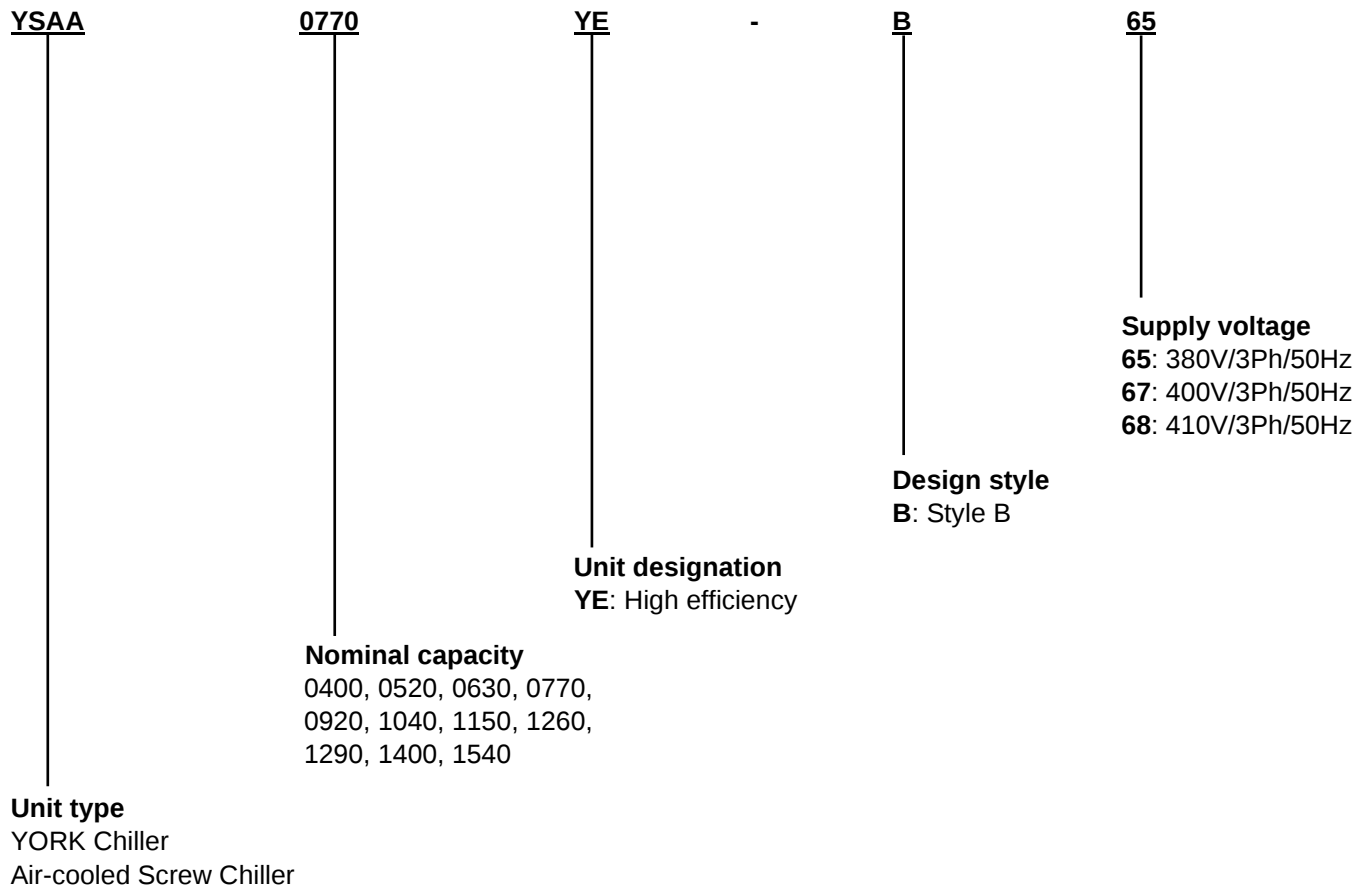


Model YSAA
Air-Cooled Screw Compressor Liquid Chillers
Style B

110 ton to 455 ton
385 kW to 1600 kW
1 or 2 compressor(s)
50 Hz
HFC-134a



Nomenclature



Approvals

- AHRI 550/590 and 551/591– Water Chilling Packages Using the Vapor Compression Cycle
- GB 19517 – National Safety Technical Code for Electric Equipment
- NB/T 47012 – Pressure Vessels for Refrigerant Equipment
- OSHA – Occupational Health and Safety Act
- ISO – International Organization for Standardization

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Unit Overview

General

YSAA-B air-cooled chillers are completely factory assembled with all interconnecting refrigerant piping and wiring ready for field installation.

The unit is pressure tested, evacuated, and fully factory charged with refrigerant R134a and oil in the independent refrigerant circuit(s). After assembly, an operational test is performed with water flowing through the heat exchanger(s) to ensure that the refrigerant circuit(s) operate correctly.

The unit structure is manufactured from heavy-gauge, galvanized steel coated with baked-on powder paint (Champagne (RAL 7006, Munsell No. 9.8YR4.36/1.2)).

YSAA-B units are designed and manufactured within an EN ISO 9001 accredited organization and in conformity with the following safety standards:

- NB/T 47012
- GB/T18430.1
- GB25131

YSAA-B units are designed to work independently, or in conjunction with other equipment via Modbus building management systems or other automated control systems. When operating, the unit controls monitor the liquid system temperatures at the unit and take the appropriate action to maintain the temperatures within desired limits. This action will involve running and controlling the capacity of the compressor (or two compressors on two circuit units) to match the effect of the refrigerating systems to the load on the liquid system. When cooling, the heat removed from the chilled liquid by the refrigerant to water heat exchanger is rejected through the ambient coils.

Sound Standard

The sound data for YSAA-B air-cooled chillers conforms to and is rated in accordance with ANSI/AHRI Standard 370. A semi-anechoic chamber has been used to test and monitor emitted sound during design.

Compressor(s)

Twin helical semi-hermetic screw compressors are provided to ensure high operational efficiency and reliable performance. Capacity control is achieved through a single slide valve. The compressor is a positive displacement type characterized by two helically grooved rotors which are manufactured from forged steel. The 50Hz motor operates at 2950 rpm to direct drive the male rotor which in turn drives the female rotor.

Each compressor is direct drive, semi-hermetic, rotary twin-screw type with integral oil separator and includes 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.
- An integral discharge check valve (to prevent rotor backspin during shutdown) and a suction gas screen within the compressor housing.
- A reliable suction gas cooled high efficiency, accessible hermetic motor with overload protection using both thermistor and over current protection.

Refrigerant Circuits

Independent refrigerant circuit(s) are provided on each unit. Each circuit uses copper refrigerant pipe formed on computer controlled bending machines to reduce the number of brazed joints resulting in a reliable and leak resistant system.

Each circuit incorporates all the components necessary for the designed operation including: reversing valves, check, ball and solenoid valves, filter-driers with removable filter elements, economizer, and electric expansion valves (EEV). Temperature and pressure sensors are also included.

Refrigerant to Water Heat Exchanger

The shell and tube type flooded heat exchanger has refrigerant in the shell and liquid flowing through the tubes. The waterside (tubes) design working pressure is 1000 kPa. The refrigerant side (shell) design working pressure is 1900 kPa. The refrigerant side is protected by pressure relief valve(s).

The heat exchanger is insulated with flexible, closed-cell foam. Water connection to the heat exchanger is via flange (to HG20615) connections.

Ambient Coils

The ambient coils are seamless copper tubes, arranged in staggered rows, mechanically expanded into aluminum fins. The ambient coil fans are designed for maximum efficiency and statically and dynamically balanced for vibration free operation. The fan includes a high strength aluminum hub and a low noise aluminum alloy blade that is incorporated into the inner rotor of the motor. They are directly driven by independent motors, and positioned for vertical air discharge. The fan guards are constructed from heavy-gauge, corrosion resistant and coated steel. The fan motors are the totally enclosed air cooled type with permanently lubricated double-sealed ball bearings.

Starter

The starter contains the main circuit breaker (-QF1) for each circuit, the auxiliary circuit breakers for the control circuit, heat exchanger heater and fans, contactors for the compressor star / delta start-up and contactors for the ambient coil fans.

PCB IPU3 (unit monitoring and control) and YORK-DRV-006 PCB (control of compressor contactors, reversing valves, solenoid valves, fan and oil pump control and oil and heat exchanger heaters) are also mounted in the starter.

Control Panel

The control panel contains XS09 which works as keyboard input and display data. The data exchange between XS09 and IPU3 in the starter is carried out through RS485 communication bus.

The emergency stop button is mounted on the right hand side of the control panel.

Control System

The microprocessor control system is capable of single or dual refrigerant circuit control (dependent on unit) to maintain liquid temperature within

programmed limits, as well as system safeties, displaying status, and daily schedules.

Remote starting, flow and equipment interlock can be accomplished by field contacts connection.

Remote indications of alarms, run status and pump control are available as outputs.

Compressor starting/stopping and loading/unloading decisions are performed by the microprocessor to maintain leaving liquid temperature.

Control Transformer

Converts unit power voltage to 220V/1Ph/50Hz (3.0 kVA capacity). Factory mounting includes primary and secondary wiring between the transformer and the control panel (factory installed).

Accessories and Options

Language LCD

English and Chinese (Simplified) are available for selection.

Compressor Acoustic Blanket

Factory fitted acoustic blanket on the screw compressor for sound attenuation.

