



⚠ You can get this in the palm of your hand! FG Finder application.



MANUAL EEV

ELECTRONIC EXPANSION VALVE



MANUALVEEV2-02T-2013B-2508

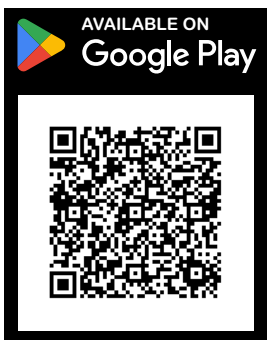
1. DESCRIPTION

The Electronic Expansion Valve (EEV) is a device of advanced technology that offers precise and efficient control of the refrigerant fluid flow in refrigeration and air conditioning systems. Opposite traditional mechanical expansion valves, which depend on system pressure to control refrigerant flow, the electronic expansion valve uses electronic sensors to monitor system temperature and pressure and adjust refrigerant flow more precisely and efficient.

The electronic expansion valve is controlled by a central electronic controller, which receives information from the sensors and determines the amount of refrigerant that must be released to the evaporator. This more precise control helps maximize the efficiency of the refrigeration or air conditioning system, saving energy and extending the equipment life.

2. VALVE SELECTION

- To select the valves, download the **FG Toolbox** Application (using the QR below) and use the **VEE Selector** tool to select the valve according to the characteristics of the installation.



- 1 - Open the **FG Toolbox** application and access the **VEE Selector**;
- 2 - Fill in the required information;
- 3 and 4 - The application will suggest the appropriate valve and controller models for the application;
- 5 and 6 - You will be able to generate a report of the valve and controller recommended for your application;

FG TOOLBOX

VEE Selector

Refrigerant Slider

Unit Converter

Superheating and Subcooling

Temperature Unit: Celsius / Fahrenheit

Type of Application: Refrigeration

Refrigerant Fluid: R290

Condensation Temperature: 45°C

Evaporation Temperature: -10°C

Evaporator Capacity: 9 kW

Application Name: Cámara fría de congelados

Subcooling: Advanced

Result

Type of application: Refrigeration

Refrigerant Fluid: R290

Condensation Temperature: 45°C

Evaporation Temperature: -10°C

Evaporator Capacity: 9kW

Subcooling: 3°C

Superheating: 6°C

Valve Info

All valves (included unless indicated)

Model **SB118**

Maximum capacity: 12.88kW

Opening Value: 69.89%

Model **SB118T**

Maximum capacity: 12.88kW

Opening Value: 69.89%

Controller Options

VX-1025E PLUS VER.04 12Vdc (KIT VEE)

Controller for Electronic Expansion Valve (VEE KIT - comes with temperature and pressure sensors)

VEE = 1 unipolar type output

VX-1225 VER.01 24Vdc (KIT VEE)

Controller for Electronic Expansion Valve (VEE KIT - comes with temperature and pressure sensors)

VEE = 2 unipolar outputs

Create Report

5

VEE Selector

Electronic Expansion Valve Selection
Full Gauge Controls®



Contact Info

Name: John Smith Phone: (51) 9 9999-9999
Company: Refrigerator Email: refrigerador01@refrigerador01.com

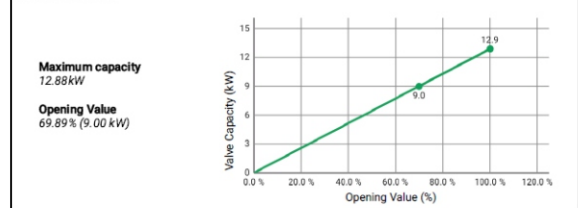
System Summary

Refrigerant Fluid:	R290	Evaporator Capacity:	9.00 kW
Condensation Temperature:	45°C	Subcooling:	3°C
Evaporation Temperature:	-10°C	Superheating:	6°C
Type of Application:	Refrigeration		
Application Name:	Walk In Cooler		

Electronic Expansion Valve

Code	SB118
04081	EXPANSION VALVE MODULE SB118 1.8 mm
Orifice:	1.8 mm
Filter:	Yes (100 mesh sieve)
Room Min. Temperature:	-40°C (-40°F)
Room Max. Temperature:	60°C (140°F)
Steps:	500
Min. Steps/Sec:	30
Max. Steps/Sec:	90
Operating Pressure:	870 psi (60 bar)

Performance Curve



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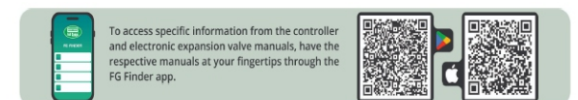
VEE Selector

Electronic Expansion Valve Selection
Full Gauge Controls®



Electronic Controller

Code	VX-1025E
4460	VX1025E PLUS VER.04 12Vdc (VEE KIT)
Temperature Control:	Yes
Sitrad Pro:	Yes
Energy Backup:	Yes
VEE Driver Functionality:	Yes
HMI:	Integrated
Pressure Sensor:	1x SB68-232A (0 - 232 psi)
Internal Clock (RTC):	Yes
Installation Type:	Painel
Dimensional:	76,0 x 34,0 x 94,0 mm (3,0" x 1,34" x 3,7")
Controller Supply Voltage:	12Vdc
External Power Supply:	Input: 100~240 Vac Output: 12Vdc / 15W
Temperature Sensor:	1x Room, 1x Defrost, 1x Superheating
Outlet for VEE:	1 unipolar type output



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3. COIL TYPES

Full Gauge's line of electronic expansion valves is available with two types of coils: unipolar and bipolar. The type of coil interferes with the choice of electronic controller.

Coil Types	Valve Models
Unipolar	SB88, SB89, SB90, SB91, SB92, SB93, SB94, SB103T, SB105T, SB108, SB108T, SB110, SB110H, SB110T, SB114, SB114T, SB115H, SB118, SB118T, SB124, SB124H, SB124T, SB130, SB130T, SB132, SB132T, SB145, SB152, SB155, SB162
Bipolar	SB2012, SB2025, SB2050, SB2100, SB2150

