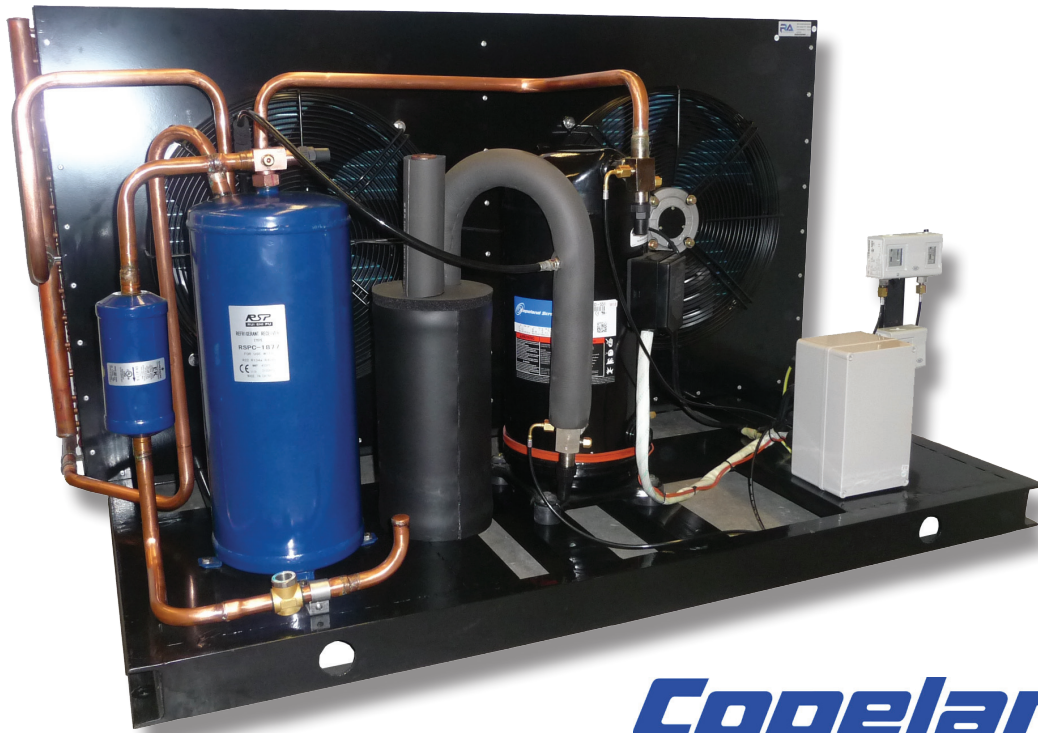


FRIGO *Scroll*

R404A
Refrigerant

R507A
Refrigerant

R134A
Refrigerant



Copeland[®]
brand products

STANDARD UNIT WITH:

Copeland ZB Scroll Compressors for medium temp applications on R404A/R507A/R134A
Copeland ZB & ZF Scroll Compressors for low temp applications on R404A/R507A

COPELAND SCROLL AIR COOLED CONDENSING UNITS

World Class Brands in World Class Refrigeration Systems

STANDARD INCLUSIONS:

- Copeland Scroll Compressor
- ZB Compressors for MT applications
- ZF Compressors for LT applications
- Crankcase Heater
- Hydrophilic Blue Fin Condenser
- External Rotor, Axial Flow Fan Motors
- Rotalock Service Valve on Receiver Outlet
- Pressure Relief Valve on Receiver
- Liquid Line Drier
- Liquid Line Sight Glass
- Oil Separator
- Accumulator
- HP/LP Control
- Flexible Pressure Control Lines



OPTIONAL EXTRAS:

- Liquid Line Solenoid Valve
- HP Fan control or Fan Speed Controller
- Electrical Control Panel
- Ziehl Abegg Fan Motors
- EC Fan Motors



COPELAND SCROLL CONDENSING UNITS PRODUCT RANGE

Description	Operating Range	Nominal HP	Models	Ambient	Capacity Range
Med Temp ZB Scroll R404A/R507A	+5C to -15C	2HP to 15HP	3**	35C	3.6kW to 27.0kW @ -5C SST
			12	43C	3.2kW to 25.0kW @ -5C SST
Med Temp ZB Scroll R134A	+10C to -15C	2HP to 10HP	3**	35C	2.5kW to 11.5kW @ -5C SST
			10	43C	2.4kW to 12.3kW @ -5C SST
Low Temp ZF Scroll R404A/R507A	-15C to -40C	3HP to 15HP	9	35C	2.87kW to 15.5kW @ -25C SST
				43C	2.5kW to 13.8kW @ -25C SST

