ECOLINE

CRM / CRL

OPTIMUM SOLUTIONS FOR COMMERCIAL REFRIGERATION









AIR COOLED REFRIGERATION CONDENSING UNITS
With Single Stage Semi-Hermetic Reciprocating Compressor

Technical Manual

Tropical

50HZ

R22 R134a R404A R507A

Carrier

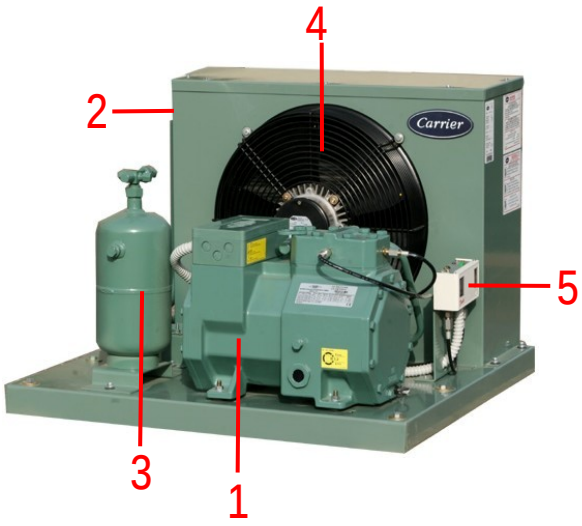
United Technologies
turn to the experts

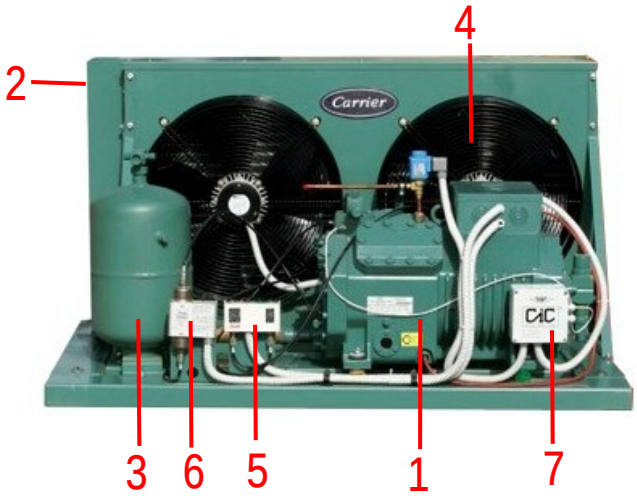
GL Quality Management System ISO 9001 : 2008 Certificate No.: QS-5519HH

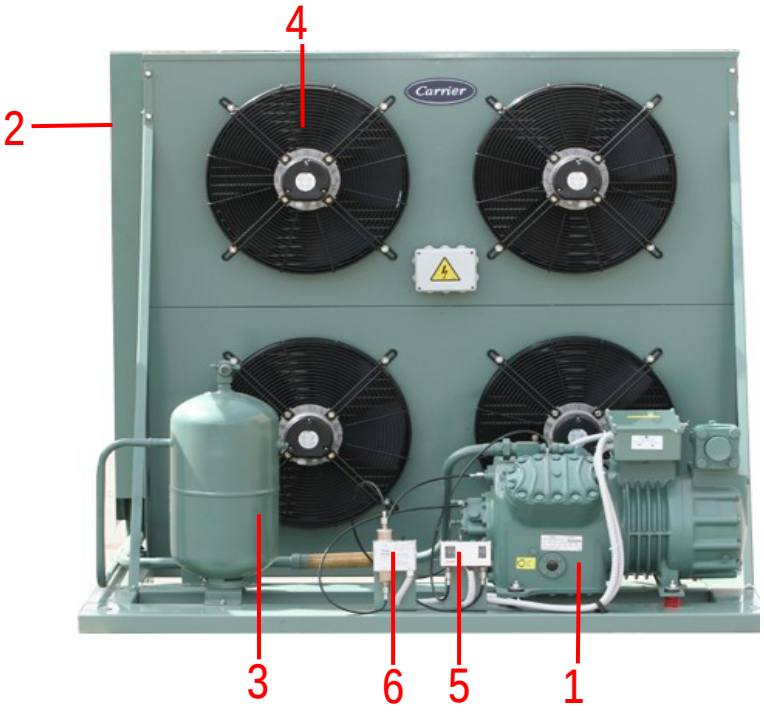
TÜV SÜD Enviromental Management System ISO 14001 : 2004 Certificate No : 12 104 30334 TMS

TÜV SÜD Safety Management System BS OHSAS 18001 : 2007 Certificate No : 12 116 30334 TMS

STANDARD COMPONENTS







1- Compressor – Semi Hermetic

2- Condenser Coil

3- Liquid Receiver

4- Fan / Motor

5- Dual High / Low Pressure Control

6- Oil Pressure Differential Control
- For Medium Temperature Compressors 10 HP to 50 HP.
- For Low Temperature Compressors 12 HP to 44 HP.

7- CIC (Controlled Injection Cooling) System
For R22 Low Temperature Compressors 7.5 HP to 44 HP.

(1)

(3)

(4)

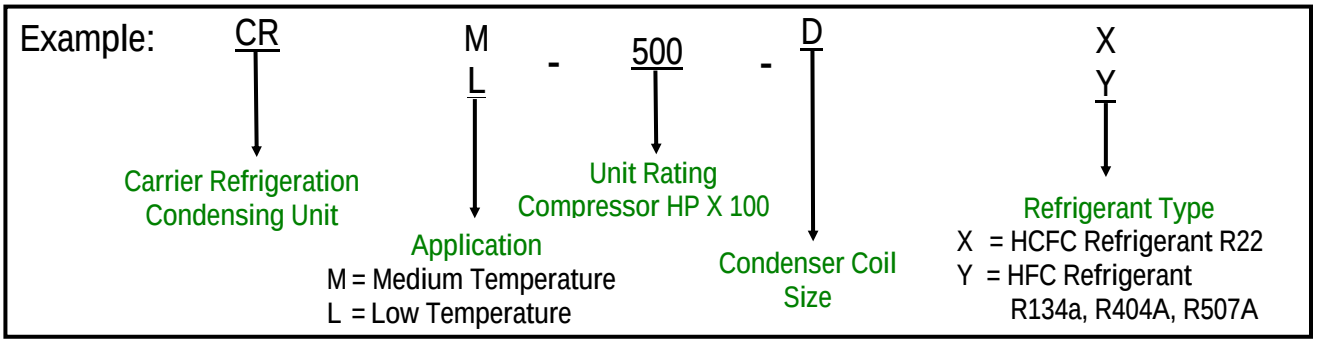
(5)

(6)

APPLICATIONS

- With Carrier new ECOLINE series, Carrier offers highly efficient all-purpose refrigeration condensing units,
- CRM complete range of air-cooled single stage-semi hermetic refrigeration condensing units is especially designed for medium temperatures applications with HCFC (R22) and HFC (R134a, R404A, R507A) refrigerants.
- CRL complete range of air-cooled single stage-semi hermetic refrigeration condensing units is especially designed for low temperatures applications with HCFC (R22), HFC (R404A, R507A) refrigerants.

CONDENSING UNIT MODEL DESIGNATION



UNIT MODELS

Medium Temperature Condensing Units

HCFC (R22)		HFC (R134a, R404A, R507A)	
Unit Model	**Compressor Model**	**Unit Model**	**Compressor Model**
CRM **– 150 – AX**	**2HES-2-40S**	CRM **– 150 – AY**	**2HES-2Y-40S**
CRM **– 200 – BX**	**2GES-2-40S**	CRM **– 200 – BY**	**2GES-2Y-40S**
CRM **– 300 – BX**	**2DES-3-40S**	CRM **– 300 – BY**	**2DES-3Y-40S**
CRM **– 300 – CX**	**2DES-3-40S**	CRM **– 300 – CY**	**2DES-3Y-40S**
CRM **– 400 – BX**	**2CES-4-40S**	CRM **– 400 – BY**	**2CES-4Y-40S**
CRM **– 400 – CX**	**2CES-4-40S**	CRM **– 400 – CY**	**2CES-4Y-40S**
CRM **– 500 – DX**	**4FES-5-40S**	CRM **– 500 – DY**	**4FES-5Y-40S**
CRM **– 750 – EX**	**4DES-7-40S**	CRM **– 750 – EY**	**4DES-7Y-40S**
CRM **– 1000 – EX**	**4VE-10-40P**	CRM **– 1000 – EY**	**4VE-10Y-40P**
CRM **– 1200 – EX**	**4TE-12-40P**	CRM **– 1200 – EY**	**4TE-12Y-40P**
CRM **– 1500 – FX**	**4PE-15-40P**	CRM **– 1500 – FY**	**4PE-15Y-40P**
CRM **– 2000 – GX**	**4NE-20-40P**	CRM **– 2000 – GY**	**4NE-20Y-40P**
CRM **– 2500 – GX**	**4HE-25-40P**	CRM **– 2500 – GY**	**4HE-25Y-40P**
CRM **– 3000 – GX**	**4GE-30-40P**	CRM **– 3000 – GY**	**4GE-30Y-40P**
CRM **– 4000 – HX**	**6GE-40-40P**	CRM **– 4000 – HY**	**6GE-40Y-40P**
CRM **– 5000 – IX**	**6FE-50-40P**	CRM **– 5000 – IY**	**6FE-50Y-40P**

Low Temperature Condensing Units

HCFC (R22)		HFC (R404A, R507A)	
Unit Model	**Compressor Model**	**Unit Model**	**Compressor Model**
CRL **– 150 – AX**	**2GES-2-40S**	CRL **– 150 – AY**	**2GES-2Y-40S**
CRL **– 200 – BX**	**2DES-2-40S**	CRL **– 200 – BY**	**2DES-2Y-40S**
CRL **– 300 – BX**	**2CES-3-40S**	CRL **– 300 – BY**	**2CES-3Y-40S**
CRL **– 400 – BX**	**4EES-4-40S**	CRL **– 400 – BY**	**4EES-4Y-40S**
CRL **– 500 – CX**	**4DES-5-40S**	CRL **– 500 – CY**	**4DES-5Y-40S**
CRL **– 750 – DX**	**4VES-7-40P**	CRL **– 750 – DY**	**4VES-7Y-40P**
CRL **– 900 – DX**	**4TE-9-40P**	CRL **– 900 – DY**	**4TE-9Y-40P**
CRL **– 1200 – DX**	**4PE-12-40P**	CRL **– 1200 – DY**	**4PE-12Y-40P**
CRL **– 1500 – FX**	**4JE-15-40P**	CRL **– 1500 – FY**	**4JE-15Y-40P**
CRL **– 2300 – FX**	**4GE-23-40P**	CRL **– 2300 – FY**	**4GE-23Y-40P**
CRL **– 2800 – GX**	**6HE-28-40P**	CRL **– 2800 – GY**	**6HE-28Y-40P**
CRL **– 3400 – GX**	**6GE-34-40P**	CRL **– 3400 – GY**	**6GE-34Y-40P**
CRL **– 4400 – HX**	**6FE-44-40P**	CRL **– 4400 – HY**	**6FE-44Y-40P**

STANDARD FEATURES

(1) EFFICIENT REFRIGERATING CAPACITY WITH MINIMUM ELECTRICAL CONSUMPTION

- **CONDENSER COIL**
  - Oversized coil for high ambient temperatures.
  - Inner groove copper tubes & aluminum corrugated fins.
- **COMPRESSOR**
  - Highly efficient working valves.
  - Minimum clearance volume.
  - Efficient, large volume motor.
  - Reduced flow losses at low condensing temperatures
- **FAN MOTOR**
  - High efficiency with low power consumption.
  - Large airflow rate.
  - Two speed motor for 50 cm models.
  - The fan casing has been designed to optimize the position of the fan blade in its opening.

(2) QUIET AND LOW VIBRATIONS

- **COMPRESSOR**
  - Compressors are mounted on rigid base plates.
  - Efficient compressor mounting springs.
  - Vibration absorbers on discharge line.
  - Optimised mass balance.
  - Low discharge gas pulsations due to special cylinder design.
- **FAN MOTOR**
  - High acoustic performance and minimum vibrations of asynchronous internal rotor motor and ball bearings.

(3) EASY AND FAST INSTALLATION

- Fully wired electrical components.
- Reinforced base frame with small footprint.

(4) EASY SERVICE AND MAINTENANCE

- Easy access to the electrical and control components for easy service.
- Compressor oil sight glass through which the oil quantity and its condition in the crankcase can observe.
- Accessible construction for fan / motor.
- Accessible hermetic construction for the compressor by use bolted parts.
- Compressor suction and discharge service of rotalock type with gauge connections.
- Liquid line service rotalock valve.

(5) DURABLE CONSTRUCTION

- Robust unit construction with compact dimensions
- Metal parts of the fans cannot be corroded.
  - Hot galvanized steel frame protected against against corrosien.
- Powder painted metal parts and backed at high temperature.
- Wear resistant drive gear for compressor.
  - Surface hardened eccentric shaft and crankshaft
  - Low fricition bearings and aluminium pistons.
  - Hard chrome plated piston rings.
- Robust compressor
  - Solid valve plate design.
  - Valves of impact resistant spring steel.
- Efficient lubrication of compressor
  - For medium and low temperature compressors 1.5 HP to 7.5 HP
    Centrifugal lubrication is used with optimum oil supply in the compressor even under extreme operating conditions.
  - For medium temperature compressors 10 HP to 50 HP
    For low temperature compressors 9 HP to 44 HP
    Oil pump lubrication is used with patented oil return system, sealed main bearing, generously sized oil pump and less carry over than with convenntional pump lubrication.

Semi Hermetic Compressors

STANDARD FEATURES (Cont.)

(6) SAFETY PROTECTIONS

❑ COMPRESSOR

- Electronic motor protection with thermal monitoring with PTC sensors.
- Internal pressure relief valve to protect the compressor against high discharge pressures.
- Terminal box enclosure class is IP65 or IP54 (as per standard IEC34).
- IP65 for terminal box enclosure for units below 20 HP
- IP54 for terminal box enclosure for units above 20 HP

❑ FAN MOTOR

- Thermal protection.
- Protection grill on propeller side for safety of personnel conforms to machinery directive (CE)
- Class F insulation as per standards NFC 51200-11 and CEI 34-1.
- Terminal box enclosure class is IP55 (as per standard IEC34).

❑ CRANKCASE HEATER

- To guard compressor against flood back conditions and to eliminate oil fluffing on start up.
- Insertion type, temperature dependent control.
- Self regulating PTC heater.
- Standard mandatory for :
  - Outdoor installation of condensing unit.
  - Long shut-off peridos
  - High refrigerant charge
- For compressor 1.5 HP to 5 HP
  The crankase heater is mounted in housing pocket (at bearing cover).
- For compressor 7.5 HP to 50 HP
  The crankase heater is mounted into pre-mounted heater sleeve (near sight glass).

❑ HIGH / LOW PRESSURE CONTROL

- To protect the compressor against high discharge pressures and low suction pressures.
- Terminal box enclosure class is IP33 (as per standards IEC529/EN60529)

❑ OIL PRESSURE DIFFERENTIAL CONTROL

- To protect compressor against insufficient oil pressure due to lack of oil.
- Connected to the oil pump discharge outlet and the crankcase pressure.
  The oil pressure control breaks the control circuit when the pressure difference between the oil pump outlet and the crankcase drops below 0.7 bar, then the compressor will be stopped after a 120 seconds delay after having solved the problem, the control has to be reset manually.
- Terminal box enclosure class is IP20 (as per standards IEC529/EN60529).

❑ CIC (CONTROLLED INJECTION COOLING) SYSTEM

- For R22 low temperature compressors 7.5HP to 44 HP to protect the compressor against high discharge temperatures by energizing an injection valve to meter a controlled amount of saturated refrigerant into the compressor suction cavity to cool the suction gas.
- Terminal box enclosure class is IP54 (as per standards IEC529/EN60529).

❑ THE UNITS COMPLY WITH CE DIRECTIVES

- Low Voltage Directive (LVD).
- Machinery Directive (MD).
- Electro-Magnetic Compatibility (EMC).

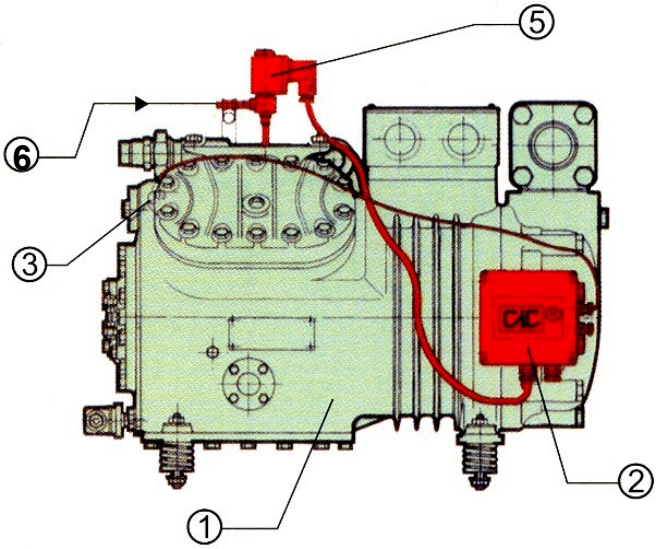
CIC (CONTROLLED INJECTION COOLING) SYSTEM FOR R22 COMPRESSORS LOW TEMPERATURE 7.5 – 9 – 12 – 15 – 23 – 28 – 34 – 44 HP

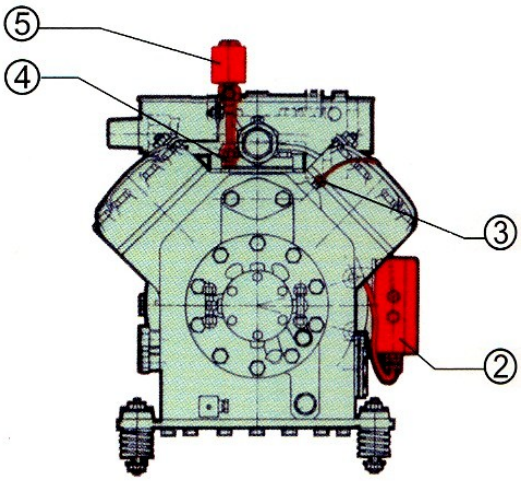
The use of refrigerant R22, in the low temperature systems places especially high demands on the compressor and the lubricant.