4. MAXIMUM REFRIGERATION CAPACITY

Application 1: Cold (kW)										Condensation temperature: 45°C (113°F)						Subcooling: 3K		
										Evaporation temperature: - 10°C (14°F)						Superheating: 6K		
Valves	R22	R23	R32	R134A	R290	R404A	R407A	R407C	R407F	R410A	R422A	R422D	R427A	R441A	R448A	R449A	R450A	R452A
SB88	3,0	NI	NI	2,3	NI	2,0	NI	3,1	NI	3,5	NI	NI	NI	NI	NI	NI	NI	NI
SB89	4,5	NI	NI	3,4	NI	3,0	NI	4,5	NI	5,2	NI	NI	NI	NI	NI	NI	NI	NI
SB90	13,2	NI	NI	10,0	NI	8,8	NI	13,3	NI	10,3	NI	NI	NI	NI	NI	NI	NI	NI
SB91	23,0	NI	NI	17,5	NI	15,3	NI	23,3	NI	16,1	NI	NI	NI	NI	NI	NI	NI	NI
SB92	31,4	NI	NI	23,9	NI	20,9	NI	31,8	NI	21,3	NI	NI	NI	NI	NI	NI	NI	NI
SB93	33,8	NI	NI	25,7	NI	22,5	NI	34,2	NI	22,4	NI	NI	NI	NI	NI	NI	NI	NI
SB94	45,9	NI	NI	34,9	NI	30,6	NI	46,4	NI	29,5	NI	NI	NI	NI	NI	NI	NI	NI
SB103T	1,2	NI	2,1	0,9	1,2	0,8	1,1	1,2	1,3	1,4	NI	NI	NI	NI	1,2	1,1	0,8	0,9
SB105T	1,8	NI	3,2	1,4	1,9	1,2	1,8	1,9	2,0	2,2	NI	NI	NI	NI	1,8	1,7	1,2	1,3
SB108	3,0	NI	5,2	2,3	3,0	2,0	2,8	3,0	3,2	3,4	1,8	1,9	2,7	3,1	2,8	2,8	2,0	2,1
SB108T	3,0	NI	5,2	2,3	3,0	2,0	2,8	3,0	3,2	3,4	NI	NI	NI	NI	2,8	2,8	2,0	2,1
SB110	4,8	NI	8,5	3,7	4,9	3,3	4,6	4,9	5,2	5,6	2,9	3,2	4,4	5,1	4,6	4,5	3,2	3,4
SB110T	4,8	NI	8,5	3,7	4,9	3,3	4,6	4,9	5,2	5,6	NI	NI	NI	NI	4,6	4,5	3,2	3,4
SB114	9,1	NI	16,1	7,0	9,3	6,2	8,7	9,3	9,8	10,6	5,2	5,8	8,2	9,5	8,6	8,6	6,1	6,5
SB114T	9,1	NI	16,1	7,0	9,3	6,2	8,7	9,3	9,8	10,6	NI	NI	NI	NI	8,6	8,6	6,1	6,5
SB118	12,6	NI	22,2	9,6	12,9	8,5	12,0	12,8	13,6	14,7	7,2	8,0	11,4	13,1	12,1	11,9	8,4	9,0
SB118T	12,6	NI	22,2	9,6	12,9	8,5	12,0	12,8	13,6	14,7	NI	NI	NI	NI	12,1	11,9	8,4	9,0
SB124	17,3	NI	30,4	13,2	17,6	11,6	16,4	17,6	18,6	20,1	9,9	11,0	15,6	17,9	16,6	16,2	11,5	12,2
SB124T	17,3	NI	30,4	13,2	17,6	11,6	16,4	17,6	18,6	20,1	NI	NI	NI	NI	16,6	16,2	11,5	12,2
SB130	32,3	NI	56,9	24,5	32,8	21,5	30,5	32,7	34,6	37,4	NI	NI	NI	NI	30,9	30,2	21,3	22,7
SB130T	24,4	NI	43,0	18,6	24,9	16,5	23,2	24,8	26,2	28,5	NI	NI	NI	NI	23,5	23,0	16,2	17,3
SB132	35,6	NI	62,6	27,0	36,1	23,7	33,7	36,1	38,2	41,3	NI	NI	NI	NI	34,1	33,3	23,5	25,0
SB132T	26,8	NI	47,1	20,4	27,4	18,1	25,5	27,3	28,8	31,3	NI	NI	NI	NI	25,7	25,2	17,8	19,0
SB145	59,8	NI	105,3	45,7	61,2	40,4	56,9	60,9	64,4	69,8	NI	NI	NI	NI	57,5	56,4	39,9	42,5
SB152	80,0	NI	140,9	61,2	81,9	54,1	76,1	81,5	86,2	93,4	NI	NI	NI	NI	77,0	75,5	53,4	56,8
SB155	92,6	NI	163,1	70,8	94,8	62,6	88,1	94,3	99,7	108,1	NI	NI	NI	NI	89,1	87,3	61,8	65,7
SB162	112,7	NI	198,4	86,1	115,3	76,2	107,1	114,7	121,3	131,5	NI	NI	NI	NI	108,3	106,2	75,2	80,0
SB2012	82,3	NI	144,8	62,8	84,1	55,5	78,3	83,7	88,5	96,0	NI	NI	NI	NI	79,2	77,4	54,7	58,4
SB2025	170,7	NI	300,7	130,4	174,6	115,3	162,5	173,9	183,7	199,4	NI	NI	NI	NI	164,3	160,7	113,5	121,2
SB2050	343,2	NI	604,4	261,9	350,8	231,7	326,5	349,6	369,2	400,8	NI	NI	NI	NI	330,1	322,8	228,2	243,6
SB2100	487,4	NI	858,4	372,1	498,3	329,1	463,7	496,4	524,3	569,1	NI	NI	NI	NI	468,9	458,5	324,1	346,0
SB2150	848,3	NI	1493,6	647,4	867,2	572,5	806,9	863,9	912,3	990,4	NI	NI	NI	NI	816,0	797,9	563,9	602,1

NI = Not Informed

Application 1: Cold (kW) (cont.)									Condensation temperature: 45°C (113°F)							Subcooling: 3K	
									Evaporation temperature: - 10°C (14°F)							Superheating: 6K	
Valves	R452B	R454A	R454B	R454C	R455A	R457A	R507A	R508B	R513A	R515B	R516A	R600A	R744	R1270	R1234YF	R1234ze(E)	
SB88	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
SB89	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
SB90	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
SB91	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
SB92	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
SB93	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
SB94	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
SB103T	1,8	1,3	1,6	1,0	1,1	0,1	0,8	NI	0,8	0,8	0,9	0,8	NI	1,6	0,6	0,7	
SB105T	2,4	1,8	2,5	1,5	1,7	0,1	1,2	NI	1,2	1,1	1,2	1,3	NI	2,1	1,0	1,1	
SB108	3,9	2,9	4,0	2,4	2,7	0,2	1,9	NI	1,9	1,7	1,9	2,0	NI	3,4	1,6	1,8	
SB108T	3,9	2,9	4,0	2,4	2,7	0,2	1,9	NI	1,9	1,7	1,9	2,0	NI	3,4	1,6	1,8	
SB110	6,4	4,7	6,5	4,0	4,3	0,4	3,2	NI	3,0	2,7	3,0	3,2	NI	5,5	2,6	2,8	
SB110T	6,4	4,7	6,5	4,0	4,3	0,4	3,2	NI	3,0	2,7	3,0	3,2	NI	5,5	2,6	2,8	
SB114	12,0	8,9	12,4	7,5	8,2	0,7	6,0	NI	5,8	5,2	5,8	6,0	NI	10,5	4,9	5,4	
SB114T	12,0	8,9	12,4	7,5	8,2	0,7	6,0	NI	5,8	5,2	5,8	6,0	NI	10,5	4,9	5,4	
SB118	16,6	12,3	17,1	10,4	11,3	1,0	8,3	NI	8,0	7,2	8,0	8,3	NI	14,5	6,8	7,5	
SB118T	16,6	12,3	17,1	10,4	11,3	1,0	8,3	NI	8,0	7,2	8,0	8,3	NI	14,5	6,8	7,5	
SB124	22,8	16,8	23,5	14,2	15,5	1,3	11,4	NI	10,9	9,8	10,9	11,3	NI	19,9	9,3	10,2	
SB124T	22,8	16,8	23,5	14,2	15,5	1,3	11,4	NI	10,9	9,8	10,9	11,3	NI	19,9	9,3	10,2	
SB130	NI	NI	NI	NI	NI	NI	20,9	NI	20,2	NI	NI	NI	NI	NI	17,2	18,9	
SB130T	32,2	23,7	33,2	20,1	21,9	1,9	16,1	NI	15,4	13,9	15,4	16,0	NI	28,1	13,2	14,4	
SB132	NI	NI	NI	NI	NI	NI	23,0	NI	22,2	NI	NI	NI	NI	NI	19,0	20,8	
SB132T	35,2	26,0	36,4	22,1	24,0	2,1	17,6	NI	16,9	15,2	16,9	17,6	NI	30,7	14,4	15,8	
SB145	79,0	58,2	81,3	49,5	53,8	4,6	39,5	NI	37,7	34,2	37,8	40,6	NI	68,9	32,2	35,4	
SB152	105,7	77,9	108,8	66,2	72,0	6,1	52,8	NI	50,5	45,7	50,6	54,3	NI	92,2	43,1	47,4	
SB155	122,4	90,2	126,0	76,6	83,3	7,1	61,1	NI	58,4	52,9	58,5	62,8	NI	106,7	49,9	54,9	
SB162	148,8	109,7	153,2	93,2	101,3	8,6	74,3	NI	71,1	64,4	71,2	76,4	NI	129,8	60,7	66,8	
SB2012	108,6	80,0	111,9	67,9	73,8	6,3	54,1	NI	51,9	46,9	51,9	NI	NI	94,7	44,4	48,6	
SB2025	225,4	166,2	232,3	140,9	153,2	13,1	112,3	NI	107,8	97,5	107,8	NI	NI	196,6	92,1	100,9	
SB2050	453,1	333,9	466,8	283,2	308,0	26,3	225,8	NI	216,7	195,9	216,7	NI	NI	395,1	185,2	202,9	
SB2100	643,5	474,2	662,9	402,2	437,3	37,4	320,7	NI	307,8	278,3	307,8	NI	NI	561,2	263,1	288,1	
SB2150	1119,8	825,3	1153,4	699,9	761,1	65,0	558,0	NI	535,6	484,2	535,7	NI	NI	976,6	457,7	501,5	

