Conquest air-cooled chillers and heat pumps

Scroll compressor
Model CGAX/CXAX
42-160 kW

CONQUEST

CG-PRC026A-E4

Introduction

Trane is a leader in the air-cooled chillers marketplace, thanks to excellence in design and manufacturing. This tradition of excellence is present in the Conquest air-cooled scroll compressor chillers range, a new generation of chillers and heat pumps, providing capacities from 41-160 kW.

Trane Quality

Trane is the designer and manufacturer of the core components applying modern market standards of quality in the finishing, a rigourous testing and manufacturing plan, a powerful service portfolio supporting the life cycle of the equipment.

Useful Efficiency

The cooling only chillers, model CGAX, are rated Class B (EER at full load at Eurovent conditions) and are optimized for the operation at seasonal part load efficiency (ESEER) to maximize energy savings during real life building demand, across all seasons.

The heat pump version, model CXAX, has been optimized in the same way. Full Load COP is class B as well, while the part load efficiency ratio SCOP is compliant with Ecodesign directive coming into force in 2015.

Acoustic Package

Two acoustical package options are available:

- Standard Noise (SN), with an average sound power of Lw 86 dB(A)
- Low Noise (LN), for sensitive environments with a sound reduction of an additional -6 dB(A)

The acoustical package does not bring any degradation on the performances: cooling capacity, operating map, or efficiency.

Smart Chillers

- The operating map of the chiller, allows in cooling mode, operation between -18°C up to 46°C ambient air temperature.
- In heating mode, CXAX units can deliver 40°C hot water, down to -15°C ambient air temperature.
- For industrial applications, with evaporator leaving water temperature down to -12°C is Ecodesign compliant (SEPR medium temperature > 2,8).
- The low profile of the Conquest units allows easy integration in buildings, thanks to the 1,5 m of height on most of the units.
- A plug & play integration is supported by the option of Hydraulic Module (with or without buffer tank).
- Chillers are provided with an Smart Controller, with a new generation of human interface, the Deluxe Touch Display.
- Full integrability capability thanks to available communication protocols: Modbus, BACnet, LonTalk and Trane BMS.

Features and Benefits

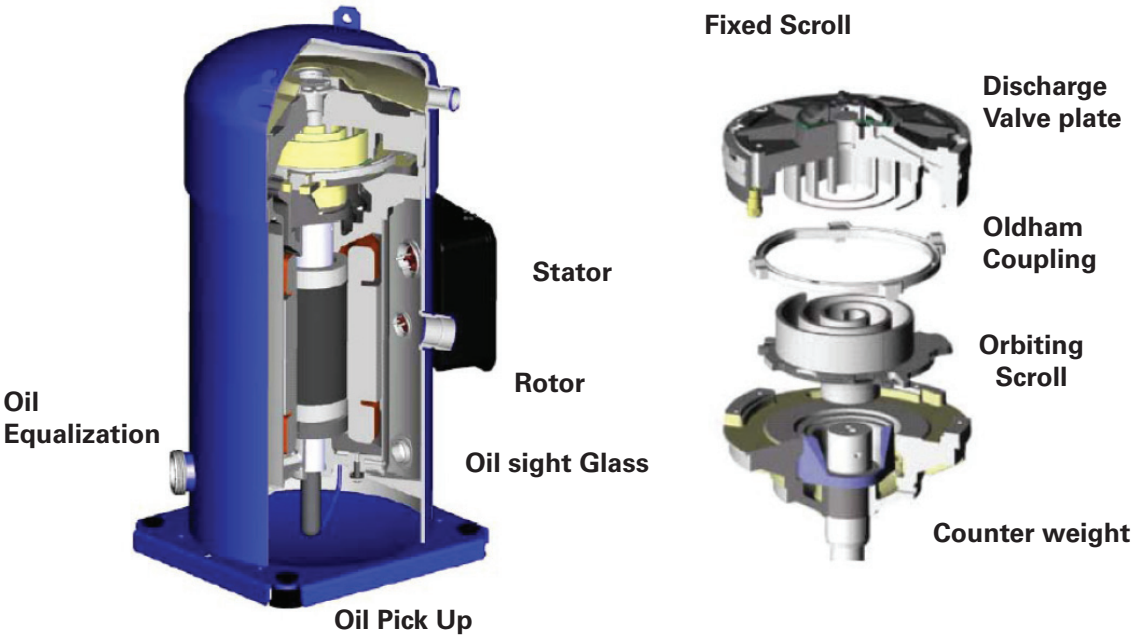
Reliability

A robust design of the compressor and refrigerant circuit has been confirmed by an extensive program of operational tests, in extreme conditions, to ensure reliability. Quality is verified during each and every step.

