



01 - 02.8
10.20.GB

REVERSE CONTROL VALVES

200 line

with LDM ANT40 actuators



200 line

RV / HU 211
RV / HU 221
RV / HU 231

Two-way single-seated control valve with reverse function

RV / HU 213
RV / HU 223
RV / HU 233

Two-way single-seated control valve with reverse function and pressure balanced plug

RV 215
RV 225
RV 235

Three-way control valve with reverse function

Control valves **200 line** designed for regulation and shut-off of process liquid flow. The selected materials correspond to recommendations stipulated by ČSN EN 12516-1 (8/2015) - steel and ČSN EN 1503-3 (1/2002) - cast. The maximal permissible operating pressures in behaviour with types of material and temperature are specified in the table on page 26 of this catalogue.

Control

By their reverse design - valves **RV / HU 200** are especially designed for LDM ANT40 actuators

Application

RV / HU 2xx - heating, ventilation, power generation and chemical processing industries

Process media

RV / HU 2xx - liquids, gases and vapours without abrasive particles e.g. water, steam, air and other media compatible with material of the valve inner parts

The usage of the valve made of spheroidal cast iron (RV 210) for steam is limited by the following parameters. The steam must be superheated (its dryness at valve outlet $x_1 \leq 0,98$) and inlet pressure $p_1 \geq 0,4$ MPa when differential pressure is of above-critical value, and $p_1 \leq 1,6$ MPa when differential pressure is of under critical value. In case these two conditions are not kept, it is necessary to use the valve made of cast steel (RV 220). To ensure a reliable regulation, the producer recommends to pipe a strainer in front of the valve into pipeline or ensure in any other way that process medium does not contain abrasive particles or impurities.

Installation

The valve can be installed in any position except position when the actuator is under the valve body. The valve is to be piped the way so that the direction of medium flow will coincide with the arrows on the body.

It is necessary to protect the actuator from excessive heat from the pipeline at medium temperatures above 150 °C, eg by appropriately insulating the pipeline and valve and tilting the actuator from the vertical axis. When the valve is used as diverting, process medium flows through common valve port AB and split streams leave through valve ports A and B.). Detailed informations are given in the instruction for installation and service.

Packings

O-Ring EPDM

Packing is designed for non-aggressive media with temperature from 0 to 140 °C. Packing excels with its reliability and long time tightness. It has ability of sealing even if the valve stem is a bit damaged. Low frictional forces enables valve to be actuated with a low linear force actuator. Service life of sealing rings depends on operating conditions and it is more than 400 000 cycles on average.

DRSpack® (PTFE)

DRSpack® (Direct Radial Sealing Pack) is a packing with high tightness at both low and high operating pressure values. It is the most used type of packing suitable for temperatures ranging from 0 °C to 260 °C. The pH range is from 0 to 14. The packing enables using of actuators with low linear force. The design enables an easy change of the whole packing. The average service life of DRSpack® is more than 500 000 cycles.

Graphite

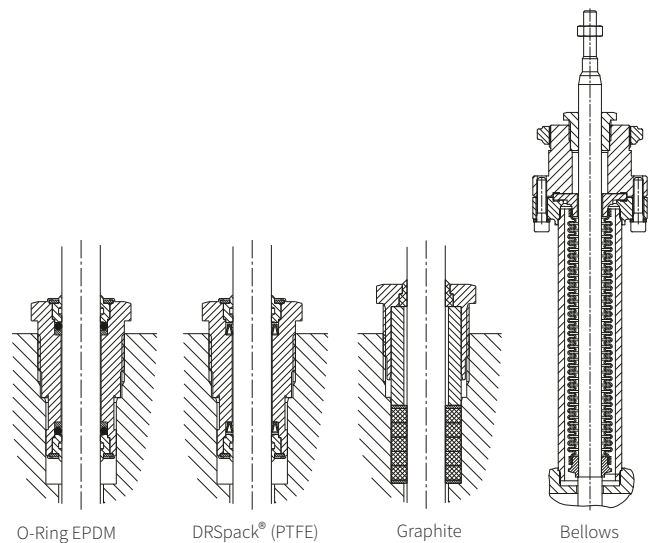
This type of packing can be used for media with temperature up to 550 °C and pH range: 0 to 14. Packing can be "sealed up" either by screwing the packing screw in or adding another sealing ring. In regard of intensive frictional forces, graphite packing is suitable for actuators with a sufficient linear force.

Bellows

Bellows packing is suitable for low and high temperatures ranging from -50 °C to 550 °C. Bellows ensures absolute tightness to environment. Packing is equipped with safety PTFE packing as standard to prevent medium from leaking in case of damage to bellows. Intensive linear forces are not required.

Application of bellows packing

Bellows packing is suitable for applications with very aggressive, toxic or other dangerous media that require absolute tightness to environment. In such case, it is necessary to check compatibility of used body material as well as the valve inner parts material with process medium. It is recommended to use bellows with safety packing preventing medium from leaking in case of damage to bellows when there is an extremely dangerous process medium used. Bellows is also a great solution to use of process medium either with temperature below zero when ice accretions cause premature damage to packing or with high temperatures when bellows ensures medium cooling.



Service life of bellows packing

Bellows material	Temperature				
	200°C	300°C	400°C	500°C	550°C
1.4541	100 000	40 000	28 000	7 000	inappropriate
1.4571	90 000	34 000	22 000	13 000	8 000

Values specified in the table above show minimal guaranteed number of cycles with the valve full stroke when the bellows is fully lengthened and pressed. In regulation, when the valve plug moves only in a portion of the stroke range at the inner centre of the valve, the service life of the bellows is many times longer then depending on concrete operating conditions.

Principles for plug type selection

V-ported plugs should not be used in above - critical differential pressures with inlet pressure $p \geq 0,4$ MPa and for regulation of saturated steam. In these cases we recommend to use a perforated plug. The perforated plug should be also used always when cavitation may occur due to a high differential pressure value or valve ports erosion caused by high speed of process medium flow. If the parabolic plug is used (because of small Kvs) for above critical differential pressures, it is necessary to close both plug and seat with a hard metal overlay, i.e. stellite trim.

Rangeability

Rangeability is the ratio of the biggest value of flow coefficient to the smallest value. In fact it is the ratio (under the same conditions) of highest regulated flow rate value to its lowest value. The lowest or minimal regulated flow rate is always higher than 0.



RV / HU 2x1

Control valves and
Fail-safe action
valves

DN 15 - 150
PN 16 and 40

Control valves **RV 211**, **RV 221** and **RV 231** are single-seated valves designed for regulation and shut-off of process medium flow.

Valves with a fail-safe action **HU 211**, **HU 221** and **HU 231** have the same design as RV 2x1 with addition of increased seat sealing. Valves are equipped with fail-safe action actuators (valve closes upon power failure).

Technical data			
Series	RV / HU 211	RV / HU 221	RV / HU 231
Type of valve	Two-way single-seated control valve with reverse function		
Nominal size range	DN 15 to 150		
Nominal pressure	PN 16, PN 40		
Body material	Spheroidal cast iron EN-JS 1025 (EN-GJS-400-10-LT)	Cast steel 1.0619 (GP240GH) 1.7357 (G17CrMo5-5)	Stainless steel 1.4581 (GX5CrNiMoNb19-11-2)
Seat material:	DN 15 - 50	1.4028 / 17 023.6	1.4028 / 17 023.6
DIN W.Nr./ČSN	DN 65 - 150	1.4027 / 42 2906.5	1.4027 / 42 2906.5
Plug material:	DN 15 - 65	1.4021 / 17 027.6	1.4021 / 17 027.6
DIN W.Nr./ČSN	DN 80 - 150	1.4027 / 42 2906.5	1.4027 / 42 2906.5
Operating temp. range	-10 to 300 °C		
Face to face dimensions	Line 1 acc. to ČSN-EN 558+A1 (5/2012)		
Connection flanges	Acc. to ČSN-EN 1092-2 (1/1999)	Acc. to ČSN-EN 1092-1 (4/2002) + A1(7/2013)	
Flange faces	Type B1 (raised-faced) acc. to ČSN-EN 1092-2 (1/1999)	Type B1 (raised-faced) nebo Typ F (female) or Type D (groove) acc. to ČSN-EN 1092-1 (2/2003) + A1(7/2013)	
Type of plug	V-ported, parabolic, perforated		
Flow characteristic	Linear, equal-percentage, LDMspline®, parabolic		
Kvs value	0.4 to 360 m ³ /h		
Leakage rate	Class III. acc. to ČSN-EN 1349 (5/2001) (<0.1% Kvs) for control valves with metal-metal seat sealing Class IV. acc. to ČSN-EN 1349 (5/2001) (<0.01% Kvs) for control valves with metal-PTFE seat sealing		
Rangeability r	50 : 1		
Packing	O - ring EPDM t _{max} = 140°C, DRSpack®(PTFE) t _{max} = 260°C, Exp. graphite, bellows t _{max} = 500°C		

Kvs values and differential pressures

Δp_{\max} value is the valve max. differential pressure when open-close function is always guaranteed. In regard of service life of seat and plug, it is recommended so that permanent differential pressure would not exceed 1.6 MPa. Otherwise it is suitable to use perforated plug or sealing surfaces of seat and plug with a hard metal overlay.

For further information on actuating, see catalogue sheets		Actuating (actuator)		ANT40.11		ANT40.11S, ANT40.11R						
		Marking in valve spec. No.		EVH		EVI						
		Linear force		2500 N		2000 N						
		Kvs [m ³ /h]							Δp_{\max} [MPa]		Δp_{\max} [MPa]	
DN	H	1	2	3	4	5	6	7	kov	PTFE	kov	PTFE
15	20	---	2.5 ¹⁾	1.6 ¹⁾	1.0 ¹⁾	0.6 ¹⁾	0.4 ¹⁾	0.25 ¹⁾	4.00	1) ¹⁾ ---	4.00	---
15		4.0 ¹⁾	---	---	---	---	---	---	4.00	---	4.00	---
20		---	---	2.5 ¹⁾	1.6 ¹⁾	1.0 ¹⁾	0.6 ¹⁾	---	4.00	---	4.00	---
20		---	4.0 ¹⁾	---	---	---	---	---	4.00	---	4.00	---
20		6.3 ¹⁾	---	---	---	---	---	---	4.00	---	4.00	---
25		---	---	---	2.5 ¹⁾	1.6 ¹⁾	---	---	3.98	4.00	3.07	3.48
25		10.0	6.3 ²⁾	4.0 ²⁾	---	---	---	---	3.98	4.00	3.07	3.48
32		---	---	---	4.0 ¹⁾	---	---	---	2.33	2.65	1.78	2.10
32		16.0	10.0	6.3 ²⁾	---	---	---	---	2.33	2.65	1.78	2.10
40		25.0	16.0	10.0	---	---	---	---	1.44	1.70	1.09	1.34
50	40.0	25.0	16.0	---	---	---	---	0.82	1.01	0.61	0.80	
65	63.0	40.0	25.0	---	---	---	---	0.46	0.61	0.33	0.48	
80	40	100.0	63.0	40.0	---	---	---	---	0.29	0.42	0.20	0.33
100		160.0	100.0	63.0	---	---	---	---	0.16	0.27	0.11	0.21
125		250.0	160.0	100.0	---	---	---	---	0.09	0.17	0.05	0.13
150		360.0	250.0	160.0	---	---	---	---	0.05	0.12	0.02	0.09

1) parabolic plug

2) V-ported plug with linear characteristic, parabolic plug with equal-percentage, LDMspline® and parabolic characteristic

Perforated plug available only with Kvs values in shadowed frames with the following restrictions:

- Kvs values 2.5 to 1.6 m³/hour available with linear characteristic only
- Perforated plug with Kvs value acc. to column No. 2 available with linear or parabolic characteristic only.