The discharge gas temperature can with higher condensing pressures very quickly reach impermissible values, where the long term stability of the refrigeration oil and thereby the lifetime of the compressor is impaired.

With the CIC System, an electronically controlled device to inject refrigerant as required, an operationally reliable method is now available for limiting the temperature of 4 and 6 cylinder single stage reciprocating compressors.

① Compressor
② Control module
③ Temperature sensor
④ Spray nozzle
⑤ Pulse injection valve
⑥ Liquid refrigerant





TECHNICAL DATA
Air Cooled Refrigeration Condensing Units Medium Temperature, CRM Series

UNIT MODEL		CRM -							
HCFC (R-22)		150-AX	200-BX	300-BX	300-CX	400-BX	400-CX	500-DX	750-EX
HFC (R134a, R-404A, R507A)		150-AY	200-BY	300-BY	300-CY	400-BY	400-CY	500-DY	750-EY
COMPRESSOR									
HCFC (R-22)		2HES-2	2GES-2	2DES-3	2DES-3	2CES-4	2CES-4	4FES-5	4DES-7
HFC (R134a, R-404A, R-507A)		2HES-2Y	2GES-2Y	2DES-3Y	2DES-3Y	2CES-4Y	2CES-4Y	4FES-5Y	4DES-7Y
Displacement	m^3/hr	6.51	7.58	13.42	13.42	16.24	16.24	18.05	26.84
Number of cylinders		2	2	2	2	2	2	4	4
Maximum Operating Current	A	4.5	5	8.6	8.6	10	10	10.8	16.5
Starting Current	A	22.5	22.5	37	37	44.2	44.2	62.2	82.4
Power supply voltage	V	380-420	380-420	380-420	380-420	380-420	380-420	380-420	380-420
Minimum-Maximum	V	360-440	360-440	360-440	360-440	360-440	360-440	360-440	360-440
Number of phases	**Φ**	3	3	3	3	3	3	3	3
Power supply frequency	Hz	50	50	50	50	50	50	50	50
Motor connection		Y	Y	Y	Y	Y	Y	Y	Y
Motor protection		SE-B1	SE-B1	SE-B1	SE-B1	SE-B1	SE-B1	SE-B1	SE-B1
Crankcase Heater	W	60	60	120	120	120	120	120	120
Oil charge	**Liter**	1	1	1.5	1.5	1.5	1.5	2	2
Oil type for HCFC refrigerant		B5.2	B5.2	B5.2	B5.2	B5.2	B5.2	B5.2	B5.2
Oil type for HFC refrigerant		BSE32	BSE32	BSE32	BSE32	BSE32	BSE32	BSE32	BSE32
Net Weight	Kg	45	45	70.5	70.5	70	70	86	88.5
CONDENSER FAN									
Quantity		1	1	1	2	1	2	2	2
Fan Diameter	mm	350	450	450	350	450	350	450	500
Current per motor	A	0.52	1.15	1.15	0.52	1.15	0.52	1.15	0.95
Total current	A	0.52	1.15	1.15	1.04	1.15	1.04	2.30	1.90
Power supply voltage	V	400	400	400	400	400	400	400	400
Number of phases	**Φ**	3	3	3	3	3	3	3	3
Power supply frequency	Hz	50	50	50	50	50	50	50	50
Motor connection		Y	Y	Y	Y	Y	Y	Y	Y
Power Input per Motor	W	175	430	430	175	430	175	430	480
Total Input Power	W	175	430	430	350	430	350	860	960
Number of Blades of Propeller		5	5	5	5	5	5	5	5
Air Flow	m^3/hr	1,890	3,170	3,170	3,780	3,170	3,780	5,940	10,300
	cfm	1,115	1,870	1,870	2,230	1,870	2,230	3,504	6,076
CONDENSER COIL									
Finned Coil Width	mm	560	660	660	860	660	860	1090	1200
Finned Coil Height	mm	460	560	560	560	560	560	660	790
LIQUID RECEIVER									
Capacity	Litre	3	3	7	7	7	7	14	18
REFRIGERANT PIPING									
Suction Diameter	Inch	5/8	5/8	7/8	7/8	7/8	7/8	7/8	1-1/8
	mm	16	16	22	22	22	22	22	28
Discharge Diameter	Inch	1/2	1/2	5/8	5/8	5/8	5/8	5/8	7/8
	mm	12	12	16	16	16	16	16	22
Liquid Diameter	Inch	1/2	1/2	1/2	1/2	1/2	1/2	7/8	7/8
	mm	12	12	12	12	12	12	22	22
Condensing unit weight	Kg	65	75	100	150	100	150	220	250

TECHNICAL DATA
Air Cooled Refrigeration Condensing Units Medium Temperature, CRM Series

UNIT MODEL		CRM -							
HCFC (R-22)		1000-EX	1200-EX	1500-EX	2000-GX	2500-GX	3000-GX	4000-HX	5000-IX
HFC (R134a, R-404A, R507A)		1000-EY	1200-EY	1500-EY	2000-GY	2500-GY	3000-GY	4000-HY	5000-IY
COMPRESSOR									
HCFC (R-22)		4VE-10	4TE-12	4PE-15	4NE-20	4HE-25	4GE-30	6GE-40	6FE-50
HFC (R134a, R-404A, R-507A)		4VE-10Y	4TE-12Y	4PE-15Y	4NE-20Y	4HE-25Y	4GE-30Y	6GE-40Y	6FE-50Y
Displacement	m^3/hr	34.73	41.33	48.50	56.25	73.60	84.50	126.80	151.60
Number of cylinders		4	4	4	4	4	4	6	6
Maximum Operating Current	A	19.9	25.1	28.2	33.2	44	51.2	73.9	96.2
Starting Current	A	59	69	81	97	125	141	219	226
Power supply voltage	V	380-420	380-420	380-420	380-420	380-420	380-420	380-420	380-420
Minimum-Maximum	V	360-440	360-440	360-440	360-440	360-440	360-440	360-440	360-440
Number of phases	**Φ**	3	3	3	3	3	3	3	3
Power supply frequency	Hz	50	50	50	50	50	50	50	50
Motor connection		YY	YY	YY	YY	YY	YY	YY	YY
Motor protection		SE-B1	SE-B1	SE-B1	SE-B1	SE-B2	SE-B2	SE-B2	SE-B2
Crankcase Heater	W	140	140	140	140	140	140	140	140
Oil charge	**Liter**	2.6	2.6	2.6	2.6	4.5	4.5	4.75	4.75
Oil type for HCFC refrigerant		B5.2	B5.2	B5.2	B5.2	B5.2	B5.2	B5.2	B5.2
Oil type for HFC refrigerant		BSE32	BSE32	BSE32	BSE32	BSE32	BSE32	BSE32	BSE32
Net Weight	Kg	139	141	147	150	194	206	238	241
CONDENSER FAN									
Quantity		2	2	2	4	4	4	4	4
Fan Diameter	mm	500	500	500	500	500	500	500	560
Current per motor	A	0.95	0.95	0.95	0.95	0.95	0.95	1.30	2.42
Total current	A	1.90	1.90	1.04	3.80	3.80	3.80	5.20	9.68
Power supply voltage	V	400	400	400	400	400	400	400	400
Number of phases	**Φ**	3	3	3	3	3	3	3	3
Power supply frequency	Hz	50	50	50	50	50	50	50	50
Motor connection		Y	Y	Y	Y	Y	Y	Y	**Δ**
Power Input per Motor	W	480	480	480	480	480	480	650	1.420
Total Input Power	W	960	960	960	1920	1920	1920	2600	5.680
Number of Blades of Propeller		5	5	5	5	5	5	5	5
Air Flow	m^3/hr	10,300	10,300	10,300	19,480	19,480	19,480	23,120	32,200
	cfm	6,076	6,076	6,076	11,492	11,492	11,492	13,640	18,997
CONDENSER COIL									
Finned Coil Width	mm	1200	1200	1440	1440	1440	1440	1440	1440
Finned Coil Height	mm	790	790	840	1420	1420	1420	1680	1680
LIQUID RECEIVER									
Capacity	Litre	18	18	18	24	24	24	40	40
REFRIGERANT PIPING									
Suction Diameter	Inch mm	1-1/8 28	1-3/8 35	1-5/8 42	1-5/8 42	2-1/8 54	2-1/8 54	2-1/8 54	2-1/8 54
Discharge Diameter	Inch mm	7/8 22	1-1/8 28	1-1/8 28	1-1/8 28	1-1/8 28	1-1/8 28	1-3/8 35	1-3/8 35
Liquid Diameter	Inch mm	7/8 22	7/8 22	7/8 22	7/8 22	7/8 22	7/8 22	7/8 22	7/8 22
Condensing unit weight	Kg	300	310	350	445	500	510	650	670

TECHNICAL DATA
Air Cooled Refrigeration Condensing Units Low Temperature, CRL Series

UNIT MODEL		CRL -						
HCFC (R-22)		150-AX	200-BX	300-BX	400-BX	500-CX	750-DX	900-DX
HFC (R-404A, R507A)		150-AY	200-BY	300-BY	400-BY	500-CY	750-DY	900-DY
COMPRESSOR								
HCFC (R-22)		2GES-2	2DES-2	2CES-3	4EES-4	4DES-5	4VES-7	4TE-9
HFC (R-404A, R-507A)		2GES-2Y	2DES-2Y	2CES-3Y	4EES-4Y	4DES-5Y	4VES-7Y	4TE-9Y
Displacement	m^3/hr	7.58	13.42	16.24	22.72	26.84	34.73	41.33
Number of cylinders		2	2	2	4	4	4	4
Maximum Operating Current	A	5	7.5	9.1	12.2	14.5	16.6	19.9
Starting Current	A	22.5	30.7	37	53.5	62.2	39	49
Power supply voltage	V	380-420	380-420	380-420	380-420	380-420	380-420	380-420
Minimum-Maximum	V	360-440	360-440	360-440	360-440	360-440	360-440	360-440
Number of phases	**Φ**	3	3	3	3	3	3	3
Power supply frequency	Hz	50	50	50	50	50	50	50
Motor connection		Y	Y	Y	Y	Y	YY	YY
Motor protection		SE-B1	SE-B1	SE-B1	SE-B1	SE-B1	SE-B1	SE-B1
Crankcase Heater	W	60	120	120	120	120	140	140
Oil charge	**Liter**	1	1.5	1.5	1.5	2	2.6	2.6
Oil type for HCFC refrigerant		B5.2	B5.2	B5.2	B5.2	B5.2	B5.2	B5.2
Oil type for HFC refrigerant		BSE32	BSE32	BSE32	BSE32	BSE32	BSE32	BSE32
Net Weight	Kg	45	68	70	84	86	129	137
CONDENSER FAN								
Quantity		1	1	1	1	2	2	2
Fan Diameter	mm	350	450	450	450	350	450	450
Current per motor	A	0.52	1.15	1.15	1.15	0.52	1.15	1.15
Total current	A	0.52	1.15	1.15	1.15	1.04	2.30	2.30
Power supply voltage	V	400	400	400	400	400	400	400
Number of phases	**Φ**	3	3	3	3	3	3	3
Power supply frequency	Hz	50	50	50	50	50	50	50
Motor connection		Y	Y	Y	Y	Y	Y	Y
Power Input per Motor	W	175	430	430	430	175	430	430
Total Input Power	W	175	430	430	430	350	860	860
Number of Blades of Propeller		5	5	5	5	5	5	5
Air Flow	m^3/hr	1,890	3,170	3,170	3,170	3,780	5,940	5,940
	cfm	1,115	1,870	1,870	1,870	2,230	3,504	3,504
CONDENSER COIL								
Finned Coil Width	mm	560	660	660	660	860	1090	1090
Finned Coil Height	mm	460	560	560	560	560	660	660
LIQUID RECEIVER								
Capacity	Litre	3	3	7	7	7	14	14
REFRIGERANT PIPING								
Suction Diameter	Inch	5/8	7/8	7/8	1-1/8	1-1/8	1-1/8	1-1/8
	mm	16	22	22	28	28	28	28
Discharge Diameter	Inch	1/2	5/8	5/8	5/8	7/8	7/8	7/8
	mm	12	16	16	16	22	22	22
Liquid Diameter	Inch	1/2	1/2	1/2	7/8	7/8	7/8	7/8
	mm	12	12	12	22	22	22	22
Condensing unit weight	Kg	75	110	115	130	155	240	248

TECHNICAL DATA
Air Cooled Refrigeration Condensing Units Low Temperature, CRL Series

UNIT MODEL		CRL -					
HCFC (R-22)		1200-DX	1500-FX	2300-FX	2800-GX	3400-GX	4400-HX
HFC (R-404A, R507A)		1200-DY	1500-FY	2300-FY	2800-GY	3400-GY	4400-HY
COMPRESSOR							
HCFC (R-22)		4PE-12	4JE-15	4GE-23	6HE-28	6GE-34	6FE-44
HFC (R-404A, R-507A)		4PE-12Y	4JE-15Y	4GE-23Y	6HE-28Y	6GE-34Y	6FE-44Y
Displacement	m^3/hr	48.50	63.50	84.50	110.50	126.80	151.60
Number of cylinders		4	4	4	6	6	6
Maximum Operating Current	A	22.7	30.8	43.9	53.2	65.5	83.2
Starting Current	A	59	97	97	141	52.2	219
Power supply voltage	V	380-420	380-420	380-420	380-420	380-420	380-420
Minimum-Maximum	V	360-440	360-440	360-440	360-440	360-440	360-440
Number of phases	**Φ**	3	3	3	3	3	3
Power supply frequency	Hz	50	50	50	50	50	50
Motor connection		YY	YY	YY	YY	YY	YY
Motor protection		SE-B1	SE-B1	SE-B2	SE-B2	SE-B2	SE-B2
Crankcase Heater	W	140	140	140	140	140	140
Oil charge	**Liter**	2.6	4	4.5	4.75	4.75	4.75
Oil type for HCFC refrigerant		B5.2	B5.2	B5.2	B5.2	B5.2	B5.2
Oil type for HFC refrigerant		BSE32	BSE32	BSE32	BSE32	BSE32	BSE32
Net Weight	Kg	139	190	192	228	228	241
CONDENSER FAN							
Quantity		2	2	2	4	4	4
Fan Diameter	mm	450	500	500	500	500	500
Current per motor	A	1.15	0.95	0.95	0.95	0.95	1.30
Total current	A	2.30	1.04	1.04	3.80	3.80	5.20
Power supply voltage	V	400	400	400	400	400	400
Number of phases	**Φ**	3	3	3	3	3	3
Power supply frequency	Hz	50	50	50	50	50	50
Motor connection		Y	Y	Y	Y	Y	Y
Power Input per Motor	W	430	480	480	480	480	650
Total Input Power	W	860	960	960	1920	1920	2600
Number of Blades of Propeller		5	5	5	5	5	5
Air Flow	m^3/hr	5940	10300	10300	19480	19480	23120
	cfm	3504	6076	6076	11492	11492	13640
CONDENSER COIL							
Finned Coil Width	mm	1090	1440	1440	1440	1440	1440
Finned Coil Height	mm	660	840	840	1420	1420	1680
LIQUID RECEIVER							
Capacity	Litre	14	18	24	24	24	40
REFRIGERANT PIPING							
Suction Diameter	Inch mm	1-3/8 35	1-5/8 42	2-1/8 54	2-1/8 54	2-1/8 54	2-1/8 54
Discharge Diameter	Inch mm	1-1/8 28	1-1/8 28	1-1/8 28	1-3/8 35	1-3/8 35	1-5/8 42
Liquid Diameter	Inch mm	7/8 22	7/8 22	7/8 22	7/8 22	7/8 22	7/8 22
Condensing unit weight	Kg	250	330	350	500	510	650

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS MEDIUM TEMPERATURE CRM SERIES

