 LDM, spol. s r.o. Czech Republic	<b>INSTRUCTIONS FOR INSTALLATION AND SERVICE</b>	<b>RV 805 RV 806</b>
	<b>CONTROL VALVE</b> <b>DN 25, 40, 50, 65, 100 PN 160, 250, 400</b>	PM-072/14/01/GB

The instructions for installation and service of valves RV805 and RV806 are binding for users to ensure proper function of valves. The user must keep the rules said here while servicing, installation and using.

## 1. TECHNICAL DESCRIPTION AND VALVE FUNCTION

### 1.1 Description

Control valves RV 805 and RV 806 are single seat valves designed to create a lot of combinations of regulating appliances. Thanks to this, valve can be adapted according to customer's request. Control valve is equipped by packing set of type "LIVE LOADING". Valve is either angle - RV 805 or "Z"- shaped RV 806. Weld ends material is optional, dimensions are according to ČSN 131075, form acc. EN 12 627.

The valves can be actuated with electric and pneumatic actuators. Producers of electric actuators are e. g. ZPA Pečky, Regada Prešov, Auma, Schiebel, EMG-Drehmo and pneumatic actuators Flowserve.

### 1.2 Application

Valves RV 80x are designed as control valve for regulation of supply water used for injection into steam pipeline. High nominal pressure (PN 400) and ability to work with high differential pressures (about 15MPa, maximum 20MPa) of these valves is cause of their high service life against some other types of valves.

The max. permissible operating pressure values correspond to EN 12 516-1.

### 1.3 Operating medium

Valves are primarily designed to regulate pressure and flow of steam cooling water. For proper function the producer recommends to install a filter into the pipeline in front of the valve. Impurities can affect the quality and reliability of regulation and can cause a reduction in service life of the valve. When some other medium is used, material of valves inner parts must be taken into account.

### 1.4 Recommended differential pressures

For valves series RV 80x, maximum operating differential pressure is recommended to 4.0 MPa for one step of reduction when perforated plug and perforated cage are used and to 2.0 MPa for one step of reduction when contoured plug are used.

### 1.5 Valva body specifications:

Series	RV 805		RV 806	
Type of valve	Control valve, single seat, weld ends, angle		Control valve, single seat, weld ends, Z - shaped	
Nominal diameter DN	25, 40, 50, 65, 80, 100			
Nominal pressure PN	160, 250, 400			
Body material	Stainless steel 1.4922 (X20CrMoV 11-1)			
Weld ends material	Cast steel 1.0425 (P 265 GH)	Alloy steel 1.7335 (13CrMo4-5)	Cast steel 1.0425 (P 265 GH)	Alloy steel 1.7335 (13CrMo4-5)
Operating temperature	-20 to 400°C	-20 to 550°C	-20 to 400°C	-20 to 550°C
Connection	Weld ends acc. to ČSN 13 1075, form acc. EN 12 627			
Type of regulating appliance	Cage-perforated plug ; seat - contoured plug (for small Kvs)			
$\Delta p_{max}$ for one step reduction	4.0 MPa - perforated plug, 2.0 MPa - contoured plug			
Flow characteristic	Linear, equal percentage acc. to EN 60534 - 1			
Leakage	Leakage class IV. acc. to EN 1349			

Note: DN 25-50...unbalanced valve  
DN 65-100... balanced valve

## 1.6 Dimensions and weights of valves

### RV 805

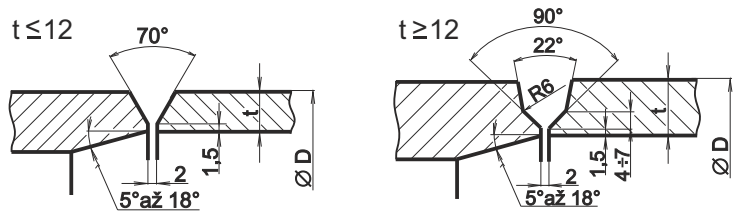
DN	PN 160, 250, 400						
	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	L	H	m
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
25	250	126	286	160	160	25	34
40	250	126	286	160	165	25	35
50	250	126	286	160	175	25	36
65	340	230	390	160	260	40	110
80	340	230	390	160	260	40	115
100	340	230	390	160	260	40	120

### RV 806

DN	PN 160, 250, 400							
	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	L	H	m
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
25	55	201	361	160	75	320	25	34
40	55	201	361	160	75	330	25	35
50	55	201	361	160	75	350	25	36
65	150	295	455	160	100	520	40	125
80	150	295	455	160	100	520	40	130
100	150	295	455	160	100	520	40	135

