

### Packing, transportation and storage

- The engraving method is according to clause 7 of TU 3712-003-22219466-2013.
- The valve is packed in a cardboard box and in polyethylene film or without it, but with protective caps. In the case of shipments of the valve in cardboard boxes, they are placed in a wooden or cardboard box.

### Dismounting and utilization

- Dismantle valve in the following sequence:
- Prior to dismantling valve make sure that pressure in the refrigeration circuit equals the surrounding's.
- Utilization of regulator is done separately from the printed circuit board, in accordance with national regulations.

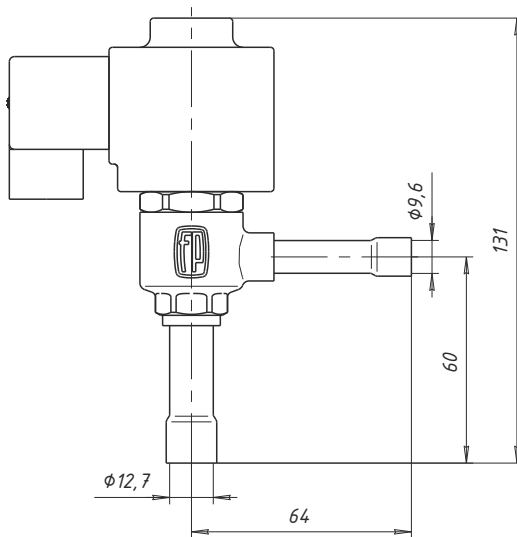


Fig.4. Dimensions and connections

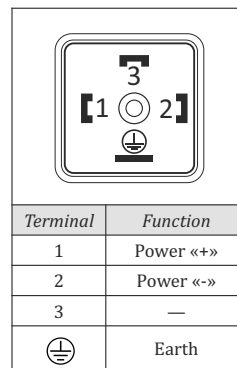


Fig.5. Electrical connections

## Operation instruction

## FP-ERV. Electronic expansion valve

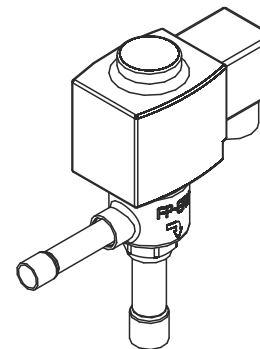


Fig.1. General view

### Application

The FP-ERV is electrically operated expansion valve (fig.1) is designed to inject refrigerant into the evaporators of refrigeration units and close the liquid line same with solenoid valve. The valve is driven by an electric drive. The valve is controlled by the FP-MC-23EM controller via a variable-duty PWM signal. HFCs, CFCs, HCFC refrigerants can be used as a working medium. The individual capacities are indicated with a number forming part of the type designation. The number represents the size of the orifice of the valve in question. The orifice is replaceable.

### Safety instructions

- ⚠ Carefully read this instruction. Ignoring these rules may lead to malfunctioning of this device, staff injuries and malfunctioning of compressor.
- ⚠ Installation and service must be done by qualified staff with appropriate level of knowledge and skills as well as access to electrical works of relevant class.  
Staff who operate the valves must have the necessary qualifications, must be instructed in safety regulations, be familiar with this manual for use and maintenance, and have individual protective equipment.
- ⚠ The valve must only be operated at the pressure, temperature and media listed in the technical data sheet. Do not use with NH3 (ammonia).
- ⚠ Follow the electrical connection sketch of oil level regulator, and also the requirements of the electrical safety standards.
- ⚠ Electromagnetic waves emitted during the operation of the valve can affect the functioning of low-current systems. Screen the system if necessary.

The device and the principle of operation

The main valve assemblies and materials used in their manufacture are presented in 1 table.