HCFC (R22) CRM 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		10	5	0	-5	-10	-15	-20	-25	-30
CRM-150-AX	27	6,383	5,531	4,741	4,015	3,356	2,765	2,240	1,781	1,383
	32	6,007	5,197	4,447	3,760	3,137	2,578	2,083	1,649	1,272
	37	5,645	4,876	4,166	3,515	2,927	2,400	1,933	1,523	1,166
Q	42	5,297	4,568	3,895	3,281	2,726	2,229	1,789	1,402	1,064
	46	5,027	4,330	3,687	3,101	2,572	2,099	1,679	1,309	
	50		4,099	3,486	2,927	2,423	1,973	1,573		
	27	1.89	1.75	1.63	1.51	1.41	1.30	1.20	1.10	0.99
	32	2.03	1.88	1.74	1.61	1.49	1.37	1.26	1.14	1.02
P	37	2.18	2.01	1.86	1.71	1.57	1.44	1.31	1.17	1.04
	42	2.32	2.14	1.97	1.81	1.65	1.5	1.36	1.21	1.06
	46	2.44	2.24	2.06	1.89	1.72	1.56	1.40	1.24	
	50		2.34	2.15	1.96	1.78	1.61	1.43		
CRM-200-BX	27	7,900	6,808	5,811	4,909	4,099	3,381	2,750	2,200	1,725
	32	7,452	6,410	5,461	4,604	3,837	3,158	2,561	2,042	1,592
	37	7,022	6,028	5,126	4,313	3,587	2,945	2,381	1,890	1,464
Q	42	6,608	5,662	4,805	4,034	3,348	2,741	2,209	1,744	1,339
	46	6,289	5,379	4,558	3,820	3,164	2,585	2,076	1,631	
	50	5,979	5,106	4,319	3,614	2,987	2,433	1,947		
	27	2.16	2.07	1.99	1.92	1.84	1.75	1.66	1.56	1.45
	32	2.34	2.24	2.14	2.04	1.94	1.84	1.73	1.61	1.48
P	37	2.52	2.40	2.28	2.16	2.04	1.92	1.79	1.65	1.50
	42	2.68	2.54	2.41	2.27	2.13	1.99	1.84	1.68	1.52
	46	2.81	2.66	2.51	2.35	2.20	2.04	1.88	1.71	
	50	2.94	2.77	2.6	2.43	2.27	2.09	1.91		
CRM-300-BX	27	13,239	11,517	9,905	8,415	7,054	5,826	4,731	3,767	2,927
	32	12,507	10,864	9,329	7,911	6,617	5,449	4,408	3,490	2,687
	37	11,797	10,233	8,774	7,426	6,197	5,089	4,101	3,228	2,462
Q	42	11,111	9,625	8,240	6,963	5,799	4,749	3,812	2,983	2,253
	46		9,156	7,830	6,608	5,495	4,491	3,595	2,801	
	50			7,435	6,268	5,206	4,248	3,392		
	27	3.95	3.68	3.43	3.18	2.95	2.72	2.49	2.26	2.03
	32	4.23	3.92	3.64	3.37	3.10	2.84	2.58	2.33	2.08
P	37	4.50	4.16	3.85	3.54	3.25	2.96	2.68	2.40	2.12
	42	4.77	4.40	4.06	3.72	3.40	3.08	2.77	2.47	2.17
	46		4.59	4.22	3.86	3.52	3.18	2.85	2.52	
	50			4.38	4.00	3.63	3.27	2.92		

NOTES

(1) **Q: Refrigerating capacity, (Watt).**
(2) P: Total input power include compressor input power and fan motors input power, (kW).
(3) **Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900**
(4) **Suction gas superheat < 20K**

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS MEDIUM TEMPERATURE CRM SERIES

HCFC (R22) CRM 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		10	5	0	-5	-10	-15	-20	-25	-30
CRM-300-CX	27	13,922	12,031	10,288	8,698	7,263	5,981	4,848	3,859	3,002
	32	13,158	11,359	9,698	8,179	6,807	5,580	4,495	3,546	2,721
	37	12,415	10,708	9,127	7,680	6,370	5,198	4,161	3,251	2,459
Q	42	11,697	10,079	8,577	7,200	5,953	4,836	3,847	2,978	2,218
	46	11,139	9,593	8,154	6,833	5,635	4,562	3,612	2,776	
	50		9,122	7,746	6,480	5,332	4,304	3,392		
	27	3.62	3.41	3.21	3.00	2.80	2.59	2.38	2.16	1.94
	32	3.90	3.66	3.42	3.19	2.95	2.72	2.48	2.24	1.99
P	37	4.18	3.90	3.63	3.37	3.11	2.84	2.58	2.31	2.04
	42	4.46	4.14	3.84	3.55	3.26	2.97	2.68	2.39	2.09
	46	4.68	4.34	4.01	3.69	3.38	3.07	2.76	2.45	
	50		4.52	4.17	3.83	3.50	3.17	2.84		
CRM-400-BX	27	15,451	13,515	11,688	9,986	8,421	6,999	5,724	4,594	3,603
	32	14,615	12,770	11,031	9,411	7,921	6,567	5,351	4,272	3,323
	37	13,806	12,052	10,399	8,859	7,442	6,155	4,998	3,969	3,061
Q	42		11,362	9,793	8,332	6,988	5,766	4,667	3,687	
	46			9,328	7,930	6,643	5,473	4,420		
	50				7,546	6,316	5,197			
	27	5.02	4.63	4.27	3.94	3.62	3.31	3.01	2.72	2.43
	32	5.35	4.93	4.53	4.16	3.81	3.47	3.14	2.81	2.5
P	37	5.68	5.22	4.79	4.38	3.99	3.62	3.26	2.91	2.57
	42		5.51	5.04	4.60	4.18	3.78	3.39	3.01	
	46			5.25	4.78	4.34	3.91	3.49		
	50				4.96	4.49	4.04			
CRM-400-CX	27	16,378	14,234	12,240	10,404	8,734	7,231	5,894	4,719	3,697
	32	15,499	13,454	11,552	9,803	8,212	6,781	5,507	4,386	3,407
	37	14,647	12,699	10,888	9,224	7,712	6,351	5,140	4,071	3,135
Q	42	13,823	11,971	10,251	8,671	7,235	5,944	4,794	3,778	
	46	13,185	11,409	9,761	8,247	6,873	5,637	4,535		
	50			9,289	7,842	6,528	5,346			
	27	4.58	4.27	3.98	3.70	3.42	3.15	2.88	2.61	2.33
	32	4.92	4.58	4.25	3.93	3.62	3.31	3.00	2.70	2.40
P	37	5.26	4.88	4.51	4.15	3.81	3.47	3.13	2.80	2.47
	42	5.59	5.17	4.77	4.38	4.00	3.63	3.26	2.90	
	46	5.86	5.41	4.98	4.56	4.15	3.75	3.36		
	50			5.19	4.74	4.31	3.89			

NOTES

(1) **Q: Refrigerating capacity, (Watt).**
(2) P: Total input power include compressor input power and fan motors input power, (kW).
(3) **Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900**
(4) **Suction gas superheat < 20K**

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS MEDIUM TEMPERATURE CRM SERIES

HCFC (R22) CRM 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		10	5	0	-5	-10	-15	-20	-25	-30
CRM-500-DX	27	19,311	16,593	14,108	11,858	9,840	8,051	6,479	5,113	3,936
	32	18,225	15,627	13,257	11,114	9,195	7,495	6,002	4,705	3,586
	37	17,161	14,685	12,428	10,392	8,571	6,960	5,546	4,318	3,257
Q	42	16,126	13,769	11,626	9,696	7,974	6,451	5,117	3,958	2,955
	46	15,321	13,060	11,008	9,162	7,518	6,067	4,797	3,694	2,739
	50	14,539	12,374	10,412	8,652	7,087	5,707	4,502	3,454	
	27	4.83	4.63	4.42	4.20	3.97	3.72	3.46	3.19	2.91
	32	5.19	4.94	4.69	4.43	4.16	3.87	3.58	3.27	2.95
P	37	5.53	5.25	4.96	4.65	4.34	4.02	3.68	3.34	2.99
	42	5.86	5.54	5.21	4.87	4.51	4.15	3.78	3.41	3.03
	46	6.12	5.77	5.40	5.03	4.65	4.26	3.86	3.46	3.07
	50	6.38	5.99	5.59	5.19	4.78	4.36	3.94	3.52	
CRM-750-EX	27	29,329	25,199	21,434	18,034	14,992	12,297	9,935	7,884	6,118
	32	27,714	23,770	20,179	16,940	14,046	11,484	9,238	7,287	5,605
	37	26,131	22,373	18,956	15,878	13,130	10,701	8,572	6,722	5,124
Q	42	24,589	21,015	17,771	14,853	12,253	9,956	7,944	6,196	4,684
	46	23,390	19,963	16,857	14,067	11,584	9,393	7,477	5,811	
	50	22,225	18,945	15,977	13,315	10,950	8,866	7,044		
	27	6.82	6.55	6.26	5.94	5.61	5.25	4.87	4.48	4.06
	32	7.39	7.05	6.69	6.31	5.91	5.50	5.06	4.61	4.15
P	37	7.94	7.53	7.11	6.67	6.21	5.74	5.25	4.75	4.24
	42	8.48	8.01	7.52	7.02	6.50	5.97	5.43	4.88	4.33
	46	8.90	8.38	7.84	7.29	6.73	6.16	5.58	4.99	
	50	9.32	8.75	8.16	7.56	6.96	6.34	5.72		
CRM-1000-EX	27	37,784	32,459	27,589	23,177	19,213	15,684	12,564	9,821	7,416
	32	35,839	30,742	26,085	21,868	18,081	14,708	11,722	9,091	6,772
	37	33,894	29,024	24,581	20,560	16,950	13,733	10,882	8,362	6,132
Q	42	31,949	27,307	23,077	19,253	15,821	12,761	10,045	7,637	
	46	30,393	25,934	21,875	18,208	14,918	11,984	9,377		
	50	28,837	24,562	20,674	17,164	14,017	11,210			
	27	9.06	8.53	8.00	7.47	6.94	6.39	5.84	5.28	4.73
	32	9.67	9.07	8.47	7.87	7.26	6.65	6.03	5.41	4.80
P	37	10.26	9.58	8.91	8.24	7.56	6.88	6.20	5.52	4.85
	42	10.82	10.07	9.32	8.58	7.83	7.09	6.35	5.61	
	46	11.24	10.44	9.64	8.83	8.04	7.24	6.45		
	50	11.65	10.79	9.93	9.07	8.22	7.37			

NOTES

(1) **Q: Refrigerating capacity, (Watt).**
(2) P: Total input power include compressor input power and fan motors input power, (kW).
(3) **Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900**
(4) **Suction gas superheat < 20K**

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS MEDIUM TEMPERATURE CRM SERIES

HCFC (R22) CRM 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		10	5	0	-5	-10	-15	-20	-25	-30
CRM-1200-EX	27	43,952	37,938	32,399	27,345	22,777	18,686	15,050	11,839	9,010
	32	41,721	35,964	30,665	25,833	21,466	17,553	14,071	10,986	8,256
	37	39,489	33,988	28,931	24,321	20,156	16,421	13,093	10,135	7,504
Q	42	37,256	32,012	27,196	22,809	18,846	15,291	12,116	9,286	
	46	35,468	30,431	25,808	21,600	17,799	14,386	11,335	8,608	
	50			24,419	20,390	16,751	13,483	10,556		
	27	11.32	10.56	9.82	9.09	8.37	7.66	6.96	6.26	5.58
	32	12.06	11.21	10.39	9.58	8.78	7.99	7.21	6.44	5.69
P	37	12.76	11.84	10.93	10.04	9.16	8.30	7.44	6.60	5.78
	42	13.44	12.43	11.44	10.47	9.52	8.57	7.65	6.74	
	46	13.95	12.88	11.83	10.80	9.78	8.78	7.79	6.83	
	50			12.20	11.10	10.02	8.96	7.92		
CRM-1500-FX	27	49,953	43,125	36,818	31,050	25,825	21,135	16,961	13,268	10,011
	32	47,301	40,782	34,761	29,253	24,263	19,780	15,783	12,236	9,094
	37	44,648	38,439	32,704	27,458	22,703	18,428	14,609	11,210	8,182
Q	42	41,997	36,098	30,650	25,666	21,147	17,079	13,439	10,188	
	46		34,226	29,008	24,235	19,904	16,004	12,507		
	50			27,369	22,806	18,665	14,932			
	27	13.10	12.15	11.24	10.35	9.48	8.63	7.78	6.95	6.12
	32	13.90	12.86	11.85	10.87	9.90	8.96	8.02	7.10	6.20
P	37	14.66	13.52	12.42	11.34	10.29	9.25	8.23	7.23	6.25
	42	15.38	14.15	12.95	11.78	10.63	9.51	8.40	7.32	
	46		14.62	13.34	12.10	10.88	9.69	8.52		
	50			13.71	12.40	11.11	9.84			
CRM-2000-GX	27	63,339	54,208	45,929	38,481	31,837	25,956	20,784	16,260	12,307
	32	60,121	51,377	43,456	36,338	29,990	24,368	19,420	15,079	11,270
	37	56,902	48,545	40,984	34,195	28,143	22,783	18,057	13,901	10,237
Q	42	53,682	45,712	38,512	32,053	26,298	21,199	16,698	12,727	
	46	51,105	43,446	36,535	30,341	24,824	19,934	15,613	11,791	
	50	48,528	41,180	34,558	28,629	23,350	18,671	14,530		
	27	14.52	13.82	13.08	12.31	11.51	10.68	9.82	8.94	8.05
	32	15.60	14.77	13.90	13.00	12.07	11.12	10.15	9.17	8.19
P	37	16.64	15.67	14.67	13.65	12.60	11.53	10.45	9.37	8.30
	42	17.63	16.53	15.40	14.26	13.09	11.91	10.72	9.54	
	46	18.38	17.18	15.96	14.71	13.45	12.18	10.91	9.65	
	50	19.11	17.80	16.48	15.14	13.78	12.42	11.07		

NOTES

(1) **Q: Refrigerating capacity, (Watt).**
(2) P: Total input power include compressor input power and fan motors input power, (kW).
(3) **Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900**
(4) **Suction gas superheat < 20K**

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS MEDIUM TEMPERATURE CRM SERIES

HCFC (R22) CRM 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		10	5	0	-5	-10	-15	-20	-25	-30
CRM-2500-GX	27	80,524	69,286	59,023	49,730	41,386	33,952	27,377	21,593	16,514
	32	76,421	65,696	55,901	47,030	39,059	31,951	25,651	20,090	15,183
	37	72,315	62,104	52,778	44,328	36,732	29,950	23,926	18,590	13,854
Q	42	68,206	58,509	49,652	41,625	34,404	27,948	22,200	17,089	
	46	64,916	55,631	47,149	39,460	32,539	26,345	20,819	15,888	
	50		52,749	44,643	37,294	30,673	24,741	19,436		
	27	19.88	18.69	17.49	16.29	15.09	13.88	12.67	11.46	10.28
	32	21.30	19.93	18.57	17.21	15.85	14.50	13.15	11.82	10.51
P	37	22.66	21.12	19.60	18.08	16.57	15.07	13.59	12.14	10.72
	42	23.98	22.27	20.58	18.91	17.25	15.61	14.00	12.42	
	46	24.99	23.15	21.33	19.54	17.76	16.01	14.29	12.61	
	50		24.00	22.05	20.13	18.24	16.38	14.56		
CRM-3000-GX	27	90,483	78,232	66,939	56,628	47,301	38,940	31,503	24,927	19,127
	32	85,950	74,243	63,454	53,604	44,691	36,692	29,565	23,242	17,636
	37	81,413	70,251	59,966	50,577	42,078	34,444	27,626	21,556	16,146
Q	42	76,870	66,253	56,474	47,547	39,463	32,192	25,685	19,869	14,654
	46		63,050	53,676	45,119	37,367	30,388	24,129	18,517	
	50			50,874	42,687	35,267	28,580	22,570		
	27	23.45	21.86	20.31	18.81	17.33	15.88	14.45	13.04	11.67
	32	25.02	23.25	21.53	19.86	18.21	16.60	15.02	13.47	11.97
P	37	26.54	24.59	22.70	20.86	19.05	17.29	15.56	13.87	12.24
	42	28.00	25.88	23.83	21.82	19.85	17.93	16.05	14.23	12.47
	46		26.88	24.69	22.55	20.46	18.41	16.42	14.49	
	50			25.52	23.25	21.03	18.87	16.77		
CRM-4000-HX	27	127,871	111,263	95,713	81,322	68,150	56,219	45,511	35,967	27,491
	32	121,269	105,408	90,566	76,834	64,263	52,866	42,618	33,454	25,275
	37	114,662	99,548	85,416	72,344	60,375	49,512	39,725	30,943	23,060
Q	42		93,682	80,260	67,850	56,483	46,157	36,831	28,431	
	46			76,131	64,250	53,366	43,469	34,514	26,420	
	50				60,647	50,246	40,779	32,194		
	27	37.31	34.33	31.54	28.91	26.41	24.01	21.69	19.46	17.31
	32	39.47	36.26	33.23	30.37	27.63	25.00	22.46	20.02	17.68
P	37	41.55	38.11	34.85	31.75	28.77	25.92	23.17	20.53	17.99
	42		39.88	36.39	33.05	29.85	26.77	23.81	20.97	
	46			37.57	34.04	30.66	27.41	24.28	21.28	
	50				34.99	31.42	28.00	24.70		

NOTES

(1) **Q: Refrigerating capacity, (Watt).**
(2) P: Total input power include compressor input power and fan motors input power, (kW).
(3) **Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900**
(4) **Suction gas superheat < 20K**

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS MEDIUM TEMPERATURE CRM SERIES

HCFC (R22) CRM 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		10	5	0	-5	-10	-15	-20	-25	-30
CRM-5000-IX	27	152,584	132,882	114,459	97,419	81,825	67,697	55,009	43,694	33,642
	32	144,760	125,967	108,385	92,114	77,211	63,690	51,521	40,631	30,903
	37	136,927	119,044	102,304	86,803	72,592	59,680	48,032	37,568	28,165
Q	42		112,111	96,215	81,484	67,967	55,666	44,539	34,501	
	46			91,336	77,223	64,261	52,449	41,740		
	50				72,954	60,548	49,225			
	27	48.12	44.46	41.03	37.81	34.75	31.83	29.03	26.36	23.80
	32	50.74	46.79	43.08	39.58	36.25	33.06	30.01	27.10	24.32
P	37	53.29	49.05	45.06	41.27	37.67	34.22	30.92	27.77	24.77
	42		51.23	46.95	42.89	39.02	35.31	31.76	28.37	
	46			48.41	44.13	40.04	36.13	32.38		
	50				45.31	41.01	36.89			

NOTES

(1) **Q: Refrigerating capacity, (Watt).**
(2) P: Total input power include compressor input power and fan motors input power, (kW).
(3) **Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900**
(4) **Suction gas superheat < 20K**

