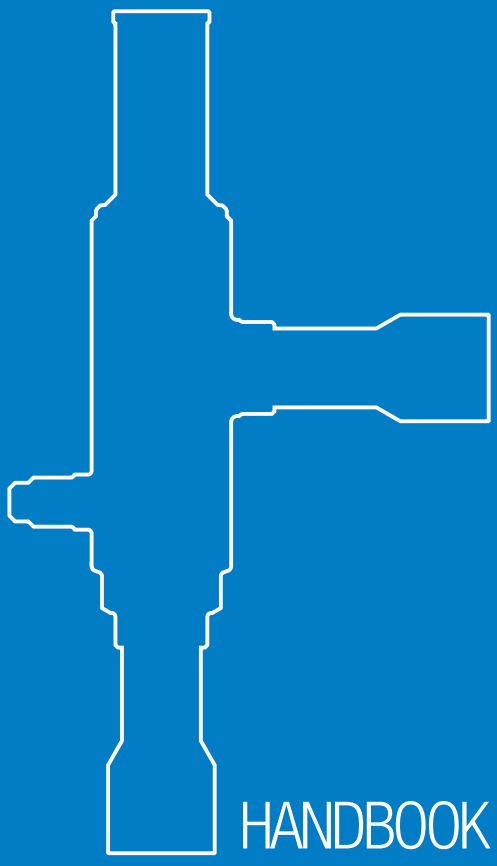


HANDBOOK

REGULATOR VALVES

Ed. 2017

Castel®
Italian technology

CHAPTER 5
CONDENSING PRESSURE REGULATORS
FOR REFRIGERATION PLANTS THAT USE HCFC OR HFC REFRIGERANTS

APPLICATIONS

When designing air conditioning and refrigerating systems that use air cooled condensing units, subject to wide range of ambient temperatures, it is very important to provide accurate condenser capacity control. Since a properly sized condensing unit operates satisfactorily at high ambient temperature, capacity control is needed at low ambient temperatures. Good condensing pressure control during low ambient temperature avoids problems during system operation and facilitates start-up. Specifically, this control maintains a sufficient pressure differential across the thermostatic expansion valve ensuring correct refrigerant feed to the evaporator.

Condensing pressure regulators, together with the differential valves, are the solution to this control need. The regulators in series 3340 and 3345 restrict the liquid flow from the condenser to the receiver, reducing the active condenser surface and raising the condensing pressure. The differential valve 3136W by-passes hot gas from the compressor discharge to the receiver, raising the liquid pressure in the receiver.

All condensing pressure regulators illustrated in this chapter are designed for installation on commercial refrigeration systems and on civil and industrial air conditioning plants that use the following refrigerant fluids:

- HCFC (R22)
- HFC (R134a, R404A, R407C, or R507)
- HFC (R410A), only series 3345

belonging to Group 2, as defined in Article 13, Chapter 1, Point (b) of Directive 2014/68/EU, with reference to EC Regulation No. 1272/2008.

For specific applications with refrigerant fluids not listed above, please contact Castel Technical Department.

OPERATION

Condensing pressure regulators adjust the flow of the liquid (hot gas) according to changes of condensation pressure (compressor discharge), upstream of the regulator. When the condensation pressure (discharge) is less than the regulator calibration pressure, the shutter remains closed. As the condensation pressure (discharge) rises above the regulator's calibration setting, the shutter begins to open and modulates in proportion to the variation in condensation pressure (discharge). As the condensing pressure (discharge) continues to rise, the shutter continues to open, until the stroke limit is reached and the regulator is open completely. When the shutter is fully open, a further increase in the valve capacity can be obtained only by increasing the load loss across the valve. Condensing pressure regulators only modulate based on the inlet pressure change, pressure changes on the outlet side do not affect their opening as the valve is equipped with an equalizer bellow with an area equal to that of the valve seat

The factory pressure settings for regulators in series 3340 is 8 bar. This means that until the condensation (discharge) pressure is below 8 bar, the regulator remains closed. When it rises above 8 bar, the regulator begins to open. According to the characteristics of the refrigerating system it may be necessary to change the factory setting by adjusting the adjustment ring on the top of the regulator body. Turn this ring clockwise to increase the regulator's calibration pressure; turn it counter-clockwise to decrease the calibration pressure. Each turn of the ring corresponds to an increase/decrease of 2.3 bar in calibration pressure (1.5 bar for models 3340/9S, 3340/M28S, and 3340/11S). The calibration range varies from 3 to 20 bar.

The factory pressure settings for regulators in series 3345 is 12 bar. This means that until the condensation (discharge) pressure is below 12 bar, the regulator remains closed. When it rises above 12 bar, the regulator begins to open. According to the characteristics of the refrigerating system it may be necessary to change the factory setting by adjusting the adjustment ring on the top of the regulator body. Turn this ring clockwise to increase the regulator's calibration pressure; turn it counter-clockwise to decrease the calibration pressure. Each turn of the ring corresponds to an increase/decrease of 2.5 bar in calibration pressure. The calibration range varies from 18 to 30 bar.

The differential valves adjust the flow of hot gas to the liquid receiver according to the differential pressure between

compressor discharge and liquid receiver The valves 3136W begin to open when the differential pressure reaches 1.4 bar and are fully open when differential pressure is 3 bar

CONSTRUCTION

The main parts of regulators in series 3340 and 3345 are manufactured with the following materials:

- Hot forged brass EN 12420 – CW 617N for the body
- Copper pipe EN 12735-1 – Cu-DHP for solder connections
- Austenitic stainless steel AISI 321 for the bellows
- Austenitic stainless steel AISI 303 for the shutter
- Brass bar EN 12164 – CW 614N for regulator ring
- Spring steel DIN 17223/84 Class C/D for setting spring
- Chloroprene rubber (CR) for outlet seal gaskets

The main parts of the differential valves 3136W are made with the following materials:

- Hot forged brass EN 12420 – CW 617N for body and cover
- Copper pipe EN 12735-1 – Cu-DHP for solder connections
- Austenitic stainless steel AISI 302 for the spring
- PTFE for seat gaskets

INSTALLATION

Condensing pressure regulators can be mounted in two locations of the refrigerating system:

- In the liquid line between the condenser and the liquid receiver (for regulator selection see Tables 27A, 28A, 29A, 30A and 31A related to liquid line). Valve 3136W is mounted between the compressor discharge and the inlet of liquid receiver. This choice requires a smaller sized regulator as it is controlling liquid refrigerant. It is most suitable for installations in temperate climates (see installation example 1).
- In the discharge line between the compressor and the condenser (for regulator selection see Tables 27B, 28B, 29B, 30B and 31B related to hot gas line). Valve 3136W is mounted between the compressor discharge and the inlet of liquid receiver. A check valve 3132W must be installed between the condenser discharge and receiver inlet to prevent liquid migration during an off cycle. This choice requires a larger sized regulator as it is controlling gaseous refrigerant. It is most suitable for installations in cold climates (see installation example 2).

SELECTION

To correctly select condensing pressure regulators, all information on the system where it will be installed must be available. Selection is based on the following data:

1. Type of refrigerant
2. Designed evaporator (system) capacity.
3. Evaporating temperature.
4. Condensing temperature.
5. Allowable condensing pressure change.
6. Allowable pressure drop across the regulator.

The refrigerating capacities indicated on Tables 27A, 27B, 28A, 28B, 29A, 29B, 30A, 30B, 31A and 31B are calculated as a function of a reference evaporating temperature of 4.4 °C.
With liquid temperatures other than 4.4 °C, the required cooling capacity of regulator is:

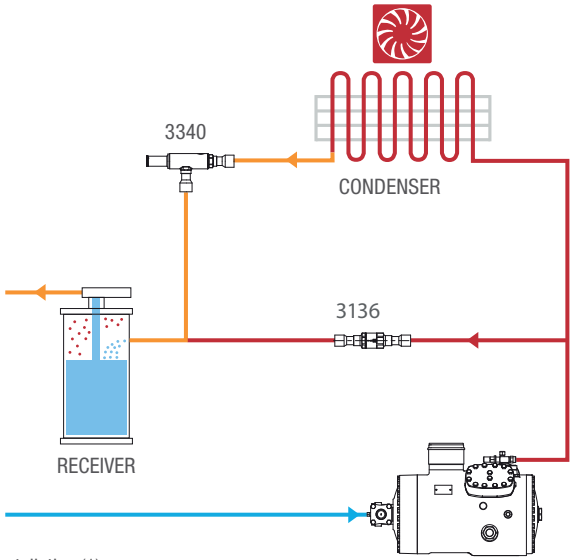
$$\frac{Q_{evap}}{K_{T\,evap}} = Q_{valve}$$

where:

Q_{evap} = Evaporator capacity [kW]
$K_{T\,evap}$ = Correction factor for $T_{evap} \neq 4.4$ °C. (See Tables 27C, 28C, 29C, 30C and 31C.)
Q_{valve} = Refrigerating capacity requested at regulator. [kW]

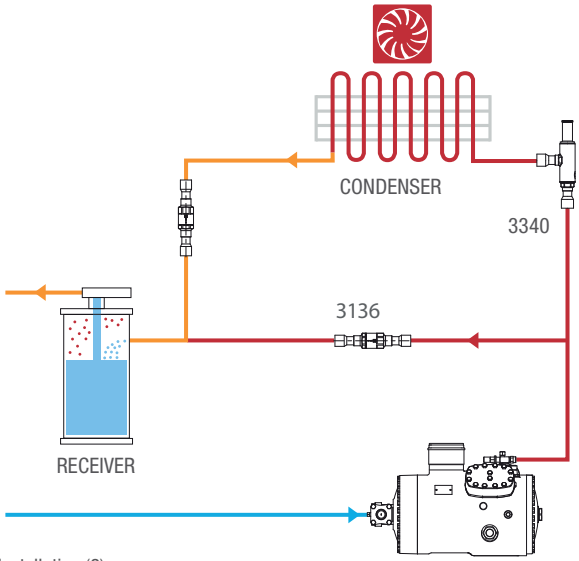
EXAMPLE

Refrigerant:	R404A
Refrigeration yield of evaporator:	20 [kW]
Designed evaporating temperature:	0 [°C]
Condensing temperature:	40 [°C]



Installation (1)

Refrigerating systems with air condensers. The regulator is installed at the condenser outlet on the liquid line, before the liquid receiver.
Injection valve 3136 guarantees sufficiently high pressure under variable conditions (min. diff. 1.4 bar / max 3 bar).



Installation (2)

Refrigerating systems with air condenser and receiver installed in very cold environments.
The regulator is installed upstream of the condenser.
Injection valve 3136 ensures that the receiver has suffi ciently high pressure.