** Single Phase Models

FEATURES:

- Compact Robust Framework
- +43C Ambient Ratings with standard condenser
- Easy access to components for service & maintenance
- Electrical components pre-wired to terminal box
- Factory pressure tested and despatched with holding charge of dry nitrogen
- Low vibration levels
- Low noise levels

APPLICATIONS:

- All medium and low temperature commercial refrigeration applications
- Compressors compatible with R404A; R507; R134A
- R407C for air conditioning applications on request
- Typical applications include cold rooms, freezer rooms, refrigerated display cabinets, liquid chillers

MODEL NOMENCLATURE - COPELAND SCROLL CONDENSING UNIT

Example: FC ZB - 2 - M - 2.35

FC = Frigo Copeland Scroll Series

ZB = Medium Temp Compressor Model

ZF = Low Temp Compressor Model

2 = Nominal HP

M = Medium Temp, L = Low Temp, H = High Temp

2 = No. of Fans

35 = Diameter of Fans x 10 in mm

Y = R134A Refrigerant

DESIGN BENEFITS - SCROLL TECHNOLOGY

Better Liquid Handling

Axial and radial compliance allow the scroll members to separate in the presence of liquid refrigerant - providing protection against liquid damage.

Greater Efficiency

More efficient over the entire operating range.

Improved Sound

Operating at lower sound and vibration levels than reciprocating compressors.

Unmatched Reliability

- 70% fewer moving parts
- Ability to start under any system load
- Easy to service and maintain due to their compact size and light weight
- Engineered for optimum performance with today's chlorine-free refrigerants
- No complex internal suction and discharge valves for quieter operation and higher reliability

FEATURES OF COPELAND SCROLL COMPRESSORS

- Improved temperature protection
- Internal pressure protection
- New quiet shutdown solution
- Optimised scroll and seal design for improved efficiency
- Redesigned shell for quieter operation
- High efficiency motor

COPELAND SCROLL COMPRESSORS

When Emerson first pioneered the use of scroll technology in compressors, it changed the industry forever. Since then the Copeland Scroll technology remains at the forefront of HVACR applications, impressing contractors and original equipment manufacturers (OEMs) with its superior efficiency, proven reliability and ease of installation.

With the broadest product line in the industry, Copeland Scroll compressors range from one to 60 horsepower and are installed in more than 75 million locations around the world.

HOW SCROLL COMPRESSORS WORK

Copeland Scroll compressors have one scroll, or spiral, orbiting in a path defined by a matching fixed scroll. The fixed scroll is attached to the compressor body.

The orbiting scroll is coupled to the crankshaft and orbits, rather than rotates. The orbiting motion creates a series of gas pockets travelling between the two scrolls.

On the outer portion of the scrolls, the pockets draw in gas, and then move into the centre of the scroll, where the gas is discharged. As the gas moves into the increasingly smaller inner pockets, the temperature and pressure increase to the desired discharge pressure.