Compressor Acoustic Enclosure

Factory fitted modular sandwich type sound acoustic enclosure with removable panels for maintenance purposes.

Flow Switch

Vapor Proof, paddle-type with 1"NPT connection for upright mounting in horizontal pipe. This flow switch or its equivalent must be supplied with each unit to protect the heat exchanger from loss of liquid flow (field installed).

Differential Pressure Switch

Alternative to the paddle type flow switch, 0-300 kPa range with ¼" NPTE pressure connections (field installed).

Neoprene Pads Isolators

Mount under the unit base rails (field mounted). Suitable for ground level installations or rooftop installations, where vibration will not affect people or equipment.

25 mm / 50 mm Spring Isolators

Level adjustable, spring and cage type isolators for mounting under the unit base rails (field mounted). Spring isolators are recommended for rooftop installations. For locations where vibration isolation is critical, 50mm spring isolators should be used.

Compressor Service Isolation Valve

Factory fitted isolation valves for compressor suction and discharge port for convenient maintenance.

Anti-freeze system

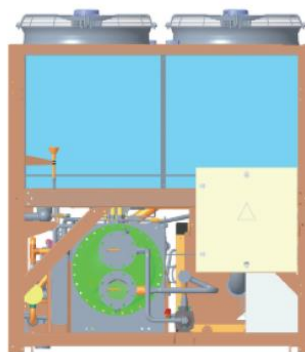
Factory fitted anti-freeze water pump and electric heater for effectively avoiding the water temperature

drops in the evaporator tube and realizes the anti-freeze protection of the evaporator when the unit operating at cold weather.

Single Point Power Supply Terminal Box (Option for duplex units, field installation)

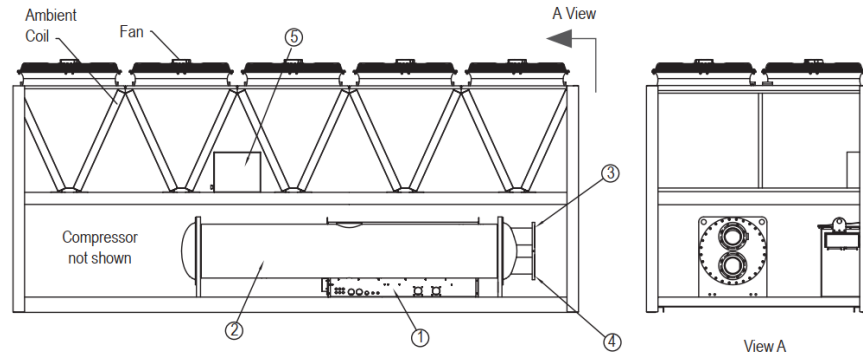
Single point power supply terminal box is to simplify site wiring of duplex units, using JCI or customer supplied harnesses.

Terminal box is supplied with mounting brackets, gaskets, nuts and bolts. Please ensure field installation correctly and prevent water from entering into the box.



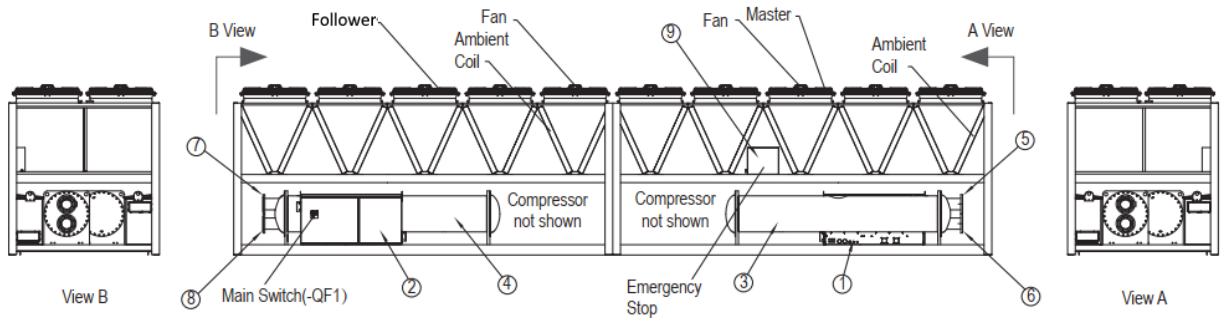
Main Components Location

YSAA0400/0520/0630/0770YE-B



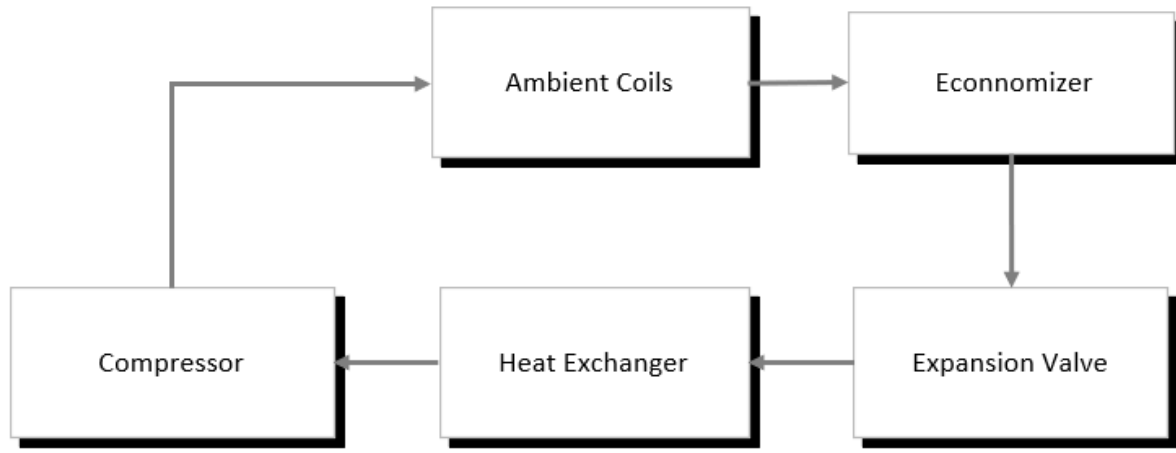
1	Starter Panel
2	Evaporator
3	Water Outlet
4	Water Inlet
5	Control Panel

YSAA0920/1040/1150/1260/1290/1400/1540YE-B



1	Master Starter
2	Follower Starter
3	Master Evaporator
4	Follower Evaporator
5	Water Outlet
6	Water Inlet
7	Water Outlet
8	Water Inlet
9	Control Panel

Refrigerant Flow Block Diagram



Low pressure liquid refrigerant enters the heat exchanger and is evaporated and superheated by the heat energy absorbed from the chilled liquid. Low pressure vapor enters the compressor, where pressure and superheat are increased. The high pressure vapor is fed to the ambient coils and fans, where heat is removed. The fully condensed and subcooled liquid passes through the economizer and expansion valves where pressure is reduced and further cooling takes place before returning to the heat exchanger.

Application Data

Location Requirements

To achieve optimum performance and trouble-free service, it is essential that the proposed installation site meet with the location and space requirements for the model being installed.

The clearances recommended are nominal for the safe and efficient operation and maintenance of the unit, power and control panels. Local Health and safety regulations, or practical considerations for service replacement of large components, may require larger clearances than those given in this manual.

Outdoor Installations

The units can be installed at ground level on a suitable and level foundation easily capable of supporting the weight of the unit, or on a suitable rooftop location. In both cases, an adequate supply of air is required. Avoid locations where the sound and air discharge from the unit may be objectionable.

When it is necessary to install the unit in noise sensitive areas, acoustic isolation facilities must be designed and installed at the job site, to keep the noise surrounding the unit under the acceptable level.

The location should be selected for minimum sun exposure and away from boiler flues and other sources of airborne chemicals that could attack the ambient coils and steel parts of the unit.

Rooftop locations - Choose a place with adequate structural strength and stiffness to safely support the entire operating weight of the unit and service personnel. The unit can be mounted on a concrete slab, or on steel channels of suitable strength. The channels should be spaced with the same center as the unit base rails. This will allow vibration isolators to be fitted if required. Concrete slab or steel channels should take root (or support) on the building girders. This will let the unit operating load transfer to the support girders, rather than to the normal area of the building.

Ground locations - The unit must be installed on a suitable flat and level concrete base that extends to fully support the two side channels of the unit base frame. A one-piece concrete slab, with footings extending below the frozen line is recommended. To

avoid noise and vibration transmission, the unit should not be secured to the building foundation.

If located in an area accessible to unauthorized persons, precautions must be taken to protect the unit from tampering by, or injury to, them. Fasteners on access panels prevents casual tampering, however, further safety precautions such as unit enclosure options, a fenced-in enclosure, or locking devices on the panels may be advisable. Check local authorities for safety regulations.

To prevent the short circuit of vibration, all external connections of the unit should adopt flexible joint and connect to the building structure through the flexible support.

YSAA-B Sound Characteristics and Environmental Influence of Installation

Sound power level and sound pressure level are used to define unit sound characteristics:

Sound power level is the total sound power emitted by the unit in all directions.

Sound pressure level is the value of the instantaneous sound pressures measured over a specified period of time around the unit.

Sound power level defines the overall level of noise emitted by the unit. The sound pressure level defines the noise level at a given point around the unit. Sound power level is the best definition of the noise emitted by the unit.

