Chiller

AQVSL/AQVSH STAR 85 to 140

Air Cooled Water Chillers
Cooling Only and Heat Pump
Engineering Data Manual

82 to 157 kW

83 to 168 kW

R410A

systemair

Outstanding Strength Points

- Units with **R410A refrigerant** (it will be the real replacement of R22). As near azeotropic mixture it behaves like a homogeneous substance **(reduced service problems in case of leakage or re-charge)** with negligible temperature glide.

  Refrigerant with superior thermo-dynamical proprieties compared to R22 and R407C, it allows to have more efficiency or compact and lighter systems and larger operating limits (T ambient = -15 °C in heating mode).

- **Bi-flow electronic expansion devices (optional)** on all units : superheating value controlled by microprocessor, simple and accessible refrigeration system especially for heat pump versions with reduction of brazing points and then possible leakage.

- **Cooling only AQVSL STAR** model is fitted with **microchannel type condensers** offering several advantages :

  - ➜ Reduction in weight due to 100% aluminium construction : fins, tubes and headers are in aluminium.
  - ➜ Optimal heat transfer due to minimized internal diameter of the channels (microchannels) inside the tube profile, and also due to brazed fins.
  - ➜ Higher thermal performances thanks to a high efficiency heat transfer, hence a better compactness.
  - ➜ Significant reduction of refrigerant charge due to small internal volume.
  - ➜ Low air pressure drop thanks to the small height of the microchannel tubes, thus fan power is reduced.
  - ➜ Noise reduction due to less air turbulence.

- **V-shape condenser coils** ensuring compactness and small foot print.

- **High EER and COP** for both fan coil and floor heating applications.

- **2 acoustic versions :** BLN (Base Low Noise) and ELN (Extra Low Noise).

- **Heat recovery option** with desuperheater.

- **Large choice of optional hydro kits** with or without buffer tank fitted on board of the chiller to perform package solution and plug & play concept.

- **Optional 3-pump kit :** energy saving in partial load.

- **Optional electric heaters fitted inside buffer tank** to ensure extra heating.

- 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.

Specifications

General

The new **AQVSL/AQVSH STAR** units have been designed to operate with **HFC 410A** refrigerant. Both compressors and heat exchangers (plate heat exchanger and coils) have been optimized for this refrigerant.

All the units are available either in **cooling only** or **heat pump** version. Each unit is fitted with high efficient and advanced 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 AQVSL/AQVSH STAR units are available in **6 sizes and 3 versions :**

- **STD (Standard) version :** Designed in accordance with specifications described in the following sections.
- **HT (High Temperature) 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.
- **HPF (High Pressure Fan) version :** It has same equipment as HT units. The HPF version provides external static pressure up to **120 Pa.**

The STD version can be supplied with **2 acoustic options :**

- **Base Low Noise (BLN) :** The units are equipped with **Star or Delta connected fan motors** depending on size. 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.

On the other hand, the HT and HPF versions can be supplied with BLN option only.

In addition, all the units can be supplied with **heat recovery option :**

- **Desuperheater :** All the versions can be supplied with plate type heat exchanger fitted on the compressor discharge line to recover about **20 % of the total heat** rejected to the condensers.

Cabinet and structure

The cabinet and structure are made of heavy gauge galvanized steel. **All galvanized steel components are individually painted** by a special painting process before the assembly of the unit. This painting system performs a homogeneous protection to the corrosion.

The painting is a polyester powder based type, coloured in **RAL 9001**.

The units are suitable for outdoor installation, directly on the building roof or at the ground level.

Refrigerant circuits

All the units are composed of 2 hermetic scroll compressors mounted in tandem.

The refrigerant circuit is equipped with liquid line and discharge line shut-off valves, filter-drier, solenoid valve and mechanical expansion valve.

The heat pump units (AQVSH STAR) are provided with 4-way reversing valve, suction accumulator, liquid receiver, sight glass and check valve.

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

Compressors

The compressors are hermetic scroll type 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.

Specifications (continued)

Evaporator

Evaporator is of a brazed stainless steel plate type heat exchanger. It is insulated with a 19 mm thick closed cell polyethylene foam material and is fitted with a film type electric heater on the external surface to prevent the unit from freezing at a low temperature (down to -18 °C) when the unit is off.

Condenser coils

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

For cooling only model (AQVSL STAR), the condenser coils are of microchannel type, made of 100% aluminium (fins, tubes and headers) with the exception of pipe couplings which are in copper.

They are mounted in V-shape arrangement, allowing the unit to be compact with small foot print.

Condenser fans

All acoustic versions (BLN & ELN) are equipped with large diameter, direct drive axial type fans with asynchronous three-phase motors.

Fans are fitted 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 version 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 version. It allows the units to operate in cooling mode at ambient temperature down to -18 °C.

Electrical board

The electrical board is located in a metal case protected by a vertically pivoted access door. 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 unloading for high pressure or high compressor pressure ratio (integrated inside the curves of compressor operating limits).
- Chilled and hot water temperature regulation (control option on inlet water temperature RWT (PID) or outlet water temperature LWT (neutral band type) of the evaporator.
- Evaporator antifreeze protection.
- Heat pump defrost control for automatic operation.
- Management of high and low pressure alarms.
- 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
- Management of the hydro kit : start-up of pump, antifreeze heater of external tank.

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

- Display of the temperature at the evaporator inlet and outlet.
- Display of the ambient air temperature.
- Display of the 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) Evaporator antifreeze
  - l) Flow switch signal for lack of water
  - m) Control of the compressor operating hours
  - n) Compressors in operation
  - o) Pump in operation and operating hours
  - p) Thermal protection of compressors
  - q) Thermal protection of fans
  - r) 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, set to 40.5 bar, automatic reset and manual reset from the control panel.
- Flow switch on the evaporator side.
- Antifreeze temperature sensor (set to +4 °C) on the evaporator.
- Safety valve on the discharge line and the liquide receiver (on AQVSH STAR), set to 45 bar.

Control :

- HP and LP transducers.
- Evaporator water inlet temperature sensor.
- Evaporator water outlet temperature sensor (with an antifreeze function).
- Ambient air temperature sensor.
- Defrost temperature sensor (AQVSH STAR).

Specifications (continued)

Conformity with standards

The following applies to all the sizes and versions of AQVSL/AQVSH STAR units :

- ✓ Machine Directive : 2006/42/EC
- ✓ Low Voltage Directive : 2006/95/EC
- ✓ Electromagnetic Compatibility Directive : 2004/108/EC
- ✓ Pressure Equipment Directive : 97/23/EC

Standard equipment

- ✓ Set point timer/clock card.
- ✓ Digital pressure and temperature reading kit.
- ✓ High ambient pressure control.
- ✓ Sequence phase control.
- ✓ Control circuit transformer 400 V/230 V.
- ✓ Power supply without neutral.
- ✓ Hour meter.
- ✓ Main switch.
- ✓ Refrigerant R410A.
- ✓ PED approval.
- ✓ Evaporator antifreeze electric heater.
- ✓ Compressor jacket (ELN version only).
- ✓ Compressor box.
- ✓ Rubber anti-vibration pads.
- ✓ Water flow switch.

Optional hydro kits

All hydro kits are supplied fitted inside the unit with or without buffer tank (325 litre) :

- **1P :** 1 low or high pressure pump kit with relevant accessories.
- **2P :** 2 low or high pressure pump kit with relevant accessories.
- **3P :** 3 low pressure pump kit with relevant accessories.
- **1P+T :** 1P kit + buffer tank covered with insulation and fitted with an antifreeze electric heater.
- **2P+T :** 2P kit + buffer tank covered with insulation and fitted with an antifreeze electric heater.
- **3P+T :** 3P kit + buffer tank covered with insulation and fitted with an antifreeze electric heater.

When thermodynamic heating is not sufficient, **optional electric heaters (24, 36 or 48 kW)** can be provided inside buffer tank to ensure extra heating.

Factory-installed options

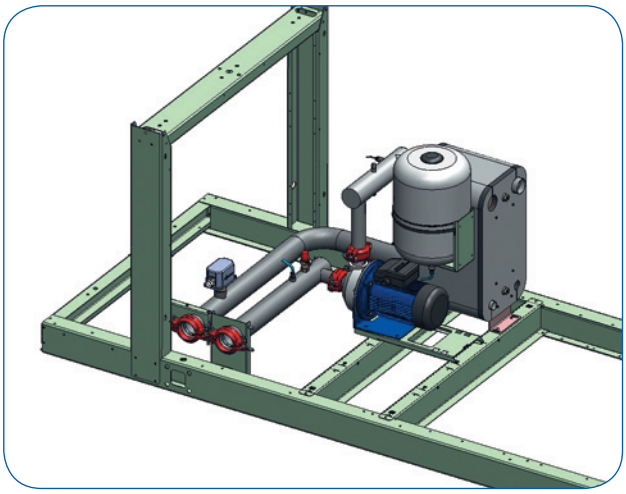
- ✓ ModBus protocol kit for BMS.
- ✓ Compressor soft starter.
- ✓ Pressure actuated stepless fan speed controller for low ambient operation (-18 °C) (BLN version).
- ✓ Double set point.
- ✓ Power factor correction capacitors.
- ✓ Electronic expansion valve.
- ✓ Compressor overload protection.
- ✓ Automatic circuit breaker.
- ✓ Condenser coils with blue fins.
- ✓ Condenser coils with black epoxy treatment.
- ✓ Condenser coils with "Fin Guard Silver" (polyurethane) treatment.
- ✓ Condenser coils with copper fins.
- ✓ Coil guards.
- ✓ Chiller grilles.
- ✓ Compressor jacket.
- ✓ Desuperheater.
- ✓ On board hydro kits.
- ✓ Electric heaters inside buffer tank to ensure extra heating.
- ✓ Automatic pump switch on 2 pump kit.
- ✓ Antifreeze electric heater for hydraulic manifolds.

Field-installed accessories

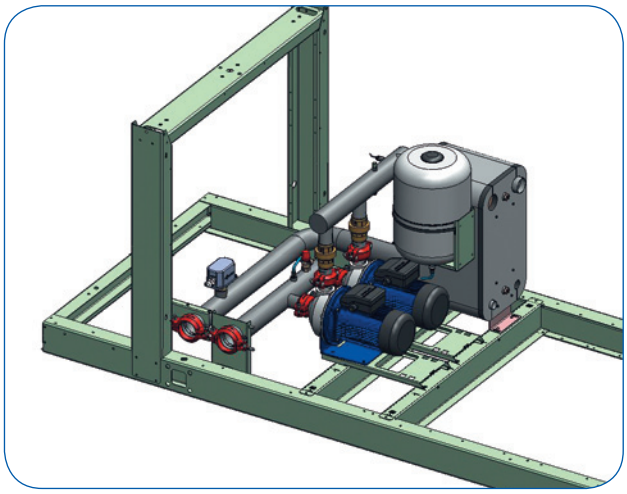
- ✓ HP & LP monometers.
- ✓ Spring type anti-vibration mounts.
- ✓ Remote keyboard panel.
- ✓ Master and slaves control, up to 4 units max.
- ✓ Coil guards.
- ✓ Chiller grilles.
- ✓ Pressure switch.
- ✓ Water filter.

Hydro Options

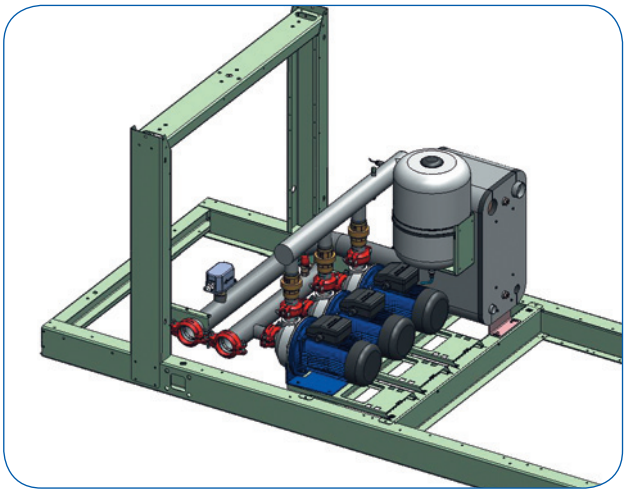
1P



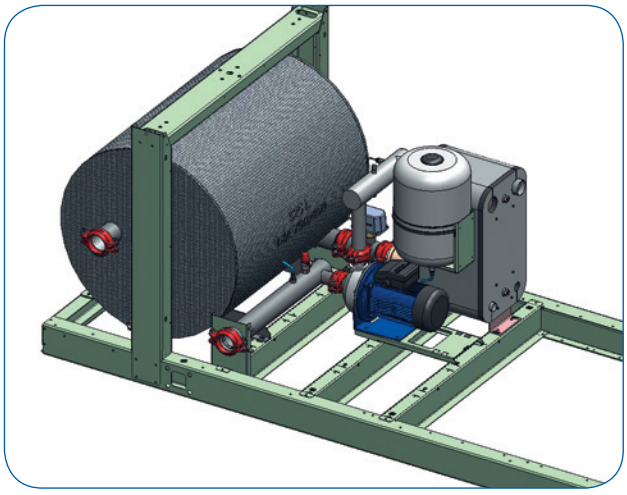
2P



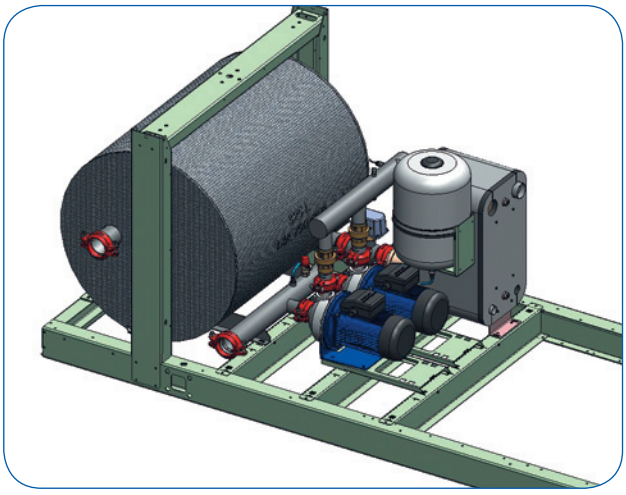
3P



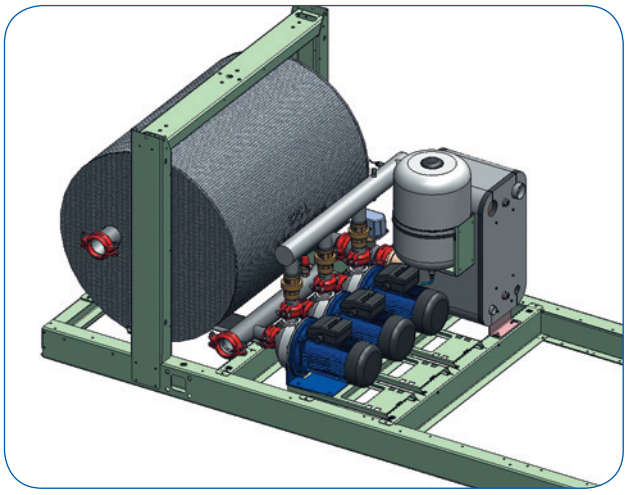
1P + T



2P + T

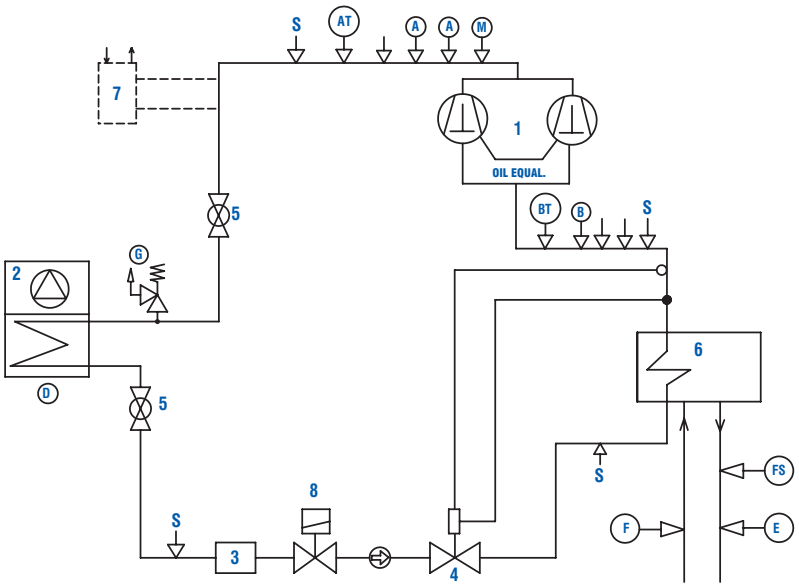


3P + T

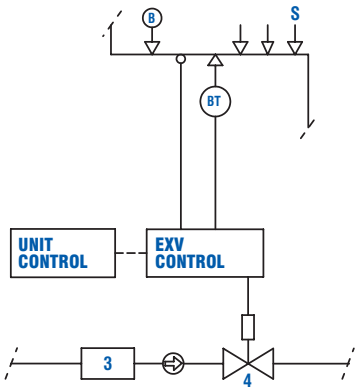


All hydro options are supplied fitted inside the unit.

Refrigerant Flow Diagram - AQVSL STAR 85 to 160 - R410A



MECHANICAL EXPANSION VALVE
(STANDARD)

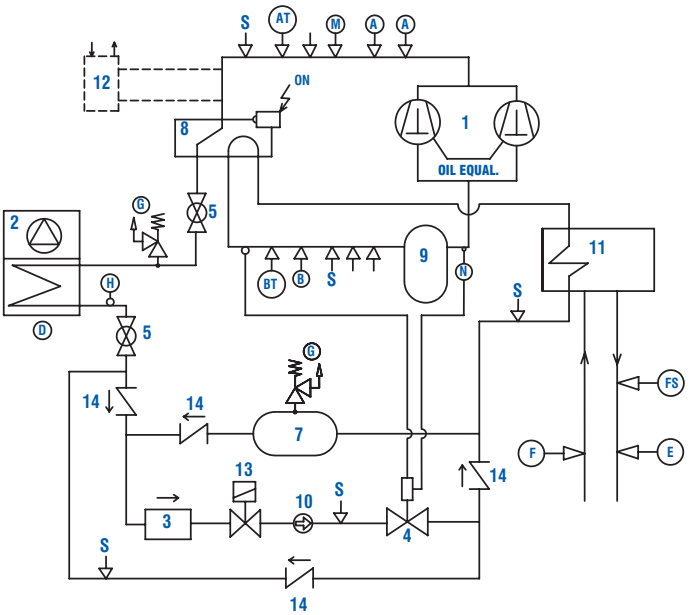


ELECTRONIC EXPANSION VALVE
(OPTIONAL)

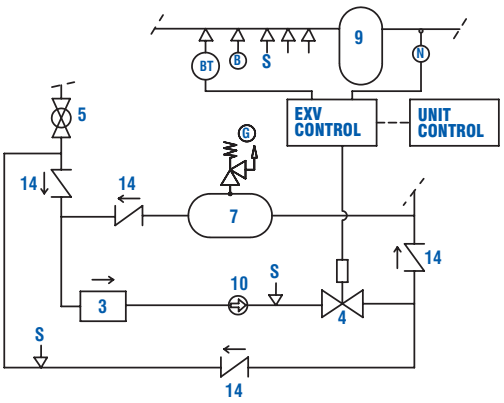
COMPONENTS	
1	Compressor tandem scroll type
2	Air cooled condenser
3	Filter drier
4	Electronic/mechanical expansion valve
5	Globe valve
6	Plate heat exchanger
7	Desuperheater (optional)
8	Solenoid valve

SAFETY / CONTROL DEVICES	
A	High pressure switch (40.5 bar)
AT	High pressure transducer
B	Low pressure switch (1.5 bar)
BT	Low pressure transducer
FS	Water flow switch
D	Air temperature sensor
E	Outlet water temperature sensor
F	Inlet water temperature sensor
G	PED pressure relief valve (45 bar)
M	Discharge temperature sensor
S	5/16" Schrader connection (service only)
	Pipe connection with Schrader valve

Refrigerant Flow Diagram - AQVSH STAR 85 to 160 - R410A



MECHANICAL EXPANSION VALVE (STANDARD)

