsibility of the installer to ensure the valve is suitable for service conditions e.g., temperature, pressure, and service media.
- Care should be taken to ensure the surface finish of the valve is protected during installation.
- The valves may be installed in horizontal or vertical pipework.
- The valve is uni-directional and should only be used for flow in the direction shown on the valve.
- Suitable gaskets / sealing material should be used during installation

5. Valve Regulating

- To open the valve, rotate the handle anti-clockwise. To close the valve, rotate the handle clockwise until a positive stop is reached.
- it is possible to regulate the flow by rotating the handle anticlockwise until the required flow rate is reached. The reading of this flow rate can be done by using a differential manometer. This interfaces with the balancing valve through two sensors inserted in the binder points placed before and after the calibrated diaphragm of the valve.
- The main index scale showing values from 0 up to 4 of the handle, states the turns of opening of the obturator, while the second circular one from 0 up to 9 registers the tenths of one turn.
- The position of the handle for the required flow rate can be memorized by a 3mm Allen Key.



6. Approvals Classification

- The ART 28 is WRAS approved.
- The valve is classified in accordance with PED 2014/68/EU as Sound Engineering Practice (SEP).

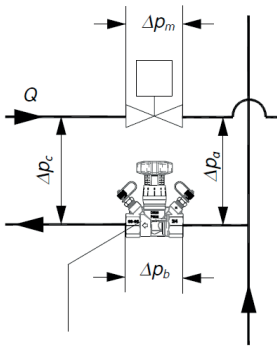
7. Troubleshooting

- If any maintenance is to be undertaken on the valve it is the responsibility of the installer to ensure the system is adequately drained and depressurized.
- A full risk assessment should be undertaken prior to any works taking place.

8. Warranty

- Albion Valves (UK) Ltd range of ART 28 & ART 28 DP Valves are supported by a 12 month warranty. Further details can be found on our website.

EXAMPLE



$\Delta p_a = \Delta p_b + \Delta p_c + \Delta p_m$

Δp_b *Pressure drop across Cim 787*
Δp_m *Pressure drop across the contr*
Δp_c *Necessary pressure for the circu*
Δp_a *Available pressure for the riser*

SUGGESTED VALUES AND TIPS:

- Pressure drop across the valve:
  Max = 50 kPa
- Pressure drop across the binders:
  Max = 50 kPa
  Min = 1 kPa
- Velocities in the pipeline:
  Max = 1.15 m/s
  Min = 0.75 m/s

For the preliminary sizings where the value of pressure drop across the valve is not known, use a value of 10 kPa.

It is required to balance the circuit in the figure, the given data are:

- Necessary pressure for the circuit: Δpc=13 kPa;
- Available pressure for the riser: Δpa=35 kPa;
- Pressure drop across the control valve: Δpm= 10 Kpa;
- Flow rate: Q= 3 m3/h=0.833 l/s.

The required differential pressure across the balancing valve can be calculated using the following relation:

$$\Delta p_b=\Delta p_a-\Delta p_m-\Delta p_c=35-10-13=12\ kPa=0,12\ bar$$

the required Kv is:

$$Kv = Q\cdot\sqrt{\frac{r}{\Delta p_b}}=3\cdot\sqrt{\frac{1}{0,12}}=8.66$$

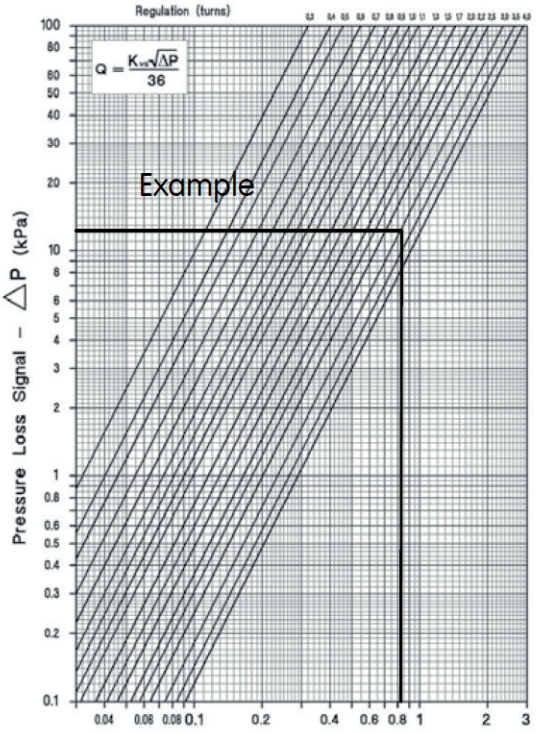
Using the attached tables to this datasheet, it is possible to find the following available valves with the relative position of the handle:

