

# Installation Operation Maintenance

CGAX/CXAX 015 - 060 Air-cooled scroll chillers and heat pumps 43-164 kW





CG-SVX027C-GB Original instructions



## **Table of Contents**

General Information	4
Model Number Description	6
Unit Description	8
Pre-Installation	9
General Data	11
Installation – Mechanical	20
Hydraulic Data	25
Operating Map	27
Partial Heat Recovery	28
Supplemental heat	29
Installation – Electrical	30
Electrical Data	32
Communication Interface Options	37
Operating Principles	38
Variable Primary Flow	43
General Start up	44
Pre-Start Check List (Sample)	47
Operation	48
Maintenance	49
Troubleshooting Guide	53



## **General Information**

## Foreword

These instructions are given as a guide to good practice in the installation, start-up, operation, and maintenance by the user, of Trane CGAX chillers or CXAX heat pumps. They do not contain full service procedures necessary for the continued successful operation of this equipment.

The services of a qualified technician should be employed through the medium of a maintenance contract with a reputable service company. Read this manual thoroughly before unit start-up.

Units are assembled, pressure tested, dehydrated, charged and tested in accordance with factory standard before shipment.

## Warnings and cautions

Warnings and Cautions appear at appropriate sections throughout this manual. Your personal safety and the proper operation of this machine require that you follow them carefully. The constructor assumes no liability for installations or servicing performed by unqualified personnel.

**WARNING**!: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**CAUTION!:** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices or for equipment or property-damage only accidents.

**CAUTION!**: Time before to work on the electrical panel of the unit with Low Ambient option: once the unit is off (confirmed by the extinction of the display), it is mandatory to wait five minutes before working on the electrical panel.

## Safety recommendations

To avoid death, injury, equipment or property damage, the following recommendations should be observed during maintenance and service visits:

- 1. The maximum allowable pressures for system leak testing on low and high pressure side are given in the chapter "Installation". Do not exceed test pressure by using an appropriate device.
- 2. Disconnect the main power supply before any servicing on the unit.
- 3. Service work on the refrigeration system and the electrical system should be carried out only by qualified and experienced personnel.

## Reception

On arrival, inspect the unit before signing the delivery note. Specify any visible damage on the delivery note, and send a registered letter of protest to the last carrier of the goods within 7 days of delivery.

Notify the local TRANE sales office at the same time. The delivery note must be clearly signed and countersigned by the driver.

Any concealed damage shall be notified by a registered letter of protest to the last carrier of the goods within 7 days of delivery. Notify the local TRANE sales office at the same time.

Important notice: No shipping claims will be accepted by TRANE if the above mentioned procedure is not respected.

For more information, refer to the general sales conditions of your local TRANE sales office.

Note: Unit inspection in France. Delay to send registered letter in case of visible and concealed damage is only 72 hours.

## Warranty

Warranty is based on the general terms and conditions of the manufacturer. The warranty is void if the equipment is repaired or modified without the written approval of the manufacturer, if the operating limits are exceeded or if the control system or the electrical wiring is modified. Damage due to misuse, lack of maintenance or failure to comply with the manufacturer's instructions or recommendations is not covered by the warranty obligation. If the user does not conform to the rules of this manual, it may entail cancellation of warranty and liabilities by the manufacturer.



## **General Information**

### Maintenance contract

It is strongly recommended that you sign a maintenance contract with your local Service Agency. This contract provides regular maintenance of your installation by a specialist in our equipment.

Regular maintenance ensures that any malfunction is detected and corrected in good time and minimizes the possibility that serious damage will occur. Finally, regular maintenance ensures the maximum operating life of your equipment.

We would remind you that failure to respect these installation and maintenance instructions may result in immediate cancellation of the warranty.

## Training

To assist you in obtaining the best use of it and maintaining it in perfect operating condition over a long period of time, the manufacturer has at your disposal a refrigeration and air conditioning service school.

The principal aim of this is to give operators and technicians a better knowledge of the equipment they are using, or that is under their charge. Emphasis is particularly given to the importance of periodic checks on the unit operating parameters as well as on preventive maintenance, which reduces the cost of owning the unit by avoiding serious and costly breakdown.



## **Model Number Description**

Digit 1-4 – Chiller Model	Digit 18 — Freeze Protection (Factory-Installed Only)
CGAX = Cooling-only unit	X = Without freeze protection
CXAX = Heat pump unit	2 = With freeze protection by heaters
	3 = With freeze protection by pump activation
Digit 5-7 — Unit Nominal Tonnage	
015	Digit 19, 20 $-$ Open for future options
017	
020	Digit 21 — Evaporator Application
023	A = Comfort application (5°C/20°C)
026	B = Process application (CGAX: -12°C/5°C;
030	CXAX: -10°C/5°C)
036	
039	Digit 22 — Evaporator Water Connection
045	1 = Grooved pipe
035	3 = Grooved pipe, couplings and pipe stub
040	
046	Digit 23 – Condensor
052	B = Standard Aluminum Fin coil for CXAX
060	E = Epoxy Aluminum Fin coil for CGAX
	H = MCHE for CGAX
Digit 8 — Unit Voltage	J = E-coated MCHE for CGAX
E = 400V/3ph/50Hz	
	Digit 24 — Heat Recovery
Digit 9 — Manufacturing Plant	X = None
1 = Europe	2 = Partial Heat Recovey
Digit 10-11 — Design Sequence	Digit 25 $-$ Open for future options
A = Factory asigned	
0 = Factory asigned	Digit 26 — Starter Type
, 0	A = Across-the-line starter
Digit 12 – Efficiency Level	B = Solid State Soft Starter
1 = Standard Efficiency (SE)	
2 = High Efficiency (HE)	Digit 27, 28, 29 $-$ Open for future options
Digit 13 – Agency Listing	Digit 30 — Human Interface
E = CE Certification	A = Standard Display
	B = Deluxe Display
Digit 14 – Pressure Vessel Code	X = Without Display
4 = Pressure Equipment Directive (PED)	
· · · · · · · · · · · · · · · · · · ·	Digit 31 — Communication Options
Digit 15 — Condenser Temperature Range	X = without remote communication
A = Standard ambient (5°C/46°C)	1 = Modbus Interface
C = Low ambient CGAX (-18°C/46°C) - CXAX cooling	2 = LonTalk Interface
mode (-10°C/46°C)	4 = BACnet Interface
Digit 16, 17 $-$ Open for future options	Digit 32 — Customer Input/Output extension module
	X = None
	A = With (1A4)



## Model Number Description

Digit 33 – Chiller Smart Sequencer	Digit 44 — Literature language
X = None	B = Spanish
	C = German
Digit 34 $-$ Open for future options	D = English
<b>o</b>	E = French
Digit 35 — Pump management	H = Dutch
X = Without contactors and pumps	J = Italian
2 = Contactors for single pump external to the unit	M = Swedish
4 = Contactor for twin pump external to the unit	N =Turkish
5 = Single pump package low pressure	P = Polish
6 = Single pump package high pressure	R = Russian
7 = Twin pump package low pressure	T = Czech
8 = Twin pump package high pressure	U = Greek
	V = Portuguese
Digit 36 — Pump Flow Control	Y = Romanian
X = Constant Flow (no pump flow control)	3 = Hungarian
B = Manual Flow Setpoint on VFD	
C = Variable primary Flow (constant deltaT)	Digit 45 — Under/Over Voltage Protection
	X = None
Digit 37 — Buffer Tank	1 = With
X = NoTank	
1 = With Tank	Digit 46 $-$ Open for future options
Digit 38 $-$ Open digit for future options	Digit 47 $-$ Customer witness performance test
	X = None
Digit 39 — Installation Accessories	
1 = None	Digit 48 $-$ Open for future options
4 = Neoprene pads	
	Digit 49 — Supplementary Heat Control
Digit 40 $-$ Open digit for future options	X = None
	1 = With
Digit 41 — Acoustical options	
2 = High external static pressure	Digit 50 — Special design
3 = Standard	X = Standard
4 = Low Noise	S = Special design
Digit 42 — Condenser Protection	
X = Without	
A = Condenser Guard Grill	

Digit 43 - Open digit for future options



## **Unit Description**

Conquest chillers, CGAX, air cooled scroll compressor type liquid chillers and CXAX heat pumps, are designed for outdoor installation. Units can have one or two independent refrigerant circuits, two or more compressors per circuit. Unit are packaged with an evaporator made with a braze plate heat exchanger, and one or more condenser coils.

Each unit is completely assembled, hermetic package, refrigerant circuit factory piped, electrical components wired, leak tested, dehydrated, charged and tested for proper control operations prior to shipment. The chilled water inlet and outlet openings are covered for shipment.

A new generation of chiller control systems, providing improved control capabilities. Integrated safety protocols to protect both compressor and motor from electrical faults like thermal overload and phase reversal.

Each refrigerant circuit is provided with filter, electronic expansion valve, and charging valves.

In cooling mode on the CXAX or on the CGAX, the evaporator is a brazed plate and frame heat exchanger equipped with water drain and vent connections on the water piping.

Condenser coil is available in four different configurations: fin and tube with aluminium fins, or black epoxy pre-coating aluminum fins for the heat pump versions, and MicroChannel type or E-coating Microchannel type for the cooling only versions.

## Accessory/options information

Check all the accessories and loose parts which are shipped with the unit against the original order. Included in these items will be rigging diagrams, wiring diagrams, and service literature, which are placed inside the control panel and/or starter panel for shipment. Also check for optional components, such as couplings and pipe stubs or neoprene pads.

The following pictograms can be found on the unit. Take necessary precautions to avoid damage and injury.







- 1 = Risk that unit is powered up
- 2 = Risk hazard due to fan rotation
- 3 = Risk hazard of burns on compressors or refrigeration piping
- 4 = Unit contains refrigerant gas. See specific warnings.
- 5 = Risk of residual voltage when speed drive or softstarter or Low Ambient options are present
- 6 = Unit under pressure
- 7 = Risk to cut, particularly on heat exchanger fins
- 8 = Read instructions before installation
- 9 = Disconnect all electric power before servicing
- 10 = Read technical instructions



## **Pre-Installation**

### **Mandatory Start-up Checklist**

This checklist is not intended to be a substitution for the contractors installation instruction. This checklist is intended to be a guide for the Trane technician just prior to unit 'start-up'. Many of the recommended checks and actions could expose the technician to electrical and mechanical hazards. Refer to the appropriate sections in the unit manual for appropriate procedures, component specifications and safety instructions.

Except where noted; it is implied that the technician is to use this checklist for inspection / verification of prior task completed by the general contractor at installation.

- 1. Unit clearances adequate for service and to avoid air recirculation, etc.
- 2. Unit exterior inspected. CXAX condensor coil will not be obstructed at any time by snow or ice during winter conditions.
- 3. Unit properly grounded
- 4. Crankcase heaters working for 24 hours prior to arrival of Trane technician performing start up
- 5. Correct voltage supplied to unit and electric heaters (imbalance not to exceed 2%)
- 6. Unit power phasing (A-B-C sequence) proper for compressor rotation
- 7. Copper power wiring meets sizing requirement in job submittal
- 8. All automation and remote controls installed/wired
- 9. All wiring connections tight
- 10. Prove chilled water side Interlock and Interconnecting Wiring Interlock and externals (chilled water pump)
- Field installed control wiring landed on correct terminals (external start/stop, emergency stop, chilled water reset...)
- 12. Verify all refrigerant and oil valves are open/back seated
- 13. Compressor oil levels (1/2 -3/4 high in glass) proper
- 14. Verify chilled water strainer is clean and free of debris and evaporator chilled water circuits are filled
- 15. A pressure switch device to detect lack of water is not included in the pump package. Installation of this type of device is highly recommended to avoid sealing damage due to operation of pump without enough water.
- 16. Close the fused-disconnect switches that supplies power to the chilled water pump starter
- 17. Start the chilled water pump to begin circulation of the water. Inspect piping for leaks and repair as necessary. Check the physical presence of the water pressure switch.
- With water circulating through the system, adjust water flow and check water pressure drop through evaporator
- 19. Return chilled water pump to auto
- 20. Verify all the chiller controller Menu Items.

- 21. All panels/doors secured prior to start-up
- 22. All coil fins inspected and straightened
- 23. Rotate fans before starting unit to inspect for potential audible and visual signs of rubbing. Start unit
- 24. Press AUTO key. The unit will start if the chiller control calls for cooling and the safety interlocks are closed
- 25. Check the evaporator and the condenser refrigerant pressure on the chiller controller.
- 26. Confirm Superheat and subcooling values are normal
- 27. Compressor operation normal and within amperage rating
- 28. Operating log completed
- 29. Press stop key
- 30. Inspect fans again after being under load to ensure no signs or rubbing exist
- 31. Verify the chilled water pump runs for at least 1 minute (possibility to configure maxi 10 mn) after the chiller is commanded to stop (for normal chilled water systems)

### Unit storage

If the chiller is to be stored for more than one month prior to installation, observe the following precautions:

- Store the chiller in a dry, vibration-free, secure area.
- Units charged with refrigerant should not be stored where temperatures exceed 68°C.
- At least every three months, attach a gauge and manually check the pressure in the refrigerant circuit. If the refrigerant pressure is below 13 bar at 20°C (or 10 bar at 10°C), call a qualified service organization and the appropriate Trane sales office.

**Note:** if the unit is stored before servicing near a construction site it is highly recommended to protect micro channel coils from any concrete and iron element. Failure to do so may considerably reduce reliablity of the unit.



## **Pre-Installation**

# Installation requirements and contractor responsibilities

A list of the contractor responsibilities typically associated with the unit installation process is provided.

Type of requirement	Trane factory Supplied	Trane factory Supplied	Field supplied
Type of requirement	Trane factory Installed	Field Installed	Field installed
Foundation			Meet foundation requirements
Rigging			<ul><li>Safety chains</li><li>Clevis connectors</li><li>Lifting beams</li></ul>
Isolation		Neoprene pads (Optional)	Isolators (customer supplied)
Electrical	<ul><li>Disconnect Switch</li><li>Unit mounted starter</li></ul>		<ul> <li>Wiring sizes per submittals and local codes and regulations</li> <li>Terminal lugs</li> <li>Control voltage wiring</li> <li>Ground connection(s)</li> <li>BAS Wiring (optional)</li> <li>Chilled water pump contactor and wiring including interlock</li> <li>Option relays and wiring</li> </ul>
Water piping			<ul> <li>Taps for thermometers and gauges</li> <li>Thermometers</li> <li>Water flow pressure gauges</li> <li>Isolation and balancing valves in water piping</li> <li>Vents and rains</li> <li>Pressure relief valves</li> <li>Pressure switch device to detect lack of water</li> </ul>
Insulation	Insulation		Insulation (piping)
Water piping connection elements	Grooved pipe	<ul> <li>Grooved pipes coupling and stub pipe (Optional)</li> </ul>	



#### Table 1 - CGAX 015-036 General Data

		CGAX	CGAX	CGAX	CGAX	CGAX	CGAX	CGAX
		015 SE-SN	017 SE-SN	020 SE-SN	023 SE-SN	026 SE-SN	030 SE-SN	036 SE-SN
Net Cooling Capacity (1)	(kW)	43	49	59	65	74	82	99
Total Power input in cooling (1)	(kW)	15	17	19	22	26	29	33
Jnit electrical data (2) (3) (4)	( )							
Short Circuit Unit Capacity (9)	(kA)	12	12	12	12	12	12	15
Power Cable Cross Section (max)	mm²	35	35	35	35	35	35	150
Disconnect switch size	(A)	80	80	100	100	100	100	250
Digit 12=2 or Digit 12=1 and Digit 41=2								
Maximum Power input	(kW)	20.4	23.2	27.9	31.6	35.4	39.1	45.1
Unit rated amps	(A)	34.5	39.2	46.9	52.0	57.1	65.5	75.4
Unit start up amps (w/o soft starter - Digit 26=A) (4)	(A)	117.0	161.0	168.7	184.7	189.8	191.0	199.5
Unit start up amps (with soft starter - Digit 26=B) (4)		77.8	104.2	111.9	121.5	126.6	129.0	140.7
Power factor		0.868	0.866	0.870	0.888	0.902	0.870	0.873
Digit 12=1 and Digit 15=A								
Maximum Power input	(kW)	19.4	22.1	25.8	29.5	33.3	37.0	43.0
Unit rated amps	(A)	33.8	38.5	45.4	50.5	55.6	64.0	73.8
Unit start up amps (w/o soft starter - Digit 26=A) (4)	(A)	116.3	160.3	167.2	183.2	188.3	189.5	197.9
Unit start up amps (with soft starter - Digit 26=B) (4)		77.1	103.5	110.4	120.0	125.1	127.5	139.1
Power factor		0.845	0.846	0.836	0.861	0.880	0.847	0.854
Digit 12=1 and Digit 15=C	(14)4/)	20.4	22.2	26.0	20.6	24.2	20.1	4 4 4
Maximum Power input	(kW)	20.4	23.2	26.8	30.6	34.3	38.1	44.1
Unit rated amps	(A)	34.5	39.2	46.2	51.3	56.4	64.8	74.6
Unit start up amps (w/o soft starter - Digit $26=A$ ) (4)	(A)	117.0	161.0	168.0	184.0	189.1	190.3	198.7
Unit start up amps (with soft starter - Digit 26=B) (4) Power factor		77.8	104.2	0.854	120.8	125.9	128.3	139.9
Compressor		0.868	0.866	0.854	0.875	0.892	0.859	0.864
Compressor Number per Circuit	#	2	2	2	2	2	2	3
Туре	π	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Model Circuit1 / Circuit 2		7,5+7,5	7,5+10	10+10	10+13	13+13	15+15	12+12+12
Max Compr Power input Circuit 1/Circuit 2	kW	9,2 + 9,2	9,2+12	12 + 12	12 + 15,7		17,61 + 17,6	13,7 +
Rated Amps Circuit1 / Circuit 2 (4)	(A)	15,5 + 15,5	15,5 + 20,2	20,2 + 20,2	20,2 + 25,3	25,3 + 25,3	29,5 + 29,5	13,7 + 13,7 22,9 +
	. ,							22,9 + 22,9 147 +
Locked Rotor Amps Circuit / Circuit 2 (4) Motor RPM	(A) (rpm)	98 + 98 2900	98 + 142 2900	142 + 142 2900	142 + 158 2900	158 + 158 2900	155 + 155 2900	147 + 147 2900
Oil sump heater Circuit1 / Circuit 2	(W)	0,17 / 0	0,17 / 0	0,17 / 0	0,17 / 0	0,17 / 0	0,17 / 0	0,25 / 0
Evaporator	. ,							
Quantity	#	1	1	1	1	1	1	1
Туре			Stair	nless steel Cop	per Brazed pla	ate Heat exch	anger	
Evaporator model		P80x66	P80x92	P80x92	P80x92	P120Tx76	P120Tx76	P120Tx104
Evaporator Water Content volume	(I)	3.8	5.3	5.3	5.3	9.2	9.2	12.5
Nominal water connection size (Grooved coupling) - Without HYM	(in) - (mm)	2" - 60,3	2" - 60,3	2" - 60,3	2" - 60,3	2" - 60,3	2" - 60,3	2" - 60,3
Nominal water connection size (Grooved coupling) - With HYM	(in) - (mm)	2" - 60,3	2" - 60,3	2" - 60,3	2" - 60,3	2" - 60,3	2" - 60,3	3" OD - 76,
lydraulic Module Components	( )							
Single pump - Standard head pressure option								
Max available Head Pressure	(kPa)	96	100	86	113	120	110	103
Motor Power	(kW)	1.20	1.20	1.20	1.50	1.50	1.50	1.50
Rated Amps	(A)	2.44	2.44	2.44	3.50	3.50	3.50	3.50
Single pump - High head pressure option								
Max available Head Pressure	(kPa)	170	174	162	152	161	152	190
Motor Power	(kW)	2.30	2.30	2.30	2.30	2.30	2.30	3.00
Rated Amps	(A)	5.03	5.03	5.03	5.03	5.03	5.03	6.23
Twin pump - Standard head pressure option								
Max available Head Pressure	(kPa)	96	100	86	113	120	110	103
Motor Power	(kW)	1.20	1.20	1.20	1.50	1.50	1.50	1.50
Rated Amps	(A)	2.44	2.44	2.44	3.50	3.50	3.50	3.50
Twin pump - High head pressure option								
Max available Head Pressure	(kPa)	170	174	162	152	161	152	190
Motor Power	(kW)	2.30	2.30	2.30	2.30	2.30	2.30	3.00
Rated Amps	(A)	5.03	5.03	5.03	5.03	5.03	5.03	6.23
Expansion Tank Volume	(I)	25	25	25	25	25	25	35
Max User water loop Volume for factory mounted expansion tank (1)	(I)	1450	1450	1450	1450	1450	1450	2000
Optionnal water Buffer tank volume	(I)	324	324	324	324	324	324	444
Antifreeze Heater without pump package	(W)	120	120	120	120	120	120	180
Antifreeze Heater with pump package	(W)	280	280	280	280	280	280	340
Condenser								
Туре			F	ull aluminum I	Micro channel	heat exchang	er	
Quantity of coil								
Quantity of coil	#	1	1	1	1	1	1	2
Face area per circuit	# (m²)	1 2.23	1 2.23	1 2.96	1 2.96	1 2.96	1 2.96	2 4.46



#### Table 1 - CGAX 015-036 General Data (continued)

		CGAX						
		015 SE-SN	017 SE-SN	020 SE-SN	023 SE-SN	026 SE-SN	030 SE-SN	036 SE-SN
ndenser Fan		5E-5IN	5E-5IN	3E-3N	3E-3N	3E-3N	5E-5N	3E-3N
Quantity	#	1	1	2	2	2	2	2
Diameter	(mm)	1	1	2	800	2	2	2
Fan / motor Type	(1111)	Propelle	ar fan ' Fived	speed AC moto		peed - EC mot	or / HESP MAX	SPEED
Digit 12=2 or Digit 12=1 and Digit 41=2		Tropen		speed Ae mot				JILLD
Fan / motor Type				EC mot	or / HESP MA>			
Airflow per fan	m <sup>3</sup> /h	13753	13718	12248	12231	12211	12193	13727
Max Power Input	Kw	1,95	1,95		1,95 + 1,95		1,95 + 1,95	1,95 + 1
Max Amps	A	3	3	3 + 3	3 + 3	3 + 3	3 + 3	3 + 3
Motor RPM	(rpm)	915	915	915	915	915	915	915
Digit 12=1 and Digit 15=A	(ipiii)	515	515	515	515	515	515	515
Fan / motor Type			Fixe	ed speed AC m	otor / Variable	speed - FC m	otor	
Airflow per fan	m <sup>3</sup> /h	13788	13828	12362	12362	12370	12375	13827
Max Power Input	Kw	0,89	0,89	0,89 + 0,89	0,89 + 0,89	0,89 + 0,89	0,89 + 0,89	0,89 + 0
Max Amps	A	2,22	2,22	2,22 + 2,22	2,22 + 2,22	, ,		2,22 + 2
Motor RPM	(rpm)	686	686	686	686	686	686	<u>2,22 + 2</u> 686
Digit 12=1 and Digit 15=C	(ipiii)	000	000	000	000	000	000	000
Fan / motor Type			Eive	d speed AC m	ator / Variable	croad EC m	otor	
	m <sup>3</sup> /h	13788	13828	12362	12362	12370	12375	1382
Airflow per fan Max Power Input	Kw	1,95	1.95	1,95 + 0,89	1,95 + 0,89	1,95 + 0,89	1,95 + 0,89	1,95 + 0
Max Power Input Max Amps	A	3	3	3 + 2,22	3 + 2,22	3 + 2,22	3 + 2,22	$\frac{1,95+0}{3+2,1}$
		686						
Motor RPM	(rpm)		686	686	686	686	686	686
Airflow per Fan	(m <sup>3</sup> /h)	13788	13828	12362	12362	12370	12375	1382
Airflow per Fan HESP (915 RPM - 100Pa)	(m <sup>3</sup> /h)	13753	13718	12248	12231	12211	12193	1372
Power per Motor	(kW)	686	686	686	686	686	686	686
tial Heat recovery (PHR) option			<u> </u>					
Heat-Exchanger Type		<b>D</b> 2 014 14		nless steel Cop				<b>D</b> 2 027
Heat-Exchanger Model		B3-014-14- 4.5M	B3-014-14- 4.5M	B3-014-14- 4.5M	B3-014-14- 4.5M	B3-027-14- 4.5L	B3-027-14- 4.5L	-B3-027 4.5L
	(in) -	G 1"1/4	G 1"1/					
Water connection size (Thread connection)	(mm)	(31.75 mm)	(31.75 n					
Water content volume	(1)	0.14	0.14	0.14	0.14	0.35	0.35	0.35
nensions (7)								
Unit Length	(mm)	2346	2346	2346	2346	2346	2346	2327
Unit Width	(mm)	1285	1285	1285	1285	1285	1285	2250
Std Unit Height	(mm)	1524	1524	1524	1524	1524	1524	1524
LN or External SP unit -			1224					
(Additional height configuration)	(mm)	+223	+224	+225	+226	+227	+228	+229
Water Buffer tank option -	(mm)	+330	+330	+330	+330	+330	+330	+330
(Additional height configuration)	(1111)	+330	+330	+330	+330	+330	+330	+550
ights								
Shipping Weight (3)	(kg)	519	531	574	579	608	621	853
Operating Weight (3)	(kg)	497	509	552	557	587	599	819
Option Additional shipping weight								
Single pump - Standard head pressure	(kg)	46	46	46	49	49	49	45
Single pump - High head pressure	(kg)	51	51	51	51	51	51	49
Twin pump - Standard head pressure	(kg)	70	70	70	75	75	75	71
Twin pump - High head pressure	(kg)	82	82	82	82	82	82	86
Pump VFD option	(kg)	0						
Partial heat recovery option	(kg)	1.48	1.48	1.48	1.48	3.82	3.82	3.82
Water Buffer tank option	(kg)	319	319	319	319	319	319	425
stem data								
Nb of refrigerant circuit	#	1	1	1	1	1	1	1
Minimum cooling load % (6)	%	50	43	50	43	50	50	33
Standard/Partial Heat Recovery Unit unit		-						
R410A refrigerant charge Circuit1 / Circuit 2	(kg)	7.5	9.0	9.0	9.0	10.5	10.5	14.0
Oil charge Circuit1 / Circuit 2	(I)	6.0	6.3	6.6	6.6	6.6	7.2	10.5
Oli charge Circuit / Circuit 2								

(1) Indicative performance at Evaporator water temperature : 12°C / 7°C - Condenser air temperature 35°C - for detailled performances, on a given unit, consult Order Write Up.

(2) under 400V/3/50Hz.

(3) Rated Condition without Pump Package.

(4) Electrical & system data are indicative and subject to change without notice. Please refer to unit nameplate data.

(5) If the power line of the unit is protected by fuses gG of the same size as the disconnect switch.

(6) OIL058E or 0IL057E are European reference for POE oil and can be mixed in any proportion with OIL00078 or OIL 00080 (same oil with US reference on compressor nameplate).

(7) For dimensions details, dimensions of hydraulic connections, electrical connections, point load and specific features for heat recovery see submittals and diagrams which are supplied with every order.



#### Table 1 - CGAX 039-060 General Data

		CGAX	CGAX	CGAX	CGAX	CGAX	CGAX	CGAX
		039 SE-SN	045 SE-SN	035 SE-SN	040 SE-SN	046 SE-SN	052 SE-SN	060 SE-SN
Net Cooling Capacity (1)	(kW)	111	127	97	116	129	147	164
Total Power input in cooling (1)	(kW)	38	41	35	39	47	51	58
Unit electrical data (2) (3) (4)								
Short Circuit Unit Capacity (9)	(kA)	15	15	15	15	15	15	15
Power Cable Cross Section (max) Disconnect switch size	mm <sup>2</sup> (A)	150 250	150 250	150 250	150 250	150 250	150 250	150 250
Digit 12=2 or Digit 12=1 and Digit 41=2	(A)	2.30	230	230	230	230	230	230
Maximum Power input	(kW)	51.1	58.7	46.4	55.8	63.3	70.7	78.2
Unit rated amps	(A)	82.6	98.2	78.1	93.5	103.7	113.9	130.7
Unit start up amps (w/o soft starter - Digit 26=A) (4)	(A)	215.3	223.7	199.9	215.3	236.4	246.6	256.2
Unit start up amps (with soft starter - Digit 26=B) (4)	. ,	152.1	161.7	143.1	158.5	173.2	183.4	194.2
Power factor		0.901	0.870	0.866	0.870	0.888	0.902	0.870
Digit 12=1 and Digit 15=A								
Maximum Power input	(kW)	49.0	55.5	44.2	51.6	59.0	66.5	74.0
Unit rated amps	(A)	81.0	95.8	76.5	90.4	100.6	110.8	127.6
Unit start up amps (w/o soft starter - Digit 26=A) (4)	(A)	213.7	221.3	198.3	212.2	233.3	243.5	253.1
Unit start up amps (with soft starter - Digit 26=B) (4)		150.5	159.3	141.5	155.4	170.1	180.3	191.1
Power factor		0.886	0.847	0.846	0.836	0.861	0.880	0.847
Digit 12=1 and Digit 15=C Maximum Power input	(kW)	50.0	56.6	46.4	53.7	61.2	68.6	76.1
Unit rated amps	(KW) (A)	81.8	96.6	78.1	91.9	102.1	112.3	129.1
Unit start up amps (w/o soft starter - Digit 26=A) (4)	(A) (A)	214.5	222.1	199.9	213.7	234.8	245.0	254.6
Unit start up amps (with soft starter - Digit 26=B) (4)	~ 7	151.3	160.1	199.9	156.9	171.6	181.8	192.6
Power factor		0.894	0.855	0.866	0.854	0.875	0.892	0.859
Compressor								
Compressor Number per Circuit	#	3	3	2	2	2	2	2
Туре		Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Model Circuit1 / Circuit 2		13+13+13	15+15+15	7,5+10 / 7,5+10	10+10 / 10+10	10+13 /10+13	13+13 / 13+13	15+15 / 15+15
Max Compr Power input Circuit 1/Circuit 2	kW	15,7 + 15,7 + 15,7	17,6 + 17,6 + 17,6	9,2 + 12 / 9,2 + 12	12 + 12 / 12 + 12	12 + 15,7 / 12 + 15,7	15,7 + 15,7 / 15,7 + 15,7	
Rated Amps Circuit1 / Circuit 2 (4)	(A)	25,3 + 25,3 + 25,3	29,5 + 29,5 + 29,5				25,3 + 25,3 / 25,3 + 25,3	
Locked Rotor Amps Circuit1 / Circuit 2 (4)	(A)	158 + 158 + 158	155 + 155 + 155	98 + 142 / 98 + 142	142 + 142 / 142 + 142	142 + 158 / 142 + 158	158 + 158 / 158 + 158 /	155 + 155 / 155 + 155
Motor RPM	(rpm)	2900	2900	2900	2900	2900	2900	2900
Oil sump heater Circuit1 / Circuit 2	(W)	0,25 / 0	0,25 / 0	0,17 / 0,17	0,17 / 0,17	0,17 / 0,17	0,17 / 0,17	0,17 / 0,17
Evaporator	()	-// -	-,, -		-,, -,			
Quantity	#	1	1	1	1	1	1	1
Туре			Stair	nless steel Cop	per Brazed pla	ate Heat excha	inger	
Evaporator model		P120Tx104	P120Tx104	DP300x82	DP300x82	DP300x82	DP300x114	DP300x114
Evaporator Water Content volume	(I)	12.5	12.5	8.5	8.5	8.5	11.8	11.8
Nominal water connection size (Grooved coupling) - Without HYM	(in) - (mm)	2" - 60,3	2" - 60,3	3" OD - 76,1	3" OD - 76,1	3" OD - 76,1	3" OD - 76,1	3" OD - 76,1
Nominal water connection size	(in) -	3" OD - 76.1	3" OD - 76.1	3" OD - 76,1	3" OD - 76.1	3" OD - 76.1	3" OD - 76.1	3" OD - 76.1
(Grooved coupling) - With HYM Hydraulic Module Components	(mm)	3 00 70,1	5 00 70,1	5 60 70,1	5 66 70,1	5 00 70,1	5 00 70,1	5 66 70,1
Single pump - Standard head pressure option								
Max available Head Pressure	(kPa)	131	104	111	133	114	113	178
Motor Power	(kW)	2.30	2.30	1.50	2.30	2.30	2.30	2.30
Rated Amps	(A)	5.03	5.03	3.50	5.03	5.03	5.03	5.03
Single pump - High head pressure option	. /							
Max available Head Pressure	(kPa)	176	151	198	179	162	162	138
Motor Power	(kW)	3.00	3.00	3.00	3.00	3.00	3.00	3.00
	· /		0.00		5.00	5.00	5.00	0.00
Rated Amps	(A)	6.23	6.23	6.23	6.23	6.23	6.23	6.23
Twin pump - Standard head pressure option	(A)	6.23	6.23	6.23	6.23	6.23	6.23	6.23
Twin pump - Standard head pressure option Max available Head Pressure	(A) (kPa)	6.23 131	6.23 104	6.23 111	6.23 133	6.23 114	6.23 113	6.23 178
Twin pump - Standard head pressure option Max available Head Pressure Motor Power	(A) (kPa) (kW)	6.23 131 2.30	6.23 104 2.30	6.23 111 1.50	6.23 133 2.30	6.23 114 2.30	6.23 113 2.30	6.23 178 2.30
Twin pump - Standard head pressure option Max available Head Pressure Motor Power Rated Amps	(A) (kPa)	6.23 131	6.23 104	6.23 111	6.23 133	6.23 114	6.23 113	6.23 178
Twin pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - High head pressure option	(A) (kPa) (kW) (A)	6.23 131 2.30 5.03	6.23 104 2.30 5.03	6.23 111 1.50 3.50	6.23 133 2.30 5.03	6.23 114 2.30 5.03	6.23 113 2.30 5.03	6.23 178 2.30 5.03
Twin pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - High head pressure option         Max available Head Pressure	(A) (kPa) (kW) (A) (kPa)	6.23 131 2.30 5.03 176	6.23 104 2.30 5.03 151	6.23 111 1.50 3.50 198	6.23 133 2.30 5.03 179	6.23 114 2.30 5.03 162	6.23 113 2.30 5.03 162	6.23 178 2.30 5.03 138
Twin pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - High head pressure option         Max available Head Pressure         Motor Power	(A) (kPa) (kW) (A) (kPa) (kW)	6.23 131 2.30 5.03 176 3.00	6.23 104 2.30 5.03 151 3.00	6.23 111 1.50 3.50 198 3.00	6.23 133 2.30 5.03 179 3.00	6.23 114 2.30 5.03 162 3.00	6.23 113 2.30 5.03 162 3.00	6.23 178 2.30 5.03 138 3.00
Twin pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - High head pressure option         Max available Head Pressure         Motor Power         Rated Amps	(A) (kPa) (kW) (A) (kPa) (kW) (A)	6.23 131 2.30 5.03 176 3.00 6.23	6.23 104 2.30 5.03 151 3.00 6.23	6.23 111 1.50 3.50 198 3.00 6.23	6.23 133 2.30 5.03 179 3.00 6.23	6.23 114 2.30 5.03 162 3.00 6.23	6.23 113 2.30 5.03 162 3.00 6.23	6.23 178 2.30 5.03 138 3.00 6.23
Twin pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - High head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Expansion Tank Volume         Max User water loop Volume for factory mounted	(A) (kPa) (kW) (A) (kPa) (kW)	6.23 131 2.30 5.03 176 3.00	6.23 104 2.30 5.03 151 3.00	6.23 111 1.50 3.50 198 3.00	6.23 133 2.30 5.03 179 3.00	6.23 114 2.30 5.03 162 3.00	6.23 113 2.30 5.03 162 3.00	6.23 178 2.30 5.03 138 3.00
Twin pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - High head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Expansion Tank Volume         Max User water loop Volume for factory mounted expansion tank (1)	(A) (kPa) (kW) (A) (kW) (kW) (A) (l) (l)	6.23 131 2.30 5.03 176 3.00 6.23 35 2000	6.23 104 2.30 5.03 151 3.00 6.23 35 2000	6.23 111 1.50 3.50 198 3.00 6.23 35 2000	6.23 133 2.30 5.03 179 3.00 6.23 35 2000	6.23 114 2.30 5.03 162 3.00 6.23 35 2000	6.23 113 2.30 5.03 162 3.00 6.23 35 2000	6.23 178 2.30 5.03 138 3.00 6.23 35 2000
Twin pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - High head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Expansion Tank Volume         Max User water loop Volume for factory mounted expansion tank (1)         Optionnal water Buffer tank volume	(A) (kPa) (kW) (A) (kPa) (kW) (A) (I) (I) (I)	6.23 131 2.30 5.03 176 3.00 6.23 35 2000 444	6.23 104 2.30 5.03 151 3.00 6.23 35 2000 444	6.23 111 1.50 3.50 198 3.00 6.23 35 2000 444	6.23 133 2.30 5.03 179 3.00 6.23 35 2000 444	6.23 114 2.30 5.03 162 3.00 6.23 35 2000 444	6.23 113 2.30 5.03 162 3.00 6.23 35 2000 444	6.23 178 2.30 5.03 138 3.00 6.23 35 2000 444
Twin pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - High head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Expansion Tank Volume         Max User water loop Volume for factory mounted expansion tank (1)         Optionnal water Buffer tank volume         Antifreeze Heater without pump package	(A) (kPa) (kW) (A) (kPa) (kW) (A) (I) (I) (I) (I) (W)	6.23 131 2.30 5.03 176 3.00 6.23 35 2000 444 180	6.23 104 2.30 5.03 151 3.00 6.23 35 2000 444 180	6.23 1111 1.50 3.50 198 3.00 6.23 35 2000 444 120	6.23 133 2.30 5.03 179 3.00 6.23 35 2000 444 120	6.23 114 2.30 5.03 162 3.00 6.23 35 2000 444 120	6.23 113 2.30 5.03 162 3.00 6.23 35 2000 444 180	6.23 178 2.30 5.03 138 3.00 6.23 35 2000 444 180
Twin pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - High head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Expansion Tank Volume         Max User water loop Volume for factory mounted expansion tank (1)         Optionnal water Buffer tank volume         Antifreeze Heater without pump package         Antifreeze Heater with pump package	(A) (kPa) (kW) (A) (kPa) (kW) (A) (I) (I) (I)	6.23 131 2.30 5.03 176 3.00 6.23 35 2000 444	6.23 104 2.30 5.03 151 3.00 6.23 35 2000 444	6.23 111 1.50 3.50 198 3.00 6.23 35 2000 444	6.23 133 2.30 5.03 179 3.00 6.23 35 2000 444	6.23 114 2.30 5.03 162 3.00 6.23 35 2000 444	6.23 113 2.30 5.03 162 3.00 6.23 35 2000 444	6.23 178 2.30 5.03 138 3.00 6.23 35 2000 444
Twin pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - High head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Expansion Tank Volume         Max User water loop Volume for factory mounted expansion tank (1)         Optionnal water Buffer tank volume         Antifreeze Heater with pump package         Antifreeze Heater with pump package         Condenser	(A) (kPa) (kW) (A) (kPa) (kW) (A) (I) (I) (I) (I) (W)	6.23 131 2.30 5.03 176 3.00 6.23 35 2000 444 180	6.23 104 2.30 5.03 151 3.00 6.23 35 2000 444 180 340	6.23 111 1.50 3.50 198 3.00 6.23 35 2000 444 120 280	6.23 133 2.30 5.03 179 3.00 6.23 35 2000 444 120 280	6.23 114 2.30 5.03 162 3.00 6.23 35 2000 444 120 280	6.23 113 2.30 5.03 162 3.00 6.23 35 2000 444 180 340	6.23 178 2.30 5.03 138 3.00 6.23 35 2000 444 180
Twin pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - High head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Expansion Tank Volume         Max User water loop Volume for factory mounted expansion tank (1)         Optionnal water Buffer tank volume         Antifreeze Heater without pump package         Antifreeze Type	(A) (kPa) (kW) (A) (kPa) (kW) (A) (I) (I) (I) (I) (W)	6.23 131 2.30 5.03 176 3.00 6.23 35 2000 444 180	6.23 104 2.30 5.03 151 3.00 6.23 35 2000 444 180 340	6.23 1111 1.50 3.50 198 3.00 6.23 35 2000 444 120	6.23 133 2.30 5.03 179 3.00 6.23 35 2000 444 120 280	6.23 114 2.30 5.03 162 3.00 6.23 35 2000 444 120 280	6.23 113 2.30 5.03 162 3.00 6.23 35 2000 444 180 340	6.23 178 2.30 5.03 138 3.00 6.23 35 2000 444 180
Twin pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - High head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Expansion Tank Volume         Max User water loop Volume for factory mounted expansion tank (1)         Optionnal water Buffer tank volume         Antifreeze Heater with pump package         Antifreeze Heater with pump package         Condenser	(A) (kPa) (kW) (A) (kPa) (kW) (A) (l) (l) (l) (l) (W) (W)	6.23 131 2.30 5.03 176 3.00 6.23 35 2000 444 180 340	6.23 104 2.30 5.03 151 3.00 6.23 35 2000 444 180 340 F	6.23 111 1.50 3.50 198 3.00 6.23 35 2000 444 120 280 ull aluminum l	6.23 133 2.30 5.03 179 3.00 6.23 35 2000 444 120 280 Micro channel	6.23 114 2.30 5.03 162 3.00 6.23 35 2000 444 120 280 heat exchange	6.23 113 2.30 5.03 162 3.00 6.23 35 2000 444 180 340 er	6.23 178 2.30 5.03 138 3.00 6.23 35 2000 444 180 340