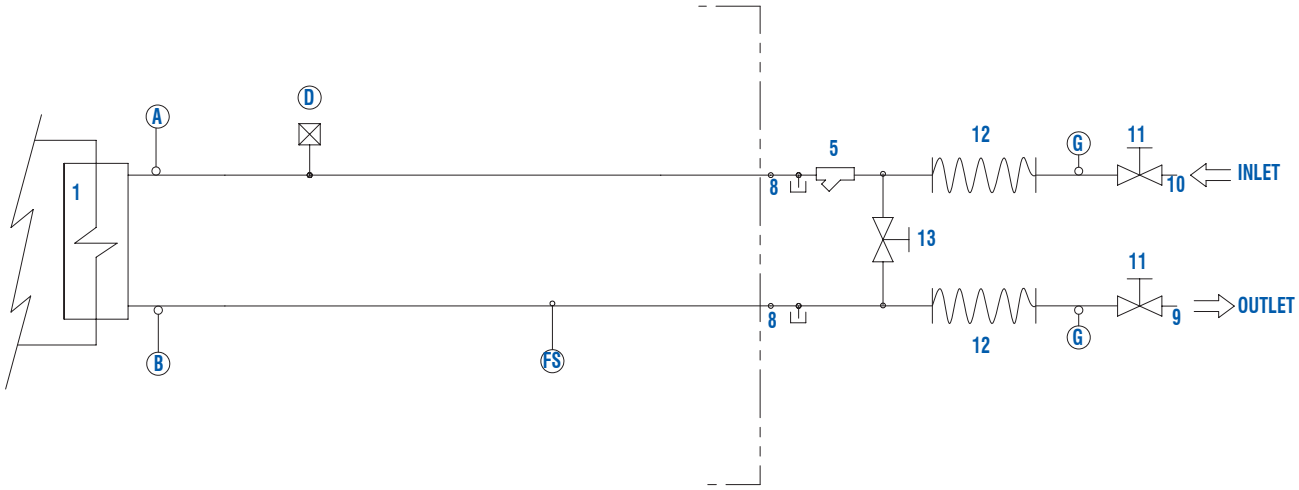


ELECTRONIC EXPANSION VALVE (OPTIONAL)

COMPONENTS	
1	Compressor tandem scroll type
2	Air cooled heat exchanger
3	Filter drier
4	Electronic/mechanical expansion valve
5	Globe valve
7	Liquid receiver
8	Four-way valve
9	Suction accumulator
10	Sight glass
11	Plate heat exchanger
12	Desuperheater (optional)
13	Solenoid valve
14	Check valve

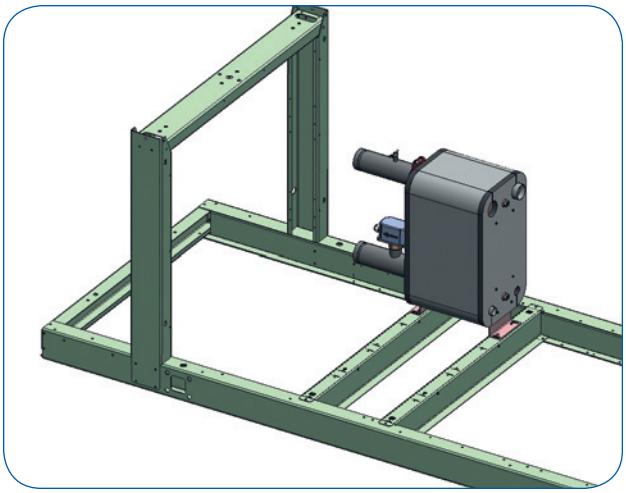
SAFETY / CONTROL DEVICES	
A	High pressure switch (40.5 bar)
AT	High pressure transducer
B	Low pressure switch (1.5 bar)
BT	Low pressure transducer
FS	Water flow switch
D	Air temperature sensor
E	Outlet water temperature sensor
F	Inlet water temperature sensor
G	PED pressure relief valve (45 bar)
H	Defrost temperature sensor
M	Discharge temperature sensor
N	Suction temperature sensor
S	5/16" Schrader connection (service only)
	Pipe connection with Schrader valve

Hydraulic Circuit Diagram - AQVSL/AQVSH STAR 85 to 160 - R410A - Basic Unit

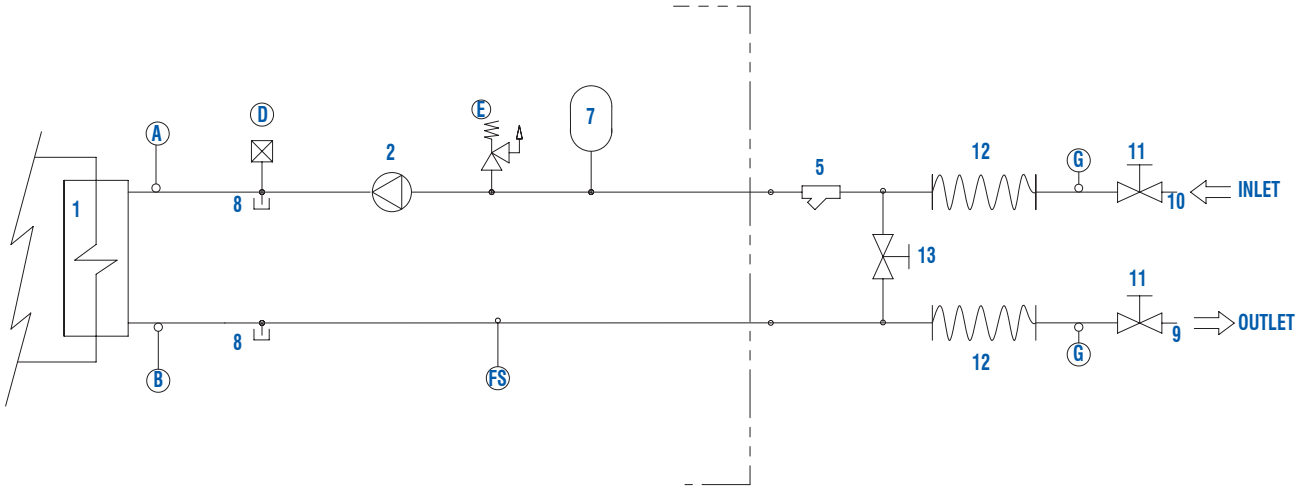


COMPONENTS	
1	Plate heat exchanger
5	Water filter
8	Pressure point/Drainage
9	Water outlet
10	Water inlet
11	Globe valve
12	Flexible pipes
13	By-pass valve

SAFETY/CONTROL DEVICES	
A	Inlet water temperature sensor
B	Outlet water temperature sensor
D	Vent valve
FS	Flow switch
G	Thermometer
—·—·	Unit side
O	Probes

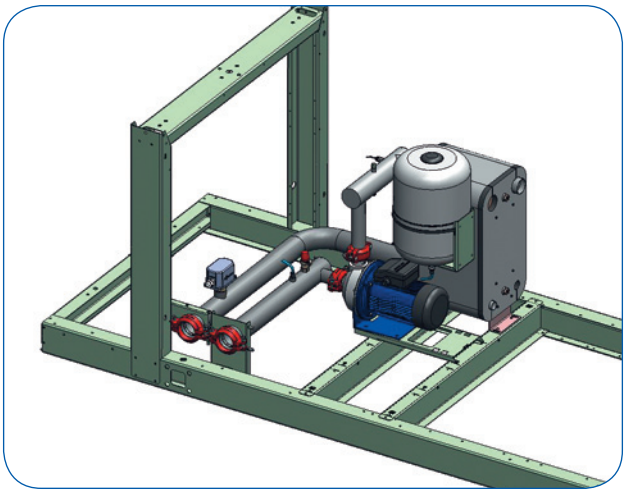


Hydraulic Circuit Diagram - AQVSL/AQVSH STAR 85 to 160 - R410A - 1P Unit

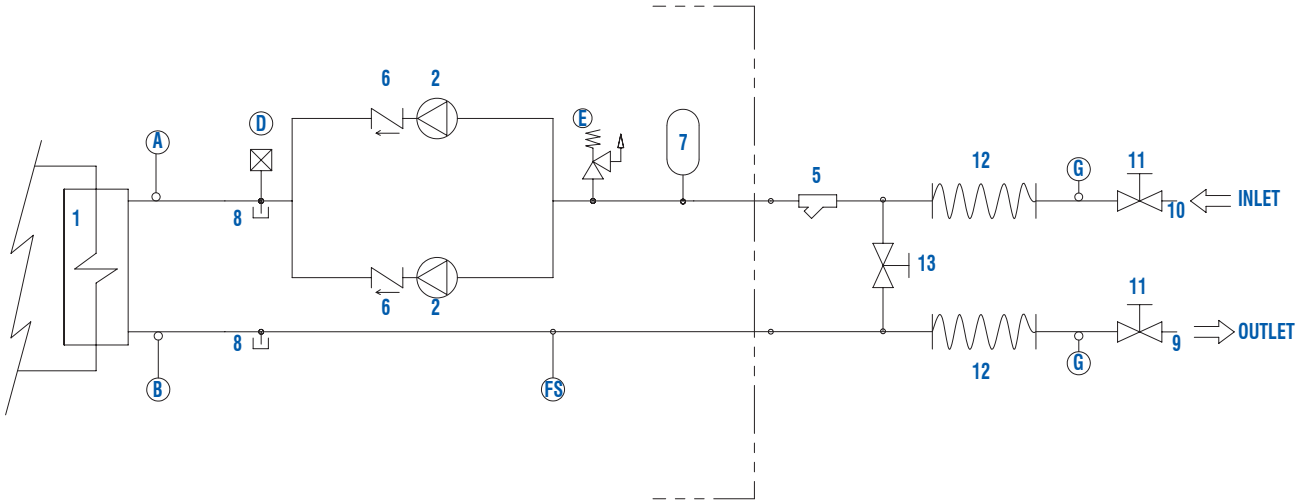


COMPONENTS	
1	Plate heat exchanger
2	Pump
5	Water filter
7	Pressure expansion tank
8	Pressure point/Drainage
9	Water outlet
10	Water inlet
11	Globe valve
12	Flexible pipes
13	By-pass valve

SAFETY/CONTROL DEVICES	
A	Inlet water temperature sensor
B	Outlet water temperature sensor
D	Vent valve
E	Water safety valve (6 bar)
FS	Flow switch
G	Thermometer
—·-·—	Unit side
○	Probes

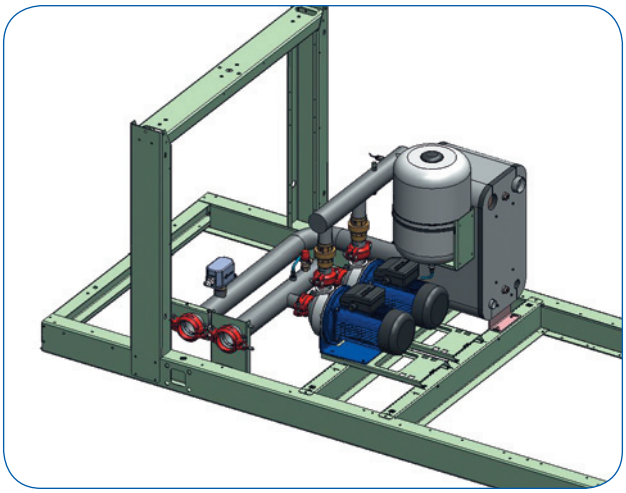


Hydraulic Circuit Diagram - AQVSL/AQVSH STAR 85 to 160 - R410A - 2P Unit

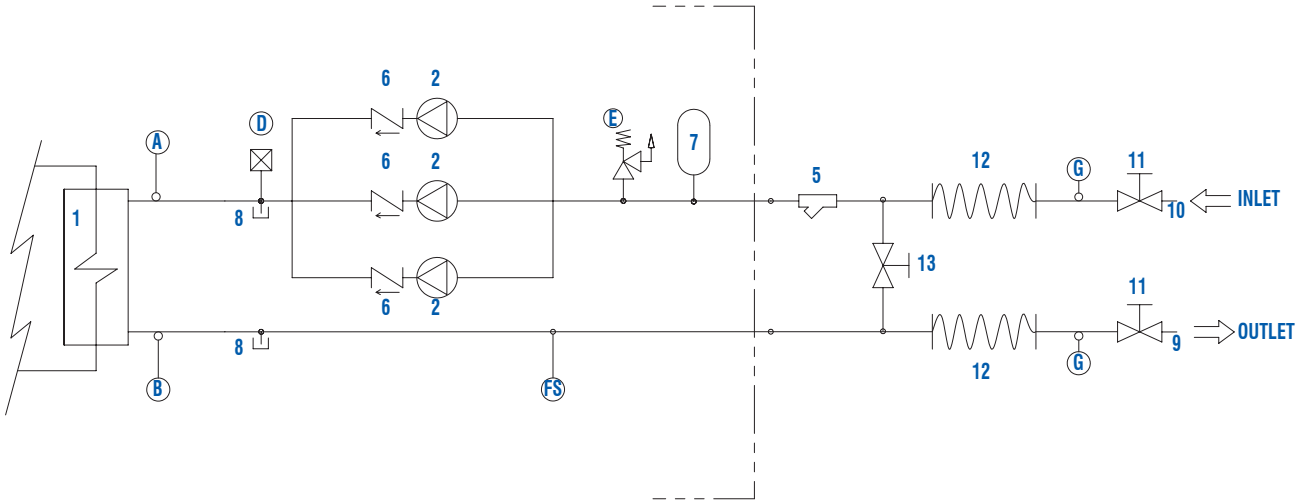


COMPONENTS	
1	Plate heat exchanger
2	Pump
5	Water filter
6	Non-return valve
7	Pressure expansion tank
8	Pressure point/Drainage
9	Water outlet
10	Water inlet
11	Globe valve
12	Flexible pipes
13	By-pass valve

SAFETY/CONTROL DEVICES	
A	Inlet water temperature sensor
B	Outlet water temperature sensor
D	Vent valve
E	Water safety valve (6 bar)
FS	Flow switch
G	Thermometer
—·-·—	Unit side
○	Probes

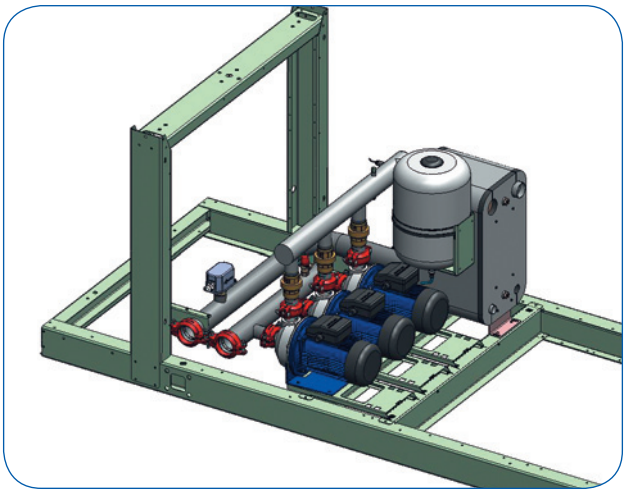


Hydraulic Circuit Diagram - AQVSL/AQVSH STAR 85 to 160 - R410A - 3P Unit

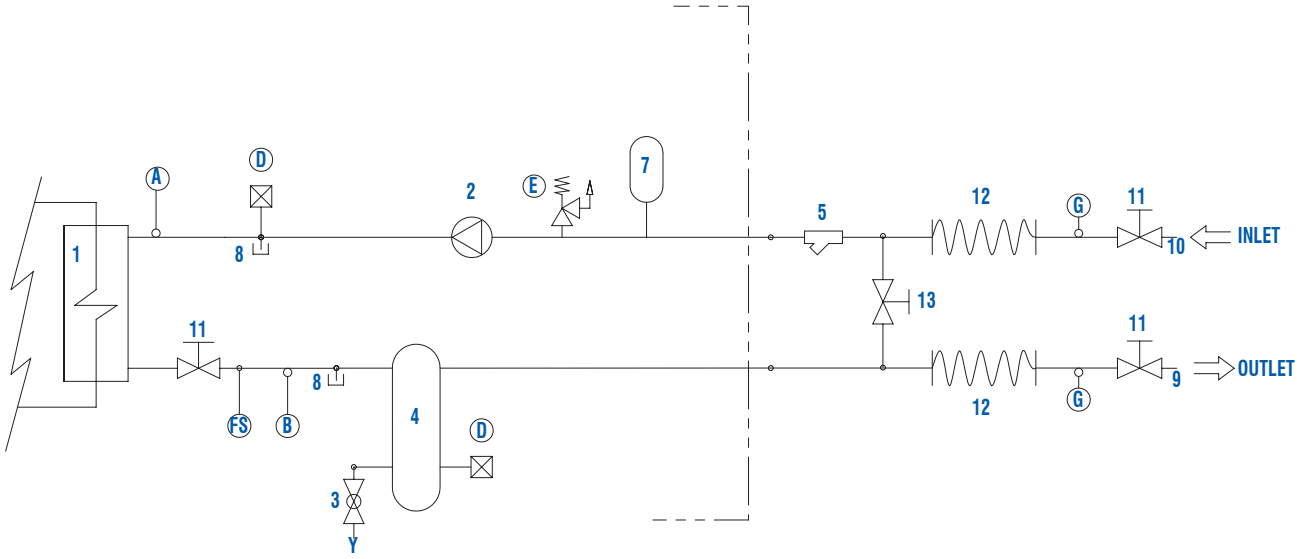


COMPONENTS	
1	Plate heat exchanger
2	Pump
5	Water filter
6	Non-return valve
7	Pressure expansion tank
8	Pressure point/Drainage
9	Water outlet
10	Water inlet
11	Globe valve
12	Flexible pipes
13	By-pass valve

SAFETY/CONTROL DEVICES	
A	Inlet water temperature sensor
B	Outlet water temperature sensor
D	Vent valve
E	Water safety valve (6 bar)
FS	Flow switch
G	Thermometer
—·-·—	Unit side
O	Probes

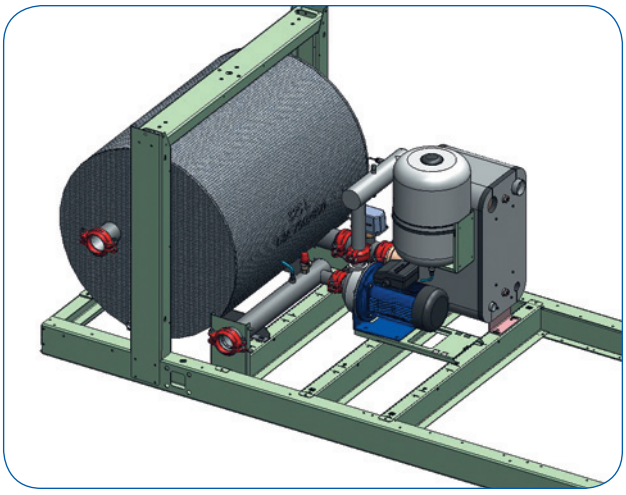


Hydraulic Circuit Diagram - AQVSL/AQVSH STAR 85 to 160 - R410A - 1P+T Unit

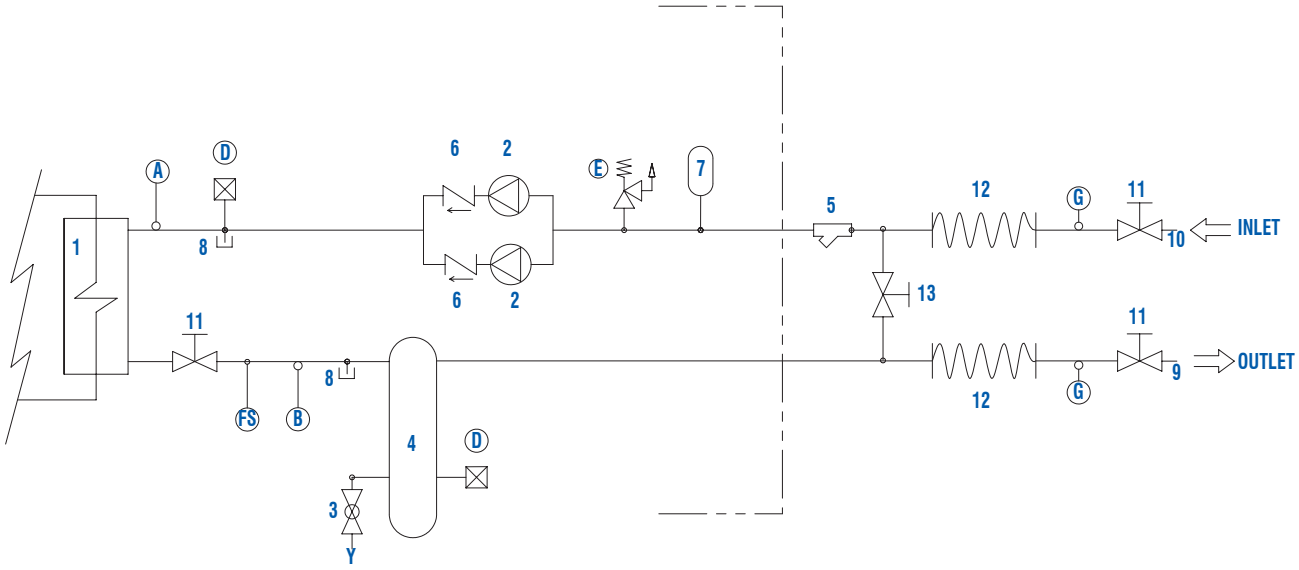


COMPONENTS	
1	Plate heat exchanger
2	Pump
3	Draining valve
4	Water buffer tank
5	Water filter
7	Pressure expansion tank
8	Pressure point/Drainage
9	Water outlet
10	Water inlet
11	Globe valve
12	Flexible pipes
13	By-pass valve

