Carrier®

30XA “A”
Air-Cooled Liquid Chillers

Nominal cooling capacity: 267-1682 kW

50 Hz

PRO-DIALOG

AQUAFORCE™



Installation, operation and maintenance instructions

LLOYD'S REGISTER QUALITY ASSURANCE
ISO9001·ISO14001

Quality and Environment Management Systems Approval

CONTENTS

1 - INTRODUCTION 4
1.1 - Installation safety considerations 4
1.2 - Equipment and components under pressure 5
1.3 - Maintenance safety considerations 5
1.4 - Repair safety considerations 6

2 - PRELIMINARY CHECKS 7
2.1 - Check equipment received 7
2.2 - Moving and siting the unit 7

3 - DIMENSIONS, CLEARANCES 9
3.1 - 30XA 252-352 - MCHE heat exchanger (standard) and 30XA 252-302 - Cu/Al heat exchanger (option 254/255) 9
3.2 - 30XA 402-452 - MCHE heat exchanger (standard) and 352-452 - Cu/Al heat exchanger (option 254/255) 9
3.3 - 30XA 502 MCHE heat exchanger (standard) and 30XA 502 Cu/Al heat exchanger (option 254/255) 10
3.4 - 30XA 602-802 MCHE heat exchanger (standard) and 30XA 602-702 Cu/Al heat exchanger (option 254/255) 10
3.5 - 30XA 852-902 MCHE heat exchanger (standard) and 30XA 752-852 Cu/Al heat exchanger (option 254/255) 11
3.6 - 30XA 1002 MCHE heat exchanger (standard) and 30XA 902-1002 Cu/Al heat exchanger (option 254/255) 11
3.7 - 30XA 1102, 1202, 1302, 1352 MCHE heat exchanger (standard) and 30XA 1102, 1202, 1302, 1352 Cu/Al heat exchanger (option 254/255) 12
3.8 - 30XA 1112, 1212, 1312, 1382 MCHE heat exchanger (standard) 12
3.9 - 30XA 1402-1502 module 1/2 - MCHE heat exchanger (standard) and 30XA 1402-1502 module 1/2 - Cu/Al heat exchanger (option 254/255) 13
3.10 - 30XA 1402-1502 module 2/2 - MCHE heat exchanger (standard) and 30XA 1402-1502 module 2/2 - Cu/Al heat exchanger (option 254/255) 13
3.11 - 30XA 1702 module 1/2 - MCHE heat exchanger (standard) and 30XA 1702 module 1/2 - Cu/Al heat exchanger (option 254/255) 14
3.12 - 30XA 1702 module 2/2 - MCHE heat exchanger (standard) and 30XA 1702 module 2/2 - Cu/Al heat exchanger (option 254/255) 14
3.13 - Multiple chiller installation 15
3.14 - Distance to the wall 15

4 - PHYSICAL AND ELECTRICAL DATA FOR 30XA UNITS 16
4.1 - Physical data 30XA 252-902 - standard units and units with option 119* 16
4.1 - Physical data 30XA 1002-1702 - standard units and units with option 119* (continued) 17
4.2 - Physical data 30XA 252-902 - units with option 254 and 255** 18
4.2 - Physical data 30XA 1002-1702 - units with option 254 and 255** (continued) 19
4.3 - Short-circuit stability current for all units 19
4.4 - Electrical data 20
4.5 - Compressor electrical data 24
4.6 - Compressor usage per circuit (A, B, C, D) 24
4.7 - Electrical data, optional hydronic module 25

5 - ELECTRICAL CONNECTION 26
5.1 - Power supply 26
5.2 - Voltage phase imbalance (%) 26
5.3 - Power connection/disconnect switch 26
5.4 - Recommended wire sections 26
5.5 - Power cable entry 26
5.6 - Field control wiring 27

6 - APPLICATION DATA 28
6.1 - Operating range 28
6.2 - Minimum chilled water flow (units without hydronic module) 28
6.3 - Maximum chilled water flow (units without hydronic module) 28
6.4 - Variable flow evaporator 29
6.5 - System minimum water volume 29
6.6 - Maximum system water volume 29
6.7 - Evaporator water flow rate 29
6.8 - Evaporator pressure drop curve 30

7 - WATER CONNECTIONS 31
7.1 - Operating precautions 31
7.2 - Victaulic water connections 32
7.3 - Flow control 33
7.4 - Evaporator water box bolt tightening 33
7.5 - Frost protection 33
7.6 - Operation of two units in master/slave mode (option 58) 33
7.7 - Pump characteristics 34

8 - FREE-COOLING OPTION (OPTION 118A) 35
8.1 - Physical data, 30XA units with free-cooling option (option 118A) 35
8.2 - Operating limits 35
8.3 - Operation 35

9 - HEAT RECLAIM CONDENSER OPTION (OPTION 50) 36
9.1 - Technical data, 30XA units with heat reclaim condenser option 36
9.2 - Dimensions, clearances 36
9.3 - Condenser location 40
9.4 - Condenser water connections 40
9.5 - Operating limits for stable operation (no mode changeover) 40
9.6 - Operating limits for changeover between modes 41
9.7 - Flow control 41
9.8 - Heat reclaim operation 41
9.9 - Condenser pump selection 41
9.10 - Frost protection 42

10 - FANS WITH AVAILABLE PRESSURE (OPTION 10) 42

11 - MAJOR SYSTEM COMPONENTS AND OPERATION DATA 42
11.1 - Direct-drive twin-screw compressor with variable capacity slide valve 42
11.2 - Pressure vessels 42
11.3 - High-pressure safety switch 43
11.4 - Condensers 43
11.5 - Fans 43
11.6 - Electronic expansion valve (EXV) 44
11.7 - Moisture indicator 44
11.8 - Filter drier 44
11.9 - Sensors 44
11.10 – Service valve (option 92) 44

12 - MAIN OPTIONS 46

13 - STANDARD MAINTENANCE 47
13.1 - Level 1 maintenance 47
13.2 - Level 2 maintenance 47
13.3 - Level 3 (or higher) maintenance 47
13.4 - Tightening torques for the main electrical connections 48
13.5 - Tightening torques for the main bolts and screws 48
13.6 - Condenser coil 48
13.7 - Evaporator maintenance 50
13.8 - Compressor maintenance 50
13.9 - Precaution for compressor power supply bus bar connection 50

14 - START-UP CHECKLIST FOR 30XA LIQUID CHILLERS (USE FOR JOB FILE) 51

The illustrations on the front cover and inside this document are for illustrative purposes only and not part of any offer for sale or contract.

1 - INTRODUCTION

The 30XA Aquaforce units are designed to cool water for the air conditioning of buildings and industrial processes.

Prior to the initial start-up of the 30XA units, the people involved in the on-site installation, start-up, operation, and maintenance of this unit should be thoroughly familiar with these instructions and the specific project data for the installation site.

The 30XA liquid chillers are designed to provide a very high level of safety during installation, start-up, operation and maintenance. They will provide safe and reliable service when operated within their application range.

This manual provides the necessary information to familiarize yourself with the control system before performing start-up procedures. The procedures in this manual are arranged in the sequence required for machine installation, start-up, operation and maintenance.

Always ensure that all required safety measures are followed, including those in this document, such as: wearing protective clothing (gloves, ear defenders, safety glasses and shoes), using appropriate tools, employing qualified and skilled technicians (electricians, refrigeration engineers) and following local regulations.

To find out, if these products comply with European directives (machine safety, low voltage, electromagnetic compatibility, equipment under pressure etc.) check the declarations of conformity for these products.

1.1 - Installation safety considerations

Access to the unit must be reserved to authorised personnel, qualified and trained in monitoring and maintenance. The access limitation device must be installed by the customer (e.g. cut-off, enclosure).

After the unit has been received, when it is ready to be installed or reinstalled, and before it is started up, it must be inspected for damage. Check that the refrigerant circuit(s) is (are) intact, especially that no components or pipes have shifted (e.g. following a shock). If in doubt, carry out a leak tightness check and verify with the manufacturer that the circuit integrity has not been impaired. If damage is detected upon receipt, immediately file a claim with the shipping company.

Carrier strongly recommends employing a specialised company to unload the machine.

Do not remove the skid or the packaging until the unit is in its final position. These units can be moved with a fork lift truck, as long as the forks are positioned in the right place and direction on the unit.

The units can also be lifted with slings, using only the designated lifting points marked on the unit.

These units are not designed to be lifted from above. Use slings with the correct capacity, and always follow the lifting instructions on the certified drawings supplied with the unit.

Safety is only guaranteed, if these instructions are carefully followed. If this is not the case, there is a risk of material deterioration and injuries to personnel.

DO NOT COVER ANY PROTECTION DEVICES.

This applies to fuse plugs and safety valves (if used) in the refrigerant or heat transfer medium circuits. Check if the original protection plugs are still present at the valve outlets. These plugs are generally made of plastic and should not be used. If they are still present, please remove them. Install devices at the valve outlets or drain piping that prevent the penetration of foreign bodies (dust, building debris, etc.) and atmospheric agents (water can form rust or ice). These devices, as well as the drain piping, must not impair operation and not lead to a pressure drop that is higher than 10% of the control pressure.

Classification and control
In accordance with the Pressure Equipment Directive and national usage monitoring regulations in the European Union the protection devices for these machines are classified as follows:

	Safety accessory*	Damage limitation accessory** in case of an external fire
Refrigerant side		
High-pressure switch	x	
External relief valve***		x
Rupture disk		x
Fuse plug		x
Heat transfer fluid side		
External relief valve****	x	x

* Classified for protection in normal service situations.
** Classified for protection in abnormal service situations.
*** The instantaneous over-pressure limited to 10% of the operating pressure does not apply to this abnormal service situation. The control pressure can be higher than the service pressure. In this case either the design temperature or the high-pressure switch ensures that the service pressure is not exceeded in normal service situations.
**** The classification of these safety valves must be made by the personnel that completes the whole hydronic installation.

Do not remove these valves and fuses, even if the fire risk is under control for a particular installation. There is no guarantee that the accessories are re-installed if the installation is changed or for transport with a gas charge.

All factory-installed safety valves are lead-sealed to prevent any calibration change. If the safety valves are installed on a change-over manifold, this is equipped with a safety valve on each of the two outlets. Only one of the two safety valves is in operation, the other one is isolated. Never leave the change-over valve in the intermediate position, i.e. with both ways open (locate the control element in the stop position).

If a safety valve is removed for checking or replacement please ensure that there is always an active safety valve on each of the change-over valves installed in the unit.

The external safety valves must always be connected to drain pipes for units installed in a closed room. Refer to the installation regulations, for example those of European standard EN 378 and EN 13136.

These pipes must be installed in a way that ensures that people and property are not exposed to refrigerant leaks. As the fluids can be diffused in the air, ensure that the outlet is far away from any building air intake, or that they are discharged in a quantity that is appropriate for a suitably absorbing environment.

Periodic check of the safety valves: See chapter 1.3 - "Maintenance safety considerations".

Provide a drain in the drain pipe, close to each safety valve, to avoid an accumulation of condensate or rain water.

All precautions concerning handling of refrigerant must be observed in accordance with local regulations.

Ensure good ventilation, as accumulation of refrigerant in an enclosed space can displace oxygen and cause asphyxiation or explosions.

Inhalation of high concentrations of vapour is harmful and may cause heart irregularities, unconsciousness, or death. Vapour is heavier than air and reduces the amount of oxygen available for breathing. These products cause eye and skin irritation. Decomposition products are hazardous.

1.2 - Equipment and components under pressure

See section "11.2 - Pressure vessels".

1.3 - Maintenance safety considerations

Engineers working on the electric or refrigeration components must be authorized, trained and fully qualified to do so.

All refrigerant circuit repairs must be carried out by a trained person, fully qualified to work on these units. He must have been trained and be familiar with the equipment and the installation. All welding operations must be carried out by qualified specialists.

Any manipulation (opening or closing) of a shut-off valve must be carried out by a qualified and authorised engineer. These procedures must be carried out with the unit shut-down.

NOTE: The unit must never be left shut down with the liquid line valve closed, as liquid refrigerant can be trapped between this valve and the expansion device and lead to the risk of a pressure increase. This valve is situated on the liquid line before the filter drier box.

During any handling, maintenance and service operations the engineers working on the unit must be equipped with safety gloves, glasses, shoes and protective clothing.

Never work on a unit that is still energized.

Never work on any of the electrical components, until the general power supply to the unit has been cut using the disconnect switch(es) in the control box(es).

If any maintenance operations are carried out on the unit, lock the power supply circuit in the open position ahead of the machine.

If the work is interrupted, always ensure that all circuits are still deenergized before resuming the work.

ATTENTION: Even if the unit has been switched off, the power circuit remains energized, unless the unit or circuit disconnect switch is open. Refer to the wiring diagram for further details. Attach appropriate safety labels.

Operating checks:
IMPORTANT INFORMATION REGARDING THE REFRIGERANT USED:

- ***This product contains fluorinated greenhouse gas covered by the Kyoto protocol.***
  Refrigerant type: R-134a
  Global Warming Potential (GWP): 1300

  Periodic inspections for refrigerant leaks may be required depending on European or local legislation. Please contact your local dealer for more information.
- ***During the life-time of the system, inspection and tests must be carried out in accordance with national regulations.***

The information on operating inspections given in annex C of standard EN 378 can be used if no similar criteria exist in the national regulations.

While working in the fan area, especially when grilles or casings are removed, disconnect the fan power supply to prevent their automatic restart.

Protection device checks:

- ***If no national regulations exist, check the protection devices on site in accordance with standard EN 378: once a year for the high-pressure switches, every five years for external safety valves.***
- ***Refer to the 30XA/30XAS/30XW Pro-Dialog control manual for a detailed explanation of the high-pressure switch test method.***

If the machine operates in a corrosive environment, inspect the protection devices more frequently.

Regularly carry out leak tests and immediately repair any leaks. Ensure regularly that the vibration levels remain acceptable and close to those at the initial unit start-up.

Before opening a refrigerant circuit, purge and consult the pressure gauges.

Change the refrigerant after an equipment failure, following a procedure such as the one described in NF E29-795 or carry out a refrigerant analysis in a specialist laboratory.

Plug all openings whenever the refrigerant circuit is opened for up to one day. For longer openings place a nitrogen charge in the circuit.

1.4 - Repair safety considerations

All installation parts must be maintained by the personnel in charge, in order to avoid material deterioration and injuries to people. Faults and leaks must be repaired immediately. The authorized technician must have the responsibility to repair the fault immediately. After each repair of the unit, check the operation of the protection devices and create a report of the parameter operation at 100%.

Comply with the regulations and recommendations in unit and HVAC installation safety standards, such as: EN 378, ISO 5149, etc.

If a leak occurs or if the refrigerant becomes contaminated (e.g. by a short circuit in a motor) remove the complete charge using a recovery unit and store the refrigerant in mobile containers.

Repair the leak detected and recharge the circuit with the total R-134a charge, as indicated on the unit name plate. Certain parts of the circuit can be isolated. Only charge liquid refrigerant R-134a at the liquid line.

Ensure that you are using the correct refrigerant type before recharging the unit. Charging any refrigerant other than the original charge type (R-134a) will impair machine operation and even destroy the compressors. The compressors operating with this refrigerant type are lubricated with a synthetic polyolester oil.

RISK OF EXPLOSION: Never use air or a gas containing oxygen during leak tests to purge lines or to pressurise a machine. Pressurised air mixtures or gases containing oxygen can be the cause of an explosion.

Only use dry nitrogen for leak tests, possibly with an appropriate tracer gas.

If the recommendations above are not observed, this can have serious or even fatal consequences and damage the installation.

Never exceed the specified maximum operating pressures. Verify the allowable maximum high- and low-side test pressures by checking the instructions in this manual and the pressures given on the unit name plate.

Do not unweld or flamecut the refrigerant lines or any refrigerant circuit component until all refrigerant (liquid and vapour) as well as the oil have been removed from chiller. Traces of vapour should be displaced with dry air nitrogen. Refrigerant in contact with an open flame produces toxic gases.

The necessary protection equipment must be available, and appropriate fire extinguishers for the system and the refrigerant type used must be within easy reach.

Do not siphon refrigerant.

Avoid spilling liquid refrigerant on skin or splashing it into the eyes. Use safety goggles and safety gloves. Wash any spills from the skin with soap and water. If liquid refrigerant enters the eyes, immediately and abundantly flush the eyes with water and consult a doctor.

Never apply an open flame or live steam to a refrigerant container. Dangerous overpressure can result. If it is necessary to heat refrigerant, use only warm water.

During refrigerant removal and storage operations follow applicable regulations. These regulations, permitting conditioning and recovery of halogenated hydrocarbons under optimum quality conditions for the products and optimum safety conditions for people, property and the environment are described in standard NF E29-795.

Any refrigerant transfer and recovery operations must be carried out using a transfer unit. A 3/8" SAE connector on the manual liquid line valve is supplied with all units for connection to the transfer station. The units must never be modified to add refrigerant and oil charging, removal and purging devices. All these devices are provided with the units. Please refer to the certified dimensional drawings for the units.

Do not re-use disposable (non-returnable) cylinders or attempt to refill them. It is dangerous and illegal. When cylinders are empty, evacuate the remaining gas pressure, and move the cylinders to a place designated for their recovery. Do not incinerate them.

ATTENTION: Only use refrigerant R134a, in accordance with 700 AHRI (Air conditioning, Heating and Refrigeration Institute). The use of any other refrigerant may expose users and operators to unexpected risks.

Do not attempt to remove refrigerant circuit components or fittings, while the machine is under pressure or while it is running. Be sure pressure is at 0 kPa and that the unit has been shut-down and de-energised before removing components or opening a circuit.

Do not attempt to repair or recondition any safety devices when corrosion or build-up of foreign material (rust, dirt, scale, etc.) is found within the valve body or mechanism. If necessary, replace the device. Do not install safety valves in series or backwards.

ATTENTION: No part of the unit must be used as a walkway, rack or support. Periodically check and repair or if necessary replace any component or piping that shows signs of damage.

The refrigerant lines can break under the weight and release refrigerant, causing personal injury.

Do not climb on a machine. Use a platform, or staging to work at higher levels.

Use mechanical lifting equipment (crane, hoist, winch, etc.) to lift or move heavy components. For lighter components, use lifting equipment when there is a risk of slipping or losing your balance.

Use only original replacement parts for any repair or component replacement. Consult the list of replacement parts that corresponds to the specification of the original equipment.

Do not drain water circuits containing industrial brines, without informing the technical service department at the installation site or a competent body first.

Close the entering and leaving water shutoff valves and purge the unit water circuit, before working on the components installed on the circuit (screen filter, pump, water flow switch, etc.).

Do not loosen the water box bolts until the water boxes have been completely drained.

Periodically inspect all valves, fittings and pipes of the refrigerant and hydronic circuits to ensure that they do not show any corrosion or any signs of leaks.

It is recommended to wear ear defenders, when working near the unit and the unit is in operation.

2 - PRELIMINARY CHECKS

2.1 - Check equipment received

- Check that the unit has not been damaged during transport and that no parts are missing. If the unit has been damaged or the shipment is incomplete, send a claim to the shipping company.
- Compare the name plate data with the order. The name plate is attached in two places to the unit:
  - on one of the unit sides on the outside,
  - on the control box door on the inside.
- The unit name plate must include the following information:
  - Version number
  - Model number
  - CE marking
  - Serial number
  - Year of manufacture and test date
  - Refrigerant used and refrigerant class
  - Refrigerant charge per circuit
  - Containment fluid to be used
  - PS: Min./max. allowable pressure (high and low pressure side)
  - TS: Min./max. allowable temperature (high and low pressure side)
  - Pressure switch cut-out pressure
  - Unit leak test pressure
  - Voltage, frequency, number of phases
  - Maximum current drawn
  - Maximum power input
  - Unit net weight
- Confirm that all accessories ordered for on-site installation have been supplied, are complete and undamaged.

The unit must be checked periodically during its whole operating life to ensure that no shocks (handling accessories, tools etc.) have damaged it. If necessary, damaged parts must be repaired or replaced. See also chapter 13 - "Standard maintenance".

2.2 - Moving and siting the unit

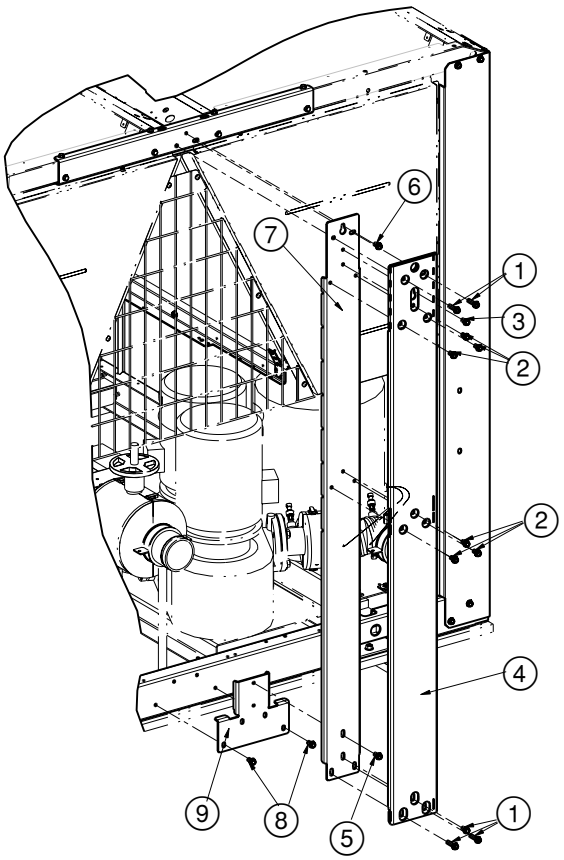
2.2.1 - Moving

See chapter 1.1 "Installation safety considerations".

In some cases vertical supports are added for the transport and handling of the unit. These supports can be removed for access or connection, if required.

IMPORTANT: Follow the disassembly sequence shown in the disassembly instruction notes.

- Unscrew screws marked 1 and 2
- Loosen screw 3, and lift and remove support 4
- Uncrew screw 5 and loosen screw 6.
- Lift and remove support 7.
- Unscrew screw 8 and remove plate 9.



Keep the vertical supports after commissioning the units and re-insert them when the unit is moved.

2.2.2 - Siting the unit

The machine must be installed in a place that is not accessible to the public or protected against access by non-authorised persons.

In case of extra-high units the machine environment must permit easy access for maintenance operations.

Always refer to the chapter 3 "Dimensions, clearances" to confirm that there is adequate space for all connections and service operations. For the centre of gravity coordinates, the position of the unit mounting holes, and the weight distribution points, refer to the certified dimensional drawing supplied with the unit.

The support points under the chassis must have at least the size of the chassis opening at the lifting point (minimum 220 x 180 mm) in order to prevent a deformation of the chassis.

Typical applications of these units are in refrigeration systems, and they do not require earthquake resistance. Earthquake resistance has not been verified.

CAUTION: Only use slings at the designated lifting points which are marked on the unit.

Before siting the unit check that:
- the permitted loading at the site is adequate or that appropriate strenghtening measures have been taken.
- the unit is installed level on an even surface (maximum tolerance is 5 mm in both axes).
- there is adequate space above the unit for air flow and to ensure access to the components.
- the number of support points is adequate and that they are in the right places.
- the location is not subject to flooding.
- for outdoor installations, where heavy snowfall is likely and long periods of sub-zero temperatures are normal, provision has to be made to prevent snow accumulating by raising the unit above the height of drifts normally experienced.
- Baffles may be necessary to deflect strong winds. They must not restrict air flow into the unit.

CAUTION: Before lifting the unit, check that all casing panels are securely fixed in place. Lift and set down the unit with great care. Tilting and jarring can damage the unit and impair unit operation.

If 30XA units are hoisted with rigging, it is advisable to protect coils against crushing while a unit is being moved. Use struts or spreader bar to spread the slings above the unit. Do not tilt a unit more than 15°.

WARNING: Never push or lever on any of the enclosure panels of the unit. Only the base of the unit frame is designed to withstand such stresses.

If a unit includes a hydronic module (options 116B, C, F, G), the hydronic module and pump piping must be installed in a way that does not submit it to any strain. The hydronic module pipes must be fitted so that the pump does not support the weight of the pipes.

2.2.3 - Checks before system start-up

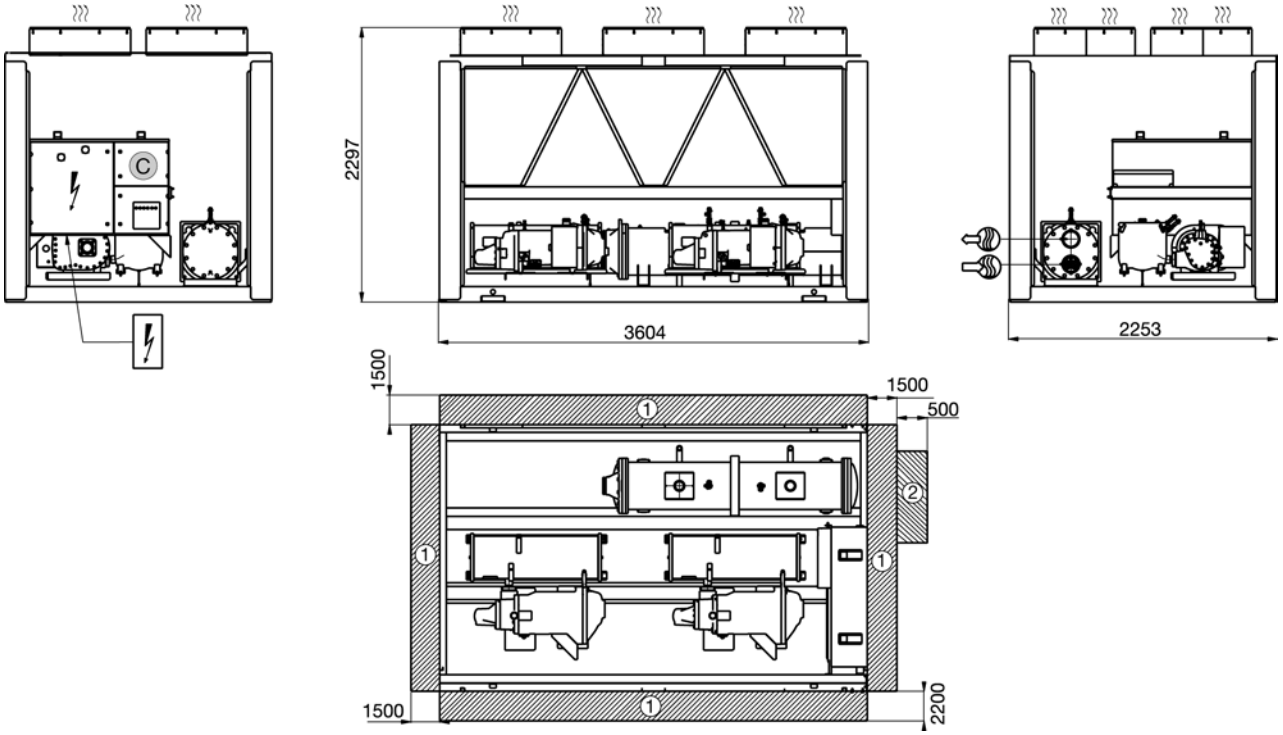
Before the start-up of the refrigeration system, the complete installation, including the refrigeration system must be verified against the installation drawings, dimensional drawings, system piping and instrumentation diagrams and the wiring diagrams.