NI = Not Informed

Application 2: Frozen (kW)										Condensation temperature: 45°C (113°F)						Subcooling: 3K		
										Evaporation temperature: -35°C (-31°F)						Superheating: 6K		
Valves	R22	R23	R32	R134A	R290	R404A	R407A	R407C	R407F	R410A	R422A	R422D	R427A	R441A	R448A	R449A	R450A	R452A
SB88	3,0	NI	NI	2,2	NI	1,8	NI	3,0	NI	3,5	NI	NI	NI	NI	NI	NI	NI	NI
SB89	4,5	NI	NI	3,2	NI	2,7	NI	4,4	NI	5,2	NI	NI	NI	NI	NI	NI	NI	NI
SB90	13,2	NI	NI	9,4	NI	8,0	NI	12,9	NI	10,4	NI	NI	NI	NI	NI	NI	NI	NI
SB91	23,3	NI	NI	16,5	NI	14,0	NI	22,6	NI	16,2	NI	NI	NI	NI	NI	NI	NI	NI
SB92	31,4	NI	NI	22,5	NI	19,2	NI	30,8	NI	21,5	NI	NI	NI	NI	NI	NI	NI	NI
SB93	33,9	NI	NI	24,2	NI	20,6	NI	33,1	NI	22,7	NI	NI	NI	NI	NI	NI	NI	NI
SB94	45,9	NI	NI	32,8	NI	28,0	NI	45,0	NI	29,9	NI	NI	NI	NI	NI	NI	NI	NI
SB103T	1,2	NI	2,2	0,9	1,2	0,7	1,1	1,2	1,2	1,4	NI	NI	NI	NI	1,1	1,1	0,7	0,8
SB105T	1,8	NI	3,4	1,3	1,8	1,1	1,7	1,8	1,9	2,2	NI	NI	NI	NI	1,7	1,6	1,1	1,2
SB108	3,0	NI	5,4	2,1	2,9	1,8	2,7	2,9	3,1	3,4	1,5	1,7	2,6	2,9	2,7	2,6	1,8	1,9
SB108T	3,0	NI	5,4	2,1	2,9	1,8	2,7	2,9	3,1	3,4	NI	NI	NI	NI	2,7	2,6	1,8	1,9
SB110	4,8	NI	8,8	3,5	4,7	3,0	4,3	4,7	5,0	5,6	2,5	2,8	4,2	4,7	4,4	4,3	2,9	3,1
SB110T	4,8	NI	8,8	3,5	4,7	3,0	4,3	4,7	5,0	5,6	NI	NI	NI	NI	4,4	4,3	2,9	3,1
SB114	9,1	NI	16,7	6,5	8,9	5,6	8,2	8,9	9,5	10,6	4,5	5,1	7,7	8,6	8,3	8,1	5,6	5,9
SB114T	9,1	NI	16,7	6,5	8,9	5,6	8,2	8,9	9,5	10,6	NI	NI	NI	NI	8,3	8,1	5,6	5,9
SB118	12,6	NI	23,0	9,0	12,3	7,8	11,4	12,2	13,1	14,7	6,2	7,1	10,7	11,8	11,5	11,2	7,7	8,1
SB118T	12,6	NI	23,0	9,0	12,3	7,8	11,4	12,2	13,1	14,7	NI	NI	NI	NI	11,5	11,2	7,7	8,1
SB124	17,2	NI	31,5	12,4	16,8	10,7	15,5	16,8	17,9	20,1	8,5	9,7	14,6	16,2	15,7	15,4	10,5	11,1
SB124T	17,2	NI	31,5	12,4	16,8	10,7	15,5	16,8	17,9	20,1	NI	NI	NI	NI	15,7	15,4	10,5	11,1
SB130	32,2	NI	59,0	22,9	31,3	19,6	28,9	31,3	33,3	37,4	NI	NI	NI	NI	29,4	28,6	19,6	20,5
SB130T	24,4	NI	44,5	17,5	23,8	15,1	22,0	23,7	25,3	28,5	NI	NI	NI	NI	22,3	21,8	14,9	15,7
SB132	35,6	NI	64,9	25,4	34,5	21,6	31,9	34,4	36,8	41,3	NI	NI	NI	NI	32,3	31,5	21,5	22,6
SB132T	26,7	NI	48,9	19,2	26,1	16,5	24,1	26,0	27,8	31,2	NI	NI	NI	NI	24,4	23,9	16,3	17,2
SB145	59,9	NI	109,2	42,9	58,4	37,0	53,9	58,1	62,1	69,9	NI	NI	NI	NI	54,7	53,4	36,5	38,5
SB152	80,1	NI	146,1	57,4	78,2	49,6	72,1	77,7	83,1	93,5	NI	NI	NI	NI	73,1	71,5	48,8	51,5
SB155	92,7	NI	169,1	66,4	90,4	57,4	83,5	89,9	96,1	108,2	NI	NI	NI	NI	84,6	82,7	56,5	59,7
SB162	112,7	NI	205,7	80,8	110,0	69,8	101,6	109,4	116,9	131,6	NI	NI	NI	NI	102,9	100,6	68,7	72,6
SB2012	82,2	NI	150,1	59,0	80,2	50,8	74,1	79,9	85,3	95,9	NI	NI	NI	NI	75,1	73,4	50,2	52,8
SB2025	170,7	NI	311,7	122,5	166,5	105,5	153,9	165,9	177,0	199,3	NI	NI	NI	NI	155,8	152,4	104,1	109,7
SB2050	343,0	NI	626,6	246,1	334,6	212,0	309,2	333,4	355,9	400,5	NI	NI	NI	NI	313,1	306,3	209,3	220,5
SB2100	487,2	NI	889,9	349,6	475,2	301,1	439,2	473,6	505,5	568,8	NI	NI	NI	NI	444,8	434,9	297,3	313,2
SB2150	847,8	NI	1548,5	608,3	826,9	523,9	764,2	824,0	879,6	989,9	NI	NI	NI	NI	773,9	757,0	517,4	544,9