SAFETY/CONTROL DEVICES	
A	Inlet water temperature sensor
B	Outlet water temperature sensor
D	Vent valve
E	Water safety valve (6 bar)
FS	Flow switch
G	Thermometer
—·-·—	Unit side
O	Probes

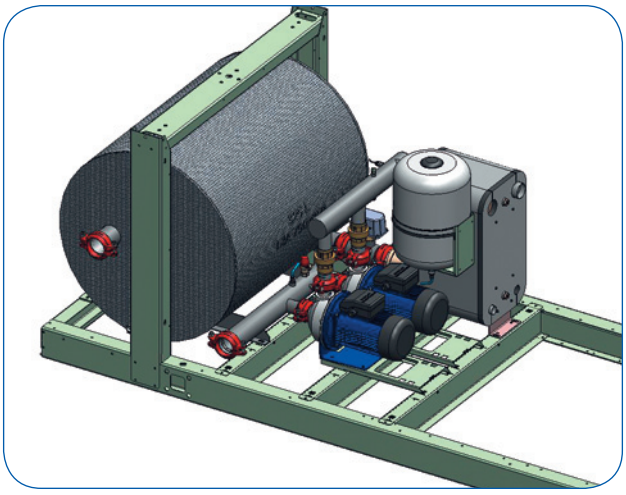


Hydraulic Circuit Diagram - AQVSL/AQVSH STAR 85 to 160 - R410A - 2P+T Unit

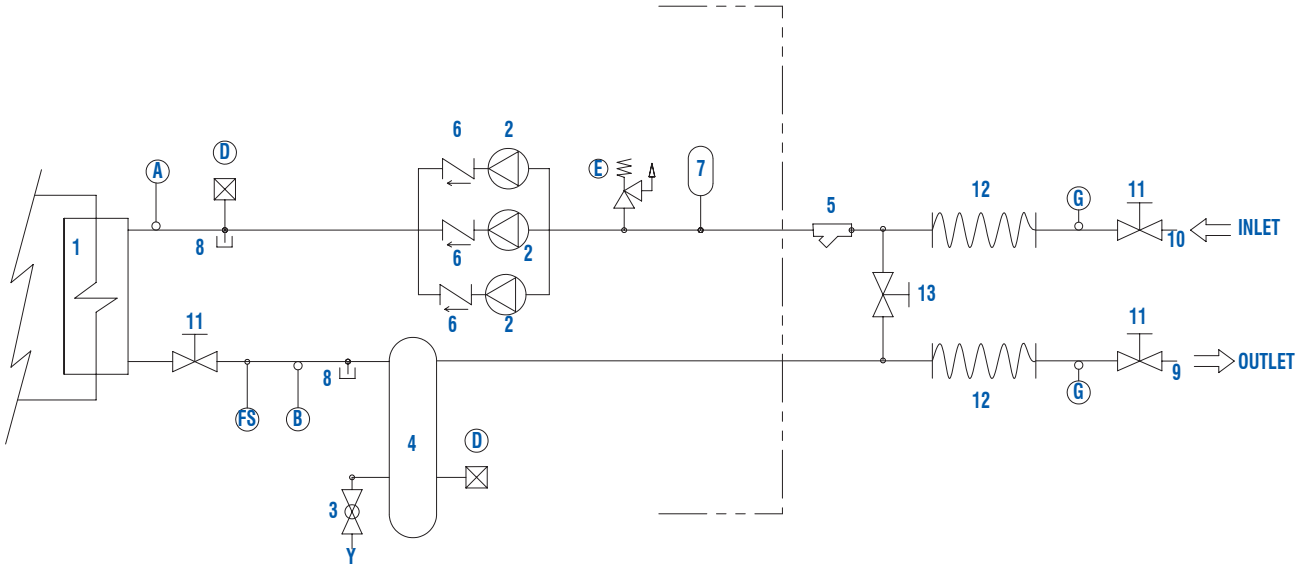


COMPONENTS	
1	Plate heat exchanger
2	Pump
3	Draining valve
4	Water buffer tank
5	Water filter
6	Non-return valve
7	Pressure expansion tank
8	Pressure point/Drainage
9	Water outlet
10	Water inlet
11	Globe valve
12	Flexible pipes
13	By-pass valve

SAFETY/CONTROL DEVICES	
A	Inlet water temperature sensor
B	Outlet water temperature sensor
D	Vent valve
E	Water safety valve (6 bar)
FS	Flow switch
G	Thermometer
—·-·—	Unit side
O	Probes

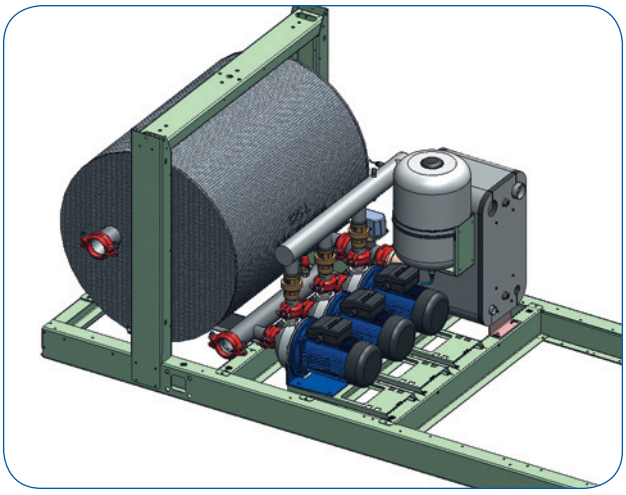


Hydraulic Circuit Diagram - AQVSL/AQVSH STAR 85 to 160 - R410A - 3P+T Unit



COMPONENTS	
1	Plate heat exchanger
2	Pump
3	Draining valve
4	Water buffer tank
5	Water filter
6	Non-return valve
7	Pressure expansion tank
8	Pressure point/Drainage
9	Water outlet
10	Water inlet
11	Globe valve
12	Flexible pipes
13	By-pass valve

SAFETY/CONTROL DEVICES	
A	Inlet water temperature sensor
B	Outlet water temperature sensor
D	Vent valve
E	Water safety valve (6 bar)
FS	Flow switch
G	Thermometer
—·-·—	Unit side
O	Probes



Operating Limits

AQVSL STAR 85 to 160 - R410A - BLN/ELN/HT Version

AQVSL STAR				85		95		115		125		140		160	
				Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Chilled liquid	Leaving water temperature	Water	°C	+5 to +18											
		Brine	°C	-6 / +5 (with glycol and electronic expansion valve); +5/+18 (standard application)											
		Temperature spread	K	3 to 8											
	Maximum operating pressure		bar	6											
Outdoor air	Outdoor air temperature	BLN	°C	+5 to +48		+5 to +48		+5 to +45		+5 to +45		+5 to +45		+5 to +45	
		ELN	°C	-18 to +45		-18 to +45		-18 to +42		-18 to +42		-18 to +42		-18 to +42	
		HT	°C	-18 to +50		-18 to +50		-18 to +48		-18 to +48		-18 to +48		-18 to +48	
	Available static pressure	Standard fans	Pa	0											
		High pressure fans (HPF)	Pa	< 120											
Power supply voltage			V	400 V, 3 Ø, 50 Hz (+/- 10%)											

AQVSH STAR 85 to 160 - R410A - BLN/ELN/HT Version

AQVSH STAR				85		95		115		125		140		160	
				Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Chilled liquid	Leaving water temperature	Water	°C	+5 to +18											
		Brine	°C	-6 / +5 (with glycol and electronic expansion valve); +5/+18 (standard application)											
		Temperature spread	K	3 to 8											
	Maximum operating pressure		bar	6											
Heated liquid	Leaving water temperature	Water	°C	+20 to +50											
		Temperature spread	K	3 to 8											
	Maximum operating pressure		bar	6											
Outdoor air	Outdoor air temperature (cooling)	BLN	°C	+5 to +42		+5 to +42		+5 to +45		+5 to +45		+5 to +45		+5 to +45	
		ELN	°C	-18 to +40		-18 to +40		-18 to +42		-18 to +42		-18 to +42		-18 to +42	
		HT	°C	-18 to +48		-18 to +48		-18 to +48		-18 to +48		-18 to +48		-18 to +48	
	Outdoor air temperature (heating)	BLN	°C	-10 to +20		-10 to +20		-10 to +20		-10 to +20		-10 to +20		-10 to +20	
		ELN	°C	-7 to +20		-7 to +20		-7 to +20		-7 to +20		-7 to +20		-7 to +20	
		HT	°C	-10 to +20		-10 to +20		-10 to +20		-10 to +20		-10 to +20		-10 to +20	
	Available static pressure	Standard fans	Pa	0											
		High pressure fans (HPF)	Pa	< 120											
Power supply voltage			V	400 V, 3 Ø, 50 Hz (+/- 10%)											

Correction factors - AQVSL/AQVSH STAR 85 to 160 - R410A

Fouling factors - Evaporator

Fouling factor (m².°C/kW)	Cooling capacity factor	Power input factor
0.044	1.000	1.000
0.088	0.987	0.995
0.176	0.964	0.985
0.352	0.915	0.962

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

Correction factors for water ΔT different from 5 K

Models	Water temperature in/out	Cooling capacity (kW)	Power input (kW)
AQVSL - AQVSH STAR	17/7(10)	95%	98%
	14/7(7)	97%	99%
	12/7(5)	100%	100%
	10/7 (3)	103%	101%

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	1.030
2400	0.943	1.040

Physical Data - AQVSL STAR 85 to 160 - R410A - BLN Version

AQVSL STAR BLN SIZES		85	95	115	125	140	160
Cooling Capacity	kW	82.3	94.9	105.8	121.0	134.3	157.2
Input Power (Compressor)	kW	24.4	28.4	34.9	39.9	46.5	52.7
Total EER *		3.08	2.98	2.75	2.78	2.68	2.71
ESEER *		4.31	4.17	3.85	3.90	3.75	3.79
Total EER */**		2.76	2.61	2.63	2.68	2.59	2.59
ESEER */**		3.87	3.65	3.68	3.75	3.63	3.63
Number of Refrigerant Circuits		1	1	1	1	1	1
Part Load Steps	%	0-50-100	0-43-100	0-50-100	0-44-100	0-50-100	0-50-100
Power Supply		400V/3/50Hz	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz
STARtup Type		Direct	Direct	Direct	Direct	Direct	Direct
Maximum Absorbed Power	kW	Refer to Electrical data section					
Maximum Current (FLA)	A						
Startup Current (LRA)	A						
REFRIGERANT							
Type		R410A					
Charge	kg	10	11	13	15	16	19
COMPRESSOR							
Number		2	2	2	2	2	2
Type		Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Crankcase Heater	W	70	120	120	150	150	150
EVAPORATOR							
Number		1	1	1	1	1	1
Type		Plate	Plate	Plate	Plate	Plate	Plate
Water flow Rate	l/s	3.93	4.53	5.06	5.78	6.42	7.51
Water Pressure Drop	kPa	Refer to Evaporator pressure drop curve					
Antifreeze Heater	W	130	130	130	130	130	130
DESUPERHEATER							
Number		1	1	1	1	1	1
Type		Plate	Plate	Plate	Plate	Plate	Plate
Heat recovery	kW	21.3	24.7	28.1	32.2	36.2	42.0
Water flow Rate	l/s	1.02	1.18	1.34	1.54	1.73	2.01
Water Pressure Drop	kPa	Refer to Desuperheater pressure drop curve					
COIL							
Number		2	2	2	2	2	2
Frontal Surface	mm	2600 x 970	2600 x 970	2600 x 970	2600 x 970	2600 x 970	2600 x 970
FANS							
Number		2	3	2	2	2	3
Air Flow Rate	m^3/s	10.1	13.9	12.5	12.2	12.2	17.3
Speed	rpm	690	690	900	900	900	900
Input Power	kW	2.3	3.5	3.6	3.6	3.6	5.4
Input Power **	kW	5.3	8.0	5.3	5.3	5.3	8.0
WATER CONNECTIONS (EVAPORATOR)							
Type		Victaulic					
Inlet Diameter	inch	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2
Outlet Diameter	inch	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2
WATER CONNECTIONS (DESUPERHEATER)							
Type		Male GAS Threaded					
Inlet Diameter	inch	1"	1"	1"	1"	1"	1"
Outlet Diameter	inch	1"	1"	1"	1"	1"	1"
WEIGHT							
Shipping Weight	kg	945	1062	1148	1170	1261	1345
Operating Weight	kg	965	1083	1172	1194	1288	1373
DIMENSIONS							
Length	mm	2950	2950	2950	2950	2950	2950
Width	mm	1110	1110	1110	1110	1110	1110
Height	mm	2250	2250	2250	2250	2250	2250
ACOUSTIC DATA							
Sound Power Level	dB(A)	84	85	88	88	88	90
Sound Pressure Level (1)	dB(A)	52	53	56	56	56	58
Sound Power Level **	dB(A)	95	97	95	95	95	97
Sound Pressure Level ** (1)	dB(A)	63	65	63	63	63	65

(1) Sound pressure calculated at 10 m. Sound pressure levels refer to ISO standard 3744 with parallepiped shape.
(*) Gross value.
(**) HPF version.

Physical Data - AQVSL STAR 85 to 160 - R410A - ELN Version

AQVSL STAR ELN SIZES		85	95	115	125	140	160
Cooling Capacity	kW	80.1	92.4	101.9	117.2	129.5	152.2
Input Power (Compressor)	kW	25.4	29.7	37.0	41.8	48.7	55.2
Total EER *		2.99	2.90	2.59	2.66	2.54	2.60
ESEER *		4.18	4.06	3.63	3.72	3.55	3.64
Number of Refrigerant Circuits		1	1	1	1	1	1
Part Load Steps	%	0-50-100	0-43-100	0-50-100	0-44-100	0-50-100	0-50-100
Power Supply		400V/3/50Hz	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz
STARtup Type		Direct	Direct	Direct	Direct	Direct	Direct
Maximum Absorbed Power	kW	Refer to Electrical data section					
Maximum Current (FLA)	A						
Startup Current (LRA)	A						
REFRIGERANT							
Type		R410A					
Charge	kg	10	11	12	14	16	18
COMPRESSOR							
Number		2	2	2	2	2	2
Type		Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Crankcase Heater	W	70	120	120	150	150	150
EVAPORATOR							
Number		1	1	1	1	1	1
Type		Plate	Plate	Plate	Plate	Plate	Plate
Water flow Rate	l/s	3.82	4.41	4.87	5.60	6.19	7.27
Water Pressure Drop	kPa	Refer to Evaporator pressure drop curve					
Antifreeze Heater	W	130	130	130	130	130	130
DESUPERHEATER							
Number		1	1	1	1	1	1
Type		Plate	Plate	Plate	Plate	Plate	Plate
Heat recovery	kW	21.1	24.4	27.8	31.8	35.7	41.5
Water flow Rate	l/s	1.01	1.17	1.33	1.52	1.70	1.98
Water Pressure Drop	kPa	Refer to Desuperheater pressure drop curve					
COIL							
Number		2	2	2	2	2	2
Frontal Surface	mm	2600 x 970	2600 x 970	2600 x 970	2600 x 970	2600 x 970	2600 x 970
FANS							
Number		2	3	2	2	2	3
Air Flow Rate	m^3/s	8.3	11.2	10.1	10.2	10.2	14.2
Speed	rpm	550	550	690	690	690	690
Input Power	kW	1.4	2.1	2.3	2.3	2.3	3.5
WATER CONNECTIONS (EVAPORATOR)							
Type		Victaulic					
Inlet Diameter	inch	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2
Outlet Diameter	inch	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2
WATER CONNECTIONS (DESUPERHEATER)							
Type		Male GAS Threaded					
Inlet Diameter	inch	1"	1"	1"	1"	1"	1"
Outlet Diameter	inch	1"	1"	1"	1"	1"	1"
WEIGHT							
Shipping Weight	kg	962	1080	1166	1188	1278	1365
Operating Weight	kg	983	1100	1189	1211	1306	1393
DIMENSIONS							
Length	mm	2950	2950	2950	2950	2950	2950
Width	mm	1110	1110	1110	1110	1110	1110
Height	mm	2250	2250	2250	2250	2250	2250
ACOUSTIC DATA							
Sound Power Level	dB(A)	82	83	84	85	85	87
Sound Pressure Level (1)	dB(A)	50	51	52	53	53	55

(1) Sound pressure calculated at 10 m. Sound pressure levels refer to ISO standard 3744 with parallepiped shape.
(*) Gross value.

Physical Data - AQVSL STAR 85 to 160 - R410A - HT Version

AQVSL STAR HT SIZES		85	95	115	125	140	160
Cooling Capacity	kW	86.1	98.9	108.6	123.6	138.0	160.8
Input Power (Compressor)	kW	22.8	26.3	33.4	38.5	44.8	50.9
Total EER *		3.06	2.88	2.80	2.82	2.75	2.73
ESEER *		4.29	4.04	3.92	3.95	3.86	3.82
Number of Refrigerant Circuits		1	1	1	1	1	1
Part Load Steps	%	0-50-100	0-43-100	0-50-100	0-44-100	0-50-100	0-50-100
Power Supply		400V/3/50Hz	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz
STARtup Type		Direct	Direct	Direct	Direct	Direct	Direct
Maximum Absorbed Power	kW	Refer to Electrical data section					
Maximum Current (FLA)	A						
Startup Current (LRA)	A						
REFRIGERANT							
Type		R410A					
Charge	kg	10	12	13	15	17	19
COMPRESSOR							
Number		2	2	2	2	2	2
Type		Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Crankcase Heater	W	70	120	120	150	150	150
EVAPORATOR							
Number		1	1	1	1	1	1
Type		Plate	Plate	Plate	Plate	Plate	Plate
Water flow Rate	l/s	4.12	4.73	5.19	5.91	6.59	7.68
Water Pressure Drop	kPa	Refer to Evaporator pressure drop curve					
Antifreeze Heater	W	130	130	130	130	130	130
DESUPERHEATER							
Number		1	1	1	1	1	1
Type		Plate	Plate	Plate	Plate	Plate	Plate
Heat recovery	kW	21.8	25.0	28.4	32.4	36.5	42.4
Water flow Rate	l/s	1.04	1.20	1.36	1.55	1.75	2.02
Water Pressure Drop	kPa	Refer to Desuperheater pressure drop curve					
COIL							
Number		2	2	2	2	2	2
Frontal Surface	mm	2600 x 970	2600 x 970	2600 x 970	2600 x 970	2600 x 970	2600 x 970
FANS							
Number		2	3	2	2	2	3
Air Flow Rate	m^3/s	15.0	21.1	14.8	14.1	14.1	20.2
Speed	rpm	1100	1100	1100	1100	1100	1100
Input Power	kW	5.3	8.0	5.3	5.3	5.3	8.0
WATER CONNECTIONS (EVAPORATOR)							
Type		Victaulic					
Inlet Diameter	inch	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2
Outlet Diameter	inch	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2
WATER CONNECTIONS (DESUPERHEATER)							
Type		Male GAS Threaded					
Inlet Diameter	inch	1"	1"	1"	1"	1"	1"
Outlet Diameter	inch	1"	1"	1"	1"	1"	1"
WEIGHT							
Shipping Weight	kg	965	1092	1168	1190	1281	1375
Operating Weight	kg	985	1113	1192	1214	1308	1403
DIMENSIONS							
Length	mm	2950	2950	2950	2950	2950	2950
Width	mm	1110	1110	1110	1110	1110	1110
Height	mm	2250	2250	2250	2250	2250	2250
ACOUSTIC DATA							
Sound Power Level	dB(A)	95	97	95	95	95	97
Sound Pressure Level (1)	dB(A)	63	65	63	63	63	65

(1) Sound pressure calculated at 10 m. Sound pressure levels refer to ISO standard 3744 with parallepiped shape.
(*) Gross value.