For these checks national regulations must be followed. If the national regulation does not specify any details, refer to standard EN 378 as follows:

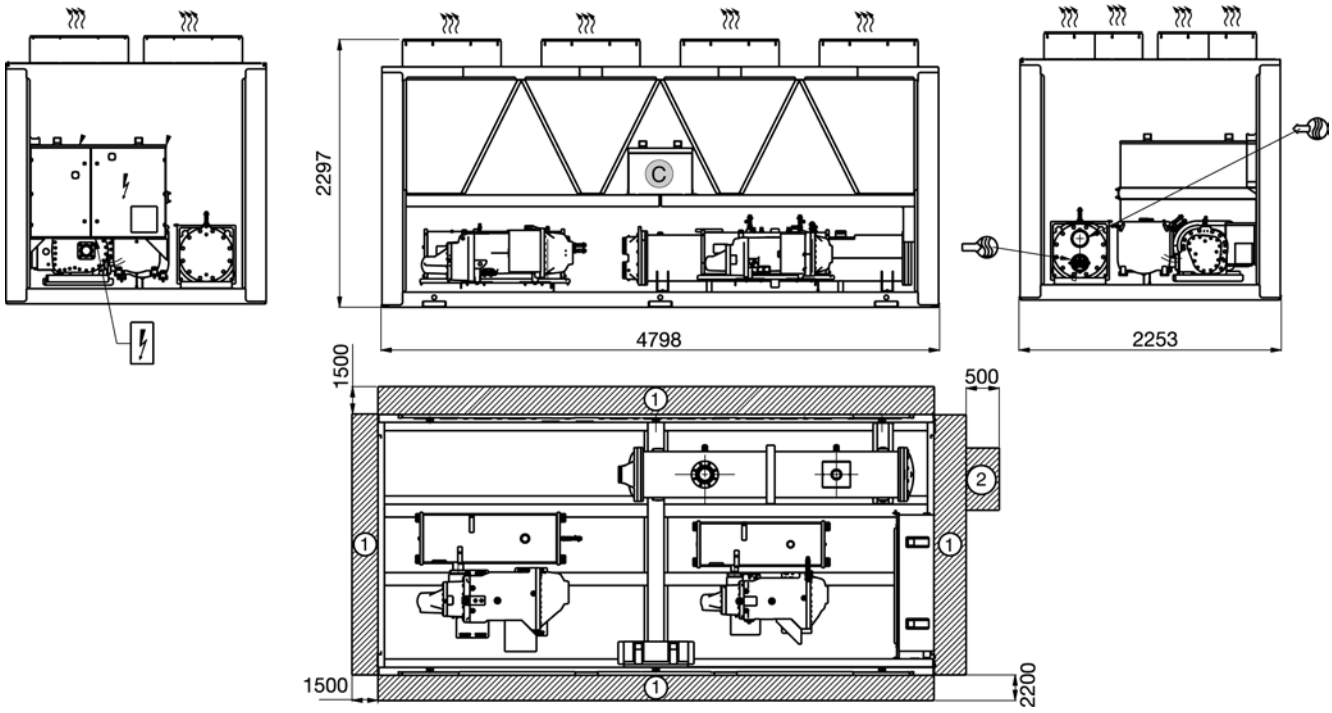
External visual installation checks:
- Compare the complete installation with the refrigeration system and power circuit diagrams.
- Check that all components comply with the design specifications.
- Check that all protection documents and equipment provided by the manufacturer (dimensional drawings, P&ID, declarations etc.) to comply with the regulations are present.
- Verify that the environmental safety and protection and devices and arrangements provided by the manufacturer to comply with the regulations are in place.
- Verify that all documents for pressure containers, certificates, name plates, files, instruction manuals provided by the manufacturer to comply with the regulations are present.
- Verify the free passage of access and safety routes.
- Check that ventilation in the plant room is adequate.
- Check that refrigerant detectors are present.
- Verify the instructions and directives to prevent the deliberate removal of refrigerant gases that are harmful to the environment.
- Verify the installation of connections.
- Verify the supports and fixing elements (materials, routing and connection).
- Verify the quality of welds and other joints.
- Check the protection against mechanical damage.
- Check the protection against heat.
- Check the protection of moving parts.
- Verify the accessibility for maintenance or repair and to check the piping.
- Verify the status of the valves.
- Verify the quality of the thermal insulation and of the vapour barriers.

3 - DIMENSIONS, CLEARANCES

3.1 - 30XA 252-352 - MCHE heat exchanger (standard) and 30XA 252-302 - Cu/Al heat exchanger (option 254/255)



3.2 - 30XA 402-452 - MCHE heat exchanger (standard) and 352-452 - Cu/Al heat exchanger (option 254/255)



Legend
All dimensions are given in mm.

(1) Required clearances for maintenance (see note)

(2) Recommended space for evaporator tube removal

Water inlet for standard unit
For options 5, 6, 100A, 100C, 107 refer to the certified drawing.

Water outlet for standard unit
For options 5, 6, 100A, 100C, 107 refer to the certified drawing.

Air outlet – do not obstruct

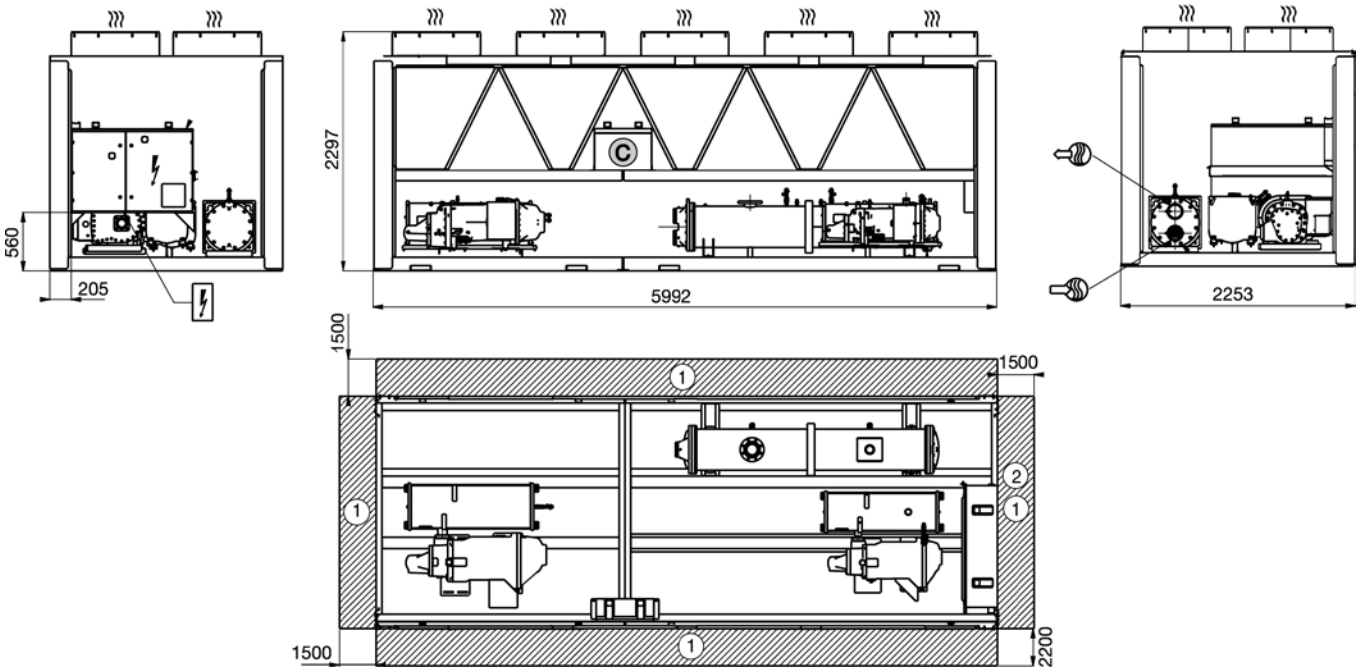
Power supply and control connection

(C) Control circuit connection for option 158

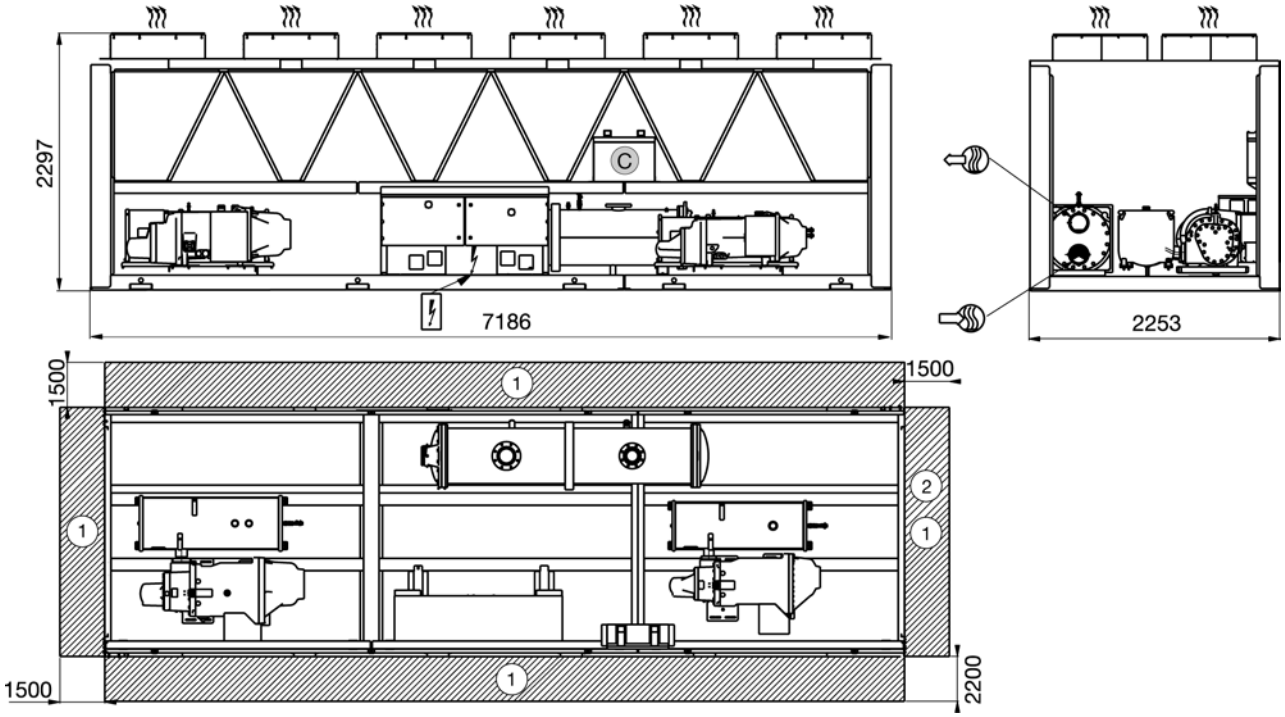
NOTES:

- ***Drawings are not contractually binding.***
- ***Before designing an installation, consult the certified dimensional drawings, available on request.***
- ***For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.***
- ***If the installation includes several units or if this (these) is (are) close to walls, please refer to chapters 3.13 - "Multiple chiller installation" and 3.14 - "Distance to the wall" of this document to determine the space required.***

3.3 - 30XA 502 MCHE heat exchanger (standard) and 30XA 502 Cu/Al heat exchanger (option 254/255)



3.4 - 30XA 602-802 MCHE heat exchanger (standard) and 30XA 602-702 Cu/Al heat exchanger (option 254/255)



Legend
All dimensions are given in mm.

(1) Required clearances for maintenance (see note)

(2) Recommended space for evaporator tube removal

Water inlet for standard unit
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Air outlet – do not obstruct

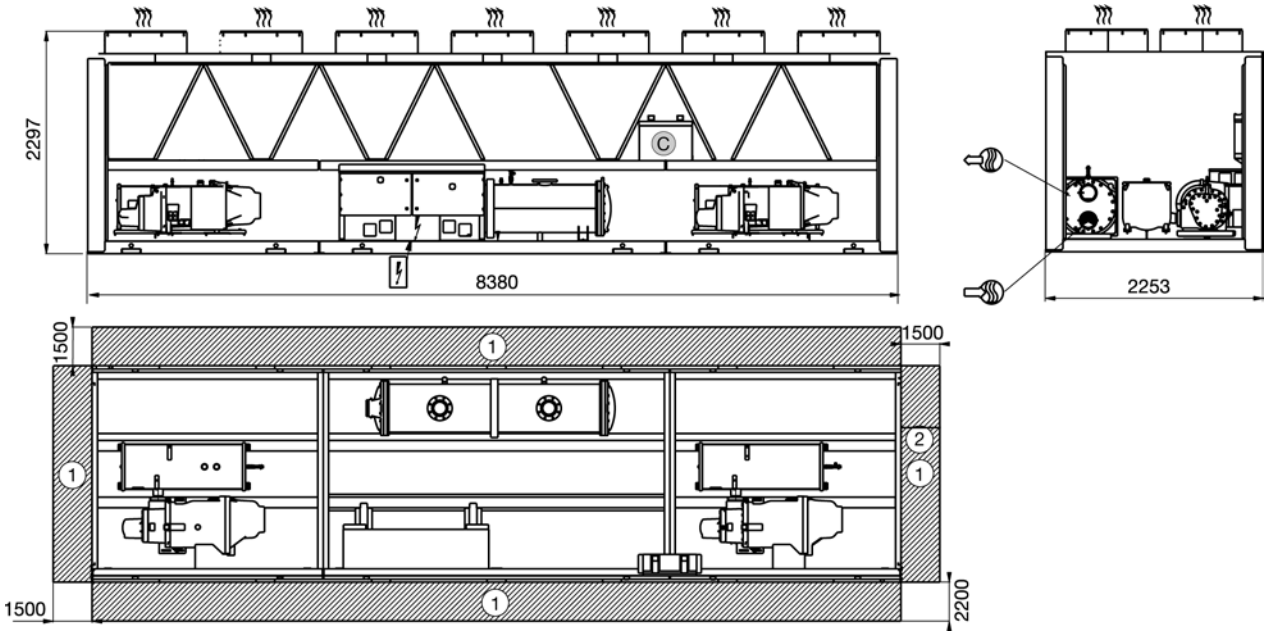
Power supply and control connection

Ⓒ Control circuit connection for option 158

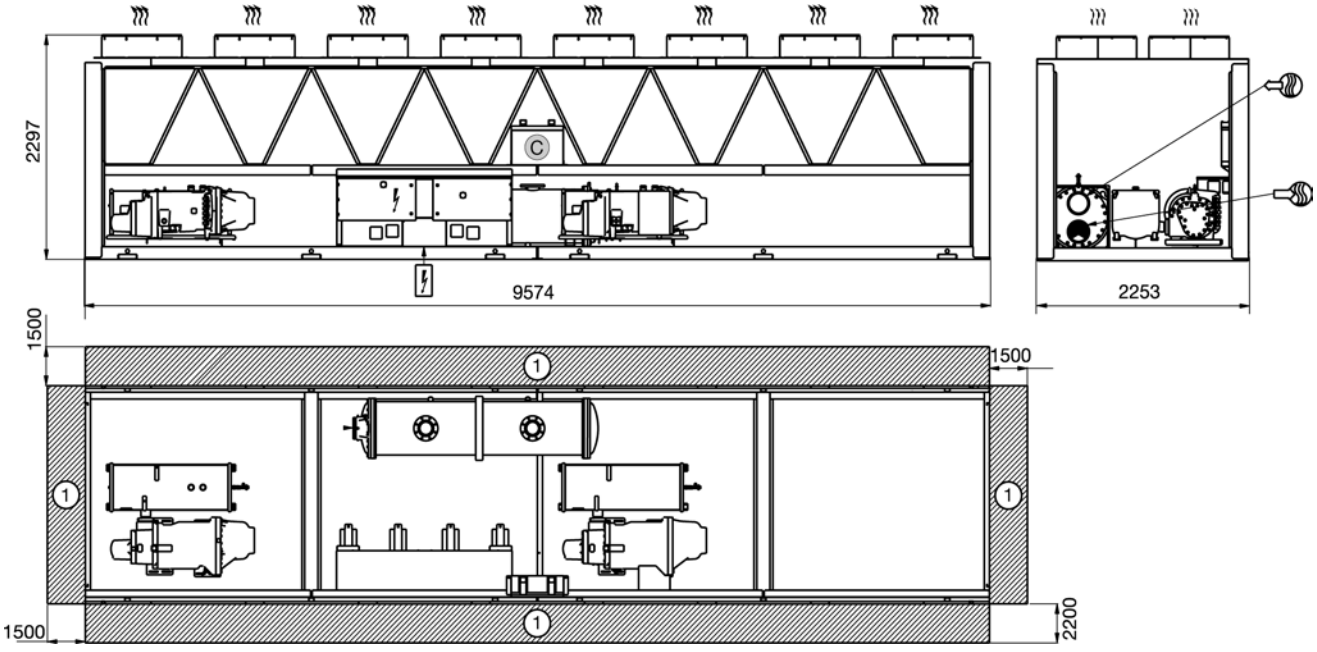
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- ***Before designing an installation, consult the certified dimensional drawings, available on request.***
- ***For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.***
- ***If the installation includes several units or if this (these) is (are) close to walls, please refer to chapters 3.13 - "Multiple chiller installation" and 3.14 - "Distance to the wall" of this document to determine the space required.***

3.5 - 30XA 852-902 MCHE heat exchanger (standard) and 30XA 752-852 Cu/Al heat exchanger (option 254/255)



3.6 - 30XA 1002 MCHE heat exchanger (standard) and 30XA 902-1002 Cu/Al heat exchanger (option 254/255)



Legend
All dimensions are given in mm.

(1) Required clearances for maintenance (see note)

(2) Recommended space for evaporator tube removal

Water inlet for standard unit
For options 5, 6, 100A, 100C, 107 refer to the certified drawing.

Water outlet for standard unit
For options 5, 6, 100A, 100C, 107 refer to the certified drawing.

Air outlet – do not obstruct

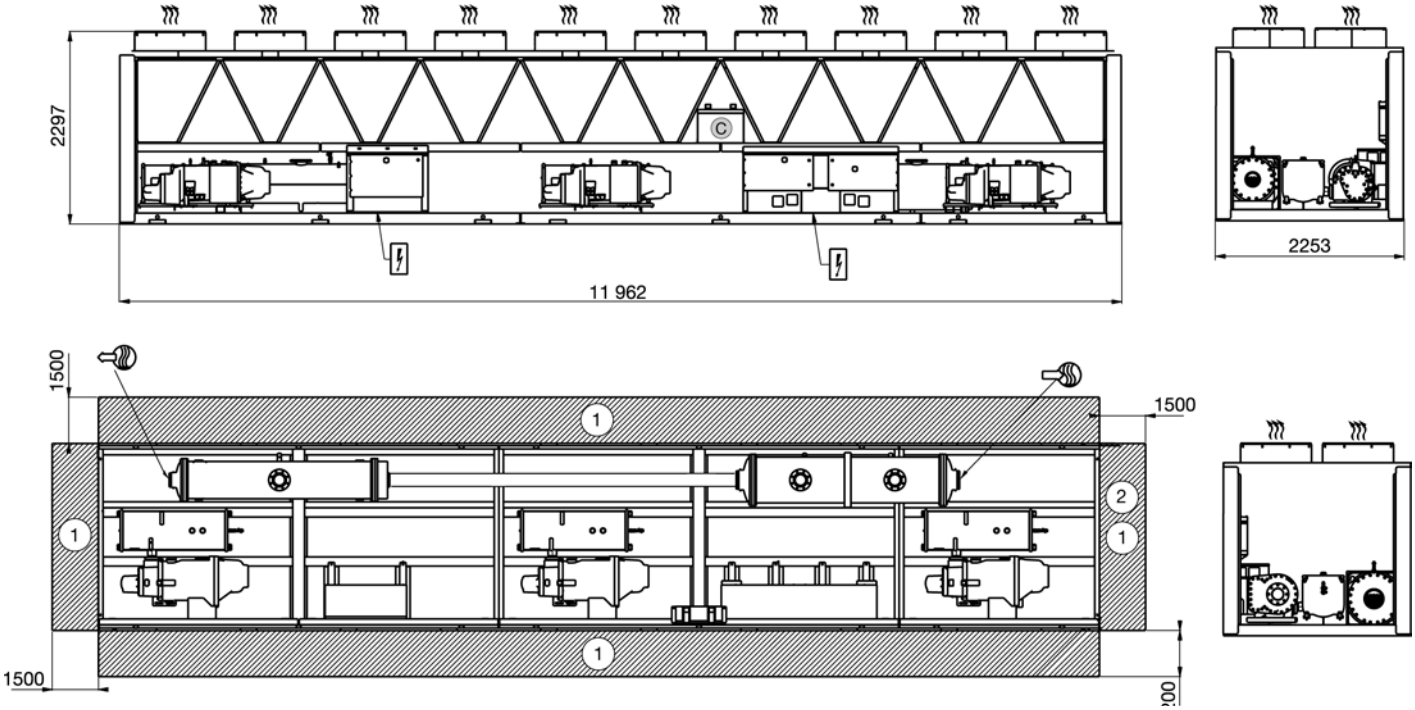
Power supply and control connection

(C) Control circuit connection for option 158

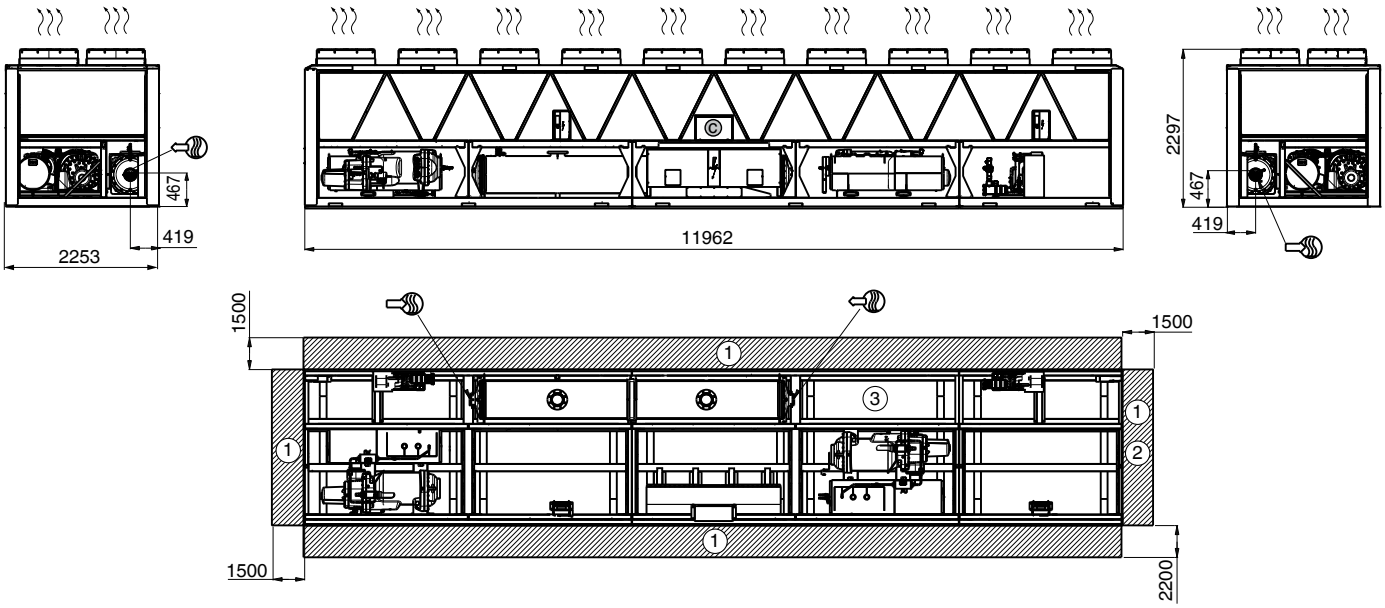
NOTES:

- ***Drawings are not contractually binding.***
- ***Before designing an installation, consult the certified dimensional drawings, available on request.***
- ***For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.***
- ***If the installation includes several units or if this (these) is (are) close to walls, please refer to chapters 3.13 - "Multiple chiller installation" and 3.14 - "Distance to the wall" of this document to determine the space required.***

3.7 - 30XA 1102, 1202, 1302, 1352 MCHE heat exchanger (standard) and 30XA 1102, 1202, 1302, 1352 Cu/Al heat exchanger (option 254/255)



3.8 - 30XA 1112, 1212, 1312, 1382 MCHE heat exchanger (standard)



Legend
All dimensions are given in mm.

(1) Required clearances for maintenance (see note)

(2) Recommended space for evaporator tube removal

(3) Required clearances for maintenance if options 100A + 107 are used together

Water inlet for standard unit
For options 5, 6, 100A, 100C, 107 refer to the certified drawing.

Water outlet for standard unit
For options 5, 6, 100A, 100C, 107 refer to the certified drawing.

Air outlet – do not obstruct

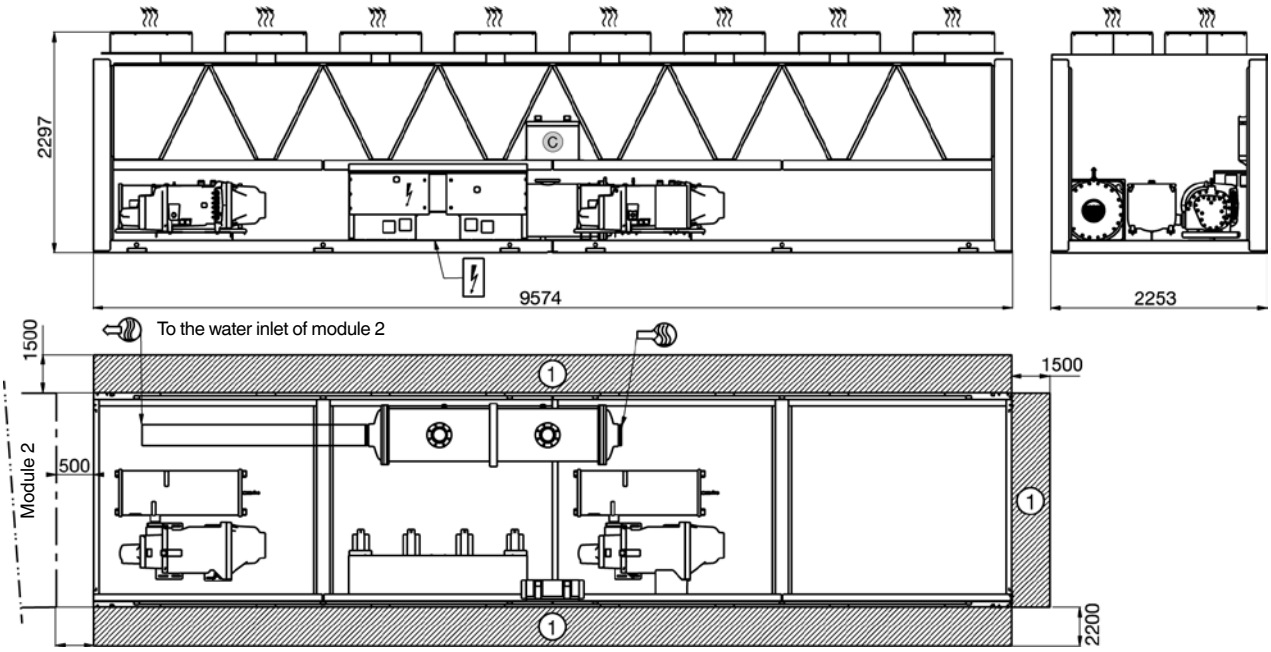
Power supply and control connection

© Control circuit connection for option 158

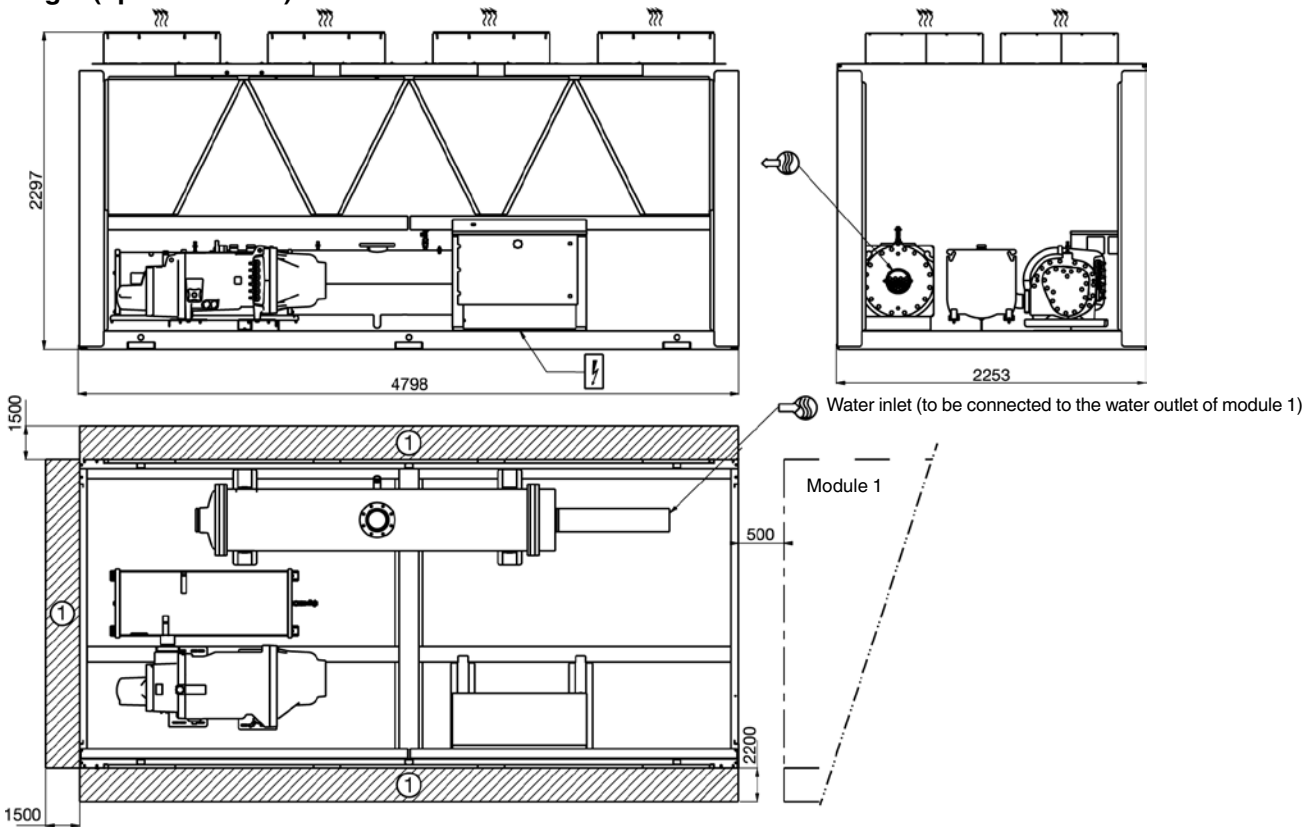
NOTES:

- ***Drawings are not contractually binding.***
- ***Before designing an installation, consult the certified dimensional drawings, available on request.***
- ***For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.***
- ***If the installation includes several units or if this (these) is (are) close to walls, please refer to chapters 3.13 - "Multiple chiller installation" and 3.14 - "Distance to the wall" of this document to determine the space required.***

3.9 - 30XA 1402-1502 module 1/2 - MCHE heat exchanger (standard) and 30XA 1402-1502 module 1/2 - Cu/Al heat exchanger (option 254/255)



3.10 - 30XA 1402-1502 module 2/2 - MCHE heat exchanger (standard) and 30XA 1402-1502 module 2/2 - Cu/Al heat exchanger (option 254/255)



Legend
All dimensions are given in mm.

