



AQUAFORCE™



Quality Management System Approval

30XA 252-1702

Nominal cooling capacity 270-1700 kW

The Aquaforce liquid chillers are the premium solution for industrial and commercial applications where installers, consultants and building owners require optimal performances and maximum quality.

The Aquaforce liquid chillers are designed to meet current and future requirements in terms of energy efficiency, operating sound levels and reliability. They use the best technologies available today:

- Twin-rotor screw compressors with a variable capacity valve.
- R134a refrigerant with zero ozone depletion potential.
- Low-noise generation IV Flying Bird fans made of composite material.
- Aluminium micro-channel heat exchangers (MCHX) or copper/aluminium coils (option).
- Touch-screen Pro-Dialog control system.

The high outdoor temperature version has been specially designed to assure reliable and durable operation in areas with extreme climatic conditions: high outdoor temperature, sand storms etc.

Features and advantages

Very economical operation

- Extremely high full load and part load energy efficiency:
 - Average Eurovent energy efficiency class "A", average COP of 3.20 kW/kW at nominal conditions

- Average integrated part load value (IPLV) of 4.50 kW/kW (high-efficiency option)
- New twin-rotor screw compressor equipped with a high-efficiency motor and a variable capacity valve that permits exact matching of the cooling capacity to the load.
- All aluminium condenser with micro-channels (standard version).
- Flooded multi-pipe evaporator to increase the heat exchange efficiency.
- Electronic expansion device permitting operation at a lower condensing pressure and improved utilisation of the evaporator heat exchange surface (superheat control).
- Economizer system with electronic expansion device for increased cooling capacity.

Low operating sound levels

- Compressors
 - Discharge dampers integrated in the oil separator (Carrier patent).
 - Silencer on the evaporator return line.
 - Suction piping with flexible connections to prevent noise and vibration transmission.
 - Acoustic compressor and oil separator enclosure reducing radiated noise.
- Condenser section
 - Condenser coils in V-shape with an open angle, allowing quieter air flow across the coil

- Low-noise 4th generation Flying Bird fans, made of a composite material (Carrier patent) are now even quieter and do not generate intrusive low-frequency noise
- Rigid fan mounting preventing start-up noise (Carrier patent)

Easy and fast installation

- Integrated hydronic module (option)
 - Centrifugal low or high-pressure water pump (as required), based on the pressure loss of the hydronic installation
 - Single or dual pump (as required) with operating time balancing and automatic changeover to the back-up pump if a fault develops
 - Water filter protecting the water pump against circulating debris
 - High-capacity membrane expansion tank ensures pressurisation of the water circuit
 - Thermal insulation and aluminium protection
 - Pressure gauge to check filter pollution and measure the system water flow rate
 - Water flow control valve
- Simplified electrical connections
 - Main disconnect switch with high trip capacity
 - Transformer to supply the integrated control circuit (400/24 V)
- Fast commissioning
 - Systematic factory operation test before shipment
 - Quick-test function for step-by-step verification of the instruments, expansion devices, fans and compressors

Environmental care

- R134a refrigerant
 - Refrigerant of the HFC group with zero ozone depletion potential
 - 30% reduction in the refrigerant charge through the use of micro-channel heat exchangers
- Leak-tight refrigerant circuit
 - Reduction of leaks as no capillary tubes and flare connections are used
 - Verification of pressure transducers and temperature sensors without transferring refrigerant charge
 - Discharge shut-off valve and liquid line service valve for simplified maintenance.

Absolute reliability

- Screw compressors
 - Industrial-type screw compressors with oversized bearings and motor cooled by suction gas.
 - All compressor components are easily accessible on site minimising down-time.
 - Electronic motor protection against overloads and power supply faults (loss of phase, phase reversal).
- Air condenser
 - The all aluminium micro-channel heat exchanger (MCHX) is not very sensitive to fouling by sand and offers a corrosion resistance that is 3.5 times higher than that of traditional coils or coils with copper tubes and aluminium fins.
- Evaporator
 - Thermal insulation with aluminium sheet finish for perfect resistance against outside aggression (mechanical and UV protection).
- Auto-adaptive control
 - Control algorithm prevents excessive compressor cycling (Carrier patent)
 - Automatic compressor unloading based on the condensing pressure. If the outside temperature is too high, the condenser coil is fouled or if there is a fan fault, the Aquaforce continues to operate at a reduced capacity.

- Control box with reinforced air tightness
 - Reinforced air tightness to protect against sand penetration (protection level IP54)
 - Forced ventilation to prevent overheating of the electrical components.
- Exceptional endurance tests
 - Partnerships with specialised laboratories and use of limit simulation tools (finite element calculation) for the design of critical components.
 - Transport simulation test in the laboratory on a vibrating table. The test is based on a military standard and equivalent to 4000 km by truck.
 - Salt mist corrosion resistance test in the laboratory for increased corrosion resistance.

Pro-Dialog control

Pro-Dialog combines intelligence with operating simplicity. The control constantly monitors all machine parameters and precisely manages the operation of compressors, electronic expansion devices, fans and of the evaporator water pump for optimum energy efficiency.

- Energy management
 - Internal time schedule clock: controls chiller on/off times and operation at a second set-point
 - Set-point reset based on the outside air temperature or the return water temperature
 - Master/slave control of two chillers connected in parallel with operating time equalisation and automatic change-over in case of a unit fault.
- Ease-of-use
 - User interface with large touch screen (120 x 99 mm) for intuitive access to the operating parameters. The information is in clear text and can be displayed in local language (please contact your distributor).

Remote management (standard)

Aquaforce is equipped with an RS485 serial port that offers multiple remote control, monitoring and diagnostic possibilities. Carrier offers a vast choice of control products, specially designed to control, manage and supervise the operation of an air conditioning system. Please consult your Carrier representative for more information.

Aquaforce also communicates with other building management systems via optional communication gateways. A connection terminal allows remote control of the Aquaforce by wired cable:

- Start/stop: opening of this contact will shut down the unit
- Dual set-point: closing of this contact activates a second set-point (example: unoccupied mode)
- Demand limit: closing of this contact limits the maximum chiller capacity to a predefined value
- Heat reclaim (option): closing of this contact allows heat reclaim mode operation
- Water pump 1 and 2 control*: these outputs control the contactors of one or two evaporator water pumps
- Water pump on reversal*: these contacts are used to detect a water pump operation fault and automatically change over to the other pump
- Operation indication: this volt-free contact indicates that the chiller is operating (cooling load) or that it is ready to operate (no cooling load)
- Alert indication: this volt-free contact indicates the need to carry out a maintenance operation or the presence of a minor fault
- Alarm indication: this volt-free contact indicates the presence of a major fault that has led to the shut-down of one or several refrigerant circuits

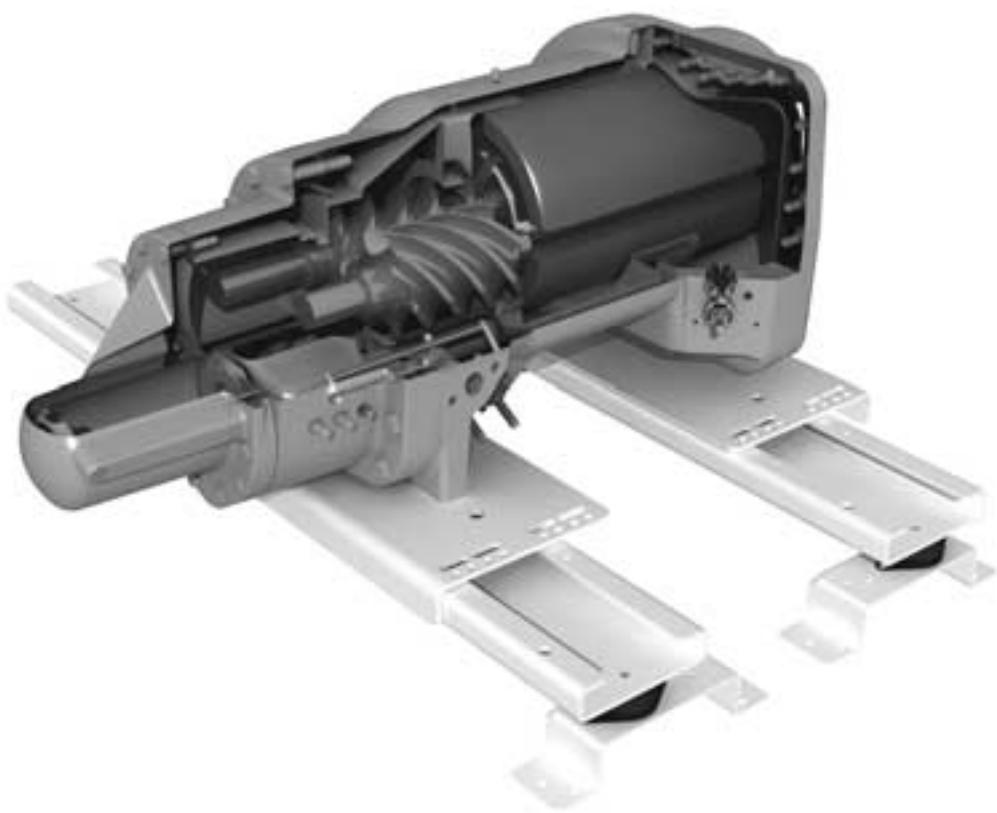
* not available for units with the hydronic module option

Remote management (EMM option)

The Energy Management Module offers extended remote control possibilities:

- Room temperature: permits set-point reset based on the building indoor air temperature (with Carrier thermostat)
- Set point reset: ensures reset of the cooling set-point based on a 4-20 mA or 0-5 V signal
- Demand limit: permits limitation of the maximum chiller power or current based on a 0-10 V signal
- Demand limit 1 and 2: closing of these contacts limits the maximum chiller power or current to two predefined values
- User safety: this contact can be used for any customer safety loop; opening of the contact generates a specific alarm

- Ice storage end: when ice storage has finished, this input permits return to the second set-point (unoccupied mode)
- Compressor operation: indicates the operation of the compressors in refrigerant circuits A, B and C
- Time schedule override: closing of this contact cancels the time schedule effects
- Out of service: this signal indicates that the chiller is completely out of service
- Chiller capacity: this analogue output (0-10 V) gives an immediate indication of the chiller capacity

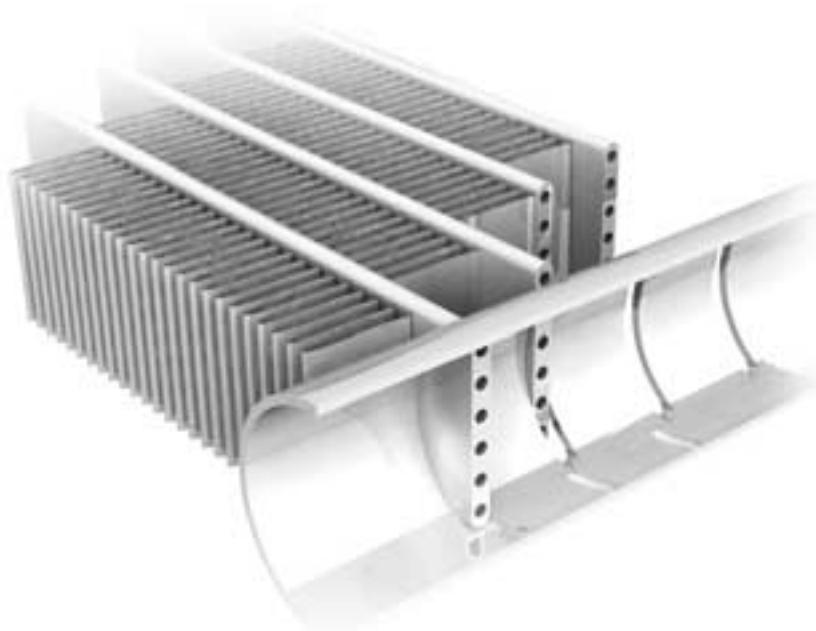


New generation 06T screw compressor

The new generation of the Carrier 06T screw compressors benefits from Carrier's long experience in the development of twin-rotor screw compressors. The compressor is equipped with bearings with oversized rollers, oil pressure lubricated for reliable and durable operation, even at maximum load. A variable control valve controlled by the oil pressure permits infinitely variable cooling capacity. This system allows optimal adjustment of the compressor cooling capacity and ensures exceptionally high stability of the chilled water leaving temperature.

Among the other advantages: if a fault occurs e.g. if the condenser is fouled or at very high outside temperature, the compressor does not switch off, but continues operation with a reduced capacity (unloaded mode).

The compressor is equipped with a separate oil separator that minimises the amount of oil in circulation in the refrigerant circuit and with its integrated silencer considerably reduces discharge gas pulsations for much quieter operation.



All aluminium micro-channel heat exchanger (MCHX)

Already utilised in the automobile and aeronautical industries for many years, the MCHX used in the Aquaforce is entirely made of aluminium. This one-piece concept significantly increases its corrosion resistance by eliminating the galvanic currents that are created when two different metals (copper and aluminium) come into contact in a saline or corrosive atmosphere.

From an energy efficiency point-of-view the MCHX heat exchanger is approximately 10% more efficient than a traditional coil and allows a 30% reduction in the amount of refrigerant used in the chiller. The low thickness of the MCHX reduces air pressure losses by 50% and makes it less susceptible to fouling by sand than a traditional coil. Cleaning of the MCHX heat exchanger is very fast using a high-pressure washer.



Pro-Dialog operator interface with touch-screen

The Aquaforce operator interface is very user-friendly. It is a large-format touch-screen, and the information is easily accessible: clear text in the selected language allows

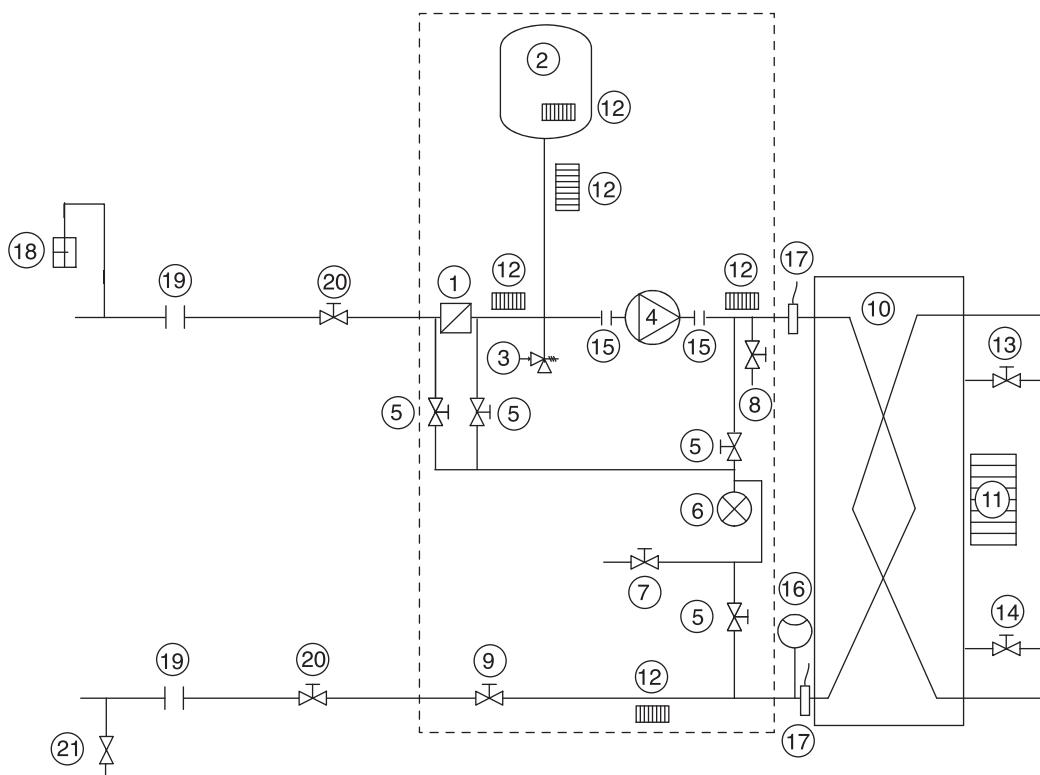
consultation of all operating parameters. Up to eight screens can be personalised.

Options and accessories

Options	No.	Description	Advantages	Use
Corrosion protection, traditional coils	2B	Factory application of Blygold Polual treatment on the copper/aluminium coils	Improved corrosion resistance, recommended for industrial, rural and severe marine environments	30XA 252-1702
Corrosion protection, traditional coils	3A	Fins made of pre-treated aluminium (polyurethane and epoxy)	Improved corrosion resistance, recommended for moderate marine and urban environments	30XA 252-1702
Grilles	23	Metallic grilles on all four unit faces	Improved aesthetics	30XA 252-1702
Evaporator frost protection	41A	Resistance heater on the evaporator	Evaporator frost protection down to -20°C outside temperature	30XA 252-1702
Evaporator and hydronic module frost protection	41B	Resistance heater on the evaporator and the hydronic module	Evaporator and hydronic module frost protection down to -20°C outside temperature	30XA 252-502
Suction valve	92	Shut-off valves on the compressor suction piping	Simplified maintenance	30XA 252-702
Three-pass evaporator	100A	Evaporator with three passes water-side	Increased water inlet and outlet pressure losses on opposite sides	30XA 252-602
One-pass evaporator	100C	Evaporator with one pass water-side	Reduced water inlet and outlet pressure losses on opposite sides	30XA 252-1002
Reversed water connections	107	Evaporator with reversed water inlet/outlet	Simplification of the water piping	30XA 252-1702
High-pressure single-pump hydronic module	116B	See hydronic module chapter	Easy and fast installation	30XA 252-502
High-pressure dual-pump hydronic module	116C	See hydronic module chapter	Easy and fast installation, operating safety	30XA 252-502
Low-pressure single-pump hydronic module	116F	See hydronic module chapter	Easy and fast installation	30XA 252-502
Low-pressure dual-pump hydronic module	116G	See hydronic module chapter	Easy and fast installation, operating safety	30XA 252-502
JBus gateway	148B	Two-directional communications board, complies with JBus protocol	Easy connection by communication bus to a building management system	30XA 252-1702
BacNet gateway	148C	Two-directional communications board, complies with BacNet protocol	Easy connection by communication bus to a building management system	30XA 252-1702
LON gateway	148D	Two-directional communications board, complies with LON protocol	Easy connection by communication bus to a building management system	30XA 252-1702
Energy Management Module EMM	156	See chapter "Energy Management Module"	Easy connection by wired connection to a building management system	30XA 252-1702
Unit without enclosure	253	Compressors not equipped with acoustic enclosure	More economical	30XA 252-1702
Traditional coils (Cu/Al) without slots	255	Coils made of copper tubes with aluminium fins without slots	Recommended for the Middle East, sand storms. Possibility to add specialised condenser treatment.	30XA 252-1702

Accessories	Description	Advantages	Use
CCN JBus gateway	See option 148B	See option 148B	See option 148B
CCN BacNet gateway	See option 148C	See option 148C	See option 148C
CCN LON Talk gateway	See option 148D	See option 148D	See option 148D
Connection sleeve	Piping to be welded with Victaulic connection	Ease-of-installation	30XA 252-1702
Energy Management Module EMM	See controls manual	Easy connection by wired connection to a building management system	30XA 252-1702
Lead-lag kit	Supplementary water outlet temperature sensor kit, field-installed, allows master/slave operation of two chillers connected in parallel	Optimised operation of two chillers connected in parallel with operating time balancing.	30XA 252-1502

Hydronic module (option)



