

AIR-COOLED LIQUID CHILLERS



Commercial and industrial applications

Compact design

Quiet operation

Variable water flow

Partial heat reclaim

30RBS



Nominal cooling capacity 30RBS: 40-156 kW

The AquaSnap range of liquid chillers pumps was designed for commercial (air conditioning of offices, hotels etc.) or industrial (low-temperature process units etc.) applications.

The AquaSnap integrates the latest technological innovations:

- Non-ozone depleting refrigerant R410A
- All-aluminium microchannel heat exchangers for the cooling only units
- Scroll compressors
- Low-noise fans made of a composite material
- Auto-adaptive microprocessor control
- Electronic expansion valve
- Variable-speed pump (option)

The AquaSnap can be equipped with a hydraulic module integrated into the unit chassis, limiting the installation to straightforward operations like connection of the power supply and the chilled water supply and return piping.



CARRIER participates in the ECP programme for LCP/HP
Check ongoing validity of certificate:
www.eurovent-certification.com

FEATURES

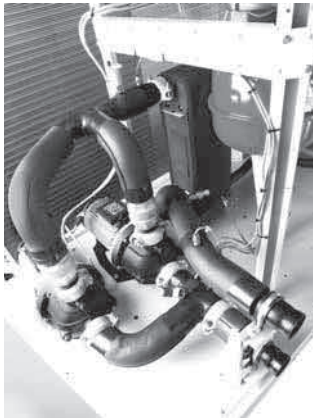
Quiet operation

- Compressors
 - Low-noise scroll compressors with low vibration level
 - The compressor assembly is installed on an independent chassis and supported by anti-vibration mountings
 - Dynamic suction and discharge piping support, minimising vibration transmission (Carrier patent).
- Condenser (30RBS) section
 - Vertical condenser coils
 - Protection grilles on anti-vibration mountings to protect the heat exchanger against possible shocks (optional on 30RBS 039-160).
 - Low-noise latest-generation Flying Bird IV fans, made of a composite material (Carrier patent) are now even quieter and do not generate intrusive low-frequency noise
 - Rigid fan installation for reduced start-up noise (Carrier patent).

Easy and fast installation

- Integrated hydraulic module (option)
 - Centrifugal low or high-pressure water pump (as required), based on the pressure loss of the hydraulic installation

Hydraulic module



- Single or dual water pump (as required) with operating time balancing and automatic changeover to the back-up pump if a fault develops
- Water filter protects the pump against circulating debris
- Pressure measurement, using two pressure transducers and allowing indication of water flow rate, water pressure and lack of water.
- High-capacity membrane expansion tank ensures pressurisation of the water circuit
- Overpressure valve, set to 4 bar
- Speed variator on the pumps (option) to ensure the correct flow rate, based on the system requirements
- Thermal insulation and frost protection down to -20°C, using an electric resistance heater (see table of options)
- Physical features
 - The unit has a small footprint and a low height (1330 mm) allowing it to blend in with any architectural styles.
 - The unit is enclosed by easily removable panels, covering all components (except air heat exchangers and fans).
- Simplified electrical connections
 - A single power supply point without neutral
 - Main disconnect switch (option 70) with high trip capacity
 - Transformer for safe 24 V control circuit supply included

- Fast commissioning
 - Systematic factory operation test before shipment
 - Quick-test function for step-by-step verification of the instruments, electrical components and motors.

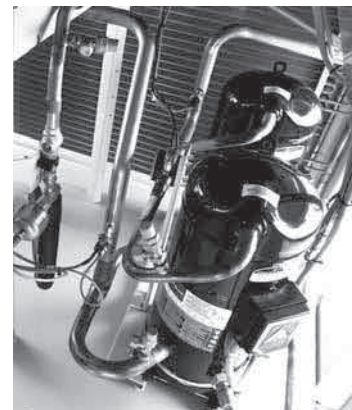
Economical operation

- Optional variable-speed pump for economical operation
- The control algorithm adjusts the water flow rate based on the actual system requirements and obsoletes the need for the control valve at the unit outlet.
- Increased energy efficiency at part load
 - The refrigerant circuit includes several compressors connected in parallel. At part load, around 99% of the operating time, only the compressors that are absolutely necessary operate. At these conditions the compressors operating are more energy efficient, as they use the total condenser and evaporator capacity.
 - The electronic expansion device (EXV) allows operation at a lower condensing pressure (SEER and SCOP Seasonal performances optimisation).
 - Dynamic superheat management for better utilisation of the water heat exchanger surface.
- Reduced maintenance costs
 - Maintenance-free scroll compressors
 - Fast diagnosis of possible incidents and their history via the Touch Pilot Junior control
 - R410A refrigerant is easier to use than other refrigerant blends.