(1) Required clearances for maintenance (see note)

(2) Recommended space for evaporator tube removal

Water inlet for standard unit
For options 5, 6, 100A, 100C, 107 refer to the certified drawing.

Water outlet for standard unit
For options 5, 6, 100A, 100C, 107 refer to the certified drawing.

Air outlet – do not obstruct

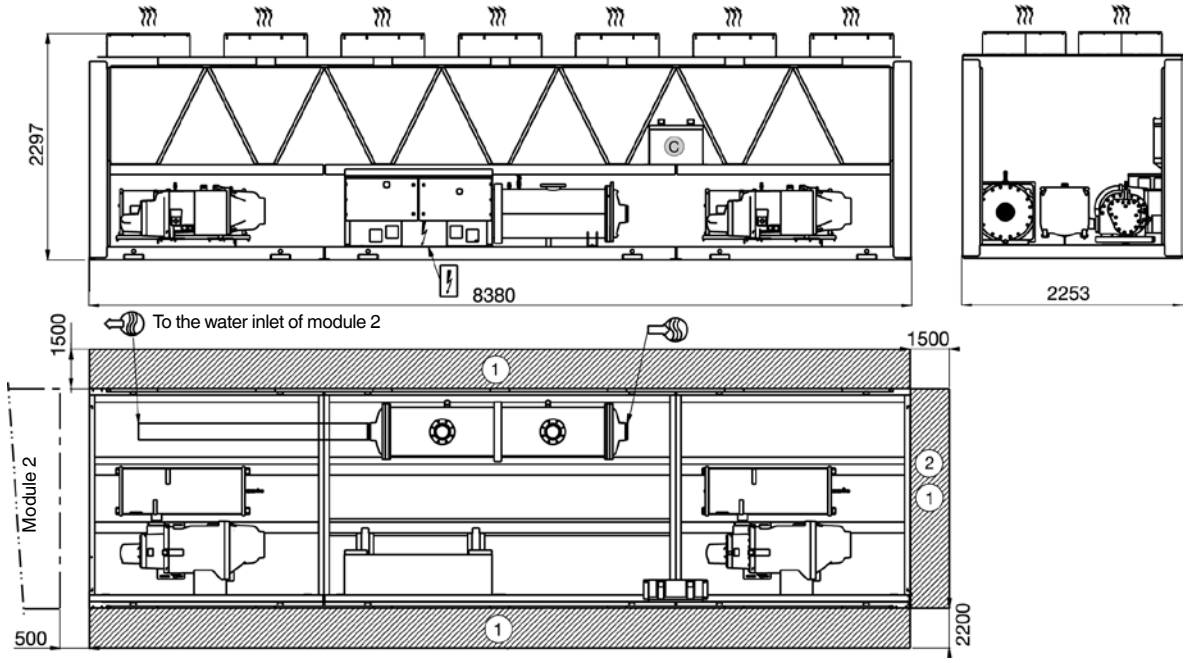
Power supply and control connection

© Control circuit connection for option 158

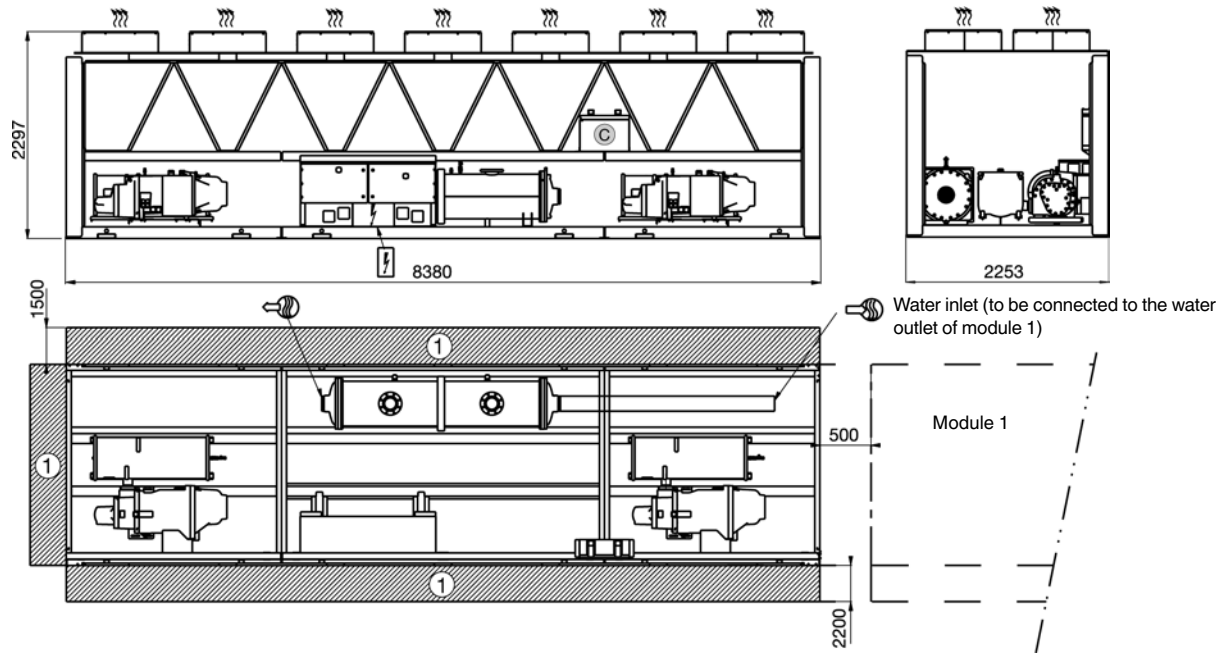
NOTES:

- ***Drawings are not contractually binding.***
- ***Before designing an installation, consult the certified dimensional drawings, available on request.***
- ***For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.***
- ***If the installation includes several units or if this (these) is (are) close to walls, please refer to chapters 3.13 - "Multiple chiller installation" and 3.14 - "Distance to the wall" of this document to determine the space required.***

3.11 - 30XA 1702 module 1/2 - MCHE heat exchanger (standard) and 30XA 1702 module 1/2 - Cu/Al heat exchanger (option 254/255)



3.12 - 30XA 1702 module 2/2 - MCHE heat exchanger (standard) and 30XA 1702 module 2/2 - Cu/Al heat exchanger (option 254/255)



Legend
All dimensions are given in mm.

(1) Required clearances for maintenance (see note)

(2) Recommended space for evaporator tube removal

Water inlet for standard unit
For options 5, 6, 100A, 100C, 107 refer to the certified drawing.

Water outlet for standard unit
For options 5, 6, 100A, 100C, 107 refer to the certified drawing.

Air outlet – do not obstruct

Power supply and control connection

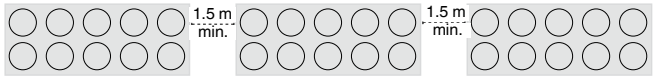
Ⓒ Control circuit connection for option 158

NOTES:

- ***Drawings are not contractually binding.***
- ***Before designing an installation, consult the certified dimensional drawings, available on request.***
- ***For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.***
- ***If the installation includes several units or if this (these) is (are) close to walls, please refer to chapters 3.13 - "Multiple chiller installation" and 3.14 - "Distance to the wall" of this document to determine the space required.***

3.13 - Multiple chiller installation

It is recommended to install multiple chillers in a single row, arranged as shown in the example below, to avoid recycling of warm air from one unit to another.

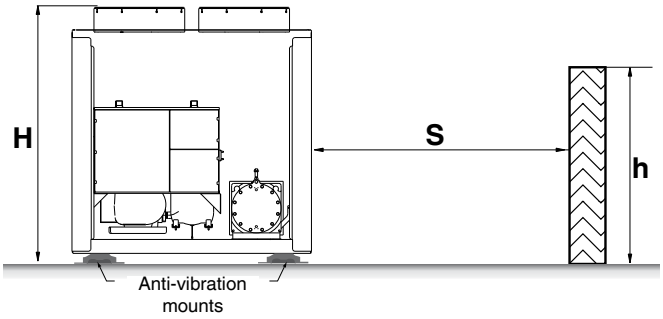


If the situation at the site does not permit this arrangement, contact your Carrier distributor to evaluate the various possible arrangements. In certain situations an accessory (supplied loose at the time of purchase) can be added.

3.14 - Distance to the wall

To ensure correct operation for most cases:
If h < H (2.3 m), minimum S = 3 m

If h > H or S < 3 m, contact your Carrier distributor to evaluate the various possible arrangements. In certain situations an accessory (supplied loose at the time of purchase) can be added.



4 - PHYSICAL AND ELECTRICAL DATA FOR 30XA UNITS

4.1 - Physical data 30XA 252-902 - standard units and units with option 119*

30XA		252	302	352	402	452	502	602	702	752	802	852	902
Operating weight*													
Standard unit and unit with option 119**	kg	3410	3450	3490	4313	4883	4814	5707	5857	6157	6457	6958	7258
Sound levels													
Standard unit													
Sound power***	dB(A)	99	99	99	98	101	98	100	98	103	102	100	104
Sound pressure at 10 m****	dB(A)	67	67	67	65	69	65	67	65	70	70	67	71
Unit with option 279**													
Sound power***	dB(A)	89	89	89	92	93	93	95	94	96	96	95	97
Sound pressure at 10 m****	dB(A)	57	57	57	60	61	61	62	61	63	64	63	64
Standard unit with option 257**													
Sound power***	dB(A)	87	87	87	90	91	91	93	92	94	94	94	95
Sound pressure at 10 m****	dB(A)	55	55	55	58	59	59	60	59	61	61	61	62
Standard unit with option 258**													
Sound power***	dB(A)	-	-	-	-	89	89	91	90	91	92	91	93
Sound pressure at 10 m****	dB(A)	-	-	-	-	57	56	58	57	59	59	59	60
High-energy-efficiency unit (option 119)**													
Sound power***	dB(A)	100	100	100	100	102	100	102	100	104	104	102	105
Sound pressure at 10 m****	dB(A)	68	68	68	68	70	68	69	68	71	71	69	72
Unit with options 119 + 257**													
Sound power***	dB(A)	93	93	93	95	95	95	97	96	97	97	97	98
Sound pressure at 10 m****	dB(A)	61	61	61	63	63	63	65	63	64	64	64	65
Refrigerant*		R-134a											
Circuit A	kg	37	35	35	50.5	52	58.5	58	58	65	69	72	69
Circuit B	kg	38.5	36	37	36.5	37	36	59	62	58	65	63	76
Circuit C	kg	-	-	-	-	-	-	-	-	-	-	-	-
Circuit D	kg	-	-	-	-	-	-	-	-	-	-	-	-
Compressors		06T semi-hermetic screw compressors, 50 r/s											
Circuit A		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
Circuit C		-	-	-	-	-	-	-	-	-	-	-	-
Circuit D		-	-	-	-	-	-	-	-	-	-	-	-
Oil charge													
Circuit A	l	20.8	20.8	20.8	23.5	23.5	23.5	23.5	23.5	27.6	27.6	27.6	27.6
Circuit B	l	20.8	20.8	20.8	20.8	20.8	20.8	23.5	23.5	23.5	23.5	23.5	27.6
Circuit C	l	-	-	-	-	-	-	-	-	-	-	-	-
Circuit D	l	-	-	-	-	-	-	-	-	-	-	-	-
Capacity control		Pro-Dialog, electronic expansion valve (EXV)											
Minimum capacity	%	15	15	15	15	15	15	15	15	15	15	15	15
Condensers		All-aluminium microchannel heat exchanger (MCHE)											
Fans		Axial Flying Bird IV fans with rotating shroud											
Standard unit													
Quantity		6	6	6	8	8	9	11	12	12	12	14	14
Total air flow	l/s	20500	20500	20500	27333	27333	30750	37583	41000	41000	41000	47833	47833
Speed	r/s	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
Unit with option 119**													
Quantity		6	6	6	8	8	9	11	12	12	12	14	14
Total air flow	l/s	27083	27083	27083	36111	36111	40625	49653	54167	54167	54167	63194	63194
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
Evaporator		Flooded multi-pipe type											
Water volume	l	58	61	61	66	70	77	79	94	98	119	119	130
Without hydronic module													
Water inlet/outlet connections		Victaulic											
Nominal diameter	in	5	5	5	5	5	5	5	6	6	6	6	6
Actual 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
Maximum water-side pressure†	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
With hydronic module (option 116)													
Water inlet/outlet connections		Victaulic											
Nominal diameter	in	4	4	4	4	4	4	-	-	-	-	-	-
Actual outside diameter	mm	114.3	114.3	114.3	114.3	114.3	114.3	-	-	-	-	-	-
Expansion tank valume	l	50	50	50	50	50	80	-	-	-	-	-	-
Maximum water-side pressure†	kPa	400	400	400	400	400	400	-	-	-	-	-	-
Chassis paint colour		Colour code: RAL7035											

* Weights are guidelines only. The refrigerant charge is given on the unit nameplate.
** Options: 119 = high energy efficiency, 257 = low sound level, 258 = very low sound level, 279 = compressor enclosure.
*** 10^{-12} W - in accordance with ISO 9614-1 and certified by Eurovent.
**** Average sound pressure level, unit in a free field on a reflecting surface. For information, calculated from the sound power level Lw(A).
† Max. water-side operating pressure without hydronic module.

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

4.1 - Physical data 30XA 1002-1702 - standard units and units with option 119* (continued)

30XA		1002	1102	1112	1202	1212	1302	1312	1352	1382	1402	1502	1702
Operating weight*													
Standard unit and unit with option 119**	kg	7836	9590	9410	10020	9570	10410	10180	10770	10270	3953/7776	3953/7926	6958/6958
Sound levels													
Standard unit													
Sound power***	dB(A)	101	102	103	103	102	102	104	104	104	103	104	103
Sound pressure at 10 m****	dB(A)	68	69	70	70	69	69	71	71	71	69	70	69
Unit with option 279**													
Sound power***	dB(A)	96	96	97	96	96	96	100	97	97	97	97	97
Sound pressure at 10 m****	dB(A)	63	63	64	63	63	63	67	64	64	64	64	64
Standard unit with option 257**													
Sound power***	dB(A)	94	95	94	95	94	95	99	96	95	96	96	96
Sound pressure at 10 m****	dB(A)	61	61	61	61	61	61	66	63	62	62	62	62
Standard unit with option 258**													
Sound power***	dB(A)	92	92	93	-	93	92	-	93	94	93	93	93
Sound pressure at 10 m****	dB(A)	59	59	60	-	60	59	-	60	61	60	60	60
High-energy-efficiency unit (option 119)**													
Sound power***	dB(A)	103	104	104	105	103	104	105	105	105	105	105	105
Sound pressure at 10 m****	dB(A)	70	71	71	72	70	71	72	72	72	72	72	71
Unit with options 119 + 257**													
Sound power***	dB(A)	98	99	98	99	98	99	101	99	99	100	100	100
Sound pressure at 10 m****	dB(A)	65	66	65	66	65	66	68	66	65	67	67	66
Refrigerant*		R-134a											
Circuit A	kg	75	64	80	69	80	70	110	83	116	84	85	72
Circuit B	kg	79	52	116	52	124	59	116	69	124	78	88	63
Circuit C	kg	-	80	-	80	-	80	-	81	-	80	80	72
Circuit D	kg	-	-	-	-	-	-	-	-	-	-	-	63
Compressors		06T semi-hermetic screw compressors, 50 r/s											
Circuit A		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
Circuit C		-	1	-	1	-	1	-	1	-	1	1	1
Circuit D		-	-	-	-	-	-	-	-	-	-	-	1
Oil charge													
Circuit A	l	27,6	23,5	27,6	27,6	27,6	27,6	36	27,6	36	27,6	27,6	27,6
Circuit B	l	27,6	23,5	36	23,5	36	23,5	36	27,6	36	27,6	27,6	23,5
Circuit C	l	-	27,6	-	27,6	-	27,6	-	27,6	-	27,6	27,6	27,6
Circuit D	l	-	-	-	-	-	-	-	-	-	-	-	23,5
Capacity control		Pro-Dialog, electronic expansion valve (EXV)											
Minimum capacity	%	15	10	8	10	8	10	8	10	8	10	10	8
Condensers		All-aluminium microchannel heat exchanger (MCHE)											
Fans		Axial Flying Bird IV fans with rotating shroud											
Standard unit													
Quantity		16	19	19	20	20	20	20	20	20	24	24	28
Total air flow	l/s	54667	64917	64917	68333	68333	68333	68333	68333	68333	82000	82000	95667
Speed	r/s	11,7	11,7	11,7	11,7	11,7	11,7	11,7	11,7	11,7	11,7	11,7	11,7
Unit with option 119**													
Quantity		16	19	19	20	20	20	20	20	20	24	24	28
Total air flow	l/s	72222	85764	64917	68333	68333	68333	68333	68333	68333	108333	108333	126389
Speed	r/s	15,7	15,7	11,7	11,7	11,7	11,7	11,7	11,7	11,7	15,7	15,7	15,7
Evaporator		Flooded multi-pipe type											
Water volume	l	140	168	164	182	174	203	180	224	189	230	240	240
Without hydronic module													
Water inlet/outlet connections		Victaulic											
Nominal diameter	in	8	6	6	6	6	6	6	8/6	6	8/6	8/6	6
Actual outside diameter	mm	219,1	168,3	168,3	168,3	168,3	168,3	168,3	219,1/168,3	168,3	219,1/168,3	219,1/168,3	168,3
Maximum water-side pressure†	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Chassis paint colour		Colour code: RAL7035											

* Weights are guidelines only. The refrigerant charge is given on the unit nameplate.
** Options: 119 = high energy efficiency, 257 = low sound level, 258 = very low sound level, 279 = compressor enclosure.
*** 10^{-12} W - in accordance with ISO 9614-1 and certified by Eurovent.
**** Average sound pressure level, unit in a free field on a reflecting surface. For information, calculated from the sound power level Lw(A).
† Max. water-side operating pressure without hydronic module.

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

4.2 - Physical data 30XA 252-902 - units with option 254 and 255**

30XA		252	302	352	402	452	502	602	702	752	802	852	902
Operating weight*	kg	3830	3860	4380	4830	4900	5470	6480	6640	7430	7750	7870	8620
Sound levels													
Standard unit with options 254 or 255****													
Sound power****	dB(A)	99	99	99	98	101	98	100	98	103	102	100	104
Sound pressure at 10 m****	dB(A)	67	67	68	65	69	65	67	65	70	70	67	71
High-energy efficiency unit with option 119 and option 254** or 255****													
Sound power***	dB(A)	100	100	100	100	102	100	102	100	104	104	102	105
Sound pressure at 10 m****	dB(A)	68	68	68	68	70	68	69	68	71	71	69	72
Refrigerant*		R-134a											
Circuit A	kg	60	64	70	85	85	102	102	100	129	112	130	129
Circuit B	kg	64	64	56	56	56	56	88	95	88	95	95	103
Circuit C	kg	-	-	-	-	-	-	-	-	-	-	-	-
Circuit D	kg	-	-	-	-	-	-	-	-	-	-	-	-
Compressors		06T semi-hermetic screw compressors, 50 r/s											
Circuit A		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
Circuit C		-	-	-	-	-	-	-	-	-	-	-	-
Circuit D		-	-	-	-	-	-	-	-	-	-	-	-
Oil charge													
Circuit A	l	20.8	20.8	20.8	23.5	23.5	23.5	23.5	23.5	27.6	27.6	27.6	27.6
Circuit B	l	20.8	20.8	20.8	20.8	20.8	20.8	23.5	23.5	23.5	23.5	23.5	27.6
Circuit C	l	-	-	-	-	-	-	-	-	-	-	-	-
Circuit D	l	-	-	-	-	-	-	-	-	-	-	-	-
Capacity control		Pro-Dialog, electronic expansion valve (EXV)											
Minimum capacity	%	15	15	15	15	15	15	15	15	15	15	15	15
Condensers		Copper/aluminium coil											
Fans		Axial Flying Bird IV fans with rotating shroud											
Quantity		6	6	7	8	8	9	11	12	13	13	14	15
Total air flow	l/s	20500	20500	20500	27333	27333	30750	37583	41000	41000	41000	47833	47833
Speed	r/s	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
Evaporator		Flooded multi-pipe type											
Water volume	l	58	61	61	66	70	77	79	94	98	119	119	130
Maximum pressure†	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

* Weights are guidelines only. For sizes 1402 to 1702 weight of modules 1 and 2. The refrigerant charge is given on the unit nameplate.
** Options: 119 = high energy efficiency, 254 = units with copper/aluminium coils, 255 = units with copper/aluminium coils without slots.
*** 10^{-12} W - in accordance with ISO 9614-1 and certified by Eurovent.
**** Average sound pressure level, unit in a free field on a reflecting surface. For information, calculated from the sound power level Lw(A).
† Max. water-side operating pressure without hydronic module.

Notes:
1. Unit sizes 30XA 1402 to 1702 are supplied in two field-assembled modules.
2. Option 119 (high energy efficiency) can be used together with options 254 and 255. Contact your Carrier representative to obtain the performances.

4.2 - Physical data 30XA 1002-1702 - units with option 254 and 255** (continued)

30XA		1002	1102	1112	1202	1212	1302	1312	1352	1382	1402	1502	1702
Operating weight*	kg	8870	10890	-	11310	-	11660	-	12060	-	4460/8830	4460/8950	7880/7880
Sound levels													
Standard unit with options 254 or 255****													
Sound power****	dB(A)	101	102	-	103	-	102	-	104	-	103	104	103
Sound pressure at 10 m****	dB(A)	68	69	-	70	-	69	-	71	-	69	70	69
High-energy efficiency unit with option 119 and option 254** or 255****													
Sound power***	dB(A)	103	104	-	105	-	104	-	105	-	105	105	105
Sound pressure at 10 m****	dB(A)	70	71	-	72	-	71	-	72	-	72	72	71
Refrigerant*		R-134a											
Circuit A	kg	140	102	-	112	-	112	-	112	-	140	140	130
Circuit B	kg	129	92	-	92	-	92	-	98	-	103	129	95
Circuit C	kg	-	135	-	135	-	135	-	122	-	135	135	130
Circuit D	kg	-	-	-	-	-	-	-	-	-	-	-	95
Compressors		06T semi-hermetic screw compressors, 50 r/s											
Circuit A		1	1	-	1	-	1	-	1	-	1	1	1
Circuit B		1	1	-	1	-	1	-	1	-	1	1	1
Circuit C		-	1	-	1	-	1	-	1	-	1	1	1
Circuit D		-	-	-	-	-	-	-	-	-	-	-	1
Oil charge													
Circuit A	l	27.6	23.5	-	27.6	-	27.6	-	27.6	-	27.6	27.6	27.6
Circuit B	l	27.6	23.5	-	23.5	-	23.5	-	27.6	-	27.6	27.6	23.5
Circuit C	l	-	27.6	-	27.6	-	27.6	-	27.6	-	27.6	27.6	27.6
Circuit D	l	-	-	-	-	-	-	-	-	-	-	-	23.5
Capacity control		Pro-Dialog. electronic expansion valve (EXV)											
Minimum capacity	%	15	10	-	10	-	10	-	10	-	10	10	8
Condensers		Copper/aluminium coil											
Fans		Axial Flying Bird IV fans with rotating shroud											
Quantity		16	19	-	20	-	20	-	20	-	24	24	28
Total air flow	l/s	54667	64917	-	68333	-	68333	-	68333	-	82000	82000	95667
Speed	r/s	11.7	11.7	-	11.7	-	11.7	-	11.7	-	11.7	11.7	11.7
Evaporator		Flooded multi-pipe type											
Water volume	l	140	168	-	182	-	203	-	224	-	230	240	240
Maximum pressure†	kPa	1000	1000	-	1000	-	1000	-	1000	-	1000	1000	1000

* Weights are guidelines only. For sizes 1402 to 1702 weight of modules 1 and 2. The refrigerant charge is given on the unit nameplate.
** Options: 119 = high energy efficiency, 254 = units with copper/aluminium coils, 255 = units with copper/aluminium coils without slots.
*** 10^{-12} W - in accordance with ISO 9614-1 and certified by Eurovent.
**** Average sound pressure level, unit in a free field on a reflecting surface. For information, calculated from the sound power level Lw(A).
† Max. water-side operating pressure without hydronic module.

Notes:
1. Unit sizes 30XA 1402 to 1702 are supplied in two field-assembled modules.
2. Option 119 (high energy efficiency) can be used together with options 254 and 255. Contact your Carrier representative to obtain the performances.
3. Unit sizes 1112, 1212, 1312 and 1382 are not available with option 254 or 255.

