

YCAS **eco²**

AIR COOLED SCREW CHILLER

R407C REFRIGERANT

COOLING CAPACITIES 260 kW to 1194 kW



The YCAS range of chillers are designed for water or water-glycol cooling. Models are available with 2, 3 and 4 refrigerant circuits.

Semi-hermetic twin helical screw compressors are provided to ensure high operational efficiencies and reliable performance.

Optional heat recovery condensers or desuperheaters are available on 2 and 4 refrigerant circuit models

All units are designed to be located outside on the roof of a building or at ground level.

AVAILABLE MODELS & NOMINAL COOLING CAPACITIES TABLE 1

Model	0295	0335	0375	0425	0475	0515	0555	0575	0605
Refrigerant Circuits	Two								
Cooling (kW)	260	308	364	397	446	495	527	558	584
Heat Recovery (kW)	253	306	365	383	435	488	527	566	574
DeSuperheater (kW)	22	26	32	33	38	42	46	49	50

Model	0685	0775	0835	0905	0965	1065	1135	1215
Refrigerant Circuits	Three			Four				
Cooling (kW)	692	782	829	898	923	1056	1125	1194
Heat Recovery (kW)	Not Available					1020	1100	1182
DeSuperheater (kW)	Not Available					82	87	100

Cooling capacities at 7°C leaving chilled liquid temperature and 35°C ambient air temperature.

Optional heat recovery capacities at 40°C leaving hot liquid temperature and 7°C leaving chilled liquid temperature.

Optional Desuperheater capacities at 60°C leaving hot liquid temperature, 7°C leaving chilled liquid temperature and 35°C ambient air temperature.

CONTENTS

Specification

Accessories and Options

Refrigeration Flow Diagrams

Operating Limitations

Selection Guide

Cooling Capacities

Heat Recovery Capacities

Physical Data

Electrical Data

Connection Diagrams

Clearances

Dimensions

FEATURES	BENEFITS
Manufactured to ISO 9001 EN 29001.	High standard of quality control.
Two, three and four refrigerant circuits.	System stand-by security.
Constructed from heavy gauge painted galvanised steel.	Durable and weather protected.
High efficiency industrial type semi-hermetic twin helical screw compressor.	Energy efficient, long life reliable compressor.
Full factory run test.	Operating quality control.
Optional acoustic kit.	Reduces operating sound levels.
Optional Star/Delta compressor starter.	Reduced starting current.
Separate power and control compartments with lockable doors and emergency stop device.	Operator safety considerations.
Power compartment optional door interlocked isolators.	Operator safety convenience.
Microprocessor control with visual display of temperatures, pressures, motor currents, operating hours and number of starts.	System data logging and temperature reset capability. Fault diagnostics. Energy management.
Unit remote alarm contacts.	Warning notification.
Remote water temperature reset.	Improved operating efficiency.
Building management system interface.	For central data logging and single point full system monitoring and control.
Fuzzy logic.	Maximise capacity control.
Suction line heat exchanger and counter flow cooler.	Maximises chiller capacity and efficiency.

SPECIFICATION

The YCAS Air Cooled chiller shall be completely assembled with all interconnecting refrigerant piping and internal wiring, ready for field installation. The unit shall be pressure tested, evacuated, and fully factory charged with refrigerant and oil in each of the independent refrigerant circuits.

After assembly, an operational test shall be performed with water flowing through the cooler to ensure that each refrigerant circuit operates correctly.

The unit structure shall be manufactured from heavy gauge, galvanised steel and coated with baked-on powder paint (Desert Sand (RAL 1019)). This provides a finish which, when subjected to 500 hour, 5% salt spray conditions, shows breakdown of less than 3mm either side of a scribed line.

All exposed power wiring shall be routed through liquid-tight, non-metallic conduit.

Compressors

Each compressor shall be direct drive, semi-hermetic, rotary twin screw type and include the following items:

- Two screw rotors, with asymmetric profiles, manufactured from forged steel.
- A cast iron compressor housing precision machined to provide optimal clearance for the rotors.
- The entire compressor, from suction to discharge shall have a design working pressure of 31 bar.
- Capacity Control: The compressors shall start at the minimum load position and provide a capacity control range from 100% to 10% of the full chiller load using a continuous function slide valve. A microprocessor controlled output pressure regulating capacity control valve shall be supplied to command compressor capacity independent of control valve input pressure and to balance the compressor capacity with the cooling load.
- An automatic spring return of capacity control valve to the minimum load position to ensure compressor starting at minimum motor load.
- An internal discharge check valve to prevent rotor backspin upon shutdown.
- An acoustically tuned, internal discharge muffler to minimise noise at the source, while optimising flow for maximum performance.
- Discharge and suction shut-off service valves.
- A rain tight terminal box.
- A reliable suction gas cooled high efficiency, accessible hermetic motor with redundant overload protection using both thermistor and current overload protection.
- A suction gas screen and serviceable, 0.5 micron full flow oil filter within the compressor housing.
- A 350 W compressor body heater.

Oil Separator

Oil separators with a design working pressure of 31 bar shall be the high efficiency, augmented gas impingement type to maximise oil extraction without fragile media to break down.

Oil Cooler

Oil cooling shall be provided by a dedicated air-cooled finned tube type heat exchanger located in the condenser section of the unit.

Refrigerant Circuits

An independent refrigerant circuit shall be provided per compressor. Each circuit will use copper refrigerant pipe formed on computer controlled bending machines to reduce the number of brazed joints resulting in a reliable and leak resistant system.

Liquid line components shall include: manual shut-off valve with charging port, high absorption removable core filter-drier, solenoid valve, sight glass with moisture indicator, and thermostatic expansion valves.

Suction lines shall be covered with closed-cell insulation.

Cooler

The cooler shall be a special optimised 'Counter-Flow' heat exchanger, which will take advantage of the "Glide" characteristic of R407C. It will employ technologically advanced (patent pending) high efficiency tube assemblies which make possible a single refrigerant pass, delivering refrigerant suction gas warmer than the leaving chilled water at full load. An independent circuit shall be provided for each compressor. The shell design working pressure shall be 10.3 bar, and 23.8 bar for the tubes.

The cooler shall have water baffles fabricated from galvanised steel to resist corrosion, removable heads for access to internally enhanced, seamless, copper tubes. The water nozzles shall be provided with grooves for mechanical couplings and be insulated by the contractor after pipe installation. Water vent and drain connections shall also be included.

The cooler shall be equipped with a thermostatically controlled heater for protection to -29°C ambient and insulated with 19 mm flexible closed-cell foam.

Suction Line Heat Exchanger

Each refrigerant circuit utilises a refrigerant to refrigerant, compact, shell and tube type suction line heat exchanger to maximise chiller capacity and efficiency by subcooling liquid refrigerant delivered to the expansion valve and superheating suction gas delivered to the compressor. The design working pressure shall be 31 bar. The exchanger shall be constructed in accordance with applicable pressure vessel safety code.

Condenser

Fans - The fans shall be dynamically and statically balanced, direct drive with corrosion resistant glass fibre reinforced composite blades moulded into low sound, full airfoil cross section, providing vertical air discharge from extended orifices for efficiency and low sound. Each fan shall be located in a separate compartment to prevent cross flow during fan cycling. Guards of heavy gauge, PVC (polyvinyl chloride) coated galvanised steel shall be provided.

Motors - The fan motors shall be the high efficiency, direct drive, 6 pole, 3 phase, Class-"F", current overload protected, totally enclosed (TEAC) type with double sealed, permanently lubricated, ball bearings.

Coils - Fin and tube condenser coils shall be manufactured from seamless, internally enhanced, high condensing coefficient, corrosion resistant copper tubes arranged in staggered rows and mechanically expanded into corrosion resistant black fin aluminium alloy with full height fin collars. The design working pressure shall be 31 bar and each coil shall be pressure tested to 34 bar.

Power and Control Panel

All controls and motor starting equipment necessary for unit operation shall be factory wired and function tested.

The panel enclosure shall be designed to IP55 (rain/dust tight) and be manufactured from powder painted galvanised steel.

The Power and Control Panel shall be divided into a power section for each electrical system, a control section and an electrical options section.

Power and control sections shall have a separate hinged, latched, and gasket sealed door equipped with wind struts for safer servicing.

Each power compartment shall contain:

Compressor and fan starting contactors, fan motor external overloads, control circuit serving compressor capacity control, compressor and fan contactor coils and compressor motor overloads.

Compressor Motor Overloads: Current transformers sense each phase, as an input to the microprocessor, to protect compressor motors from damage due to: low input current, high input current, unbalanced current, single phasing, phase reversal, and compressor locked rotor.

The control section shall contain:

On/Off toggle switch, microcomputer keypad and display, microprocessor board, I/O expansion board, relay boards and power supply board.

The options section shall contain:

A control circuit transformer providing 115/1Ø power to the unit control system.

Electrical options as described in "Accessories and Options".

Microprocessor Controls

Fuzzy Logic control will be incorporated in the YCAS range of chillers. Fuzzy logic allows the control system to monitor several key variables to provide tighter, more stable, chilled water temperature control. The control system monitors the leaving chilled water temperature to track where it has been, where it is now, how fast it is moving, and accurately adjusts chiller operation in anticipation of expected performance to minimise hunting and save energy.

The microprocessor shall have the following functions and displays:

- A liquid crystal 40 character display with text provided on two lines and light emitting diode backlighting for outdoor viewing.
- A colour coded, 35 button, sealed keypad with sections for Display, Entry, Setpoints, Clock, Print, Program and Unit On/Off switch.
- The standard controls shall include: brine chilling or thermal storage, automatic pump down, run signal contacts, demand load limit from external building automation system input, remote reset liquid temperature reset input, unit alarm contacts, chilled liquid pump control, automatic reset after power failure, automatic system optimisation to match operating conditions, software stored in non-volatile memory (EPROM) to eliminate chiller failure due to AC power failure.
- Programmed Setpoint shall be retained in a lithium battery backed RTC memory for a minimum of 5 years.

DISPLAY – In Metric (°C and Bar) or English (°F and psi) units. For each circuit, the following items shall be displayed:

- Return and leaving chilled liquid, and ambient temperature.
- Day, date and time. Daily start/stop times. Holiday and Manual Override status.
- Compressor operating hours and starts. Automatic or manual lead/lag. Lead compressor identification.
- Run permissive status. No cooling load condition. Compressor run status.
- Anti-recycle timer and anti-coincident start timer status per compressor.
- System suction (and suction superheat), discharge, and oil pressures and temperatures.
- Percent full load compressor motor current. Compressor capacity control valve input steps.
- Cut-out status and set-points for: supply fluid temperature, low suction pressure, high discharge pressure and temperature, high oil temperature, low and high ambient, high and low current, and low leaving liquid temperature.
- Unloading limit setpoints for high discharge pressure and compressor motor current.
- Liquid pull-down rate sensitivity (0.3°C to 3°C/minute in 0.05°C increments).
- Status of: evaporator heater, condenser fans, load and unload timers, chilled liquid pump.
- "Out of range" message.
- Up to 6 fault shut down conditions.
- Standard Display Language is English, with other language options.

ENTRY – Enter set point changes, cancel inputs, advance day, and change AM/PM.

SET POINTS – Chilled liquid temperature, chilled liquid range, remote reset temperature range.

CLOCK – Time, daily or holiday start/stop schedule, manual override for servicing.

PRINT – Operating data or system fault shutdown history for last six faults, and software version. Printouts through an RS-232 port via a separate printer (by others).

PROGRAM – Low leaving liquid temperature cutout, 300 to 600 second anti-recycle timer, lag compressor start time delay, average motor current unload point, liquid temperature set-point reset signal from YORK ISN or building automation system (by others) via:

- Pulse width modulated (PWM) input for up to 22°C total reset as standard.
- *Optional* Building Automation System interface input card for up to 11°C reset using a 4 to 20 mA, 0 to 10 Vdc input, or discrete reset input.
- [NOTE: The Standard microprocessor can be directly connected to a YORK ISN Building Automation System via the standard on-board RS485 communication port. This Option also provides open system compatibility with other communications networks (BACNET™ & LONMARK™) via interface through standard onboard 485 or 232 port and an external YorkTalk Translator.]
- Additional functions (password protected) for programming by a qualified service technician:
- Cut-outs for low and high ambient, low suction pressure, high discharge pressure, high oil temperature.
- Refrigerant type.
- High discharge pressure unload setpoint.
- Fan control discharge pressure set point.
- Fan ON/OFF pressure differential.
- Compressor motor current percent limit.
- The Standard unit controls permit operation down to -18°C outdoors ambient temperature.

Motor Protection

The microprocessor motor protection provides high current protection to ensure that the motor is not damaged due to voltage, excess refrigerant or other problems that could cause excessive motor current.

The microprocessor also provides low motor current protection when it senses a motor current of less than 10% FLA.

A motor protector module provides thermal and current motor overload protection. The module also protects against phase to phase current imbalance, over current, under current and phase rotation.

ACCESSORIES AND OPTIONS

ELECTRICAL OPTIONS

Power Supply Connection Options

		Multi Point Power Supply			
		Options Panel		Power Panels 1 and 2	
Models	Option	Terminal Block per Electrical System	Non-Fused Switch Disconnect per Electrical System	Door Interlocked Circuit Breaker per Individual Compressor System	Door Interlocked Non-Fused Switch Disconnect & Fuses per Individual Compressor System
0295 to 0605	2.1			*	
	2.1x				*
0685 to 1215	2.2	*		*	
	2.2x	*			*
	2.3		*	*	
	2.3x		*		*

(1) Supply to Control System Non-Fused Switch Disconnect derived internally from Compressor 1 Power Supply.

		Single Point Power Supply			
		Options Panel		Power Panels 1 and 2	
Models	Option	Terminal Block	Non-Fused Switch Disconnect	Door Interlocked Circuit Breaker per Individual Compressor System	Door Interlocked Non-Fused Switch Disconnect & Fuses per Individual Compressor System
0295 to 1215	2.4	*		*	
	2.4x	*			*
	2.5		*	*	
	2.5x		*		*

(1) **Option 2.4/2.4x** Supply to Control System Non-Fused Switch Disconnect derived internally from Compressor 1 Power Supply.
Option 2.5/2.5x Supply to Control System Non-Fused Switch Disconnect derived internally from common electrical power.

Multi Point Power Supply Connection:

Two field provided 400 V, 3Ø, 50 Hz supplies to the unit with circuit protection.

Single Point Power Supply Connection:

One field provided 400 V, 3Ø, 50 Hz supply to the unit with circuit protection.

Power Factor Correction

Factory mounted passive (static) correction capacitors to correct unit compressor power factors to 0.95 (depending on operating conditions).

Star-Delta Compressor Motor Starter

Provides approximately 65% reduced inrush current compared to direct on-line starting (Factory Mounted).

Closed Transition Star/Delta Start

With the addition of closed transition contactors and resistors the change over spike during starting can be reduced to nearer the star inrush level thus reducing the risk of electrical interference during compressor start.

OptiView™ Control panel

Field mounted remote control panel, used to monitor and control remote York air cooled chillers from an indoor location. Each panel can control up to 8 chillers.

Remote Control Panel and Wall Adaptor

Field mounted remote control panel. (Cannot be fitted when a (BAS) Interface or Multi-unit Sequence Control is fitted).

Multi-unit Sequence Control

A factory mounted Sequencing Control Centre to manage sequencing control of up to eight chillers in parallel based on mixed liquid temperature (interconnecting wiring by others).

(Cannot be fitted when a (BAS) Interface or Remote Control Panel is fitted).

Building Automation System (BAS) Interface

Provides a means to reset the leaving chilled liquid temperature and/or percent full load amps (current limiting) from the BAS (Factory Mounted):

Printed circuit board to accept 4 to 20 mA, 0 to 10 Vdc, or dry contact closure input from the BAS.

(Cannot be fitted when a Multi-unit Sequence Control or Remote Control Panel is fitted).

Note: A YORK ISN Building Automation System can provide a Pulse Width Modulated (PWM) signal direct to the standard control panel via the standard on-board RS485 port.