Environmental care

- Non-ozone depleting R410A refrigerant
 - Chlorine-free refrigerant of the HFC group with zero ozone depletion potential
 - Very efficient - gives an increased energy efficiency ratio
 - 50% reduction in the refrigerant charge through the use of micro-channel heat exchangers for the cooling only units
- Leak-tight refrigerant circuit
 - Brazed refrigerant connections for increased leak-tightness
 - Reduction of leaks due to reduced vibration levels and elimination of capillary tubes (TXVs)
 - Verification of pressure transducers and temperature sensors without transferring refrigerant charge.

Partial view of the hydraulic circuit



FEATURES

Superior reliability

- State-of-the-art concept
 - Cooperation with specialist laboratories and use of limit simulation tools (finite element calculations) for the design of the critical components, e.g. motor supports, suction/discharge piping etc.
 - All aluminium micro-channel heat exchanger (MCHE) on cooling only units (30RBS), offers increased corrosion resistance compared to traditional coils. The all-aluminium design eliminates the formation of galvanic currents between aluminium and copper that cause coil corrosion.
- Auto-adaptive control
 - Control algorithm prevents excessive compressor cycling and permits reduction of the water quantity in the hydraulic circuit (Carrier patent)
 - Hydraulic module with integrated pressure transducers allowing measurement of the water pressure at two points, as well as measurement of the water flow rate and detection of lack of water and pressure. This considerably reduces the risk of problems such as frost accumulation on the water heat exchanger.
 - Automatic compressor unloading in case of abnormally high condensing pressure. If an anomaly occurs (e.g. fouled air heat exchanger coil, fan failure) AquaSnap continues to operate, but at reduced capacity.
- Exceptional endurance tests
 - Corrosion resistance tests in salt mist in the laboratory
 - Accelerated ageing test on components that are submitted to continuous operation: compressor piping, fan supports
 - Transport simulation test in the laboratory on a vibrating table.

Touch Pilot Junior control

The Touch Pilot Junior features a control with advanced communication technology over Ethernet (IP), user-friendly and intuitive user interface with 4.3" colour touch screen.

- Energy management
 - Internal time schedule clock: Controls heat pump on/off times and operation at a second set-point
 - Set-point offset based on the outside air temperature
 - Master/slave control of two heat pumps operating in parallel with operating time equalisation and automatic change-over in case of a unit fault.
- Integrated advanced communication features
 - Night mode: Capacity and fan speed limitation for reduced noise level
 - With hydraulic module: Water pressure display and water flow rate calculation
 - Easy and high-speed communication technology over Ethernet (IP) to a building management system
 - Access to multiple unit parameters.
 - Without hydraulic module: 0-10V output is available for external variable speed pump control.

- 4.3" Touch Pilot Junior user interface



- Intuitive and user-friendly 4.3 inch touch screen interface
- Concise and clear information is available in local languages
- Complete menu, customised for different users (end user, service personnel or Carrier engineers).

Remote management (standard)

Units with Touch Pilot Junior control can be easily accessed from the internet, using a PC with an Ethernet connection. This makes remote control quick and easy and offers significant advantages for service operations.

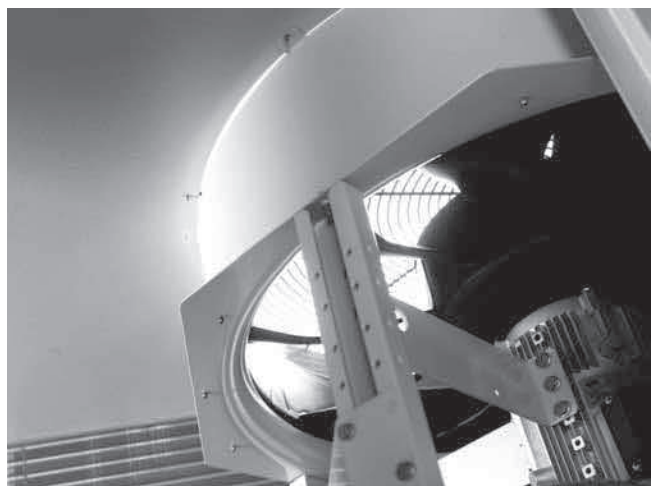
The AquaSnap is equipped with an RS485 serial port that offers multiple remote control, monitoring and diagnostic possibilities. Carrier offers a vast choice of control products, specially designed to control, manage and supervise the operation of an air conditioning system. Please consult your Carrier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

The AquaSnap also communicates with other building management systems via optional communication gateways.

