



3-way valve BR316RA
+ actuator MC55(Y)



2-way valve BR216RA
+ actuator MC100

1. Caractéristiques

- Suitable for the control of hot and chilled water (0°C ... +150°C) in HVAC systems control of heating plants.

Above 130°C valves should only be mounted in the horizontal position.

- Suitable for water with antifreeze compounds down to -15°C
- Tight shut-off in the closed position
- Microprocessor controlled
- Automatic self-calibration on start up

2. Technical data valve

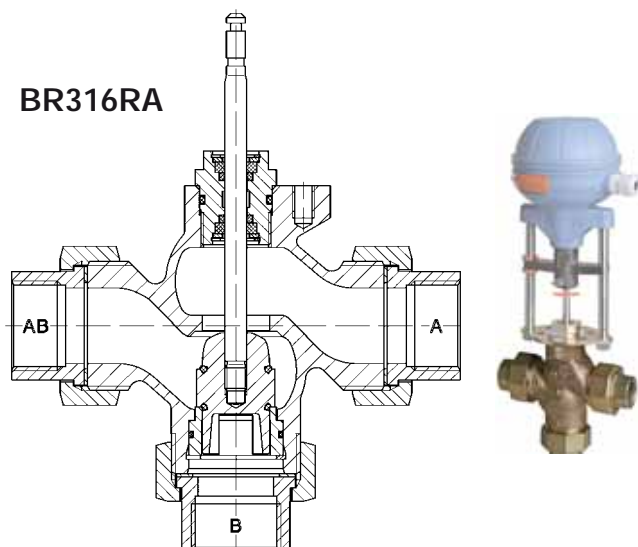
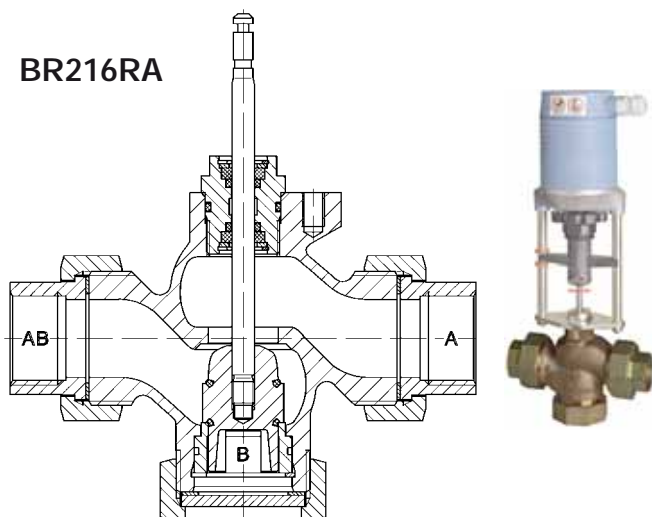
	BR216RA		BR316RA	
Form	2-way		3-way	
Diameter nominal	DN 15 ... DN 20	DN 25 ... DN 50	DN 15 ... DN 20	DN 25 ... DN 50
Pressure rating	PN16		PN16	
Characteristic	A → AB equal %		A → AB equal % B → AB linear	
Stroke	12 mm	14 mm	12 mm	14 mm
Rangeability	DN 15 50:1 DN 20...50 100:1		DN 15 50:1 DN 20...50 100:1	

Function	BR216RA : 2-way valve BR316RA : mixing or on-off valve
Connection type	Body with external thread acc. ISO 228/1 incl. connection parts of malleable cast iron with cylindrical internal thread acc. ISO 7/1, union nuts and gaskets
Leakage rate	EN 1349 – seat-leakage VI G 1 (tight sealing)
Body	Bronze CC491K
Plug	Brass CW614N
Stem	CrMo-steel 1.4122
Stem sealing	O-rings EPDM

Valve variant and accessories

- Internal thread connection parts of bronze. Union nut of malleable cast iron
- Plug made of CrNi-steel 1.4305
- Suitable for water with antifreeze compounds down to -15°C
24 VAC, 50/60 Hz or 24 VDC
Power consumption : Pmax. ≈ 400 VA
PN ≈ 45 VA
- Usable for media based on mineral oil basis (stem sealing made of FKM)
- Technical silicon free version