NI = Não Informado

Application 2: Frozen (kW) (cont.)										Condensation temperature: 45°C (113°F)						Subcooling: 3K	
										Evaporation temperature: -35°C (-31°F)						Superheating: 6K	
Valves	R452B	R454A	R454B	R454C	R455A	R457A	R507A	R508B	R513A	R515B	R516A	R600A	R744	R1270	R1234YF	R1234ze(E)	
SB88	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
SB89	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
SB90	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
SB91	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
SB92	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
SB93	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
SB94	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
SB103T	1,8	1,3	1,6	0,9	1,0	0,1	0,7	NI	0,7	0,7	0,8	0,7	NI	1,5	0,6	0,6	
SB105T	2,5	1,7	2,5	1,4	1,5	0,1	1,1	NI	1,1	0,9	1,1	1,1	NI	2,1	0,9	1,0	
SB108	3,9	2,7	4,1	2,2	2,4	0,1	1,8	NI	1,7	1,5	1,7	1,8	NI	3,3	1,4	1,6	
SB108T	3,9	2,7	4,1	2,2	2,4	0,1	1,8	NI	1,7	1,5	1,7	1,8	NI	3,3	1,4	1,6	
SB110	6,4	4,4	6,6	3,7	4,0	0,2	2,9	NI	2,8	2,5	2,8	3,0	NI	5,4	2,3	2,6	
SB110T	6,4	4,4	6,6	3,7	4,0	0,2	2,9	NI	2,8	2,5	2,8	3,0	NI	5,4	2,3	2,6	
SB114	12,2	8,4	12,5	6,9	7,5	0,4	5,5	NI	5,3	4,7	5,3	5,5	NI	10,3	4,4	4,9	
SB114T	12,2	8,4	12,5	6,9	7,5	0,4	5,5	NI	5,3	4,7	5,3	5,5	NI	10,3	4,4	4,9	
SB118	16,8	11,6	17,3	9,6	10,4	0,6	7,6	NI	7,3	6,5	7,3	7,6	NI	14,2	6,0	6,7	
SB118T	16,8	11,6	17,3	9,6	10,4	0,6	7,6	NI	7,3	6,5	7,3	7,6	NI	14,2	6,0	6,7	
SB124	23,0	15,9	23,7	13,1	14,3	0,8	10,4	NI	9,9	8,8	10,0	10,3	NI	19,4	8,2	9,2	
SB124T	23,0	15,9	23,7	13,1	14,3	0,8	10,4	NI	9,9	8,8	10,0	10,3	NI	19,4	8,2	9,2	
SB130	NI	NI	NI	NI	NI	NI	19,0	NI	18,4	NI	NI	NI	NI	NI	15,2	17,0	
SB130T	32,5	22,5	33,5	18,6	20,2	1,2	14,6	NI	14,0	12,5	14,1	14,6	NI	27,4	11,6	13,0	
SB132	NI	NI	NI	NI	NI	NI	21,0	NI	20,3	NI	NI	NI	NI	NI	16,8	18,8	
SB132T	35,6	24,7	36,7	20,4	22,1	1,3	16,1	NI	15,4	13,7	15,4	16,1	NI	30,0	12,8	14,3	
SB145	79,9	55,3	82,2	45,5	49,4	2,9	35,9	NI	34,4	30,7	34,6	37,1	NI	67,3	28,5	32,0	
SB152	106,9	74,0	109,9	60,9	66,1	3,8	48,0	NI	46,1	41,1	46,3	49,7	NI	90,0	38,1	42,8	
SB155	123,7	85,6	127,2	70,5	76,6	4,4	55,6	NI	53,3	47,5	53,6	57,5	NI	104,2	44,1	49,5	
SB162	150,5	104,2	154,8	85,8	93,1	5,4	67,6	NI	64,8	57,8	65,2	70,0	NI	126,7	53,7	60,3	
SB2012	109,8	76,0	112,9	62,6	68,0	3,9	49,4	NI	47,3	42,2	47,5	NI	NI	92,4	39,2	43,9	
SB2025	228,0	157,8	234,4	129,9	141,3	8,2	102,4	NI	98,2	87,5	98,7	NI	NI	192,0	81,5	91,1	
SB2050	458,2	317,1	471,0	261,1	283,9	16,4	206,0	NI	197,5	175,9	198,4	NI	NI	385,8	163,7	183,1	
SB2100	650,7	450,4	669,0	370,9	403,3	23,3	292,5	NI	280,5	249,9	281,8	NI	NI	547,9	232,6	260,0	
SB2150	1132,4	783,7	1164,2	645,4	701,7	40,6	509,1	NI	488,1	434,8	490,3	NI	NI	953,4	404,7	452,5	

NI = Not Informed

Application 3: CO2 (R744)

Subcooling: 3K
Superheating: 6K

SB110H		Maximum Cooling Capacity (kW)						
Evaporation Temperature (°C)		Condensation Temperature (°C).						
		-30	-20	-10	0	10	20	30
	-60	7,69	8,68	9,38	9,76	9,75	9,23	7,92
	-40	5,05	6,98	8,23	9,00	9,28	8,99	7,88
	-20	NI	NI	5,33	7,09	7,97	8,11	7,35
	0	NI	NI	NI	NI	4,86	6,02	5,93

SB124H		Maximum Cooling Capacity (kW)						
Evaporation Temperature (°C)		Condensation Temperature (°C).						
		-30	-20	-10	0	10	20	30
	-60	38,71	43,74	47,27	49,18	49,13	46,50	39,90
	-40	25,46	35,14	41,46	45,31	46,74	45,29	39,67
	-20	NI	NI	26,84	35,70	40,15	40,86	37,00
	0	NI	NI	NI	NI	24,50	30,33	29,87

SB115H		Maximum Cooling Capacity (kW)						
Evaporation Temperature (°C)		Condensation Temperature (°C).						
		-30	-20	-10	0	10	20	30
	-60	16,22	18,33	19,81	20,61	20,59	19,49	16,72
	-40	10,67	14,73	17,38	18,99	19,59	18,98	16,63
	-20	NI	NI	11,25	14,96	16,83	17,12	15,51
	0	NI	NI	NI	NI	10,27	12,71	12,52

5. COMPATIBILITY WITH REFRIGERANT FLUID	
Valve	Refrigerant Fluid
SB88 SB89 SB90 SB91 SB92 SB93 SB94	R22, R134A, R404A, R407C, R410A
SB108 SB110 SB114 SB118 SB124	R22, R32, R134A, R290, R404A, R407A, R407C, R407F, R410A, R422A, R427A, R441A, R448A, R449A, R450A, R452A, R507A, R513A, R600A, R1234yf and R1234ze
SB103T SB105T SB108T SB110T SB114T SB118T SB124T SB130T SB132T SB145 SB152 SB155 SB162	R22, R32, R134A, R290, R404A, R407A, R407C, R407F, R410A, R422A, R422D, R427A, R441A, R448A, R449A, R450A, R452A, R507A, R513A, R600A, R744*, R1234yf and R1234ze *Applicable only on T Series valves
SB130 SB132	R22, R32, R134A, R290, R404A, R407A, R407C, R407F, R410A, R422A, R422D, R427A, R441A, R448A, R449A, R450A, R452A, R507A, R513A, R600A, R1234yf and R1234ze
SB110H SB115H SB124H	R744
SB2012 SB2025 SB2050 SB2100 SB2150	R22, R32, R134A, R290, R404R, R407A, R407C, R407F, R410A, R448A, R449, R450A, R452A, R454B, R454C, R455A, R507A, R513A, R1234yf and R1234ze

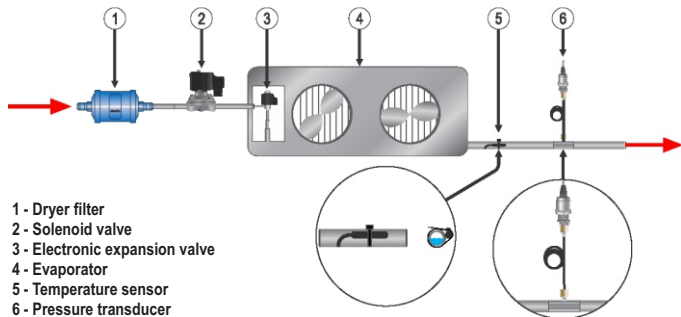
 **Note:** For more information on other refrigerants, please contact Full Gauge Controls.