Flow Switch Accessory

Johnson Controls model F61MG-1C Vapour-proof SPDT, NEMA 4X switch, 10.3 bar DWP, -29°C to 121°C, with 1" NPT (IPS) connection for upright mounting in horizontal pipe. A flow switch must be field installed with each unit.

High Static Pressure Fans

Fans and motors suitable for high external static conditions to 150 Pa.

OTHER OPTIONS

Heat Recovery

(2 and 4 Refrigerant Circuit Models only) Factory fitted plate heat exchanger(s) to provide warm water during cooling to satisfy heating and domestic hot water requirements.

Desuperheaters

(2 and 4 Refrigerant Circuit Models only) Factory fitted desuperheaters on compressor discharge lines to provide hot water during cooling.

Alternative Condenser Coils:

Copper fin condenser coils – Condenser coils are constructed with corrosion resistant copper fins.

Blygold Protective Coating - is recommended for corrosive applications, such as coastal locations where salt spray may hit the condenser fins.

Un-coated aluminium fin stock is available as an option.

DX Cooler Options:

21 Bar Waterside Design Working Pressure – The DX cooler waterside is designed and constructed for 21 bar working pressure. (Factory Mounted)

Flange Accessory – Consists of raised face flanges to convert grooved water nozzles to flanged cooler connections. Includes companion flanges for field mounting.

Unit Enclosures

Wired guards – Heavy gauge welded wire mesh guards mounted over the exterior condenser coil faces and around the bottom of the unit (factory mounted).

Sound Reduction Options

Low sound fans – Reduced RPM fan motors and alternative fan selection for low sound applications.

Compressor sound enclosures – Acoustically treated flexible compressor enclosures.

Acoustic Kit I – Comprises low sound fans and compressor sound enclosures.

Acoustic Kit II – Comprises low sound fans, compressor sound enclosures and fan speed inverters.

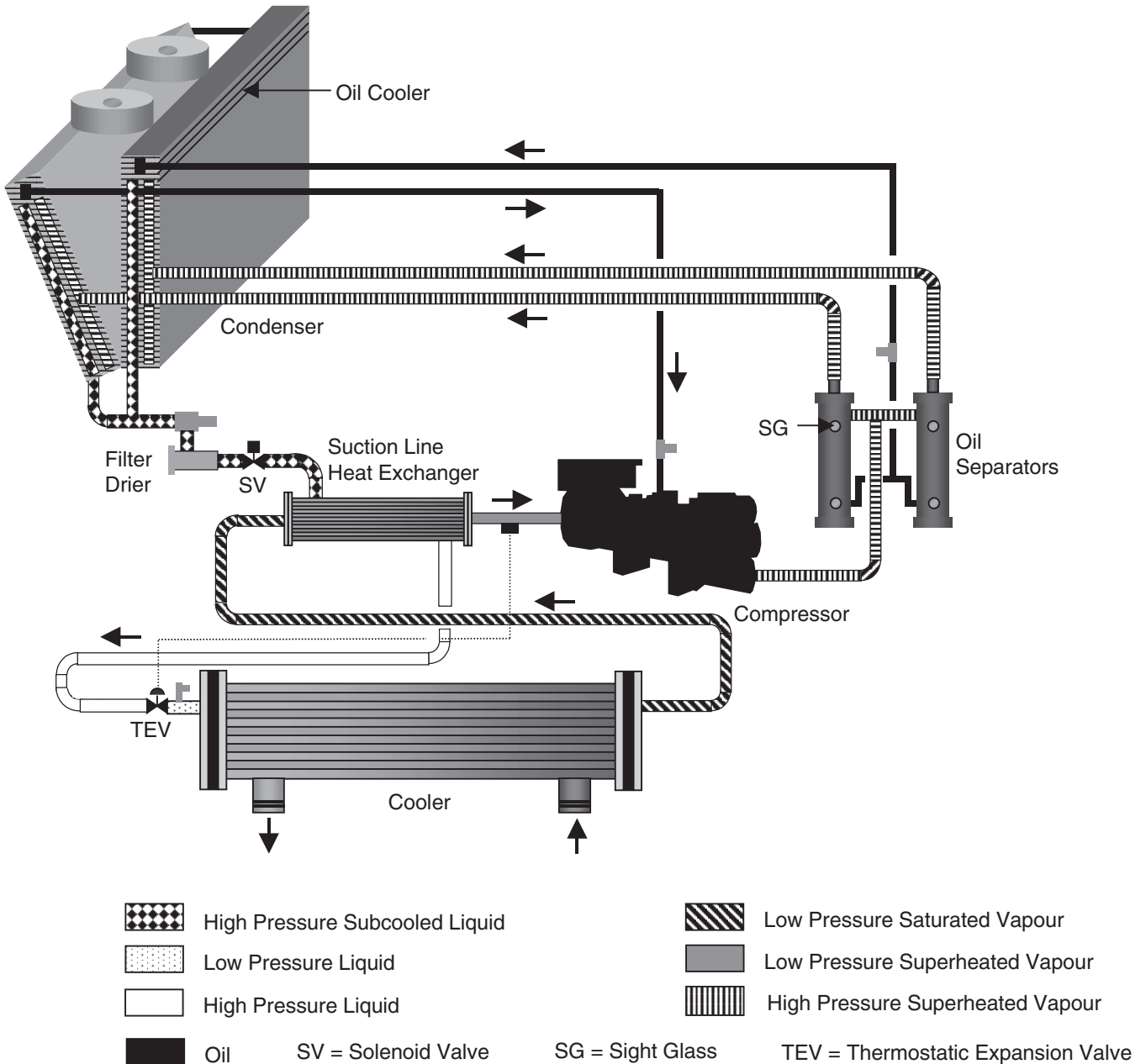
Acoustic Kit III – Comprises low sound fans, fan baffles and side and end intake silencers.

Acoustic Kit IV (ELS) – Comprises low sound fans, fan baffles, side and end intake silencers, compressor sound enclosures and fan speed inverters.

Vibration Isolation

25 mm spring isolators – Level adjustable, spring and cage type isolators for mounting under the unit base rails (Field mounted).

50 mm seismic spring isolators – Restrained Spring-Flex Mountings incorporate welded steel housing with vertical and horizontal limit stops. Housings designed to withstand a minimum 1.0 g accelerated force in all directions to 50 mm. Level adjustable, deflection may vary slightly by application (Field mounted).



Note: Only one refrigerant circuit shown.

Cooling (Figure 1)

Low pressure liquid refrigerant from the expansion valve (TEV) enters the counter-flow cooler tubes and is evaporated by the heat energy absorbed from the chilled water passing through the shell. The refrigerant leaves the cooler in a saturated vapour state.

High pressure liquid refrigerant, from the condenser, enters the suction line heat exchanger shell and superheats the refrigerant vapour entering the tubes from the cooler. The low temperature liquid refrigerant, leaving the exchanger to the cooler, has been sub-cooled by the refrigerant vapour in the exchanger tubes.

Low-pressure superheated vapour enters the compressor where pressure and superheat are increased. High pressure vapour is passed through the oil separator where compressor oil is removed and recirculated to the compressor via the oil cooler. The high pressure oil-free vapour is fed to the air cooled condenser coil and fans where the heat is removed. The high pressure liquid refrigerant returns to the expansion valve via the suction line heat exchanger.

Optional Heat Recovery (Figure 1a)

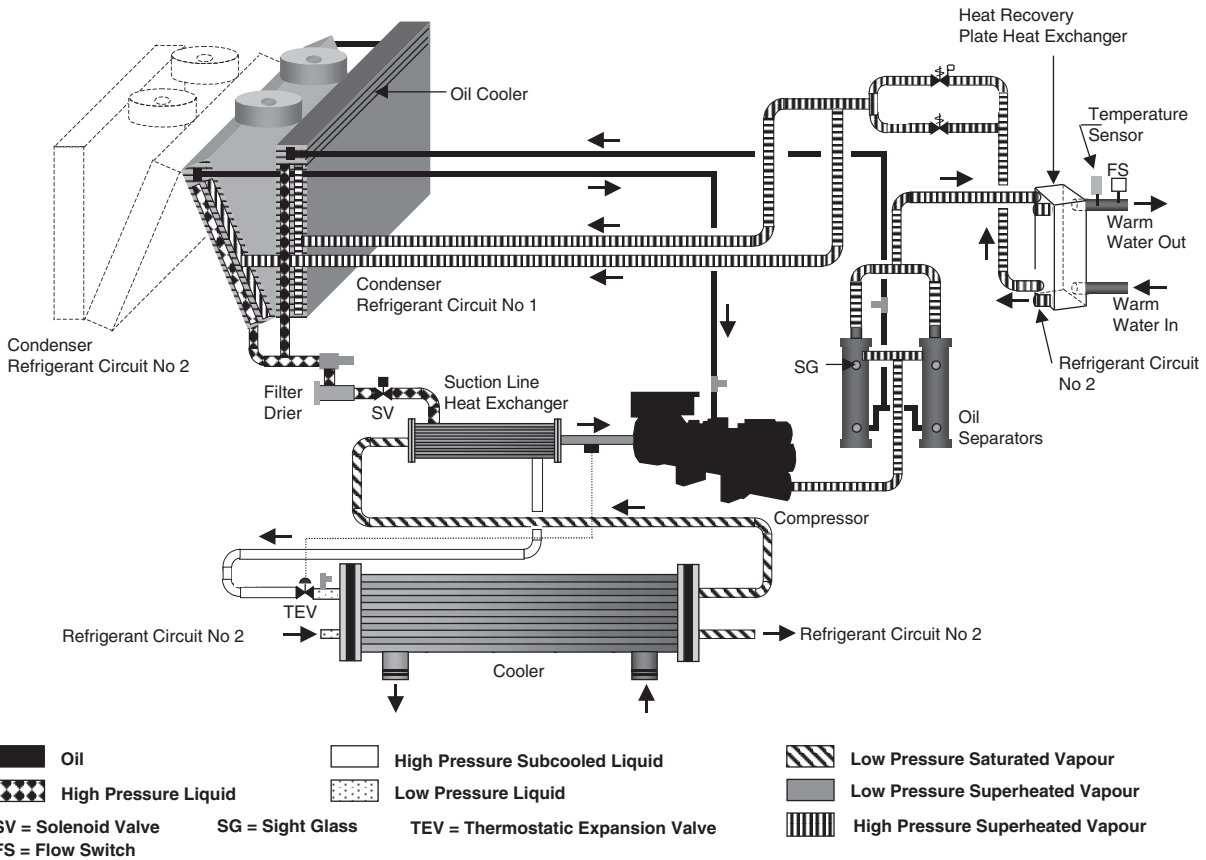
If the warm water flow switch detects water flow the heat recovery pressure regulating valves are energised. The valves allow high-pressure superheated refrigerant, from the oil separators, to enter the twin circuit heat recovery plate heat exchanger. The refrigerant is partially condensed as the warm water absorbs heat energy.

The valves are de-energised when the leaving warm water temperature sensor registers the high point of the set point dead band. If water flow is maintained the valves are re-energised if the temperature sensor registers the low point of the set point dead band.

FIGURE 1a

REFRIGERANT FLOW DIAGRAM

2 and 4 REFRIGERANT CIRCUIT MODELS WITH OPTIONAL HEAT RECOVERY

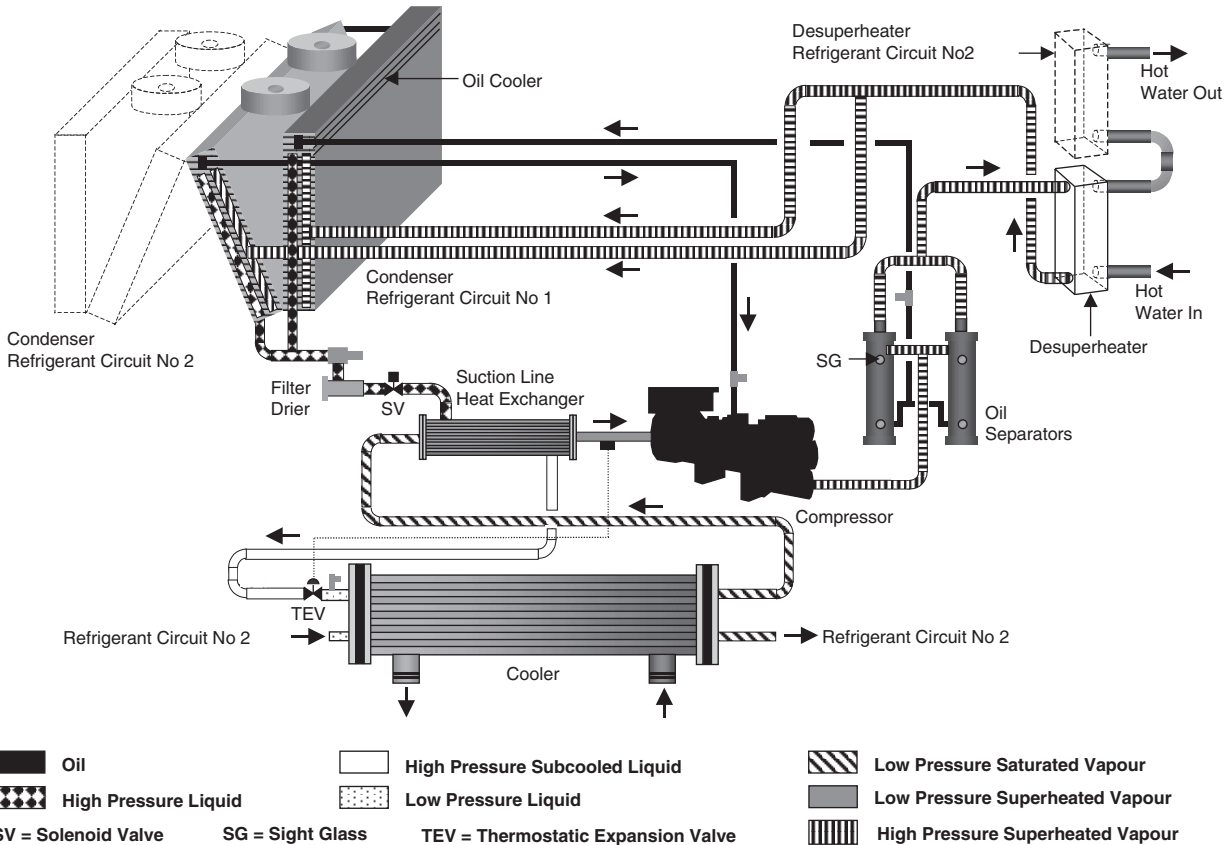


Note: Only refrigerant circuits 1 and 2 shown.

FIGURE 1b

REFRIGERANT FLOW DIAGRAM

2 and 4 REFRIGERANT CIRCUIT MODELS WITH OPTIONAL DESUPERHEATERS



Note: Only refrigerant circuits 1 and 2 shown.

