

**ELECTRONIC EXPANSION VALVE CX2**

A1

**General information**

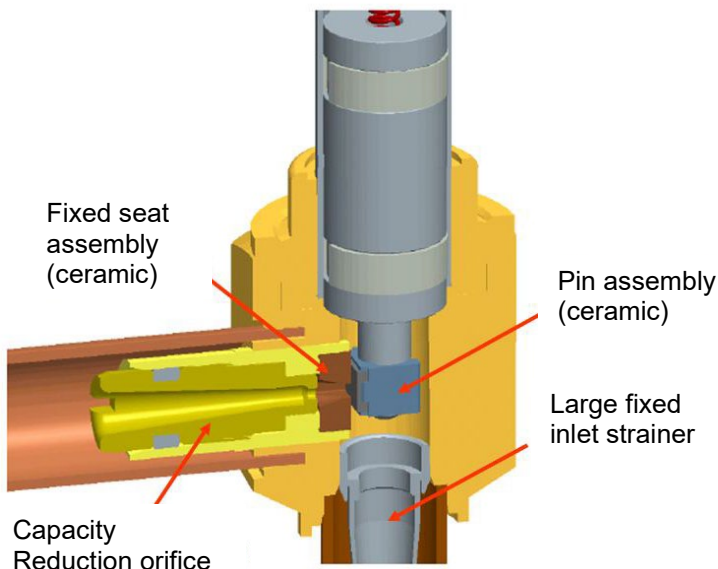
**CX2** Series is an electronically controlled expansion device. The capacity is defined through pulse width modulation. The CX2 can be driven by any electronic system having Triac output and providing the necessary electric power. The primary application is for display cases in commercial refrigeration as well as cold rooms.

**Features**

- Maximum allowable pressure PS: 90 bar
- Factory test pressure 129 bar (Single check)
- Burst pressure above 290 bar
- High MOPD up to 40 bar pressure differential
- Pulse width modulated
- Gate type port made from ceramic for high MOPD, longer lifetime and high reliability
- Shut off function eliminates the necessity of a separate solenoid valve
- One valve body can be combined with 6 orifices to make 7 capacity ranges, up to 28 kW R744
- Inlet strainer mesh size 100
- ESC coils (to be ordered separately)



**Internal Design**



**CX2 cross sectional view**

Gate type port from ceramic provides the followings advantageous features/functions:

- Tighter seat when the valve is closed
- Enables high MOPD with low wattage coil and less heat generation
- Longer life expectancy

**Selection Table - Valve**

Type	Part No.	Description	Type	Part No.	Description	Nominal capacity at 100 % continuous open (kW)	Remark (Nominal capacity)
						R744	
<b>CX2-I00</b>	<b>801095</b>	Valve: 3/8" x1/2" ODF				28.2	Valve less orifice
<b>CX2-I00</b>	<b>801095</b>	Valve: 3/8" x1/2" ODF	<b>EXO-004</b>	<b>801089</b>	Orifice 4	17.9	Single valve CX2-I00 with interchangeable orifice
			<b>EXO-003</b>	<b>801088</b>	Orifice 3	11.8	
			<b>EXO-002</b>	<b>801087</b>	Orifice 2	7.0	
			<b>EXO-001</b>	<b>801086</b>	Orifice 1	5.2	
			<b>EXO-000</b>	<b>801085</b>	Orifice 0	2.6	
			<b>EXO-00X</b>	<b>801084</b>	Orifice X	1.5	






NOTE 1: Nominal capacity at -10 °C evaporating temperature, +10 °C liquid temperature (45 bar) and 1 K subcooling. For other operating conditions use the quick selection in this document or "Select" tool ([www.copeland.com/en-gb](http://www.copeland.com/en-gb)).

NOTE 2: The table quotes capacities at 100% duty cycle, i.e. valve is open continuously. However, it is recommended to operate the valve at partial loaded (50-80 %) to allow for system load fluctuations.