4.3 - Short-circuit stability current for all units

30XA		252	302	352	402	452	502	602	702	752	802	852	902
Short-circuit stability current (TN system)*													
Circuits A + B**	kA	38	38	38	38	38	38	50	50	50	50	50	50
Circuits C + D**	kA	-	-	-	-	-	-	-	-	-	-	-	-
Units with option 81	A	-	-	-	-	-	-	-	-	-	-	-	-

30XA		1002	1102	1112	1202	1212	1302	1312	1352	1382	1402	1502	1702
Short-circuit stability current (TN system)*													
Circuits A + B**	kA	50	50	50	50	50	50	50	50	50	50	50	50
Circuits C + D**	kA	-	50	50	50	50	50	50	50	50	50	50	50
Units with option 81	A	-	50	50	50	50	50	50	50	50	50	50	-

* Type of system earthing
** rms value

4.4 - Electrical data

30XA 252-902 - standard units or units with option 81

30XA		252	302	352	402	452	502	602	702	752	802	852	902
Power circuit													
Nominal power supply	V-ph-Hz	400-3-50 ± 10%											
Control circuit		24 V via internal transformer											
Maximum start-up current*													
Circuit 1**	A	269	269	287	402	505	505	574	606	773	803	805	893
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-
Nominal start-up current***													
Circuit 1**	A	245	245	262	378	480	480	536	562	735	759	761	845
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-
Cosine Phi maximum******		0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.86	0.86	0.87	0.86
Cosine Phi nominal†		0.85	0.85	0.84	0.84	0.85	0.85	0.85	0.85	0.83	0.84	0.84	0.85
Maximum power input‡													
Circuit 1**	kW	121	131	141	165	185	204	247	267	293	312	343	359
Circuit 2**	kW	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	kW	-	-	-	-	-	-	-	-	-	-	-	-
Nominal unit current draw†													
Circuit 1**	A	151	167	184	210	242	268	325	352	408	433	453	508
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-
Maximum unit current draw (Un)‡													
Circuit 1**	A	198	215	233	270	303	335	404	436	492	522	572	611
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-
Maximum unit current draw (Un-10%)******													
Circuit 1**	A	208	232	251	290	326	360	435	469	529	561	615	657
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-

30XA 1002-1702 - standard units or units with option 81

30XA		1002	1102	1112	1202	1212	1302	1312	1352	1382	1402	1502	1702
Power circuit													
Nominal power supply	V-ph-Hz	400-3-50 ± 10%											
Control circuit		24 V via internal transformer											
Maximum start-up current*													
Circuit 1**	A	941	574	587	773	587	803	772	891	772	893	941	805
Circuit 2**	A	-	587	772	587	772	587	772	587	772	587	587	805
Option 81	A	-	991	1085	1079	1131	1155	1198	1242	1228	1248	1294	-
Nominal start-up current**													
Circuit 1**	A	865	536	587	735	587	759	772	859	772	845	865	761
Circuit 2**	A	-	587	772	587	772	587	772	587	772	587	587	761
Option 81	A	-	909	1023	993	1039	1036	1103	1156	1118	1125	1143	-
Cosine Phi maximum******		0.87	0.87	0.86	0.87	0.87	0.87	0.87	0.86	0.87	0.86	0.87	0.87
Cosine Phi nominal†		0.85	0.84	0.85	0.86	0.86	0.84	0.87	0.85	0.87	0.86	0.85	0.85
Maximum power input‡													
Circuit 1**	kW	420	247	182	293	211	342	256	388	278	390	420	343
Circuit 2**	kW	-	210	279	210	302	210	278	209	299	210	210	343
Option 81	kW	-	457	460	503	512	552	531	597	571	600	630	-
Nominal unit current draw†													
Circuit 1**	A	548	322	258	401	274	445	340	560	356	530	556	452
Circuit 2**	A	-	278	358	278	392	278	356	292	387	278	278	452
Option 81	A	-	600	616	679	666	723	696	852	743	808	834	-
Maximum unit current draw (Un)‡													
Circuit 1**	A	707	404	313	492	359	568	426	655	456	661	707	572
Circuit 2**	A	-	354	459	354	496	354	456	352	491	354	354	572
Option 81	A	-	758	771	845	855	922	882	1007	947	1015	1061	-
Maximum unit current draw (Un-10%)******													
Circuit 1**	A	760	435	332	529	381	611	462	705	494	711	760	615
Circuit 2**	A	-	380	497	380	527	380	494	378	522	380	380	615
Option 81	A	-	815	828	909	908	991	956	1083	1016	1091	1141	-

* 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.

** 30XA 1102, 1202, 1302, 1352 and 1402 to 1702 units: circuit 1 supplies circuits A and B, circuit 2 supplies circuits C and D. 30XA 1112, 1212, 1312 and 1382 units: circuit 1 supplies circuit A, circuit 2 supplies circuit B.

*** 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

Notes:

1. Motor and fan electrical data if the unit operates at Eurovent conditions (motor ambient temperature 50°C): 1.9 A for standard unit; 3.6 A for unit with option 119.
   Start-up current: 8.4 A for standard unit; 20 A for unit with option 119
   Power input: 760 W for standard unit; 1650 W for unit with option 119
2. Unit sizes 30XA 1102 to 1702 have two power connection points.

4.4 - Electrical data (continued)

30XA 252-902 - units with option 119 or units with option 119 and option 81

30XA		252	302	352	402	452	502	602	702	752	802	852	902
Power circuit													
Nominal power supply	V-ph-Hz	400-3-50 ± 10%											
Control circuit		24 V via internal transformer											
Maximum start-up current*													
Circuit 1**	A	274	274	292	407	510	510	583	616	782	812	815	905
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-
Nominal start-up current***													
Circuit 1**	A	246	246	261	379	479	479	535	561	734	757	760	845
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-
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
Cosine Phi nominal†		0.84	0.84	0.83	0.83	0.84	0.84	0.84	0.84	0.83	0.83	0.83	0.84
Maximum power input‡													
Circuit 1**	kW	126	136	147	172	192	212	257	278	304	323	356	372
Circuit 2**	kW	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	kW	-	-	-	-	-	-	-	-	-	-	-	-
Nominal unit current draw†													
Circuit 1**	A	151	167	182	210	239	267	324	349	409	430	446	511
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-
Maximum unit current draw‡													
Circuit 1**	A	208	226	243	284	316	350	423	457	512	542	596	635
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-
Maximum unit current draw (Un-10%)******													
Circuit 1**	A	219	243	262	305	340	376	455	491	551	583	640	683
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-

30XA 1002-1702 - units with option 119 or units with option 119 and option 81

30XA		1002	1102	1112	1202	1212	1302	1312	1352	1382	1402	1502	1702
Power circuit													
Nominal power supply	V-ph-Hz	400-3-50 ± 10%											
Control circuit		24 V via internal transformer											
Maximum start-up current*													
Circuit 1**	A	954	583	587	782	587	812	772	901	772	905	954	815
Circuit 2**	A	-	587	772	587	772	587	772	587	772	587	587	815
Option 81	A	-	1010	1093	1099	1139	1175	1208	1265	1238	1275	1321	-
Nominal start-up current***													
Circuit 1**	A	860	535	587	734	587	757	772	846	772	845	860	760
Circuit 2**	A	-	587	772	587	772	587	772	587	772	587	587	760
Option 81	A	-	907	1031	991	1047	1026	1113	1124	1128	1122	1133	-
Cosine Phi maximum******		0.86	0.88	0.86	0.87	0.87	0.87	0.87	0.86	0.87	0.86	0.86	0.86
Cosine Phi nominal†		0.84	0.84	0.84	0.84	0.84	0.84	0.85	0.84	0.86	0.84	0.84	0.84
Maximum power input‡													
Circuit 1**	kW	435	257	186	304	216	353	262	400	284	405	435	356
Circuit 2**	kW	-	217	286	217	309	217	284	216	305	217	217	356
Option 81	kW	-	475	471	522	525	570	544	615	584	622	652	-
Nominal unit current draw†													
Circuit 1**	A	541	323	259	400	275	435	341	529	356	527	546	446
Circuit 2**	A	-	273	360	273	393	273	356	275	386	273	273	446
Option 81	A	-	596	619	673	668	708	697	804	742	800	820	-
Maximum unit current draw (Un)‡													
Circuit 1**	A	734	423	321	512	367	588	436	678	466	688	734	596
Circuit 2**	A	-	367	470	367	508	367	466	364	501	367	367	596
Option 81	A	-	790	790	879	875	956	902	1041	967	1056	1102	-
Maximum unit current draw (Un-10%)******													
Circuit 1**	A	790	455	340	551	389	633	472	729	504	740	790	640
Circuit 2**	A	-	395	508	395	539	395	504	391	532	395	395	640
Option 81	A	-	850	847	946	928	1028	976	1120	1036	1135	1185	-

* 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.

** 30XA 1102, 1202, 1302, 1352 and 1402 to 1702 units: circuit 1 supplies circuits A and B, circuit 2 supplies circuits C and D. 30XA 1112, 1212, 1312 and 1382 units: circuit 1 supplies circuit A, circuit 2 supplies circuit B.

*** 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

Notes:

1. Motor and fan electrical data if the unit operates at Eurovent conditions (motor ambient temperature 50°C): 1.9 A for standard unit; 3.6 A for unit with option 119.
   Start-up current: 8.4 A for standard unit; 20 A for unit with option 119
   Power input: 760 W for standard unit; 1650 W for unit with option 119
2. Unit sizes 30XA 1102 to 1702 have two power connection points.

4.4 - Electrical data (continued)

30XA 252-902 - units with options 254 and 255 or units with options 254 and 255 and option 81

30XA		252	302	352	402	452	502	602	702	752	802	852	902
Power circuit													
Nominal power supply	V-ph-Hz	400-3-50 ± 10%											
Control circuit		24 V via internal transformer											
Maximum start-up current*													
Circuit 1**	A	269	269	287	402	505	505	574	606	773	805	805	893
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-
Nominal start-up current***													
Circuit 1**	A	245	245	262	378	480	480	536	562	735	761	761	845
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-
Cosine Phi maximum******		0.88	0.88	0.87	0.88	0.88	0.88	0.88	0.88	0.86	0.86	0.87	0.86
Cosine Phi nominal†		0.85	0.85	0.84	0.84	0.85	0.85	0.85	0.85	0.83	0.84	0.84	0.85
Maximum power input‡													
Circuit 1**	kW	121	131	142	165	185	204	247	267	294	313	343	360
Circuit 2**	kW	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	kW	-	-	-	-	-	-	-	-	-	-	-	-
Nominal unit current draw†													
Circuit 1**	A	151	167	186	210	242	268	325	352	412	437	453	512
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-
Maximum unit current draw (Un)‡													
Circuit 1**	A	198	215	235	270	303	335	404	436	494	524	572	613
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-
Maximum unit current draw (Un-10%)******													
Circuit 1**	A	208	232	253	290	326	360	435	469	531	563	615	659
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-

30XA 1002-1702 - units with options 254 and 255 or units with options 254 and 255 and option 81

30XA		1002	1102	1112	1202	1212	1302	1312	1352	1382	1402	1502	1702
Power circuit													
Nominal power supply	V-ph-Hz	400-3-50 ± 10%											
Control circuit		24 V via internal transformer											
Maximum start-up current*													
Circuit 1**	A	941	574	-	773	-	803	-	891	-	893	941	805
Circuit 2**	A	-	587	-	587	-	587	-	587	-	587	587	761
Option 81	A	-	991	-	1079	-	1155	-	1242	-	1248	1294	-
Nominal start-up current***													
Circuit 1**	A	865	536	-	735	-	759	-	859	-	845	865	761
Circuit 2**	A	-	587	-	587	-	587	-	587	-	587	587	761
Option 81	A	-	909	-	993	-	1036	-	1156	-	1125	1143	-
Cosine Phi maximum******		0.87	0.87	-	0.87	-	0.87	-	0.86	-	0.86	0.87	0.87
Cosine Phi nominal†		0.85	0.84	-	0.86	-	0.84	-	0.85	-	0.86	0.85	0.85
Maximum power input‡													
Circuit 1**	kW	420	247	-	293	-	342	-	388	-	390	420	343
Circuit 2**	kW	-	210	-	210	-	210	-	209	-	210	210	343
Option 81	kW	-	457	-	503	-	552	-	597	-	600	630	-
Nominal unit current draw†													
Circuit 1**	A	552	322	-	401	-	445	-	560	-	530	556	452
Circuit 2**	A	-	278	-	278	-	278	-	292	-	278	278	452
Option 81	A	-	600	-	679	-	723	-	852	-	808	834	-
Maximum unit current draw (Un)‡													
Circuit 1**	A	707	404	-	492	-	568	-	655	-	661	707	572
Circuit 2**	A	-	354	-	354	-	354	-	352	-	354	354	572
Option 81	A	-	758	-	845	-	922	-	1007	-	1015	1061	-
Maximum unit current draw (Un-10%)******													
Circuit 1**	A	760	435	-	529	-	611	-	705	-	711	760	615
Circuit 2**	A	-	380	-	380	-	380	-	378	-	380	380	615
Option 81	A	-	815	-	909	-	991	-	1083	-	1091	1141	-

* 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.

** 30XA 1102, 1202, 1302, 1352 and 1402 to 1702 units: circuit 1 supplies circuits A and B, circuit 2 supplies circuits C and D. 30XA 1112, 1212, 1312 and 1382 units: circuit 1 supplies circuit A, circuit 2 supplies circuit B.

*** 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

Notes:

1. Motor and fan electrical data if the unit operates at Eurovent conditions (motor ambient temperature 50°C): 1.9 A for standard unit; 3.6 A for unit with option 119.
   Start-up current: 8.4 A for standard unit; 20 A for unit with option 119
   Power input: 760 W for standard unit; 1650 W for unit with option 119
2. Unit sizes 30XA 1102 to 1702 have two power connection points.
3. Unit sizes 1112, 1212, 1312 and 1382 are not available with option 254 or 255.

4.4 - Electrical data (continued)

30XA 252-902 - units with options 254 and 255 + option 119 or units with options 254 and 255 + option 119 + option 81

30XA		252	302	352	402	452	502	602	702	752	802	852	902
Power circuit													
Nominal power supply	V-ph-Hz	400-3-50 ± 10%											
Control circuit		24 V via internal transformer											
Maximum start-up current*													
Circuit 1**	A	274	274	292	407	510	510	583	616	782	815	815	905
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-
Nominal start-up current***													
Circuit 1**	A	246	246	261	379	479	479	535	561	734	760	760	845
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-
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
Cosine Phi nominal†		0.84	0.84	0.83	0.83	0.84	0.84	0.84	0.84	0.83	0.83	0.83	0.84
Maximum power input‡													
Circuit 1**	kW	126	136	148	172	192	212	257	278	306	325	356	373
Circuit 2**	kW	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	kW	-	-	-	-	-	-	-	-	-	-	-	-
Nominal unit current draw†													
Circuit 1**	A	151	167	185	210	239	267	324	349	411	432	446	513
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-
Maximum unit current draw (Un)‡													
Circuit 1**	A	208	226	247	284	316	350	423	457	516	546	596	639
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-
Maximum unit current draw (Un-10%)******													
Circuit 1**	A	219	243	266	305	340	376	455	491	555	587	640	687
Circuit 2**	A	-	-	-	-	-	-	-	-	-	-	-	-
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-

30XA 1002-1702 - units with options 254 and 255 + option 119 or units with options 254 and 255 + option 119 + option 81

30XA		1002	1102	1112	1202	1212	1302	1312	1352	1382	1402	1502	1702
Power circuit													
Nominal power supply	V-ph-Hz	400-3-50 ± 10%											
Control circuit		24 V via internal transformer											
Maximum start-up current*													
Circuit 1**	A	954	583	-	782	-	812	-	901	-	905	954	815
Circuit 2**	A	-	587	-	587	-	587	-	587	-	587	587	815
Option 81	A	-	1010	-	1099	-	1175	-	1265	-	1275	1321	-
Nominal start-up current***													
Circuit 1**	A	860	535	-	734	-	757	-	846	-	845	860	760
Circuit 2**	A	-	587	-	587	-	587	-	587	-	587	587	760
Option 81	A	-	907	-	991	-	1026	-	1124	-	1122	1133	-
Cosine Phi maximum******		0.86	0.88	-	0.87	-	0.87	-	0.86	-	0.86	0.86	0.86
Cosine Phi nominal†		0.84	0.84	-	0.84	-	0.84	-	0.84	-	0.84	0.84	0.84
Maximum power input‡													
Circuit 1**	kW	435	257	-	304	-	353	-	400	-	405	435	356
Circuit 2**	kW	-	217	-	217	-	217	-	216	-	217	217	356
Option 81	kW	-	475	-	522	-	570	-	615	-	622	652	-
Nominal unit current draw†													
Circuit 1**	A	541	323	-	400	-	435	-	529	-	527	546	446
Circuit 2**	A	-	273	-	273	-	273	-	275	-	273	273	446
Option 81	A	-	593	-	678	-	712	-	812	-	808	820	-
Maximum unit current draw (Un)‡													
Circuit 1**	A	734	423	-	512	-	588	-	678	-	688	734	596
Circuit 2**	A	-	367	-	367	-	367	-	364	-	367	367	596
Option 81	A	-	790	-	879	-	956	-	1041	-	1056	1102	-
Maximum unit current draw (Un-10%)******													
Circuit 1**	A	790	455	-	551	-	633	-	729	-	740	790	640
Circuit 2**	A	-	395	-	395	-	395	-	391	-	395	395	640
Option 81	A	-	850	-	946	-	1028	-	1120	-	1135	1185	-

* 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.

** 30XA 1102, 1202, 1302, 1352 and 1402 to 1702 units: circuit 1 supplies circuits A and B, circuit 2 supplies circuits C and D. 30XA 1112, 1212, 1312 and 1382 units: circuit 1 supplies circuit A, circuit 2 supplies circuit B.

*** 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

Notes:

1. Motor and fan electrical data if the unit operates at Eurovent conditions (motor ambient temperature 50°C): 1.9 A for standard unit; 3.6 A for unit with option 119.
   Start-up current: 8.4 A for standard unit; 20 A for unit with option 119
   Power input: 760 W for standard unit; 1650 W for unit with option 119
2. Unit sizes 30XA 1102 to 1702 have two power connection points.
3. Unit sizes 1112, 1212, 1312 and 1382 are not available with option 254 or 255.

4.5 - Compressor electrical data

Compressor	I Nom* Std/Option 119	I Max** (Un)	MHA	LRYA (Un)	LRDA (Un)	Cosine Phi (max.)**	Cosine Phi (nom.)*
06TSA155	69/64	86	96	170	530	0.90	0.87
06TSA186	87/80	108	120	170	530	0.89	0.86
06TTA266	128/117	158	176	303	945	0.90	0.86
06TTA301	145/132	177	188	388	1210	0.90	0.87
06TTA356	166/153	207	220	388	1210	0.90	0.87
06TUA483	240/225	292	311	587	1828	0.88	0.87
06TUA554	262/241	338	360	587	1828	0.89	0.88
06TVA680	320/302	400	436	772	2315	0.89	0.87
06TVA753	335/315	430	468	772	2315	0.89	0.88
06TVA819	367/347	465	496	772	2315	0.89	0.88

* Average value for the range (unit at Eurovent conditions)
** Value at maximum capacity and nominal voltage (400 V)

Legend
MHA - Maximum compressor operating current, limited by the unit (current given for maximum capacity at 360 V)
LRYA - Locked rotor current for star connection (connection during compressor start-up)
LRDA - Locked rotor current for delta connection

4.6 - Compressor usage per circuit (A, B, C, D)

Compressor	30XA																							
	252	**302**	**352**	**402**	**452**	**502**	**602**	**702**	**752**	**802**	**852**	**902**	**1002**	**1102**	**1112**	**1202**	**1212**	**1302**	**1312**	**1352**	**1382**	**1402**	**1502**	**1702**
06TSA155	AB	B	—	B	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06TSA186	—	A	AB	—	B	B	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06TTA266	—	—	—	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06TTA301	—	—	—	—	A	—	B	—	B	—	—	—	—	B	—	B	—	—	—	—	—	—	—	—
06TTA356	—	—	—	—	—	A	A	AB	—	B	B	—	—	A	—	—	—	B	—	—	—	—	—	BD
06TUA483	—	—	—	—	—	—	—	—	A	A	—	AB	—	—	A	A	—	—	—	B	—	B	—	—
06TUA554	—	—	—	—	—	—	—	—	—	—	A	—	AB	C	—	C	A	AC	—	AC	—	AC	ABC	AC
06TVA680	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	A	—	—	—	—	—
06TVA753	—	—	—	—	—	—	—	—	—	—	—	—	—	—	B	—	—	—	B	—	A	—	—	—
06TVA819	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	B	—	—	—	B	—	—	—

Electrical data notes and operating conditions for 30XA units:

- 30XA 252-1002 units have a single power connection point; 30XA 1102-1702 units have two connection points.
- The control box includes the following standard features:
  - One general disconnect switch per circuit
  - Starter and motor protection devices for each compressor, the fan(s) 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.

IMPORTANT:

- Generally the recommendations of IEC 60364 are accepted as compliance with the requirements of the installation directives.
  Conformance with EN 60 204 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.
- The operating environment for the 30XA units is specified below:

1. Environment* - Environment as classified in EN 60 721 (corresponds to IEC 60721) :
- outdoor installation*
- ambient temperature range: -20°C to +55°C, class 4K4H*
- altitude: ≤ 2000 m (for hydronic kits see table 4.10)
- 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 provide a local earth and consult competent local organisations to complete the electrical installation.
7. Derived currents: If protection by monitoring of derived currents is necessary to ensure the safety of the installation, the control of the cut-out value must take the presence of leak currents into consideration that result from the use of optional frequency converters in the unit. A value of at least 150 mA is recommended to control differential protection devices.

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 IP43BW (according to reference document IEC 60529). All 30XA units are protected to IP44CW and fulfil this protection condition.

4.7 - Electrical data, optional hydronic module

The pumps that are factory-installed in these units have motors with efficiency class IE2. The additional electrical data required* is as follows:

Motors of single and dual low-pressure pumps for 30XA units (options 116F and116G)

No.**	Description***		30XA					
			252	302	352	402	452	502
1	Nominal efficiency at full load and nominal voltage	%	83.4	83.4	84.8	86.1	88.6	88.6
1	Nominal efficiency at 75% rated load and nominal voltage	%	82.9	82.9	84.5	85.7	86.9	86.9
1	Nominal efficiency at 50% rated load and nominal voltage	%	80.5	80.5	83.1	84.3	85.2	85.2
2	Efficiency level		IE2					
3	Year of manufacture		This information varies depending on the manufacturer and model at the time of incorporation. Please refer to the motor name plates.					
4	Manufacturer's name and trademark, commercial registration number and place of manufacturer							
5	Product's model number							
6	Number of motor poles		2					
7-1	Rated shaft power output at full load and nominal voltage (400 V)	kW	2.2	2.2	3	4	5.5	5.5
7-2	Maximum power input (400 V)****	kW	2.6	2.6	3.5	4.6	6.2	6.2
8	Rated input frequency	Hz	50					
9-1	Rated voltage	V	3 x 400					
9-2	Maximum current drawn at nominal voltage (400 V)†	A	4.4	4.4	5.8	7.7	10.2	10.2
10	Rated speed	r/s (rpm)	48 (2900)					
11	Product disassembly, recycling or disposal at end of life		Disassembly using standard tools. Disposal and recycling using an appropriate company.					
12	Operating conditions for which the motor is specifically designed							
	I - Altitudes above sea level	m	< 1000††					
	II - Ambient air temperature	°C	< 40					
	IV - Maximum air temperature	°C	Please refer to the operating conditions given in this manual or in the specific conditions in the Carrier selection programs.					
	V - Potentially explosive atmospheres		Non-ATEX environment					

Motors of single and dual low-pressure pumps for 30XA units (options 116B and116C)

No.**	Description***		30XA					
			252	302	352	402	452	502
1	Nominal efficiency at full load and nominal voltage	%	86.1	88.6	88.6	88.5	90.5	90.5
1	Nominal efficiency at 75% rated load and nominal voltage	%	85.7	86.9	86.9	87.7	89.3	89.3
1	Nominal efficiency at 50% rated load and nominal voltage	%	84.3	85.2	85.2	85.9	87.5	87.5
2	Efficiency level		IE2					
3	Year of manufacture		This information varies depending on the manufacturer and model at the time of incorporation. Please refer to the motor name plates.					
4	Manufacturer's name and trademark, commercial registration number and place of manufacturer							
5	Product's model number							
6	Number of motor poles		2					
7-1	Rated shaft power output at full load and nominal voltage (400 V)	kW	4.0	5,5	5,5	7,5	11.0	11.0
7-2	Maximum power input (400 V)****	kW	4.6	6.2	6.2	8.5	12.2	12.2
8	Rated input frequency	Hz	50					
9-1	Rated voltage	V	3 x 400					
9-2	Maximum current drawn at nominal voltage (400 V)†	A	7.7	10.2	10.2	13.7	20.5	20.5
10	Rated speed	r/s (rpm)	48 (2900)					
11	Product disassembly, recycling or disposal at end of life		Disassembly using standard tools. Disposal and recycling using an appropriate company.					
12	Operating conditions for which the motor is specifically designed							
	I - Altitudes above sea level	m	< 1000††					
	II - Ambient air temperature	°C	< 40					
	IV - Maximum air temperature	°C	Please refer to the operating conditions given in this manual or in the specific conditions in the Carrier selection programs.					
	V - Potentially explosive atmospheres		Non-ATEX environment					

* Required by regulation 640/2009 with regard to the application of directive 2005/32/EC on the eco-design requirements for electric motors

** Item number imposed by regulation 640/2009, annex I2b.

*** Description given by regulation 640/2009, annex I2b.

**** To obtain the maximum power input for a unit with hydronic module add the maximum unit power input from the electrical data table to the pump power input.

† To obtain the maximum unit operating current draw for a unit with hydronic module add the maximum unit current draw from the electrical data table to the pump current draw.

†† Above 1000 m, a degradation of 3% for each 500 m should be taken into consideration.

5 - ELECTRICAL CONNECTION

Please refer to the certified dimensional drawings, supplied with the unit.

5.1 - Power supply

The power supply must conform to the specification on the chiller nameplate. The supply voltage must be within the range specified in the electrical data table. For connections refer to the wiring diagrams and the certified dimensional drawings.

WARNING: Operation of the chiller with an improper supply voltage or excessive phase imbalance constitutes abuse which will invalidate the Carrier warranty. If the phase imbalance exceeds 2% for voltage, or 10% for current, contact your local electricity supply at once and ensure that the chiller is not switched on until corrective measures have been taken.

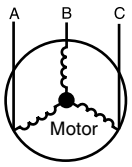
5.2 - Voltage phase imbalance (%)

$$\frac{100 \times \text{max. deviation from average voltage}}{\text{Average voltage}}$$

Example:
On a 400 V - 3 ph - 50 Hz supply, the individual phase voltages were measured to be:
AB = 406 V; BC = 399; AC = 394 V

Average voltage = (406 + 399 + 394)/3 = 1199/3
= 399.7 say 400 V

Calculate the maximum deviation from the 400 V average:
(AB) = 406 - 400 = 6
(BC) = 400 - 399 = 1
(CA) = 400 - 394 = 6



The maximum deviation from the average is 6 V. The greatest percentage deviation is: 100 x 6/400 = 1.5 %

This is less than the permissible 2% and therefore acceptable.

5.3 - Power connection/disconnect switch

Units	Connection points
30XA 0252-1002	1 per unit
30XA 1102-1702	1 for circuit 1
	1 for circuit 2

5.4 - Recommended wire sections

Wire sizing is the responsibility of the installer, and depends on the characteristics and regulations applicable to each installation site. The following is only to be used as a guide-line, and does not make in any way liable. After wire sizing has been completed, using the certified dimensional drawing, the installer must ensure easy connection and define any modifications necessary on site.

The connections provided as standard for the field-supplied power entry cables to the general disconnect/isolator switch are designed for the number and type of wires, listed in column 2 of the table on the next page.

The calculations are based on the maximum machine current (see electrical data tables).

The calculations for favourable and unfavourable cases are based on the maximum current for each unit (see electrical data tables). For the design the standardised installation methods in accordance with IEC 60364 are used: PVC (70°C) or XLPE (90°C) insulated cables with copper core; arrangement to comply with table 52c of the above standard. The maximum temperature is 46°C. The given maximum length is calculated to limit the voltage drop to 5%.

IMPORTANT: Before connection of the main power cables (L1 - L2 - L3) on the terminal block, it is imperative to check the correct order of the 3 phases before proceeding to the connection on then terminal block or the main disconnect/isolator switch.

5.5 - Power cable entry

The power cables can enter the 30XA control box from below or from the unit side. For 30XA unit sizes 602 to 1702 the control box that includes the power supply cable connection terminal is located in the lower part of the unit. In this case the control box is raised by 120 mm compared to the lowest point of the chassis.

The cable entry point depends on the unit configuration:

1. Unit raised from the ground (e.g. installation on sup-port rails): It is recommended to enter the power cables from below the control box. A removable aluminium plate below the control box allows introduction of the cables.
2. Unit placed on the ground: For power cable entry from below the control box ensure that the cable bend radius is compatible with the connection space available in the control box. If not, an aluminium plate on the control box face allows introduction of the cables.

For units with three circuits with option 81 (single power connection point) the connection must be made from below the unit.

IMPORTANT: Check the cable bend radius for cable entry into a control box, located in the lower part of the unit.

Refer to the certified dimensional drawing for the unit.