OPERATING LIMITATIONS

TABLE 2

2 Refrigerant Circuit Models

Model YCAS-EB				0295		0335		0375		0425		0475	
				Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Chilled Liquid	Liquid outlet temperature	Water outlet	°C	5 to 13									
		Glycol outlet	°C	-2 to 13 ⁽¹⁾									
		Temp. spread	°C	3 to 10									
	Flow rate	l/s	6.94	25.42	7.70	25.42	8.58	25.42	9.53	37.85	10.60	42.27	
	Pressure drop	kPa	6.2	72.9	7.5	72.9	9.3	72.9	6.0	61.3	7.1	73.9	
Maximum working pressure			bar	10.3 (21.0 Optional)									
Ambient Air	Air Entering temperature	Standard units	°C	-18 to 50									
		Low sound fans	°C	-18 to 46									
		High pressure fans	°C	-18 to 50									
	Fan Available Static Pressure	Standard units	Pa	20									
		Low sound fans	Pa	10									
High pressure fans		Pa	150										
Power supply voltage 400 V, 3 Ø, 50 Hz (nominal)			V	342 to 440									
Recommended system water volum ⁽²⁾			l	835		985		1165		1275		1430	

2 Refrigerant Circuit Models

Model YCAS-EB				0515		0555		0575		0605	
				Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Chilled Liquid	Liquid outlet temperature	Water outlet	°C	5 to 13							
		Glycol outlet	°C	-2 to 13 ⁽¹⁾							
		Temp. spread	°C	3 to 10							
	Flow rate	l/s	11.67	46.87	12.37	48.45	13.06	48.45	13.63	48.45	
	Pressure drop	kPa	8.4	88.0	9.3	93.1	10.2	93.1	10.9	93.1	
Maximum working pressure			bar	10.3 (21.0 Optional)							
Ambient Air	Air Entering temperature	Standard units	°C	-18 to 50							
		Low sound fans	°C	-18 to 46							
		High pressure fans	°C	-18 to 50							
	Fan Available Static Pressure	Standard units	Pa	20							
		Low sound fans	Pa	10							
High pressure fans		Pa	150								
Power supply voltage 400 V, 3 Ø, 50 Hz (nominal)			V	342 to 440							
Recommended system water volume ⁽²⁾			l	1585		1685		1785		1865	

3 Refrigerant Circuit Models

Model YCAS-EB				0685		0775		0835		0905		0965	
				Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Chilled Liquid	Liquid outlet temperature	Water outlet	°C	5 to 13									
		Glycol outlet	°C	-2 to 13 ⁽¹⁾									
		Temp. spread	°C	3 to 10									
	Flow rate	l/s	18.5	67.6	21.0	75.7	21.0	75.7	21.0	75.7	21.0	75.7	
	Pressure drop	kPa	8.8	97.2	9.3	92.4	9.3	92.4	9.3	92.4	9.3	92.4	
Maximum working pressure			bar	10 (21.0 Optional)									
Ambient Air	Air Entering temperature	Standard units	°C	-18 to 50									
		Low sound fans	°C	-18 to 46									
		High pressure fans	°C	-18 to 50									
	Fan Available Static Pressure	Standard units	Pa	20									
		Low sound fans	Pa	10									
High pressure fans		Pa	150										
Power supply voltage 400 V, 3 Ø, 50 Hz (nominal)			V	342 to 440									
Recommended system water volume ⁽²⁾			l	2215		2500		2650		2875		2950	

Notes: (1) -2°C is the minimum leaving chilled liquid temp. (LCLT) for standard coded vessels. ASME coded vessels and other codes with special materials have a minimum LCLT of -9.7°C.

(2) Tables show minimum water / glycol volume of system.

TABLE 2

OPERATING LIMITATIONS

4 Refrigerant Circuit Models

Model YCAS-EB				1065		1135		1215	
				Min.	Max.	Min.	Max.	Min.	Max.
Chilled Liquid	Liquid outlet temperature	Water outlet	°C	5 to 13					
		Glycol outlet	°C	-2 to 13 ⁽¹⁾					
		Temp. spread	°C	3 to 10					
	Flow rate	l/s	27.2	100.9	27.2	100.9	27.2	100.9	
	Pressure drop	kPa	10.3	93.7	10.3	93.7	10.3	93.7	
Maximum working pressure			bar	10 (21.0 Optional)					
Ambient Air	Air Entering temperature	Standard units	°C	-18 to 50					
		Low sound fans	°C	-18 to 46					
		High pressure fans	°C	-18 to 50					
	Fan Available Static Pressure	Standard units	Pa	20					
		Low sound fans	Pa	10					
		High pressure fans	Pa	150					
Power supply voltage 400 V, 3 Ø, 50 Hz (nominal)			V	342 to 440					
Recommended system water volume ⁽²⁾			l	3375		3600		3825	

Notes: (1) -2°C is the minimum leaving chilled liquid temp. (LCLT) for standard coded vessels. ASME coded vessels and other codes with special materials have a minimum LCLT of -9.7°C.

(2) Table shows minimum water / glycol volume of system.

SELECTION GUIDE

DATA REQUIRED

To select a YORK YCAS chiller the following information is required:

1. Required cooling capacity.
2. Design chilled water entering and leaving temperatures.
3. Design water flow rate if one of the temperatures in item 3 are unknown.
4. Design condenser entering air temperature. This will normally be the design summer ambient air temperature unless location or other factors have an influence.
5. Altitude above sea level.
6. Design cooler fouling factor.
7. Static pressure resistance against condenser entering and leaving air flow (where ducts, louvres, attenuators, etc., are used) at full unit air volume.

Note: Items 1, 2 and 3 must be linked by the following formulae:

$$\text{Cooling Capacity (kW)} = \text{Range (°C)} \times \text{Flow (litres/sec)} \times 4.18$$

Where:

Range = Entering liquid temperature - Leaving liquid temperature.

CHILLER SELECTION METHOD

1. Determine the correct size of chiller by selecting the model which most closely matches the required capacity at the design conditions of leaving water temperature and entering air temperature (Table 7).
2. Apply correction factors for fouling factor (Table 3) and altitude & fan application (Tables 4 & 5) to the capacity and power values from the capacity tables (Table 7). Ensure the corrected capacity is still sufficient for requirements.
3. Using the corrected capacity of the selected chiller adjust the design temperature range, or flow rate, to balance the formulae shown in "Data Required".
4. Physical and electrical data can now be determined from Tables 9 and 10.
5. Always re-check that selections fall within the design limitations specified in Table 2.

TABLE 3 FOULING FACTORS

COOLER		
Fouling Factor m ² °C/kW	Capacity Factor	Comp. 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

TABLE 4 ALTITUDE FACTORS

Altitude (m)	Capacity Factor	Comp. 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

TABLE 5 FAN APPLICATION FACTORS

Fan Type	External Static (Pa)	Capacity Factor	Comp. Input Factor
Low Sound Fans	0	1.00	1.00
	10	0.99	1.01
Standard Fans	0	1.00	1.00
	20	0.99	1.01
High Pressure Fans	150	1.00	1.00

COOLING ONLY CHILLER SAMPLE SELECTION

A chiller is required to cool water from 12°C to 7°C having a cooling capacity of 575 kW at a design flow rate of 28 l/s. Other design conditions applying are:

- Ambient air entering condenser: 35°C
- Fouling factor: 0.044 m² °C./kW
- Altitude: Sea level
- Condenser air restriction: None

From a cursory examination of Capacity Table 7, a model 0605EB gives approximately the required capacity:

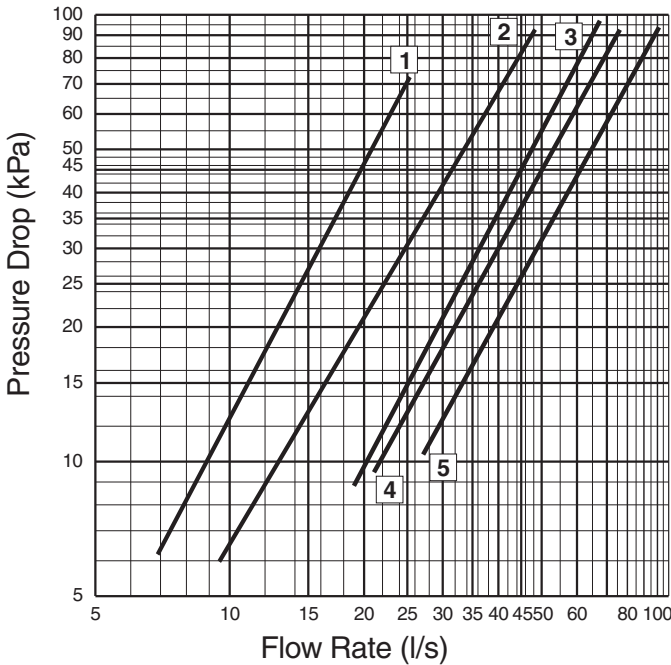
- Capacity = 584 kW
- Compressor power = 179.7 kW

No correction factors apply therefore, after calculating the flow rate, the conditions will be as follows:

- Cooling capacity: 584 kW
- Water temperature: 12°C to 7°C (Range = 5°C)
- Water flow rate: 27.95 l/s
- Compressor power: 179.7 kW

All values are within the operating limits in Table 2. From Pressure Drop Graph (Figure 2), YCAS0605EB cooler water pressure drop = 36.7 kPa at the calculated flow of 27.95 l/s.

COOLER WATER PRESSURE DROPS FIGURE 2



Model	Line	Pressure Drop Calculation
0295, 0335, 0375	1	Pressure Drop [kPa] = 0.1556 x (Flow Rate [l/s] ^{1.9004})
0425, 0475, 0515, 0555, 0575, 0605	2	Pressure Drop [kPa] = 0.1320 x (Flow Rate [l/s] ^{1.6901})
0685	3	Pressure Drop [kPa] = 0.0396 x (Flow Rate [l/s] ^{1.8523})
0775, 0835, 0905, 0965	4	Pressure Drop [kPa] = 0.0394 x (Flow Rate [l/s] ^{1.7935})
1065, 1135, 1215	5	Pressure Drop [kPa] = 0.0396 x (Flow Rate [l/s] ^{1.6837})

OPTIONAL HEAT RECOVERY SAMPLE SELECTION

A chiller is required to cool water from 12°C to 7°C having a cooling capacity of approximately 575 kW at a design flow rate of 28 l/s. Other design conditions applying are:

- Ambient air entering condenser: 35°C
- Fouling factor: 0.044 m² °C./kW
- Altitude: Sea level
- Condenser air restriction: None
- Required leaving Temperature 50°C
- Hot water temperature range 12°C

A model 0605EB meets the cooling requirements, see sample selection opposite.

From Table 8 a model 0605EB gives the following data when providing hot water at 50°C.

LWT	Cool (kW)	Power (kW)	Heat (kW)
7°C	510	226	393

The heating capacity should be corrected for the hot water temperature range Table 6: 393 kW x 1.02 = 400.8

Heat recovery water flow: $\frac{400.8}{12^\circ\text{C} \times 4.18} = 7.99 \text{ l/s}$

Heat recovery pressure drop from graph (Figure 3) is 46 kPa at the calculated flow of 7.99 l/s.

TEMPERATURE RANGE FACTORS TABLE 6

Temperature Range	Capacity Factor	Temperature Range	Capacity Factor
8	0.98	11	1.01
9	0.99	12	1.02
10	1.00	13	1.03
		14	1.04

FIGURE 3 HEAT RECOVERY PRESSURE DROP

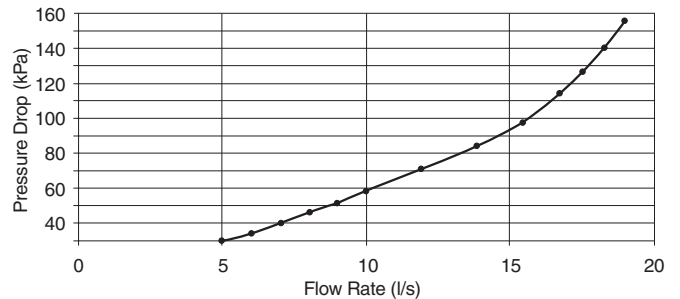
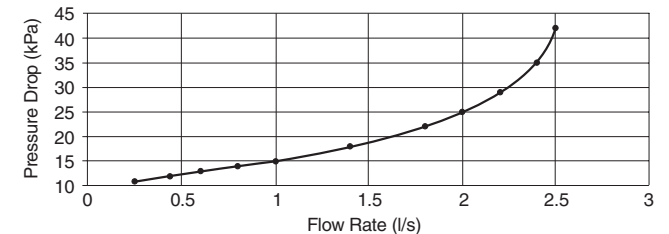


FIGURE 4 DESUPERHEATERS PRESSURE DROP



The water pressure drop values shown in figures 3 and 4 are for two refrigerant circuit models with flow rates based on 10°C hot water temperature range.

On four refrigerant circuit models two heat recovery condensers or two pairs of desuperheaters are fitted. Both options are to have their heat exchanger water circuits connected in parallel.

When connected in this configuration the water flow will be equally divided through the heat exchangers, therefore the total flow should be divided by 2 when calculating the pressure drop.