Table 1 - CGAX 039-060 General Data (continued)

		CGAX 039	CGAX 045	CGAX 035	CGAX 040	CGAX 046	CGAX 052	CGAX 060
		SE-SN	SE-SN	SE-SN	SE-SN	SE-SN	SE-SN	SE-SN
denser Fan								
Quantity	#	2	3	2	4	4	4	4
Diameter	(mm)				800			
Fan / motor Type		Propelle	er fan : Fixed s	speed AC mot	or / Variable s	peed - EC mot	or / HESP MAX	( SPEED
Digit 12=2 or Digit 12=1 and Digit 41=2					(1)505 1(1)			
Fan / motor Type	3.,		10505		or / HESP MAX			1000
Airflow per fan	m <sup>3</sup> /h	14660	13595	14686	12249	12233	12447	1220
Max Power Input	Kw	1,95 + 1,95	1,95 + 1,95 + 1,95	1,95 / 1,95 + 0			1,95 + 1,95 / 1,95 + 1,95	
Max Amps	А	3 + 3	3 + 3 + 3	3/3+0	3 + 3 / 3 + 3	3 + 3 / 3 + 3	3 + 3 / 3 + 3	3 + 3 / 3
Motor RPM	(rpm)	915	915	915	915	915	915	915
Digit 12=1 and Digit 15=A								
Fan / motor Type					notor / Variable			
Airflow per fan	m <sup>3</sup> /h	14690	13676	14687	12358	12363	12592	1237
Max Power Input	Kw	0,89 + 0,89	0,89 + 0,89 + 0,89	0,89 / 0,89 + 0	0,89 + 0,89 / 0,89 + 0,89		0,89 + 0,89 / 0,89 + 0,89	0,89 + 0 0,89 + (
Max Amps	А	2,22 + 2,22	2,22 + 2,22 + 2,22	2,22 / 2,22 + 0			2,22 + 2,22 / 2,22 + 2,22	
Motor RPM	(rpm)	686	686	686	686	686	686	686
Digit 12=1 and Digit 15=C								
Fan / motor Type			Fixe	d speed AC m	notor / Variable	speed - EC m	iotor	
Airflow per fan	m <sup>3</sup> /h	14690	13676	14687	12358	12363	12592	1237
Max Power Input	Kw	1,95 + 0,89	1,95 + 0,89 + 0,89	1,95 / 1,95 + 0		1,95 + 0,89 / 1,95 + 0,89	1,95 + 0,89 / 1,95 + 0,89	1,95 + 0 1,95 + (
Max Amps	А	3 + 2,22	3 + 2,22 + 2,22	3/3+0	3 + 2,22 / 3 + 2,22	3 + 2,22 / 3 + 2,22	3 + 2,22 / 3 + 2,22	3 + 2,2 3 + 2,
Motor RPM	(rpm)	686	686	686	686	686	686	686
Airflow per Fan	(m <sup>3</sup> /h)	14690	13676	14687	12358	12363	12592	1237
Airflow per Fan HESP (915 RPM - 100Pa)	(m <sup>3</sup> /h)	14660	13595	14686	12249	12233	12447	1220
Power per Motor	(kW)	686	686	686	686	686	686	686
tial Heat recovery (PHR) option								
Heat-Exchanger Type			Stair	less steel Co	oper Brazed pla	ate Heat excha	anger	
Heat-Exchanger Model		B3-027-20-	B3-027-20-	2x B3-014-	2x B3-014-	2x B3-014-	2x B3-027-	2x B3-0
		4.5L	4.5L	14-4.5M	14-4.5M	14-4.5M	14-4.5L	14-4.5
Water connection size (Thread connection)	(in) - (mm)	G 1"1/4 (31.75 mm)	G 1"1/4 (31.75 mm)	G 1"1/4 (31.75 mm)	G 1"1/4 (31.75 mm)	G 1"1/4 (31.75 mm)	G 1"1/4 (31.75 mm)	G 1"1, (31.75 r
Water content volume	(1)	0.5	0.5	2x 0.14	2x 0.14	2x 0.14	2x 0.35	2x 0.3
ensions (7)								
Unit Length	(mm)	2327	2327	2327	2327	2327	2327	2327
Unit Length Unit Width	(mm) (mm)	2327 2250	2327 2250	2327 2250	2327 2250	2327 2250	2327 2250	
-	. ,							2250
Unit Width Std Unit Height LN or External SP unit -	(mm)	2250	2250	2250	2250	2250	2250	2250 1524
Unit Width Std Unit Height LN or External SP unit - (Additional height configuration) Water Buffer tank option -	(mm) (mm)	2250 1524	2250 1524	2250 1524	2250 1524	2250 1524	2250 1524	2250 1524 +236
Unit Width Std Unit Height LN or External SP unit - (Additional height configuration) Water Buffer tank option - (Additional height configuration)	(mm) (mm) (mm)	2250 1524 +230	2250 1524 +231	2250 1524 +232	2250 1524 +233	2250 1524 +234	2250 1524 +235	2250 1524 +236
Unit Width Std Unit Height LN or External SP unit - (Additional height configuration) Water Buffer tank option - (Additional height configuration) ghts	(mm) (mm) (mm) (mm)	2250 1524 +230 +330	2250 1524 +231 +330	2250 1524 +232 +330	2250 1524 +233 +330	2250 1524 +234 +330	2250 1524 +235 +330	2250 1524 +236 +330
Unit Width Std Unit Height LN or External SP unit - (Additional height configuration) Water Buffer tank option - (Additional height configuration) <b>ghts</b> Shipping Weight (3)	(mm) (mm) (mm) (mm) (kg)	2250 1524 +230 +330 858	2250 1524 +231 +330 912	2250 1524 +232 +330 917	2250 1524 +233 +330 1004	2250 1524 +234 +330 	2250 1524 +235 +330 1034	2250 1524 +236 +330 1060
Unit Width Std Unit Height LN or External SP unit - (Additional height configuration) Water Buffer tank option - (Additional height configuration) <b>ghts</b> Shipping Weight (3) Operating Weight (3)	(mm) (mm) (mm) (mm)	2250 1524 +230 +330	2250 1524 +231 +330	2250 1524 +232 +330	2250 1524 +233 +330	2250 1524 +234 +330	2250 1524 +235 +330	2250 1524 +236 +330 1060
Unit Width Std Unit Height LN or External SP unit - (Additional height configuration) Water Buffer tank option - (Additional height configuration) <b>ghts</b> Shipping Weight (3) Operating Weight (3) <b>Option Additional shipping weight</b>	(mm) (mm) (mm) (mm) (kg) (kg)	2250 1524 +230 +330 858	2250 1524 +231 +330 912	2250 1524 +232 +330 917	2250 1524 +233 +330 1004	2250 1524 +234 +330 	2250 1524 +235 +330 1034	2250 1524 +236 +330
Unit Width Std Unit Height LN or External SP unit - (Additional height configuration) Water Buffer tank option - (Additional height configuration) <b>ghts</b> Shipping Weight (3) Operating Weight (3) <b>Option Additional shipping weight</b> Single pump - Standard head pressure	(mm) (mm) (mm) (mm) (kg) (kg) (kg)	2250 1524 +230 +330 858 824 47	2250 1524 +231 +330 912 879 47	2250 1524 +232 +330 917 887 45	2250 1524 +233 +330 1004 973 47	2250 1524 +234 +330 1014 983 47	2250 1524 +235 +330 1034 1004 47	2250 1524 +236 +330 1060 1029 47
Unit Width Std Unit Height LN or External SP unit - (Additional height configuration) Water Buffer tank option - (Additional height configuration) ghts Shipping Weight (3) Operating Weight (3) Option Additional shipping weight Single pump - Standard head pressure Single pump - High head pressure	(mm) (mm) (mm) (mm) (kg) (kg) (kg) (kg)	2250 1524 +230 +330 858 824 47 49	2250 1524 +231 +330 912 879 47 49	2250 1524 +232 +330 917 887 45 49	2250 1524 +233 +330 1004 973 47 49	2250 1524 +234 +330 1014 983 47 49	2250 1524 +235 +330 1034 1004 47 49	2250 1524 +236 +330 1060 1029 47 49
Unit Width Std Unit Height LN or External SP unit - (Additional height configuration) Water Buffer tank option - (Additional height configuration) ghts Shipping Weight (3) Option Additional shipping weight Single pump - Standard head pressure Single pump - High head pressure Twin pump - Standard head pressure	(mm) (mm) (mm) (mm) (kg) (kg) (kg) (kg) (kg)	2250 1524 +230 +330 858 824 47 49 75	2250 1524 +231 +330 912 879 47 49 75	2250 1524 +232 +330 917 887 	2250 1524 +233 +330 	2250 1524 +234 +330 1014 983 47 49 75	2250 1524 +235 +330 	2250 1524 +236 +330 1060 1029 47 49 75
Unit Width Std Unit Height LN or External SP unit - (Additional height configuration) Water Buffer tank option - (Additional height configuration) ghts Shipping Weight (3) Option Additional shipping weight Single pump - Standard head pressure Single pump - High head pressure Twin pump - High head pressure Twin pump - High head pressure	(mm) (mm) (mm) (mm) (kg) (kg) (kg) (kg) (kg) (kg)	2250 1524 +230 +330 858 824 47 49	2250 1524 +231 +330 912 879 47 49	2250 1524 +232 +330 917 887 45 49	2250 1524 +233 +330 1004 973 47 49	2250 1524 +234 +330 1014 983 47 49	2250 1524 +235 +330 1034 1004 47 49	2250 1524 +236 +330 1060 1029 
Unit Width Std Unit Height LN or External SP unit - (Additional height configuration) Water Buffer tank option - (Additional height configuration) <b>ghts</b> Shipping Weight (3) <b>Operating Weight (3)</b> <b>Option Additional shipping weight</b> Single pump - Standard head pressure Single pump - High head pressure Twin pump - Standard head pressure Twin pump - High head pressure Pump VFD option	(mm) (mm) (mm) (mm) (kg) (kg) (kg) (kg) (kg) (kg) (kg) (kg	2250 1524 +230 +330 858 824 47 49 75	2250 1524 +231 +330 912 879 47 49 75	2250 1524 +232 +330 917 887 45 49 75 84	2250 1524 +233 +330 1004 973 47 49 75 84	2250 1524 +234 +330 1014 983 47 49 75	2250 1524 +235 +330 1034 1004 47 49 75 84	2250 1524 +236 +330 1060 1029 47 49 75 84 0
Unit Width Std Unit Height LN or External SP unit - (Additional height configuration) Water Buffer tank option - (Additional height configuration) <b>ghts</b> Shipping Weight (3) Operating Weight (3) <b>Option Additional shipping weight</b> Single pump - Standard head pressure Single pump - High head pressure Twin pump - Standard head pressure Twin pump - High head pressure Pump VFD option <b>Partial heat recovery option</b>	(mm) (mm) (mm) (mm) (kg) (kg) (kg) (kg) (kg) (kg) (kg) (kg	2250 1524 +230 +330 858 824 47 49 75 86 86 4.6	2250 1524 +231 +330 912 879 47 49 75 86 4.6	2250 1524 +232 +330 917 887 45 45 49 75 84 84 2x 1.48	2250 1524 +233 +330 	2250 1524 +234 +330 1014 983 47 49 75 84	2250 1524 +235 +330 	2250 1524 +230 +330 1060 1029 47 47 49 75 5 84 0 2x 3.8
Unit Width Std Unit Height LN or External SP unit - (Additional height configuration) Water Buffer tank option - (Additional height configuration) ghts Shipping Weight (3) Operating Weight (3) Option Additional shipping weight Single pump - Standard head pressure Single pump - High head pressure Twin pump - High head pressure Twin pump - High head pressure Pump VFD option Partial heat recovery option Water Buffer tank option	(mm) (mm) (mm) (mm) (kg) (kg) (kg) (kg) (kg) (kg) (kg) (kg	2250 1524 +230 +330 858 824 47 49 75 86	2250 1524 +231 +330 912 879 47 49 75 86	2250 1524 +232 +330 917 887 45 49 75 84	2250 1524 +233 +330 1004 973 47 49 75 84 2x 1.48	2250 1524 +234 +330 1014 983 47 49 75 84 84 2x 1.48	2250 1524 +235 +330 1034 1004 47 49 75 84 2x 3.82	2250 1524 +230 +330 1060 1029 47 47 49 75 5 84 0 2x 3.8
Unit Width Std Unit Height LN or External SP unit - (Additional height configuration) Water Buffer tank option - (Additional height configuration) <b>ghts</b> Shipping Weight (3) Operating Weight (3) <b>Option Additional shipping weight</b> Single pump - Standard head pressure Single pump - High head pressure Twin pump - Standard head pressure Twin pump - High head pressure Pump VFD option <b>Partial heat recovery option</b>	(mm) (mm) (mm) (mm) (kg) (kg) (kg) (kg) (kg) (kg) (kg) (kg	2250 1524 +230 +330 858 824 47 49 75 86 86 4.6	2250 1524 +231 +330 912 879 47 49 75 86 4.6	2250 1524 +232 +330 917 887 45 45 49 75 84 84 2x 1.48	2250 1524 +233 +330 1004 973 47 49 75 84 2x 1.48	2250 1524 +234 +330 1014 983 47 49 75 84 84 2x 1.48	2250 1524 +235 +330 1034 1004 47 49 75 84 2x 3.82	2250 1524 +236 +330 1060 1029 47 47 49 75 5 84 0 2x 3.8
Unit Width Std Unit Height LN or External SP unit - (Additional height configuration) Water Buffer tank option - (Additional height configuration) ghts Shipping Weight (3) Option Additional shipping weight Single pump - Standard head pressure Single pump - High head pressure Twin pump - High head pressure Twin pump - High head pressure Pump VFD option Partial heat recovery option Water Buffer tank option tem data Nb of refrigerant circuit	(mm) (mm) (mm) (mm) (kg) (kg) (kg) (kg) (kg) (kg) (kg) (kg	2250 1524 +230 +330 858 824 47 49 75 86 4,6 4,6 4,25 1	2250 1524 +231 +330 912 879 47 49 75 86 4.6 4.6 425 1	2250 1524 +232 +330 917 887 45 49 75 84 2x 1.48 425 2	2250 1524 +233 +330 1004 973 47 49 75 84 2x 1.48 425	2250 1524 +234 +330 1014 983 47 49 75 84 2x 1.48 425 2	2250 1524 +235 +330 1034 1004 47 49 75 84 2x 3.82 425	2250 1524 +236 +330 1060 1025 47 49 75 84 0 2x 3.8 425
Unit Width Std Unit Height LN or External SP unit - (Additional height configuration) Water Buffer tank option - (Additional height configuration) ghts Shipping Weight (3) Option Additional shipping weight Single pump - Standard head pressure Single pump - High head pressure Twin pump - Standard head pressure Twin pump - High head pressure Pump VFD option Partial heat recovery option Water Buffer tank option tem data Nb of refrigerant circuit Minimum cooling load % (6)	(mm) (mm) (mm) (mm) (kg) (kg) (kg) (kg) (kg) (kg) (kg) (kg	2250 1524 +230 +330 858 824 47 49 75 86 	2250 1524 +231 +330 912 879 47 49 75 86 	2250 1524 +232 +330 917 887 45 49 75 84 2x 1.48 425	2250 1524 +233 +330 1004 973 47 49 75 84 2x 1.48 425 2	2250 1524 +234 +330 1014 983 47 49 75 84 2x 1.48 425	2250 1524 +235 +330 1034 1004 47 49 75 84 2x 3.82 425 2	2250 1524 +236 +330 1060 1029 47 49 75 84 0 2x 3.8 425 22
Unit Width Std Unit Height LN or External SP unit - (Additional height configuration) Water Buffer tank option - (Additional height configuration) ghts Shipping Weight (3) Option Additional shipping weight Single pump - Standard head pressure Single pump - High head pressure Twin pump - High head pressure Twin pump - High head pressure Pump VFD option Partial heat recovery option Water Buffer tank option tem data Nb of refrigerant circuit Minimum cooling load % (6) Standard/Partial Heat Recovery Unit unit	(mm) (mm) (mm) (mm) (kg) (kg) (kg) (kg) (kg) (kg) (kg) (kg	2250 1524 +230 +330 858 824 47 49 75 86 4,6 4,6 4,25 1	2250 1524 +231 +330 912 879 47 49 75 86 4.6 4.6 425 1	2250 1524 +232 +330 917 887 45 49 75 84 2x 1.48 425 2	2250 1524 +233 +330 1004 973 47 49 75 84 2x 1.48 425 2	2250 1524 +234 +330 1014 983 47 49 75 84 2x 1.48 425 2	2250 1524 +235 +330 1034 1004 47 49 75 84 2x 3.82 425 2	49 75 84 0 2x 3.8 425 2
Unit Width Std Unit Height LN or External SP unit - (Additional height configuration) Water Buffer tank option - (Additional height configuration) ghts Shipping Weight (3) Option Additional shipping weight Single pump - Standard head pressure Single pump - High head pressure Twin pump - Standard head pressure Twin pump - High head pressure Pump VFD option Partial heat recovery option Water Buffer tank option tem data Nb of refrigerant circuit Minimum cooling load % (6)	(mm) (mm) (mm) (mm) (kg) (kg) (kg) (kg) (kg) (kg) (kg) (kg	2250 1524 +230 +330 858 824 47 49 75 86 4.6 425 1 33	2250 1524 +231 +330 912 879 47 49 75 86 47 49 75 86 4.6 425 1 33	2250 1524 +232 +330 917 887 45 49 75 84 2x 1.48 425 2 2 22	2250 1524 +233 +330 1004 973 47 49 75 84 2x 1.48 425 2 25	2250 1524 +234 +330 1014 983 47 49 75 84 2x 1.48 425 2 2 22	2250 1524 +235 +330 1034 1004 47 49 75 84 2x 3.82 425 2 25	2250 1524 +236 +330 1060 1029 47 49 75 84 0 2x 3.6 425 22 25

(1) Indicative performance at Evaporator water temperature : 12°C / 7°C - Condenser air temperature 35°C - for detailled performances, on a given unit, consult Order Write Up.

(2) under 400V/3/50Hz.

(3) Rated Condition without Pump Package.

(4) Electrical & system data are indicative and subject to change without notice. Please refer to unit nameplate data.

(5) If the power line of the unit is protected by fuses gG of the same size as the disconnect switch.

(6) OIL058E or OIL057E are European reference for POE oil and can be mixed in any proportion with OIL00078 or OIL 00080 (same oil with US reference on compressor nameplate).
(7) For dimensions details, dimensions of hydraulic connections, electrical connections, point load and specific features for heat recovery see submittals and diagrams which are supplied with every order.



#### Table 2 - CXAX 015-036 General Data

		CXAX 015	CXAX 017	CXAX 020	CXAX 023	CXAX 026	CXAX 030	CXAX 036
		SE-SN	SE-SN	SE-SN	SE-SN	SE-SN	SE-SN	SE-SN
Net Cooling Capacity (1)	(kW)	43	49	59	65	74	82	99
Total Power input in cooling (1)	(kW)	15	17	19	22	26	29	33
Unit electrical data (2) (3) (4) Short Circuit Unit Capacity (9)	(kA)	12	12	12	12	12	12	15
Power Cable Cross Section (max)	mm <sup>2</sup>	35	35	35	35	35	35	150
Disconnect switch size	(A)	80	80	100	100	100	100	250
Digit 12=2 or Digit 12=1 and Digit 41=2	(1110)							
Maximum Power input Unit rated amps	(kW) (A)	20.4 34.5	23.2 39.2	27.9 46.9	31.6 52.0	35.4 57.1	<u>39.1</u> 65.5	45.1 75.4
Unit start up amps (w/o soft starter - Digit 26=A) (4)	(A)	117.0	161.0	168.7	184.7	189.8	191.0	199.5
Unit start up amps (with soft starter - Digit 26=B) (4)		77.8	104.2	111.9	121.5	126.6	129.0	140.7
Power factor		0.868	0.866	0.870	0.888	0.902	0.870	0.873
Digit 12=1 and Digit 15=A	(1110)							
Maximum Power input Unit rated amps	(kW) (A)	<u>19.4</u> 33.8	<u>22.1</u> 38.5	25.8 45.4	29.5 50.5	<u>33.3</u> 55.6	<u>37.0</u> 64.0	43.0 73.8
Unit start up amps (w/o soft starter - Digit 26=A) (4)	(A)	116.3	160.3	167.2	183.2	188.3	189.5	197.9
Unit start up amps (with soft starter - Digit 26=B) (4)		77.1	103.5	110.4	120.0	125.1	127.5	139.1
Power factor		0.845	0.846	0.836	0.861	0.880	0.847	0.854
Digit 12=1 and Digit 15=C	(1110)							
Maximum Power input	(kW)	20.4	23.2	26.8 46.2	30.6	34.3	38.1	44.1
Unit rated amps Unit start up amps (w/o soft starter - Digit 26=A) (4)	(A) (A)	<u>34.5</u> 117.0	<u> </u>	168.0	<u>51.3</u> 184.0	<u>56.4</u> 189.1	<u>64.8</u> 190.3	74.6 198.7
Unit start up amps (with soft starter - Digit 26=B) (4)		77.8	101.0	111.2	120.8	125.9	128.3	139.9
Power factor		0.868	0.866	0.854	0.875	0.892	0.859	0.864
Compressor								
Compressor Number per Circuit Type	#	2 Scroll	2 Scroll	2 Caroll	2 Caroll	2 Scroll	2 Scroll	3 Scroll
Model Circuit1 / Circuit 2		7,5+7,5	7,5+10	Scroll 10+10	Scroll 10+13	13+13	15+15	12+12+12
Max Compr Power input Circuit 1/Circuit 2	kW	9,2 + 9,2	9,2+ 12	12 + 12	12 + 15,7		17,61 + 17,6	137+
Rated Amps Circuit1 / Circuit 2 (4)	(A)	15,5 + 15,5	15,5 + 20,2	20,2 + 20,2	20,2 + 25,3	25,3 + 25,3	29,5 + 29,5	22,9 + 22,9 + 22,9
Locked Rotor Amps Circuit1 / Circuit 2 (4)	(A)	98 + 98	98 + 142	142 + 142	142 + 158	158 + 158	155 + 155	147 + 147 + 147
Motor RPM Oil sump heater Circuit1 / Circuit 2	(rpm) (W)	2900	2900	2900	2900	2900	2900	2900
Evaporator	(vv)	0,17/0	0,17 / 0	0,17 / 0	0,1770	0,17 / 0	0,17 / 0	0,25 / 0
Quantity	#	1	1	1	1	1	1	1
Туре					per Brazed pla			
Evaporator model		P80x66	P80x92	P80x92	P80x92	P120Tx76	P120Tx76	P120Tx104
Evaporator Water Content volume Nominal water connection size (Grooved coupling) - Without HYM	(in) - (mm)	3.8 2" - 60,3	5.3 2" - 60,3	5.3 2" - 60,3	5.3 2" - 60,3	9.2 2" - 60,3	9.2	12.5 2" - 60 <i>.</i> 3
				2 00,5	2 00,5	2 00,5	2" - 60,3	2 - 60,5
Nominal water connection size (Grooved coupling) -	(in) -	2" - 60 3	2" - 60 3					,-
With HYM	(in) - (mm)	2" - 60,3	2" - 60,3	2" - 60,3	2" - 60,3	2" - 60,3	2" - 60,3 2" - 60,3	2 - 60,3 3" OD - 76,1
With HYM Hydraulic Module Components		2" - 60,3	2" - 60,3					,-
With HYM		2" - 60,3 96	2" - 60,3					,-
With HYM Hydraulic Module Components Single pump - Standard head pressure option Max available Head Pressure Motor Power	(mm) (kPa) (kW)	<u>96</u> 1.20	<u>100</u> 1.20	2" - 60,3 86 1.20	2" - 60,3 113 1.50	2" - 60,3 120 1.50	2" - 60,3 110 1.50	3" OD - 76,1 103 1.50
With HYM Hydraulic Module Components Single pump - Standard head pressure option Max available Head Pressure Motor Power Rated Amps	(mm) (kPa)	96	100	2" - 60,3	2" - 60,3	2" - 60,3	2" - 60,3	3" OD - 76,1 103
With HYM Hydraulic Module Components Single pump - Standard head pressure option Max available Head Pressure Motor Power Rated Amps Single pump - High head pressure option	(mm) (kPa) (kW) (A)	96 1.20 2.44	100 1.20 2.44	2" - 60,3 86 1.20 2.44	2" - 60,3 113 1.50 3.50	2" - 60,3 <u>120</u> 1.50 3.50	2" - 60,3 <u>110</u> 1.50 3.50	3" OD - 76,1 103 1.50 3.50
With HYM Hydraulic Module Components Single pump - Standard head pressure option Max available Head Pressure Motor Power Rated Amps Single pump - High head pressure option Max available Head Pressure	(mm) (kPa) (kW) (A) (kPa)	96 1.20 2.44 170	100 1.20 2.44 174	2" - 60,3 86 1.20 2.44 162	2" - 60,3 113 1.50 3.50 152	2" - 60,3 120 1.50 3.50 161	2" - 60,3 110 1.50 3.50 152	3" OD - 76,1 103 1.50 3.50 190
With HYM Hydraulic Module Components Single pump - Standard head pressure option Max available Head Pressure Motor Power Rated Amps Single pump - High head pressure option	(mm) (kPa) (kW) (A)	96 1.20 2.44	100 1.20 2.44	2" - 60,3 86 1.20 2.44	2" - 60,3 113 1.50 3.50	2" - 60,3 <u>120</u> 1.50 3.50	2" - 60,3 <u>110</u> 1.50 3.50	3" OD - 76,1 103 1.50 3.50
With HYM  Hydraulic Module Components  Single pump - Standard head pressure option  Max available Head Pressure  Motor Power  Rated Amps  Single pump - High head pressure option  Max available Head Pressure  Motor Power  Rated Amps  Twin pump - Standard head pressure option	(mm) (kPa) (kW) (A) (kPa) (kW) (A)	96 1.20 2.44 170 2.30 5.03	100 1.20 2.44 174 2.30 5.03	2" - 60,3 86 1.20 2.44 162 2.30 5.03	2" - 60,3 113 1.50 3.50 152 2.30 5.03	2" - 60,3 120 1.50 3.50 161 2.30 5.03	2" - 60,3 110 1.50 3.50 152 2.30 5.03	3" OD - 76,1 103 1.50 3.50 190 3.00 6.23
With HYM  Hydraulic Module Components Single pump - Standard head pressure option Max available Head Pressure Motor Power Rated Amps Single pump - High head pressure option Max available Head Pressure Motor Power Rated Amps Twin pump - Standard head pressure option Max available Head Pressure	(mm) (kPa) (kW) (A) (kPa) (kW) (A) (kPa)	96 1.20 2.44 170 2.30 5.03 96	100 1.20 2.44 174 2.30 5.03 100	2" - 60,3 86 1.20 2.44 162 2.30 5.03 86	2" - 60,3 113 1.50 3.50 152 2.30 5.03 113	2" - 60,3 120 1.50 3.50 161 2.30 5.03 120	2" - 60,3 110 1.50 3.50 152 2.30 5.03 110	3" OD - 76,1 103 1.50 3.50 190 3.00 6.23 103
With HYM  Hydraulic Module Components  Single pump - Standard head pressure option  Max available Head Pressure Motor Power Rated Amps Single pump - High head pressure option Max available Head Pressure Motor Power Rated Amps Twin pump - Standard head pressure option Max available Head Pressure Motor Power	(mm) (kPa) (kW) (A) (kPa) (kW) (A) (kPa) (kW)	96 1.20 2.44 170 2.30 5.03 96 1.20	100 1.20 2.44 174 2.30 5.03 100 1.20	2" - 60,3 86 1.20 2.44 162 2.30 5.03 86 1.20	2" - 60,3 113 1.50 3.50 152 2.30 5.03 113 1.50	2" - 60,3 120 1.50 3.50 161 2.30 5.03 120 1.50	2" - 60,3 110 1.50 3.50 152 2.30 5.03 110 1.50	3" OD - 76,1 103 1.50 3.50 190 3.00 6.23 103 1.50
With HYM Hydraulic Module Components Single pump - Standard head pressure option Max available Head Pressure Motor Power Rated Amps Single pump - High head pressure option Max available Head Pressure Motor Power Rated Amps Twin pump - Standard head pressure option Max available Head Pressure Motor Power Rated Amps Twin pump - Standard head pressure option Max available Head Pressure Motor Power Rated Amps	(mm) (kPa) (kW) (A) (kPa) (kW) (A) (kPa)	96 1.20 2.44 170 2.30 5.03 96	100 1.20 2.44 174 2.30 5.03 100	2" - 60,3 86 1.20 2.44 162 2.30 5.03 86	2" - 60,3 113 1.50 3.50 152 2.30 5.03 113	2" - 60,3 120 1.50 3.50 161 2.30 5.03 120	2" - 60,3 110 1.50 3.50 152 2.30 5.03 110	3" OD - 76,1 103 1.50 3.50 190 3.00 6.23 103
With HYM  Hydraulic Module Components  Single pump - Standard head pressure option  Max available Head Pressure Motor Power Rated Amps Single pump - High head pressure option Max available Head Pressure Motor Power Rated Amps Twin pump - Standard head pressure option Max available Head Pressure Motor Power	(mm) (kPa) (kW) (A) (kPa) (kW) (A) (kPa) (kW)	96 1.20 2.44 170 2.30 5.03 96 1.20	100 1.20 2.44 174 2.30 5.03 100 1.20	2" - 60,3 86 1.20 2.44 162 2.30 5.03 86 1.20	2" - 60,3 113 1.50 3.50 152 2.30 5.03 113 1.50	2" - 60,3 120 1.50 3.50 161 2.30 5.03 120 1.50	2" - 60,3 110 1.50 3.50 152 2.30 5.03 110 1.50	3" OD - 76,1 103 1.50 3.50 190 3.00 6.23 103 1.50
With HYM  Hydraulic Module Components  Single pump - Standard head pressure option  Max available Head Pressure Motor Power Rated Amps Single pump - High head pressure option Max available Head Pressure Motor Power Rated Amps Twin pump - Standard head pressure option Max available Head Pressure Motor Power Rated Amps Twin pump - High head pressure option Max available Head Pressure Motor Power Rated Amps Twin pump - High head pressure option Max available Head Pressure Motor Power Rated Pressure Motor Power Rated Pressure Motor Power Motor Power Motor Power Motor Power	(mm) (kPa) (kW) (A) (kPa) (kW) (A) (kPa) (kPa) (kW)	96 1.20 2.44 170 2.30 5.03 96 1.20 2.44 170 2.30	100 1.20 2.44 174 2.30 5.03 100 1.20 2.44 174 2.30	2" - 60,3 86 1.20 2.44 162 2.30 5.03 86 1.20 2.44 162 2.44 162 2.30	2" - 60,3 113 1.50 3.50 152 2.30 5.03 113 1.50 3.50	2" - 60,3 120 1.50 3.50 161 2.30 5.03 120 1.50 3.50	2" - 60,3 110 1.50 3.50 152 2.30 5.03 110 1.50 3.50	3" OD - 76,1 103 1.50 3.50 190 3.00 6.23 103 1.50 3.50 190 3.00
With HYM  Hydraulic Module Components  Single pump - Standard head pressure option  Max available Head Pressure Motor Power Rated Amps  Twin pump - High head pressure option  Max available Head Pressure Motor Power Rated Amps  Twin pump - Standard head pressure option  Max available Head Pressure Motor Power Rated Amps  Twin pump - High head pressure option  Max available Head Pressure Motor Power Rated Amps  Twin pump - High head pressure option  Max available Head Pressure Motor Power Rated Amps	(mm) (kPa) (kW) (A) (kPa) (kW) (A) (kPa) (kW) (A) (kPa) (kW) (A)	96 1.20 2.44 170 2.30 5.03 96 1.20 2.44 170 2.30 5.03	100 1.20 2.44 2.30 5.03 100 1.20 2.44 174 2.30 5.03	2" - 60,3 86 1.20 2.44 162 2.30 5.03 86 1.20 2.44 162 2.30 5.03	2" - 60,3 113 1.50 3.50 152 2.30 5.03 113 1.50 3.50 152 2.30 5.03	2" - 60,3 120 1.50 3.50 161 2.30 5.03 120 1.50 3.50 161 2.30 5.03	2" - 60,3 110 1.50 3.50 152 2.30 5.03 110 1.50 3.50 152 2.30 5.03	3" OD - 76,1 103 1.50 3.50 190 3.00 6.23 103 1.50 3.50 
With HYM  Hydraulic Module Components  Single pump - Standard head pressure option  Max available Head Pressure Motor Power Rated Amps Single pump - High head pressure option Max available Head Pressure Motor Power Rated Amps Twin pump - Standard head pressure option Max available Head Pressure Motor Power Rated Amps Twin pump - High head pressure option Max available Head Pressure Motor Power Rated Amps Twin pump - High head pressure option Max available Head Pressure Motor Power Rated Amps Twin pump - High head pressure option Max available Head Pressure Motor Power Rated Amps Rated Amps Expansion Tank Volume	(mm) (kPa) (kW) (kPa) (kPa) (kPa) (kPa) (kW) (kPa) (kPa)	96 1.20 2.44 170 2.30 5.03 96 1.20 2.44 170 2.30	100 1.20 2.44 174 2.30 5.03 100 1.20 2.44 174 2.30	2" - 60,3 86 1.20 2.44 162 2.30 5.03 86 1.20 2.44 162 2.44 162 2.30	2" - 60,3 113 1.50 3.50 152 2.30 5.03 113 1.50 3.50 152 2.30	2" - 60,3 120 1.50 3.50 161 2.30 5.03 120 1.50 3.50 161 2.30	2" - 60,3 110 1.50 3.50 152 2.30 5.03 110 1.50 3.50 152 2.30	3" OD - 76,1 103 1.50 3.50 190 3.00 6.23 103 1.50 3.50 190 3.00
With HYM         Hydraulic Module Components         Single pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Single pump - High head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - High head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - High head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Expansion Tank Volume         Max User water loop Volume for factory mounted expansion tank (1)	(mm) (kPa) (kW) (A) (kPa) (kW) (A) (kW) (A) (kW) (A) (kW) (A) (l) (l)	96 1.20 2.44 170 2.30 5.03 96 1.20 2.44 170 2.30 5.03 2.5 1450	100 1.20 2.44 174 2.30 5.03 100 1.20 2.44 174 2.30 5.03 2.5 1450	2" - 60,3 86 1.20 2.44 162 2.30 5.03 86 1.20 2.44 162 2.30 5.03 2.5 1450	2" - 60,3 113 1.50 3.50 152 2.30 5.03 113 1.50 3.50 152 2.30 5.03 2.30 5.03 25 1450	2" - 60,3 120 1.50 3.50 161 2.30 5.03 120 1.50 3.50 161 2.30 5.03 25 1450	2" - 60,3 110 1.50 3.50 152 2.30 5.03 110 1.50 3.50 152 2.30 5.03 25 1450	3" OD - 76,1 103 1.50 3.50 190 3.00 6.23 103 1.50 3.50 190 3.00 6.23 3.50 190 3.00 6.23 3.50
With HYM         Hydraulic Module Components         Single pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Single pump - High head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - High head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Expansion Tank Volume         Max User water loop Volume for factory mounted expansion tank (1)         Optionnal water Buffer tank volume	(mm) (kPa) (kW) (A) (kPa) (kW) (A) (kW) (A) (kW) (A) (kW) (A) (l) (l)	96 1.20 2.44 170 2.30 5.03 96 1.20 2.44 170 2.30 5.03 2.5 1450 324	100 1.20 2.44 174 2.30 5.03 100 1.20 2.44 174 2.30 5.03 2.5 1450 324	2" - 60,3 86 1.20 2.44 162 2.30 5.03 86 1.20 2.44 162 2.30 5.03 2.44 162 2.30 5.03 25 1450 324	2" - 60,3 113 1.50 3.50 152 2.30 5.03 113 1.50 3.50 152 2.30 5.03 2.30 5.03 25 1450 324	2" - 60,3 120 1.50 3.50 161 2.30 5.03 120 1.50 3.50 161 2.30 5.03 25 1450 324	2" - 60,3 110 1.50 3.50 152 2.30 5.03 110 1.50 3.50 152 2.30 5.03 2.30 5.03 25 1450 324	3" OD - 76,1 103 1.50 3.50 190 3.00 6.23 103 1.50 3.50 
With HYM  Hydraulic Module Components  Single pump - Standard head pressure option  Max available Head Pressure Motor Power Rated Amps Single pump - High head pressure option Max available Head Pressure Motor Power Rated Amps Twin pump - Standard head pressure option Max available Head Pressure Motor Power Rated Amps Twin pump - High head pressure option Max available Head Pressure Motor Power Rated Amps Twin pump - High head pressure option Max available Head Pressure Motor Power Rated Amps Expansion Tank Volume Max User water loop Volume for factory mounted expansion tank (1) Optionnal water Buffer tank volume Antifreeze Heater without pump package	(mm) (kPa) (kW) (A) (kPa) (kW) (A) (kW) (A) (kW) (A) (kW) (A) (kW) (A) (I) (I) (I) (V)	96 1.20 2.44 170 2.30 5.03 96 1.20 2.44 170 2.30 5.03 25 1450 324 120	100 1.20 2.44 174 2.30 5.03 100 1.20 2.44 174 2.30 5.03 2.5 1450 324 120	2" - 60,3 86 1.20 2.44 162 2.30 5.03 86 1.20 2.44 162 2.30 5.03 25 1450 324 120	2" - 60,3 113 1.50 3.50 152 2.30 5.03 113 1.50 3.50 152 2.30 5.03 25 1450 324 120	2" - 60,3 120 1.50 3.50 161 2.30 5.03 120 1.50 3.50 161 2.30 5.03 25 1450 324 120	2" - 60,3 110 1.50 3.50 152 2.30 5.03 110 1.50 3.50 152 2.30 5.03 25 1450 324 120	3" OD - 76,1 103 1.50 3.50 
With HYM         Hydraulic Module Components         Single pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Single pump - High head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - High head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Expansion Tank Volume         Max User water loop Volume for factory mounted expansion tank (1)         Optionnal water Buffer tank volume	(mm) (kPa) (kW) (A) (kPa) (kW) (A) (kW) (A) (kW) (A) (kW) (A) (l) (l)	96 1.20 2.44 170 2.30 5.03 96 1.20 2.44 170 2.30 5.03 2.5 1450 324	100 1.20 2.44 174 2.30 5.03 100 1.20 2.44 174 2.30 5.03 2.5 1450 324	2" - 60,3 86 1.20 2.44 162 2.30 5.03 86 1.20 2.44 162 2.30 5.03 2.44 162 2.30 5.03 25 1450 324	2" - 60,3 113 1.50 3.50 152 2.30 5.03 113 1.50 3.50 152 2.30 5.03 2.30 5.03 25 1450 324	2" - 60,3 120 1.50 3.50 161 2.30 5.03 120 1.50 3.50 161 2.30 5.03 25 1450 324	2" - 60,3 110 1.50 3.50 152 2.30 5.03 110 1.50 3.50 152 2.30 5.03 2.30 5.03 25 1450 324	3" OD - 76,1 103 1.50 3.50 190 3.00 6.23 103 1.50 3.50 
With HYM  Hydraulic Module Components  Single pump - Standard head pressure option Max available Head Pressure Motor Power Rated Amps Single pump - High head pressure option Max available Head Pressure Motor Power Rated Amps Twin pump - Standard head pressure option Max available Head Pressure Motor Power Rated Amps Twin pump - High head pressure option Max available Head Pressure Motor Power Rated Amps Twin pump - High head pressure option Max available Head Pressure Motor Power Rated Amps Expansion Tank Volume Max User water loop Volume for factory mounted expansion tank (1) Optionnal water Buffer tank volume Antifreeze Heater without pump package Antifreeze Heater with pump package Type	(mm) (kPa) (kW) (A) (kWa) (kW) (A) (kW) (A) (kW) (A) (kW) (A) (l) (l) (l) (l) (W) (W)	96 1.20 2.44 170 2.30 5.03 96 1.20 2.44 170 2.30 5.03 2.5 1450 324 120 280	100 1.20 2.44 174 2.30 5.03 100 1.20 2.44 174 2.30 5.03 25 1450 324 120 280 F	2" - 60,3 86 1.20 2.44 162 2.30 5.03 86 1.20 2.44 162 2.30 5.03 25 1450 324 120 280	2" - 60,3 113 1.50 3.50 152 2.30 5.03 113 1.50 3.50 152 2.30 5.03 25 1450 324 120	2" - 60,3 120 1.50 3.50 161 2.30 5.03 120 1.50 3.50 161 2.30 5.03 25 1450 324 120 324 120 280 heat exchange	2" - 60,3 110 1.50 3.50 152 2.30 5.03 110 1.50 3.50 152 2.30 5.03 25 1450 324 120 280 er	3" OD - 76,1 103 1.50 3.50 190 3.00 6.23 103 1.50 3.50 190 3.00 6.23 35 2000 444 180 340
With HYM         Hydraulic Module Components         Single pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Single pump - High head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - Standard head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Twin pump - High head pressure option         Max available Head Pressure         Motor Power         Rated Amps         Expansion Tank Volume         Max User water loop Volume for factory mounted expansion tank (1)         Optionnal water Buffer tank volume         Antifreeze Heater without pump package         Antifreeze Heater without pump package         Antifreeze Heater with pump package         Condenser	(mm) (kPa) (kW) (A) (kPa) (kW) (A) (kW) (A) (kW) (A) (kW) (A) (kW) (A) (I) (I) (I) (V)	96 1.20 2.44 170 2.30 5.03 96 1.20 2.44 170 2.30 5.03 2.5 1450 324 120	100 1.20 2.44 174 2.30 5.03 100 1.20 2.44 174 2.30 5.03 25 1450 324 120 280	2" - 60,3 86 1.20 2.44 162 2.30 5.03 86 1.20 2.44 162 2.30 5.03 25 1450 324 120 280	2" - 60,3 113 1.50 3.50 152 2.30 5.03 113 1.50 3.50 152 2.30 5.03 25 1450 324 120 280	2" - 60,3 120 1.50 3.50 161 2.30 5.03 120 1.50 3.50 161 2.30 5.03 25 1450 324 120 280	2" - 60,3 110 1.50 3.50 152 2.30 5.03 110 1.50 3.50 152 2.30 5.03 25 1450 324 120 280	3" OD - 76,1 103 1.50 3.50 