Drawing



3. Technical data actuator MC55

		MC55/24	MC55/230	MC55Y
Actuating time ¹⁾	s/mm	9 . 5*	9 . 5*	9 . 5*
Actuating thrust	kN	0,6	0,6	0,6
Stroke	mm	max. 14	max. 14	max. 14
Power supply	Vac	24 ±10%	230 +6% -10%	24 ±10%
Power supply ²⁾	Vdc	24 ±10%	-	24 ±10%
Frequency	Hz	50/60 ±5%	50/60 ±5%	50/60 ±5%
Power consumption	VA	3,5	7	3,5
Input signal ³⁾		3-point	3-point	0/2 ... 10 Vdc 77kΩ 0/4 ... 20 mA 0,51kΩ
Output signal ³⁾		0 ... 10 Vdc max. 8 mA min. 1200Ω	0 ... 10 Vdc max. 8 mA min. 1200Ω	0 ... 10 Vdc max. 8 mA min. 1200Ω
Hysteresis	V	0,3	0,3	0,3

Enclosure protection	IP 54 in automatic operation IP 30 in manual operation
Resolution	Electric 0.04 VDC Mechanical 0.06 mm
Mains connection	Actuator with terminal
Operating mode	S3-50% ED c/h 1200 EN 60034-1
End position switch-off	load-dependent
Ambient temperature	0°C ... +60°C
Weight	1.5 kg

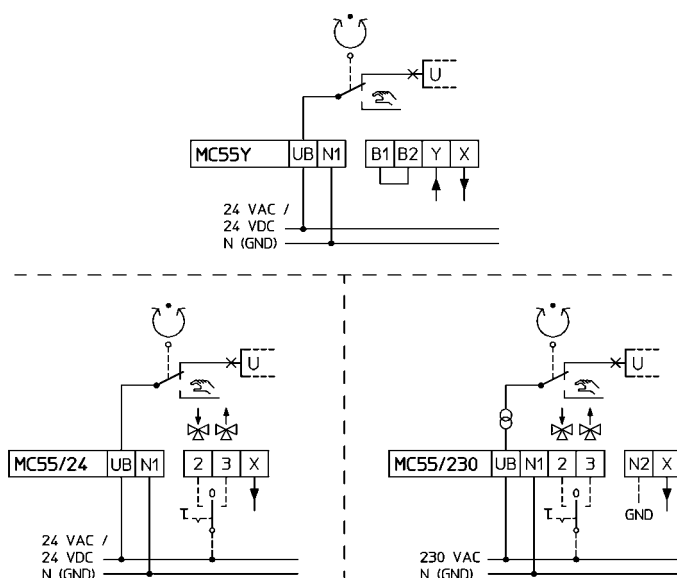
Actuator variant and accessories

- Voltage : 115 VAC,
- Adapter with coupling for external products.

Circuit diagram



B1/B2 Connection of a binary signal
(e.g. frost safety)



¹⁾ Actuating time freely adjustable, presetting is marked with *

²⁾ Only rectified alternating voltage

³⁾ Invertible input and output signal

4. Technical data actuator MC100 and MC161

		MC100/24	MC100/230	MC161/24	MC161/230
Actuating time ¹⁾	s/mm	12 . 9* . 4 . 1,9	12 . 9* . 4 . 1,9	6 . 4*	6 . 4*
Actuating thrust	kN	1,0	1,0	1,6	1,6
Stroke	mm	max. 20	max. 20	max. 20	max. 20
Power supply	Vac	24 ±10%	230 +6% -10%	24 ±10%	230 +6% -10%
Power supply ²⁾	Vdc	24 ±10%	-	24 ±10%	-
Frequency	Hz	50/60 ±5%	50/60 ±5%	50/60 ±5%	50/60 ±5%
Power consumption	VA	6	12	6	12
Input signal ³⁾		3-point 0/2 ... 10 Vdc 77kΩ 0/4 ... 20 mA 0,51kΩ	3-point 0/2 ... 10 Vdc 77kΩ 0/4 ... 20 mA 0,51kΩ	3-point 0/2 ... 10 Vdc 77kΩ 0/4 ... 20 mA 0,51kΩ	3-point 0/2 ... 10 Vdc 77kΩ 0/4 ... 20 mA 0,51kΩ
Output signal ³⁾		0 ... 10 Vdc max. 8 mA min. 1200Ω	0 ... 10 Vdc max. 8 mA min. 1200Ω	0 ... 10 Vdc max. 8 mA min. 1200Ω	0 ... 10 Vdc max. 8 mA min. 1200Ω
Hysteresis ⁴⁾	V	0,15 . 0,5	0,15 . 0,5	0,05 . 0,15 . 0,3 . 0,5	0,05 . 0,15 . 0,3 . 0,5