Typical hydronic circuit diagram

Legend

Components of unit and hydronic module

- 1 Victaulic screen filter
- 2 Expansion tank
- 3 Safety valve
- 4 Available pressure pump
- 5 Pressure tap valve (see Installation Manual)
- 6 Pressure gauge to measure the component pressure loss (see Installation Manual)
- 7 System vent valve, pressure gauge
- 8 Drain valve
- 9 Water flow control valve
- 10 Evaporator
- 11 Evaporator defrost heater (option)
- 12 Hydronic module defrost heater
- 13 Air vent (evaporator)
- 14 Water purge (evaporator)
- 15 Expansion compensator (flexible connections)
- 16 Flow switch
- 17 Water temperature sensor

System components

- 18 Air vent
- 19 Flexible connection
- 20 Shut-down valves
- 21 Charge valve

--- Hydronic module (option)

Physical data

Unit with MCHX heat exchanger (standard)

		30XA high-ambient temperature version																			
		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Nominal cooling capacity*																					
Standard unit	kW	274	300	326	393	451	508	616	677	726	792	837	899	999	1146	1245	1352	1440	1466	1521	1673
	Tons	78	85	93	112	128	144	175	192	206	225	238	256	284	326	354	384	409	417	432	476
Cooling capacity**																					
Standard unit	kW	249	271	292	361	413	465	565	620	667	727	768	825	916	1052	1144	1240	1318	1346	1395	1536
	Tons	71	77	83	103	117	132	161	176	190	207	218	235	261	299	325	353	375	383	397	437
Operating weight***																					
Standard unit	kg	3840	3880	3920	4780	4850	5330	6260	6410	6710	7010	7560	7860	8440	10440	10880	11260	11620	4250/ 8380	4250/ 8530	7560/ 7560
Refrigerant		R134a																			
Standard unit																					
Circuit A	kg	36	37	37	53	55	62	62	62	70	70	77	70	80	69	85	87	87	100	92	77
Circuit B	kg	38	38	39	37	39	39	62	66	62	57	66	75	84	66	66	68	80	85	95	66
Circuit C	kg	-	-	-	-	-	-	-	-	-	-	-	-	100	100	100	96	100	100	77	
Circuit D	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66	
Compressors		06T semi-hermetic screw compressors, 50 r/s																			
Circuit A	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Circuit B	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Circuit C	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	
Circuit D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
Minimum capacity	%	15	15	15	15	15	15	15	15	15	15	15	15	15	10	10	10	10	10	10	8
Control		PRO-DIALOG, electronic expansion valve (EXV)																			
Condensers		Aluminium micro-channel heat exchanger																			
Fans		Axial Flying Bird 4 with rotating shroud																			
Quantity, standard unit		6	6	6	8	8	9	11	12	12	12	14	14	16	19	20	20	20	24	24	28
Standard total air flow	I/s	27083	27083	27083	36111	36111	40625	49653	54167	54167	54167	63194	63194	72222	85764	90278	90278	90278	108333	108333	126389
Standard speed	r/s	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7
Evaporator		Flooded multi-pipe type																			
Water content	l	58	61	61	66	70	77	79	94	98	119	119	130	140	168	182	203	224	230	240	240
Maximum pressure****	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Water connections		Victaulic																			
Without hydronic module, inlet/outlet																					
Diameter ‡	in	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6/8	6/8	6/8	6
Outside diameter ‡	mm	141.3	141.3	141.3	141.3	141.3	141.3	141.3	168.3	168.3	168.3	168.3	168.3	219.1	168.3	168.3	168.3	168.3/ 219.3	168.3/ 219.3	168.3/ 219.3	
With hydronic module (option), inlet/outlet																					
Diameter	in	4	4	4	5	5	5	5	-	-	-	-	-	-	-	-	-	-	-	-	
Outside diameter	mm	114.3	114.3	114.3	139.7	139.7	139.7	139.7	-	-	-	-	-	-	-	-	-	-	-	-	
Expansion tank																					
volume	l	50	50	50	50	50	80	-	-	-	-	-	-	-	-	-	-	-	-	-	
Max. water-side operating pressure with hydronic module	kPa	400	400	400	400	400	400	-	-	-	-	-	-	-	-	-	-	-	-	-	

Legend:

- * Nominal conditions: evaporator entering/leaving water temperature = 12°C/7°C. Outdoor air temperature = 35°C, evaporator fouling factor = 0.000018 m² K/W
- ** Operating conditions: evaporator entering/leaving water temperature = 12.7°C/7.2°C (45°F/55°F). Outdoor air temperature = 46.1°C (115°F)
- *** Weights are guidelines only. The refrigerant charge is also given on the unit nameplate. Weight and diameters of connection modules 1 and 2 for sizes 1402 to 1702.
- **** Max. water-side operating pressure without hydronic module
- ‡ Weight and diameters of connection modules 1 and 2 for sizes 1402 to 1702

Note:

Unit sizes 30XA 1402 to 1702 are supplied in two field-assembled modules.
Contact your Carrier representative to obtain the performances

Physical data

Unit with Cu/Al heat exchanger (option 255)

		30XA high-ambient temperature version																				
		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702	
Nominal cooling capacity*																						
Standard unit	kW	272	297	325	388	449	501	616	671	724	787	829	893	980	1134	1237	1344	1439	1448	1507	1656	
	Tons	77	84	92	110	128	142	175	191	206	224	236	254	279	322	352	382	409	412	428	471	
Cooling capacity**																						
Standard unit	kW	246	267	291	355	410	457	564	613	665	719	757	818	895	1039	1135	1212	1244	1328	1380	1518	
	Tons	70	76	83	101	117	130	160	174	189	204	215	233	254	295	323	345	354	378	392	432	
Operating weight***																						
Standard unit	kg	4160	4190	4710	5190	5260	5830	6870	7030	7820	8140	8260	9010	9260	11470	11890	12250	12640	9180	9340	8270	
																			4650	4650	8270	
Refrigerant		R134a																				
Standard unit																						
Circuit A	kg	60	64	70	85	85	102	102	100	129	112	130	129	140	102	112	112	112	140	140	130	
Circuit B	kg	64	64	56	56	56	56	88	95	88	95	95	103	129	92	92	92	98	103	129	95	
Circuit C	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	130	130	130	117	130	130	130	
Circuit D	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95	
Compressors		06T semi-hermetic screw compressors, 50 r/s																				
Circuit A	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Circuit B	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Circuit C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	
Circuit D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
Minimum capacity		%	15	15	15	15	15	15	15	15	15	15	15	15	15	10	10	10	10	10	10	8
Control		PRO-DIALOG, electronic expansion valve (EXV)																				
Condensers		Copper/aluminium heat exchanger																				
Fans		Axial Flying Bird 4 with rotating shroud																				
Quantity	6	6	7	8	8	9	11	12	13	13	14	15	16	19	20	20	20	24	24	28		
Standard total air flow l/s	27083	27083	27083	36111	36111	40625	49653	54167	54167	54167	63194	63194	72222	85764	90278	90278	90278	108333	108333	126389		
Standard speed r/s	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7		
Evaporator		Flooded multi-pipe type																				
Water content l	58	61	61	66	70	77	79	94	98	119	119	130	140	168	182	203	224	230	240	240		
Maximum pressure**** kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
Water connections		Victronic																				
Without hydronic module, inlet/outlet																						
Diameter	in	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6/8	6/8	6/8		
Outside diameter	mm	141.3	141.3	141.3	141.3	141.3	141.3	141.3	168.3	168.3	168.3	168.3	168.3	219.1	168.3	168.3	168.3	168.3/219.3	168.3/219.3	168.3/219.3		
With hydronic module (option), inlet/outlet																						
Diameter	in	4	4	4	5	5	5	-	-	-	-	-	-	-	-	-	-	-	-	-		
Outside diameter	mm	114.3	114.3	114.3	139.7	139.7	139.7	-	-	-	-	-	-	-	-	-	-	-	-	-		
Expansion tank volume	l	50	50	50	50	50	80	-	-	-	-	-	-	-	-	-	-	-	-	-		
Max. water-side operating pressure with hydronic module kPa	400	400	400	400	400	400	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

Legend:

* Nominal conditions: evaporator entering/leaving water temperature = 12°C/7°C. Outdoor air temperature = 35°C, evaporator fouling factor = 0.000018 m² K/W

** Operating conditions: evaporator entering/leaving water temperature = 12.7°C/7.2°C (45°F/55°F). Outdoor air temperature = 46.1°C (115°F)

*** Weights are guidelines only. The refrigerant charge is also given on the unit nameplate.

**** Max. water-side operating pressure without hydronic module

Note:

Unit sizes 30XA 1402 to 1702 are supplied in two field-assembled modules.

Contact your Carrier representative to obtain the performances

Electrical data

Unit with MCHX heat exchanger (standard)

		30XA high-ambient temperature version*																			
		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Power circuit																					
Nominal power supply	V-ph-Hz	400-3-50																			
Voltage range	V	360-440																			
Maximum supply cable section																					
Circuits A + B	mm ²	2x240	2x240	2x240	2x240	2x240	4x240	4x240	4x240	4x240	4x240	4x240	6x240	4x240	4x240	4x240	6x240	6x240	4x240	4x240	
Circuits C + D	mm ²	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2x240	2x240	2x240	2x240	4x240
Short circuit holding current (TN system)**																					
Circuits A + B	kA	38	38	38	38	38	38	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Circuits C + D	kA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	50	50	50	50
Maximum start-up current***																					
Circuits A + B	A	262	262	283	400	507	507	579	608	778	803	807	892	945	579	778	803	889	892	945	807
Circuits C + D	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	807
Nominal start-up current****																					
Circuits A + B	A	244	244	261	377	479	479	536	560	735	755	759	842	862	536	735	755	839	842	862	759
Circuits C + D	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	759
Cosine Phi (maximum)†	0.88	0.87	0.87	0.88	0.88	0.88	0.88	0.88	0.86	0.86	0.86	0.85	0.85	0.88	0.86	0.87	0.85	0.85	0.85	0.86	
Cosine Phi (nominal)‡	0.84	0.84	0.83	0.83	0.85	0.85	0.86	0.86	0.84	0.84	0.84	0.82	0.82	0.84	0.83	0.83	0.83	0.83	0.82	0.82	0.84
Maximum power input††																					
Circuits A + B	kW	126	136	147	172	192	212	257	278	304	323	356	372	435	257	304	353	400	405	435	356
Circuits C + D	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	217	217	217	216	217	356
Nominal unit current draw‡																					
Circuits A+B	A	149	165	182	210	239	262	320	343	404	423	446	511	549	320	404	439	523	534	549	446
Circuits C+D	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	275	275	275	271	275	446
Maximum unit current draw (Un) ††																					
Circuits A + B	A	208	226	243	284	316	350	423	457	512	542	596	635	734	423	512	588	678	688	734	596
Circuits C + D	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	367	367	367	364	367	596
Maximum unit current draw (Un - 10%) †																					
Circuits A + B	A	219	243	262	305	340	376	455	491	551	583	640	683	790	455	551	633	729	740	790	640
Circuits C + D	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	395	395	395	391	395	640

Legend

- * Motor and fan electrical data if the unit operates at Eurovent conditions (motor ambient temperature 50°C); 3.6 A, start-up current: 20 A, power input: 1.65 kW
- ** kA eff: efficiency value: rms for English version
- *** Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at operation with maximum unit power input.
- **** Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C
- † Values obtained at operation with maximum unit power input.
- ‡ Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C
- †† Values obtained at operation with maximum unit power input. Values given on the unit name plate

Electrical data

Unit with copper/aluminium heat exchanger (option 255)

		30XA high-ambient temperature version*																			
		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Maximum start-up current**																					
Circuits A + B	A	272	272	295	400	507	507	579	608	778	807	807	892	945	579	778	803	889	892	945	807
Circuits C + D	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	807
Nominal start-up current***																					
Circuits A + B	A	244	244	261	377	479	479	536	560	735	759	759	842	862	536	735	755	839	842	862	759
Circuits C + D	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	759
Cosine Phi (maximum)****	0.88	0.87	0.87	0.88	0.88	0.88	0.88	0.88	0.86	0.86	0.86	0.84	0.85	0.88	0.86	0.87	0.85	0.85	0.85	0.86	
Cosine Phi (nominal)†	0.84	0.84	0.83	0.83	0.85	0.85	0.86	0.86	0.83	0.84	0.84	0.82	0.82	0.84	0.83	0.83	0.83	0.83	0.82	0.82	0.84
Maximum power input††																					
Circuits A + B	kW	126	136	148	172	192	212	257	278	306	325	356	373	435	257	304	353	400	405	435	356
Circuits C + D	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	217	217	217	216	217	356
Nominal unit current draw†																					
Circuits A + B	A	149	165	185	210	239	262	320	343	407	427	446	514	549	320	404	439	523	534	549	446
Circuits C + D	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	275	275	275	275	275	446
Maximum unit current draw (Un) ††																					
Circuits A + B	A	208	226	247	284	316	350	423	457	516	546	596	639	734	423	512	588	678	688	734	596
Circuits C + D	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	367	367	367	364	367	596
Maximum unit current draw (Un - 10%)****																					
Circuits A + B	A	219	243	266	305	340	376	455	491	555	587	640	687	790	455	551	633	729	740	790	640
Circuits C + D	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	395	395	395	391	395	640

Legend

- * Motor and fan electrical data if the unit operates at Eurovent conditions (motor ambient temperature 50°C); 3.6 A, start-up current: 20 A, power input: 1.65 kW
- ** Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at operation with maximum unit power input.
- *** Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C
- **** Values obtained at operation with maximum unit power input.
- † Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C
- †† Values obtained at operation with maximum unit power input. Values given on the unit name plate

Electrical data notes

- 30XA 252-1002 units have a single power connection point located immediately upstream of the two main disconnect switches.
- 30XA 1102-1702 units have two power connection points located upstream of the main disconnect switches.

• The control box includes:

- One main disconnect switch per circuit
- Starter and motor protection devices for each compressor, the fans and the pump
- Control devices

• Field connections:

- All connections to the system and the electrical installations must be in full accordance with all applicable local codes.
- The Carrier 30XA units are designed and built to ensure conformance with these codes. The recommendations of European standard EN 60 204-1 (corresponds to IEC 60204-1) (machine safety - electrical machine components - part 1: general regulations) are specifically taken into account, when designing the electrical equipment.

Notes:

- Generally the recommendations of IEC 60364 are accepted as compliance with the requirements of the installation directives. Conformance with EN 60204 is the best means of ensuring compliance with the Machines Directive § 1.5.1.
- Annex B of EN 60204-1 describes the electrical characteristics used for the operation of the machines.

1. The operating environment for the 30XA units is specified below:
 - Environment* - Environment as classified in EN 60721 (corresponds to IEC 60721) :
 - outdoor installation*
 - ambient temperature range: minimum temperature -20°C to +55°C, class 4K4H*
 - altitude: lower than or equal to 2000 m
 - presence of hard solids, class 4S2 (no significant dust present)
 - presence of corrosive and polluting substances, class 4C2 (negligible)
2. Power supply frequency variation: ± 2 Hz.
3. The neutral (N) line must not be connected directly to the unit (if necessary use a transformer).
4. Overcurrent protection of the power supply conductors is not provided with the unit.
5. The factory-installed disconnect switch(es)/circuit breaker(s) is (are) of a type suitable for power interruption in accordance with EN 60947-3 (corresponds to IEC 60947-3).
6. The units are designed for simplified connection on TN(s) networks (IEC 60364). For IT networks derived currents may interfere with network monitoring elements, and it is recommended to create an IT type divider for the system units that require this and/or a TN type divider for Carrier units. Please consult the appropriate local organisations to define the monitoring and protection elements and carry out the electrical installation.

NOTE: If particular aspects of an actual installation do not conform to the conditions described above, or if there are other conditions which should be considered, always contact your local Carrier representative.

* The required protection level for this class is IP43B (according to reference document IEC 60529). All 30XA units are protected to IP54 and fulfil this protection condition.

Sound levels

30XA high-ambient temperature version

	252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Sound power level*	dB(A)	94	94	94	95	95	95	96	96	98	98	98	99	99	100	99	100	101	100	
Sound pressure level at 10 m**	dB(A)	62	62	62	63	63	63	63	65	65	65	66	65	66	67	66	67	68	67	

* 10^{-12} W - In accordance with ISO 9614-1 and certified by Eurovent

** Average sound pressure level, unit in a free field on a reflective surface

Part load performances

With the rapid increase in energy costs and the care about environmental impacts of electricity production, power consumption of air conditioning equipment has become an important topic. The energy efficiency of a liquid chiller at full load is rarely representative of the actual performance of the units, as on average a chiller works less than 5% of the time at full load.

IPLV (in accordance with ARI 550/590-98)

The IPLV (integrated part load value) allows evaluation of the average energy efficiency based on four operating conditions defined by the ARI (American Refrigeration Institute). The IPLV is the average weighted value of the energy efficiency ratios (EER) at different operating conditions, weighted by the operating time.

IPLV (Integrated Part Load Value)

Load (%)	Air temperature (°C)	Energy efficiency	Operating time, %
100	35	EER ₁	1
75	26.7	EER ₂	42
50	18.3	EER ₃	45
25	12.8	EER ₄	12

$$\text{IPLV} = \text{EER}_1 \times 1\% + \text{EER}_2 \times 42\% + \text{EER}_3 \times 45\% + \text{EER}_4 \times 12\%$$

The heat load of a building depends on many factors, such as the outside air temperature, the exposure to the sun and its occupation.

Consequently it is preferable to use the average energy efficiency, calculated at several operating points that are representative for the unit utilisation.

ESEER (in accordance with EUROVENT)

The ESEER (European seasonal energy efficiency ratio) permits evaluation of the average energy efficiency at part load, based on four operating conditions defined by Eurovent. The ESEER is the average value of energy efficiency ratios (EER) at different operating conditions, weighted by the operating time.

ESEER (European seasonal energy efficiency ratio)

Load (%)	Air temperature (°C)	Energy efficiency	Operating time, %
100	35	EER ₁	3
75	30	EER ₂	33
50	25	EER ₃	41
25	20	EER ₄	23

$$\text{ESEER} = \text{EER}_1 \times 3\% + \text{EER}_2 \times 33\% + \text{EER}_3 \times 41\% + \text{EER}_4 \times 23\%$$

Part load performances

30XA	252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702	
High ambient temperature version																					
IPLV	kW/kW	4.31	4.48	4.58	4.45	4.67	4.69	4.48	4.64	4.61	4.57	4.55	4.32	4.40	4.66	4.54	4.66	4.62	4.56	4.57	4.44
ESEER	kW/kW	3.93	4.03	4.08	4.05	4.19	4.19	4.03	4.18	3.99	4.10	4.14	3.91	3.95	4.24	4.10	4.23	4.15	4.13	4.16	4.04

Operating limits

Evaporator water temperature

	°C	Minimum	Maximum
Water entering temperature at start-up	-	45	
Water entering temperature during operation	6.8	21	
Water leaving temperature during operation	3.3	15	

Note: If the leaving water temperature is below 4°C, a glycol/water solution or the frost protection option must be used.