The noise characteristics of the unit can be calculated by the following formula:

$$L_p = L_w - 20 \log_{10}(d) + 10 \log_{10}(Q) - 11$$

Where:

L_p: Sound pressure level, (dB)

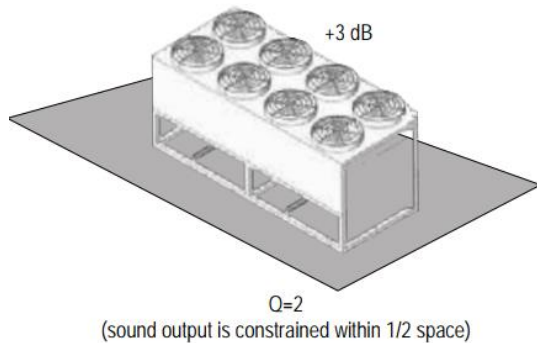
L_w: Sound power level (dB)

D: Distance from the center of the unit (m)

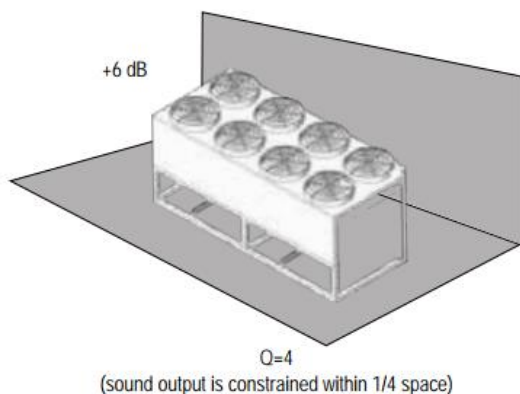
Q: Sound directivity factor

In the above formula, the sound directivity factor quantifies the effects of reflecting surfaces around the unit on the directional characteristics of the sound emitted by the unit.

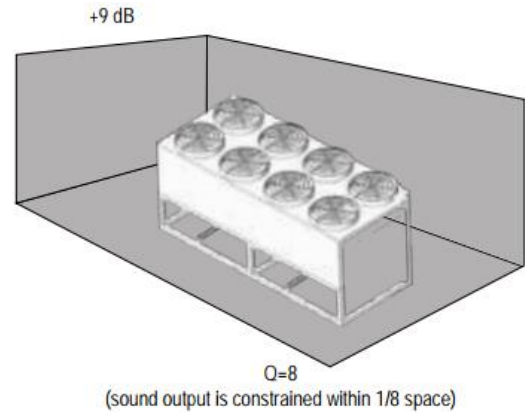
- 1) $Q = 2$, if the unit is located on the ground, roof or other flat surface. The all output power of the source is constrained within half of original free space. Therefore, the sound intensity in that space is increased twice times. The sound level rises by 3 dB.



- 2) $Q = 4$, if the unit is located at the junction of two flat, reflecting surfaces, for example, a wall and floor of a room. The all output power of the source is constrained within one quarter of the original free space. Therefore, within this quarter space, the sound power is increased by four times. The sound level rises by 6 dB.



- 3) $Q = 8$, if the unit is located in a room with flat surfaces all at 90 degree angles to each other, the extreme situation is where the floor (or ceiling) and two walls intersect. The all output power of the source is constrained within one eighth of the original free space. Therefore, the sound intensity is increased eight times. The sound level rises by 9 dB.



Source Location	Directivity Factor	Directivity Index (dB)
Free field, i.e. suspended between floor and ceiling	1	0
On a flat plane, i.e. on the floor	2	3
At the junction between two perpendicular planes, i.e. floor and wall	4	6
At the junction of three perpendicular planes, i.e. in a corner	8	9

The relationship between the sound pressure level of unit and the distance from the center of the unit is expressed in tabular form as follows:

Distance from center of unit (m)	Sound Power/Pressure Level Conversion Coefficient (dB)		
	Q2	Q4	Q8
9	-27.1	-24.1	-21
10	-28	-25	-22
12	-29.6	-26.6	-23.5
14	-30.9	-27.9	-24.9
16	-32.1	-29.1	-26
18	-33.1	-30.1	-27.1
20	-34	-31	-28
22	-34.8	-31.8	-28.8
24	-35.6	-32.6	-29.6
26	-36.3	-33.3	-30.3
28	-36.9	-33.9	-30.9
30	-37.5	-34.5	31.5

In practical applications, the actual noise value around the unit will vary greatly depending on the operating conditions and environmental conditions and it is not possible to accurately predict the noise level around the installation site. For further

information about product sound levels, please contact your local Johnson Controls sales office for support.

Unit Selection and Installation: Sound Considerations

Johnson Controls provides noise reduction options to meet user's requirements of noise reduction.

At the product selection stage, cooling performance, cost and noise etc. factors should be considered when selecting the appropriate product configuration and noise reduction options. If higher noise reduction is required, considering multiple smaller units instead of a single large unit will help to improve environmental noise situation.

It should be noted that, as previously mentioned, the installation location can have a considerable effect on noise levels. If there are not appropriate noise reduction measures, the following scenarios should be avoided:

- 1) Locate the unit in a narrow, enclosed space facing windows and doors.
- 2) Locate the unit close to a building especially near windows and doors.
- 3) Obstructions close to fan outlets and the air ventilation of fan systems is not smooth.
- 4) Install the unit without adequate anti-vibration measures for the unit casing, electrical box, external water pipes etc.
- 5) Locate the unit directly on the ground without an adequate concrete foundation and anti-vibration isolators.
- 6) Mount the unit on the roof with the location too near the edge of the building where sound may migrate to windows below the edge of the roof.
- 7) Locate the unit in public areas with no noise reduction measure.

Noise Reduction Measures

The following measures can be implemented to reduce noise:

1) Soundproof room



Effective design of a soundproof room can result in noise reduction of 20 to 30dB. To ensure efficient operation of the unit and good performance, inlet and outlet ductings should be well separated and air resistance should be minimized.

2) Sound insulated barriers



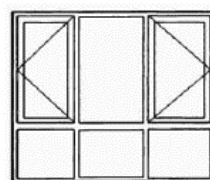
Well-designed noise barriers placed between the unit and the noise sensitive area can result in noise reduction of up to 10dB.

3) Duct silencers



Efficient inlet and outlet duct silencers can ensure unit performance as well as noise reduction.

4) Soundproof glass windows



In some installations, it is difficult to implement noise reduction measures around the unit due to space available, environment etc. Effective multi-layer soundproof glass windows can result in 15 dB, or in some cases more than 20 dB noise reduction.

5) Anti-vibration isolators

It should be noted that if correct anti-vibration isolators are not properly installed, vibration will be transmitted through the foundation to the building, resulting in noise. Correct installation of the appropriate anti-vibration isolators can significantly improve noise caused by unit vibration.

Location Clearances

Adequate clearances around the unit(s) are required for the unrestricted airflow for the ambient coils and to prevent re-circulation of discharge air back onto the coils. If clearances given are not maintained, airflow restriction or recirculation will cause a loss of unit performance, an increase in power consumption, and may cause the unit to malfunction. Consideration should also be given to the possibility of air turn back, caused by adjacent buildings, which may cause recirculation or uneven unit airflow.

For locations where significant cross winds are expected, such as exposed rooftops, an enclosure of solid or louvre type is recommended to prevent air turbulence interfering with the unit airflow.

When units are installed in an enclosure, the enclosure height should not exceed the height of the unit. Where accumulation of snow is likely, additional height must be provided under the unit to ensure normal airflow to the unit.

The table below shows the detailed installation clearances needed when structures surrounding the unit are $h1 \leq 500\text{mm}$ (location clearance drawing, I-I view)

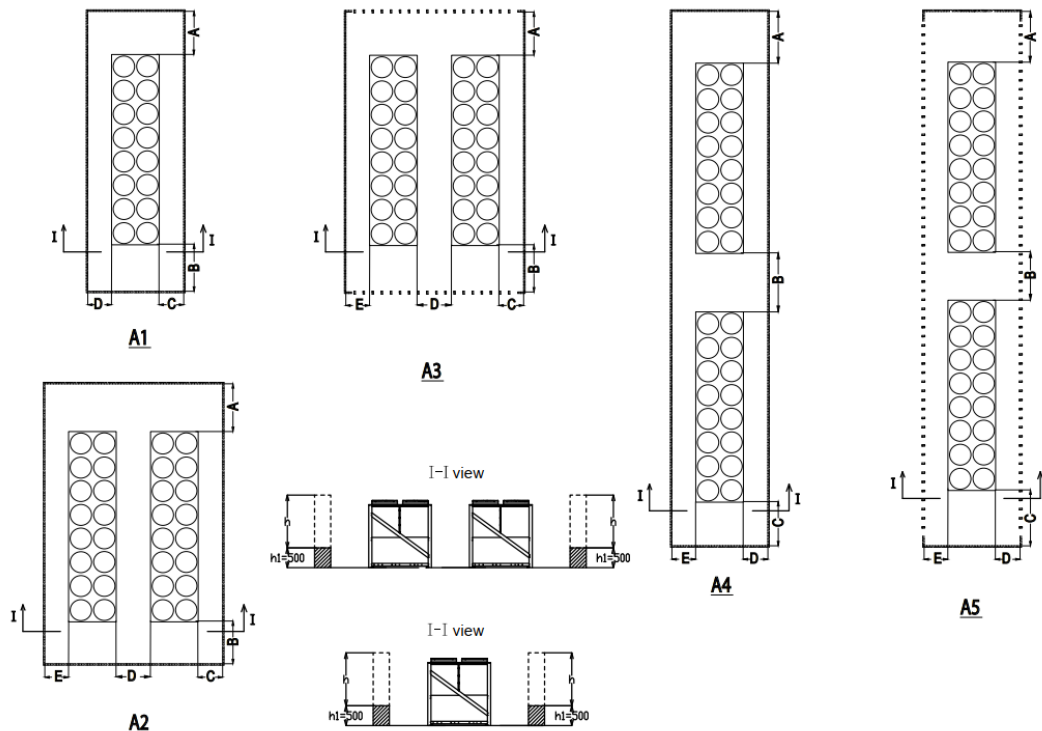
YSAA0400/0520/0630/0770YE-B					
Dim. (min)	A	B	C	D	E
Layout A1	2000	2000	2000	2000	
Layout A2	2000	2000	2000	3000	2000
Layout A3	2000	2000	2000	3000	2000
Layout A4	2000	3000	2000	2000	2000
Layout A5	2000	3000	2000	2000	2000