5.6 - Field control wiring

IMPORTANT: Field connection of interface circuits may lead to safety risks: any control box modification must maintain equipment conformity with local regulations. Precautions must be taken to prevent accidental electrical contact between circuits supplied by different sources:

- ***The routing selection and/or conductor insulation characteristics must ensure dual electric insulation.***
- ***In case of accidental disconnection, conductor fixing between different conductors and/or in the control box prevents any contact between the conductor ends and an active energised part.***

Refer to the 30XA/30XAS/30XW Pro-Dialog control manual and the certified wiring diagram supplied with the unit for the field control wiring of the following features:

- Evaporator pump interlock (mandatory)
- Remote on/off switch
- Demand limit external switch
- Remote dual set point
- Alarm, alert and operation report
- Evaporator pump control
- Heat reclaim condenser pump control (option)
- Hot water valve control (option)
- Set point reset via outside air temperature sensor reset
- Various interlocks on the Energy Management Module (EMM) board (option)

Selection of minimum and maximum wire sections for connection to 30XA units

30XA	Max. connectable section*	Calculation favourable case: Suspended aerial lines (standardised routing No. 17) XLPE insulated cable			Calculation unfavourable case: Conductors in conduits or multi-conductor cables in closed conduit (standardised routing No. 41) PVC insulated cable, if possible		
	Section	Section**	Max. length for voltage drop <5%	Cable type	Section**	Max. length for voltage drop <5%	Cable type***
	mm² (per phase)	mm² (per phase)	m		mm² (per phase)	m	
252	2 x 185	1 x 95	190	XLPE Cu	2 x 95	450	PVC Cu
302	2 x 185	1 x 95	190	XLPE Cu	2 x 95	420	PVC Cu
352	2 x 185	1 x 120	197	XLPE Cu	2 x 95	390	PVC Cu
402	2 x 185	1 x 150	200	XLPE Cu	2 x 120	400	PVC Cu
452	2 x 185	1 x 185	205	XLPE Cu	2 x 150	420	PVC Cu
502	2 x 185	1 x 240	205	XLPE Cu	2 x 185	430	PVC Cu
602	2 x 300	2 x 95	190	XLPE Cu	2 x 240	440	PVC Cu
702	2 x 300	2 x 120	198	XLPE Cu	2 x 185	330	XLPE Cu
752	2 x 300	2 x 120	198	XLPE Cu	2 x 240	370	XLPE Cu
802	2 x 300	2 x 150	200	XLPE Cu	2 x 240	330	XLPE Cu
852	2 x 300	2 x 150	200	XLPE Cu	2 x 240	320	XLPE Cu
902	2 x 300	2 x 185	205	XLPE Cu	2 x 300	330	XLPE Cu
1002	4 x 300	2 x 240	205	XLPE Cu	4 x 185	320	XLPE Cu
Circuits A and B/C (common routing)							
1102	2 x 300/2 x 240	2 x 120/1 x 240	270/310	XLPE Cu	2 x 240/2 x 150	450/380	XLPE Cu/XLPE Cu
1112	2 x 240/3 x 240	1 x 185/2 x 120	291/240	XLPE Cu	2 x 240/3 x 240	600/530	PVC Cu/PVC Cu
1202	2 x 300/2 x 240	2 x 150/1 x 240	260/310	XLPE Cu	2 x 300/2 x 150	380380	XLPE Cu/XLPE Cu
1212	2 x 240/3 x 240	1 x 240/2 x 150	310/270	XLPE Cu	2 x 150/2 x 240	380/380	XLPE Cu/XLPE/Cu
1302	2 x 300/2 x 240	2 x 185/1 x 240	270/310	XLPE Cu	2 x 300/2 x 150	380/380	XLPE Cu/XLPE Cu
1312	2 x 240/3 x 240	2 x 120/2 x 120	260/240	XLPE Cu	2 x 240/2 x 240	420/400	XLPE Cu/XLPE Cu
1352	2 x 300/2 x 240	2 x 240/1 x 240	280/310	XLPE Cu	Not compatible	-	-
1382	2 x 240/3 x 240	2 x 120/2 x 150	240/270	XLPE Cu	2 x 240/2 x 240	400/380	XLPE Cu/XLPE Cu
1402	2 x 300/2 x 240	2 x 240/1 x 240	280/310	XLPE Cu	Not compatible	-	-
1502	4 x 300/2 x 240	2 x 300/1 x 240	300/310	XLPE Cu	4 x 240/2 x 150	400/380	XLPE Cu/XLPE Cu
1702	2 x 300/2 x 300	2 x 185/2 x 185	260/260	XLPE Cu	Not compatible	-	-
Option 81							
1102	8 x 240	-	-	-	-	-	-
1202	8 x 240						
1302	8 x 240						
1352	8 x 240						
1402	8 x 240						
1502	8 x 240						
1112	5 x 240	-	-	-	-	-	-
1212	5 x 240						
1312	5 x 240						
1382	5 x 240						

* Connection capacities actually available for each machine, defined according to the connection terminal size, the control box access opening size and the available space inside the control box.

** Selection simultation result considering the hypothesis indicated.

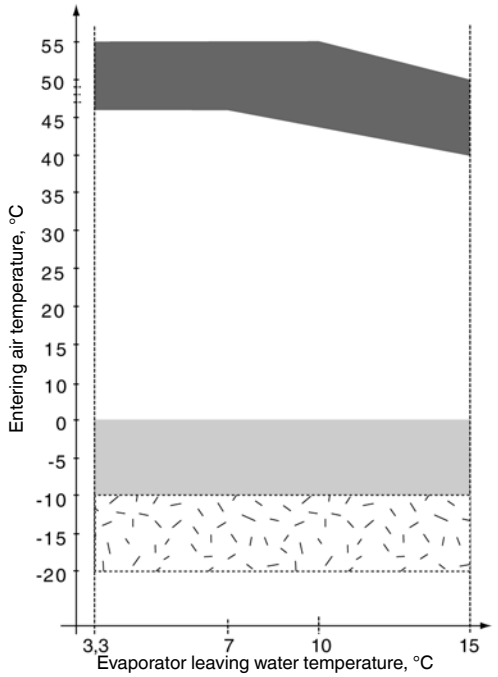
*** If the maximum calculated section is for an XLPE cable type, this means that a selection based on a PVC cable type can exceed the connection capacity actually available. Special attention must be given to the selection.

Note: The currents considered are given for a machine equipped with a hydronic kit operating at maximum current.

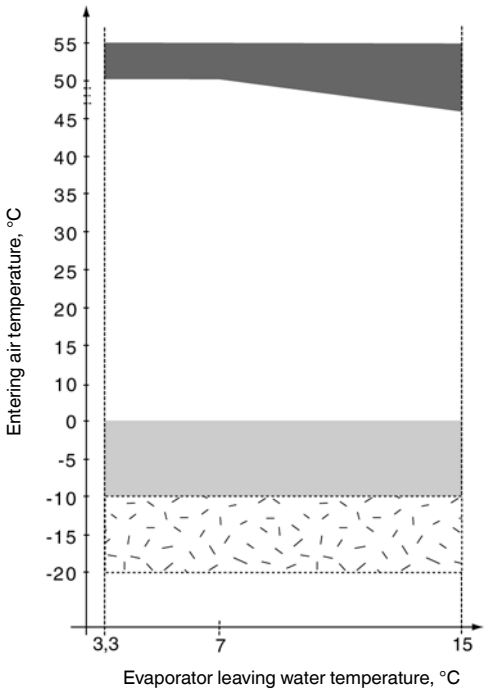
6 - APPLICATION DATA

6.1 - Operating range

30XA standard unit



30XA unit with option 119



Legend:

Operating range, unit equipped with option 28 (winter operation).

Below 0°C air temperature the unit must either be equipped with the evaporator frost protection option (41A or 41B), or the water loop must be protected against frost by using a frost protection solution (by the installer).

Part load average

ATTENTION: Option 28 (Winter operation)
If the outside temperature is below -10°C and the unit has been switched off for more than 4 hours, it is necessary to wait 2 hours after the unit has been switched on again to allow the frequency converter to warm up.

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, standard unit		-10	55**
With winter operation option (option 28)		-20	55**
With high energy efficiency option (option 119)***		-10	55****

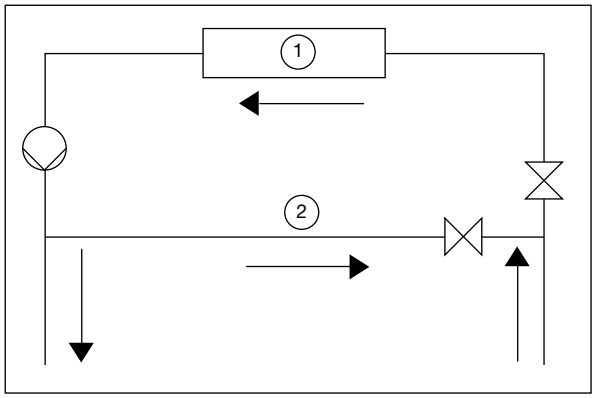
Note: If the air temperature is below 0°C, a glycol/water solution or the frost protection option must be used.

* Based on the installation type and the air temperature
** Part load, based on the water temperature
*** Recommended for operation above 46°C
**** Part-load operation

6.2 - Minimum chilled water flow (units without hydronic module)

The minimum chilled water flow is shown in the table on the next page. If the system flow is less than this, the evaporator flow can be recirculated, as shown in the diagram.

For minimum chilled water flow rate

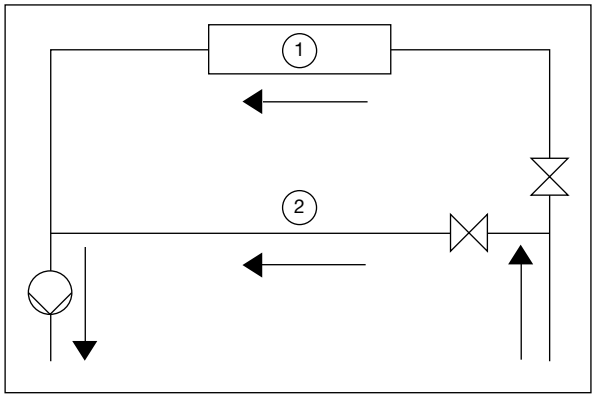


1 Evaporator
2 Recirculation

6.3 - Maximum chilled water flow (units without hydronic module)

The maximum chilled water flow is shown in the table on the next page. If the system flow exceeds the maximum value, it can be bypassed as shown in the diagram.

For maximum chilled water flow rate



1 Evaporator
2 Bypass

6.4 - Variable flow evaporator

Variable evaporator flow can be used in standard 30XA chillers. The chillers maintain a constant leaving water temperature under all flow conditions. For this to happen, the minimum flow rate must be higher than the minimum flow given in the table of permissible flow rates and must not vary by more than 10% per minute.

If the flow rate changes more rapidly, the system should contain a minimum of 6.5 litres of water per kW instead of 3.25 l/kW.

6.5 - System minimum water volume

Whichever the system, the water loop minimum capacity is given by the formula:

Capacity = Cap (kW) x N litres

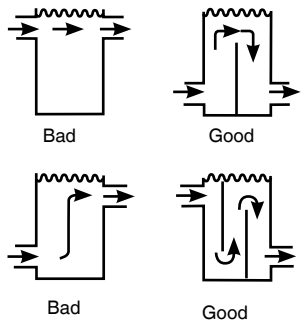
Application	N
Normal air conditioning	3.25
Process type cooling	6.5

Where Cap is the nominal system cooling capacity (kW) at the nominal operating conditions of the installation.

This volume is necessary for stable operation and accurate temperature control.

It is often necessary to add a buffer water tank to the circuit in order to achieve the required volume. The tank must itself be internally baffled in order to ensure proper mixing of the liquid (water or brine). Refer to the examples below.

Connection to a buffer tank



6.6 - Maximum system water volume

Units with hydronic module incorporate an expansion tank that limits the water volume. The table below gives the maximum loop volume for pure water or ethylene glycol with various system concentrations, as well as the static pressures. If the maximum volume is insufficient, compared to the minimum system water loop volume, an additional expansion tank must be added to the system.

30XA		252-452			502		
Static pressure	**kPa**	**100**	**200**	**250**	**100**	**200**	**250**
	bar	**1**	**2**	**2.5**	**1**	**2**	**2.5**
Max. water loop volume	**l**						
Pure water		2400	1600	1200	3960	2640	1980
Ethylene glycol 10%		1800	1200	900	2940	1960	1470
Ethylene glycol 20%		1320	880	660	2100	1400	1050
Ethylene glycol 30%		1080	720	540	1740	1160	870
Ethylene glycol 40%		900	600	450	1500	1000	750

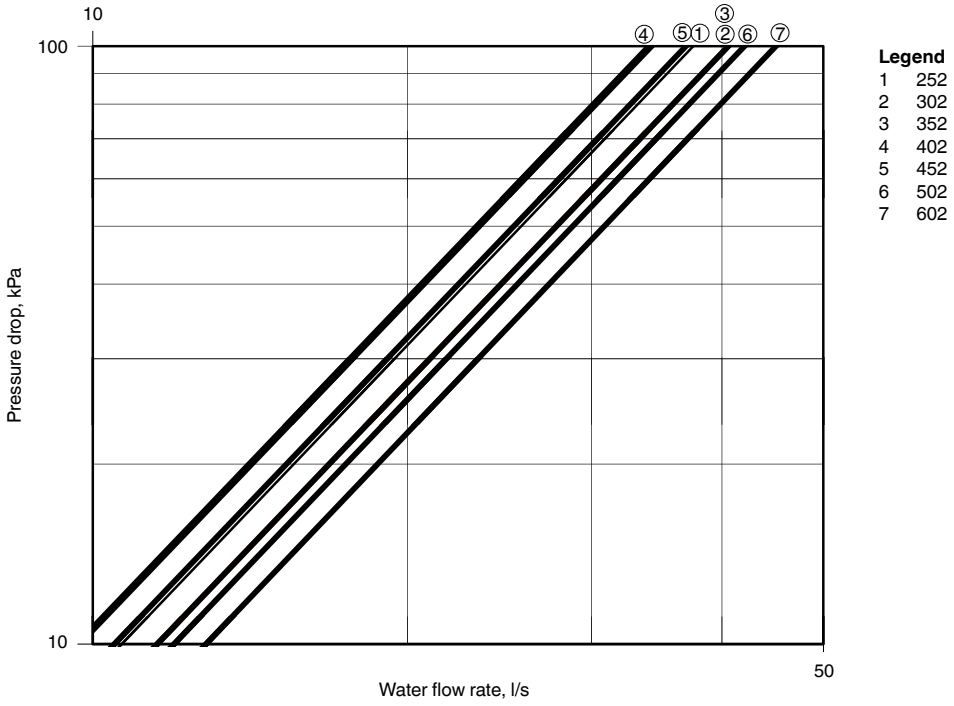
6.7 - Evaporator water flow rate

30XA	Evaporator water flow rate, l/s*	
	Min. flow rate	**Max. flow rate****
252	3.6	37.5
302	4.0	40.5
352	4.3	40.5
402	5.3	34.1
452	6.0	36.9
502	6.7	42.0
602	8.1	45.0
702	8.9	56.1
752	9.6	59.1
802	10.4	67.1
852	11.0	67.1
902	11.8	73.9
1002	13.1	83.9
1102	15.1	87.8
1112	15.1	126.5
1202	16.4	92.9
1212	16.4	132.1
1302	17.5	96.1
1312	17.5	118.5
1352	18.8	107.4
1382	18.8	131.1
1402	19.3	107.4
1502	19.9	109.4
1702	22.0	107.4

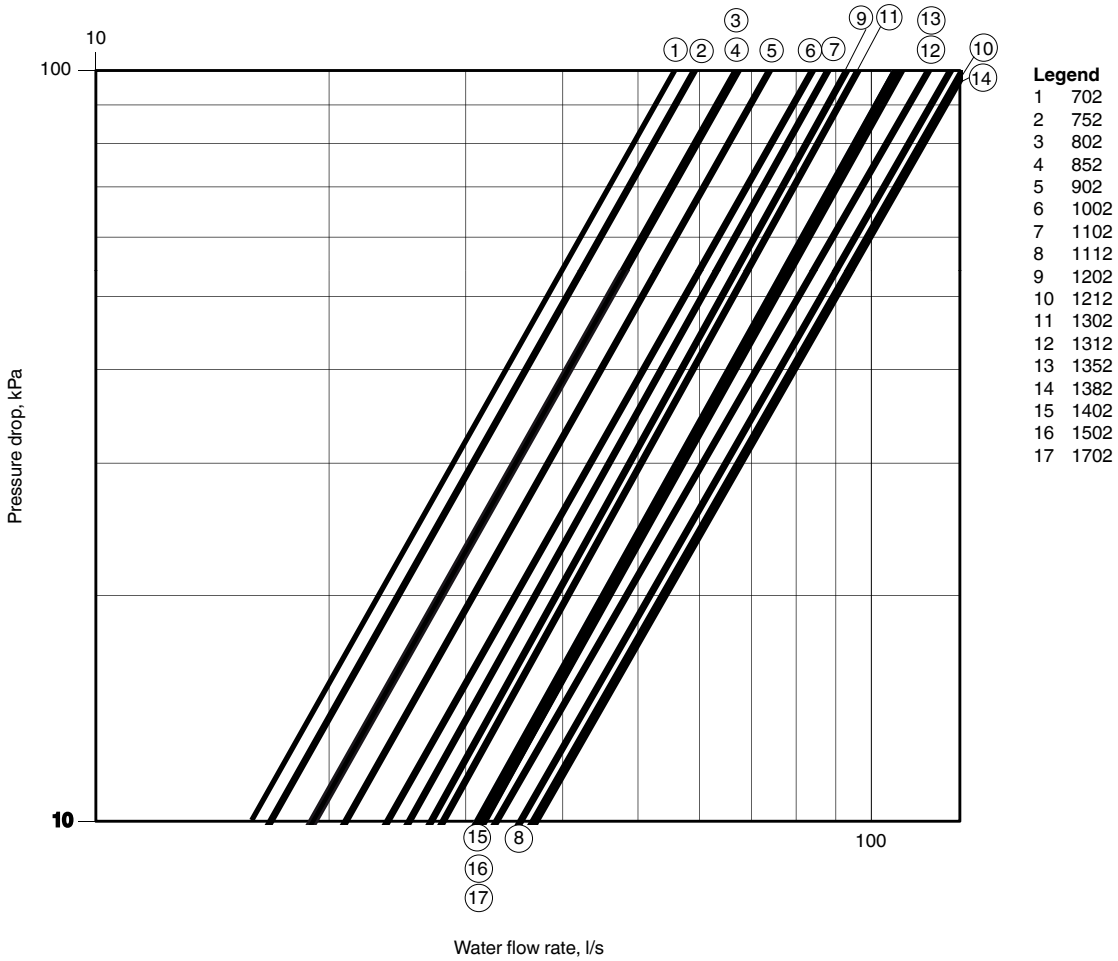
* Standard evaporators with water as the heat transfer fluid.
** The maximum water flow rate corresponds to a pressure drop of 100 kPa.

6.8 - Evaporator pressure drop curve

Sizes 252-602



Sizes 702-1702



7 - WATER CONNECTIONS

ATTENTION: Before carrying out any water connections install the water box purge plugs (one plug per water box in the lower section - supplied in the control box).

For size and position of the heat exchanger water inlet and outlet connections refer to the certified dimensional drawings supplied with the unit.

The water pipes must not transmit any radial or axial force to the heat exchangers nor any vibration.

The water supply must be analysed and appropriate filtering, treatment, control devices, isolation and bleed valves and circuits built in, to prevent corrosion, fouling and deterioration of the pump fittings. Consult either a water treatment specialist or appropriate literature on the subject.

7.1 - Operating precautions

The water circuit should be designed to have the least number of elbows and horizontal pipe runs at different levels. Below the main points to be checked for the connection:

- Comply with the water inlet and outlet connections shown on the unit.
- Install manual or automatic air purge valves at all high points in the circuit(s).
- Use a pressure reducer to maintain pressure in the circuit(s) and install a safety valve as well as an expan-sion tank.
- Install thermometers in both the entering and leaving water connections.
- Install drain connections at all low points to allow the whole circuit to be drained.
- Install stop valves, close to the entering and leaving water connections.
- Use flexible connections to reduce the transmission of vibrations.
- Insulate all pipework, after testing for leaks, both to reduce heat gains and to prevent condensation.
- Cover the insulation with a vapour barrier.
- Where there are particles in the fluid that could foul the heat exchanger, a screen filter should be installed ahead of the pump. The mesh size of the filter must be 1.2 mm (see 'Typical water circuit diagram').
- Before the system start-up verify that the water circuits are connected to the appropriate heat exchangers (e.g. no reversal between evaporator and condenser).
- Do not introduce any significant static or dynamic pressure into the heat exchange circuit (with regard to the design operating pressures).
- Before any start-up verify that the heat exchange fluid is compatible with the materials and the water circuit coating.

  In case additives or other fluids than those recommended by Carrier are used, ensure that the fluids are not considered as a gas, and that they belong to class 2, as defined in directive 97/23/EC.

Carrier recommendations on heat exchange fluids:

- No NH^{4+} ammonium ions in the water, they are very detrimental for copper. This is one of the most important factors for the operating life of copper piping. A content of several tenths of mg/l will badly corrode the copper over time.
- Cl^- Chloride ions are detrimental for copper with a risk of perforations by corrosion by puncture. If possible keep below 10 mg/l.
- SO_4^{2-} sulphate ions can cause perforating corrosion, if their content is above 30 mg/l.
- No fluoride ions (<0.1 mg/l).
- No Fe^{2+} and Fe^{3+} ions with non negligible levels of dissolved oxygen must be present. Dissolved iron < 5 mg/l with dissolved oxygen < 5 mg/l.
- Dissolved silicon: silicon is an acid element of water and can also lead to corrosion risks. Content < 1 mg/l.
- Water hardness: > 0.5 mmol/l. Values between 1 and 2.5 can be recommended. This will facilitate scale deposit that can limit corrosion of copper. Values that are too high can cause piping blockage over time. A total alkalimetric titre (TAC) below 100 is desirable.
- Dissolved oxygen: Any sudden change in water oxygenation conditions must be avoided. It is as detrimental to deoxygenate the water by mixing it with inert gas as it is to over-oxygenate it by mixing it with pure oxygen. The disturbance of the oxygenation conditions encourages destabilisation of copper hydroxides and enlargement of particles.
- Specific resistance – electric conductivity: the higher the specific resistance, the slower the corrosion tendency. Values above 30 Ohm·m are desirable. A neutral environment favours maximum specific resistance values. For electric conductivity values in the order of 20-60 mS/m can be recommended.
- pH: Ideal case pH neutral at 20-25°C
  $7 < pH < 8$

If the water circuit must be emptied for longer than one month, the complete circuit must be placed under nitrogen charge to avoid any risk of corrosion by differential aeration.

ATTENTION: Filling, completing and draining the water circuit charge must be done by qualified personnel, using the air purges and materials that are suitable for the products.

Charging and removing heat exchange fluids should be done with devices that must be included on the water circuit by the installer. Never use the unit heat exchangers to add heat exchange fluid.

7.2 - Victaulic water connections

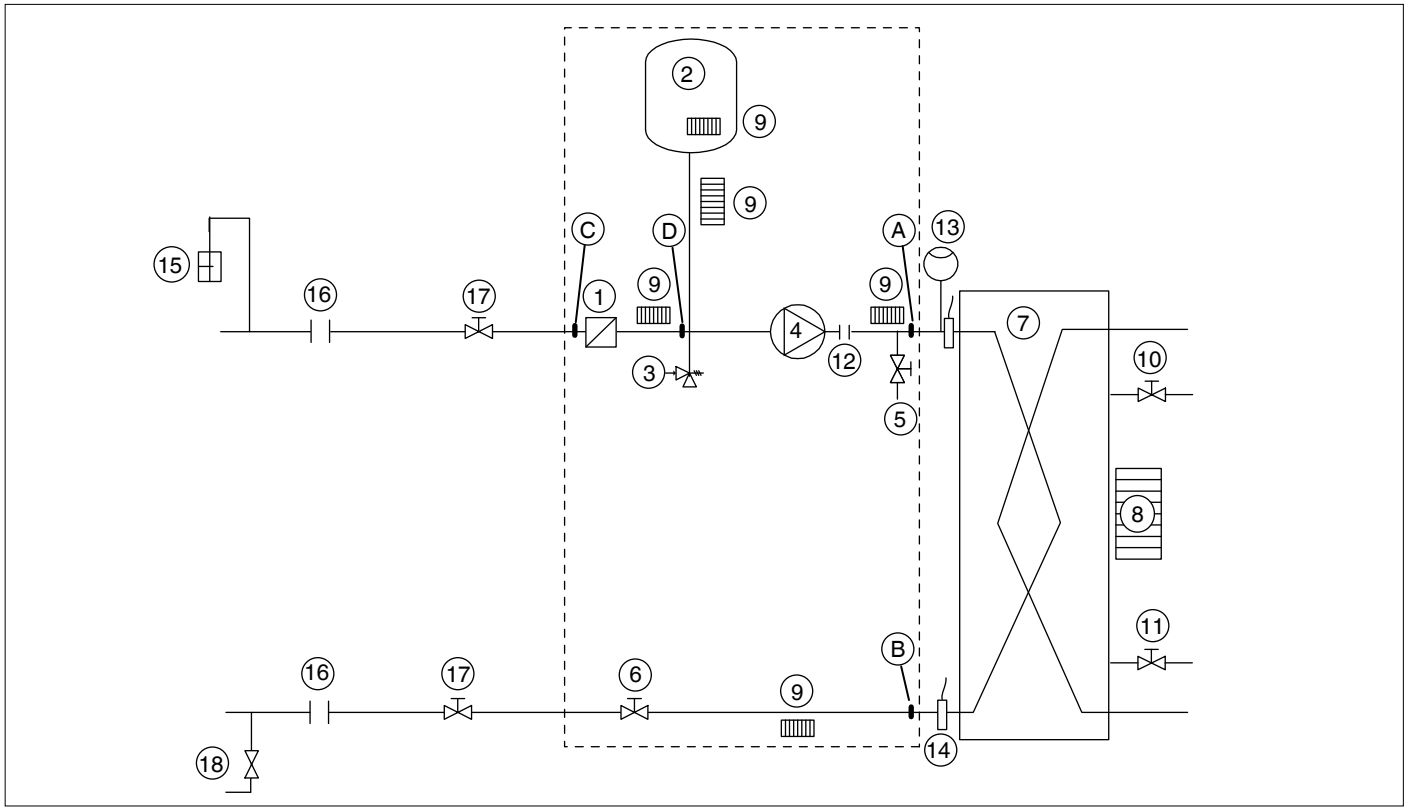
Inlet/outlet diameters without hydronic module

30XA		252	302	352	402	452	502	602	702	752	802	852	902
Standard													
Nominal diameter	in	5	5	5	5	5	5	5	6	6	6	6	6
Actual 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
Options 5, 6 and 100A*													
Nominal diameter	in	4	5	5	6	5/5	6/5	8/5	6/6	-	-	-	-
Actual outside diameter	mm	114.3	141.3	141.3	168.3	141.3/141.3	168.3/141.3	219.1/141.3	168.3/168.3	-	-	-	-
Option 100C**													
Nominal diameter	in	5	6	6	8	-	-	-	-	-	-	-	-
Actual outside diameter	mm	141.3	168.3	168.3	219.1	-	-	-	-	-	-	-	-

30XA		1002	1102	1112	1202	1212	1302	1312	1352	1382	1402	1502	1702
Standard													
Nominal diameter	in	8	6	6	6	6	6	6	8/6	6	8/6	8/6	6
Actual outside diameter	mm	219.1	168.3	168.3	168.3	168.3	168.3	168.3	219.1/168.3	168.3	219.1/168.3	219.1/168.3	168.3

* Options 5, 6 and 100A are not available for sizes 752 to 1702.
** Option 100C is not available for sizes 452 to 1702.

Typical water circuit diagram



Legend

Components of the unit and hydronic module
A Pressure sensor (A-B = ΔP evaporator)
B Pressure sensor
C Pressure sensor (C-D = ΔP water filter)
D Pressure sensor
1 Victaulic screen filter
2 Expansion tank
3 Safety valve
4 Available pressure pump
5 Drain valve
6 Flow control valve
7 Evaporator
8 Evaporator defrost heater (option)
9 Hydronic module defrost heater (option)
10 Air vent (evaporator)
11 Water drain (evaporator)
12 Expansion compensator (flexible connections)
13 Flow switch
14 Water temperature sensor

Installation components
15 Air vent
16 Flexible connection
17 Shut-off valve
18 Charge valve

--- Hydronic module (supplied as an option)

7.3 - Flow control

Evaporator flow switch and chilled water pump interlock

IMPORTANT: On 30XA units, the unit water flow switch must be energised, and the chilled water pump interlock must be connected. Failure to follow this instruction will void the Carrier guarantee.