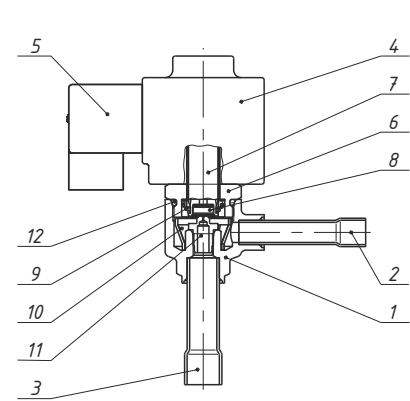


Fig.2. Valve design

Tab.1. Components

Pos	Деталь	Материал
1	Case	brass
2	Inlet connection	copper
3	Outlet connection	copper
4	Coil	—
5	DIN Plug	plastic
6	Armature	stainless steel
7	Plunger	stainless steel
8	Valve seat	PTFE
9	Spring	steel
10	Filter	stainless steel
11	Orifice	stainless steel
12	Gasket	rubber

In the static position, there is no voltage on coil 4 - the valve is closed. The plunger 7 with PTFE seal 8 fixed by the force of the spring 9 and the pressure of the working medium to the working surface of the orifice 11. To open the valve, the voltage is applied to the coil 4. Under the influence of the electromagnetic field plunger 7 is retracted and the orifice 11 opens. The working medium (refrigerant) moves due to the pressure difference through the orifice. The valve remains in the open position while coil 4 is live.

Installation instruction

- The design of the valve provides the possibility of its installation in any position, except for the position of the coil down.
- Before installation, remove all caps, plugs and coil.
- The valve should be located at a short distance to the sections of the line, which must be isolated.
- The soldering is carried out as quickly as possible.
- In the process of soldering, provide additional cooling of the casing, so that its temperature does not exceed 150 ° C. To avoid the formation of oxides, during the brazing, blow the system with an inert gas.
- After the installation is completed, carry out the tests in accordance with according with national regulations (Russian Federation PB 09-592-03 "Rules for the installation and safety of operation of refrigeration systems")
- It is recommended to periodically check the valve's operability and the absence of leaks in the solder joints.
- When replacing the orifice or filter, tightening torque not more than 10 Nm (for the orificet) and 16 Nm for the plunger.

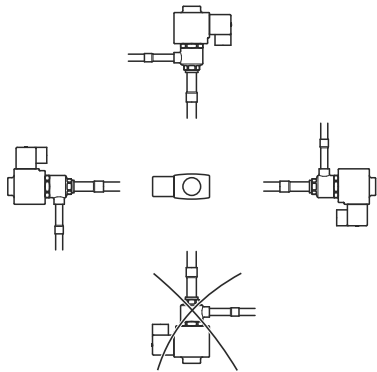


Fig.3. Spatial position

Tab.2. Technical data

Parameter	Value
Coil voltage	230 VAC, ±10%
Protection class	IP 67
Operation principle	Pulse-width modulation
Recomended period of time 6 sec	6 sec
Capacity (R22)	0,36...16,3 kW
Regulation range	10...100 %
Evaporating temperature	-60...60 °C
Ambient temperature	-50...50 °C
Leak of valve seat	<0,02 % from kv-value
MOPD	18 bar
Maximum operating pressure	45 bar
Replaceable filter	100 µm
Cable diameter	4...9 mm

Tabl.3. Nominal capacity

Type	Nominal capacity*, kW				kv-value, m³/h	Connections ODS, Input × Output, inch
	R22	R134a	R404A/R507	R407C		
ERV-1	0,36	0,32	0,29	0,39	0,003	3/8 × 1/2
ERV-2	1,0	0,9	0,8	1,1	0,010	3/8 × 1/2
ERV-3	1,6	1,4	1,3	1,7	0,017	3/8 × 1/2
ERV-4	2,6	2,1	2,0	2,5	0,025	3/8 × 1/2
ERV-5	4,1	3,4	3,1	4,0	0,046	3/8 × 1/2
ERV-6	6,4	5,3	4,9	6,4	0,064	3/8 × 1/2
ERV-7	10,2	8,5	7,8	10,1	0,114	3/8 × 1/2
ERV-8	16,3	13,5	12,5	17,0	0,162	3/8 × 1/2

\* Rated capacities are based on:  
Condensing temperature  $t_c=32\text{ }^{\circ}\text{C}$   
Liquid temperature  $t_l=28\text{ }^{\circ}\text{C}$   
Evaporating temperature  $t_e=5\text{ }^{\circ}\text{C}$