ART20 Pressure Independant Control Valve (PICV)

Technical Data and Installation Instructions

Dimensions in mm

ART20 Pressure Independant Control Valve (PICV)

PN 25

Main features:

ART20 is used for balancing the flow in cooling, heating and domestic water systems.
ART20 is an automatic balancing valve with following features:

- Easy required flow rate selection using presetting dial;
- Automatic balancing in the event of flctuating pressure conditions in system bran - ches;
- Flow rate modulation along the whole electric actuator stroke;
- Flexibility if the system is modified after the first installation;
- Reduction of balancing costs, improved energy saving and high environmental comfort;
- Easy flushing procedure thanks to quick and simple removal of differential pressure control cartridge placed inside valve body;

It is supplied with internal thread.
It is made of "CR" brass ("CR" - Corrosion Resistant).
This article is made in compliance with the quality management requirements of ISO 9001:2008 standard.
All articles are tested according to the EN 12266-1:2003 standard.
It can be used in a wide variety of sectors: heating, air conditioning, water, sanitary systems and generally with any non corrosive liquid.

Technical data:

Max. static working pressure	25 bar
Max. differential pressure	4 bar (400 kPa)
Max. flow temperature	120 °C
Min. temperature	-10°C
Fluids:	Water and Glycol
Material of parts in contact with water:	
	Valve body;
	Cartridge, etc.
Materials:	
	"CR"Brass (EN 12165-CW602N-M)
O-rings:	EPDM Perox
Threads:	ISO 228

Approved by:

EAC

Dimensions in mm

ART20 Pressure Independant Control Valve (PICV)

Models:

ART20 - Pressure independent control valve - PN 25 - "CR" Brass - Low Flow						
DN	Material	Thread	Flow rate range			Part code
			(l/s)	(l/h)	(GPM)	
15	CR Brass EN 12165-CW602N-M	G. 1/2"	0.022 ÷ 0.174	78 ÷ 625	0.34 ÷ 2.75	ADPI20LF50
20		G. 3/4"	0.036 ÷ 0.292	131 ÷ 1050	0.58 ÷ 4.62	ADPI20LF75
25		G. 1"	0.064 ÷ 0.478	231 ÷ 1722	1.02 ÷ 7.58	ADPI20LF100
-		-	-	-	-	-
-		-	-	-	-	-
-		-	-	-	-	-

ART20 - Pressure independent control valve - PN 25 - "CR" Brass - High Flow						
DN	Material	Thread	Flow rate range			Part code
			(l/s)	(l/h)	(GPM)	
15	CR Brass EN 12165-CW602N-M	G. 1/2"	0.068 ÷ 0.479	244 ÷ 1724	1.08 ÷ 7.59	ADPI20HF050
20		G. 3/4"	0.081 ÷ 0.566	292 ÷ 2039	1.28 ÷ 8.98	ADPI20HF075
25		G. 1"	0.081 ÷ 0.566	292 ÷ 2039	1.28 ÷ 8.98	ADPI20HF100
32		G. 1"1/4	0.129 ÷ 0.849	465 ÷ 3056	2.05 ÷ 13.45	ADPI20HF125
40		G. 1"1/2	0.562 ÷ 1.974	2020 ÷ 7105	8.90 ÷ 31.28	ADPI20HF150
50		G. 2"	0.612 ÷ 2.385	2204 ÷ 8586	9.70 ÷ 37.80	ADPI20HF200

Actuators:

ART20 PICV is designed to be upgraded with different type of actuators to open, close and modulate the valve on circuit.

<u>DN 15-32</u>

Three types of electric actuator are available, as follows:
- C23E: operating voltage 24 V AC/DC - 0…10 V DC control signal;
- C21V: operating voltage 24 V AC - 3-position control signal;
- C22V: operating voltage 230 V AC - 3-position control signal;

THERMOELECTRIC ACTUATORS (NO MODULATING)
- EMV312/NO 24: operating voltage 24 V AC - Normally open*;
- EMV312/NO 230: operating voltage 230 V AC - Normally open*;

* The valve will operate as Normally Closed.

<u>DN 40-50</u>

Two types of electric actuator are available, as follows:
LINEAR ACTUATORS
- C23EL: operating voltage 24 V AC /DC - 0...10 V DC and 3-position control signal;
- C22VL: operating voltage 230 V AC - 3-position control signal.

Dimensions in mm

ART20 Pressure Independant Control Valve (PICV)

Model	C23E	C21V	C22V
Technical code	ADPI20C23EN	ADPI20C21VN	ADPI20C22VN
Voltage	24 V AC	24 V AC	230 V AC
Control signal	0-10Vdc/4-20mA	3 position	3 position
Frequency	50 Hz	50 Hz	50 Hz
Power	5 VA	5 VA	5 VA
Open/Close time	18.5 sec/mm	18.5 sec/mm	18.5 sec/mm
Degree/Class of protection	IP54	IP54	IP54
Actuator stroke	6.5 mm	6.5 mm	6.5 mm
Actuating force	200 N	200 N	200 N
Cable length	1 m	1 m	1 m
Connection	M30x1.5	M30x1.5	M30x1.5

Model	EMV312/NO 24	EMV312/NO 230
Technical code	RC10940000	RC10950000
Voltage	24 V AC	230 V AC
Control	On/Off - N.O.**	On/Off - N.O.**
Frequency	50 / 60 Hz	50/60 Hz
Power	2.5 W	2.5 W
Closing and opening time	5 min	3 min
Degree/Class of protection	IP54/II	IP54/II
Actuator stroke	5.5 mm	5.5 mm
Actuating force	250 N	250 N
Cable length	1 m	1 m
Connection	M30x1.5	M30x1.5

**The valve will operate as Normally Closed.

Model	C23EL		C22VL
Technical code	ADPI20C23ELC		ADPI20C22VLC
Voltage	24 V AC/DC	24 V AC/DC	230 V AC
Control	0-10 V DC***	3 positions****	3 positions****
Frequency	50...60 Hz	50...60 Hz	50...60 Hz
Power	8.7 VA - 4.9 W	8.7 VA - 4.9 W	5 VA - 2 W
Feedback signal	0-10 V DC***	0-10 V DC	NO
Closing and opening times	60/120 sec	60/120 sec	120 sec
Degree/Class of protection	IP54	IP54	IP54
Actuator stroke	0...8 mm	0...8 mm	8 mm
Actuating force	500 N	500 N	500 N
Cable length	1.2 m	1.2 m	1.2 m
Connection	M30x1.5	M30x1.5	M30x1.5

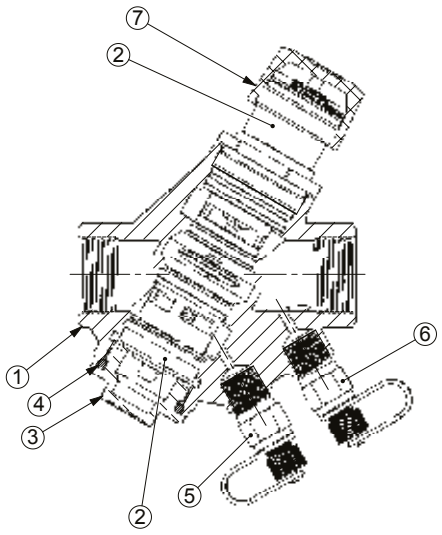
***linear or equal-percentage flow characteristics