Allowed condensing pressure change: 1.5 [bar]
Pressure drop across the regulator: 0.31 [bar]
Solder connections

1. Use Table 26C to determine the correction factor for the liquid temperature T_{evap} = 0 °C.

   K_{Tevap} = 1.02

2. Calculate the refrigerating capacity requested at regulator.

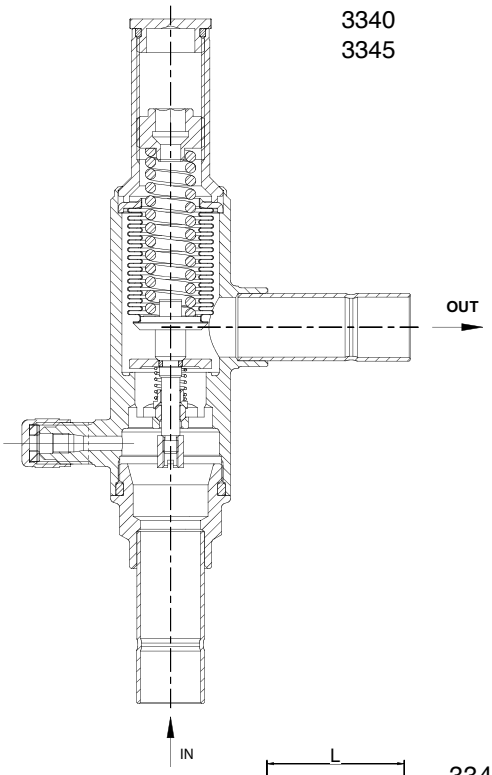
$$Q_{valve} = \frac{Q_{evap}}{K_{Tevap}} = \frac{20}{1,02} = 19,60 \text{ kW}$$

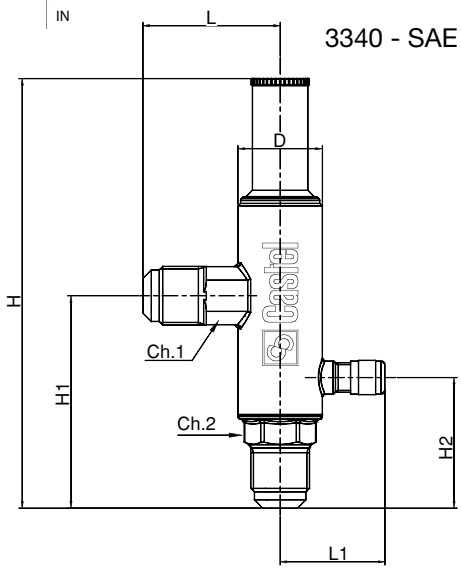
3. With the following parameters:
   - Minimum cooling capacity = 19.60 KW
   - Condensing temperature = 40 °C
   - Condensing pressure change = 1.5 bar
   - Pressure drop across the valve = 0.31 bar

Select the right valve from Table 29A. The valve selected is 3340/5S.

CERTIFICATIONS

Condensing pressure regulators in series 3340 have been approved by the American certification authority Underwriters Laboratories Inc. These regulators are **UL Listed** certified for the USA with file SA33319, in compliance with American standard UL 207. Condensing pressure regulators in series 3345 have not been approved by the American certification authority Underwriters Laboratories Inc.





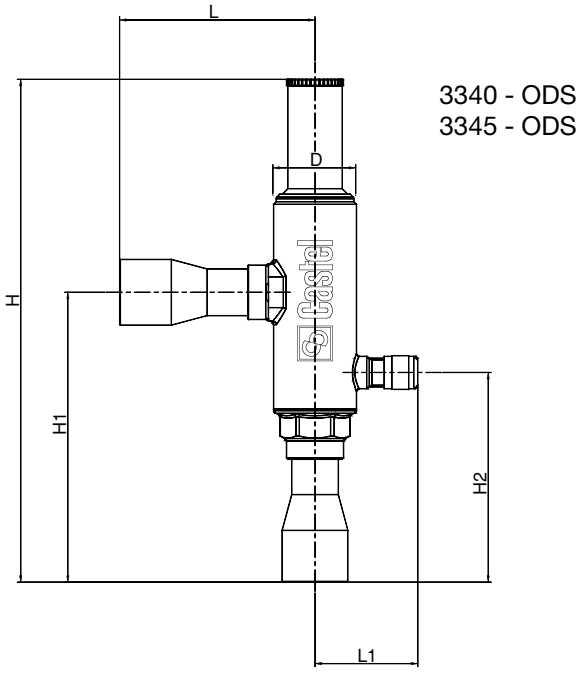


TABLE 24: General characteristics of condensing pressure regulators

Catalogue Number	Connections			Kv Factor [m³/h]	Regulating range [bar]		Factory setting [bar]	PS [bar]	TS [°C]		TA [°C]		Risk Category according to PED Recast
	SAE Flare	ODS			min.	max.			min.	max.	min.	max.	
		Ø [in.]	Ø [mm]										
3340/4	1/2"	–	–	2,70	3	20	8	28	– 40	+110	– 40	+50	Art. 4.3
3340/M12S	–	–	12										
3340/4S	–	1/2"	–										
3340/5	5/8"	–	–										
3340/5S	–	5/8"	16										
3340/7S	–	7/8"	22										
3340/9S	–	1.1/8"	–	8,4									
3340/M28S	–	–	28										
3340/11S	–	1.3/8"	35										
3345/M12S	–	–	12	2,70	18	30	10	45	– 40	+110	– 40	+50	Art. 4.3
3345/4S	–	1/2"	–										
3345/5S	–	5/8"	16										
3345/7S	–	7/8"	22										

TABLE 25: Dimensions and weights of condensing pressure regulators

Catalogue Number	Dimensions [mm]								Weight [g]
	H	H_1	H_2	L	L_1	D	Ch1	Ch2	
3340/4	159	76,5	45,5	48	37	32	22	24	490
3340/M12S	183	100,5	69,5	64			-	-	506
3340/4S	183	100,5	69,5	64			-	-	506
3340/5	163	80,5	49,5	52			22	24	550
3340/5S	183	100,5	69,5	64			-	-	506
3340/7S	194	112	81	75,5			-	-	570
3340/9S	263	151	111	105	44	46	-	-	1520
3340/M28S	263	151	111	105					1520
3340/11S	263	151	111	105					1530
3345/M12S	183	100,5	69,5	64	37	32	-	-	506
3345/4S	183	100,5	69,5	64					506
3345/5S	183	100,5	69,5	64					506
3345/7S	194	112	81	75,5					570

TABLE 26: General characteristics of differential valves

Catalogue Number	Connections			Kv Factor [m³/h]	Regulating range [bar]		PS [bar]	TS [°C]		TA [°C]		Risk Category according to PED Recast
	SAE Flare	ODS			min.	max.		min.	max.	min.	max.	
		Ø [in.]	Ø [mm]									
3136W/M12	–	–	12	1,80	1,4	3	45	– 40	+110	– 40	+50	Art. 4.3
3136W/4	–	1/2"	–									

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TABLE 27A : Refrigerant Flow Capacity of condensing pressure regulators 3340 [kW]. Liquid line											
Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3340/4 3340/4S 3340/M12S	1,5	0,07	17,93	17,05	16,07	15,19	14,30	13,15	12,00	11,30	10,59
		0,14	26,22	24,80	23,24	21,81	20,38	18,75	17,10	16,06	15,02
		0,31	45,70	43,03	40,12	37,44	34,75	32,22	29,67	27,59	25,49
		0,65	61,82	57,92	53,71	49,82	45,90	42,56	39,19	36,35	33,50
		1,03	77,67	72,46	66,84	61,63	56,38	52,27	48,14	44,55	40,94
		1,68	106,45	99,02	91,04	83,60	76,12	69,90	63,65	58,62	53,55
	3	0,07	32,36	31,29	28,60	27,53	26,36	25,12	23,78	22,70	21,55
		0,14	46,39	44,80	40,90	39,31	37,57	35,86	34,01	32,41	30,71
		0,31	73,39	70,82	64,60	62,03	59,22	56,43	53,41	51,00	48,43
		0,65	104,52	100,74	91,77	87,99	83,86	80,04	75,91	72,36	68,57
		1,03	128,57	123,78	112,61	107,82	102,58	98,07	93,18	88,67	83,87
		1,68	174,27	167,14	151,46	144,34	136,59	129,93	122,73	116,69	110,26
3340/5 3340/5S	1,5	0,07	29,89	28,42	26,79	25,32	23,84	21,92	20,00	18,83	17,66
		0,14	43,71	41,33	38,73	36,36	33,97	31,24	28,50	26,77	25,03
		0,31	76,17	71,72	66,86	62,40	57,92	53,70	49,46	45,98	42,49
		0,65	103,03	96,54	89,51	83,03	76,50	70,93	65,32	60,59	55,83
		1,03	129,46	120,76	111,40	102,71	93,96	87,12	80,23	74,25	68,23
		1,68	177,42	165,03	151,73	139,34	126,87	116,51	106,08	97,70	89,26
	3	0,07	53,93	52,15	47,67	45,89	43,94	41,87	39,63	37,83	35,91
		0,14	77,32	74,67	68,17	65,52	62,62	59,77	56,69	54,02	51,18
		0,31	122,31	118,03	107,66	103,38	98,70	94,05	89,02	85,00	80,71
		0,65	174,21	167,90	152,96	146,65	139,77	133,41	126,52	120,59	114,29
		1,03	214,29	206,29	187,69	179,69	170,97	163,45	155,30	147,78	139,78
		1,68	290,44	278,57	252,43	240,56	227,64	216,55	204,55	194,48	183,76
3340/7S	1,5	0,07	38,91	38,73	34,68	34,50	34,10	32,83	31,29	30,71	30,02
		0,14	56,59	55,99	49,84	49,25	48,29	46,51	44,32	43,39	42,29
		0,31	89,88	88,50	78,39	77,00	75,01	72,82	70,06	67,90	65,40
		0,65	128,43	125,80	110,83	108,19	104,63	101,57	97,71	94,48	90,75
		1,03	158,18	154,18	135,14	131,13	125,92	122,23	117,59	113,44	108,67
		1,68	209,46	203,51	177,77	171,83	164,21	157,88	150,17	144,17	137,31
	3	0,07	60,79	60,70	53,51	53,42	52,88	51,95	50,58	49,56	48,29
		0,14	86,43	86,19	75,87	75,63	74,72	73,54	71,74	70,17	68,23
		0,31	134,24	133,75	117,64	117,15	115,63	113,60	110,60	108,39	105,65
		0,65	187,42	186,50	163,82	162,90	160,50	157,95	154,08	150,74	146,63
		1,03	226,69	225,29	197,64	196,24	193,03	190,27	185,95	181,62	176,32
		1,68	293,29	290,33	253,67	250,71	245,28	240,57	233,74	228,10	221,22

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)
Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

Continued

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

TABLE 27A : Refrigerant Flow Capacity of condensing pressure regulators 3340 [kW]. Liquid line

Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3340/9S 3340/M28S	1,5	0,07	93,88	89,26	84,14	79,52	74,87	68,86	62,81	59,15	55,46
		0,14	137,28	129,82	121,64	114,18	106,68	98,13	89,52	84,08	78,61
		0,31	239,25	225,25	209,99	195,99	181,91	168,66	155,34	144,42	133,44
		0,65	323,58	303,20	281,14	260,76	240,26	222,76	205,15	190,29	175,34
		1,03	406,59	379,28	349,89	322,59	295,11	273,62	251,99	233,19	214,29
		1,68	557,24	518,31	476,54	437,62	398,45	365,91	333,18	306,84	280,34
	3	0,07	169,38	163,78	149,72	144,13	137,99	131,50	124,48	118,82	112,80
		0,14	242,83	234,51	214,09	205,77	196,66	187,72	178,05	169,66	160,73
		0,31	384,15	370,71	338,14	324,69	309,98	295,38	279,59	266,96	253,50
		0,65	547,14	527,34	480,40	460,60	438,97	418,99	397,36	378,75	358,94
		1,03	673,03	647,92	589,49	564,37	536,97	513,36	487,77	464,15	439,01
		1,68	912,20	874,92	792,82	755,53	714,97	680,12	642,45	610,81	577,15
3340/11S	1,5	0,07	119,33	118,77	106,36	105,80	104,56	100,69	95,94	94,18	92,06
		0,14	173,53	171,70	152,85	151,02	148,10	142,62	135,92	133,08	129,70
		0,31	275,63	271,39	240,38	236,14	230,04	223,31	214,85	208,23	200,56
		0,65	393,87	385,79	339,87	331,79	320,86	311,47	299,65	289,74	278,31
		1,03	485,10	472,83	414,42	402,15	386,15	374,84	360,61	347,88	333,25
		1,68	642,33	624,10	545,17	526,93	503,57	484,18	460,53	442,12	421,09
	3	0,07	186,43	186,16	164,09	163,82	162,15	159,32	155,12	151,98	148,09
		0,14	265,06	264,31	232,67	231,92	229,15	225,53	220,02	215,19	209,25
		0,31	411,67	410,17	360,76	359,26	354,59	348,38	339,18	332,40	323,99
		0,65	574,77	571,94	502,38	499,55	492,21	484,39	472,50	462,27	449,67
		1,03	695,17	690,88	606,09	601,79	591,95	583,49	570,25	556,96	540,71
		1,68	899,42	890,34	777,94	768,85	752,20	737,74	716,80	699,49	678,40

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)

Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

R134a

TABLE 27B : Refrigerant Flow Capacity of condensing pressure regulators 3340 [kW]. Hot gas line										
Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3340/4 3340/4S 3340/M12S	1,5	0,07	2,47	2,46	2,47	2,47	2,48	2,49	2,49	2,50	2,51
		0,14	3,47	3,46	3,47	3,48	3,49	3,50	3,51	3,53	3,54
		0,31	5,88	5,87	5,88	5,90	5,92	5,93	5,95	5,97	5,99
		0,65	7,68	7,66	7,68	7,71	7,73	7,75	7,78	7,80	7,82
		1,03	9,34	9,31	9,34	9,37	9,39	9,42	9,45	9,48	9,50
		1,68	11,86	11,82	11,86	11,89	11,93	11,96	12,00	12,03	12,07
	3	0,07	4,50	4,37	4,50	4,62	4,74	4,87	4,99	5,12	5,25
		0,14	6,35	6,17	6,35	6,52	6,70	6,87	7,05	7,22	7,41
		0,31	9,99	9,71	9,99	10,26	10,54	10,81	11,09	11,37	11,66
		0,65	14,01	13,63	14,01	14,40	14,78	15,17	15,55	15,95	16,35
		1,03	16,98	16,51	16,98	17,45	17,91	18,38	18,85	19,32	19,81
		1,68	21,72	21,12	21,72	22,32	22,91	23,51	24,11	24,72	25,35
3340/5 3340/5S	1,5	0,07	4,11	4,10	4,11	4,12	4,13	4,15	4,16	4,17	4,18
		0,14	5,79	5,77	5,79	5,81	5,82	5,84	5,86	5,88	5,89
		0,31	9,80	9,78	9,80	9,83	9,86	9,89	9,92	9,95	9,98
		0,65	12,81	12,77	12,81	12,85	12,88	12,92	12,96	13,00	13,04
		1,03	15,56	15,52	15,56	15,61	15,65	15,70	15,75	15,79	15,84
		1,68	19,76	19,71	19,76	19,82	19,88	19,94	20,00	20,06	20,12
	3	0,07	7,50	7,29	7,50	7,70	7,91	8,11	8,32	8,53	8,75
		0,14	10,58	10,29	10,58	10,87	11,16	11,45	11,74	12,04	12,35
		0,31	16,65	16,19	16,65	17,11	17,56	18,02	18,48	18,95	19,43
		0,65	23,35	22,71	23,35	23,99	24,64	25,28	25,92	26,58	27,25
		1,03	28,30	27,52	28,30	29,08	29,85	30,63	31,41	32,21	33,02
		1,68	36,20	35,21	36,20	37,20	38,19	39,19	40,18	41,20	42,25
3340/7S	1,5	0,07	5,60	5,30	5,60	5,89	6,19	6,48	6,8	7,09	7,41
		0,14	7,84	7,43	7,84	8,26	8,67	9,08	9,5	9,93	10,38
		0,31	12,10	11,46	12,10	12,74	13,37	14,01	14,6	15,32	16,01
		0,65	16,69	15,81	16,69	17,57	18,45	19,33	20,2	21,13	22,09
		1,03	19,87	18,82	19,87	20,92	21,96	23,01	24,1	25,15	26,30
		1,68	24,37	23,09	24,37	25,66	26,94	28,23	29,5	30,86	32,26
	3	0,07	8,72	8,18	8,72	9,27	9,81	10,35	10,9	11,47	12,07
		0,14	12,21	11,45	12,21	12,97	13,73	14,49	15,3	16,05	16,90
		0,31	18,86	17,69	18,86	20,04	21,21	22,39	23,6	24,80	26,10
		0,65	25,94	24,32	25,94	27,55	29,17	30,78	32,4	34,10	35,89
		1,03	30,90	28,98	30,90	32,83	34,75	36,68	38,6	40,63	42,76
		1,68	37,73	35,38	37,73	40,08	42,43	44,78	47,1	49,60	52,20

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)
Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

Continued

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

TABLE 27B : Refrigerant Flow Capacity of condensing pressure regulators 3340 [kW]. Hot gas line

Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3340/9S 3340/M28S	1,5	0,07	12,90	12,87	12,90	12,94	12,98	13,02	13,1	13,10	13,13
		0,14	18,18	18,13	18,18	18,24	18,29	18,34	18,4	18,45	18,51
		0,31	30,79	30,70	30,79	30,88	30,98	31,07	31,2	31,25	31,34
		0,65	40,23	40,11	40,23	40,35	40,46	40,58	40,7	40,82	40,94
		1,03	48,88	48,73	48,88	49,02	49,17	49,31	49,5	49,60	49,75
		1,68	62,07	61,89	62,07	62,26	62,44	62,63	62,8	63,00	63,18
	3	0,07	23,54	22,89	23,54	24,19	24,83	25,48	26,1	26,79	27,47
		0,14	33,23	32,32	33,23	34,14	35,06	35,97	36,9	37,82	38,78
		0,31	52,29	50,85	52,29	53,72	55,16	56,60	58,0	59,51	61,02
		0,65	73,34	71,33	73,34	75,36	77,38	79,39	81,4	83,48	85,59
		1,03	88,88	86,43	88,88	91,32	93,76	96,21	98,6	101,15	103,72
		1,68	113,70	110,57	113,70	116,82	119,95	123,07	126,2	129,40	132,69
3340/11S	1,5	0,07	17,17	16,26	17,17	18,07	18,98	19,88	20,8	21,74	22,73
		0,14	24,05	22,78	24,05	25,32	26,58	27,85	29,1	30,45	31,83
		0,31	37,10	35,14	37,10	39,06	41,01	42,97	44,9	46,97	49,11
		0,65	51,18	48,48	51,18	53,88	56,58	59,28	62,0	64,80	67,75
		1,03	60,93	57,72	60,93	64,14	67,36	70,57	73,8	77,14	80,65
		1,68	74,74	70,80	74,74	78,68	82,62	86,57	90,5	94,63	98,94
	3	0,07	26,76	25,09	26,76	28,42	30,09	31,75	33,4	35,17	37,02
		0,14	37,45	35,12	37,45	39,78	42,12	44,45	46,8	49,23	51,82
		0,31	57,85	54,25	57,85	61,45	65,06	68,66	72,3	76,05	80,04
		0,65	79,55	74,59	79,55	84,50	89,45	94,41	99,4	104,57	110,06
		1,03	94,77	88,87	94,77	100,67	106,57	112,47	118,4	124,59	131,12
		1,68	115,70	108,50	115,70	122,91	130,11	137,32	144,5	152,11	160,09

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)

Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

TABLE 27C : Correction factor for evaporator temperature different from nominal value

Evaporator temperature [°C]								
-40	-30	-20	-15	-10	-5	0	4,4	10
1,2	1,15	1,1	1,08	1,06	1,04	1,02	1	0,98

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TABLE 28A : Refrigerant Flow Capacity of condensing pressure regulators 3340 [kW]. Liquid line

Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3340/4 3340/4S 3340/M12S	1,5	0,07	12,67	12,16	11,66	11,16	10,66	9,94	9,23	8,51	7,78
		0,14	18,42	17,63	16,84	16,05	15,26	14,18	13,08	12,06	11,03
		0,31	31,25	29,40	27,57	25,72	23,86	22,30	20,74	19,24	17,74
		0,65	45,19	42,42	39,65	36,88	34,08	31,71	29,33	27,21	25,08
		1,03	56,48	52,88	49,30	45,70	42,08	38,99	35,87	33,27	30,66
		1,68	77,58	71,84	66,13	60,39	54,62	50,99	47,34	43,76	40,16
	3	0,07	25,93	24,97	24,10	23,14	22,09	21,04	19,91	19,02	18,06
		0,14	37,08	35,69	34,43	33,04	31,53	30,02	28,38	27,06	25,65
		0,31	58,80	56,44	54,28	51,92	49,35	47,05	44,56	42,46	40,23
		0,65	84,03	80,62	77,51	74,11	70,41	67,08	63,49	60,39	57,09
		1,03	103,26	99,04	95,19	90,98	86,39	82,26	77,79	73,86	69,67
		1,68	137,60	131,78	126,46	120,64	114,32	108,65	102,55	98,47	94,12
3340/5 3340/5S	1,5	0,07	21,17	20,33	19,38	18,55	17,71	16,53	15,34	14,13	12,93
		0,14	30,78	29,47	27,99	26,68	25,36	23,56	21,74	20,04	18,32
		0,31	52,22	49,15	45,81	42,74	39,65	37,06	34,46	31,98	29,48
		0,65	75,52	70,90	65,89	61,28	56,63	52,70	48,74	45,22	41,68
		1,03	94,37	88,39	81,93	75,95	69,93	64,78	59,61	55,29	50,96
		1,68	129,63	120,09	109,90	100,36	90,76	84,73	78,67	72,72	66,74
	3	0,07	44,32	42,79	39,06	37,53	35,86	34,18	32,37	30,91	29,36
		0,14	63,37	61,16	55,80	53,60	51,19	48,76	46,14	43,98	41,68
		0,31	100,49	96,73	87,99	84,22	80,11	76,42	72,43	69,02	65,39
		0,65	143,60	138,17	125,64	120,21	114,29	108,96	103,19	98,15	92,79
		1,03	176,46	169,74	154,29	147,57	140,24	133,61	126,44	120,05	113,25
		1,68	235,12	225,84	204,97	195,68	185,57	176,49	166,68	160,05	152,98
3340/7S	1,5	0,07	29,23	29,42	26,65	26,84	26,90	26,28	25,47	24,47	23,33
		0,14	42,10	42,22	38,10	38,22	38,14	37,09	35,76	34,36	32,75
		0,31	70,67	69,56	61,59	60,48	58,89	57,64	55,99	54,16	52,05
		0,65	100,94	99,08	87,48	85,63	83,06	80,92	78,19	75,62	72,66
		1,03	125,22	122,60	107,96	105,34	101,80	98,74	94,90	91,78	88,17
		1,68	167,69	162,21	141,04	135,56	128,68	125,78	121,98	117,54	112,45
	3	0,07	50,98	50,83	44,73	44,58	44,04	43,28	42,15	41,32	40,29
		0,14	72,37	72,12	63,45	63,20	62,40	61,29	59,64	58,36	56,77
		0,31	113,17	112,45	98,63	97,91	96,28	94,70	92,32	90,30	87,81
		0,65	158,86	157,79	138,35	137,28	134,94	132,64	129,20	126,14	122,40
		1,03	194,11	192,75	168,94	167,57	164,64	161,73	157,43	153,41	148,54
		1,68	251,39	249,24	218,11	215,96	211,73	207,62	201,68	198,77	195,01

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)
Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

Continued

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

TABLE 28A : Refrigerant Flow Capacity of condensing pressure regulators 3340 [kW]. Liquid line

Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3340/9S 3340/M28S	1,5	0,07	66,48	63,86	60,88	58,26	55,62	51,90	48,16	44,39	40,60
		0,14	96,67	92,55	87,91	83,79	79,65	73,99	68,29	62,93	57,55
		0,31	164,01	154,37	143,86	134,22	124,52	116,40	108,24	100,44	92,60
		0,65	237,19	222,69	206,95	192,45	177,86	165,51	153,08	142,03	130,91
		1,03	296,40	277,62	257,31	238,53	219,63	203,47	187,20	173,66	160,04
		1,68	407,13	377,17	345,16	315,20	285,06	266,12	247,07	228,39	209,60
	3	0,07	139,19	134,39	122,67	117,87	112,62	107,35	101,65	97,08	92,22
		0,14	199,03	192,10	175,27	168,34	160,76	153,14	144,90	138,13	130,92
		0,31	315,63	303,79	276,34	264,51	251,59	240,01	227,47	216,77	205,37
		0,65	451,00	433,96	394,60	377,56	358,96	342,21	324,09	308,26	291,42
		1,03	554,21	533,10	484,59	463,48	440,45	419,64	397,13	377,04	355,67
		1,68	738,46	709,30	643,75	614,60	582,83	554,31	523,49	502,68	480,47
3340/11S	1,5	0,07	89,64	90,23	81,72	82,31	82,48	80,59	78,12	75,06	71,55
		0,14	129,09	129,47	116,84	117,22	116,95	113,74	109,67	105,36	100,43
		0,31	216,72	213,31	188,88	185,47	180,60	176,77	171,70	166,09	159,62
		0,65	309,54	303,85	268,28	262,59	254,72	248,17	239,77	231,91	222,83
		1,03	384,02	375,98	331,08	323,03	312,20	302,81	291,04	281,45	270,38
		1,68	514,24	497,45	432,51	415,72	394,62	385,71	374,07	360,47	344,86
	3	0,07	156,34	155,87	137,18	136,71	135,04	132,72	129,26	126,71	123,54
		0,14	221,93	221,17	194,57	193,82	191,36	187,94	182,91	178,97	174,10
		0,31	347,07	344,86	302,47	300,26	295,27	290,42	283,11	276,91	269,29
		0,65	487,16	483,89	424,27	421,00	413,81	406,75	396,22	386,82	375,35
		1,03	595,28	591,09	518,09	513,90	504,90	495,97	482,77	470,46	455,52
		1,68	770,93	764,32	668,88	662,27	649,30	636,70	618,48	609,57	598,03

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)

Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

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TABLE 28B : Refrigerant Flow Capacity of condensing pressure regulators 3340 [kW]. Hot gas line										
Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3340/4 3340/4S 3340/M12S	1,5	0,07	2,23	2,23	2,23	2,24	2,25	2,25	2,26	2,27	2,27
		0,14	3,15	3,14	3,15	3,16	3,17	3,18	3,19	3,20	3,21
		0,31	4,97	4,96	4,97	4,99	5,00	5,02	5,03	5,05	5,06
		0,65	7,00	6,98	7,00	7,02	7,04	7,06	7,08	7,10	7,12
		1,03	8,52	8,49	8,52	8,54	8,57	8,60	8,62	8,65	8,67
		1,68	10,94	10,91	10,94	10,98	11,01	11,04	11,07	11,11	11,14
	3	0,07	4,36	4,24	4,36	4,48	4,60	4,72	4,84	4,96	5,08
		0,14	6,15	5,98	6,15	6,32	6,49	6,66	6,83	7,00	7,18
		0,31	9,70	9,43	9,70	9,96	10,23	10,50	10,76	11,04	11,32
		0,65	13,68	13,31	13,68	14,06	14,43	14,81	15,19	15,57	15,97
		1,03	16,60	16,15	16,60	17,06	17,52	17,97	18,43	18,90	19,38
		1,68	21,39	20,80	21,39	21,97	22,56	23,15	23,74	24,34	24,96
3340/5 3340/5S	1,5	0,07	3,72	3,71	3,72	3,73	3,74	3,75	3,77	3,78	3,79
		0,14	5,25	5,24	5,25	5,27	5,28	5,30	5,31	5,33	5,35
		0,31	8,29	8,26	8,29	8,31	8,34	8,36	8,39	8,41	8,43
		0,65	11,67	11,63	11,67	11,70	11,73	11,77	11,80	11,84	11,87
		1,03	14,20	14,16	14,20	14,24	14,28	14,33	14,37	14,41	14,45
		1,68	18,24	18,18	18,24	18,29	18,35	18,40	18,46	18,51	18,56
	3	0,07	7,26	7,06	7,26	7,46	7,66	7,86	8,06	8,26	8,47
		0,14	10,25	9,97	10,25	10,53	10,81	11,10	11,38	11,67	11,96
		0,31	16,16	15,72	16,16	16,61	17,05	17,49	17,94	18,39	18,86
		0,65	22,80	22,18	22,80	23,43	24,06	24,68	25,31	25,95	26,61
		1,03	27,67	26,91	27,67	28,43	29,20	29,96	30,72	31,50	32,30
		1,68	35,64	34,66	35,64	36,62	37,60	38,58	39,56	40,57	41,60
3340/7S	1,5	0,07	5,70	5,40	5,70	6,00	6,30	6,60	6,90	7,22	7,55
		0,14	7,97	7,55	7,97	8,39	8,81	9,23	9,65	10,09	10,54
		0,31	12,42	11,76	12,42	13,07	13,73	14,38	15,04	15,72	16,44
		0,65	17,26	16,35	17,26	18,17	19,08	19,99	20,90	21,85	22,85
		1,03	20,85	19,75	20,85	21,95	23,05	24,15	25,25	26,40	27,60
		1,68	26,09	24,71	26,09	27,46	28,84	30,21	31,59	33,02	34,53
	3	0,07	9,13	8,56	9,13	9,70	10,27	10,84	11,41	12,01	12,64
		0,14	12,80	12,00	12,80	13,59	14,39	15,19	15,99	16,82	17,71
		0,31	19,89	18,66	19,89	21,13	22,37	23,61	24,85	26,15	27,53
		0,65	27,57	25,86	27,57	29,29	31,01	32,72	34,44	36,25	38,15
		1,03	33,27	31,20	33,27	35,35	37,42	39,49	41,56	43,74	46,04
		1,68	41,65	39,06	41,65	44,24	46,84	49,43	52,02	54,75	57,63

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)
Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

Continued

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

TABLE 28B : Refrigerant Flow Capacity of condensing pressure regulators 3340 [kW]. Hot gas line

Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3340/9S 3340/M28S	1,5	0,07	11,69	11,65	11,69	11,72	11,76	11,79	11,8	11,86	11,90
		0,14	16,49	16,44	16,49	16,54	16,59	16,64	16,7	16,74	16,79
		0,31	26,03	25,95	26,03	26,10	26,18	26,26	26,3	26,41	26,49
		0,65	36,64	36,53	36,64	36,75	36,86	36,96	37,1	37,18	37,29
		1,03	44,60	44,46	44,60	44,73	44,86	44,99	45,1	45,26	45,39
		1,68	57,28	57,11	57,28	57,45	57,62	57,79	58,0	58,13	58,31
	3	0,07	22,81	22,18	22,81	23,43	24,06	24,69	25,3	25,96	26,62
		0,14	32,19	31,31	32,19	33,08	33,96	34,85	35,7	36,64	37,57
		0,31	50,76	49,36	50,76	52,15	53,55	54,94	56,3	57,77	59,24
		0,65	71,62	69,65	71,62	73,59	75,56	77,52	79,5	81,51	83,58
		1,03	86,92	84,53	86,92	89,31	91,69	94,08	96,5	98,92	101,43
		1,68	111,95	108,87	111,95	115,03	118,10	121,18	124,3	127,41	130,65
3340/11S	1,5	0,07	17,48	16,56	17,48	18,41	19,33	20,25	21,2	22,14	23,14
		0,14	24,43	23,14	24,43	25,72	27,01	28,29	29,6	30,93	32,34
		0,31	38,08	36,07	38,08	40,09	42,10	44,11	46,1	48,21	50,41
		0,65	52,93	50,14	52,93	55,72	58,51	61,30	64,1	67,01	70,06
		1,03	63,95	60,58	63,95	67,32	70,69	74,06	77,4	80,96	84,65
		1,68	79,99	75,78	79,99	84,21	88,43	92,65	96,9	101,28	105,89
	3	0,07	28,01	26,26	28,01	29,75	31,50	33,24	35,0	36,82	38,75
		0,14	39,25	36,80	39,25	41,69	44,13	46,58	49,0	51,59	54,30
		0,31	61,01	57,21	61,01	64,81	68,61	72,41	76,2	80,20	84,41
		0,65	84,56	79,29	84,56	89,82	95,09	100,35	105,6	111,16	116,99
		1,03	102,04	95,69	102,04	108,39	114,75	121,10	127,5	134,14	141,18
		1,68	127,73	119,77	127,73	135,68	143,64	151,59	159,5	167,91	176,72

