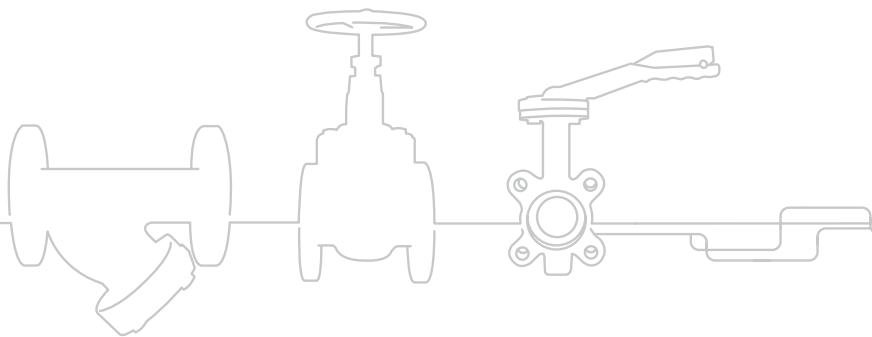


Static Balancing Valves



Product Information



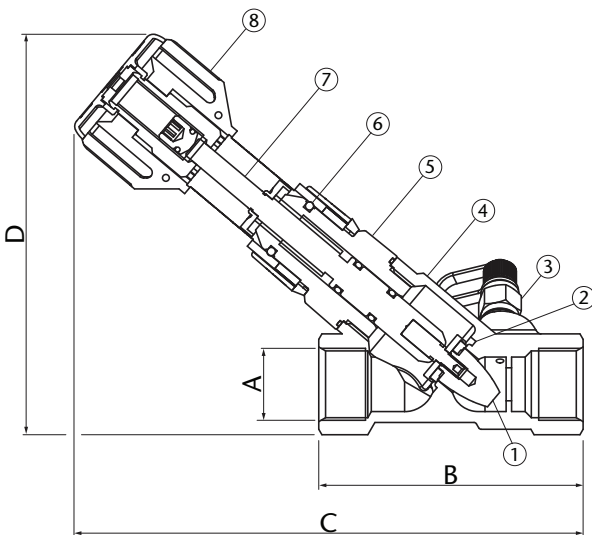
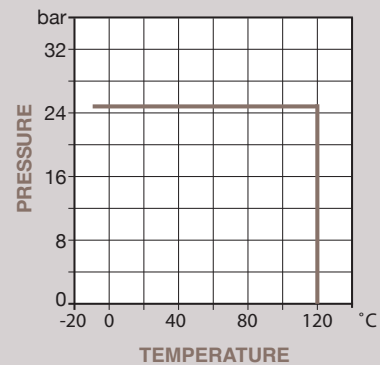


PN25 DZR Fixed Orifice Commissioning Valve

Features

- Screwed BSP parallel
- Fixed orifice with $\pm 5\%$ flow measurement accuracy
- Position indicator
- Supplied with 2 fitted test points
- EPDM disk seating gives tight shut off
- Available with 'M' Press ends Art 25 PRS

Pressure / Temperature



	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
A	Rp1/2	Rp3/4	Rp1	Rp1 1/4	Rp1 1/2	Rp2
B	85	97	113	144	163	193
C	161	185	186	207	260	281
D	125	146	159	169	212	230
kgs	0.68	0.93	1.13	1.66	2.47	3.73

Technical Data

Max Pressure	25 bar
Working Temperature	-10°C to 120°C

N.	Part Name	Materials
1	Disk	DZR Brass
2	Disk Facing	EPDM Rubber
3	Pressure Test Point	DZR Brass
4	Body	DZR Brass
5	Bonnet	DZR Brass
6	'O' Rings	Nitrile Rubber
7	Stem	DZR Brass
8	Handwheel	Nylon 6

Dimensions in mm

This data sheet 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 25 is a fixed orifice commissioning 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.

$$K_v = \frac{Q \cdot 36}{\sqrt{\Delta P}}$$

$$K_{vs} = \frac{Q \cdot 36}{\sqrt{\Delta P_s}}$$

where K_v & K_{vs} = flow coefficient (m³/hr at 1 bar differential)

Q = flow rate (l/s)

ΔP = headloss attributable to valve (kPa)

ΔP_s = differential pressure across tapings (signal) (bar)

Kvs Values

Size	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Kvs	1.8	4.1	7.5	16.6	23.0	47.4

Pressure Loss

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

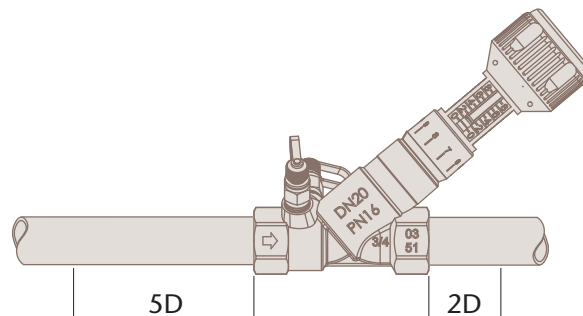
Kv Values

Size	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Kv	1.8	3.8	7.0	15.8	21.1	43.9

Installation

Fixed orifice commissioning 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.



Technical Data

Sizing

Once the required flow rate has been calculated, the size of the fixed orifice commissioning 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.