****linear flow characteristics

Dimensions in mm

Cross section:

1. Valve body
2. Kit Bonnet + DP Cartridge
3. Plug
4. O-ring
5. Blue binder point
6. Red binder point
7. Plastic cap

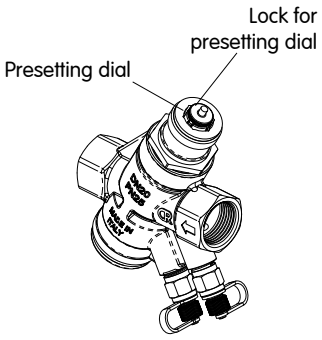


Installation procedure:

Before installation of ART20C, check that inside the valve and the pipes there are no foreign matters which might damage the tightness of the valve.
Deburr pipe connections after having threaded them and distribute the sealing material on pipe threads only and not valve threads.
Make sure that required flow rate is within operating range of the valve. Valves may be installed either on horizontal or vertical pipelines with the electric actuator faced-up and following the arrow direction casted on the valve body, which shall be the same as the flow one.
For assembly purposes, use a spanner, not a pipe wrench, by applying necessary working torque only on the valve end nearest the pipe. This helps get a firmer grip and avoids potential damages to valve body.
Make sure that pipe threading length is not longer than valve threads.
The valve is supplied with a cap allowing (when screwed) the manual opening of the valve.
After DP cartridge removal and manual full opening of the valve, it is possible to flush the system branch where the valve is installed; when flushing process is over, reposition the DP control cartridge.

Dimensions in mm

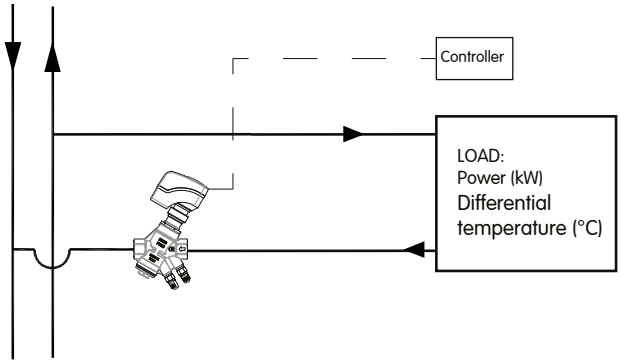
Balancing:



Take the plastic cap screwed on the upper part of the valve off. Turn the presetting dial device (see picture) and match the black mark on the swivel part with the value stated on the fixed part of said device (min., 1, 2, 3, max), which shall correspond to required flow rate. The relation between flow rate and values shown on the presetting dial device are given by the tables stated on following pages of this brochure.
Using a differential manometer, check that the differential pressure is higher or the same as the minimum value reported in said tables. The differential manometer interfaces with the balancing valve through two sensors placed in the binder points of the valve. When balancing is achieved, screw the lock for presetting dial completely, preventing any unintentional rotation.

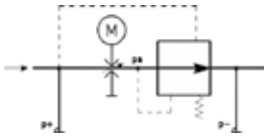
Typical installations:

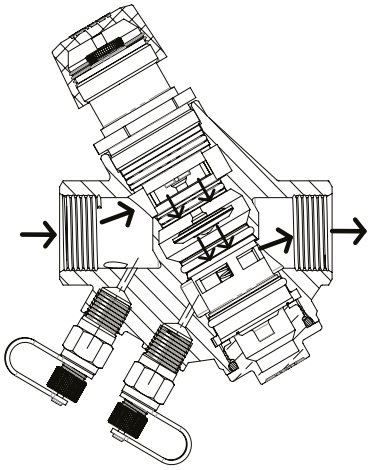
ART20 is suitable for variable volume system to control fan coil flow rate directly. Below a typical installation: in each moment the flow rate is the required one and there will be no extra-flow due to the pressure fluctuations.



Dimensions in mm

Sizing:





Thanks to their unique design, these valves are able to perform the following functions:

- REGULATION: selection of required flow rate within the operating range;
  When electric actuator or plastic cap is missing, the valve is normally closed by the spring. On the contrary, if plastic cap is screwed or electric actuator installed therein, they overcome the force of the spring and open the valve (see picture). The inlet water goes through a modulating control component whose geometry can be modified by turning the presetting dial, according to the required flow rate in the system branch where the valve is installed.

- CONTROL: constant flow rate despite of pressure fluctuations;
  Two different pressures operate on the DPC cartridge. The first one is transmitted through the passage connecting the valve inlet to the lower section of "p+" cartridge (see hydraulic schematic); the second one is registered at valve outlet by the flow rate selecting device "pa". In order to keep constant the difference between the mentioned pressures, the DPC cartridge obturator operates by closing the water outlet bore to reach the preset flow rate, regardless of fluctuating pressure conditions of the system.

- MODULATION: "Full authority" flow rate modulation for temperature control;
  The electrical actuator performs the modulating function changing the section of flow passage. When continuous modulation is carried out, the temperature is kept under control. ART20 keeps the same obturator stroke, regardless of the presetting dial position. With continuous modulation, control is excellent even with small flow opening. This eliminates on/off effect.

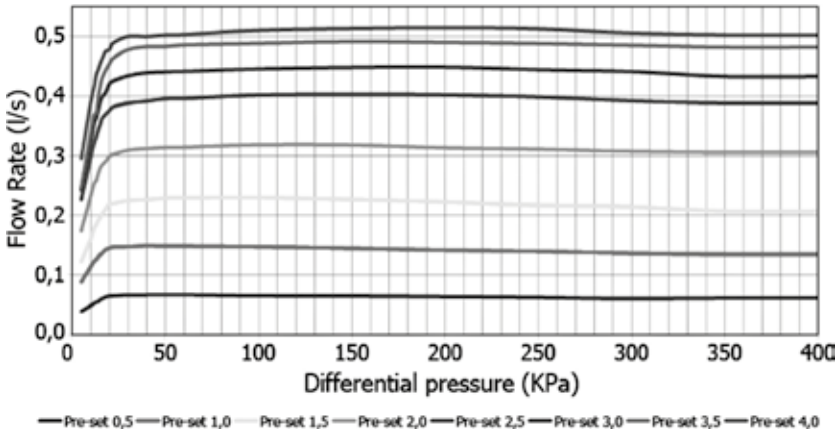
Constant flow is obtained through the valve, despite pressure fluctuations.
By simply measuring differential pressure across the valve, the flow through the cartridge is obtained as follows:

- If measured differential pressure is above Δp_{min} (start-up pressure), the flow rate is the same as the one stated on the valve table (function) of the pre-set;
- If measured differential pressure is below minimum Δp_{min} stated on valve table, flow rate is calculated with one of the following formula:

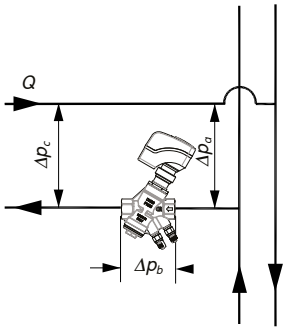
$$Q = Kvs \cdot \sqrt{\frac{\Delta p}{r}}$$

where:
Q is the flow rate in m^3/h, r is the relative density, Δp is the pressure drop across the valve;
Kvs - Kv across the valve when it is fully open (see tables).