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS MEDIUM TEMPERATURE CRM SERIES

HFC (R134a) CRM 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		10	5	0	-5	-10	-15	-20	-25	-30
CRM-150-AY	32	4,388	3,686	3,068	2,515	2,027	1,600	1,233	919	
	37	4,121	3,459	2,875	2,352	1,889	1,484	1,133	830	
	42	3,854	3,232	2,683	2,191	1,754	1,369	1,035	744	
Q	46	3,640	3,051	2,531	2,063	1,646	1,279	958	677	
	50	3,427	2,871	2,378	1,935	1,540	1,190	882	611	
	54	3,214	2,690	2,227	1,808	1,434	1,102	807	546	
	32	1.26	1.20	1.13	1.06	1.00	0.93	0.86	0.78	
	37	1.33	1.26	1.18	1.11	1.03	0.96	0.87	0.79	
P	42	1.40	1.32	1.24	1.15	1.07	0.98	0.89	0.79	
	46	1.46	1.37	1.28	1.19	1.09	1.00	0.90	0.79	
	50	1.52	1.42	1.32	1.22	1.12	1.01	0.90	0.78	
	54	1.57	1.47	1.36	1.25	1.14	1.02	0.90	0.77	
CRM-200-BY	32	5,381	4,514	3,740	3,055	2,456	1,937	1,491	1,111	
	37	5,067	4,246	3,514	2,866	2,299	1,806	1,381	1,017	
	42	4,754	3,980	3,290	2,679	2,143	1,677	1,274	926	
Q	46	4,505	3,768	3,111	2,530	2,020	1,576	1,190	855	
	50	4,256	3,557	2,934	2,383	1,899	1,476	1,107	786	
	54	4,008	3,346	2,757	2,236	1,778	1,377	1,026	717	
	32	1.63	1.57	1.51	1.44	1.37	1.3	1.22	1.13	
	37	1.72	1.65	1.57	1.50	1.42	1.33	1.24	1.14	
P	42	1.81	1.73	1.64	1.55	1.46	1.36	1.25	1.14	
	46	1.88	1.79	1.69	1.59	1.49	1.38	1.26	1.14	
	50	1.95	1.84	1.74	1.63	1.51	1.39	1.27	1.14	
	54	2.02	1.90	1.78	1.66	1.54	1.41	1.27	1.13	
CRM-300-BY	32	9,296	7,879	6,581	5,410	4,366	3,451	2,660	1,988	
	37	8,684	7,358	6,143	5,045	4,067	3,206	2,460	1,821	
	42	8,075	6,841	5,709	4,685	3,771	2,965	2,264	1,658	
Q	46	7,589	6,428	5,363	4,398	3,536	2,774	2,108	1,529	
	50	7,104	6,016	5,017	4,112	3,302	2,584	1,952	1,400	
	54	6,617	5,603	4,671	3,825	3,067	2,392	1,796	1,270	
	32	2.82	2.61	2.42	2.22	2.04	1.86	1.69	1.52	
	37	2.97	2.74	2.52	2.31	2.11	1.91	1.72	1.54	
P	42	3.11	2.86	2.62	2.38	2.16	1.95	1.74	1.55	
	46	3.21	2.94	2.68	2.43	2.20	1.97	1.76	1.55	
	50	3.30	3.02	2.74	2.48	2.23	1.99	1.76	1.55	
	54	3.39	3.08	2.79	2.51	2.25	2.00	1.76	1.54	

NOTES

(1) Q: Refrigerating capacity, (Watt). **(2) P: Total input power include compressor input power and fan motors input power, (kW).**

(3) Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS MEDIUM TEMPERATURE CRM SERIES

HFC (R134a) CRM 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		10	5	0	-5	-10	-15	-20	-25	-30
CRM-300-CY	32	9,666	8,161	6,790	5,559	4,469	3,518	2,701	2,010	
	37	9,057	7,634	6,343	5,185	4,162	3,269	2,500	1,845	
	42	8,452	7,112	5,900	4,817	3,860	3,025	2,303	1,684	
Q	46	7,969	6,696	5,548	4,525	3,621	2,831	2,147	1,557	
	50	7,488	6,281	5,197	4,233	3,382	2,638	1,991	1,430	
	54	7,006	5,866	4,846	3,941	3,143	2,445	1,835	1,302	
	32	2.64	2.46	2.28	2.11	1.94	1.77	1.60	1.44	
	37	2.80	2.59	2.39	2.20	2.01	1.82	1.63	1.46	
P	42	2.95	2.72	2.50	2.28	2.06	1.86	1.66	1.47	
	46	3.05	2.81	2.57	2.33	2.10	1.88	1.67	1.47	
	50	3.15	2.89	2.63	2.38	2.14	1.90	1.68	1.47	
	54	3.24	2.96	2.69	2.42	2.16	1.91	1.68	1.47	
CRM-400-BY	32	10,935	9,346	7,867	6,514	5,295	4,215	3,274	2,467	
	37	10,221	8,736	7,354	6,088	4,946	3,932	3,045	2,279	
	42	9,507	8,128	6,844	5,666	4,602	3,654	2,821	2,096	
Q	46	8,936	7,641	6,435	5,329	4,327	3,432	2,642	1,949	
	50	8,363	7,153	6,026	4,990	4,051	3,209	2,462	1,802	
	54	7,787	6,662	5,614	4,649	3,773	2,984	2,280	1,651	
	32	3.47	3.19	2.92	2.67	2.44	2.21	2.00	1.80	
	37	3.65	3.34	3.05	2.78	2.52	2.28	2.04	1.83	
P	42	3.82	3.48	3.17	2.87	2.59	2.33	2.08	1.85	
	46	3.94	3.59	3.25	2.94	2.64	2.37	2.10	1.86	
	50	4.05	3.68	3.33	3.00	2.69	2.39	2.12	1.87	
	54	4.15	3.76	3.39	3.05	2.72	2.42	2.13	1.87	
CRM-400-CY	32	11,465	9,735	8,148	6,711	5,431	4,307	3,335	2,508	
	37	10,749	9,119	7,626	6,278	5,076	4,020	3,104	2,319	
	42	10,035	8,506	7,110	5,849	4,726	3,738	2,877	2,135	
Q	46	9,465	8,017	6,697	5,508	4,448	3,513	2,697	1,988	
	50	8,894	7,527	6,284	5,166	4,169	3,289	2,517	1,841	
	54	8,321	7,036	5,870	4,822	3,888	3,062	2,334	1,692	
	32	3.25	3.00	2.77	2.54	2.32	2.11	1.91	1.71	
	37	3.44	3.17	2.91	2.65	2.41	2.18	1.95	1.74	
P	42	3.62	3.32	3.03	2.76	2.49	2.23	1.99	1.76	
	46	3.75	3.43	3.12	2.83	2.54	2.27	2.02	1.78	
	50	3.87	3.53	3.20	2.89	2.59	2.30	2.04	1.79	
	54	3.98	3.62	3.28	2.94	2.63	2.33	2.05	1.79	

NOTES

(1) Q: Refrigerating capacity, (Watt). **(2) P: Total input power include compressor input power and fan motors input power, (kW).**

(3) Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS MEDIUM TEMPERATURE CRM SERIES

HFC (R134a) CRM 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		10	5	0	-5	-10	-15	-20	-25	-30
CRM-500-DY	32	13,380	11,161	9,176	7,426	5,907	4,612	3,529	2,639	
	37	12,510	10,424	8,561	6,919	5,495	4,278	3,255	2,408	
	42	11,643	9,689	7,946	6,412	5,081	3,942	2,979	2,173	
Q	46	10,950	9,101	7,455	6,007	4,750	3,672	2,756	1,983	
	50	10,259	8,514	6,964	5,602	4,418	3,400	2,531	1,791	
	54	9,569	7,929	6,473	5,196	4,086	3,128	2,305	1,597	
	32	3.70	3.49	3.28	3.07	2.86	2.65	2.44	2.24	
	37	3.91	3.67	3.43	3.19	2.95	2.71	2.48	2.25	
P	42	4.10	3.82	3.55	3.28	3.02	2.76	2.50	2.25	
	46	4.23	3.93	3.64	3.35	3.06	2.78	2.51	2.24	
	50	4.35	4.03	3.72	3.40	3.09	2.79	2.50	2.22	
	54	4.46	4.12	3.78	3.44	3.11	2.79	2.49	2.2	
CRM-750-EY	32	20,119	16,805	13,845	11,239	8,979	7,050	5,434	4,101	
	37	18,840	15,721	12,941	10,496	8,376	6,565	5,041	3,776	
	42	17,564	14,638	12,037	9,752	7,771	6,076	4,645	3,446	
Q	46	16,545	13,773	11,313	9,156	7,286	5,684	4,324	3,178	
	50	15,528	12,909	10,591	8,560	6,799	5,289	4,002	2,907	
	54	14,512	12,046	9,868	7,963	6,312	4,892	3,677	2,633	
	32	5.18	4.88	4.57	4.27	3.96	3.65	3.35	3.05	
	37	5.50	5.15	4.80	4.45	4.10	3.76	3.42	3.09	
P	42	5.80	5.40	5.01	4.61	4.22	3.84	3.47	3.11	
	46	6.02	5.58	5.15	4.73	4.3	3.89	3.50	3.12	
	50	6.22	5.75	5.28	4.82	4.37	3.93	3.51	3.11	
	54	6.40	5.90	5.40	4.90	4.42	3.96	3.51	3.10	
CRM-1000-EY	32	25,087	21,033	17,388	14,149	11,307	8,848	6,750	4,982	
	37	23,444	19,626	16,198	13,156	10,489	8,181	6,209	4,541	
	42	21,806	18,225	15,015	12,171	9,680	7,525	5,679	4,113	
Q	46	20,498	17,108	14,073	11,388	9,039	7,006	5,263	3,779	
	50	19,191	15,992	13,133	10,608	8,401	6,491	4,852	3,449	
	54	17,884	14,876	12,195	9,830	7,766	5,980	4,444	3,125	
	32	6.34	5.97	5.57	5.16	4.73	4.28	3.84	3.41	
	37	6.72	6.28	5.82	5.34	4.85	4.36	3.88	3.42	
P	42	7.06	6.55	6.03	5.50	4.96	4.42	3.91	3.42	
	46	7.31	6.75	6.18	5.60	5.03	4.46	3.92	3.41	
	50	7.54	6.93	6.31	5.69	5.08	4.49	3.92	3.40	
	54	7.74	7.09	6.43	5.77	5.13	4.51	3.92	3.39	

NOTES

(1) Q: Refrigerating capacity, (Watt). **(2) P: Total input power include compressor input power and fan motors input power, (kW).**

(3) Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS MEDIUM TEMPERATURE CRM SERIES

HFC (R134a) CRM 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		10	5	0	-5	-10	-15	-20	-25	-30
CRM-1200-EY	32	29,286	24,706	20,546	16,816	13,519	10,647	8,180	6,092	
	37	27,412	23,089	19,172	15,668	12,575	9,881	7,565	5,596	
	42	25,541	21,476	17,805	14,529	11,642	9,128	6,962	5,114	
Q	46	24,045	20,189	16,715	13,623	10,901	8,531	6,488	4,737	
	50	22,548	18,901	15,627	12,719	10,163	7,939	6,018	4,365	
	54	21,050	17,613	14,538	11,815	9,426	7,349	5,551	3,997	
	32	7.73	7.20	6.65	6.09	5.53	4.99	4.47	4.00	
	37	8.20	7.59	6.97	6.34	5.71	5.11	4.54	4.03	
P	42	8.65	7.96	7.26	6.56	5.87	5.20	4.59	4.05	
	46	8.99	8.23	7.47	6.71	5.97	5.27	4.62	4.05	
	50	9.31	8.49	7.67	6.85	6.06	5.32	4.63	4.03	
	54	9.60	8.72	7.84	6.97	6.14	5.35	4.63	4.01	
CRM-1500-FY	32	33,349	28,119	23,351	19,063	15,264	11,948	9,098	6,682	
	37	31,081	26,164	21,689	17,671	14,114	11,008	8,334	6,059	
	42	28,817	24,217	20,037	16,291	12,976	10,082	7,586	5,454	
Q	46	27,009	22,662	18,721	15,192	12,073	9,349	6,997	4,980	
	50	25,203	21,111	17,408	14,098	11,176	8,623	6,415	4,513	
	54	23,396	19,560	16,097	13,008	10,282	7,902	5,839	4,054	
	32	8.78	8.13	7.48	6.82	6.17	5.52	4.88	4.27	
	37	9.28	8.53	7.80	7.06	6.34	5.62	4.94	4.29	
P	42	9.72	8.89	8.07	7.27	6.47	5.70	4.97	4.29	
	46	10.03	9.14	8.26	7.40	6.56	5.74	4.98	4.28	
	50	10.31	9.36	8.42	7.50	6.62	5.77	4.97	4.25	
	54	10.56	9.54	8.55	7.58	6.65	5.77	4.95	4.22	
CRM-2000-GY	32	37,504	31,929	26,774	22,082	17,876	14,168	10,949	8,197	
	37	35,075	29,825	24,981	20,577	16,634	13,155	10,130	7,534	
	42	32,647	27,725	23,194	19,082	15,403	12,157	9,328	6,889	
Q	46	30,704	26,046	21,767	17,890	14,424	11,365	8,695	6,383	
	50	28,759	24,366	20,340	16,700	13,448	10,578	8,068	5,883	
	54	26,809	22,683	18,912	15,509	12,474	9,793	7,444	5,388	
	32	11.71	10.80	9.93	9.08	8.26	7.47	6.71	6.01	
	37	12.25	11.26	10.30	9.38	8.48	7.63	6.82	6.07	
P	42	12.74	11.67	10.63	9.63	8.67	7.75	6.90	6.12	
	46	13.09	11.96	10.86	9.80	8.79	7.83	6.94	6.14	
	50	13.41	12.21	11.05	9.94	8.88	7.88	6.97	6.15	
	54	13.69	12.43	11.21	10.05	8.94	7.91	6.97	6.14	

NOTES

(1) Q: Refrigerating capacity, (Watt). **(2) P: Total input power include compressor input power and fan motors input power, (kW).**

(3) Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS MEDIUM TEMPERATURE CRM SERIES

HFC (R134a) CRM 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		10	5	0	-5	-10	-15	-20	-25	-30
CRM-2500-GY	32	46,251	40,031	34,082	28,507	23,386	18,772	14,696	11,163	
	37	43,262	37,429	31,853	26,627	21,820	17,478	13,622	10,254	
	42	40,275	34,826	29,622	24,744	20,249	16,176	12,539	9,332	
Q	46	37,885	32,742	27,835	23,233	18,987	15,127	11,663	8,584	
	50	35,493	30,656	26,044	21,718	17,719	14,071	10,778	7,825	
	54	33,100	28,568	24,250	20,197	16,444	13,006	9,883	7,054	
	32	15.40	14.10	12.87	11.72	10.63	9.59	8.60	7.67	
	37	16.03	14.65	13.36	12.13	10.96	9.84	8.79	7.79	
P	42	16.62	15.17	13.79	12.48	11.24	10.05	8.92	7.86	
	46	17.05	15.54	14.11	12.74	11.43	10.18	9.00	7.88	
	50	17.46	15.89	14.39	12.96	11.59	10.28	9.03	7.86	
	54	17.83	16.2	14.64	13.14	11.71	10.34	9.03	7.81	
CRM-3000-GY	32	51,479	44,916	38,496	32,377	26,681	21,501	16,895	12,891	
	37	48,118	41,985	35,991	30,274	24,942	20,075	15,721	11,899	
	42	44,750	39,045	33,472	28,152	23,180	18,620	14,513	10,868	
Q	46	42,052	36,685	31,446	26,441	21,752	17,436	13,522	10,016	
	50	39,350	34,320	29,411	24,718	20,310	16,233	12,510	9,139	
	54	36,645	31,948	27,367	22,983	18,853	15,013	11,477	8,238	
	32	18.18	16.48	14.94	13.52	12.19	10.94	9.75	8.61	
	37	18.84	17.06	15.43	13.93	12.52	11.19	9.92	8.71	
P	42	19.46	17.60	15.89	14.29	12.80	11.38	10.03	8.74	
	46	19.93	18.00	16.22	14.55	12.98	11.50	10.08	8.73	
	50	20.39	18.38	16.52	14.78	13.13	11.57	10.09	8.68	
	54	20.81	18.74	16.79	14.97	13.25	11.62	10.06	8.58	
CRM-4000-HY	32	85,592	73,089	61,546	51,052	41,656	33,375	26,186	20,036	
	37	80,402	68,643	57,790	47,915	39,059	31,229	24,399	18,511	
	42	75,112	64,105	53,949	44,705	36,402	29,039	22,584	16,975	
Q	46	70,816	60,415	50,824	42,094	34,243	27,265	21,122	15,749	
	50	66,469	56,679	47,661	39,451	32,062	25,478	19,658	14,533	
	54	62,076	52,904	44,465	36,785	29,867	23,687	18,200	13,335	
	32	25.24	23.18	21.20	19.31	17.49	15.75	14.10	12.56	
	37	26.58	24.34	22.19	20.13	18.14	16.24	14.45	12.76	
P	42	27.81	25.41	23.09	20.86	18.71	16.66	14.72	12.92	
	46	28.72	26.19	23.74	21.38	19.11	16.94	14.90	13.00	
	50	29.57	26.91	24.33	21.84	19.45	17.17	15.03	13.05	
	54	30.35	27.56	24.86	22.25	19.74	17.36	15.12	13.06	

NOTES

(1) Q: Refrigerating capacity, (Watt). **(2) P: Total input power include compressor input power and fan motors input power, (kW).**

(3) Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS MEDIUM TEMPERATURE CRM SERIES