Pressure Equipment Directive

Under the Pressure Equipment Directive (PED) these fixed orifice commissioning valves have been specified for Group 2 Liquids i.e. non-hazardous

Sizes 1/2" to 2" are classified as SEP (Sound Engineering Practice)

Installation & Operating Instructions

DZR Fixed Orifice Commissioning Valve

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

European Pressure Equipment Directive 97/23/EC

The fixed orifice commissioning valve to which this instruction document applies has been categorised in accordance with the Pressure Equipment Directive when sold or used within the European Economic Community (EEC). The fluid to be transported is limited to non-hazardous Group 2 liquids and on no account must the valve be used on Group 1 gases, Group 1 liquids and Group 2 gases.

1/2" to 2" - Sound Engineering Practice (SEP)

Operating Pressure and Temperature

Non-shock pressure at temp. range	Non-shock pressure at max. temp.
16 bar from -20°C to 120°C	16 bar at 120°C

Limits of Use

The valve is rated PN16 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.

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 commissioning 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.

Installation & Operating Instructions

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 6mm Allen key.
- Rotate the inner spindle clockwise until a stop is felt.
- The double regulating feature is now set which enables the valve to be fully closed 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 25 does not require any routine maintenance.

For the supply of genuine spares and technical assistance contact:-

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Fall Bank Industrial Estate
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S Yorkshire
S75 3LS

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Fax: +44 (0)1226 288011
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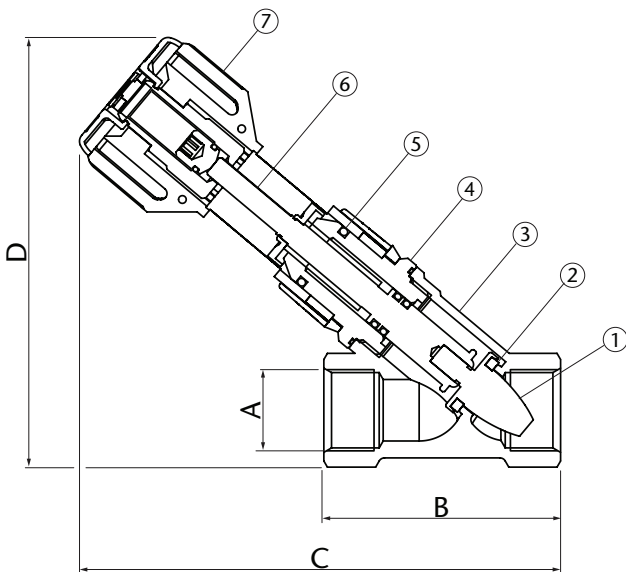
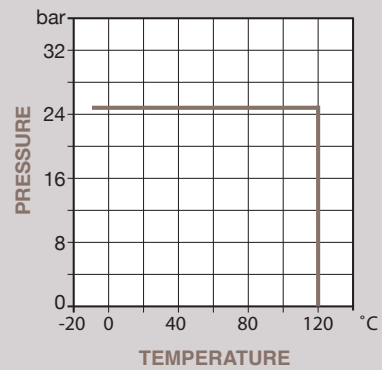


PN25 DZR Double Regulating Valve

Features

- Screwed BSP parallel
- Position indicator
- Double regulating device
- Non rising stem
- EPDM disk seating gives tight shut off
- 1/2" available in Std and Low flow versions
- Available with 'M' Press ends ART 26 PRS

Pressure / Temperature



	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
A	Rp1/2	Rp3/4	Rp1	Rp1 1/4	Rp1 1/2	Rp2
B	68	77	91	108	116	143
C	138	157	160	171	212	231
D	120	140	155	171	212	230
kgs	0.48	0.65	0.86	1.28	1.89	2.80

Technical Data

Max Pressure	25 bar
Working Temperature	-10°C to 120°C

N.	Part Name	Materials
1	Disk	DZR Brass
2	Disk Facing	EPDM Rubber
3	Body	DZR Brass
4	Bonnet	DZR Brass
5	'O' Rings	Nitrile Rubber
6	Stem	DZR Brass
7	Handwheel	Nylon 6

Dimensions in mm

This data sheet 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

Pressure Loss

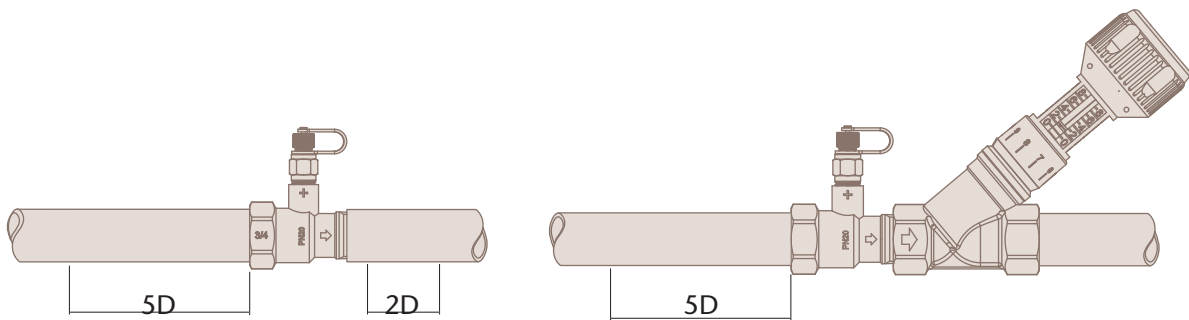
The pressure losses for the ART 26 double regulating valves are given on the individual flow charts along with the corresponding Kv values at the various positions open.

Installation

Metering stations must always be installed with a minimum of 5 pipe diameters of straight pipe, without intrusion, upstream of the metering station.