Compressors

Direct drive, low speed, new generation of scroll compressor, with few moving parts, providing high efficiency, reliable operation and simplified maintenance. Suction gas cooled motor winding, maintaining uniform low temperature for extended motor life.

Figure 1 - Scroll compressor



Chiller controller

The Conquest chiller is equipped with the new generation of chiller control systems, providing improved control capabilities, and integrated safety protocols to protect both compressors and motors from electrical faults like thermal overload and phase reversal.

The LCD display with 6 navigation buttons shows clear messages in 15 available languages. It features a customer communication package consisting in: external chilled water setpoint, external demand limit, analog capacity output, programmable relays.

Figure 2 - Standard LCD user interface

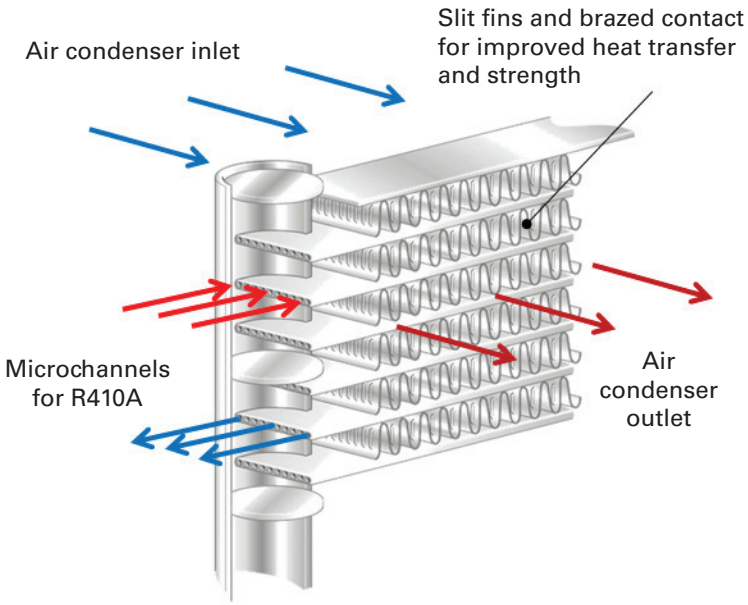
A deluxe display is available as an option.,It features an intuitive and user friendly color 7 inch touchscreen, able to display: Data trending, clear alarms logging, and TIS enable for remote monitoring.

Figure 3 - Optional deluxe user interface

Microchannel condensing coils on cooling-only units

Conquest chillers are equipped with microchannel condensing coils allowing excellent heat transfer and a dramatic improvement of corrosion resistance versus conventional tubes in fins coils. Microchannel coils are 100% aluminum and galvanic corrosion which can occur on condensers made with copper tubes and aluminum fins is avoided Microchannel coils are also well adapted for dirty environment thanks their small thickness and fins profile.

Figure 4 - Microchannel condensing coils



Heat pump units coils

The condenser coil is made of aluminum fins mechanically bonded to seamless copper tubing and includes integral subcooling circuit. The coils are factory leak tested at 5 Mpa. If the unit is to be installed in a corrosive environment, aluminum fins can be pre-coated with black epoxy, with minimum thickness of 8µm, in order to withstand 1000 hours of salt spray test according ISO 9227.

Electronic Expansion Valve

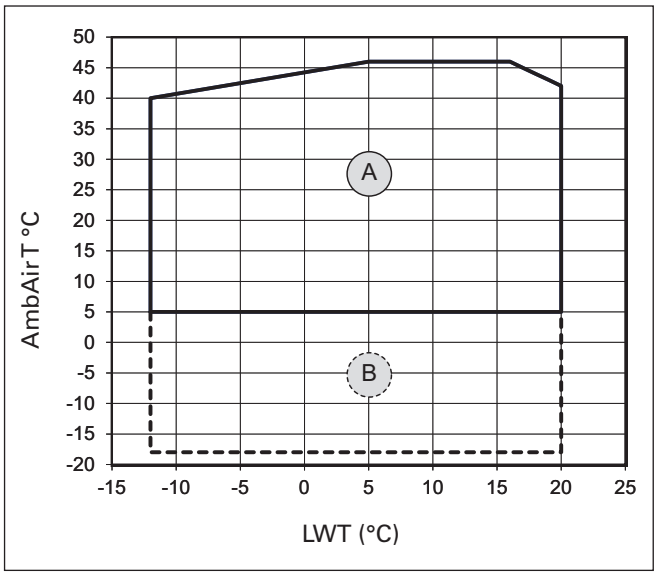
Electronic expansion valve enables tight chilled water temperature control and low superheat, resulting in more efficient full-load and part-load operation.