Condenser air temperature

	°C	Minimum	Maximum
Storage	-20	68	
Operation	-10	55*	

* Part-load operation

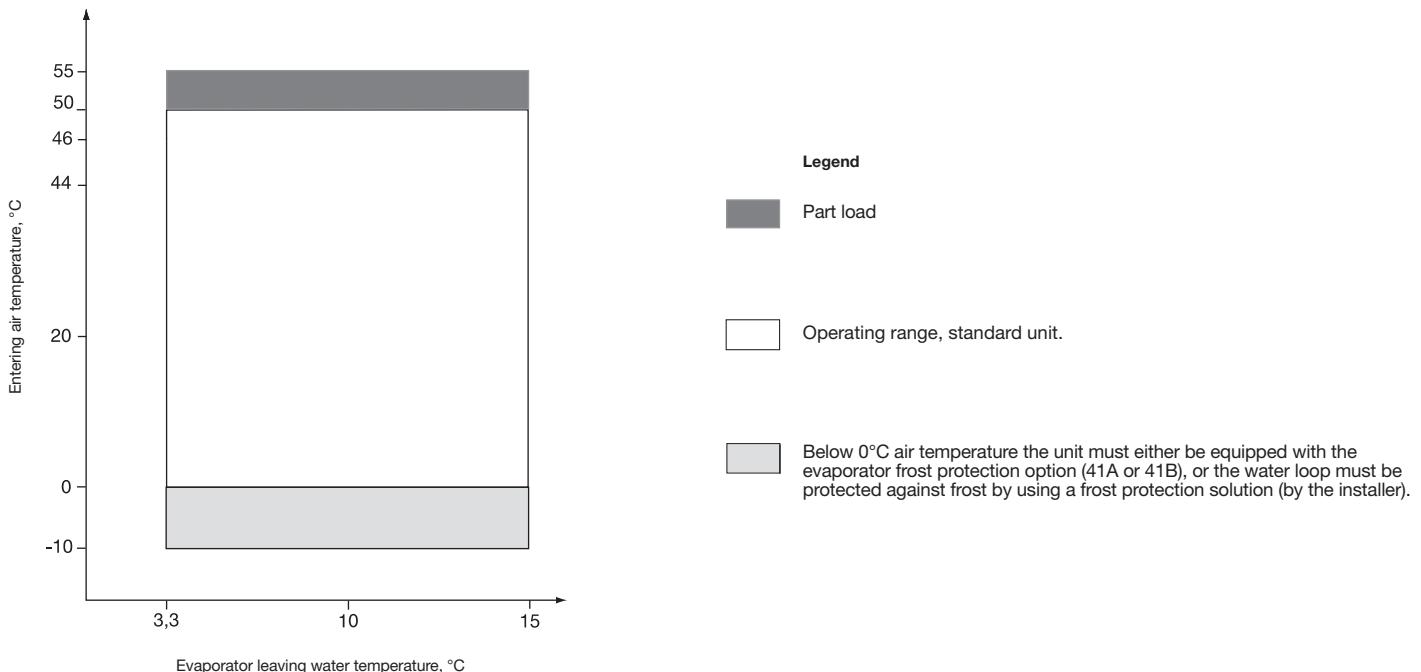
Note: If the air temperature is below 0°C, a glycol/water solution or the frost protection option must be used.

Evaporator water flow rate, l/s

30XA	Minimum	Maximum*
252	3.6	37.5
302	4	40.5
352	4.3	40.5
402	5.3	34.1
452	6	36.9
502	6.7	42
602	8.1	45
702	8.9	56.1
752	9.6	59.1
802	10.4	67.1
852	11	67.1
902	11.8	73.9
1002	13.1	83.9
1102	15.1	87.8
1202	16.4	92.9
1302	17.5	96.1
1352	18.8	107.4
1402	19.3	107.4
1502	19.9	109.4
1702	22	107.4

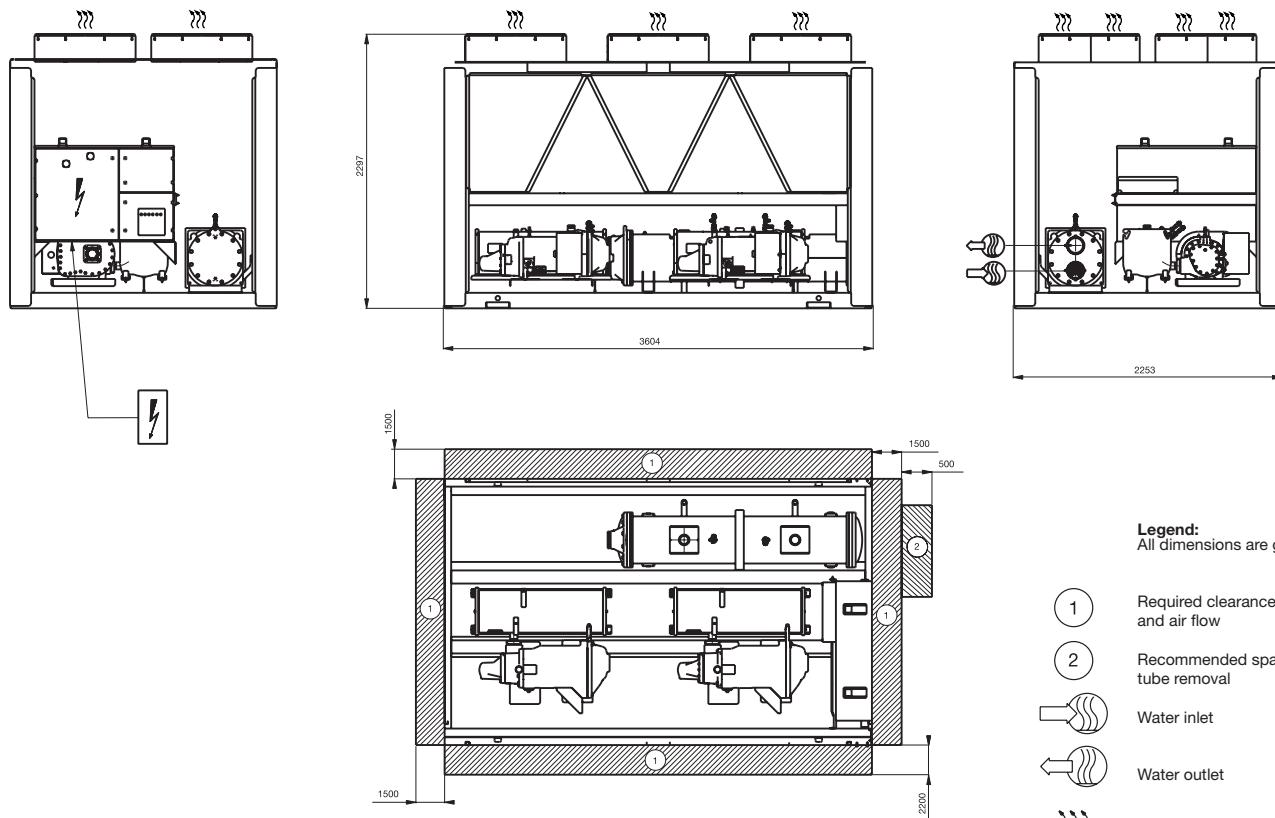
* The maximum water flow rate corresponds to a pressure drop of 100 kPa.

Operating range



Dimensions/clearances

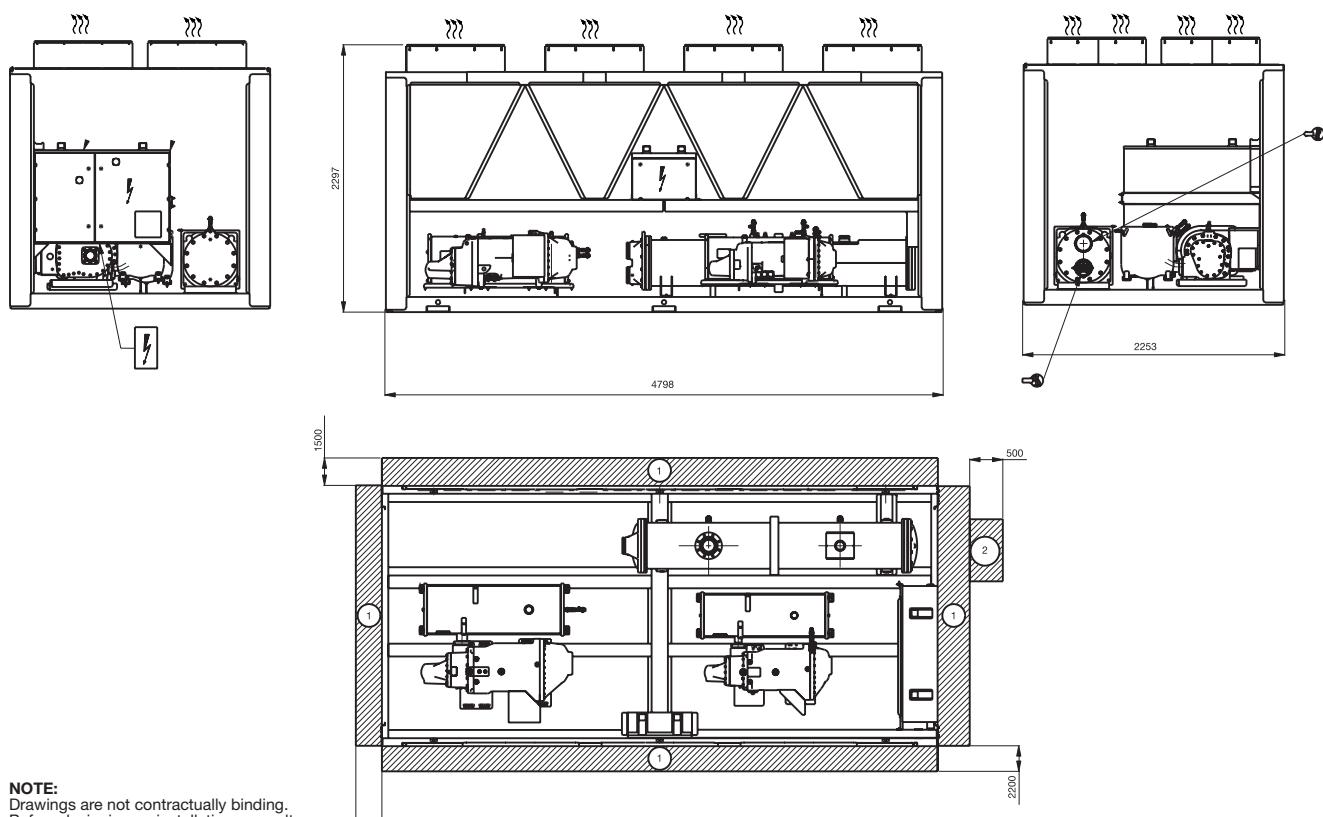
30XA 252-352 - MCHX heat exchanger (standard)
30XA 252-302 - Cu/Al heat exchanger (option 255)



Legend:
All dimensions are given in mm.

- (1) Required clearances for maintenance and air flow
- (2) Recommended space for evaporator tube removal
- Water inlet
- Water outlet
- Air outlet – do not obstruct
- Power supply connection
- Control circuit connection

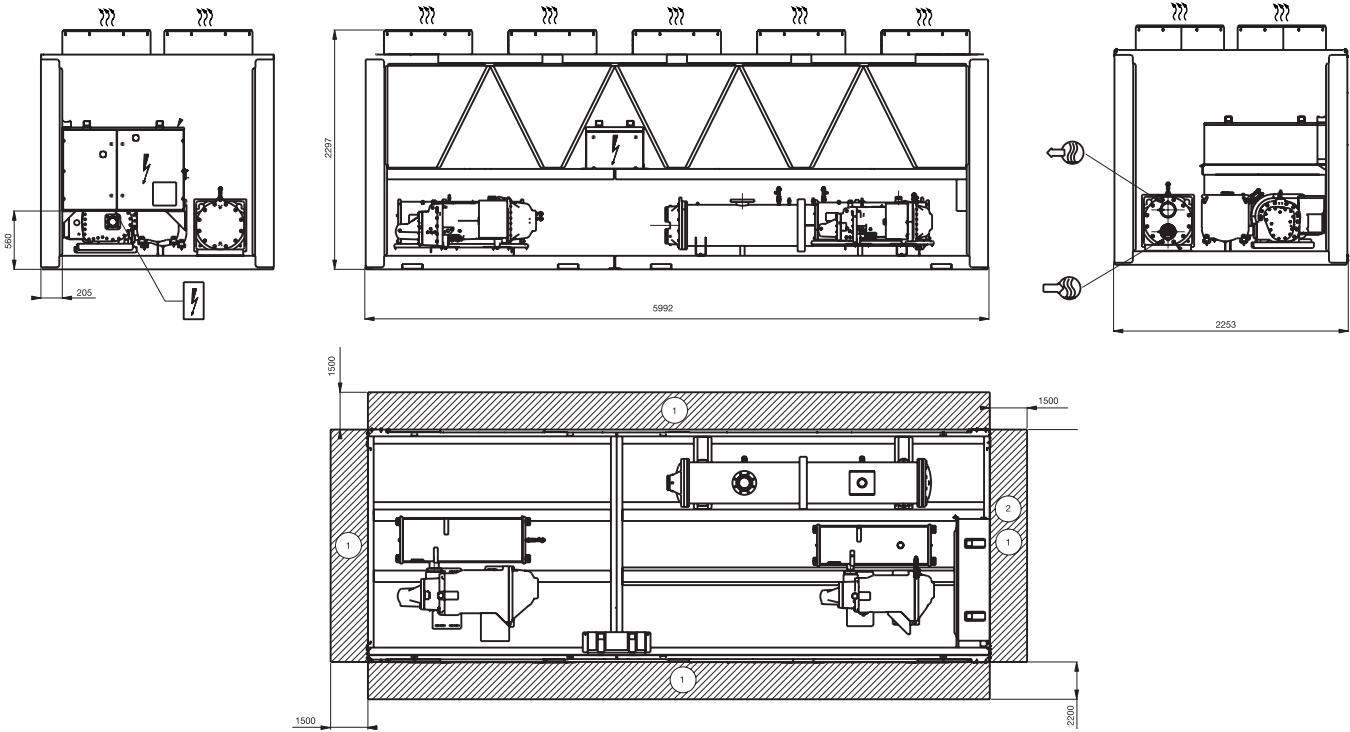
30XA 402-452 - MCHX heat exchanger (standard)
30XA 352-452 - Cu/Al heat exchanger (option 255)



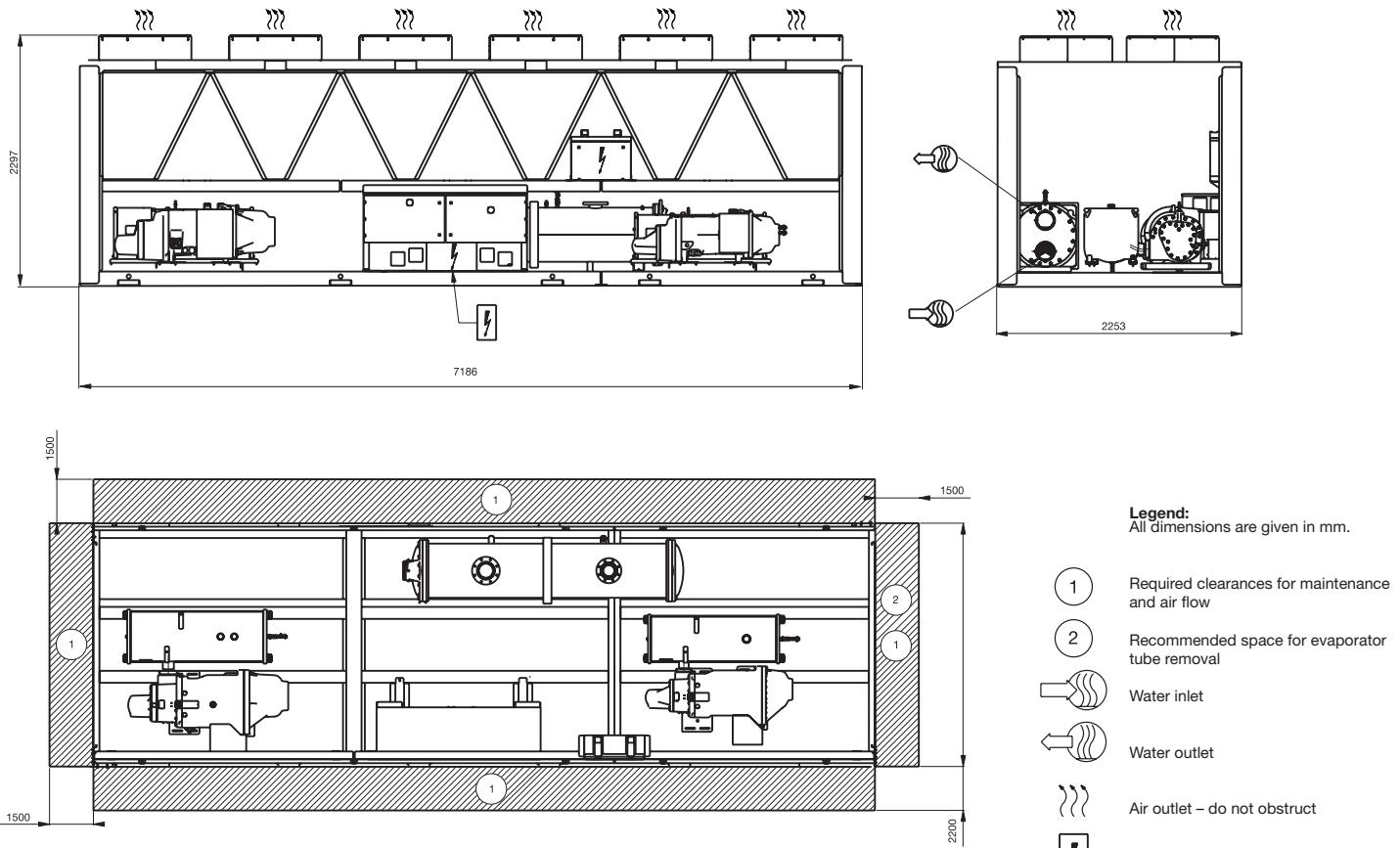
NOTE:
Drawings are not contractually binding.
Before designing an installation, consult
the certified dimensional drawings,
available on request.

Dimensions/clearances

30XA 502 - MCHX heat exchanger (standard)
30XA 502 - Cu/Al heat exchanger (option 255)



30XA 602-802 - MCHX heat exchanger (standard)
30XA 602-702 - Cu/Al heat exchanger (option 255)



Legend:
All dimensions are given in mm.

