



PRO-DIALOG ^{PLUS}



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09LF

Nominal cooling capacity 7.5 to 265 kW (R404A)

The 09LF condensers are designed as heat exchangers for commercial refrigeration and air conditioning. Due to its construction, the range is especially suitable for places where easy assembly as well as a light and robust structure are required. The units are designed for outdoor use, but the structure and low sound level make them suitable also for indoor use, where the condensation effect can be utilized for heating. 09GF dry coolers, designed for cooling water or solutions that do not corrode copper, are presented in a separate brochure.

Features

- 39 sizes with nominal capacities from 7.5 to 265 kW (R404A/ $\Delta T1$ 15 K, EN 327)
- Performance data according to Eurovent Rating Standard 7/C/002
- Three fan sizes and four fan speed alternatives
- Two mounting positions: V = vertical air flow and H = horizontal air flow

- Complete fan control systems available, based on infinitely variable fan speed control (VC) or stepped fan starting cycle (Step Control)
- Pro-Dialog option is available for air cooled condensers matching 30RWA and 30HZV condenserless chillers
- Quick installation, fans are connected to the cooler end
- Product selection with the Polar Power selection program

Technical data

The heat transfer section is made of copper tubes and aluminium fins. Fin spacing is 2.3 mm. It can be multi-circuited according to the number of circuits or equipped with a sub-cooling circuit.

The fan chambers are separated crosswise. The units are equipped with lifting lugs. All standard units are suitable for both horizontal and vertical mounting. Electrical connection including safety switch is located at the end of the condenser.

A manual including installation and service instructions is shipped with each unit.

Product designation

09LFE-94-2 03-4D-9-V-VC

09LF = condenser model

E = special model

94 = size

2 = number of fans

03 = fan diameter

4D = fan speed

4D = 23.3 r/s 4Y = 19.2 r/s

6D = 15.0 r/s 6Y = 11.7 r/s

9 = power supply

6 = 440 V-3 ph-60 Hz

7 = 230 V-1 ph-50 Hz

8 = 230 V-3 ph-50 Hz

9 = 400 V-3 ph-50 Hz

Mounting position:

V = vertical air flow

H = horizontal air flow

Options:

VC = fan speed control

– 1- / 2-circuited (-/2)

– refrigerant (**R**)

Sub = sub-cooling coil

J = multi-circuited condenser, number of passes

from left to right / from up to down (J:1:2:1)

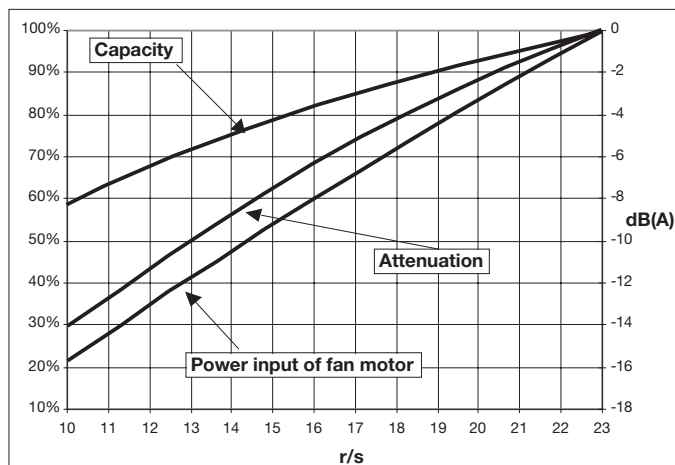
Fans

3-phase fans are suitable for 400 V-3 ph-50 Hz and single-phase fans for 230 V-1 ph-50 Hz. For other power supplies, the fans must be specified as special. All fans are suitable at least for +50 °C air out temperatures. Suitability for higher temperatures must be checked according to fan type. Protection class for all fan motors is at least IP 44.

The fan power input at +20 °C is given in the performance data tables. The full load current is given at a temperature of –30 °C for specifying the overload protector. The current value changes according to air density. This data may also vary due to changes in motor types; therefore the overload protectors should have a +/-20 % adjustment margin.

Infinitely variable fan speed control VC

- Adjustment range of fan speed approximately 35...100 %
- Fans provided with automatic internal thermal protection
- Control from 1 or 2 condensing circuits (not Ø 350 mm)
- Alarm transmission possibility in 3-phase models
- Models with Ø 350 mm fan single-phase only.



Required heat transfer capacity can be achieved steadily with variable fan speed control. This results in a significant decrease of power input and sound level.

Heat transfer capacities

The capacities, air flows and sound power levels shown on the Polar Power selection software and in the tables in this brochure are certified by Eurovent Certify-All certification, and are verified by tests (EN 327) in independent laboratories.