Physical Data - AQVSH STAR 85 to 160 - R410A - BLN Version

AQVSH STAR BLN SIZES		85	95	115	125	140	160
Cooling Capacity	kW	75.4	85.4	102.6	114.6	132.2	152.4
Input Power (Compressor)	kW	26.6	32.0	35.1	41.8	46.5	54.1
Total EER *		2.61	2.41	2.65	2.52	2.64	2.56
ESEER *		3.65	3.37	3.71	3.53	3.70	3.59
Total EER */**		2.36	2.13	2.53	2.43	2.55	2.45
ESEER */**		3.31	2.99	3.55	3.40	3.57	3.44
Heating Capacity	kW	82.9	96.0	112.2	127.9	143.2	167.6
Input Power (Compressor)	kW	24.6	30.1	34.5	39.5	44.3	51.7
Total COP *		3.08	2.86	2.94	2.97	2.99	2.94
Total COP **		2.77	2.52	2.81	2.85	2.89	2.81
Number of Refrigerant Circuits		1	1	1	1	1	1
Part Load Steps	%	0-50-100	0-43-100	0-50-100	0-44-100	0-50-100	0-50-100
Power Supply		400V/3/50Hz	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz
STARtup Type		Direct	Direct	Direct	Direct	Direct	Direct
Maximum Absorbed Power	kW	Refer to Electrical data section					
Maximum Current (FLA)	A						
Startup Current (LRA)	A						
REFRIGERANT							
Type		R410A					
Charge	kg	17	20	24	26	30	35
COMPRESSOR							
Number		2	2	2	2	2	2
Type		Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Crankcase Heater	W	70	120	120	150	150	150
EVAPORATOR							
Number		1	1	1	1	1	1
Type		Plate	Plate	Plate	Plate	Plate	Plate
Water flow Rate	l/s	3.60	4.08	4.90	5.47	6.31	7.28
Water Pressure Drop	kPa	Refer to Evaporator pressure drop curve					
Antifreeze Heater	W	130	130	130	130	130	130
DESUPERHEATER							
Number		1	1	1	1	1	1
Type		Plate	Plate	Plate	Plate	Plate	Plate
Heat recovery	kW	20.4	23.5	27.5	31.3	35.7	41.3
Water flow Rate	l/s	0.97	1.12	1.32	1.49	1.71	1.97
Water Pressure Drop	kPa	Refer to Desuperheater pressure drop curve					
COIL							
Number		2	2	2	2	2	2
Frontal Surface	mm	2600 x 970	2600 x 970	2600 x 970	2600 x 970	2600 x 970	2600 x 970
FANS							
Number		2	3	2	2	2	3
Air Flow Rate	m^3/s	9.9	13.4	11.7	11.7	11.1	14.5
Speed	rpm	690	690	900	900	900	900
Input Power	kW	2.3	3.5	3.6	3.6	3.6	5.4
Input Power **	kW	5.3	8.0	5.3	5.3	5.3	8.0
WATER CONNECTIONS (EVAPORATOR)							
Type		Victaulic					
Inlet Diameter	inch	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2
Outlet Diameter	inch	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2
WATER CONNECTIONS (DESUPERHEATER)							
Type		Male GAS Threaded					
Inlet Diameter	inch	1"	1"	1"	1"	1"	1"
Outlet Diameter	inch	1"	1"	1"	1"	1"	1"
WEIGHT							
Shipping Weight	kg	996	1114	1207	1235	1329	1415
Operating Weight	kg	1016	1134	1231	1258	1356	1442
DIMENSIONS							
Length	mm	2950	2950	2950	2950	2950	2950
Width	mm	1110	1110	1110	1110	1110	1110
Height	mm	2250	2250	2250	2250	2250	2250
ACOUSTIC DATA							
Sound Power Level	dB(A)	84	85	88	88	88	90
Sound Pressure Level (1)	dB(A)	52	53	56	56	56	58
Sound Power Level **	dB(A)	95	97	95	95	95	97
Sound Pressure Level ** (1)	dB(A)	63	65	63	63	63	65

(1) Sound pressure calculated at 10 m. Sound pressure levels refer to ISO standard 3744 with parallepiped shape.
(*) Gross value.
(**) HPF version.

Physical Data - AQVSH STAR 85 to 160 - R410A - ELN Version

AQVSH STAR ELN SIZES		85	95	115	125	140	160
Cooling Capacity	kW	72.8	82.1	98.8	109.7	126.5	145.0
Input Power (Compressor)	kW	27.8	33.9	37.3	44.4	49.2	57.8
Total EER *		2.50	2.28	2.50	2.35	2.46	2.37
ESEER *		3.50	3.19	3.49	3.28	3.44	3.31
Heating Capacity	kW	81.0	93.7	109.5	124.4	139.0	161.7
Input Power (Compressor)	kW	24.6	30.1	34.5	39.5	44.3	51.6
Total COP *		3.12	2.91	2.97	2.98	2.99	2.94
Number of Refrigerant Circuits		1	1	1	1	1	1
Part Load Steps	%	0-50-100	0-43-100	0-50-100	0-44-100	0-50-100	0-50-100
Power Supply		400V/3/50Hz	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz
STARtup Type		Direct	Direct	Direct	Direct	Direct	Direct
Maximum Absorbed Power	kW	Refer to Electrical data section					
Maximum Current (FLA)	A						
Startup Current (LRA)	A						
REFRIGERANT							
Type		R410A					
Charge	kg	17	19	23	25	29	33
COMPRESSOR							
Number		2	2	2	2	2	2
Type		Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Crankcase Heater	W	70	120	120	150	150	150
EVAPORATOR							
Number		1	1	1	1	1	1
Type		Plate	Plate	Plate	Plate	Plate	Plate
Water flow Rate	l/s	3.48	3.92	4.72	5.24	6.05	6.93
Water Pressure Drop	kPa	Refer to Evaporator pressure drop curve					
Antifreeze Heater	W	130	130	130	130	130	130
DESUPERHEATER							
Number		1	1	1	1	1	1
Type		Plate	Plate	Plate	Plate	Plate	Plate
Heat recovery	kW	20.1	23.2	27.2	30.8	35.1	40.6
Water flow Rate	l/s	0.96	1.11	1.30	1.47	1.68	1.94
Water Pressure Drop	kPa	Refer to Desuperheater pressure drop curve					
COIL							
Number		2	2	2	2	2	2
Frontal Surface	mm	2600 x 970	2600 x 970	2600 x 970	2600 x 970	2600 x 970	2600 x 970
FANS							
Number		2	3	2	2	2	3
Air Flow Rate	m^3/s	8.5	11.1	9.4	9.4	8.9	11.1
Speed	rpm	550	550	690	690	690	690
Input Power	kW	1.4	2.1	2.3	2.3	2.3	3.5
WATER CONNECTIONS (EVAPORATOR)							
Type		Victaulic					
Inlet Diameter	inch	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2
Outlet Diameter	inch	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2
WATER CONNECTIONS (DESUPERHEATER)							
Type		Male GAS Threaded					
Inlet Diameter	inch	1"	1"	1"	1"	1"	1"
Outlet Diameter	inch	1"	1"	1"	1"	1"	1"
WEIGHT							
Shipping Weight	kg	1013	1131	1225	1253	1346	1435
Operating Weight	kg	1034	1152	1248	1276	1374	1462
DIMENSIONS							
Length	mm	2950	2950	2950	2950	2950	2950
Width	mm	1110	1110	1110	1110	1110	1110
Height	mm	2250	2250	2250	2250	2250	2250
ACOUSTIC DATA							
Sound Power Level	dB(A)	82	83	84	85	85	87
Sound Pressure Level (1)	dB(A)	50	51	52	53	53	55

(1) Sound pressure calculated at 10 m. Sound pressure levels refer to ISO standard 3744 with parallepiped shape.
(*) Gross value.

Physical Data - AQVSH STAR 85 to 160 - R410A - HT Version

AQVSH STAR HT SIZES		85	95	115	125	140	160
Cooling Capacity	kW	80.5	91.5	105.3	118.1	136.2	157.3
Input Power (Compressor)	kW	24.4	28.7	33.7	40.0	44.5	51.7
Total EER *		2.71	2.49	2.70	2.60	2.73	2.63
ESEER *		3.79	3.49	3.78	3.65	3.82	3.69
Heating Capacity	kW	86.5	100.4	114.0	130.3	147.4	171.3
Input Power (Compressor)	kW	24.7	30.1	34.5	39.5	44.2	51.7
Total COP *		2.88	2.63	2.86	2.90	2.98	2.87
Number of Refrigerant Circuits		1	1	1	1	1	1
Part Load Steps	%	0-50-100	0-43-100	0-50-100	0-44-100	0-50-100	0-50-100
Power Supply		400V/3/50Hz	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz
STARtup Type		Direct	Direct	Direct	Direct	Direct	Direct
Maximum Absorbed Power	kW	Refer to Electrical data section					
Maximum Current (FLA)	A						
Startup Current (LRA)	A						
REFRIGERANT							
Type		R410A					
Charge	kg	19	21	24	27	31	36
COMPRESSOR							
Number		2	2	2	2	2	2
Type		Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Crankcase Heater	W	70	120	120	150	150	150
EVAPORATOR							
Number		1	1	1	1	1	1
Type		Plate	Plate	Plate	Plate	Plate	Plate
Water flow Rate	l/s	3.84	4.37	5.03	5.64	6.51	7.51
Water Pressure Drop	kPa	Refer to Evaporator pressure drop curve					
Antifreeze Heater	W	130	130	130	130	130	130
DESUPERHEATER							
Number		1	1	1	1	1	1
Type		Plate	Plate	Plate	Plate	Plate	Plate
Heat recovery	kW	21.0	24.0	27.8	31.6	36.1	41.8
Water flow Rate	l/s	1.00	1.15	1.33	1.51	1.73	2.00
Water Pressure Drop	kPa	Refer to Desuperheater pressure drop curve					
COIL							
Number		2	2	2	2	2	2
Frontal Surface	mm	2600 x 970	2600 x 970	2600 x 970	2600 x 970	2600 x 970	2600 x 970
FANS							
Number		2	3	2	2	2	3
Air Flow Rate	m^3/s	14.2	20.1	13.8	13.8	13.2	17.8
Speed	rpm	1100	1100	1100	1100	1100	1100
Input Power	kW	5.3	8.0	5.3	5.3	5.3	8.0
WATER CONNECTIONS (EVAPORATOR)							
Type		Victaulic					
Inlet Diameter	inch	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2
Outlet Diameter	inch	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2
WATER CONNECTIONS (DESUPERHEATER)							
Type		Male GAS Threaded					
Inlet Diameter	inch	1"	1"	1"	1"	1"	1"
Outlet Diameter	inch	1"	1"	1"	1"	1"	1"
WEIGHT							
Shipping Weight	kg	1016	1144	1227	1255	1349	1445
Operating Weight	kg	1036	1164	1251	1278	1376	1472
DIMENSIONS							
Length	mm	2950	2950	2950	2950	2950	2950
Width	mm	1110	1110	1110	1110	1110	1110
Height	mm	2250	2250	2250	2250	2250	2250
ACOUSTIC DATA							
Sound Power Level	dB(A)	95	97	95	95	95	97
Sound Pressure Level (1)	dB(A)	63	65	63	63	63	65

(1) Sound pressure calculated at 10 m. Sound pressure levels refer to ISO standard 3744 with parallepiped shape.
(*) Gross value.

Electrical Data - AQVSL/AQVSH STAR 85 to 160 - R410A - STD BLN Version

Compressor data - 400 V/3 Ph/50 Hz

		Power input at nominal cond. per comp. [kW]	Nom.Cond. current per compressor [A]	Power input at max cond. per comp. [kW]	Current at max cond. per comp. FLA [A]	STARt up current LRA [A]	Power factor @ nominal condition
85	COMP 1	12.5	23.0	17.4	38.6	197	0.79
	COMP 2	12.5	23.0	17.4	38.6	197	0.79
95	COMP 1	12.5	24.6	17.3	36.0	160	0.74
	COMP 2	17.0	30.8	23.8	51	215	0.80
115	COMP 1	17.0	30.8	23.8	51	215	0.80
	COMP 2	17.0	30.8	23.8	51	215	0.80
125	COMP 1	17.0	30.8	23.8	51	215	0.80
	COMP 2	21.9	40.5	30.0	65	260	0.78
140	COMP 1	21.9	40.5	30.0	65	260	0.78
	COMP 2	21.9	40.5	30.0	65	260	0.78
160	COMP 1	25.7	44.1	35.4	79	320	0.84
	COMP 2	25.7	44.1	35.4	79	320	0.84

Units - 400 V/3 Ph/50 Hz

Sizes	BLN unit without pump option					
	85	95	115	125	140	160
Power input [kW] nominal	27	33	38	43	47	57
Power input [kW] max.	37	45	51	57	64	76
Current input [A] nominal.	50	62	69	79	89	100
Current input [A] max.	82	94	110	124	138	169
Start-up current (A)	240	258	274	319	333	410
Sizes	**BLN unit with 1/2 pump option**					
	85	95	115	125	140	160
Power input [kW] nominal	29	35	40	45	51	60
Power input [kW] max.	39	47	54	60	67	80
Current input [A] nominal.	54	66	74	84	95	106
Current input [A] max.	85	97	115	129	144	176
Start-up current (A)	244	261	279	324	339	417
Sizes	**BLN unit with 3 pump option**					
	85	95	115	125	140	160
Power input [kW] nominal	30	36	40	46	51	60
Power input [kW] max.	40	47	54	61	67	80
Current input [A] nominal.	56	67	75	86	96	106
Current input [A] max.	87	99	115	131	145	176
Start-up current (A)	245	263	279	326	340	417

Fan electrical data - 400 V/3 Ph/50 Hz

Sizes	Number	Nominal power (kW)	Max. running current (A)	
85	2	1.15	2.2	6p - Y
95	3	1.15	2.2	6p - Y
115	2	1.80	3.8	6p - Δ
125	2	1.80	3.8	6p - Δ
140	2	1.80	3.8	6p - Δ
160	3	1.80	3.8	6p - Δ

Pump electrical data - 400 V/3 Ph/50 Hz

Sizes	1 P Unit		2 P Unit		3 P Unit	
	Nominal power (kW)	Max. running current (A)	Nominal power (kW)	Max. running current (A)	Nominal power (kW)	Max. running current (A)
85	1.99	3.65	1.99	3.65	1.43	2.70
95	1.99	3.65	1.99	3.65	1.43	2.70
115	2.47	4.98	2.47	4.98	1.43	2.70
125	2.47	4.98	2.47	4.98	1.84	3.49
140	3.58	6.38	3.58	6.38	1.84	3.49
160	3.58	6.38	3.58	6.38	1.84	3.49

Electrical Data - AQVSL/AQVSH STAR 85 to 160 - R410A - STD ELN Version

Compressor data - 400 V/3 Ph/50 Hz

		Power input at nominal cond. per comp. [kW]	Nom.Cond. current per compressor [A]	Power input at max cond. per comp. [kW]	Current at max cond. per comp. FLA [A]	STARt up current LRA [A]	Power factor @ nominal condition
85	COMP 1	12.5	23.0	17.4	38.6	197	0.79
	COMP 2	12.5	23.0	17.4	38.6	197	0.79
95	COMP 1	12.5	24.6	17.3	36.0	160	0.74
	COMP 2	17.0	30.8	23.8	51	215	0.80
115	COMP 1	17.0	30.8	23.8	51	215	0.80
	COMP 2	17.0	30.8	23.8	51	215	0.80
125	COMP 1	17.0	30.8	23.8	51	215	0.80
	COMP 2	21.9	40.5	30.0	65	260	0.78
140	COMP 1	21.9	40.5	30.0	65	260	0.78
	COMP 2	21.9	40.5	30.0	65	260	0.78
160	COMP 1	25.7	44.1	35.4	79	320	0.84
	COMP 2	25.7	44.1	35.4	79	320	0.84

Units - 400 V/3 Ph/50 Hz

Sizes	ELN unit without pump option					
	85	95	115	125	140	160
Power input [kW] nominal	27	33	36	41	46	55
Power input [kW] max.	37	45	50	56	62	74
Current input [A] nominal.	50	62	66	76	85	95
Current input [A] max.	82	94	106	120	134	165
Start-up current (A)	240	258	270	315	329	406
Sizes	**ELN unit with 1/2 pump option**					
	85	95	115	125	140	160
Power input [kW] nominal	29	35	39	44	50	58
Power input [kW] max.	39	47	52	59	66	78
Current input [A] nominal.	54	66	71	81	92	101
Current input [A] max.	85	97	111	125	141	171
Start-up current (A)	244	261	275	320	336	412
Sizes	**ELN unit with 3 pump option**					
	85	95	115	125	140	160
Power input [kW] nominal	30	36	39	45	50	59
Power input [kW] max.	40	47	53	60	66	78
Current input [A] nominal.	56	67	71	83	92	102
Current input [A] max.	87	99	112	127	141	172
Start-up current (A)	245	263	276	322	336	413

Fan electrical data - 400 V/3 Ph/50 Hz

Sizes	Number	Nominal power (kW)	Max. running current (A)	
85	2	1.15	2.2	6p - Y + FSC
95	3	1.15	2.2	6p - Y + FSC
115	2	1.15	2.2	6p - Y + FSC
125	2	1.15	2.2	6p - Y + FSC
140	2	1.15	2.2	6p - Y + FSC
160	3	1.15	2.2	6p - Y + FSC

Pump electrical data - 400 V/3 Ph/50 Hz

Sizes	1 P Unit		2 P Unit		3 P Unit	
	Nominal power (kW)	Max. running current (A)	Nominal power (kW)	Max. running current (A)	Nominal power (kW)	Max. running current (A)
85	1.99	3.65	1.99	3.65	1.43	2.70
95	1.99	3.65	1.99	3.65	1.43	2.70
115	2.47	4.98	2.47	4.98	1.43	2.70
125	2.47	4.98	2.47	4.98	1.84	3.49
140	3.58	6.38	3.58	6.38	1.84	3.49
160	3.58	6.38	3.58	6.38	1.84	3.49

Electrical Data - AQVSL/AQVSH STAR 85 to 160 - R410A - HT/HPF Version

Compressor data - 400 V/3 Ph/50 Hz

		Power input at nominal cond. per comp. [kW]	Nom.Cond. current per compressor [A]	Power input at max cond. per comp. [kW]	Current at max cond. per comp. FLA [A]	STARt up current LRA [A]	Power factor @ nominal condition
85	COMP 1	12.5	23.0	17.4	38.6	197	0.79
	COMP 2	12.5	23.0	17.4	38.6	197	0.79
95	COMP 1	12.5	24.6	17.3	36.0	160	0.74
	COMP 2	17.0	30.8	23.8	51	215	0.80
115	COMP 1	17.0	30.8	23.8	51	215	0.80
	COMP 2	17.0	30.8	23.8	51	215	0.80
125	COMP 1	17.0	30.8	23.8	51	215	0.80
	COMP 2	21.9	40.5	30.0	65	260	0.78
140	COMP 1	21.9	40.5	30.0	65	260	0.78
	COMP 2	21.9	40.5	30.0	65	260	0.78
160	COMP 1	25.7	44.1	35.4	79	320	0.84
	COMP 2	25.7	44.1	35.4	79	320	0.84

Units - 400 V/3 Ph/50 Hz

Sizes	HT/HPF unit without pump option					
	85	95	115	125	140	160
Power input [kW] nominal	30	37	39	44	49	59
Power input [kW] max.	40	49	53	59	65	79
Current input [A] nominal.	54	68	70	79	89	100
Current input [A] max.	85	99	110	124	138	170
Start-up current (A)	244	263	274	319	333	411
Sizes	**HT/HPF unit with 1/2 pump option**					
	85	95	115	125	140	160
Power input [kW] nominal	32	39	42	47	53	63
Power input [kW] max.	42	51	55	62	69	82
Current input [A] nominal.	58	71	75	84	96	107
Current input [A] max.	89	103	115	129	145	177
Start-up current (A)	247	267	279	324	340	418
Sizes	**HT/HPF unit with 3 pump option**					
	85	95	115	125	140	160
Power input [kW] nominal	33	40	42	48	53	63
Power input [kW] max.	43	52	56	63	69	82
Current input [A] nominal.	60	73	75	86	96	107
Current input [A] max.	91	105	116	131	145	177
Start-up current (A)	249	269	280	326	340	418

Fan electrical data - 400 V/3 Ph/50 Hz

Sizes	Number	Nominal power (kW)	Max. running current (A)	
85	2	2.67	4.1	EC motors
95	3	2.67	4.1	EC motors
115	2	2.67	4.1	EC motors
125	2	2.67	4.1	EC motors
140	2	2.67	4.1	EC motors
160	3	2.67	4.1	EC motors

Pump electrical data - 400 V/3 Ph/50 Hz

Sizes	1 P Unit		2 P Unit		3 P Unit	
	Nominal power (kW)	Max. running current (A)	Nominal power (kW)	Max. running current (A)	Nominal power (kW)	Max. running current (A)
85	1.99	3.65	1.99	3.65	1.43	2.70
95	1.99	3.65	1.99	3.65	1.43	2.70
115	2.47	4.98	2.47	4.98	1.43	2.70
125	2.47	4.98	2.47	4.98	1.84	3.49
140	3.58	6.38	3.58	6.38	1.84	3.49
160	3.58	6.38	3.58	6.38	1.84	3.49

Sound Data - AQVSL/AQVSH STAR 85 to 160 - R410A

STD BLN models

Sizes	Octave Band (Hz)								Sound Power Level dB(A)	Sound Pressure Level* dB(A)
	63	125	250	500	1000	2000	4000	8000		
	Sound Power Level dB									
85	88	83	84	82	79	74	68	62	84	52
95	89	84	85	83	80	75	69	63	85	53
115	92	87	88	86	83	78	72	66	88	56
125	92	87	88	86	83	78	72	66	88	56
140	92	87	88	86	83	78	72	66	88	56
160	94	89	90	88	85	80	74	68	90	58

* Sound pressure level at 10 metre. Values refers to ISO Standard 3744 with parallepiped shape.

