



VAEM Series Thermal Expansion Valves

Controls

Technical Data Sheet

VAEM Series is a uni-flow hermetic Thermal Expansion Valve designed for R134a bus AC and other AC applications that require high efficiency in replacement of parts.

VAEM Series features a MIO connector which signifies reliable connection and is ideal for those applications requiring field installation and replacements. VAEM Series valve is the perfect superheat control solution for bus AC.

The fully mechanical design offers prominent heat and moisture resistant capabilities for excellent performance and superior reliability in bus AC where operating condition is relatively tough.



Features:

- Hermetic, leak free construction
- Balanced port design valve compensates for changes in evaporator temperatures or widely varying evaporator loads to assure accurate control and reliable operation.
- Stainless steel power element eliminates corrosion, prevents valve failure and enhances operating cycle
- Nominal capacity range 1.5 to 11 Tonnages @ARI condition for R134a application
- Standard straight through configuration
- Features with transportation standard MIO connections
- Laser etched identification markings for permanent legibility
- Superheat adjustable configuration

Nomenclature Example: VAEM10 MC 5FT 5/8*3/4*1/4 MIO S/T

V	A	E	M	10	M	C	5FT	5/8*3/4*1/4	MIO	S/T
Series	Adjustable	Equalizer E=External	Connection MIO Type	Capacity (Nominal Rating in Tons)	Refrigerant Code M=R134a	Charging Code C=medium temperature	Capillary Tube Length 5 FT/1.5M	Inlet x Outlet x External equalizer tube Connection Sizes	Equalizer Connection MIO Type	Configuration S/T = Straight Through

Nominal Capacity: Tons (kW)

Model	*ARI Capacity	#Asercom Capacity	Model	*ARI Capacity	#Asercom Capacity
VAEM 1-1/2 MC	1-1/2 (5.28)	1.8 (6.47)	VAEM 6 MC	6 (21.10)	7.1 (25.01)
VAEM 2-1/4 MC	2-1/4 (7.91)	2.8 (9.74)	VAEM 7 MC	7 (24.62)	8.8 (31.13)
VAEM 3-1/2 MC	3-1/2 (12.31)	4.3 (15.12)	VAEM 9 MC	9 (31.65)	10.7 (37.60)
VAEM 4-1/4 MC	4-1/4 (14.95)	5.2 (18.36)	VAEM 10 MC	10 (35.17)	12.0 (42.20)
			VAEM 11 MC	11 (38.69)	13.3 (46.47)

*ARI Capacity : ARI 750-2007, 37.8°C liquid temperature, 4.4°C evaporator temperature, 4.13 bar pressure drop across valve

#Asercom Capacity: 38°C condensing temperature, 4.0°C evaporator temperature, supercooling degree1K.



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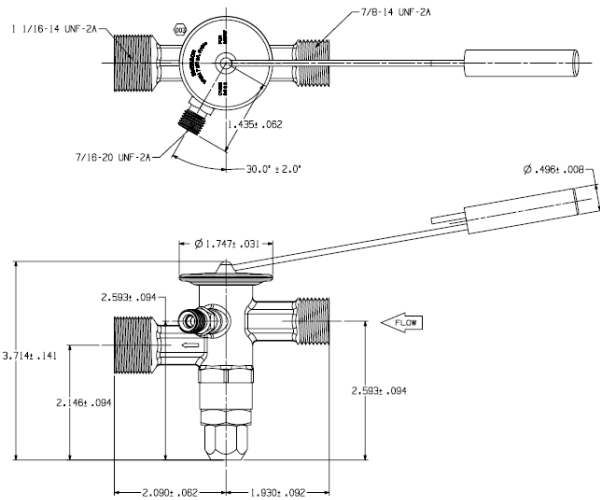
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Technical Data:

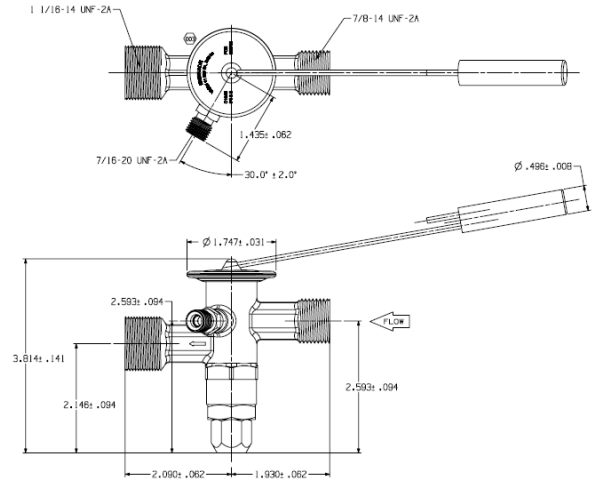
Max. Working Pressure	700psig (48.2bar)		
Operating Temp. Range	MC: -29 ~ +10 °C		
Standard Static Superheat	6A (3.3K)		
Compatible Refrigerating Oil	POE oil, Mineral oil		
External Leakage Ratio	2.835 g/year		
Net Weight	0.47 ~ 0.63 kg (excluding sensing bulb strap, weight may vary across models)		
Connections (Inlet x Outlet x External equalizer)	VAEM 1-1/2 MC	1/2 x 5/8 x 1/4 MIO	-
	VAEM 2-1/4 MC		-
	VAEM 3-1/2 MC	-	3/8 x 1/2 x 1/4 MIO
	VAEM 4-1/4 MC	1/2 x 5/8 x 1/4 MIO	
	VAEM 6 MC	-	5/8 x 3/4 x 1/4 MIO
	VAEM 7 MC	-	
	VAEM 9 MC	-	
	VAEM 10 MC	-	
VAEM 11 MC	-		
Standard S/T = Straight Through			
Bulb Cap Tube Length	5 FT (1.5M) standard cap tube		

Dimensional Data (Inch):

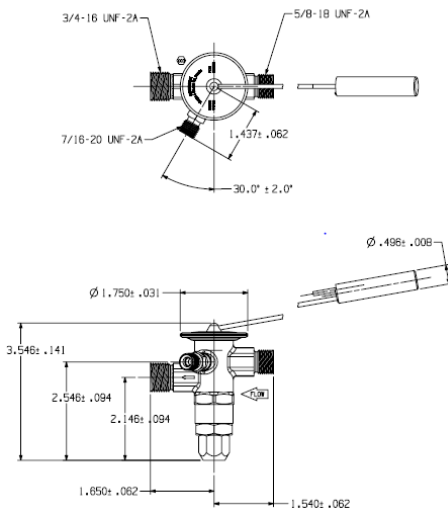
VAEM 6MC~VAEM 9MC, 5/8X3/4X1/4MIO:



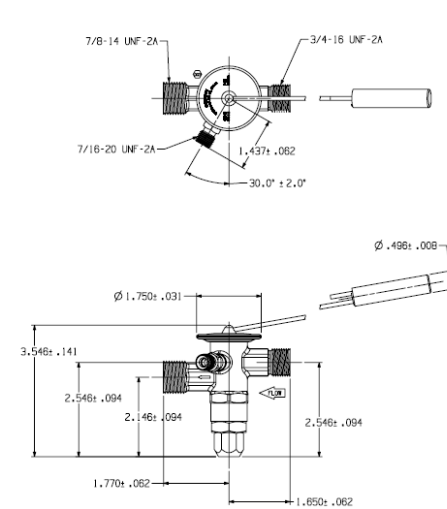
VAEM 10MC~VAEM 11MC, 5/8X3/4X1/4MIO:



VAEM 1-1/2MC~VAEM 4-1/2MC, 3/8X1/2X1/4MIO:



VAEM 1-1/2MC~VAEM 4-1/2MC, 1/2X5/8X1/4MIO:



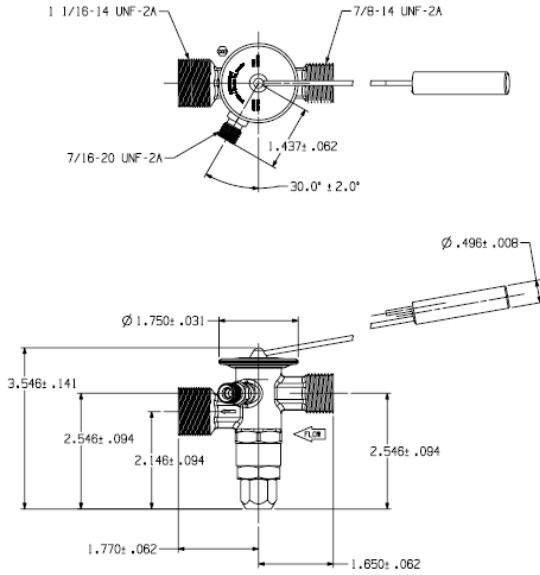


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VAEM 1-1/2MC~VAEM 4-1/2MC, 5/8X3/4X1/4MIO:



Extended Capacity Tables: R134a (kW)

Model	Nominal Capacity	Evaporator Temperature																	
		10°C						5°C						0°C					
		Pressure Drop Across Valve (bar)						Pressure Drop Across Valve (bar)						Pressure Drop Across Valve (bar)					
		4	6	7	8	10	11	4	6	7	8	10	11	4	6	7	8	10	11
VAEM 1-1/2	5.3	5.27	6.46	6.97	7.46	8.34	8.74	5.17	6.33	6.84	7.31	8.17	8.57	5.07	6.21	6.70	7.17	8.01	8.40
VAEM 2-1/4	7.9	7.91	9.69	10.46	11.18	12.50	13.11	7.75	9.50	10.26	10.97	12.26	12.86	7.60	9.31	10.05	10.75	12.02	12.60
VAEM 3-1/2	12.3	12.30	15.07	16.27	17.40	19.45	20.40	12.06	14.77	15.96	17.06	19.07	20.00	11.82	14.48	15.64	16.72	18.69	19.61
VAEM 4-1/4	14.9	14.94	18.30	19.76	21.13	23.62	24.77	14.65	17.94	19.38	20.72	23.16	24.29	14.36	17.58	18.99	20.30	22.70	23.81
VAEM 6	20.2	20.39	24.97	26.97	28.83	32.23	33.81	19.92	24.40	26.35	28.17	31.50	33.04	19.59	24.00	25.92	27.71	30.98	32.49
VAEM 7	25.2	25.31	31.00	33.48	35.79	40.02	41.97	24.82	30.39	32.83	35.09	39.24	41.15	24.32	29.79	32.18	34.40	38.46	40.34
VAEM 9	30.5	30.58	37.45	40.45	43.25	48.35	50.71	29.99	36.72	39.67	42.41	47.41	49.72	29.39	36.00	38.88	41.57	46.47	48.74
VAEM 10	34.2	34.31	42.02	45.38	48.52	54.24	56.89	33.64	41.20	44.50	47.57	53.19	55.78	32.97	40.38	43.62	46.63	52.13	54.68
VAEM 11	37.8	37.96	46.49	50.22	53.69	60.02	62.95	37.22	45.59	49.24	52.64	58.85	61.73	36.49	44.69	48.27	51.60	57.69	60.51

Model	Nominal Capacity	Evaporator Temperature																	
		-5°C						-10°C						-15°C					
		Pressure Drop Across Valve (bar)						Pressure Drop Across Valve (bar)						Pressure Drop Across Valve (bar)					
		4	6	7	8	10	11	4	6	7	8	10	11	4	6	7	8	10	11
VAEM 1-1/2	5.3	4.95	6.06	6.55	7.00	7.83	8.21	4.83	5.92	6.39	6.83	7.64	8.01	3.95	4.84	5.23	5.59	6.25	6.56
VAEM 2-1/4	7.9	7.42	9.09	9.82	10.50	11.74	12.31	7.25	8.88	9.59	10.25	11.46	12.02	5.93	7.27	7.85	8.39	9.38	9.84
VAEM 3-1/2	12.3	11.55	14.14	15.28	16.33	18.26	19.15	11.27	13.81	14.91	15.94	17.82	18.69	9.23	11.30	12.21	13.05	14.59	15.30
VAEM 4-1/4	14.9	14.02	17.17	18.55	19.83	22.17	23.25	13.69	16.76	18.11	19.36	21.64	22.70	11.21	13.72	14.82	15.85	17.72	18.58
VAEM 6	20.2	19.07	23.36	25.23	26.97	30.15	31.63	18.68	22.88	24.71	26.42	29.54	30.98	15.24	18.66	20.16	21.55	24.10	25.27
VAEM 7	25.2	23.76	29.09	31.43	33.60	37.56	39.39	23.19	28.40	30.68	32.80	36.67	38.46	18.98	23.25	25.11	26.85	30.02	31.48
VAEM 9	30.5	28.70	35.16	37.97	40.60	45.39	47.60	28.02	34.32	37.07	39.63	44.31	46.47	22.94	28.09	30.34	32.44	36.27	38.04
VAEM 10	34.2	32.20	39.44	42.60	45.54	50.92	53.40	31.43	38.50	41.58	44.45	49.70	52.13	25.73	31.52	34.04	36.39	40.69	42.67
VAEM 11	37.8	35.63	43.64	47.14	50.39	56.34	59.09	34.79	42.60	46.02	49.19	55.00	57.69	28.48	34.87	37.67	40.27	45.02	47.22



