Chiller

AQWC 1404 to 2406

Air Cooled Condensing Units
Engineering Data Manual

R410A

428 to 715 kW

systemair

Features & Strength Points

- A more **"slim and light"** structure, while keeping the features of sturdiness (successfully performed at CESI laboratory, vibration tests in accordance with ASTM standards).
- **Rivets** as joints of the structural elements.
- **Optimization of overall dimensions** for container transport.
- **Symmetric refrigerant circuit** configuration to reduce the length of pipes and consequently the pressure drop in the circuit.
- Standard coils in Al/Cu, arranged in **V configurations** to get a better air distribution and then optimize its performance.
- All the versions keep the **same configuration of the base units** (same structure, electrical board, compressors and coils). Easy upgrade of the units in stock or on the field.
- **Bi-flow electronic expansion devices** on all units : superheating value controlled by microprocessor, simple and accessible refrigeration system with reduction of brazing points and then possible leakage.
- Optimized coils design (30% refrigerant charge reduction).
- **Compressors box STD on all units** - additional compressor jackets for ELN version **(Easy upgrade of the units in stock)**.
- Special version (HSE) for high seasonal efficiency : ESEER higher than 4.5 (15% more than the STD version); and special version (HT) for high operating limits. Both versions are equipped with axial inverter fans of large diameter (electronic brushless type motor).
- Special version (HPF) for high available static pressure (max. 120 Pa) with inverter fans (electronic brushless type motor). Axial fan of large diameter.
- For safety purpose when performing service operation, special valves dedicated to R410A are supplied on the refrigerant system. These valves, of 5/16" flare SAE type, are mounted on the liquid line and on the gauges manifold of the unit.
- Range available in **STD** (BLN, LN, ELN), **HSE** (BLN, LN, ELN), **HT** (BLN) and **HPF** (BLN) version.
- **High power hermetic scroll compressors** arranged in tandem and trio configuration.

Specifications

General

The new **AQWC** units have been designed to operate with **HFC 410A** refrigerant. Both compressors and heat exchangers have been optimized for this refrigerant.

Each unit consists of **two independent refrigerant circuits** and is complete with high efficient and high technology components :

- Hermetic **Scroll** compressors with high efficiency and low vibration emissions,
- Quiet fans located in externally mounted **nozzle profile housing** generating low sound levels,
- Controller using a **state-of-the-art microprocessor**.

The AQWC units are available in **5 sizes**, from size 1404 to 2406, with a nominal capacity range from **428 to 715 kW**.

The **STD (Standard) version of AQWC units** can be supplied with **3 acoustic options :**

- **Base Low Noise (BLN) :** The units are equipped with **delta connected fan motors**. The chillers are not supplied with fan speed controller, but fitted with **compressors box** to reduce the noise emissions.
- **Low Noise (LN) :** The units are equipped with **star connected fan motors**. The chillers are not supplied with fan speed controller, but fitted with **compressors box** to reduce the noise emissions.
- **Extra Low Noise (ELN) :** The units are equipped with **star connected fan motors**, fitted with a speed controller which allows the units to operate with a very low rpm. The chillers are supplied with **compressors box** and **soundproof jackets** on compressors reducing significantly the noise emissions.

In addition to the STD version, the AQWC range offer **3 more versions :**

- **HSE (High Seasonal Efficiency) version :** It has same equipment as that of the STD version, except that the units are equipped with **special inverter fans**, of large diameter, driven by **EC (electronic brushless type)** motors with **integrated electronic inverter**, to ensure low energy consumption. This version can be supplied with BLN, LN or ELN acoustic options.
- **HT (High Temperature) version :** It has same equipment as HSE units, but the **special inverter fans and motors** have a different regulation. The HT version can be supplied with BLN acoustic option only.
- **HPF (High Pressure Fan) version :** It has same equipment as STD units, except that the units are equipped with **special inverter fans** (same as those used on HSE version, but with a different regulation) driven by **EC motors** with **integrated electronic inverter**. The HPF version provides external static pressure up to **120 Pa.** This version can be supplied with BLN acoustic option only.

Cabinet and structure

The unit cabinet and structure are made of heavy gauge galvanized steel. All the galvanized steel components are individually painted, with a polyester powder based painting **(RAL 9001)**, under a special painting process before the assembly of the unit. This painting system performs and stands a homogeneous protection of the corrosion.

All parts of the structure are totally fastened with non-corrosive screws and bolts.

Refrigerant circuits

All the units are composed of two independent and separate refrigerant circuits, complete with 4 or 6 hermetic scroll compressors in tandem or trio configuration for each circuit.

The units are not equipped with evaporator but each refrigerant circuit is fitted with suction and liquid line shut-off valves to allow the connection of the unit to an external evaporator.

The functional diagram of each circuit is shown in the section "Refrigerant flow diagram".

Specifications (continued)

Compressors

Each unit is equipped with 4 or 6 hermetic scroll compressors arranged in tandem or trio configuration per refrigerant circuit.

The compressors are fitted with an electronic control device which ensures protection of compressors against :

- overheating and overloading,
- reversal rotation and phase loss.

All compressors have direct-on-line starting and are mounted on rubber vibration isolators in order to minimize noise and vibration transmission.

Condenser coils

The condenser coils are made of seamless copper tubes, arranged in staggered rows, mechanically expanded into corrugated aluminum fins.

Condenser fans

For each size, all versions keep the same number of fans.

Large diameter, direct drive axial type fans with asynchronous three-phase motors are used in all acoustic versions (BLN, LN & ELN) of AQWC 1404-2406 STD units.

Special inverter fans with electronic brushless type motors are used in AQWC HSE, HPF and HT units.

On high pressure fans of HPF units, the external static pressure (≤ 120 Pa) can be adjusted on site to match the customer demand directly from the electronic control panel of the unit.

Fans are equipped with externally mounted nozzle profile housing which generates low sound levels.

Fan speed control

The airflow is controlled in order to operate at a low ambient temperature.

On standard unit equipped with axial fans, the air flow control is :

- step type for BLN and LN versions without fan speed controls, achieved by switching off some fans of each circuit in function of condensing pressure corrected by external temperature.
- stepless type for ELN version, achieved by an electronic fan speed control, supplied as standard, in function of condensing pressure.

The pressure actuated stepless type fan speed controller can be supplied as optional on BLN and LN versions. It allows the units to operate in cooling mode at ambient temperature down to -18 °C.

On HSE and HPF units with electronic axial fans, the pressure actuated stepless type fan speed control is supplied as standard, because these electronic fans are already equipped with an integrated fan speed control (fan speed range : 50 to 1200 rpm; ambient temperature limit : -18 °C).

Electrical board

The electrical board is located in a metal case arranged inside the unit and protected by an external horizontally pivoted panel. The metal case has an IP54 protection rating and is complete with grilles for natural air ventilation.

Electronic control

The units are supplied with the new microprocessor-based electronic control and management system ensuring the following functions :

➜ Management of the operation of compressors :

a) Power on/off

b) Anticycle management

c) Tandem or trio unloading for high pressure or high compressor pressure ratio (integrated inside the curves of compressor operating limits).

➜ Management of high and low pressure alarms.

➜ Management of the asymmetric compressors on the two circuits (tandem and trio).

➜ Management of external interlocks.

➜ Management of the remote control :

d) Unit power on/off

e) Summary alarm signals

➜ Remote signalling, by dry contacts :

f) Voltage presence

g) Compressors in operation

h) Circuit alarm unit

The unit controller can also clearly show all control parameters of the machine on the liquid crystal display, such as :

➜ Display of the ambient air temperature.

➜ Display of the circuit 1 and circuit 2 discharge pressure and suction pressure.

➜ Display of the set point.

➜ Display of speed control signal (voltage) of fans.

➜ Display of the various alarm and operation status :

i) Compressor start-up alarm (discharge pressure check)

j) Low / High pressure

k) Control of the compressor operating hours

l) Compressors in operation

m) Thermal protection of compressors

n) Thermal protection of fans

o) Faulty sensors

Control and safety devices

Each unit is fitted with the following devices :

Safety :

➜ Power disconnect switch with an emergency stop function.

➜ HP switches (double on each circuit), set to 40.5 bar, automatic reset and manual reset from the control panel.

➜ Safety valve on the discharge line set to 45 bar.