YSAA0920/1040/1150/1260/1290/1400/1540YE-B					
Dim. (min)	A	B	C	D	E
Layout A1	2000	2000	2000	2000	
Layout A2	2000	2000	2000	3000	2000
Layout A3	2000	2000	2000	3000	2000
Layout A4	2000	3000	2000	2000	2000
Layout A5	2000	3000	2000	2000	2000

The table below show the detailed installation clearances needed when structures surrounding the unit are $h1 \geq 500\text{mm}$ (location clearance drawing, I-I view)

YSAA0400/0520/0630/0770YE-B					
Dim. (min)	A	B	C	D	E
Layout A1	2000+h	2000+h	2000+h	2000+h	
Layout A2	2000+h	2000+h	2000+h	3000+h	2000+h
Layout A3	2000+h	2000+h	2000+h	3000	2000+h
Layout A4	2000+h	3000	2000+h	2000+h	2000+h
Layout A5	2000+h	3000	2000+h	2000+h	2000+h

YSAA0920/1040/1150/1260/1290/1400/1540YE-B					
Dim. (min)	A	B	C	D	E
Layout A1	2000+h	2000+h	2000+h	2000+h	
Layout A2	2000+h	2000+h	2000+h	3000+h	2000+h
Layout A3	2000+h	2000+h	2000+h	3000	2000+h
Layout A4	2000+h	3000	2000+h	2000+h	2000+h
Layout A5	2000+h	3000	2000+h	2000+h	2000+h



Piping Connection

The following piping recommendations are intended to ensure satisfactory operation of the unit. Failure to follow these recommendations could cause damage to the unit, or loss of performance, and may invalidate the warranty.

A flow switch must be installed in the customer pipework at the outlet of the heat exchanger as shown in the arrangement diagrams, and wired back to the control panel using screened cable. This is to prevent the damage to the heat exchanger caused by inadequate liquid flow. To prevent the turbulent flow, there must be straight pipework on the upstream and downstream side of the flow switch and the length of each straight pipework is equal to at least 5 times the diameter of the pipe.

The flow switches used for the low voltage/current operation must have gold plated contacts.

Alternatively, a differential pressure switch may be used and fitted on the orifice plate of inlet and outlet liquid piping. The high/low limit type is preferred.

The pumps installed in the pipework systems should discharge the liquid directly into the unit heat

exchanger of the system. The pumps need to be wired to the control panel and can be controlled automatically.

Pipework and fittings must be separately supported to prevent any loading on the heat exchanger(s). Flexible connections are recommended which can minimize the transmission of vibrations to the building. Flexible connections must be used if the unit is mounted on the anti-vibration isolators because some movement of the unit can be expected during normal operation.

Pipework and fittings directly connected to the heat exchanger(s) should be readily demountable in order to enable cleaning prior to operation, and to facilitate visual inspection of the exchanger nozzles.

Each heat exchanger must be protected by a strainer (not less than 20 US mesh) and fitted as close as possible to the liquid inlet connection, and provided with a means of local isolation.

The heat exchanger(s) must not be exposed to flushing velocities or debris released during flushing. It is recommended that a suitably sized by-pass and valve arrangement be installed to allow flushing of the pipework system. The by-pass can be used during

maintenance to isolate the heat exchanger(s) without disrupting flow to other units.

Thermometer and pressure gauge connections should be provided on the inlet and outlet connections of each heat exchanger.

Drain and air vent connections should be provided at all low and high points in the pipework to permit drainage of the system, and to vent any air in the pipes.

Freeze Damage Protection (If Applicable)

Liquid systems at risk of freezing, due to low ambient temperatures, should be protected using insulation and heater tape, or glycol should be added to the chilled liquid to protect against freezing. The liquid pumps must also be used to ensure liquid is circulated when the ambient temperature approaches freezing point. Insulation should also be installed around the heat exchanger nozzles.

The heater tape should be controlled by an ambient temperature thermostat set to switch on at approximately 2 °C and off at approximately 3 °C above the freezing temperature of the chilled liquid.



The implementation of the above operational protection requires the unit to remain powered. If the unit unexpectedly loses power and the ambient temperature drops below the freezing temperature for a short period of time, it may cause the evaporator to freeze.

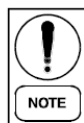
[Optional] The heat exchanger is protected by an anti-freeze pump and water box heater, which are powered from the unit control system power supply. During cold weather when there is a risk of freezing, chiller power should be left switched on to provide the freeze protection function unless the liquid systems have been drained.

If the YSAA-B unit is in maintenance or shutdown and the ambient temperature is below freezing, the freeze protection of evaporator and its tank are critical. Johnson Controls recommends the following measures for each refrigeration system to achieve frost protection:

Close the waterway shut-off valve, drain the water in the evaporator, and keep the drain valve open.



The above method is the recommended antifreeze protection method for unit maintenance or shutdown. Otherwise, if the unit unexpectedly loses power, if the ambient temperature drops below the freezing temperature, it may cause the evaporator to freeze.



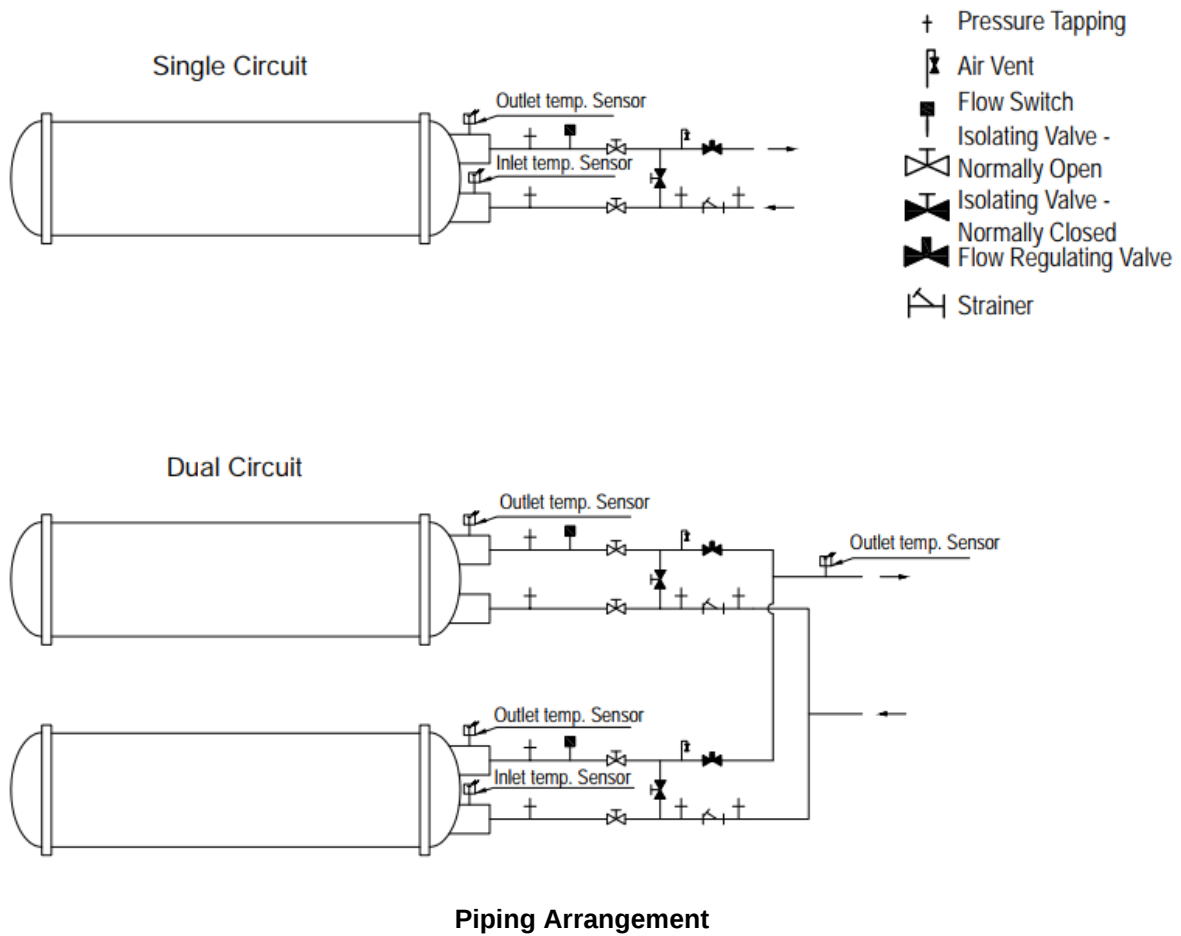
If the operation is not carried out in accordance with the relevant regulations of Johnson Controls and Anti-freezing Protection, the unit warranty will be invalid.

