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CONTROL VALVES CONTROL VALVES WITH FLOW LIMITATION **RV 122 BEE line**



BEE line

Valves series RV 122 BEE are control valves and control valves with flow limitation mechanism of a compact construction with pressure-balanced plug and externally threaded coupling. The valves' execution enables their application with low-linear force actuators for high differential pressures. They excel with minimum dimensions and weight, quality control features and a high tightness in closed position. Thanks to an unique LDMspline flow characteristic which has been optimized for thermodynamic processes control, the valves are ideal for applications in heating and air-conditioning. In regard of a sophisticated design of internal parts and long service life of the packing, the valves fulfill every demand for a long-time service without necessary maintenance. The valve is, owing to its compact execution, a basic element of a unit-type valve series BEE line.

Within the scope of delivery of the valves, we deliver connection couplings enabling the valve to be connected to pipeline either with threads, flanges or weld unions, providing so quick and trouble-free piping.

Assembled with LDM actuators, the valves can be controlled with either 3-position or continuous signal.

Application

Used materials for throttling trim which consist of plug made of high-quality stainless steel and soft sealing elements, ensure a hermetic tightness in both ports and enable the valves to be used not only in common warm-water and hot-water regulation circuits in heating but also in applications with special characteristic features of process medium such as in refrigerating industry and air-conditioning and where there is necessity for precise setting of flow. [The flow limitation enables precise setting of flow independently on Kvs value.](#) Maximal permissible operating pressures in behaviour with process medium temperature are mentioned in table on page 9 of this catalogue.

Process media

The valve series RV 122 are suitable for applications where process medium is water or air. Further they can be used for refrigerating media and other non-aggressive liquids or gases with temperature ranging +2 °C to +150 °C. Sealing surfaces of control trim are resistant to common sludge or water impurities. Yet it is recommended to pipe a strainer in front of valve to ensure a reliable function and tightness in case there are abrasive particles present.

Installation

The valves can be installed in any position except position when the actuator is under the valve body. The flow direction is indicated by the arrows positioned in the horizontal line of the valve body.

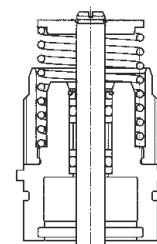
Flow characteristic selection in regard of valve stroke

To make right selection of valve flow characteristic, it is suitable to carry out checking of what stroke values will be reached in different operation states. We recommend to carry out such checking at least for minimal, nominal and maximal flow rates. The principle for flow characteristic selection is to avoid, if possible, 5 - 10% of the beginning and end of the valve stroke range.

To calculate valve stroke at different operating conditions with different types of flow characteristics is possible with the advantage of using LDM's calculation programme VALVES. The programme serves for complete design of valve from Kv calculation to specification of a concrete valve with its actuator.

Packing O-ring EPDM

Well proven type of packing with sealing elements made of high quality EPDM is suitable for operating with temperature of, +2 to +150 °C. The packing excels with its reliability and long time tightness. Its properties ensure safe usage in no-maintenance applications. Main preferences of the packing is low frictional forces, sealing capability in both ports (even when there is underpressure in the valve) and service life exceeding 1 000 000 cycles.





RV 122

Control valves
BEE line

DN 15 - 50
PN 25

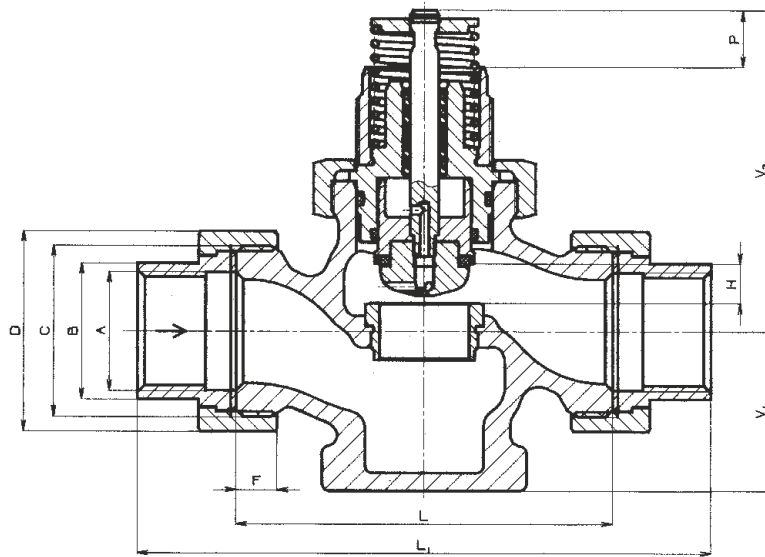
Technical data

Series	RV 122
Execution	Two-way, pressure-balanced, straight-through control valve
Nominal diameter range	DN 15 až 50
Nominal pressure	PN 25
Body material	Spheroidal cast iron EN-JS1030
Plug material	Korozivzdorná ocel 1.4006 / 17 027.6
Seat material	Stainless steel 1.4021 / 17 022.6
Stem material	Stainless steel 1.4305
Seat sealing	EPDM
Packing	EPDM
Operating temperature range	+2 to +150 °C
Connection	Externally threaded coupling + screw joints Flanges with raised faces Externally threaded coupling + weld unions
Material of weld unions	DN 15 to 32 ... 1.0036 / 11 373.0 DN 40 and 50 ... 1.0308 / 11 353.0
Plug type	Contoured with soft seat sealing
Flow characteristic	LDMspline®
Kvs value	0.16 to 40 m ³ /hour
Leakage rate	Class IV. - S1 acc. to ČSN-EN 1349 (5/2001) (<0.0005 % Kvs)
Rangeability r	min 50 : 1