A connection terminal allows remote control of the AquaSnap by wired cable:

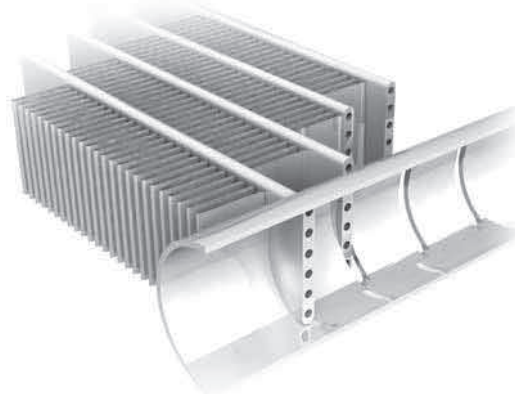
- Start/stop: Opening of this contact will shut down the unit
- Dual set-point: Closing of this contact activates a second set-point (example: unoccupied mode).
- Demand limit: Closing of this contact limits the maximum heat pump capacity to a predefined value.
- Operation indication: This volt-free contact indicates that the heat pump is operating (cooling load).
- Alarm indication: This volt-free contact indicates the presence of a major fault that has led to the shut-down of one or several refrigerant circuits.

Flying Bird IV fan



FEATURES

All-aluminium micro-channel heat exchanger (MCHE)



Already utilised in the automobile and aeronautical industries for many years, the MCHE micro-channel heat exchanger is entirely made of aluminium. This one-piece concept significantly increases its corrosion resistance by eliminating the galvanic currents that are created when two different metals (copper and aluminium) come into contact in traditional heat exchangers.

As an option, the Enviro-Shield and Super Enviro-Shield anti-corrosion protections have been developed to increase the application range of the MCHE coil from medium to very corrosive environments. With Enviro-Shield protection, corrosion resistance of the MCHE coil is doubled without any impact on heat exchange.

With Super Enviro-Shield protection corrosion resistance of the MCHE coil is multiplied by four, and allows use in very corrosive industrial or marine environments

The MCHE heat exchanger allows a reduction in chiller refrigerant charge by up to 50%.

The low thickness of the MCHE reduces air pressure losses by 50% and makes it less susceptible to fouling (e.g. by sand) than a traditional coil. Cleaning of the MCHE heat exchanger is very fast using a dry air jet or a high-pressure washer, while observing the usage precautions.

OPTIONS

Options	No.	Description	Advantages	Use
Condenser with anti-corrosion post treatment	2B	Factory application of Blygold Polual treatment on the copper/aluminium coils	Improved corrosion resistance, recommended for industrial, rural and marine environments	30RBS 039-160 with option 49, 5 or 6
Corrosion protection, traditional coils	3A	Fins made of pre-treated aluminium (polyurethane and epoxy)	Improved corrosion resistance, recommended for moderate marine and urban environments	30RBS 039-160 with option 49, 5 or 6
Medium-temperature brine solution	5B	Low temperature chilled water production down to 0°C with ethylene glycol and propylene glycol.	Covers specific applications such as ice storage and industrial processes	30RBS 039-160
Low-temperature brine solution	6B	Low temperature chilled water production down to -15°C with ethylene glycol and -12°C with propylene glycol.	Covers specific applications such as ice storage and industrial processes	30RBS 039-160
Very low noise level	15LS	Acoustic compressor enclosure and low-speed fans	Noise emission reduction at reduces fan speed	30RBS 039-160
Protection grilles	23	Metallic protection grilles	Coil protection against possible impact	30RBS 039-160
Soft Starter	25	Electronic starter on each compressor	Reduced start-up current	30RBS 039-160
Winter operation down to -20°C	28	Fan speed control via frequency converter	Stable unit operation when the air temperature is between -10°C and -20°C.	30RBS 039-160
Frost protection down to -20°C	42	Electric heater on the hydraulic module	Hydraulic module frost protection at low outside temperatures	30RBS 039-160
Partial heat recovery	49	Unit equipped with one desuperheater on each refrigerant circuit. Note: In this configuration the units are equipped with traditional coils (Cu/Al).	Production of free high-temperature hot-water simultaneously with chilled water production (or hot water for Heat pump)	30RBS 039-160
Master/slave operation	58	Unit equipped with supplementary water outlet temperature sensor kit to be field-installed allowing master/slave operation of two units connected in parallel	Optimised operation of two units connected in parrallele operation with operating time equalisation	30RBS 039-160
Main disconnect switch without fuse	70	Factory-installed main electric disconnect switch in the control box	Ease-of-installation and compliance with local electrical regulations	30RBS 039-160
HP single-pump hydraulic module	116R	Single high-pressure water pump, water filter, electronic water flow control, pressure transducers. For more details, refer to the dedicated chapter (expansion tank not included.Option with built-in safety hydraulic components available.)	Easy and fast installation (plug & play)	30RBS (Brine only) 039-160
HP dual-pump hydraulic module	116S	Dual high-pressure water pump, water filter, electronic water flow control, pressure transducers. For more details, refer to the dedicated chapter (expansion tank not included) Option with built-in safety hydraulic components available)	Easy and fast installation (plug & play)	30RBS (Brine only)
HP variable-speed single-pump hydraulic mod.	116V	Single high-pressure water pump with variable speed drive (VSD), water filter, electronic water flow control, pressure transducers. Multiple possibilities of water flow control. For more details, refer to the dedicated chapter (expansion tank not included Option with built-in safety hydraulic components available)	Easy and fast installation (plug & play), significant pumping energy cost savings (more than two-thirds), tighter water flow control, improved sytem reliability	30RBS 039-160

