4.3.2 The Condenser

The condensers are constructed with copper tubes and aluminium fins, steel-sheet housing with a fan opening. Here are the main characteristics of the condensers used on COPELAND condensing units:

Condenser designation	number of		Finned Length mm	Fin Height mm	Fin Spacing mm	Internal volume l	Fans			Air flow m^3/s
	Row	Tube					number of	model	diameter	
B8	3	14	430	350	2,1	1,6	1	71 *(75)*	300	0.36
D8	4	16	430	400	2,1	2,5	1	121 *(120)*	350	0.44
H8	3	19	625	475	2,1	3,2	1	271 *(270)*	420	0.91
H9	4	19	625	475	2,1	4,3	1	271 *(270)*	420	0.84
K9	4	16	820	400	2,1	4,7	2	121 *(120)*	350	0.86
M8	5	25	625	625	2,1	7,0	1	121 *(120)*	350	0.92
M9	5	25	625	625	2,1	7,0	1	611 *(610)*	500	1.27
P8	4	23	820	575	2,1	6,8	2	121 *(120)*	350	1.05
R7	3	23	1000	575	2,1	6,2	2	271 *(270)*	420	1.79
S9	5	26	1000	650	2,1	11,7	2	271 *(270)*	420	1.65
V5	4	31	1200	775	2,5	13,4	2	271 *(270)*	420	2.1
V6	5	31	1200	775	2,5	16,7	2	611 *(610)*	500	2.86
V9	5	31	1200	775	2,1	16,7	2	271 *(270)*	420	1.95
W9	5	33	1503	825	2,1	22,3	2	611 *(610)*	500	3.21

The first range of Copeland Scroll condensing units used to have a different designation in which the condenser type was not clearly described. The under table gives de type of condenser depending on the condensing unit designation.

Unit	ZF-U1-09	ZF-U2-11	ZF-U1-13	ZF-U1-15	ZF-U2-18	ZF-U2-24	ZF-U2-33	ZS-U1-14	ZS-U1-19	ZS-U2-21	ZS-U1-26	ZS-U1-30	ZS-U1-38	ZS-U1-45	ZS-U1-56	ZS-U1-75
Condenser	D8	H8			M8	P8	R7	D8	D8	H8			H9	M8	R7	V5

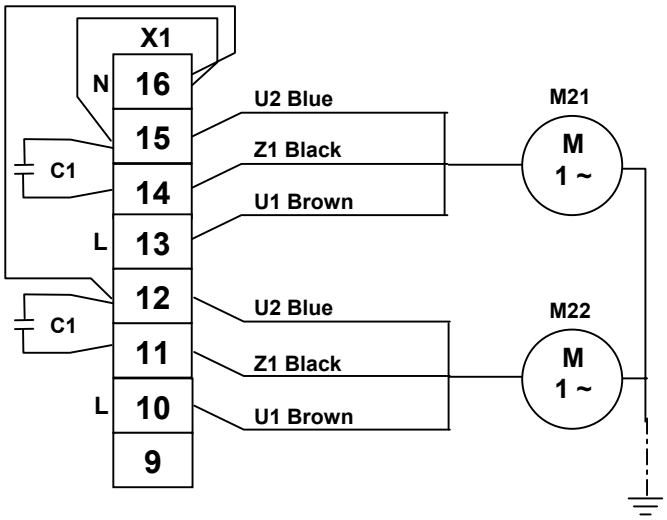
4.3.3 The Fan(s)

The present condensing units are equipped with 1, 2 or 4 fans.
The complete fan consists of an external rotor motor with the fan blades permanently fixed to the rotor and the fan guard. The fan grid has 4 feet to mount it on the condenser.
The fan is positioned in order to pull the air from the condenser and over the compressor.
The fans protection is IP 54 and its insulation class is "F".
Such as described in the condenser table, various fan models are used.

Fan model	Blade diameter mm	Power input W	Voltage V (±10%) / Ph / Hz	Run capacitor µF / V	Motor current A	Winding resistance Ω (±10%), 25°C	
						Main	Auxilary
71	300	95	220 - 240 / 1 / 50	3 / 400	0,44	115	129
121	350	117	220 - 240 / 1 / 50	4 / 400	0,54	72	108
271	420	300	220 - 240 / 1 / 50	5 / 400	1,35	25	88
611	500	570	220 - 240 / 1 / 50	10 / 400	2.4	8,5	20.5

The condensing units we are presently delivering are equipped with single-phase fans.

