



## E<sup>x</sup>V-C

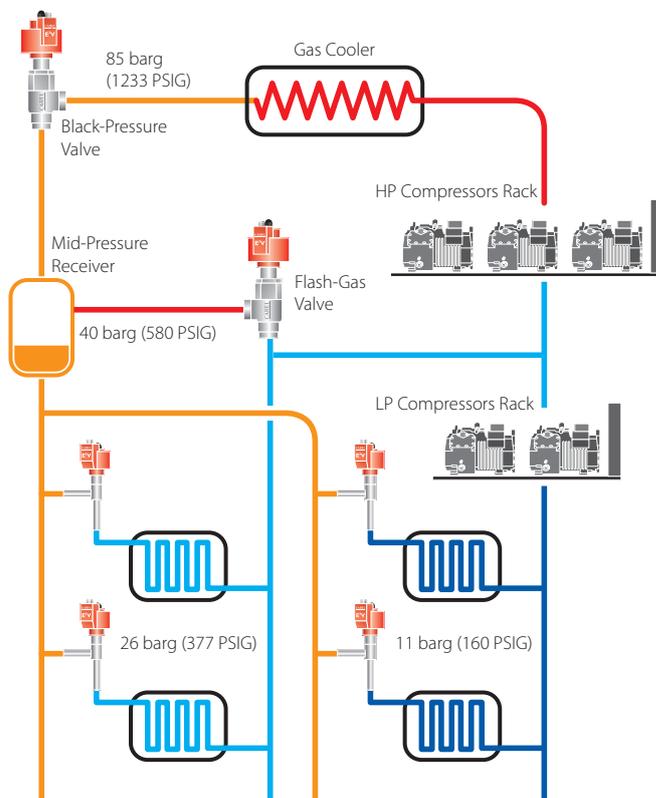
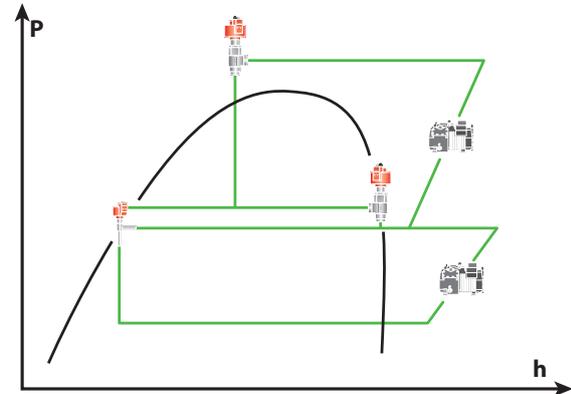
The most effective controller for all  
transcritical carbon dioxide applications

# A wide range of electronic expansion valves for transcritical CO<sub>2</sub> systems

The right model for every application, with the guaranteed precision and reliability of Carel valves.

- Equal percentage control
- MWP up to 140 barg (20314 PSIG)
- Excellent tightness on closing
- Compact dimensions

Carel's consolidated experience in high-efficiency expansion valves, specifically those working with natural refrigerants, has led to the development of a family of valves specifically designed for transcritical carbon dioxide (CO<sub>2</sub>) applications suitable, for commercial and industrial refrigeration systems and the food sector in particular.



## A complete range

A wide range (12 models) for all applications in transcritical CO<sub>2</sub> circuits.

	KV [m <sup>3</sup> /h]	CV [US-Gal/min]
E2V03	0.009	0.011
E2V05	0.014	0.017
E2V09	0.024	0.028
E2V11	0.042	0.049
E2V14	0.066	0.076
E2V18	0.09	0.10
E2V24	0.180	0.21
E3V30	0.376	0.435
E3V35	0.464	0.536
E3V45	0.628	0.726
E3V55	0.842	0.974
E3V65	1.087	1.257



### Equal percentage characteristic

Guarantees precise control even in operation at part loads.



### Perfect seal on closing

In the closed position, the valve guarantees perfect tightness to the flow of refrigerant, thanks to the Teflon gasket on the actuator and the calibrated spring that presses against the edge of the seat.