Piping Arrangement

The following are suggested pipework arrangements for single unit installations with 1 and 2 water circuits. For multiple unit installations, each unit should be piped as shown. These are recommendations of the Building Services Research Association.

Minimum liquid volume

It is good practice to include as much liquid volume as possible in a chilled liquid loop. This increases the thermal mass and flywheel effect within the system, which in turn promotes stable liquid temperature control and increases reliability by reducing compressor cycling.



Physical Data

YSAA-B			0400YE-B	0520YE-B	0630YE-B
Number of refrigerant circuits			1	1	1
Refrigerant	Circuit1/Circuit2	kg	182	218	238
Oil Charge	Circuit1/Circuit2	l	20	28	28
Compressor	Number of compressors		1	1	1
	Type		Screw		
Refrigerant-Water Heat Exchanger	Number		1	1	1
	Type		Shell and Tube		
	Water Volume(circuit1/circuit2)	l	95	120	135
	Water Connections(circuit1/circuit2)	Inch	4	6	
Ambient Coils Fans	Number of Fans(circuit1/circuit2)		6	8	10
	Total Air Flow	m ³ /s	38	51	64
Dimensions	Length	mm	4015	4528	5595
	Width	mm	2246		
	Height	mm	2526		
Basic Unit Weight	Shipping Weight(circuit1/circuit2)	kg	4267	5263	5843
	Operating Weight	kg	4362	5383	5978

YSAA-B			0770YE-B	0920YE-B	1040YE-B
Number of refrigerant circuits			1	2	2
Refrigerant	Circuit1/Circuit2	kg	302	218/182	218/218
Oil Charge	Circuit1/Circuit2	l	40	28/20	28/28
Compressor	Number of compressors		1	2	2
	Type		Screw		
Refrigerant-Water Heat Exchanger	Number		1	2	2
	Type		Shell and Tube		
	Water Volume(circuit1/circuit2)	l	160	120/95	120/120
	Water Connections(circuit1/circuit2)	Inch	6	6/4	6/6
Ambient Coils Fans	Number of Fans(circuit1/circuit2)		12	8/6	8/8
	Total Air Flow	m ³ /s	77	89	102
Dimensions	Length	mm	6712	8543	9056
	Width	mm	2246		
	Height	mm	2526		
Basic Unit Weight	Shipping Weight(circuit1/circuit2)	kg	6919	5263+4267	5263+5263
	Operating Weight	kg	7079	9745	10766

YSAA-B			1150YE-B	1260YE-B	1290YE-B
Number of refrigerant circuits			2	2	2
Refrigerant	Circuit1/Circuit2	kg	238/218	238/238	302/218
Oil Charge	Circuit1/Circuit2	l	28/28	28/28	40/28
Compressor	Number of compressors		2	2	2
	Type		Screw		
Refrigerant-Water Heat Exchanger	Number		2	2	2
	Type		Shell and Tube		
	Water Volume(circuit1/circuit2)	l	135/120	135/135	160/120
	Water Connections(circuit1/circuit2)	Inch	6/6		
Ambient Coils Fans	Number of Fans(circuit1/circuit2)		10/8	10/10	12/8
	Total Air Flow	m³/s	115	128	128
Dimensions	Length	mm	10123	11190	11240
	Width	mm	2246		
	Height	mm	2526		
Basic Unit Weight	Shipping Weight(circuit1/circuit2)	kg	5843+5263	5843+5843	6919+5263
	Operating Weight	kg	11361	11956	13057

YSAA-B			1400YE-B	1540YE-B
Number of refrigerant circuits			2	2
Refrigerant	Circuit1/Circuit2	kg	302/238	302/302
Oil Charge	Circuit1/Circuit2	l	40/28	40/40
Compressor	Number of compressors		2	2
	Type		Screw	
Refrigerant-Water Heat Exchanger	Number		2	2
	Type		Shell and Tube	
	Water Volume(circuit1/circuit2)	l	160/135	160/160
	Water Connections(circuit1/circuit2)	Inch	6/6	
Ambient Coils Fans	Number of Fans(circuit1/circuit2)		12/10	12/12
	Total Air Flow	m³/s	141	154
Dimensions	Length	mm	12307	13424
	Width	mm	2246	
	Height	mm	2526	
Basic Unit Weight	Shipping Weight(circuit1/circuit2)	kg	6919+5843	6919+6919
	Operating Weight	kg	13057	14158

Operation Limitation

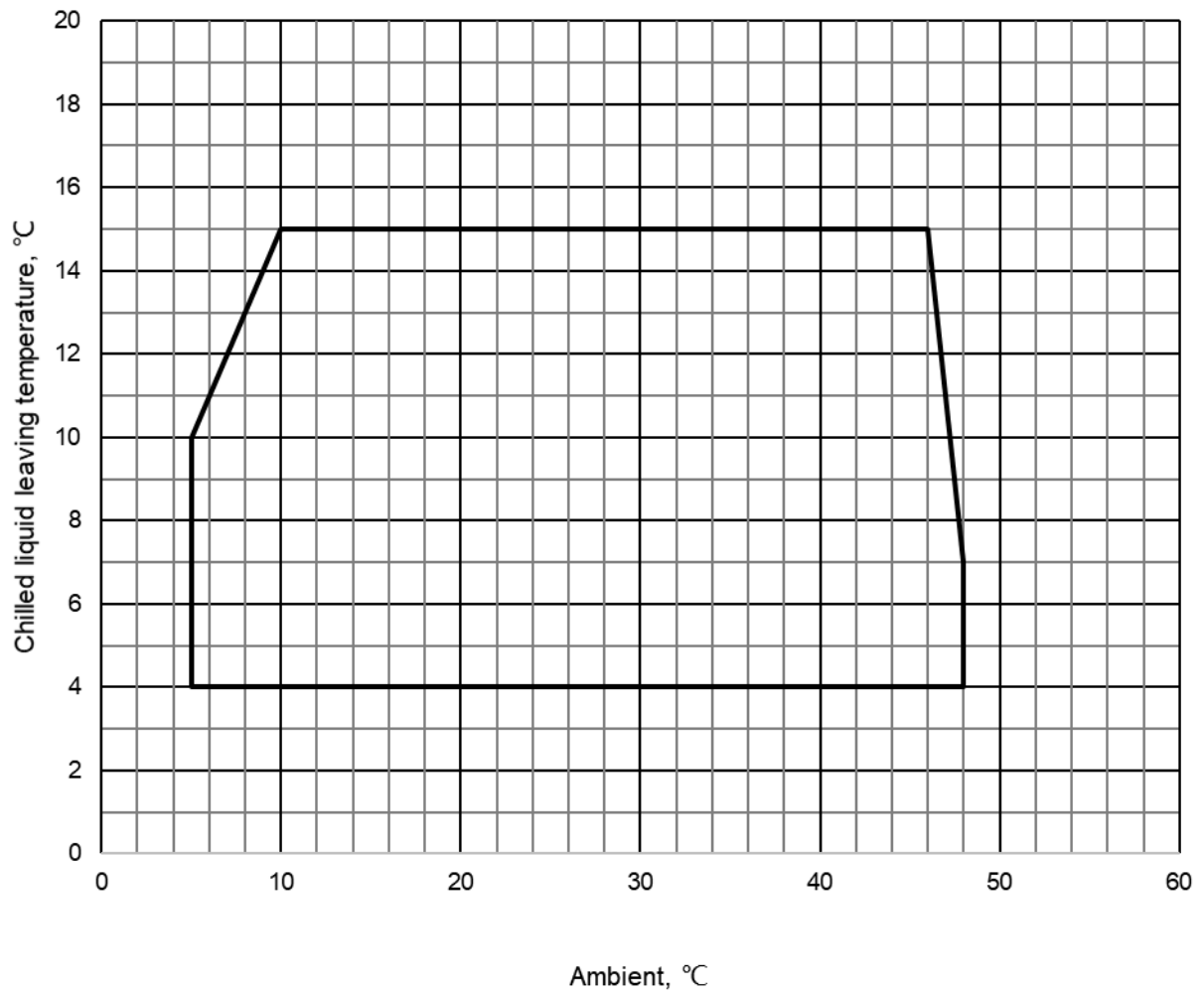
YSAA			0400YE-B		0520YE-B		0630YE-B		0770YE-B		0920YE-B		1040YE-B	
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Cooling Mode	Liquid Outlet Temp. (Water)	℃	4~15											
	Inlet/Outlet Temp. Difference (ΔT)	℃	3~10											
	Ambient	℃	5~52 ⁽¹⁾											
Heat Exchanger Flow Rate		l/s	7	23	12	37	15	46	20	59	21	52	25	74
Heat Exchanger Pressure Drop		kPa	16	134	10	72	26	102	17	122	25	128	10	72
Min. System Volume	Comfort Cooling	l	1675		2193		2737		3477		3868		4386	
	Process Cooling	l	3349		4386		5474		6953		7735		8772	
Water Side Max. Pressure		kPa	1000											
Refrigerant Side Max. Pressure		kPa	1900											
Power Supply Voltage		V	380V,400V,415V,3Ø,50Hz(nominal) ⁽²⁾											

YSAA			1150YE-B		1260YE-B		1290YE-B		1400YE-B		1540YE-B	
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Cooling Mode	Liquid Outlet Temp. (Water)	℃	4~15									
	Inlet/Outlet Temp. Difference (ΔT)	℃	3~10									
	Ambient	℃	5~52 ⁽¹⁾									
Heat Exchanger Flow Rate		l/s	28	83	31	92	32	96	35	105	39	117
Heat Exchanger Pressure Drop		kPa	25	99	26	102	16	119	25	111	17	122
Min. System Volume	Comfort Cooling	l	4930		5474		5670		6214		6954	
	Process Cooling	l	9860		10948		11339		12427		13906	
Water Side Max. Pressure		kPa	1000									
Refrigerant Side Max. Pressure		kPa	1900									
Power Supply Voltage		V	380V,400V,415V,3Ø,50Hz (nominal) ⁽²⁾									

(1) 46°C maximum ambient temperature for full load operation (part load operation up to 52°C).