#### Table 2 - CXAX 015-036 General Data (continued)

		0/01/				0/11/		0.000
		CXAX 015	CXAX 017	CXAX 020	CXAX 023	CXAX 026	CXAX 030	CXAX 036
		SE-SN	SE-SN	SE-SN	SE-SN	SE-SN	SE-SN	SE-SN
ondenser Fan								
Quantity	#	1	1	2	2	2	2	2
Diameter	(mm)				800			
Fan / motor Type		Propelle	er fan : Fixed s	speed AC moto	or / Variable s	peed - EC mot	or / HESP MAX	( SPEED
Digit 12=2 or Digit 12=1 and Digit 41=2								
Fan / motor Type					or / HESP MAX			
Airflow per fan	m <sup>3</sup> /h	13753	13718	12248	12231	12211	12193	13727
Max Power Input	Kw	1,95	1,95		1,95 + 1,95			
Max Amps	A	3	3	3 + 3	3 + 3	3 + 3	3 + 3	3 + 3
Motor RPM	(rpm)	915	915	915	915	915	915	915
Digit 12=1 and Digit 15=A								
Fan / motor Type	2			ed speed AC m				
Airflow per fan	m <sup>3</sup> /h	13788	13828	12362	12362	12370	12375	13827
Max Power Input	Kw	0,89	0,89		0,89 + 0,89			
Max Amps	A	2,22	2,22		2,22 + 2,22			
Motor RPM	(rpm)	686	686	686	686	686	686	686
Digit 12=1 and Digit 15=C						1 50		
Fan / motor Type	3	10700		ed speed AC m				10007
Airflow per fan	m <sup>3</sup> /h	13788	13828	12362	12362	12370	12375	13827
Max Power Input	Kw	1,95	1,95		1,95 + 0,89			
Max Amps	A	3	3	3 + 2,22	3 + 2,22	3 + 2,22	3 + 2,22	3 + 2,2
Motor RPM	(rpm)	686	686	686	686	686	686	686
Airflow per Fan	(m <sup>3</sup> /h)	13788	13828	12362	12362	12370	12375	13827
Airflow per Fan HESP (915 RPM - 100Pa)	(m <sup>3</sup> /h)	13753	13718	12248	12231	12211	12193	13727
Power per Motor	(kW)	686	686	686	686	686	686	686
artial Heat recovery (PHR) option Heat-Exchanger Type			Ctair	nless steel Cop	nor Prozod al	to Heat avela		
Heat-Excitatiger Type		B3-014-14-	B3-014-14-	B3-014-14-	ВЗ-014-14-	B3-027-14-	B3-027-14-	D2 027 1
Heat-Exchanger Model		4.5M	4.5M	4.5M	4.5M	4.5L	4.5L	B3-027-1 4.5L
	(in) -	G 1"1/4	G 1"1/4	G 1"1/4	G 1"1/4	G 1"1/4	G 1"1/4	G 1"1/4
Water connection size (Thread connection)				(31.75 mm)			(31.75 mm)	
Water content volume	(1)	0.14	0.14	0.14	0.14	0.35	0.35	0.35
mensions (7)								
Unit Length	(mm)	2346	2346	2346	2346	2346	2346	2327
Unit Width	(mm)	1285	1285	1285	1285	1285	1285	2250
Std Unit Height	(mm)	1524	1524	1524	1524	1524	1724	1524
LN or External SP unit -	(mm)	+223	+224	+225	+226	+227	+228	+229
(Additional height configuration)	(1111)	7225	7224	7225	+220	7227	7220	7229
Water Buffer tank option -	(mm)	+330	+330	+330	+330	+330	+330	+330
(Additional height configuration)	(1111)	1330	1550	1350	1550	1550	1550	1 3 3 0
eights								
Shipping Weight (3)	(kg)	558	564	616	644	649	684	911
Operating Weight (3)	(kg)	539	545	596	624	630	665	881
Option Additional shipping weight								
Single pump - Standard head pressure	(kg)	46	46	46	49	49	49	45
Single pump - High head pressure	(kg)	51	51	51	51	51	51	49
Twin pump - Standard head pressure	(kg)	70	70	70	75	75	75	71
Twin pump - High head pressure	(kg)	82	82	82	82	82	82	86
Pump VFD option	(kg)	0						
Partial heat recovery option	(kg)	1.48	1.48	1.48	1.48	3.82	3.82	3.82
Water Buffer tank option	(kg)	319	319	319	319	319	319	425
vstem data								
Nb of refrigerant circuit	#	1	1	1	1	1	1	1
Minimum cooling load % (6)					43	50	50	33
	%	50	43	50	43	50	30	
Standard/Partial Heat Recovery Unit unit								
Standard/Partial Heat Recovery Unit unit R410A refrigerant charge Circuit1 / Circuit 2	(kg)	7.5	9.0	9.0	9.0	10.5	10.5	14.0
Standard/Partial Heat Recovery Unit unit				9.0 6.6		10.5 6.6		

(1) Indicative performance at Evaporator water temperature : 12°C / 7°C - Condenser air temperature 35°C - for detailled performances, on a given unit, consult Order Write Up.
 (2) under 400V/3/50Hz.

(3) Rated Condition without Pump Package.

(4) Electrical & system data are indicative and subject to change without notice. Please refer to unit nameplate data.
 (5) If the power line of the unit is protected by fuses gG of the same size as the disconnect switch.

(6) OIL058E or 0IL057E are European reference for POE oil and can be mixed in any proportion with OIL00078 or OIL 00080 (same oil with US reference on compressor nameplate). (7) For dimensions details, dimensions of hydraulic connections, electrical connections, point load and specific features for heat recovery see submittals and

diagrams which are supplied with every order.