Max. differential pressure Δp for valves PN 16 must be 1.6 MPa

metal - version with metal - metal seat sealing

PTFE - version with metal - PTFE seat sealing (is not applicable to contoured plugs)

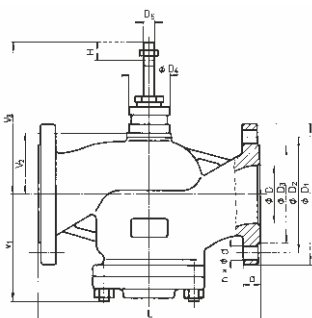
Max. differential pressures specified in table apply to PTFE and O-ring packing.

Δp for bellows must be consulted with the producer. max

Values Δp_{\max} are set for the most unfavourable pressure ratios on the valve PN 40, but in concrete cases the real Δp value can be higher than values specified in the table above.

Dimensions and weight for the type RV / HU 2x1

DN	PN 16					PN 40					PN 16, PN 40												
	D ₁ mm	D ₂ mm	D ₃ mm	d mm	n	D ₁ mm	D ₂ mm	D ₃ mm	d mm	n	D mm	D ₄ mm	D ₅ mm	L mm	V ₁ mm	V ₂ mm	*V ₂ mm	*V ₃ mm	a mm	m ₁ kg	m ₂ kg	*m _v kg	
15	95	65	45			95	65	45			15			130	68	47	---	143	---	16	4.5	5.5	---
20	105	75	58	14		105	75	58	14		20			150	68	47	---	143	---	18	5.5	6.5	---
25	115	85	68			115	85	68			25			160	85	52	250	148	346	18	6.5	8	3.5
32	140	100	78		4	140	100	78		4	32		10	180	85	52	250	148	346	20	8	9.5	3.5
40	150	110	88			150	110	88			40			200	85	52	250	148	346	20	9	11	3.5
50	165	125	102			165	125	102	18		50	44		230	117	72	270	168	366	20	14	21	3.5
65	185	145	122	18	4 ¹⁾	185	145	122			65			290	117	72	270	168	366	22	18	27	3.5
80	200	160	138			200	160	138			80		14	310	152	106	452	222	568	24	26	40	4.5
100	220	180	158		8	235	190	162	22	8	100			350	152	106	452	222	568	24	38	49	4.5
125	250	210	188			270	220	188			125			400	175	134	480	250	596	26	58	82	5
150	285	240	212	22		300	250	218			150			480	200	134	480	250	596	28	78	100	5



¹⁾ with regard of the standard previously in force, there is an option
²⁾ to have the number of connection bolts as stipulated in ČSN-EN 1092-1

m_v - weight to be added to weight of valve equipped bellows packing

m₁ - valves RV / HU 211

m₂ - valves RV / HU 221 a RV / HU 231



RV / HU 2x3

Control valves and
Fail-safe action
valves

DN 25 - 150
PN 16 and 40

Control valves **RV 213**, **RV 223** and **RV 233** are single-seated valves with pressure-balanced plug designed for regulation and shut-off of process medium flow. Valves with a fail-safe action series **HU 213**, **HU 223** and **HU 233** have the same design as RV 2x3 with addition of increased seat sealing. Valves are equipped with fail-safe action actuators (valve closes upon power failure).

Technical data

Series	RV / HU 213	RV / HU 223	RV / HU 233
Type of valve	Two-way single-seated control valve with pressure balanced plug and with reverse function		
Nominal size range	DN 25 to 150		
Nominal pressure	PN 16, PN 40		
Body material	Spheroidal cast iron EN-JS 1025 (EN-GJS-400-10-LT)	Cast steel 1.0619 (GP240GH) 1.7357 (G17CrMo5-5)	Stainless steel 1.4581 (GX5CrNiMoNb19-11-2)
Seat material:	DN 25 - 50	1.4028 / 17 023.6	1.4028 / 17 023.6
DIN W.Nr./ČSN	DN 65 - 150	1.4027 / 42 2906.5	1.4027 / 42 2906.5
Plug material:	DN 25 - 65	1.4021 / 17 027.6	1.4021 / 17 027.6
DIN W.Nr./ČSN	DN 80 - 150	1.4027 / 42 2906.5	1.4027 / 42 2906.5
Operating temp. range	-10 to 260 °C		
Face to face dimensions	Line 1 acc. to ČSN-EN 558+A1 (5/2012)		
Connection flanges	Acc. to ČSN-EN 1092-2 (1/1999)	Acc. to ČSN-EN 1092-1+A1 (7/2013)	
Flange faces	Type B1 (raised-faced)) acc. to ČSN-EN 1092-2 (1/1999)	Type B1 (raised-faced) or Type F (female) nebo Type D (groove) acc. to ČSN-EN 1092-1+A1 (7/2013)	
Type of plug	V-ported, perforated		
Flow characteristic	Linear, equal-percentage, LDMspline®, parabolic		
Kvs value	4 to 360 m ³ /h		
Leakage rate	Class III. acc. to ČSN-EN 1349 (5/2001) (<0.1% Kvs) for control valves with metal-metal seat sealing Class IV. acc. to ČSN-EN 1349 (5/2001) (<0.01% Kvs) for control valves with metal-PTFE seat sealing		
Rangeability r	50 : 1		
Packing	O - ring EPDM t _{max} = 140 °C, DRSpack® (PTFE) t _{max} = 260 °C, bellows t _{max} = 260 °C		

Kvs values and differential pressures

Δp_{max} value is the valve max. differential pressure when open-close function is always guaranteed. In regard of service life of seat and plug, it is recommended so that permanent differential pressure would not exceed 1.6 MPa. Otherwise it is suitable to use perforated plug or sealing surfaces of seat and plug with a hard metal overlay.

For further information on actuating, see catalogue sheets		Actuating (actuator) Mark. in valve spec. No.			ANT40.11 EVH				ANT40.11S, ANT40.11R EVI			
		Linear force			2500 N				2000 N			
		Kvs [m ³ /h]			Δp_{max}				Δp_{max}			
DN	H	1	2	3	metal		PTFE		metal		PTFE	
25	20	10	6.3 ¹⁾	4.0 ¹⁾	4.00	(4.00)	4.00	(4.00)	4.00	(4.00)	4.00	(4.00)
32		16.0	10.0	6.3 ¹⁾	4.00	(4.00)	4.00	(4.00)	4.00	(4.00)	4.00	(4.00)
40		25.0	16.0	10.0	4.00	(4.00)	4.00	(4.00)	4.00	(4.00)	4.00	(4.00)
50		40.0	25.0	16.0	4.00	(4.00)	4.00	(4.00)	4.00	(4.00)	4.00	(4.00)
65		63.0	40.0	25.0	4.00	(4.00)	4.00	(4.00)	4.00	(4.00)	4.00	(4.00)
80	40	100.0	63.0	40.0	4.00	(2.80)	4.00	(4.00)	4.00	(4.00)	4.00	(4.00)
100		160.0	100.0	63.0	4.00	(1.80)	4.00	(3.70)	4.00	(2.90)	4.00	(4.00)
125		250.0	160.0	100.0	4.00	(1.00)	4.00	(2.90)	4.00	(1.90)	4.00	(3.80)
150		360.0	250.0	160.0	4.00	(0.50)	4.00	(2.40)	4.00	(1.25)	4.00	(3.10)

¹⁾ linear characteristic only

metal - version with metal - metal seat sealing

PTFE - version with metal - PTFE seat sealing

(xx) - Δp_{max} values specified in parentheses apply to perforated plug

Max. differential pressure Δp for valves PN 16 must be 1.6 MPa.

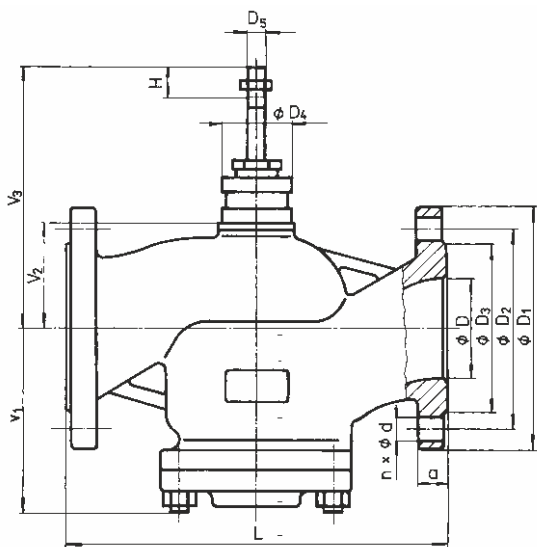
Max. differential pressures specified in table apply to PTFE and O-ring packing. Δp_{max} for bellows must be consulted with the producer.

Perforated plug available only with Kvs values in shadowed frames with the following restrictions:

- perforated plug with Kvs value acc. to column No. 2 available with linear or parabolic characteristic only

Dimensions and weights for the type RV / HU 2x3

DN	PN 16					PN 40					PN 16, PN 40												
	D ₁ mm	D ₂ mm	D ₃ mm	d mm	n	D ₁ mm	D ₂ mm	D ₃ mm	d mm	n	D mm	D ₄ mm	D ₅ mm	L mm	V ₁ mm	V ₂ mm	[#] V ₂ mm	V ₃ mm	[#] V ₃ mm	a mm	m ₁ kg	m ₂ kg	[#] m ₁ kg
25	115	85	68	14	4	115	85	68	14	4	25	10	44	160	85	52	250	148	346	18	6.5	8	3.5
32	140	100	78	140		100	78	14	32		180			85	52	250	148	346	20	8	9.5	3.5	
40	150	110	88	150		110	88	18	40		200			85	52	250	148	346	20	9	11	3.5	
50	165	125	102	165		125	102	18	50		230			117	72	270	168	366	20	14	21	3.5	
65	185	145	122	18	4 ¹⁾	185	145	122	22	8	65	14	44	290	117	72	270	168	366	22	18	27	3.5
80	200	160	138	200	160	138	22	80			310			152	106	452	222	568	24	26	40	4.5	
100	220	180	158	220	180	158	26	100			350			152	106	452	222	568	24	38	49	4.5	
125	250	210	188	250	210	188	26	125			400			175	134	480	250	596	26	58	82	5	
150	285	240	212	22	300	250	218	26	150	480	200	134	480	250	596	28	78	100	5				



¹⁾ with regard of the standard previously in force, there is an option

^{#)} to have the number of connection bolts as stipulated in ČSN-EN 1092-1 - for valve with bellows packing

m_v - weight to be added to weight of valve equipped with bellows packing

m₁ - valves RV / HU 213

m₂ - valves RV / HU 223 and RV / HU 233



RV 2x5

Control valves

DN 15 - 150
PN 16 a 40

Control valves **RV 215**, **RV 225** and **RV 235** are three-way valves with mixing or flow-diverting function.

