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Control valves
and steam-conditioning station
500 line

Kv coefficient calculation

Calculation itself is carried out with respect to conditions of regulating circuit and operating medium according to equations mentioned below. Control valve must be designed to be able to regulate maximal flow quantity at given operating conditions. At the same time it is necessary to check whether minimal flow quantity can be even regulated or not.
Because of eventual minus tolerance 10% of Kv_{100} against Kvs and requirement for possible regulation within range of maximal flow (decrement and increase of flow), producer recommends to select Kvs value higher than maximal operating Kv value:

$$Kvs = 1.2 \div 1.3\ Kv$$

It is necessary to take into account to which extent Q_{max} involve "precautionary additions" that could result in valve oversizing.

Relations of Kv calculation

		Pressure drop $p_2 > p_1/2$ $\Delta p < p_1/2$	Pressure drop $\Delta p \geqq p_1/2$ $p_2 \leqq p_1/2$
Kv =	Liquid	$\frac{Q}{100}\sqrt{\frac{\rho_1}{\Delta p}}$	
	Gas	$\frac{Q_n}{5141}\sqrt{\frac{\rho_n . T_1}{\Delta p . p_2}}$	$\frac{2.Q_n}{5141.p_1}\sqrt{\rho_n . T_1}$
	Superh. steam	$\frac{Q_m}{100}\sqrt{\frac{v_2}{\Delta p}}$	$\frac{Q_m}{100}\sqrt{\frac{2v}{p_1}}$
	Sat. steam	$\frac{Q_m}{100}\sqrt{\frac{v_2 . x}{\Delta p}}$	$\frac{Q_m}{100}\sqrt{\frac{2v.x}{p_1}}$

Above critical flow of vapours and gases

When pressure ratio is above critical ($p_2 / p_1 < 0.54$), speed of flow reaches acoustic velocity at the narrowest section. This event can cause higher level of noisiness and then it is convenient to use a throttling system ensuring low noisiness (multi-step pressure reduction, damping orifice plate at outlet).

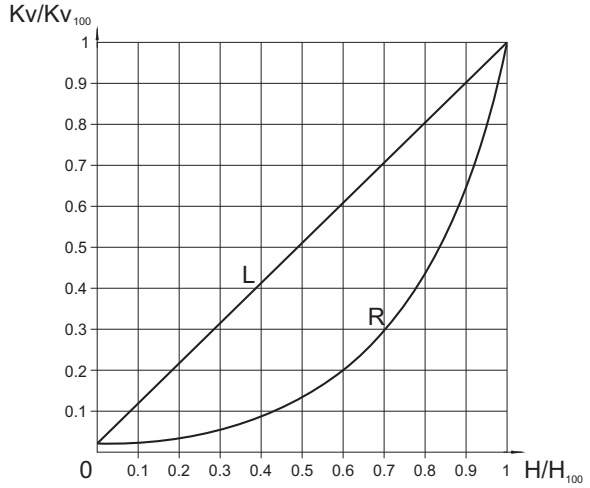
Cavitation

Cavitation is a phenomenon when there are steam bubbles creating and vanishing in shocks - generally at the narrowest section of flowing due to local pressure drop. This event expressively cuts down service life of inner parts and can result in creation of unpleasant vibrations and noisiness. In control valves it can happen on condition that

$$(p_1 - p_2) \geqq 0.6\ (p_1 - p_s)$$

Valve differential pressure should be set the way so that neither any undesired pressure drop causing cavitation can occur, nor liquid-steam(wet steam) mixture can create. Otherwise it must be taken into account when calculating Kv value. If the creation of cavitation still threatens, it is necessary to use a multi-step pressure reduction.

Valve flow characteristics



L - linear characteristic

$$Kv/Kv_{100} = 0.0183 + 0.9817 . (H/H_{100})$$

R - equal-percentage characteristic (4-percentage)

$$Kv/Kv_{100} = 0.0183 . E^{(4 . H/H_{100})}$$

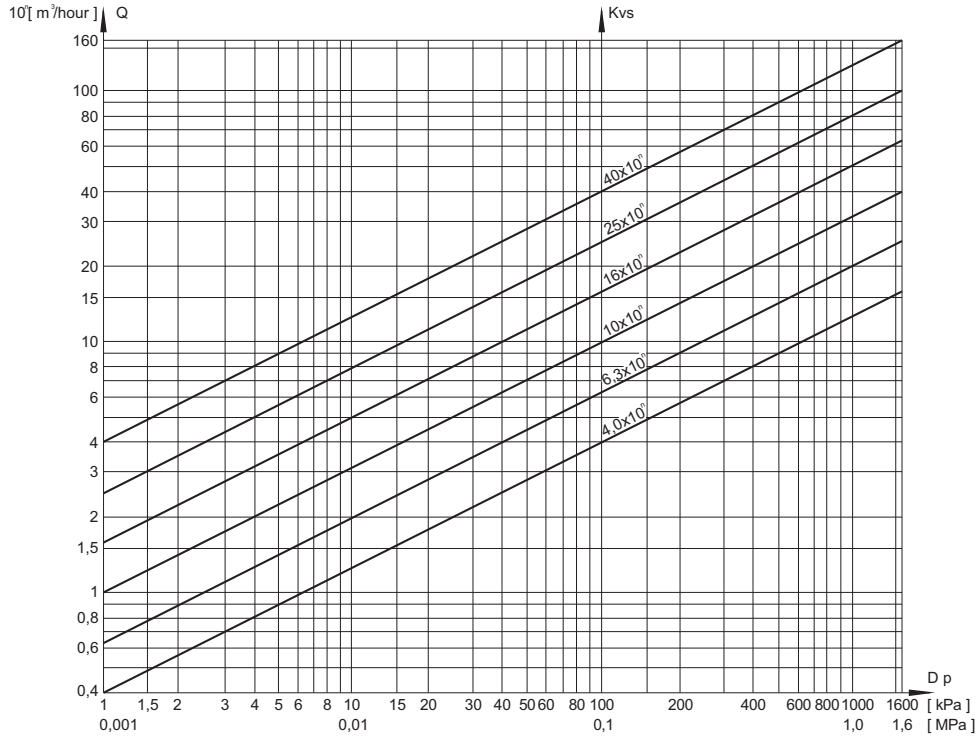
Rangeability

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.

Dimensions and units

Marking	Unit	Name of dimension
Kv	m^3/hour	Flow coefficient under conditions of units of flow
Kv_{100}	m^3/hour	Flow coefficient at nominal stroke
Kvs	m^3/hour	Valve nominal flow coefficient
Q	m^3/hour	Flow rate in operating conditions (T_1, p_1)
Q_n	Nm^3/hour	Flow rate in normal conditions (0 °C, 0.101 MPa)
Q_m	kg/hour	Flow rate in operating conditions (T_1, p_1)
p_1	MPa	Upstream absolute pressure
p_2	MPa	Downstream absolute pressure
p_s	MPa	Absolute pressure of saturated steam at given temperature (T_1)
Δp	MPa	Valve differential pressure ($\Delta p = p_1 - p_2$)
ρ_1	kg/m^3	Process medium density in operating conditions (T_1, p_1)
ρ_n	kg/Nm^3	Gas density in normal conditions (0 °C, 0.101 MPa)
v_2	m^3/kg	Specific volume of steam when temperature T_1 and pressure p_2
v	m^3/kg	Specific volume of steam when temperature T_1 and pressure $p_1/2$
T_1	K	Absolute temperature at valve inlet ($T_1 = 273 + t_1$)
x	1	Proportionate weight volume of saturated steam in wet steam

Diagram for the valve Kvs value specification according to the required flow rate of water Q and the valve differential pressure Δp



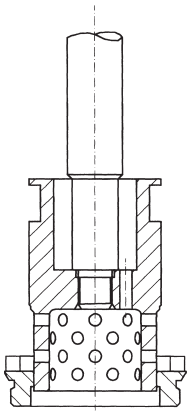
The diagram serves to specify the valve Kvs value regarding to the required flow rate of water at a given differential pressure. It can be also used for finding out the differential pressure value of the existing valve in behaviour with the flow rate. The diagram apllies to water with the density of 1000 kg/m^3.

For the value Q = q .10^n, it is necessary to calculate with Kvs = k .10^n. Example: water flow rate of 16 .10^{-1} = 1,6 m^3 /hour corresponds to Kv = 2,5 = 25. 10 when differential pressure 40kPa.

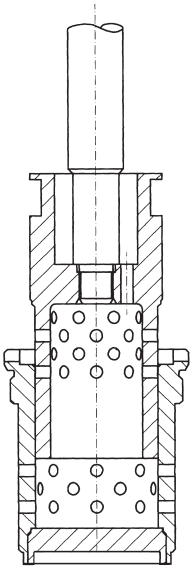
Application of multi-step pressure reduction

When the valves are designed for operation in above-critical differential pressure (p_2/p_1 <0,54 when throttling steam and gases), or when diff. pressure value is higher than the recommended service diff. pressure, it is effectual to use a throttling system in two or three steps to prevent the cavitation from creating and to ensure both a long service life of the valve inner parts and low noisiness when operating.

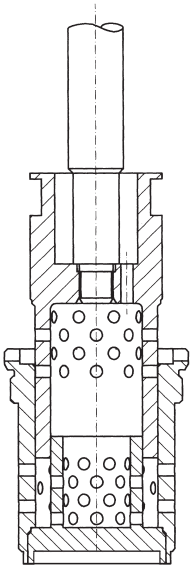
One-step pressure reduction



Two-step pressure reduction



Three-step pressure reduction



RV 501

Control valves
DN 15 to 150 , PN 16 to 160

Description

The valves series RV 501 are single-seated control valves of a unit construction designed to fit in all demands of an appliance the valve is designed for. The pressure-balanced, multi-step throttling system is always designed with regard to the resistance to creation and effects of cavitation and noisiness.

The valves can be delivered with weld ends or flanges having faces acc. to the customer´s requirements and demands.

The valves are actuated with linear actuators. The connection is designed for using both domestic and foreign actuators of the following producers: ZPA Pečky, Regada Prešov, Auma, Schiebel and Flowserve.

Process media

The valves are especially designed for the flow and pressure control of the process medium without impurities, however they can be used for gases and vapours when inlet and outlet flow velocities are kept within the permissible range. The common process media are for example water, steam and other media with no special demands on the used type of material of the valve. The producer recommends to pipe a strainer into pipeline in front of the valve when impurities are present. Impurities can affect the quality and reliability of regulation and can cause a reduction of the valve service life.The valve application for any other media should be consulted with the producer because of the type of material that is in contact with the process medium.

Application

The sphere of application of these valves continues in the sphere of application for the valves series RV 210 to RV 235. They are especially designed for industry applications such as heating plants, power plants or regulation of technology processes. The max. permissible operating pressure values correspond to EN 12 516-1 see page 38 of this catalogue.

Installation

The valve is to be piped the way so that the direction of medium flow will coincide with the arrows on the body.

The valve can be installed in any position except position when the actuator is under the valve body. Detailed informations are given in the instruction for installation and service.

Recommended differential pressures

In regard to the pressure balancing of the plug and to linear forces of usable actuators, the valves´ application in high differential pressures is not limited by the forces caused by process medium pressure but by the type of used throttling system. A recommended max. differential pressure for one step of a multi-step pressure reduction is 4.0 MPa when perforated plug and perforated cage are used and 2.0 MPa when a parabolic plug is used. It is recommended to consult the producer and discuss the concrete cases with regard to pressure ratio and service parametres of other equipment.

Technical data

Series	RV 501	
Type of valve	Control valve, single-seated, straight-through, with pressure-balanced plug	
Nominal size range	DN 15 to 150	
Nominal pressure	PN 16 to 160	
Body material	Carbon steel 1.0619 (GP 240 GH)	Alloy steel 1.7357(G17CrMo5-5)
Material of weld ends	1.0425 (P 265 GH)	1.7335 (13CrMo4-5)
Seat material: DN 15 - 150	17 021.6 (1.4006) + stellited seat STELLIT 6	
Plug material: DN 15 - 150	17 123.6 (1.4078) hardened	
Operating temp. range	-20 to 400 °C	-20 to 550 °C
Connection flanges	For PN 16 to 160 acc. to ČSN EN 1092-1 (2/2003)	
Type of flanges	Type B1 acc. to ČSN EN 1092-1 (2/2003) - raised flange	
	Type F acc. to ČSN EN 1092-1 (2/2003) - female flange	
	Type B2 acc. to ČSN EN 1092-1 (2/2003) - plain flange	
Weld ends	Acc. to ČSN 13 1075	
Type of trim	One - three-step pressure reduction	
	Perforated plug - seat(cage), contoured plug for DN 15 and 25	
Flow characteristic	Linear, equal-percentage	
Leakage rate	Acc. to ČSN EN 1349 (5/2001) Class III	
Packing	Graphite	

Range of Kvs values

DN	15 *)	25 **)	40	50	65	80	100	125	150
Multi-step press. red.	Kvs values [m³/h] - linear characteristic								
1	0.32 - 3.2	0.1 - 8.0	2.5 - 20	3.2 - 32	6.3 - 50	8.0 - 80	10 - 125	10 - 125	16 - 250
2	0.32 - 3.2	0.1 - 8.0	2.0 - 20	2.5 - 32	5.0 - 50	8.0 - 80	8.0 - 100	8.0 - 100	12.5 - 250
3	---	1.6 - 8.0	2.0 - 20	2.5 - 32	4.0 - 40	8.0 - 80	8.0 - 80	8.0 - 80	12.5 - 200
Multi-step press. red.	Kvs values [m³/h] - equal-percentage characteristic								
1	0.63 - 3.2	0.1 - 8.0	6.3 - 20	6.3 - 25	6.3 - 32	16 - 50	16 - 63	16 - 63	25 - 125
2	0.63 - 3.2	0.1 - 6.3	5.0 - 16	5.0 - 20	5.0 - 25	12.5 -40	12.5 - 50	12.5 - 50	25 - 100
3	---	1.6 - 5.0	4.0 - 12.5	4.0 - 16	4.0 - 20	10 - 32	10 - 40	10 - 40	20 - 80

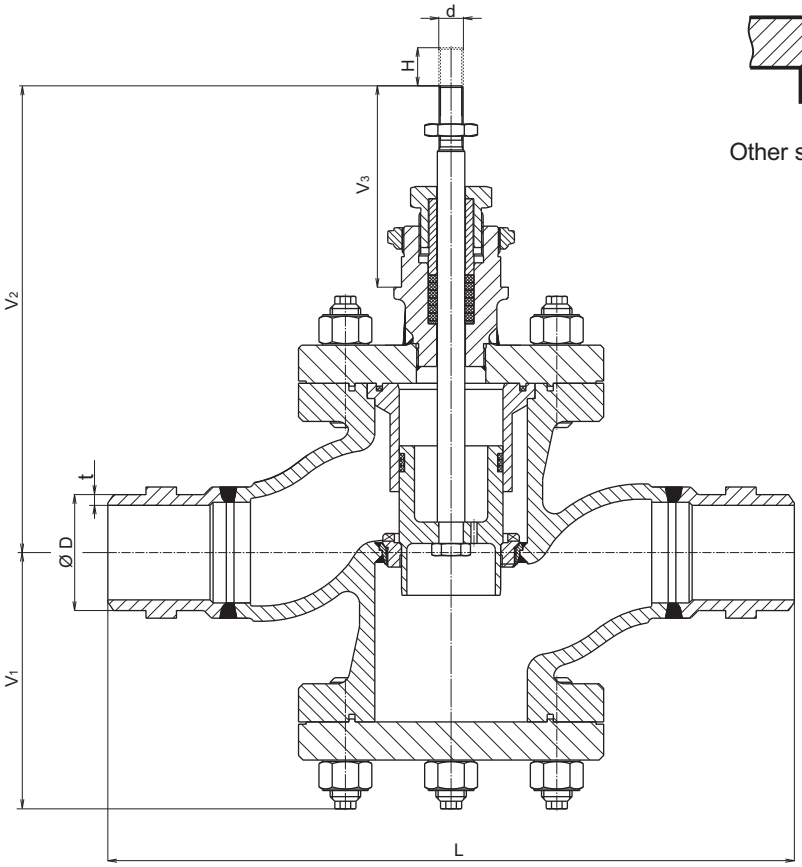
*) contoured plug
**) contoured plug for Kvs of 0,1 - 1,6 m3/h
Nominal values of Kvs are understood as multiples of 10 of the progression of selected numbers R10 (1.0; 1.25;1.6; 2.0; 2.5; 3.2; 4.0; 5.0; 6.3; 8.0; 10.0). They are specified individually for every valve acc. to the customer´s requirements and value within the appropriate range shown in the table above.

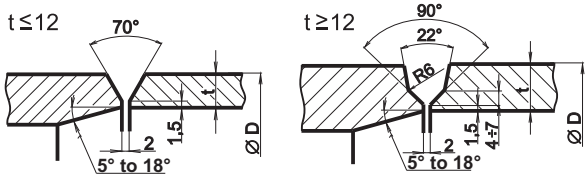
Dimensions and weights for the valve type RV 501 with weld ends

	PN 16	PN 25	PN 40	PN 63	PN 100	PN 160	PN 16 to 160							
DN	t	t	t	t	t	t	D	L	V_1	V_2	V_3	H	d	m
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[kg]
15	2.6	2.6	2.6	2.6	2.6	2.9	21.3	220	30	246	130	16	M10x1	6.5
25	2.6	2.6	2.6	2.6	2.9	4.0	33.7	270	100	254	130	16		11
40	2.6	2.6	2.6	2.9	3.6	5.0	48.3	300	129	265	130	25	M16x1,5	22
50	2.9	2.9	2.9	3.2	4.5	6.3	60.3	390	150	291	130	25		30
65	3.2	3.2	3.2	3.6	5.0	7.0	76.1	450	175	310	130	25		45
80	3.6	3.6	3.6	4.0	5.6	8.0	88.9	480	180	320	130	40		67
100	4.0	4.0	4.0	5.0	7.0	10	114.3	580	204	345	130	40		78
125	4.5	4.5	4.5	5.6	8	12.5	139.7	580	204	345	130	40		90
150	5.0	5.0	5.0	7.0	10	14	168.3	720	264	453	190	63	M20x1,5	220

Connecting dimensions of weld ends can be modified on request by the customer.