Downstream of the metering station a minimum of 2 pipe diameters of straight pipe are required.

When close coupled to an Albion ART 26 double regulating valves only the straight pipe upstream of the metering station is required.



Sizing

Once the required flow rate has been calculated, the size of the metering station 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.

Pressure Equipment Directive

Under the Pressure Equipment Directive (PED) these metering stations and double regulating valves have been specified for Group 2 Liquids i.e. non-hazardous

Sizes 1/2" to 2" are classified as SEP (Sound Engineering Practice)

Installation & Operating Instructions

DZR Double Regulating Valve

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

This product is rated PN20.

European Pressure Equipment Directive 97/23/EC

The double regulating valve to which this instruction document applies has been categorised in accordance with the Pressure Equipment Directive when sold or used within the European Economic Community (EEC). The fluid to be transported is limited to non-hazardous Group 2 liquids and on no account must the valve be used on Group 1 gases, Group 1 liquids and Group 2 gases.

1/2" to 2" - Sound Engineering Practice (SEP)

Operating Pressure and Temperature

Non-shock pressure at temp. range	Non-shock pressure at max. temp.
20 bar from -20°C to 120°C	20 bar at 120°C

Limits of Use

The valve is rated PN20 and must be installed in a piping system where the normal pressure and temperature does not exceed the above ratings.

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.

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.

The double regulating valve may be installed individually, or close coupled to metering station.

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.

Installation & Operating Instructions

Installation Cont.

If installed as part of a commissioning set, care should be taken regarding the orientation of the test points to give sufficient room for manometer probe connection. Also for a commissioning set, there must be a minimum of 5 diameters of straight pipe upstream of the same nominal diameter and not including any reducers or any other intrusions into the bore.

It is important to ensure that the flow arrow on the valve is coincident with the direction of flow in the pipeline. If close coupled to a metering station, the metering station must be upstream with the flow passing through the orifice before the valve.

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.

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 6mm Allen key.
- Rotate the inner spindle clockwise until a stop is felt.
- The double regulating feature is now set which enables the valve to be fully closed 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 26 does not require any routine maintenance.

For the supply of genuine spares and technical assistance contact:-

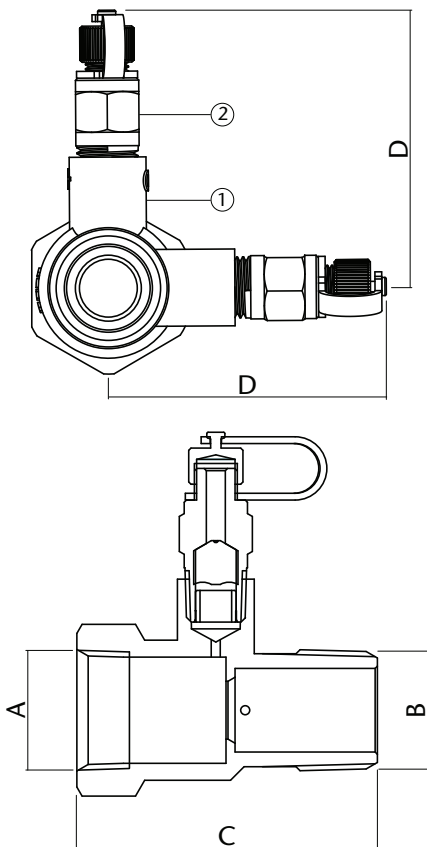
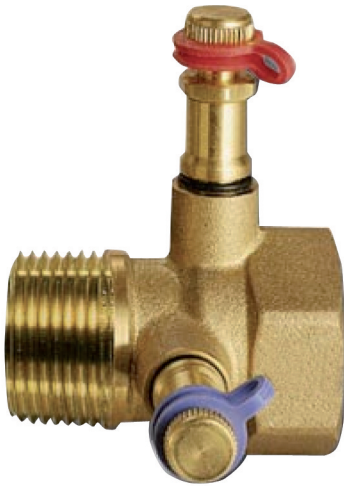
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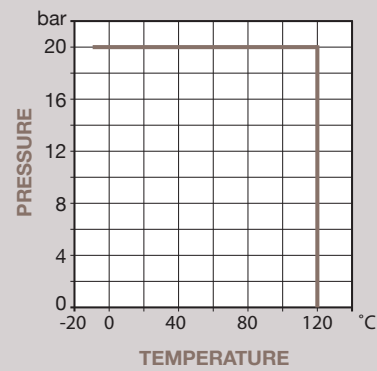
PN20 DZR Metering Station

Features

- Screwed BSP taper
- Fixed orifice with $\pm 5\%$ flow measurement accuracy
- Can be close coupled to a double regulating valve
- Supplied with 2 fitted test points
- 1/2" available in Std, Med, Low, Ultra Low and Ultra Ultra Low flow versions



Pressure / Temperature



	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
A	Rc1/2	Rc3/4	Rc1	Rc1 1/4	Rc1 1/2	Rc2
B	R1/2	R3/4	R1	R1 1/4	R1 1/2	R2
C	67	67	64	71	71	80
D	59	62	65	70	73	79
kgs	0.22	0.27	0.31	0.46	0.52	0.77

Technical Data

Max Pressure	20 bar
Working Temperature	-10°C to 120°C

N.	Part Name	Materials
1	Body	DZR Brass
2	Pressure Test Point	DZR Brass

Dimensions in mm

This data sheet 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 27 is a fixed orifice metering station used to measure the flow passing through it, which can be used close coupled to an ART 26 double regulating valve to form a commissioning set.