Relative density	
Fluid	r
Water	1.000
Water and glycol 10%	1.012
Water and glycol 20%	1.028
Water and glycol 30%	1.040
Water and glycol 40%	1.054
Water and glycol 50%	1.067



Dimensions in mm



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

Δp_b *Pressure drop across ART20*
Δp_c *Circuit pressure drop*

SUGGESTED VALUES AND TIPS:

- Velocities in the pipeline:
  Max = 1.15 m/s
  Min = 0.75 m/s

For the preliminary sizings where the value of maximum available pressure is not known, it is possible to use the maximum head of the pump directly.

EXAMPLE

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

- Circuit pressure drop: Δp_c=10 kPa;
- Flow rate: Q= 0.480 m^3/h=0.133 l/s;
- Maximum head: $\Delta p_{a,max}$ = 60 kPa (Pump head);
- Pipeline size: DN 25.

It is possible to install a valve with the same diameter of the pipe, to avoid fittings installation. Using a ART20 DN25, it is possible to select from the attached tables the pre-set position (1.00 - 0.135 l/s).
This P.I.C.V. in this conditions needs at least 14 kPa of differential pressure in order to work properly, the available pressure on the riser should be at least:

$$\Delta p_a = \Delta p_b + \Delta p_c = 14 + 10 = 24\ kPa$$

The maximum allowable differential pressure across the balancing valve is 400 kPa, it means that the maximum head at the riser should be:

$$\Delta p_a = \Delta p_b + \Delta p_c = 410 + 10 = 410\ kPa$$

Being the maximum head less than the calculated limit, the installation is correct.

Dimensions in mm

Measurement conversion chart:

Pressure

FROM	MULTIPLY BY	TO OBTAIN
Pa, Pascal	0,001	kPa, kiloPascal
Pa, Pascal	0,000001	MPa, Mega Pascal
Pa, Pascal	0,00001	bar
Pa, Pascal	0,00010972	m_{H2O}, metres of water
Pa, Pascal	0,000145038	psi, pound per square inch
bar	1,01325	atm, atmosphere
bar	0,980665	Kg/cm^2, kilograms per square centimetre
bar	10,1972	m_{H2O}, metres of water
bar	14,5038	psi, pound per square inch
atm, atmosphere	1,03323	Kg/cm^2, kilograms per square centimetre
atm, atmosphere	10,3323	m_{H2O}, metres of water
atm, atmosphere	14,6959	psi, pound per square inch
Kg/cm^2	10	m_{H2O}, metres of water
Kg/cm^2	14,2233	psi, pound per square inch
m_{H2O}	1,42233	psi, pound per square inch

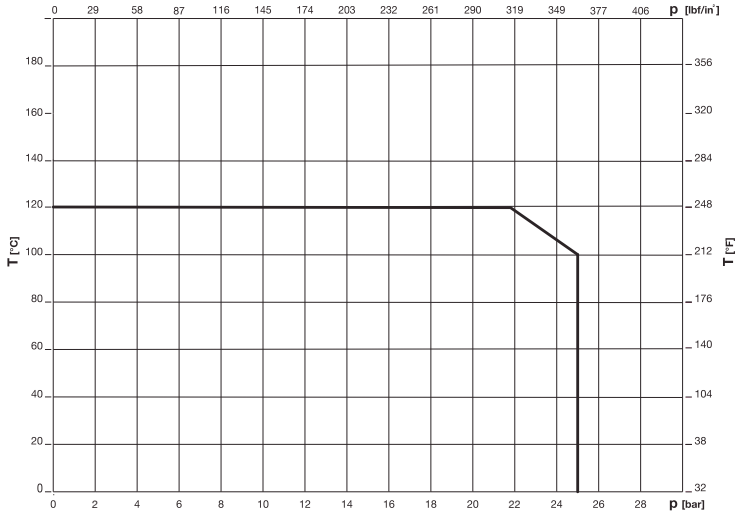
TO OBTAIN — DIVIDE BY — FROM

Length, Area, Volume, Density

FROM	MULTIPLY BY	TO OBTAIN
inches	0,0254	m, metres
inches	2,54	cm, centimetres
feet	0,3048	m, metres
feet	30,48	cm, centimetres
yards	0,9144	m, metres
square inches	0,00064516	m^2, metri quadrati
square feet	0,09290304	m^2, square metres
square inches	6,4516	cm^2, square centimetres
square feet	929,0304	cm^2, square centimetres
square yards	0,8361274	m^2, square metres
l, litres	0,001	m^3, cubic metres
gallons	0,003789412	m^3, cubic metres
cubic yards	0,7645549	m^3, cubic metres
cubic feet	0,02831685	m^3, cubic metres
cubic inches	0,0000164	m^3, cubic metres
cubic inches	16,38706	cm^3, cubic centimetres
cubic feet	28,31685	l, litres
gallons	3,875412	l, litres

TO OBTAIN — DIVIDE BY — FROM

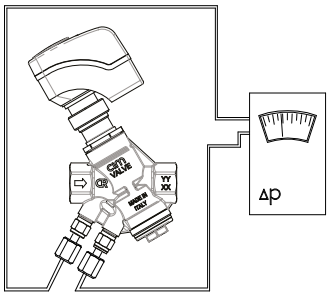
Pressure-temperature ratings:



