



● **FHC**

1.5 - 81.9 kW - 127 models

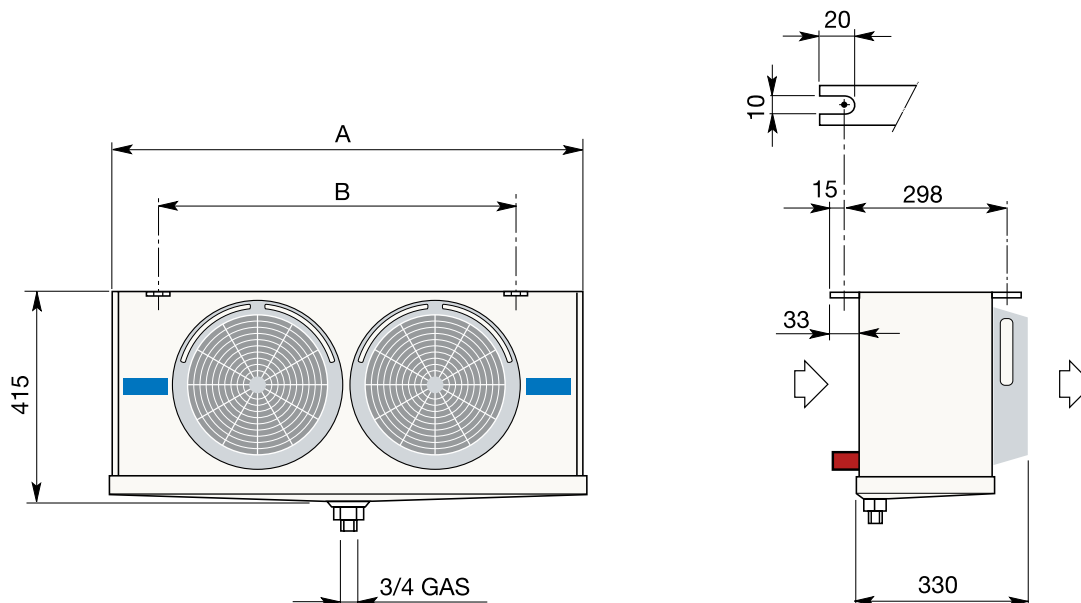
1450 - 9400 W



4 = 4.5 mm Passo alette Fin spacing			TC > -25 °C						
Modello	Type	F27HC	25-4	36-4	49-4	71-4	107-4	142-4	
Potenza (R404A)	• TC 2,5 °C (ΔT1 10K)	W	1850	2350	3850	4750	7200	9400	
Capacity	TC 0 °C (ΔT1 8K)	W	1350	1750	2850	3500	5300	6900	
Portata d'aria	Air quantity	m³/h	900	900	1800	1800	2700	3600	
Freccia d'aria	Air throw	m	10,5	10,5	12,5	12,5	14,0	15,5	
Superficie esterna	External surface	m²	7,3	7,3	14,6	14,6	21,9	29,2	
Superficie interna	Internal surface	m²	0,5	0,7	1,0	1,4	2,1	2,8	
Peso	Weight	kg	12	13	19	21	28	36	
6 = 6.0 mm Passo alette Fin spacing			TC > -25 °C						
Modello	Type	F27HC	19-6	28-6	38-6	55-6	85-6	110-6	
Potenza (R404A)	• TC 2,5 °C (ΔT1 10K)	W	1600	2050	3300	4150	6300	8300	
Capacity	TC 0 °C (ΔT1 8K)	W	1200	1500	2450	3050	4650	6100	
Portata d'aria	Air quantity	m³/h	950	950	1900	1900	2850	3800	
Freccia d'aria	Air throw	m	11,0	11,0	13,0	13	14,5	16,0	
Superficie esterna	External surface	m²	5,6	5,6	11,2	11,2	16,8	22,4	
Superficie interna	Internal surface	m²	0,5	0,7	1,0	1,4	2,1	2,8	
Peso	Weight	kg	11	12	18	20	27	34	
7 = 7.0 mm Passo alette Fin spacing			TC > -25 °C						
Modello	Type	F27HC	16-7	23-7	31-7	46-7	70-7	92-7	
Potenza (R404A)	• TC 2,5 °C (ΔT1 10K)	W	1450	1850	3000	3700	5700	7600	
Capacity	TC 0 °C (ΔT1 8K)	W	1050	1350	2200	2700	4200	5600	
Portata d'aria	Air quantity	m³/h	1000	1000	2000	2000	3000	4000	
Freccia d'aria	Air throw	m	11,5	11,5	13,5	13,5	15,5	17,0	
Superficie esterna	External surface	m²	4,9	4,9	9,8	9,8	14,7	19,6	
Superficie interna	Internal surface	m²	0,5	0,7	1,0	1,4	2,1	2,8	
Peso	Weight	kg	10	11	17	19	26	32	
DATI COMUNI / COMMON DATA									
Elettroventilatori	Fans	Ø 275 mm x n°	1 o	1 o	2 oo	2 oo	3 ooo	4 oooo	
Assorbimento motori	Motor power consumption	1~230 V 50 Hz	W	85	85	170	170	255	340
			A	0,6	0,6	1,2	1,2	1,8	2,4
Assorbimento motori	Motor power consumption	EC 1~230 V 50 Hz	W	26	26	52	52	78	104
			A	0,2	0,2	0,4	0,4	0,6	0,8
Sbrinamento	Defrost	E 230 V	W	1220	1220	2160	2160	3080	4000
Volume circuito	Circuit volume	dm³	0,8	1,3	1,6	2,3	3,3	4,3	
Attacchi entrata	Inlet connections	Ø mm	10	12	12	12	12	12	
Attacchi uscita	Outlet connections	Ø mm	10	22	22	28	28	28	
Dimensioni	Dimensions	A mm	678	678	1048	1048	1418	1788	
		B mm	412	412	782	782	1152	1522	

(*) Per altre condizioni vedere diagrammi. (*) For other conditions see diagrams.

EC = Motori con commutazione elettronica (1400 r.p.m.). Risparmio energia = ~ 70%. EC = Motors with electronic commutation (1400 r.p.m.). Energy saving = ~ 70%.



