

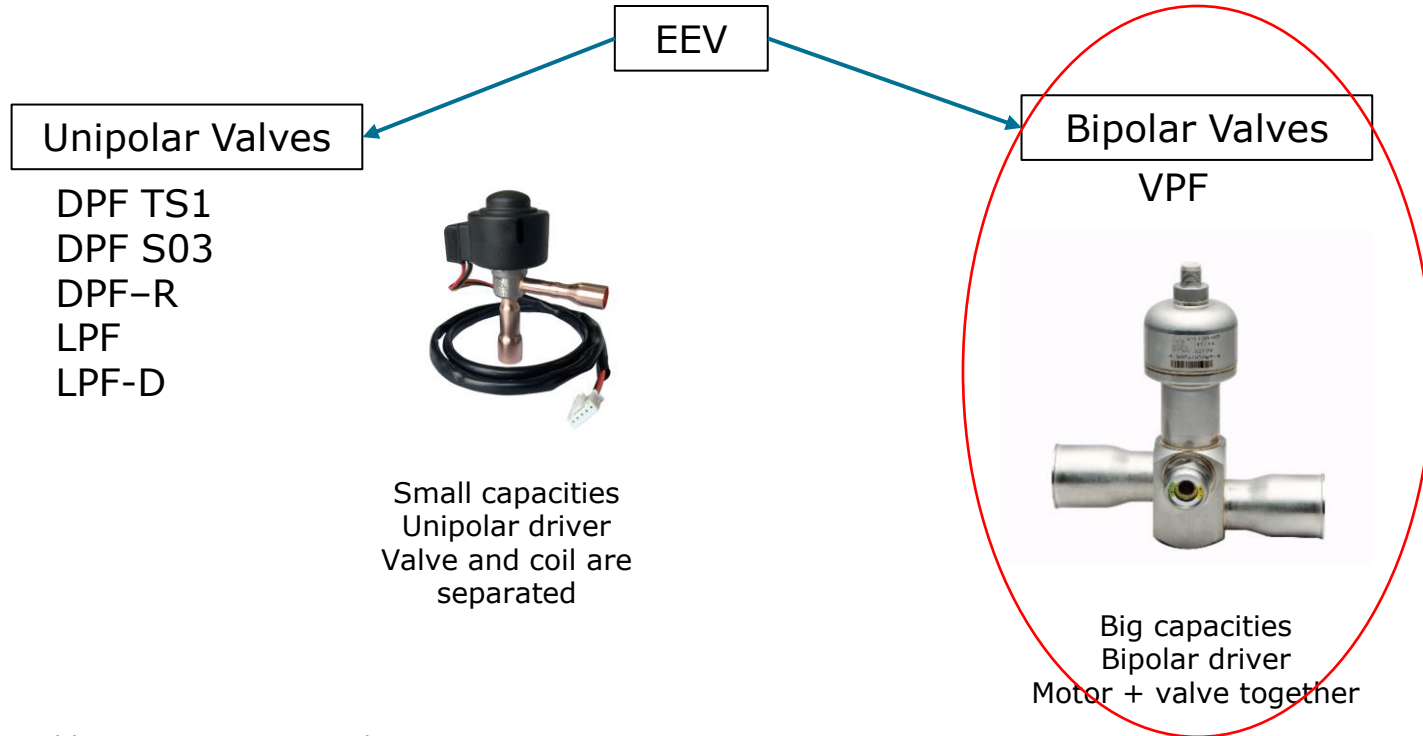
INTERNAL TRAINING ***Electronic Expansion Valve (EEV)***

Bi polar - VPF



JG – April 2022

Electronic Expansion Valves



Old Versions : DPF TO1 / DPF Q - O - T

Electronic Expansion Valves

Bipolar Valves - VPF

7 models
12.5 / 25 / 50 / 100 / 150 / 250 / 400

Capacity from 10 to 2200 kW (R410a)