#### Table 2 - CXAX 039-060 General Data

Total Power input in cooling (1)(ikit electrical data (2) (3) (4)(4)Short Circuit Unit Capacity (9)(kPower Cable Cross Section (max)mDisconnect switch size(7)Digit 12=2 or Digit 12=1 and Digit 41=2Maximum Power input(kUnit rated amps(7)Unit start up amps (w/o soft starter - Digit 26=A) (4)(7)Power factorDigit 12=1 and Digit 15=AMaximum Power input(kUnit rated amps(7)Unit start up amps (w/o soft starter - Digit 26=A) (4)(7)Unit start up amps (w/o soft starter - Digit 26=A) (4)(7)Power factorDigit 12=1 and Digit 15=CMaximum Power input(kUnit start up amps (w/o soft starter - Digit 26=A) (4)(7)Power factorDigit 12=1 and Digit 15=CMaximum Power input(kUnit start up amps (w/o soft starter - Digit 26=A) (4)(7)Power factorCompressorDigit 12=1 and Digit 15=CMaximum Power input(kUnit start up amps (w/o soft starter - Digit 26=A) (4)(7)Power factorCompressorModel Circuit 1 / Circuit 2(7)Model Circuit 1 / Circuit 2(4)Max Compr Power input Circuit 1/Circuit 2 (4)(7)Motor RPM(7)Oil sump heater Circuit 1 / Circuit 2 (4)(7)Oil sump heater Circuit 1 / Circuit 2(7)Aporator modelEvaporator modelEvaporator Water Connection size (Grooved coupling) - (irWithout HYM <th>W) (A) (A) (W) (W) (W) (W) (W) (W) (W) (W</th> <th>15,7 + 15,7 + 15,7 25,3 +</th> <th>SE-SN 127 41 15 150 250 </th> <th>15,5 + 20,2 / 15,5 + 20,2 98 + 142 / 98 + 142 2900</th> <th>20,2 + 20,2</th> <th>12 + 15,7 20,2 + 25,3 / 20,2 + 25,3</th> <th>SE-SN 147 51 15 150 250 70.7 113.9 246.6 183.4 0.902 66.5 110.8 243.5 180.3 0.880 68.6 112.3 245.0 181.8 0.892 2 Scroll 13+13/ 15,7 + 15,7/ 15,7 + 15,7/ 25,3 + 25,3/ 25,3 + 25,3 158 + 158/ 158 + 158/ 150 + 150/ 150 + 158/ 150 + 156/ 150 + 156/ 150 + 156/ 150 + 156/ 150 + 156/ 150 + 156/ 150 + 156/ 150</th> <th>17,6 + 1 29,5 + 29 29,5 + 29</th>	W) (A) (A) (W) (W) (W) (W) (W) (W) (W) (W	15,7 + 15,7 + 15,7 25,3 +	SE-SN 127 41 15 150 250 	15,5 + 20,2 / 15,5 + 20,2 98 + 142 / 98 + 142 2900	20,2 + 20,2	12 + 15,7 20,2 + 25,3 / 20,2 + 25,3	SE-SN 147 51 15 150 250 70.7 113.9 246.6 183.4 0.902 66.5 110.8 243.5 180.3 0.880 68.6 112.3 245.0 181.8 0.892 2 Scroll 13+13/ 15,7 + 15,7/ 15,7 + 15,7/ 25,3 + 25,3/ 25,3 + 25,3 158 + 158/ 158 + 158/ 150 + 150/ 150 + 158/ 150 + 156/ 150	17,6 + 1 29,5 + 29 29,5 + 29
Total Power input in cooling (1)(kit electrical data (2) (3) (4)(4)Short Circuit Unit Capacity (9)(kPower Cable Cross Section (max)mDisconnect switch size(a)Digit 12=2 or Digit 12=1 and Digit 41=2Maximum Power input(kUnit rated amps(a)Unit start up amps (w/o soft starter - Digit 26=A) (4)Power factorDigit 12=1 and Digit 15=AMaximum Power input(kUnit rated amps(c)Unit start up amps (w/o soft starter - Digit 26=A) (4)Unit start up amps (w/o soft starter - Digit 26=A) (4)Unit start up amps (w/o soft starter - Digit 26=A) (4)Power factorDigit 12=1 and Digit 15=CMaximum Power input(kUnit start up amps (w/o soft starter - Digit 26=A) (4)Power factorDigit 12=1 and Digit 15=CMaximum Power input(kUnit start up amps (w/o soft starter - Digit 26=A) (4)(c)Unit start up amps (w/o soft starter - Digit 26=A) (4)(c)Unit start up amps (with soft starter - Digit 26=B) (4)Power factormpressorCompressor Number per CircuitTypeModel Circuit / Circuit 2Max Compr Power input Circuit 1/Circuit 2Max Compr Power input Circuit 1/Circuit 2Max Compr Power input Circuit 2 (4)(c)Motor RPM(c)Oil sump heater Circuit / Circuit 2AporatorQuantityTypeVominal	W)           (A)           (M)           (A)           (A)	38 15 150 250 51.1 82.6 215.3 152.1 0.901 49.0 81.0 213.7 150.5 0.886 50.0 81.8 214.5 151.3 0.894 3 Scroll 13+13+13 15,7 + 15,7 + 15,8 + 158 +	41 15 150 250 58.7 98.2 223.7 161.7 0.870 55.5 95.8 221.3 159.3 0.847 56.6 96.6 222.1 160.1 0.855 95.8 221.3 159.3 0.847 3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 155 +	35 15 150 250 46.4 78.1 199.9 143.1 0.866 44.2 76.5 198.3 141.5 0.846 46.4 78.1 199.9 143.1 0.866 2 5 Croll 7,5+10 9,2 + 12 9,2 + 12 9,2 + 12 98 + 142 2800	39 15 150 250 55.8 93.5 215.3 158.5 0.870 51.6 90.4 212.2 155.4 0.836 91.9 213.7 91.9 213.7 156.9 0.854 0.854 0.854 2 Scroll 10+10/ 10+10 12+12/ 12+12 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 142+142/ 152+142/ 142+142+142/ 142+142+142/ 142+142+142/ 142+142+142+142/ 142+142+142	47 15 150 250 63.3 103.7 236.4 173.2 0.888 0.888 0.06 233.3 170.1 0.66 233.3 170.1 0.66 233.3 170.1 0.61 0.61 234.8 171.6 0.875 0.87	51 15 250 70.7 113.9 246.6 183.4 0.902 66.5 110.8 243.5 180.3 0.880 68.6 112.3 245.0 181.8 0.892 2 Scroll 13+13/ 13+13 15,7+15,7/ 15,7+15,7/ 15,7+25,3 25,3+25,3 158+158	58 15 150 250 78.2 130.7 256.2 194.2 0.870 74.0 127.6 253.1 191.1 0.847 76.1 129.1 254.6 192.6 0.859 2 Scroll 15+15 15+15 17,6 + 17 17,6 + 17 17,6 + 17 29,5 + 29 29,5 + 29 29,5 + 21 29,5 + 15 155 + 15
it electrical data (2) (3) (4) Short Circuit Unit Capacity (9) (k Power Cable Cross Section (max) m Disconnect switch size (7) Digit 12=2 or Digit 12=1 and Digit 41=2 Maximum Power input (k Unit rated amps (w/o soft starter - Digit 26=A) (4) (7) Unit start up amps (with soft starter - Digit 26=B) (4) Power factor Digit 12=1 and Digit 15=A Maximum Power input (k Unit start up amps (w/o soft starter - Digit 26=A) (4) (7) Unit start up amps (w/o soft starter - Digit 26=A) (4) (7) Unit start up amps (w/o soft starter - Digit 26=A) (4) (7) Unit start up amps (w/o soft starter - Digit 26=B) (4) Power factor Digit 12=1 and Digit 15=C Maximum Power input (k Unit rated amps (w/o soft starter - Digit 26=A) (4) (7) Unit start up amps (w/o soft starter - Digit 26=B) (4) Power factor Digit 12=1 and Digit 15=C Maximum Power input (k Unit start up amps (w/o soft starter - Digit 26=B) (4) Power factor mpressor Compressor Number per Circuit Type Model Circuit1 / Circuit 2 Max Compr Power input Circuit 1/Circuit 2 Max Compr Power input Circuit 1/Circuit 2 Max Compr Power input Circuit 1/Circuit 2 (4) (7) Coli sump heater Circuit1 / Circuit 2 (4) (7) Oil sump heater Circuit1 / Circuit 2 (4) (7) Quantity Type Evaporator model Evaporator model Evaporator Water Content volume (7) Nominal water connection size (Grooved coupling) - (ir Without HYM (7) Nominal water connection size (Grooved coupling) - (ir With HYM (7) draulic Module Components Single pump - Standard head pressure option Max available Head Pressure (k	(A)       m²       A)       W)       W)       A)       W)       W)       W)       A)       W)       W)       W)       W)       W)	15 150 250 51.1 82.6 215.3 152.1 0.901 49.0 81.0 213.7 150.5 0.886 50.0 81.8 214.5 151.3 0.894 3 Scroll 13+13+13 15,7 + 15,7 + 15,8 + 158 + 158 + 2900	15 150 250 250 223.7 161.7 0.870 223.7 161.7 0.870 223.7 161.7 0.870 255.5 95.8 221.3 159.3 0.847 22.1 159.3 0.847 22.1 159.3 0.847 22.1 159.3 0.847 22.1 159.3 0.847 22.1 159.3 159.3 3 Scroll 15+15+15 155 + 155 155 + 155 155 + 155 2900	15 150 250 46.4 78.1 199.9 143.1 0.866 44.2 76.5 198.3 141.5 0.846 46.4 78.1 199.9 143.1 0.866 2 46.4 78.1 199.9 143.1 0.866 2 5 croll 7,5+10/ 7,5+10/ 7,5+10/ 7,5+10/ 7,5+10/ 9,2+12/	15 150 250 355.8 93.5 215.3 158.5 0.870 51.6 90.4 212.2 155.4 0.836 215.4 0.836 91.9 213.7 91.9 213.7 156.9 0.854 53.7 91.9 213.7 156.9 0.854 2 53.7 10.9 2 10.4 10.4 10.4 10.4 10.4 10.4 10.4 10.4	15 150 250 320 103.7 236.4 173.2 0.888 59.0 100.6 233.3 170.1 0.861 233.3 170.1 0.861 233.3 170.1 0.861 234.8 171.6 0.875 32 102.1 234.8 171.6 0.875 32 102.1 234.8 171.6 0.875 32 102.1 234.8 171.6 0.875 102.1 234.8 171.6 0.875 102.1 234.8 171.6 0.875 102.1 234.8 171.6 0.875 102.1 234.8 171.6 0.875 102.1 234.8 171.6 0.875 102.1 234.8 171.6 0.875 102.1 234.8 171.6 0.875 102.1 234.8 171.6 0.875 102.1 234.8 171.6 0.875 102.1 234.8 171.6 0.875 102.1 234.8 171.6 0.875 102.1 24.5 17.6 17.6 17.7 17.7 17.7 17.7 17.7 17.7	15 150 250 70.7 113.9 246.6 183.4 0.902 66.5 110.8 243.5 180.3 0.880 68.6 112.3 245.0 181.8 0.892 2 Scroll 13+13/ 13+13 15,7+15,7/ 15,7+15,7/ 25,3+25,3 158+158/ 158+158	15 150 250 78.2 130.7 256.2 194.2 0.870 74.0 127.6 253.1 191.1 0.847 76.1 129.1 254.6 192.6 0.859 2 Scroll 15+15 15+15 15+15 17,6 + 17 17,6 + 1 29,5 + 29 29,5 + 29 29,5 + 21
Short Circuit Unit Capacity (9)(kPower Cable Cross Section (max)mDisconnect switch size(.Digit 12=2 or Digit 12=1 and Digit 41=2Maximum Power input(kUnit rated amps(.Unit start up amps (w/o soft starter - Digit 26=A) (4)(.Power factorDigit 12=1 and Digit 15=AMaximum Power input(.kUnit start up amps (w/o soft starter - Digit 26=A) (4)(.Unit start up amps (w/o soft starter - Digit 26=A) (4)(.Unit start up amps (w/o soft starter - Digit 26=A) (4)(.Unit start up amps (w/o soft starter - Digit 26=B) (4)Power factorDigit 12=1 and Digit 15=CMaximum Power input(.kUnit start up amps (w/o soft starter - Digit 26=A) (4)(.Power factorDigit 12=1 and Digit 15=CMaximum Power input(.kUnit start up amps (w/o soft starter - Digit 26=A) (4)(.Unit start up amps (w/o soft starter - Digit 26=A) (4)(.Unit start up amps (with soft starter - Digit 26=B) (4)Power factormpressorCompressor Number per Circuit.TypeModel Circuit / Circuit 2kMax Compr Power input Circuit 1/Circuit 2 (4)(.Locked Rotor Amps Circuit1 / Circuit 2 (4)(.Oil sump heater Circuit1 / Circuit 2 (4)(.Motor RPM(Oil sump heater Content volume(.Nominal water connection size (Grooved coupling) - (Without HYM(Nominal water connection size (Grooved coupling) - (Wi	m <sup>2</sup> A) W) A) A) A) A) A) A) A) A) A) A) A) A) A)	$\begin{array}{c} 150\\ 250\\ \hline\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $	150 250 38.7 98.2 223.7 161.7 0.870 55.5 95.8 221.3 159.3 0.847 56.6 96.6 222.1 160.1 0.855 3 5croll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 155 + 155 155 + 155 + 155 2900	150 250 46.4 78.1 199.9 143.1 0.866 44.2 76.5 198.3 141.5 0.846 46.4 78.1 199.9 143.1 0.866 2 Scroll 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+20,2 / 15,5 + 20,2 / 15,5 + 20,2 / 98 + 142 2900	150 250 55.8 93.5 215.3 158.5 0.870 51.6 90.4 212.2 155.4 0.836 7 53.7 91.9 213.7 156.9 0.854 7 2 Scroll 10+10/ 10+10/ 10+10 12+12/ 12+12/ 12+12 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 142+142/ 142+142	150 250 63.3 103.7 236.4 173.2 0.888 59.0 100.6 233.3 170.1 0.861 61.2 102.1 234.8 171.6 0.875 2 Scroll 10+13 /10+13 /10+13 12 + 15,7 / 12 + 15,7 20,2 + 25,3 / 20,2 + 25,3 / 20,2 + 25,3 / 20,2 + 25,3 / 142 + 158 / 142 + 158	150 250 70.7 113.9 246.6 183.4 0.902 66.5 110.8 243.5 180.3 0.880 68.6 112.3 245.0 181.8 0.892 2 2 Scroll 13+13 / 13+13 15,7 + 15,7 / 15,7 + 15,7 25,3 + 25,3 158 + 158 / 158 + 158	150 250 78.2 130.7 256.2 194.2 0.870 74.0 127.6 253.1 191.1 0.847 76.1 129.1 254.6 0.859 2 2 Scroll 15+15 15+15 15+15 15+15 15+15
Power Cable Cross Section (max)       m         Disconnect switch size       (r.         Digit 12=2 or Digit 12=1 and Digit 41=2         Maximum Power input       (k         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (r.         Unit start up amps (with soft starter - Digit 26=A) (4)       (r.         Power factor       Digit 12=1 and Digit 15=A         Maximum Power input       (k         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (r.         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (r.         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (r.         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (r.         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (r.         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (r.         Unit start up amps (with soft starter - Digit 26=A) (4)       (r.         Unit start up amps (with soft starter - Digit 26=B) (4)       Power factor         mpressor       Compressor Number per Circuit       Group ressor Number per Circuit 2         Max Compr Power input Circuit 1/Circuit 2       k       k         Rated Amps Circuit1 / Circuit 2 (4)       (r.         Motor RPM       (r.         Oil sump heater Circuit 1 / Circuit 2       (r. <td>m<sup>2</sup> A) W) A) A) A) A) A) A) A) A) A) A) A) A) A)</td> <td><math display="block">\begin{array}{c} 150\\ 250\\ \hline\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ </math></td> <td>150 250 38.7 98.2 223.7 161.7 0.870 55.5 95.8 221.3 159.3 0.847 56.6 96.6 222.1 160.1 0.855 3 5croll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 155 + 155 155 + 155 + 155 2900</td> <td>150 250 46.4 78.1 199.9 143.1 0.866 44.2 76.5 198.3 141.5 0.846 46.4 78.1 199.9 143.1 0.866 2 Scroll 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+20,2 / 15,5 + 20,2 / 15,5 + 20,2 / 98 + 142 2900</td> <td>150 250 55.8 93.5 215.3 158.5 0.870 51.6 90.4 212.2 155.4 0.836 7 53.7 91.9 213.7 156.9 0.854 7 2 Scroll 10+10/ 10+10/ 10+10 12+12/ 12+12/ 12+12 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 142+142/ 142+142</td> <td>150 250 63.3 103.7 236.4 173.2 0.888 59.0 100.6 233.3 170.1 0.861 61.2 102.1 234.8 171.6 0.875 2 Scroll 10+13 /10+13 /10+13 12 + 15,7 / 12 + 15,7 20,2 + 25,3 / 20,2 + 25,3 / 20,2 + 25,3 / 20,2 + 25,3 / 142 + 158 / 142 + 158</td> <td>150 250 70.7 113.9 246.6 183.4 0.902 66.5 110.8 243.5 180.3 0.880 68.6 112.3 245.0 181.8 0.892 2 2 Scroll 13+13 / 13+13 15,7 + 15,7 / 15,7 + 15,7 25,3 + 25,3 158 + 158 / 158 + 158</td> <td>150 250 78.2 130.7 256.2 194.2 0.870 2253.1 191.1 0.847 76.1 129.1 254.6 192.6 0.859 2 Scrol 15+15 15+15 15+15 17,6 + 17 29,5 + 2 29,5 + 2 29,5 + 2 29,5 + 12</td>	m <sup>2</sup> A) W) A) A) A) A) A) A) A) A) A) A) A) A) A)	$\begin{array}{c} 150\\ 250\\ \hline\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $	150 250 38.7 98.2 223.7 161.7 0.870 55.5 95.8 221.3 159.3 0.847 56.6 96.6 222.1 160.1 0.855 3 5croll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 155 + 155 155 + 155 + 155 2900	150 250 46.4 78.1 199.9 143.1 0.866 44.2 76.5 198.3 141.5 0.846 46.4 78.1 199.9 143.1 0.866 2 Scroll 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+20,2 / 15,5 + 20,2 / 15,5 + 20,2 / 98 + 142 2900	150 250 55.8 93.5 215.3 158.5 0.870 51.6 90.4 212.2 155.4 0.836 7 53.7 91.9 213.7 156.9 0.854 7 2 Scroll 10+10/ 10+10/ 10+10 12+12/ 12+12/ 12+12 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 142+142/ 142+142	150 250 63.3 103.7 236.4 173.2 0.888 59.0 100.6 233.3 170.1 0.861 61.2 102.1 234.8 171.6 0.875 2 Scroll 10+13 /10+13 /10+13 12 + 15,7 / 12 + 15,7 20,2 + 25,3 / 20,2 + 25,3 / 20,2 + 25,3 / 20,2 + 25,3 / 142 + 158 / 142 + 158	150 250 70.7 113.9 246.6 183.4 0.902 66.5 110.8 243.5 180.3 0.880 68.6 112.3 245.0 181.8 0.892 2 2 Scroll 13+13 / 13+13 15,7 + 15,7 / 15,7 + 15,7 25,3 + 25,3 158 + 158 / 158 + 158	150 250 78.2 130.7 256.2 194.2 0.870 2253.1 191.1 0.847 76.1 129.1 254.6 192.6 0.859 2 Scrol 15+15 15+15 15+15 17,6 + 17 29,5 + 2 29,5 + 2 29,5 + 2 29,5 + 12
Disconnect switch size (, Digit 12=2 or Digit 12=1 and Digit 41=2 Maximum Power input (k Unit rated amps (w/o soft starter - Digit 26=A) (4) (7 Unit start up amps (with soft starter - Digit 26=B) (4) Power factor Digit 12=1 and Digit 15=A Maximum Power input (k Unit start up amps (w/o soft starter - Digit 26=A) (4) (7 Unit start up amps (w/o soft starter - Digit 26=A) (4) (7 Unit start up amps (w/o soft starter - Digit 26=B) (4) Power factor Digit 12=1 and Digit 15=C Maximum Power input (k Unit rated amps (int soft starter - Digit 26=A) (4) (7 Unit start up amps (w/o soft starter - Digit 26=A) (4) (7 Unit start up amps (w/o soft starter - Digit 26=A) (4) (7 Unit start up amps (with soft starter - Digit 26=A) (4) (7 Unit start up amps (with soft starter - Digit 26=A) (4) (7 Unit start up amps (with soft starter - Digit 26=B) (4) Power factor mpressor Compressor Number per Circuit 3 Type Model Circuit1 / Circuit 2 Max Compr Power input Circuit 1/Circuit 2 Max Compr Power input Circuit 1/Circuit 2 (4) (7 Motor RPM (7 Quantity 3 Type Evaporator model Evaporator model	A)           W)           A)           WW	250 51.1 82.6 215.3 152.1 0.901 49.0 81.0 213.7 150.5 0.886 50.0 81.8 214.5 151.3 0.894 3 Scroll 13+13+13 15,7 + 15,7 + 15,8 + 158 + 158 + 2900	250 58.7 98.2 223.7 161.7 0.870 55.5 95.8 221.3 159.3 0.847 56.6 96.6 222.1 160.1 0.855 3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,5 + 155 + 155 + 155 + 155 + 155 + 155 +	250 46.4 78.1 199.9 143.1 0.866 44.2 76.5 198.3 141.5 0.846 46.4 78.1 199.9 143.1 0.866 2 Scroll 7,5+10 / 7,5+10 / 7,5+10 / 9,2 + 12 / 9,3 + 142 / 98 + 142 / 2900	250 55.8 93.5 215.3 158.5 0.870 51.6 90.4 212.2 155.4 0.836 53.7 91.9 213.7 156.9 0.854 2 53.7 91.9 213.7 156.9 0.854 2 Scroll 10+10/ 10+10 12+12/ 12+12 20,2+20,2/ 2	250 63.3 103.7 236.4 173.2 0.888 59.0 100.6 233.3 170.1 0.861 61.2 102.1 234.8 171.6 0.875 2 Scroll 10+13 /10+13 12 + 15,7 12 + 15,7 12 + 15,7 12 + 15,7 142 + 158 / 142 + 158 142 + 158 / 142 + 158 /	250 70.7 113.9 246.6 183.4 0.902 66.5 110.8 243.5 180.3 0.880 68.6 112.3 245.0 181.8 0.892 2 5croll 13+13 / 13+13 15,7 + 15,7 / 15,7 + 15,7 25,3 + 25,3 158 + 158	250 78.2 130.7 256.2 194.2 0.87( 253.1 191.1 0.847 76.1 192.1 0.847 76.1 192.6 192.6 0.859 2 Scrol 15+15 15+15 17,6 + 17 17,6 + 1 29,5 + 2 29,5 + 2 29,5 + 2 29,5 + 1
Digit 12=2 or Digit 12=1 and Digit 41=2         Maximum Power input       (k         Unit rated amps       (c         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (c         Unit start up amps (with soft starter - Digit 26=B) (4)       (c         Power factor       Digit 12=1 and Digit 15=A         Maximum Power input       (k         Unit rated amps       (c         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (c         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (c         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (d         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (d         Unit start up amps (w/o soft starter - Digit 26=B) (4)       Power factor         Digit 12=1 and Digit 15=C       Maximum Power input       (k         Unit rated amps       (c       Unit start up amps (w/o soft starter - Digit 26=A) (4)       (c         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (d       (d         Unit start up amps (w/o soft starter - Digit 26=B) (4)       Power factor         mpressor       Compressor Number per Circuit       (f         Compressor Number per Circuit 1/Circuit 2       k       Rated Amps Circuit1 / Circuit 2 (4)       (d         Max Compr Power input Circuit 1/Ci	W) A) A) W) A) A) A) W) W) W) A) W) W) W) W)	$\begin{array}{c} 51.1\\ 82.6\\ 215.3\\ 152.1\\ 0.901\\ \hline \\ 49.0\\ 81.0\\ 213.7\\ 150.5\\ 0.886\\ \hline \\ 50.0\\ 81.8\\ 214.5\\ 151.3\\ 0.894\\ \hline \\ \\ 3\\ Scroll\\ 13+13+13\\ 15,7+\\ 15,7+15,7\\ 25,3+\\ 25,3+25,3\\ 158+\\ 158+\\ 158+\\ 158+\\ 2900\\ \hline \end{array}$	58.7 98.2 223.7 161.7 0.870 55.5 95.8 221.3 159.3 0.847 56.6 96.6 222.1 160.1 0.855 221.1 160.1 0.855 3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 155 +	46.4 78.1 199.9 143.1 0.866 44.2 76.5 198.3 141.5 0.846 46.4 78.1 199.9 143.1 0.866 2 Scroll 7,5+10 9,2 + 12/ 9,2 + 12/ 9,3 + 142/ 9,8 + 142/ 2900	55.8 93.5 215.3 158.5 0.870 51.6 90.4 212.2 155.4 0.836 53.7 91.9 213.7 156.9 0.854 2 5croll 10+10/ 10+10/ 10+10 12 + 12/ 12 + 12 20,2 + 20,2/ 20,2 + 20,2/ 20,2 + 20,2/ 142 + 142/ 142 + 142/	63.3 103.7 236.4 173.2 0.888 59.0 100.6 233.3 170.1 0.861 61.2 102.1 234.8 171.6 0.875 2 Scroll 10+13 /10+13 12 + 15,7 / 12 + 15,7 20,2 + 25,3 / 20,2 + 25,3 / 20,2 + 25,3 / 20,2 + 25,3 / 142 + 158 / 142 + 158	$\begin{array}{c} 70.7\\ 113.9\\ 246.6\\ 183.4\\ 0.902\\ \hline\\ 66.5\\ 110.8\\ 243.5\\ 180.3\\ 0.880\\ \hline\\ 68.6\\ 112.3\\ 245.0\\ \hline\\ 112.3\\ 245.0\\ \hline\\ 181.8\\ 0.892\\ \hline\\ \hline\\ 2\\ Scroll\\ 13+13 /\\ 13+13 /\\ 13+13 /\\ 13+13 /\\ 15,7+15,7 /\\ 15,7+15,7\\ 25,3+25,3\\ 158+158 /\\ 158+158 \end{array}$	78.2 130 256 194 0.870 74.0 127.0 253 191 0.844 76.1 129 254.0 152.5 155.1 17,6 + 1 17,6 + 1 155 + 1
Maximum Power input(kUnit rated amps(r)Unit start up amps (w/o soft starter - Digit 26=A) (4)(r)Unit start up amps (with soft starter - Digit 26=B) (4)Power factorDigit 12=1 and Digit 15=A(k)Maximum Power input(k)Unit rated amps(r)Unit start up amps (w/o soft starter - Digit 26=A) (4)(r)Unit start up amps (w/o soft starter - Digit 26=A) (4)(r)Unit start up amps (with soft starter - Digit 26=A) (4)(r)Digit 12=1 and Digit 15=CMaximum Power input(k)Maximum Power input(k)(r)Unit start up amps (w/o soft starter - Digit 26=A) (4)(r)Unit start up amps (w/o soft starter - Digit 26=A) (4)(r)Unit start up amps (with soft starter - Digit 26=A) (4)(r)Unit start up amps (with soft starter - Digit 26=A) (4)(r)Power factorrmpressorcompressor Number per CircuitTypeModel Circuit1 / Circuit 2Max Compr Power input Circuit 1/Circuit 2kRated Amps Circuit1 / Circuit 2 (4)(r)Motor RPM(rp)Oil sump heater Circuit1 / Circuit 2 (4)(r)Oil sump heater Circuit1 / Circuit 2(r)Vaporator Model(r)Evaporator Model(r)Evaporator Wodel Content volume(r)Nominal water connection size (Grooved coupling) -(r)Without HYM(r)Module ComponentsSingle pump - Standard head pressure optionMax available Head Pressure(k)	A) A) W) A) A) A) A) A) A) A) A) A) A) M) M) M) W)	$\begin{array}{c} 82.6\\ 215.3\\ 152.1\\ 0.901\\ \hline \\ 49.0\\ 81.0\\ 213.7\\ 150.5\\ 0.886\\ \hline \\ 50.0\\ 81.8\\ 214.5\\ 151.3\\ 0.894\\ \hline \\ \\ 3\\ Scroll\\ 13+13+13\\ 15,7+\\ 15,7+15,7\\ 25,3+\\ 25,3+25,3\\ 158+\\ 158+158\\ 2900\\ \end{array}$	98.2 223.7 161.7 0.870 55.5 95.8 221.3 159.3 0.847 56.6 96.6 222.1 160.1 0.855 3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,5 + 155 + 155 + 155 + 155 + 155 + 155 +	78.1 199.9 143.1 0.866 44.2 76.5 198.3 141.5 0.846 46.4 78.1 199.9 143.1 0.866 2 Scroll 7,5+10 / 7,5+10 / 7,5+10 / 9,2 + 12 / 9,2 + 12 / 15,5 + 20,2 / 15,5 + 20,2 / 98 + 142 2900	93.5 215.3 158.5 0.870 90.4 212.2 155.4 0.836 7 91.9 213.7 91.9 213.7 156.9 0.854 0.854 0.854 0.854 10+10 12+12/ 12+12 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 142+142+142/ 142+142+142/ 142+142+142/ 142+14	103.7 236.4 173.2 0.888 59.0 100.6 233.3 170.1 0.861 61.2 102.1 234.8 171.6 0.875 0.875 2 Scroll 10+13 7(10+13) 12+15,7/ 12+15,7/ 20,2+25,3/ 20	$\begin{array}{c} 113.9\\ 246.6\\ 183.4\\ 0.902\\ \hline\\ 66.5\\ 110.8\\ 243.5\\ 180.3\\ 0.880\\ \hline\\ 68.6\\ 112.3\\ 245.0\\ 181.8\\ 0.892\\ \hline\\ 2\\ Scroll\\ 13+13 \\ 15,7+15,7\\ 15,7+15,7\\ 15,7+15,7\\ 25,3+25,3\\ 158+158\\ \end{array}$	130 256 194 0.870 74.0 127.6 253 191 0.842 76.1 129 254.6 192.6 0.855 2 Scrol 15+15 17,6+12 15,5+12
Unit rated amps(,Unit start up amps (w/o soft starter - Digit 26=A) (4)Unit start up amps (with soft starter - Digit 26=B) (4)Power factorDigit 12=1 and Digit 15=AMaximum Power inputUnit start up amps (w/o soft starter - Digit 26=A) (4)Unit start up amps (w/o soft starter - Digit 26=A) (4)Unit start up amps (w/o soft starter - Digit 26=B) (4)Power factorDigit 12=1 and Digit 15=CMaximum Power input(kUnit start up amps (w/o soft starter - Digit 26=A) (4)Unit start up amps (w/o soft starter - Digit 26=A) (4)Unit start up amps (w/o soft starter - Digit 26=A) (4)Unit start up amps (w/o soft starter - Digit 26=A) (4)Unit start up amps (w/o soft starter - Digit 26=A) (4)Unit start up amps (w/o soft starter - Digit 26=B) (4)Power factorpressorCompressor Number per CircuitCompressor Number per Circuit 1/Circuit 2Max Compr Power input Circuit 1/Circuit 2 (4)Model Circuit1 / Circuit 2 (4)Locked Rotor Amps Circuit1 / Circuit 2 (4)Motor RPMOil sump heater Circuit1 / Circuit 2 (4)Vithout HYMVithout HYMNominal water connection size (Grooved coupling) - With HYMIvaporator Water Content volumeNominal water connection size (Grooved coupling) - With HYMIvauite Module Components Single pump - Standard head pressure optionMax available Head PressureMax available Head Pressure	A) A) W) A) A) A) A) A) A) A) A) A) A) M) M) M) W)	$\begin{array}{c} 82.6\\ 215.3\\ 152.1\\ 0.901\\ \hline \\ 49.0\\ 81.0\\ 213.7\\ 150.5\\ 0.886\\ \hline \\ 50.0\\ 81.8\\ 214.5\\ 151.3\\ 0.894\\ \hline \\ \\ 3\\ Scroll\\ 13+13+13\\ 15,7+\\ 15,7+15,7\\ 25,3+\\ 25,3+25,3\\ 158+\\ 158+158\\ 2900\\ \end{array}$	98.2 223.7 161.7 0.870 55.5 95.8 221.3 159.3 0.847 56.6 96.6 222.1 160.1 0.855 3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,5 + 155 + 155 + 155 + 155 + 155 + 155 +	78.1 199.9 143.1 0.866 44.2 76.5 198.3 141.5 0.846 46.4 78.1 199.9 143.1 0.866 2 Scroll 7,5+10 / 7,5+10 / 7,5+10 / 9,2 + 12 / 9,2 + 12 / 15,5 + 20,2 / 15,5 + 20,2 / 98 + 142 2900	93.5 215.3 158.5 0.870 90.4 212.2 155.4 0.836 7 91.9 213.7 91.9 213.7 156.9 0.854 0.854 0.854 0.854 10+10 12+12/ 12+12 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 142+142+142/ 142+142+142/ 142+142+142/ 142+14	103.7 236.4 173.2 0.888 59.0 100.6 233.3 170.1 0.861 61.2 102.1 234.8 171.6 0.875 0.875 2 Scroll 10+13 7(10+13) 12+15,7/ 12+15,7/ 20,2+25,3/ 20	$\begin{array}{c} 113.9\\ 246.6\\ 183.4\\ 0.902\\ \hline\\ 66.5\\ 110.8\\ 243.5\\ 180.3\\ 0.880\\ \hline\\ 68.6\\ 112.3\\ 245.0\\ 181.8\\ 0.892\\ \hline\\ 2\\ Scroll\\ 13+13 \\ 15,7+15,7\\ 15,7+15,7\\ 15,7+15,7\\ 25,3+25,3\\ 158+158\\ \end{array}$	130. 256. 194. 194. 253. 191. 253. 191. 254. 192. 254. 192. 254. 192. 255. 2 5crol 15+15 17,6+1 17,6+1 17,6+2 29,5+2 29,5+2 155+1
Unit start up amps (w/o soft starter - Digit 26=A) (4)       (4)         Unit start up amps (with soft starter - Digit 26=B) (4)       Power factor         Digit 12=1 and Digit 15=A       (4)         Maximum Power input       (k         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (7)         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (7)         Unit start up amps (with soft starter - Digit 26=A) (4)       (7)         Power factor       Digit 12=1 and Digit 15=C         Maximum Power input       (k         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (7)         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (7)         Unit start up amps (with soft starter - Digit 26=A) (4)       (7)         Unit start up amps (with soft starter - Digit 26=B) (4)       Power factor         mpressor       Compressor Number per Circuit       (7)         Compressor Number per Circuit 1/Circuit 2       k         Max Compr Power input Circuit 1/Circuit 2       (7)         Motor RPM       (7)         Oil sump heater Circuit1 / Circuit 2 (4)       (7)         Motor RPM       (7)         Oil sump heater Content volume       (7)         Nominal water connection size (Grooved coupling) - (1)       (1)         Wit	A) W) A) A) A) A) A) () () () () () () () () () () () () ()	$215.3 \\ 152.1 \\ 0.901 \\ 49.0 \\ 81.0 \\ 213.7 \\ 150.5 \\ 0.886 \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $	223.7 161.7 0.870 55.5 95.8 221.3 159.3 0.847 	199.9 143.1 0.866 44.2 76.5 198.3 141.5 0.846 46.4 78.1 199.9 143.1 0.866 2 Scroll 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+20,2 15,5 + 20,2 98 + 142 98 + 142 2900	215.3 158.5 0.870 51.6 90.4 212.2 155.4 0.836 	236.4 173.2 0.888 59.0 100.6 233.3 170.1 0.861 0.861 102.1 234.8 171.6 0.875 2 Scroll 10+13 7(10+13) 12+15,7 12+15,7 20,2+25,3/ 20,2+25,3/ 20,2+25,3/ 142+158/ 142+158	$\begin{array}{r} 246.6\\ 183.4\\ 0.902\\ \hline\\ 66.5\\ 110.8\\ 243.5\\ 180.3\\ 0.880\\ \hline\\ 68.6\\ 112.3\\ 245.0\\ 181.8\\ 0.892\\ \hline\\ 2\\ Scroll\\ 13+13\\ 15,7+15,7\\ 15,7+15,7\\ 15,7+15,7\\ 25,3+25,3\\ 158+158\\ 158+158\\ \end{array}$	256 194 0.87 74.0 127 253 191. 0.84 76.1 129. 254 192 0.85 2 2 Scroi 15+1 17,6 + 1 17,6 + 2 29,5 + 2 29,5 + 1
Unit start up amps (with soft starter - Digit 26=B) (4)         Power factor         Digit 12=1 and Digit 15=A         Maximum Power input       (k         Unit rated amps       (u/o soft starter - Digit 26=A) (4)         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (u/o unit start up amps (with soft starter - Digit 26=A) (4)         Power factor       Digit 12=1 and Digit 15=C         Maximum Power input       (k         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (u/o unit start up amps (w/o soft starter - Digit 26=A) (4)         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (u/o unit start up amps (w/o soft starter - Digit 26=A) (4)         Power factor       mpressor         Compressor Number per Circuit       and	W) A) A) A) A) A) A) (W) (W) (W) (W)	$\begin{array}{c} 152.1\\ 0.901\\ \\ \\ 49.0\\ 81.0\\ 213.7\\ 150.5\\ 0.886\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	161.7 0.870 55.5 95.8 221.3 159.3 0.847 56.6 96.6 222.1 160.1 0.855 3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 155 +	143.1 0.866 44.2 76.5 198.3 141.5 0.846 46.4 78.1 199.9 143.1 0.866 2 Scroll 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+20,2 / 15,5 + 20,2 / 15,5 + 20,2 / 98 + 142 2900	158.5 0.870 51.6 90.4 212.2 155.4 0.836 53.7 91.9 213.7 156.9 0.854 2 5 5 croll 10+10/ 10+10/ 10+10 12+12/ 12+12/ 12+12 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 142+142/ 142+142	173.2 0.888 59.0 100.6 233.3 170.1 0.861 61.2 102.1 234.8 171.6 0.875 2 Scroll 10+13 /10+13 12 + 15,7 20,2 + 25,3 / 20,2 + 25,3 / 20,2 + 25,3 / 20,2 + 25,3 / 142 + 158 / 142 + 158	$\begin{array}{r} 183.4\\ 0.902\\ \\\hline \\ 66.5\\ 110.8\\ 243.5\\ 180.3\\ 0.880\\ \\\hline \\ 68.6\\ 112.3\\ 245.0\\ 181.8\\ 0.892\\ \\\hline \\ 2\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	194 0.870 74.0 127 253 191 0.84 76.1 129 254 192 0.859 2 2 Scrol 15+15 17,6 + 1 17,6 + 2 29,5 + 2 155 + 1
Power factor       Image: Construct of the second sec	A) A) W) A) A) A) # W W A) W W W V)	$\begin{array}{c} 0.901 \\ \\ 49.0 \\ \\ 81.0 \\ \\ 213.7 \\ 150.5 \\ \\ 0.886 \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $	0.870 55.5 95.8 221.3 159.3 0.847 56.6 96.6 222.1 160.1 0.855 3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,5 + 29,5 + 29,5 + 29,5 + 2955 + 2900	0.866 44.2 76.5 198.3 141.5 0.846 46.4 78.1 199.9 143.1 0.866 2 Scroll 7,5+10 / 7,5+10 / 7,5+10 / 9,2 + 12 / 9,2 + 12 / 9,2 + 12 15,5 + 20,2 / 15,5 + 20,2 / 15,5 + 20,2 / 98 + 142 / 98 + 142 / 98 + 142	0.870 51.6 90.4 212.2 155.4 0.836 53.7 91.9 213.7 156.9 0.854 2 Scroll 10+10/ 10+10/ 12+12/ 12+12 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 142+142/ 142+142/	0.888 59.0 100.6 233.3 170.1 0.861 61.2 102.1 234.8 171.6 0.875 2 Scroll 10+13 /10+13 12 + 15,7 20,2 + 25,3 / 20,2 + 25,3 / 142 + 158 / 142 + 158	0.902 66.5 110.8 243.5 180.3 0.880 68.6 112.3 245.0 181.8 0.892 2 Scroll 13+13 / 13+13 15,7 + 15,7 / 15,7 + 15,7 25,3 + 25,3 158 + 158 / 158 + 158	0.87( 74.0 127.( 253.: 191.: 0.84? 76.1 129.: 254.( 192.( 0.85? 2 5crol 155+1 17,6+1 17,6+1 17,6+1 29,5+2 29,5+2 29,5+1
Maximum Power input       (k         Unit rated amps       (r         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (r         Unit start up amps (with soft starter - Digit 26=B) (4)       Power factor         Digit 12=1 and Digit 15=C       Maximum Power input       (k         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (r         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (r         Unit start up amps (with soft starter - Digit 26=B) (4)       Power factor         Power factor       Power factor         mpressor       Compressor Number per Circuit         Compressor Number per Circuit 1/Circuit 2       k         Max Compr Power input Circuit 1/Circuit 2       k         Rated Amps Circuit1 / Circuit 2 (4)       (r         Motor RPM       (rr         Oil sump heater Circuit1 / Circuit 2       (r         Quantity       a         Type       (r         Vaporator Model       (r         Evaporator Model       (r         Nominal water connection size (Grooved coupling) - (r       (r         Nominal water connection size (Grooved coupling) - (r       (r         Mith HYM       (r       (r         Module Components       Single pump - Standard head pressure o	A) A) W) A) A) A) # W W A) W W W V)	$\begin{array}{r} 81.0\\ 213.7\\ 150.5\\ 0.886\\ \hline\\ 50.0\\ 81.8\\ 214.5\\ 151.3\\ 0.894\\ \hline\\ 3\\ Scroll\\ 13+13+13\\ 15,7+\\ 15,7+15,7\\ 25,3+\\ 25,3+25,3\\ 158+\\ 158+158\\ 2900\\ \hline\end{array}$	95.8 221.3 159.3 0.847 56.6 96.6 222.1 160.1 0.855 3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,5 + 155 + 155 + 155 + 155 + 155 + 155 +	76.5 198.3 141.5 0.846 46.4 78.1 199.9 143.1 0.866 2 Scroll 7,5+10 9,2 + 12 9,2 + 12 9,2 + 12 15,5 + 20,2 98 + 142 98 + 142 2900	90.4 212.2 155.4 0.836 53.7 91.9 213.7 156.9 0.854 2 Scroll 10+10 / 10+10 / 12+12 / 12+12 20,2 + 20,2 / 20,2 + 20,2 / 20,2 + 20,2 / 20,2 + 20,2 / 20,2 + 20,2 / 142 + 142 / 142 + 142	100.6 233.3 170.1 0.861 61.2 102.1 234.8 171.6 0.875 2 Scroll 10+13 7(10+13 12+15,7/ 12+15,7/ 20,2+25,3/ 20,2+25,3/ 20,2+25,3/ 20,2+25,3/ 142+158/	$\begin{array}{r} 110.8\\ 243.5\\ 180.3\\ 0.880\\ \hline \\ 68.6\\ 112.3\\ 245.0\\ 181.8\\ 0.892\\ \hline \\ 2\\ Scroll\\ 13+13 \\ 15,7+15,7\\ 15,7+15,7\\ 15,7+15,7\\ 25,3+25,3\\ 158+158\\ 158+158\\ \end{array}$	127. 253. 191. 0.84 76.1 129. 254. 192. 0.85 <sup>o</sup> 2 Scroo 15+15 15+1 17,6+1 17,6+2 29,5+2 29,5+2 155+1
Unit rated amps       (r.         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (r.         Unit start up amps (with soft starter - Digit 26=B) (4)       Power factor         Digit 12=1 and Digit 15=C       Maximum Power input       (k.         Maximum Power input       (k.         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (r.         Unit start up amps (w/o soft starter - Digit 26=B) (4)       Power factor         mpressor       (mit start up amps (with soft starter - Digit 26=B) (4)         Power factor       mpressor         Compressor Number per Circuit       (a)         Model Circuit / Circuit 2       (a)         Max Compr Power input Circuit 1/Circuit 2       (a)         Rated Amps Circuit1 / Circuit 2 (4)       (a)         Motor RPM       (rp.         Oil sump heater Circuit1 / Circuit 2       (a)         Poporator       (a)         Quantity       (a)         Type       (b)         Evaporator model       (c)         Evaporator Water Content volume       (c)         Norminal water connection size (Grooved coupling) - ((ir)       (if)         Without HYM       (rr)         Norminal water connection size (Grooved coupling) - ((ir)         Without HYM <td>A) A) W) A) A) A) # W W A) W W W V)</td> <td><math display="block">\begin{array}{r} 81.0\\ 213.7\\ 150.5\\ 0.886\\ \hline\\ 50.0\\ 81.8\\ 214.5\\ 151.3\\ 0.894\\ \hline\\ 3\\ Scroll\\ 13+13+13\\ 15,7+\\ 15,7+15,7\\ 25,3+\\ 25,3+25,3\\ 158+\\ 158+158\\ 2900\\ \hline\end{array}</math></td> <td>95.8 221.3 159.3 0.847 56.6 96.6 222.1 160.1 0.855 3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,5 + 155 + 155 + 155 + 155 + 155 + 155 +</td> <td>76.5 198.3 141.5 0.846 46.4 78.1 199.9 143.1 0.866 2 Scroll 7,5+10 9,2 + 12 9,2 + 12 9,2 + 12 15,5 + 20,2 98 + 142 98 + 142 2900</td> <td>90.4 212.2 155.4 0.836 53.7 91.9 213.7 156.9 0.854 2 Scroll 10+10 / 10+10 / 12+12 / 12+12 20,2 + 20,2 / 20,2 + 20,2 / 20,2 + 20,2 / 20,2 + 20,2 / 20,2 + 20,2 / 142 + 142 / 142 + 142</td> <td>100.6 233.3 170.1 0.861 61.2 102.1 234.8 171.6 0.875 2 Scroll 10+13 7(10+13 12+15,7/ 12+15,7/ 20,2+25,3/ 20,2+25,3/ 20,2+25,3/ 20,2+25,3/ 142+158/</td> <td><math display="block">\begin{array}{r} 110.8\\ 243.5\\ 180.3\\ 0.880\\ \hline \\ 68.6\\ 112.3\\ 245.0\\ 181.8\\ 0.892\\ \hline \\ 2\\ Scroll\\ 13+13 \\ 15,7+15,7\\ 15,7+15,7\\ 15,7+15,7\\ 25,3+25,3\\ 158+158\\ 158+158\\ \end{array}</math></td> <td>127. 253. 191. 0.84 76.1 129. 254. 192. 0.85<sup>o</sup> 2 Scroo 15+15 15+1 17,6+1 17,6+2 29,5+2 29,5+2 155+1</td>	A) A) W) A) A) A) # W W A) W W W V)	$\begin{array}{r} 81.0\\ 213.7\\ 150.5\\ 0.886\\ \hline\\ 50.0\\ 81.8\\ 214.5\\ 151.3\\ 0.894\\ \hline\\ 3\\ Scroll\\ 13+13+13\\ 15,7+\\ 15,7+15,7\\ 25,3+\\ 25,3+25,3\\ 158+\\ 158+158\\ 2900\\ \hline\end{array}$	95.8 221.3 159.3 0.847 56.6 96.6 222.1 160.1 0.855 3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,5 + 155 + 155 + 155 + 155 + 155 + 155 +	76.5 198.3 141.5 0.846 46.4 78.1 199.9 143.1 0.866 2 Scroll 7,5+10 9,2 + 12 9,2 + 12 9,2 + 12 15,5 + 20,2 98 + 142 98 + 142 2900	90.4 212.2 155.4 0.836 53.7 91.9 213.7 156.9 0.854 2 Scroll 10+10 / 10+10 / 12+12 / 12+12 20,2 + 20,2 / 20,2 + 20,2 / 20,2 + 20,2 / 20,2 + 20,2 / 20,2 + 20,2 / 142 + 142 / 142 + 142	100.6 233.3 170.1 0.861 61.2 102.1 234.8 171.6 0.875 2 Scroll 10+13 7(10+13 12+15,7/ 12+15,7/ 20,2+25,3/ 20,2+25,3/ 20,2+25,3/ 20,2+25,3/ 142+158/	$\begin{array}{r} 110.8\\ 243.5\\ 180.3\\ 0.880\\ \hline \\ 68.6\\ 112.3\\ 245.0\\ 181.8\\ 0.892\\ \hline \\ 2\\ Scroll\\ 13+13 \\ 15,7+15,7\\ 15,7+15,7\\ 15,7+15,7\\ 25,3+25,3\\ 158+158\\ 158+158\\ \end{array}$	127. 253. 191. 0.84 76.1 129. 254. 192. 0.85 <sup>o</sup> 2 Scroo 15+15 15+1 17,6+1 17,6+2 29,5+2 29,5+2 155+1