OPTIONS

Options	No.	Description	Advantages	Use
HP variable-speed dual-pump hydraulic mod.	116W	Dual high-pressure water pump with variable speed drive (VSD), water filter, electronic flow switch, pressure transducers. Multiple possibilities of water flow control. For more details, refer to the dedicated chapter (expansion tank not included Option with built-in safety hydraulic components available)	Easy and fast installation (plug & play), significant pumping energy cost savings (more than two-thirds), tighter water flow control, improved sytem reliability	30RBS 039-160
J-Bus gateway	148B	Two-directional communication board complying with JBus protocol	Connects the unit by communication bus to a building management system	30RBS 039-160
Lon gateway	148D	Two-directional communication board complying with Lon Talk protocol	Connects the unit by communication bus to a building management system	30RBS 039-160
Bacnet over IP	149	Two-directional high-speed communication using BACnet protocol over Ethernet network (IP)	Easy and high-speed connection by ethernet line to a building management system. Allows access to multiple unit parameters	30RBS 039-160
Compliance with Russian regulations	199	EAC certification	Conformance with Russian regulations	30RBS 039-160
Enviro-Shield anti-corrosion protection	262	Coating by conversion process which modifies the surface of the aluminum producing a coating that is integral to the coil. Complete immersion in a bath to ensure 100% coverage. No heat transfer variation, tested 4000 hours salt spray per ASTM B117	Improved corrosion resistance, recommended for use in moderately corrosive environments	30RBS 039-160
Super Enviro-Shield anti-corrosion protection	263	Extremely durable and flexible epoxy polymer coating applied on micro channel heat exchangers by electro coating process, final UV protective topcoat. Minimal heat transfer variation, tested 6000 hours constant neutral salt spray per ASTM B117, superior impact resistance per ASTM D2794	Improved corrosion resistance, recommended for use in extremely corrosive environments	30RBS 039-160
Evaporator screw connection sleeves	264	Evaporator inlet/outlet screw connection sleeves	Allows unit connection to a screw connector	30RBS 039-160
Welded evaporator connection kit	266	Victaulic piping connections with welded joints	Easy installation	30RBS 039-160
Reinforced ECM filtration for fan VFD	282A	Fan variable frequency drive compliance to IEC 61800-3 C1 class	Allows unit installation in domestic residential environment by reducing electromagnetic interferences	30RBS 039-160 with option 5B, 6B or 28
Reinforced ECM filtration for pump VFD	282B	Pump variable frequency drive compliance to IEC 61800-3 C1 class	Allows unit installation in domestic residential environment by reducing electromagnetic interferences	30RBS 039-160 with option 116V or 116W
Expansion tank	293	6 bar expansion tank integrated in the hydraulic module (require option 116)	Easy and fast installation (plug & play), & Protection of closed water systems from excessive pressure	30RBS 039-160
Set-point adjustment by 4-20mA signal	311	Connections to allow a 4-20mA signal input	Easy energy managment, allow to adjust set-point by a 4-20mA external signal	30RBS 039-160
Free Cooling dry cooler management	313	Control & connections to a Free Cooling Drycooler 09PE or 09VE fitted with option FC control box	Easy system management, Extended control capabilities to a dryccoler used in Free Cooling mode	30RBS 039-160