Control valve RV 501 with weld ends





Other shapes of weld ends after agreement with producer

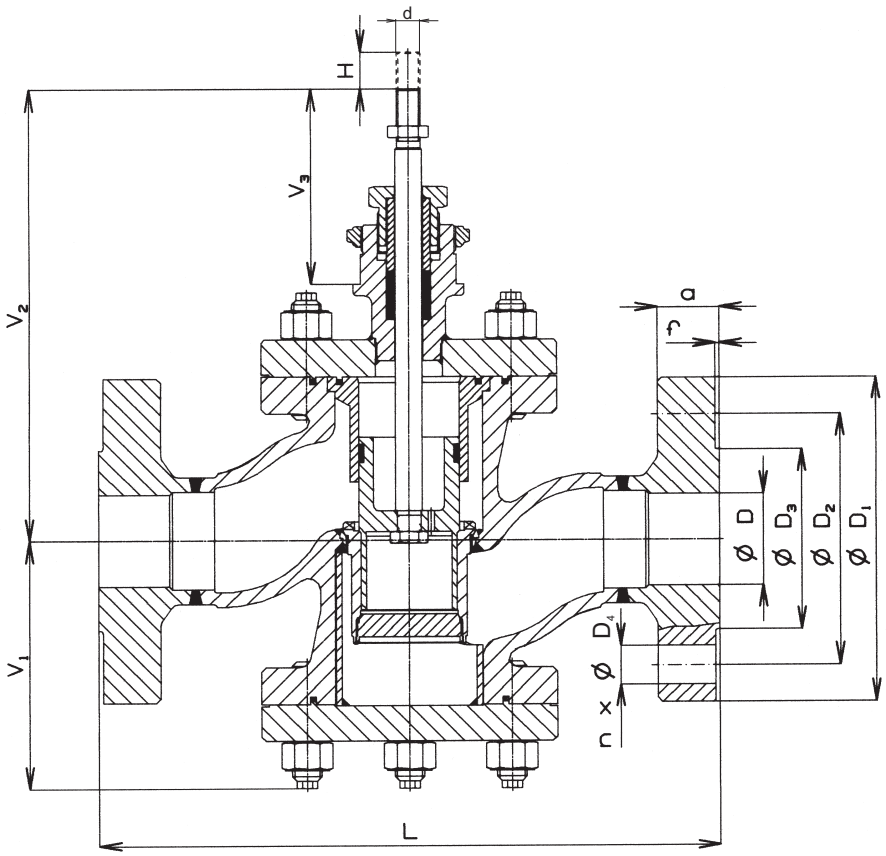
Dimensions and weights for the valve type RV 501 with flanges

	PN 16					PN 25					PN 40					PN 63				
DN	D_1	D_2	a	d	n	D_1	D_2	a	d	n	D_1	D_2	a	d	n	D_1	D_2	a	d	n
	[mm]	[mm]	[mm]	[mm]	[pcs]	[mm]	[mm]	[mm]	[mm]	[pcs]	[mm]	[mm]	[mm]	[mm]	[pcs]	[mm]	[mm]	[mm]	[mm]	[pcs]
15	95	65	16	14	4	95	65	16	14	4	95	65	16	14	4	105	75	20	14	4
25	115	85	18	14	4	115	85	18	14	4	115	85	18	14	4	140	100	24	18	4
40	150	110	18	18	4	150	110	18	18	4	150	110	18	18	4	170	125	26	22	4
50	165	125	18	18	4	165	125	20	18	4	165	125	20	18	4	180	135	26	22	4
65	185	145	18	18	8	185	145	22	18	8	185	145	22	18	8	205	160	26	22	8
80	200	160	20	18	8	200	160	24	18	8	200	160	24	18	8	215	170	28	22	8
100	220	180	20	18	8	235	190	24	22	8	235	190	24	22	8	250	200	30	26	8
125	250	210	22	18	8	270	220	26	26	8	270	220	26	26	8	295	240	34	30	8
150	285	240	22	22	8	300	250	28	26	8	300	250	28	26	8	345	280	36	33	8

	PN 100					PN 160					PN 16 do 160								
DN	D_1	D_2	a	D_4	n	D_1	D_2	a	D_4	n	D_3	V_1	V_2	V_3	L	f	H	d	m
	[mm]	[mm]	[mm]	[mm]	[ks]	[mm]	[mm]	[mm]	[mm]	[ks]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[kg]
15	105	75	20	14	4	105	75	20	14	4	45	30	246	130	230		16	M10x1	8
25	140	100	24	18	4	140	100	24	18	4	68	103	254	130	260	2	16		13
40	170	125	26	22	4	170	125	28	22	4	88	129	265	130	300		25		24
50	195	145	28	26	4	195	145	30	26	4	102	150	291	130	350		25		34
65	220	170	30	26	8	220	170	34	26	8	122	175	310	130	420		25	M16x1,5	50
80	230	180	32	26	8	230	180	36	26	8	138	180	320	130	450		40		73
100	265	210	36	30	8	265	210	40	30	8	162 [1]	204	345	130	520	3	40		86
125	315	250	40	33	8	315	250	44	33	8	188	204	345	130	520		40		86
150	355	290	44	33	12	355	290	50	33	12	218 [2]	264	453	190	680		63	M20x1,5	240

[1] for PN 16 ... 158 mm
[2] for PN 16 ... 212 mm

Control valve RV 501 with flanges



Valve complete specification No. for ordering RV 501

		XX	X X X	X X X	X X X X	X X		XXX	/	XXX	-	XXX
1. Valve	Control valve	RV										
2. Series	Control valve, straight-through		5 0 1									
3. Type of actuating	Electric actuator			E								
	Pneumatic actuator			P								
	Hand wheel			R								
	Electric actuator Modact MTN Control			E Y A								
	Electric actuator Modact MTP Control			E Y A								
	Electric actuator Modact MTNED, MTPED			E Y A								
	Electric actuator Modact MTN, MTP			E Y B								
	Electric actuator Modact MTR			E P D								
	Electric actuator Modact ST 2, STR 2, STR 2PA			E P M								
	Electric actuator Auma SA 07.2			E A A								
	Electric actuator Auma SA Ex 07.2			E A B								
	Electric actuator Auma SAR 07.2			E A C								
	Electric actuator Auma SAR Ex 07.2			E A D								
	Electric actuator Auma SA 07.6			E A E								
	Electric actuator Auma SA ExC 07.6			E A F								
	Electric actuator Auma SAR 07.6			E A G								
	Electric actuator Auma SAR ExC 07.6			E A H								
	Electric actuator Schiebel AB5			E Z E								
	Electric actuator Schiebel exAB5			E Z F								
	Electric actuator Schiebel rAB5			E Z G								
	Electric actuator Schiebel exrAB5			E Z H								
	Pneumatic actuator Flowserve PB 502			P F B								
	Pneumatic actuator Flowserve PB 700			P F C								
	Pneumatic actuator Flowserve PO 1502			P F D								
4. Connection	Flange with raised face				1							
	Flange with female face				2							
	Flange with plain face				3							
	Weld ends				4							
5. Body material *(operating temp. ranges are specified in parentheses)*	Cast steel 1.0619 (-20 to 400°C)				1							
	Alloy steel 1.7357 (-20 to 550°C)				7							
	Other material on request				9							
6. Packing	Graphite				5							
7. Multi-step pressure reduction	One-step pressure reduction				1							
	Two-step pressure reduction				2							
	Three-step pressure reduction				3							
8. Flow characteristic	Linear - Leakage rate class III.					L						
	Equal-percentage - Leakage rate class III.					R						
9. No. of orifice plate	Without					0						
10. Nominal pressure	PN 16							016				
	PN 25							025				
	PN 40							040				
	PN 63							063				
	PN 100							100				
	PN 160							160				
11. Max. operating temp. °C	Acc. to process medium									XXX		
12. Nominal size	DN - acc. to the valve´s execution											XXX

Ordering example: Two-way, control valve DN 80, PN 160, with electric actuator Modact MTN Control, body material: cast steel, weld ends, packing Graphite, two-step pressure reduction, linear flow characteristic is specified as follows: **RV501 EYA 4152 L0 160/400-080**

Note

In case of request, it is possible to deliver a different type of actuator.

RV 502

Control valves
Inlet DN 25 - 150
Outlet DN 25 - 700
PN 16 - 160

Description

The valves with extended outlet series RV 502 are single-seated control valves of a unit construction designed to fit in all demands of an appliance the valve is designed for. The pressure-balanced, multi-step throttling system is always designed to eliminate the valve´s high differential pressures with a high resistance to wearing caused by flow and effects of expanding steam. It also ensures a low noisiness level.
The valve can be delivered with weld ends or flanges having faces acc. to the customer´s requirements and demands.
The valves are actuated with linear actuators. The connection is designed for using both domestic and foreign actuators of the following producers: ZPA Pečky, Regada Prešov, Auma, Schiebel and Foxboro.

Process media

The valves are especially designed to control the flow and pressure of vapours and gases without impurities. The producer recommends to pipe a strainer into pipeline in front of the valve when impurities are present. Impurities can affect the quality and reliability of regulation and can cause a reduction of the valve service life. The common process media are for example saturated or superheated steam and other media with no special demands on the used type of material of the valve. The valve application for any other media must be consulted with the producer because of the type of material that is in contact with the process medium.

Application

The sphere of application of these valves continues in the sphere for the valves series RV 210 to RV 235. They are especially designed for industry applications such as heating plants, power plants or regulation of technological processes. The max. permissible operating pressure values correspond to EN 12 516-1, see page 38 of this catalogue.

Installation

The valve is to be piped the way so that the direction of medium flow will coincide with the arrows on the body.
The valve can be installed in any position except position when the actuator is under the valve body. Detailed informations are given in the instruction for installation and service.

Recommended differential pressures

In regard to the pressure balancing of the plug and to linear forces of usable actuators, the valves´ application in high differential pressures is not limited by the forces caused by process medium pressure but by the type of used throttling system. A recommended max. differential pressure for one step of multi-step pressure reduction is 5.0 MPa when perforated plug and perforated cage are used. It is recommended to consult the concrete cases with the producer with regard to pressure ratio and parametres of other equipment.

Technical data

Series	RV 502	
Type of valve	Control valve, single-seated, straight-through, with pressure-balanced plug, with extended outlet and orifice plate at outlet	
Nominal size range	Inlet DN 25 to 40; outlet DN 25 to 700	
Nominal pressure	Inlet PN 16 to 160; outlet PN 16 to 100	
Body material	Carbon steel 1.0619 (GP 240 GH)	Alloy steel 1.7357 (G17CrMo5-5)
Material of weld ends	1.0425 (P 265 GH)	1.7335 (13CrMo4-5)
Seat material: DN 25 - 150	17 021.6 (1.4006) + stellited seat STELLIT 6	
Plug material: DN 25 - 150	17 023.7 (1.4078) hardened	
Operating temp. range	-20 to 400°C	-20 to 550°C
Connection flanges	For PN 16 to 160 acc. to ČSN EN 1092-1 (2/2003)	
Type of flanges	Type B1 acc. to ČSN EN 1092-1 (2/2003) - raised flange	
	Type F acc. to ČSN EN 1092-1 (2/2003) - female flange	
	Type B2 acc. to ČSN EN 1092-1 (2/2003) - plain flange	
Weld ends	Acc. to ČSN 13 1075 (3/1991)	
Type of trim	One or two-step pressure reduction	
	Perforated plug - seat (cage), orifice plate	
Flow characteristic	Linear, equal-percentage	
Lekage rate	Acc. to ČSN EN 1349 (5/2001) Class III	
Packing	Graphite	

Range of Kvs values

DN	25/XXX	40/XXX	50/XXX	65/XXX	80/XXX	100/XXX	125/XXX	150/XXX
Multi-step pressure reduct.	Kvs [m³/h] - linear flow characteristic							
1	1.6 - 8.0	2.5 - 20	2.5 - 32	6.3 - 50	8.0 - 80	10 - 125	10 - 125	12.5 - 250
2	1.25 - 8.0	2.0 - 20	2.5 - 32	5.0 - 40	8.0 - 80	10 - 100	10 - 100	12.5 - 250
Multi-step pressure reduct.	Kvs [m³/h] - equal-percentage flow characteristic							
1	2.0 - 6.3	6.3 - 20	6.3 - 25	6.3 - 32	16 - 50	16 - 63	16 - 63	25 - 160
2	1.6 - 5.0	5.0 - 16	5.0 - 20	5.0 - 25	16 - 40	16 - 50	16 - 50	25 - 80

Nominal values of Kvs are understood as multiplies of 10 of the progression of selected number R10 (1.0; 1.25; 1.6; 2.0; 2.5; 3.2; 4.0; 5.0; 6.3; 8.0; 10.0). They are specified individually for every valve acc. to the customer´s requirements and value within the appropriate range showen in the table above.

Dimensions and weights for the valve type RV 502 with weld ends

DN	V_1	V_2	V_3	L	H	d	m
	[mm]	[mm]	[mm]	[mm]	[mm]		[kg]
25/40	103	254	130	300	16	M10x1	13
40/80	129	265	130	460	25	M16x1,5	26
50/100	150	291	130	550	25		35
65/125	175	310	130	610	25		53
65/200	175	310	130	665	25		75
80/150	180	320	130	670	40		81
100/200	204	345	130	765	40		98
125/250	204	345	130	785	40		---
150/200	264	453	190	900	63	M20x1,5	245
150/300	264	453	190	940	63		318
150/500	264	453	190	1100	63		428

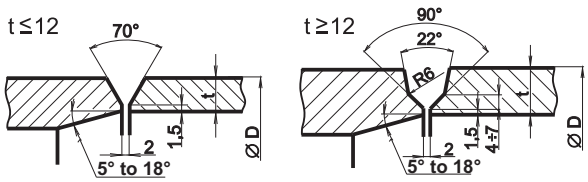
*) There are only recommended combination of DN for inlet and outlet of RV 502 valve.

Note: Mentioned weights are approximate. The missing data are to be specified by the producer.

Weld ends connection dimensions

	PN 16	PN 25	PN 40	PN 63	PN 100	PN 160	PN 16-160
DN	t	t	t	t	t	t	D
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
25	2.6	2.6	2.6	2.6	2.9	4	33.7
40	2.6	2.6	2.6	2.9	3.6	5	48.3
50	2.9	2.9	2.9	3.2	4.5	6.3	60.3
65	3.2	3.2	3.2	3.6	5	7	76.1
80	3.6	3.6	3.6	4	5.6	8	88.9
100	4	4	4	5	7	10	114.3
125	4.5	4.5	4.5	5.6	8	12.5	139.7
150	5	5	5	7	10	14	168.3
200	6.3	6.3	6.3	8	12.5	---	219.1
250	7	7	7	10	16	---	273
300	8	8	8	12.5	18	---	323.9
400	11	11	11	14	20	---	406.4
500	14	14	14	18	25	---	508
600	18	18	18	23	---	---	610
700	23	23	23	---	---	---	721

Connecting dimensions of weld ends can be modified on request by the customer.



Other shapes of weld ends after agreement with producer

Dimensions and weights for the valve RV 502 with flanges *)

DN	V_1	V_2	V_3	L	L_c	H	d	m
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[kg]
25/40	103	254	130	---	---	16	M10x1	17
40/80	129	265	130	---	480	25	M16x1,5	34
50/100	150	291	130	---	---	25		50
65/125	175	310	130	470	620	25		73
80/150	180	320	130	---	650	40		108
100/200	204	345	130	609	720	40		127
125/250	204	345	130	---	---	40		---
150/300	264	453	190	785	950	63	M20x1,5	308
150/500	264	453	190	---	---	63		---

*) There are only recommended combination of DN for inlet and outlet of the valves in the table.
L_c - length L for valves with orifice plates
Note: Mentioned weight should be considered as approximate. The missing data are to be specified by the producer.

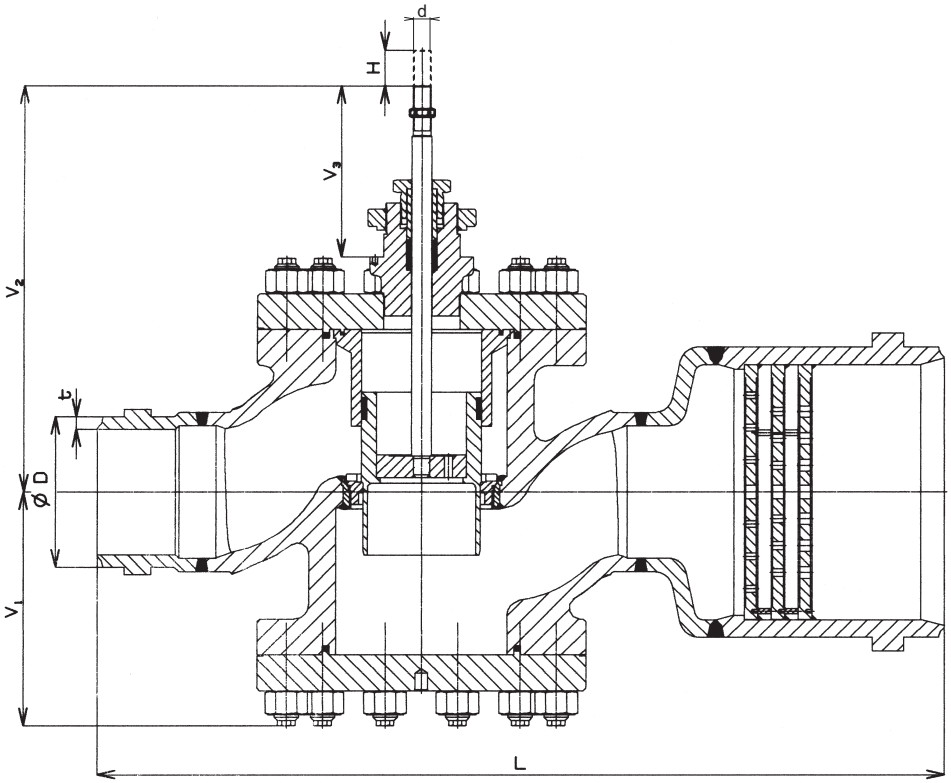
Connection dimensions of flanges

	PN 16					PN 25					PN 40					PN 63				
DN	D_1	D_2	a	D_4	n	D_1	D_2	a	D_4	n	D_1	D_2	a	D_4	n	D_1	D_2	a	D_4	n
	[mm]	[mm]	[mm]	[mm]	[ks]	[mm]	[mm]	[mm]	[mm]	[ks]	[mm]	[mm]	[mm]	[mm]	[ks]	[mm]	[mm]	[mm]	[mm]	[ks]
25	115	85	18	14	4	115	85	18	14	4	115	85	18	14	4	140	100	24	18	4
40	150	110	18	18	4	150	110	18	18	4	150	110	18	18	4	170	125	26	22	4
50	165	125	18	18	4	165	125	20	18	4	165	125	20	18	4	180	135	26	22	4
65	185	145	18	18	8	185	145	22	18	8	185	145	22	18	8	205	160	26	22	8
80	200	160	20	18	8	200	160	24	18	8	200	160	24	18	8	215	170	28	22	8
100	220	180	20	18	8	235	190	24	22	8	235	190	24	22	8	250	200	30	26	8
125	250	210	22	18	8	270	220	26	26	8	270	220	26	26	8	295	240	34	30	8
150	285	240	22	22	8	300	250	28	26	8	300	250	28	26	8	345	280	36	33	8
200	340	295	24	22	12	360	310	30	26	12	375	320	34	30	12	415	345	42	36	12
250	405	355	26	26	12	425	370	32	30	12	450	385	38	33	12	470	400	46	36	12
300	460	410	28	26	12	485	430	34	30	16	515	450	42	33	16	530	460	52	36	16
400	580	525	32	30	16	620	550	40	36	16	660	585	50	39	16	670	585	60	42	16
500	715	650	44	33	20	730	660	48	36	20	755	670	57	42	20	800	705	68	48	20

