



01 - 02.4
08.18.ENG

CONTROL VALVES

RV 111 COMAR line



The valves series RV 111 COMAR are control valves of a compact construction with external threaded coupling connection. The valves excel with minimum dimensions and weight, quality control function 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 packing, the valves fulfill every demand for a long-time service without necessary maintenance.

The valves are optionally manufactured either two-way or three-way. The part of the delivery is a screw joint enabling a quick and easy installation to an appliance.

Assembled with electromechanic actuators, the valve can be controlled with 3-point or continuous signal. The part of the delivery of valves RV 111 R is also a hand wheel which can be used for the valve control until assembling with an actuator (**LDM, Siemens or Sauter**).

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.

Process media

The valves series RV 111 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 from +2 °C to +150 °C. The valves are not applicable to conditions with cavitation. 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 on the valve body - inlet ports are indicated by letters A and B, outlet port AB.

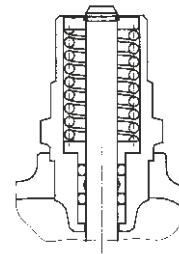
Flow characteristic selection in regard of valve stroke

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 +130°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 500 000 cycles.





RV 111 R

Control Valves
COMAR line

DN 15 - 40
PN 16

Valves **RV 111 R** are suitable for connection with actuators **LDM** a **Siemens**

Technical data	
Series	RV 111 R
Type of valve	Two-way, reverse, control valve Three-way control valve
Nominal size range	DN 15 to 40
Nominal pressure	PN 16
Body material	Grey cast iron EN-JL 1030
Plug material	Stainless steel 1.4021
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 ... 1.0308 / 11 353.0
Type of plug	Contoured or V-ported, with soft seat sealing
Flow characteristic	LDMspline®, linear Linear / linear
Kvs value	0.16 to 25 m ³ /hour 0.25 to 25 m ³ /hour
Leakage rate	Class IV. - S1 acc. to ČSN-EN 1349 (5/2001) (<0.0005 % Kvs)
Rangeability r	min 50 : 1
Packing	O - ring EPDM

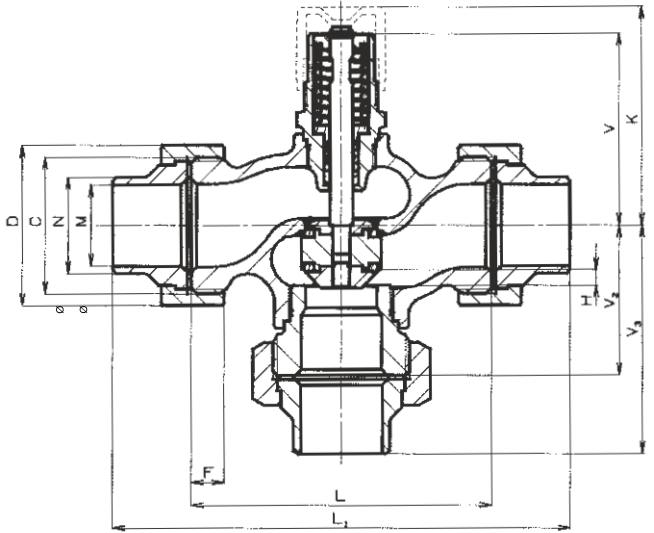
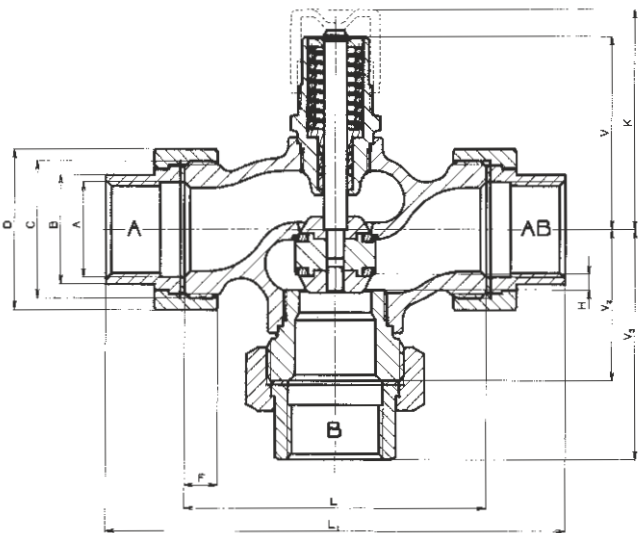
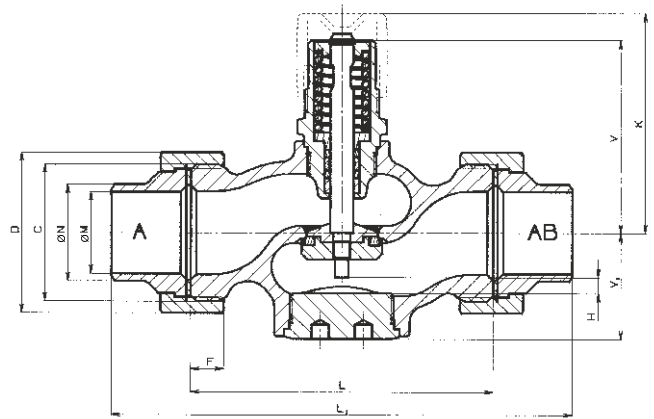
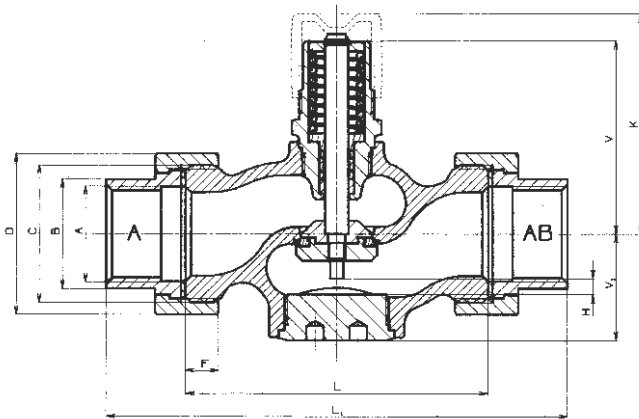
Material	Maximal permissible operating pressures [Mpa]	
	PN	Temperature [°C]
Grey cast iron EN-JL 1030 (EN-GJL-200)	16	120 150 1,60 1,44