PHYSICAL DATA, 30RBS

30RBS		039	045	050	060	070	080	090	100	120	140	160	
Cooling													
Standard unit													
Full load performances*	CA1	Nominal capacity	kW										
		EER	kW/kW										
	CA2	Eurovent class	C C D D C C C C D C D										
		Nominal capacity	kW										
Seasonal efficiency*	SEER _{12/7°C} Comfort low temp.	kWh/kWh											
		%											
	SEER _{23/18°C} Comfort medium temp.	kWh/kWh											
		SEPR _{12/7°C} Process high temp.											
SEPR _{-2/-8°C} Process medium temp.		kWh/kWh											
Integrated Part Load Value		IPLV.SI											
Sound levels													
Standard unit													
Sound power level ⁽¹⁾		dB(A)											
Sound pressure level at 10 m ⁽²⁾		dB(A)											
Unit with option 15LS													
Sound power level ⁽¹⁾		dB(A)											
Sound pressure level at 10 m ⁽²⁾		dB(A)											
Dimensions													
Length		mm											
Width		mm											
Height		mm											
Operating weight with MCHE coil⁽³⁾													
Standard unit without hydraulic module		kg											
Standard unit with hydraulic module													
Single high-pressure pump		kg											
Dual high-pressure pump		kg											
Compressors		Hermetic scroll compressors, 48.3 r/s											
Circuit A		2 2 2 2 2 2 2 3 3 3 2 2											
Circuit B		- - - - - - - - - - 2 2											
No of control stages		2 2 2 2 2 2 2 3 3 3 4 4											
Refrigerant charge with MCHE coil⁽³⁾		R-410A											
Circuit A		kg 4.7 5.3 5.9 6.7 6.2 7.3 10.7 10.8 11.4 6.5 7.4											
Circuit B		teqCO ₂ 9.8 11.1 12.3 14.0 12.9 15.2 22.3 22.6 23.8 13.6 15.5											
Circuit B		kg - - - - - - - - - - 6.5 7.4											
Circuit B		teqCO ₂ - - - - - - - - - - 13.6 15.5											
Capacity control		Touch Pilot Junior											
Minimum capacity		% 50 50 50 50 50 50 33 33 33 25 25											
Condensers		All-aluminium microchannel heat exchanger (MCHEx)											
Fans		Axial Flying Bird IV with rotating shroud											
Quantity		1 1 1 1 1 1 2 2 2 2 2											
Maximum total air flow		l/s 3885 3883 3687 3908 5013 5278 6940 6936 7370 10026 10556											
Maximum rotation speed		r/s 12 12 12 12 16 16 12 12 12 16 16											
Evaporator		Direct expansion, plate heat exchanger											
Water volume		l 2.6 3.0 3.3 4.0 4.8 5.6 8.7 9.9 11.3 12.4 14.7											
Without hydraulic module (option)													
Max. water-side operating pressure		kPa 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000											
With hydraulic module (option)													
Single or dual pump (as selected)		Pump, Victaulic screen filter, relief valve, expansion tank, purge valves (water + air), pressure sensors											
Expansion tank volume		l 12 12 12 12 12 12 35 35 35 35 35											
Expansion tank pressure ⁽⁴⁾		bar 1 1 1 1 1 1 1.5 1.5 1.5 1.5 1.5											
Max. water-side operating pressure		kPa 400 400 400 400 400 400 400 400 400 400 400											
Water connections with/without hydraulic module		Victaulic											
Diameter		in 2 2 2 2 2 2 2 2 2 2 2											
Outside tube diameter		mm 60.3 60.3 60.3 60.3 60.3 60.3 60.3 60.3 60.3 60.3 60.3											
Chassis paint colour		Colour code: RAL7035											

* In accordance with standard EN14511-3:2013

CA1 Cooling mode conditions: Evaporator water entering/leaving temperature 12°C/7°C, outside air temperature 35°C, evaporator fouling factor 0 m².K/W

CA2 Cooling mode conditions: Evaporator water entering/leaving temperature 23°C/18°C, outside air temperature 35°C, evaporator fouling factor 0 m².K/W

IjS cool_{12/7°C} & SEER_{12/7°C} Applicable Ecodesign regulation: (EU) No 2016/2281

SEER_{23/18°C} Applicable Ecodesign regulation: (EU) No 2016/2281

SEPR_{12/7°C} Applicable Ecodesign regulation: (EU) No 2016/2281

SEPR_{-2/-8°C} Applicable Ecodesign regulation: (EU) No 2015/1095

IPLV.SI Calculations according to standard performances AHRI 551-591.

(1) In dB ref=10⁻¹²W, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). Measured in accordance with ISO 9614-1 and certified by Eurovent.

(2) In dB ref 20µPa, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). For information, calculated from the sound power level Lw(A).

(3) Values shown are a guideline only. Please refer to the unit nameplate

(4) When delivered, the standard pre-inflation of the tank is not necessarily the optimal value for the system. To permit changing the water volume, change the inflation pressure to a pressure that is close to the static head of the system. Fill the system with water (purging the air) to a pressure value that is 10 to 20 kPa higher than the pressure in the tank.



Eurovent certified values

ELECTRICAL DATA, 30RBS

30RBS without hydraulic module		039	045	050	060	070	080	090	100	120	140	160
Power circuit												
Nominal power supply	V-ph-Hz	400-3-50										
Voltage range	V	360-440										
Control circuit supply												
24 V via internal transformer												
Maximum start-up current (Un)*												
Standard unit	A	114	135	143	146	176	213	174	208	248	243	286
Unit with electronic starter option	A	75	87	94	96	114	140	125	150	176	186	215
Unit power factor at maximum capacity**		0.83	0.81	0.81	0.83	0.81	0.78	0.83	0.81	0.79	0.81	0.78
Maximum operating power input**	kW	20	22	25	28	31	36	42	46	53	62	72
Nominal unit operating current draw***	A	26	29	33	36	42	53	55	62	77	85	106
Maximum operating current draw (Un)****	A	35	45	47	53	67	73	81	99	108	134	146
Maximum operating current draw (Un-10%)†	A	38	49	51	58	75	80	89	110	118	150	159
Customer-side unit power reserve	Customer reserve at the 24 V control power circuit											
Short-circuit stability and protection	See table 9.1											

* Maximum instantaneous start-up current at operating limit value (maximum operating current of the smallest compressor(s) + fan current + locked rotor current of the largest compressor).