6. TECHNICAL SPECIFICATIONS TABLE						
Model	Voltage	Type	Steps	Minimum Steps / Seconds	Maximum Steps / Seconds	Additional Steps
SB88	12 Vdc ± 10%	Unipolar	480	30	30	-
SB89	12 Vdc ± 10%	Unipolar	480	30	30	-
SB90	12 Vdc ± 10%	Unipolar	480	30	30	-
SB91	12 Vdc ± 10%	Unipolar	480	30	30	-
SB92	12 Vdc ± 10%	Unipolar	480	30	30	-
SB93	12 Vdc ± 10%	Unipolar	480	30	30	-
SB94	12 Vdc ± 10%	Unipolar	480	30	30	-
SB103T	12 Vdc ± 10%	Unipolar	500	30	90	-
SB105T	12 Vdc ± 10%	Unipolar	500	30	90	-
SB108	12 Vdc ± 10%	Unipolar	500	30	90	-
SB108T	12 Vdc ± 10%	Unipolar	500	30	90	-
SB110	12 Vdc ± 10%	Unipolar	500	30	90	-
SB110H	12 Vdc ± 10%	Unipolar	500	30	90	-
SB110T	12 Vdc ± 10%	Unipolar	500	30	90	-
SB114	12 Vdc ± 10%	Unipolar	500	30	90	-
SB114T	12 Vdc ± 10%	Unipolar	500	30	90	-
SB115H	12 Vdc ± 10%	Unipolar	500	30	90	-
SB118	12 Vdc ± 10%	Unipolar	500	30	90	-
SB118T	12 Vdc ± 10%	Unipolar	500	30	90	-
SB124	12 Vdc ± 10%	Unipolar	500	30	90	-
SB124H	12 Vdc ± 10%	Unipolar	500	30	90	-
SB124T	12 Vdc ± 10%	Unipolar	500	30	90	-
SB130	12 Vdc ± 10%	Unipolar	500	30	90	-
SB130T	12 Vdc ± 10%	Unipolar	500	30	90	-
SB132	12 Vdc ± 10%	Unipolar	500	30	90	-
SB132T	12 Vdc ± 10%	Unipolar	500	30	90	-
SB145	12 Vdc ± 10%	Unipolar	500	30	40	-
SB152	12 Vdc ± 10%	Unipolar	500	30	40	-
SB155	12 Vdc ± 10%	Unipolar	500	30	40	-
SB162	12 Vdc ± 10%	Unipolar	500	30	40	-
SB2012	12 Vdc ± 10%	Bipolar	2600	100	300	260
SB2025	12 Vdc ± 10%	Bipolar	2600	100	300	260
SB2050	12 Vdc ± 10%	Bipolar	2600	100	300	260
SB2100	12 Vdc ± 10%	Bipolar	3500	100	300	260
SB2150	12 Vdc ± 10%	Bipolar	3800	100	300	260

7. MECHANICAL SPECIFICATIONS TABLE

Model	Orifice	Ø Inlet	Ø Outlet	Filter	Minimum Room Temperature	Maximum Room Temperature	Valve Leakage (Closed)	Operating Pressure	MOPD Direct
SB88	1.0 mm	5/16"	5/16"	No	-30°C (-22°F)	70°C (158°F)	350 cm³/min	609 psi (42bar)	507 psi (35 bar)
SB89	1.4 mm	5/16"	5/16"	No	-30°C (-22°F)	70°C (158°F)	350 cm³/min	609 psi (42bar)	507 psi (35 bar)
SB90	1.8 mm	1/4"	1/4"	No	-30°C (-22°F)	70°C (158°F)	500 cm³/min	609 psi (42bar)	507 psi (35 bar)
SB91	2.5 mm	5/16"	5/16"	No	-30°C (-22°F)	70°C (158°F)	700 cm³/min	609 psi (42bar)	507 psi (35 bar)
SB92	3.0 mm	5/16"	5/16"	No	-30°C (-22°F)	70°C (158°F)	500 cm³/min	609 psi (42bar)	406 psi (28 bar)
SB93	3.2 mm	5/16"	5/16"	No	-30°C (-22°F)	70°C (158°F)	500 cm³/min	609 psi (42bar)	406 psi (28 bar)
SB94	4.0 mm	5/16"	5/16"	No	-30°C (-22°F)	70°C (158°F)	700 cm³/min	609 psi (42bar)	304 psi (21 bar)
SB103T	0.3 mm	3/8"	1/2"	Yes (100 mesh sieve)	-40°C (-40°F)	60°C (140°F)	< 1 cm³/min	1305 psi (90 bar)	725 psi (50 bar)
SB105T	0.5 mm	3/8"	1/2"	Yes (100 mesh sieve)	-40°C (-40°F)	60°C (140°F)	< 1 cm³/min	1305 psi (90 bar)	725 psi (50 bar)
SB108	0.8 mm	3/8"	1/2"	Yes (100 mesh sieve)	-40°C (-40°F)	60°C (140°F)	< 1 cm³/min	870 psi (60 bar)	500 psi (34,5 bar)
SB108T	0.8 mm	3/8"	1/2"	Yes (100 mesh sieve)	-40°C (-40°F)	60°C (140°F)	< 1 cm³/min	1305 psi (90 bar)	725 psi (50 bar)
SB110	1.0 mm	3/8"	1/2"	Yes (100 mesh sieve)	-40°C (-40°F)	60°C (140°F)	< 1 cm³/min	870 psi (60 bar)	500 psi (34,5 bar)
SB110H	1.0 mm	1/4"	1/4"	Não	-30°C (-22°F)	60°C (140°F)	< 600 cm³/min	2030 psi (140 bar)	1450 psi (100 bar)
SB110T	1.0 mm	3/8"	1/2"	Yes (100 mesh sieve)	-40°C (-40°F)	60°C (140°F)	< 1 cm³/min	1305 psi (90 bar)	725 psi (50 bar)
SB114	1.4 mm	3/8"	1/2"	Yes (100 mesh sieve)	-40°C (-40°F)	60°C (140°F)	< 1 cm³/min	870 psi (60 bar)	500 psi (34,5 bar)
SB114T	1.4 mm	3/8"	1/2"	Yes (100 mesh sieve)	-40°C (-40°F)	60°C (140°F)	< 1 cm³/min	1305 psi (90 bar)	725 psi (50 bar)
SB115H	1.5 mm	1/4"	1/4"	Sim (100 mesh sieve)	-30°C (-22°F)	60°C (140°F)	< 600 cm³/min	2030 psi (140 bar)	1450 psi (100 bar)
SB118	1.8 mm	3/8"	1/2"	Yes (100 mesh sieve)	-40°C (-40°F)	60°C (140°F)	< 1 cm³/min	870 psi (60 bar)	500 psi (34,5 bar)
SB118T	1.8 mm	3/8"	1/2"	Yes (100 mesh sieve)	-40°C (-40°F)	60°C (140°F)	< 1 cm³/min	1305 psi (90 bar)	725 psi (50 bar)
SB124	2.4 mm	3/8"	1/2"	Yes (100 mesh sieve)	-40°C (-40°F)	60°C (140°F)	< 1 cm³/min	870 psi (60 bar)	500 psi (34,5 bar)
SB124H	2.4 mm	5/16"	5/16"	Sim (100 mesh sieve)	-30°C (-22°F)	60°C (140°F)	< 1000 cm³/min	2030 psi (140 bar)	1450 psi (100 bar)
SB124T	2.4 mm	3/8"	1/2"	Yes (100 mesh sieve)	-40°C (-40°F)	60°C (140°F)	< 1 cm³/min	1305 psi (90 bar)	725 psi (50 bar)
SB130	3.0 mm	5/16"	5/16"	No	-30°C (-22°F)	60°C (140°F)	500 cm³/min	650 psi (45bar)	500 psi (34,5 bar)
SB130T	3.0 mm	3/8"	1/2"	Yes (100 mesh sieve)	-40°C (-40°F)	60°C (140°F)	< 1 cm³/min	1305 psi (90 bar)	507 psi (35 bar)
SB132	3.2 mm	5/16"	5/16"	No	-30°C (-22°F)	60°C (140°F)	500 cm³/min	650 psi (45bar)	500 psi (34,5 bar)
SB132T	3.2 mm	3/8"	1/2"	Yes (100 mesh sieve)	-40°C (-40°F)	60°C (140°F)	< 1 cm³/min	1305 psi (90 bar)	507 psi (35 bar)
SB145	4.5 mm	5/8"	5/8"	No	-30°C (-22°F)	60°C (140°F)	< 2 cm³/min	710 psi (49 bar)	507 psi (35 bar)
SB152	5.2 mm	5/8"	5/8"	No	-30°C (-22°F)	60°C (140°F)	< 3 cm³/min	710 psi (49 bar)	507 psi (35 bar)
SB155	5.5 mm	5/8"	5/8"	No	-30°C (-22°F)	60°C (140°F)	< 4 cm³/min	710 psi (49 bar)	507 psi (35 bar)
SB162	6.2 mm	5/8"	5/8"	No	-30°C (-22°F)	60°C (140°F)	< 4 cm³/min	710 psi (49 bar)	507 psi (35 bar)
SB2012	7.5 mm	5/8"	5/8"	No	-40°C (-40°F)	60°C (140°F)	< 3 cm³/min	725 psi (50 bar)	565 psi (39 bar)
SB2025	7.5 mm	5/8"	5/8"	No	-40°C (-40°F)	60°C (140°F)	< 5 cm³/min	725 psi (50 bar)	565 psi (39 bar)
SB2050	11.4 mm	7/8"	7/8"	No	-40°C (-40°F)	60°C (140°F)	< 9 cm³/min	725 psi (50 bar)	565 psi (39 bar)
SB2100	14.4 mm	1 1/8"	1 3/8"	No	-40°C (-40°F)	60°C (140°F)	< 14 cm³/min	725 psi (50 bar)	565 psi (39 bar)
SB2150	14.8 mm	1 1/8"	1 3/8"	No	-40°C (-40°F)	60°C (140°F)	< 26 cm³/min	725 psi (50 bar)	565 psi (39 bar)