Dimensions and weights of RV 111 R/T with threaded connection and RV 111 R/W with weld unions

DN	L	L ₁	V	V ₁	V ₂	V ₃	K	A	B	C	D	ØM	ØN	F	H	m	m
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[kg]	[kg]
15	100	146	67	36.5	50	73	77	Rp 1/2	25	G 1	41	16.1	21.3	9	5,5	1.15	1.35
20	100	149	67	36.5	50	74.5	77	Rp 3/4	32	G 1 1/4	51	21.7	26.9	10	5,5	1.45	1.75
25	105	160	67	37	52.5	80	77	Rp 1	38	G 1 1/2	56	29.5	33.7	11	5,5	1.7	2.15
32	130	193	78	49	65	96.5	88	Rp 1 1/4	47	G 2	71	37.2	42.4	12	5,5	3.0	3.8
40	140	207	78	49	70	103.5	88	Rp 1 1/2	53	G 2 1/4	76	43.1	48.3	14	5,5	3.5	4.4

Valves RV 111 R/T with threaded connection

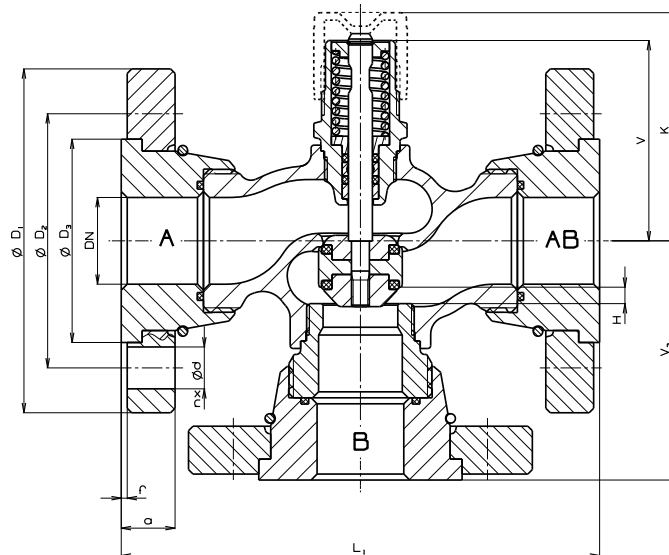
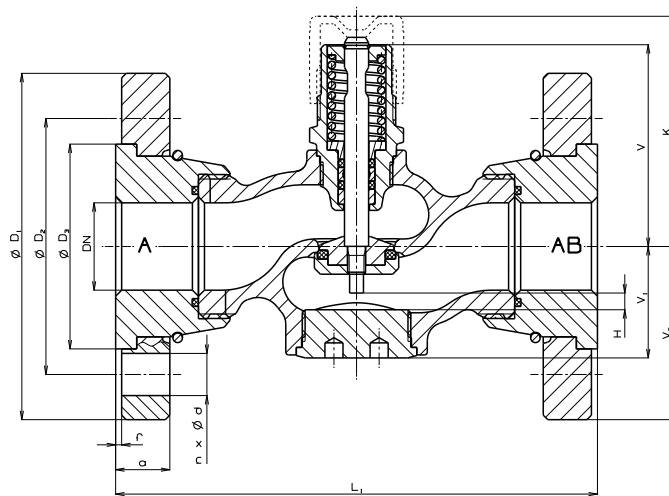
Valves RV 111 R/W with weld unions