2550 - 16300 W

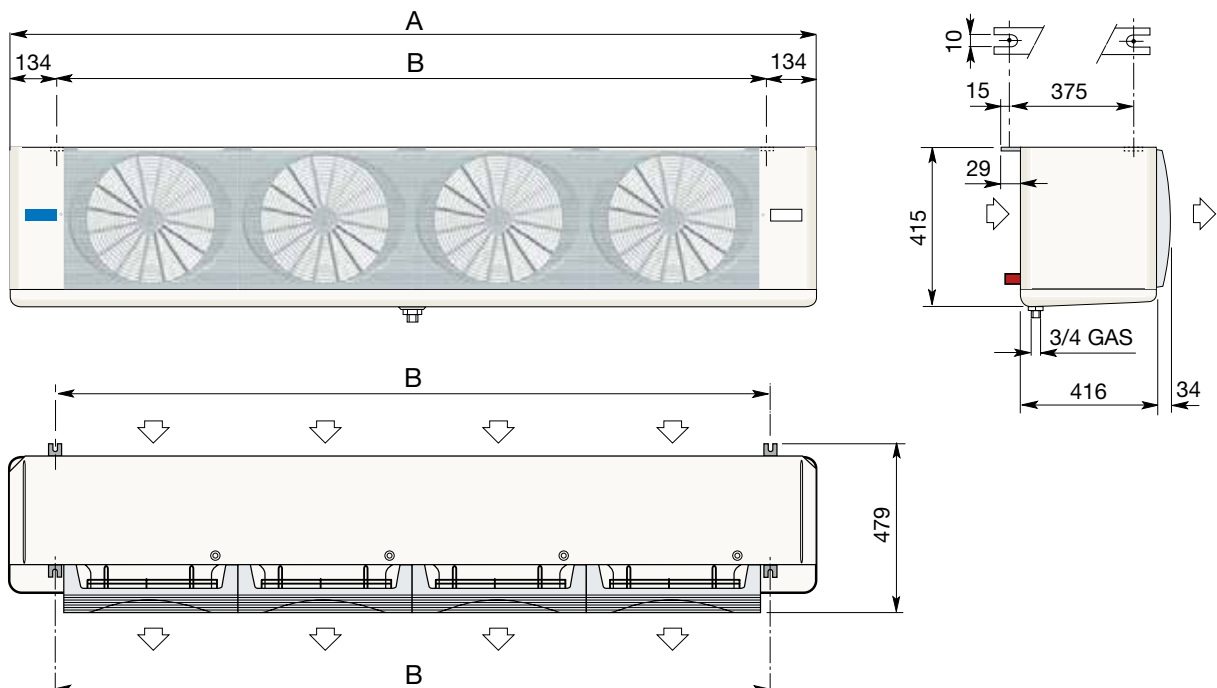


4 = 4.5 mm Passo alette Fin spacing			TC > -25 °C						
Modello	Type	F30HC	411-4	412-4	421-4	422-4	431-4	432-4	442-4
Potenza (R404A)	• TC 2,5 °C (ΔT1 10K) W		3300	4050	6700	8050	9900	12350	16300
Capacity	TC 0 °C (ΔT1 8K) W		2450	3000	4950	5900	7300	9100	12000
Portata d'aria	Air quantity	m ³ /h	1450	1300	2900	2600	4350	3900	5200
Freccia d'aria	Air throw	m	16	14	19	17	22	20	21
Superficie esterna	External surface	m ²	8,9	13,3	17,8	26,6	26,7	39,9	53,2
Superficie interna	Internal surface	m ²	0,5	0,8	1,1	1,6	1,6	2,4	3,2
Peso	Weight	kg	23	25	39	44	56	63	82
6 = 6.0 mm Passo alette Fin spacing			TC > -25 °C						
Modello	Type	F30HC	511-6	512-6	521-6	522-6	531-6	532-6	542-6
Potenza (R404A)	• TC 2,5 °C (ΔT1 10K) W		2800	3600	5700	7250	8550	11000	14700
Capacity	TC 0 °C (ΔT1 8K) W		2050	2650	4200	5350	6300	8100	10800
Portata d'aria	Air quantity	m ³ /h	1500	1400	3000	2800	4500	4200	5600
Freccia d'aria	Air throw	m	17	15	20	18	23	21	22
Superficie esterna	External surface	m ²	6,8	10,2	13,6	20,4	20,4	30,6	40,8
Superficie interna	Internal surface	m ²	0,5	0,8	1,1	1,6	1,6	2,4	3,2
Peso	Weight	kg	22	24	38	42	54	60	78
7 = 7.0 mm Passo alette Fin spacing			TC > -25 °C						
Modello	Type	F30HC	611-7	612-7	621-7	622-7	631-7	632-7	642-7
Potenza (R404A)	• TC 2,5 °C (ΔT1 10K) W		2550	3350	5150	6700	7700	10100	13500
Capacity	TC 0 °C (ΔT1 8K) W		1900	2450	3800	4950	5650	7450	9950
Portata d'aria	Air quantity	m ³ /h	1550	1450	3100	2900	4650	4350	5800
Freccia d'aria	Air throw	m	18	16	21	19	24	22	23
Superficie esterna	External surface	m ²	5,9	8,9	11,8	17,8	17,7	26,7	35,6
Superficie interna	Internal surface	m ²	0,5	0,8	1,1	1,6	1,6	2,4	3,2
Peso	Weight	kg	21	23	37	41	53	58	76

DATI COMUNI / COMMON DATA										
Elettroventilatori	Fans	Ø 300 mm x n°	1 o	1 o	2 oo	2 oo	3 oo	3 oo	4 oo	
Assorbimento motori	1-230 V 50 Hz	W	80	80	160	160	240	240	320	
Motor power consumption		A	0,35	0,35	0,7	0,7	1,05	1,05	1,4	
Assorbimento motori	EC 1-230 V 50 Hz	W	60	60	120	120	180	180	240	
Motor power consumption		A	0,5	0,5	1,0	1,0	1,5	1,5	2,0	
Sbrinamento	Defrost	E 230 V	W	1700	2550	2900	4300	4050	6050	7800
Volume circuito	Circuit volume	dm ³	1,5	2,3	2,8	4,2	4,1	6,3	8,1	
Attacchi entrata	Inlet connections	Ø mm	12	12	12	12	12	16	16	
Attacchi uscita	Outlet connections	Ø mm	16	18	18	22	22	35	35	
Dimensioni	Dimensions	A mm	760	760	1210	1210	1660	1660	2110	
		B mm	492	492	942	942	1392	1392	1842	

(*) Per altre condizioni vedere diagrammi. (*) For other conditions see diagrams.

EC = Motori con commutazione elettronica (1400 r.p.m.). Risparmio energia = ~ 25%. EC = Motors with electronic commutation (1400 r.p.m.). Energy saving = ~ 25%.