Application versatility

Extended operating map, allowing chiller operation in multiple applications:

- Industrial/low temperature process cooling with precise temperature control capability
- Optimal and reliable operation at high ambient temperatures.

Figure 5 - Operating map- Cooling-only Model CGAX



LWT = Leaving water temperature

Amb Air T = Ambient air temperature

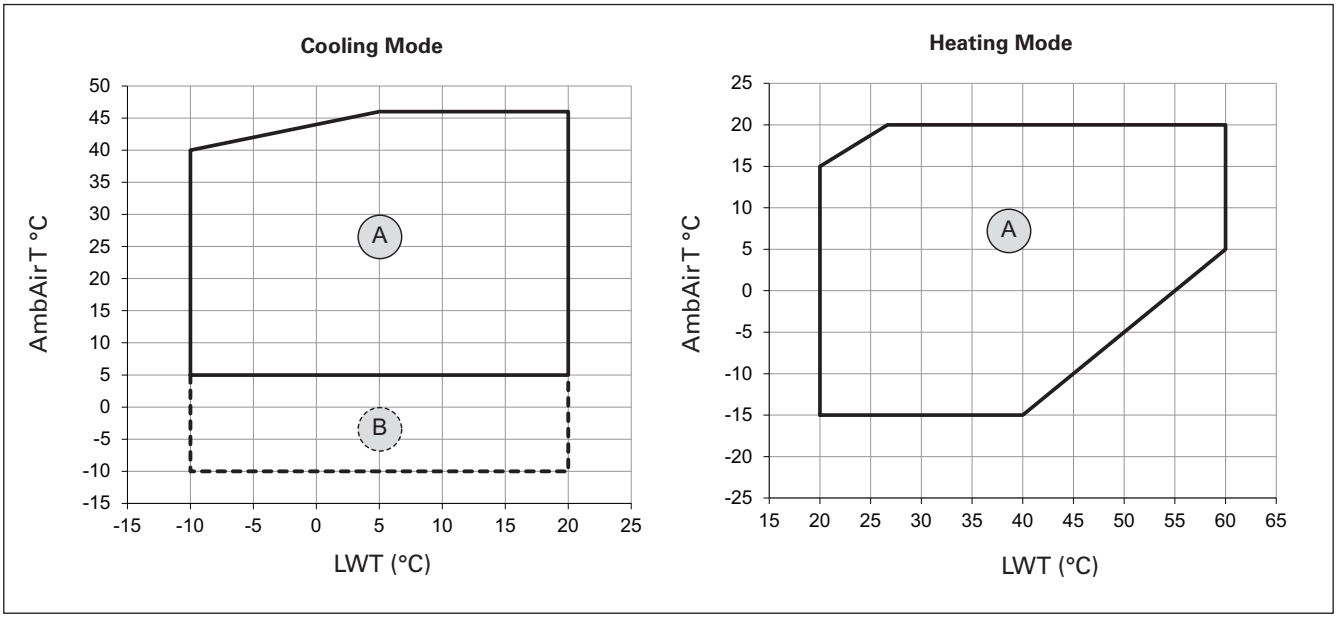
A = Standard operating map

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

Features and Benefits

Figure 6 - Heat Pump Model CXAX operating map



LWT = Leaving water temperature

Amb Air T = 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

Improved Serviceability

- Main components, like compressors, refrigerant components… are close to the unit's edge to make them accessible. When unit are supplied with hydraulic module, service valves and strainer are located accessible and for easy service.
- Water connections are supplied up to the edge of the unit, for easy connection with system water piping.
- Optional pump package is designed for easy maintenance and service on site.
- Pressure transducers and temperature sensors, are supplied for easy identification of potential troubleshooting and eventually, replacement, without the need of refrigerant handling.
- Dead front panel and IP20 protection, allows for safe servicing.