Dimensions and weights of RV 111 R/F with flanges

DN	L ₁	V	V ₁	V ₂	V ₃	ØD ₁	ØD ₂	ØD ₃	a	f	n	Ød	K	H	m	m
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[mm]	[mm]	[mm]	[kg]	[kg]
15	130	67	36.5	42.5	65	95	65	45	16	2	4	14	77	5,5	2.3	3.1
20	150	67	36.5	52.5	75	105	75	58	16	2	4	14	77	5,5	3.2	4.4
25	160	67	37	57.5	80	115	85	68	18	2	4	14	77	5,5	3.8	5.3
32	180	78	49	70	90	140	100	78	18	2	4	18	88	5,5	5.9	8.1
40	200	78	49	75	100	150	110	88	19	3	4	18	88	5,5	6.9	9.5

Valves RV 111 R/F with raised-faced flanges



Kvs and differential pressure values

DN	Kvs [m ³ / hour]								• P _{max} kPa
	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 ¹⁾	400
20	6.3	---	---	---	---	---	---	---	350
25	10.0	---	---	---	---	---	---	---	200
32	16.0	---	---	---	---	---	---	---	110
40	25.0	---	---	---	---	---	---	---	60

Two-way execution DN 15 to 25 - flow characteristic LDMspline[®], DN 32 and 40 - flow characteristic linear.

Three-way execution - linear characteristic in both ports.
¹⁾ applies to two-way execution only

Valve complete specification No. for ordering RV 111 R

		XX	XXX	X	XX	XX	XX	XX	XXX	-	XX	/	X
1. Valve	Control valve	RV											
2. Series	Valve with external thread		111										
3. Type of actuating	Hand wheel with possibility of using electric actuator			R									
4. Execution	Two-way				2								
	Three-way				3								
5. Body material	Grey cast iron				3								
6. Flow characteristic	Linear (2-way execution DN 32, 40 and 3-way execution) LDMspline [®] (two-way execution DN 15 to 25)					1							
						3							
7. Kvs	Column No. acc. to Kvs values table						X						
8. Nominal pressure	PN 16							16					
9. Max. temperature °C	150 °C								150				
10. Nominal size	DN 15 to 40										XX		
11. Connection	Threaded connection												T
	Raised-faced flanges												F
	Weld unions												W

Ordering example: **RV 111 R 2331 16/150-25/T**
Actuator must be specified separately

Available actuators

LDM	Electric actuator ANT3-5.10	AC 24 V, 3-position control
	Electric actuator ANT3-5.11	AC/DC 24 V, control 0(2) - 10V, (0)4 - 20 mA
	Electric actuator ANT3-5.10SC	AC/DC 24 V, 3-position control, fail-safe function
	Electric actuator ANT3-5.11SC	AC/DC 24 V, control 0(2) - 10V, (0)4 - 20 mA fail-safe function
	Electric actuator ANT3-5.20, ANT3-5.22	AC 230 V, 3-position control
	Electric actuator ANT3-5.21	AC 230 V, control 0(2) - 10V, (0)4 - 20 mA
	Electric actuator ANT3-5.20SC	AC 230 V, 3-position control, fail-safe function
	Electric actuator ANT3-5.21SC	AC 230 V, control 0(2) - 10V, (0)4 - 20 mA fail-safe function
	Siemens	Electric actuator SSC31
Electric actuator SSC61		AC 24 V, control DC 0...10V
Electric actuator SSC61.5		AC 24 V, control DC 0...10V, fail-safe function
Electric actuator SSC81		AC 24 V, 3-position control
Electric actuator SAS 31.00; 31.03		AC 230 V, 3-position control
Electric actuator SAS 31.50; 31.53		AC 230 V, 3-position control, fail-safe function
Electric actuator SAS 61.03		AC/DC 24 V, proportional control
Electric actuator SAS 61.33; 61.53		AC/DC 24 V, proportional, fail-safe function
Electric actuator SAS 81.00; 81.03		AC/DC 24 V, 3-position control
Electric actuator SAS 81.33	AC/DC 24 V, 3-position control, fail-safe function	