**Air-Cooled Condensing Units - Medium Temperature Capacity Tables R404A/R507
COPELAND ZB SCROLL COMPRESSORS**

Cond. Unit Model	Comp Model	HP	Ambient °C	SATURATED SUCTION TEMPERATURE					
				-15C	-10C	-5C	0C	+5C	+7C
SINGLE FAN MODELS									
FC ZB-2-M-1.45	ZB15KQE	2	35	2931	3542	4169	4886	5638	5961
			43	2417	2981	3584	4256	4946	5279
FC ZB-2.5-M-1.45	ZB19KQE	2.5	35	5960	7073	8294	9636	11055	11859
			43	5187	6199	7333	8596	9986	10761
FC ZB-3-M-1.45	ZB21KQE	3	35	4402	5210	6108	7109	8169	8588
			43	3815	4560	5417	6331	7375	7781
FC ZB-3.5-M-1.45	ZB26KQE	3.5	35	4957	5855	6863	7926	9094	9586
			43	4336	5192	6148	7190	8344	8805
FC ZB-4-M-1.50	ZB29KQE	4	35	5960	7073	8294	9636	11055	11859
			43	5187	6199	7333	8596	9986	10761
FC ZB-5-M-1.50	ZB38KQE	5	35	7426	8778	10310	11958	13732	14494
			43	6449	7746	9180	10776	12514	13235
FC ZB-6-M-1.50	ZB45KQE	6	35	8508	10042	11729	13574	15537	16312
			43	7461	8893	10487	12267	14232	14997
FC ZB-7-M-1.50	ZB48KQE	7	35	9276	10939	12760	14727	16819	17946
			43	8140	9693	11415	13313	15384	16518
FC ZB-8-M-1.50	ZB58KQE	8	35	10624	12581	14632	16789	19054	20272
			43	9207	11230	13308	15480	17772	19018
FC ZB-9-M-1.50	ZB66KQE	9	35	11787	13770	15896	18152	20522	21769
			43	10510	12439	14518	16759	19162	20469
DOUBLE FAN MODELS									
FC ZB-5-M-2.45	ZB38KQE	5	35	7529	8914	10489	12189	14027	14819
			43	6521	7843	9307	10942	12727	13470
FC ZB-6-M-2.45	ZB45KQE	6	35	8954	10631	12498	14569	16805	17698
			43	7776	9310	11033	12976	15147	15998
FC ZB-7-M-2.45	ZB48KQE	7	35	9739	11551	13559	15755	18124	19413
			43	8471	10129	11984	14048	16324	17582
FC ZB-8-M-2.45	ZB58KQE	8	35	11241	13402	15699	18151	20763	22183
			43	9639	11821	14088	16485	19045	20449
FC ZB-9-M-2.45	ZB66KQE	9	35	12545	14758	17163	19755	22524	24000
			43	11063	13163	15450	17944	20653	22142
FC ZB-10-M-2.50	ZB76KQE	10	35	15135	17935	20963	24213	27676	29531
			43	13273	15953	18847	21975	25345	27180
FC ZB-13-M-2.50	ZB95KQE	13	35	18422	21859	25467	29315	33446	35702
			43	15459	19063	22724	26540	30604	32841
FC ZB-15-M-2.50	ZB114KQE	15	35	20994	24987	29187	33605	38250	40726
			43	17744	21840	26124	30640	35431	38010

**Air-Cooled Condensing Units - Low Temperature Capacity Tables R404A/R507
COPELAND ZF SCROLL COMPRESSORS**

Cond. Unit Model	Comp Model	HP	Ambient °C	Saturated Suction Temperature					
				-40C	-35C	-30C	-25C	-20C	-15C
SINGLE FAN MODELS									
FC ZF-3-L-1.45	ZF09K4E	3	35	1569	1960	2395	2866	3421	4032
			43	1400	1752	2136	2577	3060	3645
FC ZF-3.5-L-1.45	ZF11K4E	3.5	35	1938	2405	2924	3470	4111	4829
			43	1715	2144	2607	3120	3696	4376
FC ZF-4-L-1.45	ZF13K4E	4	35	2237	2796	3455	4160	4961	5884
			43	2046	2505	3042	3660	4398	5243
FC ZF-5-L-1.45	ZF15K4E	5	35	2697	3332	4073	4907	5857	6865
			43	2397	2965	3667	4393	5223	6189
FC ZF-6-L-1.50	ZF18K4E	6	35	3392	4184	5084	6122	7279	8535
			43	2971	3684	4504	5443	6488	7670
DOUBLE FAN MODELS									
FC ZF-5-L-2.35	ZF15K4E	5	35	2721	3365	4119	4970	5942	6976
			43	2415	2990	3702	4439	5285	6271
FC ZF-6-L-2.35	ZF18K4E	6	35	3284	4035	4882	5848	6915	8060
			43	2890	3574	4355	5242	6223	7323
FC ZF-7.5-L-2.45	ZF24K4E	7.5	35	4074	5152	6328	7592	9013	10569
			43	3492	4536	5599	6775	8053	9513
FC ZF-10-L-2.45	ZF33K4E	10	35	5459	6815	8279	9916	11722	13707
			43	4775	6045	7411	8900	10581	12474
FC ZF-13-L-2.45	ZF40K4E	13	35	6698	8465	10276	12323	14525	16957
			43	5905	7512	9204	11051	13089	15354
FC ZF-15-L-2.50	ZF48K4E	15	35	8496	10539	12868	15549	18516	21809
			43	7456	9325	11433	13808	16566	19609

