

Electronic Expansion Valves Series EX2

Pulse width modulated with exchangeable orifices

Can be used with EC2 display case controllers

Features

- Pulse width modulated
- Shut-off function eliminates the necessity of a separate solenoid valve
- Dampened plunger reduces noise effects of water hammer
- One valve body can be combined with 6 orifices to make 7 capacity ranges
- Applicable to all common refrigerants (HCFC, HFC) and for subcritical CO₂ applications
- Long lifetime, high reliability
- PS: 40bar, TS: -40 to +65°C



EX2 with Orifice

Selection Chart

Type	Part No.	Function	Capacity Q _n at 100% open Valve (kW)*						
			R134a	R22	R404A	R507	R407C	R744	R407F
EX2-M00	801 091	10 mm inlet / 12 mm outlet ODF							
EX2-I00	801 090	3/8" inlet / 1/2" outlet ODF	13.3	17.2	12.1	12.1	18.7	35.0	19.2
EXO-004	801 089	Orifice 4	8.5	10.9	7.7	7.7	11.8	22.2	12.2
EXO-003	801 088	Orifice 3	5.6	7.2	5.1	5.1	7.8	14.6	8.0
EXO-002	801 087	Orifice 2	3.3	4.3	3.0	3.0	4.7	8.7	4.8
EXO-001	801 086	Orifice 1	2.5	3.2	2.3	2.3	3.5	6.5	3.6
EXO-000	801 085	Orifice 0	1.2	1.6	1.1	1.1	1.7	3.3	1.8
EXO-00X	801 084	Orifice X	0.7	0.9	0.6	0.6	1.0	1.8	1.0
ASC3 24V	801 079	Coil 24 VAC 50 (60)Hz (8W)							

* Orifice should be selected at max. 80% of Q_n to allow covering the load fluctuation

Description	Type	PCN (single packing)	PCN (bulk packing)
Plug and cable assembly (1.5 m)	ASC-N15	804570	804570M
Plug and cable assembly (3.0 m)	ASC-N30	804571	804571M
Plug and cable assembly (6.0 m)	ASC-N60	804572	-
Plug PG9	Plug	801012	-
Plug PG11	Plug	801013	-

The nominal capacity (Q_n) is based on the following conditions:

Refrigerant	Evaporating temperature	Condensing temperature	Subcooling
R407C, R407F	+4°C (dew point)	+38°C bubble point / +43°C dew point	1K
R22, R134a, R404A, R507	+4°C	+38°C	1K
R744	-40°C	-10°C	1K

For other operating conditions the selection tool "Controls Navigator" can be downloaded from www.emersonclimate.eu, or use correction factors with following formula:

$$Q_n = Q_o \times K_t \times K_{\Delta p}$$

- Q_n: Nominal valve capacity
 Q_o: Required cooling capacity
 K_t: Correction factor for evaporating and liquid temperature
 K_{Δp}: Correction factor for pressure drop at valve

Liquid Temperature entering Valve °C	Correction Factor K_f											
	Evaporating Temperature °C											
	+15	+10	+5	0	-5	-10	-15	-20	-25	-30	-40	
+55	1.21	1.23	1.26	1.29	1.33	1.33	1.39	1.43	1.47	1.52	1.62	
+50	1.13	1.15	1.17	1.20	1.23	1.26	1.28	1.32	1.36	1.39	1.48	
+45	1.06	1.08	1.10	1.12	1.15	1.17	1.19	1.22	1.26	1.29	1.37	
+40	0.99	1.01	1.03	1.05	1.08	1.10	1.12	1.14	1.17	1.20	1.27	
+35	0.94	0.96	0.97	0.99	1.01	1.03	1.05	1.07	1.10	1.12	1.18	
+30	0.89	0.91	0.92	0.94	0.96	0.98	0.99	1.01	1.03	1.06	1.11	
+25	0.85	0.86	0.87	0.89	0.91	0.92	0.94	0.95	0.97	1.00	1.04	
+20	0.81	0.82	0.83	0.85	0.89	0.88	0.89	0.91	0.92	0.94	0.98	
+15	0.77	0.78	0.79	0.81	0.82	0.84	0.84	0.86	0.88	0.89	0.93	
+10		0.75	0.76	0.77	0.78	0.80	0.81	0.82	0.84	0.85	0.89	
+5			0.73	0.74	0.75	0.76	0.77	0.78	0.80	0.81	0.84	
0				0.71	0.72	0.73	0.74	0.75	0.76	0.78	0.81	
-5					0.69	0.70	0.71	0.72	0.73	0.74	0.77	
-10						0.68	0.68	0.69	0.70	0.71	0.74	

Correction Factor $K_{\Delta p}$																								
Δp	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0
$K_{\Delta p}$	1.34	1.25	1.18	1.12	1.07	1.02	0.98	0.95	0.91	0.88	0.86	0.83	0.79	0.75	0.72	0.69	0.67	0.65	0.63	0.61	0.59	0.57	0.56	0.55