TABLE 7

2 REFRIGERANT CIRCUIT MODELS COOLING CAPACITIES

Model	Leaving Water Temp. °C	Condenser Entering Air Temperature °C											
		25		30		35		40		45		50	
		Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW
YCAS 0295EB	5.0	274	60.4	260	67.8	244	76.6	229	86.4	214	97.4	200	109.4
	6.0	283	60.1	269	67.6	252	76.2	236	86.0	221	96.9	208	108.7
	7.0	292	59.9	277	67.3	260	75.9	244	85.7	229	96.4	215	108.1
	8.0	301	59.7	285	67.1	269	75.7	252	85.3	236	96.0	222	107.6
	9.0	310	59.5	293	66.9	277	75.5	260	85.1	244	95.7	230	107.2
	10.0	319	59.2	301	66.7	285	75.3	268	84.9	252	95.4	237	106.8
	11.0	328	59.1	309	66.6	294	75.2	276	84.8	260	95.3	243	105.8
	12.0	337	58.9	317	66.5	302	75.1	285	84.7	268	95.2	245	103.7
13.0	346	58.7	326	66.4	311	75.1	293	84.7	276	95.2	249	102.2	
YCAS 0335EB	5.0	327	77.6	309	87.4	289	98.7	271	111.4	253	125.4	212	125.9
	6.0	338	77.7	318	87.5	299	98.8	282	111.5	262	125.4	217	124.4
	7.0	348	77.8	328	87.6	308	98.8	289	111.3	271	125.2	222	123.1
	8.0	358	77.9	338	87.7	318	98.9	298	111.4	280	125.1	227	121.7
	9.0	368	78.0	348	87.8	327	99.0	308	111.4	289	125.1	233	120.1
	10.0	379	78.0	357	87.9	337	99.1	317	111.5	298	125.1	237	119.5
	11.0	389	78.1	367	88.0	347	99.2	327	111.7	307	125.2	241	118.0
	12.0	399	78.2	377	88.2	357	99.4	336	111.8	317	125.4	244	116.1
13.0	410	78.2	388	88.3	367	99.5	346	112.0	326	125.6	247	114.5	
YCAS 0375EB	5.0	389	94.9	365	107.1	342	121.0	320	136.4	299	153.6	227	142.3
	6.0	400	95.4	376	107.6	353	121.4	330	136.7	309	153.9	230	140.0
	7.0	412	95.8	387	108.1	364	121.8	341	137.1	320	154.1	234	138.1
	8.0	424	96.2	399	108.5	375	122.2	352	137.5	330	154.3	236	135.7
	9.0	435	96.6	411	108.8	386	122.6	363	137.9	341	154.6	240	134.0
	10.0	447	96.9	422	109.2	398	122.9	374	138.3	352	154.9	242	132.1
	11.0	459	97.2	434	109.6	409	123.3	385	138.7	363	155.3	245	130.2
	12.0	471	97.5	446	109.9	421	123.7	396	139.0	373	155.6	248	128.5
13.0	483	97.8	459	110.3	432	124.1	408	139.3	385	156.0	250	126.8	
YCAS 0425EB	5.0	425	87.2	399	98.4	373	111.2	349	125.5	326	141.4	305	158.8
	6.0	437	87.4	412	98.6	385	111.3	360	125.5	337	141.4	316	158.7
	7.0	450	87.5	424	98.7	397	111.5	372	125.7	348	141.4	327	158.6
	8.0	463	87.7	437	98.9	410	111.6	384	125.7	359	141.4	338	158.5
	9.0	477	87.8	450	99.0	422	111.6	396	125.8	371	141.4	346	157.5
	10.0	490	87.9	463	99.1	435	111.7	408	125.9	383	141.4	349	154.3
	11.0	505	87.8	476	99.1	448	111.8	420	125.9	395	141.4	355	152.2
	12.0	518	87.8	489	99.2	461	111.9	433	126.0	407	141.5	361	150.0
13.0	533	87.8	502	99.2	474	112.0	445	126.1	419	141.6	365	147.6	
YCAS 0475EB	5.0	478	103.6	449	116.9	420	131.8	392	148.6	367	167.3	318	174.1
	6.0	492	104.0	462	117.2	433	132.2	405	148.9	379	167.5	326	172.5
	7.0	507	104.3	476	117.6	446	132.5	418	149.2	391	167.6	333	170.9
	8.0	521	104.6	491	117.9	460	132.8	431	149.4	404	167.8	341	169.4
	9.0	536	104.9	505	118.1	474	133.1	444	149.7	417	168.0	347	167.5
	10.0	551	105.1	542	118.5	488	133.3	458	150.0	430	168.2	351	164.6
	11.0	598	105.4	534	118.7	502	133.6	471	150.3	443	168.4	356	162.2
	12.0	581	105.6	577	118.9	516	133.9	485	150.5	456	168.7	361	159.9
13.0	596	105.8	563	119.1	530	134.2	499	150.8	470	169.0	364	157.5	
YCAS 0515EB	5.0	532	120.1	498	135.3	466	152.5	436	171.8	408	193.2	331	189.3
	6.0	547	120.6	513	135.9	481	153.1	450	172.2	421	193.6	336	186.2
	7.0	563	121.1	529	136.4	495	153.6	464	172.7	435	193.9	340	183.3
	8.0	579	121.6	544	136.9	510	154.0	478	173.2	449	194.2	344	180.4
	9.0	596	122.0	560	137.4	526	154.5	493	173.7	463	194.6	349	177.6
	10.0	612	122.5	576	137.8	541	155.0	507	174.2	477	195.0	353	174.9
	11.0	628	123.0	592	138.3	556	155.5	522	174.6	491	195.5	356	172.3
	12.0	644	123.4	608	138.7	572	156.0	538	175.0	506	195.9	360	169.8
13.0	660	123.8	624	139.1	587	156.5	553	175.5	521	196.4	364	167.4	
YCAS 0555EB	5.0	566	136.1	530	153.4	496	172.8	463	194.5	418	209.6	326	199.4
	6.0	582	136.8	546	154.1	511	173.5	478	195.2	432	209.8	331	196.3
	7.0	599	137.6	562	154.9	527	174.2	493	195.8	445	209.9	335	193.4
	8.0	616	138.3	578	155.5	542	174.9	508	196.5	459	210.1	339	190.5
	9.0	633	138.9	595	156.1	558	175.5	524	197.1	472	210.3	343	187.8
	10.0	650	139.5	611	156.8	574	176.2	539	197.8	486	210.5	347	185.1
	11.0	667	140.2	628	157.5	591	176.9	555	198.5	500	210.7	350	182.5
	12.0	684	140.8	645	158.2	607	177.6	571	199.1	514	211.0	354	180.1
13.0	701	141.3	662	158.8	623	178.3	587	199.8	528	211.1	357	177.7	
YCAS 0575EB	5.0	599	152.1	561	171.4	525	193.0	491	217.3	429	226.0	322	209.5
	6.0	617	153.1	578	172.3	541	193.9	507	218.2	442	226.0	326	206.4
	7.0	634	154.1	595	173.4	558	194.8	523	219.0	455	226.0	330	203.5
	8.0	652	155.0	613	174.0	574	195.7	539	219.8	468	226.0	334	200.7
	9.0	670	155.8	630	174.9	591	196.6	555	220.6	482	226.0	338	197.9
	10.0	688	156.6	647	175.7	608	197.4	571	221.5	495	226.0	341	195.3
	11.0	706	157.5	664	176.9	625	198.3	588	222.3	509	226.0	345	192.7
	12.0	724	158.2	682	177.7	642	199.2	604	223.2	523	226.0	348	190.3
13.0	743	158.9	700	178.6	660	200.1	621	224.1	536	226.0	351	187.9	
YCAS 0605EB	5.0	625	140.8	586	158.5	549	178.6	513	201.2	479	226.0	398	226.0
	6.0	643	141.5	604	159.3	566	179.1	530	201.7	495	226.0	411	226.0
	7.0	662	142.0	622	159.8	584	179.7	546	202.2	510	226.0	425	226.0
	8.0	681	142.6	640	160.4	606	180.5	563	202.7	525	226.0	438	226.0
	9.0	700	143.1	658	160.9	618	180.9	581	203.0	541	226.0	450	225.0
	10.0	719	143.5	677	161.4	636	181.5	598	203.6	556	226.0	456	221.5
	11.0	738	143.9	696	161.9	654	182.0	615	204.3	572	226.0	461	217.9
	12.0	757	144.3	715	162.4	673	182.5	633	204.8	588	226.0	466	214.4
13.0	776	144.7	734	162.8	691	183.0	651	205.4	603	226.0	471	211.1	

3 REFRIGERANT CIRCUIT MODELS COOLING CAPACITIES

TABLE 7

Model	Leaving Water Temp. °C	Condenser Entering Air Temperature °C											
		25		30		35		40		45		50	
		Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW
YCAS 0685EB	5.0	743	166.3	695	187.5	650	211.5	608	238.2	558	262.7	448	256.5
	6.0	764	167.1	717	188.2	671	212.1	627	238.8	577	262.9	455	252.6
	7.0	786	167.8	738	188.9	692	212.8	647	239.4	595	263.1	461	248.7
	8.0	809	168.4	760	189.5	713	213.4	667	239.9	614	263.3	467	245.0
	9.0	831	168.9	782	190.0	734	213.9	688	240.5	633	263.4	473	241.4
	10.0	853	169.4	804	190.7	755	214.5	709	241.0	652	263.7	479	237.9
	11.0	876	169.8	827	191.3	777	215.1	730	241.6	671	263.9	484	234.5
	12.0	900	170.3	849	191.8	799	215.7	751	242.2	691	264.1	489	231.3
13.0	938	170.8	872	192.4	821	216.3	772	242.8	710	264.3	495	228.2	
YCAS 0775EB	5.0	839	175.2	786	197.5	735	222.7	687	251.0	643	282.3	567	299.0
	6.0	864	175.8	810	198.1	759	223.3	709	251.4	664	282.6	576	294.0
	7.0	889	176.3	835	198.7	782	223.8	732	251.9	686	282.9	584	289.1
	8.0	915	176.8	860	199.2	806	224.3	755	252.3	708	283.3	592	284.4
	9.0	940	177.3	885	199.7	830	224.8	778	252.8	730	283.6	600	279.8
	10.0	965	177.7	910	200.1	855	225.3	802	253.2	753	284.0	607	275.3
	11.0	990	178.4	936	200.6	879	225.7	826	253.7	776	284.4	614	271.0
	12.0	1015	178.7	961	201.0	904	226.2	850	254.2	799	284.8	621	266.9
13.0	1042	179.0	987	201.4	929	226.7	874	254.7	823	285.3	628	262.8	
YCAS 0835EB	5.0	891	190.8	834	214.9	780	242.2	728	272.7	671	301.3	568	307.2
	6.0	917	191.6	859	215.7	804	242.9	752	273.4	693	301.5	576	302.3
	7.0	943	192.3	885	216.4	829	243.6	775	274.0	715	301.7	584	297.4
	8.0	970	193.0	911	217.0	854	244.3	800	274.7	737	301.9	591	292.7
	9.0	997	193.6	937	217.7	879	244.9	824	275.2	760	302.2	599	288.2
	10.0	1023	194.3	964	218.4	905	245.6	849	275.8	782	302.5	606	283.8
	11.0	1050	194.8	990	219.1	930	246.2	874	276.5	805	302.7	613	279.5
	12.0	1078	195.3	1017	219.7	956	246.9	899	277.1	829	303.0	619	275.4
13.0	1106	195.8	1044	220.3	983	247.6	924	277.9	852	303.3	625	271.5	
YCAS 0905EB	5.0	966	221.3	904	249.1	845	280.6	790	315.8	708	339.0	562	327.8
	6.0	993	222.7	932	250.2	872	281.7	815	316.9	730	339.0	569	322.7
	7.0	1022	223.7	959	251.3	898	282.7	841	318.0	752	339.0	576	317.9
	8.0	1051	224.7	987	252.3	925	283.7	866	318.9	775	339.0	584	313.2
	9.0	1080	225.6	1015	253.5	952	284.7	893	319.7	797	339.0	590	308.6
	10.0	1109	226.5	1042	254.7	980	285.7	919	320.6	820	339.0	597	304.2
	11.0	1139	227.4	1071	255.6	1007	286.7	946	321.6	843	339.0	603	300.0
	12.0	1169	228.2	1100	256.6	1035	287.8	973	322.6	866	339.0	609	295.9
13.0	1198	229.0	1129	257.5	1063	288.9	1000	323.7	889	339.0	615	291.9	
YCAS 0965EB	5.0	990	211.4	928	237.9	869	267.7	812	301.4	751	334.8	630	339.0
	6.0	1020	212.3	956	238.8	896	268.5	838	302.2	775	334.8	652	339.0
	7.0	1049	213.1	985	239.7	923	269.3	864	302.9	799	334.8	668	336.3
	8.0	1090	214.1	1014	240.4	950	270.4	891	303.6	823	334.9	681	332.6
	9.0	1108	214.5	1043	241.2	978	271.1	918	304.3	848	335.0	694	329.1
	10.0	1173	216.1	1072	241.9	1007	271.9	945	305.2	873	335.0	707	325.7
	11.0	1169	215.8	1101	242.6	1035	272.7	972	306.1	897	335.3	720	322.4
	12.0	1199	216.4	1131	243.3	1064	273.5	1000	306.9	922	335.4	732	319.2
13.0	1230	216.9	1161	244.0	1093	274.2	1028	307.7	947	335.6	744	316.2	

4 REFRIGERANT CIRCUIT MODELS COOLING CAPACITIES

TABLE 7

Model	Leaving Water Temp. °C	Condenser Entering Air Temperature °C											
		25		30		35		40		45		50	
		Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW
YCAS 1065EB	5.0	1134	234.0	1062	263.7	993	297.3	927	334.9	867	376.6	760	396.5
	6.0	1168	234.8	1094	264.5	1024	298.0	957	335.5	896	377.0	771	389.9
	7.0	1202	235.4	1127	265.2	1056	298.6	988	336.1	925	377.4	782	383.4
	8.0	1236	236.1	1161	265.8	1088	299.3	1019	336.6	955	377.9	793	377.2
	9.0	1270	236.6	1194	266.5	1120	300.0	1050	337.2	985	378.3	803	371.1
	10.0	1303	237.4	1229	267.1	1153	300.6	1082	337.9	1015	378.8	813	365.2
	11.0	1337	238.0	1249	267.3	1186	301.3	1114	338.5	1046	379.4	822	359.6
	12.0	1372	238.5	1298	268.2	1219	301.9	1146	339.2	1077	380.0	831	354.1
13.0	1409	238.9	1332	268.9	1253	302.6	1178	339.9	1109	380.6	840	348.8	
YCAS 1135EB	5.0	1208	264.4	1132	297.8	1058	335.6	989	377.9	904	414.3	754	417.0
	6.0	1244	265.8	1166	298.9	1091	336.7	1020	378.9	933	414.5	765	410.4
	7.0	1280	266.8	1201	300.0	1125	337.7	1052	379.9	963	414.7	775	403.9
	8.0	1316	267.7	1236	301.0	1159	338.8	1085	380.9	992	414.9	785	397.6
	9.0	1352	268.6	1272	302.0	1193	339.7	1118	381.7	1022	415.2	795	391.5
	10.0	1389	269.7	1307	303.2	1227	340.7	1152	382.6	1053	415.4	804	385.6
	11.0	1425	270.5	1343	304.1	1262	341.7	1185	383.6	1083	415.7	813	380.0
	12.0	1463	271.3	1380	305.1	1297	342.7	1220	384.6	1114	416.0	821	374.5
13.0	1501	272.1	1416	306.0	1333	343.8	1254	385.6	1145	416.3	830	369.2	
YCAS 1215EB	5.0	1283	294.9	1202	332.0	1124	374.0	1050	421.0	941	452.0	748	437.6
	6.0	1320	296.8	1238	333.5	1159	375.5	1084	422.3	971	452.0	758	430.8
	7.0	1358	298.2	1275	334.9	1194	376.8	1117	423.8	1000	452.0	768	424.3
	8.0	1396	299.5	1312	336.2	1230	378.2	1152	425.1	1030	452.0	777	418.0
	9.0	1435	300.7	1349	337.6	1266	379.5	1187	426.2	1060	452.0	786	411.9
	10.0	1474	301.9	1386	339.4	1302	380.8	1222	427.4	1090	452.0	795	406.1
	11.0	1514	303.1	1424	340.7	1339	382.2	1257	428.7	1121	452.0	804	400.4
	12.0	1553	304.2	1462	341.9	1376	383.6	1293	430.0	1151	452.0	812	394.9
13.0	1593	305.3	1501	343.2	1413	385.0	1329	431.5	1182	452.0	820	389.6	