Application Considerations

Certain applications contraints should be considered when sizing, selecting and installing Conquest air-cooled Scroll chillers. Unit and system reliability often depends upon proper and complete compliancewith those considerations.

Unit Size

Unit oversizing is often not recommended since erratic unit operation and excessive compressor cycling are often a direct result of an oversized chiller. If oversizing is desired, consider the alternative of multiple units, splitting the total capacity.

Water Treatment

The use of untreated or improperly treated water in chillers may result in scaling, erosion, corrosion, and algae or slime buildup. This will adversely affect heat transfer between the water and system components. Proper water treatment must be determined locally and depends on thetype of system and local water characteristics.

Neither salt nor brackish water is recommend for use in Trane air-cooled Conquest chiller. Use of either will lead to a shortened life. Trane encourages the employment of a qualified water treatment specialist, familiar with local water conditions, to assist in the establishment of a proper water treatment program.

Foreign matter in the chilled water system can also increase pressure drop and, consequently, reduce water flow. For this reason it is important to thoroughly flush all water piping to the unit before making the final piping connections to the unit.

Effect of the altitude on the cooling capacity

At elevations substantially above sea level, the decreased air density will decrease condenser capacity and, therefore, unit capacity and efficiency.

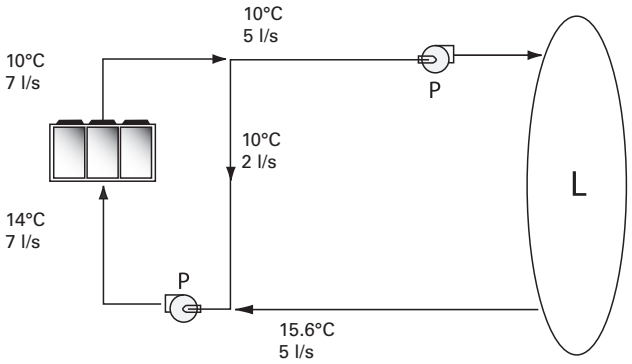
Water flow limits

The minimum water flow rates are given in the General Data section of this catalog. Evaporator flow rates below the tabulated values will result in laminar flow causing freeze-up problems,scaling, stratification and poor control. The maximum evaporator water flow rate is also given. Flow rates exceeding those listed may result in very high pressure drop across the evaporator.

Flow Rates Out of Range

Many process cooling jobs require flow rates that cannot be met with the minimum and maximum published values within the Conquest chiller evaporator. A simple piping change can alleviate this problem. For example: a plastic injection molding process requires 5.0 l/s of 10°C water and returns that water at 15.6°C. The selected chiller can operate at these temperatures, but has a minimum flow rate of 6.6 l/s. The system layout in Figure 1 can satisfy the process.

Figure 7 - Flow rate out of range systems solution



Flow Proving

Trane provides a factory-installed water flow switch monitored by chilller controller CH535 which protects the chiller from operating in loss of flow conditions.

Water Temperature

Leaving Water Temperature Limits

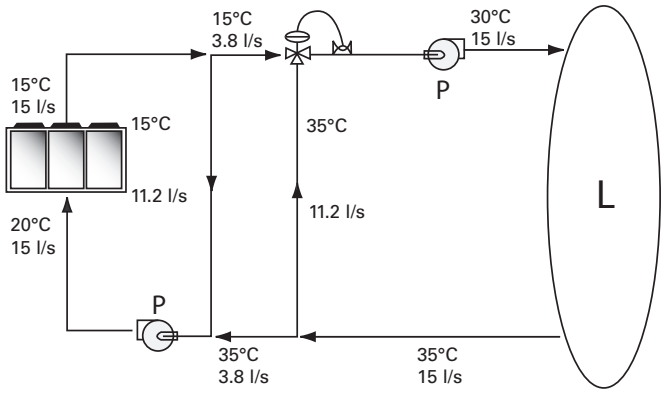
Trane air-cooled Conquest chillers have two distinct leaving water categories:

- standard, with a leaving solution range of 5.5 to 18°C
- low temperature process cooling, with leaving solution range of -12 to 18°C

Since the leaving solution temperature below 5.5°C results in suction temperature at or below the freezing point of water, a glycol solution is required for all low temperature.