Note: Actuators SSC respectively SAS are suitable for maximal medium temperature 110°C respectively 130°C



RV 111 S

Control Valves
COMAR line

DN 15 - 40
PN 16

Valves **RV 111 S** are suitable for connection with actuators **Sauter**

Technical data	
Series	RV 111 R
Type of valve	Two-way, reverse, control valve Three-way control valve
Nominal size range	DN 15 to 40
Nominal pressure	PN 16
Body material	Grey cast iron EN-JL 1030
Plug material	Stainless steel 1.4021
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 ... 1.0308 / 11 353.0
Type of plug	Contoured or V-ported, with soft seat sealing
Flow characteristic	LDMspline®, linear Linear / linear
Kvs value	0.16 to 25 m ³ /hour 0.25 to 25 m ³ /hour
Leakage rate	Class IV. - S1 acc. to ČSN-EN 1349 (5/2001) (<0.0005 % Kvs)
Rangeability r	min 50 : 1
Packing	O - ring EPDM

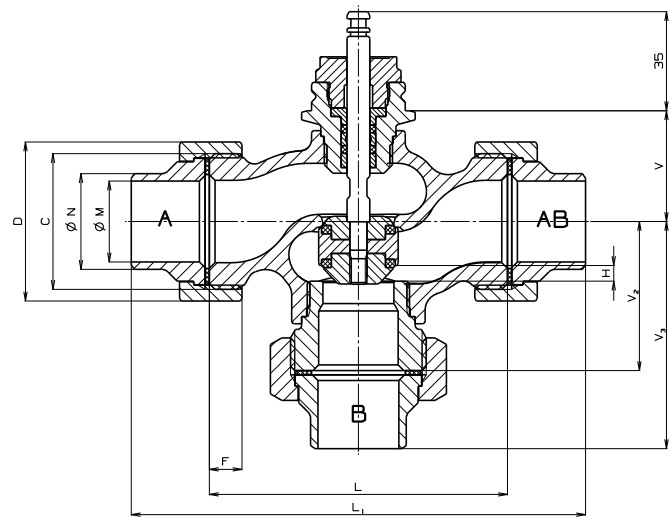
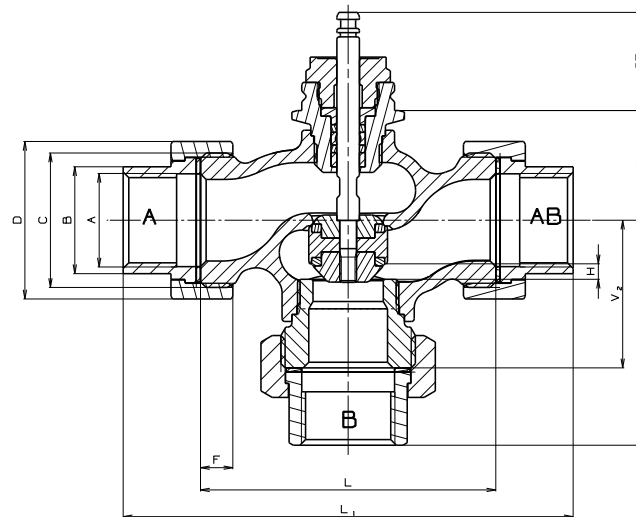
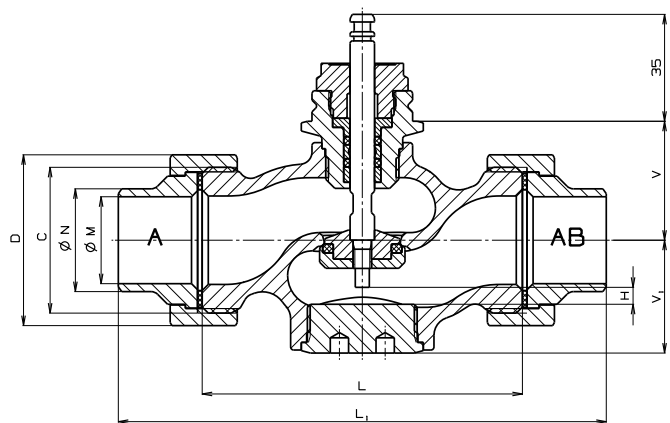
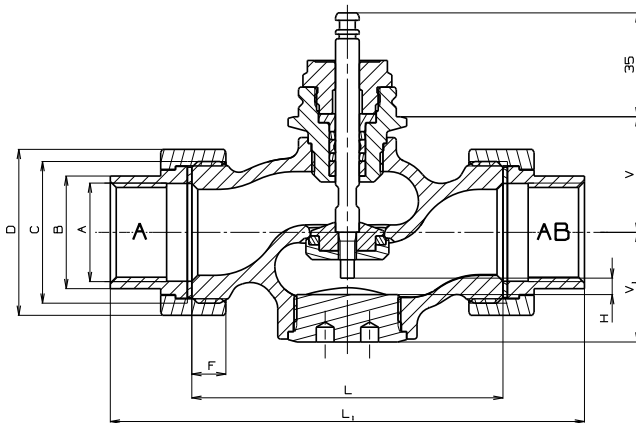
Material	Maximal permissible operating pressures [Mpa]	
	PN	Temperature [°C]
Grey cast iron EN-JL 1030 (EN-GJL-200)	16	120 150
		1,60 1,44

