EMERSON
Climate Technologies

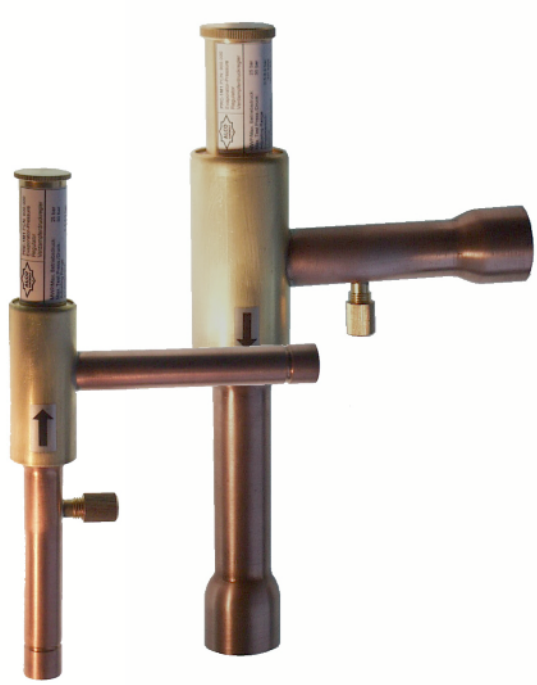
PRE and PRC
Evaporator and Cankcase Pressure Regulator

Alco Controls

D A T A S H E E T

Features

- Compact Design permits minimal space requirements
- Schraeder Valve on Inlet for ease of setting
- Direct operated Regulator
- Balanced Port Design provides accurate Pressure Control
- Copper tubes for easy soldering



PRE / PRC

Introduction

Evaporator Pressure Regulator Series PRE

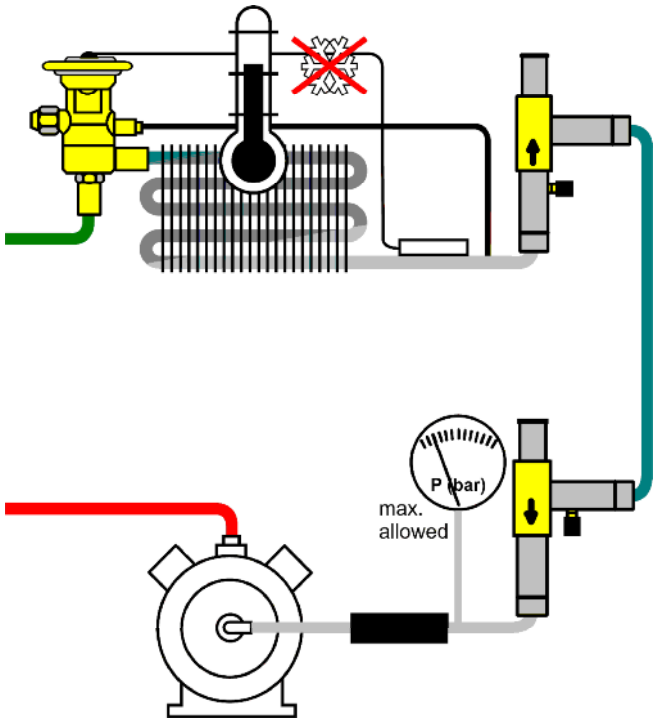
PRE Upstream Pressure Regulators accurately maintain a predetermined minimum evaporator pressure, regardless of sudden load or suction pressure changes. These valves operate from an inlet pressure signal, opening on rise in pressure above the valve set point and closing at any inlet pressure below the set point. By avoiding lower evaporating pressures than designed, a de-humidification of the chilled goods is limited. PRE Regulators can also be used to avoid freezing of water in water chillers or to avoid too low evaporating temperatures in air-conditioning systems. As a further application the PRE allows to run with different evaporating temperatures in a multiple evaporator system. Compressor cycling, using pressure or temperature controls is not always satisfactory. Although a Thermostatic Expansion Valve can regulate the flow of refrigerant depending on the load at the evaporator, it cannot control evaporator pressure.

Crankcase Pressure Regulator Series PRC

PRC Downstream Pressure Regulators accurately maintain a predetermined maximum outlet pressure. Designed to prevent compressor motor overload at start up conditions and other conditions (i.e. after defrost cycle) where high evaporating pressures can be expected. PRC Regulators limiting crankcase pressures above setting.

Description

Valve is made from corrosion resistant materials brass and copper. Copper connections provide easy and quick brazing process for the installation. Bellows are pressure equalized (balanced) which has the advantage, that varying pressures have no impact on the valve setting assuring precise pressure control.



Technical Data

Refrigerants		HFC, HCFC
Oil compatibility		Mineral, Alkyl Benzene and Polyol-Ester (POE) lubricants
Max. Operating Pressure		PS: 25 bar
Max. Test pressure		PT: 30 bar
Material, Housing		CW509L (EN12420)
Temperature:	Storage	-30°C to 80°C
	Medium	Ts: -30°C to 80°C
	Ambient	-30°C to 80°C

Pressure change per turn:	
Valve Size 1	0,6 bar
Valve Size 2	0,4 bar
Pressure range:	0,5 to 6,9 bar
Factory setting:	2 bar
Weight:	
PRC/PRE-1..	0,6 kg
PRC/PRE-2..	1,3 kg

Selection

Type	Part Code Nr.	Tube Connection ODF	Pressure Range (bar)	Factory setting (bar)	Nominal Capacity Qn (kW)*			
					R 134a	R 404A / R 507	R 407C	R 22
PRE-11A	800 380	16mm-5/8“	0,5 – 6,9	2 bar	3,0	4,5	4,5	4,8
PRE-11B	800 381	22mm-7/8“						
PRE-21C	800 382	28mm			7,4	11,1	11,1	11,9
PRE-21D	800 383	1-1/8“						
PRC-11A	800 384	16mm-5/8“	0,5 – 6,9	2 bar	3,0	4,5	4,5	4,8
PRC-11B	800 385	22mm-7/8“						
PRC-21C	800 386	28mm			7,4	11,1	11,1	11,9
PRC-21D	800 387	1-1/8“						
PRC-21E	800 388	35mm-1-3/8“						

*Nominal Capacities are based on Evaporating Temperature +4°C and Condensing Temperature 38°C and a pressure drop of 1 K.