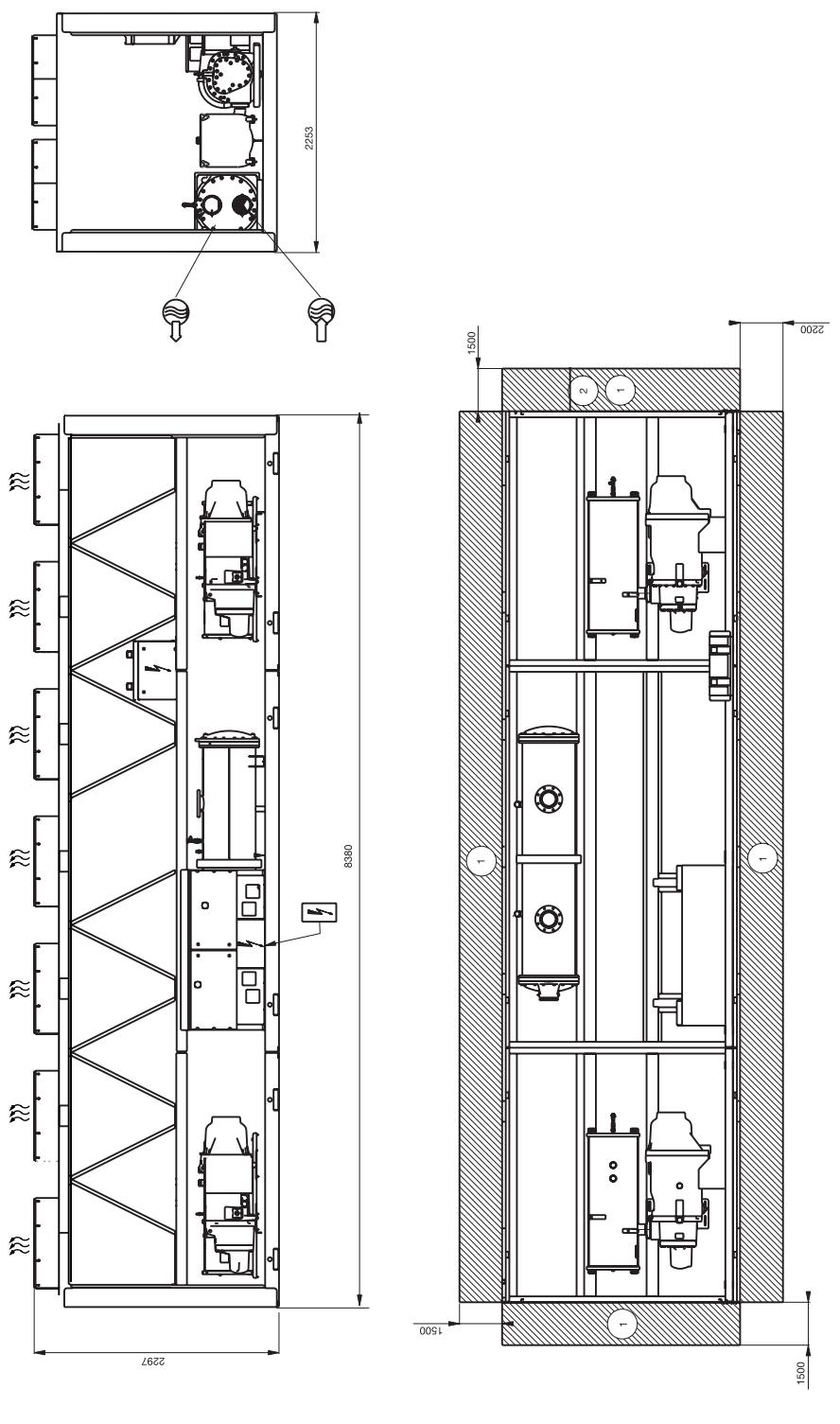
- (1) Required clearances for maintenance and air flow
- (2) Recommended space for evaporator tube removal
- Water inlet
- Water outlet
- Air outlet – do not obstruct
- Power supply connection
- Control circuit connection

NOTE:

Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings, available on request.

Dimensions/clearances

30XA 852-902 - MCHX heat exchanger (standard)
30XA 752-852 - Cu/Al heat exchanger (option 255)



Legend:
All dimensions are given in mm.

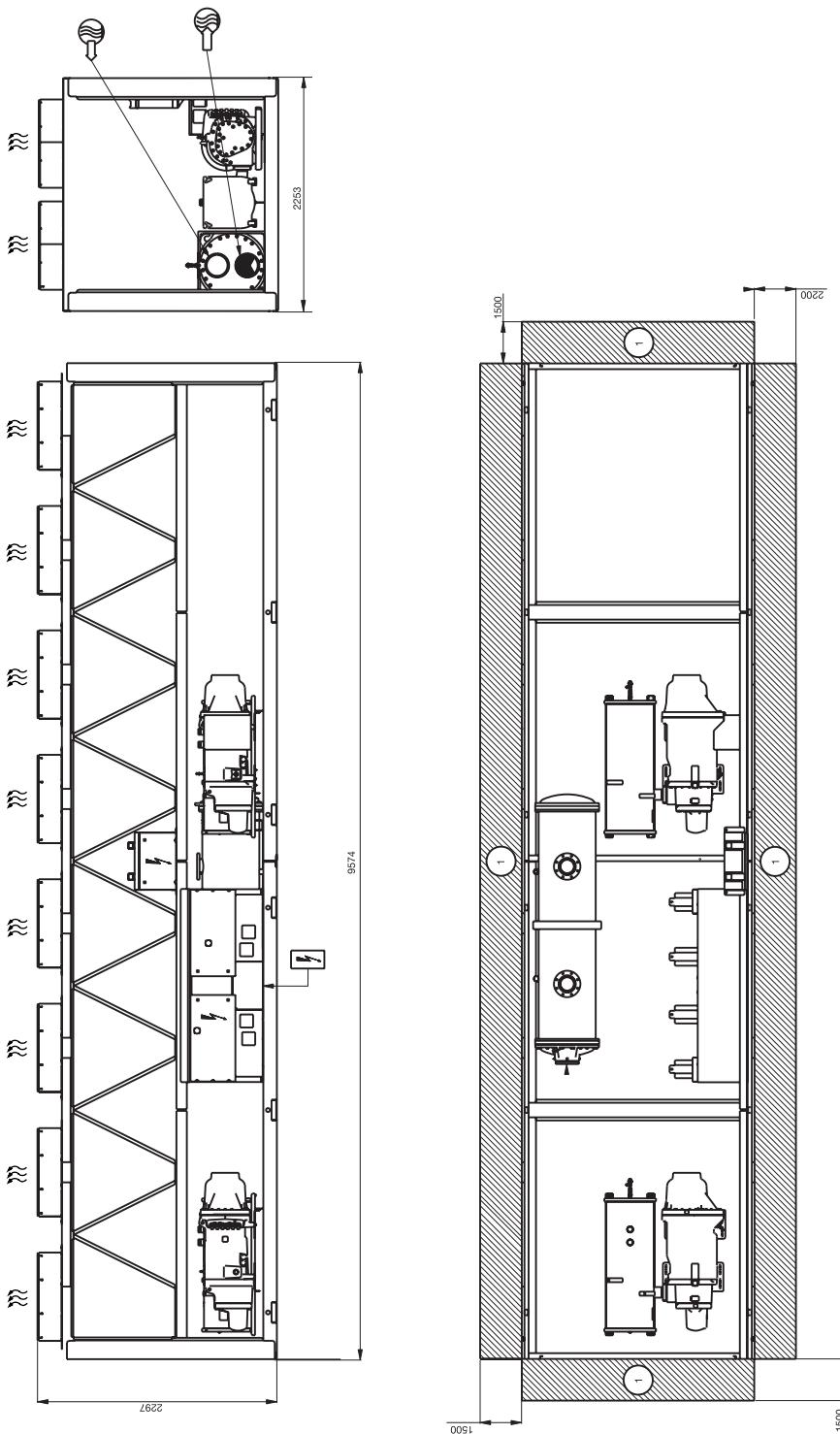
- (1) Required clearances for maintenance and air flow
- (2) Recommended space for evaporator tube removal
- Water inlet
- Water outlet
- Air outlet – do not obstruct
- Power supply connection
- Control circuit connection

NOTE:

Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings, available on request.

Dimensions/clearances

30XA 1002 - MCHX heat exchanger (standard)
30XA 902-1002 - Cu/Al heat exchanger (option 255)



Legend:
All dimensions are given in mm.

- (1) Required clearances for maintenance and air flow
- (2) Recommended space for evaporator tube removal
- Water inlet
- Water outlet
- Air outlet – do not obstruct
- Power supply connection
- Control circuit connection

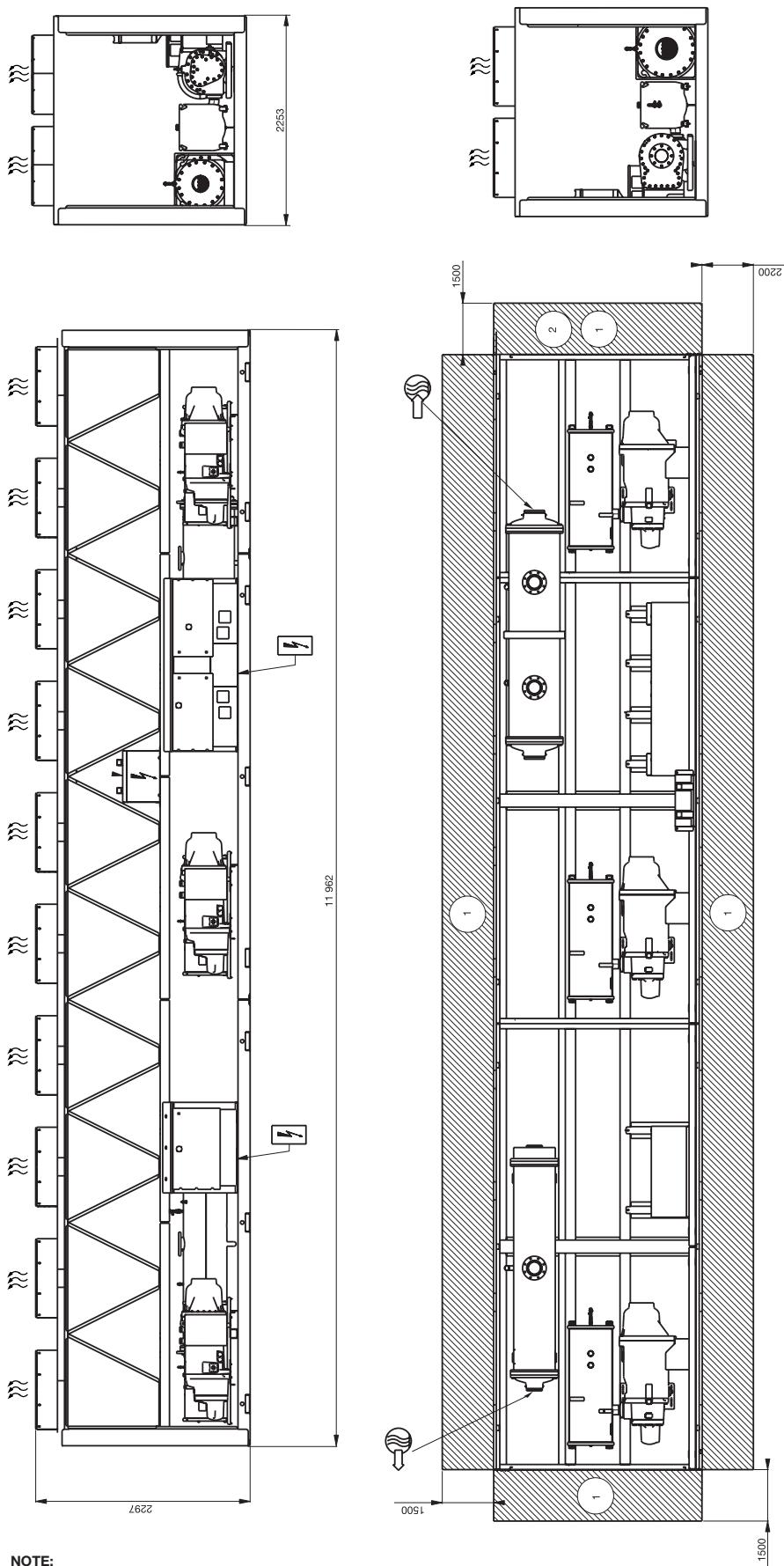
NOTE:

Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings, available on request.

Dimensions/clearances

30XA 1102-1352 - MCHX heat exchanger (standard)

30XA 1102-1352 - Cu/Al heat exchanger (option 255)



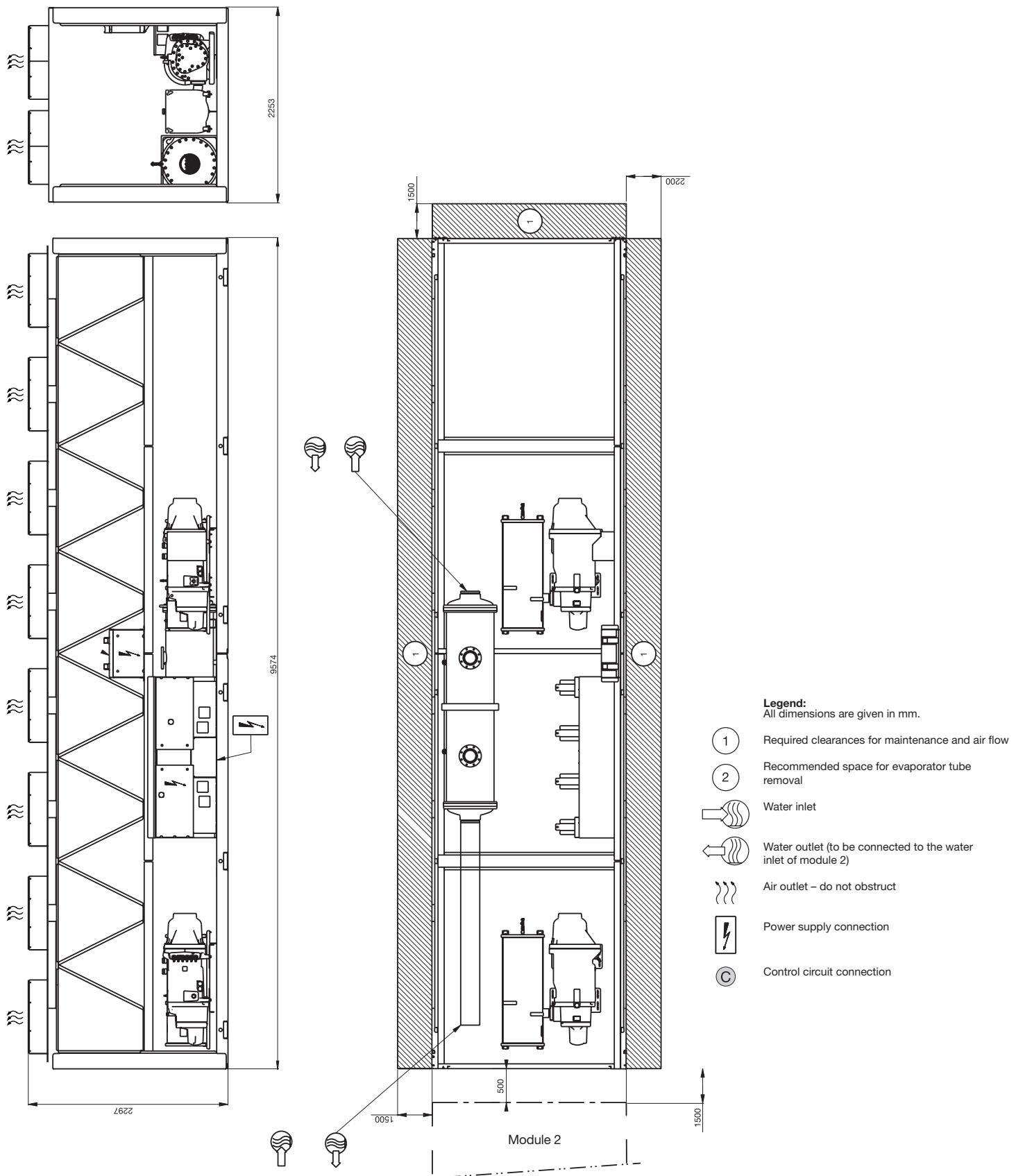
NOTE:

Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings, available on request.

Dimensions/clearances

30XA 1402-1502, module 1/2 - MCHX heat exchanger (standard)

30XA 1402-1502, module 1/2 - Cu/Al heat exchanger (option 255)

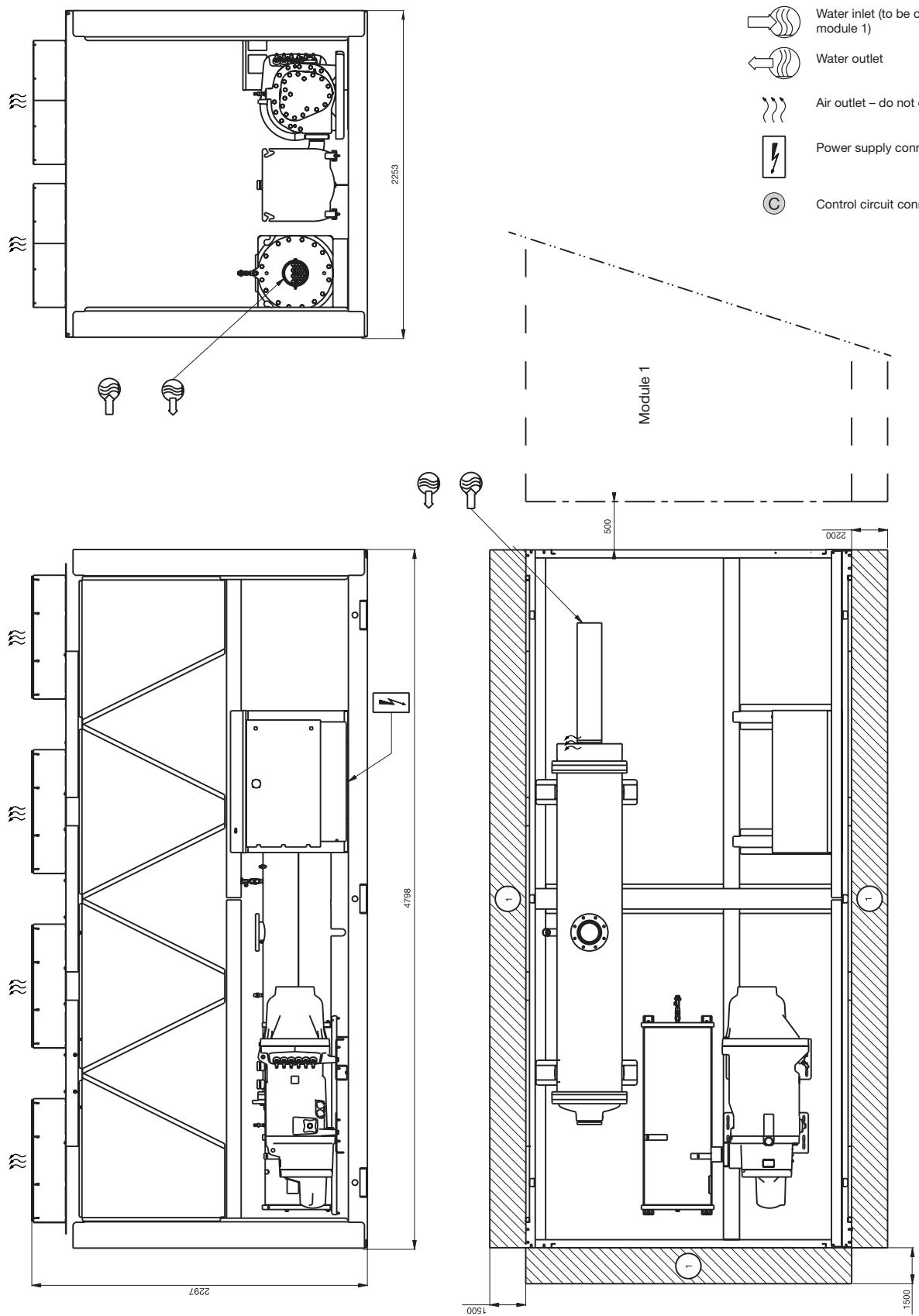


NOTE:

Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings, available on request.