Dimensions and weights of RV 111 S/T with threaded connection and RV 111 S/W with weld unions

DN	L	L ₁	V	V ₁	V ₂	V ₃	K	A	B	C	D	ØM	ØN	F	H	m	m
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[kg]	[kg]
15	100	146	39	36.5	50	73	77	Rp 1/2	25	G 1	41	16.1	21.3	9	5,5	1.15	1.35
20	100	149	39	36.5	50	74.5	77	Rp 3/4	32	G 1 1/4	51	21.7	26.9	10	5,5	1.45	1.75
25	105	160	39	37	52.5	80	77	Rp 1	38	G 1 1/2	56	29.5	33.7	11	5,5	1.7	2.15
32	130	193	50	49	65	96.5	88	Rp 1 1/4	47	G 2	71	37.2	42.4	12	5,5	3.0	3.8
40	140	207	50	49	70	103.5	88	Rp 1 1/2	53	G 2 1/4	76	43.1	48.3	14	5,5	3.5	4.4

Valves RV 111 S/T with threaded connection

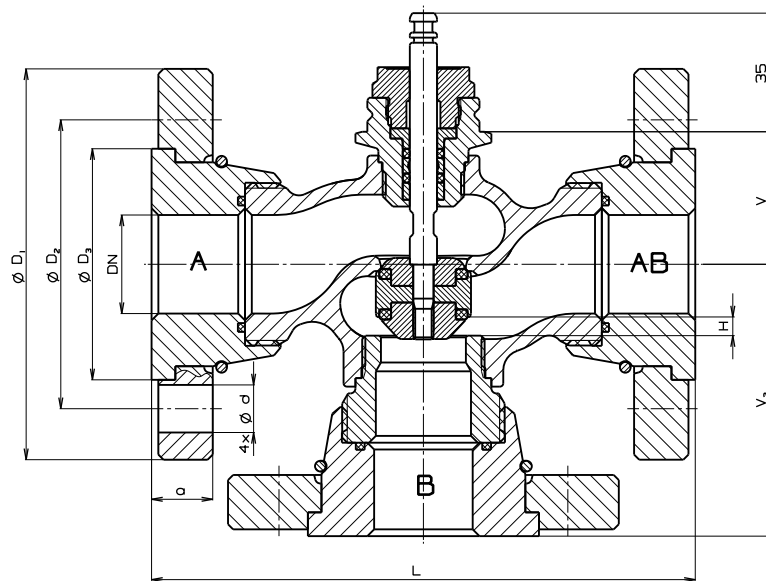
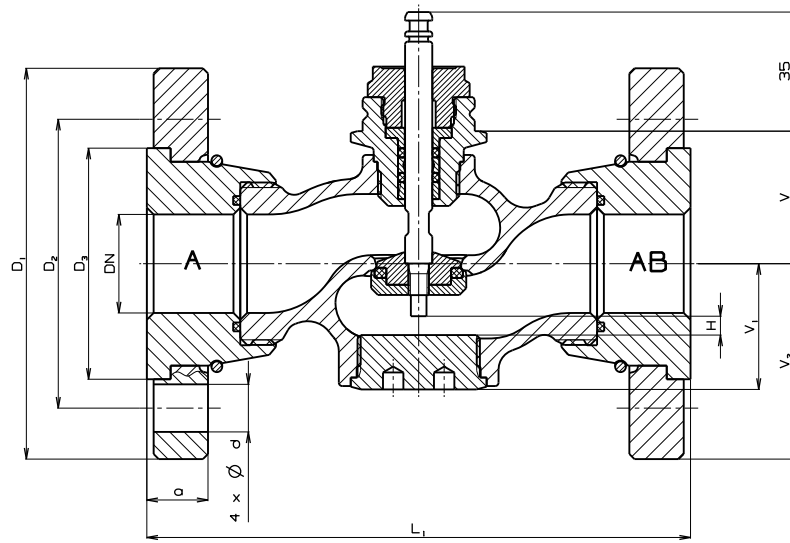
Valves RV 111 S/W with weld unions