8. FIXING PROCEDURE



To proceed with the EEV installation, follow the procedures and recommendations below.

- Respect the position indicated in the refrigeration installation for the Electronic Expansion Valve (EEV) and the sensors necessary for calculating the superheat.

- Install the temperature sensor close to the evaporator outlet. Use a plastic clamp to fix and elastomeric tape to thermally insulate the temperature sensor next to the piping.

- If the EEV electronic controller has a power backup system for closing the valve in case of power interruption, the installation of the solenoid valve is optional. Check the electronic controller manual.

- It is recommended to use a solenoid valve to protect the cooling system in the event of a power interruption, positioning it close to the EEV (preferably between 5cm (2") to 20cm (8")).

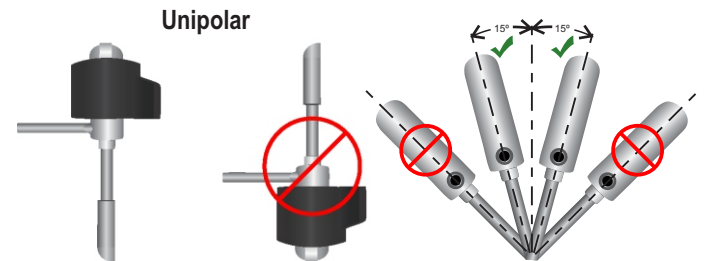
- To avoid damage to the pressure transducer, a valve (schrader, sphere, etc.) must be used to isolate it from the cooling system during the vacuum process. It is recommended to use a flexible capillary (or copper tube) to position the pressure sensor above the level of the suction line.

- Observe the pressure transducer placement recommendations to avoid mechanical damage and oil accumulation.

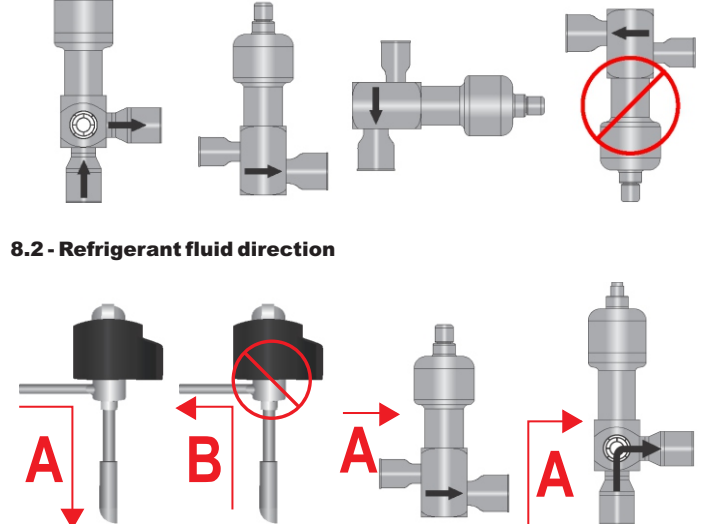
- The installation must have a filter drier to retain possible impurities that are present in the piping.

8.1 - Installation guidance

For the installation of the EEV, respect the maximum tolerance of $\pm 15^\circ$ in relation to the axis.



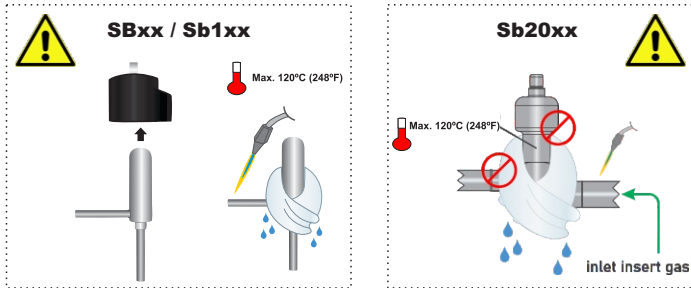
8.2 - Refrigerant fluid direction



The recommended direction for the flow of the refrigerant fluid is "A". The use of EEV is not recommended for the "flow" direction of the refrigerant fluid "B". In this direction of flow, EEV does not maintain the specified cooling capacity and has less support for reverse pressure.

9 - VALVE WELDING

- Before the welding process, remove the coil from the EEV;
- Use a wet rag during the welding process in order to avoid heating the EEV;
- The temperature in the valve body must not exceed 120°C (248°F);
- After welding, replace the EEV coil.