Unit rated amps       (,         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (,         Unit start up amps (with soft starter - Digit 26=B) (4)       Power factor         Digit 12=1 and Digit 15=C       (,         Maximum Power input       (,         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (,         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (,         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (,         Unit start up amps (w/o soft starter - Digit 26=B) (4)       Power factor         npressor       (,         Compressor Number per Circuit       (,         Type       (,         Model Circuit1 / Circuit 2       (,         Max Compr Power input Circuit 1/Circuit 2 (4)       (,         Locked Rotor Amps Circuit1 / Circuit 2 (4)       (,         Motor RPM       (rr         Oil sump heater Circuit1 / Circuit 2       (,         Vaporator Water Content volume       (,         Nominal water connection size (Grooved coupling) -       (,         Without HYM       (,         Nominal water connection size (Grooved coupling) -       (,         With HYM       (,         Model E pupp - Standard head pressure option       (,	A) W) A) A) A) # W W A) A) W)	$\begin{array}{c} 213.7\\ 150.5\\ 0.886\\ \hline\\ 50.0\\ 81.8\\ 214.5\\ 151.3\\ 0.894\\ \hline\\ 3\\ Scroll\\ 13+13+13\\ 15,7+\\ 15,7+15,7\\ 25,3+25,3\\ 158+\\ 158+158\\ 2900\\ \end{array}$	221.3 159.3 0.847 56.6 96.6 222.1 160.1 0.855 3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,5 + 155 + 155 + 155 + 155 + 155 + 2900	198.3 141.5 0.846 46.4 78.1 199.9 143.1 0.866 2 Scroll 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 9,2 + 12 / 9,8 + 142 / 98 + 142 / 2900	212.2 155.4 0.836 53.7 91.9 213.7 156.9 0.854 2 Scroll 10+10 / 10+10 / 10+10 / 12 + 12 / 12 + 12 20,2 + 20,2 142 + 142 / 142 + 142	233.3 170.1 0.861 61.2 102.1 234.8 171.6 0.875 2 Scroll 10+13 /10+13 /10+13 12 + 15,7 20,2 + 25,3 / 20,2 + 25,3 / 20,2 + 25,3 / 142 + 158 / 142 + 158	243.5 180.3 0.880 68.6 112.3 245.0 181.8 0.892 2 Scroll 13+13 / 13+13 15,7 + 15,7 / 15,7 + 15,7 25,3 + 25,3 158 + 158 / 158 + 158	253. 191. 0.84 76.1 129. 254. 192. 0.85 <sup>o</sup> 2 Scroi 15+11 17,6 + 1 17,6 + 2 29,5 + 2 29,5 + 1
Unit start up amps (w/o soft starter - Digit 26=A) (4)       (.         Unit start up amps (with soft starter - Digit 26=B) (4)       Power factor         Digit 12=1 and Digit 15=C       Maximum Power input       (.k         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (.         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (.         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (.         Unit start up amps (with soft starter - Digit 26=B) (4)       Power factor         npressor       Compressor Number per Circuit       G.         Type       Model Circuit1 / Circuit 2       K         Max Compr Power input Circuit 1/Circuit 2 (4)       (.         Locked Rotor Amps Circuit1 / Circuit 2 (4)       (.         Motor RPM       (rr         Quantity       G.         Type       (.         Evaporator model       (.         Evaporator Mater connection size (Grooved coupling) - ()       ()         Without HYM       ()         Nominal water connection size (Grooved coupling) - ()       ()         Max available Head Pressure option       Max available Head Pressure option	A) W) A) A) A) # W W A) A) W)	$\begin{array}{c} 213.7\\ 150.5\\ 0.886\\ \hline\\ 50.0\\ 81.8\\ 214.5\\ 151.3\\ 0.894\\ \hline\\ 3\\ Scroll\\ 13+13+13\\ 15,7+\\ 15,7+15,7\\ 25,3+25,3\\ 158+\\ 158+158\\ 2900\\ \end{array}$	221.3 159.3 0.847 56.6 96.6 222.1 160.1 0.855 3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,5 + 155 + 155 + 155 + 155 + 155 + 2900	198.3 141.5 0.846 46.4 78.1 199.9 143.1 0.866 2 Scroll 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 7,5+10 / 9,2 + 12 / 9,8 + 142 / 98 + 142 / 2900	212.2 155.4 0.836 53.7 91.9 213.7 156.9 0.854 2 Scroll 10+10 / 10+10 / 10+10 / 12 + 12 / 12 + 12 20,2 + 20,2 142 + 142 / 142 + 142	233.3 170.1 0.861 61.2 102.1 234.8 171.6 0.875 2 Scroll 10+13 /10+13 /10+13 12 + 15,7 20,2 + 25,3 / 20,2 + 25,3 / 20,2 + 25,3 / 142 + 158 / 142 + 158	243.5 180.3 0.880 68.6 112.3 245.0 181.8 0.892 2 Scroll 13+13 / 13+13 15,7 + 15,7 / 15,7 + 15,7 25,3 + 25,3 158 + 158 / 158 + 158	253. 191. 0.84 76.1 129. 254. 192. 0.85 <sup>o</sup> 2 Scroi 15+11 17,6 + 1 17,6 + 2 29,5 + 2 29,5 + 1
Unit start up amps (with soft starter - Digit 26=B) (4)         Power factor         Digit 12=1 and Digit 15=C         Maximum Power input       (k         Unit rated amps       (c         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (c         Unit start up amps (w/o soft starter - Digit 26=B) (4)       Power factor         npressor       Compressor Number per Circuit       Starter - Digit 26=B) (4)         Model Circuit1 / Circuit 2       Max Compr Power input Circuit 1/Circuit 2       k         Rated Amps Circuit1 / Circuit 2 (4)       (c       (c         Motor RPM       (rr       (rr         Oil sump heater Circuit1 / Circuit 2 (4)       (c       (rr         Vithout HYM       Staporator       Staporator       Staporator         Nominal water connection size (Grooved coupling) - Without HYM       (ri       (ri         Nominal water connection size (Grooved coupling) - Without HYM       (ri       (ri         Nominal water connection size (Grooved coupling) - With HYM       (ri       (ri         Nominal water connection size (Grooved coupling) - With HYM       (ri       (ri         Max available Head Pressure option       Max available Head Pressure option       (ri	W) A) A) # W W A) Om) V)	$\begin{array}{r} 150.5\\ 0.886\\ \hline\\ \\ 50.0\\ 81.8\\ 214.5\\ 151.3\\ 0.894\\ \hline\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $	159.3 0.847 56.6 96.6 222.1 160.1 0.855 3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,5 + 29,5 + 29,5 + 29,5 + 155 + 155 + 155 +	141.5 0.846 46.4 78.1 199.9 143.1 0.866 2 Scroll 7,5+10 / 7,5+10 / 7,5+10 / 9,2 + 12 / 9,2 + 12 / 9,2 + 12 15,5 + 20,2 / 15,5 + 20,2 / 15,5 + 20,2 / 98 + 142 / 98 + 142 /	155.4 0.836 53.7 91.9 213.7 156.9 0.854 2 Scroll 10+10 / 10+10 / 10+10 / 12 + 12 / 12 + 12 20,2 + 20,2 / 20,2 + 20,2 / 20,2 + 20,2 / 142 + 142 / 142 + 142	170.1 0.861 61.2 102.1 234.8 171.6 0.875 2 Scroll 10+13 /10+13 12 + 15,7 / 12 + 15,7 20,2 + 25,3 / 20,2 + 25,3 / 20,2 + 25,3 / 142 + 158 / 142 + 158	$\begin{array}{r} 180.3\\ 0.880\\ \hline\\ 68.6\\ 112.3\\ 245.0\\ 181.8\\ 0.892\\ \hline\\ 2\\ \hline\\ Scroll\\ 13+13\\ 15,7+15,7\\ 15,7+15,7\\ 25,3+25,3\\ 158+158\\ 158+158\\ \end{array}$	191. 0.84 76.1 129. 254. 192. 0.85 2 Scroi 15+11 17,6 + 1 17,6 + 2 29,5 + 2 29,5 + 1
Power factor         Digit 12=1 and Digit 15=C         Maximum Power input       (k         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (c         Unit start up amps (with soft starter - Digit 26=B) (4)       (c         Power factor       (f         npressor       (f         Compressor Number per Circuit       (f         Type       (f         Model Circuit1 / Circuit 2       (k         Rated Amps Circuit1 / Circuit 2 (4)       (c         Locked Rotor Amps Circuit1 / Circuit 2 (4)       (c         Motor RPM       (rr         Oil sump heater Circuit1 / Circuit 2       (f         Evaporator Water Content volume       (f         Nominal water connection size (Grooved coupling) - (fr       (fr         Nominal water connection size (Grooved coupling) - (fr       (fr         Nominal water connection size (Grooved coupling) - (fr       (fr         Nominal water connection size (Grooved coupling) - (fr       (fr         Nominal water connection size (Grooved coupling) - (fr       (fr         Module Components       (fr         Single pump - Standard head pressure option       (fr         Max available Head Pressure       (k	A) (A) (A) (W) (A) (A) (M) (M) (A) (A) (A) (A) (A) (A) (A) (A	$\begin{array}{c} 0.886 \\ \hline \\ 50.0 \\ 81.8 \\ 214.5 \\ 151.3 \\ 0.894 \\ \hline \\ 3 \\ Scroll \\ 13+13+13 \\ 15,7 + \\ 15,7 + 15,7 \\ 25,3 + \\ 25,3 + 25,3 \\ 158 + \\ 158 + \\ 158 + \\ 158 + \\ 158 \\ 2900 \\ \end{array}$	0.847 56.6 96.6 222.1 160.1 0.855 3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,5 + 29,5 + 29,5 + 155 + 155 + 155 + 2900	0.846 46.4 78.1 199.9 143.1 0.866 2 Scroll 7,5+10 / 7,5+10 / 7,5+10 / 9,2 + 12 / 9,2 + 12 / 9,2 + 12 15,5 + 20,2 / 15,5 + 20,2 / 15,5 + 20,2 / 98 + 142 / 98 + 142 /	0.836 53.7 91.9 213.7 156.9 0.854 2 Scroll 10+10/ 10+10/ 12+12/ 12+12/ 12+12 20,2+20,2/ 20,2+20,2/ 20,2+20,2/ 142+142/ 142+142	0.861 61.2 102.1 234.8 171.6 0.875 2 Scroll 10+13 /10+13 12 + 15,7 12 + 15,7 20,2 + 25,3 / 20,2 + 25,3 / 20,2 + 25,3 / 142 + 158 / 142 + 158	$\begin{array}{c} 0.880\\ \hline\\ 68.6\\ 112.3\\ 245.0\\ 181.8\\ 0.892\\ \hline\\ 2\\ \hline\\ 35croll\\ 13+13 \\ 15,7+15,7 \\ 15,7+15,7\\ 15,7+15,7\\ 25,3+25,3\\ 158+158 \\ 158+158\\ \end{array}$	0.84 76.1 129. 254. 192. 0.85 <sup>5</sup> 2 Scroo 15+15 15+1 17,6+1 17,6+2 29,5+2 29,5+2 155+1
Digit 12=1 and Digit 15=C         Maximum Power input       (k         Unit rated amps       (r         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (r         Unit start up amps (with soft starter - Digit 26=B) (4)       Power factor         Porer factor       Inpressor         Compressor Number per Circuit       Integration         Model Circuit1 / Circuit 2       Max Compr Power input Circuit 1/Circuit 2         Max Compr Power input Circuit 1/Circuit 2 (4)       (r         Locked Rotor Amps Circuit1 / Circuit 2 (4)       (r         Motor RPM       (rr         Oil sump heater Circuit1 / Circuit 2       (r         Quantity       Inprese         Type       (r         Nominal water connection size (Grooved coupling) - (r       (r         Without HYM       (r         Nominal water connection size (Grooved coupling) - (r       (r         Motinal water connection size (Grooved coupling) - (r       (r         Mominal water connection size (Grooved coupling) - (r       (r         Mominal water connection size (Grooved coupling) - (r       (r         Motor B       Single pump - Standard head pressure option       (r	A) (A) (A) (W) (A) (A) (M) (M) (A) (A) (A) (A) (A) (A) (A) (A	50.0 81.8 214.5 151.3 0.894 3 Scroll 13+13+13 15,7 + 15,7 + 15,7 25,3 + 25,3 + 25,3 158 + 158 + 158 + 158 2900	56.6 96.6 222.1 160.1 0.855 3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,5 + 29,5 + 29,5 + 29,5 + 155 + 155 + 155 + 155 + 155 +	46.4 78.1 199.9 143.1 0.866 2 Scroll 7,5+10 / 7,5+10 / 9,2 + 12 / 9,2 + 12 / 9,2 + 12 / 15,5 + 20,2 / 15,5 + 20,2 / 98 + 142 / 98 + 142 / 98 + 142	53.7 91.9 213.7 156.9 0.854 2 Scroll 10+10 / 10+10 / 12+12 / 12+12 20,2+20,2 / 20,2+20,2 / 20,2+20,2 142+142 / 142+142	61.2 102.1 234.8 171.6 0.875 2 Scroll 10+13 /10+13 12 + 15,7 12 + 15,7 20,2 + 25,3 20,2 + 25,3 20,2 + 25,3 142 + 158 142 + 158	68.6 112.3 245.0 181.8 0.892 2 Scroll 13+13 / 13+13 15,7 + 15,7 / 15,7 + 15,7 25,3 + 25,3 158 + 158 / 158 + 158	76.1 129. 254. 192. 0.85 2 Scro 15+1 15+1 17,6+1 17,6+2 29,5+2 29,5+2 155+1
Maximum Power input       (k         Unit rated amps       (r         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (r         Unit start up amps (with soft starter - Digit 26=B) (4)       (r         Power factor	A) (A) (A) (W) (A) (A) (M) (M) (A) (A) (A) (A) (A) (A) (A) (A	$81.8 \\ 214.5 \\ 151.3 \\ 0.894 \\ 3 \\ Scroll \\ 13+13+13 \\ 15,7 + \\ 15,7 + 15,7 \\ 25,3 + 25,3 \\ 158 + \\ 158 + 158 \\ 2900 \\ $	96.6 222.1 160.1 0.855 3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,5 + 29,5 + 29,5 + 255 + 155 + 155 + 155 + 155 + 2900	78.1 199.9 143.1 0.866 2 Scroll 7,5+10 9,2 + 12 9,2 + 12 9,2 + 12 15,5 + 20,2 98 + 142 98 + 142 2900	91.9 213.7 156.9 0.854 2 Scroll 10+10 / 10+10 12 + 12 / 12 + 12 20,2 + 20,2 / 20,2 + 20,2 142 + 142 / 142 + 142	102.1 234.8 171.6 0.875 2 Scroll 10+13 /10+13 12+15,7 12+15,7 20,2+25,3 /20,2+25,3 142+158 142+158	$\begin{array}{r} 112.3\\ 245.0\\ 181.8\\ 0.892\\ \hline \\ 2\\ Scroll\\ 13+13 \\ 13+13\\ 15,7+15,7 \\ 15,7+15,7\\ 25,3+25,3\\ 15,7+25,3\\ 15,8+158\\ 158+158\\ \end{array}$	129. 254. 192. 0.85 2 Scro 15+1! 15+1 17,6+1 17,6+2 29,5+2 29,5+1 155+1
Unit rated amps       (,         Unit start up amps (w/o soft starter - Digit 26=A) (4)       (,         Unit start up amps (with soft starter - Digit 26=B) (4)       Power factor         Power factor       (,         pressor       Compressor Number per Circuit         Compressor Number per Circuit 1/Circuit 2       (,         Model Circuit1 / Circuit 2       (,         Max Compr Power input Circuit 1/Circuit 2 (4)       (,         Locked Rotor Amps Circuit1 / Circuit 2 (4)       (,         Motor RPM       (rp         Oil sump heater Circuit1 / Circuit 2       (,         Powerator       (,         Quantity       (,         Type       (,         Nominal water connection size (Grooved coupling) - (,       (,         Without HYM       (,         Nominal water connection size (Grooved coupling) - (,       (,         With HYM       (,         Single pump - Standard head pressure option       (,	A) (A) (A) (W) (A) (A) (M) (M) (A) (A) (A) (A) (A) (A) (A) (A	$81.8 \\ 214.5 \\ 151.3 \\ 0.894 \\ 3 \\ Scroll \\ 13+13+13 \\ 15,7 + \\ 15,7 + 15,7 \\ 25,3 + 25,3 \\ 158 + \\ 158 + 158 \\ 2900 \\ $	96.6 222.1 160.1 0.855 3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,5 + 29,5 + 29,5 + 255 + 155 + 155 + 155 + 155 + 2900	78.1 199.9 143.1 0.866 2 Scroll 7,5+10 9,2 + 12 9,2 + 12 9,2 + 12 15,5 + 20,2 98 + 142 98 + 142 2900	91.9 213.7 156.9 0.854 2 Scroll 10+10 / 10+10 12 + 12 / 12 + 12 20,2 + 20,2 / 20,2 + 20,2 142 + 142 / 142 + 142	102.1 234.8 171.6 0.875 2 Scroll 10+13 /10+13 12+15,7 12+15,7 20,2+25,3 /20,2+25,3 142+158 142+158	$\begin{array}{r} 112.3\\ 245.0\\ 181.8\\ 0.892\\ \hline \\ 2\\ Scroll\\ 13+13 \\ 13+13\\ 15,7+15,7 \\ 15,7+15,7\\ 25,3+25,3\\ 15,7+25,3\\ 15,8+158\\ 158+158\\ \end{array}$	129. 254. 192. 0.85 2 Scro 15+1! 15+1 17,6+1 17,6+2 29,5+2 29,5+1 155+1
Unit start up amps (w/o soft starter - Digit 26=A) (4)       (.         Unit start up amps (with soft starter - Digit 26=B) (4)       Power factor         Power factor       Power factor         pressor       Compressor Number per Circuit       Factor         Model Circuit1 / Circuit 2       Max Compr Power input Circuit 1/Circuit 2       K         Max Compr Power input Circuit 1/Circuit 2 (4)       (.         Locked Rotor Amps Circuit1 / Circuit 2 (4)       (.         Motor RPM       (rr         Oil sump heater Circuit1 / Circuit 2       (.         Poprator       (.         Quantity       Factor         Type       (.         Nominal water connection size (Grooved coupling) - (ir       (ir         Without HYM       (rr         Nominal water connection size (Grooved coupling) - (ir       (ir         With HYM       (rr         Nominal water connection size (Grooved coupling) - (ir       (ir         With HYM       (rr         Nominal water connection size (Grooved coupling) - (ir       (ir         With HYM       (rr         Module Components       Single pump - Standard head pressure option         Max available Head Pressure       (k	4) # W A) A) Dm) V)	$\begin{array}{c} 214.5\\ 151.3\\ 0.894\\ \hline \\ 3\\ Scroll\\ 13+13+13\\ 15,7+\\ 15,7+15,7\\ 25,3+\\ 25,3+25,3\\ 158+\\ 158+158\\ 2900\\ \end{array}$	222.1 160.1 0.855 3 5croll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 17,5 + 155 + 155 + 155 + 155 + 155 + 155 +	199.9 143.1 0.866 2 Scroll 7,5+10 / 7,5+10 / 7,5+10 / 9,2 + 12 / 9,2 + 12 / 9,2 + 12 15,5 + 20,2 / 15,5 + 20,2 / 15,5 + 20,2 / 98 + 142 2900	213.7 156.9 0.854 2 Scroll 10+10 / 10+10 12 + 12 / 12 + 12 20,2 + 20,2/ 20,2 + 20,2/ 142 + 142 / 142 + 142	234.8 171.6 0.875 2 Scroll 10+13 /10+13 12 + 15,7 / 12 + 15,7 20,2 + 25,3 / 20,2 + 25,3 / 20,2 + 25,3 / 142 + 158 / 142 + 158	245.0 181.8 0.892 2 Scroll 13+13 / 13,7 + 15,7 / 15,7 + 15,7 25,3 + 25,3 158 + 158 / 158 + 158	254. 192. 0.85 2 Scro 15+1 17,6+1 17,6+2 29,5+2 29,5+2 155+1
Unit start up amps (with soft starter - Digit 26=B) (4) Power factor pressor Compressor Number per Circuit Type Model Circuit1 / Circuit 2 Max Compr Power input Circuit 1/Circuit 2 Max Compr Power input Circuit 2 (4) Locked Rotor Amps Circuit1 / Circuit 2 (4) Locked Rotor Amps Circuit1 / Circuit 2 (4) Locked Rotor Amps Circuit1 / Circuit 2 (4) Cotor RPM Oil sump heater Circuit1 / Circuit 2 Quantity Type Evaporator model Evaporator Water Content volume (rr Nominal water connection size (Grooved coupling) - Without HYM Nominal water connection size (Grooved coupling) - Circuit Module Components Single pump - Standard head pressure option Max available Head Pressure (k	# W A) m) V)	$ \begin{array}{r} 151.3\\ 0.894\\ \hline 3\\ Scroll\\ 13+13+13\\ 15,7+\\ 15,7+15,7\\ 25,3+\\25,3+25,3\\ 158+\\158+158\\ 2900\\ \end{array} $	160.1 0.855 3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 29,5 + 29,5 + 29,5 + 29,5 + 155 + 155 + 155 + 155 + 2900	143.1 0.866 2 Scroll 7,5+10 / 7,5+10 9,2 + 12 / 9,2 + 12 15,5 + 20,2 / 15,5 + 20,2 98 + 142 / 98 + 142 2900	156.9 0.854 2 Scroll 10+10 / 10+10 / 12 + 12 / 12 + 12 20,2 + 20,2 / 20,2 + 20,2 / 20,2 + 20,2 / 142 + 142 / 142 + 142	171.6 0.875 2 Scroll 10+13 /10+13 12 + 15,7 20,2 + 25,3 / 20,2 + 25,3 / 20,2 + 25,3 142 + 158 / 142 + 158	181.8 0.892 2 Scroll 13+13 / 15,7 + 15,7 / 15,7 + 15,7 25,3 + 25,3 158 + 158 / 158 + 158	192. 0.85 2 Scro 15+1 15+1 17,6 + 1 17,6 + 2 29,5 + 2 29,5 + 2 29,5 + 1
Power factor  Power factor  Power factor  Poressor  Compressor  Compressor  Compressor  Max Compr Power input Circuit  Max Compr Power input Circuit 1/Circuit 2  Max Compr Power input Circuit 1/Circuit 2  Max Compr Power input Circuit 2 (4)  Locked Rotor Amps Circuit1 / Circuit 2 (4)  Locked Rotor Amps Circuit1 / Circuit 2 (4)  Locked Rotor Amps Circuit1 / Circuit 2 (4)  Motor RPM  (rr  Quantity  Type  Evaporator Model  Evaporator Model  Evaporator Model  Evaporator Mater connection size (Grooved coupling) -  Without HYM  Nominal water connection size (Grooved coupling) -  Without HYM  (rr  Taulic Module Components  Single pump - Standard head pressure option  Max available Head Pressure  (k	W 4) A) 0m) V)	0.894 3 Scroll 13+13+13 15,7 + 15,7 + 15,7 25,3 + 25,3 + 25,3 158 + 158 + 158 + 158 + 158 + 2900	0.855 3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 29,5 + 29,5 + 29,5 + 29,5 + 155 + 155 + 155 + 155 + 2900	0.866 2 Scroll 7,5+10 / 7,5+10 9,2 + 12 / 9,2 + 12 15,5 + 20,2 / 15,5 + 20,2 98 + 142 / 98 + 142 2900	0.854 2 Scroll 10+10 / 10+10 / 12 + 12 / 12 + 12 20,2 + 20,2 / 20,2 + 20,2 / 20,2 + 20,2 / 142 + 142 / 142 + 142	0.875 2 Scroll 10+13 /10+13 12 + 15,7 / 12 + 15,7 20,2 + 25,3 / 20,2 + 25,3 / 20,2 + 25,3 142 + 158 / 142 + 158	0.892 2 Scroll 13+13 / 15,7 + 15,7 / 15,7 + 15,7 25,3 + 25,3 25,3 + 25,3 158 + 158 / 158 + 158	0.85 2 Scro 15+1 17,6 + 1 17,6 + 2 29,5 + 2 29,5 + 1 155 + 1
appressor         Compressor Number per Circuit         Type         Model Circuit1 / Circuit 2         Max Compr Power input Circuit 1/Circuit 2         Max Compr Power input Circuit 1/Circuit 2         Rated Amps Circuit1 / Circuit 2 (4)         Locked Rotor Amps Circuit1 / Circuit 2 (4)         Motor RPM         Oil sump heater Circuit1 / Circuit 2         Quantity         Type         Evaporator Model         Evaporator Model         Evaporator Water Content volume         Nominal water connection size (Grooved coupling) - (ir         Without HYM         Nominal water connection size (Grooved coupling) - (ir         Without By         Table Dump - Standard head pressure option         Max available Head Pressure	W 4) A) 0m) V)	3 Scroll 13+13+13 15,7 + 15,7 + 15,7 25,3 + 25,3 + 25,3 158 + 158 + 158 2900	3 Scroll 15+15+15 17,6 + 17,6 + 17,6 + 17,6 + 17,6 + 29,5 + 29,5 + 29,5 + 29,5 + 155 + 155 + 155 + 155 + 155 + 2900	2 Scroll 7,5+10 / 7,5+10 9,2 + 12 / 9,2 + 12 15,5 + 20,2 / 15,5 + 20,2 98 + 142 / 98 + 142 / 98 + 142	2 Scroll 10+10 / 10+10 12 + 12 / 12 + 12 20,2 + 20,2 20,2 + 20,2 142 + 142 / 142 + 142	2 Scroll 10+13 /10+13 12 + 15,7 / 12 + 15,7 20,2 + 25,3 20,2 + 25,3 142 + 158 / 142 + 158	2 Scroll 13+13 / 13+13 15,7 + 15,7 / 15,7 + 15,7 25,3 + 25,3 25,3 + 25,3 158 + 158 / 158 + 158	2 Scro 15+1 17,6 + 1 17,6 + 2 29,5 + 2 29,5 + 2 29,5 + 1
Compressor Number per Circuit       Image: Strength Strengt Strength Strength Strength Strength Strength Strength Strength St	W 4) A) 0m) V)	Scroll 13+13+13 15,7 + 25,3 + 25,3 + 25,3 158 + 158 + 158 2900	Scroll 15+15+15 17,6 + 17,6 + 17,6 29,5 + 29,5 + 29,5 155 + 155 + 155 2900	Scroll 7,5+10 / 7,5+10 9,2 + 12 / 9,2 + 12 15,5 + 20,2 / 15,5 + 20,2 98 + 142 / 98 + 142 2900	Scroll 10+10 / 10+10 12 + 12 / 12 + 12 20,2 + 20,2 / 20,2 + 20,2 142 + 142 / 142 + 142	Scroll 10+13 /10+13 12 + 15,7 / 12 + 15,7 20,2 + 25,3 20,2 + 25,3 142 + 158 / 142 + 158	Scroll 13+13 / 13+13 15,7 + 15,7 / 15,7 + 15,7 25,3 + 25,3 / 25,3 + 25,3 158 + 158 / 158 + 158	Scro 15+1 15+1 17,6 + 1 17,6 + 2 29,5 + 2 29,5 + 2 155 + 1
Type         Model Circuit1 / Circuit 2         Max Compr Power input Circuit 1/Circuit 2         Rated Amps Circuit1 / Circuit 2 (4)         Locked Rotor Amps Circuit1 / Circuit 2 (4)         Motor RPM         Oil sump heater Circuit1 / Circuit 2         Quantity         Type         Evaporator model         Evaporator Water Content volume         Nominal water connection size (Grooved coupling) - (ir Without HYM         Nominal water connection size (Grooved coupling) - (ir mraulic Module Components         Single pump - Standard head pressure option         Max available Head Pressure	W A) A) V)	Scroll 13+13+13 15,7 + 25,3 + 25,3 + 25,3 158 + 158 + 158 2900	Scroll 15+15+15 17,6 + 17,6 + 17,6 29,5 + 29,5 + 29,5 155 + 155 + 155 2900	Scroll 7,5+10 / 7,5+10 9,2 + 12 / 9,2 + 12 15,5 + 20,2 / 15,5 + 20,2 98 + 142 / 98 + 142 2900	Scroll 10+10 / 10+10 12 + 12 / 12 + 12 20,2 + 20,2 / 20,2 + 20,2 142 + 142 / 142 + 142	Scroll 10+13 /10+13 12 + 15,7 / 12 + 15,7 20,2 + 25,3 20,2 + 25,3 142 + 158 / 142 + 158	Scroll 13+13 / 13+13 15,7 + 15,7 / 15,7 + 15,7 25,3 + 25,3 / 25,3 + 25,3 158 + 158 / 158 + 158	Scro 15+1 15+1 17,6 + 1 17,6 + 2 29,5 + 2 29,5 + 2 155 + 1
Model Circuit1 / Circuit 2         Max Compr Power input Circuit 1/Circuit 2         Rated Amps Circuit1 / Circuit 2 (4)         Locked Rotor Amps Circuit1 / Circuit 2 (4)         Motor RPM         Oil sump heater Circuit1 / Circuit 2         Quantity         Type         Evaporator model         Evaporator Water Content volume         Vithout HYM         Nominal water connection size (Grooved coupling) - (ir         With HYM         Single pump - Standard head pressure option         Max available Head Pressure	4) 4) 0 <u>m)</u> V)	$13+13+13 \\ 15,7 + \\ 15,7 + 15,7 \\ 25,3 + \\ 25,3 + 25,3 \\ 158 + \\ 158 + 158 \\ 2900$	$\begin{array}{c} 15{+}15{+}15\\ 17,6+\\ 29,5+\\ 29,5+\\ 29,5+\\ 29,5+\\ 155+\\ 155+\\ 155+\\ 2900\end{array}$	7,5+10 / 7,5+10 9,2 + 12 / 9,2 + 12 15,5 + 20,2 / 15,5 + 20,2 98 + 142 / 98 + 142 2900	10+10 / 10+10 12 + 12 / 12 + 12 20,2 + 20,2 / 20,2 + 20,2 142 + 142 / 142 + 142	10+13 /10+13 12 + 15,7 / 12 + 15,7 20,2 + 25,3 / 20,2 + 25,3 142 + 158 / 142 + 158	13+13 / 13+13 15,7 + 15,7 / 15,7 + 15,7 25,3 + 25,3 / 25,3 + 25,3 158 + 158 / 158 + 158	15+1 15+1 17,6 + 1 17,6 + 2 29,5 + 2 29,5 + 2 155 + 1
Max Compr Power input Circuit 1/Circuit 2       k         Rated Amps Circuit1 / Circuit 2 (4)       (x)         Locked Rotor Amps Circuit1 / Circuit 2 (4)       (x)         Motor RPM       (rr         Oil sump heater Circuit1 / Circuit 2       (x)         Porator       (x)         Quantity       (x)         Type       (x)         Evaporator model       (x)         Evaporator Water Content volume       (x)         Without HYM       (rr         Nominal water connection size (Grooved coupling) - (x)       (x)         Without HYM       (rr         Single pump - Standard head pressure option       Max available Head Pressure	4) 4) 0 <u>m)</u> V)	15,7 + 15,7 + 15,7 + 25,3 + 25,3 + 25,3 + 25,3 + 158 + 158 + 158 + 2900	17,6 + 17,6 + 17,6 29,5 + 29,5 + 29,5 155 + 155 + 155 2900	7,5+10 9,2 + 12 / 9,2 + 12 15,5 + 20,2 / 15,5 + 20,2 98 + 142 / 98 + 142 2900	10+10 12 + 12 / 12 + 12 20,2 + 20,2 / 20,2 + 20,2 142 + 142 / 142 + 142	/10+13 12 + 15,7 / 12 + 15,7 20,2 + 25,3 / 20,2 + 25,3 142 + 158 / 142 + 158	13+13 15,7 + 15,7 / 15,7 + 15,7 25,3 + 25,3 / 25,3 + 25,3 158 + 158 / 158 + 158	15+1 17,6 + 1 17,6 + 29,5 + 2 29,5 + 1 155 + 1
Rated Amps Circuit / Circuit 2 (4)       (A         Locked Rotor Amps Circuit / Circuit 2 (4)       (A         Motor RPM       (rp         Oil sump heater Circuit / Circuit 2       (A         porator       (A         Quantity       (A         Type       (A         Evaporator model       (A         Evaporator Water Content volume       (A         Nominal water connection size (Grooved coupling) - (ir       (ir         Without HYM       (rr         Nominal water connection size (Grooved coupling) - (ir       (ir         Taulic Module Components       (Adule Components)         Single pump - Standard head pressure option       Max available Head Pressure	4) 4) 0 <u>m)</u> V)	$     \begin{array}{r} 15,7 + 15,7 \\             25,3 + \\             25,3 + 25,3 \\             158 + \\             158 + 158 \\             2900 \\         \end{array} $	$17,6 + 17,6 \\ 29,5 + \\ 29,5 + 29,5 \\ 155 + \\ 155 + 155 \\ 2900$	9,2 + 12 / 9,2 + 12 15,5 + 20,2 / 15,5 + 20,2 98 + 142 / 98 + 142 2900	12 + 12 / 12 + 12 20,2 + 20,2 / 20,2 + 20,2 142 + 142 / 142 + 142	12 + 15,7 / 12 + 15,7 20,2 + 25,3 / 20,2 + 25,3 142 + 158 / 142 + 158	15,7 + 15,7 / 15,7 + 15,7 25,3 + 25,3 / 25,3 + 25,3 158 + 158 / 158 + 158	17,6 + 1 17,6 + 29,5 + 2 29,5 + 2 155 + 1
Rated Amps Circuit / Circuit 2 (4)       (A         Locked Rotor Amps Circuit / Circuit 2 (4)       (A         Motor RPM       (rp         Oil sump heater Circuit / Circuit 2       (A         porator       (A         Quantity       (A         Type       (A         Evaporator model       (A         Evaporator Water Content volume       (A         Nominal water connection size (Grooved coupling) - (ir       (ir         Without HYM       (rr         Nominal water connection size (Grooved coupling) - (ir       (ir         Taulic Module Components       (Adule Components)         Single pump - Standard head pressure option       Max available Head Pressure	4) 4) 0 <u>m)</u> V)	$     \begin{array}{r} 15,7 + 15,7 \\             25,3 + \\             25,3 + 25,3 \\             158 + \\             158 + 158 \\             2900 \\         \end{array} $	$17,6 + 17,6 \\ 29,5 + \\ 29,5 + 29,5 \\ 155 + \\ 155 + 155 \\ 2900$	9,2 + 12 15,5 + 20,2 / 15,5 + 20,2 98 + 142 / 98 + 142 2900	12 + 12 20,2 + 20,2 / 20,2 + 20,2 142 + 142 / 142 + 142	12 + 15,7 20,2 + 25,3 / 20,2 + 25,3 142 + 158 / 142 + 158	15,7 + 15,7 25,3 + 25,3 / 25,3 + 25,3 158 + 158 / 158 + 158	17,6 + 29,5 + 2 29,5 + 1 155 + 1
Locked Rotor Amps Circuit / Circuit 2 (4) (A Motor RPM (rr Oil sump heater Circuit / Circuit 2 (1) Dorator Quantity 2 (1) Evaporator model Evaporator model Evaporator Water Content volume (C Nominal water connection size (Grooved coupling) - (ir Without HYM (rr Nominal water connection size (Grooved coupling) - (ir Without HYM (rr Nominal water connection size (Grooved coupling) - (ir With HYM (rr Taulic Module Components Single pump - Standard head pressure option Max available Head Pressure (k	4) 0m) V)	25,3 + 25,3 158 + 158 + 158 2900	29,5 + 29,5 155 + 155 + 155 2900	15,5 + 20,2 98 + 142 / 98 + 142 2900	20,2 + 20,2 142 + 142 / 142 + 142	20,2 + 25,3 142 + 158 / 142 + 158	25,3 + 25,3 158 + 158 / 158 + 158	29,5 + 2 155 + 1
Locked Rotor Amps Circuit / Circuit 2 (4) (A Motor RPM (rr Oil sump heater Circuit / Circuit 2 (1) Dorator Quantity 2 (1) Evaporator model Evaporator model Evaporator Water Content volume (C Nominal water connection size (Grooved coupling) - (ir Without HYM (rr Nominal water connection size (Grooved coupling) - (ir Without HYM (rr Nominal water connection size (Grooved coupling) - (ir With HYM (rr Taulic Module Components Single pump - Standard head pressure option Max available Head Pressure (k	4) 0m) V)	158 + 158 + 158 2900	155 + 155 + 155 2900	15,5 + 20,2 98 + 142 / 98 + 142 2900	20,2 + 20,2 142 + 142 / 142 + 142	20,2 + 25,3 142 + 158 / 142 + 158	25,3 + 25,3 158 + 158 / 158 + 158	29,5 + 2 155 + 1
Motor RPM       (rp         Oil sump heater Circuit1 / Circuit 2       (r)         porator       (r)         Quantity       (r)         Type       (r)         Evaporator model       (r)         Evaporator Water Content volume       (r)         Without HYM       (r)         Nominal water connection size (Grooved coupling) - (ir)       (r)         Without HYM       (r)         Nominal water connection size (Grooved coupling) - (ir)       (r)         With HYM       (r)         Module Components       (r)         Single pump - Standard head pressure option       Max available Head Pressure	om) V)	158 + 158 2900	155 + 155 2900	98 + 142 2900	142 + 142	142 + 158	158 + 158	
Motor RPM       (rp         Oil sump heater Circuit1 / Circuit 2       (r)         porator       (r)         Quantity       (r)         Type       (r)         Evaporator model       (r)         Evaporator Water Content volume       (r)         Without HYM       (r)         Nominal water connection size (Grooved coupling) - (ir)       (r)         Without HYM       (r)         Nominal water connection size (Grooved coupling) - (ir)       (r)         With HYM       (r)         Module Components       Single pump - Standard head pressure option         Max available Head Pressure       (k	om) V)	2900	2900	2900				155 +
Oil sump heater Circuit1 / Circuit 2       (1)         porator       (1)         Quantity       (2)         Type       (2)         Evaporator model       (2)         Evaporator Water Content volume       (2)         Nominal water connection size (Grooved coupling) -       (1)         Without HYM       (1)         Nominal water connection size (Grooved coupling) -       (1)         With HYM       (1)         Taulic Module Components       (1)         Single pump - Standard head pressure option       (1)         Max available Head Pressure       (1)	V)				2900	2000	2000	
porator         Quantity         Type         Evaporator model         Evaporator Water Content volume         (ir         Without HYM         Nominal water connection size (Grooved coupling) -         With HYM         Nominal water connection size (Grooved coupling) -         (ir         With HYM         Single pump - Standard head pressure option         Max available Head Pressure	Ź	0,25 / 0	0,25 / 0				2900	290
Quantity     :       Type     :       Evaporator model     :       Evaporator Water Content volume     (ir       Nominal water connection size (Grooved coupling) -     (ir       Without HYM     (m       Nominal water connection size (Grooved coupling) -     (ir       With HYM     (m <b>Nominal water connection size (Grooved coupling) -</b> (ir <b>With HYM</b> (m <b>Single pump - Standard head pressure option</b> Max available Head Pressure	#			0,17 / 0,17	0,17 / 0,17	0,17 / 0,17	0,17 / 0,17	0,17/
Type Evaporator model Evaporator Water Content volume Nominal water connection size (Grooved coupling) - (ir Without HYM Nominal water connection size (Grooved coupling) - (ir With HYM raulic Module Components Single pump - Standard head pressure option Max available Head Pressure (k	ŧ							
Evaporator model         Evaporator Water Content volume       (in         Nominal water connection size (Grooved coupling) -       (in         Without HYM       (m         Nominal water connection size (Grooved coupling) -       (in         With HYM       (m         Iraulic Module Components       Single pump - Standard head pressure option         Max available Head Pressure       (k		1	1	1	1	1	1	1
Evaporator Water Content volume       ((ir         Nominal water connection size (Grooved coupling) -       (ir         Without HYM       (m         Nominal water connection size (Grooved coupling) -       (ir         With HYM       (m         raulic Module Components       (ir         Single pump - Standard head pressure option       (k         Max available Head Pressure       (k		D1207 101		•	per Brazed pla		•	DDDDD
Nominal water connection size (Grooved coupling) -       (ir         Without HYM       (m         Nominal water connection size (Grooved coupling) -       (ir         With HYM       (m <b>Taulic Module Components</b> (m         Single pump - Standard head pressure option       (m         Max available Head Pressure       (k	1)	P120Tx104	P120Tx104		DP300x82	DP300x82	DP300x114	
Without HYM     (m       Nominal water connection size (Grooved coupling) -     (ir       With HYM     (m       raulic Module Components     Single pump - Standard head pressure option       Max available Head Pressure     (k	<u>l)</u>	12.5	12.5	8.5	8.5	8.5	11.8	11.8
Nominal water connection size (Grooved coupling) -       (ir         With HYM       (m         raulic Module Components       (m         Single pump - Standard head pressure option       (m         Max available Head Pressure       (k	1) -	2" - 60,3	2" - 60,3	3" OD - 76,1	3" OD - 76,1	3" OD - 76,1	3" OD - 76,1	3" OD -
With HYM     (m       raulic Module Components     Image: Component service option       Single pump - Standard head pressure option     Max available Head Pressure								
Single pump - Standard head pressure option           Max available Head Pressure         (k		3" OD - 76,1	3" OD - 76,1	3" OD - 76,1	3" OD - 76,1	3" OD - 76,1	3" OD - 76,1	3" OD -
Single pump - Standard head pressure option           Max available Head Pressure         (k								
Max available Head Pressure (k								
	Pa۱	131	104	111	133	114	113	178
Motor Power (k	W)	2.30	2.30	1.50	2.30	2.30	2.30	2.30
	4)	5.03	5.03	3.50	5.03	5.03	5.03	5.03
Single pump - High head pressure option	9	5.05	5.05	5.50	5.05	5.05	5.05	5.0.
	Pa)	176	151	198	179	162	162	138
· · · · · · · · · · · · · · · · · · ·	W)	3.00	3.00	3.00	3.00	3.00	3.00	3.00
,	4)	6.23	6.23	6.23	6.23	6.23	6.23	6.23
Twin pump - Standard head pressure option	1)	0.25	0.23	0.25	0.23	0.23	0.23	0.23
· · · · · ·	Pa)	121	104	111	122	114	110	178
,		131	104	111	133	2 20	2 20	
•	W)	2.30	2.30	1.50	2.30	2.30	2.30	2.30
· · · · · · · · · · · · · · · · · · ·	4)	5.03	5.03	3.50	5.03	5.03	5.03	5.03
Twin pump - High head pressure option		176	151	100	170	160	160	1.20
	Pa)	176	151	198	179	162	162	138
	W)	3.00	3.00	3.00	3.00	3.00	3.00	3.00
	<u>A)</u>	6.23	6.23	6.23	6.23	6.23	6.23	6.23
	l)	35	35	35	35	35	35	35
Max User water loop Volume for factory mounted	I)	2000	2000	2000	2000	2000	2000	200
expansion tank (1)								
	l)	444	444	444	444	444	444	444
· · · · · · · · · · · · · · · · · · ·	N)	180	180	120	120	120	180	180
	N)	340	340	280	280	280	340	340
denser								
Туре								
Quantity of coil     Image: Second Seco	#	2	F	ull aluminum 2	Micro channel 2	heat exchang 2	er 2	2