4000 - 27500 W

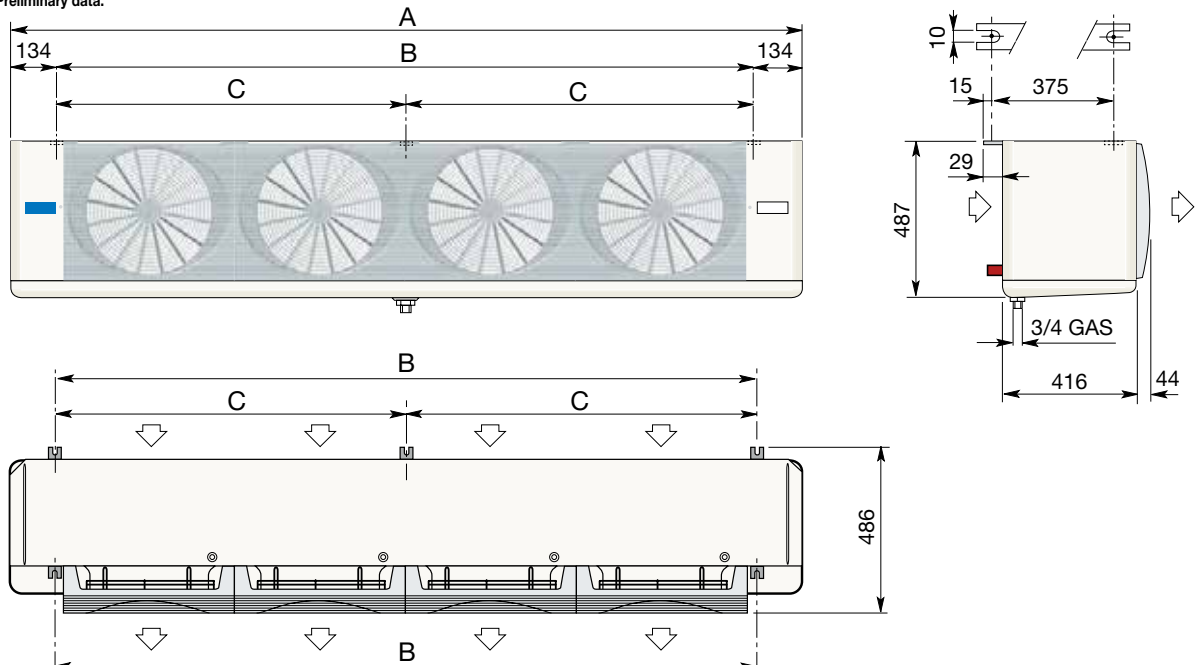


4 = 4.5 mm Passo alette Fin spacing		TC > -25 °C								
Modello	Type	F35HC	73-4	106-4	145-4	215-4	272-4	323-4	362-4	430-4
Potenza (R404A)	• TC 2,5 °C (ΔT1 10K) W		5400	6800	10900	13600	18700	20400	25100	27500
Capacity	TC 0 °C (ΔT1 8K) W		4000	5000	8000	10000	13750	15000	18500	20250
Portata d'aria	Air quantity	m ³ /h	2600	2400	5200	4800	7450	7200	9950	9600
Freccia d'aria	Air throw	m	19,5	18,0	23,0	22,0	26,0	25,0	30,0	29,0
Superficie esterna	External surface	m ²	13,1	19,7	26,2	39,4	49,1	59,1	65,5	78,8
Superficie interna	Internal surface	m ²	1,3	1,9	2,6	3,8	4,8	5,7	6,4	7,6
Peso	Weight	kg	27	32	44	51	65	71	86	93
6 = 6.0 mm Passo alette Fin spacing		TC > -25 °C								
Modello	Type	F35HC	59-6	84-6	117-6	174-6	218-6	261-6	290-6	348-6
Potenza (R404A)	• TC 2,5 °C (ΔT1 10K) W		4500	5900	9200	12000	16100	18000	21500	24000
Capacity	TC 0 °C (ΔT1 8K) W		3300	4350	6800	8850	11850	13250	15850	17650
Portata d'aria	Air quantity	m ³ /h	2650	2500	5300	5000	7700	7500	10300	10000
Freccia d'aria	Air throw	m	20,0	18,5	23,5	22,5	26,5	25,5	30,5	29,5
Superficie esterna	External surface	m ²	10,1	15,1	20,2	30,2	37,9	45,3	50,5	60,4
Superficie interna	Internal surface	m ²	1,3	1,9	2,6	3,8	4,8	5,7	6,4	7,6
Peso	Weight	kg	26	31	42	49	62	67	82	88
7 = 7.0 mm Passo alette Fin spacing		TC > -25 °C								
Modello	Type	F35HC	47-7	69-7	94-7	143-7	179-7	213-7	238-7	284-7
Potenza (R404A)	• TC 2,5 °C (ΔT1 10K) W		4000	5400	8200	11000	14600	16500	19400	22000
Capacity	TC 0 °C (ΔT1 8K) W		2950	4000	6050	8100	10750	12150	14300	16200
Portata d'aria	Air quantity	m ³ /h	2700	2600	5400	5200	7950	7800	10600	10400
Freccia d'aria	Air throw	m	20,5	19,0	24,0	23,0	27,0	26,0	31,0	30,0
Superficie esterna	External surface	m ²	8,7	13,1	17,4	26,2	32,6	39,3	43,5	52,4
Superficie interna	Internal surface	m ²	1,3	1,9	2,6	3,8	4,8	5,7	6,4	7,6
Peso	Weight	kg	25	30	41	47	60	65	79	85
DATI COMUNI / COMMON DATA										
Elettroventilatori	Fans	Ø 350 mm x n°	1 ○	1 ○	2 ○○	2 ○○	3 ○○○	3 ○○○	4 ○○○○	4 ○○○○
Assorbimento motori	W	1-230 V 50 Hz	175	175	350	350	525	525	700	700
Motor power consumption	A		0,8	0,8	1,6	1,6	2,4	2,4	3,2	3,2
Assorbimento motori	W *	EC 1-230 V 50 Hz	135	135	270	270	405	405	540	540
Motor power consumption	A *		1,1	1,1	2,2	2,2	3,3	3,3	4,4	4,4
Sbrinamento	Defrost	E 230 V	W	2075	2975	3680	5280	7620	7620	9940
Volume circuito	Circuit volume		dm ³	2,1	3,2	4,0	6,0	7,4	8,7	9,7
Attacchi entrata	Inlet connections	Ø mm	12	12	12	16	16	16	16	22
Attacchi uscita	Outlet connections	Ø mm	28	28	28	28	35	35	42	42
Dimensioni	Dimensions	A mm	865	865	1420	1420	1975	1975	2530	2530
		B mm	597	597	1152	1152	1707	1707	2262	2262
		C mm	—	—	—	—	—	—	1131	1131

(*) Per altre condizioni vedere diagrammi. (*) For other conditions see diagrams.

EC = Motori con commutazione elettronica (1400 r.p.m.). Risparmio energia = ~ 23%. EC = Motors with electronic commutation (1400 r.p.m.). Energy saving = ~ 23%.

* Dati preliminari. * Preliminary data.