HFC (R134a) CRM 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		10	5	0	-5	-10	-15	-20	-25	-30
CRM-5000-IY	32	100,847	86,328	72,806	60,435	49,320	39,517	31,033	23,824	
	37	94,260	80,664	68,014	56,441	46,030	36,819	28,803	21,929	
	42	87,654	74,981	63,203	52,429	42,722	34,105	26,558	20,021	
Q	46	82,358	70,422	59,343	49,208	40,065	31,923	24,753	18,486	
	50	77,053	65,854	55,473	45,978	37,400	29,734	22,942	16,945	
	54	71,740	61,279	51,596	42,740	34,727	27,539	21,125	15,401	
	32	32.78	30.33	28.01	25.79	23.67	21.64	19.71	17.88	
	37	34.11	31.53	29.05	26.67	24.37	22.18	20.07	18.07	
P	42	35.30	32.59	29.97	27.43	24.97	22.61	20.34	18.18	
	46	36.16	33.35	30.61	27.95	25.37	22.88	20.49	18.22	
	50	36.92	34.01	31.17	28.40	25.70	23.09	20.59	18.20	
	54	37.61	34.60	31.65	28.76	25.95	23.24	20.62	18.13	

NOTES

(1) Q: Refrigerating capacity, (Watt). **(2) P: Total input power include compressor input power and fan motors input power, (kW).**

(3) Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS MEDIUM TEMPERATURE CRM SERIES

HFC (R404A / R507A) CRM 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		10	5	0	-5	-10	-15	-20	-25	-30
CRM-150-AY	27		5,747	5,004	4,301	3,644	3,038	2,488	1,996	1,560
	32		5,285	4,597	3,946	3,337	2,777	2,267	1,809	1,402
	37		4,828	4,194	3,595	3,035	2,520	2,050	1,627	1,250
Q	42		4,375	3,796	3,249	2,739	2,268	1,839	1,452	1,104
	46		4,016	3,481	2,977	2,506	2,072	1,675	1,316	993
	50			3,170	2,708	2,277	1,879	1,515	1,185	886
	27		1.95	1.83	1.71	1.60	1.48	1.37	1.25	1.13
	32		2.06	1.92	1.79	1.66	1.53	1.40	1.27	1.13
P	37		2.16	2.00	1.86	1.71	1.57	1.42	1.28	1.13
	42		2.25	2.08	1.92	1.76	1.60	1.44	1.28	1.12
	46		2.32	2.15	1.97	1.80	1.63	1.46	1.29	1.11
	50			2.20	2.02	1.83	1.65	1.47	1.28	1.10
CRM-200-BY	27		7,141	6,154	5,242	4,410	3,658	2,986	2,392	1,873
	32		6,576	5,659	4,815	4,045	3,350	2,730	2,181	1,700
	37		6,019	5,174	4,397	3,689	3,051	2,481	1,976	1,533
Q	42		5,471	4,696	3,986	3,340	2,758	2,238	1,777	1,371
	46		5,037	4,319	3,661	3,065	2,528	2,048	1,622	1,244
	50		4,607	3,946	3,341	2,794	2,301	1,861	1,469	1,120
	27		2.38	2.27	2.15	2.04	1.92	1.79	1.66	1.53
	32		2.52	2.39	2.26	2.12	1.98	1.84	1.70	1.55
P	37		2.66	2.51	2.36	2.20	2.05	1.89	1.73	1.56
	42		2.80	2.63	2.46	2.28	2.11	1.93	1.75	1.57
	46		2.92	2.73	2.54	2.35	2.16	1.97	1.78	1.58
	50		3.03	2.82	2.62	2.41	2.21	2.00	1.80	1.59
CRM-300-BY	27		11,783	10,362	8,989	7,685	6,467	5,346	4,331	3,423
	32		10,809	9,512	8,257	7,064	5,948	4,918	3,981	3,138
	37		9,818	8,645	7,509	6,428	5,415	4,477	3,620	2,844
Q	42		8,811	7,762	6,747	5,778	4,869	4,024	3,249	2,543
	46			7,046	6,126	5,249	4,423	3,655	2,947	2,297
	50				5,497	4,712	3,971	3,280	2,639	2,047
	27		4.20	3.89	3.60	3.32	3.04	2.77	2.51	2.25
	32		4.39	4.06	3.74	3.44	3.14	2.85	2.57	2.29
P	37		4.55	4.21	3.87	3.54	3.22	2.91	2.61	2.31
	42		4.70	4.33	3.98	3.63	3.29	2.96	2.63	2.32
	46			4.42	4.05	3.68	3.33	2.98	2.64	2.31
	50				4.11	3.73	3.35	2.99	2.63	2.29

NOTES

(1) Q: Refrigerating capacity, (Watt). (2) P: Total input power include compressor input power and fan motors input power, (kW).
(3) Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS MEDIUM TEMPERATURE CRM SERIES

HFC (R404A / R507A) CRM 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		10	5	0	-5	-10	-15	-20	-25	-30
CRM-300-CY	27		12,625	11,007	9,473	8,040	6,719	5,520	4,445	3,495
	32		11,629	10,139	8,727	7,408	6,193	5,087	4,092	3,209
	37		10,614	9,253	7,964	6,761	5,651	4,640	3,728	2,913
Q	42		9,582	8,349	7,184	6,097	5,095	4,180	3,353	2,609
	46			7,614	6,549	5,556	4,641	3,805	3,046	2,361
	50				5,904	5,006	4,179	3,423	2,734	2,108
	27		3.94	3.67	3.41	3.16	2.9	2.65	2.41	2.16
	32		4.15	3.86	3.57	3.29	3.02	2.74	2.47	2.2
P	37		4.34	4.03	3.72	3.41	3.11	2.81	2.52	2.23
	42		4.51	4.17	3.84	3.51	3.18	2.86	2.55	2.24
	46			4.27	3.92	3.57	3.23	2.89	2.56	2.23
	50				3.99	3.63	3.26	2.91	2.56	2.21
CRM-400-BY	27		13,536	12,027	10,537	9,097	7,730	6,454	5,283	4,223
	32		12,389	11,026	9,675	8,363	7,114	5,943	4,863	3,880
	37		11,220	10,005	8,794	7,612	6,481	5,417	4,430	3,525
Q	42			8,966	7,894	6,843	5,832	4,876	3,983	3,158
	46				7,162	6,216	5,302	4,433	3,618	2,859
	50					5,579	4,763	3,983	3,245	2,553
	27		5.23	4.82	4.44	4.06	3.71	3.36	3.03	2.71
	32		5.44	5.01	4.6	4.21	3.83	3.46	3.11	2.77
P	37		5.64	5.19	4.76	4.34	3.94	3.55	3.17	2.81
	42			5.34	4.89	4.45	4.02	3.61	3.21	2.83
	46				4.98	4.52	4.08	3.65	3.23	2.83
	50					4.58	4.12	3.68	3.24	2.83
CRM-400-CY	27		14,701	12,922	11,210	9,589	8,079	6,693	5,439	4,320
	32		13,533	11,900	10,330	8,843	7,457	6,181	5,023	3,984
	37		12,342	10,857	9,429	8,077	6,816	5,653	4,593	3,636
Q	42		11,130	9,792	8,507	7,292	6,157	5,109	4,149	3,277
	46			8,925	7,756	6,651	5,619	4,663	3,785	2,982
	50				6,993	5,999	5,070	4,208	3,414	2,682
	27		4.91	4.55	4.21	3.87	3.55	3.23	2.92	2.62
	32		5.15	4.77	4.40	4.04	3.69	3.34	3.00	2.67
P	37		5.37	4.97	4.57	4.18	3.80	3.43	3.07	2.72
	42		5.57	5.14	4.72	4.31	3.90	3.51	3.12	2.75
	46			5.27	4.82	4.39	3.97	3.55	3.15	2.75
	50				4.92	4.46	4.02	3.58	3.16	2.75

NOTES

(1) Q: Refrigerating capacity, (Watt). **(2) P: Total input power include compressor input power and fan motors input power, (kW).**

(3) **Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900**

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS MEDIUM TEMPERATURE CRM SERIES

HFC (R404A / R507A) CRM 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		10	5	0	-5	-10	-15	-20	-25	-30
CRM-500-DY	27		17,968	15,492	13,185	11,069	9,159	7,463	5,982	4,710
	32		16,578	14,298	12,177	10,235	8,481	6,922	5,557	4,378
	37		15,161	13,077	11,144	9,376	7,780	6,360	5,113	4,029
Q	42		13,719	11,832	10,087	8,493	7,057	5,778	4,650	3,664
	46		12,548	10,818	9,224	7,771	6,464	5,298	4,268	3,361
	50		11,361	9,790	8,346	7,036	5,857	4,807	3,875	3,048
	27		5.30	5.05	4.78	4.50	4.22	3.92	3.62	3.32
	32		5.59	5.31	5.02	4.71	4.39	4.07	3.74	3.41
P	37		5.86	5.55	5.23	4.89	4.55	4.19	3.83	3.47
	42		6.09	5.76	5.41	5.05	4.67	4.29	3.9	3.51
	46		6.26	5.91	5.54	5.15	4.76	4.35	3.94	3.53
	50		6.41	6.04	5.65	5.24	4.82	4.40	3.97	3.54
CRM-750-EY	27		27,380	23,543	20,009	16,794	13,907	11,349	9,112	7,184
	32		25,378	21,816	18,538	15,559	12,885	10,516	8,441	6,647
	37		23,349	20,063	17,044	14,303	11,845	9,667	7,758	6,101
Q	42		21,292	18,284	15,525	13,026	10,787	8,802	7,061	5,544
	46		19,627	16,841	14,293	11,988	9,926	8,099	6,494	5,092
	50		17,943	15,382	13,046	10,937	9,053	7,385	5,919	4,633
	27		7.64	7.25	6.84	6.42	5.98	5.53	5.07	4.6
	32		8.11	7.67	7.21	6.73	6.24	5.74	5.23	4.72
P	37		8.55	8.06	7.54	7.01	6.47	5.92	5.36	4.81
	42		8.96	8.41	7.85	7.27	6.67	6.07	5.47	4.88
	46		9.26	8.67	8.07	7.45	6.82	6.18	5.55	4.92
	50		9.54	8.91	8.27	7.61	6.94	6.27	5.61	4.95
CRM-1000-EY	27		33,649	29,015	24,691	20,712	17,103	13,878	11,038	8,574
	32		31,070	26,744	22,722	19,031	15,691	12,709	10,085	7,804
	37		28,494	24,479	20,759	17,358	14,287	11,551	9,143	7,047
Q	42		25,921	22,217	18,802	15,691	12,892	10,402	8,212	6,302
	46		23,863	20,409	17,239	14,362	11,780	9,489	7,473	5,712
	50			18,603	15,678	13,035	10,672	8,580	6,740	5,129
	27		9.70	9.02	8.35	7.69	7.03	6.37	5.73	5.09
	32		10.21	9.46	8.72	7.99	7.26	6.54	5.83	5.14
P	37		10.70	9.88	9.06	8.26	7.46	6.68	5.92	5.18
	42		11.15	10.26	9.38	8.51	7.65	6.81	5.99	5.20
	46		11.49	10.55	9.61	8.69	7.78	6.89	6.03	5.21
	50			10.82	9.83	8.85	7.89	6.96	6.06	5.21

NOTES

(1) Q: Refrigerating capacity, (Watt). **(2) P: Total input power include compressor input power and fan motors input power, (kW).**

(3) **Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900**

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS MEDIUM TEMPERATURE CRM SERIES

HFC (R404A / R507A) CRM 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		10	5	0	-5	-10	-15	-20	-25	-30
CRM-1200-EY	27		38,770	33,649	28,826	24,351	20,260	16,576	13,308	10,452
	32		35,800	31,036	26,559	22,411	18,625	15,218	12,195	9,549
	37		32,830	28,424	24,294	20,477	16,998	13,870	11,094	8,659
Q	42		29,858	25,812	22,031	18,545	15,375	12,528	10,001	7,780
	46		27,476	23,720	20,219	17,000	14,079	11,458	9,131	7,081
	50			21,625	18,405	15,455	12,782	10,389	8,263	6,386
	27		12.03	11.11	10.21	9.34	8.48	7.64	6.83	6.04
	32		12.65	11.65	10.67	9.71	8.78	7.87	6.98	6.14
P	37		13.24	12.16	11.10	10.06	9.05	8.07	7.12	6.22
	42		13.80	12.64	11.50	10.39	9.31	8.26	7.25	6.29
	46		14.23	13.01	11.81	10.64	9.50	8.39	7.34	6.34
	50			13.35	12.09	10.86	9.67	8.52	7.42	6.38
CRM-1500-FY	27		43,754	38,014	32,560	27,463	22,780	18,547	14,783	11,489
	32		40,274	34,945	29,891	25,177	20,851	16,943	13,467	10,421
	37		36,799	31,882	27,231	22,902	18,935	15,354	12,169	9,372
Q	42		33,329	28,826	24,579	20,637	17,031	13,780	10,887	8,341
	46			26,385	22,463	18,832	15,516	12,531	9,873	7,529
	50				20,351	17,032	14,008	11,289	8,868	6,727
	27		13.79	12.66	11.58	10.53	9.51	8.51	7.55	6.61
	32		14.45	13.23	12.05	10.9	9.79	8.71	7.66	6.66
P	37		15.06	13.75	12.48	11.24	10.04	8.88	7.76	6.69
	42		15.62	14.22	12.86	11.54	10.26	9.01	7.82	6.69
	46			14.58	13.15	11.75	10.4	9.10	7.85	6.67
	50				13.4	11.94	10.53	9.17	7.87	6.65
CRM-2000-GY	27		57,449	49,315	41,813	34,983	28,845	23,404	18,647	14,546
	32		53,106	45,530	38,559	32,225	26,542	21,510	17,111	13,312
	37		48,763	41,748	35,311	29,476	24,251	19,630	15,591	12,098
Q	42		44,417	37,966	32,066	26,732	21,968	17,761	14,084	10,898
	46		40,936	34,937	29,468	24,538	20,144	16,269	12,884	9,945
	50		37,448	31,903	26,867	22,342	18,320	14,779	11,687	8,997
	27		15.87	14.9	13.9	12.89	11.87	10.84	9.81	8.80
	32		16.82	15.71	14.59	13.45	12.3	11.16	10.03	8.93
P	37		17.73	16.48	15.23	13.97	12.71	11.46	10.24	9.06
	42		18.58	17.21	15.83	14.45	13.08	11.73	10.42	9.17
	46		19.24	17.76	16.28	14.81	13.36	11.93	10.56	9.25
	50		19.86	18.29	16.71	15.15	13.62	12.12	10.68	9.32

NOTES

(1) Q: Refrigerating capacity, (Watt). (2) P: Total input power include compressor input power and fan motors input power, (kW).

(3) Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS MEDIUM TEMPERATURE CRM SERIES

HFC (R404A / R507A) CRM 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		10	5	0	-5	-10	-15	-20	-25	-30
CRM-2500-GY	27		70,434	61,207	52,552	44,538	37,213	30,604	24,718	19,540
	32		65,136	56,580	48,562	41,143	34,362	28,241	22,779	17,957
	37		59,775	51,894	44,519	37,701	31,472	25,845	20,816	16,360
Q	42		54,354	47,152	40,425	34,214	28,543	23,420	18,831	14,750
	46		49,974	43,319	37,115	31,394	26,176	21,460	17,231	13,456
	50			39,454	33,775	28,549	23,788	19,485	15,621	12,158
	27		21.22	19.73	18.27	16.86	15.47	14.10	12.76	11.44
	32		22.32	20.69	19.1	17.55	16.03	14.54	13.08	11.65
P	37		23.33	21.57	19.85	18.17	16.52	14.91	13.33	11.8
	42		24.26	22.38	20.53	18.72	16.95	15.21	13.53	11.89
	46		24.95	22.96	21.01	19.1	17.23	15.41	13.64	11.92
	50			23.5	21.45	19.44	17.47	15.56	13.71	11.92
CRM-3000-GY	27		78,021	68,200	58,868	50,133	42,077	34,751	28,185	22,376
	32		71,991	62,942	54,343	46,290	38,858	32,090	26,008	20,607
	37		65,880	57,608	49,747	42,383	35,582	29,382	23,795	18,813
Q	42		59,693	52,203	45,085	38,418	32,256	26,632	21,552	16,999
	46		54,691	47,830	41,311	35,206	29,563	24,407	19,739	15,539
	50			43,416	37,501	31,963	26,844	22,162	17,913	14,074
	27		24.82	22.96	21.17	19.43	17.74	16.10	14.50	12.94
	32		25.95	23.97	22.05	20.18	18.36	16.59	14.87	13.19
P	37		27.00	24.89	22.85	20.85	18.91	17.01	15.17	13.38
	42		27.95	25.73	23.56	21.44	19.37	17.36	15.40	13.51
	46		28.65	26.33	24.07	21.85	19.69	17.58	15.54	13.57
	50			26.88	24.52	22.21	19.95	17.76	15.63	13.59
CRM-4000-HY	27		106,300	93,850	81,746	70,197	59,368	49,383	40,324	32,233
	32		97,834	86,446	75,352	64,747	54,783	45,573	37,188	29,661
	37		89,283	78,965	68,889	59,237	50,149	41,723	34,023	27,068
Q	42		80,631	71,390	62,340	53,649	45,443	37,811	30,802	24,429
	46			65,251	57,027	49,109	41,614	34,621	28,171	22,267
	50				51,637	44,496	37,715	31,365	25,477	20,047
	27		37.64	34.77	32.01	29.33	26.74	24.23	21.79	19.45
	32		39.22	36.20	33.26	30.42	27.66	24.97	22.37	19.85
P	37		40.71	37.52	34.43	31.41	28.48	25.62	22.85	20.17
	42		42.09	38.75	35.49	32.30	29.19	26.17	23.22	20.38
	46			39.65	36.25	32.93	29.68	26.52	23.44	20.45
	50				36.93	33.47	30.09	26.78	23.56	20.44