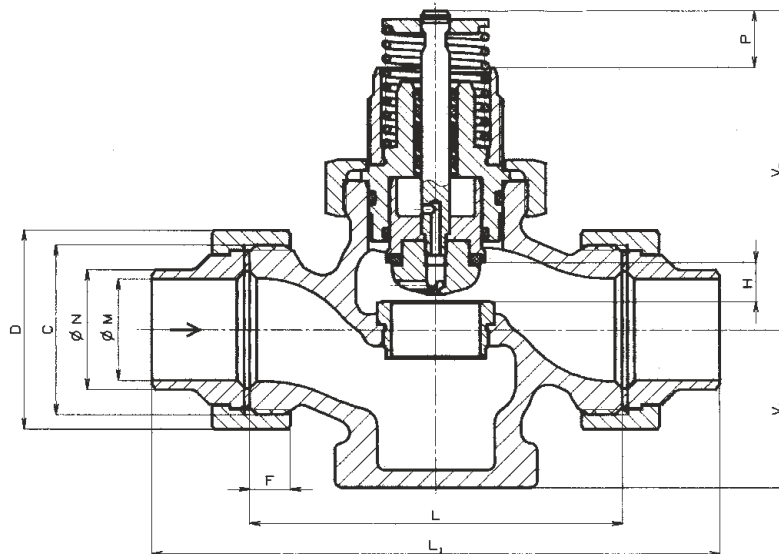
Dimensions and weights of RV 122/T with threaded connection and RV 122/W with welded unions

DN	L	L ₁	V ₁	V ₂	A	B	C	D	ØM	ØN	F	H	P	m 122/T	m 122/W
	[mm]	[mm]	[mm]	[mm]		[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]	[kg]
15	100	146	44.5	90	Rp 1/2	25	G 1	41	16.1	21.3	9	11	16	1.7	1.7
20	100	149	44.5	90	Rp 3/4	32	G 1 1/4	51	21.7	26.9	10	11	16	2.0	1.9
25	105	160	44.5	90	Rp 1	38	G 1 1/2	56	29.5	33.7	11	11	16	2.3	2.3
32	130	193	63	110.4	Rp 1 1/4	47	G 2	71	37.2	42.4	12	11	16	3.7	3.6
40	140	207	63	110.4	Rp 1 1/2	53	G 2 1/4	76	43.1	48.3	14	11	16	4.6	4.5
50	160	233	63	110.4	Rp 2	66	G 2 3/4	91	54.5	60.3	16	11	16	6.7	6.5

Valves RV 122/T with threaded connection



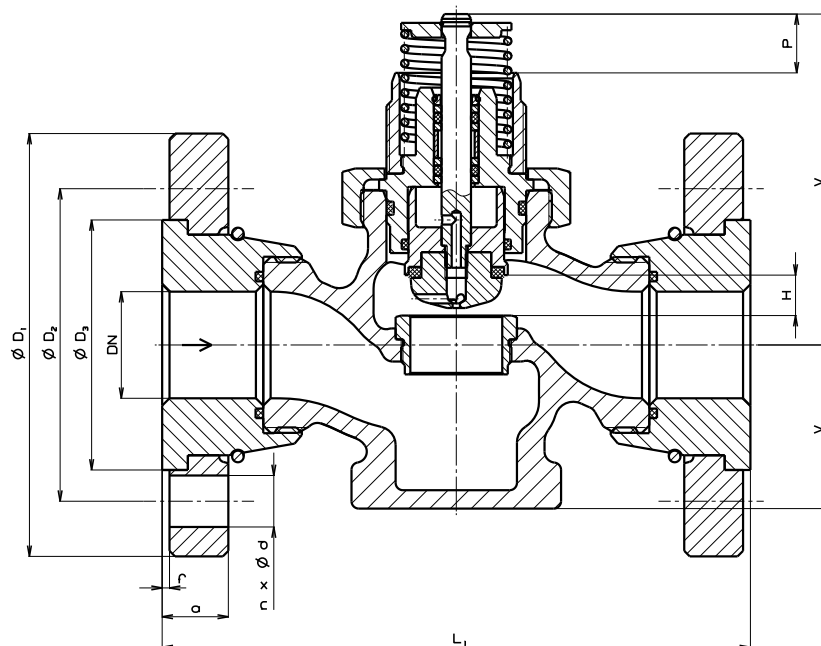
Valves RV 122/W with weld unions



Dimensions and weights of RV 122/F with flanges

DN	L ₁	V ₁	V ₂	ØD ₁	ØD ₂	ØD ₃	a	f	n	Ød	H	P	m 122/F
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[mm]	[mm]	[mm]	[kg]
15	130	44.5	90	95	65	45	16	2	4	14	11	16	2.8
20	150	44.5	90	105	75	58	16	2	4	14	11	16	3.5
25	160	44.5	90	115	85	68	18	2	4	14	11	16	4.4
32	180	63	110.4	140	100	78	18	2	4	18	11	16	6.5
40	200	63	110.4	150	110	88	19	3	4	18	11	16	8.0
50	230	63	110.4	165	125	102	19	3	4	18	11	16	10.9