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Model	Nominal Capacity	Evaporator Temperature																	
		-20°C						-25°C						-30°C					
		Pressure Drop Across Valve (bar)						Pressure Drop Across Valve (bar)						Pressure Drop Across Valve (bar)					
		6	7	8	10	11	12	6	7	8	10	11	12	6	7	8	10	11	12
VAEM 1-1/2	5.3	3.77	4.07	4.35	4.87	5.11	5.33	3.41	3.68	3.94	4.40	4.62	4.82	3.05	3.29	3.52	3.94	4.13	4.31
VAEM 2-1/4	7.9	5.66	6.11	6.53	7.30	7.66	8.00	5.11	5.52	5.91	6.60	6.92	7.23	4.57	4.94	5.28	5.90	6.19	6.47
VAEM 3-1/2	12.3	8.80	9.50	10.16	11.36	11.91	12.44	7.96	8.59	9.19	10.27	10.77	11.25	7.11	7.68	8.21	9.18	9.63	10.06
VAEM 4-1/4	14.9	10.68	11.54	12.34	13.79	14.47	15.11	9.66	10.43	11.15	12.47	13.08	13.66	8.64	9.33	9.97	11.15	11.69	12.21
VAEM 6	20.2	14.58	17.85	19.28	20.62	23.05	24.17	13.14	14.19	15.17	16.96	17.79	18.58	11.78	12.73	13.61	15.21	15.96	16.66
VAEM 7	25.2	18.10	22.16	23.94	25.59	28.61	30.01	16.37	17.68	18.90	21.13	22.16	23.14	14.63	15.80	16.89	18.89	19.81	20.69
VAEM 9	30.5	21.87	26.78	28.93	30.92	34.57	36.26	19.78	21.36	22.83	25.53	26.78	27.97	17.68	19.09	20.41	22.82	23.93	25.00
VAEM 10	34.2	24.53	26.50	28.33	31.67	33.22	34.70	22.18	23.96	25.62	28.64	30.04	31.37	19.83	21.42	22.90	25.61	26.86	28.05
VAEM 11	37.8	27.14	33.24	35.91	38.39	42.92	45.01	24.55	26.52	28.35	31.69	33.24	34.72	21.94	23.70	25.34	28.33	29.71	31.03

Note: Nominal Capacity based on ARI 750-2007, 37.8°C liquid temperature, 4.4°C evaporator temperature, 4.13 bar pressure drop across valve

Refrigerant Liquid Temperature Valve Capacity Multiplier Correction Factors:

	Refrigerant Liquid Temperature °C														
	-18	-12	-7	-1	4	10	16	21	27	32	38	43	49	54	60
R-134a Correction Factor	1.70	1.63	1.56	1.49	1.42	1.36	1.29	1.21	1.14	1.07	1.00	0.93	0.85	0.78	0.71

These factors include corrections for liquid refrigerant density and net refrigerating effect and are based on an average evaporator temperature of -18°C. However, they may be used for any evaporator temperature from -40°C to +4°C since the variation of the actual factors across this range is insignificant.