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)

Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

TABLE 28C : Correction factor for evaporator temperature different from nominal value

Evaporator temperature [°C]								
-40	-30	-20	-15	-10	-5	0	4,4	10
1,12	1,08	1,05	1,04	1,03	1,02	1,01	1	0,99

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TABLE 29A : Refrigerant Flow Capacity of condensing pressure regulators 3340 [kW]. Liquid line										
Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3340/4 3340/4S 3340/M12S	1,5	0,07	11,30	10,61	9,87	9,19	8,50	8,06	7,62	6,95	6,27
		0,14	16,16	15,20	14,15	13,19	12,23	11,59	10,94	9,95	8,96
		0,31	26,31	24,64	22,83	21,16	19,48	18,14	16,79	15,55	14,30
		0,65	37,42	35,08	32,55	30,21	27,86	25,94	24,00	22,17	20,33
		1,03	46,04	43,21	40,14	37,31	34,46	32,08	29,68	27,35	25,00
		1,68	62,48	58,40	53,99	49,90	45,79	42,63	39,45	36,42	33,38
	3	0,07	22,15	21,52	19,77	19,14	18,45	17,64	16,76	15,81	14,80
		0,14	31,76	30,83	28,30	27,36	26,33	25,21	24,00	22,63	21,17
		0,31	52,00	50,22	45,85	44,07	42,12	40,07	37,86	35,75	33,51
		0,65	74,00	71,40	65,12	62,52	59,68	56,86	53,81	50,79	47,58
		1,03	91,29	88,00	80,19	76,90	73,31	69,94	66,29	62,55	58,57
		1,68	120,77	116,30	105,84	101,36	96,47	92,37	87,92	82,97	77,71
3340/5 3340/5S	1,5	0,07	18,83	17,69	16,45	15,32	14,17	13,44	12,70	11,58	10,45
		0,14	26,93	25,33	23,59	21,99	20,38	19,31	18,24	16,59	14,93
		0,31	43,85	41,07	38,05	35,27	32,47	30,23	27,99	25,92	23,84
		0,65	62,36	58,46	54,25	50,35	46,43	43,23	40,00	36,95	33,88
		1,03	76,73	72,02	66,90	62,19	57,44	53,47	49,47	45,58	41,67
		1,68	104,14	97,33	89,98	83,17	76,32	71,05	65,75	60,71	55,63
	3	0,07	36,91	35,86	32,95	31,91	30,75	29,40	27,94	26,35	24,67
		0,14	52,94	51,38	47,16	45,60	43,89	42,02	40,00	37,71	35,29
		0,31	86,67	83,70	76,41	73,45	70,20	66,79	63,10	59,59	55,86
		0,65	123,33	119,00	108,53	104,20	99,46	94,76	89,68	84,65	79,31
		1,03	152,15	146,67	133,64	128,17	122,18	116,57	110,49	104,25	97,62
		1,68	201,29	193,83	176,39	168,93	160,78	153,95	146,53	138,28	129,52
3340/7S	1,5	0,07	28,72	28,08	27,66	27,02	26,18	25,92	25,54	24,27	22,84
		0,14	40,68	39,83	39,28	38,43	37,29	36,92	36,35	34,47	32,34
		0,31	65,85	64,14	62,93	61,22	59,00	57,39	55,38	53,46	51,26
		0,65	91,91	89,64	88,06	85,79	82,83	80,55	77,71	74,83	71,53
		1,03	111,82	109,20	107,41	104,79	101,34	98,54	95,04	91,29	87,00
		1,68	149,30	145,06	142,00	137,76	132,34	128,71	124,17	119,50	114,16
	3	0,07	45,07	45,08	45,42	45,43	45,11	44,34	43,22	41,84	40,20
		0,14	64,02	63,96	64,37	64,31	63,77	62,76	61,27	59,30	56,95
		0,31	104,06	103,33	103,44	102,71	101,15	98,91	95,86	92,91	89,39
		0,65	145,90	144,72	144,73	143,55	141,17	138,25	134,20	130,02	125,03
		1,03	177,91	176,28	176,13	174,50	171,39	168,07	163,40	158,25	152,10
		1,68	230,21	227,79	227,32	224,90	220,54	217,05	211,92	205,27	197,33

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)
Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

Continued

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

TABLE 29A : Refrigerant Flow Capacity of condensing pressure regulators 3340 [kW]. Liquid line

Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3340/9S 3340/M28S	1,5	0,07	59,14	55,56	51,68	48,10	44,51	42,20	39,88	36,36	32,82
		0,14	84,57	79,54	74,08	69,05	64,00	60,65	57,28	52,11	46,90
		0,31	137,72	128,98	119,52	110,78	101,98	94,96	87,89	81,40	74,87
		0,65	195,86	183,62	170,37	158,14	145,83	135,76	125,64	116,05	106,41
		1,03	241,00	226,19	210,12	195,31	180,40	167,92	155,37	143,16	130,87
		1,68	327,08	305,69	282,61	261,21	239,69	223,15	206,51	190,66	174,72
	3	0,07	115,93	112,64	103,50	100,21	96,57	92,34	87,75	82,77	77,49
		0,14	166,26	161,37	148,12	143,23	137,85	131,99	125,62	118,45	110,83
		0,31	272,20	262,88	240,00	230,68	220,48	209,77	198,19	187,15	175,43
		0,65	387,36	373,75	340,88	327,28	312,39	297,63	281,66	265,86	249,08
		1,03	477,86	460,66	419,74	402,54	383,74	366,10	347,01	327,41	306,60
		1,68	632,19	608,76	554,00	530,56	504,98	483,51	460,21	434,30	406,78
3340/11S	1,5	0,07	88,08	86,12	84,82	82,87	80,27	79,50	78,32	74,44	70,05
		0,14	124,76	122,15	120,45	117,85	114,35	113,21	111,46	105,70	99,17
		0,31	201,93	196,69	192,98	187,74	180,95	176,00	169,83	163,96	157,20
		0,65	281,85	274,89	270,05	263,09	254,00	247,02	238,30	229,47	219,34
		1,03	342,92	334,88	329,39	321,35	310,77	302,17	291,45	279,94	266,79
		1,68	457,86	444,86	435,46	422,46	405,85	394,70	380,77	366,48	350,09
	3	0,07	138,21	138,24	139,29	139,32	138,34	135,96	132,53	128,31	123,29
		0,14	196,34	196,15	197,41	197,22	195,56	192,46	187,89	181,84	174,64
		0,31	319,11	316,88	317,22	314,99	310,18	303,34	293,98	284,94	274,14
		0,65	447,42	443,80	443,84	440,22	432,94	423,97	411,55	398,73	383,43
		1,03	545,59	540,59	540,12	535,12	525,59	515,41	501,11	485,29	466,44
		1,68	705,98	698,57	697,12	689,70	676,33	665,63	649,87	629,48	605,16

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)
Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

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TABLE 29B : Refrigerant Flow Capacity of condensing pressure regulators 3340 [kW]. Hot gas line										
Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3340/4 3340/4S 3340/M12S	1,5	0,07	2,08	2,07	2,08	2,08	2,09	2,10	2,10	2,11	2,11
		0,14	2,94	2,93	2,94	2,95	2,96	2,97	2,98	2,99	3,00
		0,31	4,64	4,62	4,64	4,65	4,66	4,68	4,69	4,70	4,72
		0,65	6,54	6,52	6,54	6,55	6,57	6,59	6,61	6,63	6,65
		1,03	7,97	7,95	7,97	8,00	8,02	8,04	8,07	8,09	8,11
		1,68	10,24	10,21	10,24	10,27	10,30	10,33	10,36	10,39	10,42
	3	0,07	4,26	4,14	4,26	4,38	4,49	4,61	4,73	4,85	4,97
		0,14	6,04	5,87	6,04	6,20	6,37	6,54	6,70	6,87	7,05
		0,31	9,52	9,26	9,52	9,78	10,04	10,31	10,57	10,84	11,11
		0,65	13,40	13,03	13,40	13,77	14,14	14,51	14,87	15,25	15,64
		1,03	16,35	15,90	16,35	16,80	17,25	17,70	18,15	18,61	19,08
		1,68	21,01	20,43	21,01	21,59	22,16	22,74	23,32	23,91	24,52
3340/5 3340/5S	1,5	0,07	3,46	3,45	3,46	3,47	3,48	3,49	3,50	3,51	3,52
		0,14	4,90	4,89	4,90	4,92	4,93	4,95	4,96	4,98	4,99
		0,31	7,73	7,70	7,73	7,75	7,77	7,80	7,82	7,84	7,86
		0,65	10,89	10,86	10,89	10,92	10,96	10,99	11,02	11,05	11,09
		1,03	13,29	13,25	13,29	13,33	13,37	13,41	13,45	13,49	13,52
		1,68	17,06	17,01	17,06	17,11	17,16	17,21	17,26	17,31	17,37
	3	0,07	7,10	6,90	7,10	7,29	7,49	7,68	7,88	8,08	8,28
		0,14	10,06	9,79	10,06	10,34	10,62	10,89	11,17	11,45	11,74
		0,31	15,87	15,43	15,87	16,30	16,74	17,18	17,61	18,06	18,52
		0,65	22,33	21,72	22,33	22,95	23,56	24,18	24,79	25,42	26,06
		1,03	27,25	26,51	27,25	28,00	28,75	29,50	30,25	31,02	31,81
		1,68	35,01	34,05	35,01	35,98	36,94	37,90	38,86	39,85	40,86
3340/7S	1,5	0,07	5,80	5,49	5,80	6,11	6,41	6,72	7,02	7,34	7,68
		0,14	8,14	7,71	8,14	8,57	9,00	9,43	9,86	10,31	10,78
		0,31	12,74	12,07	12,74	13,41	14,08	14,75	15,43	16,13	16,86
		0,65	17,63	16,70	17,63	18,56	19,49	20,42	21,35	22,32	23,34
		1,03	21,27	20,15	21,27	22,39	23,51	24,63	25,76	26,93	28,15
		1,68	26,84	25,43	26,84	28,26	29,67	31,09	32,50	33,98	35,53
	3	0,07	9,51	8,92	9,51	10,11	10,70	11,29	11,88	12,51	13,16
		0,14	13,36	12,53	13,36	14,19	15,02	15,85	16,69	17,56	18,48
		0,31	20,89	19,59	20,89	22,19	23,49	24,79	26,09	27,46	28,90
		0,65	28,96	27,16	28,96	30,77	32,57	34,37	36,18	38,08	40,07
		1,03	34,93	32,76	34,93	37,11	39,28	41,46	43,63	45,92	48,33
		1,68	43,88	41,15	43,88	46,62	49,35	52,08	54,82	57,69	60,72