TABLE 8

**2 REFRIGERANT CIRCUIT MODELS
HEAT RECOVERY CAPACITIES**

Model	Leaving Chilled Water Temp. °C	Leaving Hot Water Temperature °C														
		30			35			40			45			50		
		Cool kW	Power kW	Heat kW	Cool kW	Power kW	Heat kW	Cool kW	Power kW	Heat kW	Cool kW	Power kW	Heat kW	Cool kW	Power kW	Heat kW
YCAS 0295EB	5.0	274	60.4	275	260	67.8	260	244	76.6	241	229	86.4	216	214	97.4	166
	6.0	283	60.1	282	269	67.6	266	252	76.2	247	236	86.0	221	221	96.9	170
	7.0	292	59.9	289	277	67.3	272	260	75.9	253	244	85.7	227	229	96.4	174
	8.0	301	59.7	296	285	67.1	279	269	75.7	259	252	85.3	232	236	96.0	178
	9.0	310	59.5	304	293	66.9	285	277	75.5	265	260	85.1	237	244	95.7	182
	10.0	319	59.2	311	301	66.7	291	285	75.3	271	268	84.9	242	252	95.4	186
	11.0	328	59.1	318	309	66.6	297	294	75.2	277	276	84.8	248	260	95.3	190
	12.0	337	58.9	325	317	66.5	304	302	75.1	284	285	84.7	254	268	95.2	194
13.0	346	58.7	332	326	66.4	311	311	75.1	290	293	84.7	259	276	95.2	198	
YCAS 0335EB	5.0	327	77.6	333	309	87.4	314	289	98.7	292	271	111.4	262	253	125.4	203
	6.0	338	77.7	341	318	87.5	321	299	98.8	299	282	111.5	270	262	125.4	207
	7.0	348	77.8	350	328	87.6	329	308	98.8	306	289	111.3	275	271	125.2	212
	8.0	358	77.9	358	338	87.7	337	318	98.9	313	298	111.4	281	280	125.1	217
	9.0	368	78.0	367	348	87.8	345	327	99.0	321	308	111.4	288	289	125.1	221
	10.0	379	78.0	375	357	87.9	352	337	99.1	328	317	111.5	294	298	125.1	226
	11.0	389	78.1	384	367	88.0	360	347	99.2	336	327	111.7	301	307	125.2	231
	12.0	399	78.2	392	377	88.2	368	357	99.4	343	336	111.8	308	317	125.4	236
13.0	410	78.2	401	388	88.3	377	367	99.5	351	346	112.0	315	326	125.6	241	
YCAS 0375EB	5.0	389	94.9	397	365	107.1	373	342	121.0	348	320	136.4	313	299	153.6	242
	6.0	400	95.4	407	376	107.6	383	353	121.4	357	330	136.7	321	309	153.9	248
	7.0	412	95.8	417	387	108.1	392	364	121.8	365	341	137.1	328	320	154.1	253
	8.0	424	96.2	427	399	108.5	402	375	122.2	374	352	137.5	336	330	154.3	259
	9.0	435	96.6	437	411	108.8	411	386	122.6	383	363	137.9	344	341	154.6	265
	10.0	447	96.9	447	422	109.2	421	398	122.9	392	374	138.3	352	352	154.9	271
	11.0	459	97.2	457	434	109.6	431	409	123.3	401	385	138.7	359	363	155.3	277
	12.0	471	97.5	467	446	109.9	440	421	123.7	410	396	139.0	368	373	155.6	283
13.0	483	97.8	478	459	110.3	450	432	124.1	419	408	139.3	376	385	156.0	289	
YCAS 0425EB	5.0	425	87.2	421	399	98.4	394	373	111.2	364	349	125.5	326	326	141.4	250
	6.0	437	87.4	431	412	98.6	404	385	111.3	374	360	125.5	334	337	141.4	256
	7.0	450	87.5	442	424	98.7	414	397	111.5	383	372	125.7	342	348	141.4	262
	8.0	463	87.7	453	437	98.9	424	410	111.6	392	384	125.7	350	359	141.4	268
	9.0	477	87.8	464	450	99.0	435	422	111.6	402	396	125.8	358	371	141.4	274
	10.0	490	87.9	475	463	99.1	445	435	111.7	411	408	125.9	367	383	141.4	280
	11.0	505	87.8	487	476	99.1	455	448	111.8	421	420	125.9	375	395	141.4	287
	12.0	518	87.8	498	489	99.2	465	461	111.9	431	433	126.0	384	407	141.5	293
13.0	533	87.8	510	502	99.2	476	474	112.0	441	445	126.1	392	419	141.6	300	
YCAS 0475EB	5.0	478	103.6	478	449	116.9	448	420	131.8	415	392	148.6	371	367	167.3	285
	6.0	492	104.0	490	462	117.2	459	433	132.2	425	405	148.9	380	379	167.5	292
	7.0	507	104.3	502	476	117.6	470	446	132.5	435	418	149.2	389	391	167.6	299
	8.0	521	104.6	514	491	117.9	482	460	132.8	446	431	149.4	399	404	167.8	306
	9.0	536	104.9	527	505	118.1	493	474	133.1	457	444	149.7	408	417	168.0	313
	10.0	551	105.1	539	542	118.5	523	488	133.3	467	458	150.0	417	430	168.2	320
	11.0	598	105.4	578	534	118.7	516	502	133.6	478	471	150.3	427	443	168.4	327
	12.0	581	105.6	564	577	118.9	551	516	133.9	489	485	150.5	436	456	168.7	334
13.0	596	105.8	577	563	119.1	540	530	134.2	500	499	150.8	446	470	169.0	341	
YCAS 0515EB	5.0	532	120.1	536	498	135.3	501	466	152.5	465	436	171.8	417	408	193.2	321
	6.0	547	120.6	549	513	135.9	514	481	153.1	477	450	172.2	427	421	193.6	329
	7.0	563	121.1	562	529	136.4	526	495	153.6	488	464	172.7	437	435	193.9	336
	8.0	579	121.6	576	544	136.9	539	510	154.0	500	478	173.2	447	449	194.2	344
	9.0	596	122.0	590	560	137.4	552	526	154.5	512	493	173.7	458	463	194.6	351
	10.0	612	122.5	603	576	137.8	565	541	155.0	524	507	174.2	468	477	195.0	359
	11.0	628	123.0	617	592	138.3	578	556	155.5	535	522	174.6	479	491	195.5	367
	12.0	644	123.4	630	608	138.7	591	572	156.0	547	538	175.0	489	506	195.9	375
13.0	660	123.8	644	624	139.1	604	587	156.5	560	553	175.5	500	521	196.4	383	
YCAS 0555EB	5.0	566	136.1	577	530	153.4	541	496	172.8	503	463	194.5	452	418	209.6	336
	6.0	582	136.8	591	546	154.1	554	511	173.5	515	478	195.2	462	432	209.8	343
	7.0	599	137.6	605	562	154.9	567	527	174.2	527	493	195.8	473	445	209.9	350
	8.0	616	138.3	619	578	155.5	581	542	174.9	540	508	196.5	484	459	210.1	357
	9.0	633	138.9	634	595	156.1	594	558	175.5	552	524	197.1	495	472	210.3	365
	10.0	650	139.5	648	611	156.8	608	574	176.2	565	539	197.8	506	486	210.5	372
	11.0	667	140.2	663	628	157.5	622	591	176.9	577	555	198.5	517	500	210.7	380
	12.0	684	140.8	678	645	158.2	636	607	177.6	590	571	199.1	529	514	211.0	388
13.0	701	141.3	692	662	158.8	650	623	178.3	603	587	199.8	540	528	211.1	395	
YCAS 0575EB	5.0	599	152.1	618	561	171.4	580	525	193.0	540	491					

4 REFRIGERANT CIRCUIT MODELS HEAT RECOVERY CAPACITIES

TABLE 8

Model	Leaving Chilled Water Temp. °C	Leaving Hot Water Temperature °C														
		30			35			40			45			50		
		Cool kW	Power kW	Heat kW	Cool kW	Power kW	Heat kW	Cool kW	Power kW	Heat kW	Cool kW	Power kW	Heat kW	Cool kW	Power kW	Heat kW
YCAS 1065EB	5.0	1134	234.0	1124	1062	263.7	1049	993	297.3	970	927	334.9	867	867	376.6	665
	6.0	1168	234.8	1152	1094	264.5	1075	1024	298.0	995	957	335.5	888	896	377.0	680
	7.0	1202	235.4	1181	1127	265.2	1102	1056	299.1	1020	988	336.1	909	925	377.4	696
	8.0	1236	236.1	1209	1161	265.8	1129	1088	299.3	1044	1019	336.6	931	955	377.9	712
	9.0	1270	236.6	1238	1194	266.5	1156	1120	300.0	1068	1050	337.2	953	985	378.3	729
	10.0	1303	237.4	1266	1229	267.1	1184	1153	300.6	1094	1082	337.9	975	1015	378.8	745
	11.0	1337	238.0	1294	1249	267.3	1200	1186	301.3	1119	1114	338.5	997	1046	379.4	762
	12.0	1372	238.5	1323	1298	268.2	1239	1219	301.9	1145	1146	339.2	1020	1077	380.0	779
13.0	1409	238.9	1354	1332	268.9	1267	1253	302.6	1171	1178	339.9	1043	1109	380.6	796	
YCAS 1135EB	5.0	1208	264.4	1210	1132	297.8	1131	1058	335.6	1049	989	377.9	938	904	414.3	705
	6.0	1244	265.8	1240	1166	298.9	1159	1091	336.7	1074	1020	378.9	961	933	414.5	720
	7.0	1280	266.8	1271	1201	300.0	1188	1125	337.7	1100	1052	379.9	984	963	414.7	736
	8.0	1316	267.7	1301	1236	301.0	1217	1159	338.8	1127	1085	380.9	1007	992	414.9	752
	9.0	1352	268.6	1332	1272	302.0	1245	1193	339.7	1153	1118	381.7	1030	1022	415.2	769
	10.0	1389	269.7	1363	1307	303.2	1274	1227	340.7	1180	1152	382.6	1054	1053	415.4	785
	11.0	1425	270.5	1393	1343	304.1	1304	1262	341.7	1207	1185	383.6	1078	1083	415.7	801
	12.0	1463	271.3	1425	1380	305.1	1333	1297	342.7	1234	1220	384.6	1102	1114	416.0	818
13.0	1501	272.1	1457	1416	306.0	1363	1333	343.8	1262	1254	385.6	1126	1145	416.3	835	
YCAS 1215EB	5.0	1283	294.9	1297	1202	332.0	1214	1124	374.0	1127	1050	421.0	1011	941	452.0	745
	6.0	1320	296.8	1328	1238	333.5	1244	1159	375.5	1154	1084	422.3	1034	971	452.0	761
	7.0	1358	298.2	1361	1275	334.9	1274	1194	376.8	1182	1117	423.8	1058	1000	452.0	776
	8.0	1396	299.5	1393	1312	336.2	1304	1230	378.2	1210	1152	425.1	1083	1030	452.0	792
	9.0	1435	300.7	1426	1349	337.6	1335	1266	379.5	1238	1187	426.2	1108	1060	452.0	808
	10.0	1474	301.9	1459	1386	339.4	1365	1302	380.8	1266	1222	427.4	1133	1090	452.0	824
	11.0	1514	303.1	1493	1424	340.7	1396	1339	382.2	1295	1257	428.7	1158	1121	452.0	841
	12.0	1553	304.2	1526	1462	341.9	1428	1376	383.6	1324	1293	430.0	1184	1151	452.0	857
13.0	1593	305.3	1560	1501	343.2	1459	1413	385.0	1353	1329	431.5	1209	1182	452.0	873	

Heat recovery capacities (Heat) are for a leaving hot water temperature range of 10°C, where range = leaving liquid temperature - entering liquid temperature.
Total heat recovery capacities shown are for both heat recovery condensers piped in parallel.

TABLE 9

2 REFRIGERANT CIRCUIT MODELS PHYSICAL DATA

Model YCAS-EB			0295	0335	0375	0425	0475	
Refrigerant circuits			2	2	2	2	2	
Refrigerant Charge	Circuit 1	kg	55	65	65	79	85	
	Circuit 2	kg	55	55	65	79	79	
Oil Charge	Per circuit	l	19	19	19	19	19	
Compressor	Number		2	2	2	2	2	
	Type (circuit 1)		DXS12L	DXS24L	DXS24L	DXS24L	DXS36L	
	Nominal cooling capacity	kW	145	190	190	190	250	
	Type (circuit 2)		DXS12L	DXS12L	DXS24L	DXS24L	DXS24L	
	Nominal cooling capacity	kW	145	145	190	190	190	
Capacity Control	%	10 - 100%	10 - 100%	10 - 100%	10 - 100%	10 - 100%		
Evaporator	Number		1	1	1	1	1	
	Type		1084	1084	1084	1160	1160	
	Water volume	l	143	143	143	309	309	
Air Cooled Condenser	Total coil face area	m ²	17.84	17.84	17.84	23.78	23.78	
	Number of tube rows		3	3	3	3	3	
	Number of fans (circuit 1)		3	3	3	4	4	
	Number of fans (circuit 2)		3	3	3	4	4	
Fans	Standard	Nominal speed	rpm	950	950	950	950	950
		Total airflow	m ³ /s	37.6	37.6	37.6	50.2	50.2
	Low sound	Nominal speed	rpm	690	690	690	690	690
		Total airflow	m ³ /s	36.8	36.8	36.8	49.1	49.1
	High pressure	Nominal speed	rpm	965	965	965	965	965
		Total airflow (@ 150 Pa EXT.)	m ³ /s	37.6	37.6	37.6	50.2	50.2
Sound level to EN 292 1991 ⁽¹⁾	Standard fans	dBA	67	67	68	69	69	
	Low sound fans	dBA	63	64	64	65	65	
	Acoustic Kit I fitted	dBA	63	63	63	64	64	
	Acoustic Kit II fitted	dBA	61	61	61	62	62	
	Acoustic Kit III fitted	dBA	62	62	62	63	63	
	Acoustic Kit IV fitted	dBA	58	58	58	59	59	
	High pressure fans	dBA	72	72	72	73	73	
Dimensions ⁽³⁾	Length ⁽²⁾	mm	4499	4499	4499	5718	5718	
	Width	mm	2321	2321	2321	2321	2321	
	Height	mm	2438	2438	2438	2438	2438	
Operating Weight ⁽⁴⁾	Units with aluminum fin coils	kg	4353	4555	4678	5938	6021	
	Units with copper fin coils	kg	4762	4964	5087	6510	6593	
	Heat recovery units with aluminum fin coils	kg	4826	5041	5176	6443	6538	
	Heat recovery units with copper fin coils	kg	5235	5449	5584	7015	7110	
	Aluminum fin coil units (Acoustic Kit III/IV fitted)	kg	4871	5073	5196	6592	6674	
	Copper fin coils units (Acoustic Kit III/IV fitted)	kg	5279	5482	5605	7164	7246	

(1) Sound Pressure levels are 10 m from the Control Panel, at a height of 1.6 m from the unit base.

Levels may vary at different positions around the unit.

(2) Length excludes switch disconnect and/or circuit breaker handles.

(3) The unit length is increased by 300 mm and the width is increased by 600 mm with optional Acoustic Kit III or IV fitted.

(4) Shipping weights are Operating Weight - 140 kg (models 0295, 0335 and 0375) or Operating Weight - 300 kg (models 0425 and 0475).

Weights with Acoustic Kits fitted include the intake silencers which are fitted on site.

2 REFRIGERANT CIRCUIT MODELS PHYSICAL DATA

TABLE 9

Model YCAS-EB			0515	0555	0575	0605	
Refrigerant circuits			2	2	2	2	
Refrigerant Charge	Circuit 1	kg	85	88	88	94	
	Circuit 2	kg	85	85	88	94	
Oil Charge	Per circuit	l	19	19	19	19	
Compressor	Number		2	2	2	2	
	Type (circuit 1)		DXS36L	DXS45L	DXS45L	DXS45L	
	Nominal cooling capacity	kW	250	280	280	280	
	Type (circuit 2)		DXS36L	DXS36L	DXS45L	DXS45L	
	Nominal cooling capacity	kW	250	250	280	280	
Capacity Control	%	10 - 100%	10 - 100%	10 - 100%	10 - 100%		
Evaporator	Number		1	1	1	1	
	Type		1160	1160	1160	1160	
	Water volume	l	309	309	309	309	
Air Cooled Condenser	Total coil face area	m ²	23.78	23.78	23.78	29.73	
	Number of tube rows		3	3	3	3	
	Number of fans (circuit 1)		4	4	4	5	
	Number of fans (circuit 2)		4	4	4	5	
Fans	Standard	Nominal speed	rpm	950	950	950	950
		Total airflow	m ³ /s	50.2	50.2	50.2	62.7
	Low sound	Nominal speed	rpm	690	690	690	690
		Total airflow	m ³ /s	49.1	49.1	49.1	61.4
	High pressure	Nominal speed	rpm	965	965	965	965
		Total airflow (@ 150 Pa EXT.)	m ³ /s	50.2	50.2	50.2	62.7
Sound level to EN 292 1991 ⁽¹⁾	Standard fans	dBA	69	70	71	71	
	Low sound fans	dBA	66	67	68	69	
	Acoustic Kit I fitted	dBA	64	64	64	65	
	Acoustic Kit II fitted	dBA	62	62	62	63	
	Acoustic Kit III fitted	dBA	63	63	63	64	
	Acoustic Kit IV fitted	dBA	59	59	59	59	
	High pressure fans	dBA	73	74	74	75	
Dimensions ⁽³⁾	Length ⁽²⁾	mm	5718	5718	5718	6937	
	Width	mm	2321	2321	2321	2321	
	Height	mm	2438	2438	2438	2438	
Operating Weight ⁽⁴⁾	Units with aluminum fin coils	kg	6098	6121	6150	6570	
	Units with copper fin coils	kg	6670	6693	6722	7261	
	Heat recovery units with aluminum fin coils	kg	6626	6657	6699	7118	
	Heat recovery units with copper fin coils	kg	7198	7229	7271	7810	
	Aluminum fin coil units (Acoustic Kit III/IV fitted)	kg	6751	6775	6804	7359	
	Copper fin coils units (Acoustic Kit III/IV fitted)	kg	7324	7347	7376	8051	

(1) Sound Pressure levels are 10 m from the Control Panel, at a height of 1.6 m from the unit base.
Levels may vary at different positions around the unit.

(2) Length excludes switch disconnect and/or circuit breaker handles.

(3) The unit length is increased by 300 mm and the width is increased by 600 mm with optional Acoustic Kit III or IV fitted.

(4) Shipping weights are Operating Weight - 300 kg (models 0515, 0555, 0575 and 0605).

Weights with Acoustic Kits fitted include the intake silencers which are fitted on site.