Valves RV 122/F with raised-faced flanges





RV 122 P

Control valves
with flow limitation
BEE line

DN 15 - 50
PN 25

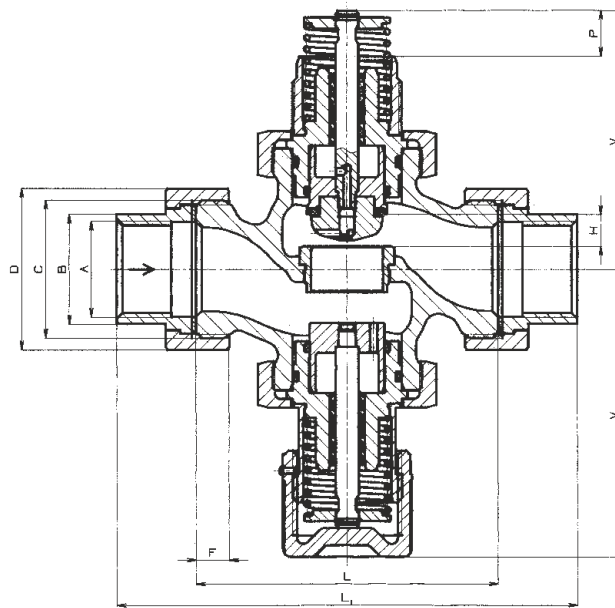
Technical data

Series	RV 122 P
Execution	Two-way, pressure-balanced, straight-through control valve with flow limitation
Nominal diameter range	DN 15 to 50
Nominal pressure	PN 25
Body material	Spheroidal cast iron EN-JS1030
Plug material	Stainless steel 1.4006 / 17 027.6
Seat material	Stainless steel 1.4021 / 17 022.6
Stem material	Stainless steel 1.4305
Seat sealing	EPDM
Packing	EPDM
Operating temperature range	+2 to +150 °C
Connection	Externally threaded coupling + screw joints Flanges with raised faces Externally threaded coupling + weld unions
Material of weld unions	DN 15 to 32 ... 1.0036 / 11 373.0 DN 40 and 50 ... 1.0308 / 11 353.0
Plug type	Contoured with soft seat sealing
Flow characteristic	LDMspline*
Kvs value	0.16 to 35 m ³ /hour
Leakage rate	Class IV. - S1 acc. to ČSN-EN 1349 (5/2001) (<0.0005 % Kvs)
Rangeability r	min 50 : 1

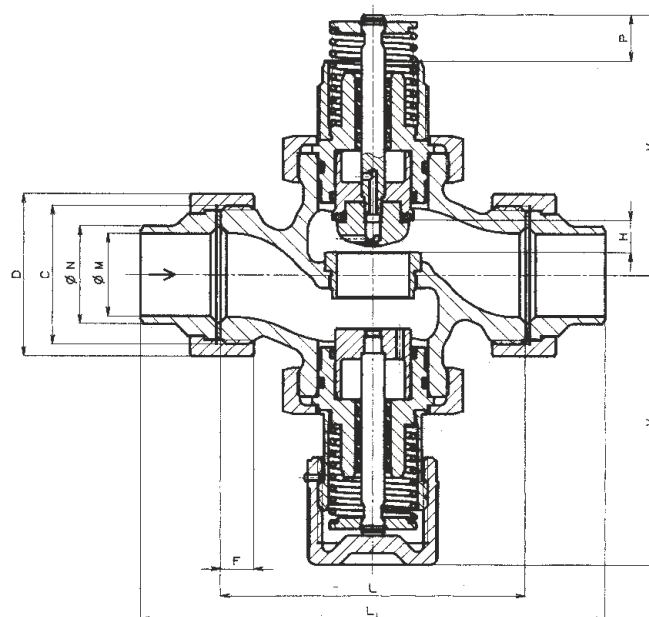
Dimensions and weights of RV 122 P./T with threaded connection and RV 122 P./W with weld unions

DN	L	L ₁	V ₁	V ₂	A	B	C	D	ØM	ØN	F	H	P	m 122/T	m 122/W
	[mm]	[mm]	[mm]	[mm]		[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]	[kg]
15	100	146	100	90	Rp 1/2	25	G 1	41	16.1	21.3	9	11	16	2.1	2.1
20	100	149	100	90	Rp 3/4	32	G 1 1/4	51	21.7	26.9	10	11	16	2.4	2.3
25	105	160	100	90	Rp 1	38	G 1 1/2	56	29.5	33.7	11	11	16	2.7	2.7
32	130	193	119	110.4	Rp 1 1/4	47	G 2	71	37.2	42.4	12	11	16	4.5	4.4
40	140	207	119	110.4	Rp 1 1/2	53	G 2 1/4	76	43.1	48.3	14	11	16	5.5	5.4
50	160	233	119	110.4	Rp 2	66	G 2 3/4	91	54.5	60.3	16	11	16	8.0	7.8