Technical data				
Series		RV 215	RV 225	RV 235
Type of valve	Three-way control valve with reverse function			
Nominal size range	DN 15 to 150			
Nominal pressure	PN 16, PN 40			
Body material		Spheroidal cast iron EN-JS 1025 (EN-GJS-400-10-LT)	Cast steel 1.0619 (GP240GH) 1.7357 (G17CrMo5-5)	Stainless steel 1.4581 (GX5CrNiMoNb19-11-2)
Seat material:	DN 25 - 50	1.4028 / 17 023.6	1.4028 / 17 023.6	1.4571 / 17 347.4
DIN W.Nr./ČSN	DN 65 - 150	1.4027 / 42 2906.5	1.4027 / 42 2906.5	1.4581 / 42 2941.4
Plug material:	DN 25 - 65	1.4021 / 17 027.6	1.4021 / 17 027.6	1.4571 / 17 347.4
DIN W.Nr./ČSN	DN 80 - 150	1.4027 / 42 2906.5	1.4027 / 42 2906.5	1.4581 / 42 2941.4
Operating temp. range	-10 to 300 °C			
Face to face dimensions	Line 1 acc. to ČSN-EN 558+A1 (5/2012)			
Connection flanges	Acc. to ČSN-EN 1092-2 (1/1999)		Acc. to ČSN-EN 1092-1+A1 (7/2013)	
Flange face	Type B1 (raised-face) acc. to ČSN-EN 1092-2 (1/1999)		Typ B1 (raised-face) nebo Typ F (female) nebo Typ D (groove) acc. to ČSN-EN 1092-1+A1 (7/2013)	
Type of plug	V-ported, perforated			
Flow characteristic	Linear, equal-percentage, LDMspline [®] , parabolic			
Kvs value	1.6 to 360 m ³ /h			
Leakage rate in A-AB way	Class III. acc. to ČSN-EN 1349 (5/2001) (<0.1% Kvs) for control valves with metal-metal seat sealing Class IV. acc. to ČSN-EN 1349 (5/2001) (<0.01% Kvs) for control valves with metal-PTFE seat sealing			
Leakage rate in B-AB way	Not guaranteed, to 2% Kvs			
Rangeability r	50 : 1			
Packing	O - ring EPDM t _{max} = 140 °C, DRSpack [®] (PTFE) t _{max} = 260 °C, bellows t _{max} = 260 °C			

Kvs values and differential pressures

Δp_{\max} value is the valve max. differential pressure when open-close function is always guaranteed. In regard of service life of seat and plug, it is recommended so that permanent differential pressure would not exceed 1.6 MPa. Otherwise it is suitable to use perforated plug or sealing surfaces of seat and plug with a hard metal overlay.

For further information on actuating, see catalogue sheets		Actuating (actuator)			ANT40.11		ANT40.11S, ANT40.11R	
		Marking in valve specification No.			EVH		EVI	
		Linear force			2500 N		2000 N	
		Kvs [m ³ /h]			Δp_{\max}		Δp_{\max}	
DN	H	1	2	3	metal	PTFE	metal	PTFE
15	20	4.0 ¹⁾	2.5 ¹⁾	1.6 ¹⁾	4.00	---	4.00	---
20		6.3 ¹⁾	4.0 ¹⁾	2.5 ¹⁾	3.98	4.00	3.07	3.48
25		10.0	6.3 ²⁾	4.0 ²⁾	4.00	---	4.00	---
32		16.0	10.0	6.3 ²⁾	2.33	2.65	1.78	2.10
40		25.0	16.0	10.0	1.44	1.70	1.09	1.34
50		40.0	25.0	16.0	0.82	1.01	0.61	0.80
65	40	63.0	40.0	25.0	0.46	0.61	0.33	0.48
80		100.0	63.0	40.0	0.29	0.42	0.20	0.33
100		160.0	100.0	63.0	0.16	0.27	0.11	0.21
125		250.0	160.0	100.0	0.09	0.17	0.05	0.13
150		360.0	250.0	160.0	0.05	0.12	0.02	0.09

¹⁾ parabolic plug in straight way, V-ported plug in angle way

²⁾ V-ported plug in angle way, in straight way for linear characteristic V-ported plug and for equal-percentage characteristic parabolic plug

metal - version with metal - metal seat sealing

PTFE - version with metal - PTFE seat sealing (does not apply to contoured plugs)

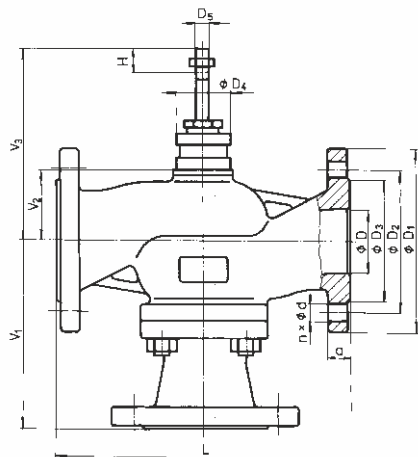
Max. differential pressures specified in table apply to PTFE and O-ring packing. Δp_{\max} for bellows must be consulted with the producer.

Bellows packing can be used with V-ported plug only.

Max. differential pressure Δp for valves PN 16 must be 1.6 MPa.

Dimensions and weight of valves RV 2x5

DN	PN 16					PN 40					PN 16, PN 40													
	D ₁ mm	D ₂ mm	D ₃ mm	d mm	n	D ₁ mm	D ₂ mm	D ₃ mm	d mm	n	D mm	D ₄ mm	D ₅ mm	L mm	V ₁ mm	V ₂ mm	*V ₂ mm	V ₃ mm	*V ₃ mm	a mm	m ₁ kg	m ₂ kg	*m _v kg	
15	95	65	45	14	4	95	65	45	14	4	15	44	10	130	110	47	---	143	---	16	5.5	6	---	
20	105	75	58			105	75	58			14			20	150	115	47	---	143	---	18	6.5	7	---
25	115	85	68			115	85	68			18			25	160	130	52	250	148	346	18	8.3	9.5	3.5
32	140	100	78			140	100	78			18			32	180	135	52	250	148	346	20	10.5	12	3.5
40	150	110	88			150	110	88			18			40	200	140	52	250	148	346	20	12	13.5	3.5
50	165	125	102			165	125	102			18			50	230	175	72	270	168	366	20	17	24	3.5
65	185	145	122	18	4 ¹⁾	185	145	122	18	8	65	14	290	180	72	270	168	366	22	22	31	3.5		
80	200	160	138			200	160	138			22		80	310	220	106	452	222	568	24	31	43	4.5	
100	220	180	158	22	8	235	190	162	22	8	100	14	350	230	106	452	222	568	24	44	55	4.5		
125	250	210	188			270	220	188			26		125	400	260	134	480	250	596	26	65	90	5	
150	285	240	212			300	250	218			26		150	480	290	134	480	250	596	28	94	120	5	



¹⁾ with regard of the standard previously in force, there is an option

²⁾ to have the number of onnection bolts as stipulated in ČSN-EN 1092-1 - for valve with bellows packing

m_v - weight to be added to weight of valve equipped with bellows packing

m_1 - valves RV 215

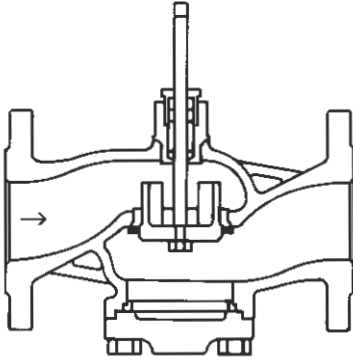
m_2 - valves RV 225 and RV 235

Valve complete specification No. for ordering RV / HU 2x1, RV / HU 2x3, RV 2x5		XX	XXX	XXX	XXXX	XX	-	XX	/	XXX	-	XXX
1. Valve	Control valve	RV										
	Fail-safe action valve	HU										
2. Series	Valves made of sph. cast iron EN-JS 1025		2 1									
	Valves made of cast steel 1.0619, 1.7357		2 2									
	Valves made of stainless steel 1.4581		2 3									
	Reverse valve		1									
	Pressure-balanced, reverse valve		3									
	Mixing (diverting), reverse valve		5									
3. Actuating ¹⁾ Fail-safe action actuators	Electric actuator			E								
	ANT40.11			EVH								
	ANT40.11S ¹⁾			EVI								
	ANT40.11R ¹⁾			HVI								
4. Connection	Raised flange				1							
	Female flange				2							
	Groove flange				3							
5. Body material <small>(Operating temperature ranges are specified in parentheses)</small>	Cast steel 1.0619 (-20 to 400 °C)				1							
	Sphreoidal cast iron EN-JS 1025 (-20 to 300 °C)				4							
	CrMo steel 1.7357 (-20 to 500 °C)				7							
	Stainless steel 1.4581 (-20 to 400 °C)				8							
	Other material on request				9							
6. Seat sealing ²⁾ from DN 25; t _{max} = 260 °C	Metal - Metal				1							
	Soft sealing (metal - PTFE) in straight way ²⁾				2							
	Hard metal overlay on sealing surfaces				3							
7. Packing	O - ring EPDM				1							
	DRSpack® (PTFE)				3							
	Bellows				7							
	Bellows with safety PTFE packing				8							
8. Flow characteristic ³⁾ Not applicable to RV 2x5	Linear					L						
	Equal-percentage in straight way					R						
	LDMspline® ³⁾					S						
	Parabolic ³⁾					P						
	Linear - perforated plug ³⁾					D						
	Equal-percentage - perforated plug ³⁾					Q						
Parabolic - perforated plug ³⁾					Z							
9. Kvs	Column No. acc. to Kvs values table						X					
10. Jmenovitý tlak PN	PN 16							16				
	PN 40							40				
11. Max. operating temperature °C ⁴⁾ Not applicable for RV / HU 2x3	O - ring EPDM									140		
	DRSpack® (PTFE), bellows									220		
	DRSpack® (PTFE), bellows									260		
	Bellows ⁴⁾									300		
12. Nominal size DN	DN											XXX