Dimensions/clearances

30XA 1402-1502, module 2/2 - MCHX heat exchanger (standard)
30XA 1402-1502, module 2/2 - Cu/Al heat exchanger (option 255)



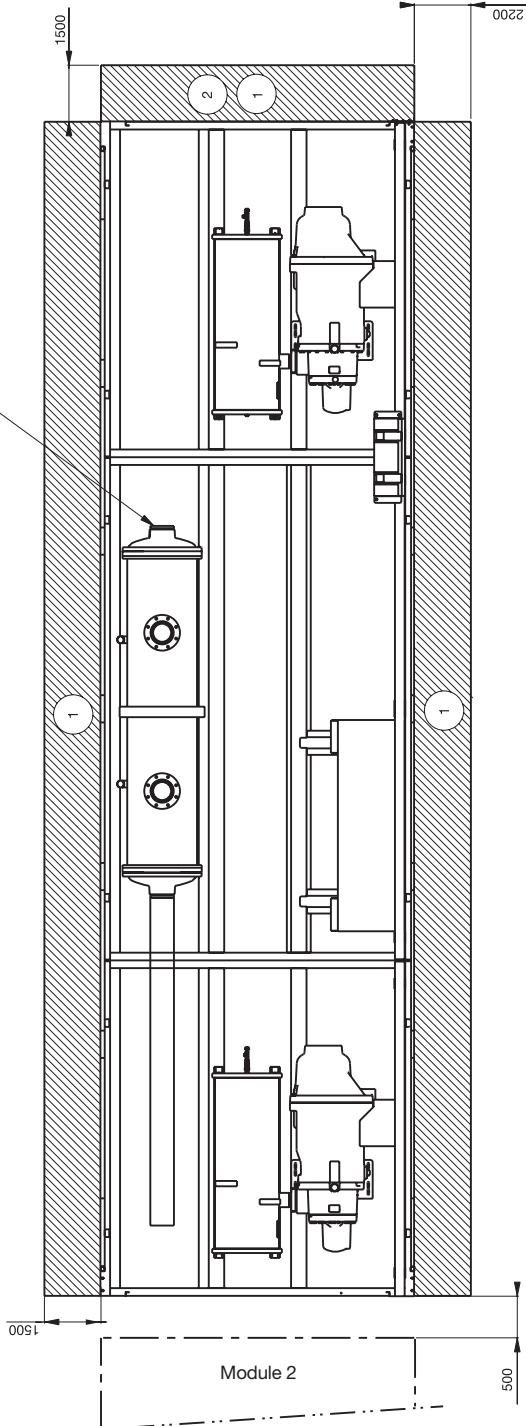
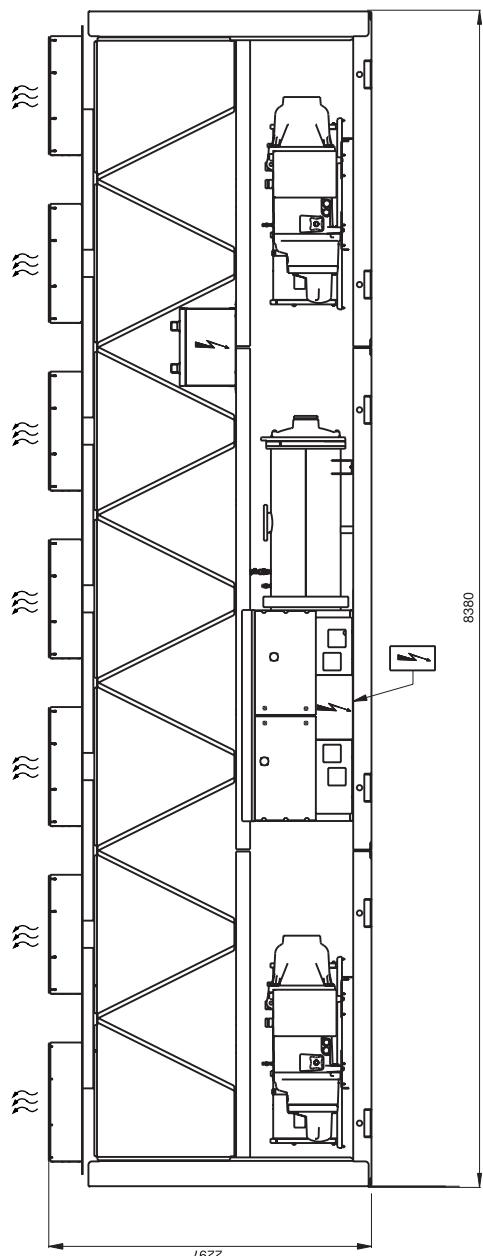
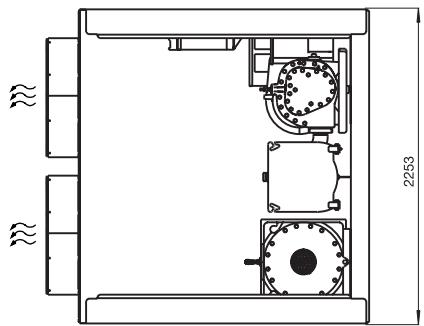
NOTE:

Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings, available on request.

Unit sizes 1402-1502 are supplied in two field-assembled modules (connection pipe completion to be done by the installer).

Dimensions/clearances

30XA 1702, module 1/2 - MCHX heat exchanger (standard)
30XA 1702, module 1/2 - Cu/Al heat exchanger (option 255)



Legend:
All dimensions are given in mm.

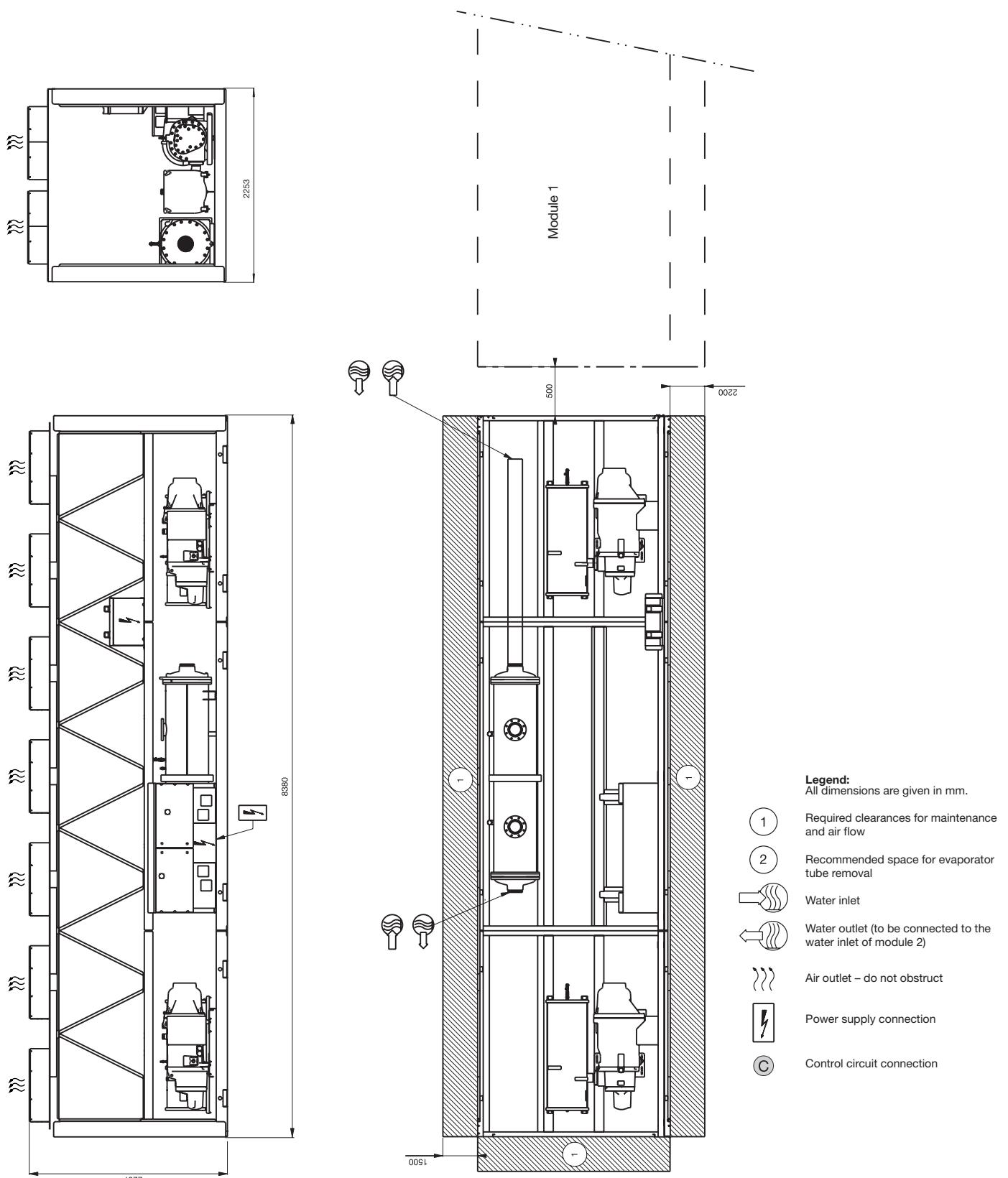
- (1) Required clearances for maintenance and air flow
- (2) Recommended space for evaporator tube removal
- Water inlet
- Water outlet (to be connected to the water inlet of module 2)
- Air outlet – do not obstruct
- Power supply connection
- (C) Control circuit connection

NOTE:

Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings, available on request.
Unit size 1702 is supplied in two field-assembled modules (connection pipe completion to be done by the installer).

Dimensions/clearances

30XA 1702, module 2/2 - MCHX heat exchanger (standard)
 30XA 1702, module 2/2 - Cu/Al heat exchanger (option 255)



NOTE:

Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings, available on request.
 Unit size 1702 is supplied in two field-assembled modules (connection pipe completion to be done by the installer).

Cooling capacities (SI)

Unit with MCHX heat exchanger (standard)

High ambient temperature unit - LWT = 5°C											
Air temperature, °C											
30		35		40		46		49		52	
CAP kW	COMP kW	COOL kW	COOL kW	CAP kW	COMP UNIT kW	COOL kW	CAP kW	COMP UNIT kW	COOL kW	COMP kW	COOL kW
30XA		I/s kPa	I/s kPa		I/s kPa	I/s kPa		I/s kPa	I/s kPa	I/s kPa	I/s kPa
252	267	69	79	13	257	76	12	247	84	93	12
302	294	77	86	14	282	84	93	102	13	12	253
352	320	84	93	15	307	93	102	15	292	101	110
402	382	96	108	18	316	105	117	18	305	115	127
452	440	113	125	21	342	124	136	20	320	136	148
502	496	124	138	24	347	136	150	23	311	149	163
602	599	154	171	29	42	169	186	28	39	185	202
702	660	163	182	31	34	178	197	30	32	195	214
752	708	190	209	34	35	193	208	226	33	228	246
802	773	202	223	37	33	196	222	242	36	243	263
852	818	206	230	39	36	199	226	249	38	248	271
902	878	232	256	42	34	204	254	278	40	32	302
1002	976	249	278	46	34	212	272	301	45	32	305
1102	1119	281	312	53	39	210	292	338	51	36	308
1202	1216	314	347	58	40	214	344	376	56	38	312
1302	1322	346	379	63	44	217	379	412	61	41	322
1352	1411	380	411	67	41	1360	417	448	65	38	306
1402	1433	363	404	68	43	1383	397	437	60	40	330
1502	1489	375	416	71	44	1436	411	451	68	41	380
1702	1635	413	459	78	53	1578	452	498	75	50	1517

High ambient temperature unit - LWT = 6°C											
Air temperature, °C											
30		35		40		46		49		52	
CAP kW	COMP kW	COOL kW	COOL kW	CAP kW	COMP UNIT kW	COOL kW	CAP kW	COMP UNIT kW	COOL kW	COMP kW	COOL kW
30XA		I/s kPa	I/s kPa		I/s kPa	I/s kPa		I/s kPa	I/s kPa	I/s kPa	I/s kPa
252	276	71	80	13	14	266	77	86	13	255	94
302	303	78	87	14	14	291	86	95	14	278	103
352	330	86	95	16	17	316	94	103	15	301	112
402	395	97	109	19	33	381	106	118	18	311	128
452	454	115	127	22	36	438	127	138	21	341	139
502	511	126	140	24	35	493	138	152	23	333	151
602	619	157	174	29	44	597	172	189	28	574	188
702	681	165	185	32	36	657	181	200	31	632	198
752	730	193	212	35	36	705	211	230	34	678	231
802	797	206	226	38	34	769	225	245	37	739	257
852	843	210	233	40	38	813	230	253	39	782	275
902	905	236	260	43	36	873	259	282	42	333	283
1002	1007	253	282	48	36	971	277	306	46	333	304
1102	1153	285	316	55	41	1113	312	343	53	380	351
1202	1254	319	352	60	42	1210	349	382	58	401	415
1302	1362	352	385	65	46	1314	386	419	63	423	456
1352	1454	388	419	69	43	1401	425	455	67	40	1345
1402	1478	370	410	70	45	1425	404	444	68	42	1370
1502	1534	382	422	73	46	1479	418	458	70	43	1421
1702	1684	420	466	80	56	1625	459	505	77	52	1562

High ambient temperature unit - LWT = 5°C											
Air temperature, °C											
30		35		40		46		49		52	
CAP kW	COMP kW	COOL kW	COOL kW	CAP kW	COMP UNIT kW	COOL kW	CAP kW	COMP UNIT kW	COOL kW	COMP kW	COOL kW
30XA		I/s kPa	I/s kPa		I/s kPa	I/s kPa		I/s kPa	I/s kPa	I/s kPa	I/s kPa
252	276	71	80	13	14	266	77	86	13	255	94
302	303	78	87	14	14	291	86	95	14	278	103
352	330	86	95	16	17	316	94	103	15	301	112
402	395	97	109	19	33	381	106	118	18	311	128
452	454	115	127	22	36	438	127	138	21	341	139
502	511	126	140	24	35	493	138	152	23	333	151
602	619	157	174	29	44	597	172	189	28	574	188
702	681	165	185	32	36	657	181	200	31	632	198
752	730	193	212	35	36	705	211	230	34	678	231
802	797	206	226	38	34	769	225	245	37	739	257
852	843	210	233	40	38	813	230	253	39	782	275
902	905	236	260	43	36	873	259	282	42	333	283
1002	1007	253	282	48	36	971	277	306	46	333	304
1102	1153	285	316	55	41	1113	312	343	53	380	351
1202	1254	319	352	60	42	1210	349	382	58	401	415
1302	1362	352	385	65	46	1314	386	419	63	423	456
1352	1454	388	419	69	43	1401	425	455	67	40	1345
1402	1478	370	410	70	45	1425	404	444	68	42	1370
1502	1534	382	422	73	46	1479	418	458	70	43	1421
1702	1684	420	466	80	56	1625	459	505	77	52	1562

Legend

LWT Leaving water temperature

CAP kW Cooling capacity

COMP kW Compressor power input

UNIT kW Unit power input (compressors, fans and control circuit)

COOL I/s Evaporator water flow rate

COOL kPa Evaporator pressure drop

Application data:

Standard units, refrigerant: R134a

Evaporator temperature rise: 5 K

Evaporator fluid: chilled water

Fouling factor: 0.18 × 10⁻⁴ (m² K/W)

Performances in accordance with EN 14511.

High ambient temperature unit - LWT = 7.2°C

Air temperature, °C

	30	35	40	46	49	52
30XA	CAP kW	COMP UNIT kW	COOL kW	CAP kW	COMP UNIT kW	COOL kW
	I/s kPa	I/s kPa	kW	I/s kPa	I/s kPa	kW
252	286	72	81	14	15	276
302	315	80	89	15	15	302
352	343	88	97	16	18	328
402	409	99	111	20	25	395
452	470	118	130	22	38	454
502	530	128	143	25	38	511
602	642	160	177	31	47	620
702	706	169	188	34	38	681
752	757	197	216	36	39	730
802	826	210	230	39	36	797
852	874	214	238	42	40	842
902	938	241	265	45	38	904
1002²	1043	259	287	50	38	1005
1102	1196	292	323	57	43	1151
1202	1299	326	359	62	45	1254
1302	1412	360	393	67	49	1361
1352	1506	397	428	72	46	1450
1402	1532	378	418	73	48	1476
1502	1590	391	431	76	49	1552
1702²	1746	429	475	83	60	1684

High ambient temperature unit - LWT = 10°C

Air temperature, °C

	30	35	40	46	49	52
30XA	CAP kW	COMP UNIT kW	COOL kW	CAP kW	COMP UNIT kW	COOL kW
	I/s kPa	I/s kPa	kW	I/s kPa	I/s kPa	kW
252	312	75	84	15	17	300
302	342	83	93	16	18	328
352	372	92	101	18	21	356
402	446	103	115	21	40	430
452	510	124	136	24	44	492
502	575	135	149	27	43	554
602	698	168	185	33	54	674
702	767	177	197	37	43	739
752	823	207	226	39	44	793
802	898	220	241	43	42	865
852	948	225	249	45	46	914
902	1019	254	277	49	43	981
1002²	1132	272	301	54	43	1091
1102²	1297	306	337	62	50	1250
1202²	1409	343	376	67	52	1359
1302²	1532	379	412	73	56	1476
1352²	1632	419	450	78	52	1570
1402²	1662	397	438	79	55	1601
1502²	1724	411	451	82	56	1660
1702²	1894	450	497	90	69	1825

Legend

- LWT Leaving water temperature
- CAP kW Cooling capacity
- COMP kW Compressor power input
- UNIT kW Unit power input (compressors, fans and control circuit)
- COOL I/s Evaporator water flow rate
- COOL kPa Evaporator pressure drop

Application data:

- Standard units, refrigerant: R134a
- Evaporator temperature rise: 5 K
- Evaporator fluid: chilled water
- Fouling factor: 0.18 × 10⁻⁴ (m² K/W)

Performances in accordance with EN 14511.