Valves RV 122 P./T with threaded connection



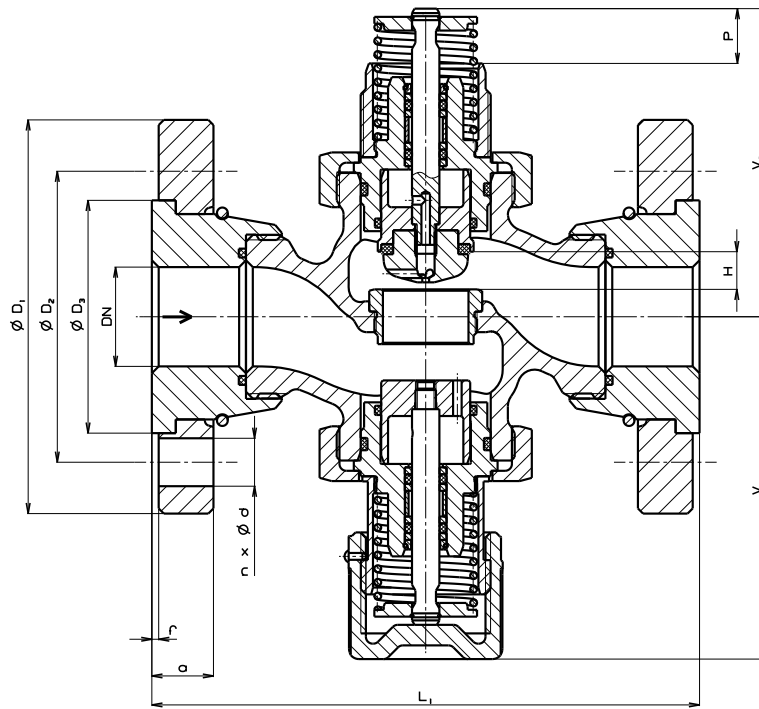
Valves RV 122 P./W with weld unions



Dimensions and weights of RV 122 P./F with flanges

DN	L ₁	V ₁	V ₂	ØD ₁	ØD ₂	ØD ₃	a	f	n	Ød	H	P	m 122/F
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[mm]	[mm]	[mm]	[kg]
15	130	100	90	95	65	45	16	2	4	14	11	16	2.8
20	150	100	90	105	75	58	16	2	4	14	11	16	3.5
25	160	100	90	115	85	68	18	2	4	14	11	16	4.4
32	180	119	110.4	140	100	78	18	2	4	18	11	16	6.5
40	200	119	110.4	150	110	88	19	3	4	18	11	16	8.0
50	230	119	110.4	165	125	102	19	3	4	18	11	16	10.9

Valves RV 122 P./F with raised-faced flanges



Valve complete specification No. for ordering RV 122 (BEE)

		XX	XXX	X	XX	XX	XX	/	XXX	-	XX	/	X
1. Type of valve	Control valve	RV											
2. Series	Pressure-balanced valve with external thread		122										
3. Function	Control valve			R									
	Control valve with flow limitation			P									
4. Execution	Two-way				2								
5. Body material	Spheroidal cast iron EN-JS1030				4								
6. Flow characteristic	LDMspline*					3							
7. Kvs	No. of the column acc. to the table of Kvs values						X						
8. Nominal pressure	PN 25							25					
9. Max. temperature °C	150 °C								150				
10. Nominal size	DN 15 to 50										XX		
11. Connection	Threaded												T
	Flange PN 25 with raised face												F
	Weld unions												W

Note: Connection dimensions of flanges for PN 25, PN 16 and PN 10 are for DN 15 to 50 the same

Ordering example: **RV 122 R 2431 25/150-25/T**

Due to a uniqueness of each version, the valves can be ordered with a simplified code as follows

Example: **BEE DN 25/T** two-way valve DN 25 with threaded connection
BEE DN 32/F two-way valve DN 32 with flanges
BEE DN 32P/F two-way valve with flow limitation DN 32 with flanges
BEE DN 15-1.6/W two-way valve DN 15 with weld unions
 Kvs of DN15 is mentioned behind the dash

Available actuators

Electric actuator **LDM ANT3-11.xx** ... AC 230 or AC/DC 24 V, 3-position control or 0(2) - 10 V, (0)4 - 20 mA