Designation construction

VPF 100 H 03

VPF 100 H 03 = EEV Series

VPF 100 H 03 = Capacity size

VPF 100 H 03 = Solder

VPF 100 H 03 = 0= with sight glass / 5=without sight glass

VPF 100 H 03 = Pipe connection

VPF 12.5 / 25 / 150
Straight / L shape



VPF 50/100
With / Without sight glass



VPF 250 / 400



Electronic Expansion Valves

Bipolar Valves – VPF – Technical features



2600 steps – VPF 12.5 / 25 / 50

3800 steps - VPF 100 / 150 / 250 / 400

Medium temperature : -40°C / +90°C

Ambient temperature : -40°C / +60°C

Max Pressure : 50 bar (45 bar for VPF 250 / 400)

Relative humidity : 0 to 100% RH

Bi metal connectors

Bi flow valve

Certifications : UL / CSA / EAC, PED Declaration for fluids group 2 full range
and fluid group 1 for VPF12.5 to 100 (suitable with EN 60335-2-24/40/89)

Electronic Expansion Valves



Bipolar Valves – VPF Electrical features

12 VDC, rectangular wave
2-phase 4-step permanent magnet stepping motor
Excitation mode : 2 phase excitation, bi-pole actuation
Coil resistance : $52 \pm 5,2\Omega/\text{coil}$ (20°C)
Protection class : IP 67
M12 connector

	Voltage drive	Current drive
Excitation rate	150 pps Max	300 pps Max
Motion time from completely open to completely closed	VPF12.5...VPF50: 17,3s VPF100: 23,3s VPF150...VPF400: 25,3s	VPF12.5...VPF50: 8,7s VPF100: 11,7s VPF150...VPF400: 12,7s
Nominal motor current*	124mA RMS per phase in control operation	100mA RMS per phase in control operation
Peak motor current*	238mA RMS per phase in control operation	140mA RMS per phase in control operation

*Specified motor currents are based on max. excitation rates

Electronic Expansion Valves

Bipolar Valves - VPF



Cooling Capacities

Model	Steps	Max Cooling Capacity ¹⁾ [kW]												
		R134a	R407A	R407C	R407F	R404A R507A	R410A	R32	R290	R454B	R454C	R455A	R1234yf	R1234ze
VPF12.5	2600	54	67	71	76	50	82	126	77.4	101.2	66.1	72.8	41.9	43
VPF25	2600	116	144	152	162	108	176	262	160.8	210.1	137.2	151.1	87	92
VPF50	2600	221	275	290	310	206	336	527	323.1	422.3	275.7	303.6	173	175
VPF100	3500	319	397	418	447	297	484	748	458.9	599.7	391.6	431.3	248	253
VPF150	3800	574	714	752	804	534	871	N.C	N.C	N.C	N.C	N.C	432	455
VPF250	3800	892	1108	1168	1249	830	1353	N.C	N.C	N.C	N.C	N.C	692	706
VPF400	3800	1495	1857	1958	2094	1392	2269	N.C	N.C	N.C	N.C	N.C	1161	1183

1) Nominal conditions: Condensing temperature = 38°C / Evaporating temperature = +4,4°C / liquid temperature = 37°C