NOTES

(1) Q: Refrigerating capacity, (Watt). **(2) P: Total input power include compressor input power and fan motors input power, (kW).**

(3) **Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900**

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS MEDIUM TEMPERATURE CRM SERIES

HFC (R404A / R507A) CRM 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		10	5	0	-5	-10	-15	-20	-25	-30
CRM-5000-IY	27		128,287	113,054	98,490	84,740	71,919	60,118	49,399	39,799
	32		117,467	103,901	90,760	78,226	66,446	55,529	45,548	36,540
	37		106,522	94,634	82,923	71,612	60,878	50,851	41,613	33,203
Q	42		95,451	85,250	74,977	64,896	55,214	46,081	37,592	29,784
	46			77,658	68,542	59,449	50,613	42,199	34,311	26,989
	50				62,036	53,936	45,947	38,255	30,972	24,139
	27		49.31	45.85	42.42	39.04	35.72	32.49	29.36	26.36
	32		51.24	47.51	43.85	40.25	36.73	33.30	29.97	26.77
P	37		53.01	49.03	45.14	41.32	37.59	33.96	30.43	27.03
	42		54.62	50.40	46.27	42.24	38.31	34.47	30.74	27.12
	46			51.37	47.07	42.87	38.77	34.77	30.86	27.08
	50				47.77	43.40	39.13	34.96	30.88	26.91

NOTES

(1) Q: Refrigerating capacity, (Watt). **(2) P: Total input power include compressor input power and fan motors input power, (kW).**

(3) Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS LOW TEMPERATURE CRL SERIES

HCFC (R22) CRL 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		0	-5	-10	-15	-20	-25	-30	-35	-40
CRL-150-AX	27	5,409	4,602	3,870	3,214	2,632	2,120	1,673	1,287	952
	32	5,094	4,322	3,627	3,005	2,454	1,971	1,548	1,181	862
	37	4,791	4,055	3,394	2,805	2,284	1,827	1,427	1,078	771
Q	42	4,500	3,798	3,171	2,613	2,121	1,689	1,310	976	
	46	4,276	3,601	2,999	2,465	1,995	1,581	1,217		
	50	4,058	3,409	2,832	2,322	1,872	1,476			
	27	1.91	1.79	1.68	1.57	1.45	1.34	1.21	1.08	0.94
	32	2.04	1.91	1.77	1.64	1.51	1.38	1.24	1.09	0.93
P	37	2.16	2.01	1.86	1.72	1.57	1.41	1.25	1.09	0.92
	42	2.28	2.11	1.95	1.78	1.61	1.44	1.27	1.09	
	46	2.37	2.19	2.01	1.83	1.65	1.47	1.28		
	50	2.45	2.26	2.07	1.88	1.69	1.49			
CRL-200-BX	27		8,395	7,034	5,813	4,730	3,778	2,951	2,240	1,634
	32		7,903	6,601	5,435	4,402	3,496	2,709	2,031	1,449
	37		7,432	6,186	5,075	4,092	3,230	2,480	1,833	1,275
Q	42		6,982	5,793	4,734	3,799	2,980	2,267	1,649	
	46		6,638	5,493	4,476	3,579	2,794	2,109		
	50			5,209	4,233	3,373	2,620			
	27		3.25	3.00	2.75	2.51	2.26	2.02	1.79	1.56
	32		3.44	3.16	2.88	2.61	2.33	2.07	1.81	1.56
P	37		3.63	3.32	3.01	2.71	2.41	2.11	1.83	1.56
	42		3.82	3.48	3.14	2.81	2.48	2.16	1.85	
	46		3.98	3.61	3.24	2.89	2.54	2.20		
	50			3.74	3.35	2.97	2.60			
CRL-300-BX	27		9,991	8,412	6,990	5,722	4,604	3,628	2,786	2,065
	32		9,426	7,913	6,554	5,345	4,278	3,347	2,542	1,848
	37		8,885	7,438	6,141	4,987	3,971	3,083	2,312	1,644
Q	42		8,370	6,988	5,750	4,652	3,684	2,837	2,098	
	46		7,978	6,646	5,457	4,401	3,471	2,655		
	50									
	27		3.99	3.66	3.34	3.02	2.72	2.42	2.13	1.86
	32		4.23	3.86	3.50	3.15	2.81	2.48	2.17	1.87
P	37		4.47	4.06	3.67	3.28	2.91	2.55	2.21	1.89
	42		4.71	4.27	3.84	3.42	3.01	2.63	2.26	
	46		4.91	4.43	3.97	3.53	3.10	2.69		
	50									

NOTES

(1) Q: Refrigerating capacity, (Watt). (2) P: Total input power include compressor input power and fan motors input power, (kW).
(3) Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900
(4) Suction gas superheat < 20K (5) Controlled Injection Cooling (CIC)

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS LOW TEMPERATURE CRL SERIES

HCFC (R22) CRL 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		0	-5	-10	-15	-20	-25	-30	-35	-40
CRL-400-BX	27		12,763	10,786	8,986	7,366	5,923	4,653	3,549	2,596
	32		12,010	10,110	8,386	6,838	5,463	4,255	3,203	2,294
	37		11,290	9,466	7,817	6,342	5,034	3,885	2,884	2,018
Q	42		10,609	8,860	7,286	5,881	4,638	3,548	2,597	
	46				6,890	5,542	4,351			
	50									
	27		5.53	4.98	4.45	3.96	3.49	3.04	2.62	2.22
	32		5.82	5.21	4.64	4.10	3.59	3.10	2.64	2.21
P	37		6.10	5.45	4.83	4.25	3.69	3.16	2.67	2.20
	42		6.37	5.68	5.02	4.39	3.79	3.23	2.70	
	46				5.17	4.50	3.87			
	50									
CRL-500-CX	27		15,552	13,137	10,944	8,976	7,227	5,692	4,358	3,211
	32		14,655	12,332	10,231	8,350	6,684	5,222	3,952	2,857
	37		13,797	11,565	9,555	7,760	6,174	4,784	3,576	2,531
Q	42		12,981	10,841	8,920	7,211	5,704	4,385	3,237	
	46				8,446	6,806	5,361			
	50									
	27		6.30	5.68	5.10	4.54	4.02	3.51	3.03	2.57
	32		6.64	5.97	5.33	4.73	4.15	3.59	3.07	2.57
P	37		6.98	6.26	5.57	4.91	4.28	3.68	3.11	2.58
	42		7.31	6.54	5.8	5.10	4.42	3.77	3.17	
	46				5.99	5.24	4.53			
	50									
CRL-750-DX	27		21,737	18,189	14,976	12,092	9,525	7,253	5,813	4,146
	32		20,503	17,073	13,985	11,227	8,778	6,613	5,317	3,747
	37		19,271	15,958	12,995	10,361	8,030	6,469	4,761	3,290
Q	42		18,038	14,842	12,003	9,494	7,644	5,793	4,192	2,818
	46				11,209	9,079	7,046	5,282	3,761	2,459
	50							4,824	3,377	2,141
	27		8.03	7.29	6.59	5.92	5.27	4.66	4.14	3.51
	32		8.42	7.62	6.85	6.11	5.4	4.73	4.22	3.55
P	37		8.79	7.92	7.08	6.28	5.51	4.95	4.27	3.56
	42		9.13	8.20	7.29	6.42	5.73	5.00	4.27	3.5
	46				7.44	6.59	5.77	4.99	4.21	3.41
	50							4.92	4.10	3.26

NOTES

(1) Q: Refrigerating capacity, (Watt). (2) P: Total input power include compressor input power and fan motors input power, (kW).
(3) Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900
(4) Suction gas superheat < 20K (5) Controlled Injection Cooling (CIC)

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS LOW TEMPERATURE CRL SERIES

HCFC (R22) CRL 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		0	-5	-10	-15	-20	-25	-30	-35	-40
CRL-900-DX	27		25,406	21,401	17,732	14,408	11,423	8,762	7,024	5,049
	32		23,986	20,136	16,619	13,437	10,582	8,547	6,362	4,478
	37		22,565	18,870	15,504	12,464	10,158	7,790	5,714	3,923
Q	42			17,602	14,386	11,487	9,297	7,055	5,090	3,393
	46					11,040	8,630	6,489	4,613	2,993
	50							5,947	4,162	2,619
	27		9.83	8.85	7.95	7.10	6.30	5.54	4.95	4.19
	32		10.30	9.24	8.26	7.34	6.47	5.83	5.10	4.32
P	37		10.74	9.61	8.56	7.56	6.76	5.99	5.22	4.39
	42			9.96	8.82	7.75	6.92	6.09	5.26	4.39
	46					7.93	6.99	6.10	5.22	4.31
	50							6.04	5.10	4.14
CRL-1200-DX	27		28,225	23,773	19,672	15,938	12,571	9,557	7,941	5,661
	32		26,583	22,237	18,280	14,706	11,503	8,644	7,221	5,090
	37		24,942	20,703	16,887	13,474	10,433	8,604	6,495	4,507
Q	42				15,494	12,240	10,427	7,944	5,784	3,929
	46						9,656	7,289	5,239	3,481
	50								4,725	3,055
	27		11.13	9.96	8.87	7.87	6.92	6.02	5.6	4.83
	32		11.57	10.34	9.18	8.09	7.06	6.08	5.66	4.86
P	37		11.98	10.69	9.45	8.28	7.16	6.62	5.71	4.88
	42				9.68	8.42	7.78	6.73	5.76	4.89
	46						7.92	6.80	5.79	4.90
	50								5.82	4.89
CRL-1500-FX	27		39,440	33,158	27,477	22,390	17,875	13,895	10,069	7,072
	32		37,163	31,106	25,664	20,813	16,520	12,737	9,141	6,287
	37		34,914	29,083	23,878	19,261	15,187	11,431	8,256	5,552
Q	42			27,089	22,120	17,736	13,930	10,441	7,443	4,895
	46					16,889	13,043	9,714	6,861	4,441
	50							9,060	6,356	4,066
	27		14.00	12.73	11.53	10.38	9.27	8.22	7.12	6.13
	32		14.62	13.27	11.98	10.74	9.55	8.42	7.19	6.09
P	37		15.18	13.75	12.37	11.04	9.77	8.53	7.27	6.04
	42			14.17	12.70	11.29	10.20	8.75	7.36	5.99
	46					12.16	10.53	8.97	7.45	5.96
	50							9.22	7.57	5.95

NOTES

(1) Q: Refrigerating capacity, (Watt). (2) P: Total input power include compressor input power and fan motors input power, (kW).
(3) Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900
(4) Suction gas superheat < 20K (5) Controlled Injection Cooling (CIC)

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS LOW TEMPERATURE CRL SERIES

HCFC (R22) CRL 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		0	-5	-10	-15	-20	-25	-30	-35	-40
CRL-2300-FX	27		50,862	43,113	36,069	29,720	24,043	19,000	13,217	9,430
	32		48,038	40,589	33,846	27,788	22,376	17,564	12,010	8,380
	37			38,095	31,653	25,881	20,732	14,876	10,848	7,383
Q	42					23,080	18,031	13,611	9,779	6,487
	46						16,936	12,694	9,024	5,876
	50								8,386	5,385
	27		20.40	18.31	16.38	14.59	12.92	11.38	9.46	8.11
	32		21.31	19.11	17.06	15.15	13.37	11.74	9.64	8.11
P	37			19.84	17.67	15.65	13.77	11.67	9.82	8.08
	42					16.43	14.25	12.11	10.03	8.04
	46						14.85	12.52	10.24	8.02
	50								10.49	8.03
CRL-2800-GX	27		68,608	57,859	48,131	39,408	31,652	24,802	17,453	12,324
	32		64,748	54,392	45,074	36,753	29,371	22,850	15,842	10,958
	37		60,934	50,971	42,060	34,138	27,124	19,714	14,292	9,663
Q	42			47,597	39,091	30,823	23,959	17,995	12,865	8,498
	46					29,045	22,451	16,746	11,854	7,699
	50								10,994	7,051
	27		25.60	23.21	20.97	18.85	16.84	14.95	12.66	10.94
	32		26.76	24.23	21.83	19.55	17.40	15.37	12.79	10.87
P	37		27.84	25.16	22.60	20.17	17.87	15.13	12.91	10.77
	42			26.00	23.29	20.79	18.09	15.52	13.04	10.66
	46					21.58	18.68	15.89	13.20	10.60
	50								13.42	10.58
CRL-3400-GX	27		79,088	66,728	55,541	45,509	36,587	28,705	20,244	14,337
	32		74,674	62,767	52,051	42,479	33,985	25,005	18,428	12,783
	37		70,313	58,857	48,609	39,493	30,157	22,921	16,656	11,288
Q	42			55,000	45,216	35,733	27,834	20,949	15,007	9,927
	46					33,696	26,102	19,507	13,830	8,985
	50								12,824	8,215
	27		29.63	26.78	24.11	21.60	19.25	17.04	14.58	12.62
	32		31.05	28.02	25.16	22.46	19.92	17.21	14.84	12.61
P	37		32.38	29.16	26.10	23.22	20.52	17.77	15.12	12.58
	42			30.21	26.95	24.53	21.46	18.42	15.44	12.54
	46					25.62	22.32	19.02	15.74	12.51
	50								16.09	12.51

NOTES

(1) Q: Refrigerating capacity, (Watt). (2) P: Total input power include compressor input power and fan motors input power, (kW).
(3) Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900
(4) Suction gas superheat < 20K (5) Controlled Injection Cooling (CIC)

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS LOW TEMPERATURE CRL SERIES

HCFC (R22) CRL 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		0	-5	-10	-15	-20	-25	-30	-35	-40
CRL-4400-HX	27		94,899	80,075	66,693	54,717	44,081	34,691	24,344	17,397
	32		89,671	75,424	62,618	51,189	41,050	30,022	22,292	15,637
	37		84,504	70,832	58,598	47,710	36,144	27,638	20,252	13,898
Q	42				54,631	42,795	33,501	25,379	18,341	12,296
	46						31,552	23,739	16,984	11,188
	50								15,845	10,298
	27		35.77	32.53	29.47	26.57	23.83	21.25	17.72	15.63
	32		37.41	33.96	30.69	27.58	24.65	20.96	18.14	15.64
P	37		38.95	35.29	31.81	28.50	25.14	21.72	18.54	15.62
	42				32.82	30.02	26.17	22.47	18.93	15.59
	46						27.00	23.07	19.24	15.56
	50								19.56	15.53

NOTES

(1) Q: Refrigerating capacity, (Watt). **(2) P: Total input power include compressor input power and fan motors input power, (kW).**
(3) Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900
(4) **Suction gas superheat < 20K** **(5)** **Controlled Injection Cooling (CIC)**

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS LOW TEMPERATURE CRL SERIES

HFC (R404A / R507A) CRL 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		0	-5	-10	-15	-20	-25	-30	-35	-40
CRL-150-AY	27	5,562	4,798	4,085	3,427	2,829	2,290	1,812	1,392	1,028
	32	5,107	4,403	3,746	3,140	2,587	2,089	1,646	1,254	910
	37	4,659	4,015	3,414	2,859	2,352	1,895	1,485	1,121	798
Q	42	4,217	3,633	3,087	2,584	2,123	1,705	1,329	992	689
	46	3,867	3,331	2,830	2,367	1,942	1,556	1,207	891	604
	50	3,521	3,032	2,575	2,153	1,764	1,409	1,087	792	520
	27	2.16	2.01	1.86	1.72	1.57	1.43	1.29	1.14	0.99
	32	2.28	2.11	1.94	1.78	1.62	1.46	1.30	1.14	0.98
P	37	2.39	2.2	2.02	1.84	1.66	1.49	1.32	1.14	0.97
	42	2.50	2.29	2.09	1.90	1.7	1.52	1.33	1.14	0.96
	46	2.59	2.37	2.15	1.94	1.74	1.54	1.34	1.14	0.95
	50	2.69	2.45	2.22	1.99	1.77	1.56	1.35	1.14	0.93
CRL-200-BY	27	10,388	8,988	7,675	6,457	5,342	4,334	3,434	2,639	1,945
	32	9,550	8,264	7,056	5,936	4,908	3,977	3,143	2,402	1,750
	37		7,526	6,425	5,402	4,464	3,611	2,844	2,158	1,549
Q	42		6,775	5,782	4,858	4,010	3,236	2,538	1,909	1,344
	46		6,166	5,259	4,416	3,640	2,932	2,289	1,707	1,179
	50			4,730	3,968	3,265	2,623	2,037	1,502	1,013
	27	4.00	3.69	3.38	3.09	2.80	2.52	2.25	1.99	1.74
	32	4.19	3.84	3.51	3.19	2.88	2.58	2.29	2.01	1.74
P	37		3.98	3.63	3.28	2.95	2.63	2.32	2.02	1.73
	42		4.10	3.72	3.35	3.00	2.65	2.32	2.01	1.71
	46		4.18	3.78	3.40	3.02	2.66	2.31	1.99	1.67
	50			3.83	3.43	3.03	2.66	2.30	1.95	1.63
CRL-300-BY	27	12,054	10,542	9,090	7,719	6,444	5,275	4,220	3,278	2,447
	32	11,075	9,690	8,360	7,103	5,931	4,854	3,877	3,000	2,219
	37		8,822	7,614	6,471	5,404	4,421	3,524	2,714	1,985
Q	42		7,939	6,854	5,826	4,865	3,976	3,162	2,420	1,745
	46		7,221	6,235	5,301	4,425	3,613	2,866	2,180	1,551
	50			5,609	4,768	3,979	3,245	2,566	1,938	1,354
	27	4.95	4.53	4.13	3.75	3.39	3.04	2.71	2.4	2.1
	32	5.16	4.71	4.28	3.88	3.49	3.12	2.77	2.43	2.11
P	37		4.88	4.42	3.99	3.58	3.18	2.81	2.45	2.12
	42		5.02	4.54	4.08	3.65	3.23	2.83	2.46	2.1
	46		5.12	4.62	4.15	3.69	3.25	2.84	2.45	2.08
	50			4.69	4.19	3.72	3.26	2.83	2.43	2.05