Kvs and differential pressure values

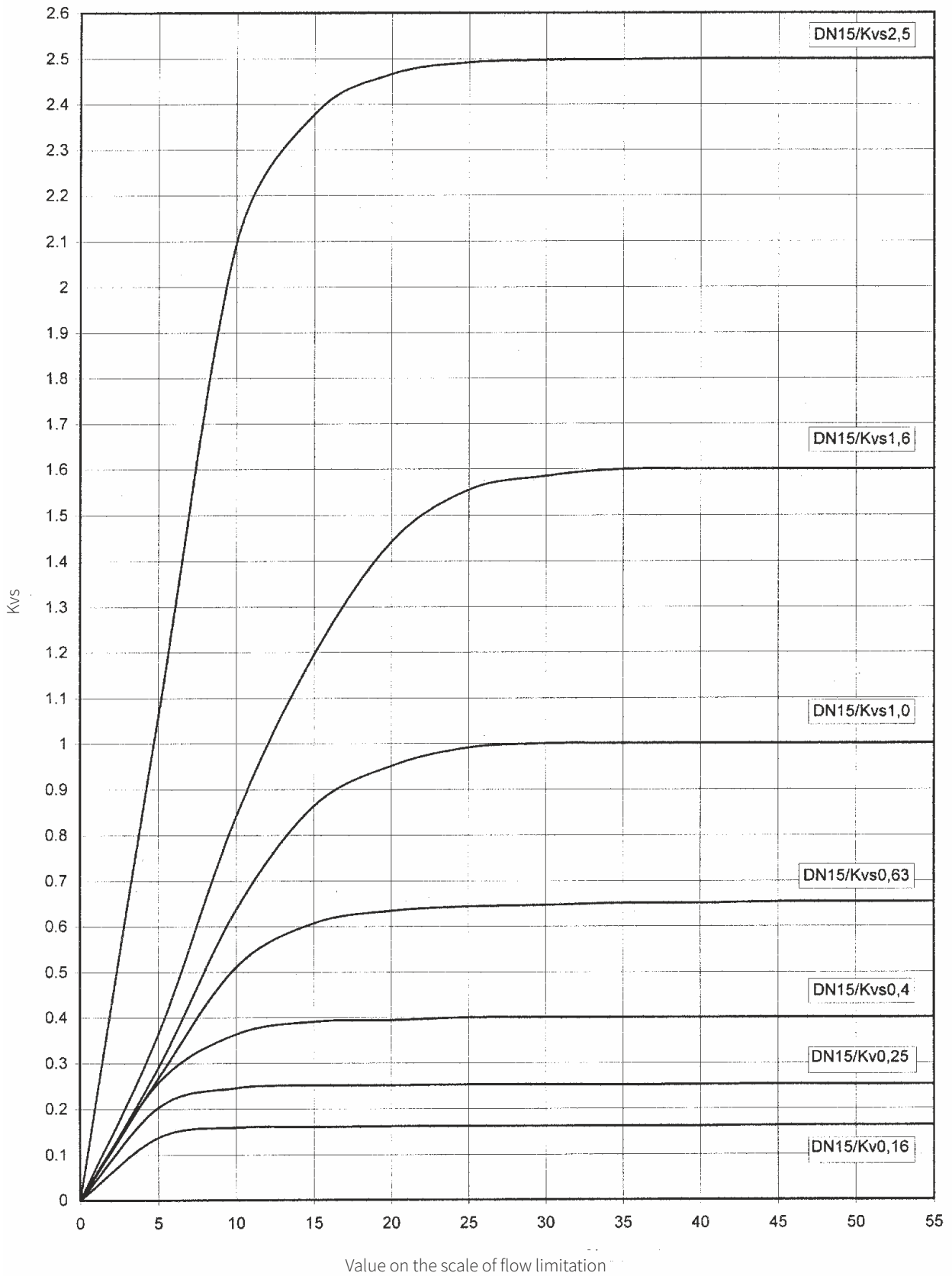
DN	Kvs [m ³ /h]								Δp_{max} MPa
	1	2	3	4	5	6	7	8	
15	4.0	2.5	1.6	1.0	0.63	0.4	0.25	0.16	2.5
20	6.3	---	---	---	---	---	---	---	2.5
25	10.0	---	---	---	---	---	---	---	2.5
32	16.0	---	---	---	---	---	---	---	2.5
40	25.0 (22.0)*	---	---	---	---	---	---	---	2.5
50	40.0 (35.0)*	---	---	---	---	---	---	---	2.5