➜ Discharge gas temperature protection set to 135 °C, on the discharge line of each Scroll compressor (Danfoss compressors only).

Control :

➜ HP and LP transducers (two for each circuit).

➜ Ambient air temperature sensor.

Conformity with standards

The following applies to all the sizes and versions of AQWC units :

✓ Machine Directive : 2006/42/EC

✓ Low Voltage Directive : 2006/95/EC

✓ Electromagnetic Compatibility Directive : 2004/108/EC

✓ Pressure Equipment Directive : 97/23/EC

Specifications (continued)

Standard equipment

- ✓ Set point timer/clock card.
- ✓ Back light display.
- ✓ Digital pressure and temperature reading kit.
- ✓ High ambient pressure control.
- ✓ Sequence phase control.
- ✓ Control circuit transformer 400 V/230 V.
- ✓ Data logger.
- ✓ Power supply single point box.
- ✓ Power supply without neutral.
- ✓ Hour meter.
- ✓ Main switch.
- ✓ PED approval.
- ✓ Compressor jacket (ELN version only).
- ✓ Compressor box.
- ✓ Rubber anti-vibration pad.

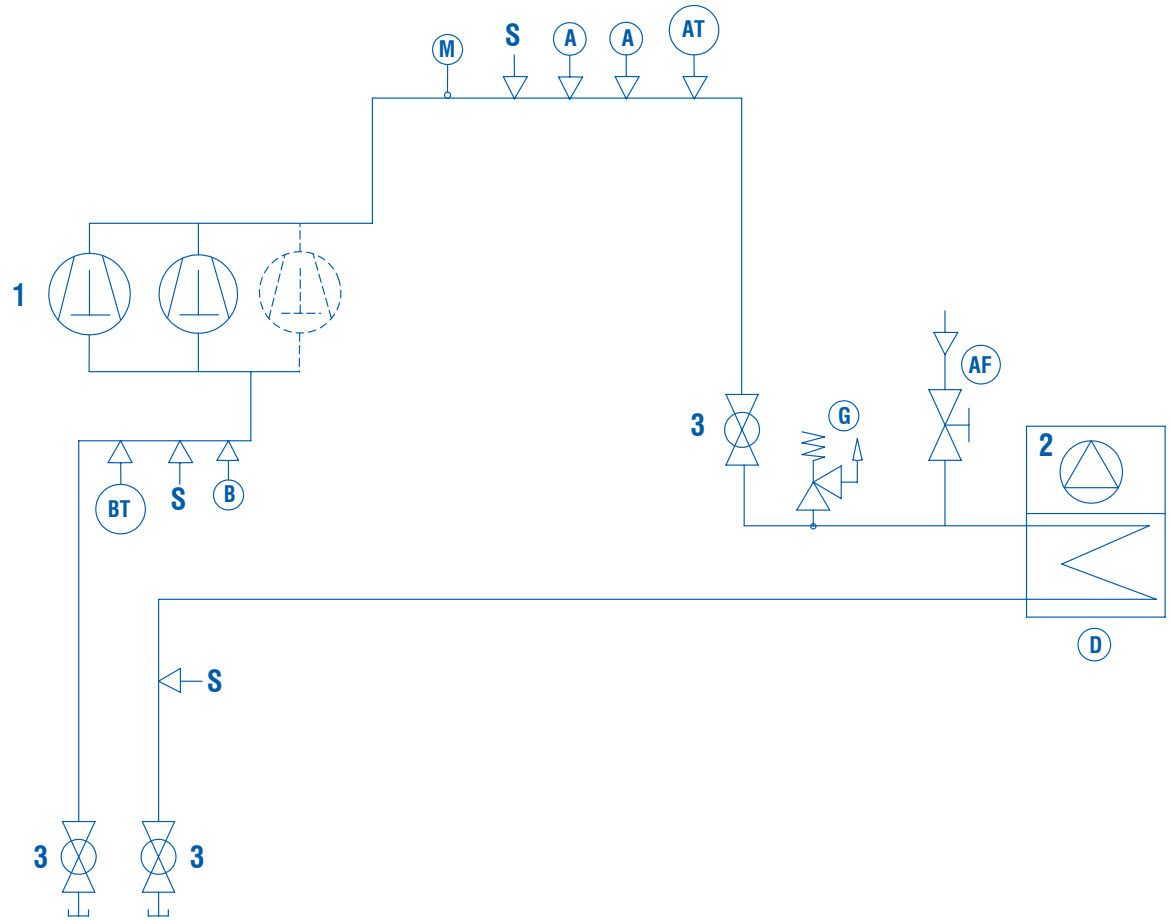
Factory-installed options

- ✓ ModBus protocol kit for BMS.
- ✓ Lonwork protocol kit for BMS.
- ✓ Bacnet protocol kit for BMS.
- ✓ WEBctrl.
- ✓ Ethernet TCP/IP interface board.
- ✓ Compressors soft starter.
- ✓ Pressure actuated stepless fan speed controller for low ambient operation (-18 °C) (BLN & LN versions).
- ✓ Power factor correction capacitors.
- ✓ Compressors overload protection.
- ✓ GSM.
- ✓ HP & LP manometers.
- ✓ Condenser coils with blue fins treatment.
- ✓ Condenser coils with "Fin Guard Silver" (polyurethane) treatment.
- ✓ Condenser coils with copper fins.
- ✓ High static pressure fans (ESP<120 Pa) for HPF version.
- ✓ Coil guards.
- ✓ Chiller grilles.
- ✓ Compressor jacket.

Field-installed accessories

- ✓ Remote ON/OFF control.
- ✓ Remote keyboard panel.
- ✓ Master and slaves control, up to 4 units max.
- ✓ Chiller grilles.
- ✓ Spring anti-vibration mounts for basic unit.
- ✓ Spring anti-vibration mounts for unit with copper fins.

Refrigerant Flow Diagram - AQWC Units



COMPONENTS	
1	Tandem or trio Scroll type compressors
2	Air cooled condenser
3	Globe valve

SAFETY / CONTROL DEVICES	
A	High pressure switch (40.5 bar)
AF	Accessfitting sae flare 1/4"
AT	High pressure transducer
B	Low pressure switch (1.5 bar)
BT	Low pressure transducer
D	Air temperature sensor
G	PED pressure relief valve (45 bar)
M	Discharge temperature sensor
S	5/16" shrader connection (service only)
	Pipe connection with shrader valve

Note : For reasons of readability, one circuit only is shown. The second circuit is identical.

Operating Limits and Correction Factors

AQWC				1404		1604		1806		2106		2406	
				Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Evaporating temperature			°C	+3 to +15									
Ambient Air	Air entering temperature	BLN	°C	-5 to +44		+0 to +44		+0 to +44		+0 to +44		+0 to +44	
		LN	°C	-5 to +42		+0 to +42		+0 to +42		+0 to +42		+0 to +42	
		ELN	°C	-18 to +40		-18 to +40		-18 to +40		-18 to +40		-18 to +40	
		HT (1)	°C	-18 to +45		-18 to +45		-18 to +45		-18 to +45		-18 to +45	
	External static pressure	Standard fans	Pa	0									
		High pressure fans	Pa	< 120									
Power supply voltage (2)			V	400 V, 3 Ph, 50 Hz (nominal)									

(1) Max. ambient air temperature of +48 °C in part loaded conditions.
(2) Voltage : 400 V ± 10 %.