Flow Coefficient

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

$$K_v = \frac{Q \cdot 36}{\sqrt{\Delta P}}$$

$$K_{vs} = \frac{Q \cdot 36}{\sqrt{\Delta P_s}}$$

where K_v & K_{vs} = flow coefficient (m³/hr at 1 bar differential)

Q = flow rate (l/s)

ΔP = headloss attributable to valve (kPa)

ΔP_s = differential pressure across tapings (signal) (bar)

Kvs Values

Size	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Kvs	1.8	4.1	7.5	16.6	23.0	47.4

Pressure Loss

The pressure loss across a metering station is less than signal differential pressure indicated on the flow charts. The pressure loss is obtained by multiplying the pressure signal by the pressure recovery factors given in the table.

This applies to when the metering station is used in a stand alone application or close coupled to a double regulating valve.

Pressure Recovery Factors

Size	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Factor	0.67	0.5	0.5	0.5	0.5	0.4

Installation & Operating Instructions

DZR Metering Station

This metering station is a precision manufactured product and should be handled, installed and used with care as detailed in these instructions.

This product is rated PN20.

European Pressure Equipment Directive 97/23/EC

The metering station to which this instruction document applies has been categorised in accordance with the Pressure Equipment Directive when sold or used within the European Economic Community (EEC). The fluid to be transported is limited to non-hazardous Group 2 liquids and on no account must the metering station be used on Group 1 gases, Group 1 liquids and Group 2 gases.

1/2" to 2" - Sound Engineering Practice (SEP)

Operating Pressure and Temperature

Non-shock pressure at temp. range	Non-shock pressure at max. temp.
20 bar from -20°C to 120°C	20 bar at 120°C

Limits of Use

The metering station 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.

Installation

Metering stations are precision manufactured products and should not be subjected to misuse. Careless handling should be avoided and the metering station should be as clean as possible prior to installation and free from foreign particles.

The metering station may be installed individually, close coupled to an isolating valve or regulating valve.

Metering stations should be installed with a minimum of 5 diameters equivalent of straight pipe upstream having the same nominal diameter as the metering station and should not include any reducers or any other intrusions into the bore within this specified length. When metering stations are used as individual items, a minimum of 2 diameters of straight pipe must be fitted downstream.

All special packaging material must be removed.

Immediately prior to installation, the adjacent pipework should be checked for cleanliness and freedom from debris. It is important that the pipe bore is free from internal burrs or other defects which will disrupt the velocity profile of the liquid and induce inaccuracies outside the specified flow rate tolerance.

It is important to ensure that the flow arrow on the metering station is coincident with the direction of flow in the pipeline. If close coupled to a valve, the metering station must be upstream with the flow passing through the orifice before the valve.

When installed in **horizontal pipework at low level**, the upstream (HP-red) test point should be vertical. This will prevent the other (LP-blue) test point acting as a dirt pocket since it will be horizontal and half way from the bottom of the pipe. Also the HP test point can be used to bleed air from the system.

Where pipework runs close to a wall or adjacent equipment, it is essential that there is at least 100mm clearance to allow a manometer probe to be connected to the test point. This may mean that the test points may have to point up at 45°.

Installation & Operating Instructions

Installation Cont.

For **horizontal piping at high level** the general principles for installing at low level should be applied. However, where pipework is enclosed in ceilings or voids, it may be difficult to access the test points in order to connect the manometer probes. In this situation, it may be advantageous to have both test points pointing down at 45° to ensure that neither becomes an obvious dirt pocket.

In **vertical pipework** there are no inherent dirt entrapment areas therefore the orientation of the test points is dependant upon the ease of manometer probe connection

In assembly, a suitable thread sealant should preferably be used on the male and female threads to be tightened.

Test points

Metering stations are supplied with test points fitted.

Operation

The commissioning stage is the only time that the metering station 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.

Maintenance

Metering Stations are maintenance free and after commissioning should require no further attention.

For technical assistance contact:-

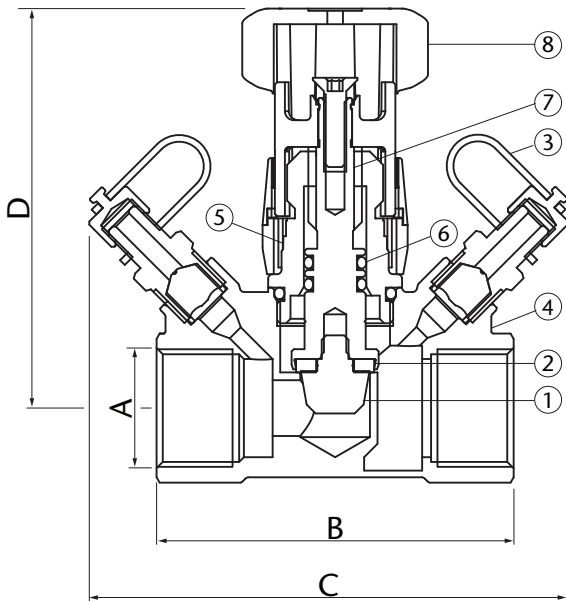
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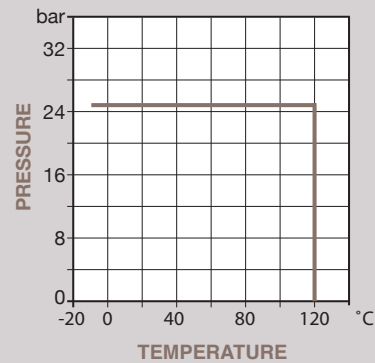
PN25 DZR Variable Orifice Commissioning Valve