(2) Tolerance for power supply voltage is +/- 10%.

Cooling Mode



Electrical Data

YSAA	Single Point Wiring											
	RLA			Max. Operating Current			Inrush Current - Star/Delta ⁽¹⁾					
	Amps @380V	Amps @400V	Amps @415V	Amps @380V	Amps @400V	Amps @415V	Star @380V	Delta @380V	Star @400V	Delta @400V	Star @415V	Delta @415V
0400YE-B	210	200	192	326	310	299	443	1330	463	1390	417	1250
0520YE-B	285	271	261	422	401	386	743	2230	777	2330	682	2045
0630YE-B	350	333	320	506	481	463	875	2625	915	2745	955	2865
0770YE-B	450	428	412	631	599	578	888	2665	935	2805	782	2345
0920YE-B	495	471	453	748	711	685	1069	2556	1087	2640	981	2344
1040YE-B	570	542	522	844	802	772	1165	2652	1178	2731	1068	2431
1150YE-B	635	604	581	928	882	849	1297	3047	1316	3146	1341	3251
1260YE-B	700	666	640	1012	962	926	1381	3131	1396	3226	1418	3328
1290YE-B	735	699	673	1053	1000	964	1310	3087	1336	3206	1168	2731
1400YE-B	800	761	732	1137	1080	1041	1394	3171	1416	3286	1245	2808
1540YE-B	900	856	824	1262	1198	1156	1519	3296	1534	3404	1360	2923

YSAA	Dual Point Wiring - Master Unit											
	RLA			Max. Operating Current			Inrush Current - Star/Delta ⁽¹⁾					
	Amps @380 V	Amps @400 V	Amps @415 V	Amps @380 V	Amps @400 V	Amps @415 V	Star @380 V	Delta @380 V	Star @400 V	Delta @400 V	Star @415 V	Delta @415 V
0920YE-B	285	271	261	422	401	386	743	2230	777	2330	682	2045
1040YE-B	285	271	261	422	401	386	743	2230	777	2330	682	2045
1150YE-B	350	333	320	506	481	463	875	2625	915	2745	955	2865
1260YE-B	350	333	320	506	481	463	875	2625	915	2745	955	2865
1290YE-B	450	428	412	631	599	578	888	2665	935	2805	782	2345
1400YE-B	450	428	412	631	599	578	888	2665	935	2805	782	2345
1540YE-B	450	428	412	631	599	578	888	2665	935	2805	782	2345

YSAA	Dual Point Wiring - Follower Unit											
	RLA			Max. Operating Current			Inrush Current - Star/Delta ⁽¹⁾					
	Amps @380 V	Amps @400 V	Amps @415 V	Amps @380 V	Amps @400 V	Amps @415 V	Star @380 V	Delta @380 V	Star @400 V	Delta @400 V	Star @415 V	Delta @415 V
0920YE-B	210	200	192	326	310	299	443	1330	463	1390	417	1250
1040YE-B	285	271	261	422	401	386	743	2230	777	2330	682	2045
1150YE-B	285	271	261	422	401	386	743	2230	777	2330	682	2045
1260YE-B	350	333	320	506	481	463	875	2625	915	2745	955	2865
1290YE-B	285	271	261	422	401	386	743	2230	777	2330	682	2045
1400YE-B	350	333	320	506	481	463	875	2625	915	2745	955	2865
1540YE-B	450	428	412	631	599	578	888	2665	935	2805	782	2345

(1) Unit compressor starts up from Star to Delta.

(2) Voltage allowed tolerance: +/- 10%.

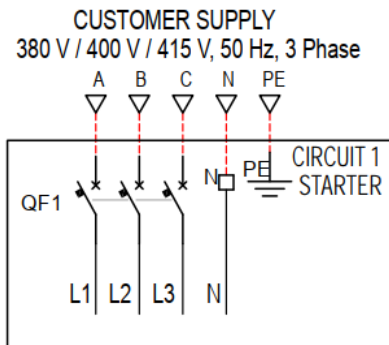
(3) The calculated value of unit power factor is 0.87 at nominal operating conditions

Fan Electrical Data

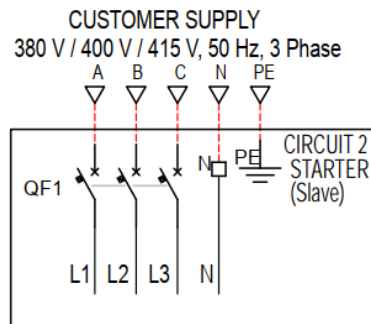
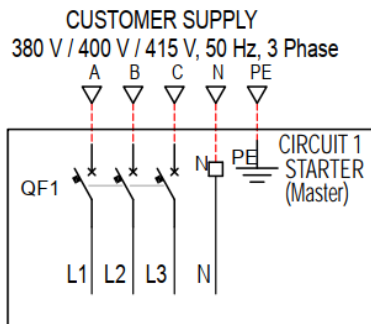
	Power	FLA @380V	FLA @400V	FLA @415V	Wiring Type
YSAA STD fan (Each)	2.7 kW	5.6 A	5.32 A	5.13 A	Star

Power Wiring

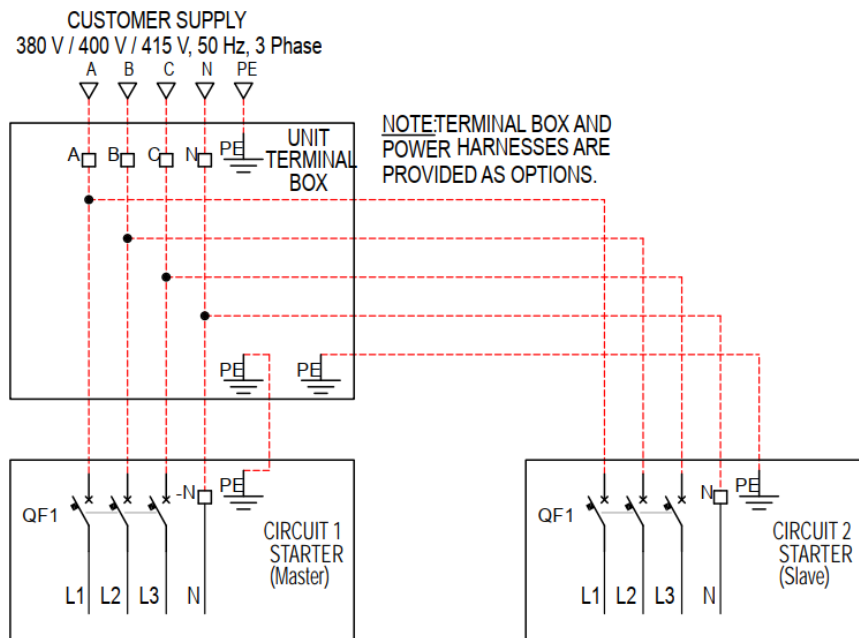
Standard Single Point Power Wiring - YSAA0400/0520/0630/0770YE-B