NOTE 3: CX2 is released as expansion valve and during operation of valve CO<sub>2</sub> must be feed in liquid phase to inlet of the valve.

NOTE 4: For assistance with selection, please contact your local Emerson Sales offices.

**Selection Table Accessory**

Coils						
Type	Part No.	Supply Voltage	Power Input	Description	Temperature range	Illustration
<b>ESC-M24VAC</b>	<b>801304</b> <b>801304M*</b>	24 VAC ±10 % 50(60) Hz	25 VA, 16 W	IP65 with plug/cable assembly acc. EN 60529 test conditions	-40...+60 °C	 All Types: 
<b>ESC-M230VAC</b>	<b>801027</b> <b>801027M*</b>	230 VAC ±10 % 50(60) Hz	25 VA, 16 W			
<b>ESC3-W24VAC</b>	<b>801028</b> <b>801028M*</b>	24 VAC ±10 % 50(60) Hz	38 VA, 18 W			
<b>ESC-W230VAC</b>	<b>801029</b> <b>801029M*</b>	230 VAC ±10 % 50(60) Hz	38 VA, 18 W			
Cable Assembly for ESC Coils						
Type	Part No.	Description	Cable length	Temperature range	Illustration	
<b>ASC-N15</b>	<b>804570</b> <b>804570M*</b>	Connector Cable Assembly to Relay, loose wires 3 x 0.75 mm <sup>2</sup> (valve use)	1.5 m	-50...+80 °C (valid for stationary use)		
<b>ASC-N30</b>	<b>804571</b> <b>804571M*</b>		3.0 m			
<b>ASC-N60</b>	<b>804572</b>		6.0 m			
Others						
Type	Part No.	Description				Illustration
<b>Plug PG9</b>	<b>801012</b>	Plug acc. EN175301 with cable gland				
<b>Plug PG11</b>	<b>801013</b>	Plug acc. EN175301 with cable gland				
<b>ESC-K01</b>	<b>801034</b>	Screw cap (incl. cap, 2x O-ring & fixing retainer)				

NOTE 1: \*) M = Multipack = 20 pcs. Coils are delivered with retainer kit. Please order cable assemblies separately.

NOTE 2: For more Technical Data of coils, see Technical Information document of ESC.


**CX2 - Quick selection**

(80% of valve capacity, included 1.5 bar pressure drop for liquid line components and distributor)