Features

- Screwed BSP parallel
- Position indicator
- Double regulating device
- Supplied with 2 fitted test points
- EPDM disk seating gives tight shut off



Pressure / Temperature



	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
A	Rp1/2	Rp3/4	Rp1	Rp1 1/4	Rp1 1/2	Rp2
B	78	80	87	108	115	124
C	106	107	107	123	128	132
D	88	90	92	99	99	100
kgs	0.38	0.44	0.54	0.96	1.12	1.35

Technical Data

Max Pressure	25 bar
Working Temperature	-10°C to 120°C

N.	Part Name	Materials
1	Disk	DZR Brass
2	Disk Facing	EPDM Rubber
3	Pressure Test Point	DZR Brass
4	Body	DZR Brass
5	Bonnet	DZR Brass
6	'O' Rings	Nitrile Rubber
7	Stem	DZR Brass
8	Handwheel	Nylon 6

Dimensions in mm

This data sheet 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 28 is a variable orifice commissioning valve used to regulate and measure the flow passing through it.

Flow Coefficient

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

$$K_v = \frac{Q \cdot 36}{\sqrt{\Delta P}}$$

$$K_{vs} = \frac{Q \cdot 36}{\sqrt{\Delta P_s}}$$

where K_v & K_{vs} = flow coefficient (m^3/hr at 1 bar differential)

Q = flow rate (l/s)

ΔP = headloss attributable to valve (kPa)

ΔP_s = differential pressure across tapings (signal) (bar)

K_{vs} Values

The K_{vs} values are given on each flow chart at various positions from 25% to fully open.

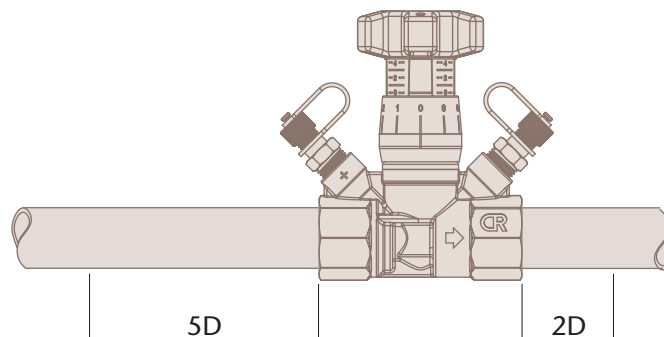
Pressure Loss and K_v Value

The pressure loss across a variable orifice commissioning valve is the same as the differential pressure (signal) measured across the body seat.

The K_v value is therefore the same as the K_{vs} value used to calculate flow rate.

Installation

Variable orifice commissioning valves must always be installed with a minimum of 5 pipe diameters of straight pipe, without intrusion, upstream of the valve and a minimum of 2 pipe diameters downstream.



Technical Data

Sizing

Once the required flow rate has been calculated, the size of the variable orifice double regulating valve can be determined based on the following:

With the valve fully open, a minimum signal at the design flow rate of 1 kPa.
The maximum signal is normally less than 5 kPa but can be up to 10 kPa.

For sizing the flow velocity should not exceed 1.15 m/s at the design flow rate.

Pressure Equipment Directive

Under the Pressure Equipment Directive (PED) these variable orifice commissioning valves have been specified for Group 2 Liquids i.e. non-hazardous

Sizes ½" to 2" are classified as SEP (Sound Engineering Practice)

Installation & Operating Instructions

DZR Variable Orifice Commissioning Valve

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

European Pressure Equipment Directive 97/23/EC

The variable orifice commissioning valve to which this instruction document applies has been categorised in accordance with the Pressure Equipment Directive when sold or used within the European Economic Community (EEC). The fluid to be transported is limited to non-hazardous Group 2 liquids and on no account must the valve be used on Group 1 gases, Group 1 liquids and Group 2 gases.

1/2" to 2" - Sound Engineering Practice (SEP)

Operating Pressure and Temperature

Non-shock pressure at temp. range	Non-shock pressure at max. temp.
20 bar from -20°C to 120°C	20 bar at 120°C

Limits of Use

The valve is rated PN20, 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.

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.

Variable orifice commissioning 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.

Installation & Operating Instructions

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 a $1/2$ 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 clockwise until a stop is felt.
- The double regulating feature is now set which enables the valve to be fully closed 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 28 does not require any routine maintenance.

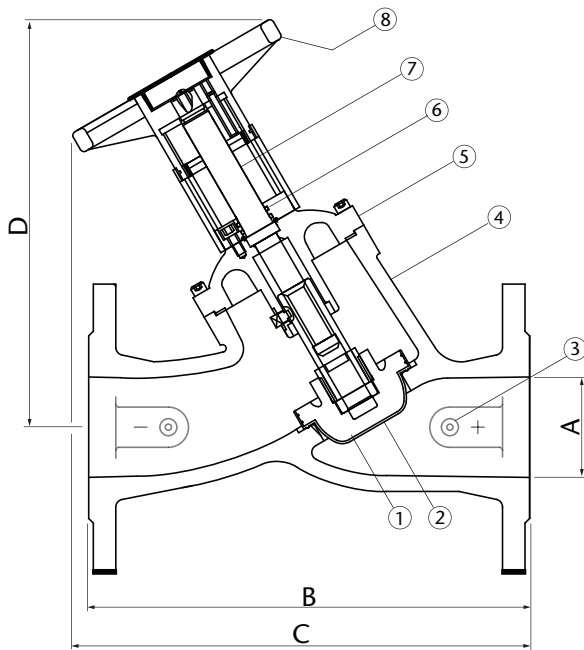
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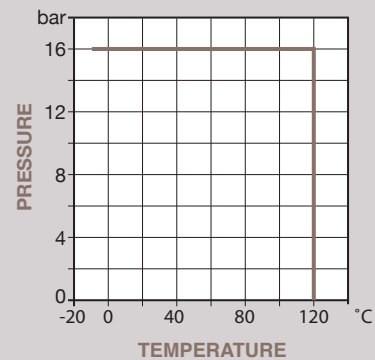
PN16 D Iron Variable Orifice DR Valve