Electronic Expansion Valves

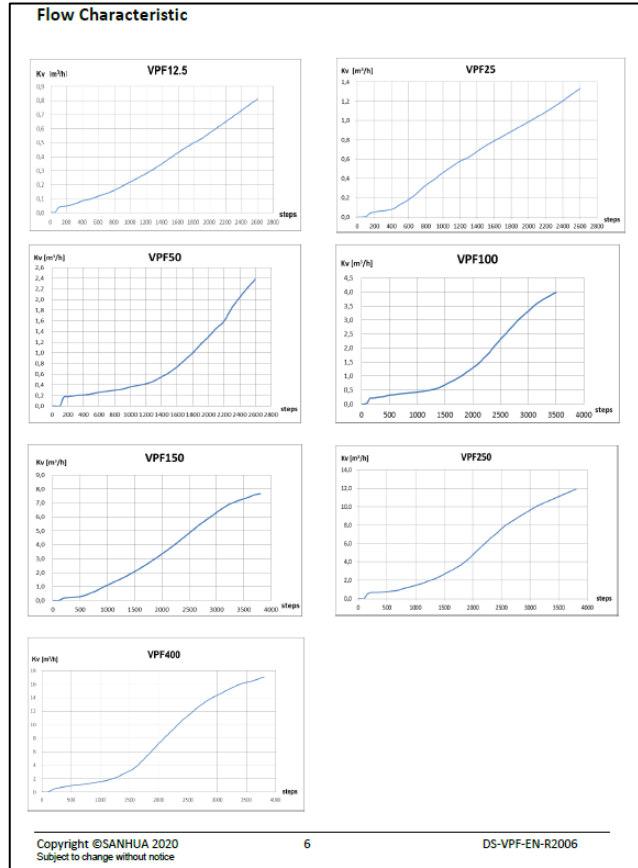
Bipolar Valves - VPF

Flow curves are not linear

Start opening :

VPF12.5, VPF25: 110 steps

VPF50...VPF400: 165 steps



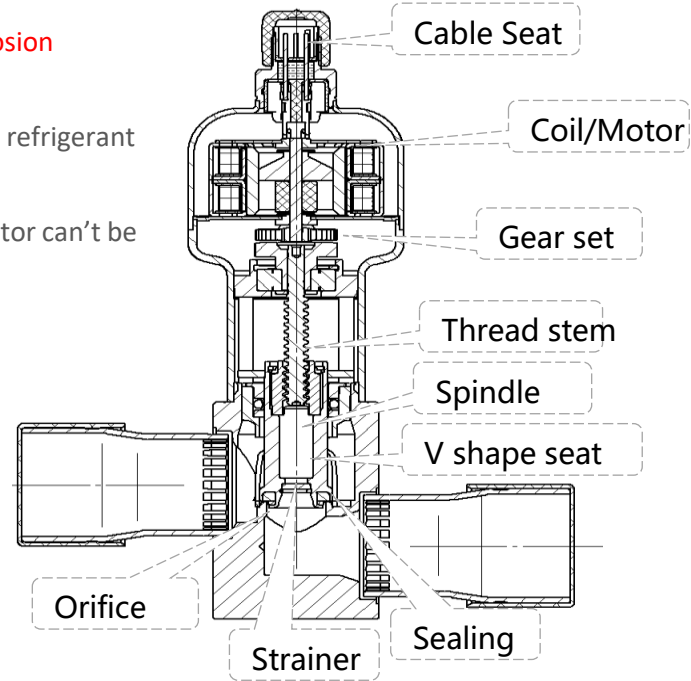
Electronic Expansion Valves

Bipolar Valves - VPF

Stainless Steel Valve Body in AISI304 : **high robustness, high corrosion resistant, long lifetime and high reliability.**

VPF valves are available with or without integrated sight glass for refrigerant status inspection.

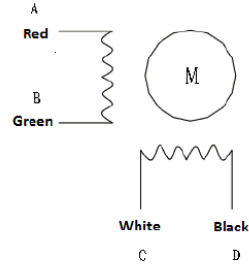
The valve head is completely sealed with a laser welding. The motor can't be replaced. This design provide **no risk of external leakage.**







Electronic Expansion Valves



Bipolar Valves – VPF – Coil excitation



COLOR OF CABLES		
A	Red	
B	Green	
C	White	
D	Black	

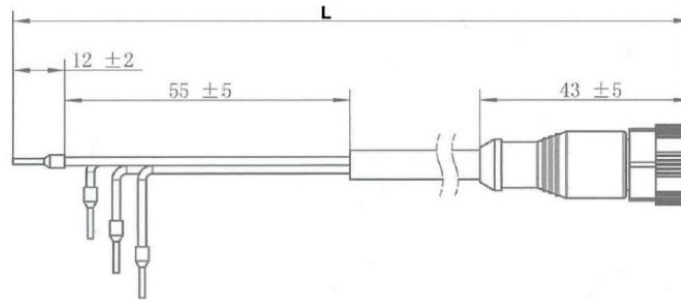
	step	First winding		second winding		
		Red	Green	White	Black	
↑ close valve	1	+	-	+	-	↓ open valve
	2	+	-	-	+	
	3	-	+	-	+	
	4	-	+	+	-	
	1	+	-	+	-	

