



E²V for ammonia

The precision of a CAREL hermetically-sealed valve for all ammonia refrigerant applications

Electronic expansion valve for ammonia circuits

The first and only valve for ammonia refrigerant with equal percentage characteristic and total accuracy, guaranteed by precision mechanisms, stepper motor and fully hermetically sealed construction.

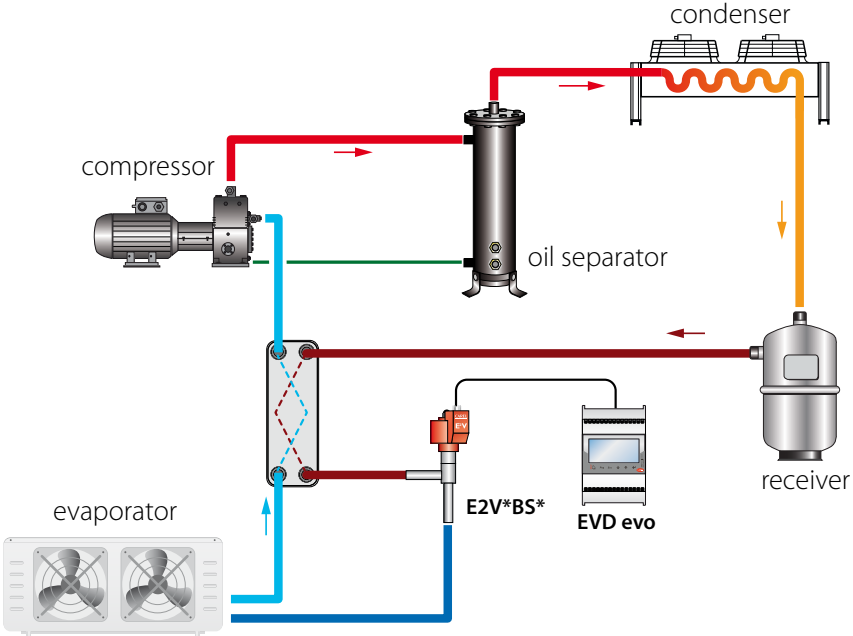
- Maximum versatility: hermetically tight stainless steel structure designed specifically for ammonia applications;
- Precise superheat control in all operating conditions;
- Perfectly tight closure at all times when system off;
- Extremely compact dimensions.

Highest efficiency

Ammonia was the first ever refrigerant to be used, and now one century later, it still guarantees the highest levels of efficiency; as a result, interest in ammonia is again growing in the refrigeration industry, with applications also extending into the air-conditioning sector, specifically on heat pumps that can now exploit the precision of the CAREL E²V.

Both cooling and heating

CAREL E²V guarantees perfect delivery of refrigerant to the cooling units on cold rooms (at the same time avoiding the need to use a solenoid shutoff valve), maximising the efficiency of dry-expansion evaporators. With constant and stable superheat control (also ensured by the wide range of drivers available), and completely bi-directional flow, E²V can today be used to construct extremely high efficiency heat pumps with a very low refrigerant charge (less than 25g/kWf).



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.

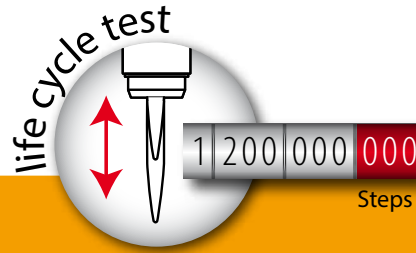


High reliability and high quality materials

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.

CAREL technology

In general, expansion devices need to ensure high quality control and maximum reliability. The CAREL E²V offers all these features for ammonia circuits, the result of CAREL's extensive experience in the control of refrigerant circuits and mastery of the most advanced materials technology. Unique on the market, CAREL E²V features an equal percentage characteristic for maximum control even at low flow-rates, at the same time guaranteeing maximum response at high flow-rates. Technology that also ensures reliability, as proven by lifetime testing to 1 million cycles.



As part of CAREL's product development procedures, the E²V valves for ammonia have also been subjected to lifetime testing, confirming reliable operation even after 1.2 billion steps performed in the most extreme operating conditions.

Performance

CAREL E²V for ammonia offers maximum versatility, being able to ensure CAREL's renowned perfectly tight closure at any operating pressure in both directions of flow.

In addition, the fully hermetically sealed stainless steel construction, two types of fittings - straight and socket, virtually complete freedom of installation and extremely compact dimensions mean E²V for ammonia can respond to the needs of any circuit.