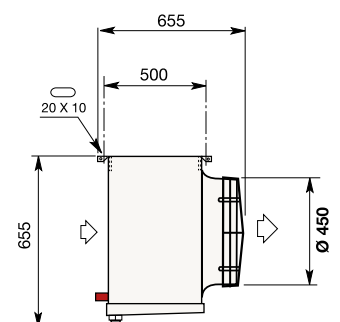
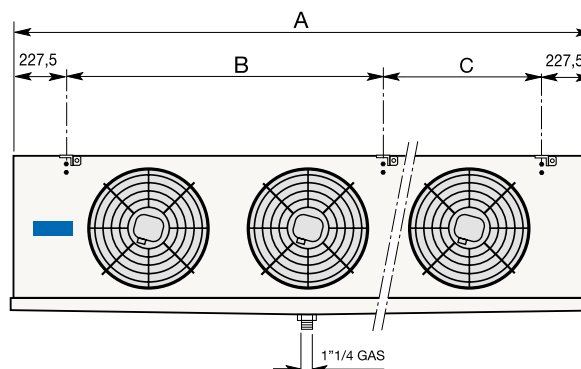
7.6 - 57.6 kW



4 = 4.5 mm Passo alette Fin spacing			TC > -25 °C							
Modello	Type	F45HC	1100-4	1102-4	1106-4	1108-4	1112-4	1114-4	1118-4	1120-4
Potenza (R404A)	Capacity	• TC 2,5 °C (ΔT1 10K) kW	12,2	14,1	24,4	28,3	36,6	41,9	49,3	56,9
		TC 0 °C (ΔT1 8K) kW	9,0	10,4	18,0	20,8	26,9	30,8	36,3	41,9
Portata d'aria	Air quantity	m³/h	4900	4600	9800	9200	14700	13800	19600	18400
Freccia d'aria	Air throw	m	24	22	28	26	32	30	35	32
Assorbimento motori	Motor power consumption	1~230 V 50 Hz W	430	430	860	860	1290	1290	1720	1720
Superficie	Surface	m²	34	45,3	68,1	90,8	102,1	136,1	136,1	181,5
Attacchi	Connections	Entrata-uscita Inlet-outlet Ø mm	16/35	16/35	16/42	16/42	28/54	28/54	28/54	28/64
Peso	Weight	kg	82	89	134	146	185	203	241	266
6 = 6.0 mm Passo alette Fin spacing			TC > -25 °C							
Modello	Type	F45HC	1200-6	1202-6	1206-6	1208-6	1212-6	1214-6	1218-6	1220-6
Potenza (R404A)	Capacity	• TC 2,5 °C (ΔT1 10K) kW	11,0	13,1	22,1	26,4	33,1	39,1	44,8	53,0
		TC 0 °C (ΔT1 8K) kW	8,1	9,6	16,3	19,4	24,4	28,8	33,0	39,0
Portata d'aria	Air quantity	m³/h	5100	4800	10200	9600	15300	14400	20400	19200
Freccia d'aria	Air throw	m	25	24	29	28	33	32	36	34
Assorbimento motori	Motor power consumption	1~230 V 50 Hz W	430	430	860	860	1290	1290	1720	1720
Superficie	Surface	m²	26,1	34,8	52,3	69,6	78,3	104,4	104,4	139,3
Attacchi	Connections	Entrata-uscita Inlet-outlet Ø mm	16/35	16/35	16/42	16/42	28/54	28/54	28/54	28/64
Peso	Weight	kg	79	85	128	138	176	191	229	249
7 = 7.5 mm Passo alette Fin spacing			TC > -25 °C							
Modello	Type	F45HC	1300-7	1302-7	1306-7	1308-7	1312-7	1314-7	1318-7	1320-7
Potenza (R404A)	Capacity	• TC 2,5 °C (ΔT1 10K) kW	9,4	11,6	18,8	23,2	28,8	34,5	38,4	46,6
		TC 0 °C (ΔT1 8K) kW	6,9	8,5	13,8	17,1	21,2	25,4	28,3	34,3
Portata d'aria	Air quantity	m³/h	5300	5100	10600	10200	15900	15300	21200	20400
Freccia d'aria	Air throw	m	26	25	31	29	35	33	38	36
Assorbimento motori	Motor power consumption	1~230 V 50 Hz W	415	430	830	860	1245	1290	1660	1720
Superficie	Surface	m²	21,3	28,5	42,7	57	64	85,4	85,4	113,9
Attacchi	Connections	Entrata-uscita Inlet-outlet Ø mm	16/35	16/35	16/42	16/42	16/42	28/54	28/54	28/64
Peso	Weight	kg	77	82	124	133	170	184	221	240
10 = 10.0 mm Passo alette Fin spacing			TC > -25 °C							
Modello	Type	F45HC	1400-10	1402-10	1406-10	1408-10	1412-10	1414-10	1418-10	1420-10
Potenza (R404A)	Capacity	• TC 2,5 °C (ΔT1 10K) kW	7,4	9,3	15,2	18,9	22,8	27,8	30,3	37,5
		TC 0 °C (ΔT1 8K) kW	5,4	6,8	11,2	13,9	16,8	20,5	22,3	27,6
Portata d'aria	Air quantity	m³/h	5500	5300	11000	10600	16500	15900	22000	21200
Freccia d'aria	Air throw	m	27	25	32	30	46	35	40	38
Assorbimento motori	Motor power consumption	1~230 V 50 Hz W	415	415	830	830	1245	1245	1660	1660
Superficie	Surface	m²	16,6	22,1	33,2	44,2	49,8	66,3	66,3	88,6
Attacchi	Connections	Entrata-uscita Inlet-outlet Ø mm	16/35	16/35	16/35	16/42	16/42	28/54	28/54	28/64
Peso	Weight	kg	75	80	120	128	165	176	214	230
DATI COMUNI / COMMON DATA										
Elettroventilatori	Fans	Ø 450 mm x n°	1 o	1 o	2 oo	2 oo	3 ooo	3 ooo	4 oooo	4 oooo
Assorbimento motori	Motor power consumption	1~230 V 50 Hz A	2,2	2,2	4,4	4,4	6,6	6,6	8,8	8,8
Sbrinatorio	Defrost	E 230 V kW	3,39	5,08	6,27	9,40	9,15	13,72	12,03	18,04
		G 230 V kW	0,85	0,85	1,57	1,57	2,29	2,29	3,01	3,01
Livello pressione sonora	Sound pressure level	dB(A) Total	53	53	56	56	58	58	59	59
Volume circuito	Circuit volume	dm³	7,0	9,0	13,0	17,0	19,0	25,0	26,0	34,0
Dimensioni	Dimensions	A mm	1285	1285	2085	2085	2885	2885	3685	3685
		B mm	830	830	1630	1630	2430	2430	1600	1600
		C mm	—	—	—	—	—	—	1630	1630

(*) Per altre condizioni vedere diagrammi. Disponibili motori EC con commutazione elettronica (vedere Refriger®).

(*) For other conditions see diagrams. EC motors with electronic commutation are available (see Refriger®).