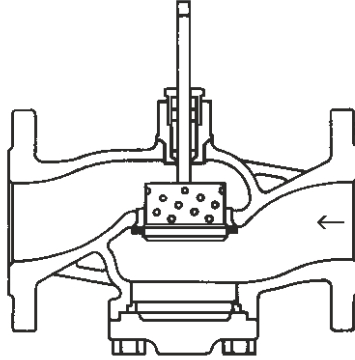
Ordering example: Two-way control valve DN 65, PN 40, with LDM actuator ANT40.11, body material: spheroidal cast iron, flange with raised face, metal-metal seat sealing, PTFE packing, linear characteristic, Kvs = 63 m³/hour is specified as follows: **RV211 EVH 1413 L1 40/220-065**

Valves RV / HU 2x1

Section of valve with V-ported plug

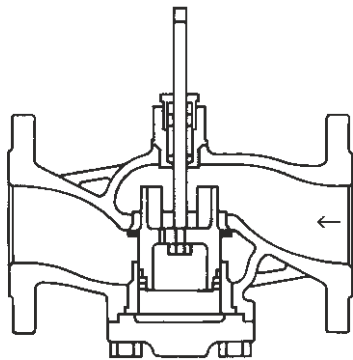


Section of valve with perforated plug

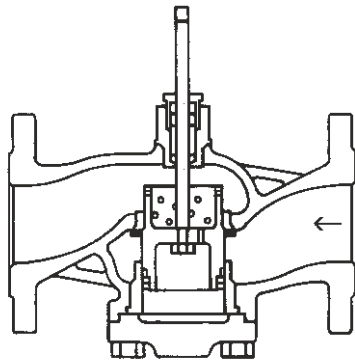


Valves RV / HU 2x3

Section of pressure-balanced valve with V-ported plug

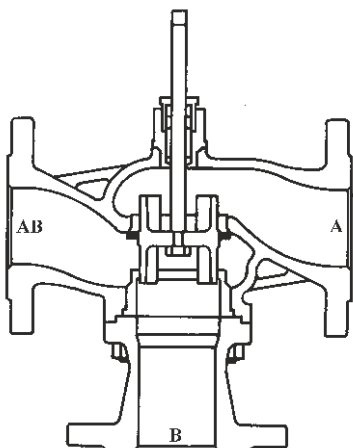


Section of pressure-balanced valve with perforated plug



Valves RV 2x5

Section of three-way valve with V-ported plug





Electric actuators

LDM ANT40.11

The actuators are designed for regulators with continuous or contact output. They are suitable to actuate two-way and three-way valves series RV 113 and RV 2xx. The actuator consists of cover made of self-extinguishing plastic housing a stepping motor, control unit with SUT technology, signalisation LEDs and no-maintenance gear made of sintered steel. The connection to its valve is provided by stainless steel columns and yoke made of light metal alloy. Electric connection (max. 2,5 mm²) is provided with the aid of screw clamps. There are three self-breaking openings for cable glands M20x1,5 (2x) and M16x1,5. One cable gland M20x1,5 is a part of standard delivery.

Application

Based on a connection variant (see wiring diagram), the actuator can be used as floating (0...10 V or 4...20 mA), or 2-position (open-closed) or 3-position (open-stop-closed). Manual operating is available with outer handle. The motor is disconnected when the hand crank is folded back. When the handle is positioned back, the actuator resumes into required position (without initialization). If the hand crank remains folded out, the actuator keeps its set position.

SUT technology

The actuator can be controlled by regulators with continuous (0...10 V and/or 4...20 mA) or contact (2-position or 3-position) output. The actuator feeding is optional. The running speed and output characteristic is also optional.

Features

- electronic switch off based on the running force registered by stops inside appliance or valve.
- automatic adapting to the valve stroke
- code switch for characteristic and running time selection
- hand crank for manual operating with switching the motor off as a start for new initiation
- possibility of direction change of control signal (feeding voltage at terminal 2a or 2b)

Installation position

Upright, vertical, max. horizontal.

Technical data	
Type	ANT40.11
Specification code	EVH
Execution	Electric actuator with SUT technology
Voltage	24 V AC \pm 20%, 50 - 60 Hz; 24 V DC \pm 15%; 230 V AC \pm 15%
Frequency	50 Hz
Power consumption	18 VA
Control	0 - 10 V, 4 - 20 mA, 3-point, 2-point
Open-close running time	Adjustable 2, 4, 6 s.mm ⁻¹
Nominal force	2500 N
Travel	20 and 40 mm
Enclosure	IP 66
Process medium max. temperature	200 °C, with a mid piece up to 240 °C
Ambient temperature range	-10 to 55 °C
Ambient humidity range	< 95 % r. v.
Weight	4,5 kg

Accessories

0313529 001	Split range unit to set sequences
0372332 001	Module, plug-in type, for 230 V ± 15% voltage supply and 3-point activation, additional power 2 VA
0372333 001	2 auxiliary changeover switches, continuously adjustable, additional load 5(2) A, 12 - 250 V, 3(1) A, 12 - 250 V AC ¹⁾
0372333 002	2 auxiliary changeover contacts with gold-plated contacts for low currents from 1 mA, max. 30 V, 3(1) A, 12 - 250 V AC ¹⁾
0372334 001	Potentiometer 2000 Ω, 1 W, 24 V ¹⁾
0372334 006	Potentiometer 1000 Ω, 1 W, 24 V ¹⁾
0372336 910	Mid piece (required for medium above 200 up to 240°C)
0386263 001	Screwed cable gland M16 x 1,5
0386263 002	Screwed cable gland M20 x 1,5 (1 piece of cable gland is standard part of actuator delivery)

¹⁾ one option of accessory can be used only

Operation

Initialisation and feedback signal

When used as a continuous drive, the device initialises itself automatically. As soon as voltage is applied to the drive for the first time, it moves to the lower limit stop on the valve, thus enabling automatic connection with the valve spindle. Then it moves to the upper limit stop and the value is recorded and saved with the help of a path measurement system. The control signal and the feedback signal are adjusted to this effective stroke. There is no re-initialisation if the voltage is interrupted or if the voltage supply is removed. The values remain saved.

To re-initialise, the drive must be connected to the voltage. To trigger an initialisation, fold the hand crank out and back in again twice within 4 seconds. Both the LEDs will then flash red.

During initialisation, the feedback signal is inactive, or it corresponds to a value of "0". Initialisation uses the shortest run time. The re-initialisation is only valid once the entire procedure has been completed. Folding the hand crank out again will interrupt the procedure.

If the valve drive detects a blockage, it will report this by setting the feedback signal to 0 V after approx. 90 s. However, the drive will try to overcome the blockage during this time. If it is possible to overcome the blockage, the normal control function is activated again and the feedback signal is resumed.

No initialisation is performed with a 2-position or 3-position control. The feedback signal is inactive.

Connection as a 2-position valve drive (24 V)

This activation (OPEN/CLOSED) can take place via two cables. The voltage is applied to terminals 1 and 2a. Applying the voltage (24 V) to terminal 2b opens the valve's control passage. After this voltage has been switched off, the drive moves to the opposite end position and closes the valve. The electronic motor switch-off responds in the end positions (valve limit stop, or when maximum stroke is reached) or in case of overload (no limit switches).

The coding switch can be used to set the run times. The characteristic curve cannot be selected in this case (resulting in the characteristic curve for the valve). Terminals 3i, 3u and 44 must not be connected.

Connection as a 3-position valve drive (24 V)

Applying voltage to terminal 2a (or 2b) makes it possible to move the valve to any desired position. If voltage is applied to terminals 1 and 2b, the valve shaft moves out and opens the valve. It moves in and closes the valve when the electrical circuit is closed over terminals 1 and 2a. In the end positions (at the valve stop, or when the maximum stroke is reached) or in case of an overload, the electronic motor switch-off responds (no limit switches). The direction of the stroke can be changed by transposing the connections.

The coding switch is used to set the run times. In this case, the characteristic curve cannot be selected (resulting in the characteristic curve for the valve). Terminals 3i, 3u and 44 must not be connected.

Connection as a 3-position valve drive with 230 V

The accessory module is plugged on in the connection area and is then connected for 3-position mode. If this accessory is used, only control in 3-position mode is available. The coding switch on the baseboard can be used to select the run times. The characteristic curve cannot be selected; the characteristic curve for the valve is applicable.

The module has a built-in switch which is automatically moved into the correct position when the module is installed. On this drive (which has no spring return action) the switching lever is in the lower position.

The accessory module is not suitable for 2-position activation.

Connection to a control voltage (0...10 V and/or 4...20 mA)

The built-in positioner controls the drive depending on the controller output signal.

The control signal used is a voltage signal (0...10 V-) at terminal 3u, or a current signal at terminal 3i. If a control signal is present at both terminals (3u (0...10 V) and 3i (4...20 mA)) simultaneously, the input with the higher value takes priority.

Mode of action 1 (mains voltage to internal connection 2a):

as the output signal increases, the valve shaft moves out and opens the valve (control passage).

Mode of action 2 (mains voltage to internal connection 2b):

as the output signal increases, the valve shaft moves in and closes the valve (control passage).

The starting point and the control span are fixed. To set partial ranges (and only for voltage input 3u), a split range unit is available as an accessory (see the split range unit function); this unit is intended for installation in the drive.

After the voltage supply is applied and after initialisation, the drive moves to each valve stroke between 0% and 100%, depending on the control signal. The electronics and the path measurement system ensure that no stroke is lost, and the drive does not require re-initialisation at intervals. When the end positions are reached, the position is checked, corrected as necessary and stored again. This ensures parallel running of several drives of the same SUT type. Feedback signal $y_0 = 0...10\text{ V}$ corresponds to the effective valve stroke of 0 to 100%.

If the 0...10 V control signal is interrupted in direction of action 1, the spindle retracts completely and the valve is closed. So that the valve can be opened (direction of action 1), a voltage of 10 V must be connected between terminals 1 and 3u, or it is necessary to switch over to direction of action 2.

The coding switch can be used to set the characteristic for the valve. Equal-percentage and square characteristics can only be produced if the device is used as a continuous-action drive. Further switches can be used to select the run-times (can be used for the 2-position, 3-position or continuous functions).

LED display

- Both LEDs flashing red: initialisation procedure
- Upper LED lit red: upper limit stop or "CLOSED" position reached
- Lower LED lit red: lower limit stop or "OPEN" position reached
- Upper LED flashing green: drive running, moving towards "CLOSED" position
- Upper LED lit green: drive stationary, last direction of running "CLOSED"
- Lower LED flashing green: drive running, moving towards "OPEN" position
- Lower LED lit green: drive stationary, last direction of running "OPEN"
- Both LEDs are lit green: waiting time after switching on, or after emergency function
- No LED lit: no voltage supply (terminal 2a or 2b)
- Both LEDs are flashing red and green: drive is in manual mode

Accessories application

Split range unit

This accessory can be built into the drive or can be accommodated externally in an electrical distribution box. The starting point U_0 and the control span ΔU can be set with the help of a potentiometer. This makes it possible to operate several regulating units in sequence or in a cascade with the control signal from the controller. The input signal (partial range) is converted into an output signal of 0...10 V.

