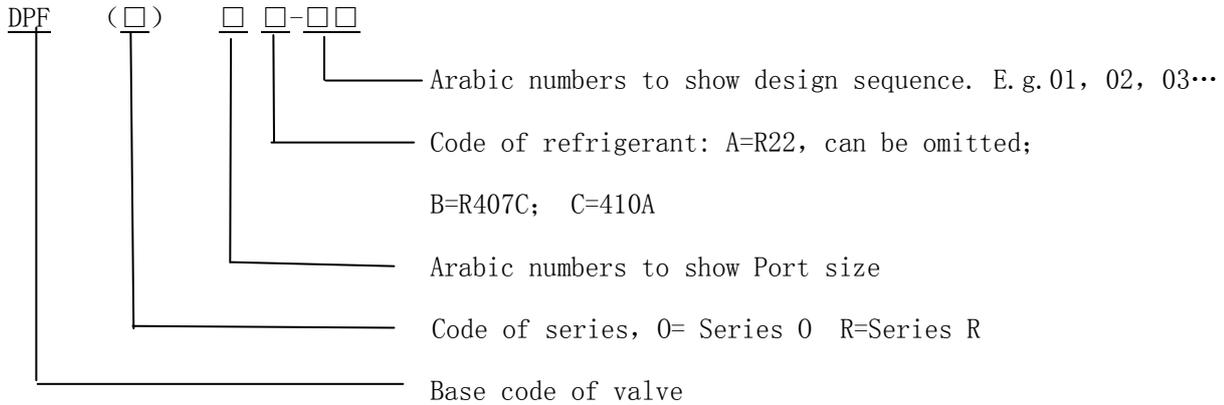


Electronic Expansion Valve

1、Nomenclature



Series 0 Electronic Expansion Valve

1、Introduction of 0 Series EXV

1) Function of Series 0 EXV: DPF(0) EXV used in Inverter air conditioning system to adjust flow of refrigerant automatically. Thus the air conditioner can always stay at the optimized working conditions with quick cooling, precise temperature control, low energy consumption, etc. This valve can also be used for other controls. This valve is reversible and can control the flow under either cooling or heating condition.

2) Series 0 Electronic Expansion Valve (EXV) is mainly composed of valve body and coil. The controller in the air conditioning system can control the step motor of EXV to synchronize the turning of geartrain which convert the rotation of gears to a pull/push force and mover the valve pin axially which can change the flow area and flow of refrigerant accordingly.

3) Characteristics of Series 0 EXV: low noise, high resolution, long life.

Pictures of Series 0 EXV



2、Specs of Series 0 EXV

1) Basic Specs:

Product Number	Port (mm)	Nominal Capacity @ R22	
		U. S. R. T	Kw
DPF (O) 1.3	1.3	1.5	5.28
DPF (O) 2.0	2.0	2.5	8.8
DPF (O) 2.4	2.4	3.0	10.56
DPF (O) 3.2	3.2	4.0	14.1
DPF (O) 3.2	3.2	5.0	17.6
DPF (O) 4.0	4.0	6.0	21.2
DPF (O) 5.2	5.2	8.0	28.1
DPF (O) 6.4	6.4	10.0	35.5

2) Related Parameters:

序号	Item	Parameters
1.	Fluid	R22、R407C、R410A+refrigerant oil
2.	Ambient Temperature	-30℃~+60℃(conductivity less than 50%)
3.	Rated Voltage	DC12V±10%, rectangular Wave
4.	Drive	Step Motor Phase 4
5.	Excitation	Phase 2-2
6.	Excitation Speed	100PPS~250PPS (Open Valve Excitation Speed ≤Close valve Excitation Speed)
7.	Flow Direction	Bi-flow
8.	Installation	Coil upwards, vertically within 15°
9.	Full Stroke	2000pulses (about 0.7mm)
10.	Coil Resistance	150±15Ω
11.	Max. Operation Pressure Difference	3.5MPa (R410A); 2.26MPa (R22);
12.	Internal Leak (ΔP=1.0MPa)	Less than 2.4, ≤600ml/min; Larger than 2.4, ≤1000ml/min;
13.	Flow Rate	As per customer's request
14.	Noise (30cm)	≤45 dB (A)
15.	Insulation Resistance	≥100 MΩ
16.	Electric Strength	AC600V, 1s or AC500V, 1min, leak current 5mA;
17.	Temperature Rise of Coil	≤60K
18.	Life	4.2MPa×5million

3、Operation Conditions

1. Voltage: 90%~110% of rated voltage;
2. Fluid Temperature: $-30^{\circ}\text{C}\sim+70^{\circ}\text{C}$ (conductivity less than 50%);
3. Ambient Temperature: $-30^{\circ}\text{C}\sim+60^{\circ}\text{C}$ (conductivity less than 50%);
4. Relative Humidity: below 95%.