High ambient temperature unit - LWT = 5°C

Air temperature, °C																								
30				35				40				46				49				52				
30XA	CAP kW	COMP kW	COOL kW	CAP I/s	COOL kW	CAP kPa	CAP I/s	COMP UNIT kW	COOL kW	CAP kW	COMP UNIT kW	COOL kW	CAP kW	COMP UNIT kW	COOL kW	CAP kW	COMP UNIT kW	COOL kW	CAP kW	COMP UNIT kW	COOL kW	CAP kW	COMP UNIT kW	
252	266	72	82	13	13	256	79	89	12	12	245	87	96	12	11	231	97	106	11	10	223	102	111	11
302	290	79	88	14	13	279	86	96	13	12	266	95	104	13	11	250	106	115	12	10	241	112	121	11
352	318	83	92	15	16	305	91	101	15	15	291	100	110	14	14	273	112	121	13	12	263	119	128	13
402	378	101	113	18	31	365	111	123	17	29	351	122	134	17	27	333	136	147	16	24	324	143	155	15
452	438	116	129	21	34	423	128	140	20	32	406	140	152	19	30	385	157	168	18	27	374	166	177	18
502	489	126	140	23	33	471	138	153	22	31	452	152	166	22	28	428	170	184	20	26	415	180	194	20
602	600	157	174	29	42	578	172	189	28	39	556	188	205	26	36	526	210	226	25	33	511	222	238	24
702	655	169	188	31	33	631	185	204	30	31	606	202	221	29	29	574	226	245	27	26	557	239	258	27
752	706	192	212	34	34	681	210	230	32	32	656	230	250	31	30	623	257	277	30	27	606	272	292	29
802	769	205	226	37	32	741	224	245	35	30	712	245	266	34	28	675	274	295	32	25	655	290	311	31
852	810	214	237	39	36	781	235	258	37	33	750	257	280	36	31	710	288	310	34	28	690	305	327	33
902	873	240	263	42	34	842	262	286	40	31	809	287	311	39	29	768	321	344	37	27	746	340	362	36
1002	959	259	286	46	33	924	284	311	44	31	888	311	338	42	29	841	348	374	40	26	817	369	395	39
1102	1107	293	323	53	38	1068	320	351	51	36	1026	351	381	49	33	972	392	422	46	30	944	415	444	45
1202	1208	326	359	58	40	1166	357	390	56	37	1121	392	424	53	35	1063	438	469	51	31	1033	463	494	49
1302	1314	359	392	63	44	1267	394	427	60	41	1217	432	465	58	38	1153	484	516	55	34	1040	463	494	50
1352	1410	392	423	67	41	1357	430	460	65	38	1303	471	502	62	35	1233	528	557	59	32	942	414	443	45
1402	1415	375	415	67	42	1365	410	450	65	39	1312	449	489	62	36	1244	503	542	59	33	1202	528	566	57
1502	1475	389	429	70	43	1422	426	466	68	40	1365	467	507	65	37	1294	523	561	62	34	1250	549	588	60
1702	1619	427	473	77	52	1561	467	513	74	49	1500	512	558	71	45	1422	573	617	68	41	1380	606	650	66
902	900	244	268	43	35	867	267	290	41	33	833	292	315	40	31	790	326	349	38	28	768	345	368	37
1002	989	264	291	47	35	952	289	316	45	32	914	317	343	44	30	866	354	380	41	27	841	375	401	40
1102	1141	298	328	54	40	1100	326	356	52	37	1057	357	387	50	35	1002	398	428	48	31	973	421	451	46
1202	1246	332	365	59	42	1201	363	396	57	39	1155	398	430	55	36	1095	445	476	52	33	1064	476	502	51
1302	1354	366	399	65	46	1305	401	434	62	43	1254	439	472	60	40	1182	483	520	56	36	1072	470	502	51
1352	1452	400	431	69	43	1388	438	469	67	40	1342	480	510	64	37	1236	517	546	59	32	979	420	450	47
1402	1459	381	422	70	44	1407	417	457	67	41	1351	457	497	64	38	1282	511	550	61	35	1230	532	570	59
1502	1520	396	436	72	45	1464	434	473	70	42	1406	475	515	67	39	1332	531	570	63	35	1274	551	589	61
1702	1667	434	480	79	55	1607	475	521	77	51	1544	521	566	74	48	1464	582	627	70	43	1409	609	653	67

High ambient temperature unit - LWT = 6°C
Air temperature, °C

Air temperature, °C																								
30				35				40				46				49				52				
30XA	CAP kW	COMP kW	COOL kW	CAP I/s	COOL kW	CAP kPa	CAP I/s	COMP UNIT kW	COOL kW	CAP kW	COMP UNIT kW	COOL kW	CAP kW	COMP UNIT kW	COOL kW	CAP kW	COMP UNIT kW	COOL kW	CAP kW	COMP UNIT kW	COOL kW	CAP kW	COMP UNIT kW	
252	274	73	83	13	14	264	81	90	13	13	253	88	97	12	12	238	99	107	11	11	230	104	113	11
302	300	80	89	14	14	288	88	97	14	13	275	106	116	13	12	258	108	117	12	11	249	114	123	11
352	328	84	94	16	17	315	93	102	15	16	300	102	111	14	14	281	114	123	13	13	272	121	130	12
402	390	103	115	19	32	377	113	125	18	30	362	123	135	17	28	344	137	149	16	26	334	145	157	16
452	452	118	130	22	36	436	130	142	21	33	419	142	154	20	31	397	159	171	19	28	385	168	180	17
502	504	128	143	24	34	486	141	155	23	32	466	154	168	22	30	441	173	187	21	27	428	183	197	20
602	619	160	177	30	44	597	175	192	28	41	574	191	208	27	38	544	214	230	26	35	226	242	253	28
702	675	172	191	32	35	651	188	207	31	33	625	206	225	30	30	592	230	248	28	28	574	243	261	27
752	728	195	216	35	36	703	214	234	33	34	676	234	254	32	32	642	261	281	31	29	624	276	295	30
802	792	208	230	38	34	764	228	249	36	32	733	249	271	35	29	695	279	299	33	27	675	295	315	32
852	835	218	241	40	37	805	239	262	38	35	773	262	284	37	33	732	292	315	35	29	710	309	332	34
902	900	244	268	43	35	867	267	290	41	33	833	292	315	40	31	790	326	349	38	28	768	345	368	37
1002	1089	264	291	47	35	952	289	316	45	32	914	317	343	44	30	866	354	380	41	27	841	375	401	40
1102	1141	298	328	54	40	1100	326	356	52	37	1057	357	387	50	35	1002	398	428	48	31	973	421	451	46
1202	1246	332	365	59	42	1201	363	396	57	39	1155	398	430	55	36	1095	445	476	52	33	1064	476	502	51
1302	1354	366	399	65	46	1305	401	434	62	43	1254	439	472	60	40	1182	483	520	5					

High ambient temperature unit - LWT = 7.2°C

Air temperature, °C

	30						35						40						46						49					
30XA	CAP kW	COMP kW	UNIT kW	COOL kW	COOL I/s kPa	CAP kW	COMP kW	UNIT kW	COOL kW	COOL I/s kPa	CAP kW	COMP kW	UNIT kW	COOL kW	COOL I/s kPa	CAP kW	COMP kW	UNIT kW	COOL kW	COOL I/s kPa	CAP kW	COMP kW	UNIT kW	COOL kW	COOL I/s kPa	CAP kW	COMP kW	UNIT kW	COOL kW	COOL I/s kPa
252	285	75	84	14	15	274	82	91	13	14	262	90	99	13	13	247	100	109	12	11	239	105	114	11	11	230	111	120	11	10
302	311	81	91	15	15	298	89	99	14	14	285	98	107	14	13	268	110	119	13	11	259	116	125	12	11	249	123	132	12	10
352	341	86	96	16	18	327	94	104	16	16	311	104	113	15	15	292	116	125	14	13	282	123	132	13	13	272	131	140	13	12
402	404	105	117	19	34	390	115	127	19	32	375	126	138	18	30	305	140	152	21	20	345	147	159	16	26	327	159	163	16	23
452	468	121	133	22	38	451	132	144	22	35	434	145	157	21	33	411	162	174	22	29	444	176	190	22	21	399	171	183	19	28
502	522	131	145	25	36	503	143	158	24	34	483	157	171	23	32	457	176	190	23	29	444	186	200	21	21	412	186	200	20	24
602	642	180	180	31	47	619	178	195	30	44	595	195	212	28	41	564	218	234	27	37	547	230	246	26	35	494	222	238	24	29
702	700	175	194	33	37	675	192	211	32	35	648	210	229	31	32	613	234	253	29	29	595	248	266	28	28	531	234	252	25	22
752	755	199	220	36	38	728	218	238	35	36	700	238	259	33	34	665	286	32	30	30	646	282	301	31	29	579	269	288	28	24
802	821	213	234	39	36	791	232	254	38	34	760	254	275	36	31	720	284	305	34	28	691	296	316	33	26	558	249	269	27	18
852	865	223	246	41	40	833	244	267	40	37	800	267	290	38	34	758	298	321	36	31	729	312	334	35	29	592	267	289	28	20
902	932	249	273	44	37	898	272	296	43	35	863	298	321	41	32	818	333	356	39	29	771	338	360	37	26	587	268	290	28	16
1002²	1024	270	297	49	37	946	295	322	47	34	946	323	350	45	32	896	361	387	43	29	850	371	396	41	26	656	305	330	31	16
1102	1183	304	335	56	42	1141	333	353	54	42	1096	364	394	52	37	1038	406	436	50	33	1001	426	455	48	31	815	365	394	39	21
1202	1291	339	372	62	44	1245	371	404	59	42	1196	406	438	57	39	1134	453	485	54	35	1086	470	501	52	32	846	414	440	40	20
1302²	1403	374	407	67	49	1352	409	442	64	45	1298	449	481	62	42	1216	494	526	58	37	1106	475	506	53	31	932	433	464	44	23
1352	1504	409	440	72	45	1447	448	479	69	42	1388	491	521	66	39	1250	511	541	60	32	1022	428	458	49	22	847	394	423	40	16
1402²	1512	390	430	72	47	1457	426	466	69	43	1399	466	506	67	40	1326	521	560	63	37	1249	529	567	60	33	975	435	472	47	21
1502²	1575	405	445	75	48	1516	443	483	72	45	1455	485	524	69	41	1378	542	581	66	37	1292	547	585	62	33	1012	457	494	48	21
1702²	1729	443	489	82	59	1666	485	531	79	55	1600	531	577	76	51	1516	594	638	72	46	1453	617	661	69	42	1190	533	576	57	29

High ambient temperature unit - LWT = 10°C

Air temperature, °C

	30						35						40						46						49					
30XA	CAP kW	COMP kW	UNIT kW	COOL kW	COOL I/s kPa	CAP kW	COMP kW	UNIT kW	COOL kW	COOL I/s kPa	CAP kW	COMP kW	UNIT kW	COOL kW	COOL I/s kPa	CAP kW	COMP kW	UNIT kW	COOL kW	COOL I/s kPa	CAP kW	COMP kW	UNIT kW	COOL kW	COOL I/s kPa	CAP kW	COMP kW	UNIT kW	COOL kW	COOL I/s kPa
252	310	78	87	15	17	298	85	94	14	16	285	93	102	14	15	268	104	113	13	13	259	109	118	12	12	250	116	124	12	11
302	338	85	95	16	17	325	93	103	15	16	310	102	111	15	15	291	114	123	14	13	281	121	130	13	12	271	128	137	13	11
352	371	90	100	18	20	355	99	108	17	19	338	108	118	16	17	317	121	131	15	15	306	129	138	15	14	296	136	145	14	14
402	439	110	122	21	39	424	120	132	20	37	407	131	143	19	34	386	145	157	18	31	375	153	165	18	29	338	148	159	16	24
452	508	126	139	24	43	490	138	150	23	40	470	151	163	22	38	446	169	181	21	34	433	179	190	21	22	381	164	176	18	25
502	567	137	152	27	42	546	150	164	26	39	524	164	178	25	36	496	184	198	24	33	482	195	209	23	31	424	179	193	20	24
602	699	171	188	33	54	674	187	204	32	50	647	204	221	31	47	613	228	244	29	42	595	241	257	28	40	498	208	224	24	29
702	761	184	203	36	43	733	201	220	35	40	704	219	238	34	37	666	245	264	32	33	646	259	278	31	32	536	220	238	26	22
752	822	209	229	39	44	792	228	248	38	41	761	249	269	36	38	722	278	298	34	35	701	294	313	33	33	552	237	256	26	21
802	892	223	245	43	41	859	244	265	41	38	824	267	288	39	36	780	298	318	37	32	723	295	316	35	28	590	247	267	28	19
852	939	234	257	45	45	904	256	279	43	42	868	280	302	41	39	821	312	336	45	37	886	348	371	42	34	324	347	367	37	22
902	1013	262	285	48	43	975	286	309	47	40	935	312	336	51	49	905	329	349	49	36	896	379	404	46	33	318	332	333	33	19
1002²	1111	284	310	53	42	1069	310	336	51	39	1025	339	357	51	49	1025	361	381	51	47	1029	413	442	54	38	1029	413	442	37	18
1102²	1284	319	350	61	49	1237	349	379	59	51	1188	381	411	57	47	1125	425	455	54	38	1029	413	442	54	38	826	347	376	39	21
1202²	1401	356	389	67	51	1349	389	422	64	48	1296	425	458	62	44	1228	474	506	59	40	1104	451	482	53	33	886	378	409	42	22
1302²	1523	393	426	73	56	1466	430	463	70	52	1406	471	503	67	48	1253	475	507	60	39</td										

Cooling capacities (Imperial)

Unit with MCHX heat exchanger (standard)

High ambient temperature unit - LWT = 42°F																																		
Air temperature, (°F)																																		
85				95				105				115				120																		
CAP	Ton	COMP UNIT	COOL COOL kW	CAP	gpm	ft WG	Ton	COMP UNIT	COOL COOL kW	CAP	gpm	ft WG	Ton	COMP UNIT	COOL COOL kW	CAP	gpm	ft WG	Ton															
30XA		kW	kW					kW	kW					kW	kW			ft WG	Ton															
252	78	69	79	185	3.8	74	77	86	178	3.5	71	85	94	169	3.2	67	94	103	160	2.9	65	99	108	155	2.7	63	104	113	150	2.6				
302	85	85	86	204	3.9	82	85	94	195	3.6	77	94	103	185	3.3	73	105	113	174	2.9	71	110	119	169	2.8	68	116	124	163	2.6				
352	93	84	93	222	4.6	89	93	102	212	4.2	84	106	118	255	8.4	102	112	200	3.8	79	115	124	188	3.4	76	130	130	182	3.2	74	128	137	176	3.0
402	111	95	108	265	9.0	107	106	118	255	8.4	102	117	129	245	7.7	98	129	141	233	7.1	95	136	148	227	6.8	92	143	154	221	6.4				
452	128	113	125	305	9.7	123	126	137	294	9.1	117	139	151	281	8.4	112	154	166	267	7.6	109	162	174	260	7.3	106	171	182	252	6.9				
502	144	124	138	344	9.6	138	137	151	331	8.9	132	152	166	316	8.2	126	168	182	300	7.5	122	177	191	292	7.1	116	183	197	277	6.5				
602	174	154	171	416	11.9	167	170	187	400	11.0	160	188	205	383	10.2	153	209	225	365	9.3	148	220	236	355	8.9	144	231	247	345	8.4				
702	192	162	192	458	9.7	184	180	199	440	9.0	176	199	218	421	8.3	168	230	239	401	7.6	163	232	250	390	7.2	159	244	263	379	6.8				
752	206	190	209	492	9.9	198	210	228	473	9.2	189	232	251	453	8.5	180	257	255	431	7.8	176	271	289	420	7.4	165	271	289	393	6.6				
802	224	202	223	537	9.3	216	224	244	516	8.7	207	248	268	494	8.0	197	274	294	470	7.3	192	289	309	458	7.0	178	286	305	425	6.1				
852	237	206	230	568	10.3	228	228	251	545	9.6	218	252	275	522	8.9	208	280	302	497	8.1	202	295	317	484	7.7	190	296	318	453	6.9				
902	255	225	256	610	9.7	245	257	280	586	9.0	235	284	307	561	8.3	223	315	338	534	7.6	218	332	354	520	7.3	199	322	345	475	6.1				
1002	284	249	278	678	9.7	272	275	303	651	9.0	261	305	323	623	8.3	248	338	365	593	7.6	242	356	383	578	7.2	224	354	380	536	6.3				
1102	325	281	312	778	11.1	313	310	341	748	10.3	299	343	374	716	9.5	285	380	410	681	8.7	278	400	430	663	8.2	262	406	435	626	7.4				
1202	354	314	347	846	11.5	340	347	380	813	10.7	326	384	416	778	9.8	310	426	457	742	9.0	302	448	480	723	8.6	278	439	470	665	7.3				
1302	385	347	380	919	12.6	369	383	416	883	11.7	354	425	457	845	10.7	337	471	503	804	9.8	321	481	513	767	9.0	289	462	493	692	7.4				
1352	410	381	412	980	11.7	394	421	452	941	10.8	376	467	497	899	9.9	358	518	548	855	9.1	322	490	519	769	7.4	263	425	454	628	5.1				
1402	417	364	404	997	12.2	401	402	442	958	11.3	384	445	484	917	10.5	366	493	532	874	9.6	356	519	558	851	9.1	313	484	520	748	7.2				
1502	433	376	413	1035	12.5	415	416	455	994	11.6	398	460	499	951	10.7	379	510	549	906	9.8	369	538	576	881	9.3	320	496	533	765	7.1				
1702	476	413	459	1137	15.2	457	456	503	1092	14.1	437	505	551	1046	13.0	417	560	605	996	11.9	406	591	635	969	11.3	365	567	610	871	9.2				