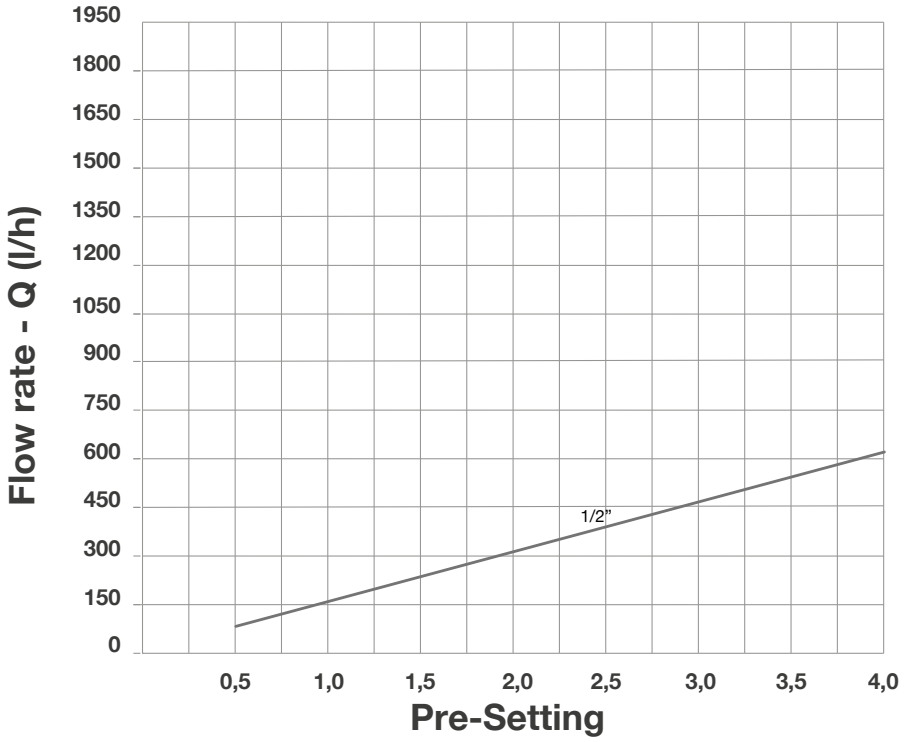
Dimensions in mm

Flow rates - DN 15

ART20LF



$\Delta p \geq \Delta p_{min}$ --> $Q = Q_{nom}$
$\Delta p < \Delta p_{min}$ --> $Q = Kvs \sqrt{\Delta p}$

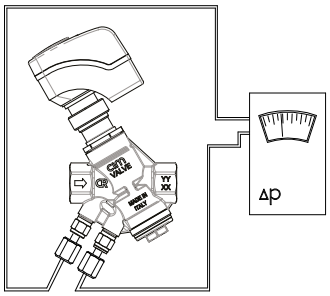


Pre-Set		0.50	0.75	1.0	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
Flow Rate	l/h	78	117	156	195	234	274	313	352	391	430	469	508	547	586	625
	l/s	0.022	0.033	0.043	0.054	0.065	0.076	0.087	0.098	0.109	0.119	0.130	0.141	0.152	0.163	0.174
	GPM	0.34	0.52	0.69	0.86	1.03	1.20	1.38	1.55	1.72	1.89	2.06	2.24	2.41	2.58	2.75
Min Δp kPa		14.5	14.5	14.5	15.1	15.1	15.1	15.1	15.7	15.7	15.7	15.7	16.0	16.0	16.0	16.0
Kvs		0.21	0.31	0.41	0.50	0.60	0.70	0.81	0.89	0.99	1.08	1.18	1.27	1.37	1.47	1.57

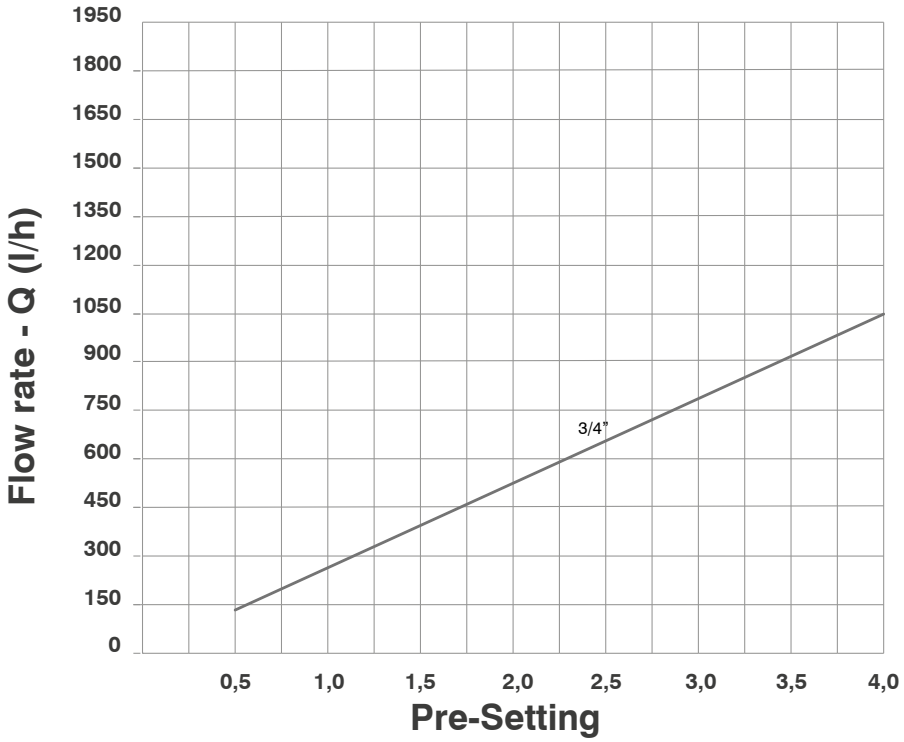
Dimensions in mm

Flow rates - DN 20

ART20LF



$\Delta p \geq \Delta p_{min}$ --> $Q = Q_{nom}$
$\Delta p < \Delta p_{min}$ --> $Q = Kvs \sqrt{\Delta p}$

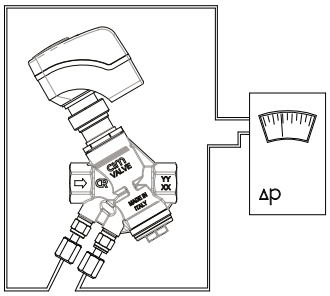


Pre-Set		0.50	0.75	1.0	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
Flow Rate	l/h	131	197	263	328	394	459	525	591	656	722	788	853	919	984	1050
	l/s	0.036	0.055	0.073	0.091	0.109	0.128	0.146	0.164	0.182	0.201	0.219	0.237	0.255	0.273	0.292
	GPM	0.58	0.87	1.16	1.44	1.73	2.02	2.31	2.60	2.89	3.18	3.47	3.76	4.04	4.33	4.62
Min Δp kPa		14.5	14.5	14.5	15.1	15.1	15.1	15.1	15.7	15.7	15.7	15.7	16.0	16.0	16.0	16.0
Kvs		0.34	0.52	0.69	0.84	1.01	1.19	1.35	1.49	1.65	1.83	1.99	2.13	2.30	2.46	2.63