4、Notes for application

1. Adjust the starting point: Close the valve and adjust the starting point to Phase A excitation;
2. When adjust the starting point, please minimize the pulses to close the valve fully. A recommended method goes as follows:
 - When the valve is deenergized: energize the valve and apply 2200 pulses to close the valve
 - Under control: add 30pulses on the existing opening position to close the valve
3. Stop drive: Add excitation for 0.1sec more after the valve stops;
4. Start drive: add 0.1+sec excitation to the last stopped excitation and operate the valve.
5. Drive reversibly: Add 0.5+sec excitation to the excitation phase of last movement to reverse the valve.
6. Two among six wires are common wires which shall be connected to positive pole of power source.
7. The EXV with PM step motor can keep the openness of valve without power.
8. The valve shall be installed upright with coil on the top. The deviation can be $\pm 15^{\circ}$ vertically.
9. When the valve is brazed, the valve body shall be kept below 120°C by using a wet cloth or showering the valve body. The flame cannot blow toward the valve body directly and nitrogen gas shall go through the valve to avoid oxidation. Water shall not get into the valve during brazing.
10. A 100+ mesh screen is required on the inlet and outlet of EXV in order to avoid impurities to enter the valve, especially during the brazing of screen and valve body.
11. Please set the excitation speed as specified.
12. Direction of flow: heat pump: A→B (heating)、B→A (Cooling) ; Cooling only: B→A.
13. In case of any drop from height or impact to the valve, please do not use directly and return the valve to our company for further inspection.
14. There might be abnormal noise when the valve is installed in the refrigeration system. And system test is required in advance.
15. Openness out of factory: 2000pulses;
16. Torque to tighten the nut: 14 (+2/0) N.m;
17. When keeping the valve closes, a further tightening shall be avoided.
18. The output voltage of controller shall match the rated voltage of EXV coil or the coil may be burnt and the valve can not work properly.
19. No moisture is allowed inside copper tube, or the freezing or rust may clog the valve.
20. The wires between valve and controller shall be fixed well to avoid vibration. If the wire need to be curved, the curve cannot be sharp. The wires shall be free from any other component, not treaded. Otherwise, the wire may get damaged or broken.
21. The wire cannot be touched at low temperature because the wire skin is stiff which may fall off or get broken;
22. Please do not use the valve with strong vibration or corrosive gases. Or malfunction may happen.
23. The malfunctions below are excluded from the performance:
 - a) The corrosion is caused by moisture in the refrigerant oil;
 - b) The clog, corrosion, unreliable operation caused by the impurities in the system.

Series Q Electronic Expansion Valve

1、 Introduction of Series Q EXV

1) Function of Series Q EXV: The controller sends pulse signal to the coil which controls the rotor synchronizing the turning of feed screw and nut, converting the rotation to movement of valve pin. Thus the flow area and flow of refrigerant will be changed accordingly. The stopper controls the stroke of valve pin within 0<->500P by slide rings.

2) Series Q EXV is composed of: The EXV is driven by PM type step Motor (Claw pole permanent Motor) which consists of two relative separate parts: 1) step motor coil; 2) multi pole rotor valve body. The coil is fixed onto the body through a clipper.

3) The main Characteristics of Series Q EXV: small size, light, the flow path is versatile to handle noise of refrigerant, high reliability and long life.