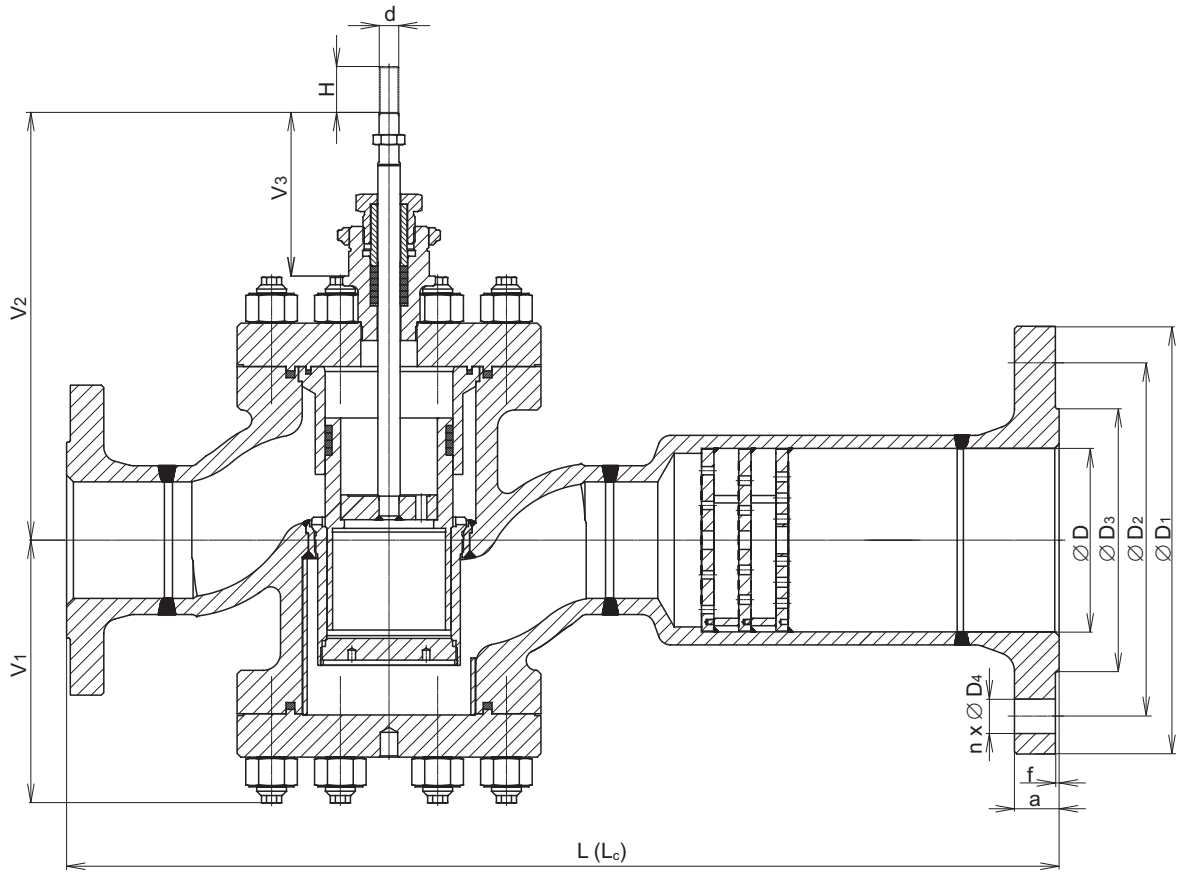
	PN 100					PN 160					PN 16 - 160	
DN	D_1	D_2	a	D_4	n	D_1	D_2	a	D_4	n	D_3	f
	[mm]	[mm]	[mm]	[mm]	[ks]	[mm]	[mm]	[mm]	[mm]	[ks]	[mm]	[mm]
25	140	100	24	18	4	140	100	24	18	4	68	2
40	170	125	26	22	4	170	125	28	22	4	88	
50	195	145	28	26	4	195	145	30	26	4	102	3
65	220	170	30	26	8	220	170	34	26	8	122	
80	230	180	32	26	8	230	180	36	26	8	138	
100	265	210	36	30	8	265	210	40	30	8	162 [1]	
125	315	250	40	33	8	315	250	44	33	8	188	
150	355	290	44	33	12	355	290	50	33	12	218 [2]	
200	430	360	52	36	12	---	---	---	---	---	285 [3]	
250	505	430	60	39	12	---	---	---	---	---	345 [4]	
300	585	500	68	42	16	---	---	---	---	---	410 [5]	4
400	715	620	78	48	16	---	---	---	---	---	535 [6]	
500	870	760	94	56	20	---	---	---	---	---	615 [7]	

[1] pro PN 16 ... 158 mm
[2] pro PN 16 ... 212 mm
[3] pro PN 16 ... 268 mm
pro PN 25 ... 278 mm
[4] pro PN 16 ... 320 mm
pro PN 25 ... 335 mm
[5] pro PN 16 ... 378 mm
pro PN 25 ... 395 mm
[6] pro PN 16 ... 490 mm
pro PN 25 ... 505 mm
[7] pro PN 16 ... 610 mm

Control valve RV 502 with weld ends



Control valve RV 502 with flanges



Valve complete specification No. for ordering RV 502

		XX	X X X	X X X	X X X X	X X		XX/XX	/	XXX	-	XX/XX
1. Valve	Control valve	RV										
2. Series	Straight-through valve with extended outlet		5 0 2									
3. Type of actuating	Electric actuator			E								
	Pneumatic actuator			P								
	Hand wheel			R								
	Electric actuator Modact MTN Control			E Y A								
	Electric actuator Modact MTP Control			E Y A								
	Electric actuator Modact MTNED, MTPED			E Y A								
	Electric actuator Modact MTN, MTP			E Y B								
	Electric actuator Modact MTR			E P D								
	Electric actuator Modact ST 2, STR 2, STR 2PA			E P M								
	Electric actuator Auma SA 07.2			E A A								
	Electric actuator Auma SA Ex 07.2			E A B								
	Electric actuator Auma SAR 07.2			E A C								
	Electric actuator Auma SAR Ex 07.2			E A D								
	Electric actuator Auma SA 07.6			E A E								
	Electric actuator Auma SA ExC 07.6			E A F								
	Electric actuator Auma SAR 07.6			E A G								
	Electric actuator Auma SAR ExC 07.6			E A H								
	Electric actuator Schiebel AB5			E Z E								
	Electric actuator Schiebel exAB5			E Z F								
	Electric actuator Schiebel rAB5			E Z G								
	Electric actuator Schiebel exrAB5			E Z H								
	Pneumatic actuator Flowserve PB 502			P F B								
	Pneumatic actuator Flowserve PB 700			P F C								
	Pneumatic actuator Flowserve PO 1502			P F D								
4. Connection	Flange with raised face				1							
	Flange with female face				2							
	Flange with plain face				3							
	Weld ends				4							
5. Body material	Cast steel 1.0619 (-20 to 400°C)				1							
(operating temp. ranges are specified in parentheses)	Alloy steel 1.7357 (-20 to 550°C)				7							
	Other material on request				9							
6. Packing	Graphite				5							
7. Multi-step pressure reduction	One-step pressure reduction				1							
	Two-step pressure reduction				2							
8. Flow characteristic	Linear - Leakage rate class III.					L						
	Equal-percentage - Leakage rate class III.					R						
9. No. of orifice plate	Max. 3					X						
10. Nominal pressure	PN inlet / outlet							XX/XX				
11. Max. operating temp. °C	Acc. to process medium									XXX		
12. Nominal size	DN - acc. to the valve´s execution											XX/XX

Order example: Two-way, control valve DN 80, PN 160, with electric actuator Modact MTN Control, body material: cast steel, weld ends, packing Graphite, two-step pressure reduction, linear flow characteristic is specified as follows:
RV502 EYA 4152 L1 160x100/400-080/150

Note:

PN and DN of outlet, multi-step pressure reduction No. of orifice plate possibly different type of actuating is possible after the agreement with the producer.

RS 502

Steam-conditioning station
Inlet DN 50 to 150
Outlet DN 100 to 700
PN 16 to 160

Description

Steam conditioning station RS 502 is single-seated control valve of a unit construction designed for water injection into the extended outlet. The pressure-balanced, multi-step throttling trim is designed to eliminate high differential pressures within the valve and ensure the low noisiness. It ensures a high resistance to wearing caused by medium flow and to effects of the expanding steam. Cooling water is injected into the extended outlet with a specially designed nozzle (VH and VHP) with changeable flow. The valves can be supplied with weld ends possibly with flanges having the faces according to the customers´ requests.
The valves are actuated with linear electric actuators. The connection is designed for both domestic and foreign actuators of the following producers: ZPA Pečky, Regada Prešov, AUMA, Schiebel and Flowserve.

Application

The valves are designed for simultaneous pressure and temperature reduction of steam. They are especially designed for industrial applications such as low-pressure steam production in heating, steam circuit in power plants or technological processes. The max. permissible operating pressures correspond to EN 12 516-1 see page 38 of this catalogue.

Installation

The valve is to be piped the way so that the direction of medium flow will coincide with the arrows on the body.
The valve can be installed in any position except position when the actuator is under the valve body. Detailed informations are given in the instruction for installation and service.

Process media

The valves are designed to regulate the pressure and temperature of water vapour without mechanical impurities. The producer recommends to pipe a strainer into pipeline in front of the valve when impurities are present. Impurities can affect the quality and reliability of regulation and can cause a reduction of the valve service life.The application for other process media must be considered with respect to used material that is in contact with the process medium and therefore its usage should be consulted with the producer.

Recommended differential pressures

In regard to the pressure balancing of the plug and to linear forces of usable actuators, the valves´ application in high differential pressures is not limited by the forces caused by process medium pressure but by the type of used throttling system. A recommended max. differential pressure for one step of multi-step pressure reduction is 5.0 MPa when perforated plug and perforated cage are used. It is recommended to consult the concrete cases with the producer with regard to pressure ratio and parametres of other equipment.

Technical data

Series		RS 502	
Type of valve		Control valve, single-seated, straight-through, with pressure-balanced plug, with extended outlet and orifice plate at outlet, with flange for water injection into outlet pipe	
Nominal size range		Inlet DN 50 to 150, outlet DN 100 to 700	
Nominal pressure		Inlet PN 16 to 160, outlet PN 16 to 100	
Body material		Carbon steel 1.0619 (GP 240 GH)	Alloy steel 1.7357 (G17CrMo5-5)
Material of weld ends		1.0425 (P 265 GH)	1.7335 (13CrMo4-5)
Seat material:	DN 50 - 150	17 021.6 (1.4006) + stellited seat STELLIT 6	
Plug material:	DN 50 - 150	17 123.6 (1.4078) hardened	
Operating temp. range		-20 to 400°C	-20 to 550°C
Connection flanges		For PN 16 to 160 acc. to ČSN EN 1092-1 (2/2003)	
Type of flanges		Type B1 acc. to ČSN EN 1092-1 (2/2003) - raised flange	
		Type F acc. to ČSN EN 1092-1 (2/2003) - female flange	
		Type B2 acc. to ČSN EN 1092-1 (2/2003) - plain flange	
Weld ends		Acc. to ČSN 13 1075 (3/1991)	
Type of trim		One or two-step pressure reduction	
		Perforated plug - seat (cage), orifice plate	
Flow characteristic		Linear, equal-percentage	
Lekage rate		Acc. to ČSN EN 1349 (5/2001) Class III	
Packing		Graphite	

Range of Kvs values

DN	50/XXX	65/XXX	80/XXX	100/XXX	125/XXX	150/XXX
Multi-step pressure reduct.	Kvs values [m³/hour] - linear flow characteristic					
1	2.5 - 32	6.3 - 50	8.0 - 80	10 - 125	10 - 125	12.5 - 250
2	2.5 - 32	5.0 - 40	8.0 - 80	10 - 100	10 - 100	12.5 - 250
Multi-step pressure reduct.	Kvs values [m³/hour] - equal-percentage characteristic					
1	6.3 - 25	6.3 - 32	16 - 50	16 - 63	16 - 63	25 - 160
2	5.0 - 20	5.0 - 25	16 -40	16 - 50	16 - 50	25 - 80

Nominal values of Kvs are understood as multiplies of 10 of the progression of selected number R10 (1.0; 1.25; 1.6; 2.0; 2.5; 3.2; 4.0; 5.0; 6.3; 8.0; 10.0). They are specified individually for every valve acc. to the customer´s requirements and value within the appropriate range showen in the table above.

Dimensions and weights for the valve type RS 502 with weld ends

DN	V_1	V_2	V_3	V_4	V_5	L	H	d	m
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[kg]
50/100	150	291	130	170	---	710	25	M16x1,5	50
65/125	175	310	130	---	---	---	25		67
80/150	180	320	130	215	262	820	40		94
100/200	204	345	130	215	290	910	40		113
125/250	204	345	130	---	314	---	40		---
150/300	264	453	190	250	343	1091	63	M20x1,5	257
150/500	264	453	190	---	430	---	63		---

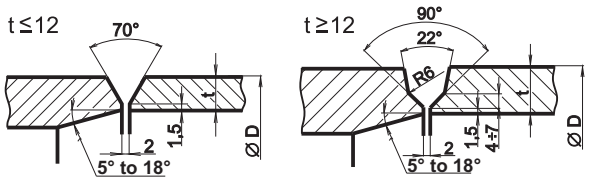
*) There are only recommended combination of DN for inlet and outlet of RS 502 valve.

Note: Mentioned weights are approximate. The missing data are to be specified by the producer.

Weld ends connection dimensions

	PN 16	PN 25	PN 40	PN 63	PN 100	PN 160	PN 16-160
DN	t	t	t	t	t	t	D
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
50	2.9	2.9	2.9	3.2	4.5	6.3	60.3
65	3.2	3.2	3.2	3.6	5	7	76.1
80	3.6	3.6	3.6	4	5.6	8	88.9
100	4	4	4	5	7	10	114.3
125	4.5	4.5	4.5	5.6	8	12.5	139.7
150	5	5	5	7	10	14	168.3
200	6.3	6.3	6.3	8	12.5	---	219.1
250	7	7	7	10	16	---	273.0
300	8	8	8	12.5	18	---	323.9
400	11	11	11	14	20	---	406.4
500	14	14	14	18	25	---	508.0
600	18	18	18	23	---	---	610
700	23	23	23	---	---	---	721

Connecting dimensions of weld ends can be modified on request by the customer.



Other shapes of weld ends after agreement with producer

Dimensions and weights for the type RS 502 with flanges *)

DN	V_1	V_2	V_3	V_4	V_5	L	H	d	m
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[kg]
50/100	150	291	130	---	---	---	25		73
65/125	175	310	130	---	---	---	25		102
80/150	180	320	130	220	262	---	40	M16x1,5	140
100/200	204	345	130	265	290	---	40		188
125/250	204	345	130	236	314	---	40		---
150/300	264	453	190	---	343	---	63	M20x1,5	428
150/500	264	453	190	---	430	---	63		---

*) There are only recommended combination of DN for inlet and outlet of the RS 502 valves in the table.
Note: Mentioned weight should be considered as approximate. The missing data are to be specified

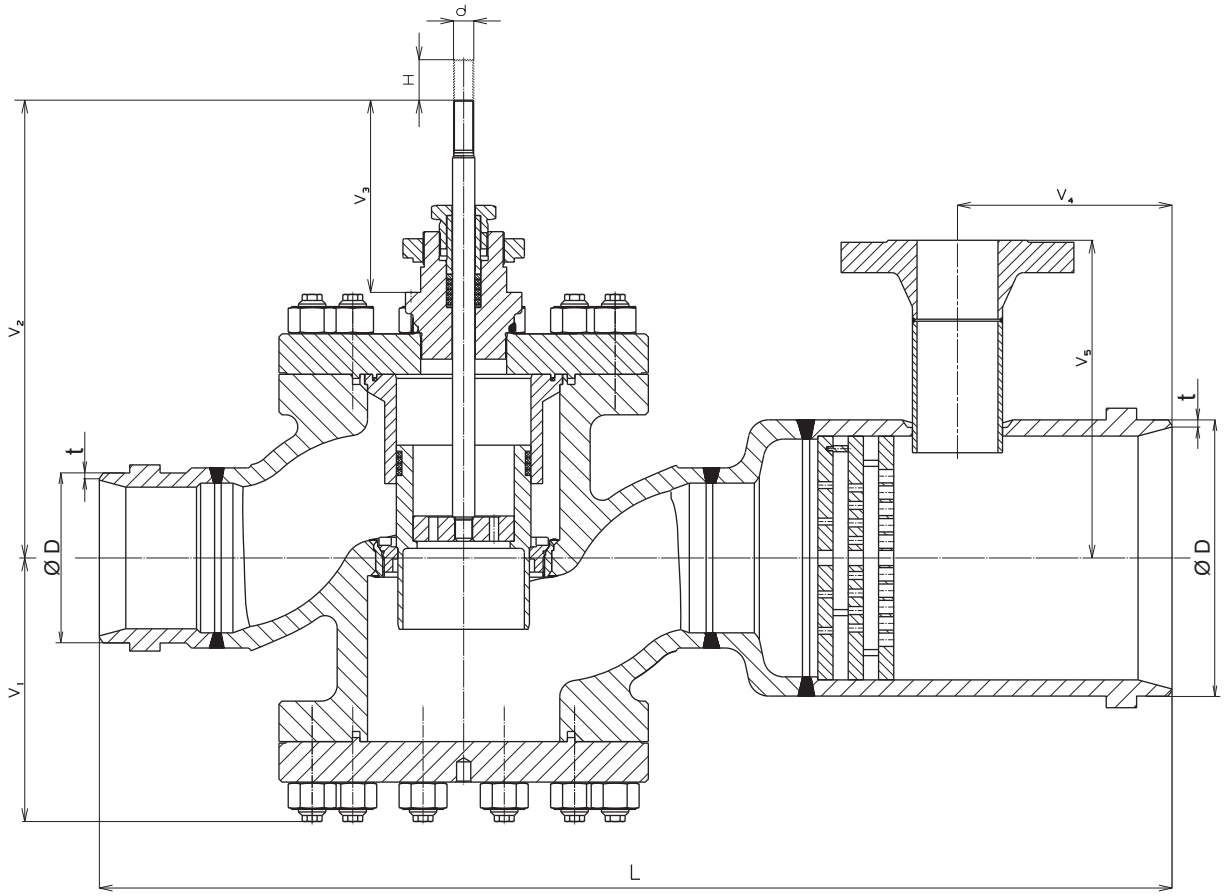
Connection flanges dimensions

	PN 16					PN 25					PN 40					PN 63				
DN	D_1	D_2	a	D_4	n	D_1	D_2	a	D_4	n	D_1	D_2	a	D_4	n	D_1	D_2	a	D_4	n
	[mm]	[mm]	[mm]	[mm]	[ks]	[mm]	[mm]	[mm]	[mm]	[ks]	[mm]	[mm]	[mm]	[mm]	[ks]	[mm]	[mm]	[mm]	[mm]	[ks]
50	165	125	18	18	4	165	125	20	18	4	165	125	20	18	4	180	135	26	22	4
65	185	145	18	18	8	185	145	22	18	8	185	145	22	18	8	205	160	26	22	8
80	200	160	20	18	8	200	160	24	18	8	200	160	24	18	8	215	170	28	22	8
100	220	180	20	18	8	235	190	24	22	8	235	190	24	22	8	250	200	30	26	8
125	250	210	22	18	8	270	220	26	26	8	270	220	26	26	8	295	240	34	30	8
150	285	240	22	22	8	300	250	28	26	8	300	250	28	26	8	345	280	36	33	8
200	340	295	24	22	12	360	310	30	26	12	375	320	34	30	12	415	345	42	36	12
250	405	355	26	26	12	425	370	32	30	12	450	385	38	33	12	470	400	46	36	12
300	460	410	28	26	12	485	430	34	30	16	515	450	42	33	16	530	460	52	36	16
400	580	525	32	30	16	620	550	40	36	16	660	585	50	39	16	670	585	60	42	16
500	715	650	44	33	20	730	660	48	36	20	755	670	57	42	20	800	705	68	48	20