TABLE 9

3 REFRIGERANT CIRCUIT MODELS PHYSICAL DATA

Model YCAS-EB			0685	0775	0835	0905	0965	
Refrigerant circuits			3	3	3	3	3	
Refrigerant Charge	Circuit 1	kg	78	88	91	91	99	
	Circuit 2	kg	78	88	88	91	99	
	Circuit 3	kg	91	88	88	91	99	
Oil Charge	Per circuit	l	15	15	15	15	15	
Compressor	Number		3	3	3	3	3	
	Type (circuit 1)		DXS24L	DXS36L	DXS45L	DXS45L	DXS45L	
	Nominal cooling capacity	kW	190	250	280	280	280	
	Type (circuit 2)		DXS24L	DXS36L	DXS36L	DXS45L	DXS45L	
	Nominal cooling capacity	kW	190	250	250	280	280	
	Type (circuit 3)		DXS45L	DXS36L	DXS36L	DXS45L	DXS45L	
Nominal cooling capacity	kW	280	250	250	280	280		
Capacity Control	%		10 - 100%	10 - 100%	10 - 100%	10 - 100%	10 - 100%	
Evaporator	Number		1	1	1	1	1	
	Type		1224	1252	1252	1252	1252	
	Water volume	l	762	914	914	914	914	
Air Cooled Condenser	Total coil face area	m ²	29.73	35.67	35.67	35.67	47.56	
	Number of tube rows		3	3	3	3	3	
	Number of fans (circuit 1)		3	4	4	4	5	
	Number of fans (circuit 2)		3	4	4	4	5	
	Number of fans (circuit 3)		4	4	4	4	6	
Fans	Standard	Nominal speed	rpm	950	950	950	950	950
		Total airflow	m ³ /s	72.7	87.2	87.2	87.2	116.3
	Low sound	Nominal speed	rpm	690	690	690	690	690
		Total airflow	m ³ /s	71.2	85.5	85.5	85.5	113.9
	High pressure	Nominal speed	rpm	965	965	965	965	965
		Total airflow (@ 150 Pa EXT.)	m ³ /s	72.7	87.2	87.2	87.2	116.3
Sound level to EN 292 1991 ⁽¹⁾	Standard fans	dBA	70	70	70	71	72	
	Low sound fans	dBA	67	67	68	69	70	
	Acoustic Kit I fitted	dBA	64	65	65	65	66	
	Acoustic Kit II fitted	dBA	62	63	63	63	64	
	Acoustic Kit III fitted	dBA	63	64	64	64	65	
	Acoustic Kit IV fitted	dBA	60	60	60	60	60	
	High pressure fans	dBA	74	74	74	75	76	
Dimensions ⁽³⁾	Length ⁽²⁾	mm	7474	8694	8694	8694	11132	
	Width	mm	2331	2331	2331	2331	2331	
	Height	mm	2438	2438	2438	2438	2438	
Operating Weight ⁽⁴⁾	Units with aluminum fin coils	kg	9089	9826	9915	9995	10746	
	Units with copper fin coils	kg	9783	10683	10772	10852	11847	
	Heat recovery units with aluminum fin coils	kg	N/A	N/A	N/A	N/A	N/A	
	Heat recovery units with copper fin coils	kg	N/A	N/A	N/A	N/A	N/A	
	Aluminum fin coil units (Acoustic Kit III/IV fitted)	kg	9879	10752	10841	10921	11952	
Copper fin coils units (Acoustic Kit III/IV fitted)	kg	10573	11609	11698	11778	13046		

(1) Sound Pressure levels are 10 m from the Control Panel, at a height of 1.6 m from the unit base.

Levels may vary at different positions around the unit.

(2) Length excludes switch disconnect and/or circuit breaker handles.

(3) The unit length is increased by 300 mm and the width is increased by 600 mm with optional Acoustic Kit III or IV fitted.

(4) Shipping weights are Operating Weight - 750 kg (model 0685) or Operating Weight - 900 kg (models 0775, 0835, 0905 and 0965).

Weights with Acoustic Kits fitted include the intake silencers which are fitted on site.

4 REFRIGERANT CIRCUIT MODELS PHYSICAL DATA

TABLE 9

Model YCAS-EB			1065	1135	1215	
Refrigerant circuits			4	4	4	
Refrigerant Charge	Circuit 1	kg	88	91	91	
	Circuit 2	kg	88	91	91	
	Circuit 3	kg	88	88	91	
	Circuit 4	kg	88	88	91	
Oil Charge	Per circuit	l	15	15	15	
Compressor	Number		4	4	4	
	Type (circuit 1 & 2)		DXS36L	DXS45L	DXS45L	
	Nominal cooling capacity	kW	250	280	280	
	Type (circuit 3 & 4)		DXS36L	DXS36L	DXS45L	
	Nominal cooling capacity	kW	250	250	280	
Capacity Control	%		10 - 100%	10 - 100%	10 - 100%	
Evaporator	Number		1	1	1	
	Type		1336	1336	1336	
	Water volume	l	1013	1013	1013	
Air Cooled Condenser	Total coil face area	m ²	47.56	47.56	47.56	
	Number of tube rows		3	3	3	
	Number of fans (circuit 1)		4	4	4	
	Number of fans (circuit 2)		4	4	4	
	Number of fans (circuit 3)		4	4	4	
	Number of fans (circuit 4)		4	4	4	
Fans	Standard	Nominal speed	rpm	950	950	950
		Total airflow	m ³ /s	116.3	116.3	116.3
	Low sound	Nominal speed	rpm	690	690	690
		Total airflow	m ³ /s	113.9	113.9	113.9
	High pressure	Nominal speed	rpm	965	965	965
		Total airflow (@ 150 Pa EXT.)	m ³ /s	116.3	116.3	116.3
Sound level to EN 292 1991 ⁽¹⁾	Standard fans	dBA	71	72	73	
	Low sound fans	dBA	68	69	70	
	Acoustic Kit I fitted	dBA	66	66	66	
	Acoustic Kit II fitted	dBA	64	64	64	
	Acoustic Kit III fitted	dBA	65	65	65	
	Acoustic Kit IV fitted	dBA	62	62	62	
	High pressure fans	dBA	75	76	76	
Dimensions ⁽³⁾	Length ⁽²⁾	mm	11132	11132	11132	
	Width	mm	2331	2331	2331	
	Height	mm	2438	2438	2438	
Operating Weight ⁽⁴⁾	Units with aluminum fin coils	kg	12889	12962	13011	
	Units with copper fin coils	kg	14077	14140	14210	
	Heat recovery units with aluminum fin coils	kg	13946	14094	14108	
	Heat recovery units with copper fin coils	kg	15133	15269	15307	
	Aluminum fin coil units (Acoustic Kit III/IV fitted)	kg	14094	14167	14217	
	Copper fin coils units (Acoustic Kit III/IV fitted)	kg	15232	15305	15354	

(1) Sound Pressure levels are 10 m from the Control Panel, at a height of 1.6 m from the unit base.

Levels may vary at different positions around the unit.

(2) Length excludes switch disconnect and/or circuit breaker handles.

(3) The unit length is increased by 300 mm and the width is increased by 600 mm with optional Acoustic Kit III or IV fitted.

(4) Shipping weights are Operating Weight - 1000 kg (models 1065, 1135 and 1215)

Weights with Acoustic Kits fitted include the intake silencers which are fitted on site.

TABLE 10

2, 3 AND 4 REFRIGERANT CIRCUIT MODELS ELECTRICAL DATA

Model YCAS EB	Standard Fan Chillers						Largest Compressor		Starting Amps per Fan	Nominal Running Amps per Fan
	Nominal Running Amps			Maximum Running Amps			Starting Amps			
	Total Unit Amps	System 1 Amps	System 2 Amps	Total Unit Amps	System 1 Amps	System 2 Amps	Star Delta Amps	Direct on Line Amps		
0295	152	76	76	228	114	114	175	523	17.1	4.4
0335	195	119	76	273	159	114	232	732	17.1	4.4
0375	238	119	119	318	159	159	232	732	17.1	4.4
0425	235	118	118	304	152	152	232	732	17.1	4.4
0475	267	150	118	357	205	152	283	907	17.1	4.4
0515	299	150	150	410	205	205	283	907	17.1	4.4
0555	330	181	150	460	255	205	283	907	17.1	4.4
0575	361	181	181	510	255	255	283	907	17.1	4.4
0605	344	172	172	482	241	241	283	907	17.1	4.4
0685	406	287	119	508	367	141	283	907	17.1	4.4
0775	440	293	147	549	366	183	283	907	17.1	4.4
0835	468	321	147	592	409	183	283	907	17.1	4.4
0905	524	349	175	678	452	226	283	907	17.1	4.4
0965	520	348	172	665	442	223	283	907	17.1	4.4
1065	586	293	293	732	366	366	283	907	17.1	4.4
1135	642	321	321	818	409	409	283	907	17.1	4.4
1215	698	349	349	904	452	452	283	907	17.1	4.4

Model YCAS EB	Low Sound Fan Chillers						Largest Compressor		Starting Amps per Fan	Nominal Running Amps per Fan
	Nominal Running Amps			Maximum Running Amps			Starting Amps			
	Total Unit Amps	System 1 Amps	System 2 Amps	Total Unit Amps	System 1 Amps	System 2 Amps	Star Delta Amps	Direct on Line Amps		
0295	151	75	75	226	113	113	175	523	13.0	4.1
0335	194	118	75	271	158	113	232	732	13.0	4.1
0375	237	118	118	316	158	158	232	732	13.0	4.1
0425	233	116	116	302	151	151	232	732	13.0	4.1
0475	265	148	116	355	204	151	283	907	13.0	4.1
0515	297	148	148	408	204	204	283	907	13.0	4.1
0555	328	179	148	458	254	204	283	907	13.0	4.1
0575	359	179	179	508	254	254	283	907	13.0	4.1
0605	341	171	171	479	240	240	283	907	13.0	4.1
0685	403	285	118	505	365	140	283	907	13.0	4.1
0775	436	291	145	545	364	182	283	907	13.0	4.1
0835	464	319	145	588	407	182	283	907	13.0	4.1
0905	520	347	173	674	450	225	283	907	13.0	4.1
0965	516	345	171	660	439	222	283	907	13.0	4.1
1065	582	291	291	727	364	364	283	907	13.0	4.1
1135	638	319	319	813	407	407	283	907	13.0	4.1
1215	694	347	347	899	450	450	283	907	13.0	4.1

Electrical Data Notes

Nominal conditions are taken at 7°C leaving chilled liquid temperature and 35°C condenser air entering temperature.

Maximum NamePlate conditions allowed by compressor motor protection.

Total Unit values are for all compressors and fans running. That is, system 1 & 2.

System 1, are values for one or two compressors with respective condenser fans running.

System 2, are values for one or two compressors with respective condenser fans running.

Starting Amps is the maximum inrush current (per compressor) when Star Delta or Direct on Line starting is employed at 400 V.

Model YCAS EB	High Pressure Fan Chillers						Largest Compressor		Starting Amps per Fan	Nominal Running Amps per Fan
	Nominal Running Amps			Maximum Running Amps			Starting Amps			
	Total Unit Amps	System 1 Amps	System 2 Amps	Total Unit Amps	System 1 Amps	System 2 Amps	Star Delta Amps	Direct on Line Amps		
0295	170	85	85	246	123	123	175	523	48.3	7.4
0335	213	128	85	291	168	123	232	732	48.3	7.4
0375	256	128	128	336	168	168	232	732	48.3	7.4
0425	259	130	130	328	164	164	232	732	48.3	7.4
0475	291	162	130	381	217	164	283	907	48.3	7.4
0515	323	162	162	434	217	217	283	907	48.3	7.4
0555	354	193	162	484	267	217	283	907	48.3	7.4
0575	385	193	193	534	267	267	283	907	48.3	7.4
0605	374	187	187	512	256	256	283	907	48.3	7.4
0685	436	308	128	538	388	150	283	907	48.3	7.4
0775	476	317	159	585	390	195	283	907	48.3	7.4
0835	504	345	159	628	433	195	283	907	48.3	7.4
0905	560	373	187	714	476	238	283	907	48.3	7.4
0965	568	381	187	713	475	238	283	907	48.3	7.4
1065	634	317	317	780	390	390	283	907	48.3	7.4
1135	690	345	345	866	433	433	283	907	48.3	7.4
1215	746	373	373	952	476	476	283	907	48.3	7.4

Electrical Data Notes

Nominal conditions are taken at 7°C leaving chilled liquid temperature and 35°C condenser air entering temperature.

Maximum NamePlate conditions allowed by compressor motor protection.

Total Unit values are for all compressors and fans running. That is, system 1 & 2.

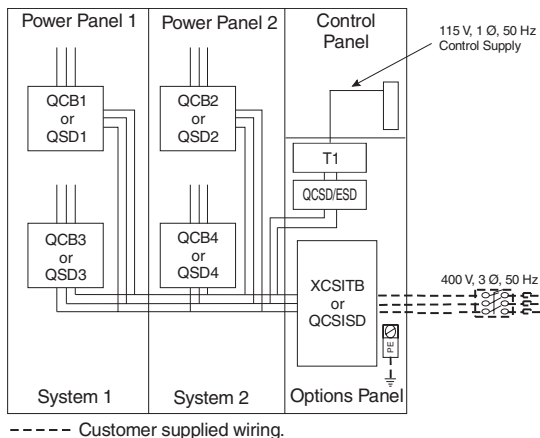
System 1, are values for one or two compressors with respective condenser fans running.

System 2, are values for one or two compressors with respective condenser fans running.

Starting Amps is the maximum inrush current (per compressor) when Star Delta or Direct on Line starting is employed at 400 V.

2, 3 AND 4 REFRIGERANT CIRCUIT MODELS CONNECTION DIAGRAMS

Single Point Power Supply Connection - All Models with Terminal Block or Non-Fused Switch Disconnect (Options 2.4, 2.4x, 2.5 or 2.5x)



Model YCAS	Terminal Block Wire Range (mm ²)	N-F Switch Disconnect Wire Range (mm ²)	Terminal Block Connection
0295	70 - 240	25-150	
0335	70 - 240	(2) 95-120	
0375	(2) 50 - 150	(2) 95-120	
0425	(2) 50 - 150	(2) 95-120	
0475	(2) 70 - 240	(3) 95-185	
0515	(2) 50 - 150	(2) 95-120	
0555	(2) 70 - 240	(3) 95-185	
0575	(2) 70 - 240	(3) 95-185	
0605	(2) 70 - 240	(3) 95-185	
0685	(2) 70 - 240	(2) 120 - 240	
0775	(2) 70 - 240	(2) 120 - 240	
0835	(2) 70 - 240	(2) 120 - 240	
0905	(3) 50 - 150	(3) 95-185	
0965	(3) 50 - 150	(3) 95-185	
1065	(3) 70 - 240	(3) 95-185	
1135	(3) 70 - 240	(4) 95-240	
1215	(3) 70 - 240	(4) 95-240	

Note: Figures in brackets denote the number of available connections per phase. For example (2) 95 - 120 mm² - can take 2 cables at the stated wire range.

One field provided 400 V, 3Ø, 50 Hz supply to the unit with circuit protection. Field connections to factory provided Terminal Block (XCSITB) or Non-Fused Switch Disconnect (QCSISD) in the Options Panel.

Options 2.4 and 2.5: Internal branch Circuit Breakers (QCB) for each circuit in the two Power Panels.

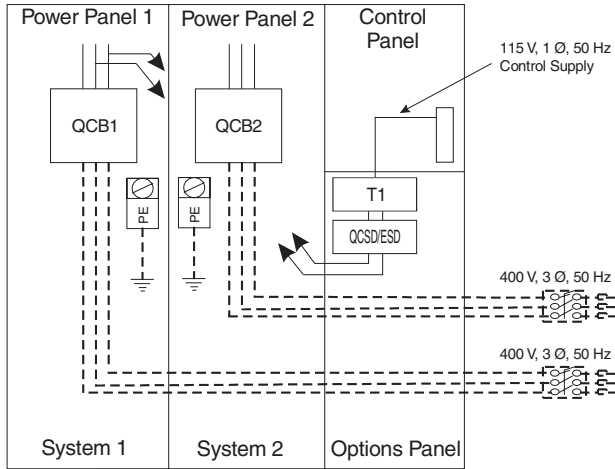
Options 2.4x and 2.5x: Internal branch Non-Fused Switch Disconnects (QSD) and Fuses for each circuit in the two Power Panels.

Options 2.4 and 2.4x: The control circuit supply is derived internally from Electrical System 1 (Circuit 1) which then feeds the Non-Fused Switch Disconnect (QCSID/ESD) and Control Transformer (T1) in the Options Panel.

Options 2.5 and 2.5x: The control circuit supply is derived internally from the common supply which then feeds the Non-Fused Switch Disconnect (QCSID/ESD) and Control Transformer (T1) in the Options Panel.