Pictures of Series Q EXV



1、Specs of Series Q EXV

1) Specs:

Product Number(Port)		Flow @ 0.1MPa(L/min)						
		Φ1.3	Φ1.65	Φ1.8	Φ2.2	Φ2.4	Φ3.0	Φ3.2
Flow Rate	250P	12	23	25	37	63	83	115
	500P	≥17	≥30	≥35	≥52	≥80	≥120	≥140
Recommended System(KW) (R22)		2.2 ~	2.2 ~	3.6 ~	6.0 ~	10~15	15~20	20~28
		2.5	3.6	6.0	10			
Full Open Pulses (P)		500						
Open Pulses(P)		32±20						
Frequency(PPS)		30~90					30~40	
MOPD(MPa)	R22	2.26						
	R407C	2.48						
	R410A	3.43					0~79P: ≥2.26	
						79 ~ 500P: ≥3.43		
Internal Leak(ml/min)		≤600					≤1000	
Max. Operation Pressure(MPa)	R22	3						
	R407C	3.3						
	R410A	4.2						
Reversible Open Valve Pressure Difference(MPa)	R22	≥1.47						
	R407C	≥1.47						
	R410A	≥2.11						

2) Related Parameters:

No.	Item	Conditions
1	Power	DC12V, Rectangular Wave
2	Voltage	90%~110% of rated voltage
3	Fluid	R410A+Refrigerant Oil
4	Fluid Temperature	-30℃~+70℃ (Conductivity less than 50%)
5	Ambient Temperature	-30℃~+60℃ (Conductivity less than 50%)
6	Relative Humidity	95%RH or less.
7	Operation Way	Direct Drive by phase 4 Permanent Step Motor
8	Excitation	Phase 1-2, single pole drive
9	Excitation Speed	30~90PPS
10	Flow Direction	Bi-flow
11	Installation	Coil upwards, vertically within 15°

2、Notes for Applciation

1. Adjust the starting point: Close the valve and adjust the starting point to Phase A excitation;
2. When adjust the starting point, please minimize the pulses to close the valve fully. A recommended method goes as follows:

- When the valve is deenergized: energize the valve and apply 560 pulses to close the valve
 - Under control: add 8pulses on the existing opening position to close the valve
3. Stop drive: Add excitation for 0.5sec more after the valve stops;
 4. Start drive: add 0.5+sec excitation to the last stopped excitation and operate the valve.
 5. Drive reversibly: Add 0.5+sec excitation to the excitation phase of last movement to reverse the valve.
 6. Two among six wires are common wires which shall be connected to positive pole of power source.
 7. The EXV with PM step motor can keep the openness of valve without power.
 8. The coil and valve body shall be packaged separately and coil cannot be mounted until the valve is brazed.
 9. The valve shall be installed upright with coil on the top. The deviation can be $\pm 15^\circ$ vertically.
 10. When the valve is brazed, the valve body shall be kept below 120°C by using a wet cloth or showering the valve body. The flame cannot blow toward the valve body directly and nitrogen gas shall go through the valve to avoid oxidation. Water shall not get into the valve during brazing.
 11. Mount the coil: The extrusion of clipper and concavity in the bracket of coil can be coupled which provides different directions to mount the coil.
 12. A 100+ mesh screen is required on the inlet and outlet of EXV in order to avoid impurities to enter the valve, especially during the brazing of screen and valve body.
 13. Please set the excitation speed as specified.
 14. Direction of flow: heat pump: A→B (heating)、B→A (Cooling) ; Cooling only: B→A.
 15. In case of any drop from height or impact to the valve, please do not use directly and return the valve to our company for further inspection.
 16. There might be abnormal noise when the valve is installed in the refrigeration system. And system test is required in advance.
 17. The voltage of coil must be $DC12V \pm 10\%$, the working voltage and wave shall be measured by oscillograph when the valve is working.
 18. Do not touch the valve and coil when it is energized, or the skin might be burnt for the high temperature of coil.
 19. At low temperature, do not touch the valve which might cause frostbite.
 20. Keep impact or drop from the height from the valve and the valve cannot hold any load, otherwise the valve may get cracks and leak.
 21. Do not apply impact or other excessive load to the coil, which may make the coil crack or damages to the insulation. And an electric shock may happen or the valve may work unreliably.
 22. Do not keep the valve warm which may prevent the heat loss of coil and cause smoke or fire.
 23. Do not place flammable stuff around coil which may be burnt when the temperature of coil rises.
 24. The output voltage of controller shall match the rated voltage of EXV coil or the coil may be burnt and the valve cannot work properly.