** Power input, at the unit permanent maximum operating conditions (data given on the unit nameplate).

*** Standardised Eurovent conditions: evaporator entering/leaving water temperature 12°C/7°C, outside air temperature 35°C.

**** Maximum unit current at 400 V, non permanent operating conditions (values given on the unit nameplate).

† Maximum unit operating current at 360 V, non permanent operating conditions.

Short-circuit stability current (TN system*)

30RBS		039	045	050	060	070	080
Value without upstream protection							
Short-term current at 1s - I _{cw} - kA rms		3.36	3.36	3.36	3.36	3.36	3.36
Admissible peak current - I _{pk} - kA pk		20	20	20	20	20	15
Value with upstream protection by circuit breaker							
Conditional short-circuit current I _{cc} - kA rms		40	40	40	40	40	40
Schneider circuit breaker - Compact series		NS100H	NS100H	NS100H	NS100H	NS100H	NS100H
Reference No.**		29670	29670	29670	29670	29670	29670

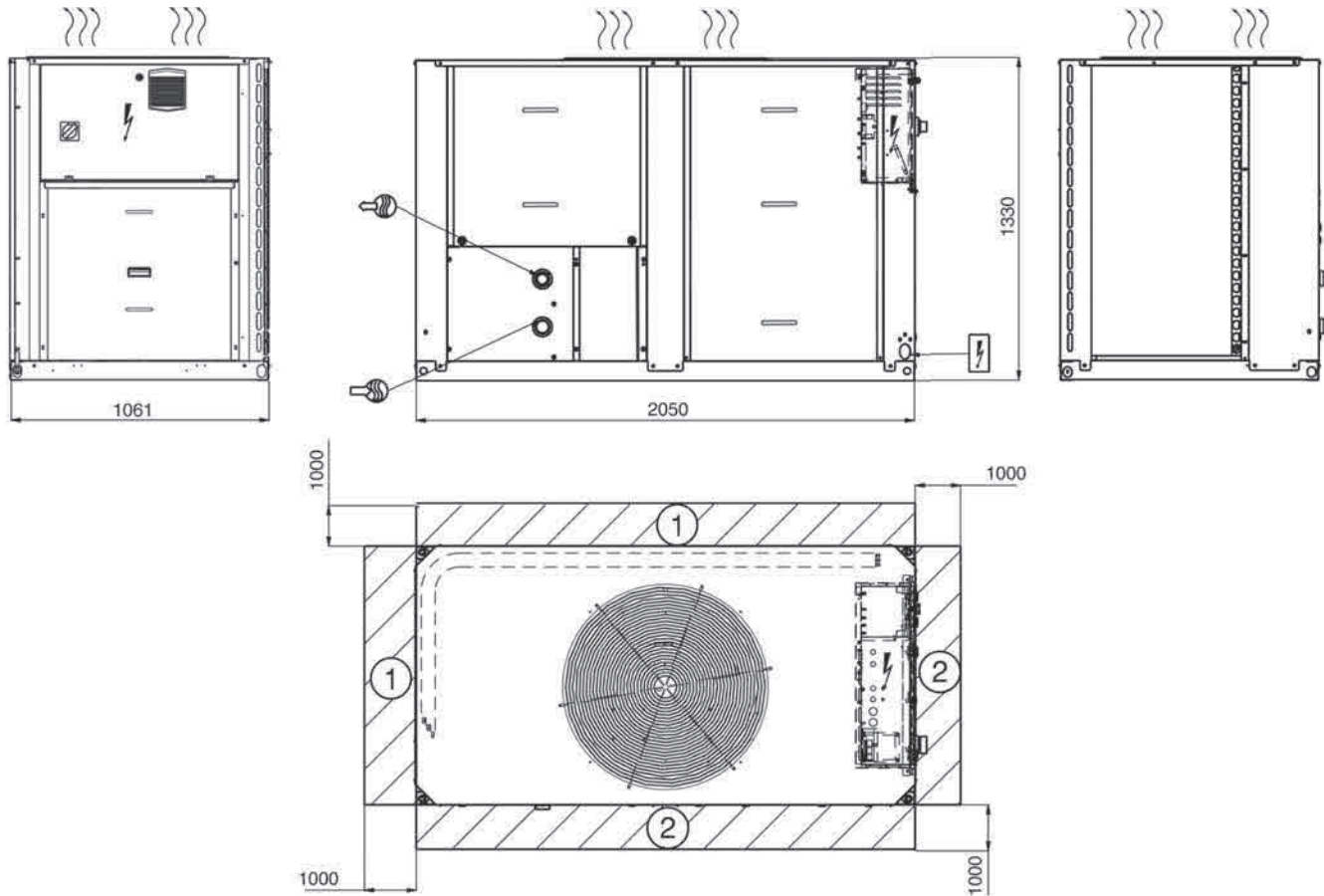
30RBS		090	100	120	140	160
Value without upstream protection						
Short-term current at 1s - I _{cw} - kA rms		5.62	5.62	5.62	5.62	5.62
Admissible peak current - I _{pk} - kA pk		20	20	15	20	15
Value with upstream protection by circuit breaker						
Conditional short-circuit current I _{cc} - kA rms		40	40	40	30	30
Schneider circuit breaker - Compact series		NS100H	NS160H	NS160H	NS250H	NS250H
Reference No.**		29670	30670	30670	31671	31671