STD ELN models

Sizes	Octave Band (Hz)								Sound Power Level dB(A)	Sound Pressure Level* dB(A)
	63	125	250	500	1000	2000	4000	8000		
	Sound Power Level dB									
85	86	81	82	80	77	72	66	60	82	50
95	87	82	83	81	78	73	67	61	83	51
115	88	83	84	82	79	74	68	62	84	52
125	89	84	85	83	80	75	69	63	85	53
140	89	84	85	83	80	75	69	63	85	53
160	91	86	87	85	82	77	71	65	87	55

* Sound pressure level at 10 metre. Values refers to ISO Standard 3744 with parallepiped shape.

HPF/HT models

Sizes	Octave Band (Hz)								Sound Power Level dB(A)	Sound Pressure Level* dB(A)
	63	125	250	500	1000	2000	4000	8000		
	Sound Power Level dB									
85	99	94	95	93	90	85	79	73	95	63
95	101	96	97	95	92	87	81	75	97	65
115	99	94	95	93	90	85	79	73	95	63
125	99	94	95	93	90	85	79	73	95	63
140	99	94	95	93	90	85	79	73	95	63
160	101	96	97	95	92	87	81	75	97	65

* Sound pressure level at 10 metre. Values refers to ISO Standard 3744 with parallepiped shape.

Performance Data - AQVSL STAR 85 to 160 - R410A - STD BLN Version

AQVSL STAR sizes	LWT (°C)	Ambient air temperature (°C)																			
		25		30		32		35		38		40		42		45		48		50	
		Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)
AQVSL 85	5	87.2	19.8	82.6	21.9	80.7	22.7	77.7	24.1	74.6	25.5	72.5	26.5	70.3	27.5	67.0	29.1	63.7	30.6	61.5	31.7
	7	92.3	20.2	87.4	22.2	85.4	23.1	**82.3**	**24.4**	79.1	25.9	76.9	26.8	74.6	27.9	71.1	29.4	67.6	31.0		
	9	97.5	20.5	92.5	22.6	90.4	23.4	87.1	24.8	83.7	26.2	81.3	27.2	78.9	28.3	75.2	29.8	71.5	31.4		
	11	102.9	20.9	97.6	22.9	95.4	23.8	91.9	25.2	88.4	26.6	85.9	27.6	83.4	28.6	79.5	30.2	75.7	31.8		
	13	108.5	21.3	102.9	23.3	100.6	24.2	97.0	25.6	93.2	27.0	90.7	28.0	88.0	29.0	83.9	30.6				
	15	114.3	21.7	108.3	23.8	105.8	24.7	102.1	26.0	98.2	27.4	95.5	28.4	92.8	29.5	88.5	31.0				
	18	123.0	22.3	116.7	24.4	114.1	25.3	110.1	26.7	105.9	28.1	103.0	29.1	100.1	30.1	95.5	31.7				
AQVSL 95	5	100.5	23.0	95.2	25.4	93.0	26.4	89.6	28.0	86.0	29.6	83.6	30.8	81.1	32.0	77.3	33.8	73.5	35.6	71.0	36.8
	7	106.4	23.4	100.8	25.8	98.5	26.8	**94.9**	**28.4**	91.2	30.0	88.6	31.2	86.0	32.4	82.0	34.2	77.9	36.0	75.3	37.2
	9	112.4	23.8	106.6	26.2	104.2	27.2	100.4	28.8	96.4	30.5	93.7	31.6	91.0	32.8	86.7	34.7	82.5	36.5		
	11	118.7	24.3	112.5	26.7	110.0	27.7	106.0	29.3	101.9	30.9	99.0	32.1	96.1	33.3	91.7	35.1	87.3	36.9		
	13	125.1	24.7	118.7	27.1	116.0	28.1	111.8	29.7	107.5	31.4	104.5	32.5	101.5	33.7	96.8	35.6	92.1	37.4		
	15	131.8	25.2	124.9	27.6	122.0	28.6	117.7	30.2	113.2	31.9	110.1	33.0	107.0	34.2	102.0	36.1				
	18	141.9	26.0	134.6	28.4	131.6	29.4	126.9	31.0	122.1	32.7	118.8	33.8	115.4	35.0	110.2	36.8				
AQVSL 115	5	112.1	28.3	106.2	31.2	103.7	32.4	99.9	34.4	96.0	36.4	93.2	37.9	90.4	39.3	86.2	41.5	81.9	43.8		
	7	118.7	28.8	112.4	31.7	109.8	32.9	**105.8**	**34.9**	101.7	36.9	98.9	38.3	95.9	39.8	91.4	42.0				
	9	125.4	29.3	118.9	32.2	116.2	33.5	112.0	35.4	107.6	37.5	104.5	38.9	101.4	40.4	96.7	42.6				
	11	132.4	29.8	125.5	32.8	122.7	34.0	118.2	36.0	113.6	38.0	110.5	39.4	107.2	40.9	102.3	43.1				
	13	139.5	30.4	132.3	33.3	129.3	34.6	124.7	36.5	119.9	38.6	116.6	40.0	113.2	41.5						
	15	147.0	31.0	139.3	33.9	136.1	35.2	131.2	37.2	126.3	39.2	122.8	40.6	119.3	42.0						
	18	158.2	31.9	150.1	34.9	146.7	36.1	141.5	38.1	136.2	40.1	132.5	41.6	128.7	43.0						
AQVSL 125	5	128.1	32.3	121.4	35.6	118.6	37.1	114.2	39.3	109.7	41.6	106.5	43.2	103.4	44.9	98.5	47.4	93.6	50.0		
	7	135.6	32.9	128.5	36.2	125.5	37.6	**121.0**	**39.9**	116.2	42.2	113.0	43.8	109.6	45.4	104.5	48.0				
	9	143.3	33.5	135.9	36.8	132.8	38.2	128.0	40.4	122.9	42.8	119.5	44.4	115.9	46.1	110.5	48.7				
	11	151.3	34.1	143.5	37.4	140.2	38.8	135.1	41.1	129.9	43.4	126.2	45.0	122.5	46.7	116.9	49.3				
	13	159.5	34.7	151.2	38.1	147.8	39.5	142.5	41.7	137.0	44.1	133.2	45.7	129.3	47.4						
	15	168.1	35.4	159.2	38.8	155.6	40.2	150.0	42.4	144.3	44.8	140.4	46.4	136.3	48.0						
	18	180.8	36.4	171.5	39.8	167.7	41.3	161.7	43.5	155.6	45.9	151.4	47.5	147.1	49.1						
AQVSL 140	5	142.2	37.7	134.7	41.6	131.6	43.2	126.8	45.8	121.7	48.5	118.3	50.4	114.7	52.4	109.3	55.3				
	7	150.5	38.4	142.7	42.2	139.4	43.9	**134.3**	**46.5**	129.0	49.2	125.4	51.1	121.7	53.0	116.0	56.0				
	9	159.1	39.1	150.9	42.9	147.4	44.6	142.0	47.2	136.5	49.9	132.6	51.8	128.7	53.8						
	11	167.9	39.7	159.2	43.7	155.6	45.3	150.0	47.9	144.1	50.7	140.1	52.6	136.0	54.5						
	13	177.0	40.5	167.9	44.4	164.1	46.1	158.2	48.7	152.1	51.4	147.9	53.3	143.6	55.2						
	15	186.6	41.3	176.7	45.2	172.7	46.9	166.5	49.5	160.2	52.2	155.9	54.1								
	18	200.7	42.5	190.4	46.5	186.1	48.2	179.5	50.8	172.7	53.5	168.1	55.4								
AQVSL 160	5	166.5	42.7	157.7	47.1	154.1	49.0	148.4	51.9	142.5	55.0	138.5	57.2	134.3	59.4	128.0	62.7				
	7	176.3	43.5	167.0	47.9	163.2	49.8	**157.2**	**52.7**	151.1	55.8	146.9	57.9	142.5	60.1	135.8	63.5				
	9	186.2	44.3	176.6	48.6	172.6	50.5	166.3	53.5	159.8	56.6	155.3	58.7	150.7	60.9	143.7	64.3				
	11	196.6	45.0	186.4	49.5	182.2	51.4	175.6	54.3	168.8	57.4	164.1	59.6	159.3	61.8	151.9	65.1				
	13	207.3	45.9	196.6	50.3	192.1	52.2	185.2	55.2	178.1	58.3	173.2	60.4	168.1	62.6						
	15	218.4	46.8	206.9	51.2	202.2	53.1	195.0	56.1	187.6	59.2	182.5	61.3	177.2	63.5						
	18	235.0	48.2	223.0	52.7	217.9	54.6	210.2	57.5	202.2	60.6	196.8	62.7	191.1	65.0						

(*) Compressors only
LWT : Leaving Water Temperature

Performance Data - AQVSL STAR 85 to 160 - R410A - STD ELN Version

AQVSL STAR sizes	LWT (°C)	Ambient air temperature (°C)																	
		25		30		32		35		38		40		42		45		48	
		Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)
AQVSL 85	5	84.8	20.6	80.3	22.7	78.5	23.6	75.6	25.0	72.6	26.5	70.5	27.6	68.4	28.6	65.2	30.2	62.0	31.9
	7	89.7	21.0	85.0	23.1	83.1	24.0	**80.1**	**25.4**	76.9	26.9	74.8	27.9	72.6	29.0	69.1	30.6		
	9	94.8	21.3	89.9	23.5	87.9	24.4	84.7	25.8	81.4	27.3	79.1	28.3	76.7	29.4	73.1	31.0		
	11	100.1	21.7	94.9	23.9	92.8	24.8	89.4	26.2	85.9	27.7	83.5	28.7	81.1	29.8	77.4	31.4		
	13	105.5	22.1	100.1	24.3	97.8	25.2	94.3	26.6	90.7	28.1	88.2	29.1	85.6	30.2	81.6	31.8		
	15	111.2	22.6	105.4	24.7	102.9	25.6	99.3	27.1	95.5	28.5	92.9	29.6	90.2	30.6				
	18	119.7	23.2	113.5	25.4	111.0	26.3	107.0	27.7	103.0	29.2	100.2	30.3	97.3	31.3				
AQVSL 95	5	97.9	24.1	92.7	26.6	90.5	27.6	87.2	29.3	83.8	31.0	81.4	32.2	78.9	33.5	75.2	35.4	71.5	37.3
	7	103.6	24.5	98.1	27.0	95.9	28.1	**92.4**	**29.7**	88.8	31.5	86.3	32.7	83.7	33.9	79.8	35.8	75.9	37.7
	9	109.4	25.0	103.8	27.4	101.4	28.5	97.7	30.2	93.9	31.9	91.3	33.1	88.5	34.4	84.4	36.3		
	11	115.5	25.4	109.6	27.9	107.1	29.0	103.2	30.6	99.2	32.4	96.4	33.6	93.6	34.8	89.3	36.7		
	13	121.8	25.9	115.5	28.4	112.9	29.5	108.8	31.1	104.6	32.9	101.8	34.1	98.8	35.3	94.2	37.2		
	15	128.3	26.4	121.6	28.9	118.8	30.0	114.6	31.7	110.2	33.4	107.2	34.6	104.1	35.8	99.3	37.8		
	18	138.1	27.2	131.0	29.7	128.1	30.8	123.5	32.5	118.8	34.2	115.6	35.4	112.3	36.6				
AQVSL 115	5	108.0	30.0	102.3	33.1	99.9	34.4	96.2	36.5	92.4	38.6	89.8	40.1	87.1	41.7	83.0	44.1		
	7	114.3	30.5	108.3	33.6	105.8	34.9	**101.9**	**37.0**	98.0	39.2	95.2	40.7	92.4	42.2				
	9	120.8	31.1	114.5	34.2	111.9	35.5	107.8	37.6	103.6	39.7	100.7	41.2	97.7	42.8				
	11	127.5	31.6	120.9	34.7	118.1	36.1	113.9	38.2	109.4	40.3	106.4	41.8	103.3	43.4				
	13	134.4	32.2	127.5	35.3	124.6	36.7	120.1	38.8	115.5	40.9	112.3	42.4						
	15	141.6	32.9	134.2	36.0	131.1	37.3	126.4	39.4	121.6	41.6	118.3	43.0						
	18	152.4	33.8	144.6	37.0	141.3	38.3	136.3	40.4	131.1	42.6								
AQVSL 125	5	124.2	33.9	117.6	37.4	114.9	38.9	110.7	41.2	106.3	43.6	103.2	45.3	100.2	47.1	95.4	49.7		
	7	131.4	34.5	124.5	38.0	121.7	39.5	**117.2**	**41.8**	112.6	44.2	109.5	45.9	106.2	47.6	101.2	50.3		
	9	138.8	35.1	131.7	38.6	128.7	40.1	124.0	42.4	119.1	44.9	115.8	46.6	112.3	48.3				
	11	146.6	35.7	139.0	39.2	135.8	40.7	130.9	43.1	125.8	45.5	122.3	47.2	118.7	49.0				
	13	154.5	36.4	146.6	39.9	143.2	41.4	138.1	43.8	132.8	46.2	129.1	47.9	125.3	49.7				
	15	162.8	37.1	154.3	40.6	150.7	42.2	145.3	44.5	139.8	46.9	136.0	48.6						
	18	175.2	38.2	166.2	41.8	162.5	43.3	156.7	45.6	150.8	48.1								
AQVSL 140	5	137.2	39.5	130.0	43.6	126.9	45.3	122.3	48.0	117.4	50.9	114.1	52.9	110.7	54.9				
	7	145.2	40.2	137.6	44.3	134.4	46.0	**129.5**	**48.7**	124.5	51.6	121.0	53.5	117.4	55.6				
	9	153.4	40.9	145.5	45.0	142.2	46.7	137.0	49.5	131.6	52.3	127.9	54.3						
	11	162.0	41.7	153.6	45.8	150.1	47.5	144.7	50.2	139.0	53.1	135.2	55.1						
	13	170.7	42.4	161.9	46.5	158.3	48.3	152.6	51.0	146.7	53.9								
	15	179.9	43.3	170.5	47.4	166.6	49.2	160.6	51.9	154.5	54.7								
	18	193.6	44.6	183.7	48.7	179.5	50.5	173.2	53.2										
AQVSL 160	5	161.2	44.7	152.7	49.3	149.2	51.3	143.7	54.4	138.0	57.6	134.1	59.8	130.0	62.1	123.9	65.6		
	7	170.6	45.5	161.7	50.1	158.0	52.1	**152.2**	**55.2**	146.2	58.4	142.2	60.6	137.9	62.9				
	9	180.3	46.3	171.0	50.9	167.1	52.9	161.0	56.0	154.7	59.2	150.3	61.5	145.9	63.8				
	11	190.3	47.1	180.5	51.8	176.4	53.7	170.0	56.9	163.4	60.1	158.8	62.3	154.2	64.6				
	13	200.6	48.0	190.3	52.7	186.0	54.6	179.3	57.8	172.4	61.0	167.6	63.2						
	15	211.4	49.0	200.3	53.6	195.7	55.6	188.7	58.7	181.6	61.9	176.6	64.1						
	18	227.5	50.4	215.8	55.1	211.0	57.1	203.5	60.2	195.8	63.4								