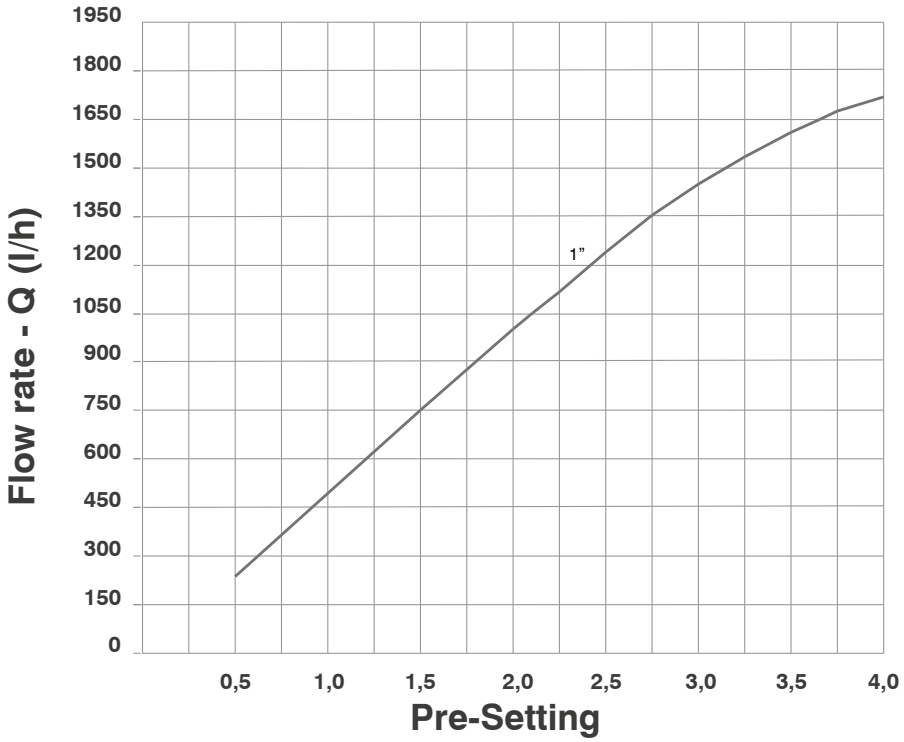
Dimensions in mm

Flow rates - DN 25

ART20LF



$\Delta p \geq \Delta p_{min}$ --> $Q = Q_{nom}$
$\Delta p < \Delta p_{min}$ --> $Q = Kvs \sqrt{\Delta p}$

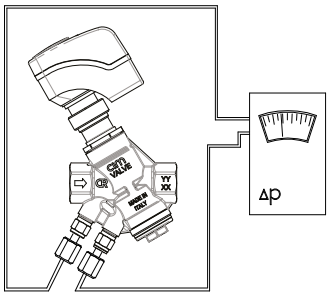


Pre-Set		0.50	0.75	1.0	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
Flow Rate	l/h	231	357	486	617	749	878	1005	1128	1244	1352	1452	1540	1615	1676	1722
	l/s	0.064	0.099	0.135	0.171	0.208	0.244	0.279	0.313	0.346	0.376	0.403	0.428	0.449	0.466	0.478
	GPM	1.02	1.57	2.14	2.72	3.30	3.87	4.43	4.96	5.48	5.95	6.39	6.78	7.11	7.38	7.58
Min Δp kPa		14.0	14.0	14.0	14.8	14.8	14.8	14.8	15.5	15.5	15.5	15.5	16.0	16.0	16.0	16.0
Kvs		0.62	0.95	1.30	1.60	1.95	2.28	2.61	2.86	3.16	3.44	3.69	3.85	4.04	4.19	4.30

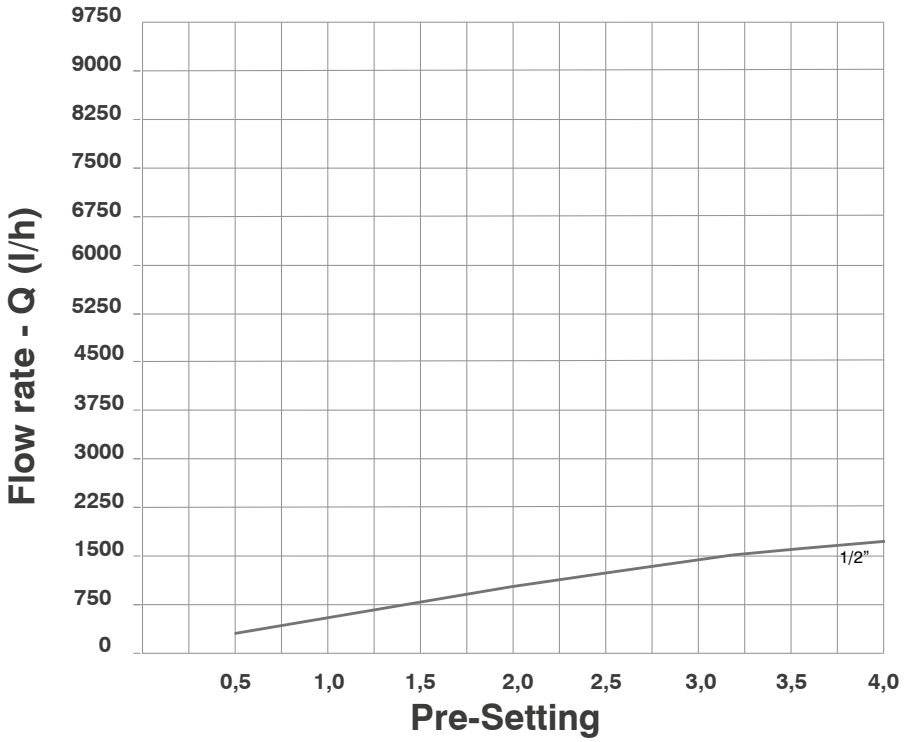
Dimensions in mm

Flow rates - DN 15

ART20HF



$\Delta p \geq \Delta p_{min}$ --> $Q = Q_{nom}$
$\Delta p < \Delta p_{min}$ --> $Q = Kvs \sqrt{\Delta p}$

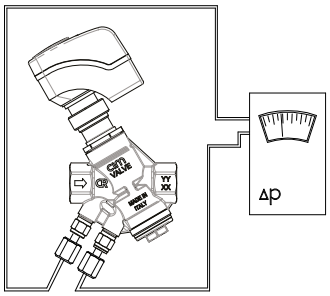


Pre-Set		0.50	0.75	1.0	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
Flow Rate	l/h	244	372	501	630	759	886	1009	1128	1241	1347	1444	1532	1609	1673	1724
	l/s	0.068	0.103	0.139	0.175	0.211	0.246	0.280	0.313	0.345	0.374	0.401	0.426	0.447	0.465	0.479
	GPM	1.08	1.64	2.20	2.77	3.34	3.90	4.44	4.97	5.46	5.93	6.36	6.74	7.08	7.37	7.59
Min Δp kPa		14.0	14.0	14.0	15.8	15.8	15.8	15.8	17.0	17.0	17.0	17.0	18.0	18.0	18.0	18.0
Kvs		0.65	0.99	1.34	1.58	1.91	2.23	2.54	2.73	3.01	3.27	3.50	3.61	3.79	3.95	4.06