NOTES

(1) Q: Refrigerating capacity, (Watt). **(2) P: Total input power include compressor input power and fan motors input power, (kW).**

(3) **Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900**

(4) **Suction gas superheat < 20K**

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS LOW TEMPERATURE CRL SERIES

HFC (R404A / R507A) CRL 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		0	-5	-10	-15	-20	-25	-30	-35	-40
CRL-400-BY	27	14,888	13,195	11,500	9,850	8,283	6,831	5,513	4,343	3,325
	32		12,083	10,541	9,039	7,612	6,285	5,076	3,994	3,043
	37		10,959	9,570	8,217	6,929	5,728	4,628	3,636	2,753
Q	42		9,824	8,588	7,384	6,236	5,162	4,172	3,271	2,456
	46			7,795	6,710	5,675	4,703	3,801	2,974	2,216
	50				6,032	5,109	4,239	3,427	2,674	1,973
	27	7.06	6.40	5.78	5.19	4.63	4.10	3.60	3.14	2.71
	32		6.62	5.97	5.36	4.77	4.21	3.68	3.19	2.73
P	37		6.82	6.15	5.50	4.88	4.30	3.74	3.22	2.74
	42		7.00	6.30	5.62	4.98	4.36	3.78	3.23	2.72
	46			6.40	5.70	5.03	4.39	3.79	3.22	2.70
	50				5.76	5.07	4.41	3.79	3.20	2.67
CRL-500-CY	27	18,499	16,271	14,095	12,017	10,071	8,285	6,675	5,250	4,009
	32		14,985	12,981	11,069	9,279	7,635	6,149	4,828	3,669
	37		13,688	11,856	10,110	8,478	6,976	5,617	4,402	3,326
Q	42			10,719	9,141	7,667	6,310	5,078	3,970	2,980
	46			9,803	8,359	7,013	5,773	4,643	3,623	2,702
	50				7,572	6,353	5,230	4,205	3,273	2,423
	27	8.04	7.29	6.58	5.91	5.28	4.67	4.10	3.57	3.07
	32		7.56	6.82	6.11	5.44	4.8	4.19	3.63	3.10
P	37		7.81	7.04	6.29	5.58	4.91	4.27	3.67	3.11
	42			7.23	6.45	5.71	4.99	4.32	3.69	3.11
	46			7.37	6.56	5.79	5.05	4.35	3.7	3.10
	50				6.65	5.85	5.09	4.37	3.69	3.08
CRL-750-DY	27	25,959	22,387	19,035	15,932	13,102	10,558	8,306	6,342	4,654
	32	23,933	20,596	17,473	14,591	11,967	9,612	7,529	5,709	4,139
	37		18,826	15,933	13,271	10,853	8,686	6,769	5,093	3,639
Q	42		17,075	14,412	11,968	9,756	7,776	6,025	4,489	3,149
	46		15,685	13,205	10,937	8,888	7,057	5,437	4,013	2,763
	50			12,008	9,914	8,028	6,344	4,855	3,541	2,379
	27	9.97	9.01	8.10	7.25	6.46	5.70	5.00	4.34	3.72
	32	10.42	9.38	8.40	7.48	6.62	5.81	5.05	4.34	3.69
P	37		9.74	8.69	7.70	6.77	5.9	5.09	4.33	3.65
	42		10.07	8.96	7.90	6.91	5.98	5.12	4.33	3.61
	46		10.33	9.16	8.05	7.01	6.04	5.14	4.31	3.58
	50			9.35	8.19	7.10	6.09	5.15	4.30	3.54

NOTES

(1) Q: Refrigerating capacity, (Watt). **(2) P: Total input power include compressor input power and fan motors input power, (kW).**

(3) **Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900**

(4) **Suction gas superheat < 20K**

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS LOW TEMPERATURE CRL SERIES

HFC (R404A / R507A) CRL 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		0	-5	-10	-15	-20	-25	-30	-35	-40
CRL-900-DY	27	29,688	25,838	22,179	18,753	15,595	12,727	10,164	7,907	5,951
	32	27,348	23,766	20,365	17,185	14,256	11,599	9,223	7,127	5,301
	37		21,701	18,559	15,625	12,927	10,481	8,293	6,359	4,665
Q	42		19,640	16,758	14,072	11,605	9,371	7,372	5,601	4,039
	46			15,320	12,832	10,551	8,487	6,640	4,999	3,544
	50				11,595	9,499	7,605	5,910	4,400	3,051
	27	12.26	11.04	9.90	8.83	7.83	6.89	6.03	5.23	4.50
	32	12.77	11.47	10.26	9.12	8.05	7.05	6.12	5.27	4.50
P	37		11.88	10.60	9.39	8.25	7.19	6.20	5.30	4.48
	42		12.27	10.91	9.63	8.43	7.31	6.27	5.32	4.46
	46			11.14	9.81	8.56	7.39	6.31	5.32	4.44
	50				9.97	8.67	7.46	6.33	5.31	4.40
CRL-1200-DY	27	32,493	28,422	24,458	20,681	17,154	13,926	11,026	8,470	6,255
	32		26,082	22,411	18,916	15,655	12,670	9,985	7,611	5,541
	37		23,742	20,364	17,153	14,160	11,419	8,951	6,761	4,839
Q	42		21,404	18,320	15,394	12,670	10,176	7,926	5,923	4,152
	46			16,688	13,992	11,484	9,188	7,116	5,264	3,615
	50			15,061	12,595	10,304	8,209	6,315	4,616	3,091
	27	13.74	12.34	11.03	9.81	8.66	7.59	6.58	5.65	4.80
	32		12.70	11.32	10.03	8.82	7.68	6.62	5.63	4.73
P	37		13.01	11.57	10.21	8.94	7.74	6.61	5.57	4.63
	42		13.27	11.77	10.35	9.01	7.75	6.57	5.48	4.49
	46			11.9	10.43	9.04	7.73	6.51	5.38	4.36
	50			12.00	10.48	9.03	7.68	6.42	5.25	4.20
CRL-1500-FY	27	47,542	41,400	35,569	30,114	25,082	20,506	16,401	12,765	9,581
	32		38,231	32,819	27,756	23,084	18,831	15,008	11,611	8,617
	37		35,043	30,053	25,385	21,075	17,149	13,612	10,457	7,658
Q	42		31,840	27,274	23,002	19,058	15,462	12,215	9,306	6,707
	46		29,268	25,042	21,090	17,441	14,110	11,098	8,390	5,955
	50			22,804	19,173	15,821	12,759	9,984	7,479	5,210
	27	17.70	16.09	14.58	13.16	11.81	10.53	9.31	8.15	7.06
	32		16.73	15.12	13.6	12.15	10.77	9.46	8.22	7.06
P	37		17.32	15.60	13.98	12.43	10.96	9.57	8.25	7.01
	42		17.85	16.03	14.3	12.66	11.1	9.62	8.23	6.92
	46		18.23	16.33	14.53	12.81	11.18	9.63	8.18	6.82
	50			16.6	14.71	12.92	11.22	9.61	8.09	6.69

NOTES

(1) Q: Refrigerating capacity, (Watt). **(2) P: Total input power include compressor input power and fan motors input power, (kW).**

(3) **Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900**

(4) **Suction gas superheat < 20K**

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS LOW TEMPERATURE CRL SERIES

HFC (R404A / R507A) CRL 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		0	-5	-10	-15	-20	-25	-30	-35	-40
CRL-2300-FY	27		50,954	44,619	38,440	32,544	27,029	21,967	17,398	13,337
	32		46,873	41,085	35,426	30,015	24,941	20,264	16,021	12,217
	37		42,752	37,512	32,378	27,456	22,826	18,542	14,631	11,093
Q	42			33,906	29,299	24,872	20,693	16,807	13,236	9,974
	46			31,001	26,819	22,790	18,976	15,415	12,122	9,087
	50				24,326	20,699	17,254	14,022	11,013	8,210
	27		23.73	21.16	18.80	16.64	14.63	12.78	11.07	9.50
	32		24.56	21.87	19.40	17.12	15.01	13.05	11.25	9.60
P	37		25.32	22.52	19.94	17.54	15.32	13.27	11.38	9.65
	42			23.11	20.41	17.90	15.58	13.43	11.46	9.67
	46			23.53	20.74	18.15	15.75	13.53	11.49	9.65
	50				21.03	18.36	15.87	13.59	11.49	9.60
CRL-2800-GY	27	83,189	72,346	62,109	52,579	43,829	35,904	28,824	22,578	17,131
	32	76,895	66,868	57,392	48,563	40,448	33,087	26,493	20,654	15,527
	37		61,348	52,638	44,515	37,041	30,250	24,151	18,724	13,925
Q	42		55,780	47,842	40,430	33,602	27,388	21,789	16,783	12,318
	46			43,970	37,132	30,825	25,075	19,882	15,215	11,022
	50			40,066	33,804	28,021	22,740	17,954	13,632	9,715
	27	30.87	28.22	25.66	23.21	20.85	18.58	16.4	14.34	12.39
	32	32.27	29.42	26.69	24.05	21.52	19.08	16.75	14.53	12.45
P	37		30.54	27.62	24.81	22.10	19.50	17.01	14.64	12.43
	42		31.56	28.46	25.47	22.59	19.82	17.18	14.67	12.32
	46			29.06	25.93	22.91	20.01	17.24	14.62	12.16
	50			29.6	26.32	23.17	20.14	17.24	14.51	11.95
CRL-3400-GY	27	91,615	80,562	69,899	59,790	50,365	41,718	33,907	26,958	20,861
	32		74,357	64,615	55,338	46,656	38,658	31,399	24,900	19,144
	37		68,070	59,259	50,824	42,893	35,554	28,857	22,816	17,410
Q	42		61,683	53,811	46,228	39,056	32,382	26,254	20,680	15,630
	46			49,375	42,477	35,918	29,781	24,112	18,914	14,152
	50			44,858	38,649	32,706	27,110	21,902	17,082	12,610
	27	38.11	34.54	31.19	28.04	25.08	22.30	19.68	17.24	14.98
	32		36.08	32.51	29.16	26.00	23.03	20.24	17.64	15.24
P	37		37.53	33.75	30.19	26.83	23.68	20.72	17.96	15.41
	42		38.90	34.90	31.13	27.58	24.24	21.10	18.18	15.49
	46			35.75	31.82	28.11	24.61	21.34	18.28	15.46
	50			36.53	32.43	28.56	24.92	21.49	18.30	15.36

NOTES

(1) Q: Refrigerating capacity, (Watt). (2) P: Total input power include compressor input power and fan motors input power, (kW).

(3) **Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900**

(4) **Suction gas superheat < 20K**

REFRIGERATING CAPACITY (Q Watts) AND POWER INPUT (P kW)
AIR COOLED REFRIGERATION CONDENSING UNITS LOW TEMPERATURE CRL SERIES

HFC (R404A / R507A) CRL 50HZ

UNIT MODEL	AMBIENT °C	EVAPORATING TEMPERATURE (ºC)								
		0	-5	-10	-15	-20	-25	-30	-35	-40
CRL-4400-HY	27	109,509	96,374	83,641	71,522	60,187	49,760	40,322	31,912	24,527
	32		88,967	77,275	66,130	55,680	46,034	37,258	29,379	22,380
	37		81,468	70,821	60,650	51,090	42,230	34,123	26,781	20,175
Q	42		73,876	64,274	55,083	46,415	38,347	30,914	24,115	17,910
	46			58,970	50,563	42,613	35,181	28,291	21,931	16,052
	50			53,605	45,985	38,754	31,960	25,617	19,701	14,152
	27	45.34	41.50	37.79	34.23	30.81	27.54	24.42	21.46	18.70
	32		42.97	39.08	35.32	31.69	28.21	24.89	21.75	18.80
P	37		44.32	40.23	36.27	32.44	28.76	25.25	21.91	18.78
	42		45.54	41.25	37.09	33.06	29.18	25.47	21.95	18.64
	46			41.97	37.65	33.46	29.42	25.55	21.89	18.44
	50			42.60	38.11	33.76	29.57	25.55	21.74	18.16

NOTES

(1) Q: Refrigerating capacity, (Watt). **(2) P: Total input power include compressor input power and fan motors input power, (kW).**

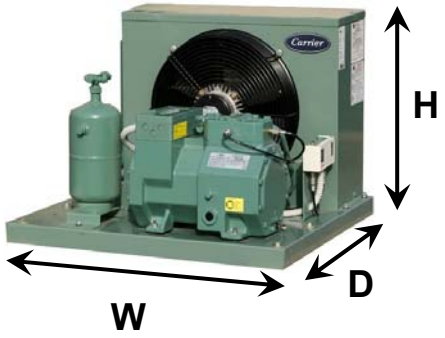
(3) **Performance data are based on 20°C suction gas temperature with 0°K sub cooling and 50Hz driving frequency according to European standard EN12900**

(4) **Suction gas superheat < 20K**

DIMENSIONS (mm)

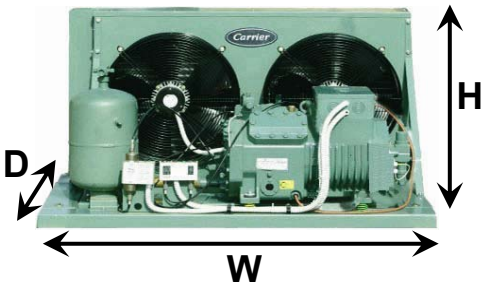
Model	W Width	H Height	D Depth	Mounting Holes
CRM – 150 – AX	727	515	700	667 X 248
CRM – 150 – AY				
CRL – 150 – AX				
CRL – 150 – AY				
CRM – 200 – BX	827	615	800	767 X 355
CRM – 200 – BY				
CRM – 300 – BX				
CRM – 300 – BY				
CRM – 400 – BX				
CRM – 400 – BY				
CRL – 200 – BX				
CRL – 200 – BY				
CRL – 300 – BX				
CRL – 300 – BY				
CRL – 400 – BX				
CRL – 400 – BY				

ONE FAN
REFRIGERATION CONDENSING UNIT



Model	W Width	H Height	D Depth	Mounting Holes
CRM – 300 – CX	1023	615	800	667 X 248
CRM – 300 – CY				
CRM – 400 – CX				
CRM – 400 – CY				
CRL – 500 – CX				
CRL – 500 – CY				
CRM – 500 – DX	1291	720	910	1175 X 468
CRM – 500 – DY				
CRL – 750 – DX				
CRL – 750 – DY				
CRL – 900 – DX				
CRL – 900 – DY				
CRL – 1200 – DX				
CRL – 1200 – DY				
CRM – 750 – EX	1377	845	910	1261 X 468
CRM – 750 – EY				
CRM – 1000 – EX				
CRM – 1000 – EY				
CRM – 1200 – EX				
CRM – 1200 – EY				
CRM – 1500 – FX	1665	895	1160	1549 X 474
CRM – 1500 – FY				
CRL – 1500 – FX				
CRL – 1500 – FY				
CRL – 2300 – FX				
CRL – 2300 – FY				

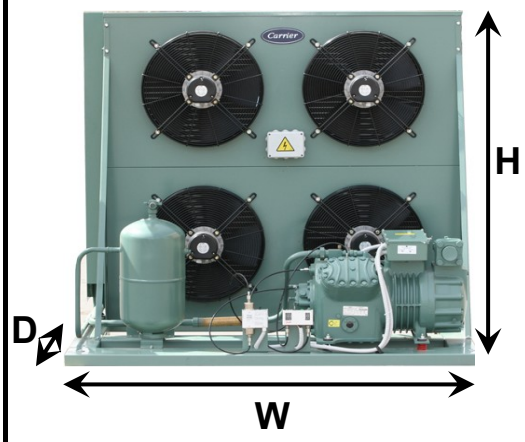
TWO FANS
REFRIGERATION CONDENSING UNIT



DIMENSIONS (mm)

Model	W Width	H Height	D Depth	Mounting Holes
CRM – 2000 – GX	1665	1482	1160	1549 X 474
CRM – 2000 – GY				
CRM – 2500 – GX				
CRM – 2500 – GY				
CRM – 3000 – GX				
CRM – 3000 – GY				
CRL – 2800 – GX				
CRL – 2800 – GY				
CRL – 3400 – GX				
CRL – 3400 – GY				
CRM – 4000 – HX	1665	1735	1160	1549 X 474
CRM – 4000 – HY				
CRM – 5000 – IX				
CRM – 5000 – IY				
CRL – 4400 – HX				
CRL – 4400 – HY				

FOUR FANS
REFRIGERATION CONDENSING UNIT



IMPORTANT INFORMATION

Only qualified personnel should install and repair compressors. The electrical connection of the compressor and of its accessories is also to be done by authorized personnel only.

Delivery

Please check whether the delivery is complete and intact. Deficiencies should be immediately reported in writing.

General Safety Information

- Refrigeration compressors must be used with approved refrigerants and refrigeration oils only.
  It is not allowed to run a test without the compressor being connected to the system and without refrigerant.
- It is of vital importance that the discharge stop valve has been fully opened before the compressor is started.
- If the discharge stop valve is closed or partly closed an unaccepted - able pressure with accordingly high temper.
- Natures may develop in the cylinder head.
  Even when handling the compressor correctly high temperatures may develop and cause injuries when touching.
- The maximum operating pressures stamped on the nameplate are compulsory, and should never be exceeded.