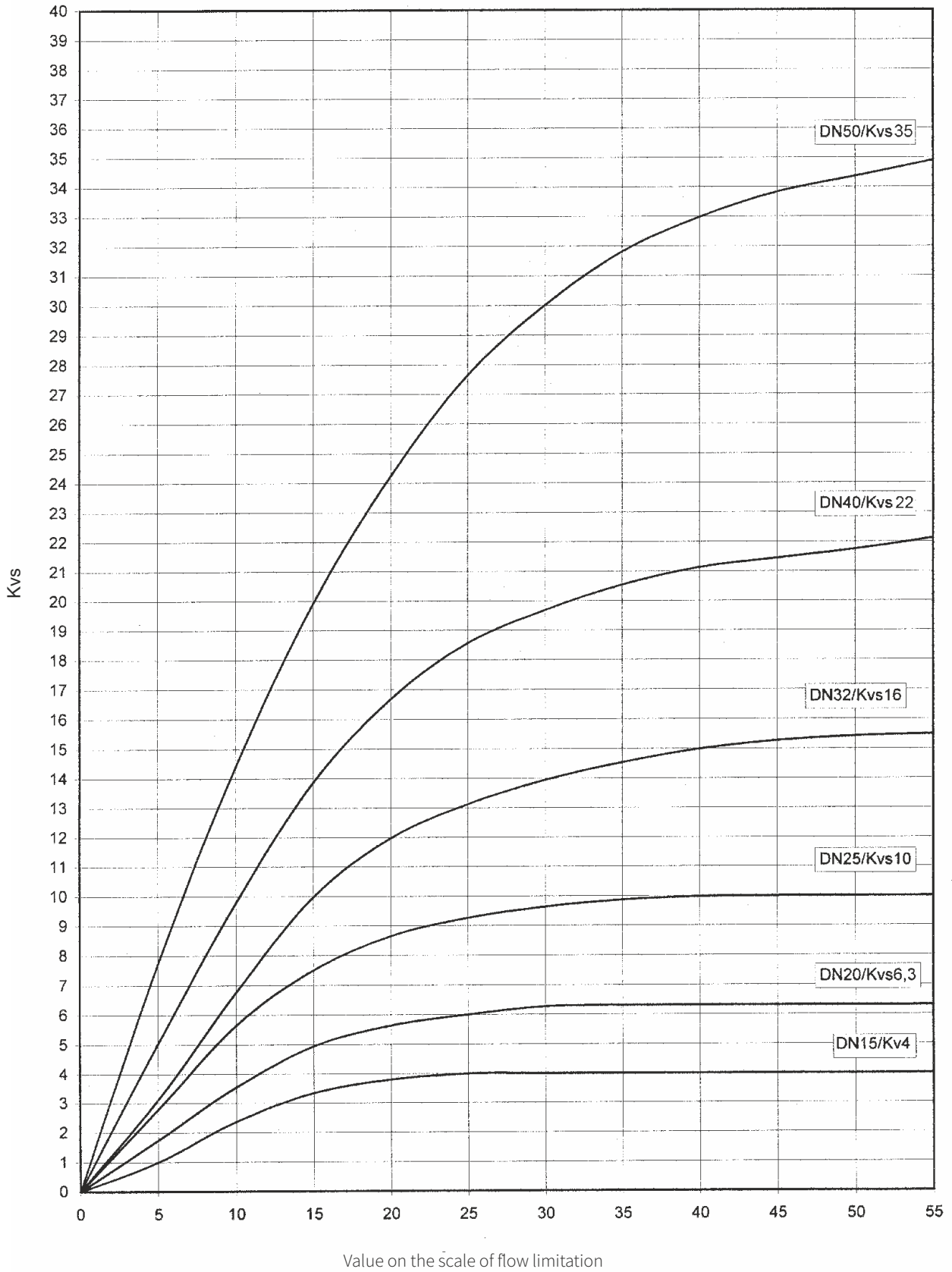
* Hodnoty v závorkách platí pro provedení ventilů s omezovačem průtoku

Maximal permissible operating pressures [MPa]

Material	PN	Temperature [°C]	
		120	150
Spheroidal cast iron EN-JS 1030	25	2,50	2,43

RV 122 P - behaviour of Kvs with setting of flow limitation







Electric actuators

LDM**ANT3-11.1x(SC)**
ANT3-11.2x(SC)

Electromechanical actuators ANT3-11 are designed to control the regulating valves LDM series RV 122 BEE line and actuators ANT3-5 to control regulating valves RV 111 COMAR line. Its connection to the valve ensures a zero clearance between stem of the actuator and the valve so the precise regulating ability is ensured even for minimal position changes. The actuators are self-adaptive. The end positions are limited by the valve stroke. To communicate with a control system, the actuators are equipped with either standard 3-position control or proportional control (options: 0..10 V, 2..10 V, 0..20 mA or 4..20 mA). The version marked "SC" contains electronically controlled fail-safe function activated by power supply failure, by valves with proportional control by failure of voltage at NF terminal as well. In setting mode for the actuators with proportional control it is possible to define a final position in percentage of the stroke value. The actuator automatically runs into that position when the fail-safe function is induced. Standard setting is position "closed". As a source of energy for the fail-safe function, there are block of capacitors which are continuously charged when the actuator is in operation. Service life of capacitors is 10 years what corresponds with service life of the actuator under standard conditions. All the types of ANT actuator are equipped with hand wheel for manual operating.

Properties

- Easy assembly to the valve without the necessity of any adjusting. No tools required
- Self-adaptive function precisely sets the stroke range according to the limit positions of the valve stroke
- Hand wheel for operating in case of emergency
- Stroke indicator for information on actual open position of the valve
- Option of equipping with resistance feedback or adjustable position switch (for actuators with 3-position control without safety function)
- Intelligent microprocessor control (for actuators with a fail-safe function and proportional control)
- Automatic recognition of presence of impurities between the seat and plug of the valve including an algorithm for self-cleaning function (for actuators with proportional control)
- Option of control signal 0..10V, 2..10V, 0..20 mA, 4..20 mA (for actuators with proportional control)
- Option of adjusting a final position for actuators with fail-safe function in range of 0..100% of the stroke
- Possibility to read history and detection of failures (for actuators with microprocessor)
- Long service life and reliability with a sophisticated and patented design due to a selection of high quality materials
- Feedback 0(2)-10V or 0(4)-20mA for actuators with microprocessor control
- Possibility of digital control (protocol MODBUS)
- Adjustable user setting of deadband and suppression of control signal zero
- The possibility of control signal direction available

Application

The actuators in combination with LDM valves are designed especially for applications in heating, air-conditioning and refrigerating. There they can take advantage of combination of control flow characteristic LDMspline[®] optimized for heat transfer processes and precision and reliability provided by simple mechanic design. In some applications, it is possible to make use of its fail-safe function which is induced by voltage failure at given terminal and puts the valve to previously defined position.