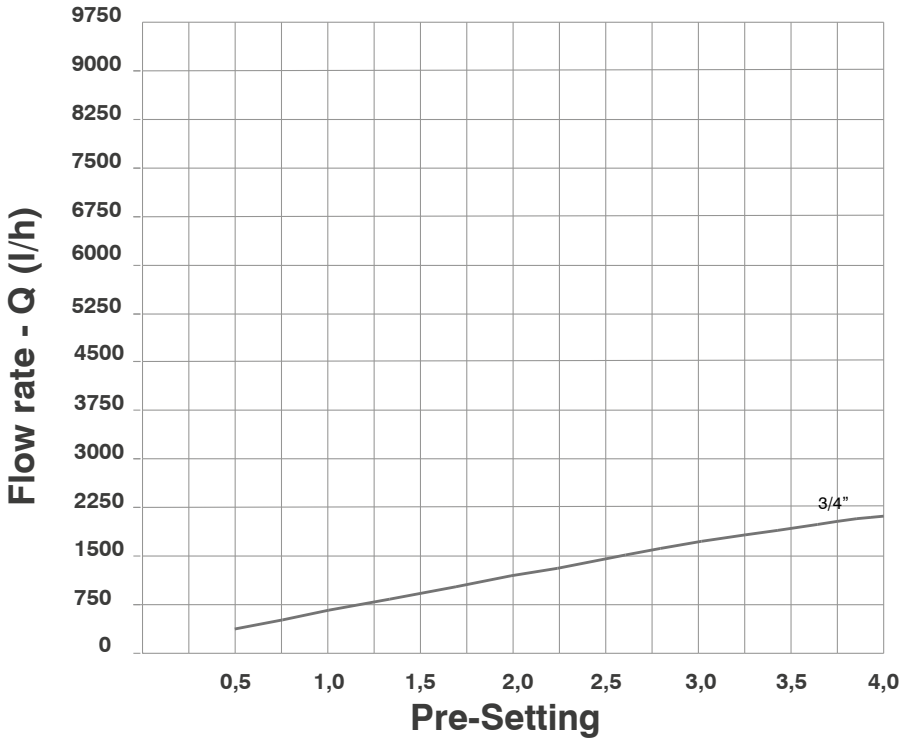
Dimensions in mm

Flow rates - DN 20

ART20HF



$\Delta p \geq \Delta p_{min}$ --> $Q = Q_{nom}$
$\Delta p < \Delta p_{min}$ --> $Q = Kvs \sqrt{\Delta p}$

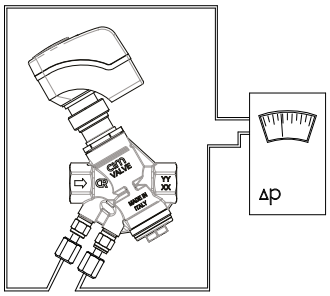


Pre-Set		0.50	0.75	1.0	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
Flow Rate	l/h	292	435	577	719	863	1007	1152	1296	1437	1573	1700	1815	1913	1990	2039
	l/s	0.081	0.121	0.160	0.200	0.240	0.280	0.320	0.360	0.399	0.437	0.472	0.504	0.531	0.553	0.566
	GPM	1.28	1.91	2.54	3.17	3.80	4.43	5.07	5.70	6.33	6.92	7.48	7.99	8.42	8.76	8.98
Min Δp kPa		14.0	14.0	14.0	18.0	18.0	18.0	18.0	20.0	20.0	20.0	20.0	22.0	22.0	22.0	22.0
Kvs		0.78	1.16	1.54	1.70	2.04	2.38	2.72	2.90	3.21	3.52	3.80	3.87	4.08	4.24	4.34

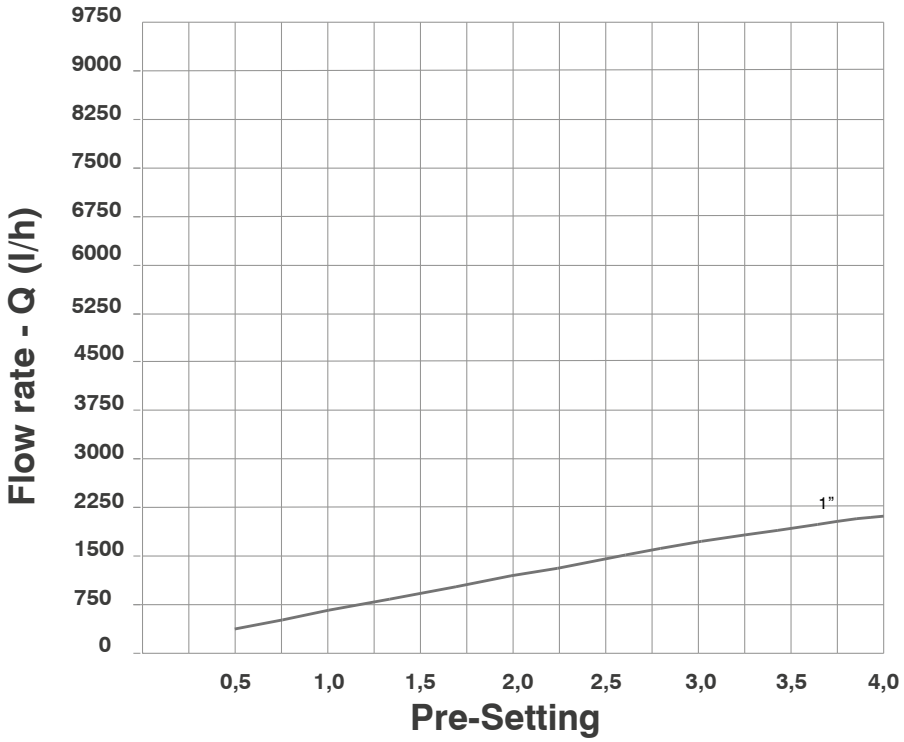
Dimensions in mm

Flow rates - DN 25

ART20HF



$\Delta p \geq \Delta p_{min}$ --> $Q = Q_{nom}$
$\Delta p < \Delta p_{min}$ --> $Q = Kvs \sqrt{\Delta p}$

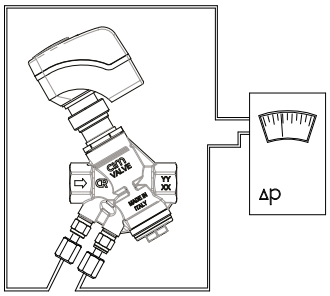


Pre-Set		0.50	0.75	1.0	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
Flow Rate	l/h	292	435	577	719	863	1007	1152	1296	1437	1573	1700	1815	1913	1990	2039
	l/s	0.081	0.121	0.160	0.200	0.240	0.280	0.320	0.360	0.399	0.437	0.472	0.504	0.531	0.553	0.566
	GPM	1.28	1.91	2.54	3.17	3.80	4.43	5.07	5.70	6.33	6.92	7.48	7.99	8.42	8.76	8.98
Min Δp kPa		14.0	14.0	14.0	18.0	18.0	18.0	18.0	20.0	20.0	20.0	20.0	22.0	22.0	22.0	22.0
Kvs		0.78	1.16	1.54	1.70	2.04	2.38	2.72	2.90	3.21	3.52	3.80	3.87	4.08	4.24	4.34