- ART28 DN 40 --> Preset: 3.1 (Kv=8.66);
- ART28 DN 50 --> Preset: 2.0 (Kv=8.75);

The two selected models are comparable. As a general rule, it is better to choose the valve with the smallest diameter, in this way the valve will be quite opened and there will be no problem with noises and cavitations.

Measuring the pressure drop across the binders of the ART28 DN 40 (Preset 3.1), the operator will find this value:

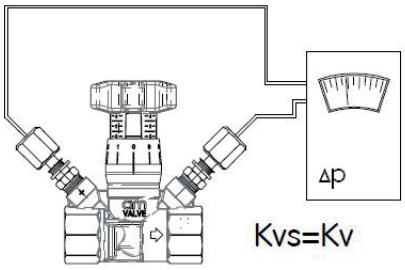
$$\Delta p_{bin}= r\cdot\left(\frac{Q}{Kvs}\right)^2=1\cdot\left(\frac{3}{8.66}\right)^2=0.12\ bar=12\ kPa$$

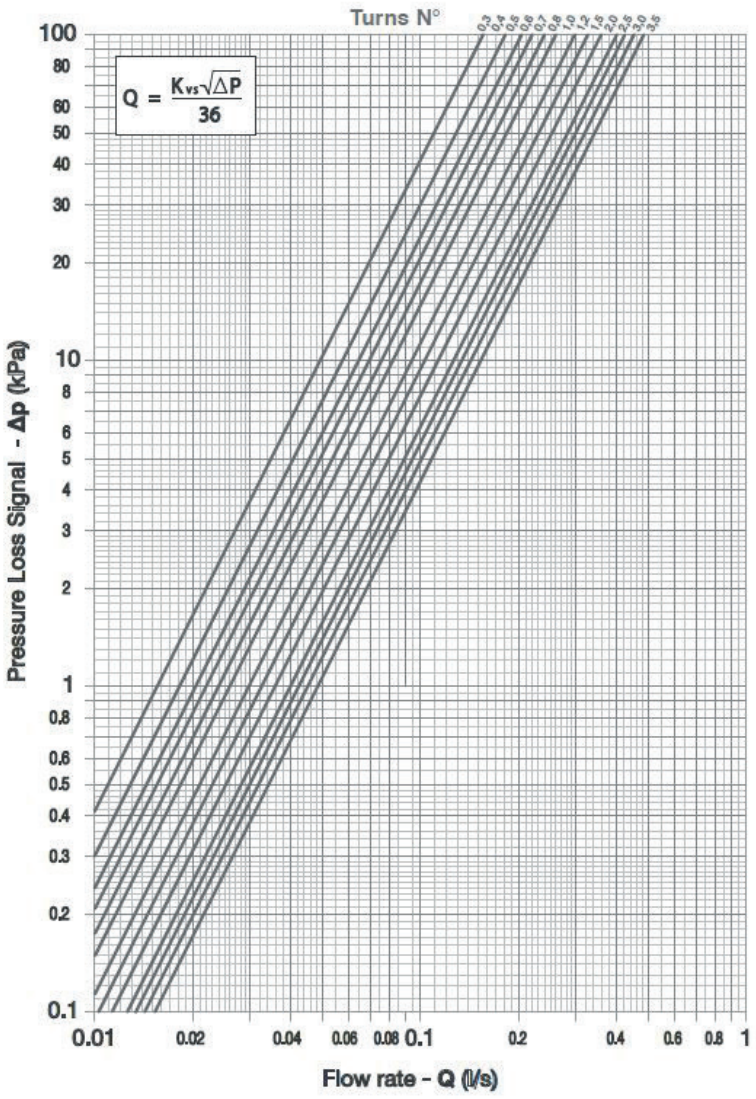


N.B. The Kvs value is equal to the Kv of the valve and the measured pressure drop across the binders is the pressure drop across the valve too.