10 - COIL ASSEMBLY

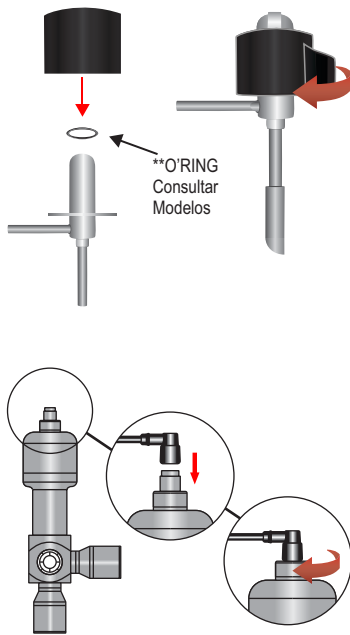
10.1. Unipolar:

- Install the coil over the valve body and rotate the coil to fix it correctly;
- Observe and verify that the coil is properly attached to the valve;
- Never energize the coil unless it is connected and fixed on the valve.

** Assemble O'ring on the models: SB103T, SB105T, SB108, SB108T, SB110, SB110T, SB114, SB114T, SB118, SB118T, SB124, SB124T, SB130T, SB132T, SB145, SB152, SB155 e SB162.

10.2. Bipolar:

- Connect the cable accordingly upper position of EEV.



11 - CABLE LENGTH

11.1. Coil cable length

Coil cable length	Valves
0,7 m	SB110H, SB115H and SB124H
1,0 m	SB88, SB89, SB90, SB91, SB92, SB93 and SB94 SB103T, SB105T, SB108, SB108T, SB110, SB110T, SB114, SB114T, SB118, SB118T, SB124, SB124T, SB130, SB130T, SB132, SB132T, SB145, SB152, SB155 and SB162
1.5 m	
2.0 m	SB2012, SB2025, SB2050, SB2100 and SB2150

11.2. Maximum cable length

For applications where it is necessary to increase the cable distance between the controller and the valve, use the specifications in the following tables.
For both applications, it is recommended to use shielded cables.

Valves: SB88 to SB162 - VX1025E Plus (Unipolar)

Gauge	Number of cable ways	Maximum length
0,75 mm ²	5	20 meters
1,00 mm ²	5	30 meters
1,50 mm ²	5	45 meters
2,50 mm ²	5	70 meters

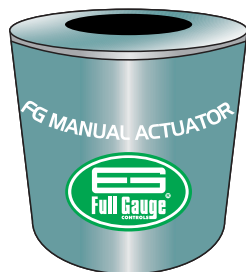
Valves: SB2012 to SB2150 - VX1050E Plus (Bipolar)

Gauge	Number of cable ways	Maximum length
1,00 mm ²	4	100 meters

12 - FG MANUAL ACTUATOR - Sold Separately

Accessory for manually opening and closing the electronic expansion valve.

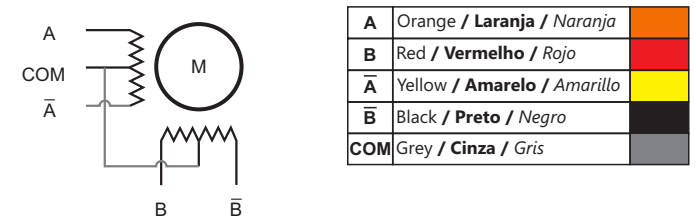
Compatible with: SB103T, SB105T, SB108, SB108T, SB110, SB110H, SB110T, SB114, SB114T, SB115H, SB118, SB118T, SB124, SB124H, SB124T, SB130, SB130T, SB132, SB132T, SB145, SB152, SB155, SB162.



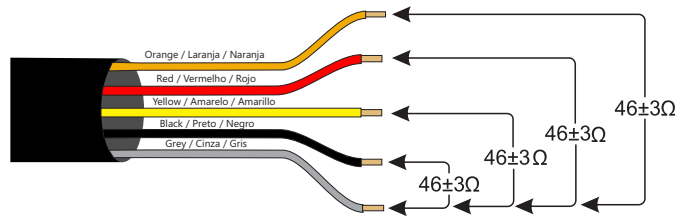
13 - COIL INTEGRITY TEST

13.1. UNIPOLAR COIL

To check the coil integrity, use a multimeter and check the electrical resistance of each coil, for example, between terminal "A" and terminal "COM". The measured resistance must be in accordance with the value informed for the unipolar coil, in this case $46 \pm 3.0\Omega$.

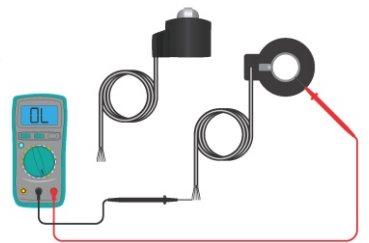


Coil resistance: $46 \pm 3.0\Omega$ per phase (20°C)



To carry out the unipolar coil integrity test, it is necessary to individually measure the resistance of each coil cable track with the internal metallic part of the coil.

This measure must always result in an open loop "OL", otherwise the integrity of the coil may be compromised.

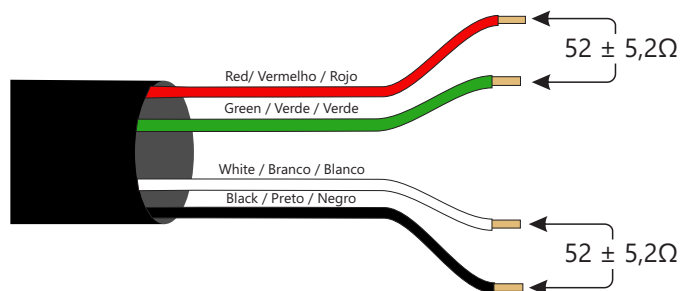


13.2. BIPOLAR COIN

To check the integrity of the coil, use a multimeter and check the electrical resistance between the "A" and "A" coils; "B" and "B". The measured resistance must be in accordance with the value reported for the bipolar coil, in this case $52 \pm 5.2\Omega$. Resistance measurement between different coils must always result in an open loop "OL".

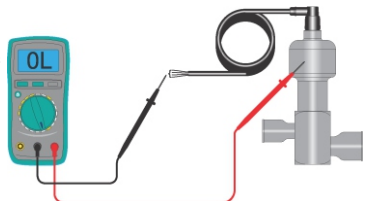


Coil resistance: $52 \pm 5.2\Omega$ per phase (20°C)



To carry out the unipolar coil integrity test, it is necessary to individually measure the resistance of each coil cable track with the internal metallic part of the coil.

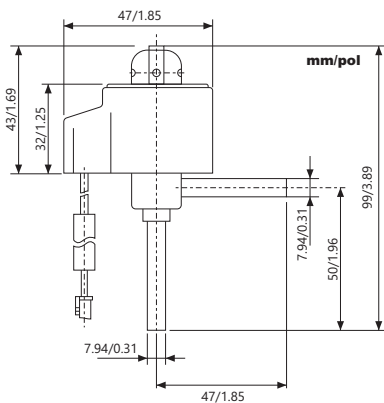
This measure must always result in an open loop "OL", otherwise the integrity of the coil may be compromised.



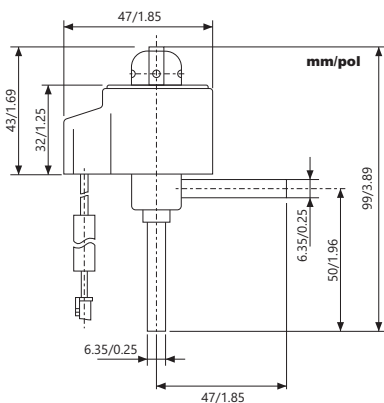
Connect the cable of the EEV to the controller, at indicated positions. Valve Voltage power supply is 12Vdc $\pm 10\%$. Only energize the valve coil connected to the controller. The motor has permanent magnets that maintain the current position of the valve in case of power failure.