Refrigeration Injection

For low temperature ZF models, liquid injection is required to keep discharge gas temperature within safe limits. The compressor is supplied with a 13/16" diameter injection stub to accept a discharge temperature control (DTC) valve for liquid injection. Inside the compressor, injection takes place in two distinct pockets of the spirals without influencing the suction process. Injection increases the mass flow through the system slightly.

DTC – Discharge Temperature Control

Liquid injection is achieved by a DTC control valve. The DTC valve eliminates the need for capillary tube, liquid injection solenoid valve and current relay.

ZF compressors (BOM 556) include a well in the top cap, combined with a valve cap.

The Copeland DTC valve is equipped with a custom bulb profile, which must be installed in the top cap of the compressor, sensing the temperature closest to the discharge port. The bulb/bellows combination injects only when cooling is needed and in the required amounts.

DTC Valve Specifications

Set Point: 89.4°C ± 2.4°C
Liquid Line Connection: 3/8" Braze

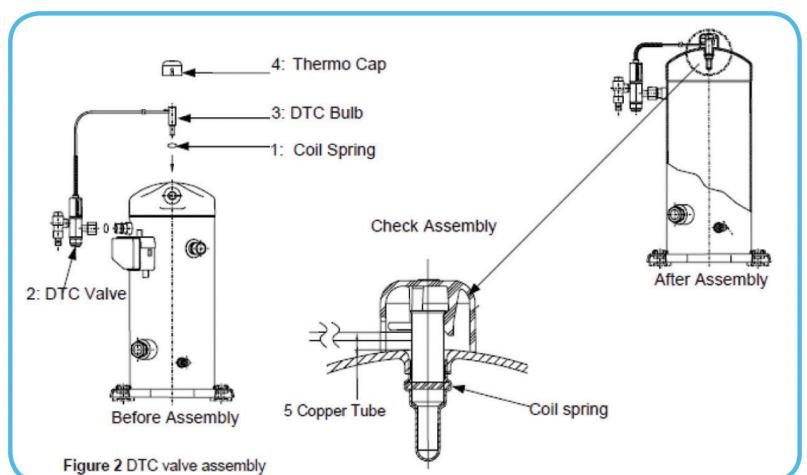


Figure 2 DTC valve assembly

**Air-Cooled Condensing Units - Medium Temperature Capacity Tables R134A
COPELAND ZB SCROLL COMPRESSORS - Y Series**

Cond. Unit Model	Comp Model	HP	Ambient °C	SATURATED SUCTION TEMPERATURE					
				-15C	-10C	-5C	0C	+5C	+10C
R134A MED TEMP COPELAND ZB SCROLL COMPRESSORS - THREE PHASE									
SINGLE FAN MODELS									
FC ZB-2-M-1.45-Y	ZB15KQE	2	35	1643	2065	2554	3014	3612	4250
			43	1554	1921	2457	2976	3552	4193
FC ZB-3-M-1.45-Y	ZB21KQE	3	35	2445	2946	3671	4366	5177	6086
			43	2223	2770	3479	4250	5077	6029
FC ZB-3.5-M-1.45-Y	ZB26KQE	3.5	35	2691	3425	4118	4938	5855	6852
			43	2488	3115	3981	4814	5773	6766
FC ZB-4-M-1.50-Y	ZB29KQE	4	35	3190	4029	4920	5892	6970	8206
			43	2960	3738	4717	5666	6791	8033
FC ZB-5-M-1.50-Y	ZB38KQE	5	35	3909	4995	6121	7343	8737	10264
			43	3682	4679	5917	7198	8517	10088
FC ZB-6-M-1.50-Y	ZB45KQE	6	35	4645	5937	7248	8642	10224	11852
			43	4302	5460	6913	8398	10054	11783
FC ZB-7-M-1.50-Y	ZB48KQE	7	35	5213	6598	7957	9461	11117	12948
			43	4919	6143	7702	9238	10938	12809
FC ZB-8-M-1.50-Y	ZB58KQE	8	35	5461	7353	8736	10183	11747	13317
			43	5064	6360	8384	9916	11571	13192
DOUBLE FAN MODELS									
FC ZB-5-M-2.45-Y	ZB38KQE	5	35	3940	5043	6189	7439	8868	10440
			43	3706	4715	5970	7273	8618	10226
FC ZB-6-M-2.45-Y	ZB45KQE	6	35	4788	6156	7560	9072	10816	12632
			43	4409	5618	7152	8734	10518	12403
FC ZB-7-M-2.45-Y	ZB48KQE	7	35	5373	6839	8292	9921	11736	13773
			43	5043	6322	7965	9600	11427	13462
FC ZB-8-M-2.45-Y	ZB58KQE	8	35	5643	7657	9148	10728	12456	14210
			43	5203	6560	8703	10344	12133	13903
FC ZB-9-M-2.45-Y	ZB66KQE	9	35	6372	8616	10251	12030	13895	15831
			43	5910	7419	9811	11612	13620	15590
FC ZB-10-M-2.50-Y	ZB76KQE	10	35	7380	10065	12038	14158	16408	18734
			43	6854	8581	11436	13594	15968	18303