DN15 ART 28 / ART 28DP Variable Orifice Double Regulating Valve

Kv Values

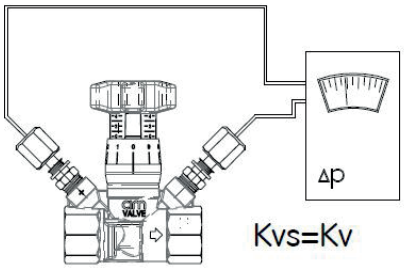


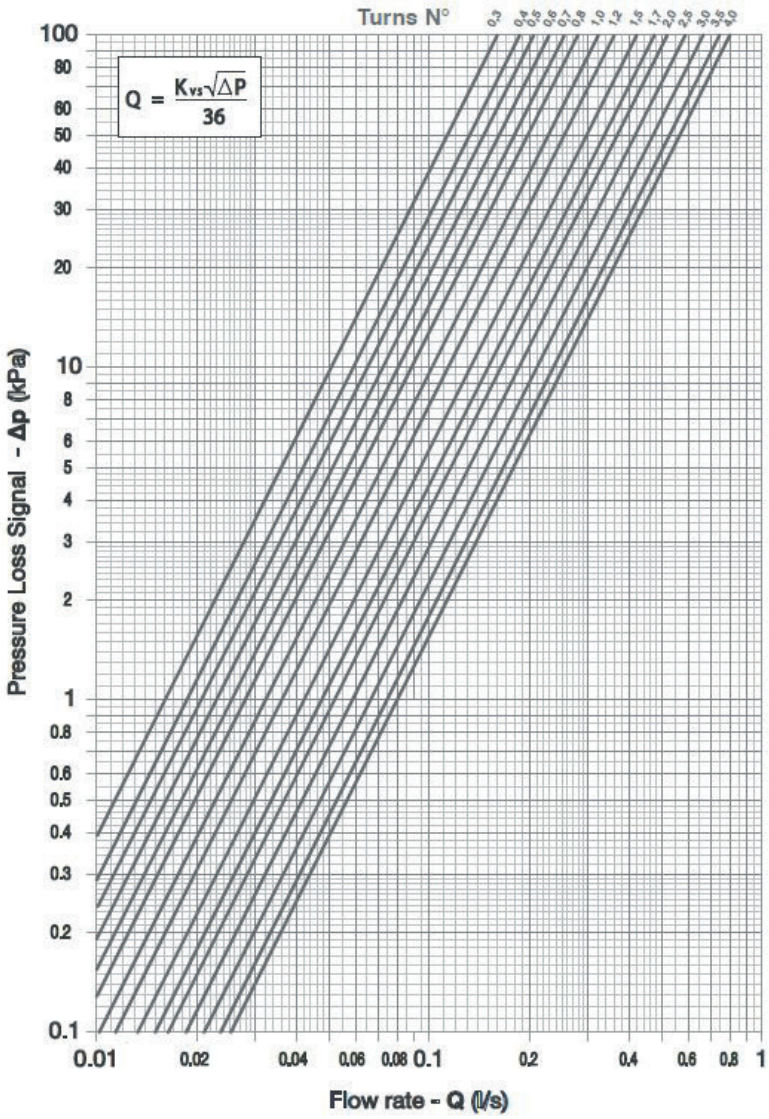


Kv-Kvs (Flow rate in m³/h @ 1 bar pressure drop)										
Full turn		Tenths of turn								
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0	-	-	0.42	0.56	0.65	0.71	0.79	0.86	0.94	1.01
1	1.07	1.12	1.17	1.22	1.25	1.28	1.31	1.34	1.37	1.41
2	1.44	1.46	1.49	1.50	1.51	1.53	1.55	1.58	1.60	1.62
3	1.64	1.65	1.66	1.68	1.69	1.70	1.71	1.72	1.73	1.74
4	1.75									