14 - VALVES DIMENSIONS

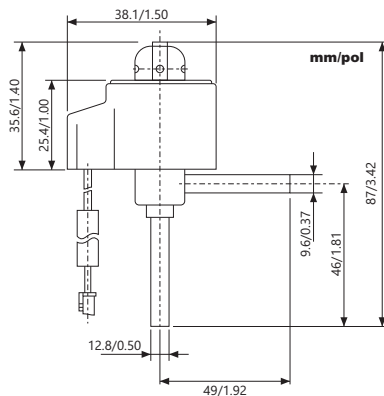
SB88 - SB89 - SB91
SB92 - SB93 - SB94



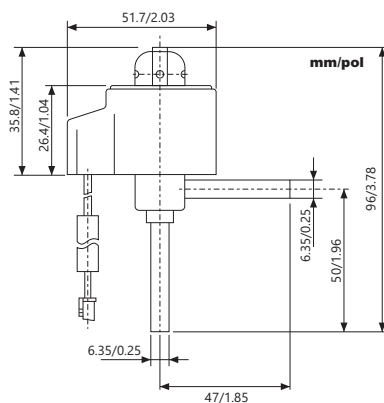
SB90



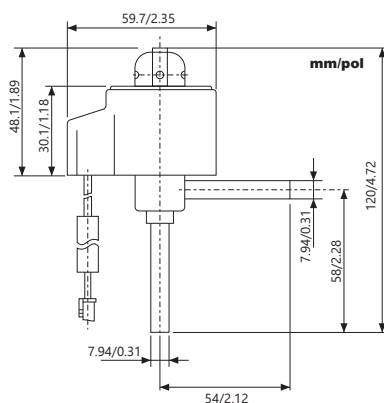
SB103T - SB105T - SB108
SB110 - SB110T - SB114
SB114T - SB118 - SB118T
SB124 - SB124T - SB130T
SB132T



SB110H - SB115H

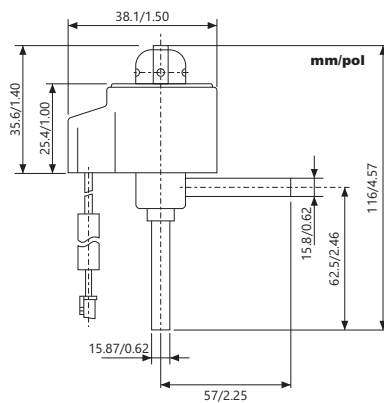


SB124H

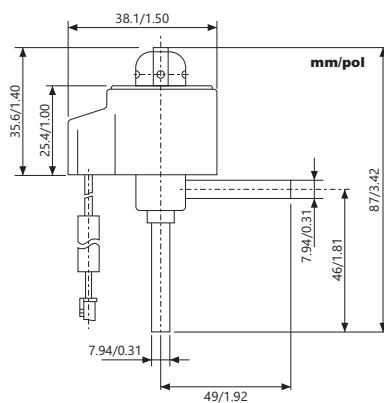


14 - VALVES DIMENSIONS

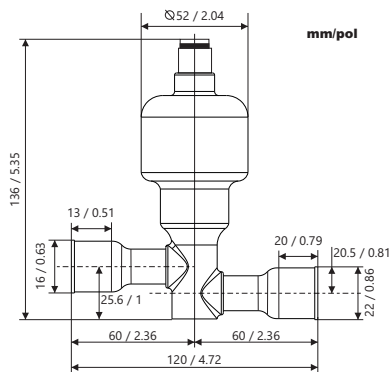
SB145 - SB152 - SB155
SB162



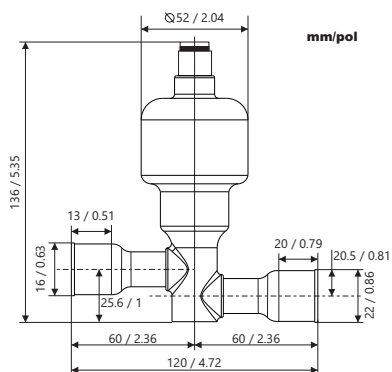
SB130 - SB132



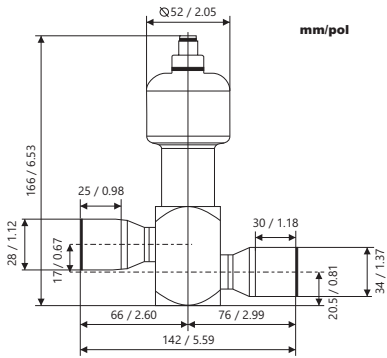
SB2012 - SB2025



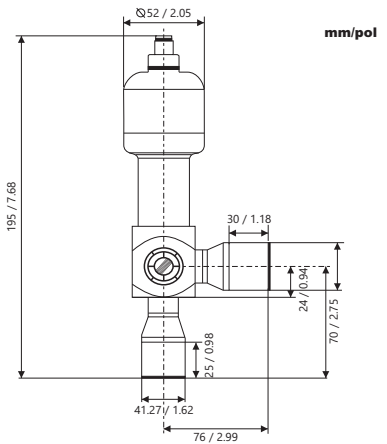
SB2050



SB2100



SB2150



15. WARRANTY



ENVIRONMENTAL INFORMATION

Packaging:
Full Gauge products use packaging made from entirely recycled materials. Please dispose of it through specialized recyclers.

Product:
The components used in Full Gauge controllers can be recycled and reused if they are dismantled by specialists.

Disposal:
Do not burn or throw controllers in the domestic waste, once they have reached the end of their working life. Follow the current legislation applicable to your area in relation to disposing of electronic waste. If you have any questions, contact Full Gauge Controls.

Products manufactured by Full Gauge Controls, from May 2005, have a warranty period of 10 (ten) years direct from the factory and 01 (one) year from accredited retailers, starting from the consignment date on the sales invoice. After this year, the warranty will continue to be honored for purchases from retailers if the device is sent directly to Full Gauge Controls. This period is valid in Brazil. Other countries provide a guarantee for 2 years. The products are guaranteed in the event of a manufacturing fault that makes them unsuitable or inappropriate for the uses to which they were intended. The warranty is limited to the maintenance of devices manufactured by Full Gauge Controls, regardless of any other form of costs, such as any indemnity due to damage caused to other equipment.

WARRANTY EXCEPTIONS

The Warranty does not cover transport and / or insurance costs for sending products believed to have defects or to have malfunctioned to Technical Support. The following events are also not covered: natural wear of parts, external damage caused by falls or improper packing of products.

LOSS OF WARRANTY

The product will automatically no longer be covered if:

- The instructions for use and assembly contained in the technical description and installation procedures listed in the NBR5410 standard are not observed;
- It is subjected to conditions beyond the limits specified in its technical description;
- If it is opened up or repaired by a person who is not part of Full Gauge's technical team;
- The damage which has taken place was the result of a fall, blow or impact, water damage, electrical surge or atmospheric discharge.

USING THE WARRANTY

To take advantage of the warranty, the customer must send the product properly packed, together with the corresponding purchase invoice, to Full Gauge Controls. The delivery cost for the product is borne by the client. You will also need to send as much information as possible regarding the defect that has been detected, thus making it possible to streamline the analysis, testing and servicing.

These processes and any eventual maintenance of the product will only be carried out by Full Gauge Controls' Technical Support, at the Company's head office - Rua Júlio de Castilhos, 250 - Zip Code 92120-030 - Canoas - Rio Grande do Sul - Brazil.

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