Fouling factors

CONDENSER		
Fouling factor (m².°C/kW)	Cooling capacity factor	Power input factor
0.044	1.000	1.000
0.088	0.987	1.023
0.176	0.955	1.068
0.352	0.910	1.135

Altitude factors

Altitude (m)	Cooling capacity factor	Power input factor
0	1.000	1.000
600	0.987	1.010
1200	0.973	1.020
1800	0.958	1.029
2400	0.943	1.038

Physical Data - AQWC STD/HSE/HPF - BLN Version

AQWC STD/HSE/HPF - BLN models		1404	1604	1806	2106	2406
Nominal cooling capacity (1)	kW	428	477	559	634	715
Input power (2)	kW	123	139	162	185	208
Number of refrigerant circuits		2	2	2	2	2
Total capacity steps	%	21-50-71-100	25-50-75-100	17-33-50-67-83-100	15-29-43-62-81-100	17-33-50-67-83-100
COMPRESSORS						
Number		4	4	6	6	6
Type		Scroll				
Oil type		POE				
N° of loading stages		0/100	0/100	0/100	0/100	0/100
AIR COOLED CONDENSER						
Number of coils		4	4	4	4	4
Total coil face area per coil	m^2	4.4	4.4	5.6	6.7	6.7
Number of rows		3 + 3	4 + 4	3 + 3	3 + 3	3 + 3
FANS						
Number of fans		8	8	10	10	12
Nominal speed	rpm	880	880	880	880	880
Total airflow	m^3/h	162000	153000	190000	204000	227000
Total input power	kW	14.4	14.4	18.0	18.0	21.6
Total input power (*)	kW	13.0	13.0	16.2	16.2	19.5
External static pressure	Pa	0 or 120 Pa (**)				
REFRIGERANT CONNECTIONS						
In	Inch	1 1/8"	1 3/8"	1 3/8"	1 1/8"	1 1/8"
Out	Inch	2 1/8"	2 1/8" (2 5/8")	2 5/8"	2 1/8"	2 1/8"
WEIGHT						
Shipping weight	kg	2393	2581	3255	3496	3579
ADDITIONAL WEIGHT						
HSE version	kg	0	0	0	0	0
HPF version	kg	0	0	0	0	0
Copper Fins	kg	Consult factory				
SOUND LEVELS						
Sound power level (3)	dB(A)	97	97	98	98	99
Sound pressure level - (10m) (4)	dB(A)	65	65	66	66	67
DIMENSIONS						
Length	mm	4000	4000	5000	6000	6000
Width	mm	2200	2200	2200	2200	2200
Height	mm	2550	2550	2550	2550	2550

(1) Data based on 7 °C evaporating temperature and 35 °C condenser air temperature.
(2) Compressors only.
(3) Sound levels are at fully loaded conditions. Sound power level values refer to ISO standard 3744 and Eurovent 8/1.
(4) Sound pressure levels refer to ISO standard 3744, parallelepiped shape.
(*) High efficiency units (HSE) with inverter fans.
(**) HPF units with high static pressure fans.

Physical Data - AQWC STD/HSE - LN Version

AQWC STD/HSE - LN models		1404	1604	1806	2106	2406
Nominal cooling capacity (1)	kW	415	462	542	613	693
Input power (2)	kW	129	145	169	192	216
Number of refrigerant circuits		2	2	2	2	2
Total capacity steps	%	21-50-71-100	25-50-75-100	17-33-50-67-83-100	15-29-43-62-81-100	17-33-50-67-83-100
COMPRESSORS						
Number		4	4	6	6	6
Type		Scroll				
Oil type		POE				
N° of loading stages		0/100	0/100	0/100	0/100	0/100
AIR COOLED CONDENSER						
Number of coils		4	4	4	4	4
Total coil face area per coil	m^2	4.4	4.4	5.6	6.7	6.7
Number of rows		3 + 3	4 + 4	3 + 3	3 + 3	3 + 3
FANS						
Number of fans		8	8	10	10	12
Nominal speed	rpm	700	700	700	700	700
Total airflow	m^3/h	124000	116000	142000	156000	172000
Total input power	kW	9.6	9.6	12.0	12.0	14.4
Total input power (*)	kW	6.6	6.6	8.2	8.2	9.8
External static pressure	Pa	0 Pa				
REFRIGERANT CONNECTIONS						
In	Inch	1 1/8"	1 3/8"	1 3/8"	1 1/8"	1 1/8"
Out	Inch	2 1/8"	2 1/8" (2 5/8")	2 5/8"	2 1/8"	2 1/8"
WEIGHT						
Shipping weight	kg	2393	2581	3255	3496	3579
ADDITIONAL WEIGHT						
HSE version	kg	0	0	0	0	0
Copper Fins	kg	Consult factory				
SOUND LEVELS						
Sound power level (3)	dB(A)	91	91	92	92	93
Sound pressure level - (10m) (4)	dB(A)	59	59	60	60	61
DIMENSIONS						
Length	mm	4000	4000	5000	6000	6000
Width	mm	2200	2200	2200	2200	2200
Height	mm	2550	2550	2550	2550	2550

(1) Data based on 7 °C evaporating temperature and 35 °C condenser air temperature.
(2) Compressors only.
(3) Sound levels are at fully loaded conditions. Sound power level values refer to ISO standard 3744 and Eurovent 8/1.
(4) Sound pressure levels refer to ISO standard 3744, parallelepiped shape.
(*) High efficiency units (HSE) with inverter fans.

Physical Data - AQWC STD/HSE - ELN Version

AQWC STD/HSE - ELN models		1404	1604	1806	2106	2406
Nominal cooling capacity (1)	kW	395	439	514	583	658
Input power (2)	kW	137	153	180	205	230
Number of refrigerant circuits		2	2	2	2	2
Total capacity steps	%	21-50-71-100	25-50-75-100	17-33-50-67-83-100	15-29-43-62-81-100	17-33-50-67-83-100
COMPRESSORS						
Number		4	4	6	6	6
Type		Scroll				
Oil type		POE				
N° of loading stages		0/100	0/100	0/100	0/100	0/100
AIR COOLED CONDENSER						
Number of coils		4	4	4	4	4
Total coil face area per coil	m^2	4.4	4.4	5.6	6.7	6.7
Number of rows		3 + 3	4 + 4	3 + 3	3 + 3	3 + 3
FANS						
Number of fans		8	8	10	10	12
Nominal speed	rpm	550	550	550	550	550
Total airflow	m^3/h	97000	91000	112000	122000	135000
Total input power	kW	9.6	9.6	12.0	12.0	14.4
Total input power (*)	kW	2.6	2.6	3.2	3.2	3.8
External static pressure	Pa	0 Pa				
REFRIGERANT CONNECTIONS						
In	Inch	1 1/8"	1 3/8"	1 3/8"	1 1/8"	1 1/8"
Out	Inch	2 1/8"	2 1/8" (2 5/8")	2 5/8"	2 1/8"	2 1/8"
WEIGHT						
Shipping weight	kg	2393	2581	3255	3496	3579
ADDITIONAL WEIGHT						
HSE version	kg	0	0	0	0	0
Copper Fins	kg	Consult factory				
SOUND LEVELS						
Sound power level (3)	dB(A)	88	88	89	89	90
Sound pressure level - (10m) (4)	dB(A)	56	56	57	57	58
DIMENSIONS						
Length	mm	4000	4000	5000	6000	6000
Width	mm	2200	2200	2200	2200	2200
Height	mm	2550	2550	2550	2550	2550

(1) Data based on 7 °C evaporating temperature and 35 °C condenser air temperature.
(2) Compressors only.
(3) Sound levels are at fully loaded conditions. Sound power level values refer to ISO standard 3744 and Eurovent 8/1.
(4) Sound pressure levels refer to ISO standard 3744, parallelepiped shape.
(*) High efficiency units (HSE) with inverter fans.

Physical Data - AQWC HT

AQWC HT		1404	1604	1806	2106	2406
Nominal cooling capacity (1)	kW	433	471	565	640	722
Input power (2)	kW	122	137	160	183	206
Number of refrigerant circuits		2	2	2	2	2
Total capacity steps	%	21-50-71-100	25-50-75-100	17-33-50-67-83-100	15-29-43-62-81-100	17-33-50-67-83-100
COMPRESSORS						
Number		4	4	6	6	6
Type		Scroll				
Oil type		POE				
N° of loading stages		0/100	0/100	0/100	0/100	0/100
AIR COOLED CONDENSER						
Number of coils		4	4	4	4	4
Total coil face area per coil	m^2	4.4	4.4	5.6	6.7	6.7
Number of rows		3 + 3	4 + 4	3 + 3	3 + 3	3 + 3
FANS						
Number of fans		8	8	10	10	12
Nominal speed	rpm	1100	1100	1100	1100	1100
Total airflow	m^3/h	198000	187000	232000	249000	277000
Total input power (*)	kW	20.8	20.8	26.0	26.0	31.2
External static pressure	Pa	0 Pa				
REFRIGERANT CONNECTIONS						
In	Inch	1 1/8"	1 3/8"	1 3/8"	1 1/8"	1 1/8"
Out	Inch	2 1/8"	2 1/8" (2 5/8")	2 5/8"	2 1/8"	2 1/8"
WEIGHT						
Shipping weight	kg	2393	2581	3255	3496	3579
ADDITIONAL WEIGHT						
Copper Fins	kg	Consult factory				
SOUND LEVELS						
Sound power level (3)	dB(A)	103	103	104	104	105
Sound pressure level - (10m) (4)	dB(A)	71	71	72	72	73
DIMENSIONS						
Length	mm	4000	4000	5000	6000	6000
Width	mm	2200	2200	2200	2200	2200
Height	mm	2550	2550	2550	2550	2550

(1) Data based on 7 °C evaporating temperature and 35 °C condenser air temperature.
(2) Compressors only.
(3) Sound levels are at fully loaded conditions. Sound power level values refer to ISO standard 3744 and Eurovent 8/1.
(4) Sound pressure levels refer to ISO standard 3744, parallelepiped shape.
(*) High temperature units (HT) with inverter fans.