Enclosure protection	IP 54		
Resolution	MC...	electric	0.04 VDC
	MC100	mechanical	0.095 mm
	MC161	mechanical	0.05 mm
Operating mode	S3-50% ED c/h 1200 EN 60034-1		
End position switch-off	load-dependent		
Ambient temperature	0°C ... +60°C		
Weight	MC100	2.5 kg	
	MC161	3.2 kg	

Actuator variant and accessories

- Voltage 115 VAC
- Position switch unit⁵⁾ 2 switches (WE1/WE2), potential free, infinitely adjustable
 Rated load 8 A / 250 VAC
 8 A / 30 VDC
 Turn-on voltage max. 400 VAC
 max. 125 VDC
- Enclosure protection IP 65
- Board for output signal⁵⁾ X=0(4)...20 mA
- Adapter with coupling for external products

¹⁾ Actuating time freely adjustable, presetting is marked with *

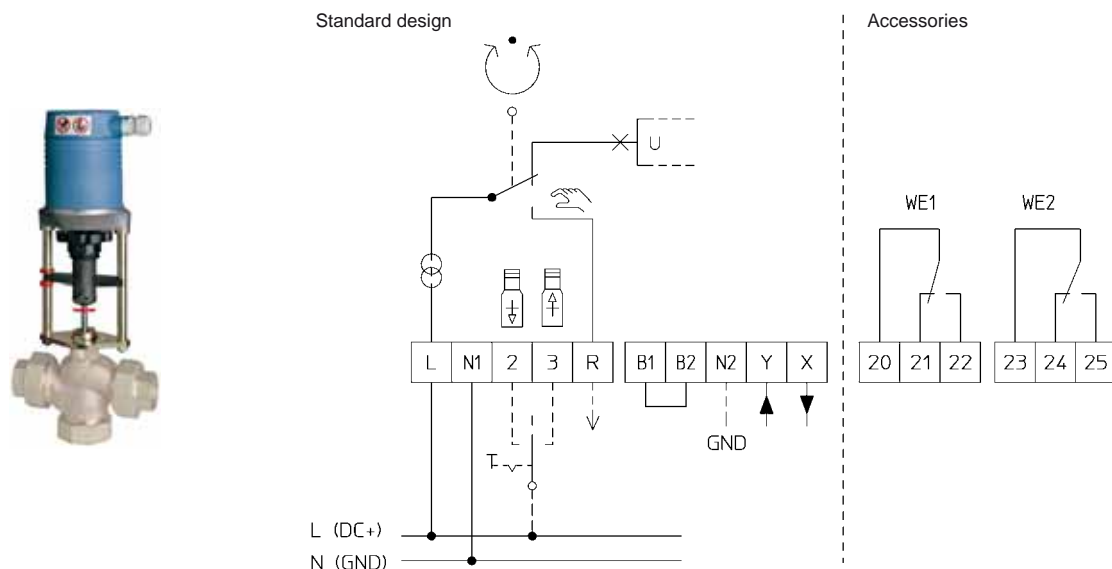
²⁾ Only rectified alternating voltage

³⁾ Invertible input and output signal

⁴⁾ Freely adjustable

⁵⁾ Position switch unit and output signal 0(4)...20 mA not in combination

Circuit diagram



B1/B2 Connection of a binary signal (e.g. frost safety)

5. Technical data valve with actuator

DN		15	20	25	32	40	50	
KVS-value	m ³ /h	4	1,6	6,3	10	16	40	
		2,5	1,25 0,63	5	8	12,5	31,5	
Stroke	mm	12			14			
MC55/24 MC55/230 MC55Y	Actuating time ¹⁾	105 . 60*			125 . 70*			
	Closing pressure	1 500	1 500	1 250	750	450	250	150
MC100/24 MC100/230	Actuating time ¹⁾	145 . 105* . 45 . 20			170 . 125* . 55 . 30			
	Closing pressure	1 600	1 600	1 600	1 500	900	550	350
MC161/24 MC161/230	Actuating time ¹⁾	-			95 . 55*			
	Closing pressure	-			1 500	950	600	

Installation instruction

Valve trim could be damaged by dirt in the pipe system. Therefore we recommend the installation of strainers.