Standard Dual Point Power Wiring - YSAA0920/1040/1150/1260/1290/1400/1540YE-B

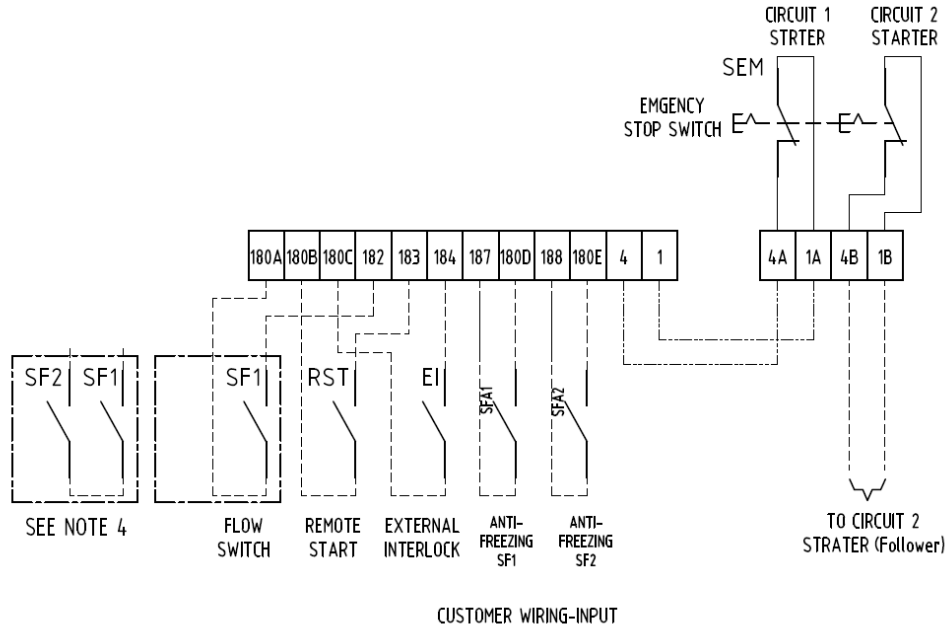


Optional Single Point Power Wiring - YSAA0920/1040/1150/1260/1290/1400/1540YE-B



Customer Control Wiring

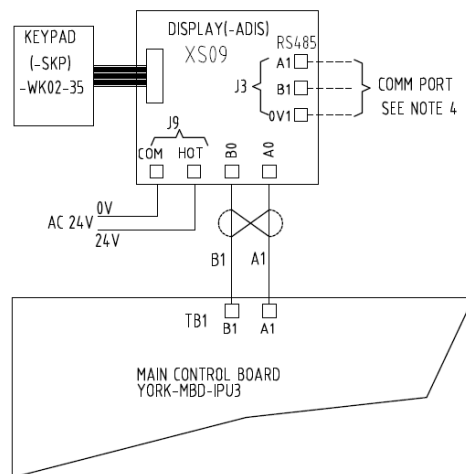
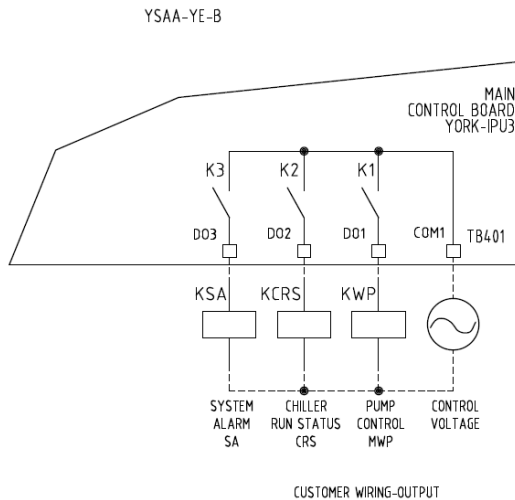
Customer Wiring - Inputs



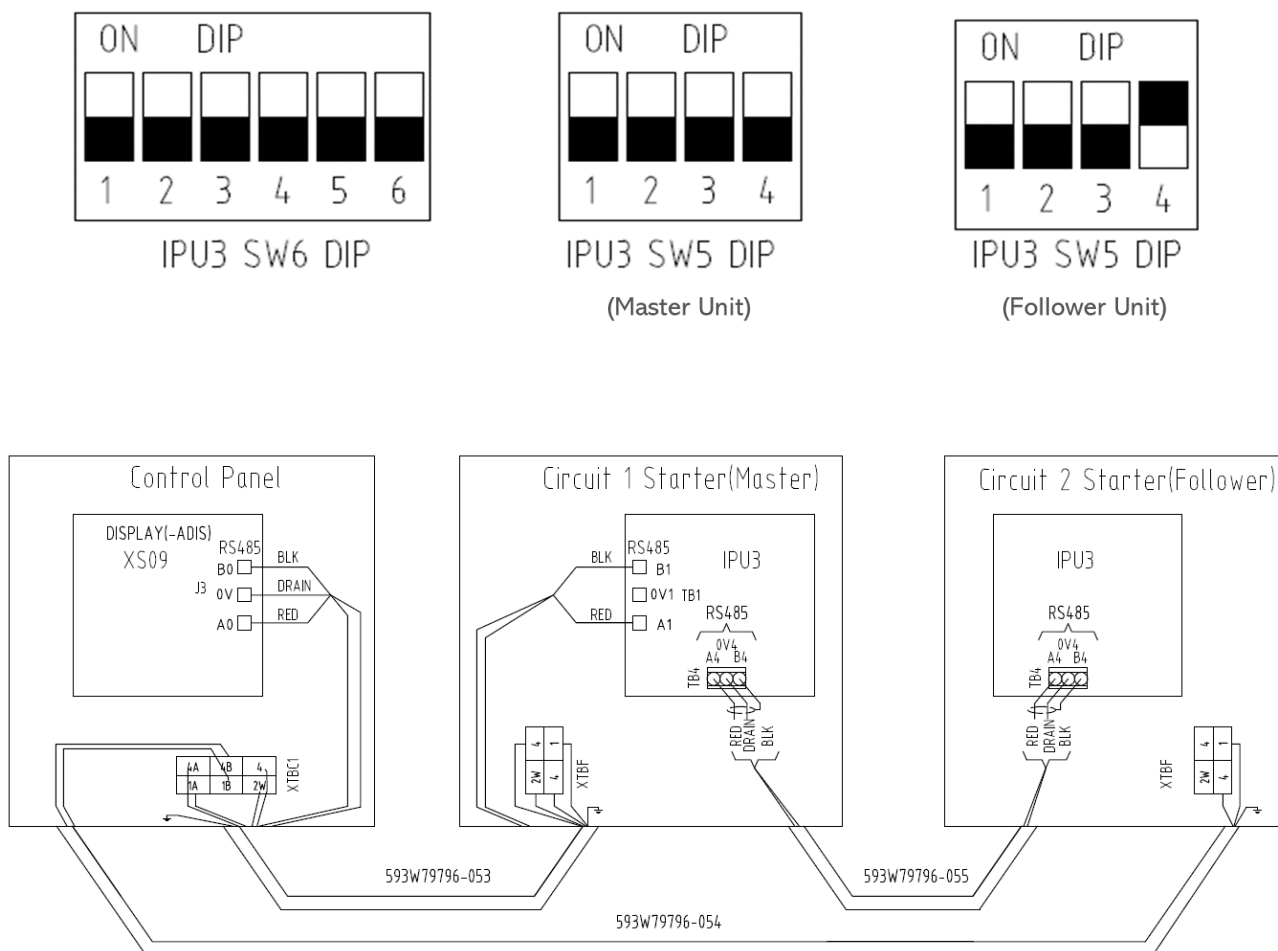
NOTES

1. RATED CAPACITY OF RELAY K1,K2,K3: 1A@AC220V.
2. CONTROL VOLTAGE IS SELECTED ACCORDING TO RELAY COIL PROVIDED BY CUSTOMER (AC110V-240V OR DC24V).
3. YSAA STANDARD UNIT PROVIDE MODBUS PROTOCOL AND EQUIPPED WITH SC-EQ BOARD TO COMMUNICATE THROUGH TO BAC THROUGH BACnet MS/TP AND N2.
4. FOR DUAL MODEL FLOW SWITCHS SF1 & SF2 ARE CONNECTED IN SERIES.

Customer Wiring – Outputs



Dual Circuit Unit Connection



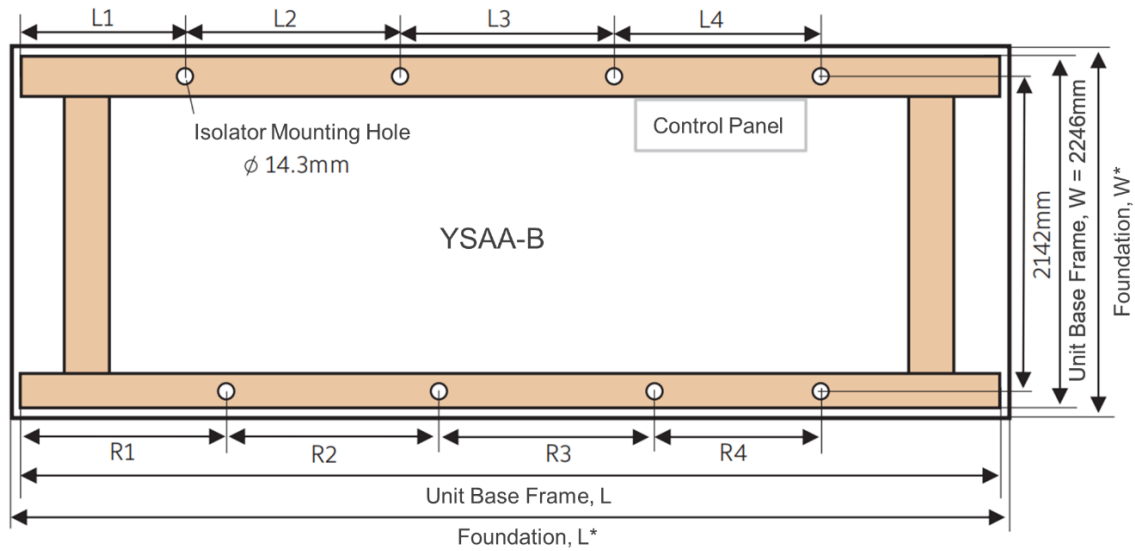
Dual Circuit Unit Connections

NOTES

1. On duplex models, Starter 2 emergency stop must be connected to be control panel with Starter2-CP Link Harness(593W79796-054).
2. On duplex models, Starter1 TB3 must be connected to Starter2 TB4 with Starter1-Starter2 Link Harness(593W79796-055).
3. On all models, Starter1 emergency stop and TB4 are connected to control panel with Starter1-CP Link Harness(593W79796-053).