Liquid temperature (°C)	R744		Capacity (kW)										R744		Orifice/ Valve Type
	Evaporating temperature (°C)														
	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45			
15		0.5	0.7	0.9	1.1	1.2	1.3	1.4	1.4	1.5	1.5	1.6	1.6	EXO-00X	
		0.9	1.3	1.7	1.9	2.1	2.3	2.4	2.6	2.7	2.7	2.8	2.8	EXO-000	
		1.7	2.7	3.3	3.8	4.3	4.6	4.9	5.1	5.3	5.5	5.6	5.7	EXO-001	
		2.3	3.6	4.5	5.2	5.7	6.2	6.6	6.9	7.1	7.4	7.5	7.6	EXO-002	
		3.9	6.0	7.5	8.6	9.6	10.4	11.0	11.5	12.0	12.3	12.6	12.8	EXO-003	
		5.9	9.1	11.3	13.1	14.5	15.7	16.7	17.5	18.1	18.6	19.0	19.3	EXO-004	
		9.4	14.3	17.8	20.6	22.9	24.8	26.3	27.6	28.6	29.4	30.0	30.5	CX2-I00	
10		0.5	0.8	1.0	1.1	1.3	1.4	1.4	1.5	1.6	1.6	1.6	EXO-00X		
		0.9	1.4	1.8	2.0	2.2	2.4	2.5	2.7	2.8	2.8	2.9	EXO-000		
		1.8	2.8	3.5	4.0	4.5	4.8	5.1	5.3	5.5	5.7	5.8	EXO-001		
		2.5	3.8	4.7	5.4	6.0	6.5	6.9	7.2	7.4	7.6	7.8	EXO-002		
		4.1	6.3	7.9	9.1	10.0	10.8	11.5	12.0	12.4	12.7	13.0	EXO-003		
		6.3	9.6	11.9	13.8	15.2	16.4	17.4	18.2	18.8	19.3	19.7	EXO-004		
		9.9	15.2	18.8	21.7	24.0	25.9	27.4	28.7	29.7	30.4	31.0	CX2-I00		
5			0.5	0.8	1.0	1.2	1.3	1.4	1.5	1.5	1.6	1.6	EXO-00X		
			1.0	1.5	1.8	2.1	2.3	2.5	2.6	2.7	2.8	2.9	EXO-000		
			1.9	2.9	3.6	4.2	4.6	4.9	5.2	5.5	5.6	5.8	EXO-001		
			2.6	3.9	4.9	5.6	6.2	6.6	7.0	7.3	7.6	7.8	EXO-002		
			4.3	6.6	8.2	9.4	10.3	11.1	11.8	12.3	12.7	13.0	EXO-003		
			6.5	10.0	12.4	14.2	15.7	16.8	17.8	18.6	19.2	19.7	EXO-004		
			10.2	15.7	19.5	22.4	24.7	26.6	28.1	29.3	30.3	31.0	CX2-I00		
0				0.5	0.8	1.0	1.2	1.3	1.4	1.5	1.5	1.6	EXO-00X		
				1.0	1.5	1.9	2.1	2.3	2.5	2.6	2.8	2.8	EXO-000		
				1.9	3.0	3.7	4.2	4.7	5.0	5.3	5.5	5.7	EXO-001		
				2.6	4.0	5.0	5.7	6.3	6.7	7.1	7.4	7.6	EXO-002		
				4.3	6.7	8.3	9.5	10.5	11.3	11.9	12.4	12.8	EXO-003		
				6.6	10.2	12.6	14.5	15.9	17.1	18.0	18.8	19.3	EXO-004		
				10.3	16.1	19.9	22.8	25.1	26.9	28.4	29.6	30.5	CX2-I00		
-5					0.5	0.8	1.0	1.2	1.3	1.4	1.5	1.5	EXO-00X		
					1.0	1.5	1.9	2.1	2.3	2.5	2.6	2.8	EXO-000		
					1.9	3.0	3.7	4.3	4.7	5.0	5.3	5.5	EXO-001		
					2.6	4.0	5.0	5.7	6.3	6.8	7.1	7.4	EXO-002		
					4.3	6.8	8.4	9.6	10.6	11.3	11.9	12.4	EXO-003		
					6.5	10.2	12.7	14.5	16.0	17.1	18.0	18.7	EXO-004		
					10.3	16.2	20.0	22.9	25.2	27.0	28.4	29.6	CX2-I00		
-10						0.5	0.8	1.0	1.2	1.3	1.4	1.5	EXO-00X		
						0.9	1.5	1.9	2.1	2.3	2.5	2.6	EXO-000		
						1.9	3.0	3.7	4.3	4.7	5.0	5.2	EXO-001		
						2.5	4.0	5.0	5.7	6.3	6.7	7.1	EXO-002		
						4.2	6.7	8.4	9.6	10.5	11.2	11.8	EXO-003		
						6.4	10.2	12.6	14.5	15.9	17.0	17.9	EXO-004		
						10.0	16.1	20.0	22.8	25.1	26.8	28.2	CX2-I00		
-15							0.5	0.8	1.0	1.2	1.3	1.4	EXO-00X		
							0.9	1.5	1.8	2.1	2.3	2.5	EXO-000		
							1.8	2.9	3.7	4.2	4.6	4.9	EXO-001		
							2.4	3.9	4.9	5.6	6.2	6.6	EXO-002		
							4.0	6.6	8.2	9.4	10.3	11.1	EXO-003		
							6.1	10.0	12.5	14.3	15.7	16.7	EXO-004		
							9.6	15.8	19.7	22.5	24.7	26.4	CX2-I00		
-20								0.5	0.8	1.0	1.2	1.3	EXO-00X		
								0.8	1.4	1.8	2.0	2.2	EXO-000		
								1.7	2.9	3.6	4.1	4.5	EXO-001		
								2.3	3.8	4.8	5.5	6.0	EXO-002		
								3.8	6.4	8.1	9.2	10.1	EXO-003		
								5.8	9.7	12.2	14.0	15.3	EXO-004		
								9.1	15.4	19.2	22.0	24.2	CX2-I00		
-25									0.4	0.8	1.0	1.1	EXO-00X		
									0.8	1.4	1.7	2.0	EXO-000		
									1.6	2.7	3.5	4.0	EXO-001		
									2.1	3.7	4.7	5.3	EXO-002		
									3.5	6.2	7.8	8.9	EXO-003		
									5.3	9.4	11.8	13.5	EXO-004		
									8.3	14.8	18.6	21.4	CX2-I00		