### High reliability and high quality materials

The valve's kinematic mechanism is made entirely from high quality materials. Gearless construction means the mechanism is highly reliable and long-lasting, guaranteeing extended product operation.

## Versatility

The entire E<sup>X</sup>V-C series guarantees maximum installation freedom. Freedom ensured by extremely compact dimensions (up to 30% smaller than the alternatives), the result of a patented design (E<sup>2</sup>V-C: patent in Europe, US and China; E<sup>3</sup>V-C: patent pending), and the removable stator that, even when not powered, allows complete manual valve operation using the optional EEVMAG accessory.



The compact dimensions of the E<sup>X</sup>V-C also means a significantly lower weight than other products currently today, simplifying installation and reducing any problems due to vibrations in the system. Modular construction and a washable stainless steel filter further simplify installation and maintenance of the E<sup>3</sup>V-C.



Moreover, the E2VxxCS100 series can be fitted with a high-capacity metal filter (optional, P/N E2VFIL0100) before welding the valve to the circuit.



All models in the E<sup>X</sup>V-C family are made entirely from stainless steel, so as to guarantee maximum mechanical strength and chemical compatibility.

## Precision

Like all CAREL valves, E<sup>X</sup>V-C also guarantees an equal percentage flow characteristic, in other words, it ensures maximum precision in all specific flow conditions. This property is especially effective at part loads, operating conditions that are typical of variable flow-rate CO<sub>2</sub> refrigeration systems, such as booster circuits.

## Hermetic closure

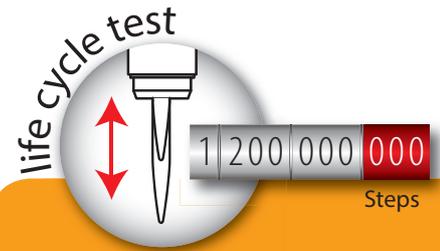
The Teflon gasket with spring closing that ensures constant tightness even when the valve is not operating is the technological heart of the proverbial hermetic seal of Carel valves, once again confirmed in the series for CO<sub>2</sub> applications.

## Reliability

The same construction philosophy used on the CAREL E<sup>V</sup> series is applied to the EXV-C, with direct coupling of the motor to the valve's moveable element: the Carel design in fact features a high-torque motor, eliminating the need for gears, a source of unreliability. The reliability of Carel valves for CO<sub>2</sub> applications is moreover guaranteed by extensive, stringent development tests: >1.2 billion steps, corresponding to more than 10 years' operation in real applications in accordance with the AHRI standard. As a further guarantee of quality, uniquely for a high pressure valve, the E2V\*\*CS\*\*\* models have obtained UL certification for high pressure and hazardous fluids.

## CAREL E<sup>X</sup>V-C technical specifications

	E2V-C	E3V-C
Maximum operating pressure (MOP)	140 bar (2031 PSI)	140 bar (2031 PSI)
Maximum operating pressure difference (MOPD)	120 bar (1740 PSI) – for E2V24C 85 bar (1233 PSI)	90 bar (1305 PSI)
Burst pressure	> 700 barg (UL certified) (>10150 PSIG)	> 600 barg (>8700 PSIG)
Refrigerant temp.	-40T70 °C (-40T158 °F)	-40T70 °C (-40T158 °F)
Ambient temp.	-30T70 °C (-22T158 °F)	-30T70 °C (-22T158 °F)



As envisaged by the CAREL product development procedure, E<sup>3</sup>V-C has also been lifetime tested, confirming reliable operation even after 1.2 billion steps performed in limit operating conditions.

## In summary

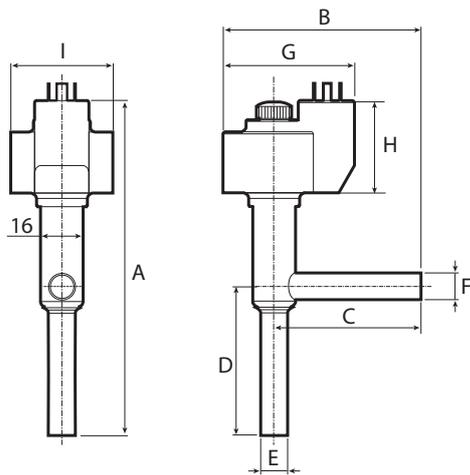
The E<sup>X</sup>V-C family valves offer maximum freedom of application, managing maximum working pressure (MWP) up to 140 barg and able to ensure the renowned CAREL tight closure even at very high pressure differentials.