High ambient temperature unit - LWT = 44°F															
Air temperature, (°F)															
85				95				105				115			
30kA	CAP Ton	COMP kW	UNIT kW	Cool kW	Cool kW	CAP gpm ft WG	Ton	COMP kW	UNIT kW	Cool kW	Cool kW	CAP gpm ft WG	Ton	COMP kW	UNIT kW
252	80	70	80	192	4.0	77	.78	184	3.7	73	.86	95	.69	104	3.1
302	88	78	87	211	4.1	84	.87	96	202	3.8	.96	105	.76	106	3.5
352	96	86	95	230	4.9	92	.95	104	219	4.4	.87	105	.79	114	4.0
402	115	109	127	275	9.5	111	107	119	265	8.9	106	126	101	117	207
452	132	116	127	316	10.3	127	128	140	304	9.6	121	131	253	8.2	142
502	149	126	140	356	10.1	143	139	154	342	9.4	137	154	168	8.8	290
602	180	157	174	431	12.6	173	174	190	415	11.7	166	192	209	9.7	327
702	198	166	185	474	10.2	191	183	202	456	9.5	182	202	221	8.8	173
752	213	193	212	500	10.4	204	214	232	489	9.7	196	236	255	8.0	186
802	232	206	226	555	9.8	223	228	248	534	9.1	213	252	272	8.4	203
852	246	210	234	587	10.9	236	232	256	564	10.2	226	257	280	9.4	215
902	264	237	261	631	10.2	253	261	285	606	9.5	242	289	312	8.8	231
1002	293	254	282	700	10.2	282	280	309	673	9.5	269	310	338	8.8	256
1102	337	286	317	805	11.7	323	316	347	774	10.9	310	350	387	9.2	287
1202	366	320	353	875	12.2	352	354	386	841	11.3	337	391	424	10.4	321
1302	398	353	387	951	13.3	382	391	424	914	12.3	365	433	465	9.5	312
1352	424	389	420	1014	12.3	407	430	461	973	11.4	389	476	507	9.0	369
1402	431	411	411	1032	12.9	410	449	491	991	12.0	396	453	493	9.8	378
1502	448	384	424	1071	13.2	430	424	463	1028	12.3	411	469	502	10.1	365
1702	492	421	468	1176	16.1	472	465	511	1130	14.9	452	515	560	1082	13.7
120				125				130				135			
30kA	CAP Ton	COMP kW	UNIT kW	Cool kW	Cool kW	CAP gpm ft WG	Ton	COMP kW	UNIT kW	Cool kW	Cool kW	CAP gpm ft WG	Ton	COMP kW	UNIT kW
252	80	70	80	192	4.0	77	.78	184	3.7	73	.86	95	.69	104	3.1
302	88	78	87	211	4.1	84	.87	96	202	3.8	.96	105	.76	106	3.5
352	96	86	95	230	4.9	92	.95	104	219	4.4	.87	105	.79	114	4.0
402	115	109	127	275	9.5	111	107	119	265	8.9	106	126	101	117	207
452	132	116	127	316	10.3	127	128	140	304	9.6	121	142	153	8.8	290
502	149	126	140	356	10.1	143	139	154	342	9.4	137	154	168	8.8	327
602	180	157	174	431	12.6	173	174	190	415	11.7	166	192	209	9.7	310
702	198	166	185	474	10.2	191	183	202	456	9.5	182	202	221	8.8	173
752	213	193	212	500	10.4	204	214	232	489	9.7	196	236	255	8.0	186
802	232	206	226	555	9.8	223	228	248	534	9.1	213	252	272	8.4	203
852	246	210	234	587	10.9	236	232	256	564	10.2	226	257	280	9.4	215
902	264	237	261	631	10.2	253	261	285	606	9.5	242	289	312	8.8	231
1002	293	254	282	700	10.2	282	280	309	673	9.5	269	310	338	8.8	256
1102	337	286	317	805	11.7	323	316	347	774	10.9	310	350	387	9.2	287
1202	366	320	353	875	12.2	352	354	386	841	11.3	337	391	424	10.4	321
1302	398	353	387	951	13.3	382	391	424	914	12.3	365	433	465	9.5	312
1352	424	389	420	1014	12.3	407	430	461	973	11.4	389	476	507	9.0	369
1402	431	411	411	1032	12.9	410	449	491	991	12.0	396	453	493	9.8	378
1502	448	384	424	1071	13.2	430	424	463	1028	12.3	411	469	502	10.1	365
1702	492	421	468	1176	16.1	472	465	511	1130	14.9	452	515	560	1082	13.7
120				125				130				135			
30kA	CAP Ton	COMP kW	UNIT kW	Cool kW	Cool kW	CAP gpm ft WG	Ton	COMP kW	UNIT kW	Cool kW	Cool kW	CAP gpm ft WG	Ton	COMP kW	UNIT kW
252	80	70	80	192	4.0	77	.78	184	3.7	73	.86	95	.69	104	3.1
302	88	78	87	211	4.1	84	.87	96	202	3.8	.96	105	.76	106	3.5
352	96	86	95	230	4.9	92	.95	104	219	4.4	.87	105	.79	114	4.0
402	115	109	127	275	9.5	111	107	119	265	8.9	106	126	101	117	207
452	132	116	127	316	10.3	127	128	140	304	9.6	121	142	153	8.8	290
502	149	126	140	356	10.1	143	139	154	342	9.4	137	154	168	8.8	327
602	180	157	174	431	12.6	173	174	190	415	11.7	166	192	209	9.7	310
702	198	166	185	474	10.2	191	183	202	456	9.5	182	202	221	8.8	173
752	213	193	212	500	10.4	204	214	232	489	9.7	196	236	255	8.0	186
802	232	206	226	555	9.8	223	228	248	534	9.1	213	252	272	8.4	203
852	246	210	234	587	10.9	236	232	256	564	10.2	226	257	280	9.4	215
902	264	237	261	631	10.2	253	261	285	606	9.5	242	289	312	8.8	231
1002	293	254	282	700	10.2	282	280	309	673	9.5	269	310	338	8.8	256
1102	337	286	317	805	11.7	323	316	347	774	10.9	310	350	387	9.2	287
1202	366	320	353	875	12.2	352	354	386	841	11.3	337	391	424	10.4	321
1302	398	353	387	951	13.3	382	391	424	914	12.3	365	433	465	9.5	312
1352	424	389	420	1014	12.3	407	430	461	973	11.4	389	476	507	9.0	369
1402	431	411	411	1032	12.9	410	449	491	991	12.0	396	453	493	9.8	378
1502	448	384	424	1071	13.2	430	424	463	1028	12.3	411	469	502	10.1	365
1702	492	421	468	1176	16.1	472	465	511	1130	14.9	452	515	560	1082	13.7
120				125				130				135			
30kA	CAP Ton	COMP kW	UNIT kW	Cool kW	Cool kW	CAP gpm ft WG	Ton	COMP kW	UNIT kW	Cool kW	Cool kW	CAP gpm ft WG	Ton	COMP kW	UNIT kW
252	80	70	80	192	4.0	77	.78	184	3.7	73	.86	95	.69	104	3.1
302	88	78	87	211	4.1	84	.87	96	202	3.8	.96	105	.76	106	3.5
352	96	86	95	230	4.9	92	.95	104	219	4.4	.87	105	.79	114	4.0
402	115	109	127	275	9.5	111	107	119	265	8.9	106	126	101	117	207
452	132	116	127	316	10.3	127	128	140	304	9.6	121	142	153	8.8	290
502	149	126	140	356	10.1	143	139	154	342	9.4	137	154	168	8.8	327
602	180	157	174	431	12.6	173	174	190	415	11.7	166	192	209	9.7	310
702	198	166	185	474	10.2	191	183	202	456	9.5	182	202	221	8.8	173
752	213	193	212	500	10.4	204	214	232	489	9.7	196	236	255	8.0	186
802	232	206	226	555	9.8	223	228	248	534	9.1	213	252	272	8.4	203
852	246	210	234	587	10.9	236	232	256	564	10.2	226	257	280	9.4	215
902	264	237	261	631	10.2	253	261	285	606	9.5	242	289	312	8.8	231
1002	293	254	282	700	10.2	282	280	309	673	9.5	269	310	338	8.8	256
1102	337	286	317	805	11.7	323	316	347	774	10.9	310	350	387	9.2	287
1202	366	320	353	875	12.2	352	354	386	841	11.3	337	391	424	10.4	321
1302	398	353	387	951	13.3	382	391	424	914	12.3	365	433	465	9.5	312
1352	424	389													

Application data:
Legend

Standard units, refrigerant: R134a
 Evaporator temperature rise: 10°F
 Evaporator fluid: chilled water
 Fouling factor: 0.000 1 h ft²/F/Btu

Performances in accordance with EN 14511

High ambient temperature unit - LWT = 42°F

Cooling capacities (Imperial)

Unit with MCHX heat exchanger (standard)

High ambient temperature unit - LWT = 45°F											
Air temperature, (°F)											
85			95			105			115		
30XA	Ton	Cap kW	COMP UNIT kW	COOL kW	COOL CAP ft WG Ton	COMP UNIT kW	COOL kW	COOL CAP ft WG Ton	COMP UNIT kW	COOL kW	COOL CAP ft WG Ton
252	82	71	80	196	4.1	78	79	88	187	3.8	75
302	90	79	88	215	4.2	86	87	96	205	3.9	81
352	98	87	96	234	5.0	93	96	105	223	4.6	88
402	117	98	110	280	9.8	112	108	120	269	9.1	108
452	134	117	129	321	10.6	129	141	309	9.8	123	143
502	151	127	141	362	10.4	145	141	155	348	9.7	139
602	183	158	176	439	12.9	176	175	192	422	12.0	169
702	202	167	187	482	10.5	194	185	204	463	9.8	185
752	216	195	214	517	10.7	208	215	234	497	10.0	199
802	236	208	228	565	10.1	227	230	250	543	9.4	217
852	250	212	236	597	11.2	240	235	258	574	10.4	229
902	268	239	263	641	10.5	257	264	287	616	9.8	246
1002²	298	256	285	713	10.5	286	283	311	685	9.8	274
1102	342	289	320	819	12.0	329	319	350	787	11.2	315
1202	372	324	356	890	12.5	357	390	855	11.6	342	395
1302	404	357	390	967	13.7	388	394	427	929	12.7	371
1352	431	393	424	1030	12.7	413	435	465	988	11.7	395
1402	439	375	415	1049	13.3	421	413	453	1008	12.3	403
1502	455	387	428	1089	13.6	437	428	468	1045	12.6	418
1702²	500	425	472	1196	16.6	480	470	516	1149	15.4	460

High ambient temperature unit - LWT = 46°F

High ambient temperature unit - LWT = 46°F											
Air temperature, (°F)											
85			95			105			115		
30XA	Ton	Cap kW	COMP UNIT kW	COOL kW	COOL CAP ft WG Ton	COMP UNIT kW	COOL kW	COOL CAP ft WG Ton	COMP UNIT kW	COOL kW	COOL CAP ft WG Ton
252	83	72	81	199	4.3	80	79	88	191	3.9	76
302	91	80	89	218	4.4	87	88	97	209	4.0	83
352	99	88	97	238	5.1	95	97	106	227	4.7	90
402	119	98	111	284	10.0	114	109	121	274	9.4	110
452	136	118	130	307	10.9	131	130	142	314	10.1	125
502	154	128	143	368	10.7	148	142	156	354	9.9	141
602	186	160	177	446	13.3	179	177	194	429	12.4	172
702	205	169	188	490	10.8	197	186	206	471	10.0	188
752	220	197	216	526	11.0	211	217	236	506	10.3	202
802	240	210	230	575	10.4	231	232	252	552	9.7	221
852	254	214	238	607	11.5	244	237	260	583	10.7	233
902	273	242	265	652	10.8	262	266	290	626	10.0	250
1002²	303	259	288	725	10.8	291	286	314	696	10.0	278
1102	348	292	323	832	12.4	334	322	353	800	11.5	320
1202	378	327	360	905	12.8	363	360	398	869	11.9	348
1302	411	361	394	983	14.1	398	431	944	13.0	377	441
1352	438	398	429	1047	13.0	420	439	470	1004	12.0	401
1402	446	378	419	1067	13.6	428	417	457	1024	12.6	409
1502	463	391	432	1107	14.0	444	432	472	1062	12.9	424
1702²	508	429	476	1216	17.0	488	474	520	1168	15.8	467

High ambient temperature unit - LWT = 46°F

LWT	CAP Tons	COMP UNIT kW	COOL kW	COOL CAP ft WG	COOL UNIT kW	COOL kW	COOL CAP ft WG	COOL UNIT kW	COOL kW	COOL CAP ft WG	COOL UNIT kW
LWT	Cooling capacity	Compressor power input	Unit power input (compressors, fans and control circuit)	Evaporator water flow rate	Fouling factor: 0.0001 h ft ² /Btu	Evaporator pressure drop	Leaving water temperature	Standard units, refrigerant: R134a	Evaporator temperature rise: 10°F	Evaporator fluid: chilled water	Performances in accordance with EN 14511.
CAP	Tons	COMP UNIT kW	COOL kW	COOL CAP ft WG	COOL UNIT kW	COOL kW	COOL CAP ft WG	COOL UNIT kW	COOL kW	COOL CAP ft WG	COOL UNIT kW
UNIT	kW	COMP UNIT kW	COOL kW	COOL CAP ft WG	COOL UNIT kW	COOL kW	COOL CAP ft WG	COOL UNIT kW	COOL kW	COOL CAP ft WG	COOL UNIT kW
COOL	gpm	COMP UNIT kW	COOL kW	COOL CAP ft WG	COOL UNIT kW	COOL kW	COOL CAP ft WG	COOL UNIT kW	COOL kW	COOL CAP ft WG	COOL UNIT kW
COOL ft WG	ft WG	COMP UNIT kW	COOL kW	COOL CAP ft WG	COOL UNIT kW	COOL kW	COOL CAP ft WG	COOL UNIT kW	COOL kW	COOL CAP ft WG	COOL UNIT kW

Application data:

Standard units, refrigerant: R134a
Evaporator temperature rise: 10°F
Evaporator fluid: chilled water
Fouling factor: 0.0001 h ft²/Btu

Cooling capacities (Imperial)

Unit with MCHX heat exchanger (standard)

High ambient temperature unit - LWT = 50°F															
Air temperature, (°F)															
85			95			105			115			120			
CAP	Ton	COMP UNIT kW	Cool kW	Cool ft WG	CAP	COMP UNIT kW	Cool kW	Cool ft WG	Ton	CAP	COMP UNIT kW	Cool kW	Cool ft WG	CAP	COMP UNIT kW
30XA															
252	89	74	83	213	4.8	85	82	91	204	4.4	81	90	99	195	4.0
302	98	83	92	234	4.9	93	91	100	223	4.5	88	101	110	212	4.1
352	106	91	100	255	5.7	101	101	110	242	5.2	96	111	120	229	4.7
402	127	102	114	305	11.2	122	112	124	293	10.5	117	124	136	281	9.7
452	146	122	134	349	12.1	140	135	147	335	11.2	134	149	161	320	10.3
502	164	134	148	393	11.9	158	147	162	377	11.0	151	163	177	361	10.2
602	199	166	183	478	14.9	192	183	200	459	13.8	183	202	219	439	12.7
702	219	175	195	524	12.0	210	193	213	504	11.2	201	214	233	482	10.3
752	235	205	224	563	12.3	226	226	245	541	11.4	216	249	268	517	10.5
802	256	218	239	614	11.6	246	241	261	590	10.7	235	266	286	564	9.9
852	271	223	247	649	12.8	260	246	269	623	11.9	248	272	295	595	11.0
902	291	252	275	697	12.1	279	277	300	669	11.2	267	306	329	639	10.3
1002	323	270	298	775	12.0	310	297	326	743	11.1	297	328	356	711	10.2
1102	371	304	335	889	13.8	356	335	366	854	12.8	341	369	400	816	11.8
1202	403	340	373	966	14.3	387	375	407	927	13.3	370	413	446	887	12.2
1302	438	376	409	1050	15.7	421	415	447	1008	14.5	402	458	491	963	13.3
1352	467	415	446	1188	14.5	447	458	489	1071	13.4	427	506	537	1023	12.3
1402	476	394	434	1140	15.2	456	434	474	1094	14.1	436	519	544	1045	13.0
1502	493	408	448	1182	15.6	473	450	489	1134	14.4	452	536	569	994	11.8
1702	542	447	493	1298	19.0	520	493	539	1247	17.6	498	544	590	1192	16.2

Legend

Leaving water temperature

ooling capacity

compressor power input

unit power input (compressor)

vaporator water flow rate

Application data:

Standard units, refrigerant: R134a
Evaporator temperature rise: 10°F

- Evaporator fluid: chilled water

FE8uling factor: 0.00001 h ft² °F/Btu

Performances in accordance with EN 11411

Cooling capacities (Imperial)

Unit with copper/aluminium heat exchanger (option 255)

High ambient temperature unit - LWT = 42°F

Air temperature, (°F)											
		85		95		105		115		120	
30XA	CAP Ton	COMP kW	COOL kW	COOL kW	CAP gpm ft WG	COMP UNIT kW	COOL kW	CAP gpm ft WG Ton	COMP UNIT kW	COOL kW	CAP gpm ft WG Ton
252	77	72	81	184	3.8	74	80	89	176	3.5	70
302	84	79	88	201	3.8	81	87	97	193	3.5	77
352	92	83	92	221	4.5	88	92	101	211	4.2	84
402	110	101	113	263	8.8	106	112	124	252	8.2	101
452	127	116	128	304	9.7	122	129	141	292	9.0	117
502	142	126	140	339	9.3	136	140	154	326	8.7	130
602	174	157	174	416	11.9	167	173	190	400	11.0	160
702	190	168	188	454	9.5	183	186	206	436	8.8	174
752	205	192	212	490	9.8	197	212	232	471	9.1	189
802	223	205	226	534	9.2	214	226	247	512	8.5	205
852	235	214	237	562	10.2	226	237	260	540	9.4	216
902	253	240	263	606	9.6	243	265	288	582	8.9	233
1002²	279	259	286	666	9.4	267	287	314	639	8.7	255
1102	322	293	324	770	10.9	309	324	354	739	10.1	300
1202	352	327	359	840	11.4	338	361	393	807	10.5	323
1302	382	360	393	914	12.4	367	398	431	877	11.5	351
1352	410	393	424	979	11.6	393	435	465	939	10.8	375
1402	412	375	415	985	11.9	396	415	455	946	11.1	378
1502	429	390	430	1026	12.3	412	431	471	984	11.4	394
1702²	471	427	473	1125	14.9	452	472	518	1081	13.8	432

High ambient temperature unit - LWT = 44°F

Air temperature, (°F)											
		85		95		105		115		120	
30XA	CAP Ton	COMP kW	COOL kW	COOL kW	CAP gpm ft WG	COMP UNIT kW	COOL kW	CAP gpm ft WG Ton	COMP UNIT kW	COOL kW	CAP gpm ft WG Ton
252	80	73	83	191	4.0	76	81	90	183	3.7	73
302	87	80	89	209	4.0	83	89	98	107	3.7	79
352	96	84	94	229	4.8	91	94	103	218	4.4	104
402	114	103	115	272	9.3	109	114	126	261	8.7	105
452	131	118	131	314	10.2	126	131	143	302	9.5	121
502	147	128	143	351	9.9	141	142	156	337	9.2	135
602	180	160	177	431	12.6	173	177	194	415	11.7	166
702	197	172	191	470	10.1	189	190	209	452	9.3	180
752	212	196	216	507	10.4	204	216	236	488	9.7	195
802	231	209	230	552	9.7	222	230	252	530	9.0	212
852	243	218	242	581	10.7	231	241	265	558	10.0	223
902	262	244	268	627	10.1	251	270	293	602	9.4	240
1002²	288	265	292	689	9.9	276	293	319	661	9.2	264
1102²	333	299	329	797	11.5	320	330	360	765	10.7	306
1202²	363	333	366	869	12.0	349	368	401	835	11.1	334
1302	395	367	400	945	13.2	379	406	439	907	12.2	363
1352²	423	401	432	1013	12.3	406	444	475	971	11.4	387
1402²	426	383	423	1019	12.6	409	423	463	978	11.7	391
1502²	444	398	438	1061	13.0	426	439	479	1018	12.0	407
1702²	487	435	482	1164	15.8	467	481	527	1118	14.6	447

High ambient temperature unit - LWT = 44°F

Legend
LWT Leaving water temperature
CAP Tons Cooling capacity
COMP kW Compressor power input
UNIT kW Unit power input (compressors, fans and control circuit)
COOL gpm Evaporator water flow rate
COOL ft WG Evaporator pressure drop

Application data:

Standard units, refrigerant: R134a

Evaporator temperature rise: 10°F

Evaporator fluid: chilled water

Fouling factor: 0.0001 h ft²/F/Btu

Performances in accordance with EN 14511.