#### Table 2 - CXAX 039-060 General Data (continued)

		CXAX 039	CXAX 045	CXAX 035	CXAX 040	CXAX 046	CXAX 052	CXAX 060
		SE-SN	SE-SN	SE-SN	SE-SN	SE-SN	SE-SN	SE-SN
Condenser Fan								
Quantity	#	2	3	2	4	4	4	4
Diameter	(mm)				800			
Fan / motor Type		Propelle	r fan : Fixed sj	peed AC mot	or / Variable s	peed - EC mot	tor / HESP MA	X SPEED
Digit 12=2 or Digit 12=1 and Digit 41=2					(1)=05.141			
Fan / motor Type	3.4	1.1660	10505		or / HESP MAX		12117	12205
Airflow per fan	m <sup>3</sup> /h	14660	13595	14686	12249	12233	12447	12205
Max Power Input	Kw	1,95 + 1,95	1,95 + 1,95 + 1,95	1,95 / 1,95 + 0		1,95 + 1,95 / 1,95 + 1,95		1,95 + 1,95 1,95 + 1,95
Max Amps	А	3 + 3	3 + 3 + 3	3/3+0	3 + 3 / 3 + 3	3 + 3 / 3 + 3	3 + 3 / 3 + 3	3 + 3 / 3 +
Motor RPM	(rpm)	915	915	915	915	915	915	915
Digit 12=1 and Digit 15=A								
Fan / motor Type					otor / Variable			
Airflow per fan	m <sup>3</sup> /h	14690	13676	14687	12358	12363	12592	12374
Max Power Input	Kw	0,89 + 0,89	0,89 + 0,89 + 0,89	0,89 / 0,89 + 0	0,89 + 0,89 / 0,89 + 0,89	0,89 + 0,89 / 0,89 + 0,89	0,89 + 0,89 / 0,89 + 0,89	0,89 + 0,89 0,89 + 0,89
Max Amps	А	2,22 + 2,22	2,22 + 2,22 + 2,22	2,22 / 2,22 + 0	2,22 + 2,22 /	2,22 + 2,22 / 2,22 + 2,22		
Motor RPM	(rpm)	686	686	686	686	686	686	686
Digit 12=1 and Digit 15=C	(1911)							
Fan / motor Type			Fixed	I speed AC m	otor / Variable	e speed - EC n	notor	
Airflow per fan	m <sup>3</sup> /h	14690	13676	14687	12358	12363	12592	12374
Max Power Input	Kw	1,95 + 0,89	1,95 + 0,89 + 0,89	1,95 / 1,95 + 0		1,95 + 0,89 / 1,95 + 0,89	1,95 + 0,89 / 1,95 + 0,89	1,95 + 0,89 1,95 + 0,89
			3 + 2,22 +		3 + 2,22 /	3 + 2,22 /	3 + 2,22 /	3 + 2.22
Max Amps	А	3 + 2,22	2,22	3/3+0	3 + 2,22	3 + 2,22	3 + 2,22	3 + 2,22
Motor RPM	(rpm)	686	686	686	686	686	686	686
Airflow per Fan	(m <sup>3</sup> /h)	14690	13676	14687	12358	12363	12592	12374
Airflow per Fan HESP (915 RPM - 100Pa)	(m <sup>3</sup> /h)	14660	13595	14686	12249	12233	12447	12205
Power per Motor	(kW)	686	686	686	686	686	686	686
Partial Heat recovery (PHR) option								
Heat-Exchanger Type			Stainl	ess steel Cop	pper Brazed pl	ate Heat exch	anger	
Heat-Exchanger Model		B3-027-20-	B3-027-20-		-2x B3-014-14-		2x B3-027-14-	2x B3-027-1
		4.5L	4.5L	4.5M	4.5M	4.5M	4.5L	4.5L
Water connection size (Thread connection)	(in) - (mm)	G 1"1/4 (31.75 mm)	G 1"1/4 (31.75 mm)	G 1"1/4 (31.75 mm)	G 1"1/4 (31.75 mm)	G 1"1/4 (31.75 mm)	G 1"1/4 (31.75 mm)	G 1"1/4 (31.75 mm
Water content volume	(1)	0.5	0.5	2x 0.14	2x 0.14	2x 0.14	2x 0.35	2x 0.35
Dimensions (7)	( )							
Unit Length	(mm)	2327	2327	2327	2327	2327	2327	2327
Unit Width	(mm)	2250	2250	2250	2250	2250	2250	2250
Std Unit Height	(mm)	1524	1524	1524	1524	1524	1524	1724
LN or External SP unit - (Additional height configuration)	(mm)	+230	+231	+232	+233	+234	+235	+236
Water Buffer tank option -								
(Additional height configuration)								
	(mm)	+330	+330	+330	+330	+330	+330	+330
Veights	(mm)	+330	+330	+330	+330	+330	+330	+330
Veights Shipping Weight (3)	(mm) (kg)	+330	+330	+330	+330	+330	+330	+330
Shipping Weight (3) Operating Weight (3)	. ,							
Shipping Weight (3)	(kg)	954	972	1000	1098	1098	1120	1190
Shipping Weight (3) Operating Weight (3) Option Additional shipping weight Single pump - Standard head pressure	(kg) (kg) (kg)	954 925 47	972 942 47	1000 974 45	1098 1072 47	1098 1072 47	1120 1093 47	1190
Shipping Weight (3)         Operating Weight (3)         Option Additional shipping weight         Single pump - Standard head pressure         Single pump - High head pressure	(kg) (kg) (kg) (kg)	954 925 47 49	972 942 47 49	1000 974 45 49	1098 1072 47 49	1098 1072 47 49	1120 1093	1190 1163 47 49
Shipping Weight (3)         Operating Weight (3)         Option Additional shipping weight         Single pump - Standard head pressure         Single pump - High head pressure         Twin pump - Standard head pressure	(kg) (kg) (kg) (kg) (kg)	954 925 47 49 75	972 942 47 49 75	1000 974 45 49 75	1098 1072 47 49 75	1098 1072 47 49 75	1120 1093 47 49 75	1190 1163 47 49 75
Shipping Weight (3)         Operating Weight (3)         Option Additional shipping weight         Single pump - Standard head pressure         Single pump - High head pressure         Twin pump - Standard head pressure         Twin pump - High head pressure	(kg) (kg) (kg) (kg)	954 925 47 49	972 942 47 49	1000 974 45 49	1098 1072 47 49	1098 1072 47 49	1120 1093 47 49	1190 1163 47 49 75 84
Shipping Weight (3)         Operating Weight (3)         Option Additional shipping weight         Single pump - Standard head pressure         Single pump - High head pressure         Twin pump - Standard head pressure         Twin pump - High head pressure         Pump VFD option	(kg) (kg) (kg) (kg) (kg) (kg) (kg)	954 925 47 49 75 86	972 942 47 49 75 86	1000 974 45 49 75 84	1098 1072 47 49 75 84	1098 1072 47 49 75 84	1120 1093 47 49 75 84	1190 1163 47 49 75 84 0
Shipping Weight (3)         Operating Weight (3)         Option Additional shipping weight         Single pump - Standard head pressure         Single pump - High head pressure         Twin pump - Standard head pressure         Twin pump - High head pressure         Twin pump - High head pressure         Pump VFD option         Partial heat recovery option	(kg) (kg) (kg) (kg) (kg) (kg) (kg) (kg)	954 925 47 49 75 86 4.6	972 942 47 49 75 86 4.6	1000 974 45 49 75 84 2x 1.48	1098 1072 47 49 75 84 2x 1.48	1098 1072 47 49 75 84 2x 1.48	1120 1093 47 49 75 84 2x 3.82	1190 1163 47 49 75 84 0 2x 3.82
Shipping Weight (3)         Operating Weight (3)         Option Additional shipping weight         Single pump - Standard head pressure         Single pump - High head pressure         Twin pump - Standard head pressure         Twin pump - High head pressure         Pump VFD option         Partial heat recovery option         Water Buffer tank option	(kg) (kg) (kg) (kg) (kg) (kg) (kg)	954 925 47 49 75 86	972 942 47 49 75 86	1000 974 45 49 75 84	1098 1072 47 49 75 84	1098 1072 47 49 75 84	1120 1093 47 49 75 84	1190 1163 47 49 75 84 0
Shipping Weight (3)         Operating Weight (3)         Option Additional shipping weight         Single pump - Standard head pressure         Single pump - High head pressure         Twin pump - Standard head pressure         Twin pump - High head pressure         Pump VFD option         Partial heat recovery option         Water Buffer tank option	(kg) (kg) (kg) (kg) (kg) (kg) (kg) (kg)	954 925 47 49 75 86 4.6 425	972 942 47 49 75 86 4.6 425	1000 974 45 49 75 84 2x 1.48 425	1098 1072 47 49 75 84 2x 1.48 425	1098 1072 47 49 75 84 2x 1.48 425	1120 1093 47 49 75 84 2x 3.82 425	1190 1163 47 49 75 84 0 2x 3.82 425
Shipping Weight (3)         Operating Weight (3)         Option Additional shipping weight         Single pump - Standard head pressure         Single pump - High head pressure         Twin pump - Standard head pressure         Twin pump - Standard head pressure         Pump VFD option         Partial heat recovery option         Water Buffer tank option         System data         Nb of refrigerant circuit	(kg) (kg) (kg) (kg) (kg) (kg) (kg) (kg)	954 925 47 49 75 86 4.6 425 1	972 942 47 49 75 86 4.6 425 1	1000 974 45 49 75 84 2x 1.48 425 2	1098 1072 47 49 75 84 2x 1.48 425 2	1098 1072 47 49 75 84 2x 1.48 425 2	1120 1093 47 49 75 84 2x 3.82 425 2	1190 1163 47 49 75 84 0 2x 3.82 425 2
Shipping Weight (3)         Operating Weight (3)         Option Additional shipping weight         Single pump - Standard head pressure         Single pump - High head pressure         Twin pump - Standard head pressure         Twin pump - High head pressure         Pump VFD option         Partial heat recovery option         Water Buffer tank option         vystem data         Nb of refrigerant circuit         Minimum cooling load % (6)	(kg) (kg) (kg) (kg) (kg) (kg) (kg) (kg)	954 925 47 49 75 86 4.6 425	972 942 47 49 75 86 4.6 425	1000 974 45 49 75 84 2x 1.48 425	1098 1072 47 49 75 84 2x 1.48 425	1098 1072 47 49 75 84 2x 1.48 425	1120 1093 47 49 75 84 2x 3.82 425	1190 1163 47 49 75 84 0 2x 3.82 425
Shipping Weight (3)         Operating Weight (3)         Option Additional shipping weight         Single pump - Standard head pressure         Single pump - High head pressure         Twin pump - Standard head pressure         Twin pump - High head pressure         Pump VFD option         Partial heat recovery option         Water Buffer tank option         system data         Nb of refrigerant circuit         Minimum cooling load % (6)         Standard/Partial Heat Recovery Unit unit	(kg) (kg) (kg) (kg) (kg) (kg) (kg) (kg)	954 925 47 49 75 86 4.6 425 1 33	972 942 47 49 75 86 4.6 425 1 33	1000 974 45 49 75 84 2x 1.48 425 2 2 22	1098 1072 47 49 75 84 2x 1.48 425 2 25	1098 1072 47 49 75 84 2x 1.48 425 2 2 22	1120 1093 47 49 75 84 2x 3.82 425 2 25	1190 1163 47 49 75 84 0 2x 3.82 425 2 25
Shipping Weight (3)         Operating Weight (3)         Option Additional shipping weight         Single pump - Standard head pressure         Single pump - High head pressure         Twin pump - Standard head pressure         Twin pump - High head pressure         Pump VFD option         Partial heat recovery option         Water Buffer tank option         System data         Nb of refrigerant circuit         Minimum cooling load % (6)         Standard/Partial Heat Recovery Unit unit         R410A refrigerant charge Circuit1 / Circuit 2	(kg) (kg) (kg) (kg) (kg) (kg) (kg) (kg)	954 925 47 49 75 86 4.6 425 1 33 33 14.5	972 942 47 49 75 86 4.6 425 1 33 33	1000 974 45 49 75 84 2x 1.48 425 2 2 2 2 2 2 8.0 / 8.0	1098 1072 47 49 75 84 2x 1.48 425 2 25 8.0 / 8.0	1098 1072 47 49 75 84 2x 1.48 425 2 2 2 2 2 2 8.0 / 8.0	1120 1093 47 49 75 84 2x 3.82 425 2 2 5 9.0 / 9.0	1190 1163 47 49 75 84 0 2x 3.82 425 2 25 9.5 / 9.5
Shipping Weight (3)         Operating Weight (3)         Option Additional shipping weight         Single pump - Standard head pressure         Single pump - High head pressure         Twin pump - Standard head pressure         Twin pump - High head pressure         Pump VFD option         Partial heat recovery option         Water Buffer tank option         system data         Nb of refrigerant circuit         Minimum cooling load % (6)         Standard/Partial Heat Recovery Unit unit	(kg) (kg) (kg) (kg) (kg) (kg) (kg) (kg)	954 925 47 49 75 86 4.6 425 1 33	972 942 47 49 75 86 4.6 425 1 33	1000 974 45 49 75 84 2x 1.48 425 2 2 22 8.0 / 8.0 6,3 / 6,3	1098 1072 47 49 75 84 2x 1.48 425 2 25	1098 1072 47 49 75 84 2x 1.48 425 2 22 22 8.0 / 8.0 6,6 / 6,6	1120 1093 47 49 75 84 2x 3.82 425 2 25	1190 1163 47 49 75 84 0 2x 3.82 425 2 25

(1) Indicative performance at Evaporator water temperature : 12°C / 7°C - Condenser air temperature 35°C - for detailled performances, on a given unit, consult Order Write Up.

(2) under 400V/3/50Hz.

(3) Rated Condition without Pump Package.

(4) Electrical & system data are indicative and subject to change without notice. Please refer to unit nameplate data.
 (5) If the power line of the unit is protected by fuses gG of the same size as the disconnect switch.

(6) OIL058E or OIL057E are European reference for POE oil and can be mixed in any proportion with OIL00078 or OIL 00080 (same oil with US reference on compressor nameplate).

(7) For dimensions details, dimensions of hydraulic connections, electrical connections, point load and specific features for heat recovery see submittals and diagrams which are supplied with every order.



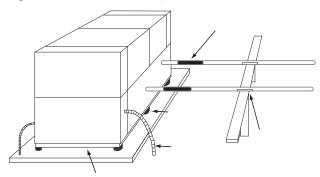
## **Location Requirements**

#### Sound Considerations

The most effective form of acoustical isolation is to locate the unit away from any sound sensitive area. Structurally transmitted sound can be reduced by elastomeric vibration eliminators. Spring isolators are not recommended. Consult an acoustical engineer in critical sound applications.

#### Foundation

#### Figure 2 - Installation example



For maximum isolation effect, water lines and electrical conduit should also be isolated. Wall sleeves and rubber isolated piping hangers can be used to reduce the sound transmitted through water piping. To reduce the sound transmitted through electrical conduit, use flexible electrical conduit.

EU and Local codes on sound emissions should always be considered. Since the environment in which a sound source is located affects sound pressure, unit placement must be carefully evaluated. Consult an acoustical engineer for critical applications.

Provide rigid, non-warping mounting pads or a concrete foundation of sufficient strength and mass to support the applicable operating weight (i.e. including completed piping, and full operating charges of refrigerant, oil and water). Refer to the chapter on Unit Dimensions/Weights for unit operating weights. Once in place, the unit must be level with 3 mm over its length and width. Trane is not responsible for equipment problems resulting from an improperly designed or constructed foundation.

#### Clearances

Provide enough space around the unit to allow the installation and maintenance personnel unrestricted access to all service points. Refer to submittal drawings for the unit dimensions, to provide sufficient clearance for the opening of control panel doors and unit service. Refer to the chapter on Unit Dimensions/Weights for minimum clearances. In all cases, local codes which require additional clearances will take precedence over these recommendations.

If the installation includes several units or if units are close to walls, contact your local Trane Sales Office for additional requirements. Winter operation : CXAX coil will not be obstructed at any time by snow or ice.

Specifc attention should be paid to avoid accumulation of ice and snow at the bottom of the coil.

#### Rigging

Refer to weights tables for typical unit lifting weights. Refer to the rigging label attached to the unit for further details.

#### Lifting Procedure

Refer to the lifting label affixed to the unit. Lifting beam crossbars MUST be positioned so lifting cables do not contact the sides of the unit. Adjust as necessary for even level lift.

1- Use the four rigging points which are built into the unit.

2- Slings and a spreader bar are to be provided by the rigger.

3 -The minimum lifting capacity of each sling as well as the spreader bar must be equal or higher than the tabulated unit shipping weight.

4- Caution: this unit must be lifted and handled with care. Avoid shocks while handling.

## Unit isolation and Leveling

#### Mounting

Construct an isolated concrete pad for the unit or provide concrete footings at each of the four unit mounting points. Mount the unit directly to the concrete pads or footings. Level the unit using the base rail as a reference. The unit must be level within 5 mm over the entire length. Use shims as necessary to level the unit.

#### **Isolation Pads installation (Optional)**

Install the optional neoprene pads at each mounting location. Refer to unit submittals for further details on location. Consult a vibration engineer for critical applications.

### **Evaporator piping**

Evaporator water connections are grooved. Thoroughly flush all water piping to the CGAX or CXAX units before making the final piping connections to the unit. Components and layout will vary slightly, depending on the location of connections and the water source.

#### **CAUTION Equipment Damage!**

If using an acidic commercial flushing solution, construct a temporary bypass around the unit to prevent damage to internal components of the evaporator.

#### **CAUTION Proper Water Treatment!**

The use of untreated or improperly treated water in a chiller may result in scaling, erosion, corrosion, algae or slime. It is recommended that the services of a qualified water treatment specialist be engaged to determine what water treatment, if any, is required. Trane assumes no responsibility for equipment failures which result from untreated or improperly treated water, or saline or brackish water.



#### Drainage

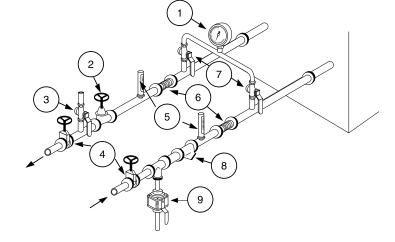
Locate the unit near a large capacity drain for water vessel draindown during shutdown or repair. Water piping is provided with drain connections. Refer to "Water Piping." All local and national codes apply.

#### Piping

A vent is provided on the top of the evaporator at the return end. Be sure to provide additional vents at high points in the piping to bleed air from the chilled water system. Install necessary pressure gauges to monitor the entering and leaving chilled water pressures.

#### Figure 3 - Unit typical water circuit

Provide shutoff valves in lines to the gauges to isolate them from the system when they are not in use. Use rubber vibration eliminators to prevent vibration transmission through the water lines. If desired, install thermometers in the lines to monitor entering and leaving water temperatures. Install a balancing valve in the leaving water line to control water flow balance. Install shutoff valves on both the entering and leaving water lines so that the evaporator can be isolated for service. Make sure the water circuit includes all devices and controls used to provide proper water system operation and unit operating safety.



- 1 = Pressure gauges: show entering and leaving water pressure
- 2 = Balancing valve: adjusts water flow.
- 3 = Air purge allows to remove the air from the water circuit during fill up.
- 4 = Stop valves: isolate chillers and water circuiting pump during maintenance operations.
- 5 = Thermometers: indicate chilled water entering and leaving temperatures.
- 6 = Expansion compensators: avoid mechanical stress between chiller and piping installation.
- 7 = Stop valve located on the outlet connection: used to measure the water pressure inlet or outlet of evaporator.
- 8 = Strainer: avoid to get heat exchangers dirty. All installation must be equipped with efficient strainer in order that only clean water enters into exchanger. If there is no strainer, reserve will be formulated by the Trane technician at the start-up of the unit. The trainer used must be able to stop all particles with a diameter greater than 1 mm.
- 9 = Draining: used as the draining the plate heat exchanger.
- 10 = Do not start the unit with low water volume or not enough pressurized circuit.

Note: A pressure switch device to detect lack of water is not included in the pump package. Installation of this type of device is highly recommended to avoid sealing damage due to operation of pump without enough water.

### Minimal installation water content

The water volume is an important parameter because it allows as table chilled water temperature and avoids short cycle operation of the compressors.

## Parameters which influence the water temperature stability

- Water loop volume
- Load fluctuation
- Number of capacity steps
- Compressors rotation
- Dead band (adjusted on chiller controller)
- Minimum time between 2 starts of a compressor

#### **Minimum water volume for a comfort application** For comfort application we can allow water temperature fluctuation at part load. The parameter to take into account is the minimum operating time of the compressor. In order to avoid lubrication problem on a scroll compressor it must run at least 2 minutes 120 seconds) before it stops.



Average Dead band =  $3^{\circ}C$  (or  $2^{\circ}C$ )

The minimum volume can be determined by using the following formula: Volume = Cooling capacity xTime x highest capacity step (%) / Specific heat / Dead band Minimum operating time = 120 seconds Specific heat = 4.18 kJ / kg Note: To estimate the biggest step, it is usually more reliable to make a selection at lower ambient temperature where efficiency is higher and compressors steps bigger. It is also essential to take into account the brine specific heat, in case of the use of glycol.

Process applications will need more water volume to minimize the water temperature fluctuation at part load.

#### Table 3 - Minimum water volumes for comfort applications

Unit Size	Capacity (KW)	Biggest Step (%)	Minimum Water Volume (I) Dead band = 2 °C	Minimum Water Volume (I) Dead band = 3 °C
15	42	50	301	201
17	48	57	393	262
20	58	50	416	278
23	65	56	522	348
26	74	50	531	354
30	82	50	589	392
36	94	33	445	297
39	107	33	507	338
45	123	33	583	388
35	96	33	455	303
40	114	25	409	273
46	126	28	506	338
52	143	25	513	342
60	160	25	574	383

### **Expansion tank (option)**

The factory-installed expansion tank initial pressure should be adjusted about 0.2 bar lower than the static pressure of the circuit at the pump inlet. The expansion tank volume has been selected for typical loop volume. It is recommended to check the expansion tank volume with the installation information.

The following data is required:

- C = Water capacity of the circuit
- e = Expansion coefficient (difference between max and min water temperature, in operation or not)
- Pi = Initial pressure of the expansion tank
- Pf = Final pressure: Max is given by the pressure relief valve

Minimum Volume of expansion tank =  $(C \times e)/(1-Pi/Pf)$ 

Expansion coefficient of water at various temperatures

°C	е
0	0.00013
10	0.00027
20	0.00177
30	0.00435
40	0.00782
50	0.01210



### **Freeze Protection**

If the unit is exposed to ambient temperatures below 0°C, the chilled water system must be protected from freezing following one of the options shown below:

#### 1. Heaters

a. Heaters can be factory-installed (option) on the evaporator and water piping and will protect it from freezing in ambient temperatures down to -18°C.

b. Install, outside the unit, heat tape on all water piping, pumps, and other components that may be damaged if exposed to freezing temperatures. Heat tape must be designed for low ambient temperature applications. Heat tape selection should be based on the lowest expected ambient temperature.

#### OR

#### 2. Freeze inhibitor

a. Add a freeze inhibitor fluid to the chilled water system. The solution must be strong enough to provide protection against ice formation at the lowest anticipated ambient temperature.

Note: Use of a freeze inhibitor fluid reduces the cooling capacity of the unit and must be considered in the design of the system specifications.

#### 3. Water pump

a: Chiller controller can start the pump to prevent freezing. This function needs to be validated, pump has to be controlled by the unit and water circuit valves need to stay open at all times. This protection will be efficient to protect the unit, if the water loop is reduced. The installation of a bypass is advised.

If ambient temperatures below -18°C, the water circuit must be protected against freezing.

Add a freeze inhibitor fluid and activate the heat tape on the unit; do not shut the unit down.

It is not recommended to drain the water circuit for the following reasons:

1. The water circuit will rust and its lifetime could be reduced.

2. Water will remain in the bottom of the plate heat exchangers and freeze damage could occur.

**Note:** If water pump control is enabled form the chiller controller, it will request start of customer pump during ambient air temperatures below freezing.

**CAUTION!** When using freeze inhibitor, never fill the system with pure glycol. Always fill the system with diluted solution. Maximum concentration of glycol is 40%. Higher glycol concentration will damage pump seal.

*Note:* Never fill high Glycol concentration at the pump suction as there is a high risk to damage pump seal.

In case of winter water drainage for freeze protection, it is compulsory to disconnect the evaporators heaters to protect them from burning due to overheat. **Note:** Water pump control and heater combination will protect the evaporator down to any ambient temperature provided power is available to the pump and the controller. This option will NOT protect the evaporator in the event of power failure to the chiller unless backup power is supplied to the necessary components.

The warranty will be void, in case of freezing due to the lack of use of either of these protections.

Low refrigeration temperature setpoint and antifreeze setpoint on chiller controller

**CAUTION!** The chiller is provided with standard factory settings. It can be necessary to modify the Low Pressure saturation Temperature and the Antifreeze Setpoint on the unit control. Based on the following examples, it is necessary to modify on the chiller controller the following settings:

- The LP saturation temperature (LRTC)
- The antifreeze setpoint (LWTC)

#### Examples:

#### For:

- 7°C, the LP setting must be -4°C where the antifreeze setting shall be 2°C
- 2°C, the LP setting must be -9°C where the antifreeze setting shall be -4°C
- -12°C, the LP setting must be -23°C where the antifreeze setting shall be -17°C

#### Freeze protection with glycol

It is mandatory to use a freeze inhibitor for leaving water setpoint less or equal to 5°C. On the glycol recommended concentration figure, you must select concentration on or above the curve. For example, for -4°C brine temperature, a concentration of 25% ethylene glycol is not sufficient. The concentration must be 28% ethylene glycol or 33% propylene glycol.

#### Using glycol with hydraulic module

If the glycol brine percentage is not at the recommended percentage (greyed area), corrosion inhibitor present in the glycol may not be efficient enough. For instance, a glycol concentration of 15% will provide freeze protection to the unit down to -5°C, but it might generate additional corrosion.



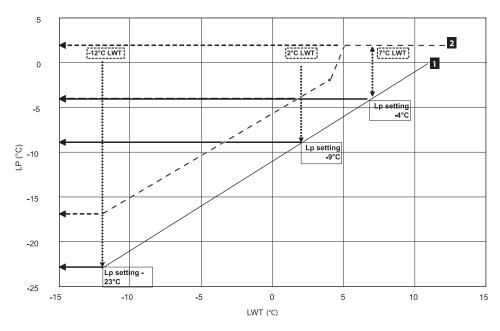
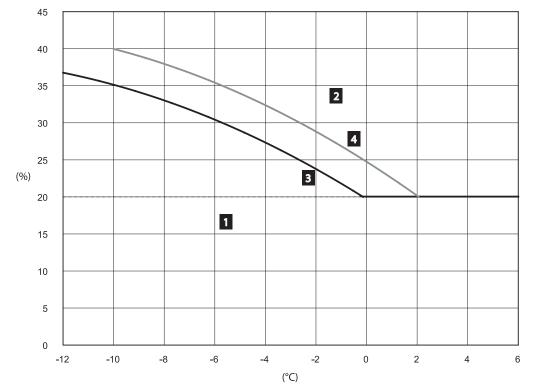


Figure 4 - LP setting vs. Leaving Water Temperature setpoint

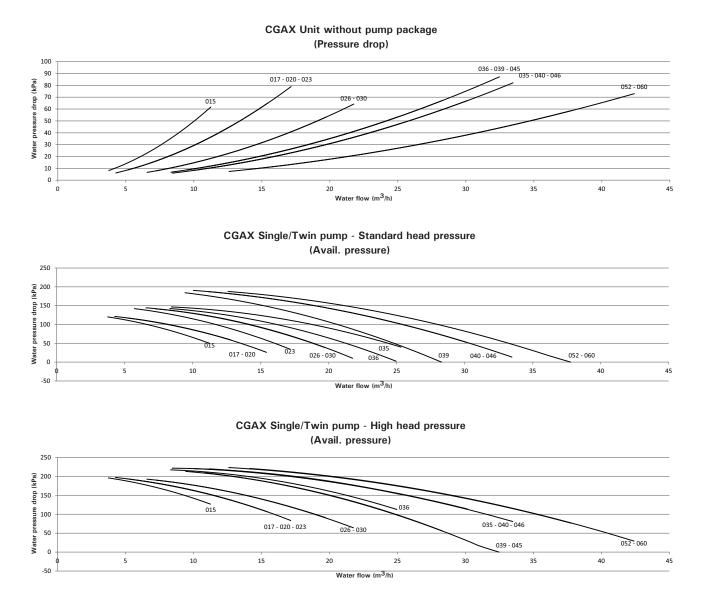




1 = Critical risks of freezing

- 2 = Efficient freeze protection
- 3 = Ethylene glycol
- 4 = Propylene glycol
- % = Glycol percentage (mass concentration)
- °C = Glycol or water temperature

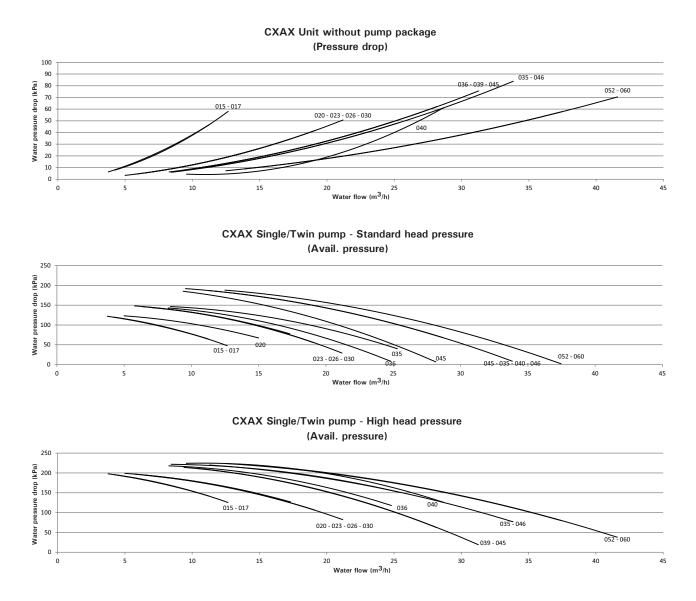




Note: Extremity of the curves represents minimum and maximum water flow.



## Hydraulic Data



Note: Extremity of the curves represents minimum and maximum water flow.

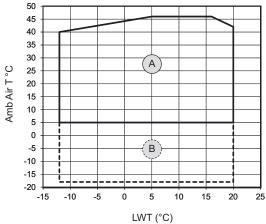


## **Operating Map**

#### CGAX

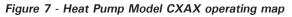
- Minimum Starting Operating Ambient
- Std Ambient unit = 5°C
- Low Ambient unit = -18°C
- Maximum Ambient = 46°C
- Evaporator Outlet Temperature
- Comfort application [5°C; 20°C]
- Process application [-12°C; 5°C]

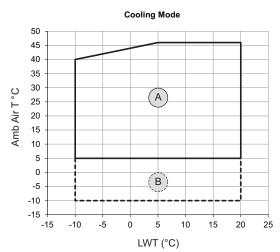
Figure 6 - Operating map- Cooling-only Model CGAX

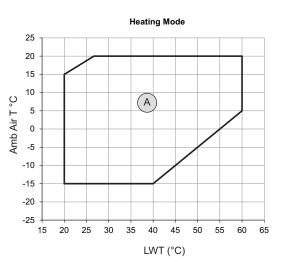


#### CXAX

- Minimum Starting Operating Ambient
- Std Ambient unit
  - Cooling mode = 5°C
  - Heating mode = -15°C
- Low Ambient unit
  - Cooling mode = -10°C
  - Heating mode = -15°C
- Maximum Ambient = 46°C
- Evaporator outlet temperature
- Comfort Application [5°C; 20°C]
- Process Application [-10°C; 5°C]







LWT = Leaving water temperature

Amb AirT = Ambient air temperature

A = Standard operating map

B = Low ambient operating map (Variable air flow control)

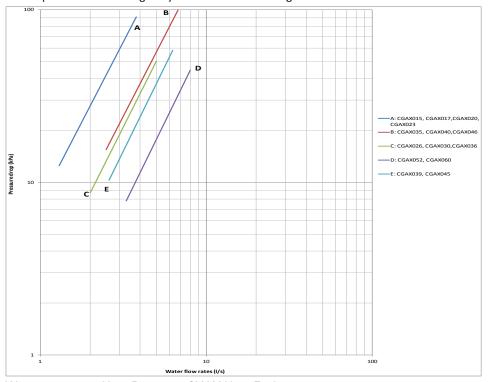
Minimum start-up/operation ambient based on a 2.22 m/s (5mph) wind across the condenser



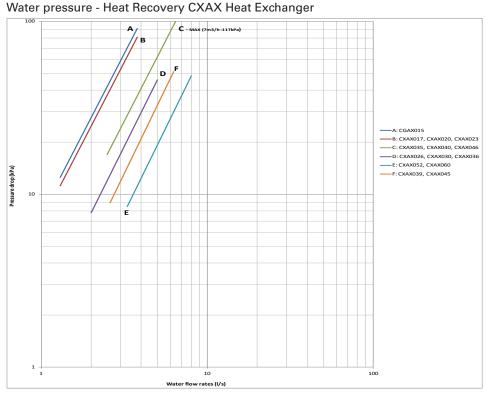
## **Partial Heat Recovery**

Heat recovery option is made with a plate heat exchanger in series with the air-cooled condenser. This heat exchanger benefits the discharge gas superheat as well as a part of the condensing gas heat to be transferred to hot water system.

All submittals, lifting diagrams, neoprene pads, positioning and wiring diagrams have been supplied with the chiller order.



Water pressure - Cooling only CGAX Heat Exchanger





## Supplemental heat

The scope of Supplemental heat is to produce additional capacity by energizing customer supplied electric heaters when the Heat Pump alone cannot achieved customer requested capacity. this option is only available for Heat Pump units and is only enabled in heating mode. Trane supplies software control and does not propose any hardware. 3 digitals output are available (configurable for 1 to 3) and can be enabled or disabled. Heaters remain energized during defrost and start only when all the compressors are on.



## Installation – Electrical

## **General Recommendations**

When reviewing this manual keep in mind:

- All field-installed wiring must be in accordance with local regulations and CE directives and guidelines. Be sure to satisfy proper equipment grounding requirements according CE
- The following standardized values Maximum Amps -Short Circuit Amps - Starting Amps are displayed on unit nameplate.
- All field-installed wiring must be checked for proper terminations, and for possible shorts or grounds.

**Note:** always refer to wiring diagrams shipped with chiller or unit submittal for specific electrical schematic and connection information.

#### WARNING Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/ tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

**CAUTION!** Time before to work on the electrical panel of the unit with Low Ambient option: once the unit is off (confirmed by the extinction of the display), it is mandatory to wait five minutes before working on the electrical panel.