10.7 - 81.9 kW

4 = 4.5 mm Passo alette Fin spacing											TC > -25 °C	
Modello	Type	4P Δ	F50HC	1600-4	1602-4	1606-4	1608-4	1612-4	1614-4	1618-4	1620-4	
Potenza (R404A)	● TC 2,5 °C (ΔT1 10K)	kW	17,5	20,4	35,2	40,8	52,7	59,2	70,2	81,9		
Capacity			TC 0 °C (ΔT1 8K)	kW	12,9	15,1	26,0	30,1	39,0	43,8	51,9	60,6
Portata d'aria	Air quantity	m³/h	7400	7000	14800	14000	22200	21000	29600	28000		
Freccia d'aria	Air throw	m	32	30	39	36	43	41	47	44		
Assorbimento motori	3~400 V 50 Hz	W	730	730	1460	1460	2190	2190	2920	2920		
Motor power consumption		A	1,4	1,4	2,8	2,8	4,2	4,2	5,6	5,6		
Superficie	Surface	m²	47,6	63,5	95,3	127,1	142,9	190,5	190,5	254,1		
Attacchi	Connections	Entrata-uscita Inlet-outlet	Ø mm	16/35	16/42	28/54	28/54	28/64	28/54	28/64	35/76	
Peso	Weight	kg	108	117	175	194	242	269	302	339		

6 = 6.0 mm Passo alette Fin spacing											TC > -25 °C	
Modello	Type	4P Δ	F50HC	1700-6	1702-6	1706-6	1708-6	1712-6	1714-6	1718-6	1720-6	
Potenza (R404A)	● TC 2,5 °C (ΔT1 10K)	kW	15,8	18,9	31,7	38,0	47,6	55,4	64,2	76,2		
Capacity			TC 0 °C (ΔT1 8K)	kW	11,6	13,9	23,4	28,1	35,2	41,0	47,5	56,3
Portata d'aria	Air quantity	m³/h	7600	7300	15200	14600	22800	21900	30400	29200		
Freccia d'aria	Air throw	m	33	32	41	38	45	43	49	47		
Assorbimento motori	3~400 V 50 Hz	W	700	730	1400	1460	2100	2190	2800	2920		
Motor power consumption		A	1,4	1,4	2,8	2,8	4,2	4,2	5,6	5,6		
Superficie	Surface	m²	36,5	48,7	73	97,5	109,7	146,2	146,2	194,9		
Attacchi	Connections	Entrata-uscita Inlet-outlet	Ø mm	16/35	16/42	28/54	28/54	28/64	28/5	28/64	35/76	
Peso	Weight	kg	103	111	166	182	228	250	284	315		

7 = 7.5 mm Passo alette Fin spacing											TC > -25 °C	
Modello	Type	4P Δ	F50HC	1800-7	1802-7	1806-7	1808-7	1812-7	1814-7	1818-7	1820-7	
Potenza (R404A)	● TC 2,5 °C (ΔT1 10K)	kW	13,5	16,6	27,0	33,4	41,2	48,8	54,9	66,8		
Capacity			TC 0 °C (ΔT1 8K)	kW	9,9	12,2	19,9	24,7	30,4	36,1	40,6	49,4
Portata d'aria	Air quantity	m³/h	7800	7600	15600	15200	23400	22800	31200	30400		
Freccia d'aria	Air throw	m	35	32	42	39	47	44	51	48		
Assorbimento motori	3~400 V 50 Hz	W	700	700	1400	1400	2100	2100	2800	2800		
Motor power consumption		A	1,4	1,4	2,8	2,8	4,2	4,2	5,6	5,6		
Superficie	Surface	m²	29,9	39,8	59,7	79,8	89,7	119,6	119,6	159,4		
Attacchi	Connections	Entrata-uscita Inlet-outlet	Ø mm	16/35	16/42	28/54	28/54	28/54	28/54	28/64	35/76	
Peso	Weight	kg	100	108	160	174	220	240	273	300		

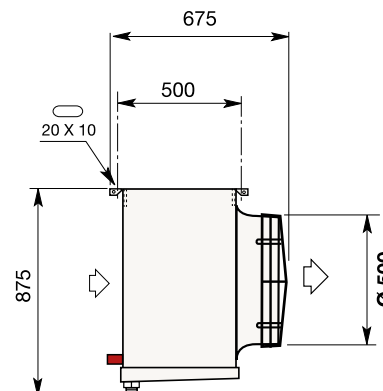
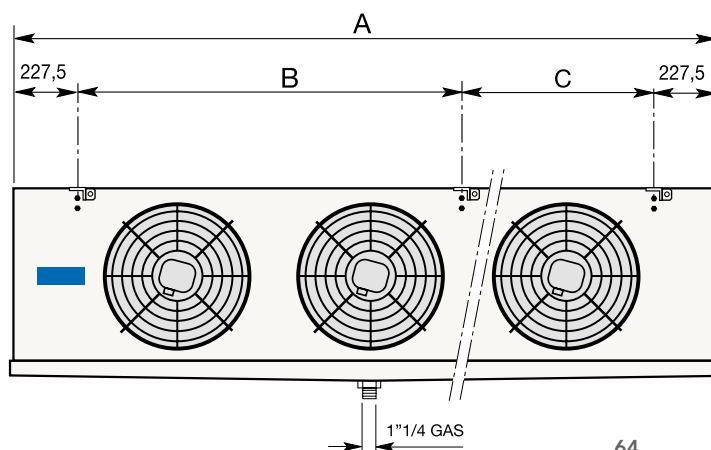
10 = 10.0 mm Passo alette Fin spacing											TC > -25 °C	
Modello	Type	4P Δ	F50HC	1900-10	1902-10	1906-10	1908-10	1912-10	1914-10	1918-10	1920-10	
Potenza (R404A)	● TC 2,5 °C (ΔT1 10K)	kW	10,7	13,4	21,3	27,0	32,9	40,3	43,7	54,1		
Capacity			TC 0 °C (ΔT1 8K)	kW	7,9	9,9	15,7	19,9	24,3	29,8	32,3	40,0
Portata d'aria	Air quantity	m³/h	8100	7800	16200	15600	24300	23400	32400	31200		
Freccia d'aria	Air throw	m	35	34	43	42	48	47	52	51		
Assorbimento motori	3~400 V 50 Hz	W	700	700	1400	1400	2100	2100	2800	2800		
Motor power consumption		A	1,4	1,4	2,8	2,8	4,2	4,2	5,6	5,6		
Superficie	Surface	m²	23,2	31	46,4	61,9	69,7	93	93	123,9		
Attacchi	Connections	Entrata-uscita Inlet-outlet	Ø mm	16/35	16/42	28/54	28/54	28/54	28/54	28/64	35/76	
Peso	Weight	kg	98	104	155	167	212	230	262	286		

DATI COMUNI / COMMON DATA

Elettroventilatori	Fans	Ø 500 mm x n°	1 o	1 o	2 o o	2 o o	3 o o o	3 o o o	4 o o o o	4 o o o o
Sbrinatorio	E 230 V	kW	4,24	5,93	7,84	10,97	11,44	16,01	15,04	21,05
Defrost	G 230 V	kW	0,85	0,85	1,57	1,57	2,29	2,29	3,01	3,01
Livello pressione sonora	Sound pressure level	dB(A) Total	57	57	60	60	62	62	63	63
Volume circuito	Circuit volume	dm³	10,0	13,0	19,0	25,0	28,0	36,0	36,0	49,0
Dimensioni	Dimensions	A mm	1285	1285	2085	2085	2885	2885	3685	3685
		B mm	830	830	1630	1630	2430	2430	1600	1600
		C mm	—	—	—	—	—	—	1630	1630