The nominal heat transfer capacities of the condensers are given for refrigerant R404A, with temperature difference 15 K and air entering temperature of +25 °C. L_{wa} is the A-weighted sound power level [dB(A)]. The A-weighted sound pressure level L_{pa} [dB(A)] is given at fan deck height at a distance of 10 m from the end of the units, with the unit in free field conditions over one reflective plane (hemisphere).

Selection

The preliminary product selection can be made by using the tables in this leaflet. The condenser capacities for required refrigerant and temperature difference can be calculated with help of the correction factors. The exact cooler selection is made by Polar Power software, which is available on CD-rom.

The selection is based on required capacity, temperatures, noise level at desired point and refrigerant. The program gives the most suitable models with heat transfer capacities, connection data, noise levels by octave bands, operating cost calculations and dimensional drawings.

Performance data 09LF

R404A, ΔT1 15 K, EN 327

400 V-3 ph-50 Hz

09LF	Fan		4D=23.3 r/s				4Y=19.2 r/s				6D=15.0 r/s				6Y=11.7 r/s			
	Ø	Qty.	CAP kW	Flow m³/s	Lpa dB(A)	Lwa dB(A)	CAP kW	Flow m³/s	Lpa dB(A)	Lwa dB(A)	CAP kW	Flow m³/s	Lpa dB(A)	Lwa dB(A)	CAP kW	Flow m³/s	Lpa dB(A)	Lwa dB(A)
91	350	1	7.54	0.67	42	73	-	-	-	-	-	-	-	-	-	-	-	-
92	350	1	9.16	0.63	42	73	-	-	-	-	-	-	-	-	-	-	-	-
93	350	1	10.1	0.60	42	73	-	-	-	-	-	-	-	-	-	-	-	-
94	350	2	15.2	1.34	45	76	-	-	-	-	-	-	-	-	-	-	-	-
95	350	2	18.6	1.27	45	76	-	-	-	-	-	-	-	-	-	-	-	-
97	350	2	19.8	1.20	45	76	-	-	-	-	-	-	-	-	-	-	-	-
98	350	3	23.0	2.01	47	78	-	-	-	-	-	-	-	-	-	-	-	-
101	350	3	27.8	1.90	47	78	-	-	-	-	-	-	-	-	-	-	-	-
102	350	3	30.0	1.80	47	78	-	-	-	-	-	-	-	-	-	-	-	-
96	500	1	18.6	1.91	52	84	16.8	1.53	46	77	14.9	1.26	41	72	12.6	0.98	33	64
99	500	1	23.9	1.79	52	84	20.4	1.42	46	77	17.8	1.18	41	72	14.5	0.90	33	64
100	500	1	26.2	1.68	52	84	22.0	1.31	46	77	18.7	1.10	41	72	15.1	0.83	33	64
104	500	2	38.9	3.82	55	87	34.0	3.06	49	80	30.1	2.53	44	75	25.4	1.96	36	67
107	500	2	48.3	3.59	55	87	40.9	2.83	49	80	35.4	2.36	44	75	29.3	1.81	36	67
108	500	2	52.6	3.37	55	87	43.0	2.63	49	80	37.5	2.21	44	75	29.7	1.67	36	67
109	500	3	57.7	5.73	57	89	50.0	4.58	51	82	44.4	3.80	46	77	37.6	2.95	38	69
111	500	3	72.7	5.38	57	89	61.7	4.24	51	82	54.0	3.54	46	77	44.1	2.71	38	69
112	500	3	79.0	5.05	57	89	65.4	3.94	51	82	57.0	3.31	46	77	45.2	2.50	38	69
103	630	1	32.1	3.07	58	89	28.4	2.51	53	84	26.6	2.25	46	77	20.7	1.62	37	67
105	630	1	40.1	2.92	58	89	34.4	2.35	53	84	31.8	2.10	46	77	24.1	1.49	37	67
106	630	1	43.6	2.77	58	89	36.7	2.20	53	84	33.7	1.98	46	77	25.0	1.38	37	67
110	630	2	64.3	6.14	61	92	56.8	5.02	56	87	52.9	4.48	49	80	43.0	3.25	40	70
114	630	2	80.7	5.84	61	92	69.3	4.71	56	87	63.9	4.21	49	80	49.3	2.99	40	70
115	630	2	88.1	5.54	61	92	74.0	4.41	56	87	67.8	3.95	49	80	50.1	2.76	40	70
113	500	4	80.6	7.46	58	90	69.1	5.91	52	83	60.6	4.89	47	78	50.9	3.77	39	70
116	500	4	94.0	7.08	58	90	78.9	5.55	52	83	68.8	4.63	47	78	54.7	3.49	39	70
118	500	4	103	6.41	58	90	84.0	4.94	52	83	72.3	4.16	47	78	55.4	3.06	39	70
117	630	3	101	9.06	62	94	88.0	7.35	57	89	82.5	6.57	51	82	65.3	4.67	42	72
119	630	3	117	8.67	62	94	100	6.95	57	89	91.8	6.22	51	82	70.3	4.39	42	72
120	630	3	131	7.99	62	94	107	6.26	57	89	98.2	5.62	51	82	70.9	3.86	42	72
121	630	4	137	12.1	63	95	119	9.81	58	90	110	8.76	52	83	86.0	6.22	43	73
122	630	4	156	11.6	63	95	134	9.26	58	90	123	8.30	52	83	93.6	5.85	43	73
124	630	4	175	10.6	63	95	144	8.35	58	90	131	7.49	52	83	94.6	5.15	43	73
123	630	5	167	15.1	64	96	151	12.3	59	91	140	11.0	53	84	108	7.78	44	74
125	630	5	198	14.4	64	96	168	11.6	59	91	154	10.4	53	84	117	7.31	44	74
127	630	5	220	13.3	64	96	180	10.4	59	91	164	9.37	53	84	118	6.43	44	74
126	630	6	206	18.1	65	97	179	14.7	60	92	165	13.1	54	85	131	9.34	45	75
128	630	6	235	17.3	65	97	203	13.9	60	92	186	12.4	54	85	141	8.77	45	75
129	630	6	265	16.0	65	97	217	12.5	60	92	198	11.2	54	85	142	7.72	45	75