Auxiliary changeover switch

- Auxiliary changeover switch double 0372333 001
- Switching capacity max. 250 V~, min. current 250 mA at 12 V (or 20 mA at 20 V)
 - Switching capacity max. 12...30 V=, max. current 100 mA

- Auxiliary changeover switch double gold 0372333 002
- Switching capacity max. 250 V~, min. current 1 mA at 5 V
 - Switching capacity max. 0.1...30 V=, current 1...100 mA

Even if used only once above 10 mA or up to 50 V, the gold coating will be destroyed. The switch can then be used only for higher switching outputs.

CE - Conformity

Directive EMC 2004/108/ES	Low Voltage Directive 2006/95/ES
EN 61000-6-2 *)	EN 60730 1
EN 61000-6-4	EN 60730-2-14
	Over-voltage category III
	Degree of pollution III

*) limitation of HF resistance:
feedback signal between 80 MHz and 1000 MHz criterion B, otherwise criterion A

Engineering and installation notes

Penetration of condensate or dripping water, etc. along the valve spindle into the drive should be avoided.

The valve is plugged directly onto the drive and is fixed with screws (no further settings are needed). The drive is automatically connected to the valve spindle. When the device is delivered, the drive spindle is in the middle position.

The housing contains three breakthrough-type cable leadthroughs which are broken open automatically when the cable leadthrough is screwed in. The stepping motor/ electronics concept guarantees parallel running of several valve drives of the same type. The cross-section of the connecting cable should be selected according to the line length and the number of drives. With five drives connected in parallel and a line length of 50 m, we recommend using a cable cross-section of 1.5 mm² (power consumption of the drive × 5). The drive can be assembled with a maximum of one 230 V module, one additional accessory component (auxiliary switch or potentiometer) and the split range unit.

Warnings

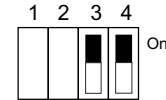
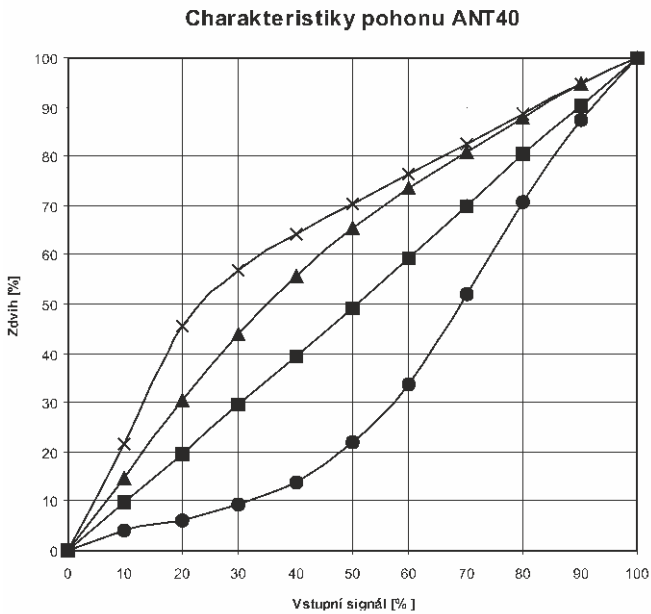
If the temperature of the medium in the valve is high, the drive columns and the shaft may also reach high temperatures. It is necessary to ensure that the maximum ambient temperature be max. 55°C during operation. If the temperature exceeds this limit, it is recommended to insulate the valve (eg. IKA insulation, see cataloguesheet 01-09.6).

If a failure of the final control element could cause damage, additional protective precautions must be taken.

Switch coding

Actuator characteristic (switches 3 and 4)

- optional for actuators with floating control only



A (Linear)



B (Quadratic)




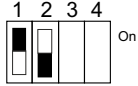

C (Logarithmic)



D (Equal percentage)

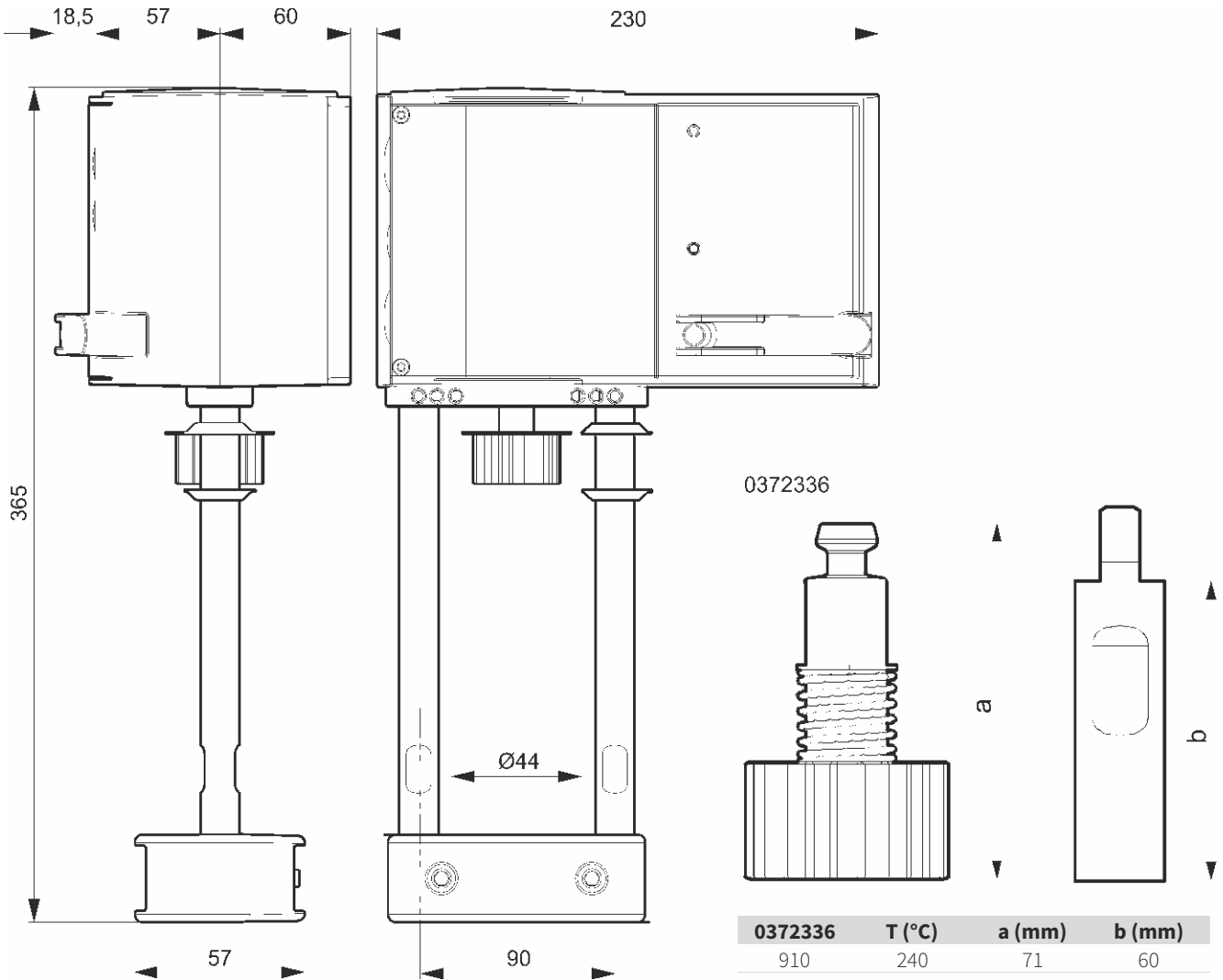
Run time (switches 1 and 2)

- optional for all types of control of the actuator

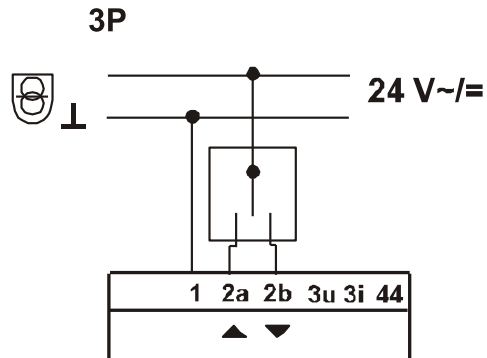
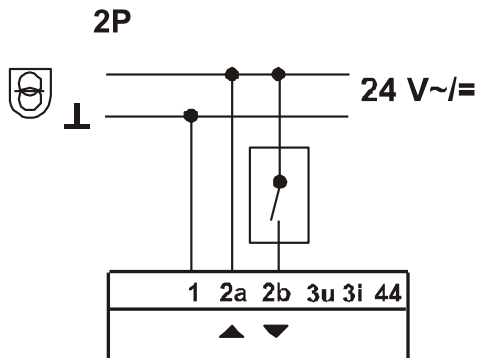
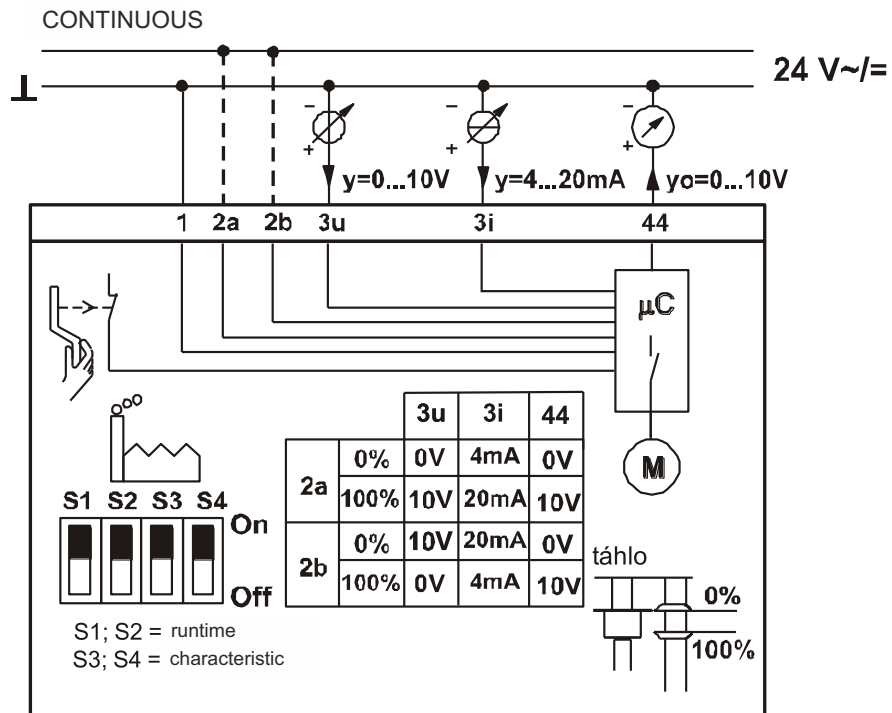
Run time per mm	Switch coding	Run time for 20 mm stroke	Run time for 40 mm stroke
2 s / mm	 On	40 s ± 1	80 s ± 2
4 s / mm	 On	80 s ± 2	160 s ± 4
6 s / mm	 On	120 s ± 4	240 s ± 8