Technical data of actuators ANT3-11

Type ANT3-...	11.10	11.11	11.10SC	11.11SC	11.12SC	11.20	11.21	11.20SC	11.21SC
Voltage ($\pm 10\%$)	24 V AC	24 V AC/DC				230 V AC			
Frequency	50 Hz								
Control	3-position	0..10V, 4..20mA ²⁾	3-position	0..10V, 4..20mA ²⁾	3-position ²⁾	3-position	0..10V, 4..20mA ²⁾	3-position	0..10V, 4..20mA ²⁾
Power consumption	1,5 VA	14 VA				3 VA	10 VA		
Nominal force	300 N + 30%								
Nominal stroke	ANT3-11.xx ... 11 mm								
Open-close run time 50 Hz	66 s	10 s	66 s	10 s	25 s	66 s	10 s	66 s	10 s
Fail-safe function	---	---	15 s	15 s	15 s	---	---	15 s	15 s
Feedback	100 Ω , 1k Ω ¹⁾	0(2) - 10 V; 0(4) - 20 mA ²⁾				100 Ω , 1k Ω ¹⁾	0(2) - 10 V; 0(4) - 20 mA ²⁾		
Adjustable pos. switch	PS1 ¹⁾	---				PS1 ¹⁾	---		
Impedance of input control signal	---	≥ 10 k Ω (V) 250 Ω (mA)	---	≥ 10 k Ω (V) 250 Ω (mA)	---	≥ 10 k Ω (V) 250 Ω (mA)	---	≥ 10 k Ω (V) 250 Ω (mA)	≥ 10 k Ω (V) 250 Ω (mA)
Enclosure	IP 54 (IEC 60529)								
Medium max. temp.	150°C								
Ambient temp. range	-5 až +55°C								
Ambient humidity range	5 ... 95 % of relative humidity								
Storage conditions	-15 to +55°C, 5 ... 95 % of relative humidity								
Weight	0,7 kg		0,8 kg			0,7 kg		0,8 kg	

¹⁾ Optional accessories. It shall be clearly specified in the order. Only one accessory is usable

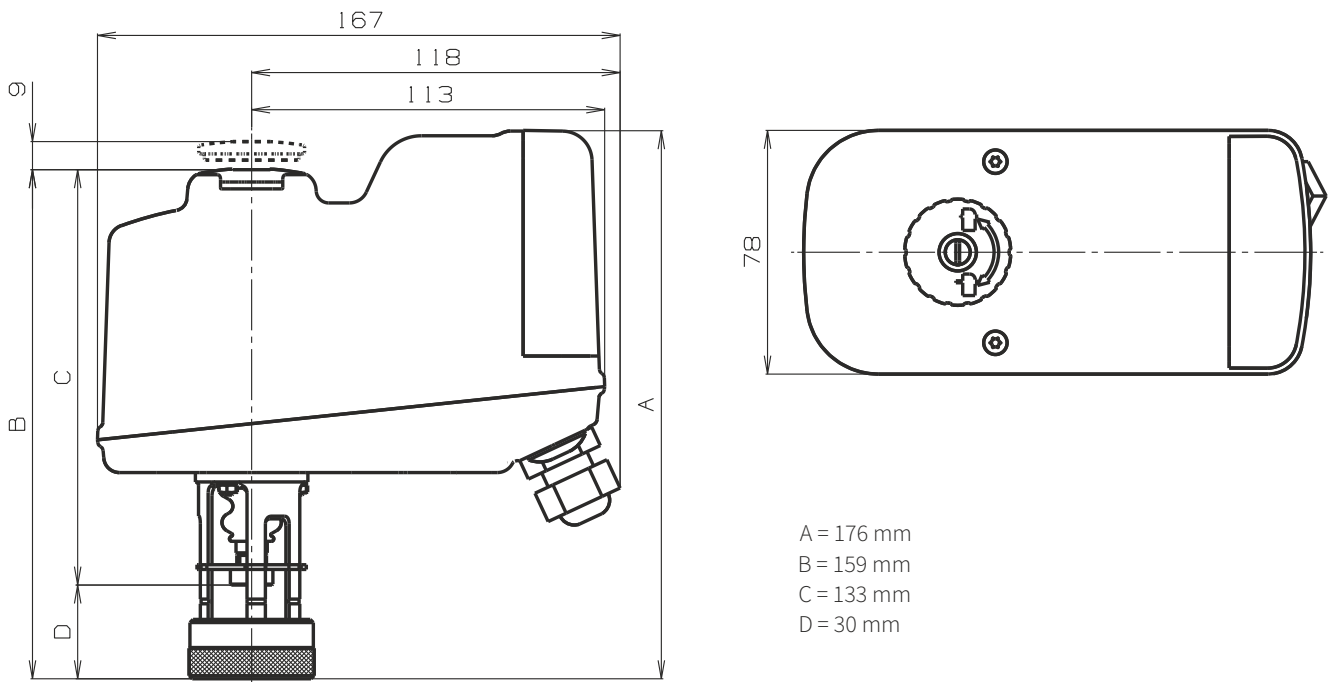
²⁾ Standard equipment. It shall be clearly specified in the order (type and range of feedback signal, basic execution 0-10V)