HPF Version Fan Data

Sizes	Fan Static Pressure (Pa)	Fan rpm	Parameter in Service Level Max Speed (Vdc)	Sound Power Level dB(A)
1404	40	900	8.3	96
	60	930	8.5	97
	80	**970**	**8.8**	**98**
	100	1000	9.1	99
	120	1030	9.3	100
1604	40	900	8.2	96
	60	930	8.5	97
	80	**970**	**8.8**	**98**
	100	1000	9.1	99
	120	1030	9.3	100
1806	40	900	8.3	97
	60	930	8.5	98
	80	**970**	**8.8**	**99**
	100	1000	9.1	100
	120	1030	9.3	101
2106	40	900	8.3	97
	60	940	8.6	98
	80	**970**	**8.8**	**99**
	100	1000	9.1	100
	120	1040	9.4	101
2406	40	1010	9.1	101
	60	1040	9.4	102
	80	**1080**	**9.7**	**103**
	100	1100	9.8	104
	120	1130	10.0	105

Note : Values in bold are standard factory settings.

Electrical Data - AQWC 1404 to 2406 - R410A

Compressors @ 400 V / 3 Ph / 50 Hz

Models		Power input at max. conditions per compressor (kW)	Current at max. conditions per compressor FLA (A)	Start up current LRA (A)	Crankcase heater (W)
1404	Circuit 1	46.7	82.0	408	150
		36.1	65.4	310	150
	Circuit 2	36.1	65.4	310	150
		46.7	82.0	408	150
1604	Circuit 1	46.7	82.0	310	150
		46.7	82.0	408	150
	Circuit 2	46.7	82.0	408	150
		46.7	82.0	408	150
1806	Circuit 1	36.1	65.4	310	150
		36.1	65.4	310	150
		36.1	65.4	310	150
	Circuit 2	36.1	65.4	310	150
		36.1	65.4	310	150
		36.1	65.4	310	150
2106	Circuit 1	36.1	65.4	310	150
		36.1	65.4	310	150
		36.1	65.4	310	150
	Circuit 2	46.7	82.0	408	150
		46.7	82.0	408	150
		46.7	82.0	408	150
2406	Circuit 1	46.7	82.0	408	150
		46.7	82.0	408	150
		46.7	82.0	408	150
	Circuit 2	46.7	82.0	408	150
		46.7	82.0	408	150
		46.7	82.0	408	150

Fans - 400 V / 3 Ph / 50 Hz

Model	Standard Fans 6 poles										Electronic Fans (Brushless)				
	BLN - fans D (Delta connection)					LN and ELN - fans Y (Star connection)									
	Fans number	Nominal power (kW)	Max running current (A)	Total nominal power (kW)	Total max current (A)	Fans number	Nominal power (kW)	Max running current (A)	Total nominal power (kW)	Total max current (A)	Fans number	Nominal power (kW)	Max running current (A)	Total nominal power (kW)	Total max current (A)
1404	8	1.8	3.8	14.4	30.4	8	1.15	2.2	9.2	17.6	8	2.67	4.1	21.36	32.8
1604	8	1.8	3.8	14.4	30.4	8	1.15	2.2	9.2	17.6	8	2.67	4.1	21.36	32.8
1806	10	1.8	3.8	18	38	10	1.15	2.2	11.5	22	10	2.67	4.1	26.7	41
2106	10	1.8	3.8	18	38	10	1.15	2.2	11.5	22	10	2.67	4.1	26.7	41
2406	12	1.8	3.8	21.6	45.6	12	1.15	2.2	13.8	26.4	12	2.67	4.1	32.04	49.2

Electrical Data - AQWC 1404 to 2406 - R410A (continued)

Units - 400 V / 3 Ph / 50 Hz

AQWC BLN models		1404	1604	1806	2106	2406
Maximum power input (*)	kW	180	201	235	266	302
Maximum current input (*)	A	325	358	430	480	538
Start-up current (*)	A	651	684	675	806	864

AQWC LN models		1404	1604	1806	2106	2406
Maximum power input (*)	kW	175	196	228	260	294
Maximum current input (*)	A	312	346	414	464	518
Start-up current (*)	A	638	672	659	790	844

AQWC ELN models		1404	1604	1806	2106	2406
Maximum power input (*)	kW	175	196	228	260	294
Maximum current input (*)	A	312	346	414	464	518
Start-up current (*)	A	638	672	659	790	844

AQWC HSE/HT/HPF models		1404	1604	1806	2106	2406
Maximum power input (*)	kW	187	208	243	275	312
Maximum current input (*)	A	328	361	433	483	541
Start-up current (*)	A	654	687	678	809	867

(*) Data to be specified on the unit characteristic plate.

Sound Data - AQWC Units

		FREQUENCY (Hz)							Sound Power dB(A)	Sound Pressure (*) dB(A)
		125	250	500	1000	2000	4000	8000		
AQWC BLN	1404	91.0	90.0	98.0	92.0	86.0	71.0	59.0	97	65
	1604	91.0	90.0	98.0	92.0	86.0	71.0	59.0	97	65
	1806	92.0	91.0	99.0	93.0	87.0	72.0	60.0	98	66
	2106	92.0	91.0	99.0	93.0	87.0	72.0	60.0	98	66
	2406	93.0	92.0	100.0	94.0	88.0	73.0	61.0	99	67
AQWC LN	1404	85.0	84.0	92.0	86.0	80.0	65.0	53.0	91	59
	1604	85.0	84.0	92.0	86.0	80.0	65.0	53.0	91	59
	1806	86.0	85.0	93.0	87.0	81.0	66.0	54.0	92	60
	2106	86.0	85.0	93.0	87.0	81.0	66.0	54.0	92	60
	2406	87.0	86.0	94.0	88.0	82.0	67.0	55.0	93	61
AQWC ELN	1404	82.0	81.0	89.0	83.0	77.0	62.0	50.0	88	56
	1604	82.0	81.0	89.0	83.0	77.0	62.0	50.0	88	56
	1806	83.0	82.0	90.0	84.0	78.0	63.0	51.0	89	57
	2106	83.0	82.0	90.0	84.0	78.0	63.0	51.0	89	57
	2406	84.0	83.0	91.0	85.0	79.0	64.0	52.0	90	58
AQWC HT (**)	1404	97.0	96.0	104.0	98.0	92.0	77.0	65.0	103	71
	1604	97.0	96.0	104.0	98.0	92.0	77.0	65.0	103	71
	1806	98.0	97.0	105.0	99.0	93.0	78.0	66.0	104	72
	2106	98.0	97.0	105.0	99.0	93.0	78.0	66.0	104	72
	2406	99.0	98.0	106.0	100.0	94.0	79.0	67.0	105	73

(*) Sound pressure levels are given at 10 meters distance according to ISO standard 3744 with parallepiped shape.
(**) Sound data is given at maximum air flow rate condition.