Liquid Temperature entering Valve °C	Correction Factor K_f												
	Evaporating Temperature °C												
	+15	+10	+5	0	-5	-10	-15	-20	-25	-30	-35	-40	
+55	1.42	1.46	1.50	1.55	1.61	1.68	1.75	1.83	1.92	2.01	2.13	2.25	
+50	1.23	1.26	1.30	1.34	1.38	1.43	1.48	1.54	1.61	1.68	1.75	1.84	
+45	1.10	1.12	1.15	1.18	1.22	1.26	1.30	1.34	1.39	1.45	1.51	1.57	
+40	0.99	1.02	1.04	1.07	1.09	1.13	1.16	1.20	1.24	1.28	1.33	1.38	
+35	0.91	0.93	0.95	0.97	1.00	1.02	1.05	1.08	1.11	1.15	1.19	1.23	
+30	0.84	0.86	0.88	0.90	0.92	0.94	0.96	0.99	1.02	1.05	1.08	1.11	
+25	0.79	0.80	0.82	0.83	0.85	0.87	0.89	0.92	0.94	0.97	0.99	1.02	
+20	0.74	0.75	0.77	0.78	0.80	0.81	0.83	0.85	0.87	0.90	0.92	0.95	
+15	0.70	0.71	0.72	0.73	0.75	0.76	0.78	0.80	0.82	0.84	0.86	0.88	
+10		0.67	0.68	0.69	0.71	0.72	0.74	0.75	0.77	0.79	0.81	0.83	
+5			0.65	0.66	0.67	0.68	0.70	0.71	0.73	0.74	0.76	0.78	
0				0.63	0.64	0.65	0.66	0.68	0.69	0.71	0.72	0.74	
-5					0.61	0.62	0.63	0.65	0.66	0.67	0.69	0.70	
-10						0.60	0.61	0.62	0.63	0.64	0.65	0.67	

Correction Factor $K_{\Delta p}$																								
Δp	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0
$K_{\Delta p}$	1.74	1.63	1.54	1.46	1.39	1.33	1.28	1.23	1.19	1.15	1.12	1.09	1.03	0.98	0.94	0.9	0.87	0.84	0.81	0.79	0.77	0.75	0.73	0.71

Liquid Temperature entering Valve °C	Correction Factor K_f										
	Evaporating Temperature °C										
	+5	0	-5	-10	-15	-20	-25	-30	-35	-40	
+5	1.12	1.10	1.09	1.08	1.08	1.08	1.07	1.07	1.08	1.08	
0		1.02	1.01	1.01	1.00	1.00	1.00	1.00	1.00	1.01	
-5			0.95	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
-10				0.89	0.89	0.88	0.88	0.88	0.89	0.89	
-15					0.84	0.84	0.84	0.84	0.84	0.84	
-20						0.80	0.80	0.80	0.80	0.80	
-25							0.76	0.76	0.76	0.76	
-30								0.73	0.73	0.73	
-35									0.70	0.70	
-40										0.67	

Correction Factor $K_{\Delta p}$																								
Δp	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0	27.0	28.0
$K_{\Delta p}$	1.81	1.65	1.53	1.43	1.35	1.28	1.22	1.17	1.12	1.08	1.05	1.01	0.98	0.95	0.93	0.91	0.88	0.86	0.84	0.83	0.81	0.79	0.78	0.77

Liquid Temperature entering Valve °C	R22	Correction Factor K _t																						
		Evaporating Temperature °C																						
		+15	+10	+5	0	-5	-10	-15	-20	-25	-30	-35	-40											
+55	1.17	1.19	1.20	1.22	1.24	1.25	1.27	1.29	1.32	1.34	1.37	1.39												
+50	1.11	1.11	1.13	1.15	1.16	1.18	1.20	1.22	1.24	1.26	1.28	1.30												
+45	1.05	1.05	1.07	1.08	1.10	1.12	1.13	1.15	1.17	1.18	1.20	1.23												
+40	1.00	1.01	1.02	1.03	1.04	1.06	1.07	1.09	1.10	1.12	1.14	1.16												
+35	0.95	0.96	0.97	0.98	0.99	1.01	1.02	1.03	1.05	1.06	1.08	1.10												
+30	0.91	0.92	0.93	0.94	0.95	0.96	0.97	0.98	1.00	1.01	1.03	1.04												
+25	0.87	0.88	0.89	0.89	0.91	0.92	0.93	0.94	0.95	0.96	0.98	0.99												
+20	0.83	0.84	0.85	0.86	0.87	0.88	0.89	0.90	0.91	0.92	0.93	0.95												
+15	0.80	0.81	0.81	0.82	0.83	0.84	0.85	0.86	0.87	0.88	0.89	0.91												
+10		0.78	0.78	0.79	0.80	0.81	0.82	0.83	0.84	0.85	0.86	0.87												
+5			0.75	0.76	0.77	0.78	0.79	0.79	0.80	0.81	0.82	0.83												
0				0.73	0.74	0.75	0.76	0.77	0.77	0.78	0.79	0.80												
-5					0.72	0.72	0.73	0.74	0.75	0.75	0.76	0.77												
-10							0.70	0.71	0.71	0.72	0.73	0.74												
Correction Factor K _{Δp}																								
Δp	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0
K _{Δp}	1.59	1.49	1.40	1.33	1.27	1.22	1.17	1.13	1.09	1.05	1.02	0.99	0.94	0.90	0.86	0.83	0.80	0.77	0.75	0.72	0.70	0.68	0.67	0.65