(*) Compressors only
LWT : Leaving Water Temperature

Performance Data - AQVSL STAR 85 to 160 - R410A - HT/HPF Version

AQVSL STAR sizes	LWT (°C)	Ambient air temperature (°C)																			
		25		30		32		35		38		40		42		45		48		50	
		Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)
AQVSL 85	5	91.2	18.5	86.4	20.4	84.4	21.2	81.3	22.5	78.1	23.8	75.9	24.7	73.6	25.7	70.1	27.1	66.7	28.6	64.4	29.5
	7	96.6	18.8	91.5	20.7	89.4	21.5	**86.1**	**22.8**	82.8	24.1	80.5	25.0	78.1	26.0	74.4	27.5	70.7	28.9	68.3	29.9
	9	102.0	19.1	96.8	21.0	94.6	21.8	91.1	23.1	87.5	24.5	85.1	25.4	82.6	26.4	78.7	27.8	74.9	29.3	72.3	30.3
	11	107.7	19.5	102.2	21.4	99.8	22.2	96.2	23.5	92.5	24.8	89.9	25.8	87.3	26.7	83.2	28.2	79.2	29.6	76.6	30.6
	13	113.6	19.8	107.7	21.8	105.3	22.6	101.5	23.9	97.6	25.2	94.9	26.1	92.1	27.1	87.9	28.6	83.6	30.0	80.8	31.0
	15	119.7	20.2	113.4	22.2	110.8	23.0	106.8	24.3	102.8	25.6	100.0	26.5	97.1	27.5	92.6	28.9	88.2	30.4	85.3	31.4
	18	128.8	20.8	122.2	22.8	119.4	23.6	115.2	24.9	110.8	26.2	107.8	27.1	104.7	28.1	100.0	29.6	95.2	31.0	92.2	32.0
AQVSL 95	5	104.8	21.3	99.3	23.5	97.0	24.5	93.4	25.9	89.7	27.5	87.2	28.5	84.5	29.6	80.6	31.3	76.6	33.0	74.0	34.1
	7	110.9	21.7	105.1	23.9	102.7	24.8	**98.9**	**26.3**	95.1	27.8	92.4	28.9	89.7	30.0	85.5	31.7	81.2	33.4	78.5	34.5
	9	117.2	22.1	111.2	24.3	108.6	25.2	104.7	26.7	100.6	28.2	97.7	29.3	94.8	30.4	90.4	32.1	86.0	33.8	83.1	34.9
	11	123.7	22.5	117.3	24.7	114.7	25.6	110.5	27.1	106.2	28.7	103.3	29.7	100.2	30.8	95.6	32.5	91.0	34.2	88.0	35.3
	13	130.4	22.9	123.7	25.1	120.9	26.1	116.5	27.5	112.1	29.1	109.0	30.1	105.8	31.2	100.9	32.9	96.0	34.7	92.8	35.8
	15	137.5	23.3	130.2	25.6	127.2	26.5	122.7	28.0	118.0	29.5	114.8	30.6	111.5	31.7	106.4	33.4	101.3	35.1	97.9	36.2
	18	147.9	24.0	140.3	26.3	137.2	27.2	132.3	28.7	127.3	30.3	123.8	31.3	120.3	32.4	114.8	34.1	109.4	35.8	105.9	36.9
AQVSL 115	5	115.0	27.1	108.9	29.9	106.4	31.1	102.5	32.9	98.4	34.9	95.6	36.3	92.8	37.7	88.4	39.8	84.0	41.9		
	7	121.7	27.6	115.3	30.4	112.7	31.6	**108.6**	**33.4**	104.3	35.4	101.4	36.7	98.4	38.1	93.8	40.3	89.1	42.4		
	9	128.6	28.1	122.0	30.9	119.2	32.0	114.8	33.9	110.3	35.9	107.2	37.3	104.1	38.7	99.2	40.8	94.3	43.0		
	11	135.8	28.6	128.8	31.4	125.8	32.6	121.3	34.5	116.5	36.4	113.3	37.8	110.0	39.2	104.9	41.3	99.8	43.5		
	13	143.1	29.1	135.7	31.9	132.7	33.1	127.9	35.0	123.0	37.0	119.6	38.3	116.1	39.7	110.7	41.9				
	15	150.8	29.7	142.9	32.5	139.6	33.7	134.6	35.6	129.5	37.5	126.0	38.9	122.4	40.3	116.7	42.5				
	18	162.3	30.6	154.0	33.4	150.5	34.6	145.2	36.5	139.7	38.5	135.9	39.8	132.0	41.2	126.0	43.4				
AQVSL 125	5	131.0	31.2	124.1	34.4	121.2	35.8	116.7	37.9	112.1	40.2	108.9	41.7	105.7	43.3	100.7	45.8	95.7	48.2		
	7	138.6	31.7	131.4	35.0	128.3	36.3	**123.6**	**38.5**	118.8	40.7	115.5	42.3	112.1	43.9	106.8	46.3	101.5	48.8		
	9	146.5	32.3	138.9	35.5	135.7	36.9	130.8	39.0	125.7	41.3	122.1	42.9	118.5	44.5	113.0	47.0	107.5	49.5		
	11	154.7	32.9	146.6	36.1	143.3	37.5	138.1	39.7	132.7	41.9	129.0	43.5	125.3	45.1	119.5	47.6				
	13	163.0	33.5	154.6	36.7	151.1	38.1	145.7	40.3	140.1	42.5	136.2	44.1	132.2	45.7	126.1	48.2				
	15	171.8	34.2	162.7	37.4	159.0	38.8	153.3	41.0	147.5	43.2	143.5	44.7	139.4	46.4	133.0	48.9				
	18	184.8	35.2	175.4	38.5	171.4	39.9	165.3	42.0	159.1	44.3	154.8	45.8	150.3	47.4						
AQVSL 140	5	146.1	36.3	138.4	40.0	135.2	41.6	130.2	44.1	125.1	46.7	121.5	48.6	117.9	50.4	112.3	53.3	106.8	56.1		
	7	154.7	36.9	146.6	40.7	143.2	42.3	**138.0**	**44.8**	132.6	47.4	128.9	49.2	125.0	51.0	119.2	53.9				
	9	163.4	37.6	155.0	41.3	151.5	42.9	145.9	45.4	140.2	48.1	136.3	49.9	132.2	51.8	126.1	54.7				
	11	172.6	38.2	163.6	42.0	159.9	43.6	154.1	46.1	148.1	48.8	144.0	50.6	139.8	52.5	133.3	55.3				
	13	181.9	39.0	172.5	42.7	168.6	44.4	162.5	46.9	156.3	49.5	152.0	51.3	147.5	53.2						
	15	191.7	39.7	181.6	43.5	177.4	45.1	171.1	47.7	164.6	50.3	160.1	52.1	155.5	53.9						
	18	206.2	40.9	195.7	44.7	191.3	46.4	184.5	48.9	177.5	51.5	172.7	53.3	167.7	55.2						
AQVSL 160	5	170.4	41.3	161.4	45.6	157.7	47.4	151.8	50.2	145.8	53.2	141.7	55.2	137.4	57.4	131.0	60.6	124.5	63.9		
	7	180.3	42.0	170.9	46.3	166.9	48.1	**160.8**	**50.9**	154.6	53.9	150.2	55.9	145.8	58.1	138.9	61.4	132.1	64.6		
	9	190.5	42.8	180.7	47.0	176.6	48.8	170.1	51.7	163.5	54.7	158.9	56.8	154.2	58.9	147.0	62.2	139.8	65.5		
	11	201.2	43.5	190.8	47.8	186.4	49.6	179.7	52.5	172.7	55.5	167.9	57.6	163.0	59.7	155.4	63.0				
	13	212.0	44.3	201.1	48.6	196.5	50.5	189.5	53.3	182.2	56.3	177.2	58.4	172.0	60.5	164.1	63.8				
	15	223.5	45.2	211.7	49.5	206.8	51.4	199.5	54.2	191.9	57.2	186.7	59.2	181.3	61.4	173.0	64.7				
	18	240.4	46.6	228.1	50.9	223.0	52.8	215.1	55.6	206.9	58.6	201.3	60.7	195.5	62.8						

(*) Compressors only
LWT : Leaving Water Temperature

Performance Data - AQVSH STAR 85 to 160 - R410A - STD BLN Version

Cooling mode

AQVSH STAR sizes	LWT (°C)	Ambient air temperature (°C)																	
		25		30		32		35		38		40		42		45		48	
		Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)
AQVSH 85	5	80.1	21.5	75.8	23.8	74.0	24.7	71.3	26.2	68.4	27.7	66.5	28.8	64.5	29.9	61.5	31.6		
	7	84.7	21.9	80.2	24.2	78.3	25.1	**75.4**	**26.6**	72.4	28.2	70.4	29.2	68.3	30.3				
	9	89.4	22.3	84.7	24.6	82.8	25.5	79.7	27.0	76.5	28.6	74.4	29.7	72.1	30.8				
	11	94.3	22.7	89.4	25.0	87.3	26.0	84.1	27.5	80.8	29.0	78.5	30.1	76.2	31.2				
	13	99.4	23.2	94.1	25.5	92.0	26.4	88.6	27.9	85.1	29.5	82.7	30.6						
	15	104.6	23.6	99.1	25.9	96.8	26.9	93.2	28.4	89.6	30.0	87.1	31.1						
	18	112.5	24.4	106.6	26.7	104.1	27.7	100.4	29.2	96.5	30.8								
AQVSH 95	5	90.7	25.9	85.9	28.6	83.9	29.8	80.8	31.5	77.5	33.4	75.3	34.7	73.0	36.0	69.6	38.0		
	7	95.9	26.4	90.8	29.1	88.7	30.2	**85.4**	**32.0**	82.1	33.9	79.7	35.2	77.3	36.5				
	9	101.3	26.9	96.0	29.6	93.8	30.7	90.3	32.5	86.7	34.4	84.2	35.7	81.7	37.1				
	11	106.9	27.4	101.2	30.1	98.9	31.3	95.3	33.1	91.5	35.0	88.9	36.3	86.3	37.6				
	13	112.6	27.9	106.6	30.7	104.2	31.8	100.4	33.6	96.4	35.5	93.7	36.8						
	15	118.5	28.5	112.2	31.2	109.6	32.4	105.6	34.2	101.5	36.1	98.7	37.4						
	18	127.5	29.4	120.7	32.2	118.0	33.3	113.7	35.2	109.3	37.0								
AQVSH 115	5	108.9	28.4	103.1	31.4	100.7	32.6	97.0	34.6	93.1	36.7	90.4	38.1	87.7	39.5	83.6	41.7	79.5	43.9
	7	115.2	29.0	109.1	31.9	106.5	33.2	**102.6**	**35.1**	98.5	37.2	95.7	38.6	92.8	40.1	88.5	42.3		
	9	121.6	29.5	115.2	32.5	112.6	33.7	108.4	35.7	104.1	37.8	101.1	39.2	98.1	40.7	93.5	42.9		
	11	128.3	30.0	121.5	33.0	118.7	34.3	114.4	36.3	109.9	38.4	106.8	39.8	103.6	41.2	98.8	43.5		
	13	135.2	30.6	128.0	33.6	125.1	34.9	120.5	36.9	115.8	39.0	112.5	40.4	109.2	41.9				
	15	142.2	31.2	134.7	34.3	131.6	35.5	126.8	37.5	121.8	39.6	118.4	41.0	115.0	42.5				
	18	153.1	32.2	145.0	35.3	141.6	36.6	136.5	38.6	131.2	40.6	127.6	42.1	123.9	43.5				
AQVSH 125	5	121.6	33.9	115.1	37.4	112.5	38.9	108.3	41.2	103.9	43.6	101.0	45.3	97.9	47.1	93.4	49.7		
	7	128.6	34.5	121.8	38.0	119.0	39.5	**114.6**	**41.8**	110.0	44.3	106.9	46.0	103.7	47.7	98.8	50.4		
	9	135.9	35.1	128.7	38.7	125.7	40.1	121.1	42.5	116.3	45.0	113.0	46.7	109.6	48.4				
	11	143.3	35.8	135.7	39.3	132.6	40.9	127.7	43.2	122.7	45.7	119.3	47.4	115.7	49.1				
	13	151.0	36.5	143.0	40.1	139.7	41.6	134.6	44.0	129.3	46.4	125.7	48.1	122.0	49.9				
	15	158.8	37.2	150.5	40.8	147.0	42.3	141.6	44.7	136.1	47.2	132.3	48.9						
	18	170.9	38.4	161.9	42.0	158.2	43.5	152.4	45.9	146.5	48.4								
AQVSH 140	5	140.3	37.6	132.8	41.5	129.7	43.1	124.9	45.7	119.9	48.5	116.5	50.3	113.0	52.3	107.7	55.1		
	7	148.4	38.3	140.5	42.2	137.2	43.9	**132.2**	**46.5**	126.9	49.2	123.3	51.1	119.6	53.0	114.0	56.0		
	9	156.7	39.0	148.5	42.9	145.0	44.6	139.7	47.2	134.1	49.9	130.3	51.8	126.4	53.8				
	11	165.3	39.7	156.6	43.7	152.9	45.4	147.3	48.0	141.5	50.7	137.6	52.6	133.5	54.5				
	13	174.1	40.5	164.9	44.5	161.1	46.2	155.2	48.8	149.1	51.5	145.0	53.4	140.7	55.4				
	15	183.2	41.3	173.6	45.3	169.5	47.0	163.4	49.6	157.0	52.4	152.6	54.3						
	18	197.2	42.6	186.7	46.6	182.4	48.3	175.8	51.0	169.0	53.7	164.3	55.6						
AQVSH 160	5	161.8	43.8	153.2	48.3	149.6	50.2	144.0	53.3	138.2	56.4	134.3	58.6	130.3	60.8	124.2	64.2		
	7	171.1	44.6	162.0	49.1	158.2	51.1	**152.4**	**54.1**	146.3	57.3	142.2	59.5	137.9	61.7	131.4	65.2		
	9	180.7	45.4	171.2	50.0	167.2	51.9	161.1	55.0	154.6	58.2	150.2	60.4	145.8	62.6	138.9	66.1		
	11	190.6	46.3	180.5	50.9	176.4	52.8	169.9	55.9	163.2	59.1	158.6	61.2	153.9	63.5				
	13	200.8	47.1	190.2	51.8	185.8	53.8	179.0	56.8	172.0	60.0	167.1	62.2	162.2	64.5				
	15	211.3	48.1	200.1	52.7	195.5	54.7	188.4	57.8	181.0	61.0	175.9	63.2	170.8	65.5				
	18	227.4	49.6	215.3	54.3	210.4	56.3	202.7	59.4	194.9	62.6	189.5	64.8						

(*) Compressors only
LWT : Leaving Water Temperature

Performance Data - AQVSH STAR 85 to 160 - R410A - STD BLN Version

Heating mode

AQVSH STAR sizes	LWT (°C)	Ambient air temperature (°C)															
		-7		-5		-3		0		5		7		10		15	
		Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)
AQVSH 85	30	59.0	17.5	63.1	17.6	66.6	17.6	72.2	17.6	82.1	17.6	86.8	17.6	93.7	17.6	107.3	17.7
	35	58.6	19.6	62.6	19.6	66.0	19.6	71.5	19.7	81.0	19.7	85.5	19.7	92.1	19.7	105.2	19.7
	40	58.4	21.8	62.3	21.9	65.5	21.9	70.8	22.0	79.9	22.0	84.2	22.0	90.6	22.0	103.0	22.0
	45					65.1	24.5	70.1	24.6	80.0	25.1	**82.9**	**24.6**	88.9	24.6	100.7	24.6
	50									96.5	35.0	81.5	27.6	87.2	27.6	98.2	27.6
AQVSH 95	30	68.4	21.5	73.1	21.5	77.1	21.5	83.7	21.5	95.1	21.5	100.6	21.6	108.6	21.6	124.3	21.7
	35	67.8	24.0	72.5	24.0	76.5	24.0	82.8	24.1	93.8	24.1	99.1	24.1	106.8	24.1	121.8	24.2
	40	67.6	26.7	72.2	26.8	75.9	26.9	82.0	26.9	92.5	26.9	97.5	26.9	104.9	26.9	119.3	27.0
	45					75.5	30.0	81.2	30.1	92.7	30.7	**96.0**	**30.1**	103.0	30.1	116.6	30.2
	50									111.8	42.9	94.4	33.8	101.0	33.8	113.8	33.8
AQVSH 115	30	79.9	24.6	85.4	24.6	90.1	24.6	97.8	24.6	111.1	24.7	117.5	24.7	126.8	24.7	145.2	24.9
	35	79.3	27.4	84.7	27.5	89.3	27.5	96.7	27.5	109.6	27.6	115.7	27.6	124.7	27.6	142.3	27.7
	40	79.0	30.6	84.3	30.7	88.7	30.8	95.8	30.8	108.1	30.8	114.0	30.8	122.6	30.8	139.4	30.9
	45					88.2	34.4	94.9	34.5	108.2	35.2	**112.2**	**34.5**	120.3	34.5	136.2	34.5
	50									130.7	49.1	110.3	38.7	118.0	38.7	132.9	38.7
AQVSH 125	30	91.0	28.1	97.3	28.2	102.7	28.2	111.4	28.2	126.7	28.2	133.9	28.3	144.6	28.3	165.6	28.5
	35	90.4	31.4	96.6	31.5	101.9	31.5	110.3	31.5	125.0	31.6	131.9	31.6	142.2	31.6	162.3	31.7
	40	90.1	35.1	96.1	35.2	101.1	35.2	109.2	35.3	123.2	35.3	129.9	35.3	139.7	35.3	158.9	35.4
	45					100.5	39.4	108.2	39.4	123.4	40.3	**127.9**	**39.5**	137.2	39.5	155.3	39.5
	50									149.0	56.2	125.7	44.3	134.5	44.3	151.5	44.3
AQVSH 140	30	102.0	31.6	109.0	31.6	115.1	31.6	124.8	31.6	141.9	31.7	150.0	31.7	162.0	31.7	185.4	31.9
	35	101.2	35.2	108.2	35.3	114.1	35.3	123.5	35.4	140.0	35.4	147.8	35.4	159.2	35.4	181.8	35.5
	40	100.9	39.3	107.6	39.4	113.3	39.5	122.3	39.5	138.0	39.6	145.5	39.6	156.5	39.6	178.0	39.6
	45					112.6	44.1	121.2	44.2	138.2	45.1	**143.2**	**44.3**	153.7	44.3	174.0	44.3
	50									166.8	63.0	140.8	49.6	150.7	49.6	169.7	49.6
AQVSH 160	30	119.3	36.8	127.5	36.9	134.6	36.9	146.1	36.9	166.1	36.9	175.5	37.0	189.5	37.0	217.0	37.2
	35	118.4	41.1	126.6	41.2	133.5	41.2	144.5	41.3	163.8	41.3	172.9	41.3	186.3	41.3	212.7	41.4
	40	118.1	45.9	126.0	46.0	132.6	46.0	143.1	46.1	161.5	46.2	170.3	46.2	183.1	46.2	208.2	46.2
	45					131.7	51.5	141.8	51.6	161.7	52.7	**167.6**	**51.7**	179.8	51.7	203.6	51.7
	50									195.2	73.5	164.7	57.9	176.3	57.9	198.5	57.9

(*) Compressors only
LWT : Leaving Water Temperature

Performance Data - AQVSH STAR 85 to 160 - R410A - STD ELN Version

Cooling mode

AQVSH STAR sizes	LWT (°C)	Ambient air temperature (°C)															
		25		30		32		35		38		40		42		45	
		Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)
AQVSH 85	5	77,3	22,5	73,1	24,8	71,4	25,8	68,8	27,3	66,0	29,0	64,1	30,1	62,2	31,2		
	7	81,7	22,9	77,4	25,2	75,6	26,2	**72,8**	**27,8**	69,9	29,4	67,9	30,5				
	9	86,3	23,3	81,8	25,6	79,9	26,6	76,9	28,2	73,9	29,8	71,8	31,0				
	11	91,0	23,7	86,2	26,1	84,2	27,1	81,1	28,7	77,9	30,3						
	13	95,9	24,2	90,8	26,6	88,7	27,6	85,5	29,2	82,1	30,8						
	15	100,9	24,7	95,6	27,1	93,4	28,1	90,0	29,6								
	18	108,6	25,4	102,8	27,9	100,5	28,9	96,8	30,5								
AQVSH 95	5	87,1	27,5	82,5	30,3	80,6	31,5	77,6	33,4	74,5	35,4	72,3	36,8	70,2	38,1		
	7	92,2	28,0	87,3	30,8	85,2	32,0	**82,1**	**33,9**	78,8	35,9	76,6	37,3				
	9	97,3	28,5	92,2	31,3	90,1	32,5	86,8	34,5	83,3	36,5	80,9	37,8				
	11	102,7	29,0	97,2	31,9	95,0	33,1	91,5	35,0	87,9	37,0						
	13	108,2	29,6	102,4	32,5	100,1	33,7	96,4	35,6	92,6	37,6						
	15	113,8	30,1	107,8	33,1	105,3	34,3	101,5	36,2								
	18	122,5	31,1	116,0	34,1	113,3	35,3	109,2	37,2								
AQVSH 115	5	104,9	30,2	99,3	33,3	97,0	34,6	93,3	36,7	89,6	38,9	87,0	40,4	84,4	41,9	80,5	44,2
	7	110,9	30,7	105,0	33,9	102,6	35,2	**98,8**	**37,3**	94,9	39,4	92,2	41,0	89,4	42,5		
	9	117,1	31,3	111,0	34,4	108,4	35,8	104,4	37,9	100,2	40,1	97,4	41,6	94,5	43,1		
	11	123,5	31,9	117,0	35,0	114,3	36,4	110,1	38,5	105,8	40,7	102,8	42,2	99,8	43,7		
	13	130,2	32,5	123,3	35,7	120,4	37,0	116,0	39,1	111,5	41,3	108,3	42,9				
	15	136,9	33,1	129,7	36,3	126,7	37,7	122,1	39,8	117,3	42,0	114,0	43,5				
	18	147,4	34,2	139,6	37,4	136,4	38,8	131,4	40,9	126,3	43,1						
AQVSH 125	5	116,4	36,0	110,2	39,7	107,6	41,3	103,6	43,8	99,5	46,4	96,6	48,2	93,8	50,0	89,4	52,8
	7	123,1	36,6	116,6	40,4	113,9	42,0	**109,7**	**44,4**	105,3	47,0	102,3	48,8	99,3	50,7		
	9	130,0	37,3	123,2	41,1	120,3	42,6	115,9	45,1	111,3	47,8	108,1	49,6	104,9	51,4		
	11	137,2	38,0	129,9	41,8	126,9	43,4	122,3	45,9	117,5	48,5	114,2	50,3				
	13	144,5	38,7	136,9	42,6	133,7	44,2	128,8	46,7	123,8	49,3	120,3	51,1				
	15	152,0	39,5	144,0	43,3	140,7	44,9	135,6	47,5	130,3	50,1						
	18	163,6	40,7	155,0	44,6	151,4	46,2	145,9	48,8	140,3	51,4						
AQVSH 140	5	134,3	39,8	127,2	43,9	124,2	45,7	119,6	48,4	114,8	51,3	111,5	53,3	108,2	55,3	103,1	58,3
	7	142,1	40,5	134,5	44,7	131,4	46,4	**126,5**	**49,2**	121,5	52,0	118,1	54,0	114,5	56,1	109,1	59,2
	9	150,0	41,3	142,1	45,4	138,8	47,2	133,7	49,9	128,4	52,8	124,8	54,8	121,0	56,9		
	11	158,3	42,0	149,9	46,2	146,4	48,0	141,1	50,8	135,5	53,7	131,7	55,6	127,8	57,7		
	13	166,7	42,8	157,9	47,1	154,3	48,8	148,6	51,6	142,8	54,5	138,8	56,5				
	15	175,4	43,7	166,2	47,9	162,3	49,7	156,4	52,5	150,3	55,4						
	18	188,8	45,1	178,8	49,4	174,7	51,2	168,4	53,9	161,8	56,8						
AQVSH 160	5	153,9	46,8	145,7	51,6	142,3	53,7	137,0	56,9	131,5	60,3	127,8	62,6	124,0	65,0	118,2	68,6
	7	162,8	47,6	154,2	52,5	150,6	54,6	**145,0**	**57,8**	139,2	61,2	135,3	63,5	131,2	65,9	125,0	69,6
	9	171,9	48,5	162,9	53,4	159,1	55,5	153,2	58,7	147,1	62,1	142,9	64,5	138,7	66,9		
	11	181,3	49,4	171,8	54,4	167,8	56,4	161,6	59,7	155,3	63,1	150,9	65,4	146,5	67,8		
	13	191,0	50,4	180,9	55,3	176,8	57,4	170,3	60,7	163,6	64,1	159,0	66,5				
	15	201,0	51,4	190,4	56,4	186,0	58,5	179,2	61,7	172,2	65,2						
	18	216,3	53,0	204,9	58,0	200,2	60,1	192,9	63,4	185,4	66,8						