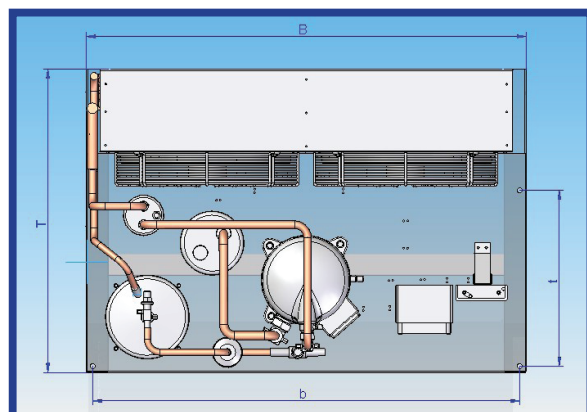
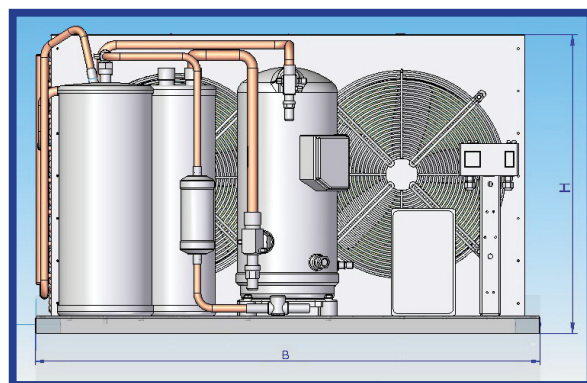
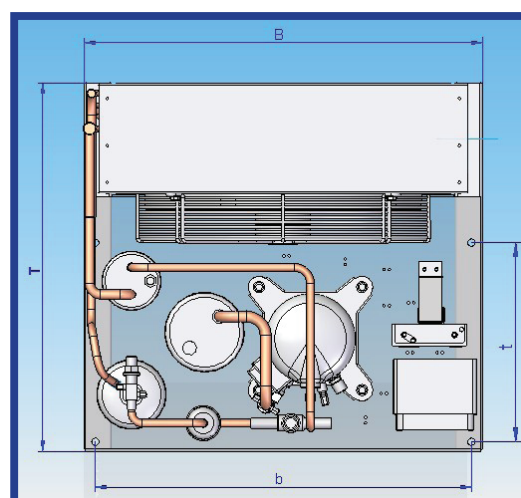
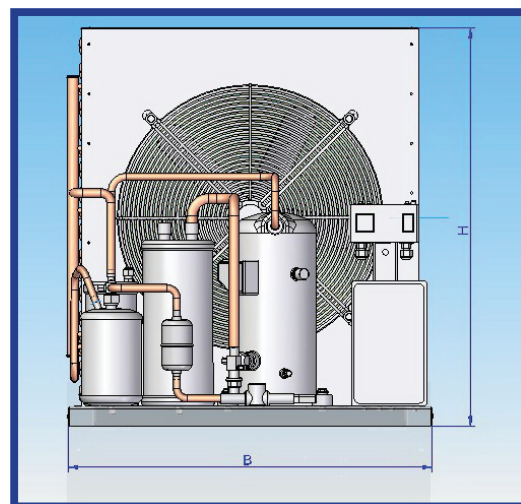