Consult your local Trane sales engineer for applications or selections involving low temperature. The maximum water temperature that can be circulated through the CGAX evaporator when the unit is not operating is 51.7°C. For the model CXAX the water temperature limit is 60°C. Evaporator damage may result above this temperature.

Figure 8 - Temperature out of range system solution



Application Considerations

Supply Water Temperature Drop

Full load chilled water temperature drops from 3.3 to 10°C may be used as long as minimum and maximum water temperature and minimum and maximum flow rates are not violated.

Temperature drops outside this range at full load conditions are beyond the optimum range for control and may adversely affect the microcomputer's ability to maintain an acceptable supply water temperature range. Furthermore, full load temperature drops of less than 3.3°C may resultin inadequate refrigerant superheat which is critical to long term efficient and reliable operation.

Sufficient superheat is always a primary concern in any refrigerant system and is especially important in a packaged chiller where the evaporator is closely coupled to the compressor.

Parameters which influence the water temperature stability:

- Ambient temperature and water temperature (modify cooling capacity)
- Number of capacity steps
- Minimum time between starts of a compressor
- Control dead band
- Water loop volume
- Load fluctuations
- Fluid type or percentage of glycol

Typical Water Piping

All building water piping must be flushed prior to making final connections to the chiller. To reduce heat loss and prevent condensation, insulation should be applied. Expansion tanks are also usually required so that chilled water volume changes can be accommodated.

Avoidance of Short Water Loops

Adequate chilled water system water volume is an important system design parameter because it provides for stable chilled water temperature control and helps limit unacceptable short cycling of chiller compressors.

The Conquest Air Cooled chiller's temperature control sensor is located in the supply (outlet) water connection or pipe. This location allows the building to act as a buffer to slow the rate of change of the system water temperature. If there is not a sufficient volume of water in the system to provide an adequate buffer, temperature control can suffer, resulting in erratic system operation and excessive compressor cycling.

Typically, a two-minute water loop circulation time is sufficient to prevent short water loop issues. Therefore, as a guideline, ensure the volume of water in the chilled water loop equals or exceeds two times the evaporator flow rate. For systems with a rapidly changing load profile the amount of volume should be increased.

If the installed system volume does not meet the above recommendations, the following items should be given careful consideration to increase the volume of water in the system and, therefore, reduce the rate of change of the return water temperature.

- A volume buffer tank located in the return water piping.
- Larger system supply and return header piping (which also reduces system pressure drop and pump energy use).

An optional factory-installed buffer tank is designed to meet the minimum two minute loop time without additional job site piping. The buffer tank can also be used on jobs that already meet or exceed the minimum loop time to further reduce the potential for compressor cycling, increasing the compressor life span, and reducing system temperature fluctuations.

Minimum water volume for a process application

If a chiller is attached to an on/off load such as a process load, it may be difficult for the controller to respond quickly enough to the very rapid change in return solution temperature if the system has only the minimum water volume recommended. Such systems may cause chiller low temperature safety trips or in the extreme case evaporator freezing. In this case, it may be necessary to add or increase the size of the mixing tank in the return line or consider the optional factory-installed buffer tank with the chiller. Some guidance on calculating the minimum volume necessary for proper Scroll Compressors Chillers operation are given here, through a simplified formula, which does not take in account variations on chiller efficiency, compressor sequencing, evaporator inlet/outlet temperature.

Minimum recommendable volume on the hydraulic loop

V= Cc * T / (Sh * Db) where:

Cc * T = V * Db * Sh

V = Volume of the loop (l)

Cc = Cooling Capacity of the chiller biggest Stage (kW)

T = Compressor Time (min running time (s))

Db = Dead Band (K)

Sh = Brine Specific heat ($kJ.K^{-1}.kg^{-1}$)

Multiple Unit Operation

Whenever two or more units are used on one chilled water loop, Trane recommends that their operation be coordinated with a higher level system controller for best system efficiency and reliability. The Trane Tracer system has advanced chilled plant control capabilities designed to provide such operation.

Unit Placement

Setting The Unit

A base or foundation is not required if the selected unit location is level and strong enough to support the unit's operating weight (see "Weights" section of this catalog).