Optional accessories

Resistance position transmitter 0..100 W or 0..1000 W (for 3-position control actuators only without safety function)

Adjustable position switch PS1 (for 3-position control actuators only without safety function)

Dimensions of actuator



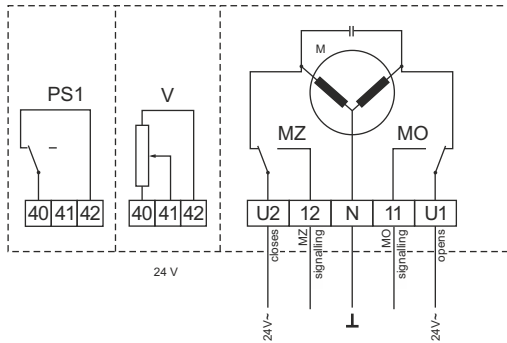
A = 176 mm
B = 159 mm
C = 133 mm
D = 30 mm

Wiring diagrams of actuators

Note: ANT3-11 ... closes the valve by extending its stem: 

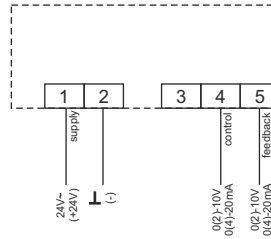
ANT3-11.10

3-position control, 24 V AC



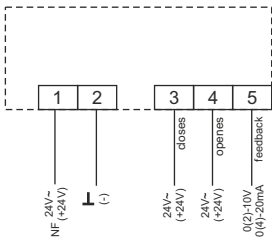
ANT3-11.11

Proportional control, 24 V AC/DC



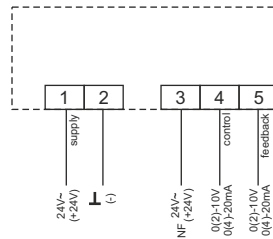
ANT3-11.10SC ANT3-11.12SC

3-position control, 24 V AC/DC,
fail-safe function



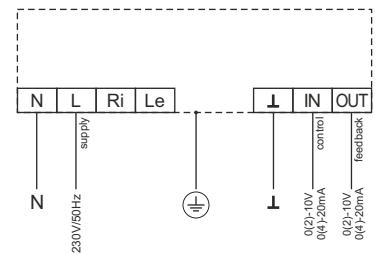
ANT3-11.11SC

3-position control, 24 V AC/DC,
fail-safe function



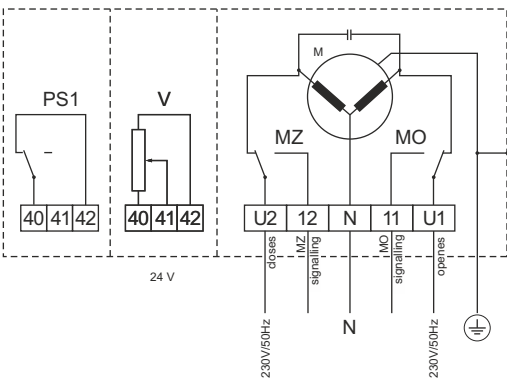
ANT3-11.21

Proportional control, 230 V AC



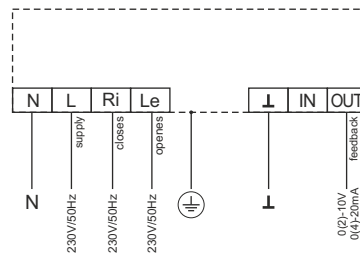
ANT3-11.20

3-position control, 230 V AC



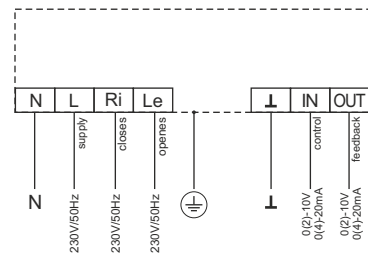
ANT3-11.20SC

3-position control, 230 V AC,
fail-safe function



ANT3-11.21SC

Proportional control, 230 V AC,
fail-safe function



- MO** power switch for "Open" position
- MZ** power switch for "Closed" position
- M** motor
- V** feedback 100Ω or 1000Ω
- PS1** adjustable position switch (max. 0,5 A)
- NF** terminal fail-safe function
- 11, 12** terminals signalling of end positions (max. 0,5 A)

The range and the type of input and output control signal can be adjusted by wiring



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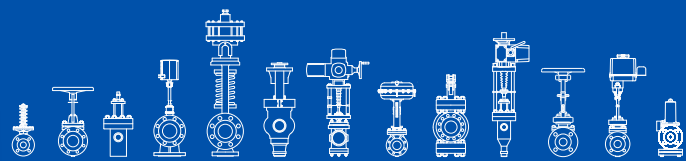
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POWER THROUGH IDEAS