Cooling capacities (Imperial)

Unit with copper/aluminium heat exchanger (option 255)

Air temperature, (°F)																														
85			95			105			115			120																		
30XA	CAP Ton	COMP kW	COOL kW	COOL gpm ft WG	CAP Ton	COMP kW	COOL kW	CAP gpm ft WG	COMP kW	COOL kW	CAP gpm ft WG	COMP kW	COOL kW	CAP gpm ft WG																
252	81	74	194	4.1	78	82	91	186	3.8	74	91	100	177	3.5	70	105	114	162	2.9	68	110	119	157	2.8						
302	89	81	212	4.2	85	89	99	203	3.8	81	99	108	193	3.5	76	110	119	182	3.1	74	116	125	176	3.0	71	122	131	170	2.8	
352	97	85	233	4.9	93	94	104	222	4.5	88	105	114	210	4.1	83	116	126	198	3.7	80	123	132	192	3.5	78	130	139	186	3.3	
402	116	104	116	276	9.6	111	115	127	266	8.9	106	127	139	254	8.2	101	140	152	242	7.5	98	147	159	235	7.1	96	155	166	229	6.8
452	134	120	132	320	10.5	128	132	144	307	9.8	123	146	158	294	9.0	117	162	174	279	8.2	114	171	183	272	7.8	106	170	181	253	6.9
502	149	130	144	357	10.1	143	158	169	343	9.4	137	159	173	327	8.6	130	176	190	311	7.9	126	186	200	302	7.5	118	185	199	282	6.6
602	183	161	178	439	12.9	176	178	195	422	12.0	169	197	214	403	11.1	160	218	235	384	10.1	156	220	236	326	7.5	141	226	246	338	8.0
702	200	173	193	478	10.3	192	192	211	459	9.6	183	212	231	439	8.8	174	235	253	417	8.0	169	247	266	405	7.6	154	238	256	369	6.4
752	216	198	218	516	10.7	207	218	238	496	9.9	198	241	261	475	9.2	189	267	287	452	8.4	184	281	300	441	8.0	168	272	291	401	6.7
802	235	211	232	562	10.0	225	233	254	539	9.3	215	257	278	515	8.5	205	285	306	490	7.8	197	295	316	471	7.2	162	253	273	388	5.1
852	247	221	244	591	11.0	237	244	267	567	10.2	227	270	292	542	9.4	215	299	321	515	8.6	208	311	333	497	8.0	172	272	293	411	5.7
902	266	247	271	637	10.4	256	272	296	612	9.7	244	301	325	585	8.9	233	334	356	556	8.1	222	342	364	531	7.5	168	266	289	402	4.5
1002	293	267	294	700	10.2	281	295	322	671	9.4	268	327	353	641	8.7	255	362	388	609	7.9	242	370	396	580	7.2	188	304	329	449	4.5
1102	339	302	332	810	11.8	325	333	364	778	11.0	311	368	398	744	10.1	296	408	437	707	9.2	288	429	459	688	8.7	233	364	393	558	5.9
1202	369	336	369	884	12.3	355	371	404	849	11.4	339	411	443	812	10.5	323	455	486	773	9.6	310	470	501	742	8.9	243	382	413	580	5.6
1302	402	371	404	961	13.5	385	410	443	922	12.5	368	454	487	881	11.5	345	491	523	825	10.2	318	479	510	761	8.7	267	431	462	640	6.3
1352	430	406	437	1029	12.6	412	448	479	986	11.7	393	497	527	941	10.7	354	509	539	847	8.8	292	428	457	698	6.1	249	451	481	596	4.6
1402	433	386	427	1036	13.0	415	427	467	994	12.0	397	472	512	950	10.1	378	523	562	904	10.1	359	533	571	858	9.1	279	433	471	669	5.8
1502	451	401	442	1079	13.4	432	444	483	1035	12.4	413	491	530	988	11.4	393	544	583	939	10.3	369	547	585	883	9.2	290	455	492	693	5.9
1702	495	440	486	1184	16.2	475	486	532	1137	15.0	454	537	583	1087	13.8	432	596	641	1033	12.6	413	613	657	988	11.6	347	541	585	829	8.3

High ambient temperature unit - LWT = 46°F
Air temperature, (°F)

Air temperature, (°F)																														
85			95			105			115			120																		
30XA	CAP Ton	COMP kW	COOL kW	COOL gpm ft WG	CAP Ton	COMP kW	COOL kW	CAP gpm ft WG	COMP kW	COOL kW	CAP gpm ft WG	COMP kW	COOL kW	CAP gpm ft WG																
252	83	75	198	4.2	79	83	92	189	3.9	75	91	100	180	3.6	71	101	110	171	3.2	69	106	115	165	3.0	67	111	120	160	2.8	
302	90	81	216	4.3	86	95	105	226	4.7	82	100	196	3.6	77	111	120	185	3.2	75	117	126	179	3.0	72	123	132	173	2.9		
352	99	96	237	5.1	94	95	116	128	7.0	91	108	128	140	258	8.4	103	117	127	202	8.0	82	124	133	195	7.9	131	140	189	3.4	
402	117	105	117	281	9.8	113	116	128	270	9.1	108	128	140	258	8.4	103	141	153	246	7.7	100	148	160	239	7.3	95	152	163	227	6.7
452	136	121	133	325	10.8	130	134	146	312	10.0	125	148	160	298	9.2	119	164	175	284	8.4	115	172	184	276	8.0	108	171	183	258	7.0
502	152	131	145	363	10.4	146	145	159	349	9.7	139	160	174	333	8.9	132	178	192	316	8.1	128	188	201	307	7.7	120	187	200	287	6.8
602	187	163	180	446	13.3	179	180	197	429	12.4	171	216	210	411	11.4	163	220	237	390	10.4	159	232	248	379	9.9	144	222	238	344	8.2
702	203	175	194	10.6	195	193	212	467	9.9	187	214	233	446	9.1	177	237	255	424	8.3	172	250	268	412	7.8	154	222	233	359	6.4	
752	219	199	220	525	11.0	211	220	240	505	10.2	202	243	263	483	9.4	192	269	289	460	8.6	187	284	303	448	8.2	168	249	268	403	6.8
802	239	213	234	571	10.3	229	235	256	548	9.5	219	260	281	524	8.8	208	288	308	498	8.0	198	294	314	473	7.3	163	249	269	389	5.1
852	251	223	246	601	11.3	241	246	269	577	10.5	230	272	295	551	9.7	219	302	324	524	8.8	209	310	332	501	8.1	172	268	290	412	5.7
902	271	249	273	648	10.7	260	275	299	622	9.7	248	304	327	536	9.1	236	337	360	566	8.3	223	340	363	534	7.5	171	269	291	410	4.6
1002	297	270	297	726	10.4	285	298	325	682	9.7	272	330	356	652	8.9	243	366	392	619	8.1	243	366	392	580	7.2	191	306	331	458	4.7
1102	344	304	335	824	12.1	331	336	367	791	11.3	316	372	402	756	10.4	300	411	441	719	9.4	290	429	459	695	8.9	238	367	395	569	6.1
1202	375	340	373	899	12.7	361	375	408	863	11.8	345	415	447	825	10.8	328	459	491	786	9.9	313	470	501	750	9.0	247	385	416	592	5.8
1302	408	375	408	977	13.9	392	414	447	937	12.9	374	458	491	896	11.8	348	492	524	834	10.3	322	479	510	769	8.9	272	434	465	652	6.5
1352	437	410	441	1046	13.0	419	453	484	1003	12.0	400	502	532	957	11.0	354	502</													

Cooling capacities (Imperial)

Unit with copper/aluminium heat exchanger (option 255)

High ambient temperature unit - LWT = 50°F																														
Air temperature, (°F)																														
85			95			105			115			120			125															
30XA	Ton	CAP kW	COMP UNIT kW	COOL kW	COOL ft WG	CAP kW	COMP UNIT kW	COOL kW	CAP kW	COMP UNIT kW	COOL kW	CAP kW	COMP UNIT kW	COOL kW	CAP kW	COMP UNIT kW	COOL kW													
252	88	77	86	212	4.7	85	94	203	4.3	81	94	103	193	4.0	76	104	113	182	3.6	74	109	118	177	3.4	71	115	123	171	3.2	
302	97	84	94	231	4.8	92	93	103	221	4.4	87	103	112	210	4.0	83	114	123	198	3.6	80	120	129	192	3.4	77	127	136	185	3.2
352	106	99	253	5.7	101	99	108	242	5.2	95	109	119	229	4.7	90	121	131	216	4.2	87	128	137	209	4.0	84	135	144	202	3.8	
402	125	109	121	301	11.0	121	120	132	289	10.2	115	132	144	276	9.4	110	146	157	263	8.6	107	153	165	256	8.1	99	152	163	237	7.1
452	145	125	137	347	12.0	139	138	150	334	11.1	133	153	165	319	10.2	127	169	181	303	9.4	123	178	190	295	8.9	110	166	178	263	7.2
502	162	136	150	388	11.6	155	150	164	372	10.8	148	166	180	355	9.9	141	184	198	338	9.0	137	194	208	329	8.6	121	178	192	290	6.8
602	199	169	186	478	14.9	192	187	204	459	13.8	183	206	223	439	12.7	174	228	244	417	11.6	169	240	256	406	11.0	145	212	228	348	8.3
702	217	182	201	520	11.8	208	201	220	500	11.0	199	222	241	477	10.1	189	246	264	453	9.2	184	259	277	441	8.7	156	224	242	374	6.5
752	235	207	227	562	12.3	225	228	248	540	11.4	215	252	272	516	10.5	205	278	298	492	9.6	200	293	313	479	9.1	158	235	254	378	5.9
802	255	221	243	611	11.5	244	244	265	586	10.6	233	269	290	559	9.7	222	298	319	531	8.9	206	295	315	494	7.8	172	251	271	412	5.6
852	268	232	255	642	12.6	257	256	279	616	11.7	246	283	305	588	10.7	233	313	335	559	9.8	217	310	332	520	8.6	182	271	292	436	6.2
902	289	259	283	693	11.9	277	286	309	664	11.0	265	316	339	634	10.1	252	349	372	603	9.2	225	329	351	540	7.6	186	277	300	445	5.3
1002²	317	281	308	761	11.6	304	310	337	729	10.7	290	343	369	695	9.9	275	379	405	660	9.0	232	331	357	556	6.6	207	316	341	495	5.3
1102	367	317	347	880	13.5	349	380	844	12.5	337	385	416	807	11.5	320	427	456	767	10.5	298	422	451	714	9.2	246	361	390	590	6.4	
1202	401	353	386	960	14.1	384	389	422	921	13.1	367	430	462	880	12.0	349	476	508	837	11.0	315	450	481	755	9.0	264	392	422	632	6.5
1302	436	390	423	1044	15.5	418	431	463	1001	14.3	399	476	509	956	13.1	357	477	509	855	10.7	331	473	504	793	9.3	284	431	462	680	7.0
1352	466	427	458	1118	14.5	447	472	503	1070	13.3	426	522	552	1020	12.2	334	429	459	801	7.8	302	418	448	724	6.5	250	377	406	598	4.5
1402	470	406	446	1126	14.9	450	448	488	1079	13.8	430	495	534	1031	12.6	406	543	582	974	11.4	360	499	537	863	9.1	303	443	480	727	6.6
1502	489	422	462	1172	15.3	468	465	505	1123	14.1	447	514	554	1071	13.0	424	570	608	1017	11.8	352	484	522	843	8.3	308	453	491	737	6.5
1702	537	462	508	1286	18.6	515	509	555	1234	17.2	492	563	608	1179	15.8	467	624	668	1120	14.4	420	587	631	1006	11.7	361	529	573	864	8.8

Legend

- LWT Leaving water temperature
- CAP Tons Cooling capacity
- COMP kW Compressor power input
- UNIT kW Unit power input (compressors, fans and control circuit)
- COOL gpm Evaporator water flow rate
- COOL ft WG Evaporator pressure drop

Application data:

Standard units, refrigerant: R134a

Evaporator temperature rise: 10°F

Evaporator fluid: chilled water

Fouling factor: 0.0001 h ft² °F/Btu

Performances in accordance with EN 14511.

Guide Specifications

Equipment

- Factory assembled single-piece air-cooled liquid chiller. Includes two or three independent refrigerant circuits, power and control system. Each circuit equipped with fully accessible twin-screw compressors, an electronic expansion valve and a charge of ozone friendly R134a refrigerant.

Quality assurance

- The chiller shall be designed, manufactured and tested in a facility with a quality assurance system certified ISO 9001 and an environment management system certified ISO 14001.
- Thermodynamic performances shall be in accordance EN14511 and sound levels in accordance with ISO 9614 standards and Eurovent standard.
- All units shall undergo a complete run test in the factory before shipment.
- The chiller shall be CE marked and shall comply with the requirements of the following European directives:
 - Machinery directive 98/37/EC modified,
 - Low-voltage directive 73/23/EEC modified,
 - Electromagnetic compatibility directive 89/336/EEC modified, and with the applicable recommendations of European standards
 - European Pressure Equipment Directive 97/23/EC,
 - Machine safety, electrical equipment in machines, general regulations: EN 60204-1,
 - Radiated electromagnetic emissions: EN50081-1,
 - Conducted electromagnetic emissions: EN 50081-2,
 - Electromagnetic immunity: EN 50082.

Performance

- The unit shall be able to start up with an evaporator entering fluid temperature of up to 45°C.
- The unit shall be able to operate as standard at outside air temperatures from -10°C to 55°C and an evaporator leaving fluid setpoint between 3.3°C and 15°C.

Compressors and motors

Compressors shall be semi-hermetic twin-screw type. All main components shall be fully accessible. Compressors shall be mounted on sliding rails and equipped with a discharge gas shut-off valve for ease of service.

Electric motor

- Two-pole motor cooled by suction gas with full-stream 120 micron efficiency suction gas filter.
- The motor shall be protected by an electronic board capable to protect against the following faults:
 - Motor overheat by means of internal temperature sensors
 - Motor overload according to the current drawn
 - Loss of phase
 - Phase reversal
 - Voltage dips

Lubrication

- External oil separator for each compressor with no moving parts, designed for 2100 kPa working pressure.
- Oil separator shall include a temperature actuated heater and an oil level safety switch.
- Refrigerant system differential pressure shall provide oil return through a replaceable 5 micron oil filter external to the compressor. Oil filter shall be equipped with service shut-off valve for easy replacement.

Capacity control

- Compressors shall be equipped with a capacity control valve capable of adjusting the chiller capacity from 100 to 15% load.
- Compressors shall start at minimum load.
- Compressor capacity shall be microprocessor controlled to maintain the required chilled water temperature, and protect the motor against overload or the refrigerant circuit against high-pressure cut-out.

Low vibration and sound level

- Compressor rails shall be mounted on rubber in shear anti-vibration blocks.
- Compressor shall have a discharge gas muffler to dampen gas pulsation.
- Compressor and oil separator shall have an acoustic enclosure with large access doors easily removable with 1/4 turn screws.

Evaporator

- The unit shall be equipped with shell-and-tube flooded evaporator. Independent refrigerant circuits shall be provided per compressor.
- The maximum refrigerant-side operating pressure shall be 2000 kPa and the maximum water-side pressure shall be 1000 kPa.
- The evaporator shall be tested with pressurised dry air. Water or oil pressures are not acceptable.
- The weld-free copper tubes shall be internally finned and expanded into the tube sheets.
- The evaporator shall be mounted on support feet with thermal bridge rupture.
- Shell shall be integrally insulated with 19-mm thick polyurethane foam mechanically protected by an aluminium cladding.
- The chiller shall have only one inlet/outlet Victaulic water connection to ensure mechanical decoupling between the unit and the hydronic installation. The evaporator shall be equipped with a water drain and a purge plug.

Condenser

- The heat exchanger will consist of multiple transverse V-shaped coils to provide self protection. Each V will have an angle above 50° to ensure optimum air distribution.
- Coils with integrated sub-cooling shall be entirely made of aluminium to limit galvanic corrosion and will offer a corrosion resistance compatible with coastal or urban environments. Coils shall have a thickness of 25 mm to generate low air pressure drop and offer reduced sensitivity to clogging. Coils shall be easily cleanable using a high pressure cleaner.
- The condenser coils shall be leak-tested by helium gas detection.

Fans

- The low-noise direct-drive fans shall be equipped with an impeller with nine aerodynamic blades and a rotating shroud to ensure optimal leak-tightness between the blades and the fan mouth. The impeller shall be one-piece and made of a corrosion-resistant composite material, and statically and dynamically balanced. The air shall be discharged vertically upwards.
- The fans shall be protected by polyethylene-coated steel wire grilles.
- The three-phase electric motors shall have class F insulation, IP 55 protection with a minimum efficiency of 80%. They shall have individual overload protection via a circuit breaker.

Refrigerant circuit components

- Chiller shall have an independent circuit for each compressor to provide maximum redundancy.
- Each refrigerant circuit shall include: discharge gas shut-off valve, liquid shut-off valve, electronic expansion valve controlled by a stepper motor, liquid sight glass, filter drier with removable cartridge, refrigerant economiser controlled by an auxiliary electronic expansion valve and complete charge of both refrigerant and oil.
- Instrumentation and safety devices shall include: high-pressure safety switch, low-pressure safety relief valve, low and high-pressure transducers accessible without draining the refrigerant charge.
- The refrigerant circuit shall be factory leak-tested with pressurised air and helium gas detection at 2500 kPa.

Power and electrical components

Power requirements

- The unit shall operate at 400 volts, 3 phases, 50 hertz (400 V ± 10%) without neutral.
- Main disconnect switch with lockable handle for each compressor shall be provided as standard.

Power and control cabinets

- Powder-painted steel cabinet with hinged and gasket sealed doors. Power box doors shall be interlocked with main disconnect switch handle so that door opening is not possible without disconnecting power.
- Power cabinet includes: compressor short-circuit and overload protection, fan and control circuit breakers.
- Separate control cabinet for safe and easy access to control display.

Compressor starter

- Motor starter shall be star-delta type for minimum inrush current, star-delta transition shall be managed electronically without electromechanical relays.

Control transformer

- The control circuit voltage shall be 24 V maximum, supplied by a factory-installed transformer.

Unit control

General

- The chiller shall be equipped with microprocessor control, regulating all unit operating and safety parameters in order to optimise energy efficiency and minimise the risk of the refrigerant circuit shutting down due to a fault.

Main control features:

- Entering or leaving water temperature control by PID loop with equalisation of the compressor operating times and number of compressor start-ups.
- Protection against excessive compressor cycling by autoadaptive control algorithm acting on the leaving water setpoint deadband.
- Optimisation of the condensing pressure with a floating setpoint based on the outside temperature and the thermal load in order to limit power consumption.
- Dynamic evaporator superheat control via the electronic expansion valve (EXV) in order to maximise the use of the evaporator capacity, whilst protecting the compressors against migration of liquid refrigerant.

- Control of one or two water pumps (standby pump) with run time equalisation and automatic changeover to the standby pump in case a fault occurs.
- Periodic water pump start-up when the unit is shut down in order to prolong the operating life of the mechanical pump seal.
- Automatic compressor unloading when an abnormally high condensing pressure is detected to prevent the shut-down of the refrigerant circuit due to a high-pressure fault.
- Master/slave control of two chillers operating in series or in parallel with run time equalisation.

Display and keypad

- 320 x 24 pixels touch screen display for easy access to all operating parameters. Icon driven menu for intuitive navigation and display of full test message in English or other language.
 - Display data: Water entering/leaving temperatures, outside air temperature, compressor suction/discharge pressures and temperatures, chilled water setpoint, compressor operating times and the number of start-ups. Fan operating time, percent loading, compressor current.
 - Quick test function to verify correct operation of compressor, fan, electronic expansion valve, probes and sensors for easy and fast commissioning.
 - Chiller diagnostics with last 50 alarm history for quick trouble shooting.

Automatic operation

- The chiller shall be equipped with a programming clock, permitting:
 - On/off control
 - Changeover to the second setpoint (unoccupied mode)
 - Capacity or current draw limitation
- The control shall ensure the following operating modes:
 - On/off mode based on the outside temperature
 - Setpoint reset based on the outside air temperature or the return water temperature

Remote control

- The chiller shall include dry contacts permitting:
 - On/off control
 - Capacity or current draw limitation (one stage)
 - Changeover to the second setpoint (unoccupied mode)
 - Integration of customer safety device
- The chiller shall include output contacts permitting:
 - Signalling that the unit is ready to start
 - Signalling the occurrence of a minor incident (alert relay)
 - Signalling the occurrence of a major incident (alarm relay)
 - Water pump on/off control (single or dual pump with automatic changeover)
- The chiller shall be equipped with an RS485 serial port for remote control via a communication bus.

Chassis/structure

- Frame shall be made of U steel beam with hot dip galvanization or electrophoresis treatment completed with paint.
- Panels and electrical box shall be made of galvanised sheet steel with oven-baked polyester powder-paint finish in light grey colour (RAL 7035).

Options:

Hydronic module (if required)

- The hydronic module shall be integrated in the chiller chassis without increasing its dimensions and include the following elements: removable screen filter, membrane type expansion tank, centrifugal single-cell water pump with three-phase motor equipped with internal over-temperature protection, electronic water flow switch without paddle, safety relief valve calibrated to 4 bar, long-stroke flow control valve. A pressure gauge and a valve set permit differential pressure measurements: water pump, evaporator pressure loss, filter pressure loss.
- To limit vibration and noise transmission the water pump shall be isolated from the chiller structure.
- The water piping shall be protected against corrosion and equipped with drain and purge plugs. The customer connections shall be Victaulic connections. The piping and the water pump shall be fully insulated by polyurethane foam, and aluminium cladding to prevent condensation. Emergency frost protection by starting up of the water pump in case of a risk of frost formation.
- A choice of four pump types shall be available:
 - Single high-pressure pump
 - Dual high-pressure pump
 - Single low-pressure pump
 - Dual low-pressure pump

This document describes the characteristics for the following products:
30XA + option 119 + option 20A (units with MCHX heat exchangers)
30XA + option 255 + option 119 + option 20A (units with copper/aluminium heat exchangers).



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