Last update: 05-2022
www.climate.emerson.com/en-gb

Ref: TI_CX2_A1_EN_Rev03
Application Engineering Europe

ELECTRONIC EXPANSION VALVE CX2

A1

General information

EMERSON **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.

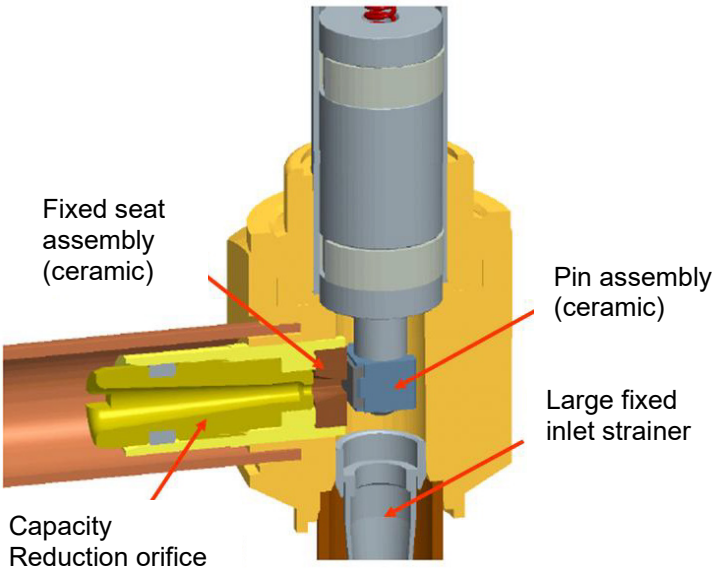
Features

- Maximum allowable working 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)

ESC

CX2

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 capacitiy)
						R744	
CX2-I00	**801095**	Valve: 3/8" x1/2" ODF				28.2	Valve less orifice
CX2-I00	**801095**	Valve: 3/8" x1/2" ODF	**EXO-004**	**801089**	Orifice 4	17.9	Single valve CX2-I00 with interchangeable orifice
			EXO-003	**801088**	Orifice 3	11.8	
			EXO-002	**801087**	Orifice 2	7.0	
			EXO-001	**801086**	Orifice 1	5.2	
			EXO-000	**801085**	Orifice 0	2.6	
			EXO-00X	**801084**	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.climate.emerson.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_2 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
ESC-M24VAC	**801304**	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: CE, UKCA, EAC Only ESC-W…: EAC
ESC-M230VAC	**	230 VAC ±10 % 50(60) Hz	25 VA, 16 W			
ESC3-W24VAC	**801028 801028M***	24 VAC ±10 % 50(60) Hz	38 VA, 18 W			
ESC-W230VAC	**801029 801029M***	230 VAC ±10 % 50(60) Hz	38 VA, 18 W			

Cable Assembly for ESC Coils

Type	Part No.	Description	Cable length	Temperature range	Illustration
ASC-N15	**804570 804570M***	Connector Cable Assembly to Relay, loose wires 3 x 0.75 mm^2 (valve use)	1.5 m	-50…+80 °C (valid for stationary use)	
ASC-N30	**804571 804571M***		3.0 m		
ASC-N60	**804572**		6.0 m		

Others

Type	Part No.	Description	Illustration
Plug PG9	**801012**	Plug acc. EN175301 with cable gland	
Plug PG11	**801013**	Plug acc. EN175301 with cable gland	
ESC-K01	**801034**	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.
**) coming soon
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* ESC-W24/W230VAC Medium	 max. +60 °C max. +45 °C -40…+65°C
Coils	ESC-M24/M230VAC* ESC-W24/M230VAC
Lifetime	>30 Million cycles

Function	Pulse width modulation (recommended 6 seconds pulse cycle)
Seat leakage	< 0.08cm³/h Nitrogen at 10 bar differential pressure
Connection	3/8” x 1/2” (10 x 12 mm) ODF
Weight	0.25 kg
Released Refrigerants **Fluid group II**	R744 Oils: Mineral, Alkyl benzene and ester lubricants A1
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: *) ESC-M230VAC in progress, coming soon
NOTE 2: **) 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 3: 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)