The patented design (patented in Europe, the USA and China), modern construction processes and strict quality control all ensure that CAREL's high performance is maintained throughout the valve's working life.



- ✓ lifetime tested to 1.2 million of cycles
- ✓ hermetic stainless steel construction
- ✓ equal percentage control of movable element
- ✓ perfectly tight closure
- ✓ patented design
- ✓ fully bi-flow operation
- ✓ extremely compact dimensions

Operating specifications

Maximum working pressure (MWP)	45 barg (653 PSig)
Maximum operating pressure differential (MOPD)	35 bars (508 PSI)
Leakage values *	<50 std-ml/min of Nitrogen (N ₂) at 10 bar pressure differential. Like a solenoid valve.
Tightness	<3 g/year R134a equivalent at 45 barg (653 PSig) pressure
Refrigerant temperature limits	-45T70 °C (-49T158 °F)
Installation temperature limits	-30T70 °C (-22T158 °F)
Ingress protection	IP67
Certification	CE, UL

(*) measurement performed on E2V24BS with direct flow

Cooling capacity

		E2V03	E2V05	E2V09	E2V11	E2V14	E2V18	E2V24	E2V30	E2V35
Cooling capacity	kW	5.8	8.9	14.8	25.9	40.7	55.6	111	167	226
	kBtu/h	19.8	30.4	50.5	88.4	139.0	189.9	379	570	772

(*) cooling capacity calculated in the following conditions: tevap= -12 °C (6.4 °F); tcond= 37.8 °C (100 °F); SC= 1k (1.8 °R)

Dimensions

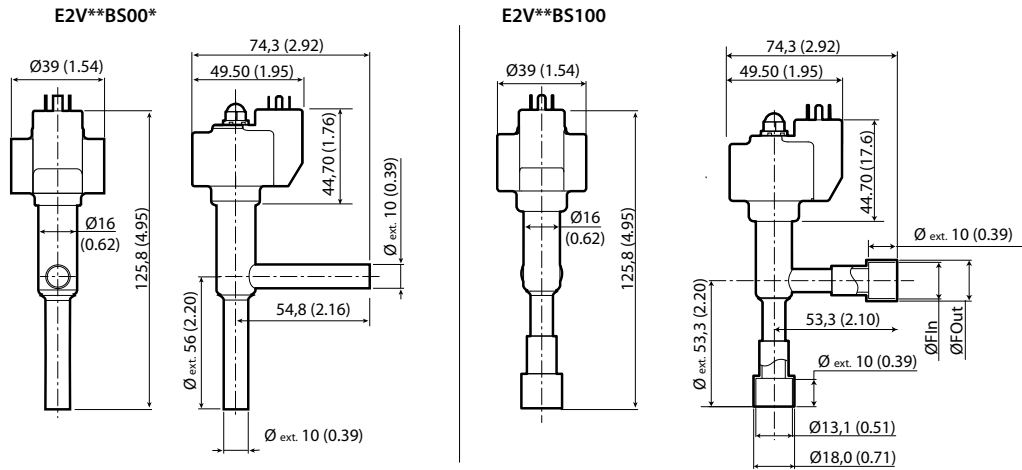


Table of part numbers - E²V for ammonia (NH₃, R717)

Fittings			
Ø10 mm		Ø13.1 mm	
P/N	Description	P/N	Description
E2V03BS000	E2V03-B Ø10-10 mm	E2V03BS100	E2V03-B Ø13-13mm ODF
E2V05BS000	E2V05-B Ø10-10 mm	E2V05BS100	E2V05-B Ø13-13mm ODF
E2V09BS000	E2V09-B Ø10-10 mm	E2V09BS100	E2V09-B Ø13-13mm ODF
E2V11BS000	E2V11-B Ø10-10 mm	E2V11BS100	E2V11-B Ø13-13mm ODF
E2V14BS000	E2V14-B Ø10-10 mm	E2V14BS100	E2V14-B Ø13-13mm ODF
E2V18BS000	E2V18-B Ø10-10 mm	E2V18BS100	E2V18-B Ø13-13mm ODF
E2V24BS000	E2V24-B Ø10-10 mm	E2V24BS100	E2V24-B Ø13-13mm ODF
E2V30BS000	E2V30-B Ø10-10 mm	E2V30BS100	E2V30-B Ø13-13mm ODF
E2V35BS000	E2V35-B Ø10-10 mm	E2V35BS100	E2V35-B Ø13-13mm ODF



CAREL exv 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 EXV.

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

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