Cooling Capacities - AQWC STD/HSE/HPF - BLN Version

AQWC models	EVT (°C)	Condenser air entering temperature (°C)											
		25		30		32		35		40		44	
		Cooling capacity (kW)	Input power (kW)	Cooling capacity (kW)	Input power (kW)	Cooling capacity (kW)	Input power (kW)	Cooling capacity (kW)	Input power (kW)	Cooling capacity (kW)	Input power (kW)	Cooling capacity (kW)	Input power (kW)
1404 BLN	2	422.0	97.4	401.5	106.9	393.0	110.8	380.0	116.6	353.1	129.4	336.7	137.6
	3	432.6	98.6	411.7	108.0	403.1	112.0	389.5	117.9	362.2	130.6	345.3	138.9
	4	443.4	99.8	421.8	109.3	412.7	113.3	399.4	119.1	371.3	131.9	353.9	140.2
	5	454.0	101.1	432.0	110.5	422.8	114.6	408.9	120.5	379.7	133.3	362.1	141.6
	7	475.6	103.5	452.5	113.2	443.1	117.2	**428.3**	**123.1**	398.1	136.2	379.4	144.6
	10	508.0	107.5	483.6	117.1	473.4	121.2	457.4	127.4	425.4	140.4	405.4	149.0
1604 BLN	2	469.8	109.6	446.9	120.2	437.4	124.7	423.0	131.2	393.1	145.6	374.8	154.8
	3	481.5	111.0	458.3	121.6	448.7	126.0	433.6	132.7	403.2	146.9	384.3	156.3
	4	493.6	112.3	469.6	123.0	459.5	127.5	444.6	134.0	413.3	148.4	394.0	157.8
	5	505.3	113.7	480.9	124.4	470.7	128.9	455.2	135.6	422.7	149.9	403.1	159.4
	7	529.4	116.5	503.7	127.4	493.2	131.8	**476.8**	**138.5**	443.1	153.2	422.3	162.7
	10	565.5	121.0	538.4	131.8	527.0	136.4	509.1	143.3	473.5	158.0	451.3	167.6
1806 BLN	2	550.8	127.8	524.1	140.2	512.9	145.4	496.0	153.0	460.9	169.8	439.5	180.5
	3	564.6	129.4	537.4	141.8	526.1	146.9	508.4	154.7	472.7	171.4	450.7	182.2
	4	578.8	130.9	550.6	143.5	538.7	148.6	521.3	156.3	484.6	173.1	462.0	184.0
	5	592.5	132.6	563.9	145.0	551.9	150.3	533.8	158.1	495.6	174.9	472.7	185.8
	7	620.8	135.9	590.6	148.6	578.3	153.7	**559.1**	**161.5**	519.6	178.7	495.2	189.8
	10	663.1	141.1	631.3	153.7	617.9	159.0	597.0	167.1	555.2	184.2	529.1	195.5
2106 BLN	2	624.1	146.1	593.8	160.3	581.2	166.2	562.0	174.9	522.3	194.1	498.0	206.4
	3	639.8	147.9	608.9	162.1	596.1	168.0	576.1	176.9	535.6	195.9	510.6	208.3
	4	655.8	149.7	623.9	164.0	610.4	169.9	590.7	178.6	549.1	197.9	523.4	210.3
	5	671.4	151.6	638.9	165.8	625.3	171.9	604.8	180.8	561.6	199.9	535.6	212.4
	7	703.4	155.3	669.2	169.8	655.3	175.8	**633.5**	**184.7**	588.7	204.2	561.1	216.9
	10	751.3	161.3	715.3	175.7	700.1	181.8	676.4	191.0	629.1	210.6	599.6	223.5
2406 BLN	2	704.1	164.4	669.9	180.4	655.7	187.0	634.0	196.8	589.2	218.4	561.7	232.2
	3	721.7	166.4	686.9	182.4	672.5	189.0	649.9	199.0	604.3	220.4	576.0	234.4
	4	739.8	168.4	703.8	184.5	688.6	191.2	666.4	201.0	619.5	222.7	590.5	236.7
	5	757.4	170.6	720.8	186.5	705.5	193.4	682.3	203.4	633.5	224.9	604.2	239.0
	7	793.5	174.8	754.9	191.1	739.2	197.8	**714.7**	**207.8**	664.1	229.8	633.0	244.1
	10	847.5	181.5	806.9	197.7	789.8	204.5	763.1	215.0	709.7	237.0	676.4	251.5

Notes :
- EVT : Evaporating temperature.
- Power input data are given for compressors only.

Cooling Capacities - AQWC STD/HSE - LN Version

AQWC models	EVT (°C)	Condenser air entering temperature (°C)									
		25		30		32		35		40	
		Cooling capacity (kW)	Input power (kW)	Cooling capacity (kW)	Input power (kW)	Cooling capacity (kW)	Input power (kW)	Cooling capacity (kW)	Input power (kW)	Cooling capacity (kW)	Input power (kW)
1404 LN	2	408.7	101.9	388.8	111.8	380.6	115.9	368.0	122.0	342.0	135.4
	3	418.9	103.2	398.7	113.0	390.3	117.2	377.2	123.4	350.7	136.6
	4	429.4	104.4	408.5	114.4	399.7	118.5	386.8	124.6	359.6	138.0
	5	439.6	105.8	418.4	115.6	409.5	119.9	396.0	126.1	367.7	139.4
	7	460.6	108.3	438.2	118.5	429.1	122.6	**414.8**	**128.8**	385.5	142.5
	10	491.9	112.5	468.4	122.5	458.5	126.8	442.9	133.3	412.0	146.9
1604 LN	2	455.3	114.5	433.2	125.6	424.0	130.2	410.0	137.0	381.0	152.0
	3	466.7	115.9	444.2	126.9	434.9	131.6	420.3	138.5	390.8	153.4
	4	478.4	117.2	455.1	128.5	445.3	133.1	430.9	139.9	400.6	155.0
	5	489.8	118.8	466.1	129.9	456.2	134.6	441.2	141.6	409.7	156.6
	7	513.2	121.7	488.2	133.0	478.0	137.7	**462.2**	**144.6**	429.5	160.0
	10	548.1	126.3	521.8	137.6	510.8	142.4	493.5	149.6	459.0	165.0
1806 LN	2	534.2	133.7	508.2	146.6	497.4	152.0	481.0	160.0	447.0	177.5
	3	547.6	135.3	521.1	148.3	510.2	153.7	493.0	161.8	458.4	179.2
	4	561.3	136.9	534.0	150.0	522.5	155.4	505.6	163.4	470.0	181.0
	5	574.6	138.7	546.9	151.7	535.2	157.2	517.6	165.4	480.6	182.9
	7	602.0	142.1	572.8	155.4	560.8	160.8	**542.2**	**168.9**	503.9	186.8
	10	643.0	147.6	612.2	160.7	599.2	166.3	578.9	174.8	538.5	192.7
2106 LN	2	604.1	152.1	574.8	166.8	562.6	172.9	544.0	182.0	505.6	202.0
	3	619.3	153.9	589.4	168.6	577.0	174.8	557.6	184.0	518.5	203.8
	4	634.8	155.7	603.9	170.7	590.9	176.8	571.8	185.9	531.5	205.9
	5	649.9	157.8	618.5	172.5	605.3	178.8	585.4	188.1	543.6	208.0
	7	680.9	161.6	647.8	176.7	634.3	182.9	**613.2**	**192.2**	569.8	212.5
	10	727.2	167.8	692.4	182.8	677.7	189.2	654.7	198.8	609.0	219.1
2406 LN	2	683.0	171.3	649.8	187.9	636.0	194.8	615.0	205.0	571.5	227.5
	3	700.1	173.4	666.3	190.0	652.3	196.9	630.4	207.3	586.1	229.6
	4	717.6	175.4	682.7	192.2	668.0	199.2	646.4	209.4	600.9	231.9
	5	734.7	177.7	699.2	194.3	684.3	201.4	661.8	211.9	614.5	234.3
	7	769.8	182.0	732.3	199.1	717.1	206.0	**693.2**	**216.4**	644.2	239.4
	10	822.1	189.0	782.7	205.9	766.2	213.1	740.2	223.9	688.5	246.8

Notes :
- EVT : Evaporating temperature.
- Power input data are given for compressors only.