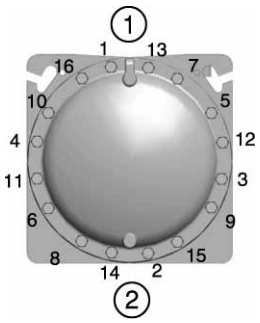
The water flow switch is installed on the evaporator water inlet and adjusted by the control, based on unit size and application. If adjustment is necessary, it must be carried out by qualified personnel trained by Carrier Service.

Terminals 34 and 35 are provided for field installation of the chilled water pump interlock (auxiliary contact for pump operation to be wired on site).

7.4 - Evaporator water box bolt tightening

The evaporator (and condenser) are of the shell and tube type with removable water boxes to facilitate cleaning. Re-tightening or tightening must be done in accordance with the illustration below.

Water box tightening sequence



Legend:

① Sequence 1: 1, 2, 3, 4
Sequence 2: 5, 6, 7, 8
Sequence 3: 9, 10, 11, 12
Sequence 4: 13, 14, 15, 16

② Tightening torque
Bolt size M16 - 171 - 210 Nm

NOTE: Before this operation we recommend draining the circuit and disconnecting the pipes to be sure that the bolts are correctly and uniformly tightened.

7.5 - Frost protection

7.5.1 - Standard machine

If the chiller or the water piping is in an area where the ambient temperature can fall below 0°C it is recommended to add an antifreeze solution to protect the unit and the water piping to a temperature of 10 K below the lowest temperature likely to be reached at the installation site. Use only antifreeze solutions, approved for heat exchanger duty. If the system is not protected by an antifreeze solution and will not be used during the freezing weather conditions, draining of the cooler and outdoor piping is mandatory. Damage due to freezing is not covered by the warranty.

IMPORTANT: Depending on the climatic conditions in your area you must:

- ***Add ethylene glycol with an adequate concentration to protect the installation up to a temperature of 10 K below the lowest temperature likely to occur at the installation site.***
- ***If the unit is not used for an extended period, it is recommended to drain it, and as a safety precaution add ethylene glycol to the heat exchanger, using the water entering purge valve connection (a purge connection is available somewhere on the heat exchanger water box in case the machine is not perfectly level).***
- ***At the start of the next season, refill the unit with water and add an inhibitor.***
- ***For the installation of auxiliary equipment, the installer must comply with basic regulations, especially for minimum and maximum flow rates, which must be between the values listed in the operating limit table (application data).***

7.5.2 - Optional evaporator frost protection (30XA)

In cases where it is not possible to apply the recommendations in paragraph 7.5.1, the units can be equipped with heaters to protect the evaporator against frost (option 41A or 41B).

7.6 - Operation of two units in master/slave mode (option 58)

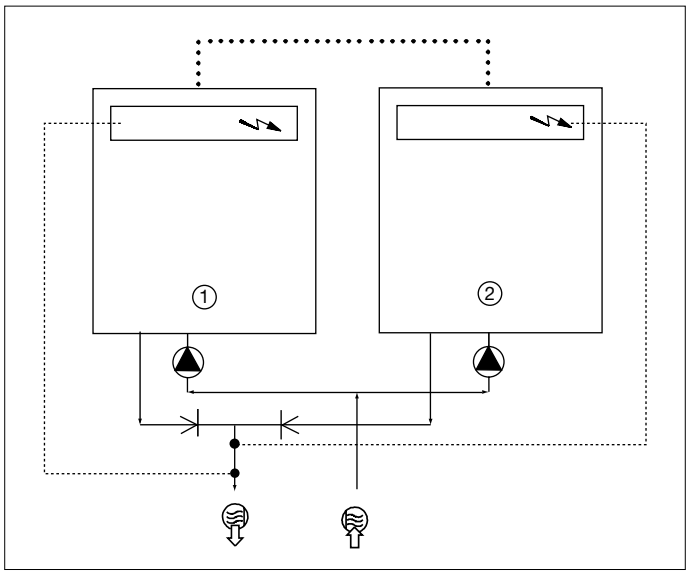
NOTE: This operating mode is not available for 30XA 1702 units.

The control of a master/slave assembly is in the entering water and does not require any additional sensors (standard configuration). It can also be located in the leaving water. In this case two additional sensors must be added on the common piping.

All parameters, required for the master/slave function must be configured using the Service Configuration menu. All remote controls of the master/slave assembly (start/stop, set point, load shedding etc.) are controlled by the unit con-figured as master and must only be applied to the master unit.

Each unit controls its own water pump. If there is only one common pump, in cases with variable flow, isolation valves must be installed on each unit. They will be activated at the opening and closing by the control of each heat pump (in this case the valves are controlled using the dedicated water pump outputs). Refer to the 30XA/30XAS/30XW Pro-Dialog control manual for a more detailed explanation.

30XA with configuration: leaving water control



Legend

1 Master unit
2 Slave unit

Control boxes of the master and slave units

Water inlet

Water outlet

Water pumps for each unit (included as standard for units with hydronic module)

Additional sensors for leaving water control, to be connected to channel 1 of the slave boards of each master and slave unit

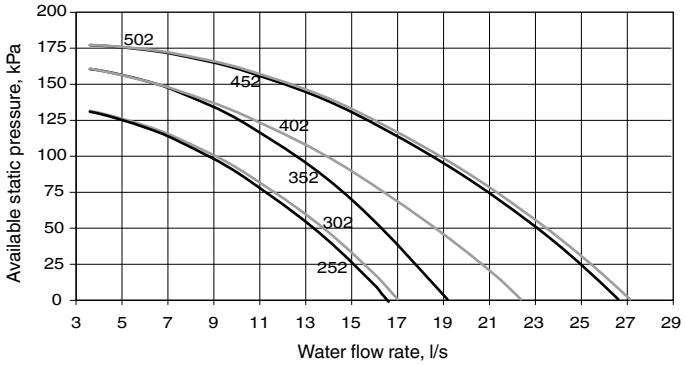
CCN communication bus

Connection of two additional sensors

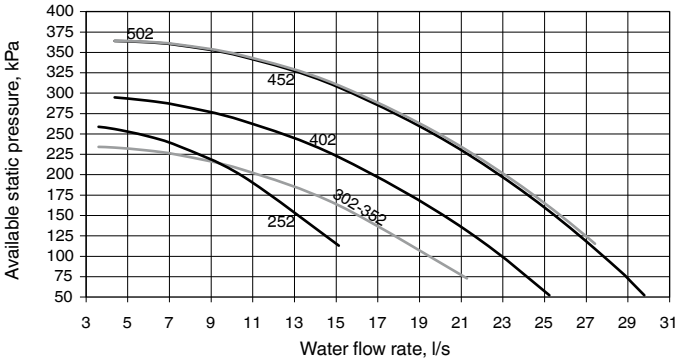
7.7 - Pump characteristics

7.7.1 - Available static system pressure (hydronic module option)

Low-pressure pumps (options 116F/116G)



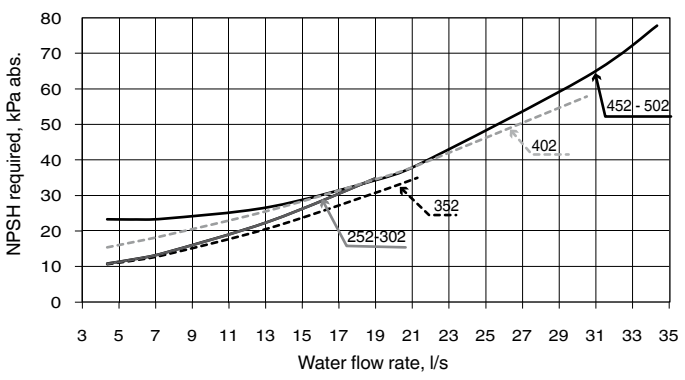
High-pressure pumps (options 116B/116C)



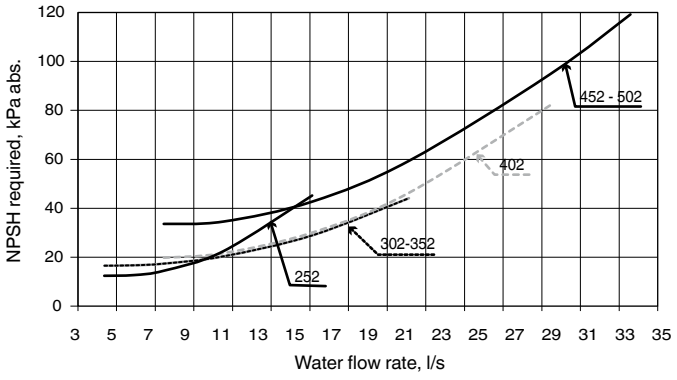
7.7.2 - Net positive suction head (NPSH) required, hydronic module option

Size the hydronic circuit to ensure a net positive suction head that is higher than or equal to the required NPSH + 50 kPa.

Low-pressure pumps (options 116F/116G)



High-pressure pumps (options 116B/116C)



8 - FREE-COOLING OPTION (OPTION 118A)

8.1 - Physical data, 30XA units with free-cooling option (option 118A)

30XA with Option 118A		252	302	352	402	452	502	602	702	752	802	852	902	1002
Operating weight with option 279 or 257	kg	3740	3780	3820	4673	4743	5174	6097	6247	6547	6847	7308	7648	8226
Refrigerant charge	kg													
Circuit A		37	35	35	51.5	53.5	60.5	60	60	67	71	74	71	78
Circuit B		38.5	37.5	37.5	36.5	37	36	61	64	60	67	65	78	82
Refrigerant charge, option 254	kg													
Circuit A		60	64	*	87	87	104	104	102	*	*	133	*	143
Circuit B		64	64	*	56	56	56	90	97	*	*	97	*	132

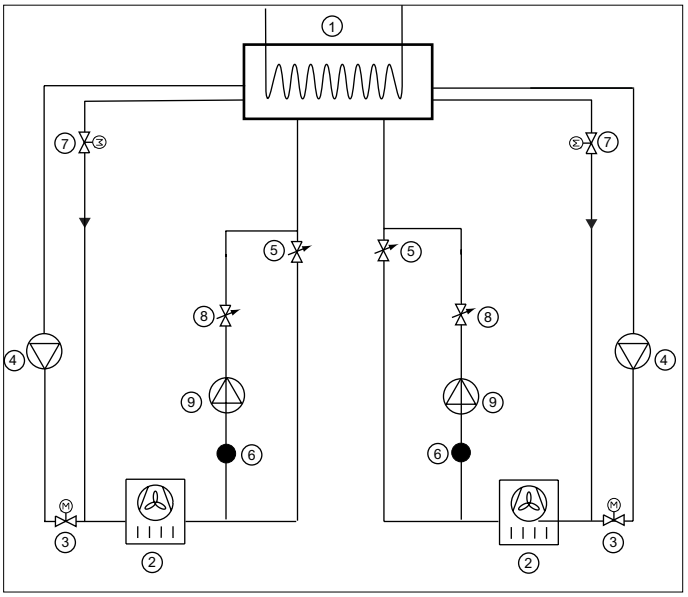
* Option 118A (free cooling) is not compatible with these unit sizes.

8.2 - Operating limits

Cooling mode			
Evaporator		**Minimum**	**Maximum**
Entering water temperature at start-up	°C	-	45
Entering water temperature during operation	°C	6.8	21
Leaving water temperature during operation		3.3	15
Condenser (air)			
Outdoor ambient operating temperature	°C	-10	55*
With winter operation option (option 28)	°C	-20	55*
Free-cooling mode			
Evaporator		**Minimum**	**Maximum**
Entering water temperature at start-up	°C	-	45
Leaving water temperature during operation		3.3	26*
Condenser (air)		**Minimum**	**Maximum**
Outdoor ambient operating temperature	°C	-10	20
With winter operation option (option 28)	°C	-20	20

* Maximum configurable set-point

8.3 - Operation



Legend
1 Evaporator
2 Air condenser (coils)
3 Motorised two-way valve, discharge side
4 Compressor and oil separator
5 Principal electronic expansion valve (EXV)
6 Pressure and temperature measurement to calculate the sub-cooling upstream of the pump
7 Motorised two-way bypass valve
8 Free-cooling expansion device (EXV)
9 Refrigerant pump

The change-over between the cooling and free-cooling modes is automatically controlled (it is possible to block the change-over to free-cooling by reconfiguring the machine - see Controls IOM). The configurable parameters permitting change-over are the outside air temperature and the leaving water temperature set-point. As soon as the temperature difference LWT_{stp} - OAT is above 8 K the current capacity in cooling mode is calculated and compared with the theoretical free-cooling capacity. This comparison authorizes/stops the change-over to free-cooling.

After change-over to free-cooling all compressors are stopped, the two (or four) two-way valves change to the free-cooling position (the compressor functions are bypassed). As soon as the valves open, the free-cooling pump is started. This change-over logic takes around 4 minutes. Taking this timing into consideration two cooling - free-cooling change-overs are authorized per hour.

If the capacity supplied in the free-cooling mode is insufficient (set-point not reached), the unit automatically changes over to cooling mode.

To optimize operation in free-cooling mode we strongly recommend to use the set-point offset function. This favours the change-over to free-cooling and increases the capacity in free-cooling mode.

9 - HEAT RECLAIM CONDENSER OPTION (OPTION 50)

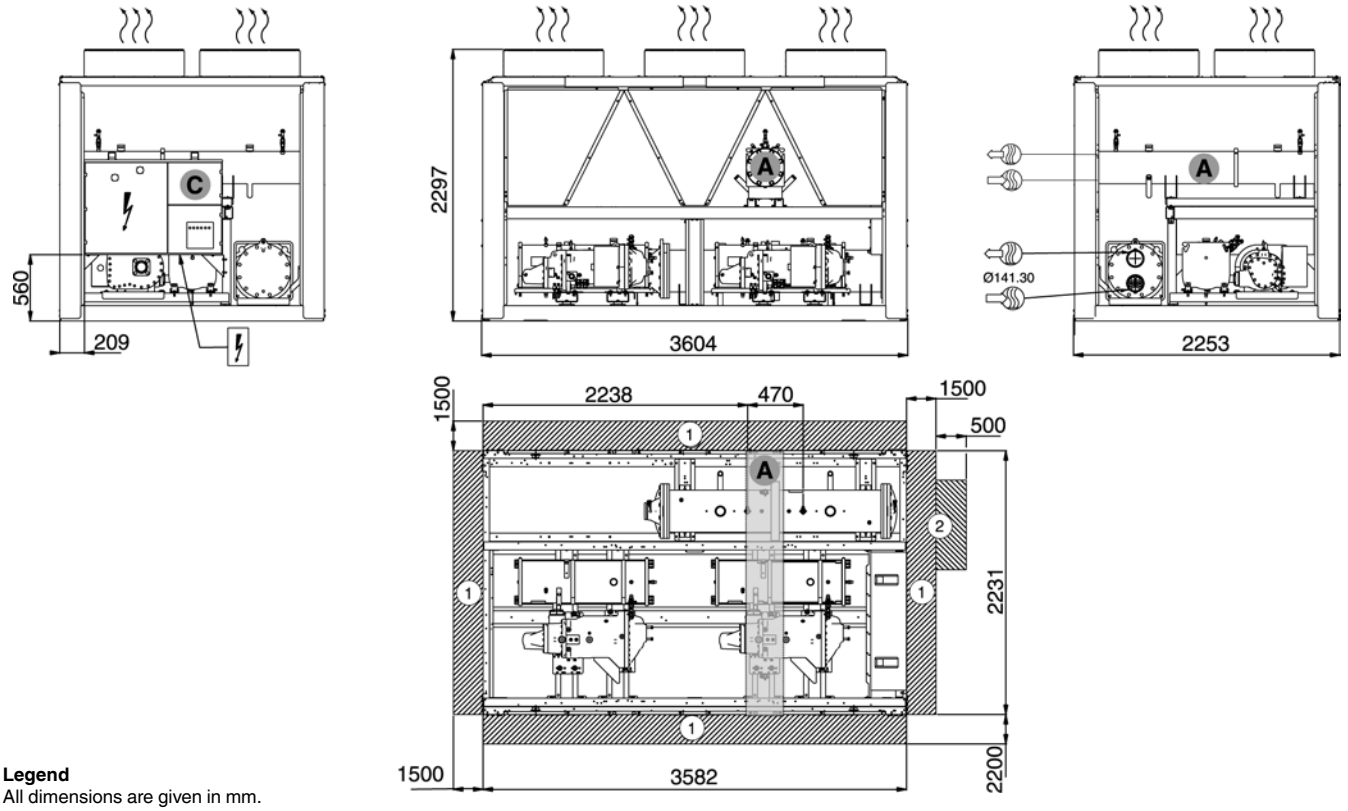
9.1 - Technical data, 30XA units with heat reclaim condenser option

30XA heat reclaim mode		252	302	352	402	452	502	602	702	752	802	852	902	1002
Operating weight*	kg	3920	3960	3970	4930	5050	5550	6670	6730	7130	7350	7890	8340	8950
Refrigerant charge														
Circuit A	kg	37	35	35	51	52	59	58	58	65	69	72	69	91
Circuit B	kg	39	37	37	37	37	36	59	62	58	65	63	76	89
Heat reclaim condenser		Flooded multi-pipe condenser												
Water volume	l	38	38	38	55	68	68	55 + 55	55 + 55	55 + 68	55 + 68	55 + 68	68 + 68	68 + 68
Water connections		Victaulic												
Nominal diameter	in	3	3	3	4	4	4	4	4	4	4	4	4	4
Actual outside diameter	mm	88.9	88.9	88.9	114.3	114.3	114.3	114.3	114.3	114.3	114.3	114.3	114.3	114.3

* Weights are for guidance only

9.2 - Dimensions, clearances

9.2.1 - 30XA 252-352 - heat reclaim option



Legend
All dimensions are given in mm.

(1) Required clearances for maintenance (see note)

(2) Recommended space for evaporator tube removal

Water inlet for standard unit
For options 5, 6, 100A, 100C, 107 refer to the certified drawing.

Water outlet for standard unit
For options 5, 6, 100A, 100C, 107 refer to the certified drawing.

Air outlet – do not obstruct

Power supply and control connection

Ⓒ Control circuit connection for option 158

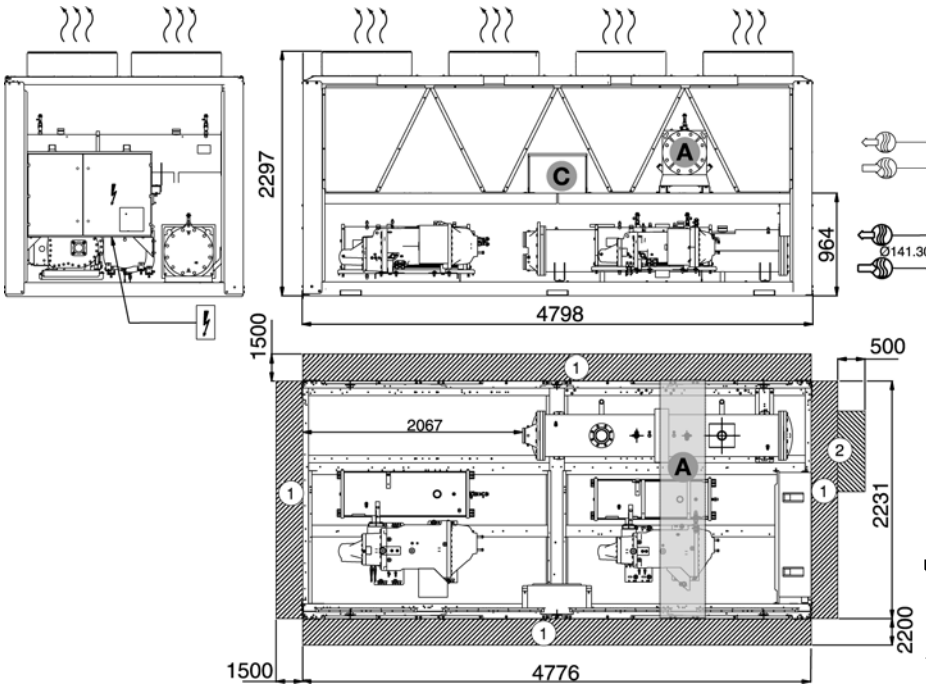
A Heat reclaim condenser

ATTENTION: The condenser connection sleeves are not installed, but supplied with the unit. The sealing joints are in the control box. The temperature sensors and the condenser flow switch are wired and fixed in the machine. They must be installed as described in the chapter "Condenser water connections".

NOTES:

- ***Drawings are not contractually binding.***
- ***Before designing an installation, consult the certified dimensional drawings, available on request.***
- ***For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.***
- ***If the installation includes several units or if this (these) is (are) close to walls, please refer to chapters 3.12 - "Multiple chiller installation" and 3.13 - "Distance to the wall" of this document to determine the space required.***

9.2.2 - 30XA 402-452 - heat reclaim option



Legend
All dimensions are given in mm.

1. Required clearances for maintenance (see note)
2. Recommended space for evaporator tube removal

Water inlet for standard unit
For options 5, 6, 100A, 100C, 107 refer to the certified drawing.

Water outlet for standard unit
For options 5, 6, 100A, 100C, 107 refer to the certified drawing.

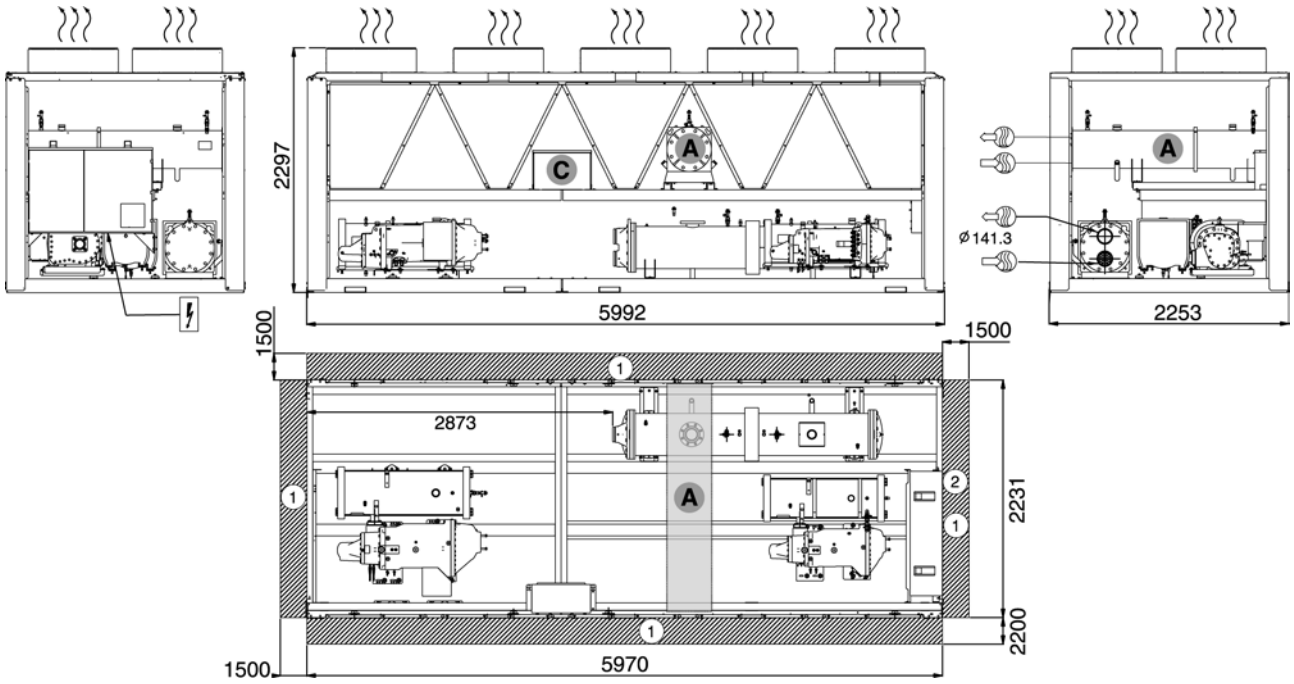
Air outlet – do not obstruct

Power supply and control connection

Ⓒ Control circuit connection for option 158

A Heat reclaim condenser

9.2.3 - 30XA 502 - heat reclaim option

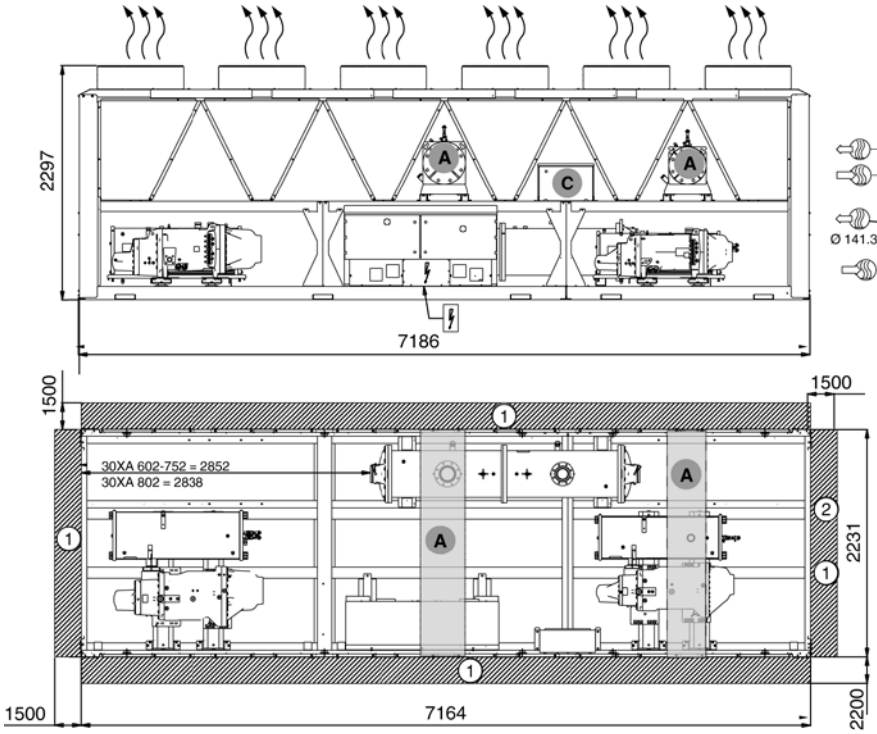


ATTENTION: The condenser connection sleeves are not installed, but supplied with the unit. The sealing joints are in the control box. The temperature sensors and the condenser flow switch are wired and fixed in the machine. They must be installed as described in the chapter "Condenser water connections".

NOTES:

- ***Drawings are not contractually binding.***
- ***Before designing an installation, consult the certified dimensional drawings, available on request.***
- ***For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.***
- ***If the installation includes several units or if this (these) is (are) close to walls, please refer to chapters 3.12 - "Multiple chiller installation" and 3.13 - "Distance to the wall" of this document to determine the space required.***

9.2.4 - 30XA 602-802 - heat reclaim option



Legend
All dimensions are given in mm.

(1) Required clearances for maintenance (see note)

(2) Recommended space for evaporator tube removal

Water inlet for standard unit
For options 5, 6, 100A, 100C, 107 refer to the certified drawing.

Water outlet for standard unit
For options 5, 6, 100A, 100C, 107 refer to the certified drawing.