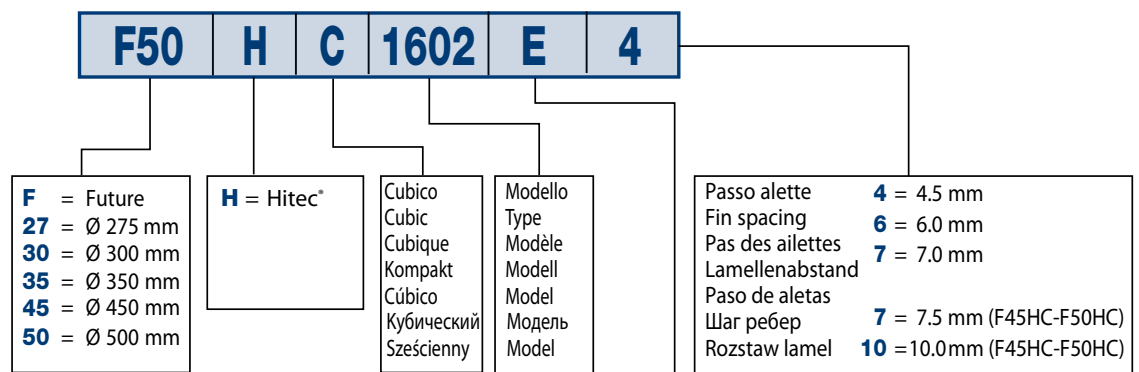
(*) Per altre condizioni vedere diagrammi. Disponibili motori EC con commutazione elettronica (vedere Refriger®).

(*) For other conditions see diagrams. EC motors with electronic commutation are available (see Refriger®).





**Esempio di ordinazione / Exemple de commande / Ordering example / Typenschlüssel / Ejemplo de pedido
Пример заказа / Nomenclatura**



N = Sbrinamento ad aria E = Sbrinamento elettrico G = Sbrinamento a gas caldo per batteria ed elettrico nella bacinella (F45HC-F50HC)	N = Air defrost E = Electric defrost G = Hot gas defrost for the coil and electr. defrost in the drain tray (F45HC-F50HC)	N = Dégivrage à air E = Dégivrage électrique G = Dégivrage à gaz chaud pour la batterie et électrique dans l'égouttoire (F45HC-F50HC)	N = Luftabtauung E = Elektrische Abtauung G = Heissgasabtauung für die Batterie und elektrische Abtauung in der Tropfschale (F45HC-F50HC)
N = Aire descongelación E = Desescarche eléctrico G = Descongelación con gas caliente y eléctrica de la batería en la bandeja (F45HC-F50HC)	N = Air размораживание E = Электрическая оттайка G = Размораживание горячим газом и электрической батареи в трее (F45HC-F50HC)	N = Odszranianie powietrzem E = Odszranianie elektryczne G = Odszranianie gorącym gazem w wymienniku i elektryczne w tacy (F45HC-F50HC)	

Disponibili anche versioni per:
 Versions available:
 Versions disponibles pour:
 Verfügbare Versionen:
 Versiones disponibles:
 Доступные версии:
 Dostępne wersje na:



COMMERCIAL UNIT COOLERS

LU-VE commercial unit coolers are designed for the conservation of fresh and frozen goods.

All ranges are super compact:

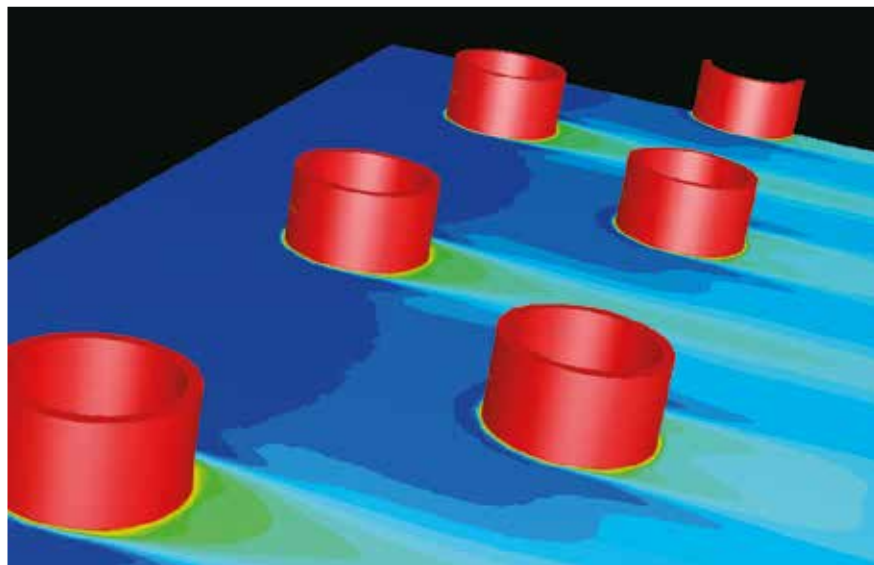
- Cubic unit coolers for cold rooms (FHC)
- Angled unit coolers for cold rooms (FHA and BMA-SMA)
- Dual discharge unit coolers with normal ventilation for cold rooms (FHD)
- Dual discharge unit coolers with low ventilation and low noise for laboratories, work rooms and packing areas (FHD).

- Extremely quiet dual discharge unit coolers with normal and low ventilation for cold rooms and work rooms (FHD).

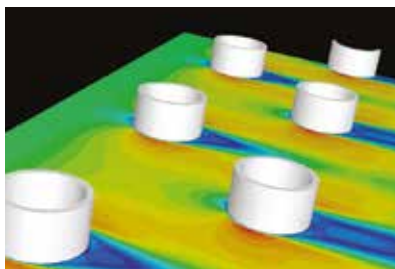
All the ranges have these special characteristics of size and function:

- **extremely high efficiency of heat transfer.**
- **reduced dehumidification of the cold room.**
- **reduced frost formation.**
- **long air throw.**
- **extremely low internal volume of the circuit.**
- **low noise level.**
- **low energy consumption.**
- **greatly reduced footprint.**

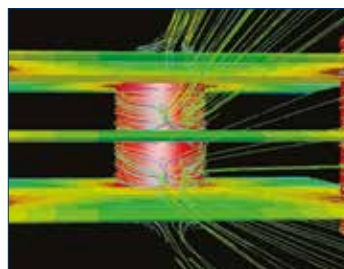
RESEARCH AND DEVELOPMENT



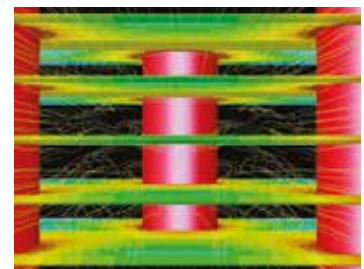
Temperature field - CFD output



Velocities - CFD output



Path lines - CFD output



Path lines - CFD output

CFD (Computational Fluid Dynamics)

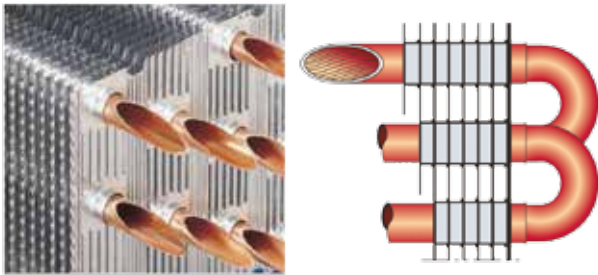
CFD codes have been used in the study of thermo fluid dynamic processes in heat exchangers.