Dimensions and weights of RV 111 S/F with flanges

DN	L ₁	V	V ₁	V ₂	V ₃	ØD ₁	ØD ₂	ØD ₃	a	f	n	Ød	K	H	m	m
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[mm]	[mm]	[mm]	[kg]	[kg]
15	130	39	36.5	42.5	65	95	65	45	16	2	4	14	77	5,5	2.3	3.1
20	150	39	36.5	52.5	75	105	75	58	16	2	4	14	77	5,5	3.2	4.4
25	160	39	37	57.5	80	115	85	68	18	2	4	14	77	5,5	3.8	5.3
32	180	50	49	70	90	140	100	78	18	2	4	18	88	5,5	5.9	8.1
40	200	50	49	75	100	150	110	88	19	3	4	18	88	5,5	6.9	9.5

Valves RV 111 S/F with raised-faced flanges



Kvs and differential pressure values

DN	Kvs [m ³ / hour]								p _{max}	
	1	2	3	4	5	6	7	8	250 N	500 N
15	4.0	2.5	1.6	1.0	0.63	0.4	0.25	0.16 ¹⁾	400	400
20	6.3	---	---	---	---	---	---	---	400	400
25	10.0	---	---	---	---	---	---	---	350	400
32	16.0	---	---	---	---	---	---	---	220	400
40	25.0	---	---	---	---	---	---	---	130	300

Two-way execution DN 15 to 25 - flow characteristic LDMspline[®], DN 32 and 40 - flow characteristic linear.

Three-way execution - linear characteristic in both ports.

¹⁾ applies to two-way execution only

Valve complete specification No. for ordering RV 111 S

		XX	XXX	X	XX	XX	XX	XX	XX	XX	XX	X
1. Valve	Control valve	RV										
2. Series	Valve with external thread		111									
3. Type of actuating	Hand wheel with possibility of using electric actuator			S								
4. Execution	Two-way				2							
	Three-way				3							
5. Body material	Grey cast iron				3							
6. Flow characteristic	Linear (2-way execution DN 32, 40 and 3-way execution) LDMspline [®] (two-way execution DN 15 to 25)					1						
						3						
7. Kvs	Column No. acc. to Kvs values table						X					
8. Nominal pressure	PN 16							16				
9. Max. temperature °C	150 °C								150			
10. Nominal size	DN 15 to 40									XX		
11. Connection	Threaded connection											T
	Raised-faced flanges											F
	Weld unions											W

Ordering example: **RV111 S 2331 16/150-25/T**

Actuator must be specified separately

Available actuators

Sauter	Electric actuator AVM 105	AC 24 V or 230 V, 3-position control 250 N
	Electric actuator AVM 115	AC 24 V or 230 V, 3-position control, 500N
	Electric actuator AVM 105S	AC 24 V, SUT control technology 0-10V, 250N
	Electric actuator AVM 115S	AC 24 V, SUT control technology 0-10V, 500N



Electric actuators

LDM**ANT3-5.1x(SC)****ANT3-5.2x(SC)**

Electromechanical actuators ANT3-5 are designed to control the regulating valves LDM series 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 LDM spline 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 ANT3-5									
Type ANT3-...	5.10	5.11	5.10SC	5.11SC	5.20	5.22	5.21	5.20SC	5.21SC
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	0..10V, 4..20mA ²	3-position	0..10V, 4..20mA ²	0..10V, 4..20mA ²
Power consumption	1,5 VA	14 VA			3 VA		10 VA		
Nominal force	300 N + 30%								
Nominal stroke	ANT3-5.xx ... 5,5 mm								
Open-close run time 50 Hz	66 s	8 s	33 s	8 s	66 s	33 s	8 s	33 s	8 s
Fail-safe function	---	---	8 s	8 s	---	---	---	8 s	8 s
Feedback	100 Ω , 1k Ω ¹	0(2) - 10 V; 0(4) - 20 mA ²			100 Ω , 1 k Ω ¹		0(2) - 10 V; 0(4) - 20 mA ²		
Adjustable position 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)
Enclosure	IP 54 (IEC 60529)								
Medium max. temp.	150 $^{\circ}$ C								
Ambient temp. range	-5 to +55 $^{\circ}$ C								
Ambient humidity range	5 .. 95 % relative humidity								
Storage conditions	-15 to +55 $^{\circ}$ C, 5 .. 95 % relative humidity								
Weight	0,7 kg		0,8 kg		0,7 kg			0,8 kg	

¹ Optional accessories. One piece of accessory can be used only. Must be specified in order.