Performance data for single-phase fan motors corresponds to that of 3-phase motors with same fan diameter and fan speed.

CAP = Nominal capacity
Flow = Air flow
Lpa = Sound pressure level
Lwa = Sound power level

Correction factors for different refrigerants

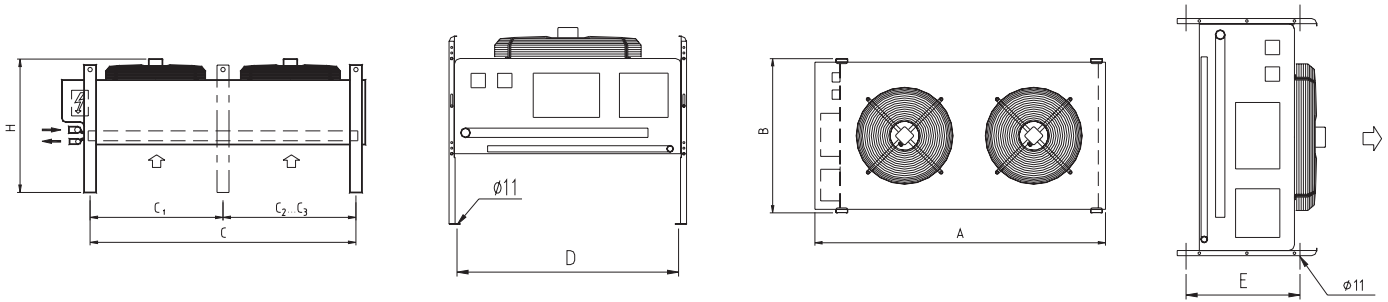
Refrigerant	Temperature difference ΔT1 [K]:							
	8	10	12	14	15	16	18	20
R404A / R507	0.53	0.67	0.80	0.93	1.00	1.07	1.20	1.33
R407C	0.40	0.54	0.67	0.81	0.87	0.94	1.07	1.20
R134a	0.50	0.62	0.74	0.87	0.93	0.99	1.12	1.24
R22	0.51	0.64	0.77	0.90	0.96	1.02	1.15	1.28

Technical data of fan motors, 400 V-3 ph-50 Hz

Fan diameter	4D=23.3 r/s		4Y=19.2 r/s		6D=15.0 r/s		6Y=11.7 r/s	
	Power input kW	FLC A	Power input kW	FLC A	Power input kW	FLC A	Power input kW	FLC A
350	0.15	0.46	-	-	-	-	-	-
500	0.60	1.52	0.40	0.82	0.24	0.62	0.15	0.38
630	0.90	2.30	0.62	1.35	0.44	1.20	0.25	0.57

Technical data of fan motors, 230 V-1 ph-50 Hz

Fan diameter	4D=23.3 r/s		6D=15.0 r/s	
	Power input kW	FLC A	Power input kW	FLC A
350	0.15	0.74	-	-
500	0.59	3.60	-	-
630	-	-	0.46	2.40