* Earthing system type

** If another current limitation protection system is used, its time-current and thermal constraint (I²t) trip characteristics must be at least equivalent to those of the recommended Schneider circuit breaker.
The short-circuit stability current values above are suitable with the TN system.








DIMENSIONS/CLEARANCES, 30RBS

30RBS 039-080, units with and without hydraulic module



Legend:

All dimensions are given in mm

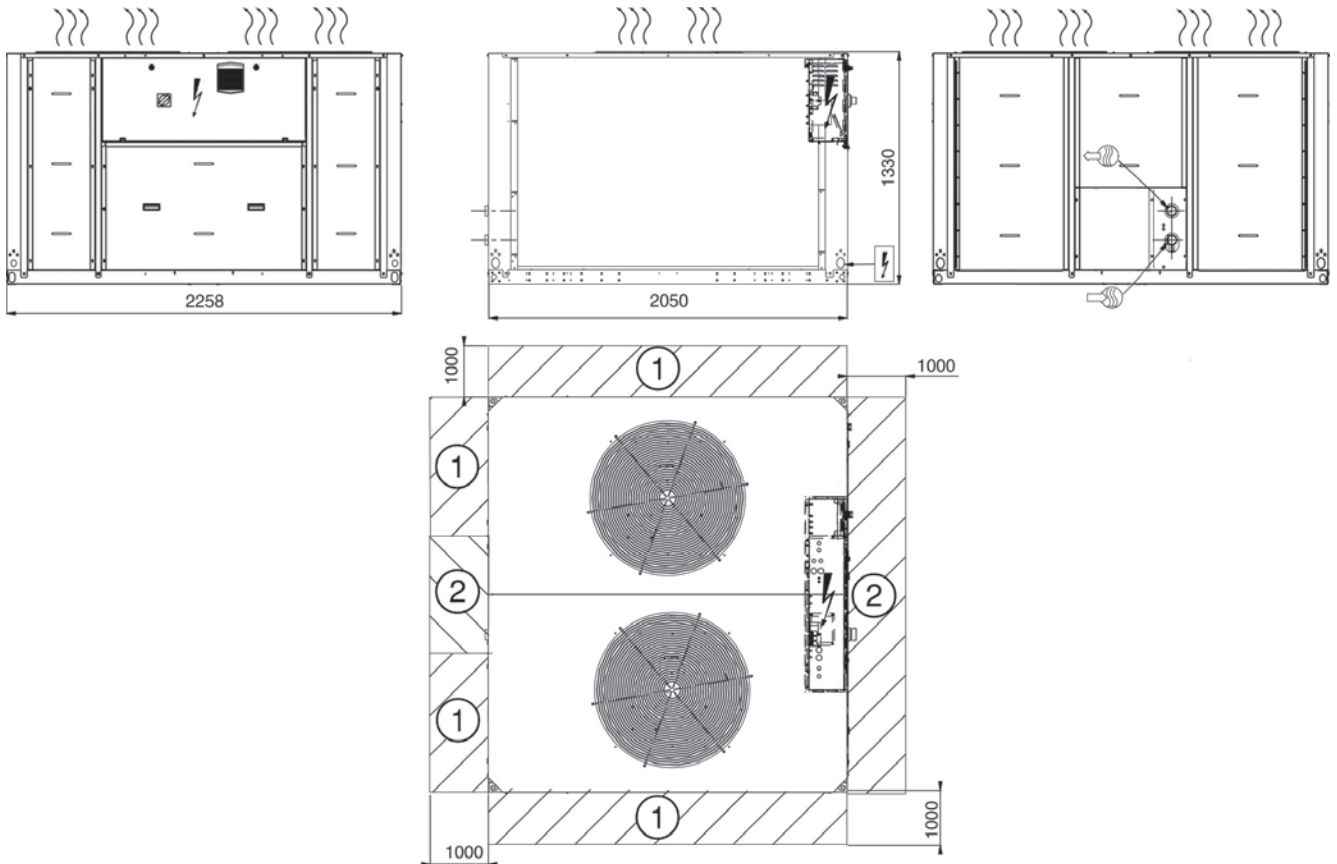
-  Control box
-  Water inlet
-  Water outlet
-  Required clearances for air entry
-  Recommended space for maintenance
-  Air outlet, do not obstruct
-  Power supply inlet