Cooling Capacities - AQWC STD/HSE - ELN Version

AQWC models	EVT (°C)	Condenser air entering temperature (°C)									
		25		30		32		35		40	
		Cooling capacity (kW)	Input power (kW)	Cooling capacity (kW)	Input power (kW)	Cooling capacity (kW)	Input power (kW)	Cooling capacity (kW)	Input power (kW)	Cooling capacity (kW)	Input power (kW)
1404 ELN	2	422.0	97.4	401.5	106.9	393.0	110.8	380.0	116.6	353.1	129.4
	3	432.6	98.6	411.7	108.0	403.1	112.0	389.5	117.9	362.2	130.6
	4	443.4	99.8	421.8	109.3	412.7	113.3	399.4	119.1	371.3	131.9
	5	454.0	101.1	432.0	110.5	422.8	114.6	408.9	120.5	379.7	133.3
	7	475.6	103.5	452.5	113.2	443.1	117.2	**428.3**	**123.1**	398.1	136.2
	10	508.0	107.5	483.6	117.1	473.4	121.2	457.4	127.4	425.4	140.4
1604 ELN	2	469.8	109.6	446.9	120.2	437.4	124.7	423.0	131.2	393.1	145.6
	3	481.5	111.0	458.3	121.6	448.7	126.0	433.6	132.7	403.2	146.9
	4	493.6	112.3	469.6	123.0	459.5	127.5	444.6	134.0	413.3	148.4
	5	505.3	113.7	480.9	124.4	470.7	128.9	455.2	135.6	422.7	149.9
	7	529.4	116.5	503.7	127.4	493.2	131.8	**476.8**	**138.5**	443.1	153.2
	10	565.5	121.0	538.4	131.8	527.0	136.4	509.1	143.3	473.5	158.0
1806 ELN	2	550.8	127.8	524.1	140.2	512.9	145.4	496.0	153.0	460.9	169.8
	3	564.6	129.4	537.4	141.8	526.1	146.9	508.4	154.7	472.7	171.4
	4	578.8	130.9	550.6	143.5	538.7	148.6	521.3	156.3	484.6	173.1
	5	592.5	132.6	563.9	145.0	551.9	150.3	533.8	158.1	495.6	174.9
	7	620.8	135.9	590.6	148.6	578.3	153.7	**559.1**	**161.5**	519.6	178.7
	10	663.1	141.1	631.3	153.7	617.9	159.0	597.0	167.1	555.2	184.2
2106 ELN	2	624.1	146.1	593.8	160.3	581.2	166.2	562.0	174.9	522.3	194.1
	3	639.8	147.9	608.9	162.1	596.1	168.0	576.1	176.9	535.6	195.9
	4	655.8	149.7	623.9	164.0	610.4	169.9	590.7	178.6	549.1	197.9
	5	671.4	151.6	638.9	165.8	625.3	171.9	604.8	180.8	561.6	199.9
	7	703.4	155.3	669.2	169.8	655.3	175.8	**633.5**	**184.7**	588.7	204.2
	10	751.3	161.3	715.3	175.7	700.1	181.8	676.4	191.0	629.1	210.6
2406 ELN	2	704.1	164.4	669.9	180.4	655.7	187.0	634.0	196.8	589.2	218.4
	3	721.7	166.4	686.9	182.4	672.5	189.0	649.9	199.0	604.3	220.4
	4	739.8	168.4	703.8	184.5	688.6	191.2	666.4	201.0	619.5	222.7
	5	757.4	170.6	720.8	186.5	705.5	193.4	682.3	203.4	633.5	224.9
	7	793.5	174.8	754.9	191.1	739.2	197.8	**714.7**	**207.8**	664.1	229.8
	10	847.5	181.5	806.9	197.7	789.8	204.5	763.1	215.0	709.7	237.0

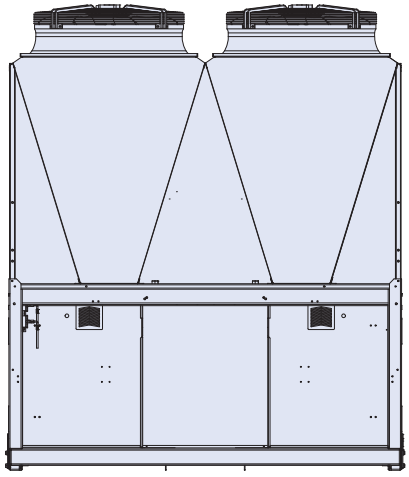
Notes :
- EVT : Evaporating temperature.
- Power input data are given for compressors only.

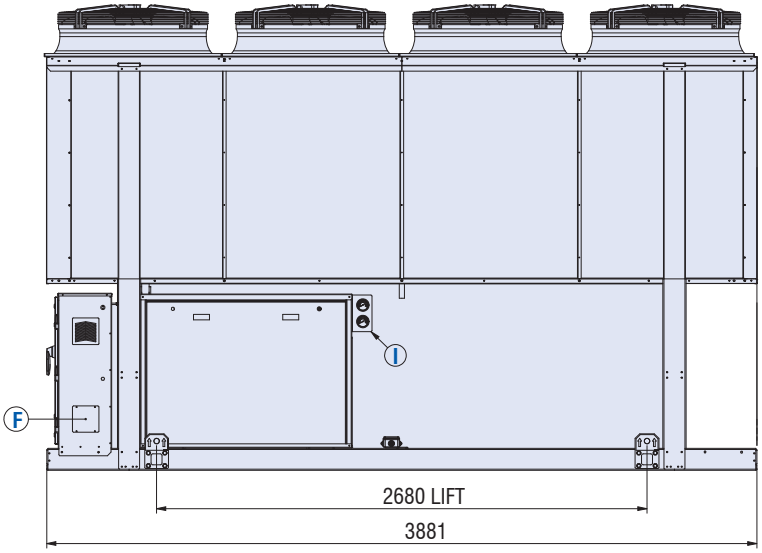
Cooling Capacities - AQWC HT

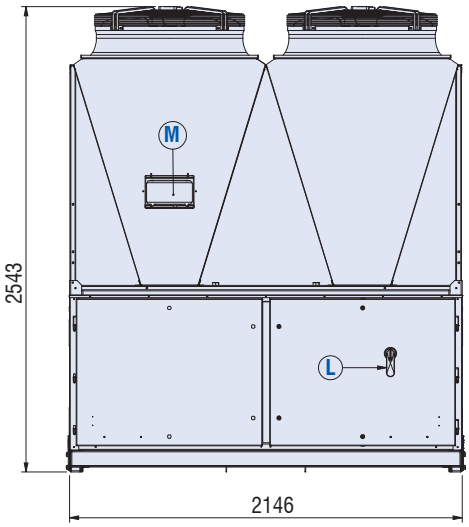
AQWC models	EVT (°C)	Condenser air entering temperature (°C)											
		25		30		32		35		40		44	
		Cooling capacity (kW)	Input power (kW)	Cooling capacity (kW)	Input power (kW)	Cooling capacity (kW)	Input power (kW)	Cooling capacity (kW)	Input power (kW)	Cooling capacity (kW)	Input power (kW)	Cooling capacity (kW)	Input power (kW)
1404 HT	2	426.2	96.4	405.5	105.8	396.9	109.7	383.8	115.4	356.7	128.1	340.1	136.2
	3	436.9	97.6	415.8	106.9	407.1	110.8	393.4	116.7	365.8	129.3	348.7	137.4
	4	447.8	98.8	426.1	108.2	416.9	112.1	403.4	117.9	375.0	130.6	357.5	138.8
	5	458.5	100.0	436.3	109.4	427.1	113.4	413.0	119.3	383.5	131.9	365.7	140.2
	7	480.4	102.5	457.0	112.1	447.5	116.0	**432.6**	**121.8**	402.0	134.8	383.2	143.1
	10	513.1	106.4	488.5	115.9	478.1	119.9	461.9	126.1	429.6	139.0	409.5	147.5
1604 HT	2	474.3	108.5	451.3	119.1	441.7	123.4	427.1	129.9	396.9	144.1	378.4	153.3
	3	486.2	109.9	462.7	120.4	453.0	124.8	437.8	131.3	407.1	145.5	388.1	154.7
	4	498.4	111.2	474.1	121.8	463.9	126.2	448.9	132.7	417.3	147.0	397.8	156.2
	5	510.2	112.6	485.6	123.1	475.2	127.6	459.6	134.2	426.8	148.5	407.0	157.8
	7	534.6	115.3	508.6	126.1	498.0	130.5	**481.4**	**137.1**	447.4	151.7	426.4	161.1
	10	571.0	119.8	543.6	130.5	532.1	135.0	514.0	141.9	478.1	156.4	455.6	166.0
1806 HT	2	556.4	126.6	529.4	138.9	518.1	144.0	501.0	151.5	465.6	168.1	443.9	178.8
	3	570.3	128.1	542.8	140.4	531.4	145.5	513.5	153.2	477.5	169.7	455.2	180.4
	4	584.6	129.6	556.2	142.1	544.2	147.2	526.6	154.7	489.5	171.4	466.6	182.2
	5	598.5	131.3	569.6	143.6	557.5	148.9	539.1	156.6	500.6	173.1	477.4	184.0
	7	627.1	134.5	596.6	147.1	584.1	152.2	**564.7**	**160.0**	524.8	176.9	500.2	187.9
	10	669.7	139.7	637.6	152.2	624.1	157.5	603.0	165.5	560.8	182.4	534.5	193.6
2106 HT	2	630.4	144.7	599.7	158.7	587.0	164.6	567.6	173.2	527.5	192.2	502.9	204.4
	3	646.2	146.5	615.0	160.5	602.0	166.3	581.8	175.1	541.0	194.0	515.7	206.3
	4	662.3	148.2	630.1	162.4	616.5	168.3	596.6	176.9	554.6	196.0	528.6	208.3
	5	678.1	150.1	645.3	164.2	631.6	170.2	610.8	179.0	567.2	197.9	540.9	210.4
	7	710.4	153.8	675.9	168.2	661.8	174.0	**639.8**	**182.9**	594.6	202.3	566.7	214.8
	10	758.8	159.7	722.4	174.0	707.1	180.0	683.1	189.2	635.4	208.6	605.5	221.3
2406 HT	2	711.5	162.8	677.0	178.5	662.6	185.1	640.7	194.8	595.4	216.2	567.7	229.8
	3	729.4	164.7	694.2	180.5	679.6	187.1	656.7	197.0	610.6	218.2	582.1	232.0
	4	747.6	166.7	711.2	182.7	695.9	189.2	673.4	198.9	626.0	220.4	596.7	234.2
	5	765.4	168.9	728.4	184.6	712.9	191.4	689.5	201.3	640.2	222.6	610.6	236.6
	7	801.9	173.0	762.9	189.2	747.0	195.8	**722.2**	**205.7**	671.1	227.5	639.7	241.6
	10	856.5	179.6	815.4	195.7	798.2	202.5	771.1	212.8	717.2	234.6	683.5	248.9