DN20 ART 28 / ART 28DP Variable Orifice Double Regulating Valve

Kv Values

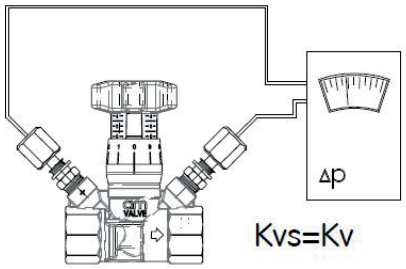


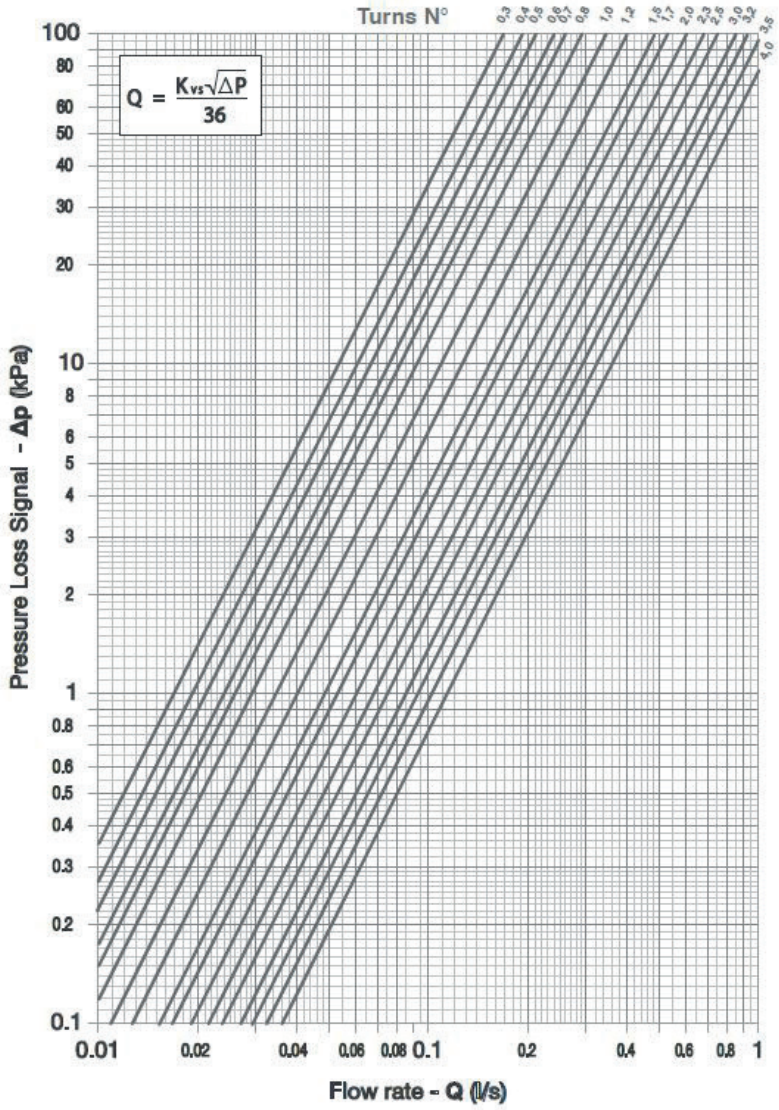


Kv-Kvs (Flow rate in m³/h @ 1 bar pressure drop)										
Full turn	Tenths of turn									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0	-	-	0.44	0.56	0.67	0.74	0.82	0.91	1.00	1.08
1	1.16	1.24	1.31	1.38	1.44	1.52	1.62	1.70	1.77	1.83
2	1.89	1.94	1.99	2.04	2.09	2.13	2.18	2.22	2.29	2.35
3	2.42	2.47	2.53	2.59	2.65	2.71	2.74	2.77	2.80	2.84
4	2.87									