CAUTION! To avoid corrosion, overheating or general damage, at terminal connections, unit is designed for copper conductors only. In case of aluminum conductors an intermediate connection box must be added. In case of aluminum cable bi material connecting device is mandatory. Cable routing inside control panel should be made case by case by installer.

#### Important!

Do not allow conduit to interfere with other components, structural members or equipment. Control voltage (230 V) wiring in conduit must be separate from conduit carrying low voltage (<30V) wiring. To prevent control malfunctions, do not run low voltage wiring (<30V) in conduit with conductors carrying more than 30 volts.

#### Soft starter recommended settings

Acceleration time: 0.5 second speed Start-up torque: 50%

#### Deceleration time: 0 second

**CAUTION!** Inverters are equipped with integrated filters. They are not compatible with insulated neutral load earthing arrangements.

#### WARNING! High voltage!

Any contact with electric components, even after the unit has been switched off, can cause serious injury or death. Wait at least 4 minutes after switching off the unit, until the current dissipates.

#### Grounding

Note the fan speed inverter has a high leakage current. Be sure to ground the unit and take this into account when installing the differiential protection device. Differential protection should be suited for industrial machinery with current leak which can be higher than 100 mA (several motors and frequency drives).

### **Installer-Supplied Components**

Customer wiring interface connections are shown in the electrical schematics and connection diagrams that are shipped with the unit. The installer must provide the following components if not ordered ith the unit:

- Power supply wiring (in conduit) for all field-wired connections.
- All control (interconnecting) wiring (in conduit) for field supplied devices.
- Circuit breakers.

## **Power Supply Wiring**

#### WARNING Ground Wire!

All field-installed wiring must be completed by qualified personnel. All field-installed wiring must comply with local codes and regulations. Failure to follow this instruction could result in death or serious injury.

All power supply wiring must be sized and selected accordingly by the project engineer in accordance with local codes and regulations.

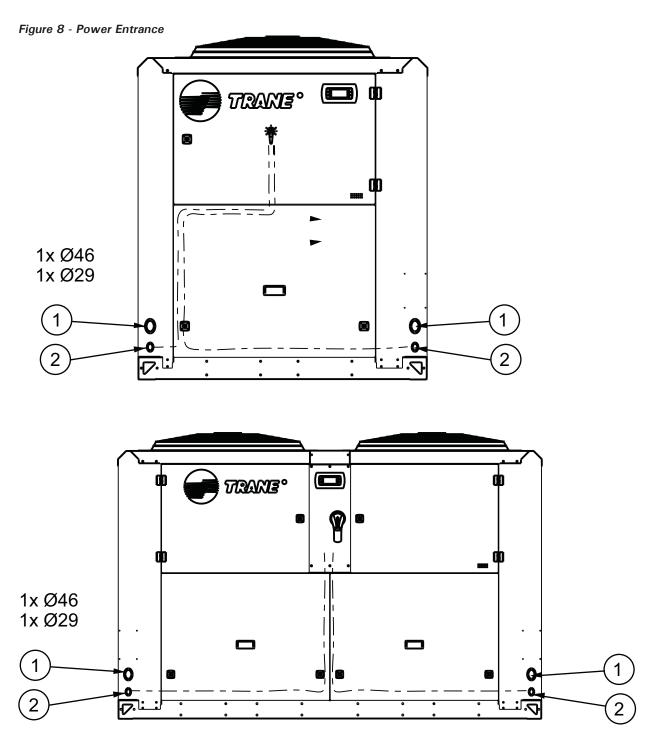
#### WARNING Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/ tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

All wiring must comply with local codes and regulations. The installing (or electrical) contractor must provide and install the system interconnecting wiring, as well as the power supply wiring. It must be properly sized and equipped with the appropriate fused disconnect switches. The type and installation location(s) of the fused disconnects must comply with all applicable codes. Knock-outs for wiring are located on the bottom right side of the control panel. The wiring is passed through these conduits and connected to the disconnect switch. To provide proper phasing of 3-phase input, make connections as shown in field wiring diagrams and as stated on the WARNING label in the starter panel. For additional information on proper phasing, refer to "Unit Voltage Phasing." Proper equipment ground must be provided to each ground connection in the panel (one for each customer supplied conductor per phase). High voltage field-provided connections are made through knockouts on the right side of the panel.



Installation – Electrical



1 = Incoming power (left side or right side to best suit installation)

2 = Low voltage power (left side or right side to best suit installation)



For electrical data details, refer to General Data tables for each unit configuration and size.

- Maximum Power input (kW)
- Unit rated amps (Max compr Fan+Control)
- Unit start up amps (Starting Amps of the largest compr+RLA of 2nd compr+RLA of all fans+ control)
- Compressor Power factor
- Disconnect switch size (A)

Wiring diagrams are shipped with unit and can be found in the unit control panel. Note : Rating is made for 400 V, 3 phases, 50 Hz power supply.



## **Control Power Supply**

Note: it is highly recommendable to read this section within the wiring diagrams, where the different components mentioned here are referenced.

### General

Unit is equipped with a control transformer (1T1), factory mounted, wired and tested, therefore it is not necessary to provide additional control power voltage to the unit. No other loads should be connected to the control power transformer. All units are factory-connected for appropriate labelled voltages.

On top of the main unit controller (1A2), when chosing digit 32 = A (with customer input/output options), an auxiliary processor module (1A4) will be mounted on the unit to host the options described on the follow chapter.

# Interconnecting Wiring / Low Voltage Wiring

#### WARNING Ground Wire!

All field-installed wiring must be completed by a qualified personnel, and must comply with local codes and regulations. Failure to follow those instructions could result on death or serious injury. The remote devices described on the sections ahead require low voltage wiring. All wiring to and from these remote input devices to the Control Panel must be made with shielded, twisted pair conductors. Be sure to ground the shielding only at the panel.

Note : To prevent control malfunctions, do not run low voltage wiring (< 30V) in conduit with conductors carrying more than 30V.

## **Customer Options**

Alarm and Status Relay Outputs (Programmable Relays) A programmable relay concept provides for enunciation of certain events or states of the chiller, selected from a list of likely needs, while only using physical ouputs relays, as shown on the field diagram. Four electromechanical relays are provided, integrated on the auxiliary module 1A4, connected on blocks J5-6-7-8, as part of the customer input/ouput option. There is a main insulation among the relays; the double-insulation does exist towards the rest of the control.

The digital outputs must be properly protected against short circuits and overloads. Moreover, they must feature the same voltage, all 24 Vac or all 230 Vac., otherwise 24 Vac utilized must be a main insulation.

The minimum cross-section of the cables used for the digital outputs must be 1.5 mm2.

Relay characteristics

relay ratings 2000 VA, 250 Vac, 8 A

approvals related to pCOE 2A FLA, 12A LRA, D300 according to UL, (30.000 cycles)

2 A resistive, 2 A inductive, cosj= 0.4, 2(2)A according to EN 60730-1, (100.000 cycles)

The list of events/states that can be assigned to the programmable relays can be found on the follow table. The relay will be energized when the event/state occurs:

Table / Alarma and (	Matura Dalary Automat /	Configuration Table /a	
Table 4 - Alarm and S	Status Relay Cultout (	Jonnouration Lable is	see also wirino olaorami
	catao monay o atpat s	bonnigaration rabio lo	ee also wiring diagram)

Device Designation	Description	Location conn block
6K1	Relays, customer provided, unit status (Compressor running) : This output is true whenever any compressor for the unit is running or commanded to be running, and false when no compressor running or commanded to be running on the unit	J5-N01/C1
6K2	Relays, customer provided, unit status (programmable) Default is Latching Alarm CKT1: This output is true whenever there is any active diagnostic that requires a manual reset to clear, that affects the Chiller, the refrigerant circuit, or any of the compressor on circuit 1. This classification does not include informational diagnostic.	J6 -N02/C2
6K3	Relays, customer provided, unit status (programmable) Default is Latching Alarm CKT2: This output is true whenever there is any active diagnostic that requires a manual reset to clear, that affects the Chiller, the refrigerant circuit, or any of the compressor on circuit 2. This classification does not include informational diagnostic.	J7 -N03/C3
6K4	Relays, customer provided, unit status (programmable) Default is Chiller limit mode: This output is true, whenever the chiller has been running in one of the unloading types of limit modes (condenser, evaporator, compressor) continoulsy for 20 minutes on any circuits	J8-N04/C4



### **External Auto/Stop**

If the unit requires external auto/stop function, the installer must provide leads from the remote contacts on unit main controller 1A2 – 1A3:

- 6S1-1: Module 1A2Terminals block J5 ID6 for circuit 1 auto/stop
- 6S1-2: Module 1A3Terminals block J4 ID4 for circuit 2 auto/stop

Chiller will run normally when the contacts are closed. When they open, the compressor(s), if operating, will cycle off. Unit operation will be inhibited. Closure of the contacts will permit the unit to return to normal operation. Field-supplied contacts for a low voltage connections must be compatible with dry circuit 24 VDC for a 12 mA resistive load. Refer to the field diagrams shipped with the unit for further information.

# Heat Pump Control and Heating / Cooling Selection

On Heat Pump version units (CXAX), change for Heating/ Cooling can be done remotely, from a remote contact on unit main controller 1A2, Terminal block J5 – ID7, identified on the wiring diagram as 6S4.

A setpoint, contact closure, or communicated command can select the unit heat/cool mode to be heat or cool. The contact closure or communicated command allows the user to remotely change the Heat/Cool operating mode. The Setpoint can be changed from the Unit Controller Front Panel. By changing this setpoint to 'Heat' the unit will then switch to heating mode and control the leaving

water temperature to the hot water setpoint. By changing this setpoint to 'Cool' the unit will switch to the cooling mode, and control the leaving water temperature to the Chilled water setpoint.

The operation of the unit is controlled by the Heat/Cool command. Switching from cooling to heating will stop all running compressors. After a 10 second delay the 4-way reversing valve will be switched into the heating mode direction and the unit will run based on the evaporator leaving water temperature compared to the hot water setpoint.

Switching from heating to cooling will stop all running compressors. After a 10 second delay the 4-way reversing valve will be switched into the cooling mode direction and the unit will run based on the evaporator leaving water temperature compared to the chilled water setpoint.

When the unit is stopped and there is a command to switch from cooling to heating or heating to cooling the 10 second delay will been forced when switching the 4-way reversing valve.

## **Auxiliary Setpoint**

If the unit requires an external Auxiliary Leaving Water Temperature Setpoint, the installer must provide leads from the remote contacts on unit main controller 1A4:

• 6S5: Terminal block J4 - ID1/IDC1

Chiller will operate normally, using the LWT Setpoint, stablished on the unit controller, whenever the 6S5 contact will be closed, the unit will move to the Auxiliary LWT Setpoint.

# External Chilled Water Setpoint (ECWS/EHWS) Option

Unit auxiliary controller (1A4) provides inputs that accept either 0-20mA or 4-20mA signals to set the external chilled/hot water setpoint (ECWS/EHWS). Important, this is not a setpoint, this input defines a reset function. This input is primarily used with generic BAS (Building Automation Systems).

The chilled water setpoint may be changed from a remote location by sending either 0-20mA or 4-20mA signal to the the terminal block on 1A4: J9-B1/GND. The 0-20mA or 4-20mA each corresponds to a reset of 0-20°C applied on the water setpoint (added on the chilled water setpoint, subtracted on the hot water setpoint. Following equation

	Current Signal (0-20mA)	Current Signal (4-20mA) (Default setting)	
As processed by Chiller Controller	Water Setpoint Reset (°C) = current(mA)	Water Setpoint Reset (°C) = $20*(mA - 4) / 16$	
If the ECWS/EWHS input develops an open or short,			

If the ECWS/EWHS input develops an open or short, the LLID will report either a very high or very low value back to the main processor. This will generate an informational diagnostic and the unit will default to using the main unit controller chilled water setpoint.

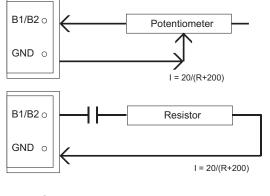


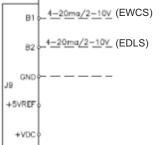
# External Demand Limit Setpoint (EDLS) Option

Unit auxiliary controller (1A4) provides a means to limit the capacity of the chiller by limiting the number of compressors or stages than are allowed to run. The maximum number of compressors allowed to run can vary from one to the number of stages on the unit. The staging algorithm is free to decide which compressor or stage shall be turned off of prevented from running to meet the requirement.

# ECWS and EDLS Analog Input Signal Wiring Details

Both the ECWS and EDLS can be connected and set up as either a 2-10 Vdc (factory default), 4-20 mA, or resistance input (also a form of 4-20 mA) as indicated below. (Need to indicate here how to switch from Vdc to mA on PC05)





Unit auxiliary controller (1A4) shall accept either 0-20mA or 4-20mA signals. Each signal corresponds to an EDLS range with a minimum of 1 compressor and a maximum of all compressors. The following tables exist:

		Nb of CMP allowed		
Percent	Current 0-20mA	Simplex Duo	Simplex Trio	Duplex
0.0%	0	1	1	1
25.0%	5	1	1	2
33.3%	6.7	1	2	2
50.0%	10	2	2	3
66.7%	13.3	2	3	3
75.0%	15	2	3	4
100.0%	20	2	3	4

		Nb of CMP allowed		
Percent	Current 4-20mA	Simplex Duo	Simplex Trio	Duplex
	(Default setting)			
20.0%	4	1	1	1
40.0%	8	1	1	2
46.7%	9.3	1	2	2
60.0%	12	2	2	3
73.4%	14.7	2	3	3
80.0%	16	2	3	4
100.0%	20	2	3	4



## **Communication Interface Options**

### Percent capacity output

The controller provides an analog voltage output (0-10 VDC) to communicate active unit capacity [%]. This signal is available on option module 1A4, Terminal block J2 – Y1, identified on the wiring diagram as S1.

### General

E/S1>

**WARNING Ground wire!** All field-installed wiring must be complete by qualified personnel, and comply with the local codes and regulations. Failure to follow this instruction could resut in death or serious injury.

Field wiring for the communication link must meet the following requirements:

• All wiring must be in accordance with local codes and regulations.

- Communication link wiring must be shielded, twisted pair wiring (Belden 8760 or equivalent), below table provides recommendation for wire size selection:
- The communication link cannot pass between buildings
- All units on the communication link can be connected in a "daisy chain" configuration.

Note: to prevent control malfunctions, do not run low voltage wiring (< 30 V) in conduit with conductors carrying more than 30 V.

#### Table 5 - Wire Size

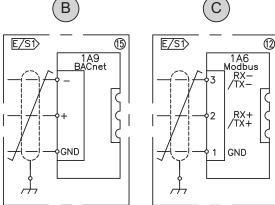
ø	Wire Size Maximum Length of Communication Wire
2.5 mm <sup>2</sup>	1525 m
1.5 mm <sup>2</sup>	610 m
1.0 mm <sup>2</sup>	305 m

D

1A7 pCOWeb

(13)

E/S1>



### **Communication wiring**

1A8 LON

B

GND

14



- B = BACnet communication
- C = ModBus Communication

D = pCOWeb Communication

#### LonTalk Communication

Unit chiller controller provides integrated LonTalk communication between chiller and the Building Automation System (BAS). The input/outputs include both mandatory and optional network variables as established by the LonMark Functional Chiller Profile 8040.

Installation Recommendations

The Lon interface uses an Echelon FTT-10 transceiver, which is approved to be used on the TP/FT-10 channel. This channel is characterized by the following main features:

- It consists of up to 60 nodes on a single network segment
- Data rate : 78 125 kbps
- Maximum distance : 1400 meters
- Recommended topology : daisy chain with double end terminator (105 ohms)

For futher details, refer to the official documentation LonWorks® FTT-10A free topology transeiver user's guide and to the official LonWorks® guidelines LonMark® layer 1-6 interoperability guidelines version 3.0.

These documents and additional information are available on the internet site www.lonmark.org

#### **BACnet Communication**

Unit chiller controller provides integrated BACnet communication between chiller and the Building Automation System (BAS).

#### **ModBus Communication**

Unit chiller controller provides integrated ModBus communication between chiller and the Building Automation System (BAS).

#### pCOWeb Communication

Unit chiller controller provides integrated pCOWeb communication between chiller and the Building Automation System (BAS).



## **Operating Principles**

This section contains an overview of the operation of CGAX and CXAX air cooled chillers, equipped with microprocessor based control systems.

Note: To ensure proper diagnosis and repair, contact a qualified service organization if a problem should occur.

### General

CGAX and CXAX chillers are scroll compressor, single or dual circuit air-cooled chillers. These units are equipped with unit-mounted starter/control panels and operate with R410A refrigerant.

The basic components on the CGAX/CXAX are:

- Unit-mounted panel containing starter and unit controller
- Scroll compressors
- Brazed plate evaporator
- Air-cooled condenser with sub-cooler
- Electronic expansion valve
- Related interconnecting piping

## **Refrigerant Cycle**

Refrigerant cycle is similar to other Trane Scroll compressor chillers. Conquest chillers use brazed plate evaporator and air-cooled condenser. Compressors use suction gas cooled motors and an oil management system to provide almost oil-free refrigerant to the condenser and evaporator for maximum heat transfer while lubricating and sealing compressor rotors and bearings. The lubrication system helps to assure long compressor life and contributes to quite operation.

Liquid refrigerant coming from the condenser coils, are metered into the brazed plate evaporator using an electronic expansion valve to maximize chiller efficiency at full and part load operation.

Chillers are equipped with a unit-mounted starter and control panel. Microprocessor-based unit controller provide accurate chilled water control an monitoring, protection and limit functions. If problems occurs the unit controller provide diagnostic messages to help the operator in troubleshooting.

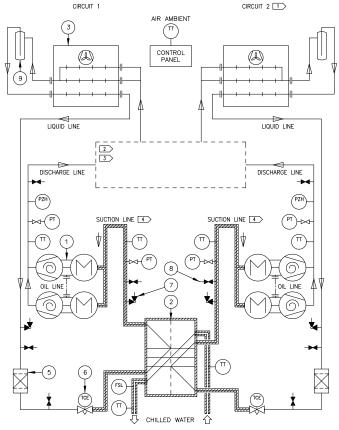


## **Operating Principles**

This section describes the overall operating principle of the CGAX design (duplex cooling unit).

2

3





1: Scroll compressor

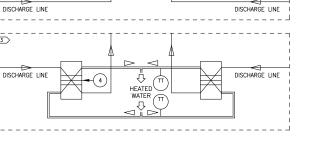
- 2: Evaporator (Brazed Plate Heat Exchanger)
- 3: Condenser (Micro Channel Heat Exchanger)
- 4: Heat Recovery (Brazed Plate Heat Exchanger)
- 5: Filter drier
- 6/TCE: Electronic Expansion Valve
- 7: Service Valve
- 8: Schrader Valve
- 9: Receiver

PT: Pressure Transducer

PZH: High Pressure Switch

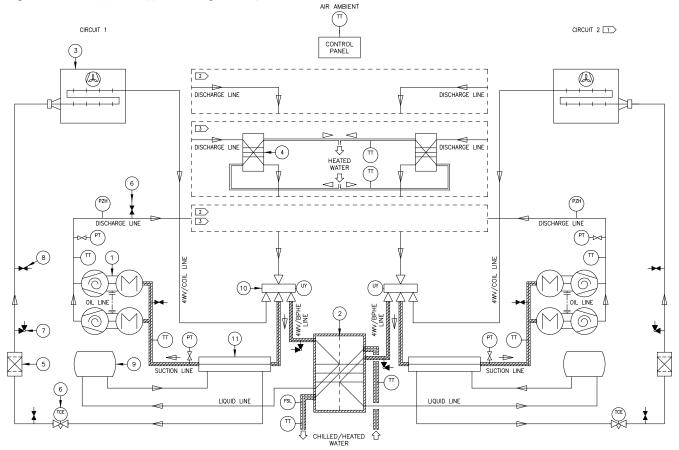
TT: Temperature Sensor

FSL: Flow Switch





## **Operating Principles**



This section describes the overall operating principle of the CXAX design (Duplex Heating pump unit).

Figure 10 - Example of Typical Refrigerant System Schematic & Oil Lube Circuit Schematic

- 1: Scroll compressor
- 2: Evaporator (Brazed Plate Heat Exchanger)
- 3: Condenser (Fins and Tubes Heat Exchanger)
- 4: Heat Recovery (Brazed Plate Heat Exchanger)
- 5: Biflow Filter drier
- 6/TCE: Electronic Expansion Valve
- 7: Service Valve
- 8: Schrader Valve
- 9: Receiver
- 10: Four ways Reversing Valve
- 11: Suction/Liquid Heat Exchanger (Tube in Tube Exchanger)
- PT: Pressure Transducer
- PZH: High Pressure Switch
- TT: Temperature Sensor
- FSL: Flow Switch
- UY: Solenoid

Note: Due to unit design there is no need to validate oil cycle while operating a reversible unit a long time in cooling mode.



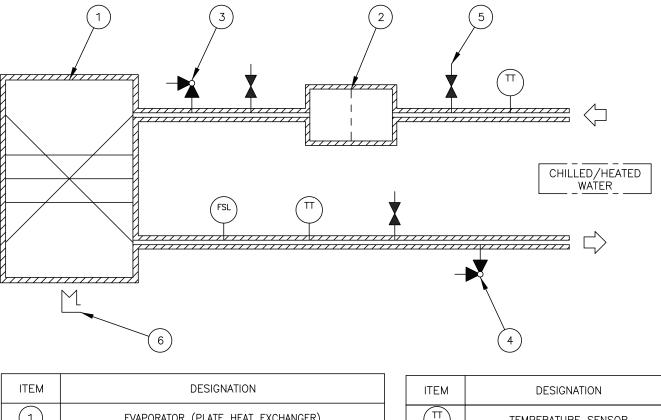
## **Operating Principles**

## **Oil System**

The oil is efficiently separated inside the scroll compressor and will remain in the scroll compressor during all run cycles. Between 1-2% of the oil circulates around with the refrigerant. See on the compressor section for oil level information.

## Hydraulic Module water charts

Figure 11 - Hydraulic Module water chart - unit without pump package



	EVAPORATOR (PLATE HEAT EXCHANGER)	
2	WATER STRAINER	
3	MANUAL AIR BLEED	
4	DRAIN VALVE	
5	VALVE FOR PRESSURE POINT	
6	ANTIFREEZE PROTECTION (OPTION)	

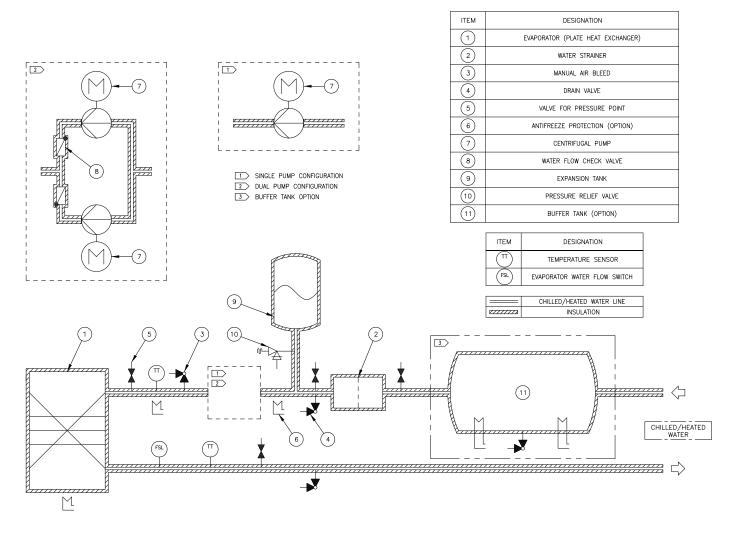
ITEM	DESIGNATION		
Π	TEMPERATURE SENSOR		
FSL	EVAPORATOR WATER FLOW SWITCH		

	CHILLED/HEATED WATER LINE	
V777777	INSULATION	



## **Operating Principles**







## **Variable Primary Flow**

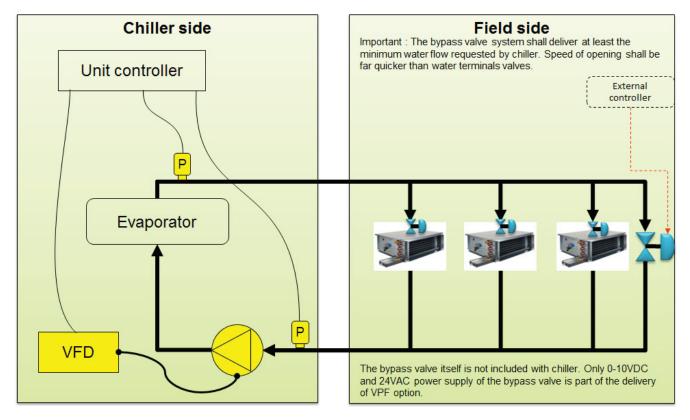
Impact on unit design : Add either differential pressure sensor or 2 water temperatures sensor. Pump selection remains unchanged. A variable speed drive to be added into the control box.

2 or 3 options of variable water flow : Manual flow adjustment Constant delta T Constant delta P

### VPF Constant delta T:

Principle :

If 1 Compressor switch off then Delta T decrease --> pump speed decrease. If 1 Compressor switch On then Delta T increase --> pump speed increase. Min pump speed = 30Hz Require 3 ways valve on customer side.





# General Start up

## **Start Up Preparation**

Carry out all operations on check list so that the unit is correctly installed and ready to operate. The installer must check all the following points before calling in Trane Service to put the equipment into service:

- Check position of unit.
- Check unit is level.
- Check type and position of rubber pads.
- Check clearance required for maintenance access (Refer to certified drawings).
- Check clearance around condenser (Refer to certified drawings).
- Chilled water circuit ready to operate, filled with water, pressure test carried out and air purged.
- Chilled water circuit must be rinsed.
- Check the presence of water strainer ahead of evaporator.
- The strainers must be cleaned after 2 hours of pumps operation.
- Check the thermometers and manometers position.
- Check chilled water pumps interconnection to control panel.
- Open the vent on the pump body to fill the pump with water.
- Ensure that the isolation resistance of all power supply terminals to ground complies with standards and regulations in force.
- Check that unit voltage and frequency supplied match rated input voltage and frequency.
- Check that all electrical connections are clean.
- Check that main power supply switch is sound.
- Check the unit power phasing to be sure that it has been installed in an "ABC" sequence.
- Check Ethylene glycol or Propylene glycol % in the chilled water circuit.
- Water flow control checking: decrease the water flow and check the electrical contact in the control panel.
- Check chilled water pressure drop through evaporator (unit without hydraulic module) or unit available pressure (unit with hydraulic module) are in accordance with the Trane order write-up (See graphics.....).
- On start-up of each motor in the system, check the direction of rotation and operation of all the components they drive.
- Check that there is enough demand for cooling on the day of the start-up (around 50% of the nominal load as minimum).

Some parameters can not be adjusted with Deluxe Touch Display. An additional Standard display PGD1 is needed for such operation.

### Water System Flow Rates

Establish a balanced chilled water flow through the evaporator. The flow rates must fall between the minimum and maximum values. Chilled water flow rates below the minimum values will result in laminar flow, which reduces heat transfer and causes either loss of EXV control or repeated nuisance, low temperature cutouts.

Water System Pressure Drop Measure water pressure drop through the evaporator at the field-installed pressure taps on the system water piping. Use the same gauge for each measurement. Measure flow at the field-installed supply and return. This will include valves, strainers, and fittings in the pressure drop readings. Pressure drop readings should be approximately those shown in the Pressure Drop Charts in the Installation-Mechanical section.

### WARNING Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/ tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

## Time before working on the electrical panel of the unit with Low Ambient option

Once the unit is off (confirmed by the extinction of the display), it is mandatory to wait five minutes before working on the electrical panel.

### WARNING Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury

**CAUTION!** When using freeze inhibitor, never fill the system with pure glycol. Always fill the system with diluted solution. Maximum concentration of Glycol is 40%. Higher glycol concentration will damage pump seal.

**CAUTION**! The pump must not run dry. Dry-running will damage the mechanical seal.

**CAUTION!** Proper Water Treatment! The use of untreated or improperly treated water in the chiller may result in scaling, erosion, corrosion, algae or slime. It is recommended that the services of a qualified water treatment specialist be engaged to determine what water treatment, if any, is required. Trane assumes no responsibility for equipment failures which result from untreated or improperly treated water, or saline or brackish water.

**CAUTION!** Strainer should be cleaned after water flow has been established for the first time, as it is likely that it collects all the particles left after field installation.



## General Start up

## Start Up

Follow the instructions below to correctly start-up the unit.

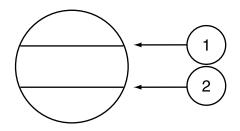
### Installation and chiller inspection

- Ensure that all the operations above (start-up preparation), are followed. Follow the instruction stuck inside the electrical cabinet
- Put the plexiglass supplied by Trane in front of the power terminal
- Ensure all water and refrigerant valves are in service positions
- Ensure that the unit is not damaged
- Ensure that sensors are properly installed in their bulbwells and submerged in heat conducting product
- Check fixing of capillary tubes (protection from vibration and from wear) and ensure that they are not damaged
- Reset all manually set control devices
- Check refrigerating circuits tightness

#### Checking and setting Compressors

• Check oil level at rest. The level should reach at least halfway up indicator located on housing. See Figure 16 for correct level.

### Figure 13 - Compressor oil level



### 1 = Max. oil level

- 2 = Min. oil level
- Reset all manually set control devices
- Check refrigerating circuits tightness
- Check electrical terminals tightening of the motors and in the control panel
- Check the isolation of the motors using a 500V DC megohmeter which meets manufacturer's specifications (minimum value 2 megohms)
- Check the direction of the rotation using phasemeter

#### Electrical power wiring

- Check all the electrical terminals tightening
- Set-up compressors overload relays
- Set-up fan-motors overload relays

#### **Electrical control wiring**

- · Check all the electrical terminals tightening
- Check all the pressostats
- · Check and set-up the chiller unit control module
- · Test and start-up without the electrical power

### Condenser

- Check direction of the rotation of fans
- Check the isolation of the motors using a 500V DC megohmeter which meets manufacturer's specifications (minimum value 500 megohms)

#### **Operating parameters statement**

- · Switch on main power supply switch
- Start the water pump(s) and check there is no cavitation
- Start-up the unit following procedure described in the CH535 controller user guide. The unit and the chilled water pumps contactor must be connected together
- After unit start up, leave in operation for at least 15 minutes, to ensure pressures are stabilized

### Then check:

- voltage
- · compressors and fan-motors currents
- · leaving and return chilled water temperature
- suction temperature and pressure
- ambient air temperature
- blowing air temperature
- discharge pressure and temperature
- liquid refrigerant temperature and pressure
- operating parameters
  - chilled water pressure drop through evaporator (if no hydraulic module is installed) or unit available pressure. It must be in accordance with Trane order write-up
  - superheat: difference between suction temperature and dew point temperature. Normal superheat should be within 5 and 7 °C with R410A in cooling mode
  - sub-cooling: difference between liquid temperature and bubble point temperature. Normal sub-cooling should be within 2 and 15°C with R410A in cooling mode
  - difference between dew point temperature in high pressure and condenser air inlet temperature. Normal value on standard unit with R410A should be 15 to 23°C
  - difference between outlet water temperature and dew point temperature in low pressure. Normal value on standard unit, without Ethylene glycol in chilled water, should be about 3.5°C



## General Start up

### **Final check**

When the unit is operating correctly:

- Check that the unit is clean and clear of any debris, tools, etc...
- All valves are in operating position
- Close control and starter panel doors and check panels fixation

### CAUTION!

- For the warranty to apply, any start-up carried out directly by the customer must be recorded in a detailed report, which must be sent as soon as possible to the nearest Trane office.
- Do not start-up a motor whose insulation resistance is less than 2 meghoms
- Phase imbalance should not be greater than 2%
- The voltage supplied to motors should be within 5% of the rated voltage on the compressor nameplate.
- Excessive emulsion of the oil in the compressor shows that refrigerant is present in the oil and the result will be that compressor is not lubricated enough.. Shut down compressor and wait for 60 minutes for the sump heaters to heat oil and start again. Should this not work, consultTrane technician.
- Excess oil in compressor can damage the compressor. Before adding oil, consult Trane technician. Use only Trane products recommended.
- The compressors must operate in a single direction of rotation. If refrigerant high pressure remains stable in the 30 seconds after compressor start-up, immediately shut down unit and check the direction of rotation using phasemeter.

### WARNING!

- The chilled water circuit may be under pressure. Bring down this pressure before opening up the system to rise out or fill up the water circuit. Failure to comply with this instruction may cause accidental injury to maintenance personnel.
- If a cleaning solution is used in the chilled water circuit, the chiller must be isolated from the water circuit to avoid all the damage risks of the chiller and evaporator water pipes.



# **Pre-Start Check List (Sample)**

UNIT			
Check clearance around condenser			
Check clearance required for maintenance access			
Check type and position of the rubbers pads			
Check unit is level			
CHILLED WATER CIRCUIT			
Check thermometers and manometers presence and position			
Check water flow rate balancing valve presence and position			
Check presence of strainer ahead the evaporator			
Check presence of air-purge valve			
Check rinsing and filling of chiller water pipes			
Check water pump(s) contactor interconnected to control panel			
Check water flow			
Check chilled water pressure drop or unit available pressure (units with hydraulic module)			
Check for leaks in chilled water pipes			
ELECTRICAL EQUIPMENT			
Check installation and rating of mains power switch/fuses			
Check electrical connections complied with specification			
Check that electrical connections are in accordance with information on manufacturer's identification plate			
Check direction of rotation using phasemeter			
Comments			
Name			
Signature			
Order Number			
Job site			



# Operation

## **Control System**

Unit operation is intergrally managed by the microprocessor-based unit controller.

## **Unit Operation**

- Check that the chilled water pump(s) operates correctly
- Start up the unit following procedure described in the unit controller user guide. The unit will operate correctly when there is sufficient water flow. The compressors will start up if the evaporator water leaving temperature is above the control module setpoint.

## Weekly start up

- · Check that the chilled water pump(s) operates correctly
- Start up the unit following procedure described in the unit controller user guide

## Weekend shutdown

- If the unit needs to be shut down for a short period of time, stop the unit following procedure described in the unit controller user guide. (See «Clock» menu)
- If the unit is shut down for a longer period, see under «Seasonal shutdown», below
- Ensure that all safeties are taken to prevent frost damages during negative ambient temperature
- Do not put the general disconnect switches to off, except if the unit is drained. Trane does not recommend draining the unit, due to the fact that it increases corrosion

## Seasonal shutdown

- Check water flows and interlocks
- Check glycol % in the chilled water circuit if glycol presence is required
- Carry out leak test
- Carry out oil analysis
- Record operating pressures, temperatures, amperages and voltage
- Check operation of machines/ compare conditions of operation against original commissioning data
- Stop the unit following procedure described on the unit controller user guide
- Ensure that all safeties are taken to prevent frost damages during negative ambient temperature
- Fill out the visit log sheet and review with the operator Do not put the general disconnect switch to off, except if the unit is drained
- Trane does not recommend draining the unit, due to the fact that it increases corrosion

## Seasonal start-up

- Check water flows and interlocks
- Check Ethylene glycol % in the chilled water circuit if glycol presence is required
- Check operational setpoints and performance
- Calibrate controls
- Check operation of all safety devices
- Inspect contacts and tighten terminals.
- Megger the motor compressor windings
- Record operating pressures, temperatures, amperages and voltage
- Carry out leak test
- Check configuration of unit control module
- Change the oil as required based upon results of the oil analysis made during seasonal shutdown Get the 8 condition easurements at the same time, on each circuit
- HP
- LP
- Suction temperature
- Discharge temperature
- Liquid temperature
- Water entering temperature
- Water leaving temperature
- Outdoor ambient temperature Then calculate the subcooling and superheat. No diagnosis can be accurate with one of these recordsmissing
- Check operation of machines/compare conditions of operation against original commissioning data
- Fill out the visit log sheet and review with the operator



## **Maintenance Instructions**

The following maintenance instructions are part of maintenance operations required for this equipment. A qualified technician is needed for regular maintenance as part of a regular maintenance contract. Carry out all operations as required by schedule. This will ensure long unit service life and reduce the possibility of serious and costly breakdown. Keep service records up to date, showing monthly information on unit operations. These records can be of great help to aintenance personnel diagnostics.