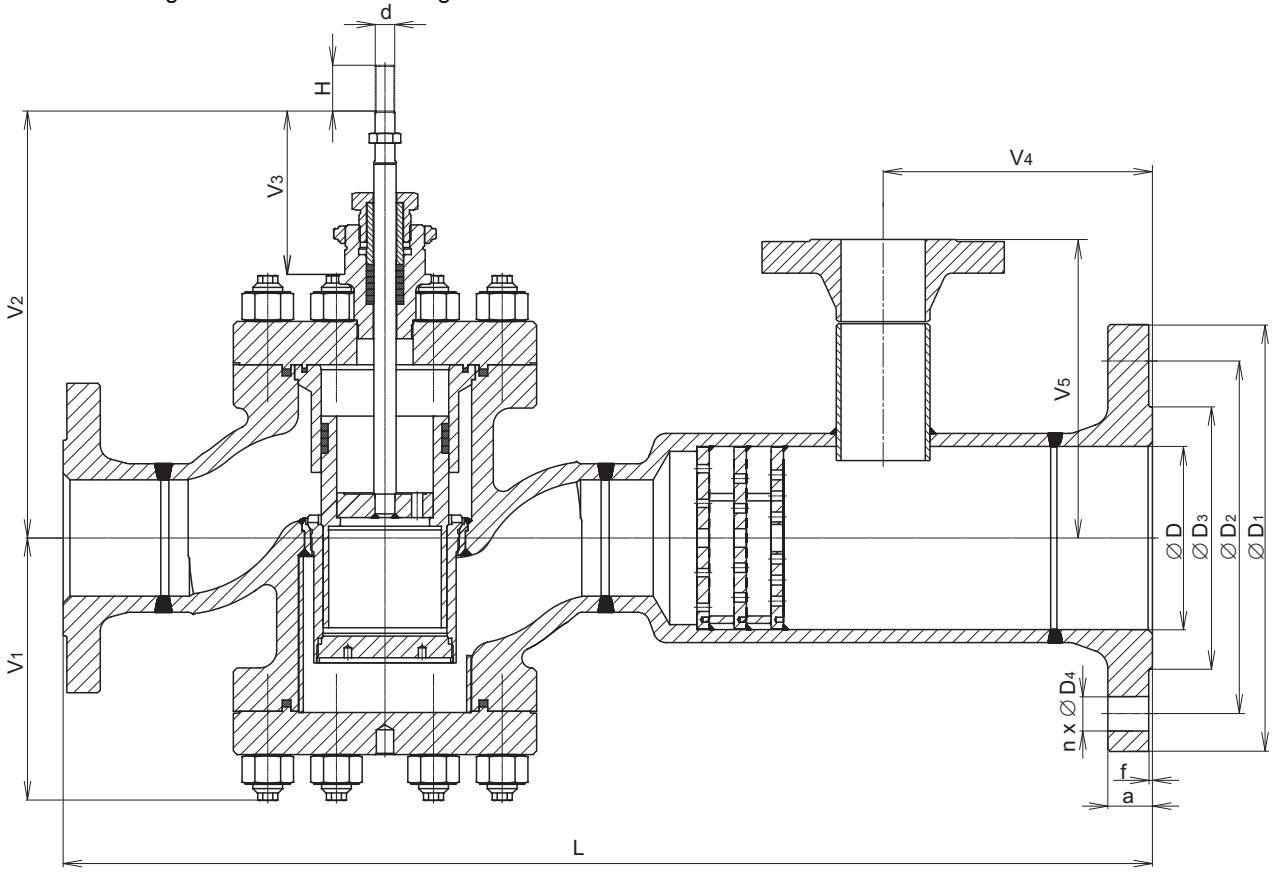
	PN 100					PN 160					PN 16 - 160	
DN	D_1	D_2	a	D_4	n	D_1	D_2	a	D_4	n	D_3	f
	[mm]	[mm]	[mm]	[mm]	[ks]	[mm]	[mm]	[mm]	[mm]	[ks]	[mm]	[mm]
50	195	145	28	26	4	195	145	30	26	4	102	
65	220	170	30	26	8	220	170	34	26	8	122	
80	230	180	32	26	8	230	180	36	26	8	138	
100	265	210	36	30	8	265	210	40	30	8	162 [1)]	3
125	315	250	40	33	8	315	250	44	33	8	188	
150	355	290	44	33	12	355	290	50	33	12	218 [2)]	
200	430	360	52	36	12	---	---	---	---	---	285 [3)]	
250	505	430	60	39	12	---	---	---	---	---	345 [4)]	
300	585	500	68	42	16	---	---	---	---	---	410 [5)]	
400	715	620	78	48	16	---	---	---	---	---	535 [6)]	4
500	870	760	94	56	20	---	---	---	---	---	615 [7)]	

[1)] for PN 16 ... 158 mm
[2)] for PN 16 ... 212 mm
[3)] for PN 16 ... 268 mm
for PN 25 ... 278 mm
[4)] for PN 16 ... 320 mm
for PN 25 ... 335 mm
[5)] for PN 16 ... 378 mm
for PN 25 ... 395 mm
[6)] for PN 16 ... 490 mm
for PN 25 ... 505 mm
[7)] for PN 16 ... 610 mm

Steam-conditioning station RS 502 with weld ends



Steam-conditioning station RS 502 with flanges



Valve complete specification No. for ordering RS 502

		XX	X X X	X X X	X X X X	X X		XXxXX	/	XXX	-	XX/XX
1. Valve	Steam-conditioning station	RS										
2. Series	Straight-through valve with extended outlet and water injection into outlet pipe		5 0 2									
3. Type of actuating	Electric actuator			E								
	Pneumatic actuator			P								
	Hand wheel			R								
	Electric actuator Modact MTN Control			E Y A								
	Electric actuator Modact MTP Control			E Y A								
	Electric actuator Modact MTNED, MTPED			E Y A								
	Electric actuator Modact MTN, MTP			E Y B								
	Electric actuator Modact MTR			E P D								
	Electric actuator Modact ST 2, STR 2, STR 2PA			E P M								
	Electric actuator Auma SA 07.2			E A A								
	Electric actuator Auma SA Ex 07.2			E A B								
	Electric actuator Auma SAR 07.2			E A C								
	Electric actuator Auma SAR Ex 07.2			E A D								
	Electric actuator Auma SA 07.6			E A E								
	Electric actuator Auma SA ExC 07.6			E A F								
	Electric actuator Auma SAR 07.6			E A G								
	Electric actuator Auma SAR ExC 07.6			E A H								
	Electric actuator Schiebel AB5			E Z E								
	Electric actuator Schiebel exAB5			E Z F								
	Electric actuator Schiebel rAB5			E Z G								
	Electric actuator Schiebel exrAB5			E Z H								
	Pneumatic actuator Flowserve PB 502			P F B								
	Pneumatic actuator Flowserve PB 700			P F C								
	Pneumatic actuator Flowserve PO 1502			P F D								
4. Connection	Flange with raised face				1							
	Flange with female face				2							
	Flange with plain face				3							
	Weld ends				4							
5. Body material	Cast steel 1.0619 (-20 to 400°C)				1							
(operating temp. ranges are specified in parentheses)	Alloy steel 1.7357 (-20 to 550°C)				7							
	Other material on request				9							
6. Packing	Graphite				5							
7. Multi-step pressure reduction	One-step pressure reduction				1							
	Two-step pressure reduction				2							
8. Flow characteristic	Linear - Leakage rate class III.					L						
	Equal-percentage - Leakage rate class III.					R						
9. No. of orifice plate	Max. 3					X						
10. Nominal pressure	PN inlet / outlet							XX/XX				
11. Max. operating temp. °C	Acc. to process medium									XXX		
12. Nominal size	DN - acc. to the valve´s execution											XX/XX

Ordering example: Steam-conditioning station with water injection, DN 80/150, PN 160/100, with electric actuator Modact MTN Control, body material: carbon steel, connection: weld ends, packing: graphite, two-step pressure reduction, one orifice plate at outlet, with linear flow characteristic is specified as follows:
RS502 EYA 4152 L1 160x100/400-080/150

Note:

PN and DN of outlet, multi-step pressure reduction No. of orifice plate possibly different type of actuating is possible after the agreement with the producer.
Further it is necessary to specify in the order the parametres of injection water possibly the type of injection nozzle (VH) acc. to the data sheet No. 02-03.2 or i**njection head** (drive-steam type) (VHP) acc. to the data sheet No. 02-03.3.

RV 504

Control valves
DN 25 to 150, PN 16 to 160

Description

Control valves type RV504 are three-way valves with mixing or diverting function. Due to the pressure unbalanced execution, it is necessary to take into account a max. differential pressure for a given size which you can find on the following page.
Flow characteristics, Kvs values and leakage rates correspond to international standards.
The valves can be delivered with flanges or weld ends having faces acc. to the customer´s requirements and demands. In case of a service or replacement of bottom seat of a valve with weld ends execution it is always necessary to cut out a valve from a pipeline and weld up back.
The valves can be delivered with weld ends or flanges having faces acc. to the customer´s requirements and demands.
The valves are actuated with linear actuators. The connection is designed for using both domestic and foreign actuators of the following producers: ZPA Pečky, Regada Prešov, Auma, Schiebel and Flowserve.

Process media

Valves serie RV504 are designed for regulation of flow and pressure of liquids, gases and vapours without abrasive particles e.g. water, steam, air and other media compatible with materials of a valve body and inner parts.
To ensure a reliable regulation, the producers recomends 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.

Application

The sphere of application of these valves continues in the sphere of application for the valves series RV 214 to RV 235. They are especially designed for industry applications such as heating plants, power plants or regulation of technology processes. The max. permissible operating pressure values correspond to EN 12 516-1 see page 42 of this catalogue.

Installation

When the valve is used as mixing, it must be piped the way so that direction of process medium flow will coincide with the arrows on the body (inlet ports A, B and outlet port AB).
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).
The valve can be installed in any position except position when the actuator is under the valve body.
Detailed informations are given in the instruction for installation and service.

Technical data

Series	RV 504	
Type of valve	Control valve, three-way, straight-through	
Nominal size range	DN 25 to 150	
Nominal pressure	PN 16 to 160	
Body material	Carbon steel 1.0619 (GP 240 GH)	Alloy steel 1.7357(G17CrMo5-5)
Material of weld ends	1.0425 (P 265 GH)	1.7335 (13CrMo4-5)
Seat material: DN 15 - 150	17 021.6 (1.4006) + stellited seat STELLIT 6	
Plug material: DN 15 - 150	17 123.6 (1.4078) hardened	
Operating temp. range	-20 to 400 °C	-20 to 550 °C
Connection flanges	For PN 16 to 160 acc. to ČSN EN 1092-1 (2/2003)	
Type of flanges	Type B1 acc. to ČSN EN 1092-1 (2/2003) - raised flange	
	Type F acc. to ČSN EN 1092-1 (2/2003) - female flange	
	Type B2 acc. to ČSN EN 1092-1 (2/2003) - plain flange	
Weld ends	Acc. to ČSN 13 1075	
Type of plug	Perforated plug	
Flow characteristic	Linear, equal-percentage - only in direct way	
Leakage rate	Acc. to ČSN EN 1349 (7/2012) Class II	
Packing	Graphite	

Range of Kvs values and differential pressures Δp_{max} [MPa]

DN	25	40	50	65	80	100	125	150
Number of reduction steps	Kvs values [m³/h] - linear characteristic							
1	1.6 - 5.0	2.5 - 20	3.2 - 32	6.3 - 50	8.0 - 80	10 - 125	10 - 125	16 - 250
Number of reduction steps	Kvs values [m³/h] - equal-percentage characteristic							
1	1.6 - 5.0	6.3 - 20	6.3 - 25	6.3 - 32	16 - 50	16 - 63	16 - 63	25 - 125

Δp_{max}	4	4	4	2.53	2.07	1.36	1.36	0.89
Δp_{max} (PNEU actuator, splitting function)	2.42	1.32	0.81	0.51	0.41	0.27	0.27	0.18

Nominal values of Kvs are understood as multiples of 10 of the progression of selected numbers R10 (1.0; 1.25;1.6; 2.0; 2.5; 3.2; 4.0; 5.0; 6.3; 8.0; 10.0).

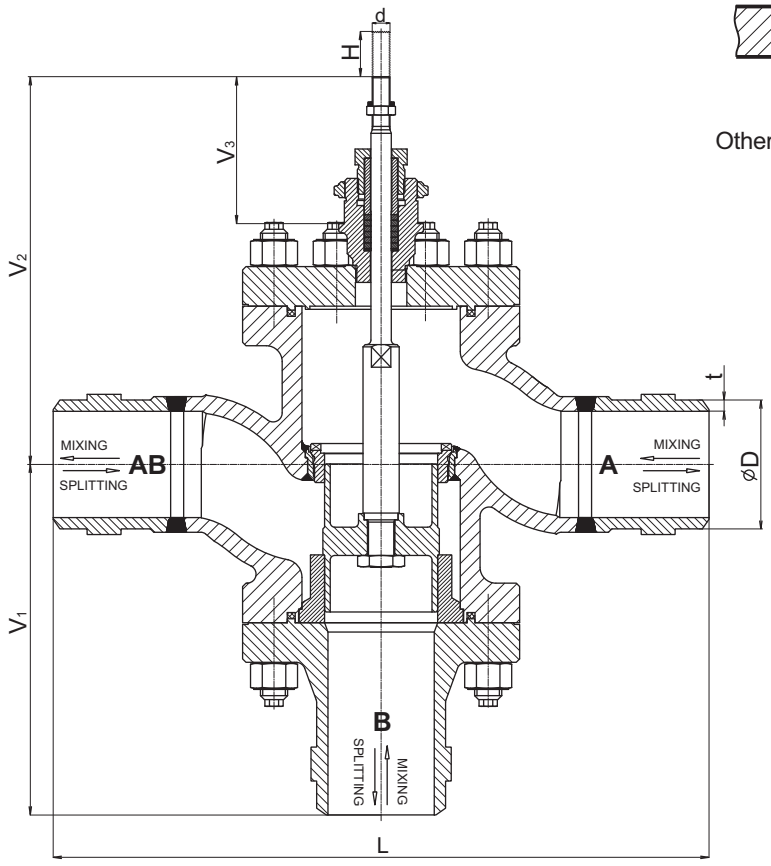
They are specified individually for every valve acc. to the customer´s requirements and value within the appropriate range showen in the table above.

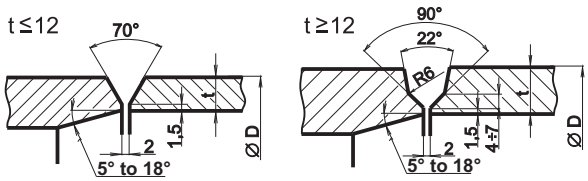
Dimensions and weights for the valve type RV 504 with weld ends

	PN 16	PN 25	PN 40	PN 63	PN 100	PN 160	PN 16 to 160							
DN	t	t	t	t	t	t	D	L	V_1*)	V_2	V_3	H	d	m*)
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[kg]
25	2.6	2.6	2.6	2.6	2.9	4.0	33.7	270	---	254	130	16	M10x1	---
40	2.6	2.6	2.6	2.9	3.6	5.0	48.3	300	---	265	130	25		---
50	2.9	2.9	2.9	3.2	4.5	6.3	60.3	390	---	291	130	25		---
65	3.2	3.2	3.2	3.6	5.0	7.0	76.1	450	---	310	130	25		---
80	3.6	3.6	3.6	4.0	5.6	8.0	88.9	480	---	320	130	40	M16x1,5	---
100	4.0	4.0	4.0	5.0	7.0	10	114.3	580	310	345	130	40		88
125	4.5	4.5	4.5	5.6	8	12.5	139.7	580	310	345	130	40		100
150	5.0	5.0	5.0	7.0	10	14	168.3	720	---	453	190	63	M20x1,5	---

Connecting dimensions of weld ends can be modified on request by the customer.

Control valve RV 501 with weld ends





Other shapes of weld ends after agreement with producer

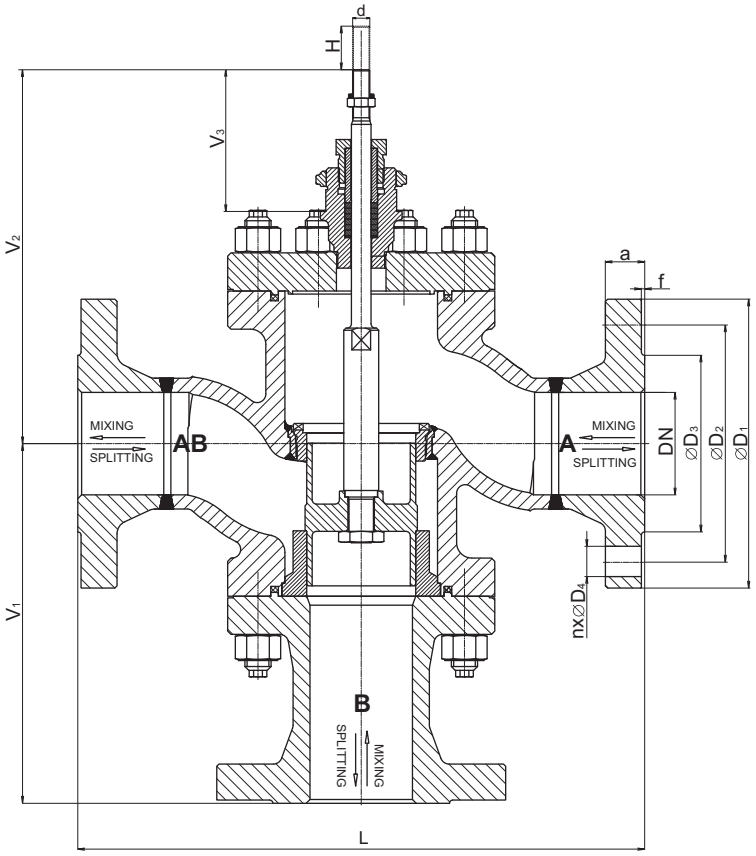
Dimensions and weights for the valve type RV 504 with flanges

	PN 16					PN 25					PN 40					PN 63				
DN	D_1	D_2	a	D_4	n	D_1	D_2	a	D_4	n	D_1	D_2	a	D_4	n	D_1	D_2	a	D_4	n
	[mm]	[mm]	[mm]	[mm]	[ks]	[mm]	[mm]	[mm]	[mm]	[ks]	[mm]	[mm]	[mm]	[mm]	[ks]	[mm]	[mm]	[mm]	[mm]	[ks]
25	115	85	18	14	4	115	85	18	14	4	115	85	18	14	4	140	100	24	18	4
40	150	110	18	18	4	150	110	18	18	4	150	110	18	18	4	170	125	26	22	4
50	165	125	18	18	4	165	125	20	18	4	165	125	20	18	4	180	135	26	22	4
65	185	145	18	18	8	185	145	22	18	8	185	145	22	18	8	205	160	26	22	8
80	200	160	20	18	8	200	160	24	18	8	200	160	24	18	8	215	170	28	22	8
100	220	180	20	18	8	235	190	24	22	8	235	190	24	22	8	250	200	30	26	8
125	250	210	22	18	8	270	220	26	26	8	270	220	26	26	8	295	240	34	30	8
150	285	240	22	22	8	300	250	28	26	8	300	250	28	26	8	345	280	36	33	8

	PN 100					PN 160					PN 16 do 160								
DN	D_1	D_2	a	D_4	n	D_1	D_2	a	D_4	n	D_3	V_1*)	V_2	V_3	L	f	H	d	m*)
	[mm]	[mm]	[mm]	[mm]	[ks]	[mm]	[mm]	[mm]	[mm]	[ks]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[kg]
25	140	100	24	18	4	140	100	24	18	4	68	---	254	130	260	2	16	M10x1	---
40	170	125	26	22	4	170	125	28	22	4	88	---	265	130	300		25		---
50	195	145	28	26	4	195	145	30	26	4	102	---	291	130	350		25		---
65	220	170	30	26	8	220	170	34	26	8	122	---	310	130	420		25	M16x1,5	---
80	230	180	32	26	8	230	180	36	26	8	138	---	320	130	450		40		---
100	265	210	36	30	8	265	210	40	30	8	162 1)	330	345	130	520	3	40		120
125	315	250	40	33	8	315	250	44	33	8	188	330	345	130	520		40		---
150	355	290	44	33	12	355	290	50	33	12	218 2)	---	453	190	680		63	M20x1,5	---