DN25 ART 28 / ART 28DP Variable Orifice Double Regulating Valve

Kv Values

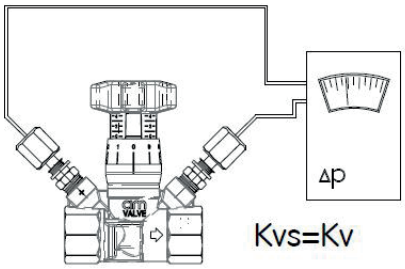


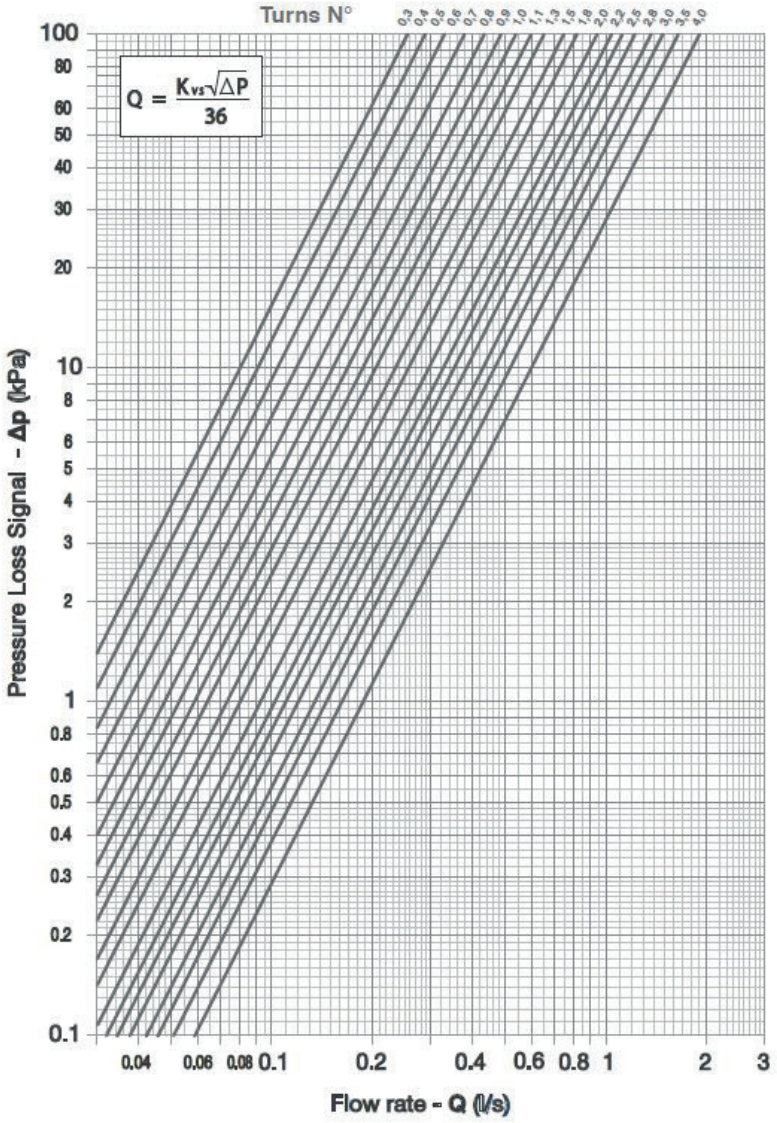


Kv-Kvs (Flow rate in m³/h @ 1 bar pressure drop)										
Full turn		**Tenths of turn**								
	0.0	**0.1**	**0.2**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.9**
0	-	-	0.52	0.61	0.69	0.76	0.86	0.94	1.05	1.15
1	1.25	1.35	1.46	1.55	1.64	1.74	1.83	1.92	1.99	2.06
2	2.15	2.22	2.33	2.45	2.59	2.69	2.70	2.72	2.82	2.94
3	3.08	3.20	3.34	3.46	3.58	3.67	3.75	3.87	3.95	4.03
4	4.08									