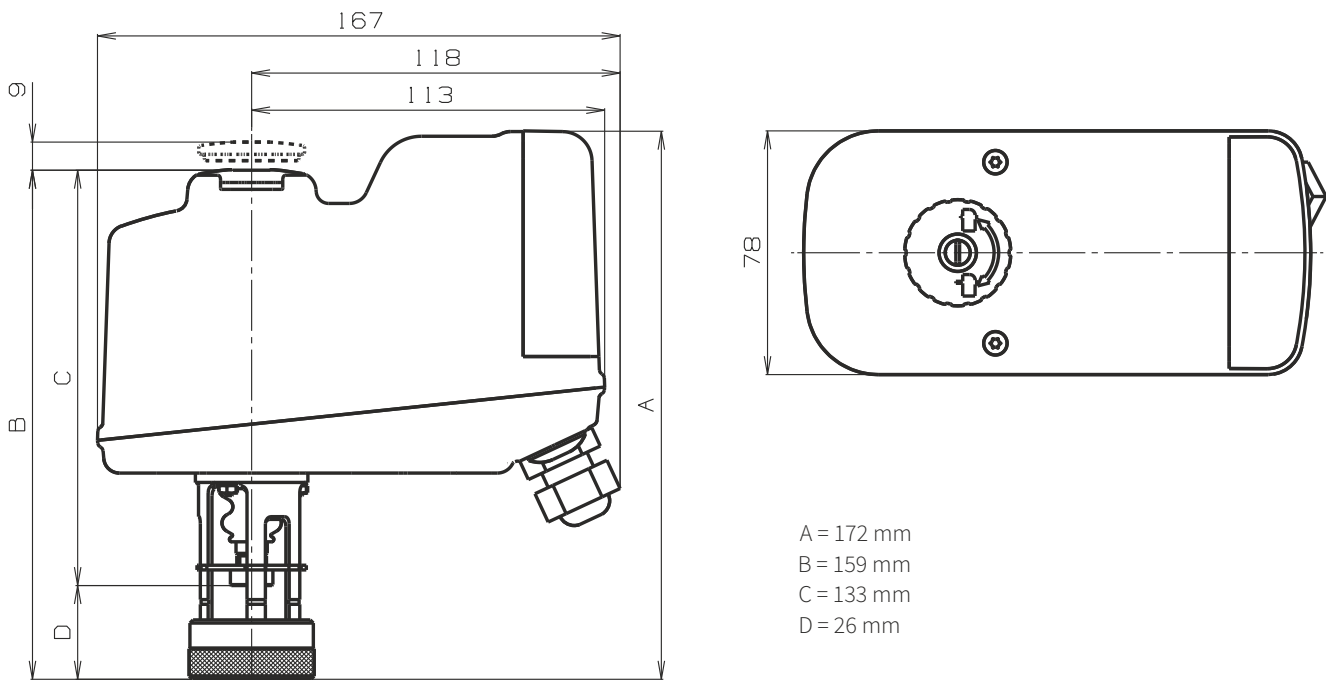
² Standard equipment. It shall be clearly specified in the order (type and range of feedback signal, basic execution 0-10V)

Optional accessories

Resistance position transmitter 0..100 Ω nebo 0..1000 Ω / (for 3-position control actuators only without safety function)

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

Wiring diagrams of actuators

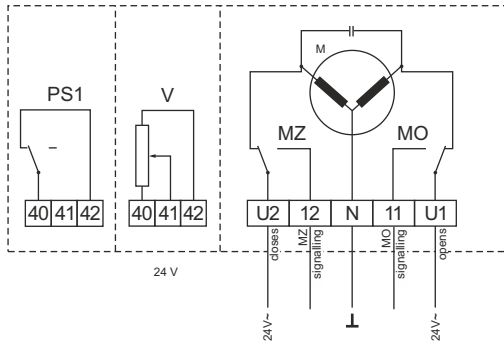


Wiring diagrams of actuators

Note: ANT3-5 ... closes the valve by retracting its stem: 