230V ±15% / 1 ~ / 50-60 Hz



Since January 2003:
- fan 71 is replacing 75
- fan 121 is replacing 120
- fan 211 is replacing 210
- fan 611 is replacing 610

Fan model	Blade diameter mm	Power input W	Voltage V (±10%) / Ph / Hz	Run capacitor µF / V	Motor current A	Winding resistance Ω (±10%), 25°C
75	300	80	220 - 240 / 1 / 50 220-240 Δ / 380-420Y / 3 / 50 500 - 550 / 3 / 50	5 / 400	0,36 0,33/0,19 0,15	102 104 ±3 / 218 ±6 574 ±37
120	350	135	220 - 240 / 1 / 50 220-240 Δ / 380-420Y / 3 / 50 500 - 550 / 3 / 50	8 / 400	0,63 0,55/0,32 0,25	54,7 57 ±3 / 172 ±10 325 ±24
270	420	280	220 - 240 / 1 / 50 220-240 Δ / 380-420Y / 3 / 50 500 - 550 / 3 / 50	16 / 400	1,30 1,10/0,65 0,52	20 20 / 60 51
610	500	630	220 - 240 / 1 / 50 220-240 Δ / 380-420Y / 3 / 50 500 - 550 / 3 / 50	25 / 400	3,6 2,95/1,70 1,1	6,2 6,2 / 18,6 9,3

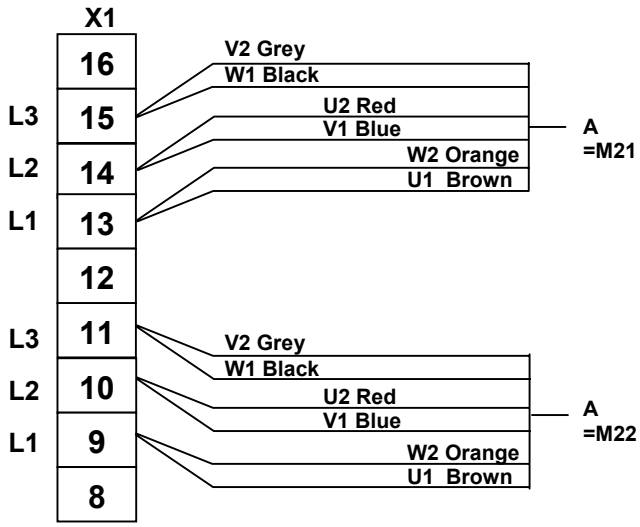
It is possible to convert the "old" three-phase fan into a single-phase motor by a capacitor, the characteristics of this run capacitor are given in the above table.

The fan motors are protected by a thermostatic switch. A single-pole bimetallic-element switch protects the motor against damage from:
- Motor overload
- Over-voltage and under-voltage
- Electrical and mechanical blockages
- Inadequate cooling.

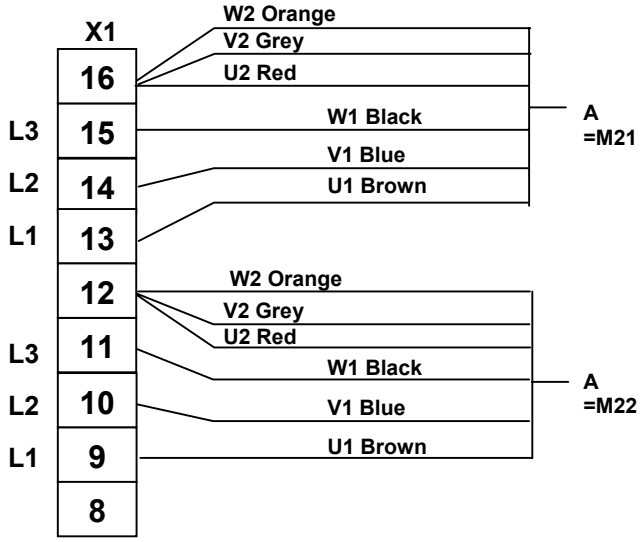
After connecting the condensing unit electrically, check the fan rotational direction. The fan must pull air over the condenser then over the compressor.

The old condensing units (before January 2003) were originally equipped with three-phase fans.

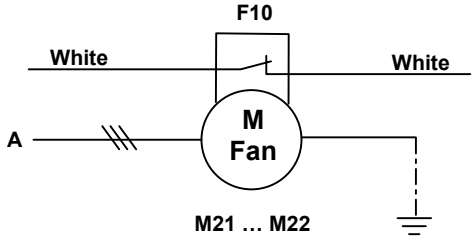
Δ 230V ±15% / 3 ~ / 50-60 Hz

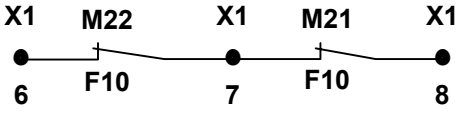


Y 400V±15% / 3 ~ / 50-60 Hz
Y 500V±15% / 3 ~ / 50-60 Hz



Fan Motor Protection = F10





Single-phase units were equipped with three-phase fans connected in single-phase thanks to a capacitor (the capacity characteristic of this run capacitor is given in the above table).

3 Phases Old Fan Connected in Single Phase Δ 230V ±15% / 1 ~ / 50 Hz