100 kPa = 1 bar = 10 mWS

¹⁾ Actuating time freely adjustable, presetting is marked with *

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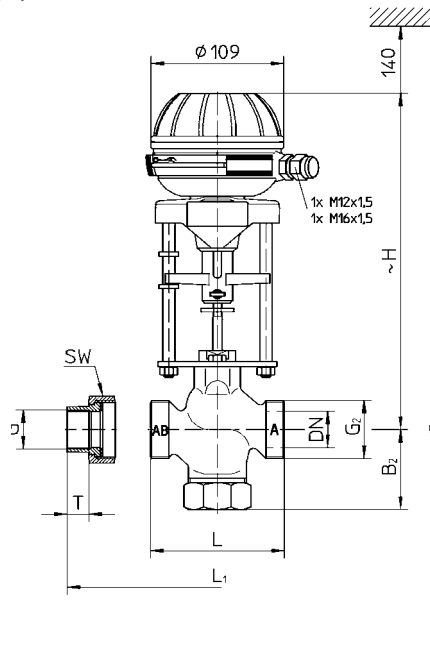
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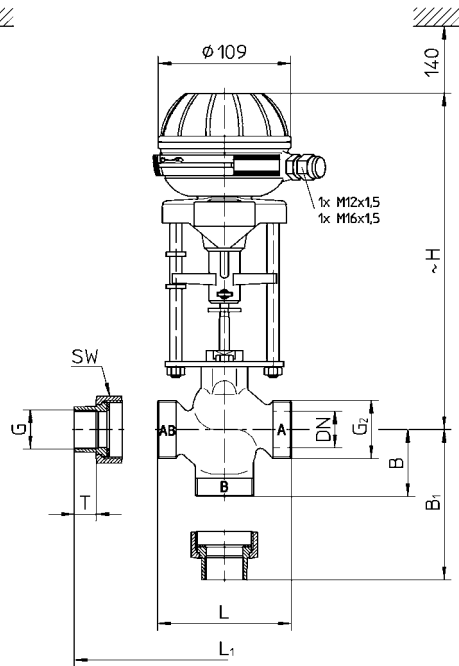
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Drawing

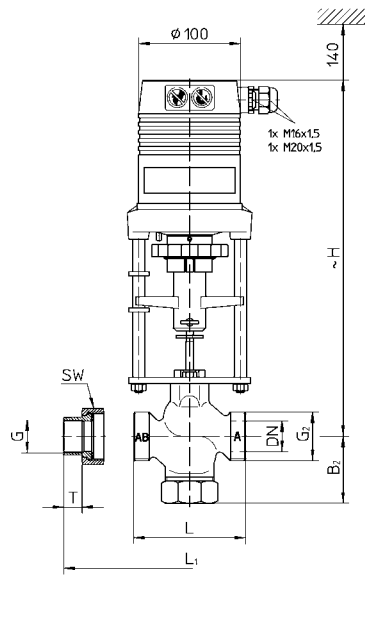
BR216RA MC55(Y)



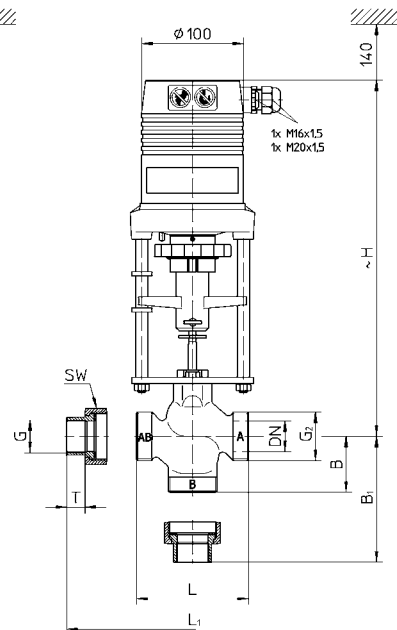
BR316RA MC 55(Y)