When applied to finned heat exchangers, this permits better understanding of the fluid dynamic phenomena and the heat transfer processes.

As a result of this, the heat transfer characteristics of the geometries used (already of a very high standard),

have been steadily improved by constantly renewing the layers of air in contact with the fins and generating greater turbulence from the louvers. The more uniform air flow also prevents the deposition of humidity on the fins and consequently stops frost formation.

Results of CFD analyses are regularly confirmed by experimental tests carried out in the LU-VE laboratory.



HEAT EXCHANGERS TURBOCOIL®

The very high-efficiency **TURBOCOIL®** heat exchangers have the best power/cost ratio obtainable and are constructed with:

- high-efficiency **TURBOFIN®** aluminum fins with special configuration of the louvre profile to reduce dehumidification and frost formation;
- high-efficiency small-diameter copper tubes with internal helical grooving, designed for optimum evaporation of the new refrigerant fluids.

JET-O-MATIC® (Optional)

The **JET-O-MATIC®** distributor is specially designed to guarantee maximum efficiency of the heat exchanger in different operating conditions.

Its advantages are:

- **greater operating stability** – the even distribution of refrigerant fluids (through the different circuits) ensures stable, reliable performance from the unit cooler;
- **better frost formation** – the uniform distribution of the fluid guarantees homogeneous deposition of frost on all the finned surfaces, allowing less frequent defrosting operations;
- **maximum capacity** – in all operating conditions, especially with the new HCFC refrigerants characterized by a mixture with a high gas/liquid ratio.



JET STREAMER®

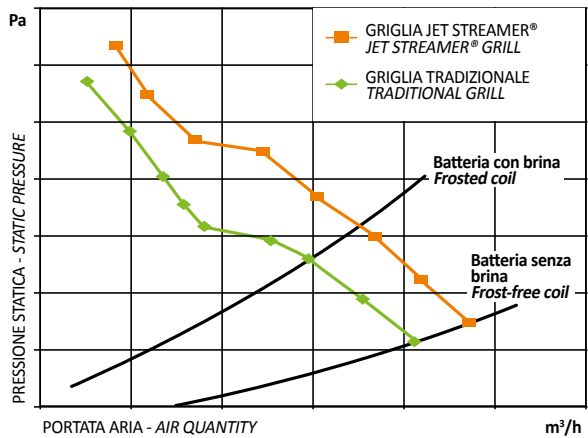
The design process of the FHC range centred on research into new operating efficiency limit, using in-depth study of fluid dynamics. Lengthy experimentation in the wind tunnel of the LU-VE laboratory enabled the development and patenting of the **JETSTREAMER®** directional grill.

The innovative design of its profile provides special advantages:

- **uniform distribution** of airflow through the heat exchanger;
- **significant increase** in air quantity, with both frost-free coil (from +4 to +9%) and, above all, also with frost on the coil fins (from +7 to +15%).



The improvement in air quantity during the frosting stage has a special significance; it guarantees notably superior capacity and a 25% longer air throw.



FIN PITCH

Specific fin pitches are provided to satisfy the requirements for refrigeration at high, medium and low temperatures in different humidity conditions, by type of application:

- processing: 3.0 mm
- conservation at positive temperatures: 4.5 and 6.0 mm
- conservation at negative temperatures and freezing: 7.0, 7.5 and 10.0 mm.

DEFROST

Various types are available to ensure efficient and effective defrost depending on operating conditions (TC = Room Temperature):

- TC > 2°C air defrost (N)
- TC > -35°C electric defrost (E)
- TC > -35°C hot gas defrost for coil and electric in the drain tray (G).

The stainless steel electric heaters, connected to the junction box, provide efficient and rapid defrost of the coil. For especially severe working conditions more powerful electric defrost is available, as is an electric heater for the fan shroud.

FAN MOTORS

All models use the new high-efficiency low-consumption fan motors with incorporated thermal protection.

The fans are statically and dynamically balanced, and the fan motors are connected to the junction box (optional for F45HC and F50HC).

ELECTRONIC MOTORS

The new FHD unit coolers are fitted – as standard equipment - with electronic fans developed using EC technology, dramatically reducing energy consumption.



COMMERCIAL UNIT COOLERS

CASING

FHC, BMA-SMA: specially designed corrosion-resistant galvanized steel casings with epoxy-polyester powder coating.
FHA: casings are constructed from "Safeshell" impact-resistant safety material.

FHD: strengthened "Safeshell" casing.

FAN SHROUD AND FAN GUARD

The guards conform to the most stringent safety standards to guarantee maximum protection.

The optimized matching of fan shrouds, guards and casings permits:

- homogeneous unidirectional outlet airflow
- air throw increased by 25% compared with other commonly used solutions.

(Versions with JETSTREAMER®).

DISTRIBUTOR AND REFRIGERANT CIRCUIT

The distributors and the refrigerant circuits have been designed to ensure maximum efficiency of the heat exchanger in the different operating conditions of the unit cooler.

SUPER HITEC: Venturi distributor.

BENEFIT (B): JET-O-MATIC® distributor (except for F45HC and F50HC).

PRESSURE GAUGE VALVE

This measures evaporation pressure at the outlet of the unit cooler and checks that the machine is functioning correctly.

JUNCTION BOX

IP 55 protection.

MAINTENANCE AND CLEANING

Only one tool required to access all internal parts.

The fan guards, side panels and drain tray are easy to remove to reach the electric motors, heaters and thermostatic valve.

TESTING

The coil is tested at appropriate pressure, carefully degreased and dried with dry air.

CONSTRUCTION VARIANTS

Versions are also available for: Glycol-NH3-CO2.

- Stainless steel tubes.
- Alupaint fins and copper fins for fin pitch 3.0-4.5-6.0-7.5 mm.
- Insulated drain tray (recommended for TC < -20 °C) (only for FHC).
- Device for reducing defrost time and energy consumption (only for FHC).
- Electric heaters for the mouth of the fan shrouds, (only for FHC).
- Wired fans (standard for all units, optional for F45HC and F50HC).
- Electronic motors to reduce energy consumption.

PERFORMANCE

The capacities of unit coolers are tested in dry atmosphere (sensible heat) according to ENV 328.

Total capacities (sensible heat plus latent heat) indicated in the catalogue (R404A) for the usual applications in dry atmosphere refer to a room temperature of 2.5°C and evaporating temperature of -7.5 °C (DT1=10K).

They correspond to dry atmosphere capacities multiplied by a factor of 1.25 (latent heat factor) to take into account the increase of capacity (latent heat) caused by the condensation of water vapour on the surfaces of the unit cooler.

This factor depends on the operating conditions of the cold room. It increases for high room temperatures and decreases for low room temperatures as indicated in the table.

Air inlet temperature	Latent heat factor
10 °C	1.35
2.5 °C	1.25
0 °C	1.15
-18 °C	1.05
-25 °C	1.01

STANDARDS

The products are provided for incorporation in machines as defined in the EC Machine Directive 2006/42/CE and subsequent modifications.