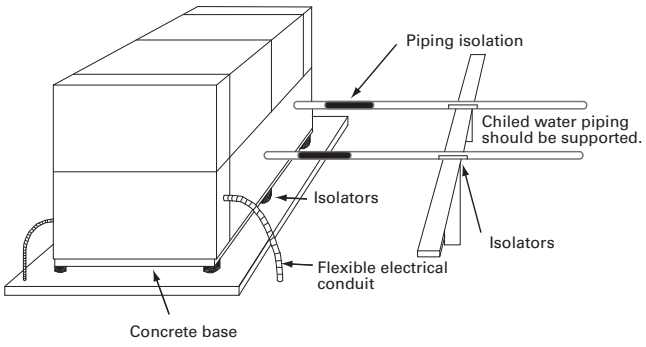
For a detailed discussion of base and foundation construction, refer to the sound engineering bulletin or the unit IOM. Manuals are available through the local Trane office.

HVAC equipment must be located to minimize sound and vibration transmission to the occupied spaces of the building structure it serves. If the equipment must be located in close proximity to a building, it should be placed next to an unoccupied space such as a storage room, mechanical room, etc. It is not recommended to locate the equipment near occupied, sound sensitive areas of the building or near windows. Locating the equipment away from structures will also prevent sound reflection, which can increase sound levels at property lines or other sensitive points.

Isolation and Sound Emission

Structurally transmitted sound can be reduced by elastomeric vibration eliminators. Elastomeric isolators are generally effective in reducing vibratory noise generated by compressors, and therefore, are recommended for sound sensitive installations. An acoustical engineer should always be consulted in critical situations

Figure 9 - 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.

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. Sound power levels for chillers are available on request.

Servicing

Adequate clearance for evaporator and compressor servicing should be provided. Recommended minimum space envelopes for servicing are located in the dimensional data section and can serve as a guideline for providing adequate clearance. The minimum space envelopes also allow for control panel door swing and routine maintenance requirements. Local code requirements may take precedence.

Unit Location

General

Unobstructed flow of condenser air is essential to maintain chiller capacity and operating efficiency. When determining unit placement, careful consideration must be given to assure a sufficient flow of air across the condenser heat transfer surface. Two detrimental conditions are possible and must be avoided: warm air recirculation and coil starvation. Air recirculation occurs when discharge air from the condenser fans is recycled back to the condenser coil inlet. Coil starvation occurs when free airflow to the condenser is restricted.

Condenser coils and fan discharge must be kept free of snow or other obstructions to permit adequate airflow for satisfactory unit operation. Debris, trash, supplies, etc., should not be allowed to accumulate in the vicinity of the air-cooled chiller. Supply air movement may draw debris into the condenser coil, blocking spaces between coil fins and causing coil starvation.

Both warm air recirculation and coil starvation cause reductions in unit efficiency and capacity because of the higher head pressures associated with them. The air-cooled Conquest chiller offers an advantage over competitive equipment in these situations. Operation is minimally affected in many restricted air flow situations due to its advanced chiller controller.

Microprocessor which has the ability to understand the operating environment of the chiller and adapt to it by first optimizing its performance and then staying on line through abnormal conditions. For example, high ambient temperatures combined with a restricted air flow situation will generally not cause the air-cooled model CGAX chiller to shut down. Other chillers would typically shut down on a high pressure nuisance cut-out in these conditions.

Cross winds, those perpendicular to the condenser, tend to aid efficient operation in warmer ambient conditions. However, they tend to be detrimental to operation in lower ambients due to the accompanying loss of adequate head pressure. Special consideration should be given to low ambient units. As a result, it is advisable to protect air-cooled chillers from continuous direct winds exceeding 4.5 m/s in low ambient conditions.

Provide Sufficient Unit-to-Unit Clearance

Units should be separated from each other by sufficient distance to prevent warm air recirculation or coil starvation. Doubling the recommended single unit air-cooled chiller clearances will generally prove to be adequate.

Walled Enclosure Installations

When the unit is placed in an enclosure or small depression, the top of the surrounding walls should be no higher than the top of the fans. The chiller should be completely open above the fandeck. There should be no roof or structure covering the top of the chiller. Ducting individual fans is not recommended.