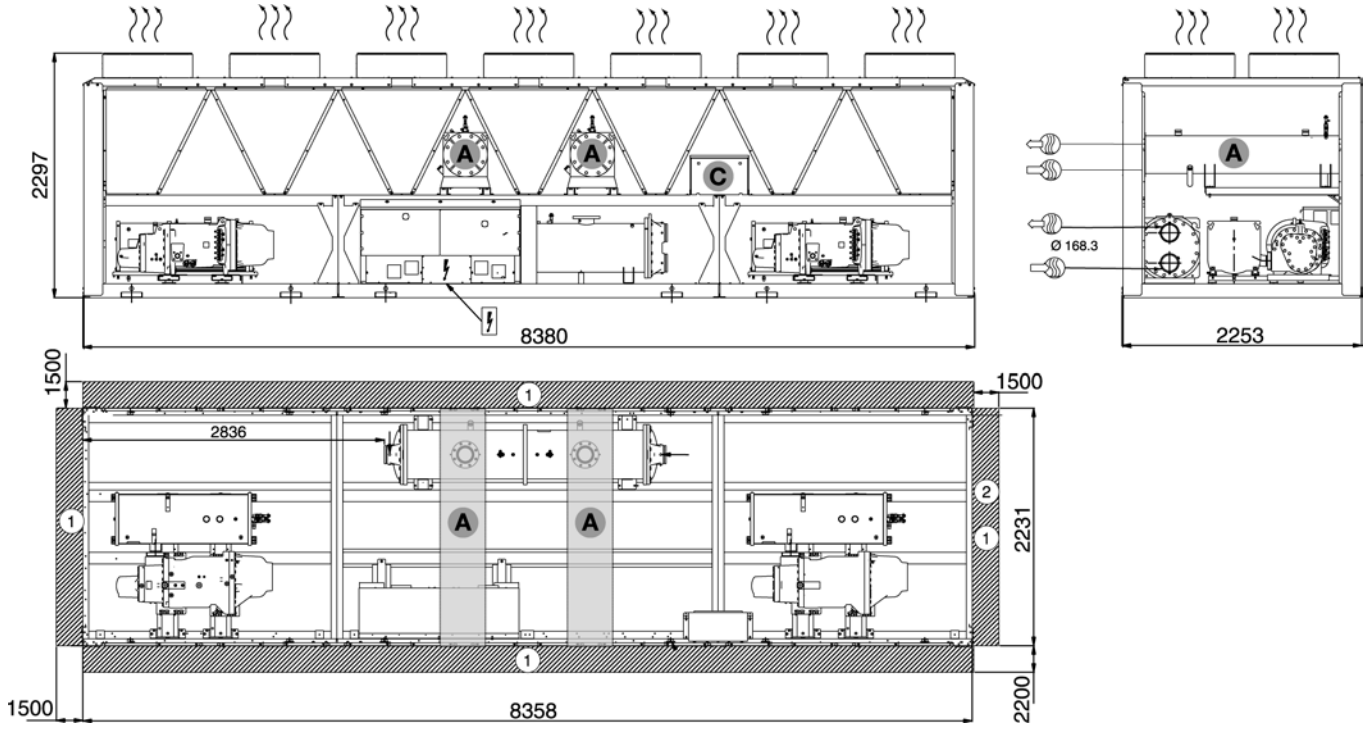
Air outlet – do not obstruct

Power supply and control connection

Control circuit connection for option 158

A Heat reclaim condenser

9.2.5 - 30XA 852-902 - heat reclaim option

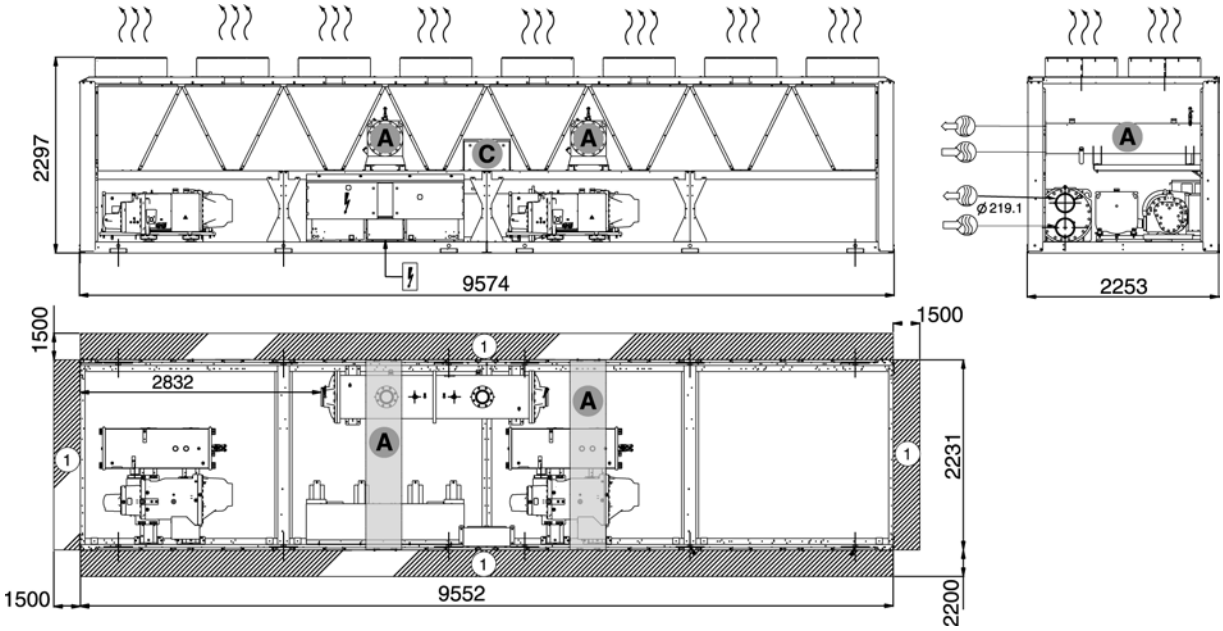


ATTENTION: The condenser connection sleeves are not installed, but supplied with the unit. The sealing joints are in the control box. The temperature sensors and the condenser flow switch are wired and fixed in the machine. They must be installed as described in the chapter "Condenser water connections".

NOTES:

- ***Drawings are not contractually binding.***
- ***Before designing an installation, consult the certified dimensional drawings, available on request.***
- ***For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.***
- ***If the installation includes several units or if this (these) is (are) close to walls, please refer to chapters 3.12 - "Multiple chiller installation" and 3.13 - "Distance to the wall" of this document to determine the space required.***

9.2.6 - 30XA 1002 - heat reclaim option



Legend
All dimensions are given in mm.

(1) Required clearances for maintenance (see note)

(2) Recommended space for evaporator tube removal

Water inlet for standard unit
For options 5, 6, 100A, 100C, 107 refer to the certified drawing.

Water outlet for standard unit
For options 5, 6, 100A, 100C, 107 refer to the certified drawing.

Air outlet – do not obstruct

Power supply and control connection

(C) Control circuit connection for option 158

(A) Heat reclaim condenser

ATTENTION: The condenser connection sleeves are not installed, but supplied with the unit. The sealing joints are in the control box. The temperature sensors and the condenser flow switch are wired and fixed in the machine. They must be installed as described in the chapter "Condenser water connections".

NOTES:

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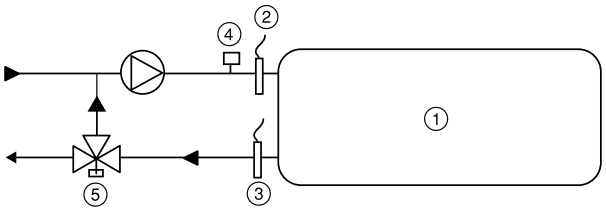
9.3 - Condenser location

All heat reclaim condensers are located between the air-cooled condensers on the upper part of the chassis, supported by two cross rails. The water inlet and outlet are on the same side.

9.4 - Condenser water connections

9.4.1 - Unit with one heat reclaim condenser (30XA 252-502)

The water flow switch must be installed at the water inlet of the installation that arrives at the heat reclaim condenser.

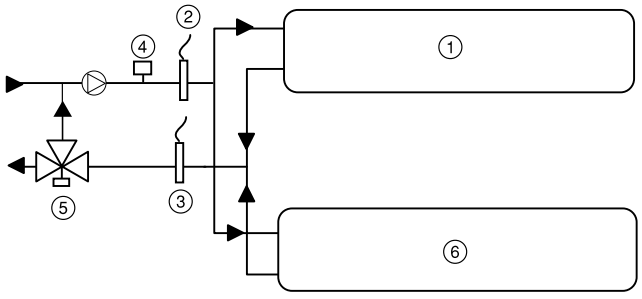


Legend
1 Heat reclaim condenser
2 Entering water temperature sensor (supplied)
3 Leaving water temperature sensor (supplied)
4 Condenser water flow switch (supplied)
5 Three-way valve (not supplied)

9.4.2 - Unit with two heat reclaim condensers (30XA 602-1002)

The two condensers must be installed in parallel in the water system of the installation. The water flow switch and the entering/leaving water temperature sensors must be installed in the line that is common to both heat reclaim circuits and as close as possible to the condensers. A T-piece must be provided by the installer at the water inlet and outlet of the condensers.

For units with two condensers the maximum cable length of the temperature sensors and the flow switch (7.5 m) is designed to allow connection to the common inlet or outlet in a radius of 4.5 m after routing along the width of the unit.



Legend
Please refer to the legend in chapter 9.4.1 opposite, noting that items 2, 3 and 4 - flow switch and sensors - are placed on the common sections.

9.4.3 - Three-way valves

It is strongly recommended to install a three-way valve in the system (not supplied with the unit). A 0-10 V output is available on the unit electronic board to control this valve. The valve allows bypassing of the heat reclaim condenser entering/leaving circuit to ensure unit operation with heat reclaim at low entering water temperature (< 12.5°C). It also ensures an optimal and controlled leaving water temperature.

9.5 - Operating limits for stable operation (no mode changeover)

9.5.1 - Cooling only mode

Please refer to the earlier chapters in this manual:
6.1 - Unit operating range
6.7 - Evaporator water flow rate

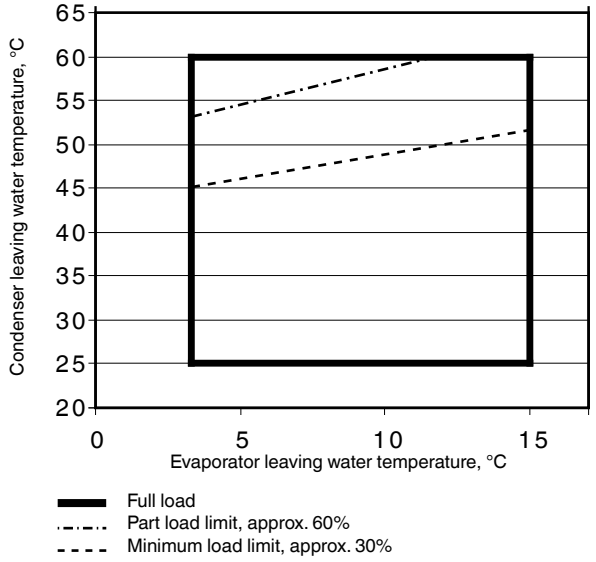
9.5.2 - Heat reclaim mode

Condenser water temperature			
	°C	**Minimum**	**Maximum**
Water entering temperature at start-up		12.5*	55
Water entering temperature during operation		20	55
Water leaving temperature during operation		25	60
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

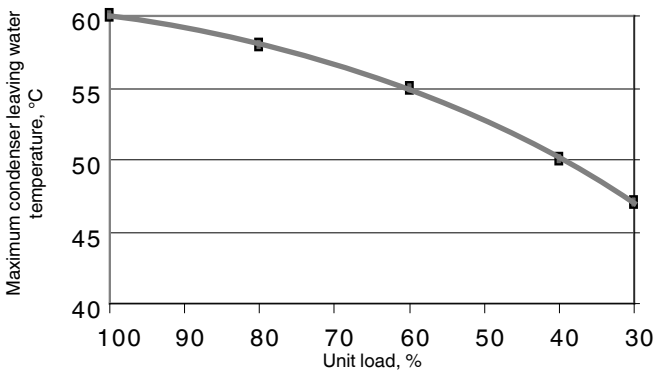
* The water entering temperature at start-up must not be lower than 12.5°C. For installations with a lower temperature a three-way valve must be used.

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

In part-load operation, the limitation of the condenser leaving water temperature is due to the operating range of the screw compressor. If the condenser leaving water temperature is above the limit value given in the curves below, the unit will automatically change over to the mode without heat recovery:



Part load operating limits (evaporator leaving water temperature = 7°C)



9.6 - Operating limits for changeover between modes

From cooling only to heat reclaim and vice versa.

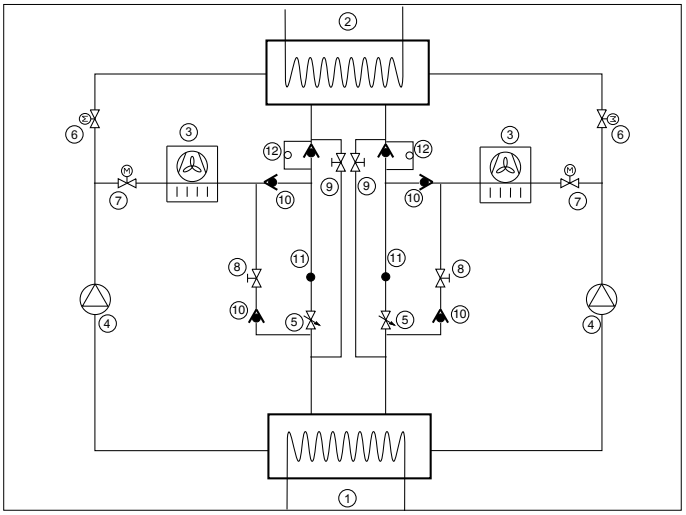
Heat reclaim condenser water temperature			
	°C	Minimum	Maximum
Water entering temperature		12.5	57.5
Ambient operating temperature		-10*	45

* -20°C with winter operation option (option 28)

9.7 - Flow control

The water flow switch supplied needs to be installed at the heat reclaim condenser water inlet and protects the condenser loop against low water flow conditions. When the heat reclaim mode is required, a signal from the additional board output activates the system pump. Once the pump is started, flow detection takes place for one minute. If no flow is detected by the end of this time:

1. changeover to the heat reclaim mode is not permitted
2. mode is changed to cooling only mode when the water flow rate is low, accompanied by a water flow detection alarm.



Legend

1 Evaporator
2 Heat reclaim condenser
3 Air condenser (coils)
4 Compressor
5 Expansion device (EXV)
6 Motorised valve - heat reclaim mode
7 Motorised valve - cooling only mode
8 Solenoid valve - charge recovery in heat reclaim mode
9 Solenoid valve - charge recovery in cooling only mode
10 Check valve
11 Pressure and temperature measurement to calculate the liquid sub-cooling to optimise the charge recovery
12 Check valve with capillary

9.8 - Heat reclaim operation

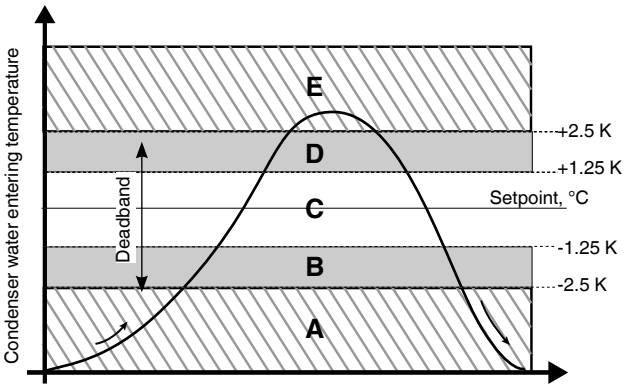
The heat reclaim condenser option is only available on units with two circuits. It has been designed with one or two single or two-circuit shell-and-tube heat exchangers, depending on the unit size.

The two circuits are independently controlled. One circuit can be in cooling only and the other in heat reclaim mode.

Changeover from one mode to the other (changeover from heat exchange at the air condenser to heat exchange at the water condenser and vice versa) is ensured by motorised two-way valves located upstream of the air and water condensers.

ATTENTION: Mode changes may lead to higher sound levels than the levels at stable operation.

Depending on the mode selected (heat reclaim or cooling), the logic compares the water entering temperature required with the setpoint. Depending on this difference the unit circuits are either activated or deactivated in heat reclaim mode (one or two together), as shown in the following diagram and table.



The deadband of 5 K is controlled by default.

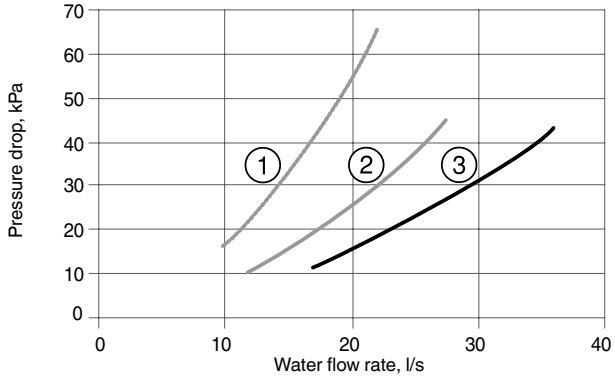
Case	Selection of the heat reclaim mode	Number of circuits in heat reclaim mode	Action
-	NO	0	+ 2 circuits in cooling mode
A	YES	Whatever the number	+ 2 circuits in heat reclaim mode
B	YES	0	+ 1 circuit in heat reclaim mode
		1	No change
		2	No change
C	YES	Whatever the number	No change
D	YES	1	No change
		2	- 1 circuit in heat reclaim mode
E	YES	Whatever the number	- 2 circuits in heat reclaim mode

For more details on the heat reclaim operation logic please refer to the 30XA/30XAS/30XW Pro-Dialog control manual, chapter 6.15 - “Optional heat reclaim module”.

9.9 - Condenser pump selection

Heat reclaim condenser water flow rate/pressure drop

Heat reclaim condenser pressure drop in water flow rate function



1 Condenser 10" (water volume = 38 litres)
2 Condenser 12" (water volume = 55 litres)
3 Condenser 14" (water volume = 68 litres)

For units with a water condenser please refer to chapter 9.1 - “Technical data, 30XA units with heat reclaim condenser option”.

9.10 - Frost protection

The heat reclaim condenser is equippped with electric heaters to protect the condenser against frost. These are activated if the condenser entering and leaving water temperatures are below 3°C and deactivated, if they are higher than 4.4°C.

10 - FANS WITH AVAILABLE PRESSURE (OPTION 10)

If this option has been selected, the fans with available pressure are equipped with discharge connection flanges to facilitate the duct connection.

NOTE: Each fan must be individually ducted.

11 - MAJOR SYSTEM COMPONENTS AND OPERATION DATA

11.1 - Direct-drive twin-screw compressor with variable capacity slide valve

- 30XA units use 06T geared twin-screw compressors equipped with a variable capacity slide valve for continuous control between 30% and 100% of full load.
- Nominal capacities range from 120 to 530 kW. The seven models used in the 30XA range are economised.

11.1.1 - Oil filter
The 06T screw compressor has an independent oil filter attached to the oil separator. This filter is field replaceable.

11.1.2 - Refrigerant
The 30XA a water chiller operating only with refrigerant R-134a.

11.1.3 - Lubricant
The 06T screw compressor is approved for use with the following lubricants:
- Castrol Icematic SW220 (Carrier specification PP47-32)
- Lubrizol Emkarate RL220H (Carrier specification PP47-13)

11.1.4 - Oil supply solenoid valve
An oil supply solenoid valve is installed on the oil return line as standard to isolate the compressor from oil flow when the compressor is not operating. The oil solenoid valve is field replaceable.

11.1.5 - Suction and economizer screens
To increase the reliability of the compressor, a screen has been incorporated as a standard feature into suction and economizer inlets of the compressor.

11.1.6 - Capacity control system
The 06T screw compressor has an unloading system that is standard on all compressors. This unloading system consists of slide valve that permits changing the length of the screw used for the refrigerant compression. This valve is controlled by the action of a piston controlled by two solenoid valves on the oil return line.

11.2 - Pressure vessels

General
Monitoring during operation, re-qualification, re-testing and re-testing dispensation:
- Follow the regulations on monitoring pressurised equipment.
- It is normally required that the user or operator sets up and maintains a monitoring and maintenance file.
- If there are no regulations or to complement them follow the control programmes of EN 378.
- If they exist follow local professional recommendations.
- Regularly inspect the condition of the coating (paint) to detect blistering resulting from corrosion. To do this, check a non-insulated section of the container or the rust formation at the insulation joints.
- Regularly check for possible presence of impurities (e.g. silicon grains) in the heat exchange fluids. These impurities maybe the cause of the wear or corrosion by puncture.
- Filter the heat exchange fluid check and carry out internal inspections as described in EN 378.
- In case of re-testing please refer to the maximum operating pressure given on the unit nameplate.
- The reports of periodical checks by the user or operator must be included in the supervision and maintenance file.

Repair
Any repair or modification, including the replacement of moving parts:
- must follow local regulations and be made by qualified operators and in accordance with qualified procedures, including changing the heat exchanger tubes.
- must be made in accordance with the instructions of the original manufacturer. Repair and modification that necessitate permanent assembly (soldering, welding, expanding etc.) must be made using the correct procedures and by qualified operators.
- An indication of any modification or repair must be shown in the monitoring and maintenance file.

Recycling
The unit is wholly or partly recyclable. After use it contains refrigerant vapours and oil residue. It is coated by paint.

Operating life
This unit is designed for:
- prolonged storage of 15 years under nitrogen charge with a temperature difference of 20 K per day.
- 452000 cycles (start-ups) with a maximum difference of 6 K between two neighbouring points in the vessel, based on 6 start-ups per hour over 15 years at a usage rate of 57%.

Corrosion allowances:
Gas side: 0 mm
Heat exchange fluid side: 1 mm for tubular plates in lightly alloyed steels, 0 mm for stainless steel plates or plates with copper-nickel or stainless steel protection.

11.2.1 - Evaporator

30XA chillers use a flooded multi-tube evaporator. The water circulates in the tubes and the refrigerant is on the outside in the shell. One vessel is used to serve both refrigerant circuits. There is a centre tube sheet which separates the two refrigerant circuits. The tubes are 3/4" diameter copper with an enhanced surface inside and out. There is just one water circuit, and depending on the size of the chiller, there may be one, two or three water passes.

The units have three refrigerant circuits with two evaporators connected in series on the heat transfer fluid.

The evaporator has a thermal insulation of 19 mm thick polyurethane foam, an aluminium sheet (option) and is equipped with a water drain and purge.

The water connection of the heat exchanger is a Victaulic connection. As an option the evaporator is available with frost protection (evaporator frost protection option).

The products that may be added for thermal insulation of the containers during the water piping connection procedure must be chemically neutral in relation to the materials and coatings to which they are applied. This is also the case for the products originally supplied by Carrier.

11.2.2 - Oil separator

In these units, the oil separator is a pressure vessel that is mounted under the outside vertical condenser coils. Discharge gas at the compressor outlet is directed towards the bottom of the oil separator ring and most of the oil separates from the gas by strong deceleration and by gravity. The gas then flows through a wire mesh screen where the remaining oil is separated by coalescence and flows to the bottom of the ring. The gas is now free from oil and leaves the ring at the top towards the condenser.

The oil separator is equipped with a trace heater regulated by the control.

11.2.3 - Economiser function

The economiser function includes a liquid line valve, a filter drier, two EXVs, a plate heat exchanger as well as protection devices (fuse or valve).

At the condenser outlet a part of the liquid is expanded via the secondary EXV in one of the heat exchanger circuits and then returns as gas at the compressor economiser. This expansion permits increase of the liquid sub-cooling of the rest of the flow that penetrates the evaporator via the principal EXV. This permits increasing the cooling capacity of the system as well as its efficiency.

11.3 - High-pressure safety switch

30XA units are equipped with high-pressure safety switches.

In accordance with the applicable code the high-pressure switches with manual reset, called PZH (former DBK), may be backed up by high-pressure switches that require resetting with a tool. The high-pressure switches that require resetting with a tool are called PZHH (former SDBK). If a PZHH cuts out, the corresponding PZH in the same compressor is faulty and must be replaced. The PZHH must be reset with a blunt tool with a diameter of less than 6 mm. Insert this tool into the opening on the pressure switch and push the reset button in this location.

These pressure switches are located at the discharge of each compressor.

11.4 - Condensers

30XA coils are all-aluminium micro-channel condensers. Optional coils with internally grooved copper tubes with aluminium fins are also available (options 254 and 255).

11.5 - Fans

The fans are axial Flying Bird fans equipped with rotating shroud and made of composite recyclable material. Each motor is fixed with transverse supports. The motors are three-phase, with permanently lubricated bearings and insulation class F (level IP55).

The table below gives the necessary additional information for eco-design requirements (European directive 2009/125/EC).

Product		**30XA**	**30XA**
Option		**Standard**	**Option 119**
Global fan efficiency	%	32.6	36.3
Measurement category		A	A
Efficiency category		Static	Static
Energy efficiency target N(2013)		N(2013) 36	N(2013) 36
Efficiency level at the optimal energy efficiency point		39.5	41.0
Variable speed drive		Optional	Optional
Year of manufacture		See label on unit	Voir étiquette sur l'unité
Fan manufacturer		Simonin	See label on unit
Motor manufacturer		Leroy Somer	Leroy Somer
Fan reference		00PSG000000100A	00PSG000000100A
Motor reference		00PPG000478500A	00PPG000478400A
Nominal motor capacity	kW	0.82	1.77
Flow rate	m^3/s	3.20	4.27
Pressure	Pa	97	172
Speed	r/s (rpm)	11.9 (713)	950
Specific ratio		1.002	1.002
Product disassembly, recycling or disposal at end of life		See service manual	See service manual
Information about minimising environmental impact		See service manual	See service manual

11.6 - Electronic expansion valve (EXV)

The EXV is equipped with a stepper motor (2785 to 3690 steps, depending on the model) that is controlled via the EXV board. The EXV is also equipped with a sightglass that permits verification of the mechanism movement and the presence of the liquid gasket.

11.7 - Moisture indicator

Located on the EXV, permits control of the unit charge and indicates moisture in the circuit. The presence of bubbles in the sight-glass indicates an insufficient charge or non-condensables in the system. The presence of moisture changes the colour of the indicator paper in the sight-glass.

11.8 - Filter drier

The role of the filter drier is to keep the circuit clean and moisture-free. The moisture indicator shows, when it is necessary to change the element. A difference in temperature between the filter inlet and outlet shows that the element is dirty.

11.9 - Sensors

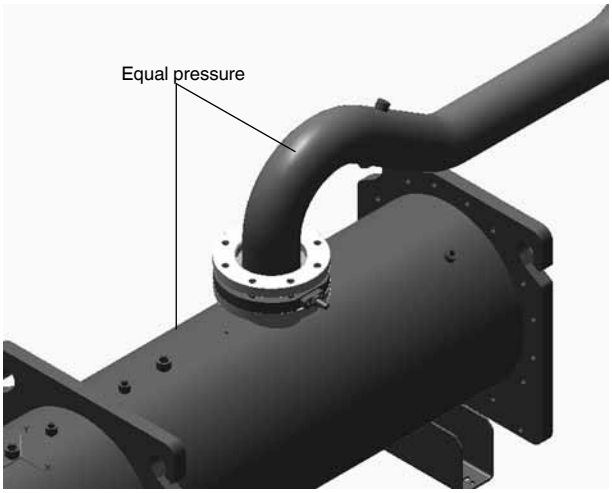
The units use thermistors to measure the temperature, and pressure transducers to control and regulate system operation. Refer to the 30XA/30XAS/30XW Pro-Dialog control manual for a more detailed explanation.

11.10 – Service valve (option 92)

The unit can be equipped with optional service valves to facilitate maintenance and repair operations.

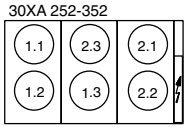
If option 92 is ordered, each refrigerant circuit will be supplied with shut-off valves on the compressor economiser, discharge and suction lines.

ATTENTION: The compressor suction valve must be used without pressure difference at the terminals. If there is a pressure difference, leak-tightness at the valve may be lost and the valve can even fail altogether.