**Technical Data**

Max. allowable Pressure PS	90 bar
Factory Test Pressure PT	129 bar
Burst Pressure	>290 bar
MOPD (maximum operating pressure differential)	30 ... 40 bar (see below table**)
Temperatures	
Ambient ESC-M24/M230VAC	max. +60 °C
ESC-W24/W230VAC	max. +45 °C
Medium	-40...+65 °C
Coils	ESC-M24/M230VAC* ESC-W24/M230VAC
Lifetime	>30 Million cycles

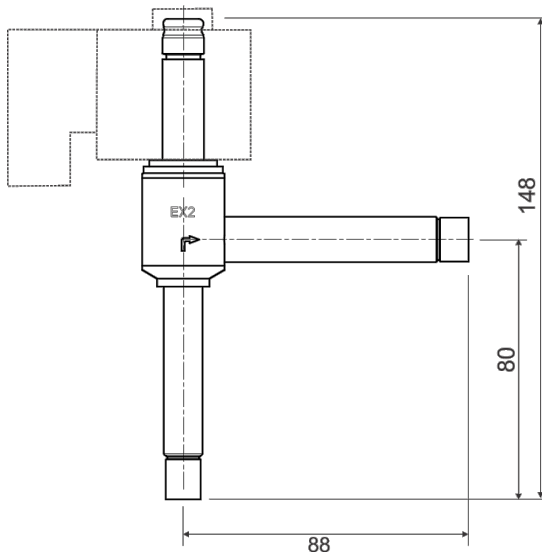
Function	Pulse width modulation (recommended 6 s pulse cycle)
Seat leakage	<5 cm <sup>3</sup> /min Nitrogen at 10 bar differential pressure
Connection	3/8" x 1/2" (10 x 12 mm) ODF
Weight	0.25 kg
Released Refrigerants <b>Fluid group II</b>	R744 Oils: Mineral, Alkyl benzene and ester lubricants <span style="float: right;">(A1)</span>
Markings	
Delivery	Single package

Supply voltage		MOPD			
		ESC-M24VAC / ESC-M230VAC		ESC-W24VAC / ESC-W230VAC	
		Ambient temperature		Ambient temperature	
		25°C	60°C	25°C	45°C
Nominal 24 VAC	Nominal 230 VAC	40 bar	35 bar	40 bar	40 bar
21.6 VAC (-10 %)	207 VAC (-10 %)	40 bar	30 bar	40 bar	40 bar

NOTE 1: \*\*) MOPD level is dependent on supply voltage to coil and ambient temperature. Lower supply voltage will reduce the MOPD level. Higher ambient temperature will reduce the MOPD level.

NOTE 2: MOPD values are valid only for 50 Hz supply voltage operation. MOPD will decrease if the coil will be used at 60 Hz frequency

**Dimension (mm)**



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