Model Number Description

Digit 1-4 — Chiller Model
CGAX: Cooling-only unit
CXAX: Heat pump unit

Digit 5-7 — Unit Nominal Tonnage
015
017
020
023
026
030
036
039
045
035
040
046
052
060

Digit 8 — Unit Voltage
E: 400V/3ph/50Hz

Digit 9 — Manufacturing Plant
1 = Europe

Digit 10-11 — Design Sequence
A: Factory asigned
0: Factory asigned

Digit 12 — Efficiency Level
1: Standard Efficiency Class (B)

Digit 13 — Agency Listing
E: CE Certification

Digit 14 — Pressure Vessel Code
4: Pressure Equipment Directive (PED)

Digit 15 — Condenser Temperature Range
A: Standard operating map (5°C/46°C)
C: Low Ambient Cooling (CGAX -18°C/46°C; CXAX -10°C/46°C)

Digit 16, 17 — Open for future options

Digit 18 — Freeze Protection (Factory-Installed Only)
X: Without freeze protection
2: With freeze protection by heaters
3: With freeze protection by pump activation

Digit 19, 20 — Open for future options

Digit 21 — Evaporator Application
A: Comfort application (5°C/20°C)
B: Process application (CGAX: -12°C/5°C; CXAX: -10°C/5°C)

Digit 22 — Water Connection (Evaporator)
1: Grooved pipe
2: Grooved pipe, couplings and pipestub

Digit 23 — Condenser Fin Material
B: Standard aluminum fins on Heat Pumps
E: Black Epoxy aluminum fins on Heat Pumps
H: Microchannel (MCHE) on Cooling-only Units
J: E-coating on MCHE on Cooling-only units

Digit 24 — Condenser Heat Recovery
X: Without Heat Recovery

Digit 25 — Open for future options

Digit 26 — Starter Type
A: Across-the-line starter
B: Solid State Soft Starter

Digit 27, 28, 29 — Open for future options

Digit 30 — Human Interface
A: Standard display
B: Deluxe touch display
X: Without display

Digit 31 — Communication Options
X: Without remote communication
1: ModBus Interface
2: LonTalk Interface
4: BACnet Interface

Digit 32 — Customer Input/Ouput Options
X: None
A: With

Model Number Description

Digit 33 — Chiller Plant Control
X: None

Digit 34 — Open for future options

Digit 35 — Hydraulic Module/Pump package type
X: Without contactors
2: Only contactors single pump
4: Only contactors twin pump
5: Single pump package low pressure
6: Single pump package high pressure
7: Twin pump package low pressure
8: Twin pump package high pressure

Digit 36 — Pump flow control
X: Constant flow

Digit 37 — Buffer Tank
X: No Tank
1: With Tank

Digit 38 — Open digit for future options

Digit 39 — Installation Accessories
1: None
4: Neoprene pads

Digit 40 — Open digit for future options

Digit 41 — Acoustical options
3: Standard
4: Low Noise

Digit 42 — Condenser Protection
X: Without

Digit 43 — Open digit for future options

Digit 44 — Literature Language
B: Spanish
C: English
D: German
E: French
H: Dutch
J: Italian
M: Swedish
N: Turkish
P: Polish
T: Czech
U: Greek
V: Portuguese
Y: Romanian
3: Hungarian

Digit 45 — Under/Over Voltage Protection
X: None
1: With

Digit 46 — Open for future options

Digit 47 — Customer witness performance test
X: None

Digit 48 — Open for future options

Digit 49 — Supplementary Heat Control
X: None

Digit 50 — Special design
X: Standard
S: Special design

Table 2 - General data CGAX - Low noise (continued)