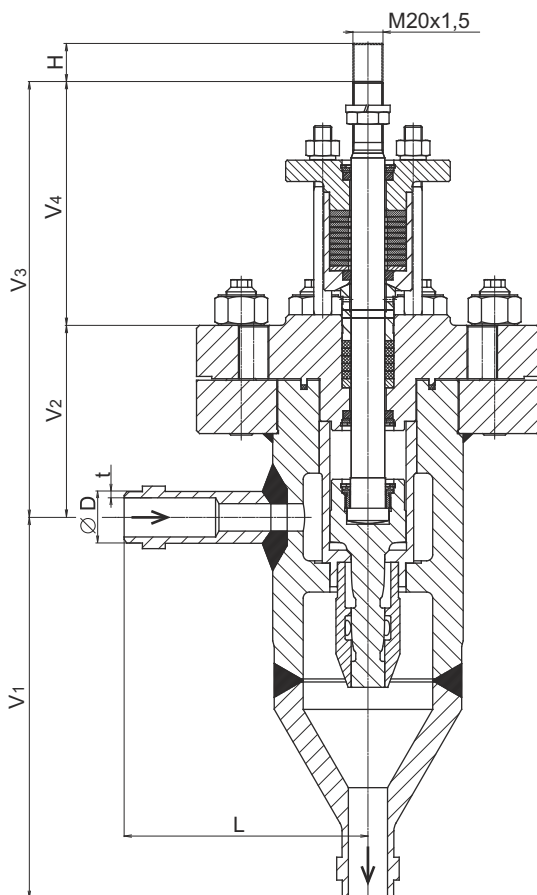
### Weld ends connection dimensions

DN	PN 160		PN 250		PN 400	
	D	t	D	t	D	t
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
25	33.7	4	33.7	5	33.7	7.1
40	48.3	5	48.3	7	48.3	11
50	60.3	6.3	60.3	8	60.3	12.5
65	76.1	7	76.1	10	76.1	17.5
80	88.1	8	88.1	12.5	88.1	19
100	114.3	10	114.3	14	114.3	20

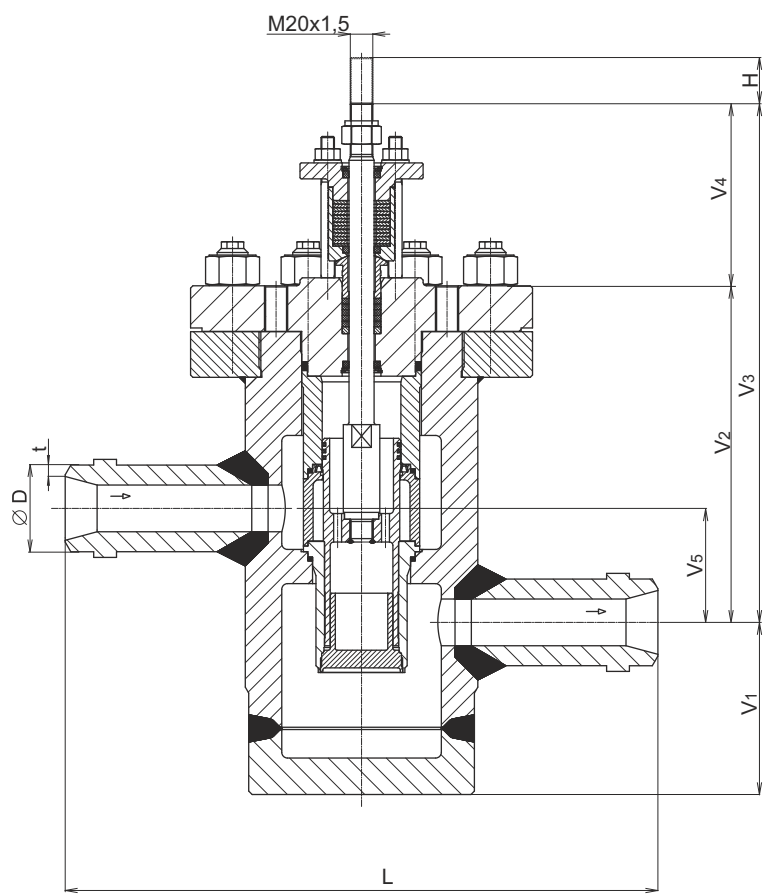


Other shapes of weld ends according to customer requirements.

Control valve RV 805, angle



Control valve RV 806, Z - shaped



## 2. DIRECTIONS FOR INSTALLATION AND OPERATING OF VALVE

### 2.1 Preparation before installation

The valves are delivered from the company assembled, adjusted and tested. Before valves installation into pipeline you have to compare the data on the name-plate with data mentioned in accompanying documentation. Then check if the valve or the actuator are not damaged and dirty. Pay attention especially to inner spaces and weld ends of valve.