DN32 ART 28 / ART 28DP Variable Orifice Double Regulating Valve

Kv Values

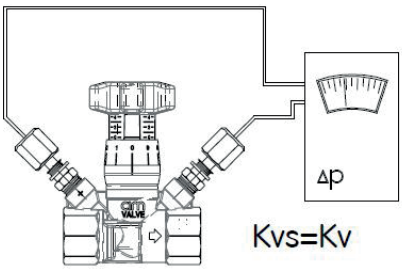


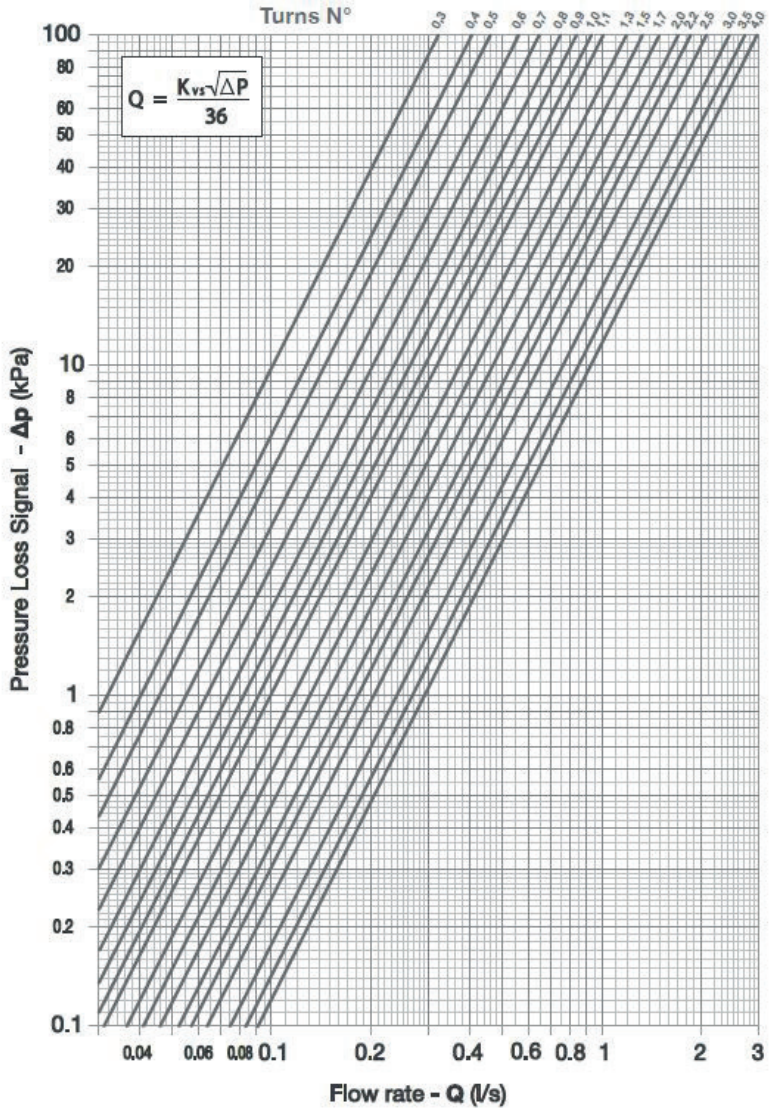


Kv-Kvs (Flow rate in m³/h @ 1 bar pressure drop)										
Full turn		Tenths of turn								
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0	-	-	0.70	0.92	1.03	1.17	1.35	1.53	1.71	1.90
1	2.11	2.31	2.47	2.63	2.74	2.87	3.00	3.16	3.31	3.48
2	3.64	3.76	3.92	4.02	4.17	4.29	4.42	4.60	4.82	5.01
3	5.17	5.29	5.53	5.66	5.79	5.81	5.99	6.01	6.19	6.37
4	6.71									