Electronic Expansion Valves

Bipolar Valves - VPF



Model	Part Number	Cable Length (L) [mm]	Tolerance [mm]	IP
Y02A	20130669202	2000	± 40	67
Y08A	20130661202	8000	± 160	67



Electronic Expansion Valves

Competitors

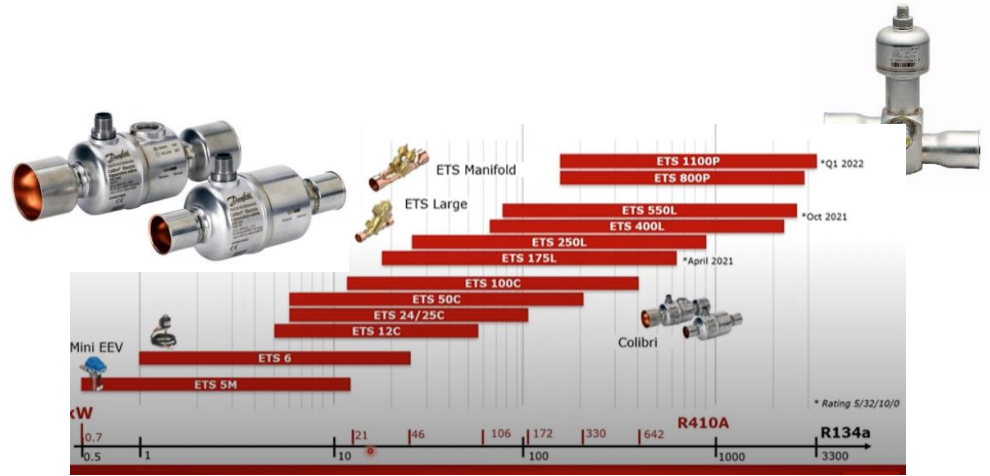
Danfoss : ETS Colibri + ETS

Alco : EX5/6/7/8

Carel : E2V / E3V/E4V / E5V / E6V/ E7V

Parker : SERI / SEHI

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Electronic Expansion Valves




Bi polar Valves – Documents at your disposal

Datasheet

PRODUCT DATA 

Electronic Expansion Valve Series VPF




VPF series electronic expansion valves are designed for commercial and industrial applications. Typical VPF applications are air conditioning and refrigeration systems or heat pumps. The valve controls the automatic adjustment of refrigerant flow rate and makes the system work under optimized conditions for the purpose of fast cooling or heating, precise temperature control and energy saving. The valve can also be used e.g. for suction line pressure controls. These valves provide bidirectional operation to control the refrigerant flow rate in heating or cooling mode.

Features

- Energy saving thanks to very precise capacity control: Up to 3800 steps
- Internal Tightness like a solenoid valve
- Optimized flow path design for noise reduction
- Applicable for reversible systems like heat pumps: bidirectional flow
- Corrosion resistant design, long lifetime, high reliability
- Compact design
- Models with integrated sight glass are available

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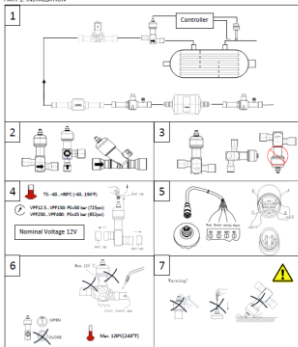
Instruction

INSTRUCTIONS 

ELECTRONIC EXPANSION VALVE series VPF


Applicable to fluids and refrigerants of GROUP 1* and GROUP 2 according to Directive 2014/68/EC.
*Note: models suitable for the fluid group 2 from size VPF 22.2 to VPF 200
 Medium Temperature allowed range (TTS) -40°C to +90°C (-40°F to +194°F)
 Design Pressure (PS) VPF 21.5 - VPF 150 50 bar (725 psi)
 VPF 200 - VPF 600 40 bar (580 psi)