Features

- Flanged PN16
- Position indicator
- Double regulating device
- Supplied with 2 fitted test points and extensions
- EPDM disk seating gives tight shut off
- Body ductile iron



Pressure / Temperature



DN	50	65	80	100	125	150	200	250	300
A	50	65	80	100	125	150	200	250	300
B	230	290	310	350	400	480	600	730	850
C	285	335	350	370	405	485	605	730	850
D	269	318	320	340	375	403	537	596	695
kgs	12.6	17.4	23	30	43	56	129	197	237

Technical Data

Max Pressure	16 bar
Working Temperature	-10°C to 120°C

N.	Part Name	Materials
1	Disk	Cast Iron
2	Disk Facing	EPDM Rubber
3	Pressure Test Point	Brass
4	Body	Ductile Iron
5	Bonnet	Cast Iron
6	'O' Rings	EPDM Rubber
7	Stem	304 Stainless Steel
8	Handwheel	Aluminium Alloy

Dimensions in mm

This data sheet 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 250 is a variable orifice double regulating valve used to regulate and measure the flow passing through it.

Flow Coefficient

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

$$K_v = \frac{Q \cdot 36}{\sqrt{\Delta P}} \qquad K_{vs} = \frac{Q \cdot 36}{\sqrt{\Delta P_s}}$$

where K_v & K_{vs} = flow coefficient (m³/hr at 1 bar differential)

Q = flow rate (l/s)

ΔP = headloss attributable to valve (kPa)

ΔP_s = differential pressure across tappings (signal) (bar)

K_{vs} Values

The K_{vs} values are given on each flow chart at various positions from 25% to fully open.

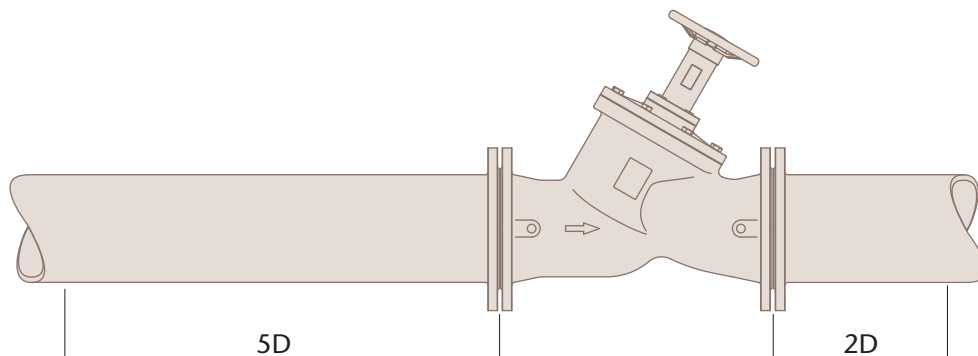
Pressure Loss and K_v Value

The pressure loss across a variable orifice double regulating valve is the same as the differential pressure (signal) measured across the body seat.

The K_v value is therefore the same as the K_{vs} value used to calculate flow rate.

Installation

Variable orifice double regulating valves must always be installed with a minimum of 5 pipe diameters of straight pipe, without intrusion, upstream of the valve and a minimum of 2 pipe diameters downstream.



Technical Data

Sizing

Once the required flow rate has been calculated, the size of the variable orifice double regulating valve can be determined based on the following:

With the valve fully open, a minimum signal at the design flow rate of 1 kPa. The maximum signal is normally less than 5 kPa but can be up to 10 kPa.

For sizing the flow velocity should not exceed 3 m/s at the design flow rate.

Pressure Equipment Directive

Under the Pressure Equipment Directive (PED) these variable orifice double regulating valves have been specified for Group 2 Liquids i.e. non-hazardous

Sizes DN50 to DN80 are classified as SEP (Sound Engineering Practice)

Installation & Operating Instructions

Iron Variable Orifice Double Regulating Valve

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

European Pressure Equipment Directive 97/23/EC

The variable orifice double regulating valve to which this instruction document applies has been categorised in accordance with the Pressure Equipment Directive when sold or used within the European Economic Community (EEC). The fluid to be transported is limited to non-hazardous Group 2 liquids and on no account must the valve be used on Group 1 gases, Group 1 liquids and Group 2 gases.

DN50 to DN80 - Sound Engineering Practice (SEP)

Operating Pressure and Temperature

Non-shock pressure at temp. range	Non-shock pressure at max. temp.
16 bar from -20°C to 120°C	16 bar at 120°C

Limits of Use

The valve is rated PN16 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.

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 handwheel operation should be avoided.

Valves must not be lifted using the handwheel or stem.

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.

Variable 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.