- Directive 2014/29/CE and subsequent modifications, Electromagnetic compatibility.
- Directive 2014/35/CE Low tension.
- PED 2014/68/CE.

EUROVENT CERTIFICATION

- Capacity (ENV 328).
- Air quantity.
- Fan motor power draw.
- External surfaces.
- Energy class.



SELECTION

A Windows software programme is available for unit selection (REFRIGER®).



ENERGY MANAGEMENT

SYSTEM

The LU-VE energy management system conforms to UNI CEI EN 50001:2011.



QUALITY ASSURANCE

LU-VE is a certificated company to UNI EN ISO 9001:2008, which is the most important Quality Assurance qualification, covering Development, Testing, Production method and Inspection procedures.



2 YEAR GUARANTEE

All our products are manufactured from high quality materials and undergo severe final tests.

They are therefore guaranteed against any construction defect for a period of two years.



Damage caused by corrosive agents is excluded. Components or units found to be defective must be returned to our factory with prepaid freight where they will be checked and, depending on our judgement, replaced or repaired. We take no responsibility for leaks or damage caused by the use or misuse of our products. No guarantee is granted in the event of misuse or incorrect installation of the products. We reserve the right to make modifications in order to improve the performance or appearance of our products at any time without notice and without any obligation to previous production.

PACKING

Products are packed in recyclable materials (RESY).





PLUG & SAVE

This is the integrated solution which combines big energy savings and respect for the environment. From today the direct expansion unit coolers are also available in the PLUG&SAVE version which includes the electronic valve and electronic control unit already fitted and wired up.

• Important energy savings

Tests carried out in supermarkets in standard conditions have registered **energy consumption reductions of up to 25% on the entire refrigeration system.**

• Absolute protection

The unit cooler is fitted with an electronic control unit (sealed into a special resin overmoulding) to regulate the valve. This is a construction technique developed for the automotive industry which guarantees performance even in the demanding operating conditions of low temperatures.

• Saving installation time

The solution proposed by LU-VE drastically reduces the installation time of the electronic control units, which in traditional systems have to be positioned outside the cold room with a consequent increase of labour time.

SELECTION

See REFRIGER®.

• Compatible with all systems and easy to programme

The PLUG&SAVE version of the unit cooler is compatible with any and all other electronic systems commonly used for the management of refrigeration plant. It can be used with 24 different refrigerants, including CO2 and the special working pressures required.

• Pre-defined working parameters and Modbus connection

All working parameters are pre-defined and are simple to select on an easy-to-read display.

The only remaining setting actions required at the moment of installation are for:

- Refrigerant
- Superheating
- Function mode, choosing between high and low temperature.

PLUG&SAVE is equipped with MODBUS serial communications protocol.



The direct expansion unit coolers are available with electronic valve and electronic control unit already fitted and wired up (see Refriger®).



Electronic direct expansion valve and electronic control unit.



Display for setting working parameters.

UNIT COOLERS FOR CO₂

In the refrigeration industry, the utilization of CO₂ fluid is becoming more and more popular as a radical solution to eliminate the greenhouse effect caused by halogenated hydrocarbons in the HFC category.

The GWP (Global Warming Potential) of CO₂ is in fact very low compared to HFCs (1 against several thousands); also, CO₂ does not present any problems of toxicity, flammability nor of impact on the ozone layer.

CO₂ is significantly different from all the traditional HFCs (R404A, R507, ...) and it poses particular problems for heat exchanger designers; in addition, the appropriate choice of heat exchanger technology is fundamentally important in the realization of high efficiency CO₂ plants. For these reasons, a specific project between LU-VE, Politecnico di Milano and some important customers was carried out in order to define the ideal product configuration to get the best out of the specific characteristics of this refrigerant and to obtain interesting benefits from it.

Over time, LU-VE has in fact developed a line of products specifically for CO₂ unit coolers and, in an even more daring project, for sophisticated gas coolers which in transcritical CO₂ plants substitute traditional condensers in HFC installations. Today LU-VE can state that it has the highest technical level and greatest experience in this particular field.

Numerous unit coolers and gas coolers have been installed in different countries in recent years.

CO₂

FHC



FHD



FHA



UNIT COOLERS

A specific configuration with copper tubes of small diameter and specialized fin geometry has been developed.

The use of copper tubes allows high product efficiency and low CO₂ content.

Particular circuiting for CO₂ has been designed for each model, taking into account the thermophysical properties of CO₂, favourable to obtain elevated heat transfer performance and low internal pressure drop.

The capacity of CO₂ unit cooler is in the region of +8% of the corresponding model working with R404A (Tevap -8 °C) and about +12% of the corresponding model working with R404A (Tevap -30 °C).

The max operating pressure has for the complete range the high value of 45 bar.

PRODUCT RANGE

- Commercial cubic FHC.
- Commercial dual discharge FHD.
- Commercial angular FHA and SMA.

GLYCOL - Air coolers for Glycol Water

HEAT EXCHANGERS

The high-efficiency heat exchangers that characterize the TURBOCOOLER® range of air coolers are manufactured with the copper tubes and with the new aluminium fins.

COMMON DATA

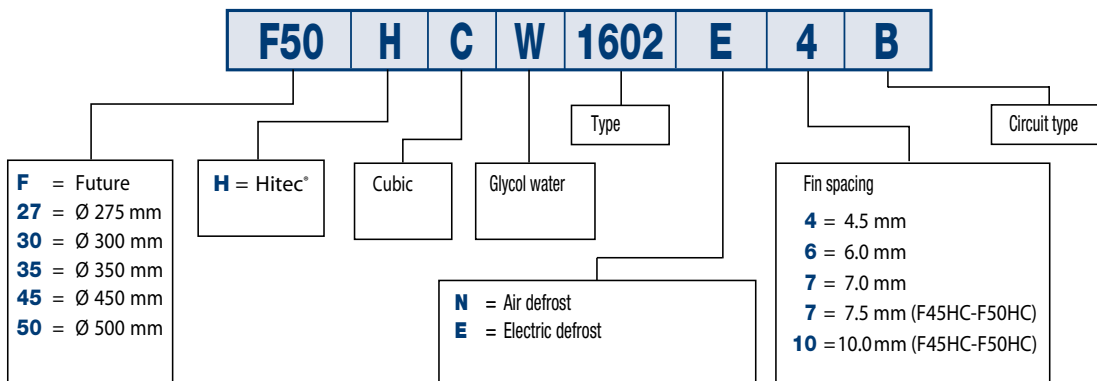
All other construction characteristics and dimensions are the same as stated for standard unit coolers.

GLYCOL

TURBOCOOLER®
by LU-VE



Ordering example



NH3 - Unit coolers for ammonia

HEAT EXCHANGERS

The high efficiency heat exchangers that characterize the ranges are manufactured with stainless steel tubes and with aluminium fins.

COMMON DATA

All other construction characteristics and dimensions are the same as stated for standard unit coolers.

NH₃

Ordering example