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)
Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

Continued

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

TABLE 29B : Refrigerant Flow Capacity of condensing pressure regulators 3340 [kW]. Hot gas line

Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3340/9S 3340/M28S	1,5	0,07	10,87	10,84	10,87	10,90	10,94	10,97	11,0	11,03	11,07
		0,14	15,40	15,36	15,40	15,45	15,50	15,54	15,6	15,63	15,68
		0,31	24,27	24,19	24,27	24,34	24,41	24,48	24,6	24,63	24,70
		0,65	34,21	34,11	34,21	34,31	34,41	34,52	34,6	34,72	34,82
		1,03	41,73	41,61	41,73	41,86	41,98	42,10	42,2	42,35	42,48
		1,68	53,58	53,42	53,58	53,74	53,90	54,06	54,2	54,38	54,54
	3	0,07	22,29	21,68	22,29	22,90	23,52	24,13	24,7	25,37	26,02
		0,14	31,60	30,74	31,60	32,47	33,34	34,21	35,1	35,97	36,88
		0,31	49,83	48,46	49,83	51,20	52,57	53,94	55,3	56,72	58,16
		0,65	70,14	68,22	70,14	72,07	74,00	75,93	77,9	79,83	81,86
		1,03	85,60	83,25	85,60	87,95	90,31	92,66	95,0	97,42	99,90
		1,68	109,97	106,95	109,97	113,00	116,02	119,04	122,1	125,16	128,34
3340/11S	1,5	0,07	17,79	16,85	17,79	18,73	19,66	20,60	21,5	22,52	23,55
		0,14	24,97	23,66	24,97	26,29	27,61	28,92	30,2	31,62	33,06
		0,31	39,07	37,01	39,07	41,13	43,19	45,25	47,3	49,46	51,71
		0,65	54,06	51,21	54,06	56,91	59,77	62,62	65,5	68,45	71,56
		1,03	65,23	61,79	65,23	68,67	72,10	75,54	79,0	82,58	86,34
		1,68	82,32	77,98	82,32	86,66	91,00	95,34	99,7	104,22	108,96
	3	0,07	29,18	27,36	29,18	30,99	32,81	34,63	36,4	38,36	40,37
		0,14	40,97	38,41	40,97	43,52	46,07	48,62	51,2	53,85	56,68
		0,31	64,06	60,07	64,06	68,05	72,04	76,03	80,0	84,21	88,63
		0,65	88,82	83,29	88,82	94,35	99,88	105,41	110,9	116,77	122,89
		1,03	107,12	100,45	107,12	113,80	120,47	127,14	133,8	140,83	148,22
		1,68	134,58	126,20	134,58	142,96	151,34	159,72	168,1	176,92	186,20

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)

Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

TABLE 29C : Correction factor for evaporator temperature different from nominal value

Evaporator temperature [°C]								
-40	-30	-20	-15	-10	-5	0	4,4	10
1,26	1,19	1,13	1,1	1,07	1,05	1,02	1	0,98

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TABLE 30A : Refrigerant Flow Capacity of condensing pressure regulators 3340 [kW]. Liquid line										
Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3340/4 3340/4S 3340/M12S	1,5	0,07	16,01	15,08	14,08	13,15	12,22	11,52	10,82	9,92	9,02
		0,14	23,06	21,75	20,31	19,00	17,68	16,52	15,35	14,11	12,85
		0,31	36,67	34,37	31,87	29,56	27,24	25,65	24,04	22,24	20,44
		0,65	52,65	49,38	45,84	42,58	39,29	36,67	34,03	31,54	29,04
		1,03	65,41	61,41	57,07	53,06	49,04	45,37	41,69	38,71	35,71
		1,68	90,55	83,88	76,76	70,09	63,38	59,02	54,62	50,52	46,40
	3	0,07	30,94	29,86	27,24	26,16	24,97	23,90	22,73	21,65	20,50
		0,14	44,23	42,71	38,99	37,48	35,82	34,21	32,47	30,86	29,16
		0,31	70,70	67,89	61,59	58,78	55,71	53,36	50,81	48,36	45,75
		0,65	100,68	96,74	87,84	83,90	79,62	76,11	72,32	68,70	64,85
		1,03	124,02	119,26	108,37	103,61	98,41	93,92	89,05	84,43	79,51
		1,68	164,06	157,56	142,98	136,49	129,42	123,12	116,32	110,26	103,82
3340/5 3340/5S	1,5	0,07	26,61	25,07	23,53	21,98	20,43	19,26	18,08	16,58	15,08
		0,14	38,33	36,14	33,95	31,76	29,55	27,61	25,66	23,58	21,48
		0,31	60,96	57,11	53,27	49,42	45,54	42,87	40,19	37,18	34,16
		0,65	87,52	82,06	76,63	71,18	65,68	61,29	56,88	52,72	48,54
		1,03	108,73	102,04	95,39	88,70	81,97	75,85	69,69	64,71	59,70
		1,68	150,53	139,38	128,31	117,16	105,95	98,65	91,31	84,45	77,56
	3	0,07	50,28	48,39	46,68	44,79	42,74	40,86	38,84	36,99	35,03
		0,14	71,87	69,23	66,82	64,18	61,29	58,50	55,49	52,74	49,83
		0,31	114,93	110,04	105,55	100,66	95,34	91,25	86,84	82,65	78,19
		0,65	163,66	156,81	150,54	143,69	136,24	130,16	123,59	117,41	110,83
		1,03	201,60	193,30	185,72	177,42	168,41	160,60	152,18	144,28	135,89
		1,68	266,69	255,38	245,04	233,74	221,47	210,55	198,78	188,43	177,42
3340/7S	1,5	0,07	36,90	36,21	35,78	35,08	34,13	33,61	32,90	31,45	29,81
		0,14	52,80	51,86	51,29	50,36	49,06	47,88	46,39	44,44	42,20
		0,31	83,13	81,03	79,57	77,47	74,74	73,50	71,82	69,28	66,35
		0,65	117,75	114,91	112,95	110,10	106,38	103,70	100,31	96,93	93,03
		1,03	144,15	140,83	138,57	135,24	130,85	126,48	121,13	117,25	112,77
		1,68	197,40	189,76	183,85	176,21	166,83	162,27	156,57	150,96	144,52
	3	0,07	59,19	58,72	58,74	58,27	57,33	56,38	55,00	53,77	52,26
		0,14	83,85	83,26	83,35	82,76	81,49	80,00	77,88	75,98	73,68
		0,31	132,79	130,95	130,28	128,44	125,43	123,49	120,61	117,83	114,42
		0,65	185,23	182,82	182,03	179,62	175,60	172,56	168,18	163,98	158,87
		1,03	226,03	223,29	222,49	219,75	215,06	210,95	205,16	199,66	193,00
		1,68	294,35	290,35	288,93	284,93	278,35	272,19	263,77	256,63	248,02

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)
Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

Continued

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

TABLE 30A : Refrigerant Flow Capacity of condensing pressure regulators 3340 [kW]. Liquid line

Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3340/9S 3340/M28S	1,5	0,07	83,58	78,73	73,90	69,05	64,16	60,49	56,79	52,08	47,35
		0,14	120,39	113,49	106,64	99,74	92,81	86,72	80,60	74,06	67,47
		0,31	191,47	179,36	167,32	155,21	143,02	134,64	126,21	116,78	107,29
		0,65	274,88	257,73	240,69	223,54	206,29	192,50	178,63	165,58	152,44
		1,03	341,50	320,49	299,61	278,60	257,46	238,22	218,86	203,23	187,49
		1,68	472,78	437,77	402,98	367,97	332,75	309,83	286,77	265,24	243,59
	3	0,07	157,91	151,99	146,60	140,68	134,22	128,34	121,99	116,18	110,01
		0,14	225,74	217,43	209,88	201,57	192,51	183,74	174,27	165,65	156,49
		0,31	360,98	345,59	331,52	316,13	299,43	286,61	272,73	259,58	245,59
		0,65	514,01	492,49	472,81	451,28	427,90	408,81	388,18	368,75	348,07
		1,03	633,16	607,11	583,30	557,24	528,93	504,42	477,95	453,16	426,79
		1,68	837,61	802,10	769,62	734,11	695,57	661,28	624,33	591,81	557,24
3340/11S	1,5	0,07	113,17	111,05	109,71	107,59	104,68	103,08	100,89	96,46	91,41
		0,14	161,92	159,05	157,30	154,43	150,44	146,84	142,27	136,27	129,43
		0,31	254,94	248,51	244,00	237,57	229,20	225,40	220,25	212,44	203,47
		0,65	361,10	352,38	346,37	337,65	326,23	318,01	307,62	297,25	285,28
		1,03	442,07	431,88	424,95	414,75	401,29	387,87	371,48	359,58	345,83
		1,68	605,37	581,93	563,82	540,38	511,62	497,63	480,15	462,95	443,20
	3	0,07	181,50	180,08	180,14	178,71	175,80	172,90	168,68	164,90	160,26
		0,14	257,13	255,32	255,60	253,79	249,90	245,33	238,83	233,02	225,94
		0,31	407,23	401,59	399,52	393,88	384,65	378,69	369,88	361,34	350,89
		0,65	568,04	560,66	558,22	550,84	538,52	529,19	515,75	502,87	487,22
		1,03	693,17	684,76	682,31	673,90	659,52	646,92	629,17	612,28	591,88
		1,68	902,68	890,41	886,05	873,78	853,60	834,71	808,89	787,00	760,59

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)

Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

R407C

TABLE 30B : Refrigerant Flow Capacity of condensing pressure regulators 3340 [kW]. Hot gas line										
Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3340/4 3340/4S 3340/M12S	1,5	0,07	16,01	15,08	14,08	13,15	12,22	11,52	10,82	9,92	9,02
		0,14	23,06	21,75	20,31	19,00	17,68	16,52	15,35	14,11	12,85
		0,31	36,67	34,37	31,87	29,56	27,24	25,65	24,04	22,24	20,44
		0,65	52,65	49,38	45,84	42,58	39,29	36,67	34,03	31,54	29,04
		1,03	65,41	61,41	57,07	53,06	49,04	45,37	41,69	38,71	35,71
		1,68	90,55	83,88	76,76	70,09	63,38	59,02	54,62	50,52	46,40
	3	0,07	30,94	29,86	27,24	26,16	24,97	23,90	22,73	21,65	20,50
		0,14	44,23	42,71	38,99	37,48	35,82	34,21	32,47	30,86	29,16
		0,31	70,70	67,89	61,59	58,78	55,71	53,36	50,81	48,36	45,75
		0,65	100,68	96,74	87,84	83,90	79,62	76,11	72,32	68,70	64,85
		1,03	124,02	119,26	108,37	103,61	98,41	93,92	89,05	84,43	79,51
		1,68	164,06	157,56	142,98	136,49	129,42	123,12	116,32	110,26	103,82
3340/5 3340/5S	1,5	0,07	26,61	25,07	23,53	21,98	20,43	19,26	18,08	16,58	15,08
		0,14	38,33	36,14	33,95	31,76	29,55	27,61	25,66	23,58	21,48
		0,31	60,96	57,11	53,27	49,42	45,54	42,87	40,19	37,18	34,16
		0,65	87,52	82,06	76,63	71,18	65,68	61,29	56,88	52,72	48,54
		1,03	108,73	102,04	95,39	88,70	81,97	75,85	69,69	64,71	59,70
		1,68	150,53	139,38	128,31	117,16	105,95	98,65	91,31	84,45	77,56
	3	0,07	50,28	48,39	46,68	44,79	42,74	40,86	38,84	36,99	35,03
		0,14	71,87	69,23	66,82	64,18	61,29	58,50	55,49	52,74	49,83
		0,31	114,93	110,04	105,55	100,66	95,34	91,25	86,84	82,65	78,19
		0,65	163,66	156,81	150,54	143,69	136,24	130,16	123,59	117,41	110,83
		1,03	201,60	193,30	185,72	177,42	168,41	160,60	152,18	144,28	135,89
		1,68	266,69	255,38	245,04	233,74	221,47	210,55	198,78	188,43	177,42
3340/7S	1,5	0,07	36,90	36,21	35,78	35,08	34,13	33,61	32,90	31,45	29,81
		0,14	52,80	51,86	51,29	50,36	49,06	47,88	46,39	44,44	42,20
		0,31	83,13	81,03	79,57	77,47	74,74	73,50	71,82	69,28	66,35
		0,65	117,75	114,91	112,95	110,10	106,38	103,70	100,31	96,93	93,03
		1,03	144,15	140,83	138,57	135,24	130,85	126,48	121,13	117,25	112,77
		1,68	197,40	189,76	183,85	176,21	166,83	162,27	156,57	150,96	144,52
	3	0,07	59,19	58,72	58,74	58,27	57,33	56,38	55,00	53,77	52,26
		0,14	83,85	83,26	83,35	82,76	81,49	80,00	77,88	75,98	73,68
		0,31	132,79	130,95	130,28	128,44	125,43	123,49	120,61	117,83	114,42
		0,65	185,23	182,82	182,03	179,62	175,60	172,56	168,18	163,98	158,87
		1,03	226,03	223,29	222,49	219,75	215,06	210,95	205,16	199,66	193,00
		1,68	294,35	290,35	288,93	284,93	278,35	272,19	263,77	256,63	248,02

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)
Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

Continued

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

TABLE 30B : Refrigerant Flow Capacity of condensing pressure regulators 3340 [kW]. Hot gas line

Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3340/9S 3340/M28S	1,5	0,07	83,58	78,73	73,90	69,05	64,16	60,49	56,79	52,08	47,35
		0,14	120,39	113,49	106,64	99,74	92,81	86,72	80,60	74,06	67,47
		0,31	191,47	179,36	167,32	155,21	143,02	134,64	126,21	116,78	107,29
		0,65	274,88	257,73	240,69	223,54	206,29	192,50	178,63	165,58	152,44
		1,03	341,50	320,49	299,61	278,60	257,46	238,22	218,86	203,23	187,49
		1,68	472,78	437,77	402,98	367,97	332,75	309,83	286,77	265,24	243,59
	3	0,07	157,91	151,99	146,60	140,68	134,22	128,34	121,99	116,18	110,01
		0,14	225,74	217,43	209,88	201,57	192,51	183,74	174,27	165,65	156,49
		0,31	360,98	345,59	331,52	316,13	299,43	286,61	272,73	259,58	245,59
		0,65	514,01	492,49	472,81	451,28	427,90	408,81	388,18	368,75	348,07
		1,03	633,16	607,11	583,30	557,24	528,93	504,42	477,95	453,16	426,79
		1,68	837,61	802,10	769,62	734,11	695,57	661,28	624,33	591,81	557,24
3340/11S	1,5	0,07	113,17	111,05	109,71	107,59	104,68	103,08	100,89	96,46	91,41
		0,14	161,92	159,05	157,30	154,43	150,44	146,84	142,27	136,27	129,43
		0,31	254,94	248,51	244,00	237,57	229,20	225,40	220,25	212,44	203,47
		0,65	361,10	352,38	346,37	337,65	326,23	318,01	307,62	297,25	285,28
		1,03	442,07	431,88	424,95	414,75	401,29	387,87	371,48	359,58	345,83
		1,68	605,37	581,93	563,82	540,38	511,62	497,63	480,15	462,95	443,20
	3	0,07	181,50	180,08	180,14	178,71	175,80	172,90	168,68	164,90	160,26
		0,14	257,13	255,32	255,60	253,79	249,90	245,33	238,83	233,02	225,94
		0,31	407,23	401,59	399,52	393,88	384,65	378,69	369,88	361,34	350,89
		0,65	568,04	560,66	558,22	550,84	538,52	529,19	515,75	502,87	487,22
		1,03	693,17	684,76	682,31	673,90	659,52	646,92	629,17	612,28	591,88
		1,68	902,68	890,41	886,05	873,78	853,60	834,71	808,89	787,00	760,59

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)
Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

TABLE 30C : Correction factor for evaporator temperature different from nominal value

Evaporator temperature [°C]								
-40	-30	-20	-15	-10	-5	0	4,4	10
1,18	1,13	1,09	1,07	1,05	1,03	1,02	1	0,98

R410A

TABLE 31A : Refrigerant Flow Capacity of condensing pressure regulators 3345 [kW]. Liquid line										
Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3345/4S 3345/M12S	1,5	0,07	18,87	17,73	16,49	15,35	14,20	13,46	12,72	11,60	10,47
		0,14	26,98	25,38	23,63	22,03	20,42	19,35	18,28	16,62	14,96
		0,31	43,94	41,15	38,13	35,34	32,53	30,29	28,04	25,97	23,89
		0,65	62,49	58,58	54,35	50,45	46,52	43,31	40,08	37,03	33,95
		1,03	76,89	72,16	67,04	62,31	57,55	53,57	49,57	45,67	41,75
		1,68	104,35	97,52	90,16	83,34	76,47	71,19	65,88	60,83	55,74
	3	0,07	36,98	35,93	33,02	31,97	30,81	29,46	27,99	26,41	24,72
		0,14	53,04	51,48	47,25	45,70	43,98	42,11	40,08	37,79	35,36
		0,31	86,84	83,87	76,57	73,59	70,34	66,92	63,23	59,71	55,97
		0,65	123,58	119,24	108,75	104,41	99,66	94,95	89,86	84,82	79,47
		1,03	152,45	146,97	133,91	128,42	122,43	116,80	110,71	104,45	97,81
		1,68	201,69	194,21	176,74	169,27	161,10	154,25	146,82	138,56	129,78
	5	0,07	61,64	59,89	55,03	53,28	51,35	49,10	46,66	44,01	41,20
		0,14	88,40	85,81	78,76	76,16	73,30	70,18	66,80	62,98	58,93
		0,31	144,74	139,78	127,61	122,66	117,23	111,54	105,38	99,51	93,28
		0,65	205,97	198,73	181,25	174,02	166,11	158,26	149,76	141,36	132,44
		1,03	254,09	244,94	223,18	214,04	204,04	194,66	184,51	174,09	163,02
		1,68	336,15	323,69	294,57	282,11	268,51	257,09	244,71	230,93	216,29
	7	0,07	86,30	83,85	77,04	74,59	71,89	68,74	65,32	61,62	57,68
		0,14	123,76	120,13	110,26	106,62	102,62	98,25	93,51	88,18	82,50
		0,31	202,63	195,69	178,66	171,72	164,12	156,15	147,53	139,32	130,59
		0,65	288,35	278,23	253,75	243,63	232,55	221,56	209,67	197,91	185,42
		1,03	355,72	342,92	312,46	299,65	285,66	272,53	258,32	243,73	228,23
		1,68	470,61	453,16	412,40	394,96	375,91	359,93	342,59	323,30	302,81
3345/5S	1,5	0,07	31,44	29,54	27,48	25,58	23,67	22,44	21,20	19,33	17,45
		0,14	44,97	42,29	39,39	36,72	34,03	32,25	30,46	27,71	24,94
		0,31	73,23	68,58	63,55	58,90	54,22	50,49	46,74	43,28	39,81
		0,65	104,14	97,64	90,59	84,08	77,54	72,19	66,80	61,71	56,58
		1,03	128,15	120,27	111,73	103,85	95,92	89,29	82,61	76,12	69,59
		1,68	173,92	162,54	150,27	138,89	127,45	118,65	109,81	101,38	92,90
	3	0,07	61,64	59,89	55,03	53,28	51,35	49,10	46,66	44,01	41,20
		0,14	88,40	85,81	78,76	76,16	73,30	70,18	66,80	62,98	58,93
		0,31	144,74	139,78	127,61	122,66	117,23	111,54	105,38	99,51	93,28
		0,65	205,97	198,73	181,25	174,02	166,11	158,26	149,76	141,36	132,44
		1,03	254,09	244,94	223,18	214,04	204,04	194,66	184,51	174,09	163,02
		1,68	336,15	323,69	294,57	282,11	268,51	257,09	244,71	230,93	216,29

Continued

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)
Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

TABLE 31A : Refrigerant Flow Capacity of condensing pressure regulators 3345 [kW]. Liquid line

Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3345/5S	5	0,07	102,73	99,82	91,72	88,80	85,58	81,83	77,76	73,35	68,67
		0,14	147,34	143,01	131,26	126,93	122,16	116,97	111,33	104,97	98,22
		0,31	241,23	232,97	212,69	204,43	195,39	185,89	175,64	165,86	155,47
		0,65	343,28	331,22	302,09	290,03	276,84	263,76	249,61	235,61	220,74
		1,03	423,48	408,24	371,97	356,73	340,07	324,44	307,52	290,15	271,71
		1,68	560,25	539,48	490,96	470,19	447,51	428,49	407,84	384,88	360,49
	7	0,07	143,83	139,75	128,41	124,32	119,82	114,56	108,87	102,70	96,14
		0,14	206,27	200,21	183,77	177,71	171,03	163,75	155,86	146,96	137,51
		0,31	337,72	326,15	297,76	286,20	273,54	260,25	245,89	232,20	217,65
		0,65	480,59	463,71	422,92	406,05	387,58	369,26	349,45	329,85	309,03
		1,03	592,87	571,53	520,76	499,42	476,10	454,22	430,53	406,21	380,39
		1,68	784,35	755,27	687,34	658,26	626,52	599,88	570,98	538,83	504,69
3345/7S	1,5	0,07	44,52	43,53	42,87	41,88	40,57	40,18	39,58	37,63	35,41
		0,14	63,06	61,74	60,88	59,57	57,80	57,22	56,34	53,42	50,13
		0,31	102,06	99,41	97,54	94,89	91,46	88,96	85,84	82,87	79,45
		0,65	142,46	138,94	136,49	132,97	128,38	124,85	120,45	115,98	110,86
		1,03	173,32	169,26	166,49	162,42	157,07	152,73	147,31	141,49	134,84
		1,68	231,42	224,85	220,09	213,52	205,13	199,50	192,46	185,23	176,95
	3	0,07	69,86	69,87	70,40	70,42	69,92	68,72	66,98	64,85	62,32
		0,14	99,24	99,14	99,78	99,68	98,84	97,27	94,97	91,91	88,27
		0,31	161,29	160,16	160,33	159,21	156,77	153,32	148,59	144,02	138,56
		0,65	226,14	224,31	224,33	222,50	218,82	214,29	208,01	201,53	193,80
		1,03	275,76	273,23	273,00	270,47	265,65	260,51	253,28	245,28	235,75
		1,68	356,83	353,08	352,35	348,60	341,84	336,43	328,47	318,16	305,87
	5	0,07	116,43	116,45	117,34	117,36	116,54	114,53	111,64	108,09	103,86
		0,14	165,40	165,23	166,30	166,13	164,74	162,12	158,28	153,18	147,12
		0,31	268,81	266,93	267,22	265,34	261,29	255,53	247,64	240,03	230,93
		0,65	376,90	373,85	373,89	370,84	364,70	357,15	346,69	335,89	323,00
		1,03	459,60	455,39	454,99	450,78	442,75	434,18	422,13	408,81	392,92
		1,68	594,71	588,47	587,24	581,00	569,74	560,72	547,45	530,27	509,78
	7	0,07	163,00	163,04	164,27	164,31	163,15	160,35	156,30	151,33	145,41
		0,14	231,55	231,32	232,82	232,59	230,63	226,97	221,59	214,46	205,96
		0,31	376,34	373,71	374,11	371,48	365,81	357,74	346,70	336,04	323,31
		0,65	527,66	523,39	523,44	519,17	510,58	500,01	485,36	470,24	452,20
		1,03	643,44	637,54	636,99	631,09	619,86	607,85	590,98	572,33	550,09
		1,68	832,60	823,86	822,14	813,40	797,63	785,01	766,43	742,38	713,69

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)

Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

R410A

TABLE 31B : Refrigerant Flow Capacity of condensing pressure regulators 3345 [kW].Hot gas line										
Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3345/4S 3345/M12S	1,5	0,07	3,47	3,46	3,47	3,48	3,49	3,50	3,51	3,52	3,53
		0,14	4,91	4,90	4,91	4,93	4,94	4,96	4,97	4,99	5,00
		0,31	7,74	7,72	7,74	7,76	7,79	7,81	7,83	7,86	7,88
		0,65	10,91	10,88	10,91	10,95	10,98	11,01	11,04	11,08	11,11
		1,03	13,31	13,27	13,31	13,35	13,39	13,43	13,47	13,51	13,55
		1,68	17,09	17,04	17,09	17,15	17,20	17,25	17,30	17,35	17,40
	3	0,07	7,11	6,92	7,11	7,31	7,50	7,70	7,89	8,09	8,30
		0,14	10,08	9,81	10,08	10,36	10,64	10,91	11,19	11,48	11,77
		0,31	15,90	15,46	15,90	16,34	16,77	17,21	17,65	18,09	18,55
		0,65	22,38	21,76	22,38	22,99	23,61	24,22	24,84	25,47	26,12
		1,03	27,31	26,56	27,31	28,06	28,81	29,56	30,31	31,08	31,87
		1,68	35,09	34,12	35,09	36,05	37,01	37,98	38,94	39,93	40,95
	5	0,07	11,85	11,53	11,85	12,18	12,50	12,83	13,16	13,49	13,83
		0,14	16,80	16,34	16,80	17,27	17,73	18,19	18,65	19,13	19,61
		0,31	26,50	25,77	26,50	27,23	27,95	28,68	29,41	30,16	30,92
		0,65	37,30	36,27	37,30	38,32	39,35	40,37	41,40	42,45	43,53
		1,03	45,52	44,26	45,52	46,77	48,02	49,27	50,52	51,80	53,12
		1,68	58,48	56,87	58,48	60,08	61,69	63,30	64,90	66,55	68,24
	7	0,07	16,59	16,14	16,59	17,05	17,51	17,96	18,42	18,89	19,37
		0,14	23,53	22,88	23,53	24,17	24,82	25,47	26,11	26,78	27,46
		0,31	37,10	36,08	37,10	38,12	39,14	40,16	41,18	42,22	43,29
		0,65	52,22	50,78	52,22	53,65	55,09	56,52	57,96	59,43	60,94
		1,03	63,72	61,97	63,72	65,47	67,22	68,98	70,73	72,52	74,37
		1,68	81,87	79,61	81,87	84,12	86,37	88,62	90,87	93,17	95,54
3345/5S	1,5	0,07	5,78	5,76	5,78	5,80	5,81	5,83	5,85	5,87	5,88
		0,14	8,19	8,17	8,19	8,22	8,24	8,26	8,29	8,31	8,34
		0,31	12,90	12,86	12,90	12,94	12,98	13,02	13,06	13,10	13,13
		0,65	18,19	18,14	18,19	18,24	18,30	18,35	18,41	18,46	18,52
		1,03	22,19	22,12	22,19	22,26	22,32	22,39	22,45	22,52	22,59
		1,68	28,49	28,41	28,49	28,58	28,66	28,74	28,83	28,91	29,00
	3	0,07	11,85	11,53	11,85	12,18	12,50	12,83	13,16	13,49	13,83
		0,14	16,80	16,34	16,80	17,27	17,73	18,19	18,65	19,13	19,61
		0,31	26,50	25,77	26,50	27,23	27,95	28,68	29,41	30,16	30,92
		0,65	37,30	36,27	37,30	38,32	39,35	40,37	41,40	42,45	43,53
		1,03	45,52	44,26	45,52	46,77	48,02	49,27	50,52	51,80	53,12
		1,68	58,48	56,87	58,48	60,08	61,69	63,30	64,90	66,55	68,24

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)
Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

Continued

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

TABLE 31B : Refrigerant Flow Capacity of condensing pressure regulators 3345 [kW].Hot gas line

Catalogue Number	Condensing pressure change [bar] (1)	Pressure drop across regulator [bar]	Condensing temperature [°C]								
			10	15	20	25	30	35	40	45	50
3345/5S	5	0,07	19,76	19,21	19,76	20,30	20,84	21,38	21,93	22,48	23,05
		0,14	28,01	27,24	28,01	28,78	29,55	30,32	31,09	31,88	32,69
		0,31	44,16	42,95	44,16	45,38	46,59	47,81	49,02	50,26	51,54
		0,65	62,16	60,45	62,16	63,87	65,58	67,29	69,00	70,75	72,55
		1,03	75,86	73,77	75,86	77,94	80,03	82,11	84,20	86,34	88,53
		1,68	97,46	94,78	97,46	100,14	102,82	105,49	108,17	110,92	113,74
	7	0,07	27,66	26,90	27,66	28,42	29,18	29,94	30,70	31,48	32,28
		0,14	39,21	38,13	39,21	40,29	41,37	42,44	43,52	44,63	45,76
		0,31	61,83	60,13	61,83	63,53	65,23	66,93	68,63	70,37	72,16
		0,65	87,03	84,64	87,03	89,42	91,81	94,20	96,60	99,05	101,56
		1,03	106,20	103,28	106,20	109,12	112,04	114,96	117,88	120,87	123,94
		1,68	136,44	132,69	136,44	140,19	143,94	147,69	151,44	155,29	159,23
3345/7S	1,5	0,07	6,67	6,32	6,67	7,02	7,37	7,73	8,08	8,45	8,83
		0,14	9,37	8,87	9,37	9,86	10,35	10,85	11,34	11,86	12,40
		0,31	14,65	13,88	14,65	15,42	16,19	16,97	17,74	18,55	19,39
		0,65	20,27	19,21	20,27	21,34	22,41	23,48	24,55	25,67	26,84
		1,03	24,46	23,17	24,46	25,75	27,04	28,33	29,62	30,97	32,38
		1,68	30,87	29,24	30,87	32,50	34,12	35,75	37,38	39,08	40,86
	3	0,07	10,94	10,26	10,94	11,62	12,30	12,99	13,67	14,38	15,14
		0,14	15,36	14,41	15,36	16,32	17,28	18,23	19,19	20,20	21,26
		0,31	24,02	22,53	24,02	25,52	27,01	28,51	30,01	31,58	33,24
		0,65	33,31	31,23	33,31	35,38	37,46	39,53	41,60	43,79	46,09
		1,03	40,17	37,67	40,17	42,67	45,17	47,68	50,18	52,81	55,58
		1,68	50,47	47,32	50,47	53,61	56,75	59,89	63,04	66,34	69,83
	5	0,07	18,24	17,10	18,24	19,37	20,51	21,64	22,78	23,97	25,23
		0,14	25,60	24,01	25,60	27,20	28,79	30,39	31,98	33,66	35,43
		0,31	40,04	37,54	40,04	42,53	45,02	47,52	50,01	52,63	55,40
		0,65	55,51	52,06	55,51	58,97	62,43	65,88	69,34	72,98	76,81
		1,03	66,95	62,78	66,95	71,12	75,29	79,46	83,63	88,02	92,64
		1,68	84,11	78,87	84,11	89,35	94,59	99,82	105,06	110,57	116,38
	7	0,07	25,53	23,94	25,53	27,12	28,71	30,30	31,89	33,56	35,32
		0,14	35,84	33,61	35,84	38,08	40,31	42,54	44,77	47,12	49,60
		0,31	56,05	52,56	56,05	59,54	63,03	66,52	70,01	73,69	77,55
		0,65	77,72	72,88	77,72	82,56	87,40	92,24	97,08	102,17	107,53
		1,03	93,73	87,90	93,73	99,57	105,41	111,24	117,08	123,22	129,69
		1,68	117,76	110,42	117,76	125,09	132,42	139,75	147,09	154,80	162,93

Standard rating conditions according to AHRI Standard 770-2014

Condensing temperature	100 °F	(37,8 °C)
Liquid temperature	98 °F	(36,7 °C)
Subcooling	2 °R	(1,1 °K)
Evaporating temperature	40 °F	(4,4 °C)

Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	150 °F	(65,6 °C)

(1) : pressure change required to move the valve shutter from “start to open” position to rated opening position

TABLE 31C : Correction factor for evaporator temperature different from nominal v

Evaporator temperature [°C]								
-40	-30	-20	-15	-10	-5	0	4,4	10
1,17	1,12	1,08	1,06	1,04	1,02	1,01	1	0,98

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