The gaskets should be suitable for the operating conditions or maximum pressure/temperature ratings and should be checked to ensure freedom from defects or damage.

Care should be taken to provide correct alignment of the flanges and gaskets being assembled. Suitable lubricant on bolt threads should be used. In assembly, bolts are tightened sequentially to make the initial contact of flanges and gaskets followed by gradual and uniform tightening in an opposite bolting sequence to avoid bending one flange relative to the other, particularly on flanges with raised faces.

Installation & Operating Instructions

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.

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

Test points and extensions are supplied loose and should be fitted during installation as follows:-

- Fit the extensions to the metering station using the two flats.
- Fit the test points to the extensions ensuring that the test point with the red strap is on the upstream side.
- When tightening the test points and extensions, excessive force is not necessary. A suitable sealing material may be used on the threads of the test points and extensions.

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:-

- Remove the plastic handwheel cap.
- Using a screw driver rotate the regulating screw clockwise to set the double regulating feature. A positive stop will be felt, tightening the regulating screw further is not required.
- The double regulating feature is now set which enables the valve to be fully closed for isolation and re-opened to the previously set position, excessive force should not be used to re-open the valve. It is recommended to record this set position for reference later if necessary.

Maintenance

The Albion Art 250 does not require any routine maintenance.

For the supply of genuine spares and technical assistance contact:-

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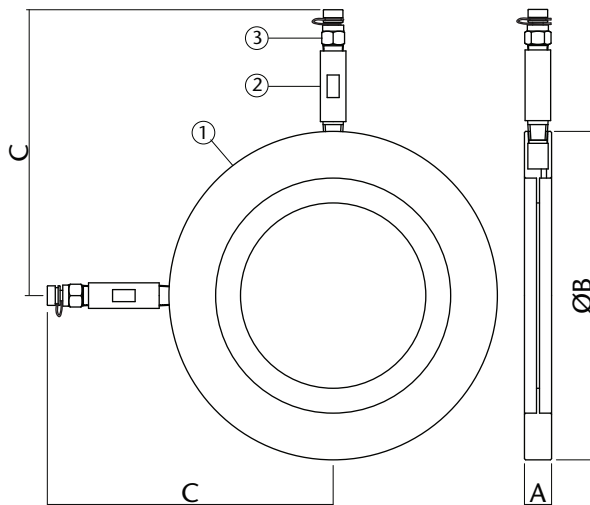
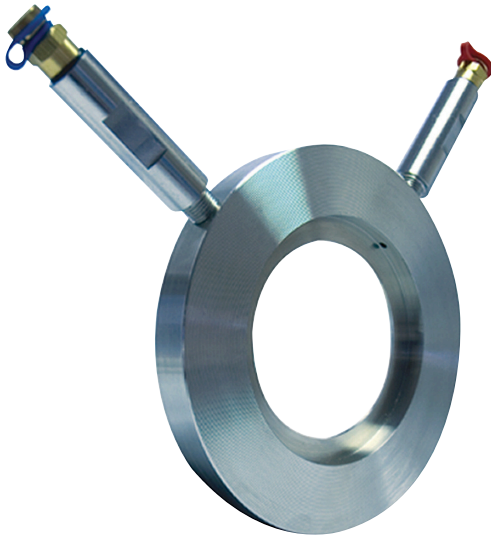
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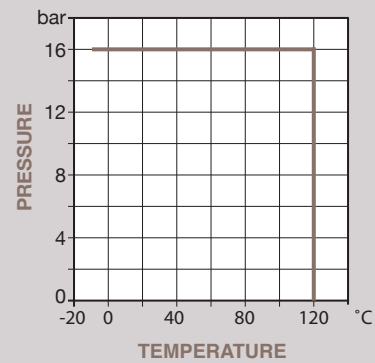
PN16 Stainless Steel Metering Station

Features

- Wafer pattern
- Fits between BS EN 1092 flanges PN16
- Flow characteristic confirmed to BS 7350
- Fixed orifice with $\pm 5\%$ flow measurement accuracy
- Can be close coupled to a double regulating valve
- Supplied with 2 extensions and test points



Pressure / Temperature



DN	50	65	80	100	125	150	200	250	300
A	20	20	20	20	20	20	20	20	20
B	108	125	144	164	194	220	275	333	385
C	136	145	154	164	179	192	219	248	304
kgs	1.4	1.9	2.2	2.4	3.1	3.4	4.7	6	8

Technical Data

Max Pressure	16 bar
Working Temperature	-10°C to 120°C

N.	Part Name	Materials
1	Body	304 Stainless Steel
2	Extension	304 Stainless Steel
3	Pressure Test Point	Brass

Dimensions in mm

This data sheet 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 270 is a fixed orifice metering station used to measure the flow passing through it, which can be used close coupled to a double regulating valve to form a commissioning set.

This flow data can also be used for the Albion ART 280 metering station manufactured from 316 stainless steel.

Flow Coefficient

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

$$K_v = \frac{Q \cdot 36}{\sqrt{\Delta P}}$$

$$K_{vs} = \frac{Q \cdot 36}{\sqrt{\Delta P_s}}$$

where K_v & K_{vs} = flow coefficient (m^3/hr at 1 bar differential)

Q = flow rate (l/s)

ΔP = headloss attributable to valve (kPa)

ΔP_s = differential pressure across tappings (signal) (bar)

K_{vs} Values

Size	DN50	DN65	DN80	DN100	DN125	DN150
K_{vs}	47.5	88.5	150.6	281.1	328.8	477.5

Size	DN200	DN250	DN300
K_{vs}	826	1218	1794

Pressure Loss

The pressure loss across a metering station is less than signal differential pressure indicated on the flow charts. The pressure loss is obtained by using the K_v values given below.