Note: Data in bold mean factory settings

Dimensions of actuator and a mid piece for higher temperatures

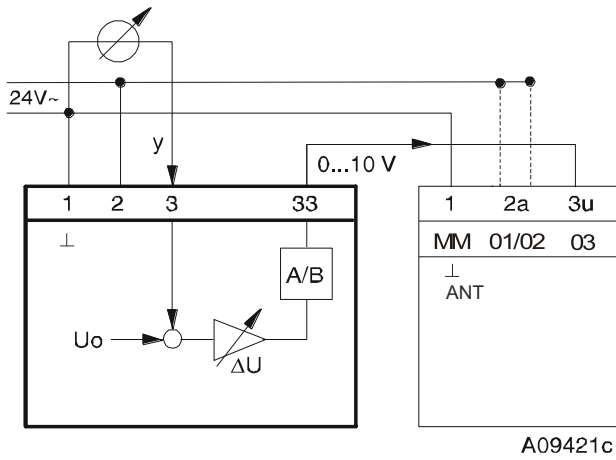


Wiring diagram of actuators

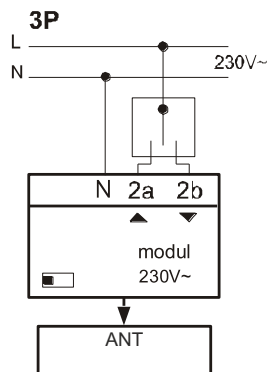
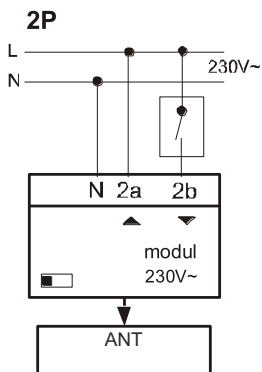
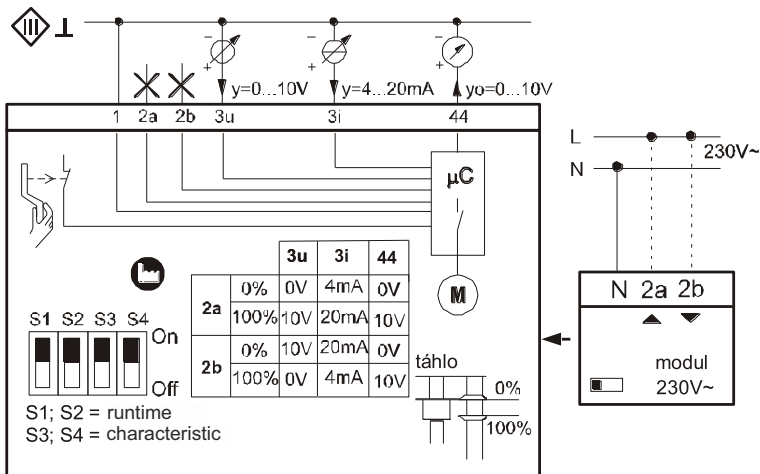


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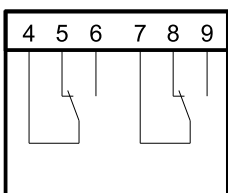


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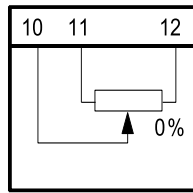
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0372333



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0372334



A01363

Accessories

- 0313529 001** Split range unit to set sequences
- 0372332 001** Module, plug-in type, for 230 V \pm 15% voltage supply and 3-point activation, additional power 2 VA
- 0372333 001** 2 auxiliary changeover switches, continuously adjustable, additional load 5(2) A, 12 - 250 V, 3(1) A, 12 - 250 V AC ¹⁾
- 0372333 002** 2 auxiliary changeover contacts with gold-plated contacts for low currents from 1 mA, max. 30 V, 3(1) A, 12 - 250 V AC ¹⁾
- 0372334 001** Potentiometer 2000 Ω , 1 W, 24 V ¹⁾
- 0372334 006** Potentiometer 1000 Ω , 1 W, 24 V ¹⁾
- 0372336 910** Intermediate piece (required for medium above 200 up to 240°C)
- 0386263 001** Screwed cable gland M16 x 1,5
- 0386263 002** Screwed cable gland M20 x 1,5 (1 piece of cable gland is standard part of actuator delivery)

¹⁾ one option of accessory can be used only

Operation

After a new start, or after a start following activation of the reset (terminal 21), up to 45 s of waiting time will pass before the drive is available again. Depending on the type of connection (see the wiring diagram), the device can be used as a continuous-action drive (0...10 V and/or 4...20 mA), a 2-point drive (open-closed) or a 3-position drive (open-stop-closed).

Initialisation and feedback signal

The drive initialises itself automatically, whether it is used in continuous-action, 2-position or 3-position mode. As soon as voltage is applied to the drive for the first time and the waiting period has elapsed, the drive moves to the lower limit stop on the valve, thus enabling automatic connection with the valve spindle. Then it moves to the upper limit stop, and the value is recorded and saved with the help of a path measurement system. The control signal and the feedback signal are adjusted to this effective stroke. After an interruption to the voltage or a spring return action, no re-initialisation is performed and the values are saved.

To re-initialise, the drive must be connected to the voltage. To trigger an initialisation, fold the hand crank out and back in again twice within 4 seconds. Both the LEDs will then flash red.

During initialisation, the feedback signal is inactive, or it corresponds to a value of "0". Initialisation uses the shortest run time. The re-initialisation is only valid once the entire procedure has been completed. Folding the hand crank out again will interrupt the procedure.

If the valve drive detects a blockage, it will report this by setting the feedback signal to 0 V after approx. 90 s. However, the drive will try to overcome the blockage during this time. If it is possible to overcome the blockage, the normal control function is activated again and the feedback signal is resumed.

Spring return

If the voltage supply fails or is switched off, or if a monitoring contact responds, the brushless DC motor releases the gear and the drive is moved into the respective end position (depending on the design version) by the pre-tensioned spring. As this happens, the control function of the drive is disabled for 45 s (both LEDs flash green) so that the end position can be reached in every case. The reset speed is controlled with the help of the motor so that there are no pressure surges in the line. The brushless DC motor has three functions: as a magnet to hold the position, as a brake (by acting as a generator) and as a motor for the control function. After a spring return function, the drive does not re-initialise itself.

Connection as a 2-position valve drive (24 V)

This activation (OPEN/CLOSED) can take place via two cables. The voltage is applied to terminals 1 and 2a. Applying the voltage (24 V) to terminal 2b opens the valve's control passage.

After this voltage has been switched off, the drive moves to the opposite end position and closes the valve. The electronic motor switch-off responds in the end positions (valve limit stop, or when maximum stroke is reached) or in case of overload (no limit switches).

The coding switch can be used to set the run times. The characteristic curve cannot be selected in this case (resulting in the characteristic curve for the valve). Terminals 3i and 3u must not be connected.

Connection as a 3-position valve drive (24 V)

Applying voltage to terminal 2a (or 2b) makes it possible to move the valve to any desired position. If voltage is applied to terminals 1 and 2b, the valve shaft moves out and opens the valve. It moves in and closes the valve when the electrical circuit is closed over terminals 1 and 2a.

In the end positions (at the valve stop, or when the maximum stroke is reached) or in case of an overload, the electronic motor switch-off responds (no limit switches). The direction of the stroke can be changed by transposing the connections.

The coding switch is used to set the run times. In this case, the characteristic curve cannot be selected (resulting in the characteristic curve for the valve). The feedback signal is active as long as the initialisation is performed and there is voltage present at terminal 21. Terminals 3i, 3u must not be connected

Connection as a 3-position valve drive with 230 V

The accessory module is plugged on in the connection area and is then connected for 3-position mode. If this accessory is used, only control in 3-position mode is available. The coding switch on the baseboard can be used to select the run times. The characteristic curve cannot be selected; the characteristic curve for the valve is applicable.

The module has a built-in switch which is automatically moved into the correct position when the module is installed. With this application, the switching lever is in the upper position.

Connection to a control voltage (0...10 V and/or 4...20 mA)

The built-in positioner controls the drive depending on the controller output signal.

The control signal used is a voltage signal (0...10 V-) at terminal 3u, or a current signal at terminal 3i. If a control signal is present at both terminals (3u (0...10 V) and 3i (4...20 mA)) simultaneously, the input with the higher value takes priority.

Mode of action 1 (mains voltage to internal connection 2a):

as the output signal increases, the valve shaft moves out and opens the valve (control passage).

Mode of action 2 (mains voltage to internal connection 2b):

as the output signal increases, the valve shaft moves in and closes the valve (control passage).

The starting point and the control span are fixed. To set partial ranges (and only for voltage input 3u), a split range unit is available as an accessory (see the split range unit function); this unit is intended for installation in the drive.

After the voltage supply is applied and after initialisation, the drive moves to each valve stroke between 0% and 100%, depending on the control signal. The electronics and the path measurement system ensure that no stroke is lost, and the drive does not require re-initialisation at intervals.

When the end positions are reached, the position is checked, corrected as necessary and stored again. This ensures parallel running of several drives of the same type. Feedback signal $y_0 = 0...10$ V corresponds to the effective valve stroke of 0 to 100%.

LED display

Both LEDs flashing red: initialisation procedure

Upper LED lit red: upper limit stop or "CLOSED" position reached | Lower LED lit red: lower limit stop or "OPEN" position reached

Upper LED flashing green: drive running, moving towards "CLOSED" position | Upper LED lit green: drive stationary, last direction of running "CLOSED"

Lower LED flashing green: drive running, moving towards "OPEN" position | Lower LED flashing green: drive stationary, last direction of running "OPEN"

Both LEDs are lit green: waiting time after switching on, or after emergency function | No LED lit: no voltage supply (terminal 2a or 2b)

Both LEDs are flashing red and green: drive is in manual mode

Accessories application

Split range unit

This accessory can be built into the drive or can be accommodated externally in an electrical distribution box. The starting point U_0 and the control span ΔU can be set with the help of a potentiometer. This makes it possible to operate several regulating units in sequence or in a cascade with the control signal from the controller. The input signal (partial range) is converted into an output signal of $0...10$ V.