1) for PN 16 ... 158 mm
2) for PN 16 ... 212 mm

Control valve RV 504 with flanges



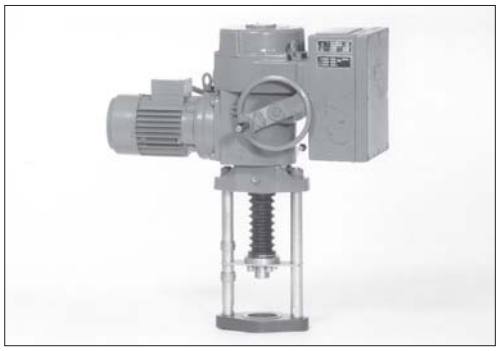
Valve complete specification No. for ordering RV 504

		XX	X X X	X X X	X X X X	X X		XXX	/	XXX	-	XXX
1. Valve	Control valve	RV										
2. Series	Control valve, straight-through, three-way		5 0 4									
3. Type of actuating	Electric actuator			E								
	Pneumatic actuator			P								
	Hand wheel			R								
	Electric actuator Modact MTN Control			E Y A								
	Electric actuator Modact MTP Control			E Y A								
	Electric actuator Modact MTNED, MTPED			E Y A								
	Electric actuator Modact MTN, MTP			E Y B								
	Electric actuator Modact MTR			E P D								
	Electric actuator Modact ST 2, STR 2, STR 2PA			E P M								
	Electric actuator Auma SA 07.2			E A A								
	Electric actuator Auma SA Ex 07.2			E A B								
	Electric actuator Auma SAR 07.2			E A C								
	Electric actuator Auma SAR Ex 07.2			E A D								
	Electric actuator Auma SA 07.6			E A E								
	Electric actuator Auma SA ExC 07.6			E A F								
	Electric actuator Auma SAR 07.6			E A G								
	Electric actuator Auma SAR ExC 07.6			E A H								
	Electric actuator Schiebel AB5			E Z E								
	Electric actuator Schiebel exAB5			E Z F								
	Electric actuator Schiebel rAB5			E Z G								
	Electric actuator Schiebel exrAB5			E Z H								
	Pneumatic actuator Flowserve PB 502			P F B								
	Pneumatic actuator Flowserve PB 700			P F C								
	Pneumatic actuator Flowserve PO 1502			P F D								
4. Connection	Flange with raised face				1							
	Flange with female face				2							
	Flange with plain face				3							
	Weld ends				4							
5. Body material *(operating temp. ranges are specified in parentheses)*	Cast steel 1.0619 (-20 to 400°C)				1							
	Alloy steel 1.7357 (-20 to 550°C)				7							
	Other material on request				9							
6. Packing	Graphite				5							
7. Multi-step pressure red.	One-step pressure reduction				1							
8. Flow characteristic	Linear - Leakage rate class II.					L						
	Equal-percentage - Leakage rate class II.					R						
9. No. of orifice plate	Without					0						
10. Nominal pressure	PN 16							016				
	PN 25							025				
	PN 40							040				
	PN 63							063				
	PN 100							100				
	PN 160							160				
11. Max. operating temp. °C	Acc. to process medium									XXX		
12. Nominal size	DN - acc. to the valve´s execution											XXX

Ordering example: Three-way, control valve DN 80, PN 160, with electric actuator Modact MTN Control, body material: cast steel, weld ends, packing Graphite, one-step pressure reduction, linear flow characteristic is specified as follows: **RV504 EYA 4151 L0 160/400-080.**
When ordering you must specify the function of the valve: **mixing / splitting**

Note

In case of request, it is possible to deliver a different type of actuator.



EYA
EYB

Electric actuators Modact MTN, MTP and Modact MTN, MTP Control, type 52 442 ZPA Pečky

Technical data

Type	Modact MTN Control	Modact MTN	Modact MTP Control	Modact MTP
Marking in valve specification No.	EYA	EYB	EYA	EYB
Voltage	3 ~ 230 V / 400 V			
Frequency	50 Hz			
Motor power	See specification table			
Control	3 - position, with regulator ZP2.RE5			
Nominal force	15 and 25 kN			
Travel	10 to 100 mm			
Enclosure	IP 55		IP 67	
Process medium max. temp.	Acc. to used valve			
Ambient temperature range	-25 to 55°C			
Ambient humidity range	5 - 100 % with condensation			
Weight	33 kg			

Wiring diagram of actuators

Note:
Detailed technical informations and wiring diagrams can be found in producer's datasheet or on the webside **www.zpa-pecky.cz.**

Specification of actuators Modact MTN, MTP and Modact MTN, MTP Control

Basic equipment	2 power switches MO, MZ	1 position transmitter - resist. 2x100 Ω or current
	2 limit switches PO, PZ	1 anti-condensation heater
	2 limit and signalisation switches SO, SZ	1 three phase asynchronous motor

Basic technical parameters

Type	Power switch setting range kN	Direct power kN	Resetting speed mm.min^{-1}	Travel mm	Power W	Electric motor			Weight	Specification No.	
						RPM 1/min	In (400V) A	Iz / In	Aluminium [kg]	Basic	Additional [2]
MTN 15 MTP 15	11,5 - 15	17	50	10 - 100	180	850	0.74	2.3	33	52 442	XX0XXM
			80		180	850	0.74	2.3			XX1XXM
			125		250	1350	0.77	3.0			XX3XXM
			36		120	645	0.51	2.2			XX2XXM
			27		120	645	0.51	2.2			XXAXXM
MTN 25 MTP 25	15 - 25	32,5	50	10 - 100	180	835	0.74	2.3	33		XX4XXM
			80		180	835	0.74	2.3			XX5XXM
			125		250	1350	0.77	3.0			XX6XXM
			36		120	645	0.51	2.2			XX7XXM
			27		120	645	0.51	2.2			XX8XXM

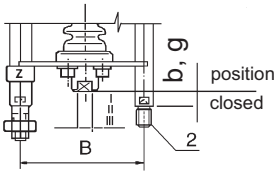
Execution, electric connection	
Via terminal board	6XXXXM
With conector HARTING	7XXXXM
Execution Modact MTN; Modact MTN Control ... enclosure IP55	XXXXNM
Execution Modact MTP; Modact MTP Control ... enclosure IP67	XXXXPM

		Current transmitter CPT without source	Current transmitter DCPT with source
Position transmitter	current 4 - 20 mA	XXX0XM	XXXRXM
	current 4 - 20 mA with BMO	XXX1XM	XXXSXM
	resistance transmitter 2x 100 Ω	XXX2XM	
	resistance transmitter 2x 100 Ω s BMO	XXX3XM	
	without transmitter, with BMO	XXXPXM	
	without transmitter, without BMO	XXXZXM	

Additional electric equipment [1]			Resistance transmitter 2x 100 ohm	Current transmitter CPT without source	Current transmitter DCPT with source
Modact Control execution (with built-in contactor combination)	without BMO	Without brake BAM and positioner	XXX4XM	XXXAXM	XXXKXM
		With brake BAM, without positioner	XXX5XM	XXXBXM	XXXLXM
		With brake BAM and with positioner		XXXCX5M [3]	
	with BMO	Without brake BAM and positioner	XXX7XM	XXXDXM	XXXMXM
		With brake BAM, without positioner	XXX8XM	XXXEXM	XXXNXM
		With brake BAM and with positioner		XXXFX5M [3]	

Notes:
[1] When execution with blinker is requested, specify this requirment in writing: Execution with blinker
[2] Design without force locking after reversation have at end position capital letter M (for example: 52442.6M51)
[3] For actuators MODACT MTN Control s with position controllers ZP2.RE5 specify number 5 on place 11 (for example: 52442.6M5FN5M)

Connection dimensions - details of additional specification No. 52 442

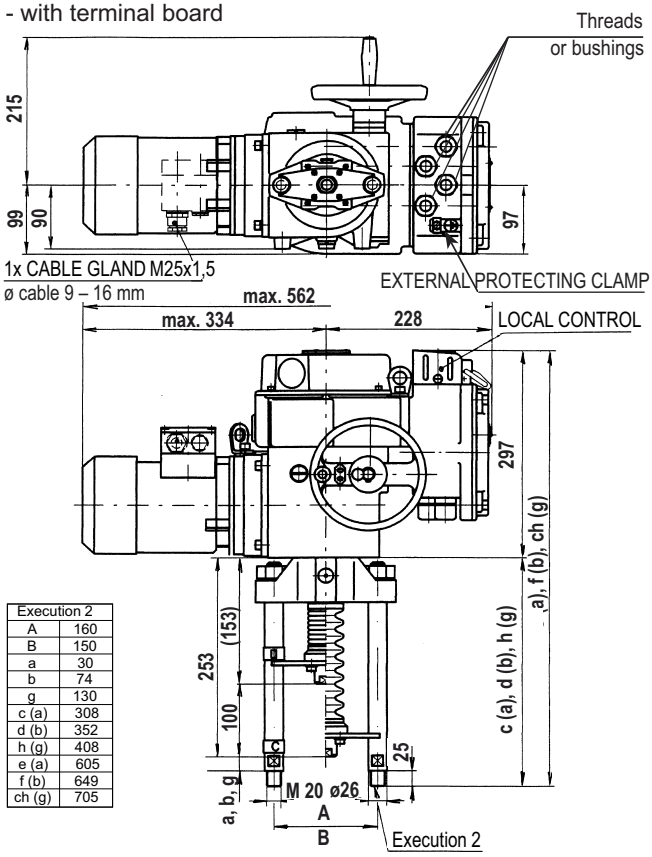


Pitch of columns	B	150
Position "closed"	b	74
	g	130
Clutch thread	I	M 20x1,5
	II	M 16x1,5
	III	M 10x1

Execution	Specification No.		For valves
	basic	additional	
Bb2II	52 442	XMXXXM	RV, RS 50x DN 40 to 125
Bb2III	52 442	XPXXXM	RV, RS 50x DN 15 to 25
Bg2I	52 442	XRXXXM	RV, RS 50x DN 150

Dimensions of actuator Modact MTN, MTP

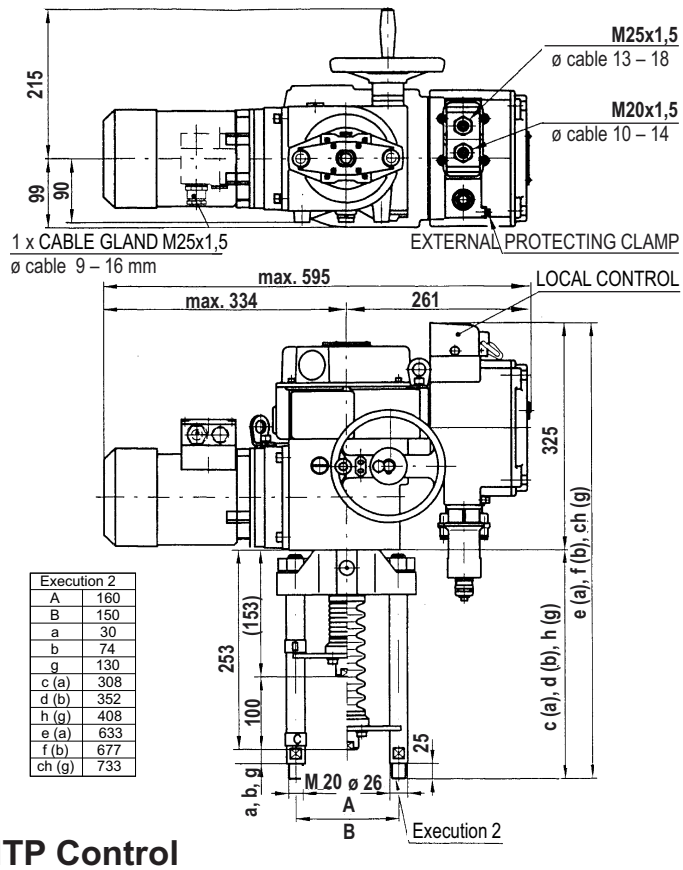
- with terminal board



Execution 2	
A	160
B	150
a	30
b	74
g	130
c (a)	308
d (b)	352
h (g)	408
e (a)	605
f (b)	649
ch (g)	705

Dimensions of actuator Modact MTN, MTP and Modact MTN, MTP Control

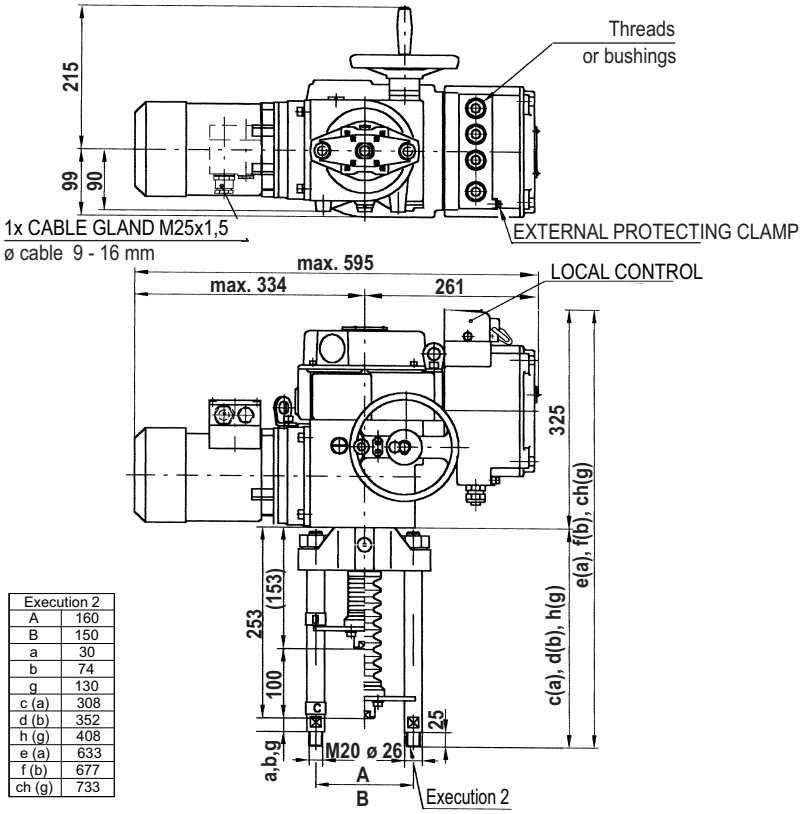
- with conector



Execution 2	
A	160
B	150
a	30
b	74
g	130
c (a)	308
d (b)	352
h (g)	408
e (a)	633
f (b)	677
ch (g)	733

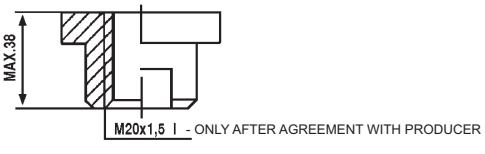
Dimensions of actuator Modact MTN, MTP Control

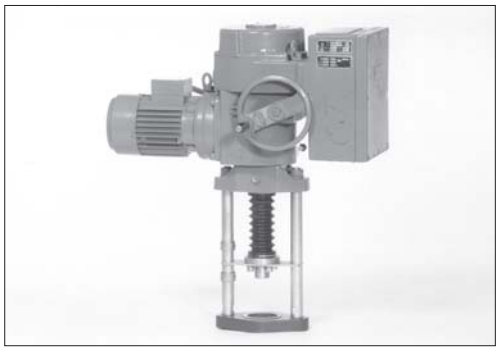
- with terminal board



Execution 2	
A	160
B	150
a	30
b	74
g	130
c (a)	308
d (b)	352
h (g)	408
e (a)	633
f (b)	677
ch (g)	733

Detail of coupling





EYA

Electric actuators Modact MTNED and Modact MTPED, typ 52 442 ZPA Pečky

Technical data

Type	Modact MTNED	Modact MTPED
Marking in valve specification No.	EYA	
Execution	The actuator equiped with electronic system DMS2 or DMS2 ED	
Voltage	3 ~ 230 V / 400 V	
Frequency	50 Hz	
Motor power	See specification table	
Control	3 - position, or continuous	
Nominal force	15 to 25 kN	
Travel	10 to 100 mm	
Enclosure	IP 55	IP 67
Process medium max. temp.	Acc. to used valve	
Ambient temperature range	-25 to 55°C	
Ambient humidity range	5 - 100 % with condensation	
Weight	33 kg	

Wiring diagram of actuators *)

Note: Detailed technical informations and wiring diagrams can be found in producer's datasheet or on the webside **www.zpa-pecky.cz.**

Elektric equipment

System DMS2 ED
The more simple system DMS2 ED substitutes electromechanical parts and/or provides for controlling the electric actuator by input analog signal as in the version Control.

Basic equipment	
Control unit	It also contains the sensor of position of the output shaft, 4 push-buttons and 3 signal LEDs for setting and checking the actuator.
Torque-limit unit	
Source unit	Contacts of seven relays (MO, MZ, PO, PZ, SO, SZ, READY) are connected to the terminal board; state of each relay is signalized by LED. The unit enables the heating resistor to be connected and controlled by the thermostat.
Optional equipment	
Feedback signal	4-20 mA
Analog regulator	
Position Indicator	LED display
Relay control or contactless control unit	
Electronic brake	

System DMS2
The system DMS2 enables the electric actuator to be used for two-position and three-position regulation or to be connected to the industrial bus bar Profibus.

Basic equipment	
Control unit	It also includes a sensor of the output shaft position 2 signal LED
Torque-limit unit	
Source unit	- 2 relays for electric motor control - Relay *Ready* with change-over contact connected to the terminal board - Signalling relays 1 - 4 with one pole of the switching contact connected to the terminal board Second poles of the switching contacts of relays 1 - 4 are interconnected and brought out to the terminal COM Heating resistor switched by a thermostat is connected to the unit The unit controls power switches of the electric motor (reversing relay) To the unit can be connected an electronic brake
Unit of display	Two-row display, 2 x 12 alpha-numeric characters
Unit of push-buttons	Push-buttons *"Open", "Close", "Stop";* Selector switch *"Local", "Remote", "Stop"*
Recommended equipment	
Electronic brake	After switching-off the motor reduces running down and precises the control
Optional equipment *(the electric actuator must be fitted with one of these units)*	
Unit of two- and three-position control	Control of the electric actuator by shifting to position Open and Close or by analog signal 0(4) - 20 mA
Unit of connection Profibus	Control of the electric actuator by industrial bus bar Profibus

Note: The electronic control DMS2 checks, within its function, sequence and fall-out of phases of supply voltage.