Selection for other operating conditions

Table 1: Correction table for Selection of Evaporator Pressure Regulator PRE

Example

Capacity Q_o: 2 kW
Refrigerant: R404A
Evaporating Temperature: -20°C
Condensing Temperature: 50°C

K_t from Table below: 3,05

$Qn = Qo * K_t$

Qn = 2 kW * 3,05 = 6,1 kW

Result: PRE-21

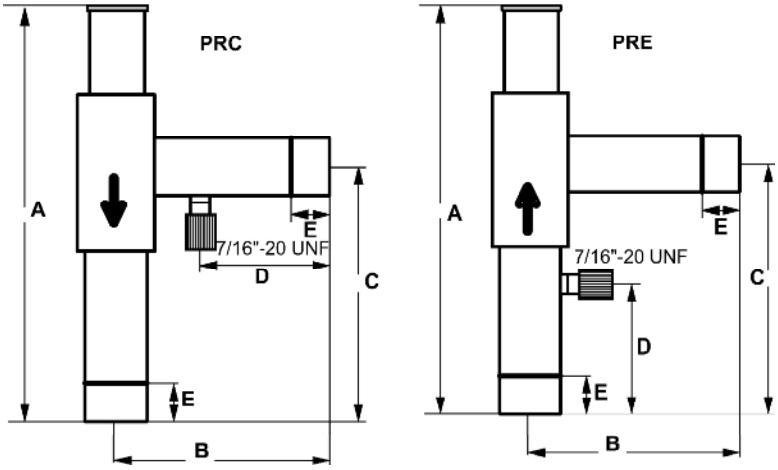
K_t-Factor (Correction Factors include 1 K pressure drop at the mentioned Evaporating Temperature)

Refrigerant	Condensing temperature °C	Correction Factor K_t Evaporating Temperature °C				
		10	0	-10	-20	-30
R 404 A / R 507	60	1,35	1,91	2,77	4,18	6,53
	50	1,05	1,46	2,07	3,05	4,62
	40	0,88	1,22	1,71	2,48	3,69
	30	0,77	1,06	1,48	2,12	3,13
R 407 C	55	1,02	1,42	2,04		
	50	0,94	1,31	1,87		
	40	0,84	1,17	1,66		
	30	0,77	1,06	1,50		
R 134 a	60	1,04	1,51	2,17		
	50	0,92	1,34	1,91		
	40	0,83	1,20	1,71		
	30	0,76	1,1	1,55		
R 22	60	1,02	1,37	1,87	2,67	3,91
	50	0,93	1,25	1,70	2,42	3,53
	40	0,86	1,15	1,57	2,22	3,23
	30	0,80	1,07	1,45	2,05	2,98

Table 2: Capacity Table for Selection of Crankcase Pressure Regulators PRC
(capacities are based on a pressure drop of 0,07 bar)

Refrigerant	Evaporating temperature °C	Capacity (kW)													
		Valve setting °C PRC-11x							Valve setting °C PRC-21x						
		-20	-15	-10	-5	0	5	10	-20	-15	-10	-5	0	5	10
R 22	-29	2,3	3,4	4,4	4,8	4,9			5,8	8,8	10,0	10,0	10,0		
	-21		2,4	4,1	5,4	5,8				6,5	12,1	12,1	12,1		
	-14			2,7	4,9	6,2					8,1	13,8	13,8		
	-8				3,5	5,3						9,0	15,4		
	-3					3,1							9,9		
R 407 C	-6				3,1	4,8						7,9	13,9		
	-1					2,9							9,2		
R 134 a	-6					2,1	3,9	5,3					5,2	10,3	12,9
	1						2,4	4,7						6,1	12,2
	7							3,3							8,1
R 404A / R 507	-27	1,6	2,9	3,7	3,9				4,8	8,2	8,2	8,2			
	-20		1,9	3,5	4,5					5,7	9,8	9,8			
	-14			2,2	4,5						6,8	11,6			
	-10				3,1							8,1			

Dimensions



Type	Connection ODF	Weight kg	Dimension				
			A	B	C	D	E
PRE-11A	16mm-5/8”	0,55	245	133	151	83	13
PRE-11B	22mm-7/8”	0,6	245	133	151	83	19
PRE-21C	28mm	1,2	310	145	196	85	25
PRE-21D	1-1/8”	1,2	310	145	196	85	25
PRC-11A	16mm-5/8”	0,55	245	133	151	83	13
PRC-11B	22mm-7/8”	0,6	245	133	151	83	19
PRC-21C	28mm	1,2	310	145	196	85	25
PRC-21D	1-1/8”	1,2	310	145	196	85	25
PRC-21E	35mm-1-3/8”	1,25	310	145	196	85	25

Name Scheme

P	R	C	-	1	1	A

Type
C = Crankcase Pressure Regulator
E = Evaporator Pressure Regulator

Valve Size
1 = small
2 = large

Connection Size
A = 5/8”-16 mm
B = 7/8”-22 mm
C = 28 mm
D = 1-1/8”
E = 35mm-1-3/8”

Pressure Range
1 = 0,5 – 6,9 bar

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