MODEL NUMBERS	COMPRESSOR				CONDENSER		CONDENSER FANS			RECEIVER CAP	PIPE SIZES (Inch)		WEIGHT
	Model	NOM HP	Disp. M3/hr	MRA Amps	Model	Capacity W/KTD	Fan Qty	Fan Dia	Air Flow l/s	Litres	Suction	Liquid	Kg
MEDIUM TEMPERATURE MODELS - COPELAND ZB SCROLL COMPRESSORS													
SINGLE FAN MODELS - 415V/3N/50Hz													
FC ZB-2-M-1.45	ZB15KQE	2	5.92	6.48	SG3	780	1	450	1444	2	3/4"	3/8"	66
FC ZB-2.5-M-1.45	ZB19KQE	2.5	6.80	6.48	SG4	900	1	450	1444	2	3/4"	3/8"	71
FC ZB-3-M-1.45	ZB21KQE	3	8.60	8.48	SG5	1070	1	450	1444	2	3/4"	3/8"	76
FC ZB-3.5-M-1.45	ZB26KQE	3.5	9.90	10.48	SG5	1070	1	450	1444	3	3/4"	3/8"	79
FC ZB-4-M-1.50	ZB29KQE	4	11.4	11.90	SG4	1070	1	450	1444	3	7/8"	3/8"	84
FC ZB-5-M-1.50	ZB38KQE	5	14.50	13.40	SU5	1770	1	500	2000	3	7/8"	3/8"	98
FC ZB-6-M-1.50	ZB45KQE	6	17.20	17.00	SU5	1770	1	500	2000	6	7/8"	1/2"	100
FC ZB-7-M-1.50	ZB48KQE	7	18.80	17.00	SU6	1830	1	500	2000	6	7/8"	1/2"	104
FC ZB-8-M-1.50	ZB58KQE	8	22.10	23.96	SU6	1830	1	500	2000	14	1 1/8"	5/8"	116
FC ZB-9-M-1.50	ZB66KQE	9	25.70	25.16	SU6	1830	1	500	2000	14	1 3/8"	5/8"	120
DOUBLE FAN MODELS - 415V/3N/50Hz													
FC ZB-5-M-2.45	ZB38KQE	5	14.50	13.40	SQ4	1940	2	450	2889	14	7/8"	3/8"	126
FC ZB-6-M-2.45	ZB45KQE	6	17.20	17.00	ST5	2460	2	450	2889	14	7/8"	1/2"	136
FC ZB-7-M-2.45	ZB48KQE	7	18.80	17.00	ST5	2460	2	450	2889	14	1 1/8"	5/8"	152
FC ZB-8-M-2.45	ZB58KQE	8	22.10	23.96	ST5	2460	2	450	2889	14	1 1/8"	5/8"	184
FC ZB-9-M-2.45	ZB66KQE	9	25.70	25.16	ST5	2460	2	450	2889	14	1 3/8"	5/8"	185
FC ZB-10-M-2.50	ZB76KQE	10	28.80	28.70	SV5	3310	2	500	4000	14	1 3/8"	5/8"	220
FC ZB-13-M-2.50	ZB95KQE	13	35.60	31.90	SW5	3880	2	500	4000	14	1 3/8"	5/8"	277
FC ZB-15-M-2.50	ZB114KQE	15	42.10	35.80	SW5	3880	2	500	4000	18	1 5/8"	7/8"	288
LOW TEMPERATURE MODELS - COPELAND ZF SCROLL COMPRESSORS													
SINGLE FAN MODELS - 415V/3N/50Hz													
FC ZF-3-L-1.45	ZF09K4E	3	8.04	7.48	SG3	780	1	450	1444	2	5/8"	3/8"	71
FC ZF-3.5-L-1.45	ZF11K4E	3.5	10.00	9.48	SG3	780	1	450	1444	3	5/8"	3/8"	77
FC ZF-4-L-1.45	ZF13K4E	4	12.00	11.00	SG5	1070	1	450	1444	3	5/8"	3/8"	84
FC ZF-5-L-1.45	ZF15K4E	5	15.00	12.48	SG5	1070	1	450	1444	6	5/8"	3/8"	94
FC ZF-6-L-1.50	ZF18K4E	6	17.00	12.98	SU4	1480	1	500	2000	6	7/8"	1/2"	98
DOUBLE FAN MODELS - 415V/3N/50Hz													
FC ZF-5-L-2.35	ZF15K4E	5	15.00	12.48	SP4	1150	2	350	1611	6	5/8"	3/8"	124
FC ZF-6-L-2.35	ZF18K4E	6	17.00	12.98	SP4	1150	2	350	1611	6	7/8"	1/2"	130
FC ZF-7.5-L-2.45	ZF24K4E	7.5	21.00	17.16	SQ4	1940	2	450	2889	14	1 1/8"	5/8"	176
FC ZF-10-L-2.45	ZF33K4E	10	29.00	23.36	SQ4	1940	2	450	2889	14	1 1/8"	5/8"	182
FC ZF-13-L-2.45	ZF40K4E	13	36.00	26.16	ST5	2460	2	450	2889	14	1 1/8"	5/8"	195
FC ZF-15-L-2.50	ZF48K4E	15	43.00	32.71	SV5	3310	2	500	4000	18	1 3/8"	5/8"	268