Liquid Temperature entering Valve °C	R507	Correction Factor K _t																						
		Evaporating Temperature °C																						
		+15	+10	+5	0	-5	-10	-15	-20	-25	-30	-35	-40											
+55	1.39	1.43	1.47	1.52	1.57	1.62	1.69	1.76	1.83	1.92	2.02	2.12												
+50	1.22	1.24	1.28	1.31	1.35	1.40	1.44	1.49	1.55	1.61	1.68	1.76												
+45	1.09	1.11	1.14	1.17	1.20	1.23	1.27	1.31	1.36	1.40	1.46	1.52												
+40	0.99	1.01	1.03	1.06	1.08	1.11	1.14	1.17	1.21	1.25	1.29	1.34												
+35	0.91	0.93	0.95	0.97	0.99	1.01	1.04	1.07	1.10	1.13	1.16	1.20												
+30	0.85	0.86	0.88	0.89	0.91	0.93	0.96	0.98	1.01	1.03	1.06	1.09												
+25	0.79	0.80	0.82	0.83	0.85	0.87	0.89	0.91	0.93	0.95	0.98	1.01												
+20	0.74	0.75	0.77	0.78	0.79	0.81	0.83	0.85	0.87	0.89	0.91	0.93												
+15	0.71	0.71	0.72	0.73	0.75	0.76	0.78	0.79	0.81	0.83	0.85	0.87												
+10		0.67	0.68	0.69	0.70	0.72	0.73	0.74	0.76	0.78	0.79	0.81												
+5			0.64	0.65	0.67	0.68	0.69	0.70	0.72	0.73	0.75	0.76												
0				0.62	0.63	0.64	0.65	0.66	0.68	0.69	0.70	0.72												
-5					0.60	0.61	0.62	0.63	0.64	0.65	0.66	0.68												
-10							0.58	0.59	0.60	0.61	0.62	0.64												
Correction Factor K _{Δp}																								
Δp	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0
K _{Δp}	1.75	1.64	1.54	1.46	1.4	1.34	1.28	1.24	1.19	1.16	1.12	1.09	1.03	0.99	0.94	0.91	0.87	0.84	0.82	0.79	0.77	0.75	0.73	0.71

Liquid Temperature entering Valve °C	R407C	Correction Factor K _t																						
		Evaporating Temperature °C																						
		+15	+10	+5	0	-5	-10	-15	-20	-25	-30	-35	-40											
+55	1.26	1.28	1.31	1.34	1.37	1.40	1.44	1.48	1.52															
+50	1.15	1.17	1.19	1.22	1.24	1.27	1.30	1.33	1.37															
+45	1.06	1.08	1.10	1.12	1.14	1.17	1.19	1.22	1.25															
+40	0.99	1.01	1.02	1.04	1.06	1.08	1.11	1.13	1.16															
+35	0.93	0.94	0.96	0.98	0.99	1.01	1.03	1.05	1.07															
+30	0.88	0.89	0.90	0.92	0.93	0.95	0.97	0.99	1.01															
+25	0.83	0.84	0.85	0.87	0.88	0.90	0.91	0.93	0.95															
+20	0.79	0.80	0.81	0.82	0.84	0.85	0.86	0.88	0.90															
+15	0.75	0.76	0.77	0.78	0.80	0.81	0.82	0.84	0.85															
+10		0.73	0.74	0.75	0.76	0.77	0.78	0.80	0.81															
+5			0.71	0.72	0.73	0.74	0.75	0.76	0.77															
0				0.69	0.70	0.71	0.72	0.73	0.74															
-5					0.67	0.68	0.69	0.70	0.71															
-10							0.65	0.66	0.67	0.68														
Correction Factor K _{Δp}																								
Δp	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0
K _{Δp}	1.81	1.69	1.59	1.51	1.44	1.38	1.33	1.28	1.23	1.19	1.16	1.13	1.07	1.02	0.98	0.94	0.9	0.87	0.84	0.82	0.8	0.78	0.76	0.74