Installation Guidance

- Do not use the units outside of the operating limits specified.
- Install only in a properly ventilated area.
- Check tightness of all screw terminals.
- Check that the electrical supply to the installation is suitable and that the motor is connected correctly.
- Check the currents drawn.
- The refrigerant circuit must be perfectly clean, dry and installed according to best refrigeration practice.
- Check settings of all safety devices.
- Limit the superheat of the suction gas to 20K for low temperature operation.

Compressor Motor of Part Winding Construction
9 – 10 – 12 – 15 – 20 – 23 – 25 – 28 – 30 – 34 – 40 – 44 – 50 HP

With this type of motor the stator winding is separated into two parts - normally in Y/YY connection. The both coil packets lay parallel to each other in the stator slots and the winding crown. They are insulated from each other. With this construction it is possible to switch the part windings one after the other (with a time delay), resulting in a significantly reduced starting current.

Electrical Connections

Closely observe part-winding
1. Part winding (contactor K1): Connections 1U1, 1V1, 1W1
2. Part-winding (contactor K2): Connections 2U1, 2V1, 2W1

Time delay before connection of the second part-winding 0.5 seconds

! Attention!

Danger of compressor damage!
Wrong wiring results in opposing or displaced rotating fields due to changed phase angle. This leads to locked rotor conditions. Mount connections correctly.

! Attention!

Compressor motor is equipped with electronic protection device!

- The electrical connections should be made according to the wiring diagram.
- When the protection device cuts out, this indicates either an overload or impermissible operating conditions:
  Determine the source of the problem and correct it!
- Terminals B1-B2, M1-M2 and cables 1-2 must not come into contact with supply or control voltage!

Electrical Connections of Fan Motor Thermal Protector

The electrical connections between the control line and the thermal protection switch of fan motor must be carried out on site. If this is omitted, the fan motor is not protected against damage.

COMMISSIONING

System Cleanness

Braze only when using inert gas. Only materials and components approved by refrigeration engineering are suitable.
It is absolutely necessary that all impurities (dirt, brazing scale, flux, scobs etc.) are removed from the system before operation in order to avoid breakdowns. Many of these impurities are so small that they can pass through the filter built into the suction side of the compressor. Other blockages can occur in the suction filter situated in the compressor. A high pressure drop can even damage the filter. For this reason we strongly recommend the use of a large suction tube filter (which causes only a minimal drop of pressure) for all installations which are to be assembled on site or in cases where the required cleanness cannot be guaranteed.

Pipe Connections

The pipe connections are designed to , accept tubes with standard millimeter or inch dimensions. Solder connections have stepped diameters. According to the size the tube can be pushed more or less into the fitting. If not required the end with the largest diameter can be cut off.

⚠ Warning!

Compressor is under pressure with holding charge.
Injury of skin and eyes possible. Wear safety goggles while working on compressor:
Do not open connections before pressure has been1'eleased.

! Attention!

Absolutely avoid penetration of air!
The shut-off valves should remain closed until evacuating.

Pipelines

Only use tubes and components which are

- Clean and dry inside (free from slag, swart, rust, and phosphate coatings) and
- Which are delivered with an air tight seal.

Leak Test

The suction shut-off valve and discharge shut-off valve on the compressor remain closed during pressure testing to prevent air and moisture from entering. The test pressure (dried nitrogen) must not exceed 20.5 bar provided no other system component’s pressure is lower; in these cases the lower pressure is the test pressure.

Evacuation (Drying)

Energize the crankcase heater.
Open all shut-off valves and solenoid valves. Evacuate the entire system including compressor using a vacuum pump connected to the high and low pressure sides.
When the pump is switched off a "standing vacuum" of less than 1.5 mbar must be maintained.
If necessary repeat this procedure several times.

! Attention!

Danger of motor and compressor damage!
Do not start compressor under vacuum!
Do not apply any voltage - not even for test purposes!

COMMISSIONING

Charging Refrigerant

Charge only permitted refrigerants

- Before refrigerant is charged:
  - Energize the crankcase heater.
  - Check the compressor oil level.
  - Do not switch on the compressor!
- Liquid refrigerant must be filled through the charge fitting in the receiver shut-off valve or in the liquid line. The use of a filter drier in the charging line is highly recommended.
- For systems with flooded evaporator refrigerant can be also charged into the evaporator.
- After commissioning it may be necessary to add refrigerant:
  Charge the refrigerant from the suction side while the compressor is in operation. Charge preferably at the evaporator inlet.
  Blends must be taken from the charging cylinder as "solid liquid".

If liquid is charged:

! Attention!

Danger of wet operation!
Charge small amounts at a time!
Keep the oil temperature above 40°C.

Danger!

Explosion risk of components and pipelines by hydraulic overpressure.
Avoid absolutely overcharging of the system with refrigerant!

CHECKS BEFORE STARTING

⚠ Ensure that all service valves are in the open position before start-up. A closed discharge or suction service valve may cause serious damage to the compressor and/or compromise safety device operation, thereby resulting in potential injury to personnel.

- Oil Level
  Each compressors is delivered with sufficient oil charge for normal operation.
  The optimum oil level should be checked by operating the compressor until the system is stable and then comparing the sight glass reading with the appropriate diagram.
  The oil level can also be checked within 10 seconds of compressor shut-down.
- Oil temperature (approx. 15 - 20 K above ambient temperature resp. suction side saturation temperature)
- Are all shut-off valves opened?
- Check that all safety devices are operational and properly set.
- For high-pressure switches the setting must not exceed maximum service pressure of any system component. Refer to the Application Guidelines for relevant compressor pressure safety limits.
- A low-pressure switch is recommended to prevent operation under vacuum. Use a minimum setting of 1.1 bar (absolute).
- Verify that all electrical connections are properly fastened and in compliance with local safety regulations.
- Ensure that the crankcase heater of compressor has been energized for a minimum of 12 hours before initial start-up and/or after prolonged shutdown periods.

START-UP PROCEDURE

⚠ Never start the system in the absence of a refrigerant charge.

⚠ Do not bypass the safety switches during start up.

Starting and Cooling Down Operations

For comissioning and pull down operations make sure that the maximum admissible operating evaporation temperature is achieved or fallen short of within a short time.

! Attention!

During pull down operation:
Danger of extreme suction gas superheat and therefore thermal overload of the compressor!
Ensure sufficient refrigerant charge bubble - free at intake of interstage expansion valve and subcooler.

Lubrication / oil check

The compressor lubrication should be checked immediately after starting.

- Oil level 1/4 to 3/4 height of sight glass (repeat checks within the first hours of operation).
- Automatic monitoring by differential oil pressure switch (differential cutout pressure 0.7 bar, time delay 120 s). When this device cuts out a subsequent fault diagnosis of the system is required. Observe therefore recommendations shown on cover of differential oil pressure switch!

! Attention!

Danger of wet operation!
Keep the discharge temperature at least 30 K (R22) or at least 20 K (R134a, R404A, R507A) above condensing temperature.

If larger quantities of oil have to be added:

! Attention!

Danger of liquid slugging!
Check the oil return.

Vibrations

The whole plant especially the pipe lines must be checked for abnormal vibrations. If necessary additional protective measures must be taken.

! Attention!

Pipe fractures and leakages at compressor and other components of the plant possible! Avoid strong vibrations!

Switching Frequency

The compressor should not be started more than 8 times per hour. Thereby a minimum running time should be guaranteed:

Unit Model	min. running time
to 7,5 HP	2 min
to 20 HP	3min
above 20 HP	5 min

START-UP PROCEDURE (CONT.)

Checking Operating Data

- Evaporating temperature.
- Suction gas temperature.
- Condensing temperature
- Discharge gas temperature.
- Oil temperature.
- Switching frequency.
- Current.
- Voltage.

Prepare data protocol.

Refrigeration Oils For Bitzer Compressors

The following refrigeration oils are approved for Bitzer Compressor:

Refrigerant	Oil Charge
HCFC R22	Mineral Oil Bitzer B 5.2
HFC R134a & R404A & R507A	Ester Oil
	Tc < 55°C Bitzer BSE 32
	R134a / tc > 55°C Bitzer BSE 55

Selection of Contactors, Cables and Fuses

The maximum working current / maximum power consumption must be considered (“Technical Data”).
Contactors : operational category AC3
Select both compressor motor contactors for approximately 60% of maximum operating current.

Special recommendations for safe compressor and plant operation

Analyses show that the vast majority of compressor failures occur due to inadmissible operating conditions. This is especially true for failures deriving from lack of lubrication:

- Expansion valve operation -pay attention to the manufacturer's guidelines!
  - Correct position and fixation of the temperature bulb at the suction line. When using a heat exchanger, place bulb **behind** evaporator, as usual -in no case behind the heat exchanger.
  - Sufficient superheat.

  - Stable operation at all operating and load conditions (also part load, summer / winter operation).
  - Bubble-free refrigerant at expansion valve.

- Avoid refrigerant migration (high pressure to low pressure side) during longer shut-off periods.
  - Application of a crankcase heater.
  - Pump down system (especially if evaporator can get warmer than suction line or compressor).
  - Automatic sequence change for systems with multiple refrigerant circuits.

SERVICE / MAINTENANCE

Electric Shock Hazard

Disconnect the main power supply before servicing the system or handling any internal parts of the unit.

Regular Checks

Examine regularly the plant according to national regulations.
Check the following points:

- Operating data.
- Oil supply.
- Protection devices and all compressor monitoring (parts differential oil pressure switch, high / low pressure switch).
- Check electrical cable connections on tight fitting.
- Check tightening torques.
- Refrigerant charge, tightness test.

- Update data protocol.

Internal Pressure Relief Valve

The valve is maintenance free.
Repeated opening of the valve due to abnormal operating conditions, however, may result in steady leakage.
Consequences are losses in capacity and increased discharge temperature. Check and replace the valve in this case.

Oil Changing

Oil changing is not normally necessary for factory assembled plants. For "field installations" and for applications near the operating limits a first oil change is recommended after approx.
100 operating hours.
This includes cleaning the oil filter and magnetic plug.
After that the oil has to be replaced approx. every 3 years or 10 000 - 12000 operating hours. Clean also oil filter and magnetic plug.

! Attention!

Ester oils are strongly hygroscopic.
Moisture is chemically compounded with these oils. It cannot be, or only insufficiently, removed by evacuation.
Handle very carefully:
Avoid air admission into the plant and oil can. Use only originally closed oil drums.

Dispose of waste oil properly!

DE-COMMISSIONING

Standstill

Keep the crankcase heater switched on until dismantling the compressor! This prevents increased refrigerant solution in the compressor oil.

Dismantling Compressor

For repair work, that makes dismantling necessary, or when decommissioning them:
Close the shut-off valves at the compressor. Pump-off the refrigerant. Do not release the refrigerant but dispose it properly!

⚠ Warning!

Compressor can be under pressure!
Severe injuries possible. Wear safety goggles!
Open the threaded joints or flanges at the compressor valves. Remove the compressor if necessary with a hoisting tool.

Disposing Compressor

Drain the oil at the compressor.
Dispose of waste oil properly!
Chlorinated oil is pollutive waste.

Have the compressor repaired or disposed of properly!

When Exchanging a Compressor:

! Attention!

Oil is already in the system,
Therefore it may be necessary to drain a part of the oil charge. If there are large quantities of oil in the circuit (possibly from a preceding compressor damage), there is also a risk of liquid slugging at start.
Adjust oil level within the marked sight glass range!

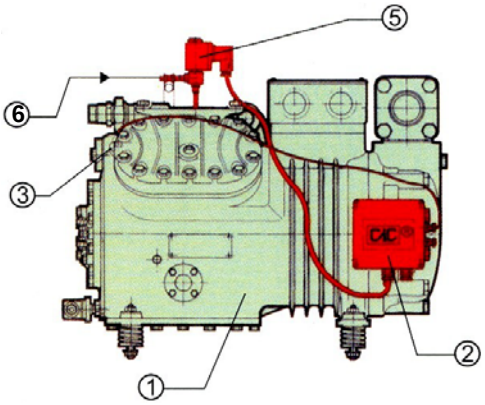
NOTES

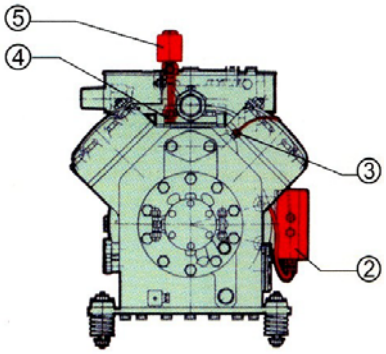
NOTES

NOTES

CIC (Controlled Injection Cooling) System
For R22 Compressors Low Temperature
7.5 – 9 – 12 – 15 – 23 – 28 – 34 – 44 HP

① Compressor
② Control module
③ Temperature sensor
④ Spray nozzle
⑤ Pulse injection valve
⑥ Liquid refrigerant

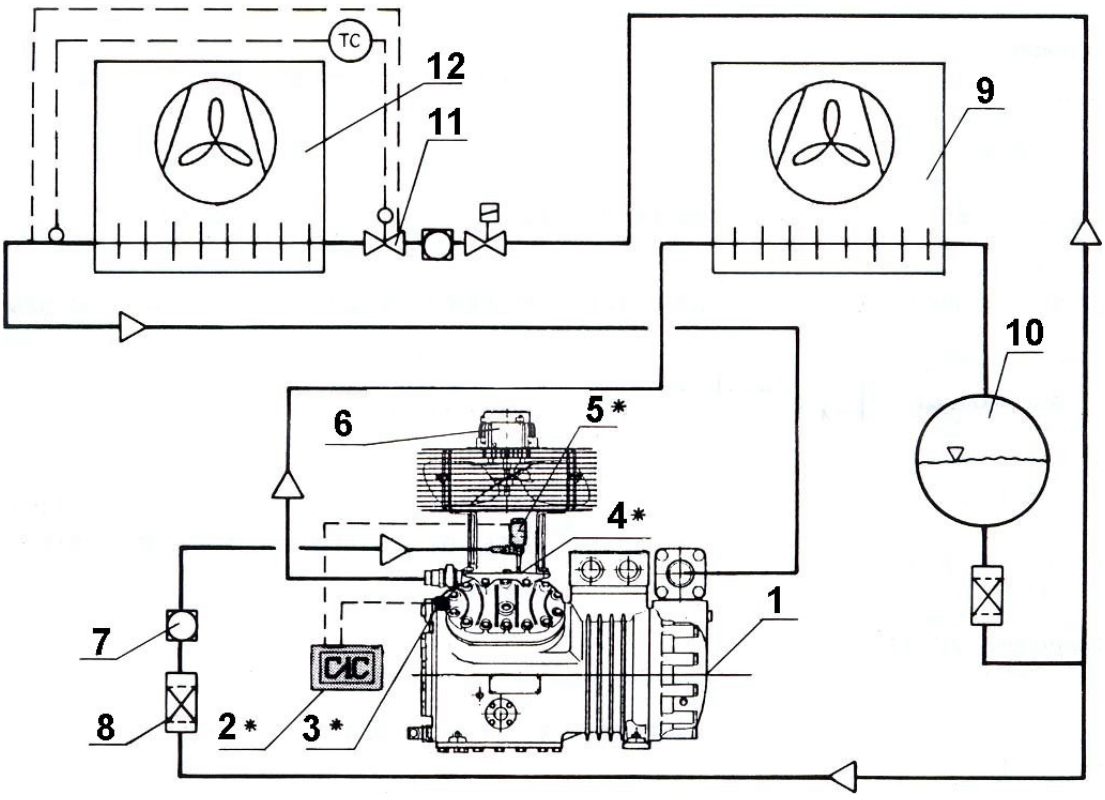




Schematic circuit with CIC-system

1 Compressor
* 2 CIC control module
* 3 Temperature sensor
* 4 Spray nozzle
* 5 Pulse injection valve
6 Additional fan (Option)
7 Sight glass
8 Filter
9 Condenser
10 Liquid receiver
11 Expansion valve (evaporator)
12 Evaporator

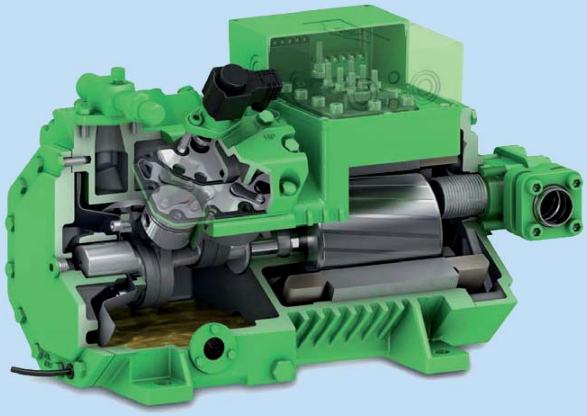
* CIC -System



Rev. (1) 2014

CARRIER OPTIMUM SOLUTIONS FOR COMMERCIAL REFRIGERATION

- Single stage - Semi Hermetic condensing units
  - 1.5 HP to 50 HP for chillers
  - 1.5 HP to 44 HP for freezers
- Oversized condenser coil
- Efficient high ambient operation
- Efficient & quiet semi hermetic compressors
- Efficient & quiet fan motors
- Minimum vibrations
- Standard crankcase heater
- Standard dual high / low pressure control
- Standard oil pressure control
  - For medium temperature compressors 10 HP to 50 HP (Chillers)
  - For low temperature compressors 12 HP to 44 HP (Freezers)
- Standard CIC cooling system for 7.5 HP to 44 HP (Freezers)
- Easy and Fast installation
- Easy service and maintenance
- Comply with CE European standards



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