Similarly, if machine operator keeps a log of changes in unit operating conditions, problems can be identified and solutions found before more serious problems arise.

## Inspection visit after the first 500 hours of operation from unit start up

- Carry out oil analysis
- Carry out leak test
- · Inspect contacts and tighten terminals
- Record operating pressures, temperatures, amperages and voltage
- Check operation of machines/ compare conditions of operation against original commissioning data
- Fill out inspection visit log sheet and review with the operator
- Check and clean the strainer

### Monthly preventive visit

- Carry out leak test
- Oil test of acidity
- Check Ethylene glycol % in the chilled water circuit if glycol presence is required
- · Inspect contacts and tighten terminals
- Record operating pressures, temperatures, amperages and voltage
- Check operation of machines/ compare conditions of operation against original commissioning data
- Fill out visit log sheet and review with the operator
- · Check and clean the water strainer

#### Annual preventive visit

- · Check water flows and interlocks
- Check expansion tank pressure
- Check glycol % in the chilled water circuit if glycol presence is required
- Check operational setpoints and performance
- Calibrate controls and pressure transducer
- Check operation of all safety devices
- Inspect contacts and tighten terminals
- Megger the motor compressor windings
- Record operating pressures, temperatures, amperages and voltage
- · Carry out leak test
- Check configuration of unit control module
- Carry out oil analysis
- Change the oil as required based upon results of the oil analysis
- Check operation of machines/ compare conditions of operation against original commissioning data
- Fill out the annual start up visit log sheet and review with the operator
- Check and clean the water strainer

### CAUTION!

- Refer to specific Trane documentation on oil, available from your nearest Trane office. Oils recommended by Trane have been exhaustively tested in Trane laboratories to the specific requirement of Trane chiller and hence the user's requirements. Any use of oils not meeting specifications recommended by Trane is the responsibility of the user only, who thereby is liable to warranty loss.
- Oil analysis and oil test acidity must be carried out by a qualified technician. Poor interpretation of results may cause unit operating problems. Also, oil analysis must follow the correct procedures, to avoid accidental injury to maintenance personnel.
- If the condensers are dirty, clean them with a soft brush and water. If the coils are too dirty, consult a cleaning professional. Never use high pressure water to clean condenser coils.
- Contact Trane Service for information on maintenance contracts.

### WARNING!

- Switch off unit main power supply before to any intervention. Failure to follow this safety instruction can lead to accident death of the maintenance personnel and may also destroy equipment.
- Never use steam or hot water above 60°C to clean condenser coils. The resulting increasing pressure could cause refrigerant lost through the safety valve.



### Pump maintenance

Pumps motor bearings and mechanical seals have a designed life expectancy of 20000-25000 hours of operation. For critical applications it might be necessary to change the components as a preventive measure.

## **Compressors Service Information**

### **Oil Equalizer line**

### **CSHD** Compressors

The oil equalizer line is equipped with a Rotolock fitting for easy removal. Torque value for tightening these fitting is 90 N.m. Before removing the oil equalizer line, the system refrigerant charge must be recovered before draining the oil. Use a catch pan to catch the oil when the compressor oil equalizer line is loosened to ensure that oil does not spill out of the compressor when the equalizer line is removed.

Tandem and Trio Compressor Suction Restrictors Since most uneven tandem and trio compressor sets require the use of a restrictor in the suction line of one or more compressors in order to provide correct oil level balance between compressors when they are operating.

## **Compressor Replacement**

If the CGAX/CXAX chiller suffers a failed compressor, use these steps for replacement:

Each compressor has lifting eyes. Both lifting eyes must be used to lift the failed compressor. DO NOT LIFT A COMPRESSOR USING A SINGLE LIFTING EYE. Use proper lifting techniques, a spreader bar and rigging as for lifting both compressors simultaneously.

Compressor weights by compressor model are:

CSHD 092 – 58 kg. CSHD 125 – 64 kg. CSHD 142 – 67 kg. CSHD 161 – 69 kg. CSHD 183 – 76 kg.

After a mechanical failure of a compressor, it is necessary to change the oil in the remaining compressor and also replace the liquid line filter drier. After an electrical failure of a compressor, it will also be necessary to change the oil in the remaining compressor, replace the liquid line filter drier and add a suction filter drier with cleanup cores.

**Note:** Do not alter the refrigerant piping in any way as this can affect compressor lubrication.

**Note:** Do not add a suction filter drier within 250mm of the elbow for CSHD compressors.

## **Refrigerant System Open Time**

Model CGAX/CXAX chillers use POE oil (Trane recommended oil OIL 048E or OIL 023E) and therefore refrigerant system open time must be kept to a minimum. The following procedure is recommended:

- Leave a new compressor sealed until it is ready to be installed in the unit. Maximum system open time is dependent upon ambient conditions, but do not exceed one hour open time.
- Plug the open refrigerant line to minimize moisture absorption. Always change the liquid line filter drier.
- Evacuate the system to 500 microns or below.
- Do not leave POE oil containers open to the atmosphere. Always keep them sealed.

### Mechanical Compressor Failure

Replace the failed compressor(s) and change the oil in the remaining compressor(s) along with the refrigerant system liquid line filter drier.

## **Electrical Compressor Failure**

Replace the failed compressor and change the oil in the other compressor(s). Also add a suction filter with cleanup cores and change the liquid line filter drier. Change filters and oil until the oil no longer test acidic. See "Oil Testing."

## **Compressor Motor Megging**

Motor megging determines the electrical integrity of the compressor motor winding insulation. Use a 500 volt megger. A less than 1 meg-ohm reading is acceptable and 1000 ohms per nameplate volts is required to safely start the compressor.

## **Compressor Current Imbalance**

Normal current imbalance could be 4 to 15 percent with balanced voltage due to motor design. Each phase should register .3 to 1.0 ohms and each phase should be within 7 percent of the other two phases. Phase to ground resistance must be infinity.

Note: Maximum allowable voltage imbalance is 2 percent.



## **Refrigerant Piping**

The compressor suction and discharge connections and piping are copper clad steel for easy brazing. In most instances, piping may be reused. If piping is not reusable, order the correct service parts. Cut all tubing with a tubing cutter to prevent copper filings from entering the system. Cut the tubing in a straight length of pipe after the compressor connection has been unsweated. The line can then be reinstalled using a slip coupling and brazing.

Note: The compressor suction line configuration must not be changed in any way. Changing compressor suction line configuration will compromise proper oil return to the compressor(s).

## **Compressor Electrical Terminal Box**

Be sure to protect the terminal box when unbrazing or brazing compressor refrigerant piping connections

## **Compressor Crankcase Heaters**

Compressor crankcase heaters must be energized at least eight hours before starting the chiller. This is required to boil refrigerant out of the oil before startup. Ambient temperature is not a factor and the crankcase heaters must always be energized prior to startup.

## **Condenser Maintenance**

### **Condenser Coil Cleaning**

Clean the condenser coils at least once a year or more frequently if the unit is in a "dirty" environment. A clean condenser coil will help to maintain chiller operating efficiency. Follow the detergent manufacturer's instructions to avoid damaging the condenser coils.

**Black epoxy coil protection (option on heat pump units)** It is recommended to clean the coils at unit start-up and regularly to obtain optimum protection and life span of the condenser coils. To clean the condenser coils use a soft brush and a sprayer such as a garden pump type or a high pressure type. A high quality detergent such as Trane Coil Cleaner is recommended.

Note: If detergent mixture is strongly alkaline (pH value greater than 8.5), an inhibitor must be added.

## **Evaporator Maintenance**

The Trane Model CGAX liquid chiller uses a brazed plate heat paddle (BPHE) evaporator with factory installed flow switch that is positioned in the evaporator water pipe. The evaporator inlet also includes a water strainer that must be kept in place to keep debris out of the evaporator.

Note: Strainer maintenance is critical to proper operation and reliability. Any particles larger than 1.6 mm entering the BPHE evaporator may cause the evaporator to fail, requiring replacement.

Acceptable BPHE evaporator water flow rate is 1.4 to 4.2 I/ min per nominal unit kW capacity. To maintain 12-7°C in/out chilled water temperatures, the nominal water flow rate is 2.8 I/min per cooling kW. Minimum water flow rate must be maintained to avoid laminar flow, potential evaporator freezing, scaling and poor temperature control. Maximum water flow is 6 m/s. Flow rates greater than this will cause excessive erosion. The BPHE evaporator is difficult to clean should it become plugged with debris. Indications of a plugged BPHE evaporator include "wet" suction due to lack of heat exchange, loss of superheat control, discharge superheat less than 35°C, compressor oil dilution and/or starvation and premature compressor failure.

### **Evaporator replacement**

If the CGAX evaporator requires replacement, it is very important that the new evaporator be replaced correctly and with the correct refrigerant and water piping connections. The refrigerant inlet/ liquid connection is at the bottom of the evaporator and the refrigerant outlet/ suction connection is at the top of the evaporator and both are on the same side. Pay particular attention to evaporators with dual circuits. Avoid cross-circuiting when installing the new evaporator.



### Water pump maintenance

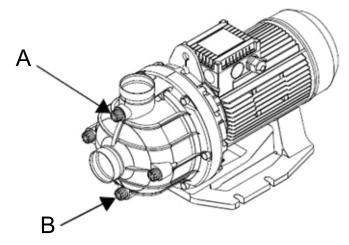
**WARNING!** Before starting work on the pump, make sure that the power supply has been switched off and that it cannot be accidentally switched on. The internal pump parts are maintenance-free. It is important to keep the motor clean in order to ensure adequate cooling of the motor. If the pump is installed in dusty environments, it must be cleaned and checked regularly. Take the enclosure class of the motor into account when cleaning. The motor has maintenance-free, greased-for-life bearings.

If the water loop must be emptied during period of frost, the pump has to be drained to avoid damage.

Remove the filling and drain plugs.

Do not refit the plugs until the pump is taken into operation again.

Figure 14 - Water pump plug locations



A = Filling plug B = Drain plug



# **Troubleshooting Guide**

This troubleshooting guide is not a comprehensive analysis of the Scroll compressor refrigeration system. The aim is to give operators simple instructions on basic unit processes so that they have the technical knowledge to identify and bring defective operations to the notice of qualified technicians.

Problems Symptoms	Problem causes	Action Recommended			
(A) Compressor does not sta	rt up				
Compressor terminals are live but motor does not start	Motor burned out	Replace compressor			
Contactor motor no operational	Coil burned out or broken contactors	Replace contactor			
No current ahead of motor contactor	(a) Power cut (b) Main power supply switched off	Check fuses and connection. See why system tripped. If system is operational, switch on main power supply			
Current ahead of fuse, but not on contactor side	Fuse blown	Check motor insulation. Replace fuse			
Low Voltage reading on voltameter	Voltage too low	Contact Power Supply Utility			
Starter coil not excited	Regulation circuit open	Locate regulation device which has tripped out and see why. See instructions concerning this device			
Compressor does not run. Compressor motor "groans" High pressure switch tripped to contacts open on high pressure. Discharger pressure too high	Compressor sticking (damaged or sticking components) Discharge pressure too high	See instructions for "discharge pressure high"			
(B) Compressor stops - Low	Pressure switch tripped				
Low refrigerant temperature or low refrigerant pressure cut out Anti-freeze security tripped	Discharge pressure too high. Not enough cooling fluid. Water flow to evaporator too low	See instructions for "Low refrigerant pressure cut out" Repair leak. Add refrigerant.Check water flow rate, and flow switch contact in water			
Compressor stops High Pressure switch tripped					
Over current thermal relay tripped Motor temperature thermostat tripped Anti-freeze security tripped	<ul> <li>Discharge pressure too high.</li> <li>(a) Voltage too low</li> <li>(b) Cooling demand too high, or condensing temperature too high.</li> <li>(c) Not enough cooling fluid. Water flow to evaporator too low</li> </ul>	<ul> <li>See instructions for "discharge temperature high"</li> <li>(a) Contact Power Supply Utility</li> <li>(b) Repair leak. Add refrigerant. Check water flow rate, and flow switch contact in water</li> </ul>			
(C) Compressor stops just after its start					
Suction pressure too low. Filter drier iced up	Filter drier clogged	Replace filter drier			
(D) The compressor keeps running without stopping					
Temperature too high in areas requiring air-conditioning	Excess load on cooling system	Check thermal insulation and air-tightness of areas requiring air-conditioning			
Chilled water temperature output too high	Excess cooling demand on system	Check thermal insulation and air-tightness of areas requiring air-conditioning			



## Troubleshooting Guide

(E)         Loss of oil in compressor           Oil level too low in indicator         Not enough oil         Contact Trane office before ordering oil           Gradual fall in oil level         Filter drier clogged         Replace filter drier           Suction line too cold.         Liquid flows back to compressor         Adjust superheat and check bulb fixing of the expansion valve           (F) Compressor noisy         Components broken in compressor         Change compressor           Suction duct abnormally cold         (b) Expansion valve locked in open position         (a) Check superheat setting (b) Repair or replace EXV           (G) Insufficient cooling capacity         Excess pressure drops through filter drier         Filter drier clogged         Replace filter drier           Excess pressure drops through filter drier         Filter drier clogged         Replace filter drier         Check adjustment of superheat and dright expansion valve           Condense abnormally hot         Presence of uncondensables liquids in the system, or excess of refrigerant         Presence of uncondensables fluids and frain off excess refrigerant           Condenser air output too hot         Excess cooling demand on exaporstor:         Quere and replace air filters. Clea clean ond replace air filters. Clea compressor operates cooling demand on exaporstor:         Check system:           Condenser air output too hot         Excess cooling demand on exaporstor:         Check system:         (a) Check superheat and chee	Problems Symptoms	Problem causes	Action Recommended		
Oil level too low in indicatorNot enough oilContact Trane office before ordering oilGradual fall in oil levelFilter drier cloggedReplace filter drierSuction line too cold. Compressor noisyLiquid flows back to compressorAdjust superheat and check bulb fixing of the expansion valve(F) Compressor noisyComponents broken in compressorChange compressorSuction duct abnormally cold(a) Uneven liquid flow (b) Expansion valve locked in open position(a) Check superheat setting (b) Repair or replace EXV(G) Insufficient cooling capacityExpansion valve force frigerantCheck refrigerant circuit tightness and add refrigerantExcess pressure drops through filter drierFilter drier cloggedReplace filter drier(H) Discharge pressure too highPresence of uncondensables liquids in the system, or excess of refrigerantPurge uncondensable fluids and drain off excess refrigerantChilled water leaving temperature too highOverload on cooling system exapontorir: (a) Expansion valve too far open open positionClean and replace air filters. Clea condensables filtuids in the system, or excess of refrigerantClean and replace air filters. Clea condensables filtuids in the system, or excess of refrigerantCleak system: (a) Check system: (a) Check system: (a) Check system: (b) Expansion valve too far open open positionCleak system: (a) Check system: (a) Check system: (b) Expansion valve too far open open positionCheck system: (a) Check system: (a) Check superheat and check that expansion valve (b) Replace EXV(J) Suction pressure too low Excessive p					
Suction line too cold. Compressor noisyLiquid flows back to compressorAdjust superheat and check bulb fixing of the expansion valve(F) Compressor noisyComponents broken in compressorChange compressorSuction duct abnormally cold(a) Uneven liquid flow (b) Expansion valve locked in open position(a) Check superheat setting (b) Repair or replace EXV(G) Insufficient cooling capacityEven Suction duct abnormally coldFilter drierExpansion valve "whistles"Not enough refrigerantCheck refrigerant circuit tightnes and add refrigerantExcess pressure drops through filter drierFilter drier cloggedReplace filter drierExcessive superheatSuperheat not properly adjustedCheck adjustment of superheat and adjust expansion valve(H) Discharge pressure too highPresence of uncondensables liquids in the system, or excess of refrigerantPurge uncondensable fluids and drain off excess refrigerantChilled water leaving temperature to highOverload on cooling systemReduce load on system. Reduce dair flow. Air intake temperature higher than specified (a) Expansion valve to far open (b) Expansion valve to far open (c) Excessive pressure drop through Refrigerant flows back to the compressor valve locked in an open position valve to far open (b) Expansion valve locked in an open position va		Not enough oil			
Compressor noisyLiquid hows back to compressorfixing of the expansion valve(F) Compressor noisyComponents broken in compressorChange compressorSuction duct abnormally cold(a) Uneven liquid flow (b) Expansion valve locked in open position(a) Check superheat setting (b) Repair or replace EXV(G) Insufficient cooling capacityExcess pressure drops through filter drierCheck refrigerant circuit tightnes and add refrigerantExcess pressure drops through filter drierFilter drier cloggedReplace filter drierExcess pressure drops through filter drierSuperheat not properly adjusted and adjust expansion valveCheck adjustment of superheat and adjust expansion valveInsufficient water flowChilled water pipes obstructedClean pipes and strainer(H) Discharge pressure too high Condense abnormally hotPresence of uncondensables liquids in the system, or excess of refrigerantPurge uncondensable fluids and drain off excess refrigerant(I) Suction pressure too high Condenser air output too hotExcess cooling demand on evaporator: (a) Expansion valve locked in an open positionCheck system: (a) Check system: (a) Check system: (b) Replace EXV(J) Suction pressure too Inger Refrigerant flows back to the compressors operates sort the unitFilter drier clogged. Excess lock system: (a) Expansion valve locked in an open positionCheck system: (a) Check system: (b) Replace EXV(J) Suction pressure too low Refrigerant does not flow through refrigerant does not flow through roperlyFilter drier clogged. Either drier clogged. Either drier clogged. <b< td=""><td>Gradual fall in oil level</td><td>Filter drier clogged</td><td>Replace filter drier</td></b<>	Gradual fall in oil level	Filter drier clogged	Replace filter drier		
Compressor knocksComponents broken in compressorChange compressorSuction duct abnormally cold(a) Uneven liquid flow (b) Expansion valve locked in open position(a) Check superheat setting (b) Repair or replace EXV(G) Insufficient cooling capacityExcess pressure drops through filter drierNot enough refrigerantCheck refrigerant circuit tightnes and add refrigerantExcess pressure drops through filter drierFilter drier cloggedReplace filter drierExcess pressure drops through filter drierSuperheat not properly adjustedCheck adjustment of superheat and adjust expansion valveInsufficient water flowChilled water pipes obstructedClean pipes and strainer(H) Discharge pressure too highPresence of uncondensables liquids in the system, or excess of refrigerantPurge uncondensable fluids and refrigerantCondense abnormally hotReduce d ir flow. Air intake temperature higher than specified for the unitClean and replace air filters. Clea motorsCondenser air output too hotExcess cooling demand on evaporator: (a) Expansion valve too far open positionCheck system: (a) Check the superheat and check that expansion valve (b) Replace EXVOutput due tabnormally cold. Refrigerant does not flow through refrigerant does not flow through pressure too lowFilter drier clogged. Expansion valve too preating properly avalve not operating properlyReplace filter drier Replace EXVCompressors operates continuouslyFilter drier clogged. Expansion valve ob operating properlyReplace filter drier Replace EXVCos of powe		Liquid flows back to compressor			
Suction duct abnormally cold(a) Uneven liquid flow (b) Expansion valve locked in open position(a) Check superheat setting (b) Repair or replace EXVG() Insufficient cooling capacityExpansion valve "whistles"Not enough refrigerantCheck refrigerant circuit tightness and add refrigerantExcess pressure drops through filter drierFilter drier cloggedReplace filter drierExcess ive superheatSuperheat not properly adjusted (Law pansion valve and adjust expansion valve and adjust expansion valve (Law pansion valve and adjust expansion valve (Law pansion valve and adjust expansion valve and and adjust expansion valve and evansion valve and replace filter drierCondense abnormally hotPresence of uncondensables liquids in the system, or excess of refrigerant flow in necessary Reduced air flow. Air intake temperature higher than specified for the unitPurge uncondensable filter science coils. Check operation of the fan motorsCondenser air output too hotExcess cooling demand on evaporator: (a) Expansion valve too far open (b) Expansion valve too far open (b) Expansion valve too far open (b) Expansion valve not operating properlyCheck system: (a) Check the superheat and ch	(F) Compressor noisy				
Suction duct abnormally cold(b) Expansion valve locked in open position(c) Repair or replace Setting (b) Repair or replace EXV(G) Insufficient cooling capacityExpansion valve "whistles"Not enough refrigerantCheck refrigerant circuit tightness and add refrigerantExcess pressure drops through filter drierFilter drier cloggedReplace filter drierExcessive superheatSuperheat not properly adjustedCheck adjustment of superheat and adjust expansion valveInsufficient water flowChilled water pipes obstructedClean pipes and strainer(H) Discharge pressure too highPresence of uncondensables liquids in the system, or excess of refrigerantPurge uncondensable fluids and drain off excess refrigerantChilled water leaving temperature too highOverload on cooling systemReduce load on system. Reduce dair flow, Air intake temperature higher than specified for the unitClean and replace air filters. Cleac coils. Check operation of the fan motors(J) Suction pressure too highExcess cooling demand on evaporator: (a) Expansion valve too far open open positionCheck system: (a) Check the superheat and check that expansion valve (b) Replace EXV(J) Suction pressure too lowFilter drier clogged. Expansion valve locked in an open positionReplace EXV(J) Suction pressure too lowExcessive pressure drops through properlyReplace EXV(J) Suction pressure too lowFilter drier clogged. Expansion valve too far open open positionReplace EXV(J) Suction pressure too lowExcessive pressure drops through properlyReplace E	Compressor knocks	Components broken in compressor	Change compressor		
Expansion valve "whistles"Not enough refrigerantCheck refrigerant circuit tightness and add refrigerantExcess pressure drops through filter drierFilter drier cloggedReplace filter drierExcessive superheatSuperheat not properly adjustedCheck adjustment of superheat and adjust expansion valveInsufficient water flowChilled water pipes obstructedClean pipes and strainer(H) Discharge pressure too highPresence of uncondensables liquids in the system, or excess of refrigerantPurge uncondensable fluids and drain off excess refrigerantCondense abnormally hotReduce dair flow. Air intake temperature higher than specified for the unitReduce load on system. Reduce water flow if necessaryCondenser air output too hotReduced air flow. Air intake temperature higher than specified for the unitCheck system: (a) Expansion valve too far open (b) Expansion valve locked in an open position(J) Suction pressure too highFilter drier clogged. Excess cooling demand on evaporator: (a) Expansion valve locked in an open positionCheck system: (a) Check the superheat and check that expansion valve (b) Expansion valve locked in an open position(J) Suction pressure too lowFilter drier clogged. Expansion valve not operating properlyReplace filter drier Replace EXV(J) Suction pressure too lowExcessive pressure drop through filter drier. Refrigerant does not flow through thermostatic expansion valveFilter drier clogged. Expansion valve obtured(A) Superheat too lowExcessive pressure drops through evaporatorFilter drier clogged. Expansion val	Suction duct abnormally cold	(b) Expansion valve locked in open			
Explaision value winsidesNot enough reinigerantand add refrigerantExcess pressure drops through filter drierFilter drier cloggedReplace filter drierExcessive superheatSuperheat not properly adjustedCheck adjustment of superheat and adjust expansion valueInsufficient water flowChilled water pipes obstructedClean pipes and strainer(H) Discharge pressure too highPresence of uncondensables liquids in the system, or excess of refrigerantPurge uncondensable fluids and drain off excess refrigerantChilled water leaving temperature too highOverload on cooling systemReduce load on system. Reduce dair flow. Air intake temperature higher than specified for the unitClean and replace air filters. Clea coils. Check operation of the fan motorsCondenser air output too hotExcess cooling demand on evaporator: (a) Expansion valve locked in an open positionCheck system: (a) Expansion valve too far open (b) Expansion valve locked in an open positionCheck system: (a) Check the superheat and check that expansion valve (b) Replace EXV(J) Suction pressure too lowFilter drier clogged. Expansion valve not operating properlyReplace filter drier Replace EXV(J) Suction pressure drop through thermostatic expansion valve thermostatic expansion valveFilter drier clogged. Expansion valve obturedReplace EXV(K) Insufficient cooling capacityExcessive pressure drops through evaporatorReplace EXVCheck water flow rate. Check state of strainer, check for obstruction in chilled water pipes	(G) Insufficient cooling capacity				
filter drierinter drier cloggedReplace filter drierExcessive superheatSuperheat not properly adjustedCheck adjustment of superheat and adjust expansion valveInsufficient water flowChilled water pipes obstructedClean pipes and strainer(H) Discharge pressure too highPresence of uncondensables liquids in the system, or excess of refrigerantPurge uncondensable fluids and drain off excess refrigerantCondense abnormally hotPresence of uncondensables liquids in the system, or excess of refrigerantPurge uncondensable fluids and drain off excess refrigerantChilled water leaving temperature too highOverload on cooling systemReduce load on system. Reduce water flow if necessaryCondenser air output too hotReduced air flow. Air intake temperature higher than specified for the unitClean and replace air filters. Clear ontice of a popen (a) Expansion valve too far open (b) Expansion valve locked in an open positionCheck system: (a) Check the superheat and cher that expansion valve (b) Replace EXV(J) Suction pressure too lowFilter drier clogged. Expansion valve not operating properlyReplace filter drier Replace filter drier Replace EXV(J) Suction pressure too lowExcessive pressure drop through filter drier.Filter drier clogged. Expansion valve obturedLoss of powerExpansion valve obtured evaporatorReplace EXVSuperheat too lowExcessive pressure drops through evaporatorCheck water flow rate. Check state of strainer, check for adjust EXV(K) Insufficient cooling capacityLow water flow rate Low wat	Expansion valve "whistles"	Not enough refrigerant	Check refrigerant circuit tightness and add refrigerant		
Excessive superneatSuperneat not properly adjustedand adjust expansion valveInsufficient water flowChilled water pipes obstructedClean pipes and strainer(H) Discharge pressure too highPresence of uncondensables liquids in the system, or excess of refrigerantPurge uncondensable fluids and drain off excess refrigerantCondense abnormally hotPresence of uncondensables liquids in the system, or excess of refrigerantPurge uncondensable fluids and drain off excess refrigerantChilled water leaving temperature too highOverload on cooling systemReduce load on system. Reduce water flow if necessaryCondenser air output too hotReduced air flow. Air intake temperature higher than specified for the unitClean and replace air filters. Clea colis. Check operation of the fan motors(I) Suction pressure too highExcess cooling demand on evaporator: (a) Expansion valve too far open (b) Expansion valve locked in an open positionCheck system: (a) Check the superheat and check that expansion valve (b) Replace EXV(J) Suction pressure too lowExcessive pressure drop through filter drier. Expansion valve not operating properlyReplace filter drier Replace EXV(Low pressure drops through thermostatic expansion valve to lowExcessive pressure drops through evaporatorReplace EXV(K) Insufficient cooling capacityLow water flow rateCheck water flow rate. Check obstruction in chilled water pipes		Filter drier clogged	Replace filter drier		
(H) Discharge pressure too highCondense abnormally hotPresence of uncondensables liquids in the system, or excess of refrigerantPurge uncondensable fluids and drain off excess refrigerantChilled water leaving temperature too highOverload on cooling systemReduce load on system. Reduce water flow if necessary Reduce air flow. Air intake temperature higher than specified for the unitReduce vater flow if necessary clean and replace air filters. Cleat coils. Check operation of the fan motors(1) Suction pressure too highExcess cooling demand on evaporator: (a) Expansion valve too far open (b) Expansion valve locked in an open positionCheck system: (a) Check the superheat and check that expansion valve (b) Expansion valve not operating properlyCheck system: (a) Check the superheat and check that expansion valve (b) Expansion valve not operating properlyJ Suction pressure too lowFilter drier clogged. Expansion valve not operating properlyReplace filter drier Replace EXVLoss of powerExcessive pressure drops through evaporatorReplace EXV(K) Insufficient cooling capacityExcessive pressure drops through evaporatorCheck water flow rate. Check state of strainer, check for obstruction in chilled water pipes	Excessive superheat	Superheat not properly adjusted			
Condense abnormally hotPresence of uncondensables liquids in the system, or excess of refrigerantPurge uncondensable fluids and drain off excess refrigerantChilled water leaving temperature too highOverload on cooling systemReduce load on system. Reduce water flow if necessaryCondenser air output too hotReduced air flow. Air intake temperature higher than specified for the unitClean and replace air filters. Clean coils. Check operation of the fan motors(1) Suction pressure too highExcess cooling demand on evaporator: (a) Expansion valve too far open (b) Expansion valve locked in an open positionCheck system: (a) Check the superheat and check that expansion valve (b) Replace EXV(1) Suction pressure too lowExcess cooling demand on evaporator: (a) Expansion valve locked in an open positionCheck system: (a) Check the superheat and check that expansion valve (b) Replace EXV(1) Suction pressure too lowFilter drier clogged. Expansion valve not operating properlyReplace filter drier Replace EXV(1) Suction valve (b) Replace EXVExcessive pressure drop through filter drier. Replace filter drier Replace EXVReplace EXV(1) Suction pressure too lowExcessive pressure drops through evaporatorReplace EXV(1) Suction pressure drop through filter drier. Refrigerant does not flow through thermostatic expansion valveFilter drier clogged. Expansion valve obturedReplace EXV(1) Suction due and propertionExcessive pressure drops through evaporatorCheck water flow rate. Check does that expansion continuence(1) Suction due and pr	Insufficient water flow	Chilled water pipes obstructed	Clean pipes and strainer		
Condense abnormally hotliquids in the system, or excess of refrigerantPurge uncondensable fluids and drain off excess refrigerantChilled water leaving temperature too highOverload on cooling systemReduce load on system. Reduce load on system. Reduce air flow. Air intake temperature higher than specified for the unitReduce load on system. Reduce water flow if necessaryCondenser air output too hotReduced air flow. Air intake temperature higher than specified for the unitClean and replace air filters. Cleat coils. Check operation of the fan motors(1) Suction pressure too highExcess cooling demand on evaporator: (a) Expansion valve too far open open positionCheck system: (a) Check the superheat and check that expansion valve (b) Replace EXV(1) Suction pressure too lowFilter drier clogged. Expansion valve not operating properlyReplace filter drier Replace EXV(1) Suction pressure dorop through filter drier. Superheat too lowFilter drier clogged. Expansion valve not operating properlyReplace EXV(1) Suction pressure dorop through filter drier. Refrigerant does not flow through thermostatic expansion valveFilter drier clogged. Expansion valve obturedReplace EXVLoss of powerExcessive pressure drops through evaporatorExcessive pressure drops through evaporatorCheck adjustment of superheat a adjust EXV(K) Insufficient cooling capacityLow water flow rateCheck water flow rate. Check state of strainer, check for obstruction in chilled water pipes	(H) Discharge pressure too high				
too highOverhoad on cooling systemReduce water flow if necessaryCondenser air output too hotReduced air flow. Air intake temperature higher than specified for the unitClean and replace air filters. Cleat coils. Check operation of the fan motors(1) Suction pressure too highExcess cooling demand on evaporator: (a) Expansion valve too far open (b) Expansion valve locked in an open positionCheck system: (a) Check the superheat and check that expansion valve (b) Replace EXV(J) Suction pressure too lowExcessive pressure drop through filter drier. Expansion valve not operating properlyFilter drier clogged. Expansion valve not operating properlyReplace filter drier Replace EXV(J) Suction pressure too lowExcessive pressure drop through filter drier. Expansion valve not operating properlyReplace filter drier Replace EXV(J) Superheat too lowExcessive pressure drops through thermostatic expansion valveFilter drier clogged. Expansion valve obturedReplace EXVSuperheat too lowExcessive pressure drops through evaporatorCheck adjustment of superheat a adjust EXV(K) Insufficient cooling capacityLow water flow rateCheck water flow rate. Check for obstruction in chilled water pipes	Condense abnormally hot	liquids in the system, or excess of			
Condenser air output too hottemperature higher than specified for the unitcoils. Check operation of the fan motors(I) Suction pressure too highExcess cooling demand on evaporator: (a) Expansion valve too far open (b) Expansion valve locked in an open positionCheck system: (a) Check the superheat and check that expansion valve (b) Replace EXV(J) Suction pressure too lowExcessive pressure drop through filter drier. Refrigerant does not flow through thermostatic expansion valveFilter drier clogged. Expansion valve not operating properlyReplace filter drier Replace EXVLoss of powerExcessive pressure drops through evaporatorExcessive pressure drops through evaporatorCheck water flow rate. Check state of strainer, check for obstruction in chilled water pipes		Overload on cooling system			
Compressors operates continuouslyExcess cooling demand on evaporator: (a) Expansion valve too far open (b) Expansion valve locked in an open positionCheck system: (a) Check the superheat and check that expansion valve (b) Replace EXV(J) Suction pressure too lowFilter drier clogged. Expansion valve not operating properlyReplace filter drier Replace EXV(Loss of powerExcessive pressure drop through thermostatic expansion valveFilter drier clogged. Expansion valve obturedReplace filter drier Replace EXVSuperheat too lowExcessive pressure drops through evaporatorCheck water flow rateCheck adjustment of superheat and check adjust the compression(K) Insufficient cooling capacityLow water flow rateCheck water flow rateCheck water flow rate	Condenser air output too hot	temperature higher than specified	•		
continuouslyevaporator: (a) Expansion valve too far open (b) Expansion valve locked in an open positionCheck system: (a) Check the superheat and check that expansion valve (b) Replace EXV(J) Suction pressure too lowFilter drier clogged. Expansion valve not operating properlyReplace filter drier Replace EXV(Loss of powerExpansion valve obturedReplace EXVSuperheat too lowExcessive pressure drops through thermostatic expansion valveExcessive pressure drops through properlyReplace filter drier Replace EXVSuperheat too lowExcessive pressure drops through evaporatorExcessive pressure drops through evaporatorCheck water flow rate. Check state of strainer, check for obstruction in chilled water pipes	(I) Suction pressure too high				
Excessive pressure drop through filter drier. Refrigerant does not flow through thermostatic expansion valveFilter drier clogged. Expansion valve not operating properlyReplace filter drier Replace EXVLoss of powerExpansion valve obturedReplace EXVSuperheat too lowExcessive pressure drops through evaporatorCheck adjustment of superheat a adjust EXV(K) Insufficient cooling capacityLow water flow rateCheck water flow rate. Check state of strainer, check for obstruction in chilled water pipes	continuously Suction duct abnormally cold. Refrigerant flows back to the	evaporator: (a) Expansion valve too far open (b) Expansion valve locked in an	(a) Check the superheat and check that expansion valve		
filter drier. Refrigerant does not flow through thermostatic expansion valveFinter drier clogged. Expansion valve not operating properlyReplace filter drier Replace EXVLoss of powerExpansion valve obturedReplace EXVSuperheat too lowExcessive pressure drops through evaporatorCheck adjustment of superheat a adjust EXV(K) Insufficient cooling capacityLow water flow rateCheck water flow rate. Check state of strainer, check for obstruction in chilled water pipes	(J) Suction pressure too low				
Superheat too lowExcessive pressure drops through evaporatorCheck adjustment of superheat a adjust EXV(K) Insufficient cooling capacityExcessive pressure drops through evaporatorCheck water flow rate. Check state of strainer, check for obstruction in chilled water pipes	filter drier. Refrigerant does not flow through	Expansion valve not operating			
Superneat too low     evaporator     adjust EXV       (K) Insufficient cooling capacity     Check water flow rate. Check state of strainer, check for obstruction in chilled water pipes	Loss of power	Expansion valve obtured	Replace EXV		
Low pressure drops through evaporator Low water flow rate Low water flow rate Low water flow rate Low water flow rate	Superheat too low		Check adjustment of superheat an adjust EXV		
Low pressure drops through evaporator Low water flow rate Low water flow rate Low water flow rate	(K) Insufficient cooling capacity				
water		Low water flow rate	state of strainer, check for obstruction in chilled water pipes, check pressure switch contact in		



Trane optimizes the performance of homes and buildings around the world. A business of Ingersoll Rand, the leader in creating and sustaining safe, comfortable and energy efficient environments, Trane offers a broad portfolio of advanced controls and HVAC systems, comprehensive building services and parts. For more information visit www.Trane.com

© 2016 Trane All rights reserved CG-SVX027C-GB November 2016 Supersedes CG-SVX027B\_1215 We are committed to using environmentally conscious print practices that reduce waste.