Notes:

- A** Non-certified drawings.
Refer to the certified dimensional drawings supplied with the unit or available on request, when designing an installation.
For the location of fixing points, weight distribution and coordinates of the center of gravity refer to the certified dimensional drawings.
- B** In multiple-chiller installations (maximum four units), the side clearance between the units should be increased from 1000 to 2000 mm.
- C** The height of the solid surface must not exceed 2 m.








DIMENSIONS/CLEARANCES, 30RBS

30RBS 090-160, units with and without hydraulic module



Legend:

All dimensions are given in mm

-  Control box
-  Water inlet
-  Water outlet
-  Required clearances for air entry
-  Recommended space for maintenance
-  Air outlet, do not obstruct
-  Power supply inlet

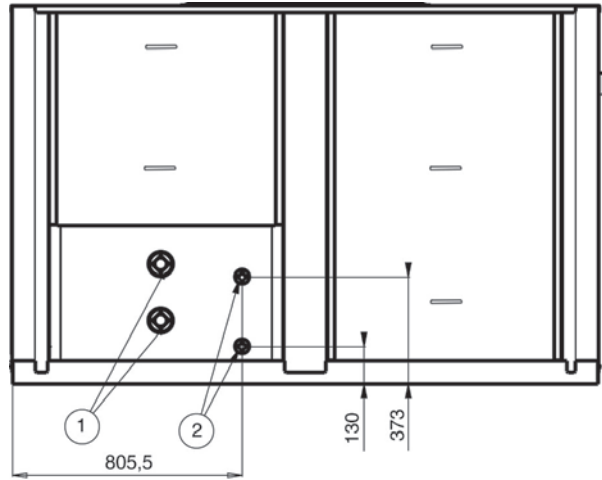
Notes:

- A** Non-certified drawings.
Refer to the certified dimensional drawings supplied with the unit or available on request, when designing an installation.
For the location of fixing points, weight distribution and coordinates of the center of gravity refer to the certified dimensional drawings.
- B** In multiple-chiller installations (maximum four units), the side clearance between the units should be increased from 1000 to 2000 mm.
- C** The height of the solid surface must not exceed 2 m.

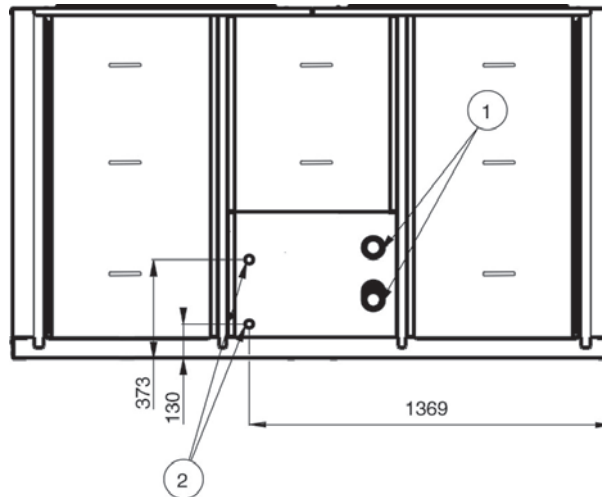
DIMENSIONS/CLEARANCES FOR 30RBS UNITS WITH OPTION 49

Position of the desuperheater inlets and outlets

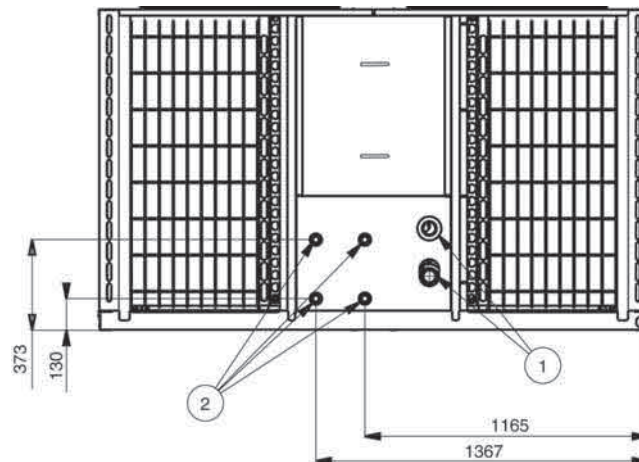
30RBS 039-080



30RBS 090-120



30RBS 140-160



- ① Unit water inlet and outlet
- ② Water inlet and outlet, unit with option 49