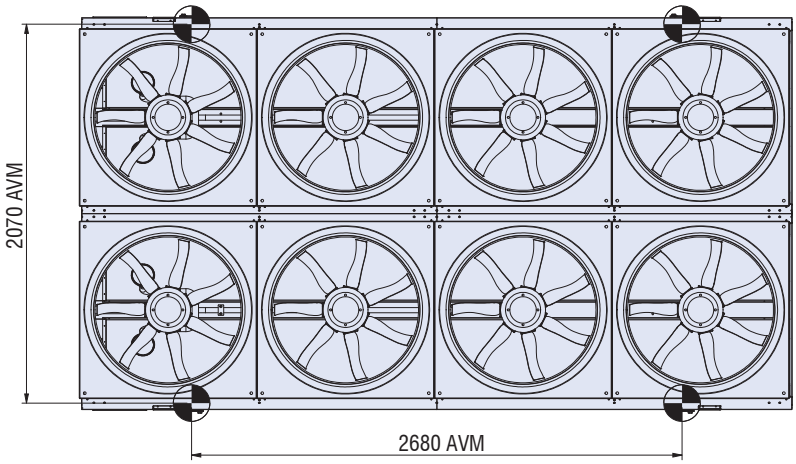
Notes :
- EVT : Evaporating temperature.
- Power input data are given for compressors only.

