

### 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.

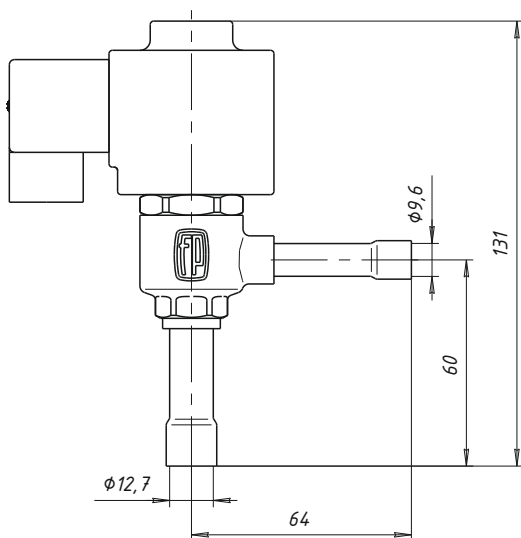


Fig.4. Dimensions and connections

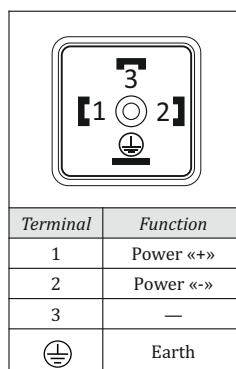


Fig.5. Electrical connections

## Operation instruction FP-ERV. Electronic expansion valve

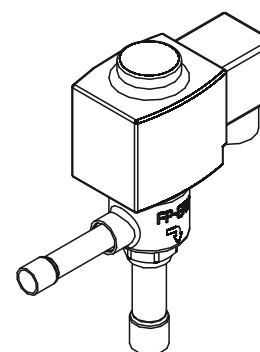


Fig.1. General view

### 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.

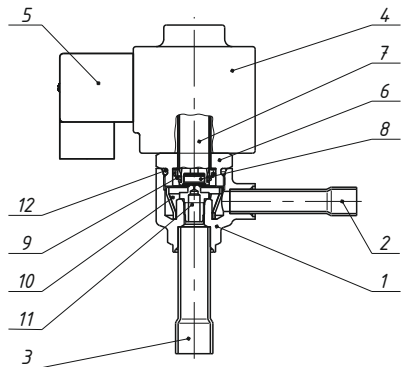


Fig.2. Valve design

Tab.1. Components

Pos	Деталь	Материал
1	Case	brass
2	Inlet connection	copper
3	Outlet connection	copper
4	Coil	—
5	Connector	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 (fig.3).
- Remove all plugs, tag and coil before soldering.
- Place the valve close to the sections of the line to be insulated.
- Solder as quickly as possible, taking care not to direct the flame towards the valve.
- During the soldering process, ensure that the case is cooled so that its temperature does not exceed 150 ° C. To avoid the formation of oxides, purge the system with an inert gas during brazing. If it is impossible to ensure cooling of the body, unscrew the valve stem and remove the filter to avoid overheating and destruction of non-metallic parts during brazing.
- After finishing soldering, allow to cool down and reassemble in reverse order and make electrical connections (Fig. 5)
- When replacing the orifice or filter, tightening torque not more than 10 Nm (for the orificet) and 16 Nm for the plunger.
- After replacing the nozzle insert, replace the marking tag with the number of the installed.

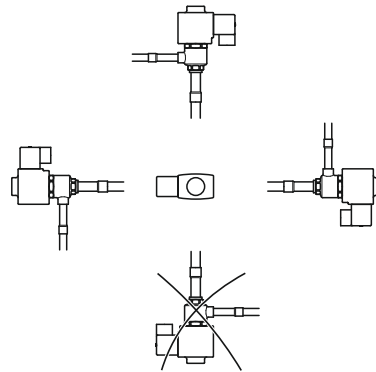


Fig.3. Spatial position

Tab.2. Technical data

Parameter	Value
Coil voltage	AC230 ±10%, 50Hz
Coil power (standard)	ERV-1..7 ERV-8
	20 W 25 W
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
Connections ODS, Input × Output, inch	3/8 × 1/2
Maximum operating pressure	80 bar
Replaceable filter	100 µm
Cable diameter	4...9 mm

Tab.3. Ratings

Type	Nominal capacity*, kW						kv, m3/h	MOPD**, bar	
	R22	R134a	R404A/R507	R407C	R410A	R744		20W	25W
ERV-1	0,36	0,32	0,29	0,39	0,46	0,42	0,003	60	60
ERV-2	1,0	0,9	0,8	1,1	1,3	1,3	0,010	51	60
ERV-3	1,6	1,4	1,3	1,7	2,0	2,1	0,017	36	48
ERV-4	2,6	2,1	2,0	2,5	3,2	3,4	0,025	31	41
ERV-5	4,1	3,4	3,1	4,0	5,1	5,3	0,046	24	31
ERV-6	6,4	5,3	4,9	6,4	8,0	8,3	0,064	23	28
ERV-7	10,2	8,5	7,8	10,1	12,7	13,2	0,114	22	27
ERV-8	16,3	13,5	12,5	17,0	20,2	21,0	0,162	16	19

\* Rated capacities are based on: Condensing temperature  $t_c=32$  °C, Liquid temperature  $t_l=28$  °C, Evaporating temperature  $t_e=5$  °C

It is recommended to select ERVs for design conditions in the VesSel online service located at <http://frigopoint.com/ru/vessel/online>

\*\* Maximum operating differential pressure for the specified coil power (at AC230 supply voltage 50Hz)