(*) Compressors only
LWT : Leaving Water Temperature

Performance Data - AQVSH STAR 85 to 160 - R410A - STD ELN Version

Heating mode

AQVSH STAR sizes	LWT (°C)	Ambient air temperature (°C)															
		-7		-5		-3		0		5		7		10		15	
		Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)
AQVSH 85	30	57,6	17,5	61,6	17,5	65,0	17,5	70,6	17,5	80,2	17,6	84,8	17,6	91,6	17,6	104,8	17,7
	35	57,2	19,5	61,2	19,6	64,5	19,6	69,8	19,6	79,1	19,6	83,5	19,6	90,0	19,6	102,7	19,7
	40			60,8	21,9	64,0	21,9	69,1	21,9	77,8	21,9	82,3	21,9	88,5	22,0	100,6	22,0
	45							68,5	24,5	74,2	23,5	**81,0**	**24,6**	86,9	24,6	98,3	24,6
	50									94,3	34,9	79,6	27,5	85,2	27,5	95,9	27,5
AQVSH 95	30	66,7	21,5	71,3	21,5	75,3	21,5	81,7	21,5	92,8	21,6	98,1	21,6	105,9	21,6	121,3	21,7
	35	66,2	24,0	70,8	24,0	74,6	24,0	80,8	24,1	91,5	24,1	96,7	24,1	104,2	24,1	118,9	24,2
	40			70,4	26,8	74,1	26,9	80,0	26,9	90,0	26,8	95,2	26,9	102,4	26,9	116,4	27,0
	45							79,3	30,1	85,8	28,8	**93,7**	**30,1**	100,5	30,2	113,8	30,2
	50									109,1	42,9	92,1	33,8	98,5	33,8	111,0	33,8
AQVSH 115	30	78,0	24,6	83,3	24,6	88,0	24,6	95,4	24,6	108,5	24,7	114,7	24,7	123,8	24,7	141,8	24,9
	35	77,4	27,4	82,7	27,5	87,2	27,5	94,4	27,5	107,0	27,6	113,0	27,6	121,8	27,6	139,0	27,7
	40			82,3	30,7	86,6	30,8	93,5	30,8	105,3	30,7	111,3	30,8	119,7	30,8	136,1	30,9
	45							92,7	34,4	100,3	33,0	**109,5**	**34,5**	117,5	34,5	133,0	34,5
	50									127,6	49,1	107,7	38,7	115,2	38,7	129,7	38,7
AQVSH 125	30	88,6	28,1	94,7	28,2	99,9	28,2	108,4	28,2	123,3	28,2	130,3	28,3	140,7	28,3	161,1	28,5
	35	87,9	31,4	94,0	31,5	99,1	31,5	107,3	31,5	121,5	31,5	128,3	31,6	138,3	31,6	157,9	31,7
	40			93,5	35,1	98,4	35,2	106,2	35,2	119,5	35,1	126,4	35,3	135,9	35,3	154,6	35,3
	45							105,2	39,4	113,9	37,8	**124,4**	**39,5**	133,5	39,5	151,1	39,5
	50									144,9	56,2	122,3	44,2	130,8	44,3	147,4	44,2
AQVSH 140	30	99,0	31,5	105,8	31,6	111,7	31,6	121,2	31,6	137,8	31,6	145,6	31,7	157,2	31,7	180,0	31,9
	35	98,3	35,2	105,1	35,3	110,8	35,3	119,9	35,3	135,9	35,4	143,4	35,4	154,6	35,4	176,5	35,5
	40			104,5	39,4	110,0	39,4	118,7	39,5	133,6	39,4	141,3	39,6	151,9	39,6	172,8	39,6
	45							117,6	44,2	127,4	42,4	**139,0**	**44,3**	149,2	44,3	168,9	44,3
	50									162,0	63,0	136,7	49,6	146,3	49,6	164,7	49,6
AQVSH 160	30	115,1	36,8	123,0	36,8	129,9	36,8	140,9	36,9	160,2	36,9	169,4	36,9	182,8	37,0	209,3	37,2
	35	114,2	41,0	122,2	41,1	128,8	41,2	139,4	41,2	158,0	41,2	166,8	41,2	179,8	41,3	205,2	41,4
	40			121,5	45,9	127,9	46,0	138,1	46,1	155,4	45,9	164,3	46,1	176,7	46,1	200,9	46,2
	45							136,8	51,5	148,1	49,4	**161,7**	**51,6**	173,5	51,6	196,4	51,6
	50									188,3	73,4	158,9	57,8	170,1	57,8	191,6	57,8

(*) Compressors only
LWT : Leaving Water Temperature

Performance Data - AQVSH STAR 85 to 160 - R410A - HT/HPF Version

Cooling mode

AQVSH STAR sizes	LWT (°C)	Ambient air temperature (°C)																			
		25		30		32		35		38		40		42		45		48		50	
		Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)	Cool. cap. (kW)	Input power* (kW)
AQVSH 85	5	85.4	19.7	80.9	21.8	79.0	22.6	76.0	24.0	73.0	25.4	70.9	26.4	68.8	27.4	65.6	28.9	62.4	30.5	60.3	31.5
	7	90.3	20.1	85.6	22.2	83.6	23.0	**80.5**	**24.4**	77.3	25.8	75.1	26.8	72.8	27.8	69.4	29.4	65.9	30.9		
	9	95.4	20.5	90.4	22.5	88.3	23.4	85.0	24.8	81.7	26.2	79.3	27.2	77.0	28.2	73.4	29.8	69.8	31.3		
	11	100.6	20.9	95.3	22.9	93.1	23.8	89.7	25.2	86.2	26.6	83.8	27.6	81.3	28.6	77.5	30.2	73.7	31.7		
	13	106.0	21.3	100.4	23.3	98.1	24.2	94.5	25.6	90.8	27.0	88.3	28.0	85.7	29.1	81.7	30.6				
	15	111.5	21.7	105.7	23.8	103.2	24.7	99.5	26.0	95.6	27.5	92.9	28.5	90.2	29.5	86.0	31.1				
	18	120.0	22.4	113.7	24.5	111.1	25.4	107.1	26.8	102.9	28.2	100.1	29.2	97.1	30.2	92.7	31.8				
AQVSH 95	5	97.1	23.2	91.9	25.6	89.8	26.7	86.5	28.3	83.0	29.9	80.6	31.1	78.2	32.3	74.6	34.1	70.9	35.9	68.5	37.0
	7	102.7	23.7	97.3	26.1	95.0	27.1	**91.5**	**28.7**	87.9	30.4	85.4	31.5	82.8	32.7	78.9	34.6	75.0	36.4		
	9	108.5	24.1	102.8	26.5	100.4	27.5	96.7	29.2	92.8	30.9	90.2	32.0	87.5	33.2	83.4	35.0	79.3	36.9		
	11	114.4	24.5	108.4	27.0	105.9	28.0	102.0	29.6	98.0	31.3	95.2	32.5	92.4	33.7	88.1	35.5	83.8	37.4		
	13	120.5	25.0	114.2	27.5	111.5	28.5	107.4	30.1	103.2	31.8	100.3	33.0	97.4	34.2	92.9	36.0				
	15	126.8	25.5	120.1	28.0	117.4	29.0	113.1	30.7	108.7	32.4	105.6	33.5	102.5	34.7	97.8	36.6				
	18	136.5	26.3	129.3	28.8	126.3	29.9	121.7	31.5	117.0	33.2	113.8	34.4	110.4	35.6	105.4	37.4				
AQVSH 115	5	111.7	27.3	105.8	30.1	103.3	31.3	99.5	33.1	95.5	35.1	92.8	36.5	90.0	37.9	85.8	39.9	81.6	42.0		
	7	118.2	27.7	111.9	30.6	109.3	31.8	**105.3**	**33.7**	101.1	35.6	98.2	37.0	95.3	38.4	90.8	40.5	86.3	42.7		
	9	124.8	28.3	118.2	31.1	115.5	32.3	111.2	34.2	106.8	36.2	103.8	37.6	100.7	39.0	96.0	41.1	91.3	43.2		
	11	131.7	28.8	124.7	31.7	121.8	32.9	117.3	34.8	112.7	36.7	109.6	38.1	106.3	39.5	101.4	41.7				
	13	138.7	29.3	131.4	32.2	128.3	33.4	123.6	35.4	118.8	37.3	115.5	38.7	112.1	40.1	106.9	42.3				
	15	145.9	29.9	138.2	32.8	135.0	34.0	130.1	36.0	125.0	37.9	121.5	39.3	118.0	40.7	112.5	42.9				
	18	157.0	30.8	148.7	33.8	145.3	35.0	140.0	36.9	134.6	38.9	130.9	40.3	127.1	41.7						
AQVSH 125	5	125.3	32.4	118.7	35.7	115.9	37.2	111.6	39.4	107.1	41.7	104.0	43.3	100.9	45.0	96.2	47.5	91.5	50.0		
	7	132.5	33.0	125.5	36.3	122.6	37.8	**118.1**	**40.0**	113.4	42.3	110.2	44.0	106.8	45.6	101.8	48.2				
	9	140.0	33.6	132.6	37.0	129.5	38.4	124.8	40.6	119.8	43.0	116.4	44.6	112.9	46.3	107.6	48.9				
	11	147.7	34.2	139.9	37.6	136.6	39.1	131.6	41.3	126.4	43.7	122.9	45.3	119.2	47.0	113.7	49.5				
	13	155.6	34.9	147.3	38.3	143.9	39.8	138.7	42.0	133.2	44.4	129.5	46.0	125.7	47.7						
	15	163.7	35.5	155.0	39.0	151.5	40.5	145.9	42.7	140.2	45.1	136.3	46.7	132.3	48.4						
	18	176.1	36.7	166.8	40.2	163.0	41.6	157.1	43.9	151.0	46.3	146.8	47.9	142.5	49.6						
AQVSH 140	5	144.5	36.1	136.9	39.8	133.7	41.4	128.7	43.8	123.5	46.5	120.0	48.3	116.4	50.1	111.0	52.9	105.6	55.6		
	7	152.9	36.7	144.8	40.5	141.4	42.0	**136.2**	**44.5**	130.8	47.1	127.1	48.9	123.2	50.8	117.4	53.7				
	9	161.5	37.4	153.0	41.1	149.4	42.7	143.9	45.2	138.2	47.9	134.2	49.7	130.2	51.6	124.2	54.4				
	11	170.3	38.1	161.3	41.9	157.6	43.5	151.8	46.0	145.8	48.6	141.7	50.4	137.5	52.3	131.1	55.1				
	13	179.4	38.8	169.9	42.6	166.0	44.3	159.9	46.8	153.7	49.4	149.4	51.2	144.9	53.1	138.2	55.9				
	15	188.8	39.6	178.8	43.4	174.7	45.0	168.3	47.6	161.7	50.2	157.2	52.0	152.6	53.9						
	18	203.1	40.8	192.4	44.7	188.0	46.3	181.2	48.9	174.1	51.5	169.3	53.3	164.4	55.2						
AQVSH 160	5	166.9	41.9	158.1	46.2	154.4	48.0	148.6	50.9	142.7	53.9	138.6	56.0	134.4	58.1	128.2	61.4	121.9	64.6		
	7	176.6	42.6	167.2	47.0	163.3	48.8	**157.3**	**51.7**	151.0	54.7	146.7	56.8	142.3	59.0	135.6	62.3	128.9	65.6		
	9	186.5	43.4	176.7	47.8	172.6	49.6	166.2	52.5	159.6	55.6	155.1	57.7	150.4	59.8	143.4	63.1				
	11	196.7	44.2	186.3	48.6	182.0	50.5	175.3	53.4	168.4	56.4	163.7	58.5	158.9	60.7	151.5	64.0				
	13	207.2	45.0	196.3	49.5	191.7	51.4	184.7	54.3	177.5	57.3	172.5	59.4	167.4	61.6	159.6	64.9				
	15	218.0	45.9	206.5	50.4	201.8	52.3	194.4	55.2	186.8	58.3	181.6	60.4	176.2	62.6	168.1	65.9				
	18	234.6	47.4	222.2	51.9	217.1	53.8	209.2	56.7	201.1	59.8	195.6	61.9	189.9	64.1						

(*) Compressors only
LWT : Leaving Water Temperature

Performance Data - AQVSH STAR 85 to 160 - R410A - HT/HPF Version

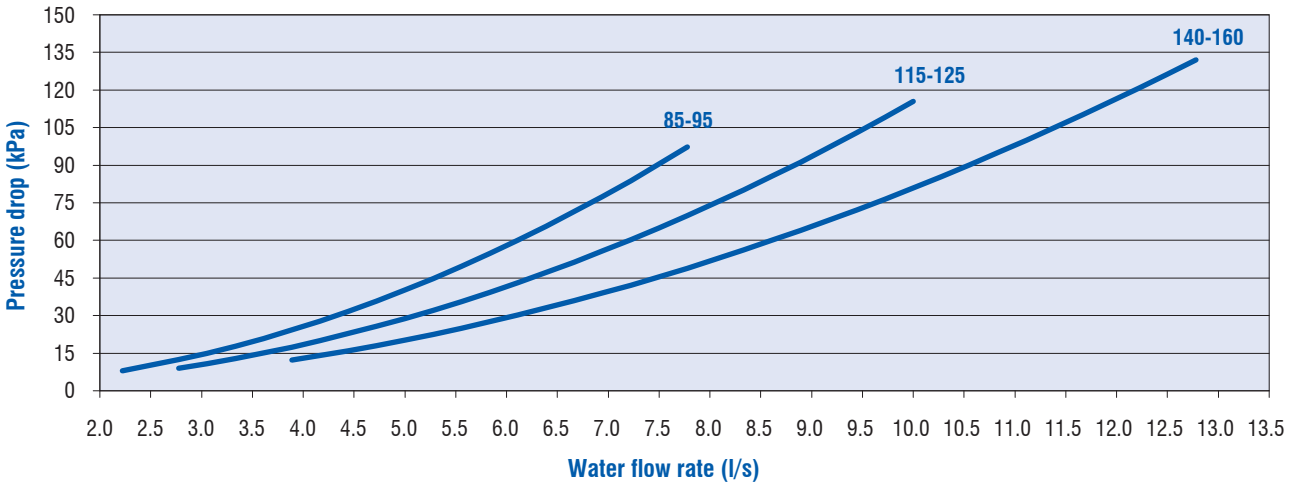
Heating mode

AQVSH STAR sizes	LWT (°C)	Ambient air temperature (°C)															
		-7		-5		-3		0		5		7		10		15	
		Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)	Heat. cap. (kW)	Input power* (kW)
AQVSH 85	30	61.6	17.6	65.8	17.6	69.5	17.7	75.4	17.7	85.7	17.7	90.6	17.7	97.8	17.7	112.0	17.8
	35	61.1	19.7	65.3	19.7	68.9	19.7	74.6	19.7	84.5	19.8	89.2	19.8	96.2	19.8	109.7	19.8
	40	60.9	21.9	65.0	22.0	68.4	22.0	73.9	22.1	83.4	22.1	87.9	22.1	94.5	22.1	107.5	22.1
	45					68.0	24.6	73.2	24.7	83.5	25.2	**86.5**	**24.7**	92.8	24.7	105.0	24.7
	50									100.7	35.2	85.0	27.7	91.0	27.7	102.5	27.7
AQVSH 95	30	71.5	21.5	76.4	21.5	80.6	21.5	87.5	21.5	99.4	21.5	105.1	21.6	113.5	21.6	129.9	21.7
	35	70.9	24.0	75.8	24.0	79.9	24.0	86.5	24.1	98.1	24.1	103.5	24.1	111.6	24.1	127.4	24.2
	40	70.7	26.7	75.4	26.8	79.4	26.8	85.7	26.9	96.7	26.9	102.0	26.9	109.7	26.9	124.7	27.0
	45					78.9	30.0	84.9	30.1	96.8	30.7	**100.4**	**30.1**	107.7	30.1	121.9	30.1
	50									116.9	42.9	98.7	33.8	105.6	33.8	118.9	33.8
AQVSH 115	30	81.1	24.6	86.7	24.6	91.5	24.6	99.3	24.6	112.9	24.7	119.4	24.7	128.9	24.7	147.6	24.9
	35	80.5	27.4	86.1	27.5	90.8	27.5	98.3	27.5	111.4	27.6	117.6	27.6	126.7	27.6	144.6	27.7
	40	80.3	30.6	85.6	30.7	90.1	30.8	97.3	30.8	109.8	30.8	115.8	30.8	124.5	30.8	141.6	30.9
	45					89.6	34.4	96.4	34.5	110.0	35.2	**114.0**	**34.5**	122.3	34.5	138.4	34.5
	50									132.7	49.1	112.0	38.7	119.9	38.7	135.0	38.7
AQVSH 125	30	92.8	28.2	99.2	28.2	104.7	28.2	113.6	28.2	129.1	28.3	136.5	28.3	147.4	28.3	168.7	28.5
	35	92.1	31.4	98.5	31.5	103.8	31.5	112.4	31.6	127.3	31.6	134.4	31.6	144.9	31.6	165.4	31.7
	40	91.8	35.1	97.9	35.2	103.1	35.2	111.3	35.3	125.6	35.3	132.4	35.3	142.4	35.3	161.9	35.4
	45					102.4	39.4	110.3	39.5	125.8	40.3	**130.3**	**39.5**	139.8	39.5	158.3	39.5
	50									151.8	56.2	128.1	44.3	137.1	44.3	154.4	44.3
AQVSH 140	30	104.9	31.5	112.2	31.5	118.4	31.5	128.4	31.5	146.0	31.6	154.4	31.6	166.7	31.6	190.8	31.8
	35	104.1	35.1	111.3	35.2	117.4	35.2	127.1	35.2	144.0	35.3	152.0	35.3	163.9	35.3	187.0	35.4
	40	103.8	39.2	110.8	39.3	116.6	39.3	125.9	39.4	142.0	39.4	149.7	39.5	161.1	39.5	183.1	39.5
	45					115.9	44.0	124.7	44.1	142.2	45.0	**147.4**	**44.2**	158.1	44.2	179.0	44.2
	50									171.7	62.8	144.9	49.5	155.0	49.5	174.6	49.5
AQVSH 160	30	122.0	36.8	130.4	36.9	137.7	36.9	149.3	36.9	169.8	37.0	179.5	37.0	193.8	37.1	221.9	37.3
	35	121.1	41.1	129.5	41.2	136.5	41.2	147.8	41.3	167.4	41.3	176.8	41.3	190.5	41.4	217.5	41.5
	40	120.7	45.9	128.8	46.0	135.5	46.1	146.3	46.2	165.2	46.2	174.1	46.2	187.2	46.2	212.9	46.3
	45					134.7	51.5	145.0	51.6	165.4	52.7	**171.3**	**51.7**	183.9	51.7	208.1	51.7
	50									199.6	73.6	168.4	57.9	180.2	58.0	203.0	57.9