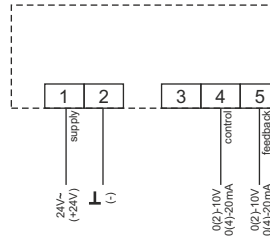
ANT3-5.10

3-position control, 24 V AC



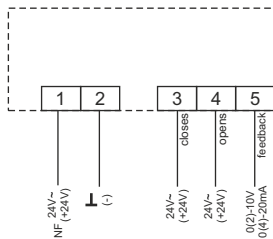
ANT3-5.11

Proportional control, 24 V AC/DC



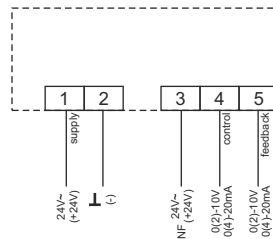
ANT3-5.10SC

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



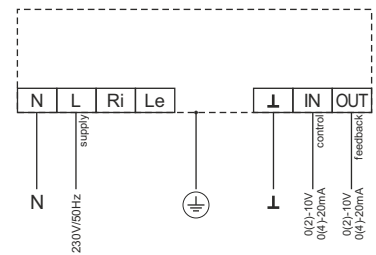
ANT3-5.11SC

Proportional control, 24 V AC/DC, fail-safe function



ANT3-5.21

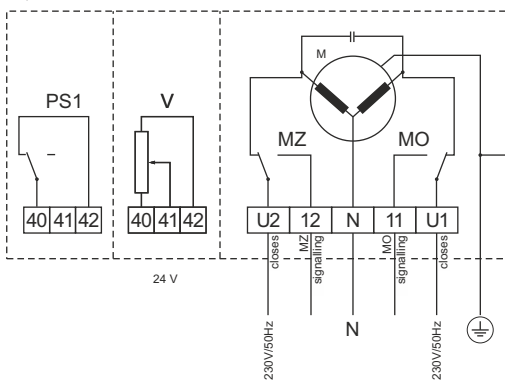
Proportional control, 230 V AC



ANT3-5.20

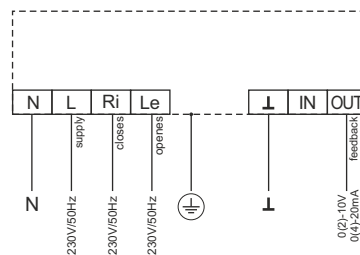
ANT3-5.22

3-position control, 230 V AC



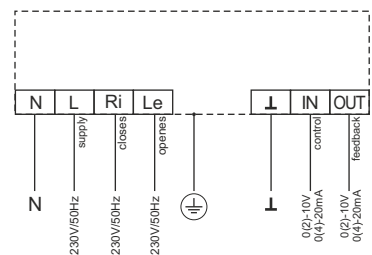
ANT3-5.20SC

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



ANT3-5.21SC

Proportional control, 230 V AC, fail-safe function



- MO** power switch for "Open" position
- MZ** power switch for "Closed" position
- M** motor
- V** feedback 100W or 1000W
- Ps1** adjustable position switch (max. zatížitelnost 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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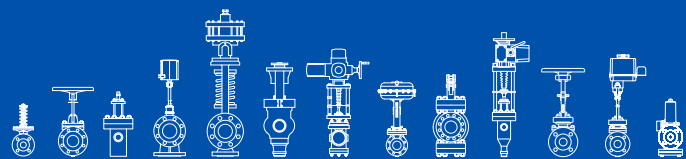
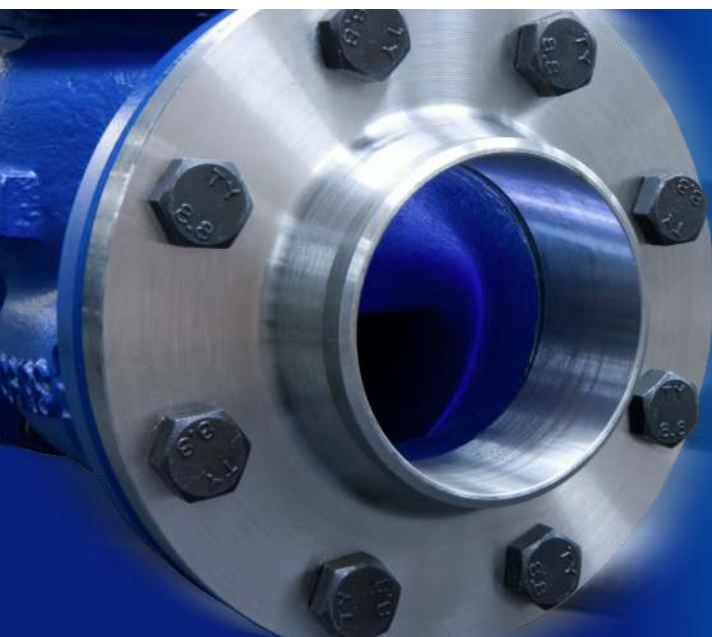
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