PART 1 - INSTALLATION



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Declaration

 浙江三花制冷集团有限公司
 Zhejiang Sanhua Climate and Appliance Controls CO., LTD
 Add: 358, West Xinchang Avenue, Xinchang, 312500, Zhejiang, China Tel: +86-575-86551978
 Xinchang, Zhejiang, China 312500 Fax: +86-575-86221855

The EU Declaration of Conformity

Issued in accordance with
 The Pressure Equipment Directive 2014/68/EU

The manufacturer's name and address:
 Company: Zhejiang Sanhua Climate and Appliance Controls Co., Ltd
 Address: 358, West Xinchang Avenue, Xinchang, 312500, Zhejiang, China
Authorized Representative: Ien Peing
Authorized Company: Sanhua International Europe S.L.
 Tel: +34 91 854 46 92 Mob: +34 6 15 83 37 02 E-Mail: iian@sanhuainurope.com
 Address: C/ Jose Celestino Mutis, 4, 2º 28703 San Sebastian de los Reyes - Spain

Section 1 - The Pressure Equipment Directive 2014/68/EU

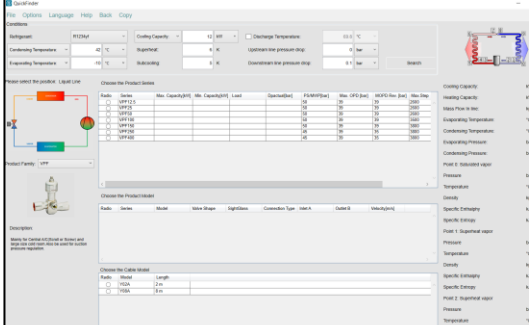
Declaration:
 Electronic Expansion Valves (VPF series), shown in the table 1, are classified "Pressure accessories" in the sense of the Pressure Equipment Directive 2014/68/EU, Article 2 point (5).
 The refrigerant proper to the Group 1 as defined in article 13 (1) (b) of Directive 2014/68/EU. Refrigerant cannot be classified as hazardous substance or mixture as defined in points (7) and (8) of Article 2 of Regulation (EC) No. 1272/2008.

Description of Products:

SANHUA MODEL	PS (bar)	Connection Diameter ID	Ts (°C)	PED category	Module Annex B1 - PED Directive 2014/68/EU
VPF 12.5HXH	50	15mm	-40°C / +90°C	Ann. 4.3	-
VPF 25HXH	50	15mm	-40°C / +90°C	Art. 4.3	-
VPF 50HXH	50	19mm	-40°C / +90°C	Art. 4.3	-

Note:
 All the models listed in the table above classified as "Ann. 4.3" aren't subjected to the Essential Safety Requirements set out in Annex I of Directive 2014/68/EU because their characteristics are below or equal to the limits fixed in Article 4 (1) (c) (i) of the same Directive. As mentioned in the Directive all these products have a nominal size "DN" below or equal to 25mm.
 Therefore, according to requirements of Article 4 (1) (c) (i) them:
 • Are designed and manufactured in accordance with a sound engineering practice in order to ensure safe use.

Quick Finder



The screenshot shows the 'Quick Finder' application window. It includes a search bar at the top, a table of product specifications, and a sidebar with various filter options. The table columns include Model, PS, Connection Diameter ID, Ts, PED category, and Module Annex B1 - PED Directive. The sidebar options include Cooling Capacity, Energy Efficiency, Sizing Capacity, Sizing Flow & Ice, Sizing, Evaporating Temperature, Condensing Temperature, Evaporating Pressure, Condensing Pressure, Point 1 - Saturated vapor Pressure, Temperature, Density, Specific Enthalpy, Specific Entropy, Point 1 - Saturated vapor Pressure, Temperature, Density, Specific Enthalpy, Specific Entropy, Point 2 - Saturated vapor Pressure, Temperature, Density, Specific Enthalpy, and Specific Entropy.