Specification of actuators Modact MTNED a MTPED

Basic technical parameters

Type	Power switch setting range kN	Direct power kN	Resetting speed mm.min^{-1}	Travel mm	Power W	Electric motor			Weight	Specification No.	
						RPM 1/min	In (400V) A	Iz / In	Aluminium [kg]	Basic	Additional
MTNED 25 MTPED 25	15 - 25	32,5	50	10 - 100	180	835	0.74	2.3	33	52 442	XX4XXED
			80		180	835	0.74	2.3			XX5XXED
			125		250	1350	0.77	3.0			XX6XXED
			36		120	645	0.51	2.2			XX7XXED
			27		120	645	0.51	2.2			XX8XXED
Execution Modact MTNED ... enclosure IP55											XXXXNED
Execution Modact MTPED ... enclosure IP67											XXXXPED

Execution, circuity, electronic equipment

	Terminal board	Conector	Terminal board, brake	Conector, brake
DMS2, ED electronics	EXXXXED	FXXXXED	HXXXXED	KXXXXED
DMS2, Profibus electronics	PXX0XED	TXX0XED	UXX0XED	YXX0XED
DMS2, 2-position or 3-position control *)	RXX0XED	VXX0XED	WXX0XED	1XX0XED

*) Producer will set in production 2- or 3- position control. If not specified in the order, the gearmotor is set to 3-position control (signal control 4-20 mA).

Equipment of DMS2ED electronics

Equipment		Character at the 9. position (52 442 xxxXxED)																						
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	H	J	K	L	M	N	P	R
Local control			x		x		x		x		x		x		x		x		x		x		x		x
Display				x	x			x	x			x	x			x	x			x	x			x	x
Relay						x	x	x	x					x	x	x	x					x	x	x	x
Analog module	Transmitter									x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Regulator																	x	x	x	x	x	x	x	x

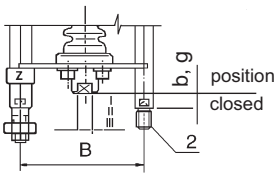
Note: In the case of using an electronic DMS2 is the character at the 9. position 0

Ambient temperature (°C)	Actuator type				Marking
	MTNED		MTPED		
	DMS2 ED	DMS2	DMS2 ED	DMS2	
-25 +70	YES	YES	NO	NO	---
-40 +60	YES	YES	YES	YES	F1
-25 +60	---	---	YES	YES	---

Note: YES - supplied
NO - not available

Relative humidity from 10% to 100% with condensation.

Connection dimensions - details of additional specification No. 52 442

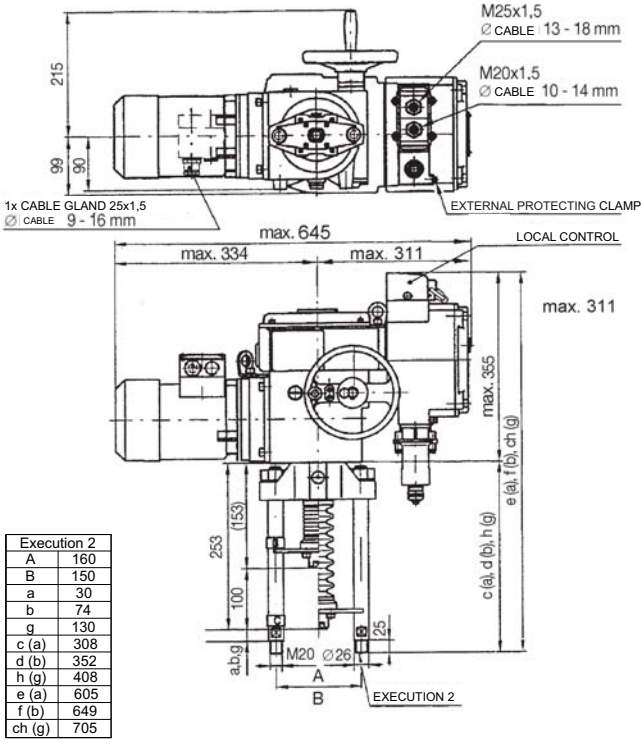


Pitch of columns	B	150
Position "closed"	b	74
	g	130
Clutch thread	I	M 20x1,5
	II	M 16x1,5
	III	M 10x1

Execution	Specification No.		For valves
	basic	additional	
Bb2II	52 442	XMXXXED	RV, RS 50x DN 40 to 125
Bb2III	52 442	XPXXXED	RV, RS 50x DN 15 to 150
Bg2I	52 442	XRXXXED	RV, RS 50x DN 200

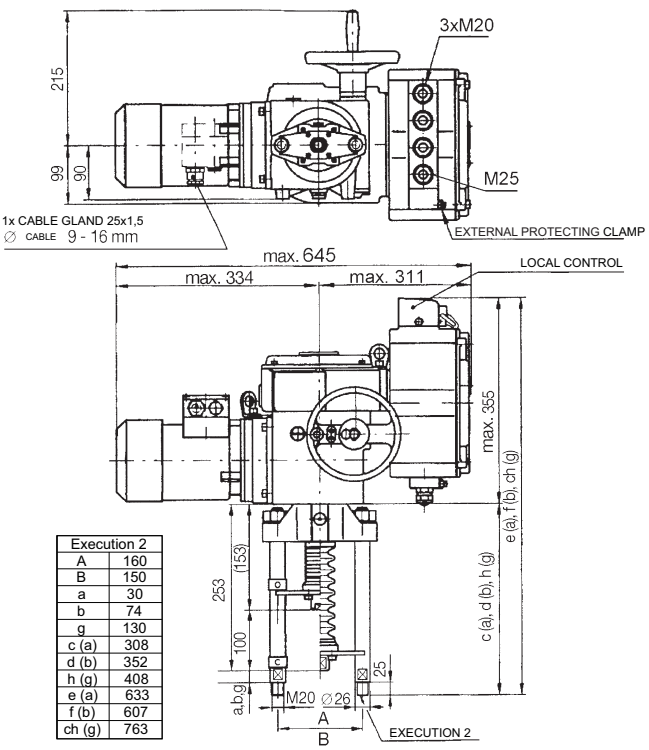
Dimensions of actuator Modact MTNED/MTPED

- with conector



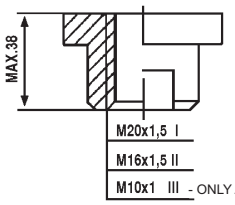
Execution 2	
A	160
B	150
a	30
b	74
g	130
c (a)	308
d (b)	352
h (g)	408
e (a)	605
f (b)	649
ch (g)	705

- with terminal board



Execution 2	
A	160
B	150
a	30
b	74
g	130
c (a)	308
d (b)	352
h (g)	408
e (a)	633
f (b)	607
ch (g)	763

Detail of coupling



- ONLY AFTER AGREEMENT WITH PRODUCER

EPD

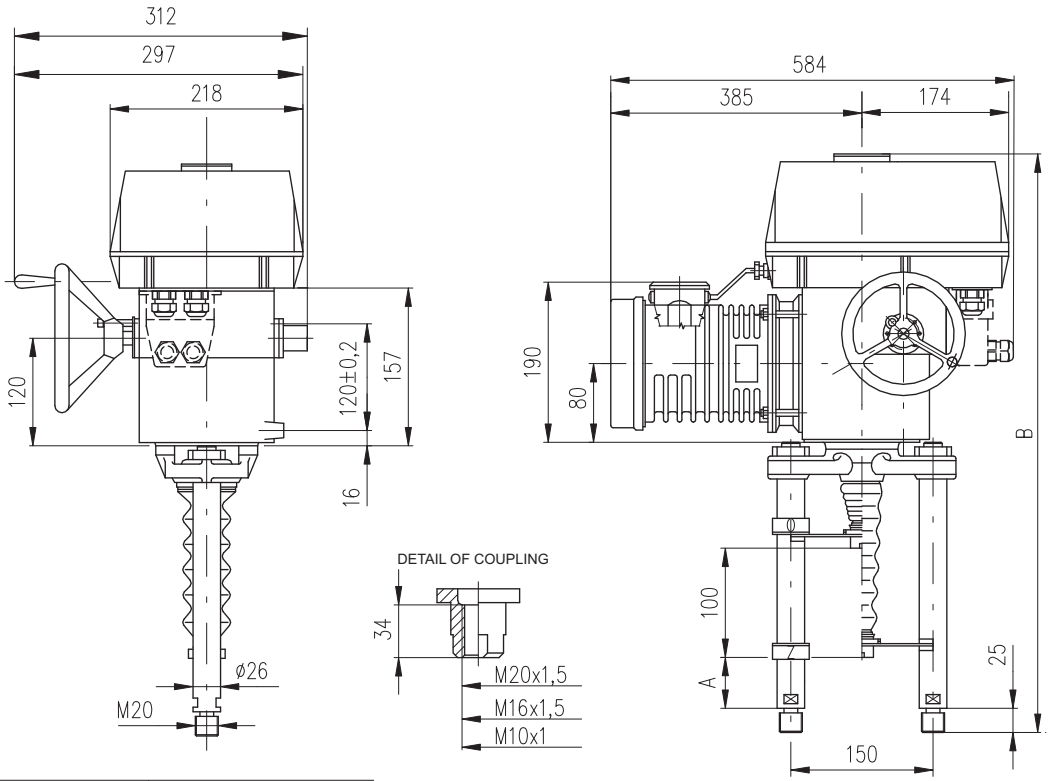
Electric actuator Modact MTR Regada

Technical data

Type	Modact MTR
Marking in valve specification No.	EPD
Voltage	230 V AC
Frequency	50 Hz
Motor power	16 or 25 W
Control	3 - pos. c. (in connection with NOTREP positioner - continuous)
Nominal force	16, 25 kN
Travel	12,5 to 100 mm
Enclosure	IP 55 / IP 67
Process medium max. temperature	Acc. to used valve
Ambient temperature range	-25 to 55°C
Ambient humidity limit	90 %
Weight	27 to 31 kg

Note: Detailed technical informations can be found in producer's data sheet or on the webside **www.regada.sk**

Dimensions of actuator Modact MTR



columns	with acme thread		for valves
verze	A	B	
P-1045a/E	74	646	RV, RS 50x DN 15 ÷ 125
P-1045a/H	130	702	RV, RS 50x DN 150

#) RV, RS 50x, DN 150
##) RV, RS 50x, DN 40 ÷ 125
###) RV, RS 50x, DN 15 a 25

Specification of Modact MTR

Electric actuator MTR, linear		52 420. X - X X X X X / X X
Mild up to hot dry with temperature range (-25 °C to +50 °C)	Enclosure IP 55	0
	Enclosure IP 67	1

Electric conection	Voltage	Code
To terminal board	230 V AC	9
To connector	230 V AC	8

Screw version		Switching-off thrust 1) 2)	Rated operating speed	Operating speed	Electric motor: Power	Electric motor: Speed	Electric motor: Current	Code
ball screw	16 000/32-G	10.0 - 16.0 kN	32 mm/min.	38 - 32 mm/min.	16 W	1 150	0.31 A	E
ball screw	25 000/32-G	10.0 - 25.0 kN	32 mm/min.	38 - 32 mm/min.	25 W	1 250	0.41 A	G
ball screw	16 000/50-G	10.0 - 16.0 kN	50 mm/min.	60 - 50 mm/min.	25 W	1 250	0.41 A	H

Control board version	Operating stroke	Code
Electromechanical control board - without local control	16 mm	B
	25 mm	C
	40 mm	E
	63 mm	F

Transmitter		Connection	Output	Code
Without transmitter		—	—	A
Resistive	Single	—	1x100 Ω	B
	Double		2x100 Ω	C
	Single		1x2000 Ω	F
	Double		2x2000 Ω	P
Resistive with current converter	Without power supply	2-wire	4 - 20 mA	S
	With power supply			Q
	Without power supply	3-wire	0 - 20 mA	T
	With power supply			U
	Without power supply		4 - 20 mA	V
	With power supply			W
	Without power supply		0 - 5 mA	Y
	With power supply			Z
Capacitive CPT	Without power supply	2-wire	4 - 20 mA	I
	With power supply			J

Mechanical connection	Connecting hight / stroke	Pillar spacing / Bore of flange	Thread of stem 3)	Dimensional drawing	Code
Columns	74/100	150/ —	M20x1.5 M16x1.5, M10x1	P-1045a/E	B
	130/100			P-1045a/H	C

Additional equipment		Code
	Without additional equipment; adjusted max. switching-off thrust from range	0 1
A	2 additional position switches S5,S6	0 2
B	Adjustment of switching-off thrust for required value	0 3

Possible combinations and execution: A+B = 07

Notes:
1) State the switching-off thrust in your order by words. If not stated it is adjusted to the maximum rate of the corresponding range. The load torgue equals minimally the maximum switching-off thrust of the choosing range multiplied by 1.3.
2) The maximum load thrust equals the max. Switching-off thrust multiplied by:
 - 0.8 for duty cycle S2-10 min., or S4-25%, 6 - 90 cycles per hour
 - 0.6 for duty cycle S4-25%, 90 - 1200 cycles per hour
3) The thread in the coupling is to be specified in the order by words.

EPM

Electric actuators ST 2, STR 2 Regada

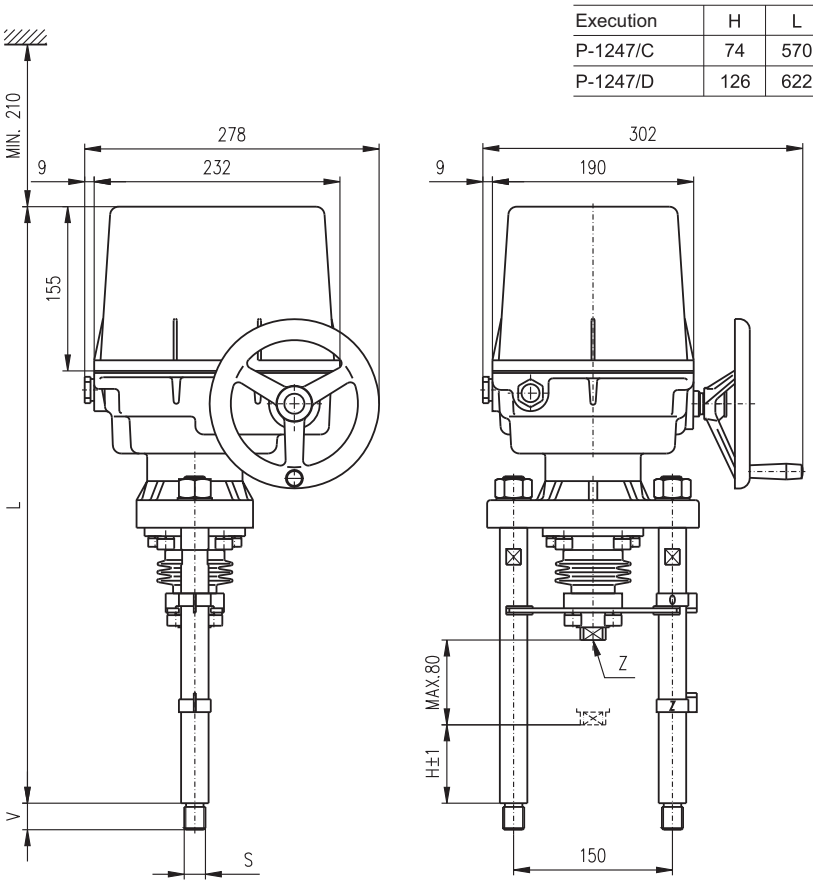
Technical data

Type	ST 2, STR 2
Marking in valve specification No.	EPM
Voltage	1 ~ 230 V AC, 3 ~ 400 V AC
Frequency	50 Hz
Motor power	*see specification table*
Control	3 - position control with positioner 0 - 10 V, (0) 4 - 20 mA
Nominal force	16 a 25 kN
Travel	16, 25, 40 and 64 mm
Enclosure	IP 65 / IP 67
Proces medium max. temperature	Acc. to used valve
Ambient temperature range	-25 to 55°C
Ambient humidity range	5 - 100% with condensation
Weight	17 to 21,5 kg

Note: Detailed technical informations can be found in producer's data sheet or on the webside **www.regada.sk**

Dimensions of actuators

Execution	H	L	S	V	Z	
P-1247/C	74	570	M20	25	M10x1.5, M16x1.5	RV, RS 50x DN 15 - 125
P-1247/D	126	622	M20	25	M20x1.5	RV, RS 50x DN 150



Specification of actuator ST 2, STR 2

Electric actuator ST 2, STR 2				492.	X	-	X	X	X	X	X	/	X	X
Resistance to surroundings	Standard	IP 65	Without positioner (ST 0.1)		0									
	Standard	IP 67	Without positioner (ST 0.1)		1									
	Tropical	IP 67	Without positioner (ST 0.1)		6									
	Standard	IP 65	With positioner (STR 0.1)	Resistive feedback	A									
	Standard	IP 65	With positioner (STR 0.1)	Current feedback	C									
	Tropical	IP 67	With positioner (STR 0.1)	Resistive feedback	G									
	Tropical	IP 67	With positioner (STR 0.1)	Current feedback	J									
Electric connection	To terminal board	Wiring diagram	24 V DC				A							
	To terminal board	Wiring diagram	230 V AC				0							
	To terminal board	Wiring diagram	3x400 V AC 1)				2							
	To terminal board	Wiring diagram	24 V AC				3							
	To terminal board	Wiring diagram	3x400 V AC				9							
	To connector	Wiring diagram	24 V DC				C							
	To connector	Wiring diagram	230 V AC				5							
	To connector	Wiring diagram	24 V AC				8							
	To connector	Wiring diagram	3x400 V AC 1)				6							
	To connector	Wiring diagram	3x400 V AC				7							
230 V AC: Nominal force [N]	Výkon elektromotoru	3x400 V AC: Nominal force [N]	Motor power	Running speed										
25 000	20 W	---	90 W	10 mm/min				A						
16 000	20 W	---	90 W	10 mm/min				J						
25 000	60 W	25 000	90 W	20 mm/min				B						
16 000	60 W	16 000	90 W	20 mm/min				L						
25 000	60 W	25 000	90 W	40 mm/min				C						
16 000	60 W	16 000	90 W	40 mm/min				R						
---	60 W	25 000	90 W	60 mm/min				D						
16 000	60 W	---	90 W	60 mm/min				V						
---	60 W	16 000	90 W	60 mm/min				W						
16 000	60 W	---	90 W	80 mm/min				E						
---	60 W	16 000	90 W	80 mm/min				Y						
---	60 W	16 000	90 W	100 mm/min				Z						
Operating stroke	Max. Without transmitter 2) ... 80 mm	With transmitter	16 mm						D					
		With transmitter	25 mm						F					
		With transmitter	40 mm						H					
		With transmitter	64 mm						J					
Remote position transmitter	Without transmitter									A				
	Resistance	Single	Feedback	1 x 100 Ω						B				
	Resistance	Single	Feedback	1 x 2000 Ω						F				
	Resistance	Double	Feedback	2 x 100 Ω						K				
	Resistance	Double	Feedback	2 x 2000 Ω						P				
	Electronic - current	Without its source	Connection: 2-wire	4 - 20 mA						S				
	Electronic - current	Without its source	Connection: 3-wire	0 - 20 mA						T				
	Electronic - current	Without its source	Connection: 3-wire	4 - 20 mA						V				
	Electronic - current	With its source 3)	Connection: 2-wire	4 - 20 mA						Q				
	Electronic - current	With its source 3)	Connection: 3-wire	0 - 20 mA						U				
	Electronic - current	With its source 3)	Connection: 3-wire	4 - 20 mA						W				
	Capacity	Without its source	Connection: 2-wire	4 - 20 mA						I				
	Capacity	With its source 3)	Connection: 2-wire	4 - 20 mA						J				
Mechanical connection 4)	DN 15 - 25, clutch M10x1, DN 40 - 125, clutch M16x1,5										L			
	DN 150, clutch M20x1,5										M			
Accessories	A	2 auxiliary position switches											0	0
	E	Space heater with terminal switch											0	2
	C	Manual control											0	7
	D	Space heater											1	5
	G	Adjustment of switch-off thrust to the required value											2	5