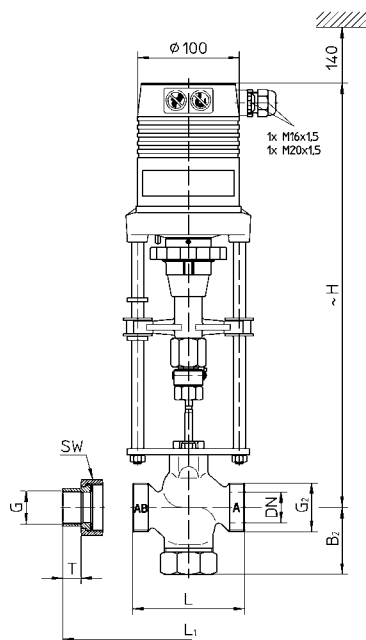
BR216RA MC100



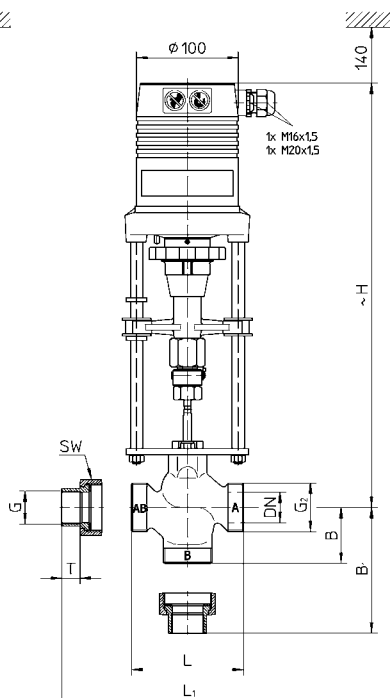
BR316RA MC100



BR216RA MC161



BR316RA MC161



Dimension

DN			15	20	25	32	40	50	
G			Rp ½	Rp ¾	Rp 1	Rp 1¼	Rp 1½	Rp 2	
L	mm		62	75	80	120	130	150	
L ₁	mm		114	127	138	184	198	222	
B	mm		40	41	45	55	60	65	
B ₁	mm		66	67	74	89	94	101	
B ₂	mm		48	53	57	68	73	78	
G ₂			G 1 A	G 1¼ A	G 1½ A	G 2 A	G 2¼ A	G 2½ A	
SW	mm		37	48	53	68	73	88	
T	mm		13	15	17	19	19	24	
H	MC55(Y)	24 Vac / 230 Vac	mm	265	268	271	280	283	283
		24 Vac	mm	338	341	344	353	358	363
	MC100	230 Vac	mm	363	366	369	378	383	388
		24 Vac	mm	-	-	-	420	423	423
MC161	230 Vac	mm	-	-	-	445	448	448	
m	MC55(Y)		kg	2,4	2,9	3,2	4,9	5,5	7,1
	MC100		kg	3,4	3,9	4,2	5,9	6,5	8,1
	MC161		kg	-	-	-	6,6	7,2	8,8

How to use the chart

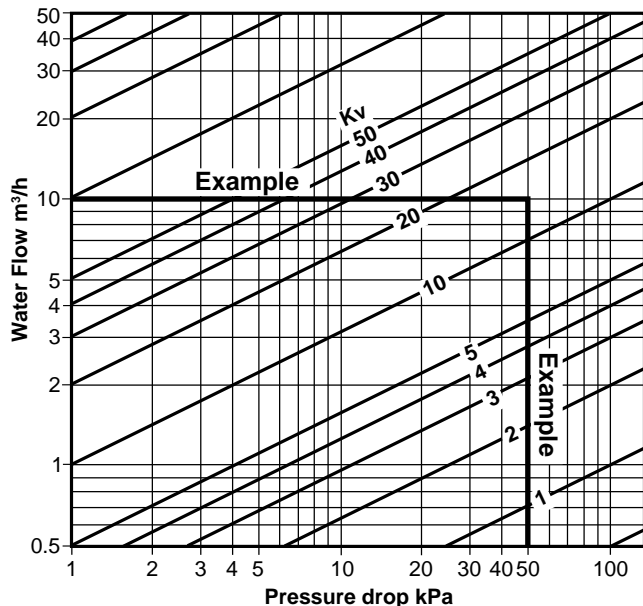
Note: the chart below is used for the following example only. A complete chart is shown overleaf.