Note: Weights are approximate and will vary with add ons.

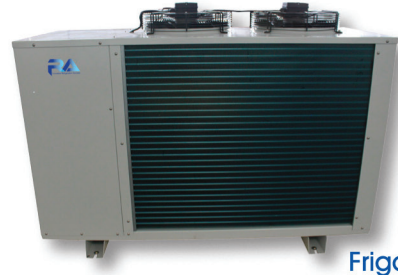
DIMENSIONS

UNIT MODEL	Overall Dimension			Hole Fixing Centres		
	B mm	T mm	H mm	b mm	t mm	Φ mm
FC ZB-2-M-1.45	735	700	540	695	370	11
FC ZB-2.5-M-1.45	735	700	540	695	370	11
FC ZB-3-M-1.45	735	700	540	695	370	11
FC ZB-3.5-M-1.45	735	700	540	695	370	11
FC ZB-4-M-1.50	735	700	540	695	370	11
FC ZB-5-M-1.50	735	700	800	695	370	11
FC ZB-6-M-1.50	735	700	800	695	370	11
FC ZB-7-M-1.50	735	700	800	695	370	11
FC ZB-8-M-1.50	735	700	800	695	370	11
FC ZB-9-M-1.50	735	700	800	695	370	11
FC ZB-5-M-2.45	1190	820	700	1155	475	14
FC ZB-6-M-2.45	1190	820	700	1155	475	14
FC ZB-7-M-2.45	1190	820	700	1155	475	14
FC ZB-8-M-2.45	1190	820	700	1155	475	14
FC ZB-9-M-2.45	1190	820	700	1155	475	14
FC ZB-10-M-2.50	1400	800	880	1155	475	14
FC ZB-13-M-2.50	1620	800	880	1155	475	14
FC ZB-15-M-2.50	1620	800	880	1155	475	14
FC ZF-3-L-1.45	735	680	540	695	370	11
FC ZF-3.5-L-1.45	735	680	540	695	370	11
FC ZF-4-L-1.45	735	680	540	695	370	11
FC ZF-5-L-1.45	735	680	540	695	370	11
FC ZF-6-L-1.50	735	680	540	695	370	11
FC ZF-5-L-2.35	1190	820	650	1155	475	14
FC ZF-6-L-2.35	1190	820	650	1155	475	14
FC ZF-7.5-L-2.45	1190	820	650	1155	475	14
FC ZF-10-L-2.45	1190	820	650	1155	475	14
FC ZF-13-L-2.45	1190	820	700	1155	475	14
FC ZF-15-L-2.50	1400	800	880	1155	475	14





Frigo Mini Pack



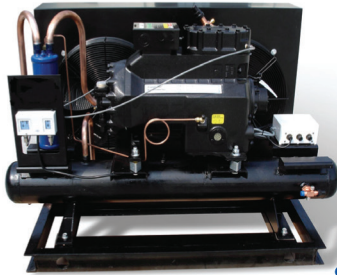
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