Allowed combination of accessories and codes:
A+E=04, A+C=08, C+E=10, A+C+E=12, A+D=16, C+D=17, A+C+D=18, A+G=26, E+G=27, C+G=28, D+G=29, A+E+G=30, A+C+G=31, A+D+G=32, C+E+G=33,C+D+G=34, A+D+E+G=35, A+C+D+G=36

1) Version with reverse contacts
2) The version without any transmitter can have adjusted its stroke from 0 up to 80 mm
3) Active position transmitter for version 24 V DC only after agreement with producer
4) Coupling thread must be specified verbally

EPM

Electric actuators STR 2PA Regada

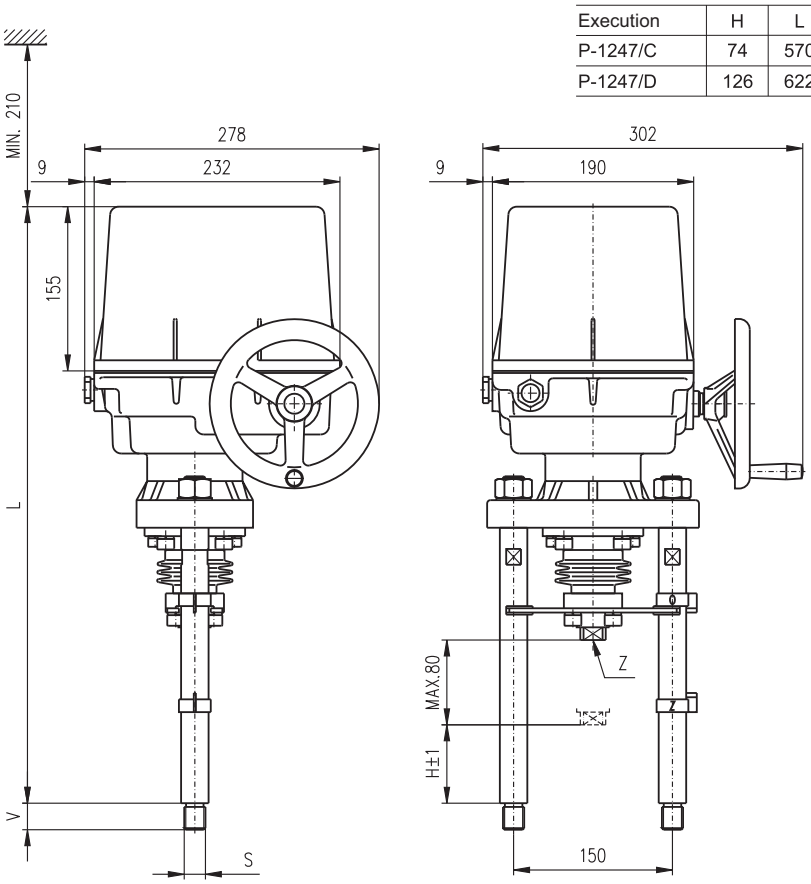
Technical data

Type	STR 2PA
Marking in valve specification No.	EPM
Voltage	1 ~ 230 V AC, 3 ~ 400 V AC
Frequency	50 Hz
Motor power	*see specification table*
Control	3 - position control with positioner 0 - 10 V, (0) 4 - 20 mA
Nominal force	16 a 25 kN
Travel	16, 25, 40 and 64 mm
Enclosure	IP 67
Proces medium max. temperature	Acc. to used valve
Ambient temperature range	-25 to 55 ℃
Ambient humidity range	5 - 100% with condensation
Weight	17 to 21 kg

Note: Detailed technical informations can be found in producer's data sheet or on the webside **www.regada.sk**

Dimensions of actuators

Execution	H	L	S	V	Z	
P-1247/C	74	570	M20	25	M10x1.5, M16x1.5	RV, RS 50x DN 15 - 125
P-1247/D	126	622	M20	25	M20x1.5	RV, RS 50x DN 150



Specifikace pohonu STR 2PA

Elektrický servomotor STR 2PA					432. X - X X X X X / X X
Resistance to surroundings	IP 67				1
Electric connection	Terminal board	Voltage	230 V AC		0
			3 ~ 400 V AC		2

Nominal force [N] 230 V AC	Nominal force [N] 3 ~ 400 V AC	Running speed	Code
25 000	---	10 mm/min	A
16 000			J
25 000	25 000	20 mm/min	B
16 000	16 000		L
25 000	25 000	40 mm/min	C
16 000	16 000		R
---	25 000	60 mm/min	D
16 000	---		V
---	16 000		W
16 000	---	80 mm/min	E
---	16 000		Y
	16 000	100 mm/min	Z
Travel		10-80 mm	K

Control board	Control			Feedback	Code
DMS3 ED	ON - OFF by feeding power supply 230 V AC			4 - 20 mA pasive	N
DMS3	ON - OFF and inching	24 V DC		---	F
	Modulating 0/4 - 20 mA	ON - OFF and inching	24 V DC	4 - 20 mA pasive	G
	Modulating 0/2 - 10 V				H

Mechanical connection 1)		Code
	DN 15 - 25, clutch M10x1, DN 40 - 125, clutch M16x1,5	D
	DN 150, clutch M20x1,5	M

Accessories			Code
		None	
	A	Adjustment of operating stroke to the required value	0 1
	B	Adjustment of switch-off thrust to the required value	0 3
	D	Additional relays R3, R4, R5	0 5
	F	Manual control for actuators with DMS3 a LCD system	0 7
	G	Manual control for actuators with DMS3 ED system	0 8

Allowed combination of accessories and codes:
A+B=20, A+D=22, A+F=24, A+G=25, A+B+D=52, A+B+F=54, A+B+G=55, A+B+D+F=114, A+B+D+G=115, A+D+F=63, A+D+G=64, B+D=29, B+F=31, B+G=32, B+D+F=80, B+D+G=81, D+F=40, D+G=41

1) Coupling thread must be specified verbally

EAA, EAB, EAC, EAD
EAE, EAF, EAG, EAH

Electric actuators
SA 07.2, SA ExC 07.2, SAR 07.2, SAR ExC 07.2
SA 07.6, SA ExC 07.6, SAR 07.6, SAR ExC 07.6
Auma

Technical data

Type	SA 07.2	SA ExC 07.2	SAR 07.2	SAR ExC 07.2	SA 07.6	SA ExC 07.6	SAR 07.6	SAR ExC 07.6
Marking in valve specification No.	EAA	EAB	EAC	EAD	EAE	EAF	EAG	EAH
Voltage	1 ~ 230 V AC; 3 ~ 380 or 400 V							
Frequency	50 Hz							
Motor power	See specification table							
Control	3 - position control or with signal 4 - 20 mA							
Nominal force	30 Nm ~ 15 kN				30 Nm ~ 15 kN; 40 Nm ~ 20 kN			
Travel	Acc. to valve's stroke 16				Acc. to valve's stroke 25, 40 and 63 mm			
Enclosure	IP 68							
Process medium max. temperat.	Acc. to used valve							
Ambient temperature range	-40 to 80˚C	-20 to 60˚C	-40 to 60˚C	-20 to 60˚C	-40 to 80˚C	-20 to 60˚C	-40 to 60˚C	-20 to 60˚C
Ambient humidity limit	100 %							
Weight	1-phase motor 49 kg; 3-phase motor 21 kg							

Note: Detailed technical informations can be found in producer's data sheet or on the webside **www.auma.com**

Specification of Auma actuators

		SA	X	XXX		07.X
Type		SA				
Duty	Control		R			
	ON - OFF					
Execution	Standard					
	Non-explosive			ExC		
Actuator´s size						07.2
						07.6

Output shaft type A (thread TR 16x4 LH, connection flange F07) ... for RV 50x DN 15, 25

Output speed (rpm)		Tripping torgue	SA 07.2 SA ExC 07.2	SAR 07.2 SAR ExC 07.2	Motor power [kW]	SA 07.2	SA ExC 07.2	SAR 07.2	SAR ExC 07.2
	4					0,02	0,02	0,02	0,02
	5,6					0,02	0,02	0,02	0,02
	8					0,04	0,04	0,04	0,04
	11		10-30 Nm	15-30 Nm		0,04	0,04	0,04	0,04
	16					0,06	0,06	0,06	0,06
	22					0,06	0,06	0,06	0,06
	32					0,1	0,1	0,1	0,1
	45					0,1	0,1	0,1	0,1

Output shaft type A (thread TR 20x4 LH, connection flange F10) ... for RV, RS 50x DN 40 to 150

Output speed (rpm)		Tripping torgue	SA 07.6 SA ExC 07.6	SAR 07.6 SAR ExC 07.6	Motor power [kW]	SA 07.6	SA ExC 07.6	SAR 07.6	SAR ExC 07.6
	4					0,03	0,03	0,03	0,03
	5,6					0,03	0,03	0,03	0,03
	8					0,06	0,06	0,06	0,06
	11		20-60 Nm	30-60 Nm		0,06	0,06	0,06	0,06
	16					0,12	0,12	0,12	0,12
	22					0,12	0,12	0,12	0,12
	32					0,2	0,2	0,2	0,2
	45					0,2	0,2	0,2	0,2

Accessories

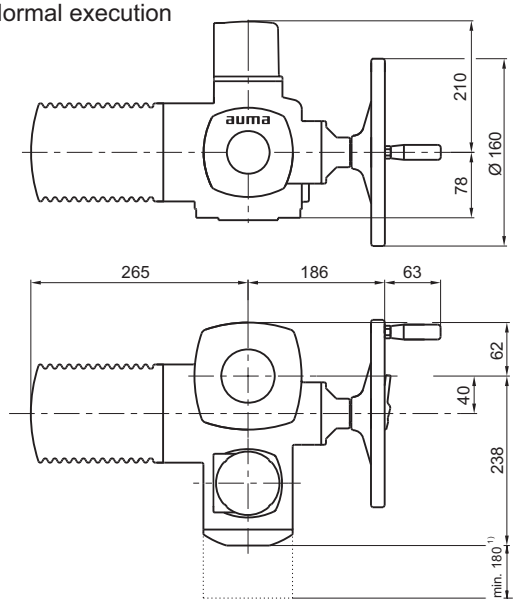
2 TANDEM switches
Gearing for signalisation of position
Mechanical position indicator
Potentiometer 1x200 Ω
Electronic position transmitter RWG (potentiometer included), 4 - 20 mA, 2-wire
Electronic position transmitter RWG (potentiometer included), 4 - 20 mA, 3/4-wire
Inductive position transmitter IWG, 4 - 20 mA
MATIC - for continuous control (specification of accessories acc. to catalogue of producer)
AUMATIC - for continuous control (specification of accessories acc. to catalogue of producer)

Other accessories acc. to catalogue of producer of actuators

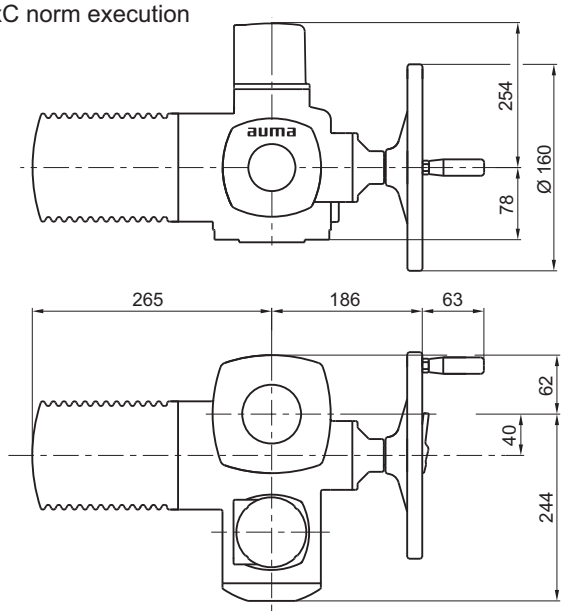
Dimension of Auma actuators 07.2 / 07.6

3-phase execution only, for dimensions of 1-phase execution see in producer's data sheet or on the webside **www.auma.com**

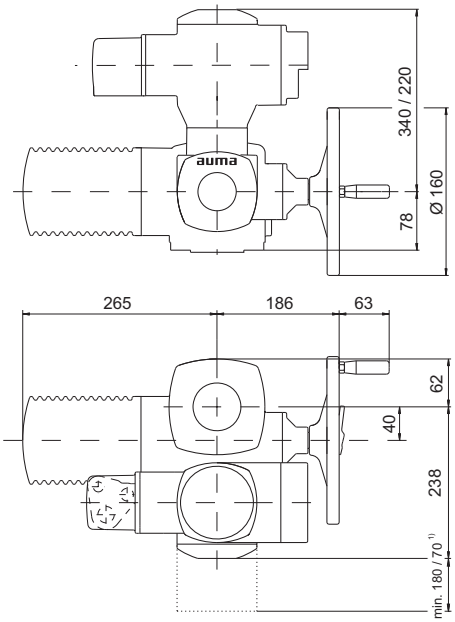
Normal execution



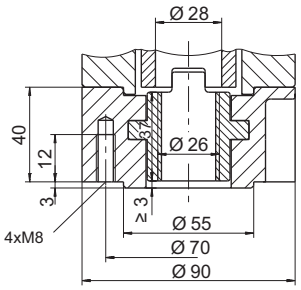
ExC norm execution



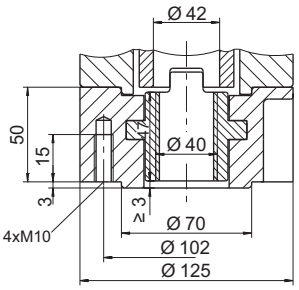
Version MATIC / AUMATIC



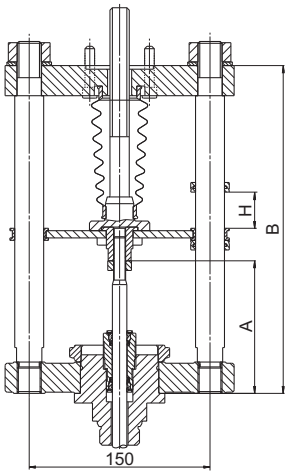
Output drive A, F07



Output drive A, F10



Attachment yoke (2 or 4 columns)



1) Space needed for opening the cover

For valves	Number of columns	A	B	Weight
RV, RS 50x DN 15 to 125	2	110	272	~ 8 kg
RV, RS 50x DN 150	2	160	412	~ 11 kg

EZE, EZF
EZG, EZH

Electric actuators ...AB5
Schiebel

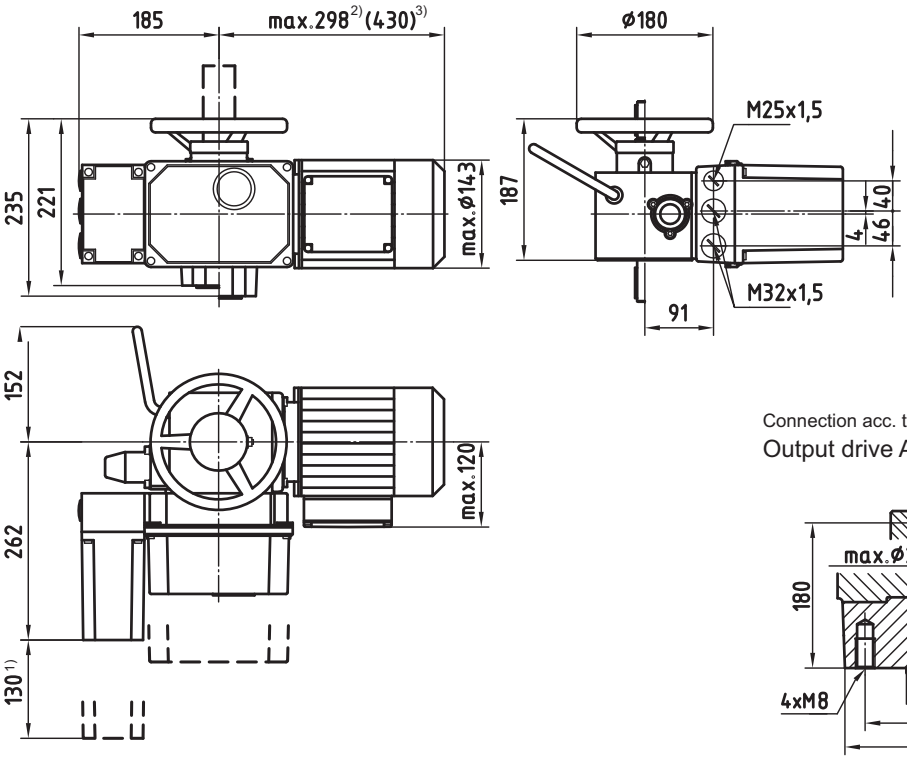
Technical data

Type	AB5	exAB5	rAB5	exrAB5
Marking in the valve´s specification No.	EZE	EZF	EZG	EZH
Voltage	400 / 230 V; 230 V	400 / 230 V	400 / 230 V; 230 V	400 / 230 V
Frequency	50 Hz			
Motor power	See specification table			
Control	3 - position control or with signal 4 - 20 mA			
Nominal force	60 Nm ~ 30 kN; 30 Nm ~ 15 kN; 40 Nm ~ 20 kN			
Stroke	Acc. to valve's stroke 16, 25, 40, 63 mm			
Enclosure	IP 66	IP 65	IP 66	IP 65
Process medium max. temperature	Acc. to used valve			
Ambient temperature range	-25 to 80 °C	-20 to 40 °C	-25 to 60 °C	-20 to 40 °C
Ambient humidity limit	90 % (tropical version 100 % with condensation)			
Weight	16 - 20 kg			

Specification of actuators

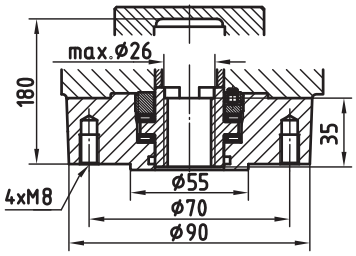
												XX	X	XXX	X	X	+	XXX
Execution					Non-explosive							Ex						
					Standard													
Duty					Control								R					
					ON - OFF													
Actuator´s torque														AB5				
Output shaft (thread TR 16x4 LH, flange F07 ... DN 15 to 25; thread TR 20x4 LH, flange F10 ... DN 40 to 150)															A			
Output speed (rpm)		Tripping torgue	AB5 exAB5	rAB5 exrAB5	Motor power [kW]	AB5		rAB5		exAB5	exrAB5							
						400/230V	230V	400/230V	230V	400/230V	400/230V							
	2,5					0,09	0,09	0,09	0,09	0,09	0,09					2,5		
	5					0,06	0,12	0,06	0,12	0,12	0,12					5		
	7,5					0,09	0,09	0,09	0,18	0,09	0,09					7,5		
	10					0,09	0,18	0,09	0,37	0,09	0,09					10		
	15					0,18	0,18	0,18	0,37	0,18	0,18					15		
	20					0,18	0,55	0,18	0,75	0,18	0,18					20		
	30					0,37	0,55	0,37	1,10	0,37	0,37					30		
	40					0,37	0,55	0,37	1,10	0,37	0,37					40		
			10-60 Nm	Tripping 30 - 60 Nm Loading 15 - 30 Nm														
Accessories					Potentiometer 1x1000 Ω													F
					Double potentiometer													FF
					Electronic transmitter 4 - 20 mA													ESM21
					Positioner ACTUMATIC R													CMR
					SMARTCON control unit													CSC