Example:

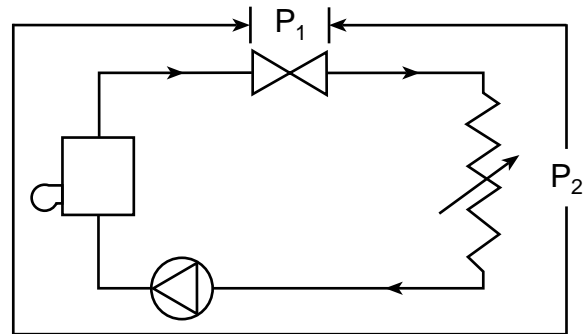
- The heat exchanger has a MTHW demand of = 10 m³/h
- The full-load pressure drop P₁ = 50 kPa (established from 'Valve authority' -see below-).
- Go to the selection chart below:
 - Draw a horizontal line from 10 m³/h
 - Run a vertical line from 50 kPa until it crosses 10 m³ / h line.
 - Kv is given at this crossing point i.e. Kv ≈ 14

Refer to the Kv values given on the appropriate Technical Information Sheet for each valve type.

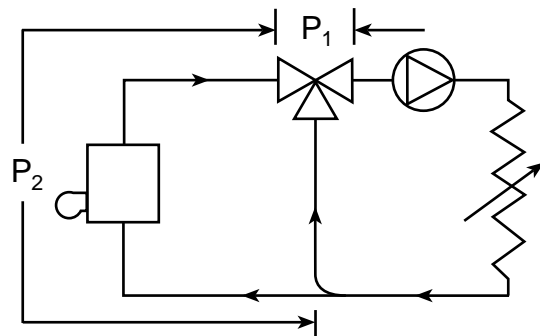
Self-acting, electronic and pneumatic controls should be sized on maximum Kv value.



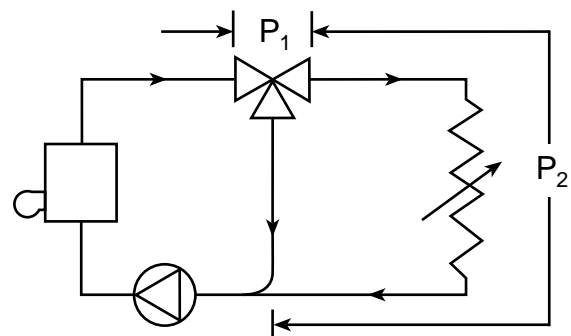
between 0.2 and 0.5 (and preferably 0.5). This will ensure that each small valve movement will influence some authority over the flow whilst not excessively increasing pumping power costs. Valve authority will always relate to the circuit which has a varying flowrate.



Valve authority - Two-port valve



Valve authority - Three-port mixing valve



Valve authority - Three-port diverting valve

Valve authority

The ratio of pressure drop across the valve when fully open to that across the complete circuit is termed the 'Valve authority' (N) and is expressed as:

$$N = \frac{P_1}{P_1 + P_2}$$

Where: N = Valve authority

P₁ = Pressure drop across the fully open valve

P₂ = Pressure drop across the remainder of the circuit

The diagrams opposite illustrate P₁ and P₂ more fully.

Valve authority is a means of selecting a valve size on a water system with due regard to economic viability and good control.