2, 3 AND 4 REFRIGERANT CIRCUIT MODELS CONNECTION DIAGRAMS

Multi-Point Power Supply Connection - Models 0295 to 0605 with Door Interlocked Circuit Breakers (Option 2.1)



----- Customer supplied wiring.

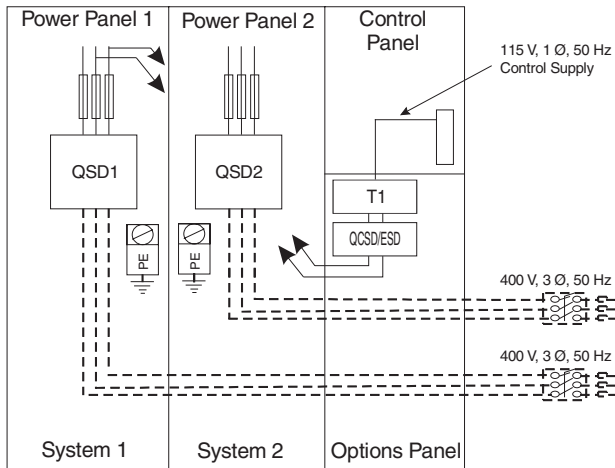
Two field provided 400 V, 3Ø, 50 Hz supplies to the unit with circuit protection. Field connections to factory provided Circuit Breakers (QCB) in each of the two Power Panels.

The control circuit supply is derived internally from Electrical System 1 which then feeds the Non-Fused Switch Disconnect (QCSD/ESD) and Control Transformer (T1) in the Options Panel.

Model YCAS	System 1 Wire Range (mm ²)	System 2 Wire Range (mm ²)	Circuit Breaker Connection
0295	25 -150	25 -150	
0335	25 -150	25 -150	
0375	25 -150	25 -150	
0425	25 -150	25 -150	
0475	(2) 95 - 120	(2) 95 - 120	
0515	25 -150	25 -150	
0555	(2) 95 - 120	(2) 95 - 120	
0575	(2) 95 - 120	(2) 95 - 120	
0605	(2) 95 - 120	(2) 95 - 120	

Note: Figures in brackets denote the number of available connections per phase. For example (2) 95 - 120 mm² - can take 2 cables at the stated wire range.

Multi-Point Power Supply Connection - Models 0295 to 0605 with Door Interlocked Non-Fused Switch Disconnects and Fuses (Option 2.1x)



----- Customer supplied wiring.

Two field provided 400 V, 3Ø, 50 Hz supplies to the unit with circuit protection. Field connections to factory provided Non-Fused Switch Disconnects (QSD) in the two Power Panels.

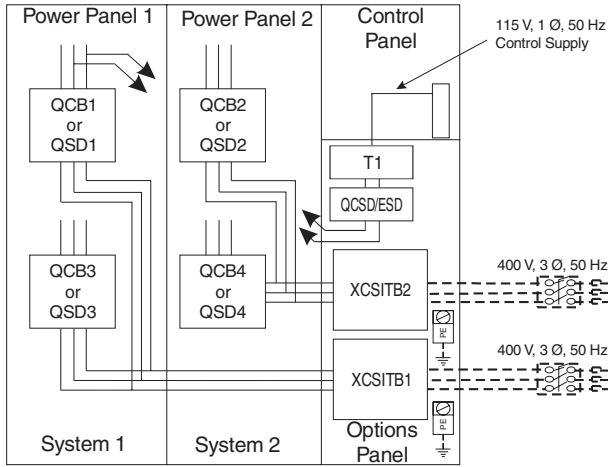
The control circuit supply is derived internally from Electrical System 1 which then feeds the Non-Fused Switch Disconnect (QCSD/ESD) and Control Transformer (T1) in the Options Panel.

Model YCAS	System 1 Wire Range (mm ²)	System 2 Wire Range (mm ²)	Non-Fused Switch Disconnect Connection
0295	70 -120	70 -120	
0335	70 -120	70 -120	
0375	70 -120	70 -120	
0425	95 -185	95 -185	
0475	95 -185	95 -185	
0515	95 -185	95 -185	
0555	95 -185	95 -185	
0575	95 -185	95 -185	
0605	95 -185	95 -185	

Note: Figures in brackets denote the number of available connections per phase. For example (2) 95 - 120 mm² - can take 2 cables at the stated wire range.

2, 3 AND 4 REFRIGERANT CIRCUIT MODELS CONNECTION DIAGRAMS

Multi-Point Power Supply Connection - Models 0685 to 1215 with Terminal Blocks (Options 2.2 and 2.2x)



----- Customer supplied wiring.

Two field provided 400 V, 3Ø, 50 Hz supplies to the unit with circuit protection. Field connections to factory provided Terminal Blocks (XCSITB) in the Options Panel.

Option 2.2: Internal branch Circuit Breakers (QCB) for each circuit in the two Power Panels.

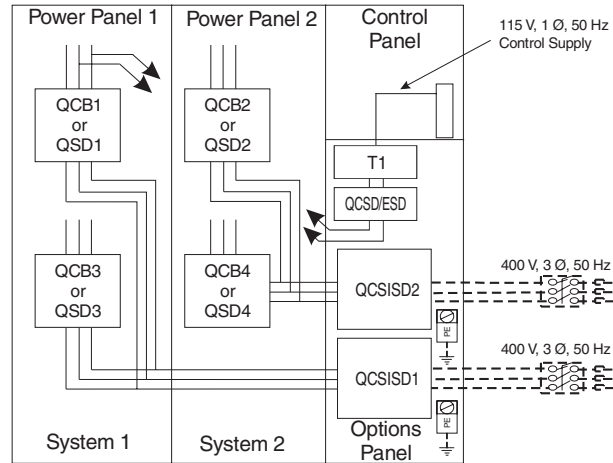
Option 2.2x: Internal branch Non-Fused Switch Disconnects (QSD) and Fuses for each circuit in the two Power Panels.

The control circuit supply is derived internally from Electrical System 1 (Circuit 1) which then feeds the Non-Fused Switch Disconnect (QCSD/ESD) and Control Transformer (T1) in the Options Panel.

Model YCAS	System 1 Wire Range (mm ²)	System 2 Wire Range (mm ²)	Terminal Block Connection
0685	(2) 35 - 95	35 - 95	
0775	(2) 35 - 95	35 - 95	
0835	(2) 50 - 150	35 - 95	
0905	(2) 50 - 150	50 - 150	
0965	(2) 50 - 150	50 - 150	
1065	(2) 35 - 95	(2) 35 - 95	
1135	(2) 50 - 150	(2) 50 - 150	
1215	(2) 50 - 150	(2) 50 - 150	

Note: Figures in brackets denote the number of available connections per phase. For example (2) 95 - 120 mm² - can take 2 cables at the stated wire range.

Multi-Point Power Supply Connection - Models 0685 to 1215 with Non-Fused Switch Disconnects (Options 2.3 and 2.3x)



----- Customer supplied wiring.

Two field provided 400 V, 3Ø, 50 Hz supplies to the unit with circuit protection. Field connections to factory provided Non-Fused Switch Disconnects (QCSISD) in the Options Panel.

Option 2.3: Internal branch Circuit Breakers (QCB) for each circuit in the two Power Panels.

Option 2.3x: Internal branch Non-Fused Switch Disconnects (QSD) and Fuses for each circuit in the two Power Panels.

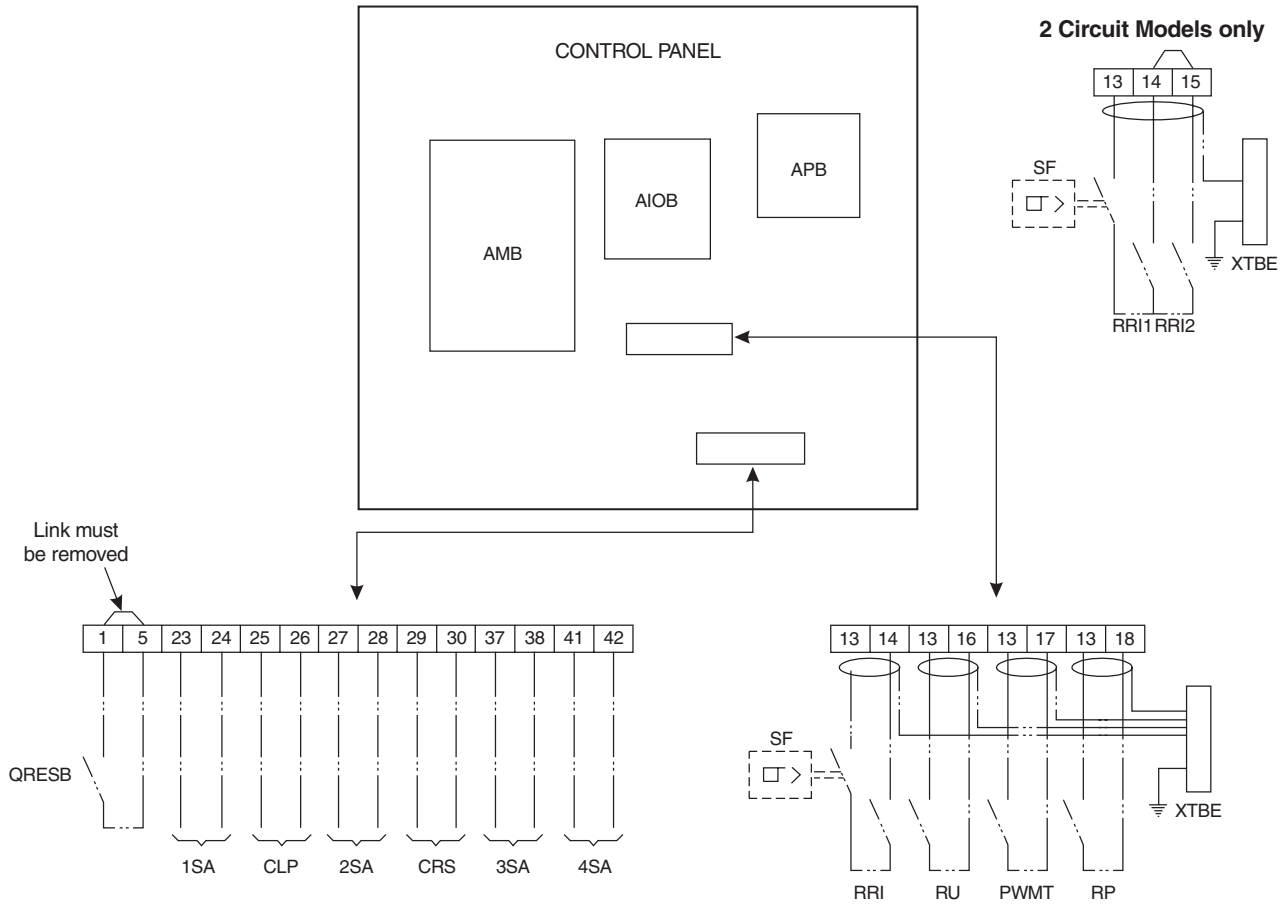
The control circuit supply is derived internally from Electrical System 1 (Circuit 1) which then feeds the Non-Fused Switch Disconnect (QCSD/ESD) and Control Transformer (T1) in the Options Panel.

Model YCAS	System 1 Wire Range	System 2 Wire Range	Non-Fused Switch Disconnect Connection
0685	(2) 95-120	35 - 95	
0775	(2) 95-120	25 - 150	
0835	(2) 120 - 240	25 - 150	
0905	(2) 120 - 240	25 - 150	
0965	(2) 120 - 240	25 - 150	
1065	(2) 95-120	(2) 95-120	
1135	(2) 120 - 240	(2) 120 - 240	
1215	(2) 120 - 240	(2) 120 - 240	

Note: Figures in brackets denote the number of available connections per phase. For example (2) 95 - 120 mm² - can take 2 cables at the stated wire range.

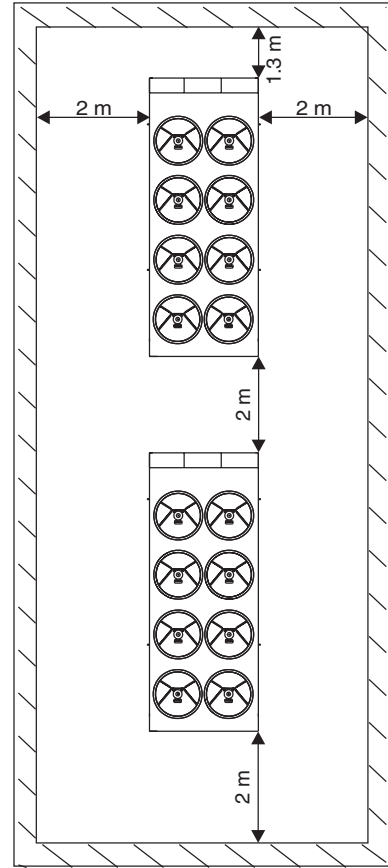
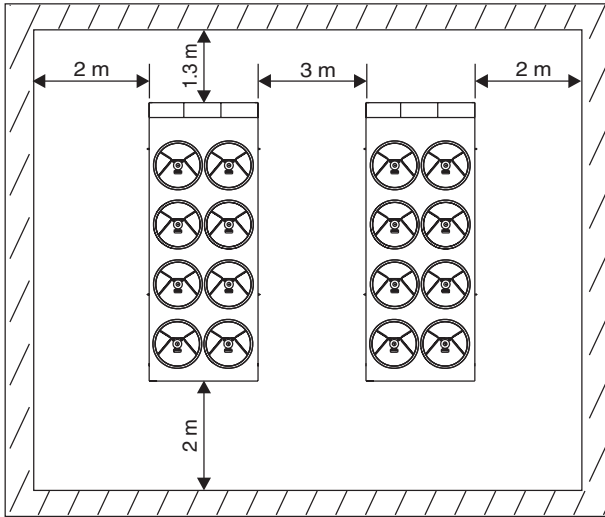
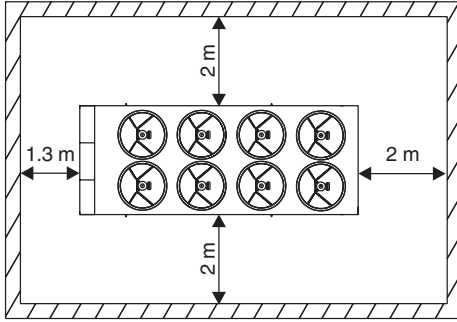
2, 3 AND 4 REFRIGERANT CIRCUIT MODELS CONNECTION DIAGRAMS