Dimensions (mm) - AQWC 1404 & 1604



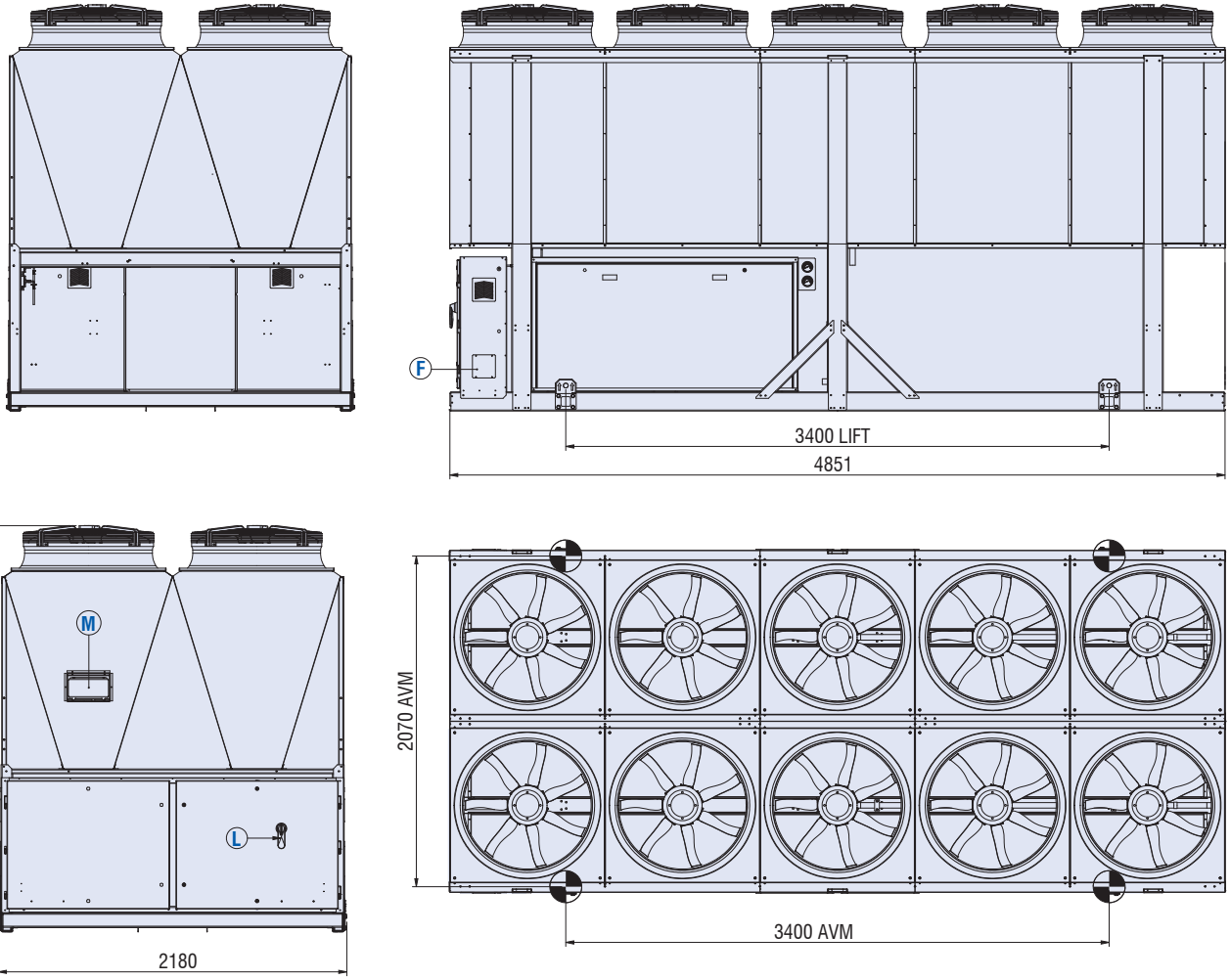






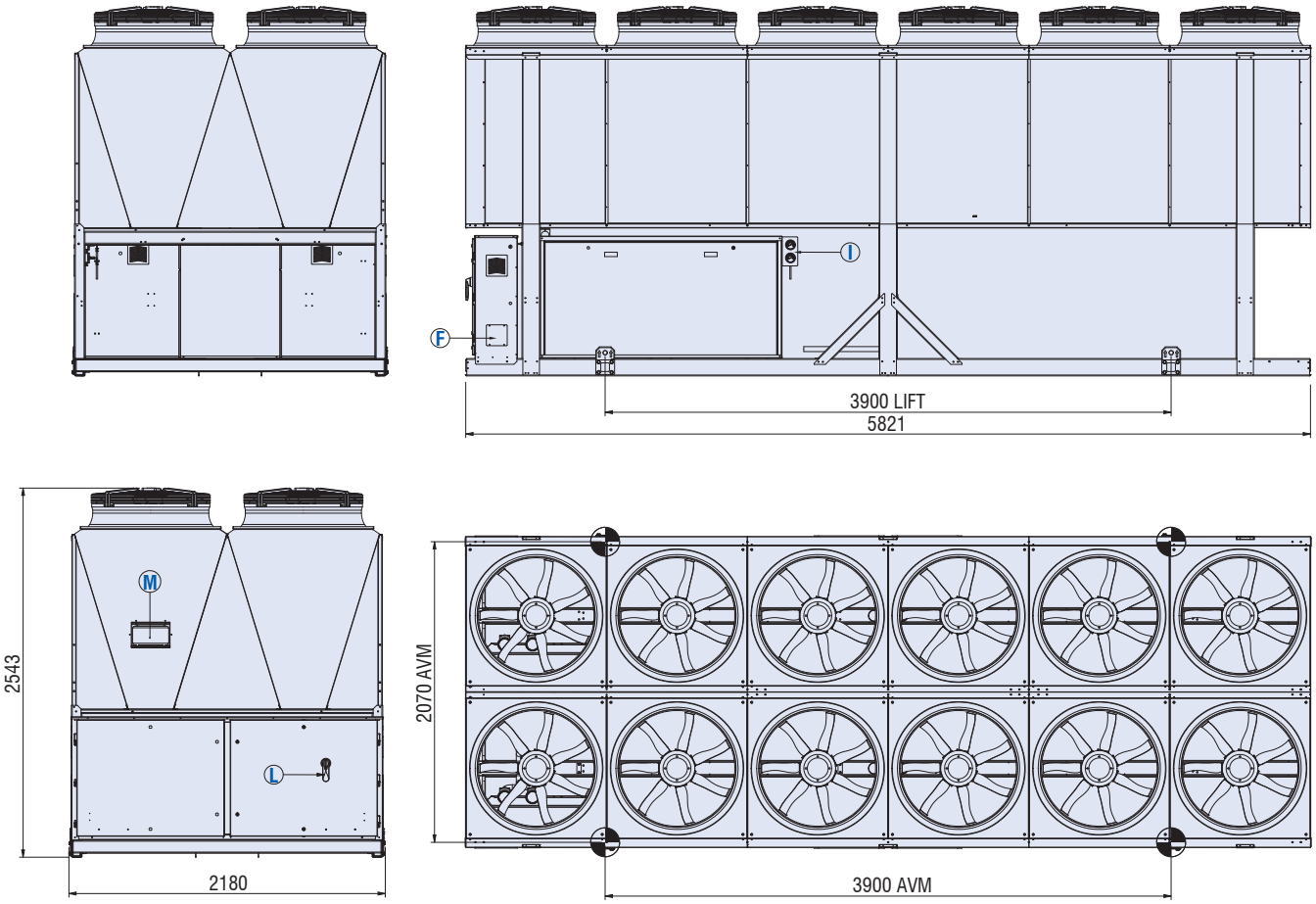
F	Electrical power supply
I	Gauge kit (accessory)
L	Main switch
M	Control keypad / Display

Dimensions (mm) - AQWC 1806



F	Electrical power supply
I	Gauge kit (accessory)
L	Main switch
M	Control keypad / Display

Dimensions (mm) - AQWC 2106 & 2406

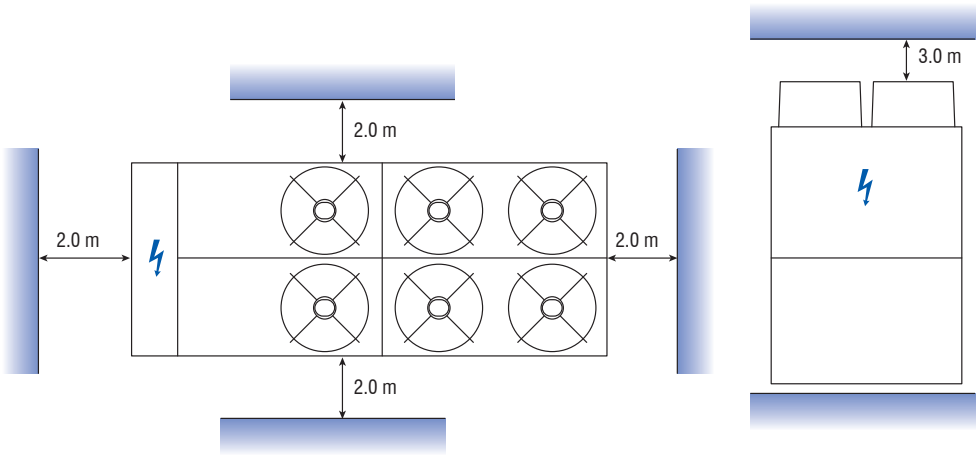


F	Electrical power supply
I	Gauge kit (accessory)
L	Main switch
M	Control keypad / Display

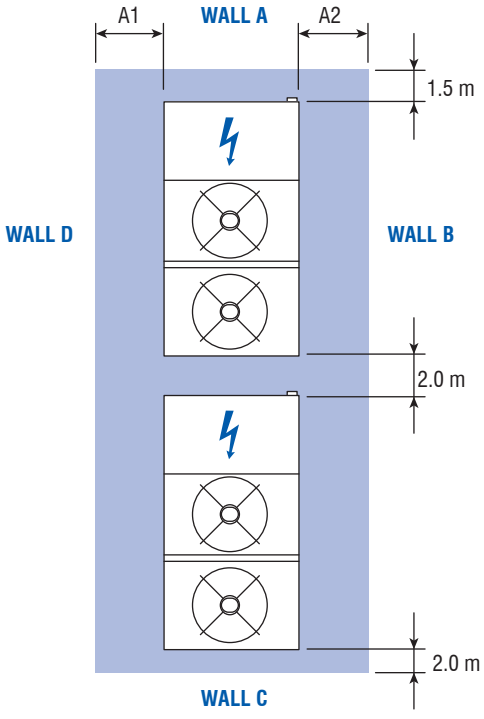
Note : AQWC 2106 has same dimensions as those of AQWC 2406; but with 10 fans instead of 12.

Space Requirements

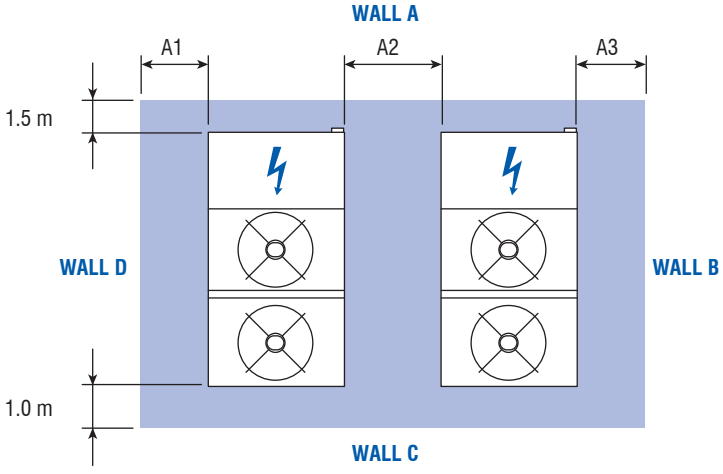
Installation of single units



Installation of several units



ARRANGEMENT 1



ARRANGEMENT 2

	A and C SCREENED B and D SOLID			A and B SOLID C and D SOLID			B and D SCREENED A and C SOLID			A and B SCREENED C and D SOLID			A and D SCREENED B and D SOLID		
	A1	A2	A3	A1	A2	A3	A1	A2	A3	A1	A2	A3	A1	A2	A3
ARRANGEMENT 1	2	2		2	2		1.5	1.5		1.0	2		1.5	2	
ARRANGEMENT 2	2	2	2	2	2	2	1.5	2	1.5	1.0	2	2	2	2	2

Note : No more than one wall can be higher than the unit.
The area enclosed by the wall must be kept clear of all obstructions that would impede air flow to the unit. Dimensions in metre.

Notes

Notes

systemair

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