DN40 ART 28 / ART 28DP Variable Orifice Double Regulating Valve

Kv Values

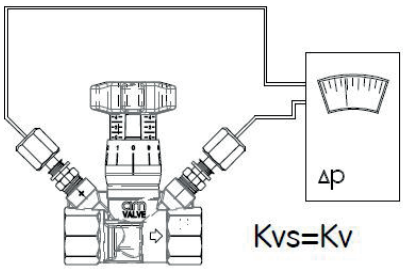


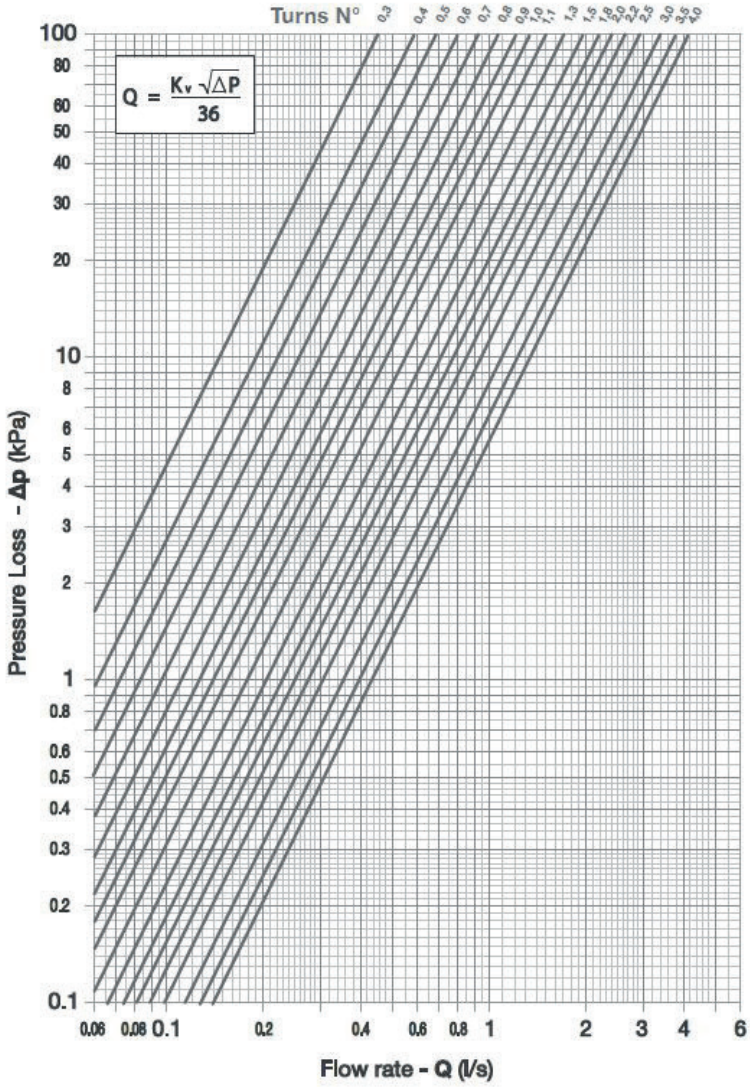


Kv-Kvs (Flow rate in m³/h @ 1 bar pressure drop)										
Full turn		Tenths of turn								
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0	-	-	0.82	1.15	1.45	1.65	1.97	2.28	2.63	2.93
1	3.25	3.57	3.88	4.16	4.37	4.67	4.96	5.19	5.47	5.69
2	5.96	6.24	6.51	6.75	6.99	7.26	7.47	7.69	7.91	8.16
3	8.45	8.66	8.84	9.05	9.26	9.51	9.69	9.92	10.10	10.28
4	10.40									

DN50 ART 28 / ART 28DP Variable Orifice Double Regulating Valve

Kv Values





Kv-Kvs (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	-	-	1.14	1.63	2.11	2.42	2.88	3.34	3.88	4.38
1	4.80	5.33	5.76	6.13	6.55	7.01	7.30	7.64	7.92	8.34
2	8.75	9.17	9.57	9.96	10.34	10.58	10.93	11.29	11.60	11.90
3	12.19	12.48	12.85	13.15	13.44	13.66	13.94	14.28	14.56	14.84
4	15.06									

About Albion Valves (UK) Limited

Albion Valves (UK) Limited has been in the industrial heating and valve market for over 40 years, with this comes a wealth of knowledge and expertise that allows us to support our network of independent distributors and their customers.

Albion aims to supply a readily available, complete, quality valve solution alongside excellent cradle-to-grave support and service.

That is why we say, ‘It’s all at Albion’.

Quality

Whatever you need, you can rest assured that if it comes from Albion it has been designed and manufactured to deliver optimum performance and is accredited with the necessary approvals. Our in-house quality and technical departments are always on hand too!

Service

Our cradle-to-grave approach means you will never be on your own. Whether you need assistance with your system designs, an industry-leading turnaround time on your quote, or some help with commissioning after installation, we have a team to help!

Delivery

We know that time is money, and when a priority project depends on a part, you can trust Albion to deliver. We deliver 95% of products the next day with 99.98% accuracy!

Choice

We may have started with a single brass ball valve, but our range has grown substantially since and we can now offer a full building services valve solution, alongside a comprehensive range of valves for the industrial and process markets.

It is becoming more and more apparent to the industry, that it really is, all at Albion.