Eurovent Performances (1)		CGAX 039 SE-LN	CGAX 045 SE-LN	CGAX 035 SE-LN	CGAX 040 SE-LN	CGAX 046 SE-LN	CGAX 052 SE-LN	CGAX 060 SE-LN
Net Cooling Capacity	(kW)	110	126	98	117	130	146	164
Total Power input in cooling	(kW)	38	42	34	39	45	53	57
EER		2.92	2.99	2.85	3.00	2.85	2.74	2.86
ESEER		4.28	4.00	3.95	3.66	3.67	3.76	3.88
Eurovent Efficiency class Cooling		**B**	**B**	**C**	**B**	**C**	**C**	**B**
Sound power level	(dBA)	80	82	81	82	82	82	83
Unit amps (4) (5)								
Unit rated amps	(A)	81	101	77	92	102	112	128
Unit start up amps	(A)	214	269	199	213	234	244	296
Power factor		0.88	0.84	0.86	0.85	0.87	0.88	0.85
Short Circuit Unit Capacity	(kA)	15	15	15	15	15	15	15
Disconnect switch size	(A)	250	250	250	250	250	250	250
Compressor								
Compressor Number per Circuit	#	3	3	2	2	2	2	2
Type		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
Rated Amps Circuit1 / Circuit 2 (4)	(A)	25,11 / 25,11 / 25,11	29,3 / 29,3 / 29,3	15,28 / 20,1 / 0	20,1 / 20,1 / 0	20,1 / 25,11 / 0	25,11 / 25,11 / 0	29,3 / 29,3 / 0
Motor RPM	(rpm)				2900			
Oil sump heater Circuit1 / Circuit 2	(W)	270	270	180/180	180/180	180/180	180/180	180/180
Evaporator								
Quantity	#	1	1	1	1	1	1	1
Type		Stainless steel Copper Brazed plate Heat exchanger						
Evaporator model		P120Tx104	P120Tx104	DP300x82	DP300x82	DP300x82	DP300x114	DP300x114
Evaporator Water Content volume	(l)	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 (Grooved coupling) - With HYM	(in) - (mm)	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
Hydraulic Module Components								
Single pump - Standard head pressure option								
Max available Head Pressure	(kPa)	123	94	109	91	126	118	85
Motor Power	(kW)	2.30	2.30	1.50	2.30	2.30	2.30	2.30
Rated Amps	(A)	4.60	4.60	2.90	4.60	4.60	4.60	4.60
Single pump - High head pressure option								
Max available Head Pressure	(kPa)	166	140	200	187	173	170	146
Motor Power	(kW)	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Rated Amps	(A)	5.90	5.90	5.90	5.90	5.90	5.90	5.90
Twin pump - Standard head pressure option								
Max available Head Pressure	(kPa)	121	90	107	88	122	114	80
Motor Power	(kW)	2.30	2.30	1.50	2.30	2.30	2.30	2.30
Rated Amps	(A)	4.60	4.60	2.90	4.60	4.60	4.60	4.60
Twin pump - High head pressure option								
Max available Head Pressure	(kPa)	163	137	198	184	169	166	141
Motor Power	(kW)	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Rated Amps	(A)	5.90	5.90	5.90	5.90	5.90	5.90	5.90
Expansion Tank Volume	(l)	35	35	35	35	35	35	35
Max User water loop Volume for factory mounted expansion tank (1)	(l)	2000	2000	2000	2000	2000	2000	2000
Optionnal water Buffer tank volume	(l)	444	444	444	444	444	444	444
Max. Water-side Operating Pressure without pump package	(kPa)				10000			
Max. Water-side Operating Pressure with pump package	(kPa)				4000			
Condenser								
Type		Full aluminum Micro channel heat exchanger						
Quantity	#	2	2	2	2	2	2	2
Condenser Fan								
Quantity	#	2	3	2	4	4	4	4
Diameter	(mm)				800			
Fan / motor Type		Propeller fan / Fixed speed AC motor / Variable speed - EC motor						
Airflow per Fan	(m^3/h)	14690	13676	14687	12358	12363	12592	12374
Power per Motor	(kW)	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Rated Amps per Motor	(A)	2.37	2.37	2.37	2.37	2.37	2.37	2.37
Motor RPM	(rpm)	686	686	686	686	686	686	686
Dimensions								
Unit Length	(mm)	2327	2327	2327	2327	2327	2327	2327
Unit Width	(mm)	2250	2250	2250	2250	2250	2250	2250
Unit Height	(mm)	1747	1747	1747	1747	1747	1747	1747
Option Additional height								
Water Buffer tank option	(mm)	+330	+330	+330	+330	+330	+330	+330
Weights								
Shipping Weight (5)	(kg)	858	912	917	1004	1014	1034	1060
Operating Weight (5)	(kg)	824	879	887	973	983	1004	1029
Option Additional shipping weight								
Single pump - Standard head pressure	(kg)	47	47	45	47	47	47	47
Single pump - High head pressure	(kg)	49	49	49	49	49	49	49
Twin pump - Standard head pressure	(kg)	75	75	75	75	75	75	75
Twin pump - High head pressure	(kg)	86	86	84	84	84	84	84
Water Buffer tank option	(kg)	425	425	425	425	425	425	425

(1) At Evaporator water temperature: 12°C / 7°C - Condenser air temperature 35°C according to EN14511:2013
(4) Under 400V/3/50Hz
(5) Rated Condition without Pump Package
Electrical & system data are subject to change without notice. Please refer to unit nameplate data.