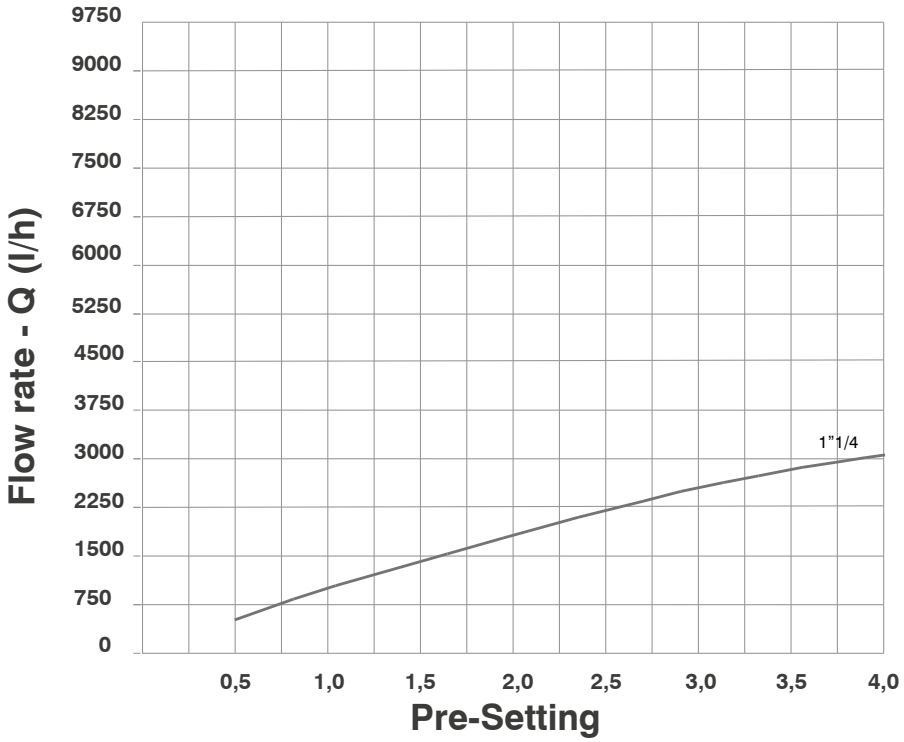
Dimensions in mm

Flow rates - DN 32

ART20HF



$\Delta p \geq \Delta p_{min}$ --> $Q = Q_{nom}$
$\Delta p < \Delta p_{min}$ --> $Q = Kvs \sqrt{\Delta p}$

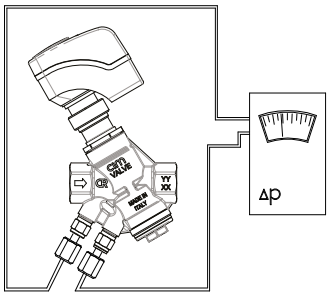


Pre-Set		0.50	0.75	1.0	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
Flow Rate	l/h	465	692	9221	1150	1377	1600	1816	2024	2221	2405	2574	2726	2858	2969	3056
	l/s	0.129	0.192	0.256	0.319	0.382	0.444	0.504	0.562	0.617	0.668	0.715	0.757	0.794	0.825	0.849
	GPM	2.05	3.05	4.05	5.06	6.06	7.04	7.99	8.91	9.78	10.59	11.33	12.00	12.58	13.07	13.45
Min Δp kPa		14.5	14.5	14.5	16.0	16.0	16.0	16.0	17.0	17.0	17.0	17.0	18.0	18.0	18.0	18.0
Kvs		1.22	1.82	2.42	2.87	3.44	4.00	4.54	4.91	5.39	5.83	6.24	6.42	6.74	7.00	7.20

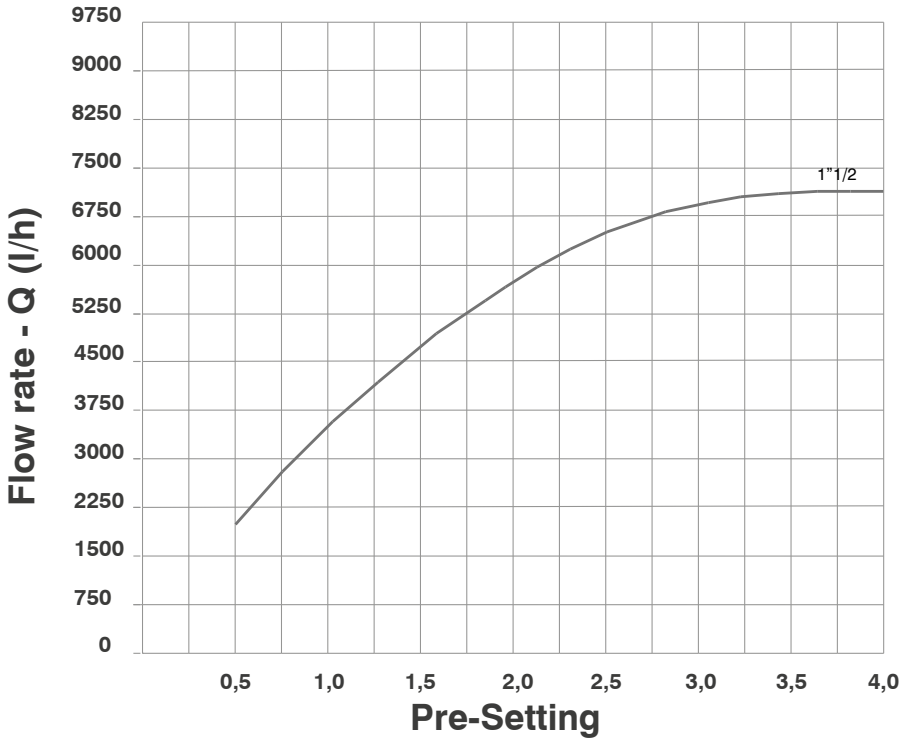
Dimensions in mm

Flow rates - DN 40

ART20HF



$\Delta p \geq \Delta p_{min}$ --> $Q = Q_{nom}$
$\Delta p < \Delta p_{min}$ --> $Q = Kvs \sqrt{\Delta p}$

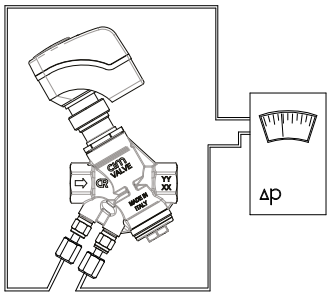


Pre-Set		0.50	0.75	1.0	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
Flow Rate	l/h	2022	2825	3538	4179	4758	5279	5741	6139	6470	6729	6916	7033	7090	7105	7105
	l/s	0.562	0.785	0.983	1.161	1.322	1.466	1.595	1.705	1.797	1.869	1.921	1.954	1.969	1.974	1.974
	GPM	8.90	12.44	15.58	18.40	20.95	23.24	25.27	27.03	28.48	29.62	30.44	30.96	31.21	31.28	31.28
Min Δp kPa		16.0	16.5	16.5	18.0	18.0	20.0	20.0	22.0	22.5	24.0	25.0	26.0	26.0	26.0	26.0
Kvs		5.06	6.96	8.71	9.85	11.22	11.80	12.84	13.09	13.64	13.73	13.80	13.80	13.90	13.94	13.94