### 2.2 Installation of valve into pipelin

Valve must be installed into pipeline so that flow of medium is according to arrows on the body. The actuator can be installed in any position except the position below the valve body. Keep the rules in installation and maintenance instructions of actuator too. Protection of actuator against the radiant heat can be necessary in case of high temperature application. As a basic provision can be made: pipeline insulation, actuator turning aside from vertical position, etc.. When the valve is installed into vertical pipeline or into horizontal pipeline with actuator turned aside from vertical position, then it is necessary to ensure suitable supporting of actuator.

For proper function of control valve, below-mentioned instructions must be obeyed :

- no excessive forces can be transferred from pipeline to valve.
- the pipeline must be cleaned from dirt before valve installation.
- the valve can not be installed just behind the bend. Pipeline should be straight min. 6x DN in front and behind the valve.
- it is recommended to keep enough space around the valve for easy manipulation and service.

#### 2.2.1 Actuator's connection to electric network

These works can be done only by the experienced workers. It is necessary to keep all safety rules. It is also necessary to follow instructions for installation, operating and service of electric actuator published by producer. Position transmitter and signalization switches, in the case they are part of the delivery, are placed under the cover of actuator.

In regard of the valve being delivered assembled together with its actuator, basic adjusting and setting of actuator is carried out. The valve is adjusted in closed position by torque switch (so that the valve will be really tight closed) meanwhile the switching off the actuator is adjusted in open position by limit switch. In case the actuator is dismantled from the valve body for any reason, such as the valve installation into pipeline etc., it is necessary to check the setting again after the assembly, possibly to carry out the complete setting of actuator again. It is necessary to keep the distance of lock nut face from stem nose (see picture No.1) for connection of valve stem and actuator coupling. Producer does not take over the guarantee if the damage was caused by improper setting or adjusting of the actuator. In case of need, it is possible to ask for such service from service organization of the producer.

The length of the cables to actuator should be selected so that the actuator could be disassembled from the valve without any need for the cables unplugging from the actuator's terminal board.

**WARNING:** It's necessary to observe the mechanical stroke indicator placed at actuator's joke or directly at the electromotor, if the valve is operated (opened or closed) by hand wheel. The extra care must be taken near to OPEN and CLOSE position. Neither position nor torque switches are in function in such case and there is a danger of valve or actuator serious damage. It's strongly prohibited to use any mechanical tools (force boosters) for hand wheel operation.

#### 2.2.2 Checking after installation

Piping system should be pressured after valve installation and then checked if there is no leak. Check tightness and compression of the packing set (see point 2.3.1) as well. Then check the proper function of actuator by doing a few strokes.

## 2.3 Operating and Service

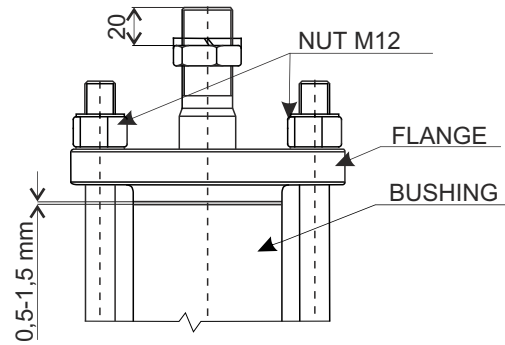
### 2.3.1 Packing set

The valves are equipped with graphite packing rings. The packing set is loaded with system of disc springs "LIVE LOADING". During the operation, it is necessary to maintain the gap between the flange and packing bushing in the range 0,5 - 1,5mm (see picture No. 1). From the factory, the value of 0,5 mm is set. The tightening is carried out by two nuts M12. The producer recommends to check this value more often (about twice a month) after starting new packing set. Later, once a half a year is enough.

### 2.3.2 Exchange of packing set

If there is a need to exchange the packing because of worse tightness, it's recommended to ask LDM service company for technical instructions for dismantling and assembly of the "LIVE LOADING" packing or to ask them for a exchange of it.

**Picture No.1: Gap between flange and bushing of packing set**



### 2.3.3 Plug and seat

When the valve is used for medium with high dirt-content, there is probability that sealing surface of plug will be wear out and seat leakage of valve will be too high . In this case the professional service must be called.

### 2.3.4 Electric actuators

It is necessary to clean and lubricate the working screw of the control valve actuators nim. 1x / year.

Ask LDM servis for lubricant type and operation routine.

Electric actuators have to be operated according to instructions given in „ Actuator manual ”. In case of malfunction of actuator, see the instructions or ask for professional service again.

## 2.4 Elimination of defects and malfunctions

If there is a fault detected on the valve (high seat leakage , high leakage of packing set or gasket of cover etc.) , it is necessary to ensure its removing as the damage of sealing surfaces or parts exposed to the effect of the leaking medium can be non-reversibly caused.