The extremely contact dimensions, part of a patented design, mean the E<sup>X</sup>V-C can be installed in any system, including existing ones (retrofit).

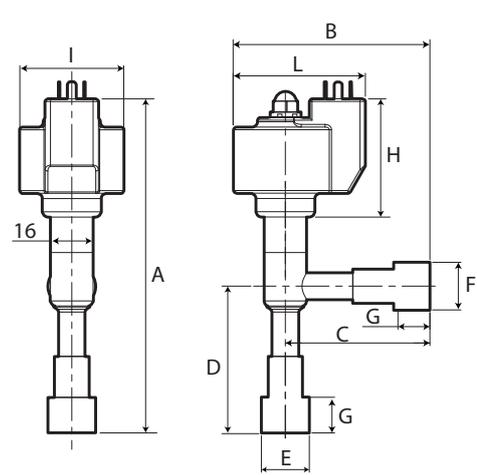
Very high mechanical precision, reliability guaranteed by extreme lifetime testing, and maximum application versatility are the main features of the incredibly high performance that E<sup>X</sup>V-C can bring to any CO<sub>2</sub> circuit.

Modern constructional procedures and strict quality controls ensure that CAREL performance is maintained throughout the valve's working life.

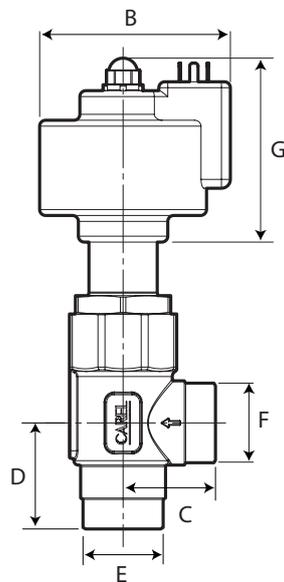
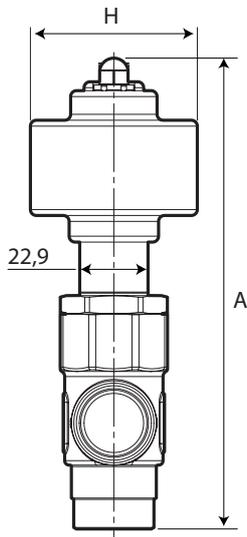
# Dimensions



Valve type	A	B	C	D	E
E2V**CS000	15.9 mm	15.9 mm	54.8 mm	56 mm	ID 9/ OD 10mm
	F ID 9/ OD 10mm	G 49.5 mm	H 44.7 mm	I 39 mm	



Valve type	A	B	C	D	E
E2V**CS100	125.8 mm	82.3 mm	52.3 mm	53.3 mm	ID 13/ OD 18 mm
	F ID 13/OD 18 mm	G 10 mm	H 44,7 mm	I 39 mm	L 49.5 mm



Valve type	A	B	C
E3V**CWM00 inox/ steel 5/8" - 5/8"	159.3 mm	62.5 mm	31 mm
	D	E	F
	35.9 mm	15.9 mm	15.9 mm
	G	H	
	61 mm	15.9 mm	

Valve type	A	B	C
E3V**CWR00 inox/ steel 7/8" - 7/8"	159.3 mm	62.5 mm	31 mm
	D	E	F
	35.9 mm	22.2 mm	22.2 mm
	G	H	
	61 mm	22.2 mm	



## exV Lab

the right choice



CAREL exv lab lab is the tool that helps users select and use CAREL valves. It is a web environment where both expert designers and novice users can find tools to select the right valve for their application, and identify the possible operating range of the E<sup>V</sup>.

<https://exvselectiontool.carel.com/ExVLab/>

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