When selecting a valve size, the valve authority should be

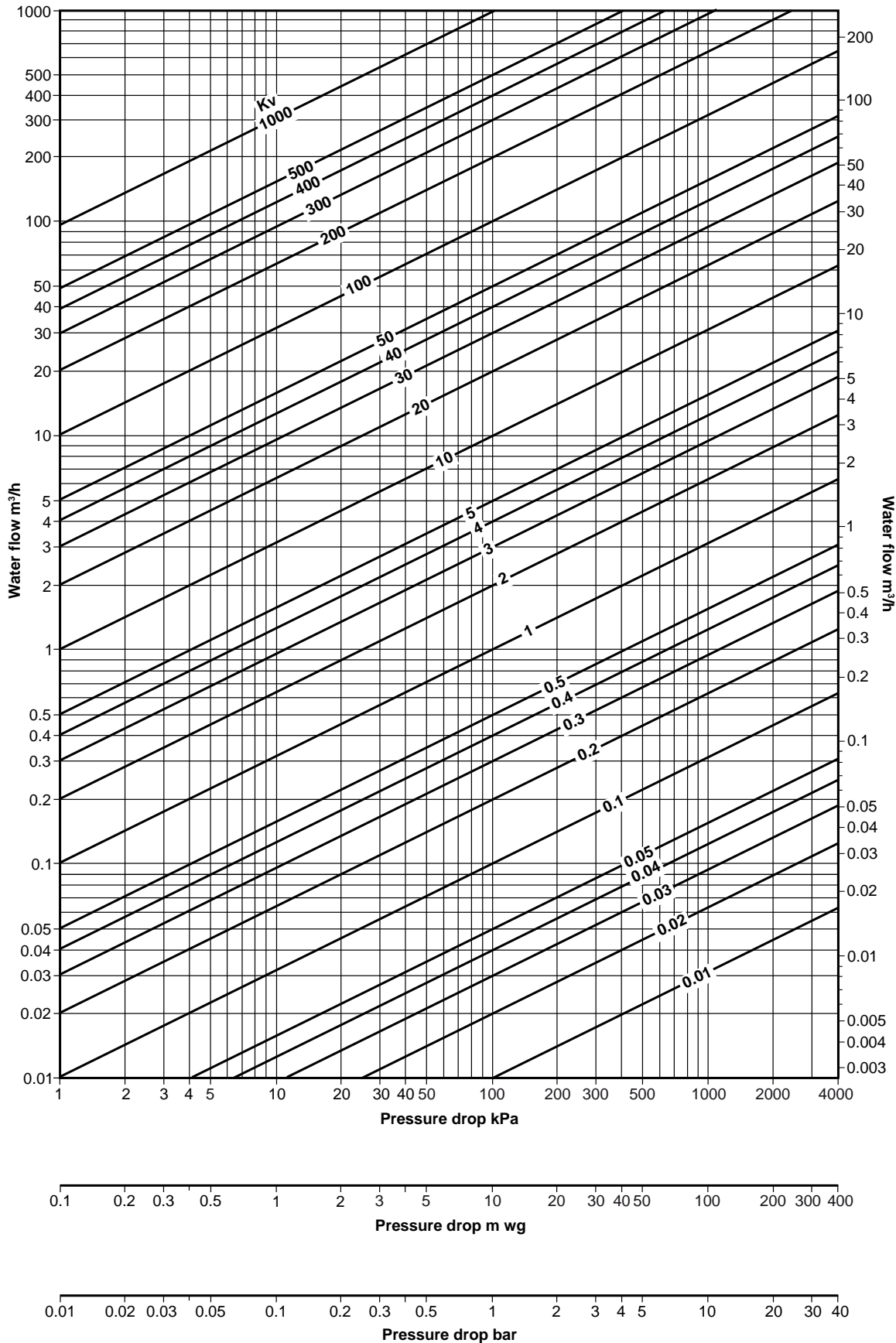
Note: $\dot{V} = K_v \sqrt{P_1}$, \dot{V} = Water flow (m³/h), P₁ = Pressure drop across the valve (bar), K_v = Flow coefficient (m³/h bar).

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Technical data can be changed without prior notice.
 This chart assumes no cavitation after the control valve.



The selection of the index based on where the motorized valve is set up

1. Inside a building

- a) In dry and frost protection premises
Protection \geq IP30
- b) In industrial premises without risk of water projection
Protection \geq IP54
- c) In wet premises and / or frost protection
Protection \geq IP65 + anti-condensation resistance
- d) In industrial premises with a risk of water projection
Protection \geq IP65 + anti-condensation resistance
+ cowling insulation

2. Outside sheltered

Protection \geq IP65 + anti-condensation resistance

3. Outside without shelter

Protection \geq IP65 + anti-condensation resistance
+ cowling insulation