### 2.4.1 High seat leakage

High leakage can be caused :

- 1 - when the valve is used under the higher differential pressure than  $\Delta p_{max}$ .
- 2 - by insufficient thrust of actuator. There is need to test the function of actuator .
- 3 - by damaged sealing surface of plug and seat. In this case the professional service must be called.

### 2.4.2 High leakage of packing set

In the case of high leakage of the packing set, points 2.3.1. and 2.3.2. must be done or professional service must be called.

### 2.4.3 Enormous increasing of noise

Enormous increasing of noise can be caused by exceeding of operating parameters mentioned on the name-plate or by presence of undesirable particle in valve throttling system . It is necessary to check the state and consult it with producer.

Repair works should be carried out by producer or authorized service organization. During the period of guarantee , no action with valve may be carried out except gland bolt tightening.

## 2.5 Spare parts

Spare parts are not part of valve delivery. They must be ordered separately. When the spare parts are ordered, following data must be written: type of a valve, nominal diameter DN, registration valves number, name of a spare part.

## 2.6 Guarantee conditions

The producer does not guarantee the valve safety a reliable operation if the product was used in other way than stipulated in this instructions for installation and service and catalogue data sheet. Any use of the product under different conditions must be consulted with the producer.

The producer does not take over the guarantee if the user made any change or modification without prior written producer's agreement.

## 2.7 Storage conditions

1. During transport and storage the valves may not be exposed to direct influence of water and must be placed in surroundings where air relative humidity will be maximum 90%.

2. With reference to used actuators, the temperature ( during transport and storage ) must be in range from -20°C to +55°C.

3. The valve inlets and outlets must be protected with plastic protectors. (These protectors are part of valve delivery)

If the valves are stocked longer than 3 years, the producer recommends to carry out special revision before the valve is used.

## 2.8 Waste disposal

Packaging and the valves (after their scrapping) shall be disposed off in the common way, e.g. by handing over to a specialized company for a disposal (body and metal parts - metal scrap, packaging + other non-metallic parts - communal waste).

### Valve complete specification No. for ordering RV 80x

		XX	X X X	X X X	X X X X	X X	-	XXX	/	XXX	-	XX
1. Valve	Control valve	RV										
2. Type of valve	Control vave, angle		8 0 5									
	Control valve, Z - shaped		8 0 6									
3. Actuator	Electric actuator			E								
	Pneumatic actuator			P								
	Electric actuator Modact MTR			E P D								
	Electric actuator Modact MT Control			E Y A								
	Electric actuator Modact MTN			E Y B								
	Electric actuator Modact MOP 52 030			E Y E								
	Electric actuator Modact MOP Control 52 030			E Y F								
	Electric actuator Modact MOP 52 031			E Y G								
	Electric actuator Modact MOP Control 52 031			E Y H								
	Electric actuator Auma SAR 10.2			E A J								
	Electric actuator Schiebel rAB8			E Z K								
Pneumatic actuator Flowserve PO 1502			P F D									
4. Connection	Weld ends				4							
5. Material of weld ends	Cast steel 1.0425 (-20 to 400°C)				2							
	Alloy steel 1.7335 (-20 to 550°C)				6							
	Other material				9							
6. Packing set	Graphite - Live Loading				5							
7. Multi-step reduction	One-step reduction				1							
	Two-step reduction				2							
	Three-step reduction				3							
	Four-step reduction				4							
8. Flow characteristic	Linear					L						
	Equal percentage					R						
9. Numer of orifice plates	Without orifice plate					0						
10. Nominal pressure PN	PN 160							160				
	PN 250							250				
	PN 400							400				
11. Operating temp. °C	According to sort of medium								XXX			
12. Nominal diameter DN	DN - on request											XX

**Ordering example :** Control valve, Z - shaped, DN 40, PN 250, with el. actuator Modact Control MTN, body material: cast steel, packing set: graphite, three-step pressure reduction, linear characteristic, is marked as:  
**RV 806 EYA 4253 L0 250/400-40**

**Note:** A different type of actuating can be delivered after agreement with the producer.

### Maximum permissible working overpressures according to EN 12 516-1 [MPa]

Material	PN	Temperature [ °C ]									
		100	150	200	250	300	350	400	450	500	550
Cast steel 1.0425	160	13.6	12.7	11.4	10.4	9.40	8.80	8.40	---	---	---
	250	21.3	19.8	17.8	16.2	14.7	13.7	13.2	---	---	---
	400	34.1	31.7	28.4	26.0	23.5	21,9	21,1	---	---	---
Alloy steel 1.7335	160	16.3	15.8	14.9	14.3	13.3	12.3	11.5	10.7	8.90	3.50
	250	25.4	24.8	23.3	22.3	20.8	19.3	18.0	16.7	13.9	5.50
	400	40.7	39.6	37.4	35.7	33.3	30.9	28.9	26.7	22.3	8.80



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