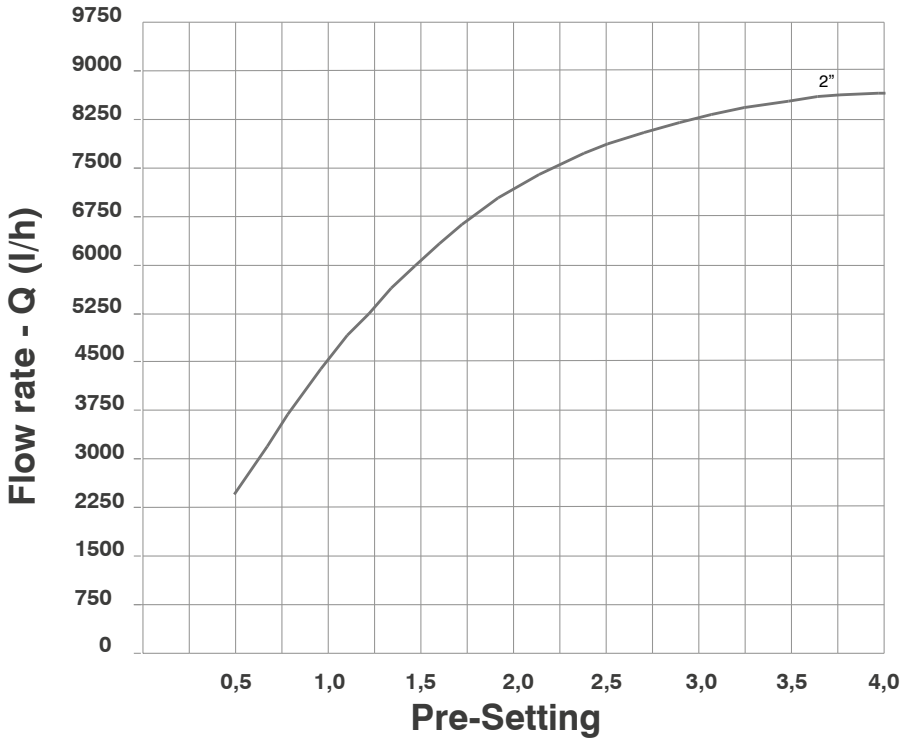
Dimensions in mm

Flow rates - DN 50

ART20HF



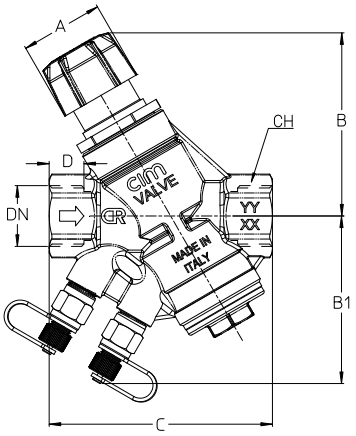
$\Delta p \geq \Delta p_{min}$ --> $Q = Q_{nom}$
$\Delta p < \Delta p_{min}$ --> $Q = Kvs \sqrt{\Delta p}$



Pre-Set		0.50	0.75	1.0	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
Flow Rate	l/h	2204	3325	4337	5218	5963	6577	7070	7459	7766	8009	8204	8362	8486	8568	8586
	l/s	0.612	0.924	1.205	1.449	1.657	1.827	1.964	2.072	2.157	2.225	2.279	2.323	2.357	2.380	2.385
	GPM	9.70	14.64	19.09	22.97	26.25	28.95	31.12	32.84	34.19	35.25	36.11	36.81	37.36	37.72	37.80
Min Δp kPa		19.0	22.0	22.0	25.0	25.0	28.0	28.0	29.0	29.0	30.0	30.0	31.0	32.0	32.0	32.0
Kvs		5.05	7.09	9.25	10.43	11.93	12.43	13.36	13.85	14.42	14.62	14.98	15.00	15.00	15.15	15.18

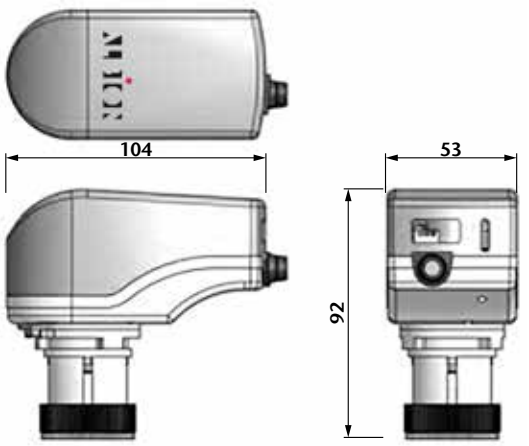
Dimensions in mm

Main dimensions:
ART 20 LF
ART 20 HF

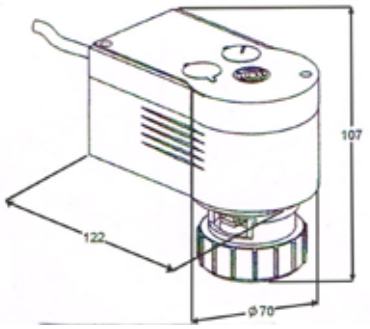


DN	15	20	25	32	40	50
Grms.	875	860	1015	1460	2550	3200
A	35	35	35	35	35	35
B	81	81	81	87	120	130
B1	72	72	72	76	87	93
C	96	97	103	128	144	155
D	14	15	16	19	17	20
CH	27	32	39	47	54	69

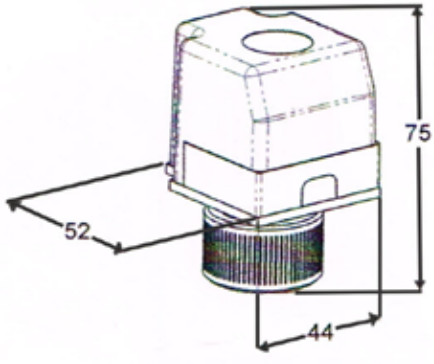
Main dimensions:
C23E
C21V
C22V
C23EL
C22VL
EMV312/NO



C21V/22V/23E



C23EL / C22VL
(DN40-50)



EMV312 series

Dimensions in mm

Maintenance:

As a rule, the balancing valve does not need any maintenance. In case of replacement or need of disassembling of some components of the valve, make sure that the installation is not under service or pressure.

Dimensions in mm

9a Fallbank Industrial Estate,
Dodworth, Barnsley, S75 3LS

Certificate No. 1437B

Certificate No. 1437A

Distributor