Customer Connection Diagram



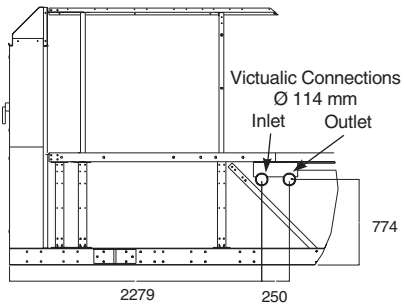
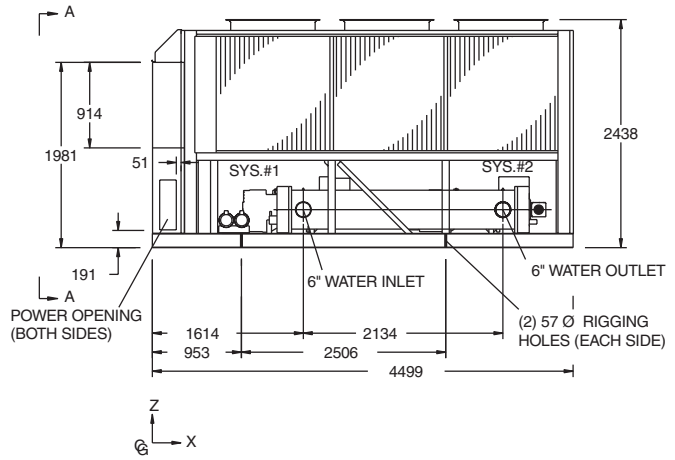
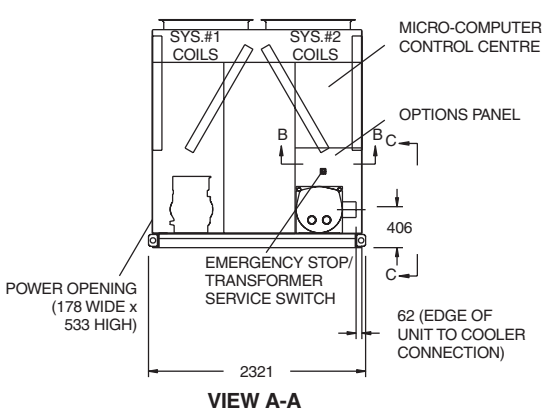
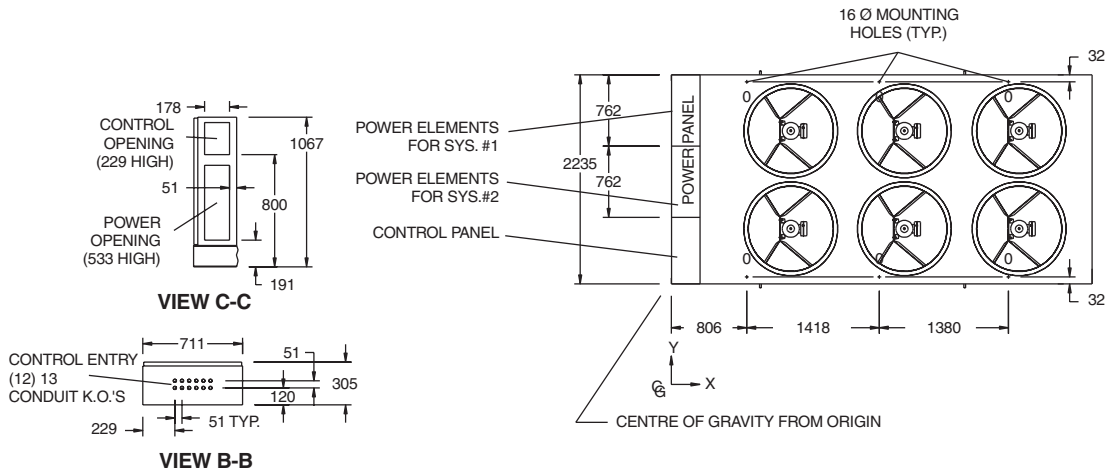
AMB	Microprocessor Board	CLP	Chilled Liquid Pump Start	1SA	System 1 Alarm Contacts
AIOB	Input/Output Board	CRS	Chiller Run	2SA	System 2 Alarm Contacts
APB	Power Board	RU	Current PWM	3SA	System 3 Alarm Contacts
QRESB	Remote Emergency Stop	PWMT	Temperature PWM	4SA	System 4 Alarm Contacts
RRI	Remote Run Interlock	RRI1	Remote Run Interlock (Circuit 1)	RRI2	Remote Run Interlock (Circuit 2)
SF	Flow Switch	RP	Remote Print	XTBE	Ground Terminal

CLEARANCES (All Models)

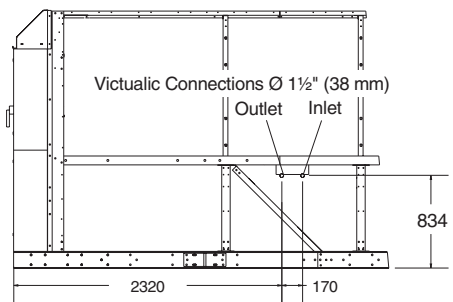


DIMENSIONS

Models 0295, 0335 and 0375



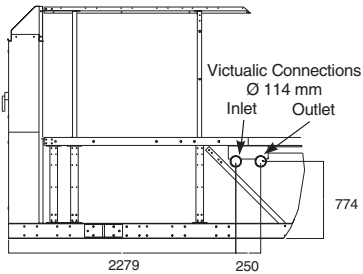
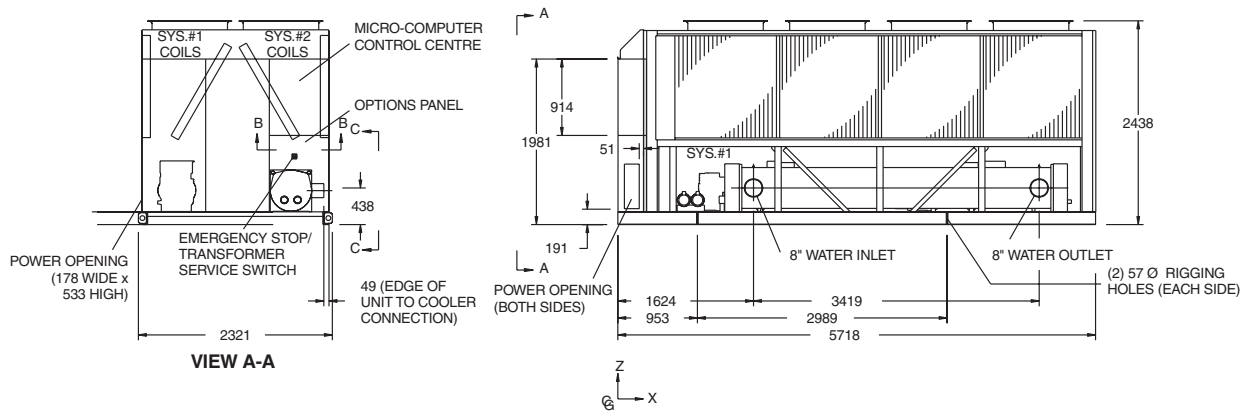
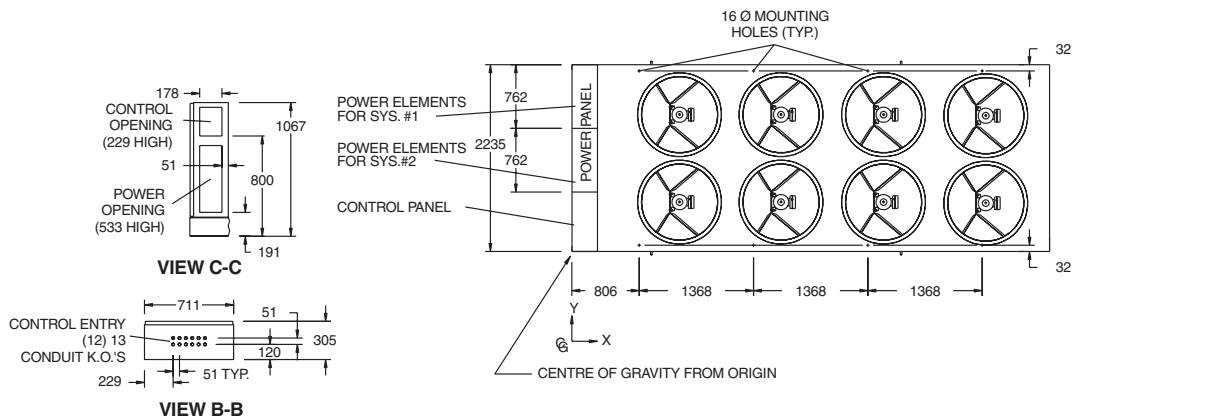
Optional Heat Recovery Condenser Connections



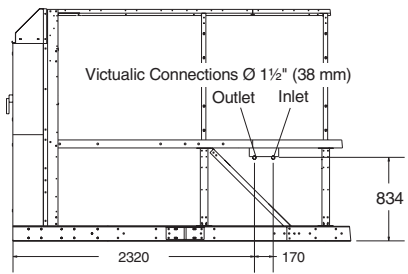
Optional Desuperheater Connections

DIMENSIONS (continued)

Models 0425, 0475, 0515, 0555 and 0575



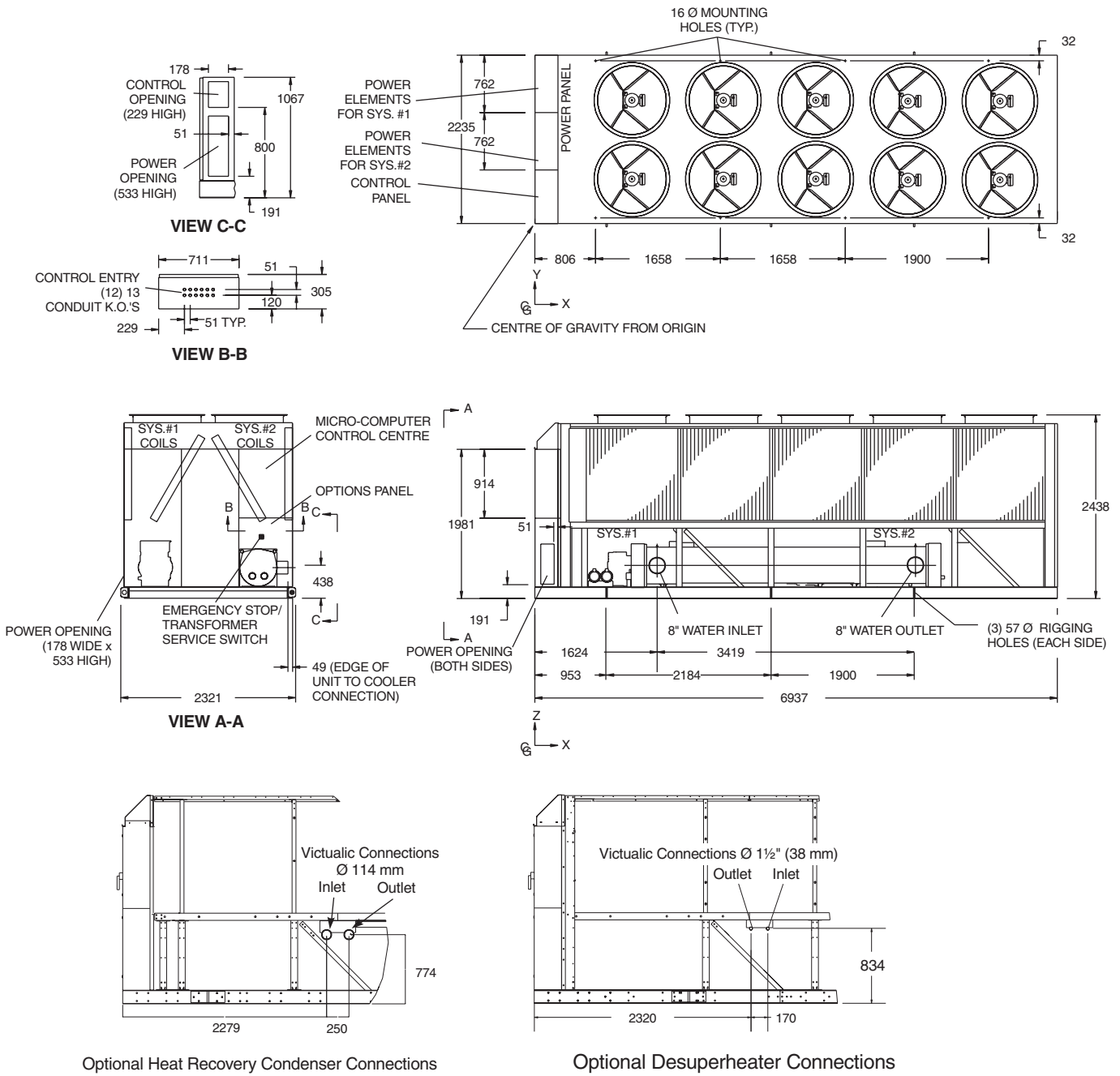
Optional Heat Recovery Condenser Connections



Optional Desuperheater Connections

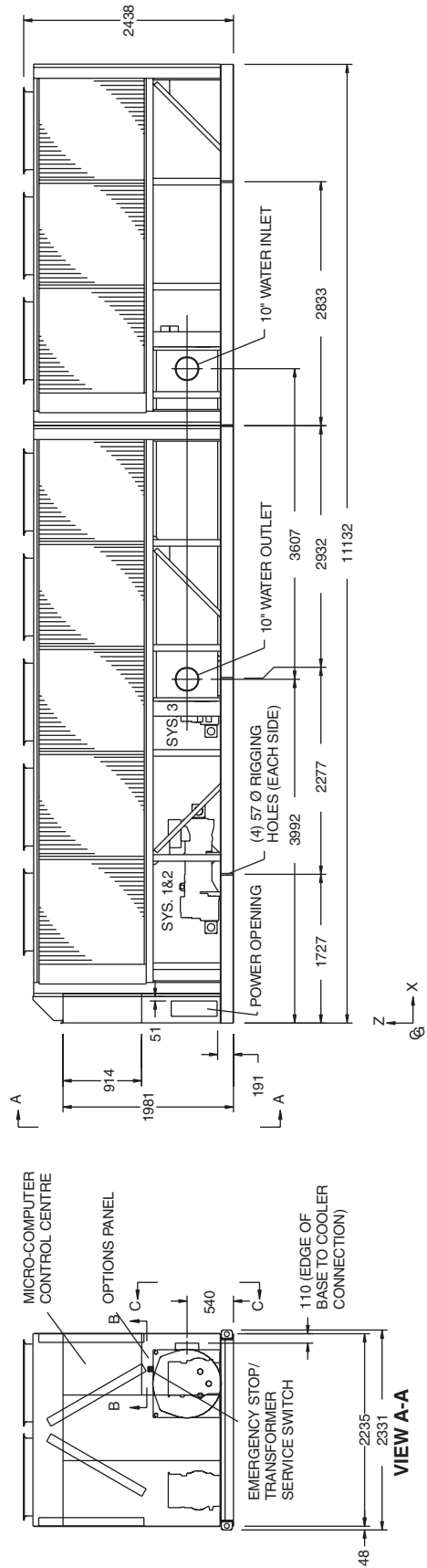
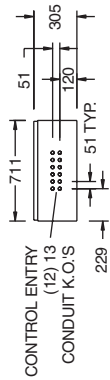
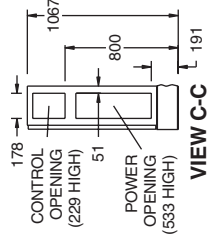
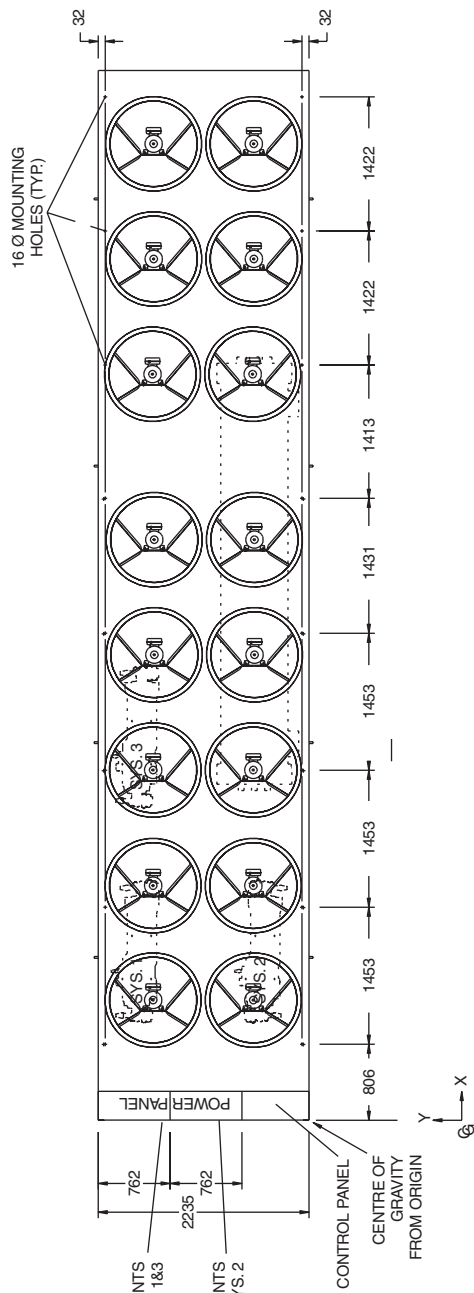
DIMENSIONS (continued)

Model 0605



DIMENSIONS (continued)

Model 0965



DIMENSIONS (continued)

Models 1065, 1135 and 1215