Auxiliary changeover switch

Auxiliary changeover switch double 0372333001

- Switching capacity max. 250 V~, min. current 250 mA at 12 V (or 20 mA at 20 V)
- Switching capacity max. 12...30 V=, max. current 100 mA

Auxiliary changeover switch double gold 0372333002

- Switching capacity max. 250 V~, min. current 1 mA at 5 V
- Switching capacity max. 0.1...30 V=, current 1...100 mA

Even if used only once above 10 mA or up to 50 V, the gold coating will be destroyed. The switch can then be used only for higher switching outputs.

CE - Conformity

Directive EMC 2004/108/ES

EN 61000-6-2 *)
EN 61000-6-4

Low Voltage Directive 2006/95/ES

EN 60730 1
EN 60730-2-14
Over-voltage category III
Degree of pollution III

*) limitation of HF resistance:
feedback signal between 80 MHz and 1000 MHz criterion B, otherwise criterion A

If the control signal $0...10$ V is interrupted in mode of action 1, the spindle moves in completely and the valve is closed. So that the valve can be opened (direction of action 1), a voltage of 10 V must be connected between terminals 1 and 3u, or it is necessary to switch over to direction of action 2.

The coding switch can be used to set the characteristic curve for the valve: linear, equal percentage or quadratic. This characteristic curve can only be generated if the drive is used as a continuous drive. Additional switches can be used to select the run times (applicable for 2-position, 3-position or continuous function).

Engineering and installation notes

Penetration of condensate or dripping water, etc. along the valve spindle into the drive should be avoided.

The valve is plugged directly onto the drive and is fixed with screws (no further settings are needed). The drive is automatically connected to the valve spindle. When the device is delivered, the drive spindle is in the middle position.

The housing contains three breakthrough-type cable leadthroughs which are broken open automatically when the cable leadthrough is screwed in. The stepping motor/ electronics concept guarantees parallel running of several valve drives of the same type. The cross-section of the connecting cable should be selected according to the line length and the number of drives. With five drives connected in parallel and a line length of 50 m, we recommend using a cable cross-section of 1.5 mm^2 (power consumption of the drive $\times 5$). The drive can be assembled with a maximum of one 230 V module, one additional accessory component (auxiliary switch or potentiometer) and the split range unit.

Warnings

If the temperature of the medium in the valve is high, the drive columns and the shaft may also reach high temperatures. It is necessary to ensure that the maximum ambient temperature be max. 55°C during operation. If the temperature exceeds this limit, it is recommended to insulate the valve (eg. IKA insulation, see catalogue sheet 01-09.6).

If a failure of the final control element could cause damage, additional protective precautions must be taken.



Electric actuators

LDM

ANT40.11S
ANT40.11R

The actuator is designed for regulators with continuous or contact output. They are suitable for actuating two-way or three way valves series RV 113 and RV 2xx. The actuator is equipped with a spring ensuring the actuator runs into its defined end position in case of power supply failure or when the sensor of limit value is activated. The actuator consists of a cover made of self-extinguishing plastic housing stepping motor, control unit with SUT technology, signalisation LEDs and no-maintenance gear made of sintered steel and spring roll. The connection to its valve is provided by stainless steel columns and yoke made of light metal alloy. Electric connection (max. 2,5 mm²) is provided with the aid of screw clamps. There are three self-breaking openings for cable glands M20x1,5 (2x) and M16x1,5. One cable gland M20x1,5 is a part of standard delivery.

Application

Based on a connection variant (see wiring diagram), the actuator can be used as floating (0...10 V or 4...20 mA), or 2-position (open-closed) or 3-position (open-stop-closed). Manual operating is with outer hand crank. The motor is disconnected when the hand crank is folded out. When the hand crank is folded back, the actuator resumes into required position (without initialization). If the hand crank remains folded out, the actuator keeps its set position.

SUT technology

The actuator can be controlled by regulators with continuous (0...10V and/or 4...20 mA) or contact (2-position or 3-position) output. The actuator feeding is optional. The running speed and output characteristic is also optional.

Installation position

Upright, vertical, max. horizontal.

Features

- electronic switch off based on the running force registered by stops inside appliance or valve.
- automatic adapting to the valve stroke
- code switch for characteristic and running time selection
- hand crank for manual operating with swithing the motor off as a start for new initiation
- possibility of direction change of control signal (feeding voltage at terminal 2a or 2b)

Direct and indirect function of actuator

Direct function ensures that actuator stem extends (the valve opens) upon power supply failure.

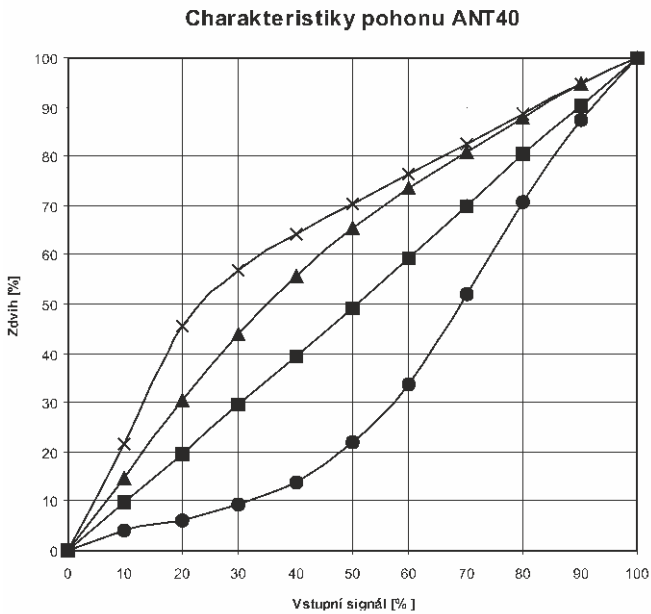
Indirect function ensures that actuator stem retracts (the valve closes) upon power supply failure.

Technical data		
Type	ANT40.11S	ANT40.11R
Specification code	EVI	
Execution	Electric actuator with spring return action and SUT technology	
Voltage	24 V AC ± 20%, 50 - 60 Hz; 24 V DC ± 15%; 230 V AC ± 15%	
Frequency	50 Hz	
Powe consumption	in operation mode 20 VA, out of operation 7 VA	
Control	0 - 10 V, 4 - 20 mA, 3-position, 2-position	
Open-close running time	Adjustable 2, 4, 6 s.mm ⁻¹	
Running time for fail-safe function	Acc. to stroke 15 - 30 s	
Fail-safe function	Indirect (NC)	Direct (NO)
Nominal force	2000 N	
Stroke	20 a 40 mm	
Enclosure	IP 66	
Process medium max. temperature	200°C, with a mid piece up to 240°C	
Ambient temperature range	-10 to 55 °C	
Ambient humidity range	< 95 % r. v.	
Weight	6,1 kg	

Switch coding

Actuator characteristic (switches 3 and 4)

- optional for actuators with floating control only



A (Linear)



B (Quadratic)



C (Logarithmic)



D (Equal percentage)

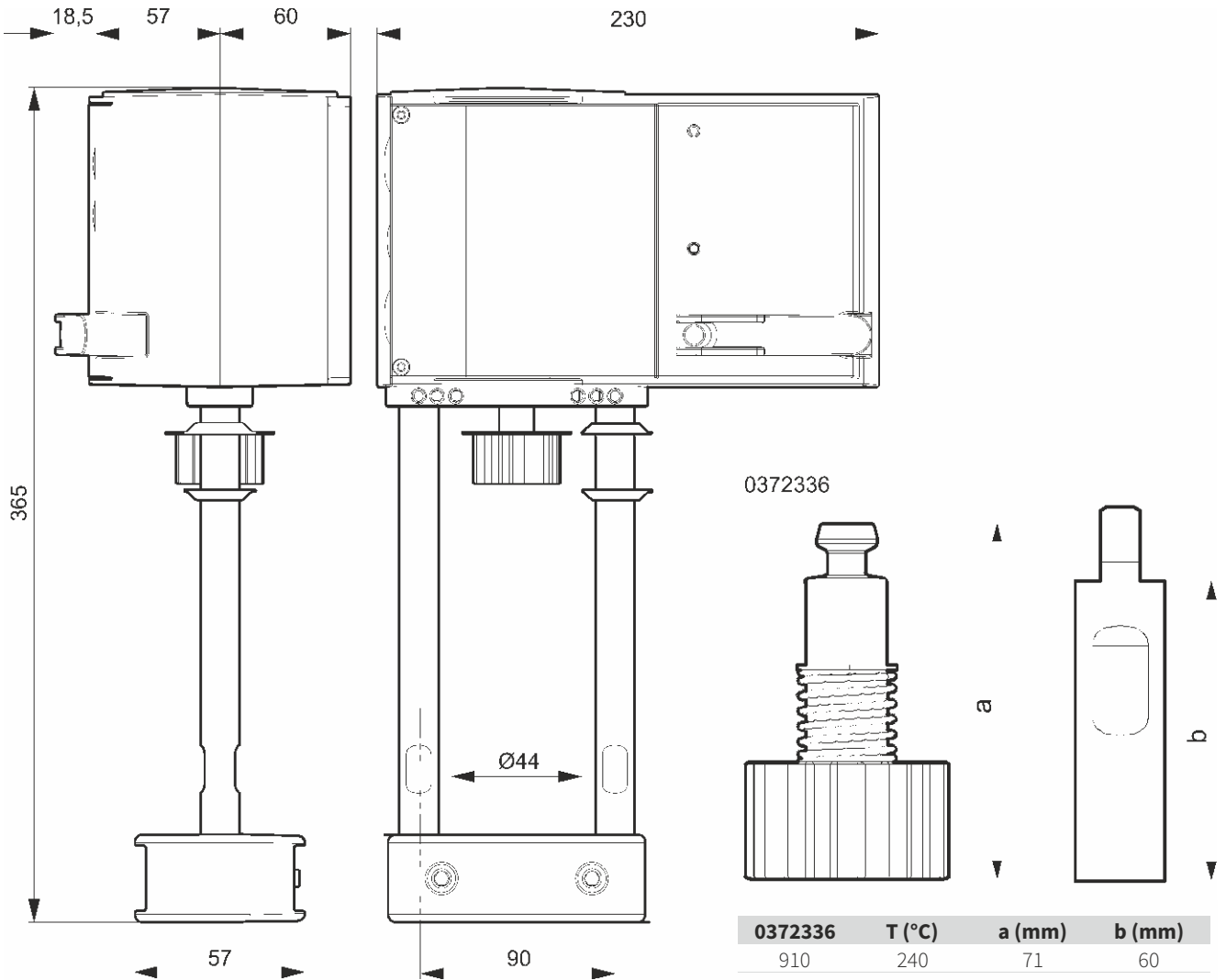
Run time (switches 1 and 2)