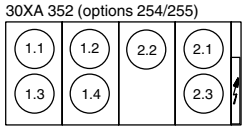


30XA fan arrangement

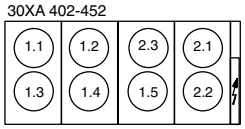
30XA 252-352



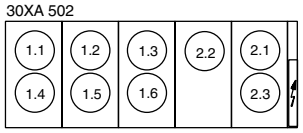
30XA 352 (options 254/255)



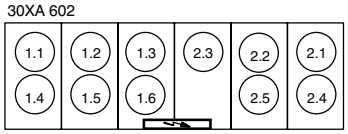
30XA 402-452



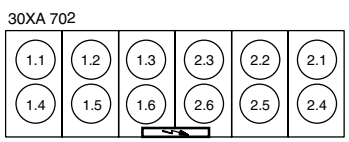
30XA 502



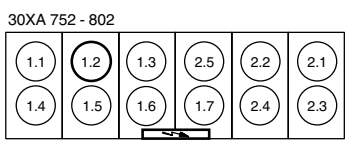
30XA 602



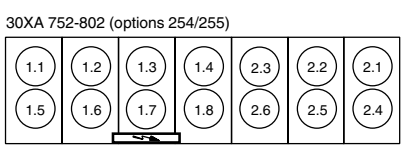
30XA 702



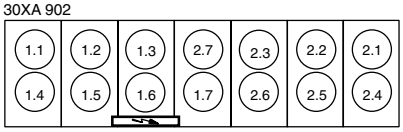
30XA 752 - 802



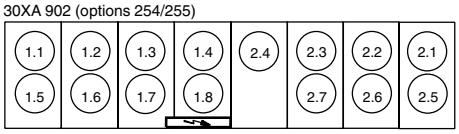
30XA 752-802 (options 254/255)



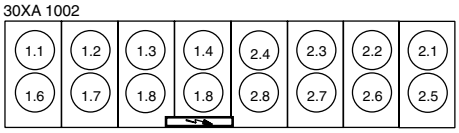
30XA 902



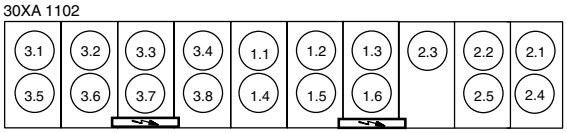
30XA 902 (options 254/255)



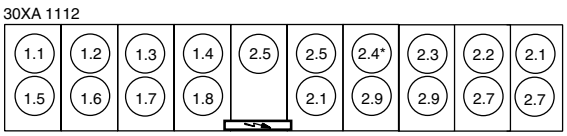
30XA 1002



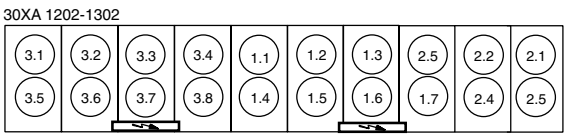
30XA 1102



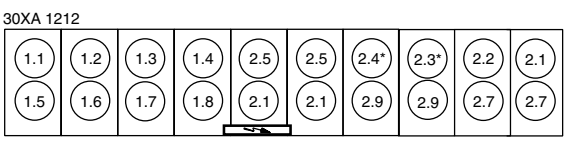
30XA 1112



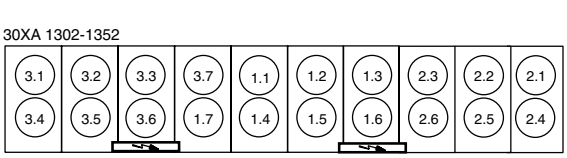
30XA 1202-1302



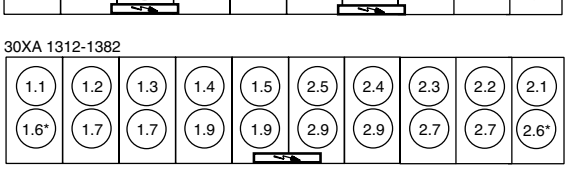
30XA 1212



30XA 1302-1352



30XA 1312-1382



x = Circuit number
y = Start-up order

NOTE: The values above do not correspond to the fan designation. The fan designation and position are given on the unit drawings and wiring diagrams supplied with the unit.

* These fans are also used to reduce the ventilation steps during change-over of dual stages: they may stop and then restart depending on the stage ordered.

12 - MAIN OPTIONS

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 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
Low temperature glycol solution	5	Low temperature chilled water production down to -6°C with ethylene glycol and -3°C with propylene glycol	Covers specific applications such as ice storage and industrial processes	30XA 252-1702
Very low temperature glycol solution	6	Low temperature chilled water production down to -12°C with ethylene glycol (limited to -10°C for certain sizes) and -8°C with propylene glycol (limited to -6°C for certain sizes)	Covers specific applications such as ice storage and industrial processes	30XA 252-1702
Unit equipped for air discharge ducting	10	Fans with available pressure equipped with discharge connection flanges - maximum available pressure = 60 Pa	Facilitates connection to the discharge ducts	30XA 252-1702
IP 54 control box	20A	Increased leak tightness of control boxes	Increased control box protection	30XA 252-1702
Tropical applications	22	Unit control box suitable for tropical applications	Reduced relative humidity in the control box for operation in tropical environments (hot and humid)	30XA 252-1702
Grilles and enclosure panels	23	Metal grilles on the unit front, rear and sides (includes option 23A)	Enhanced aesthetics, protection against intrusion to the unit interior	30XA 252-1702
Enclosure panels	23A	Side panels at each end of the coil	Enhanced aesthetics	30XA 252-1702
Winter operation	28	Fan speed control via frequency converter	Stable unit operation for air temperature down to -20°C	30XA 252-1702
Evaporator frost protection	41A	Electric resistance heater on the evaporator	Evaporator frost protection down to -20°C outside temperature	30XA 252-1702
Evaporator and hydronic module frost protection	41B	Electric resistance heater on the evaporator and the hydronic module	Evaporator and hydronic module frost protection down to -20°C outside temperature	30XA 252-1502
Heat reclaim	50	Complete recovery of the heat rejected by the condenser	Free hot-water production as well as cold-water production	30XA 252-1002
Master/slave operation	58	Additional leaving water temperature sensor kit for on-site installation, permitting master/slave operation of two chillers connected in parallel.	Optimised operation of two chillers connected in parallel with operating time balancing.	30XA 252-1502
Single power connection point	81	Power connection of the machine via one main supply connection	Quick and easy installation	30XA 1102-1502
Service valves	92	Shut-off valves on the compressor suction piping, the economiser line, the evaporator inlet and the compressor discharge piping	Simplified maintenance	30XA 252-1702
Discharge valve	93A	Shut-off valves on the compressor discharge piping	Simplified maintenance	30XA 252-1702
Evaporator with one pass more	100A	Evaporator with one pass more, water-side	Increased water inlet and outlet pressure losses on opposite sides	30XA 252-1702
Evaporator with one pass less	100C	Evaporator with one pass less, water-side	Reduced water inlet and outlet pressure losses on opposite sides	30XA 252-1002
21 bar evaporator	104	Reinforced evaporator for extension of the maximum water-side service pressure range to 2100 kPa (21 bar)	Covers applications with a high water column (high buildings)	30XA 252-1702
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 chapter 7.7 - “Pump characteristics”	Easy and fast installation	30XA 252-502
High-pressure dual-pump hydronic module	116C	See chapter 7.7 - “Pump characteristics”	Easy and fast installation, operating safety	30XA 252-502
Low-pressure single-pump hydronic module	116F	See chapter 7.7 - “Pump characteristics”	Easy and fast installation	30XA 252-502
Low-pressure dual-pump hydronic module	116G	See chapter 7.7 - “Pump characteristics”	Easy and fast installation, operating safety	30XA 252-502
Direct-expansion free-cooling system	118A	Chilled water production without the use of the compressors, using direct-expansion heat exchange on the condensers	Very economical chilled water production at low outdoor temperatures	30XA 252-1002
High energy efficiency	119	Improved condenser performance	Energy cost reduction, full load operation at higher air temperatures	30XA 252-1702
JBus/ModBus gateway	148B	Two-directional communications board, complies with JBus/ ModBus 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 “Remote management (EMM option)” in the PSD and the relevant references in the Controls Manual”	Easy connection by wired connection to a building management system	30XA 252-1702
Pro-Dialog Touch Screen	158	Touch screen interface	Large touch screen with clear text and system diagram for fast parameter setting.	30XA 252-1702
Dual relief valve installed with three-way valve	194	Three-way valve upstream of the safety valves on the evaporator and the oil separator	Valve replacement and inspection facilitated without refrigerant loss. Conforms to European standard EN 378/BGVD4	30XA 252-1352
Swiss code compliance in addition to PED code	197	Additional tests on the water heat exchangers. Additional supply of PED documents, supplementary certificates and test certificates.	Conformance with Swiss regulations in addition to PED code	30XA 252-1702
Russian code compliance (GOST)	199	GOST certification	Conformance with Russian regulations (GOST)	30XA 252-1702
Australian code compliance	200	Heat exchanger approved in accordance with the Australian code.	Conformance with Australian regulations	30XA 252-1702
Traditional Cu/Al coils	254	Coils made of copper tubes with aluminium fins	Possibility to add specialised condenser treatment	30XA 252-1702*
Traditional Cu/Al coils without slots	255	Coils made of copper tubes with aluminium fins without slots	Possibility to add specialised condenser treatment.	30XA 252-1702*
Insulation of the evaporator entering/leaving refrigerant lines	256	Thermal insulation of the evaporator entering/leaving refrigerant lines with flexible, anti-UV insulant	Prevents condensation on the evaporator entering/leaving refrigerant lines	30XA 252-1702
Low sound level	257	Compressor sound enclosure and sound insulation of main noise sources	Reduced sound emissions	30XA 252-1702
Very low sound level	258	Compressor sound enclosure and enhanced sound insulation of main noise sources. Option not compatible with option 119 (high-speed fans).	Reduced sound emissions	30XA 452-1702
Enviro-Shield anti-corrosion protection for microchannel heat exchangers (MCHE)	262	Carrier factory treatment of the MCHE heat exchanger for applications in standard and moderately corrosive environments	Improved corrosion resistance, recommended for moderately corrosive marine and industrial environments.	30XA 252-1702**
Super Enviro-Shield anti-corrosion protection for microchannel heat exchangers (MCHE)	263	Carrier factory treatment of the MCHE heat exchanger for applications in corrosive environments	The Super Enviro-Shield option was developed to extend the application range of MCHE heat exchangers in very corrosive environmental conditions.	30XA 252-1702
Welded Victaulic evaporator water connection	266	Piping to be welded with Victaulic connection	Ease-of-installation	30XA 252-1702
Remote interface	275	Remotely installed user interface (communication bus)	Remote chiller control up to 300 m	30XA 252-1702
Compressor enclosure	279	Compressor sound enclosure	Reduced sound emissions	30XA 252-1702
Evaporator with aluminium jacket	281	Evaporator aluminium sheet for thermal insulation protection.	Improved resistance to aggressive climate conditions	30XA 252-1502

* Except sizes 1112, 1212, 1312 and 1382
** Will be available during 2013

13 - STANDARD MAINTENANCE

Air conditioning equipment must be maintained by professional technicians, whilst routine checks can be carried out locally by specialised technicians.

Simple preventive maintenance will allow you to get the best performance from your HVAC unit:
- improved cooling performance
- reduced power consumption
- prevention of accidental component failure
- prevention of major time-consuming and costly interventions
- protection of the environment

There are five maintenance levels for HVAC units, as defined by the AFNOR X60-010 standard.

13.1 - Level 1 maintenance

See note “Any deviation or non-observation ... “ opposite.
Simple procedure can be carried out by the user:
- Visual inspection for oil traces (sign of a refrigerant leak)
- Air heat exchanger (condenser) cleaning - see chapter 13.6.1 - “Level 1”.
- Check for removed protection devices, and badly closed doors/covers
- Check the unit alarm report when the unit does not work. Refer to the 30XA/30XAS/30XW Pro-Dialog control manual for a more detailed explanation.

General visual inspection for any signs of deterioration.

13.2 - Level 2 maintenance

See note “Any deviation or non-observation ... “ opposite.
This level requires specific know-how in the electrical, hydronic and mechanical fields. It is possible that these skills are avail-able locally: existence of a maintenance service, industrial site, specialised subcontractor. In these cases, the following maintenance operations are recommended.

Carry out all level 1 operations, then:
- At least once a year tighten the power circuit electrical connections (see table 13.4).
- Check and re-tighten all control/command connections, if required (see table 13.4).
- Check the differential switches for correct operation every 6 months (free-cooling option 118A).
- Remove the dust and clean the interior of the control boxes, if required.
- Check the presence and the condition of the electrical protection devices.
- Check the correct operation of all heaters.
- Replace the fuses every 3 years or every 15000 hours (age-hardening).
- Replace the control box cooling fans used with option 22 (with designation EF22_) every five years.
- Check the height of the anti-vibration mountings (located between the compressor rails and the unit chassis) after 5 years of operation, and then each year. When the total minimum height of the mountings is less than 28 mm replace the mountings.
- Check the water connections.
- Purge the water circuit.
- Clean the water filter.
- Fully clean the condensers with a low-pressure jet and a bio-degradable cleaner (counter-current cleaning - see chapter 13.6.2 - “Level 2”).
- Replace the stuffing box packing of the pump after 10000 hours of operation.
- Check the unit operating parameters and compare them with previous values.
- Keep and maintain a maintenance sheet, attached to each HVAC unit.

All these operations require strict observation of adequate safety measures: individual protection garments, compliance with all industry regulations, compliance with applicable local regulations and using common sense.

13.3 - Level 3 (or higher) maintenance

NOTE: Any deviation or non-observation of these maintenance criteria will render the guarantee conditions for the HVAC unit null and void, and the manufacturer, Carrier SCS will no longer be held responsible.

The maintenance at this level requires specific skills/approval/tools and know-how and only the manufacturer, his representative or authorised agent are permitted to carry out these operations. These maintenance operations concern for example:
- A major component replacement (compressor, evaporator)
- Any intervention on the refrigerant circuit (handling refrigerant)
- Changing of parameters set at the factory (application change)
- Removal or dismantling of the HVAC unit
- Any intervention due to a missed established maintenance operation
- Any intervention covered by the warranty.

13.4 - Tightening torques for the main electrical connections

13.4.1 - Tightening torques for the main electrical connections

Component	Designation in the unit	Value (N·m)
Screw on bus bar, customer connection		
M8	-	18
M10	L1/L2/L3	30
Soldered screw PE, customer connection (M12)	PE	70
Tunnel terminal screw, compressor contactor		
Contactor 3RT103_		
Contactor 3RT104_		5
Contactor 3RT105_		11
Contactor 3RT106_	KM_	21
Nut on compressor contactor deck		
M8 for contactors 3RT105_		18
M10 for contactors 3RT10_7	KM_	30
Tunnel terminal screw, current transformer		
Size 2 (3RB2956_)		11
Size 3 (3RB2966_)	TI_	21
Nut on current transformer deck		
M8		18
M10	TI_	30
Compressor earth terminal in the power wiring control box		
Terminal M8	Gnd	30
Compressor phase connection terminals		
M12		25
M16	EC_	30
Compressor earth connection	Gnd on EC_	25
Tunnel terminal screw, disconnects 3RV1011_	QF_/QM_	1
Tunnel terminal screw, hydronic pump contactor		
Contactor 3RT101_	KM90_	1
Contactor 3RT102_		2.2

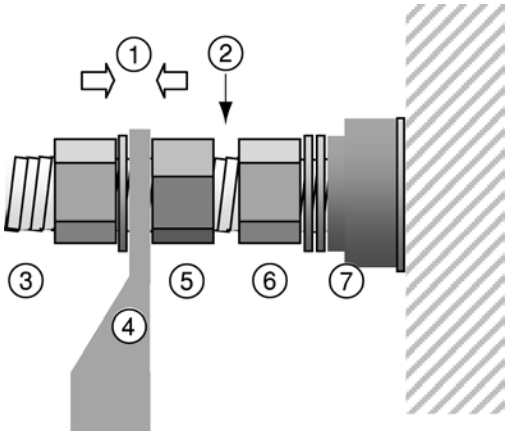
ATTENTION: The tightening of the connections at the compressor terminals requires special precautions. Please refer to the chapter below.

13.4.2 - Connection precautions for the compressor power terminals

These precautions must be applied during an intervention that requires the removal of the power conductors connected to the compressor supply terminals.

The tightening nut of terminal (6) supporting the isolator (7) must never be loosened, as ist ensures terminal tightness and compressor leak tightness.

The tightening of phase lug (4) must apply the torque between counter nut (5) and tightening nut (3): during this operation a counter-torque must be applied at counter nut (5). Counter-nut (5) must not be in contact with the tightening nut of terminal (6).



1. Torque application to tighten the lug
2. Avoid contact between the two nuts
3. Lug tightening nut
4. Flat lug
5. Counter-nut
6. Terminal tightening nut
7. Isolator

13.5 - Tightening torques for the main bolts and screws

Screw type	Used for	Value (N·m)
Metal screw D = 4.8	Condensing module, housing supports	4.2
Screw H M8	Condensing module, compressor fixing	18
Taptite screw M10	Condensing module, chassis - structure fixing, control box fixings, compressor fixings, oil separator fixing	30
Taptite screw M6	Piping support, cowling	7
Screw H M8	Piping clip	12
Screw H M6	Piping clip	10
Nut H M10	Compressor chassis	30
Nut H M10	Hydronic pump chassis	30
Screw H M8	Filter drier cover	40
Screw H M12	Economiser port flange	40
Screw H M16	Oil separator flanges, suction flanges	110
Screw H M16	Heat exchanger water boxes	190
Screw H M20	Suction flanges	190
Nut 5/8 ORFS	Oil line	65
Nut 3/8 ORFS	Oil line	26
Nut H M12/M16	Victaulic collars on suction piping	60

ATTENTION: The tightening of the connections at the compressor terminals requires special precautions. Please refer to the chapter below.

13.6 - Condenser coil

We recommend, that coils are inspected regularly to check the degree of fouling. This depends on the environment where the unit is installed, and will be worse in urban and industrial installations and near trees that shed their leaves.

For coil cleaning, two maintenance levels are used, based on the AFNOR X60-010 standard:

13.6.1 - Level 1

13.6.1.1 - Recommendations for maintenance and cleaning of round tube plate fin (RTPF) condenser coils

- Regular cleaning of the coil surface is essential for correct unit operation. Eliminating contamination and removal of harmful residue will increase the operating life of the coils and the unit.
- The maintenance and cleaning procedures below are part of the regular maintenance and will prolong the life of the coils.

Removal of fibres that obstruct the surfaces
Fibres and dirt collected on the coil surface must be removed with a vacuum cleaner. If you do not have a vacuum cleaner, a soft brush with non-metallic bristles can be used instead. In all cases cleaning must be done in the direction of the fins, as the coil surface is easily damaged. The fins bend easily and damage the protective coating of the coil, if cleaning is done at right angles to the fins. Clean against the air flow direction.

NOTE: Using a water jet from a spray hose on a polluted surface will result in fibres and dirt becoming trapped in the coil, making cleaning more difficult. All fibres and dirt must be removed from the surface, before using a low-speed rinsing jet.

Periodical cleaning with clean water:
For coils installed in a coastal or industrial environment periodical cleaning by rinsing with water is beneficial. It is however essential that rinsing is done with a low-speed water jet to avoid damaging the fins. Monthly cleaning as described below is recommended.

ATTENTION
- ***Chemical cleaning agents, water containing bleach, acidic or basic cleaning agents must never be used to clean the coil exterior or interior. These cleaning agents may be difficult to rinse off and can accelerate corrosion at the joint between tube and fins, where two different materials come into contact.***
- ***High-speed water from a high-pressure cleaner, spray hose or compressed air cleaner must never be used for coil cleaning. The force of the water or air jet will bend the fins and increase the air-side pressure drop. This can result in reduced performance or nuisance shutdowns of the unit.***

13.6.1.2 - Recommendations for maintenance and cleaning of MCHE (microchannel) condenser coils
- Regular cleaning of the coil surface is essential for correct unit operation. Eliminating contamination and removal of harmful residue will increase the operating life of the coils and the unit.
- The maintenance and cleaning procedures below are part of the regular maintenance and will prolong the life of the coils.

ATTENTION: Do not use chemical cleaners on MCHE condenser coils. These cleaning agents can accelerate corrosion and damage the coils.

- Remove foreign objects and debris attached to the coil surface or wedged between the chassis and the supports.
- Provide personal protection equipment including safety glasses and/or a face mask, waterproof clothing and safety gloves. It is recommended to wear clothing that covers the whole body.
- Start the high-pressure spray gun and remove any soap or industrial cleaner from it before cleaning the condenser coils. Only drinkable cleaning water is permitted to clean the condenser coils.
- Clean the condenser face by spraying the coil evenly und in a stable manner from bottom to top, directing the water jet at right angles to the coil. Do not exceed 6200 kPa (62 bar) or an angle of 45° related to the coil. The diffuser must be at least 300 mm away from the coil surface. It is essential to control the pressure and to be careful not to damage the fins.

ATTENTION: Excessive water pressure can break the weld points between the fins and the flat MCHE microchannel tubes.

13.6.2 - Level 2
Clean the coil, using appropriate products. We recommend cleaning with clear water to remove pollutants. If the use of cleaning products is necessary, we specify:
- pH between 7 and 8
- Absence of chlorine, sulphate, copper, iron, nickel or titanium
- Chemical compatibility with aluminium and copper

For RTPF coils this process can either be carried out using a high-pressure spray gun in the low-pressure position. With pressurised cleaning methods care should be taken not to damage the coil fins.

The spraying of the coil must be done:
- in the direction of the fins
- in the opposite direction of the air flow direction
- with a large diffuser (25-30°)
- at a minimum distance of 300 mm from the coil.

It is not necessary to rinse the coil, as the products used are pH neutral. To ensure that the coil is perfectly clean, we recommend rinsing with a low water flow rate.

For MCHE condenser coils refer to chapter 13.6.1.2 under level 1 maintenance for use of a high-presssure spray gun.

IMPORTANT:
- ***Never use pressurised water without a large diffuser. Do not use high-pressure cleaners for Cu/Cu and Cu/Al coils! High pressure cleaners are only permitted for MCHE coils (maximum permitted pressure 6200 kPa (62 bar).***
- ***Concentrated and/or rotating water jets are strictly forbidden.***
- ***Never use a fluid with a temperature above 45°C to clean the air heat exchangers.***
- ***Correct and frequent cleaning (approximately every three months) will prevent 2/3 of the corrosion problems.***
- ***Protect the control box during cleaning operations.***

13.7 - Evaporator maintenance

Check that:
- the insulating foam is intact and securely in place.
- the cooler heaters are operating, secure and correctly positioned.
- the water-side connections are clean and show no sign of leakage.

13.8 - Compressor maintenance

13.8.1 - Oil separator
Check the correct operation of the heaters and check that they are well attached to the oil separator ring.

13.8.2 - Integral oil filter change
As system cleanliness is critical to reliable system operation, there is a filter in the oil line at the oil separator outlet. The oil filter is specified to provide a high level of filtration (5 µm) required for long bearing life.

The filter should be checked after the first 500 hours of operation, and every subsequent 2000 hours. The filter should be replaced at any time when the pressure differential across the filter exceeds 200 kPa (2 bar).

The pressure drop across the filter can be determined by measuring the pressure at the filter service port and the oil pressure port. The difference in these two pressures will be the pressure drop across the filter, check valve, and solenoid valve. The pressure drop across the check valve and solenoid valve is approximately 40 kPa (0.4 bar), which should be subtracted from the two oil pressure measurements to give the oil filter pressure drop.

13.8.3 - Compressor rotation control
Correct compressor rotation is one of the most critical appli-cation considerations. Reverse rotation, even for a very short duration, damages the compressor.

The reverse rotation protection scheme must be able to determine the direction of rotation and stop the compressor within 300 ms. Reverse rotation is most likely to occur when-ever the wiring to the compressor terminals is disturbed.

To minimize the opportunity for reverse rotation, the follow-ing procedure must be applied. Rewire the power cables to the compressor terminal pin as originally wired.

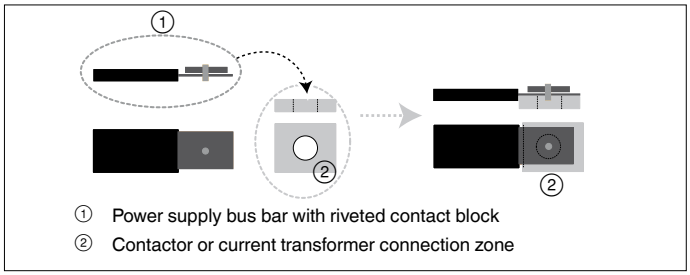
For replacement of the compressor, a low pressure switch is included with the compressor. This low pressure switch should be temporarily installed as a hard safety on the high pressure part of the compressor. The purpose of this switch is to protect the compressor against any wiring errors at the compressor terminal pin. The electrical contact of the switch would be wired in series with the high pressure switch. The switch will remain in place until the compressor has been started and direction of rotation has been verified; at this point, the switch will be removed.

The switch that has been selected for detecting reverse rotation is Carrier part number HK01CB001. This switch opens the contacts when the pressure falls below 7 kPa. The switch is a manual reset type that can be reset after the pressure has once again risen above 70 kPa. It is critical that the switch be a manual reset type to preclude the compressor from short cycling in the reverse direction.

13.9 - Precaution for compressor power supply bus bar connection

This note applies to units using power supply bus bars with riveted contact block at the level of the connection cages in the control box. During re-connection it is imperative to:
- engage each bus bar in the cage up to the stop
- ensure visually that the bus bars have good contact at the connection areas: there must not be any free move-ment between the bus bar and the connection area created by the fixing rivet of the contact block.

Connection of the contactor or current transformer



14 - START-UP CHECKLIST FOR 30XA LIQUID CHILLERS (USE FOR JOB FILE)

Preliminary information

Job name: .....
Location: .....
Installing contractor: .....
Distributor: .....

Unit
Model: .....

Compressors

Circuit A
Model number .....
Serial number .....
Motor number .....

Circuit B
Model number .....
Serial number .....
Motor number .....

Circuit C
Model number .....
Serial number .....
Motor number .....

Circuit D
Model number .....
Serial number .....
Motor number .....

Evaporator
Model number .....
Serial number .....

Condenser
Model number .....

Additional optional units and accessories .....
.....

Preliminary equipment check

Is there any shipping damage? ..... If so, where? .....
.....
Will this damage prevent unit start-up? .....

☐ Unit is level in its installation
☐ Power supply agrees with the unit nameplate
☐ Electrical circuit wiring has been sized and installed properly
☐ Unit ground wire has been connected
☐ Electrical circuit protection has been sized and installed properly
☐ All terminals are tight
☐ All chilled water valves are open
☐ All chilled water piping is connected properly
☐ All air has been vented from the chilled water circuit
☐ Chilled water pump (CWP) is operating with the correct rotation. Check the phase sequence of the electrical connection. If the unit is equipped with a hydronic module, use the pump test function. Refer to the 30XA/30XAS/30XW Pro-Dialog control manual for a more detailed explanation.
☐ Circulate chilled water in the water circuit for at least two hours, then remove, clean and replace the screen filter. After the pump test has been completed, switch the unit off again.
☐ Inlet piping to cooler includes a 20 mesh strainer with a mesh size of 1.2 mm.
☐ The compressor flange has been removed.

Unit start-up

☐ a. Oil heaters have been energized for at least 24 hours (30XA)
☐ b. Oil level is correct
☐ c. All discharge and liquid valves are open
☐ d. All suction valves are open, if equipped
☐ e. All oil line valves and economizer discharge bubbler valves (if equipped) are open
☐ f. The contactor
☐ g. Checks have been carried out for any possible leaks. Unit has been leak checked (including fittings)
  ☐ g1 - on the whole unit
  ☐ g2 - at all connections
  Locate, repair, and report any refrigerant leaks.....
  .....
  .....
☐ h. Check voltage imbalance: AB..... AC..... BC.....
  Average voltage = ... V
  Maximum deviation = ... V
  Voltage imbalance = ... %
☐ i. Voltage imbalance is less than 2%

WARNING: Operation of the chiller with an improper supply voltage or excessive phase imbalance constitutes abuse and will invalidate the Carrier warranty. If the phase imbalance exceeds 2% for voltage, or 10% for current, contact your local electricity supply at once and ensure that the chiller is not switched on until corrective measures have been taken.

Check cooler water loop

☐ Water loop volume = ... litres
☐ Calculated volume = ... litres
☐ 3.25 litres/nominal kW capacity for air conditioning
☐ 6.5 litres/nominal kW capacity for process cooling
☐ Proper loop volume established
☐ Proper loop corrosion inhibitor included.....litres of.....
☐ Proper loop freeze protection included (if required) .....litres of.....
☐ Piping includes electric heater tape, if exposed to the outside
☐ Inlet piping to cooler includes a 20 mesh strainer with a mesh size of 1.2 mm

Check pressure drop across the cooler

☐ Entering cooler = ... kPa
☐ Leaving cooler = ... kPa
☐ Leaving - entering = ... kPa

WARNING: Plot cooler pressure drop on performance data chart (in product data literature) to determine total litres per second (l/s) and find unit's minimum flow rate.

☐ Total = ... l/s
☐ Nominal kW = ... l/s
☐ Total l/s is greater than unit's minimum flow rate
☐ Total l/s meets job specified requirement of..... l/s

WARNING: Once power is supplied to the unit, check for any alarms. Refer to the 30XA/30XAS/30XW Pro-Dialog control manual for the alarm menu.

Note all alarms:**.....**

.....

Notes:**.....**

.....

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