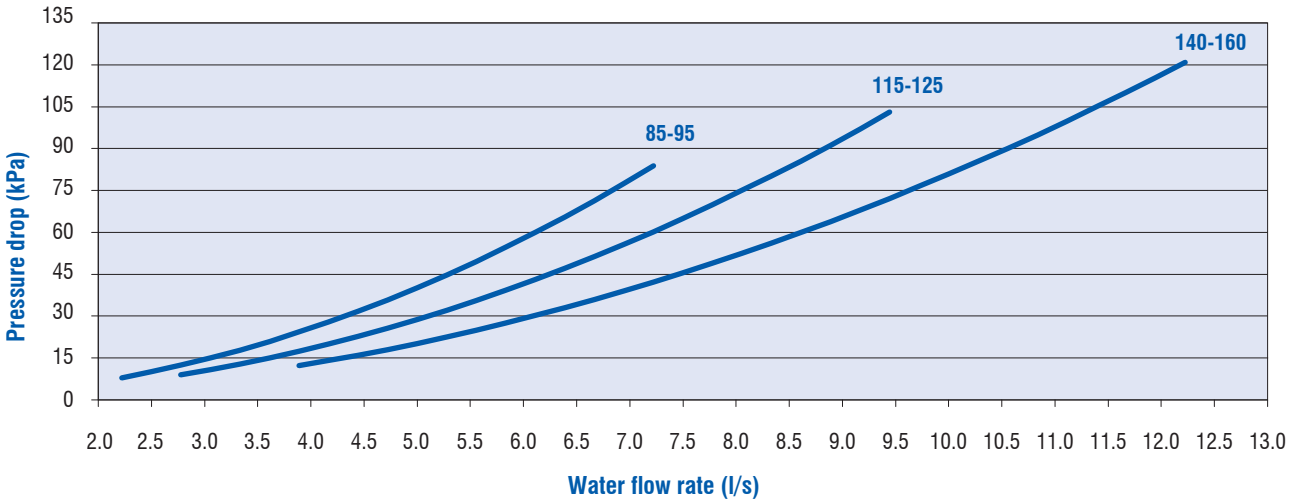
(*) Compressors only
LWT : Leaving Water Temperature

Evaporator Water Pressure Drop

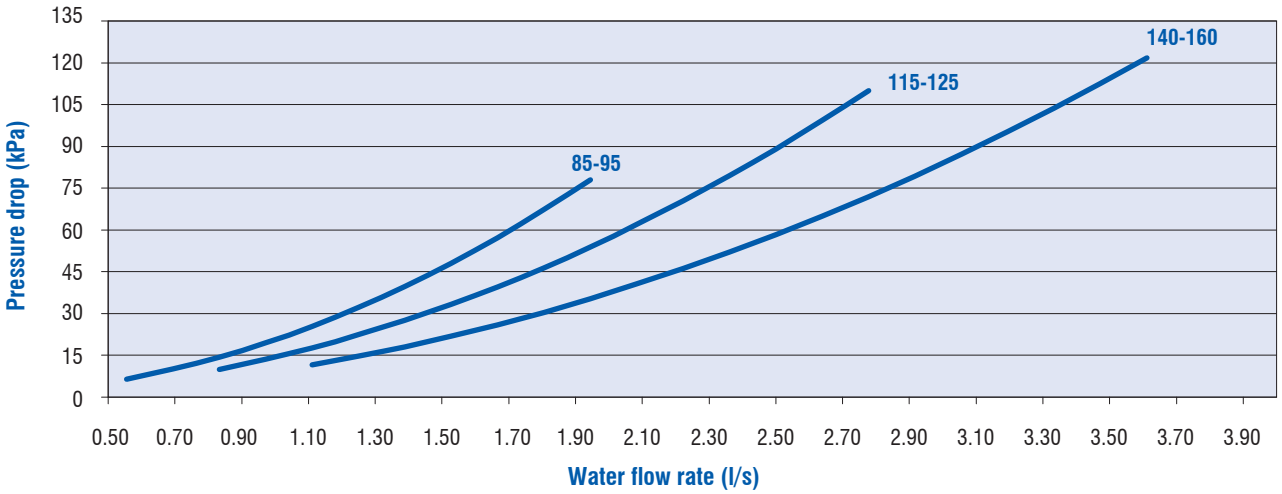
AQVSL STAR



AQVSH STAR

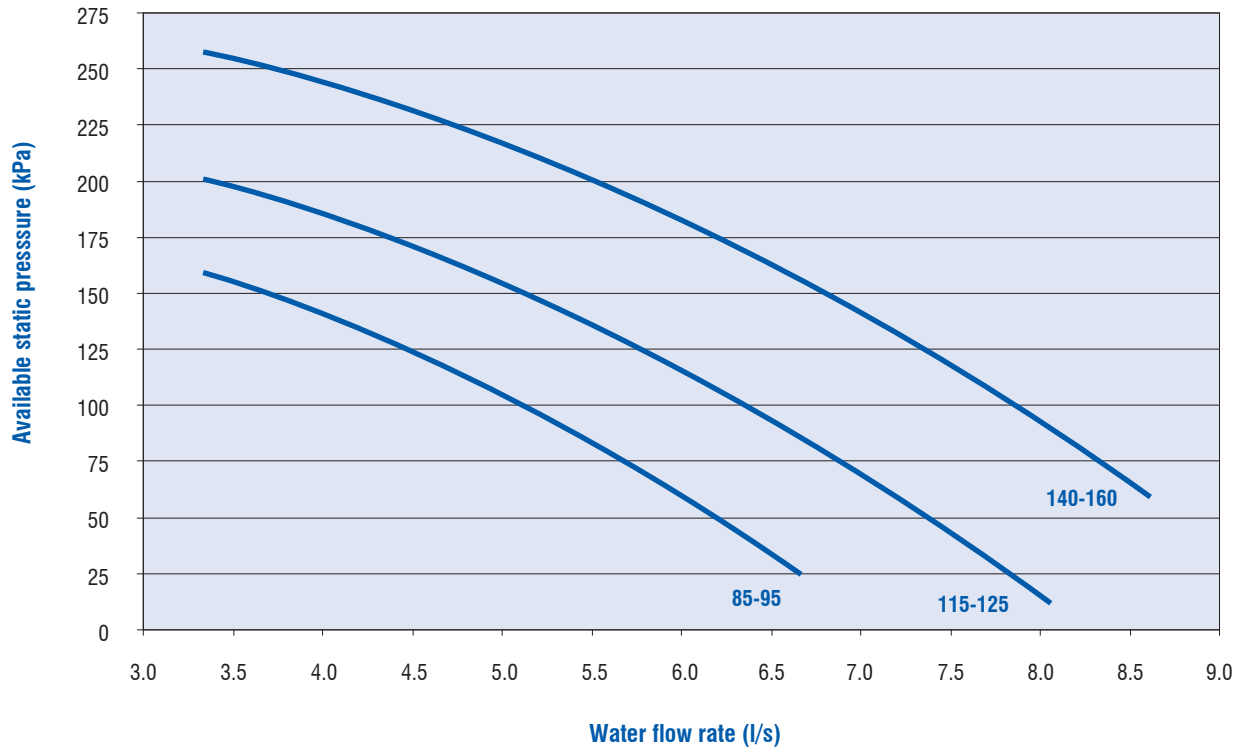


Desuperheater Water Pressure Drop - AQVSL/AQVSH STAR

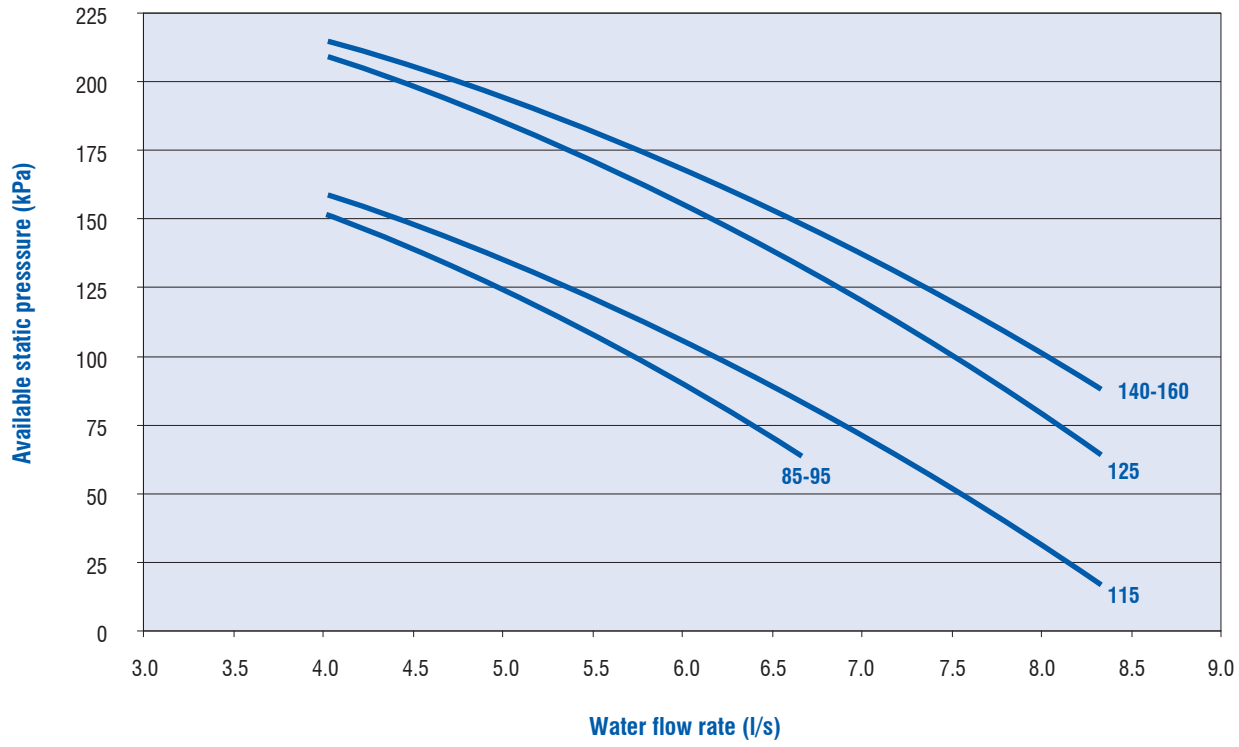


Water Pump Curves

AQVSL/AQVSH STAR - 1 or 2 pump available static pressure

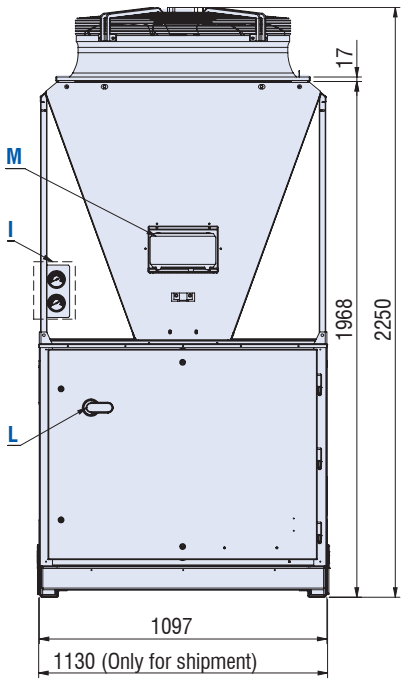


AQVSL/AQVSH STAR - 3 pump available static pressure

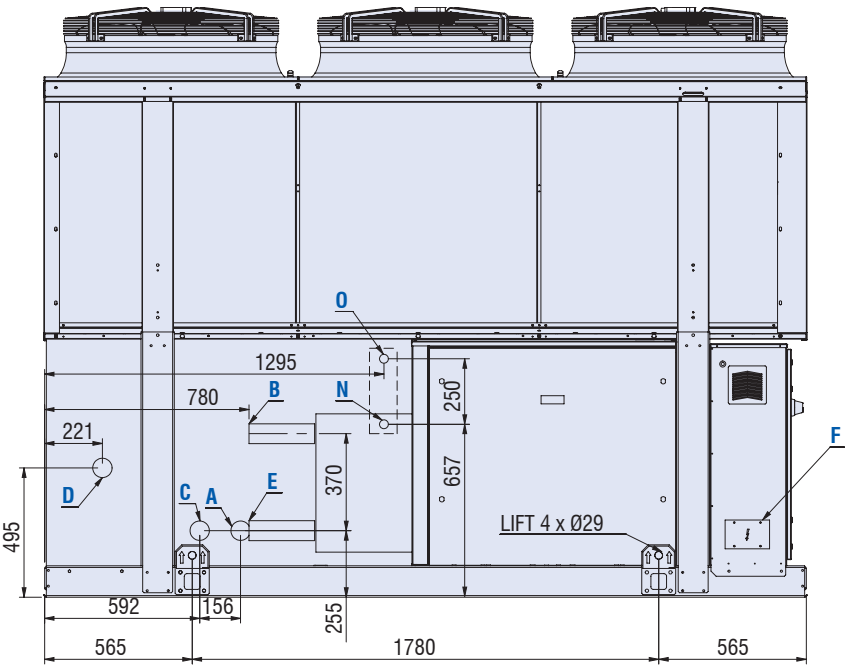


Dimensions (mm) - AQVSL/AQVSH STAR 85 to 160 - R410A

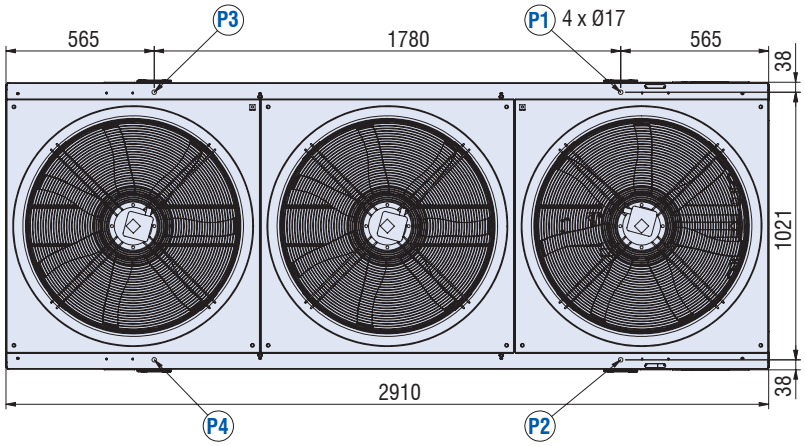
Front view



Side view



Top view



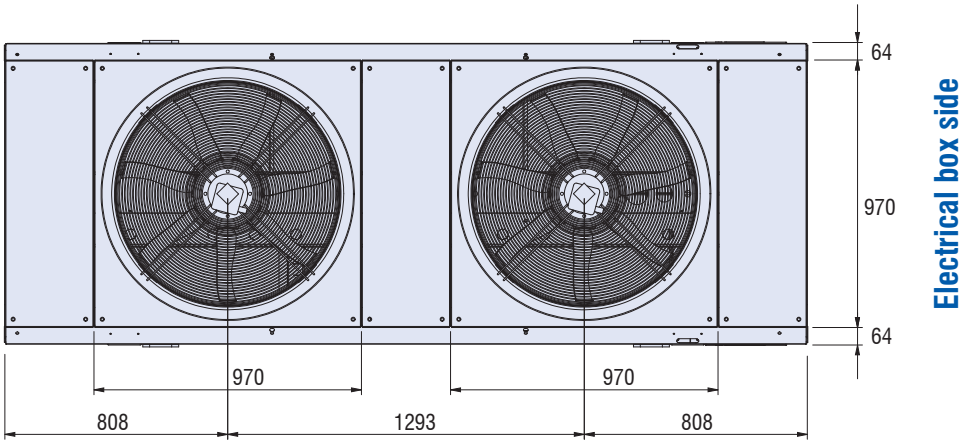
A	Water connection 2" 1/2 Victaulic Ø76.1 mm
B	Water connection 2" 1/2 Victaulic Ø76.1 mm
C	Water connection 2" 1/2 Victaulic Ø76.1 mm
D	Water connection 2" 1/2 Victaulic Ø76.1 mm
E	Water connection 2" 1/2 Victaulic Ø76.1 mm
F	Electrical power supply
I	Gauge kit (accessory)
L	Main switch
M	Control keypad / Display
N	Optional desuperheater water inlet Ø 1" Gas male
O	Optional desuperheater water outlet Ø 1" Gas male
P1	Anti-vibration mount position
P2	Anti-vibration mount position
P3	Anti-vibration mount position
P4	Anti-vibration mount position

Hydraulic option	Water in	Water out
STD	B	E
1P/2P/3P	A	C
1PT/2PT/3PT	A	D

Dimensions (mm) - AQVSL/AQVSH STAR 85 to 160 - R410A (Continued)

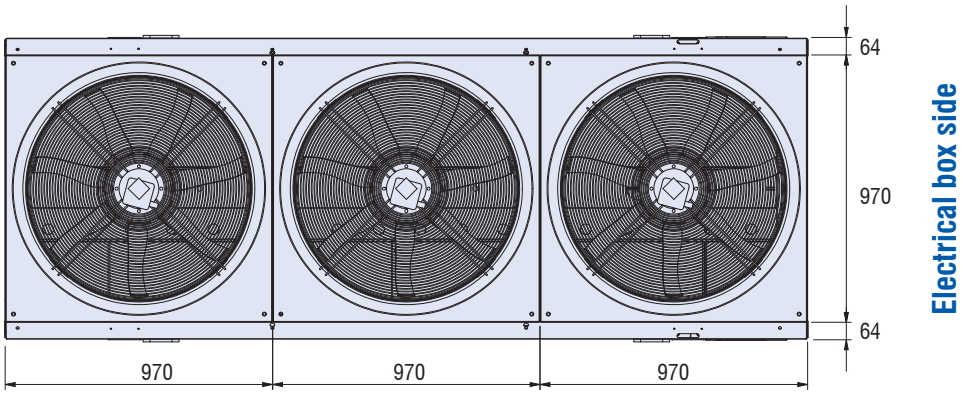
Fan position AQVSL/AQVSH STAR 85-115-125-140

Top view

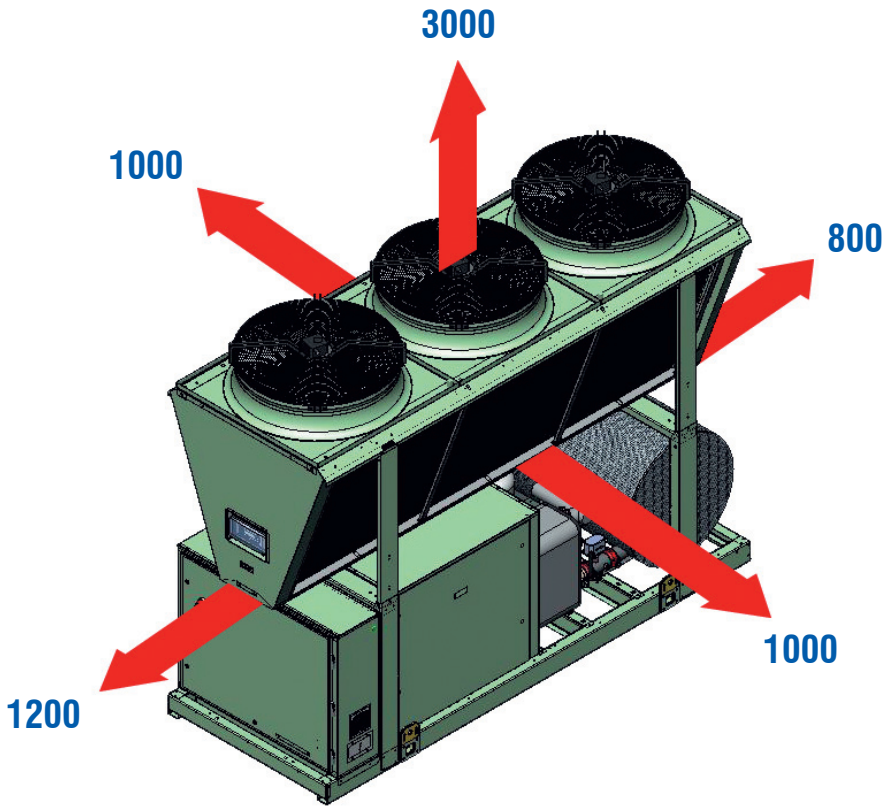


Fan position AQVSL/AQVSH STAR 95-160

Top view



Unit Clearances (mm) - AQVSL/AQVSH STAR 85 to 160 - R410A



Notes

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