- optional for all types of control of the actuator

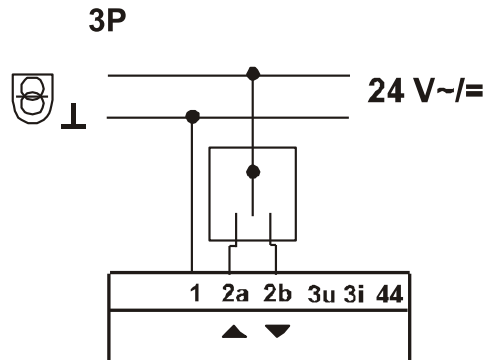
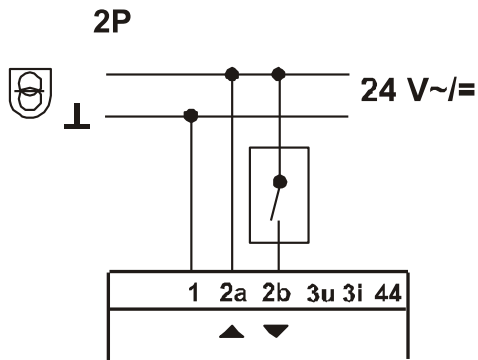
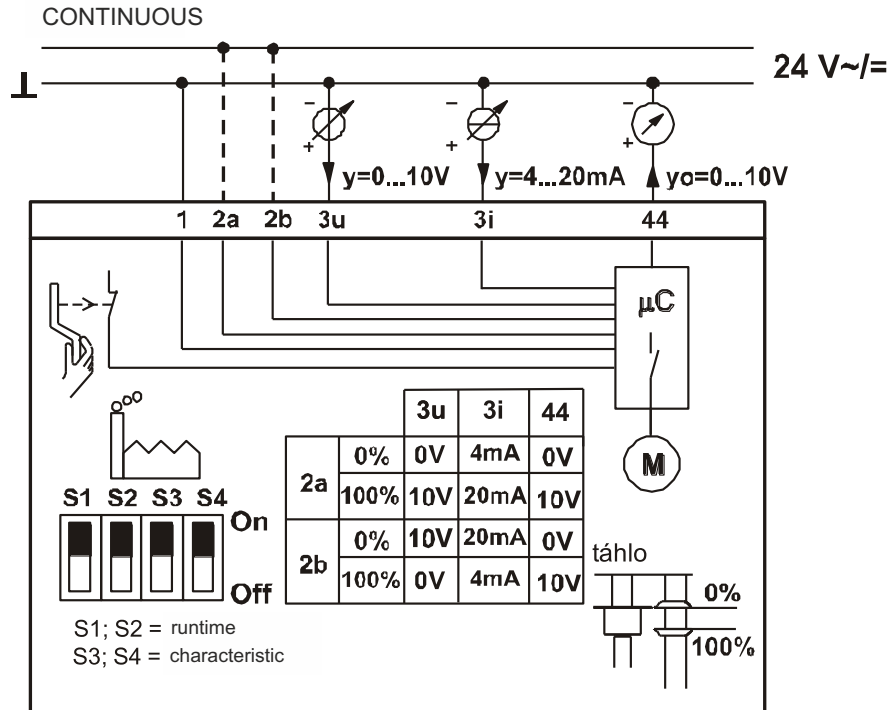
Run time per mm	Switch coding	Run time for 20 mm stroke	Run time for 40 mm stroke
2 s / mm		40 s ± 1	80 s ± 2
4 s / mm		80 s ± 2	160 s ± 4
6 s / mm		120 s ± 4	240 s ± 8

Note: Data in bold mean factory settings

Dimensions of actuator and a mid piece for higher temperatures

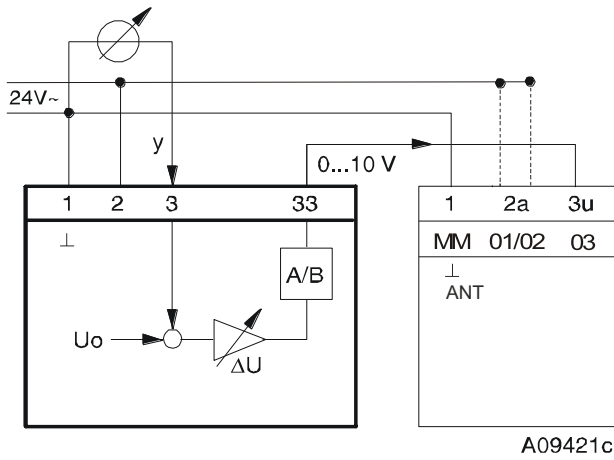


Wiring diagram of actuators

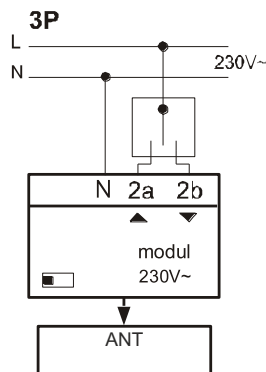
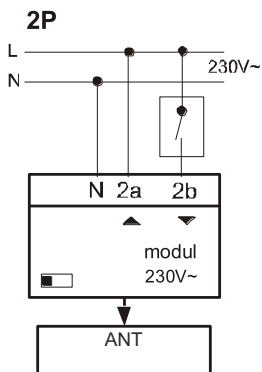
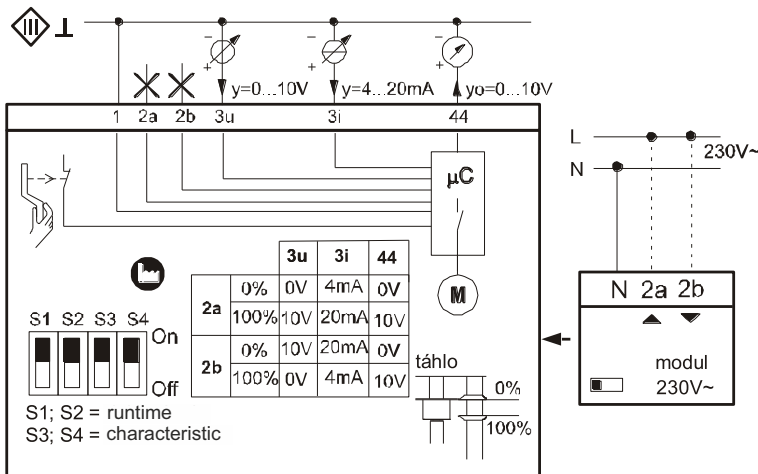


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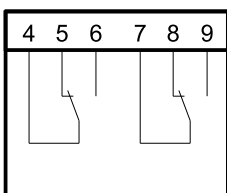


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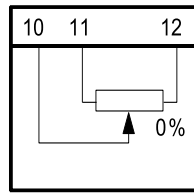
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Maximal permissible operating pressures [MPa] acc. to ČSN EN 12516-1, ČSN EN 1092-2															
Material	PN	Temperature [°C]													
		RT ¹⁾	100	120	150	200	250	300	350	375	400	425	450	475	500
Spher. cast iron EN-JS 1025 (EN-GJS-400-18-LT)	16	1,60	1,60	1,60	1,55	1,47	1,39	1,28	1,12	---	---	---	---	---	---
	25	2,50	2,50	2,50	2,43	2,30	2,18	2,00	1,75	---	---	---	---	---	---
	40	4,00	4,00	4,00	3,88	3,68	3,48	3,20	2,80	---	---	---	---	---	---
Cast steel 1.0619 (GP240GH)	16	1,56	1,36	1,32	1,27	1,14	1,04	0,94	0,88	0,86	0,84	---	---	---	---
	25	2,44	2,13	2,07	1,98	1,78	1,62	1,47	1,37	1,35	1,32	---	---	---	---
	40	3,90	3,41	3,31	3,17	2,84	2,60	2,35	2,19	2,16	2,11	---	---	---	---
Chrommolybden steel 1.7357 (G17CrMo5-5)	16	1,63	1,63	1,61	1,58	1,49	1,43	1,33	1,23	1,20	1,15	1,11	1,07	1,00	0,89
	25	2,55	2,54	2,51	2,48	2,33	2,23	2,08	1,93	1,88	1,80	1,73	1,67	1,56	1,39
	40	4,08	4,07	4,02	3,96	3,74	3,57	3,33	3,09	3,00	2,89	2,77	2,67	2,50	2,23
Stainless steel 1.4581 (GX5CrNiMoNb19-11-2)	16	1,59	1,44	1,39	1,33	1,25	1,17	1,10	1,06	1,05	1,02	1,02	1,01	1,00	0,89
	25	2,49	2,25	2,18	2,08	1,95	1,84	1,72	1,66	1,63	1,60	1,59	1,58	1,56	1,39
	40	3,98	3,60	3,49	3,33	3,13	2,94	2,75	2,65	2,61	2,56	2,54	2,52	2,50	2,23
Stainless steel 1.4308 (GX5CrNi19-10)	16	1,52	1,17	1,12	1,06	0,96	0,89	0,83	0,79	0,77	0,74	0,74	0,72	0,71	0,70
	25	2,37	1,84	1,76	1,66	1,50	1,40	1,30	1,23	1,20	1,16	1,15	1,13	1,11	1,09
	40	3,79	2,94	2,82	2,65	2,41	2,24	2,08	1,97	1,91	1,86	1,84	1,80	1,78	1,74

¹⁾ -10°C to 50°C



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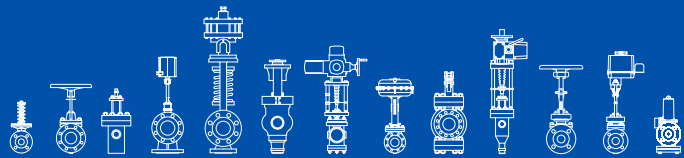
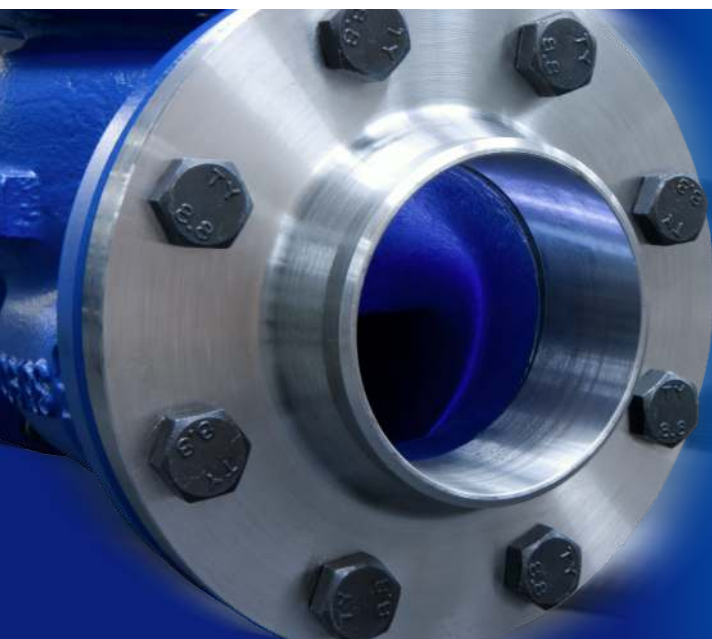
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