This applies to when the metering station is used in a stand alone application or close coupled to a double regulating valve.

K_v Values for Calculating the Pressure Loss

Size	DN50	DN65	DN80	DN100	DN125	DN150
K_v	71.6	145.5	295.4	702	572	807

Size	DN200	DN250	DN300
K_v	1416	1975	2990

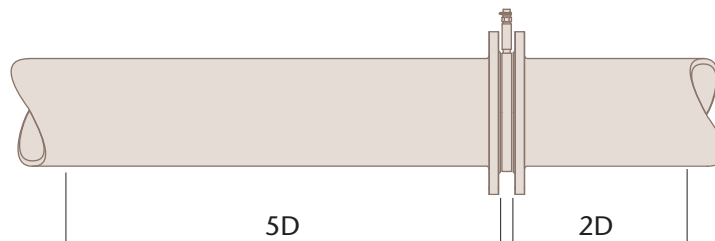
Technical Data

Installation

Metering stations must always be installed with a minimum of 5 pipe diameters of straight pipe, without intrusion, upstream of the metering station.

Downstream of the metering station a minimum of 2 pipe diameters of straight pipe are required.

When close coupled to a double regulating valves only the straight pipe upstream of the metering station is required.



Sizing

Once the required flow rate has been calculated, the size of the metering station 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.

Pressure Equipment Directive

Under the Pressure Equipment Directive (PED) these metering stations and double regulating valves have been specified for Group 2 Liquids i.e. non-hazardous

Sizes DN50 to DN300 are classified as SEP (Sound Engineering Practice)

Installation & Operating Instructions

Stainless Steel Metering Station

This metering station is a precision manufactured product and should be handled, installed and used with care as detailed in these instructions.

This product is rated PN16.

European Pressure Equipment Directive 97/23/EC

The metering station to which this instruction document applies has been categorised in accordance with the Pressure Equipment Directive when sold or used within the European Economic Community (EEC). The fluid to be transported is limited to non-hazardous Group 2 liquids and on no account must the metering station be used on Group 1 gases, Group 1 liquids and Group 2 gases.

DN50 to DN300 - Sound Engineering Practice (SEP)

Operating Pressure and Temperature

Non-shock pressure at temp. range	Non-shock pressure at max. temp.
16 bar from -20°C to 120°C	16 bar at 120°C

Limits of Use

The metering station 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.

Installation

Metering stations are precision manufactured products and should not be subjected to misuse. Careless handling should be avoided and the metering station should be as clean as possible prior to installation and free from foreign particles.

The metering station may be installed individually, close coupled to an isolating valve or regulating valve.

Metering stations should be installed with a minimum of 5 diameters equivalent of straight pipe upstream having the same nominal diameter as the metering station and should not include any reducers or any other intrusions into the bore within this specified length. When metering stations are used as individual items, a minimum of 2 diameters of straight pipe must be fitted downstream.

All special packaging material must be removed.

Immediately prior to installation, the adjacent pipework should be checked for cleanliness and freedom from debris. It is important that the pipe bore is free from internal burrs or other defects which will disrupt the velocity profile of the liquid and induce inaccuracies outside the specified flow rate tolerance.

It is important to ensure the metering station is installed with the red test point on the upstream side. If close coupled to a valve, the metering station must be upstream with the flow passing through the orifice before the valve.

When installed in **horizontal pipework at low level**, the upstream (HP-red) test point should be vertical. This will prevent the other (LP-blue) test point acting as a dirt pocket since it will be horizontal and half way from the bottom of the pipe. Also the HP test point can be used to bleed air from the system.

Where pipework runs close to a wall or adjacent equipment, it is essential that there is at least 100mm clearance to allow a manometer probe to be connected to the test point. This may mean that the test points may have to point up at 45°.

For **horizontal piping at high level** the general principles for installing at low level should be applied. However, where pipework is enclosed in ceilings or voids, it may be difficult to access the test points in order to connect the manometer probes.

Installation & Operating Instructions

Installation Cont.

In this situation, it may be advantageous to have both test points pointing down at 45° to ensure that neither becomes an obvious dirt pocket.

In **vertical pipework** there are no inherent dirt entrapment areas therefore the orientation of the test points is dependant upon the ease of manometer probe connection

Gaskets should be suitable for the operating conditions and free from defects. It is essential that the internal bore of the gasket does not intrude into the bore of the metering station at any point.

Care should be taken to provide correct alignment of the flanges and gaskets being assembled. Suitable lubricant on bolt threads should be used. In assembly, bolts are tightened sequentially to make the initial contact of flanges and gaskets followed by gradual and uniform tightening in an opposite bolting sequence to avoid bending one flange relative to the other, particularly on flanges with raised faces.

Fitting extensions and test points

Test points and extensions are supplied loose and should be fitted during installation as follows:-

- Fit the extensions to the metering station using the two flats.
- Fit the test points to the extensions ensuring that the test point with the red strap is on the upstream side.
- When tightening the test points and extensions, excessive force is not necessary. A suitable sealing material may be used on the threads of the test points and extensions.

Operation

The commissioning stage is the only time that the metering station 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.

Maintenance

Metering Stations are maintenance free and after commissioning should require no further attention.

For technical assistance contact:-

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