Dimensions and weights

09LF	Fan	Max. dimensions (mm)			Fixing points (mm)			SA	IV	No. of	TC (mm)		NW				
	Qty.	Ø	A	B	H	C	C ₁	C ₂	C ₃	D	E	m ²	l	circuits	in	out	kg
91	1	350	800	565	600	572	-	-	-	475	385	11.0	2.0	2	18	18	25
92	1	350	800	565	600	572	-	-	-	475	385	16.5	3.0	3	18	18	28
93	1	350	800	565	600	572	-	-	-	475	385	22.0	4.0	4	22	18	31
94	2	350	1400	565	600	1172	-	-	-	475	385	22.0	3.7	4	22	18	42
95	2	350	1400	565	600	1172	-	-	-	475	385	33.0	5.5	5	28	18	48
97	2	350	1400	565	600	1172	-	-	-	475	385	44.0	7.3	6	28	18	54
98	3	350	2000	565	600	1772	-	-	-	475	385	33.0	5.3	5	28	18	60
101	3	350	2000	565	600	1772	-	-	-	475	385	49.6	7.9	6	28	18	70
102	3	350	2000	565	600	1772	-	-	-	475	385	66.1	11	6	28	18	80
96	1	500	1025	895	900	772	-	-	-	810	515	23.5	4.1	5	28	18	60
99	1	500	1025	895	900	772	-	-	-	810	515	35.2	6.1	6	28	18	65
100	1	500	1025	895	900	772	-	-	-	810	515	46.9	8.2	8	35	22	70
104	2	500	1825	895	900	1572	-	-	-	810	515	47.0	7.6	8	35	22	100
107	2	500	1825	895	900	1572	-	-	-	810	515	70.5	11	12	35	22	110
108	2	500	1825	895	900	1572	-	-	-	810	515	94.0	15	12	35	22	125
109	3	500	2625	895	900	2372	-	-	-	810	515	70.5	11	16	35	22	135
111	3	500	2625	895	900	2372	-	-	-	810	515	106	17	24	42	28	155
112	3	500	2625	895	900	2372	-	-	-	810	515	141	22	21	42	28	175
103	1	630	1345	1095	1000	1092	-	-	-	1015	515	41.1	6.9	8	35	18	85
105	1	630	1345	1095	1000	1092	-	-	-	1015	515	61.6	10	10	35	22	95
106	1	630	1345	1095	1000	1092	-	-	-	1015	515	82.1	14	13	42	28	105
110	2	630	2465	1095	1000	2212	-	-	-	1015	515	82.2	13	13	42	28	140
114	2	630	2465	1095	1000	2212	-	-	-	1015	515	123	20	20	42	28	165
115	2	630	2465	1095	1000	2212	-	-	-	1015	515	164	26	20	42	28	185
113	4	500	3425	895	900	3172	1586	1586	-	810	515	191	29	8	42	28	245
116	4	500	3425	895	900	3172	1586	1586	-	810	515	255	39	11	42	28	270
118	4	500	3425	895	960	3172	1586	1586	-	810	575	383	59	17	42	28	325
117	3	630	3585	1095	1000	3332	1106	2226	-	1015	515	253	38	10	42	28	285
119	3	630	3585	1095	1000	3332	1106	2226	-	1015	515	338	52	14	42	35	320
120	3	630	3585	1095	1060	3332	1106	2226	-	1015	575	507	78	21	42	35	400
121	4	630	4705	1095	1110	4452	2226	2226	-	1015	515	338	51	14	42	35	360
122	4	630	4705	1095	1110	4452	2226	2226	-	1015	515	451	68	19	54	35	410
124	4	630	4705	1095	1170	4452	2226	2226	-	1015	575	676	102	29	54	35	515
123	5	630	5825	1095	1110	5572	2226	1120	2226	1015	515	422	63	21	54	42	440
125	5	630	5825	1095	1110	5572	2226	1120	2226	1015	515	563	85	29	54	42	500
127	5	630	5825	1095	1170	5572	2226	1120	2226	1015	575	845	127	43	54	42	625
126	6	630	6945	1095	1110	6692	2226	2240	2226	1015	515	507	75	21	54	42	515
128	6	630	6945	1095	1110	6692	2226	2240	2226	1015	515	676	101	29	54	42	590
129	6	630	6945	1095	1170	6692	2226	2240	2226	1015	575	1014	152	43	54	42	740

SA = Surface area
 TC = Tube connection
 IV = Internal volume
 NW = Net weight

09LF91...112, 114...115: 4 fixing points
 09LF113, 116...122, 124: 6 fixing points
 09LF123, 125...129: 8 fixing points



A member of the
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 Tel. +359 9 894 41
 Order No. 10404-04, February 2003, supersedes No. 10404-04, May 1999.
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Printed on Totally Chlorine Free Paper.
 Printed in Finland.