Dimensions of actuators ...AB5

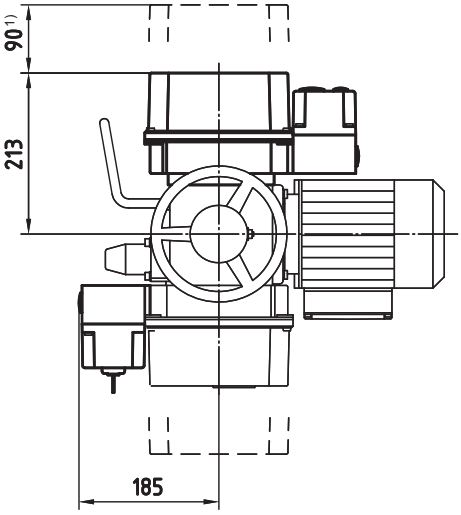


1) space needed for opening the cover
2) execution without brake
3) execution with brake

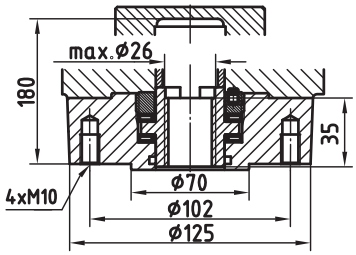
Connection acc. to ISO 5210
Output drive A, flange F07



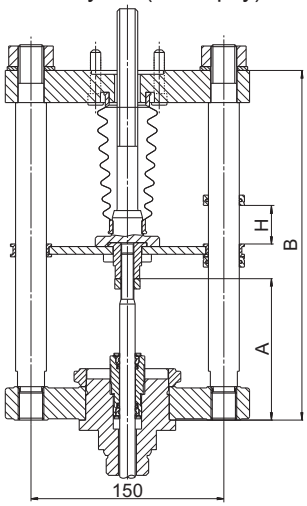
With positioner ACTUMATIC R



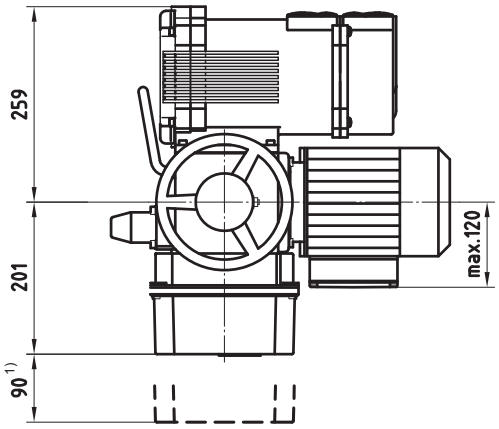
Connection acc. to ISO 5210
Output drive A, flange F10



Attachement yoke (2 sloupky)



With control unit SMARTCON



For valves	Number of columns	A	B	Weight
RV 50x DN 15 to 125	2	110	272	~ 8 kg
RV, RS 50x DN 150	2	160	412	~ 11 kg

PFB
PFC
PFD

Pneumatic actuators Flowserve

Technical data

Type	PB 502		PB 700		PO 1502	
Marking in valve specification No.	PFB		PFC		PFD	
Feeding pressure	0,6 Mpa max					
Function	Fail to open	Fail to close	Fail to open	Fail to close	Fail to open	Fail to close
Control	Pneumatic signal of 20 - 100 kPa					
	Current signal of 0(4) - 20 mA					
Nominal force	According to table of nominal force values					
Stroke	40 mm		20, 40 and 60 mm		80 mm	
Enclosure	IP 54					
Process medium max. temperature	According to used valve					
Ambient temperature range	-40 to 80°C					
Ambient humidity limit	95 %					
Weight	See table of dimensions					

Accessories

Electropneumatic positioner (analogous) type SRI 990	Device with electric input of 4 to 20 mA and outlet of controllling air into actuator. It is adjusted by switches and potentiometers.
Electropneumatic positioner (inteligent) type SRD 991	Device with electric input of 4 to 20 mA and outlet of controllling air into actuator. It is adjusted by PC and special software. Comunication HART, Fieldbus Foundation, PROFIBUS.
Electropneumatic positioner (digital) type SRD 991 - D	Device with electric input of 4 to 20 mA and outlet of contr. air into actuator. It is adjusted by a local keyboard and diods, possibly on display.
Pneumatic positioner type SRP 981	Device with pneumatic input of 20 to 100 kPa to control the pneumatic actuators with pneumatic control signal
Signalisation switches type SGE 985	Adjustable end position switches
Air set type A 3420	Reduces control air pressure to a value requied
Electropneumatic positioner type SRI 986	Analog positioner with input signal of 4 (0) - 20 mA
Electropneumatic positioner SIPART PS2	Digital with input signal of 4(0) – 20 mA
Volume Booster-valve, type EIL 100	Flow air volume increaser
Solenoid valve, standard type SC G327A001	Direct operated electromagnetic valve, execution 3/2, function U (universal), G 1/4“
Air lock valve, type EIL 200	Retaining device for closing of air pipeline on a pressure drop

Operating conditions

Pneumatic actuators Flowserve can operate with extremely high ambient temperatures with unique resistance to shock loads. They excel with resistance to vibrations and reached 10^6 of cycles in operation. It is possible to deliver the actuator with both fail to open and fail to close function, possibly with a position blocking (air lock) upon feeding pressure air supply failure. Various accessories can be delivered together with the actuator.

Direct and indirect functions

Direct function ensures that actuator´s stem retracts upon control air supply failure (valve opens).
Indirect function ensures that actuator´s stem extends upon control air supply failure (valve closes).

Dimensions and weights for Flowserve actuators

Type	Actuator							Hand wheel heavy (light)		Weight [kg]	
										Actuator	Act. w. HW
	A	B	G	H	M	V1	V2	D_s	E		
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		
PB 502	352	82	M10x1	40	140	260	160	250 (300)	485 (610)	29	38
PB 700	405	65	M16x1.5	20	105	265	290	350	605	40	58
		82		40	140	265	290		610		
PB 1502	550	150	M20x1.5	80	160	340	410	---	---	148	---

Note: Missing data to be given by producer.

Valve specification No. of Flowserve actuators

		PX XXXX	X	XX	X	X	X
Type of actuator		PB 502					
		PB 700					
		PO 1502					
Colour	White		B				
Spring range [bar]	2,0 - 3,5			FS			
	2,0 - 4,8			FY			
	1,8 - 2,7			JC			
	1,5 - 3,8			VI			
	1,5 - 2,7			VC			
Hand wheel	Without wheel				O		
	Heavy wheel [1]				H		
	Light wheel				L		
	Side wheel				S		
Function	direct					A	
	indirect					Z	
Stroke [mm]	20						A
	40						B
	60						C
	80						D

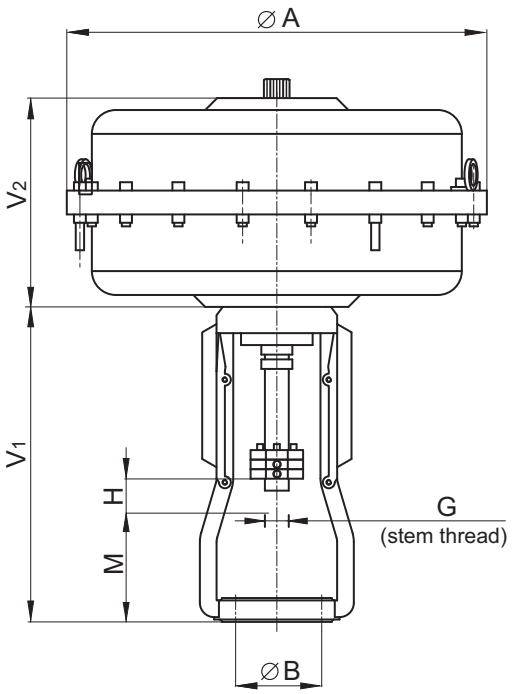
DN	Actuator type	Function	Stroke [mm]		Spring range [bar]	Setting of spring [bar]	Feeding pressure min. [bar]
			of actuator	of valve			
15, 25	PB 502 BVCxZB	closing NC	40	16	1,5 - 2,7	2,22 - 2,7	5
	PB 502 BFYxAB	opening NO	40	16	2 - 4,8	2 - 3,12	5,2
	PB 700 BJCxZA	closing NC	20	16	1,5 - 2,7	1,98 - 2,7	4,8
	PB 700 BJCxAA	opening NO	20	16	1,5 - 2,7	1,5 - 2,52	4,5
40, 50, 65	PB 700 BVIxZB	closing NC	40	25	1,5 - 3,8	2,36 - 3,8	5,3
	PB 700 BVIxAB	opening NO	40	25	1,5 - 3,8	1,5 - 2,93	5,3
80,100, 125	PB 700 BVIxZC	closing NC	60	40	1,5 - 3,8	2,26 - 3,8	5,3
	PB 700 BVIxAC	opening NO	60	40	1,5 - 3,8	1,5 - 3,03	5,3
150	PO 1502 BFSOZD	closing NC	80	63	2 - 3,5	2,3 - 3,5	5
	PO 1502 BFSOAD	opening NO	80	63	2 - 3,5	2 - 3,18	5
	PO 1502 BVCxZD [3]	closing NC	80	63	1,5 - 2,7	1,75 - 2,7	5
	PO 1502 BVCxAD [3]	opening NO	80	63	1,5 - 2,7	1,5 - 2,45	5

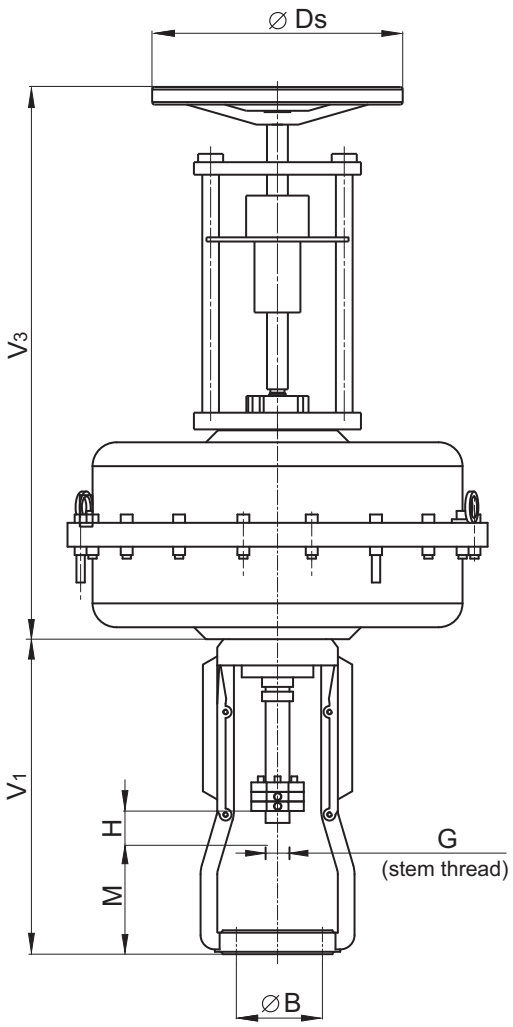
[1] only for PB 502 a PB 700 actuators
[2] only for PB 502 actuators
[3] only for PO 1502 actuators, spring 1,5 - 2,7 bar

Note: Appoint insted of „x": O - without hand wheel, H - with heavy wheel, L - with light wheel, S - with side wheel

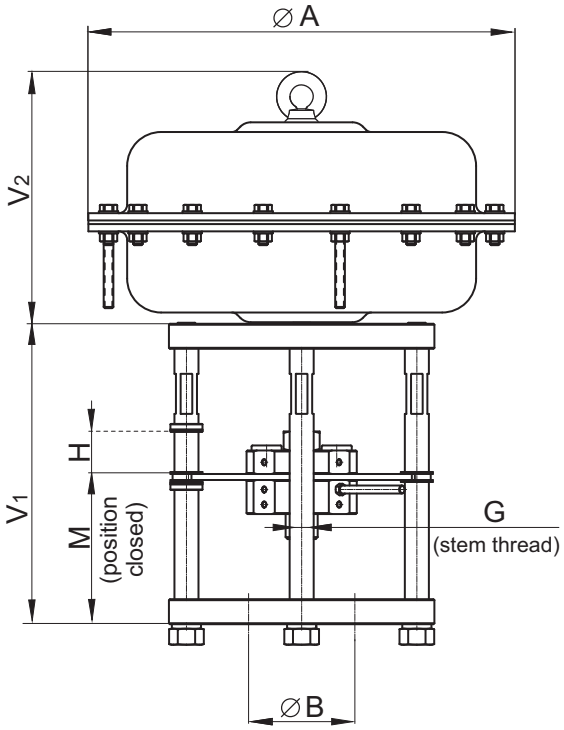
Dimensions for Foxboro actuators

PB 502, PB 700

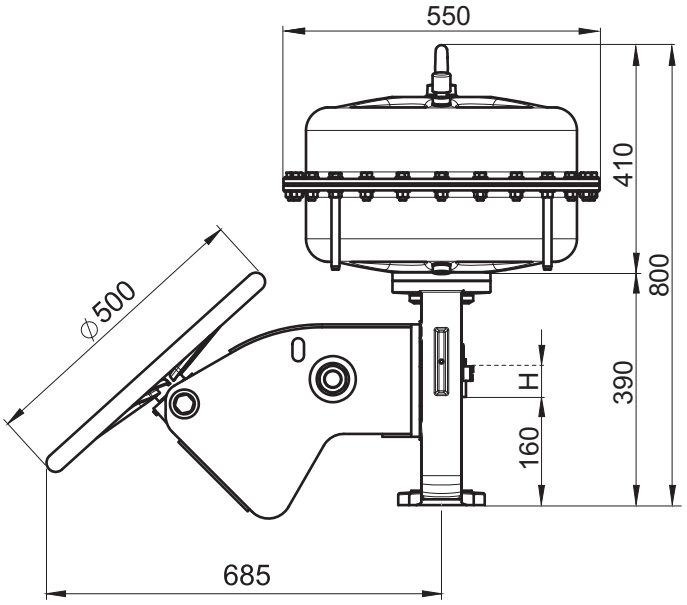




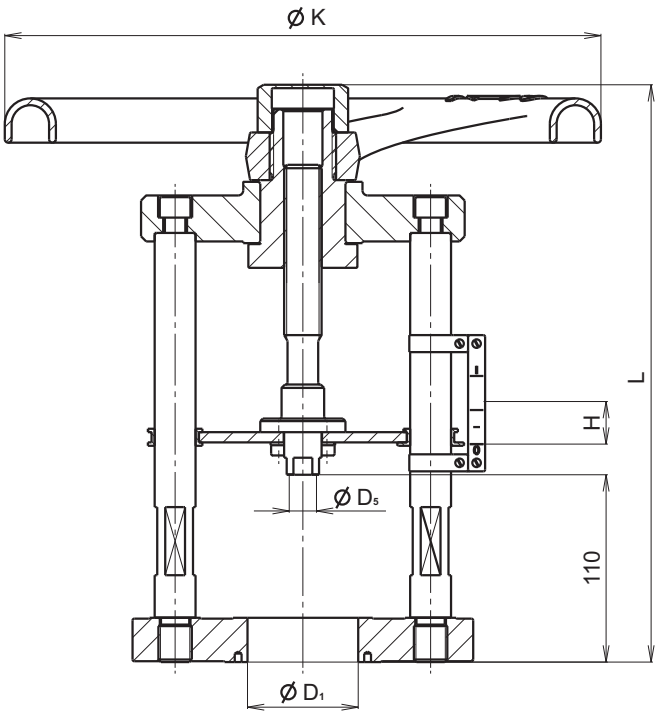
PO 1502



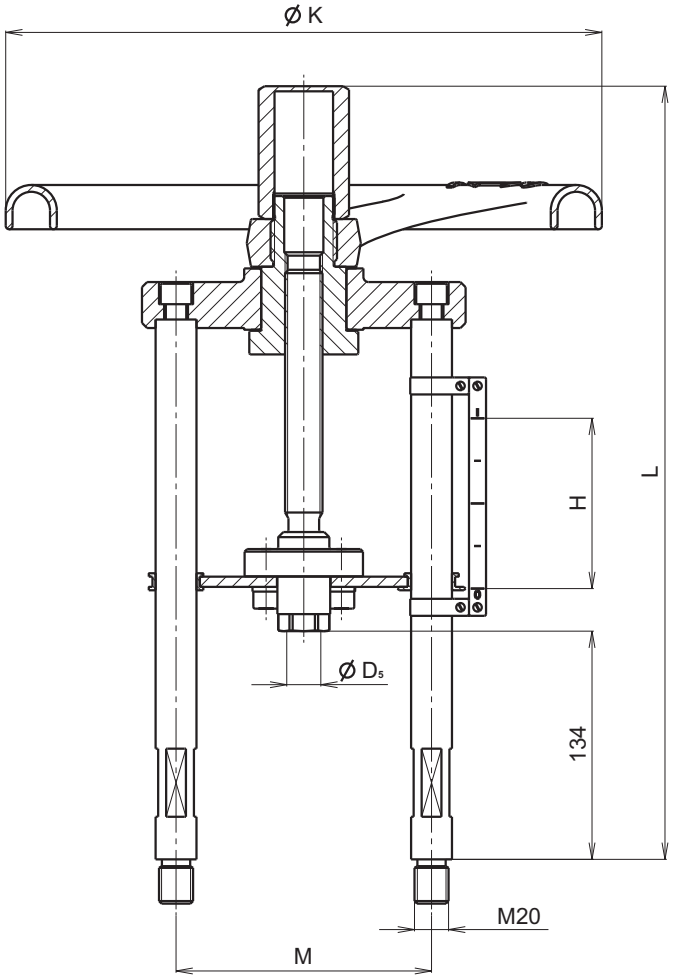
PO 1502 with hand wheel (side)



Actuating of valves RV, RS 50x with hand wheel



Hand wheel actuating of valves DN 15 - 100



Hand wheel actuating of valves DN 150

Dimensions of hand wheel actuating:

DN	Marking	H	L	ØK	M	D_1	D_5	m	Ordering number
		mm	mm	mm	mm	mm	mm	kg	(Part list number)
15	R16	16	247	160	---	65	M10x1	5	S900 0231
25									
40	R20	25	275	195	---		M16x1,5	11	S900 0161
50									
65									
80	R28	40	317	280				13	S900 0116
100									
125									
150	R35	63	454	350	150	85	M20x1,5	15	S900 0141

Maximal permissible pressure values [MPa]

Material	PN	Temperature [°C]									
		100	150	200	250	300	350	400	450	500	550
Cast steel	16	1.36	1.27	1.14	1.04	0.94	0.88	0.84	---	---	---
1.0619	25	2.13	1.98	1.78	1.62	1.47	1.37	1.32	---	---	---
	40	3.41	3.17	2.84	2.60	2.35	2.19	2.11	---	---	---
	63	5.37	4.99	4.48	4.09	3.71	3.45	3.33	---	---	---
	100	8.53	7.92	7.11	6.50	5.89	5.48	5.28	---	---	---
	160	13.6	12.7	11.4	10.4	9.40	8.80	8.40	---	---	---
Alloy steel	16	1.63	1.58	1.49	1.43	1.33	1.23	1.15	1.07	0.89	0.35
1.7357	25	2.54	2.48	2.33	2.23	2.08	1.93	1.80	1.67	1.39	0.55
	40	4.07	3.96	3.74	3.57	3.33	3.09	2.89	2.67	2.23	0.88
	63	6.41	6.24	5.88	5.63	5.24	4.86	4.55	4.20	3.51	1.39
	100	10.17	9.90	9.34	8.93	8.32	7.71	7.22	6.67	5.57	2.21
	160	16.3	15.8	14.9	14.3	13.3	12.3	11.5	10.7	8.90	3.50

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