Isolator Mounting Location & Operating Weight

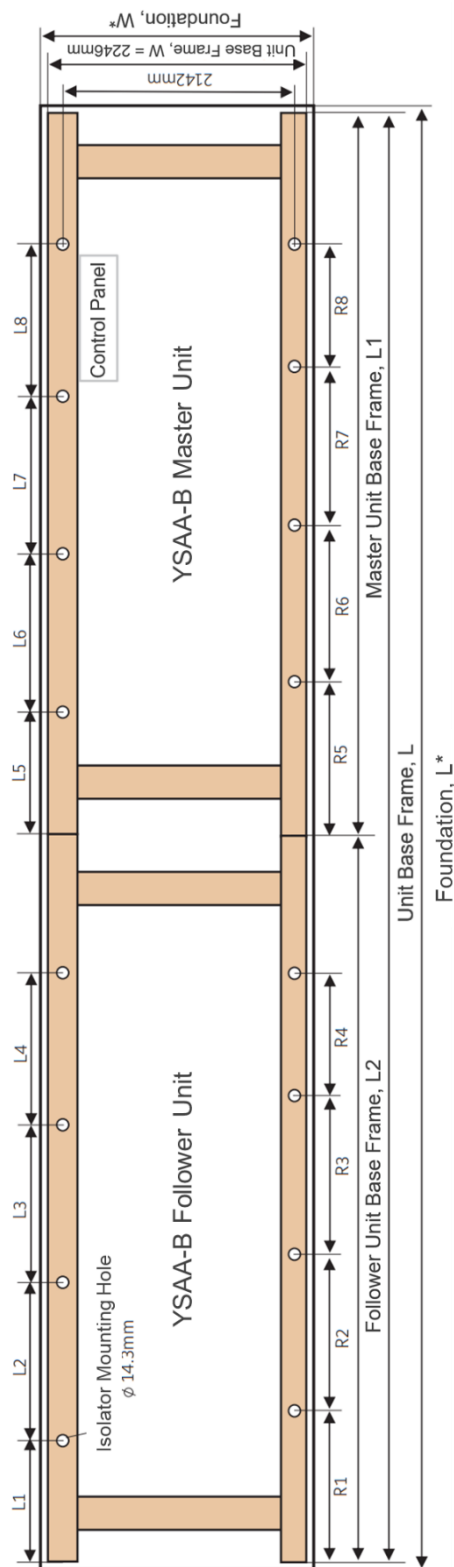
YSAA0400/0520/0630/0770YE-B



* The length and width of foundation should be greater than the unit base frame and recommended to leave the appropriate extra space.

Model		Isolator Mounting Location, mm								
		L1	L2	L3	L4	R1	R2	R3	R4	L
YSAA	0400YE-B	310	2863	-	-	610	2563	-	-	4015
	0520YE-B	634	1200	1850	-	310	1697	1788	-	4528
	0630YE-B	790	1550	2114	-	905	1475	2160	-	5595
	0770YE-B	1255	1671	484	2545	1405	1050	1505	2053	6712

Model		Operating Weight, kg							
		L1	L2	L3	L4	R1	R2	R3	R4
YSAA	0400YE-B	1103	1138	-	-	1075	1046	-	-
	0520YE-B	960	918	855	-	863	857	930	-
	0630YE-B	1019	1099	973	-	965	880	1042	-
	0770YE-B	916	964	843	851	929	879	715	982



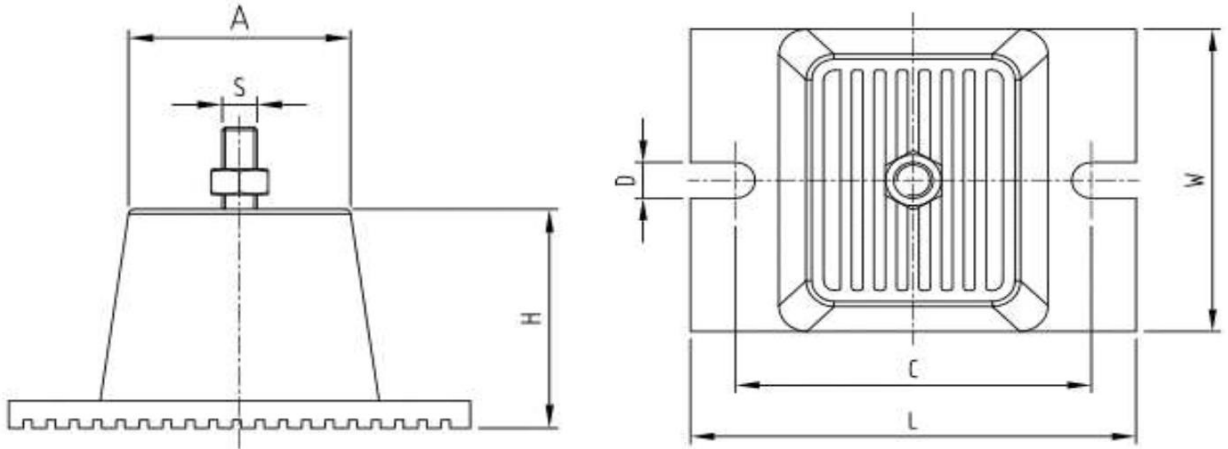
* The length and width of foundation should be greater than the unit base frame and recommended to leave the appropriate extra space.

Model		Isolator Mounting Location, mm																		
		L1	L2	L3	L4	L5	L6	L7	L8	R1	R2	R3	R4	R5	R6	R7	R8	L1	L2	L
YSAA	0920YE-B	842	2563	-	-	634	1200	1850	-	842	2863	-	-	310	1697	1788	-	4528	4015	8543
	1040YE-B	733	1788	1697	-	634	1200	1850	-	845	1850	1200	-	310	1697	1788	-	4528	4528	9056
	1150YE-B	733	1788	1697	-	790	1550	2114	-	845	1850	1200	-	905	1475	2160	-	5595	4528	10123
	1260YE-B	1055	2160	1475	-	790	1550	2114	-	1141	2114	1550	-	905	1475	2160	-	5595	5595	11190
	1290YE-B	733	1788	1697	-	1255	1671	484	2545	845	1850	1200	-	1405	1050	1505	2053	6712	4528	11240
	1400YE-B	1055	2160	1475	-	1255	1671	484	2545	1141	2114	1550	-	1405	1050	1505	2053	6712	5595	12307
	1540YE-B	700	2053	1505	1050	1255	1671	484	2545	757	2545	484	1671	1405	1050	1505	2053	6712	6712	13424
	1540YE-B	700	2053	1505	1050	1255	1671	484	2545	757	2545	484	1671	1405	1050	1505	2053	6712	6712	13424

Model	Operating Weight, kg																
	L1	L2	L3	L4	L5	L6	L7	L8	R1	R2	R3	R4	R5	R6	R7	R8	
YSAA	0920YE-B	1046	1075	-	-	960	918	855	-	1138	1103	-	-	863	857	930	-
	1040YE-B	930	857	863	-	960	918	855	-	855	918	960	-	863	857	930	-
	1150YE-B	930	857	863	-	1019	1099	973	-	855	918	960	-	965	880	1042	-
	1260YE-B	1042	880	965	-	1019	1099	973	-	973	1099	1019	-	965	880	1042	-
	1290YE-B	930	857	863	-	916	964	843	851	855	918	960	-	929	879	715	982
	1400YE-B	1042	880	965	-	916	964	843	851	973	1099	1019	-	929	879	715	982
	1540YE-B	982	715	879	929	916	964	843	851	851	843	964	916	929	879	715	982

Isolators

Neoprene Isolator



Part Number	SAP	Model	Load (kg)	Deflection (mm)	Dimension (±2mm)						
					L	W	H	C	D	S	A
028W17774-000	5458244	HA-1361	1361	12.7±3	159	118	70	127	14	M12	76
028W17774-001	5458243	HA-1814	1814	12.7±3	159	118	70	127	14	M12	76

Isolator Details		L1	L2	L3	L4
0400YE-B	Operating Weight (kg)	1103	1138	–	–
	Neoprene	Colour	Black	Black	–
		Type	HA-1814	HA-1814	–
	Isolator Details		R1	R2	R3
	Operating Weight (kg)		1075	1046	–
	Neoprene	Colour	Black	Black	–
		Type	HA-1814	HA-1814	–

Isolator Details		L1	L2	L3	L4
0520YE-B	Operating Weight (kg)	960	918	855	–
	Neoprene	Colour	Black	Black	Black
		Type	HA-1361	HA-1361	HA-1361
	Isolator Details		R1	R2	R3
	Operating Weight (kg)		863	857	930
	Neoprene	Colour	Black	Black	Black
		Type	HA-1361	HA-1361	HA-1361

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		1019	1099	973	–
0630YE-B	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1814	HA-1814	HA-1814	–
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		965	880	1042	–
	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1814	HA-1814	HA-1814	–

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		916	964	843	851
0770YE-B	Neoprene	Colour	Black	Black	Black	Black
		Type	HA-1361	HA-1361	HA-1361	HA-1361
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		929	879	715	982
	Neoprene	Colour	Black	Black	Black	Black
		Type	HA-1361	HA-1361	HA-1361	HA-1361

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		1046	1075	–	–
0920YE-B	Neoprene	Colour	Black	Black	–	–
		Type	HA-1814	HA-1814	–	–
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		960	918	855	–
	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1361	HA-1361	HA-1361	–
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		1138	1103	–	–
	Neoprene	Colour	Black	Black	–	–
		Type	HA-1814	HA-1814	–	–
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		863	857	930	–
	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1361	HA-1361	HA-1361	–

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		930	857	863	–
1040YE-B	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1361	HA-1361	HA-1361	–
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		960	918	855	
	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1361	HA-1361	HA-1361	–
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		855	918	960	–
	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1361	HA-1361	HA-1361	–
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		863	857	930	–
	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1361	HA-1361	HA-1361	–

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		930	857	863	–
1150YE-B	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1361	HA-1361	HA-1361	–
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		1019	1099	973	–
	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1814	HA-1814	HA-1814	–
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		855	918	960	–
	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1361	HA-1361	HA-1361	–
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		965	880	1042	–
	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1814	HA-1814	HA-1814	–

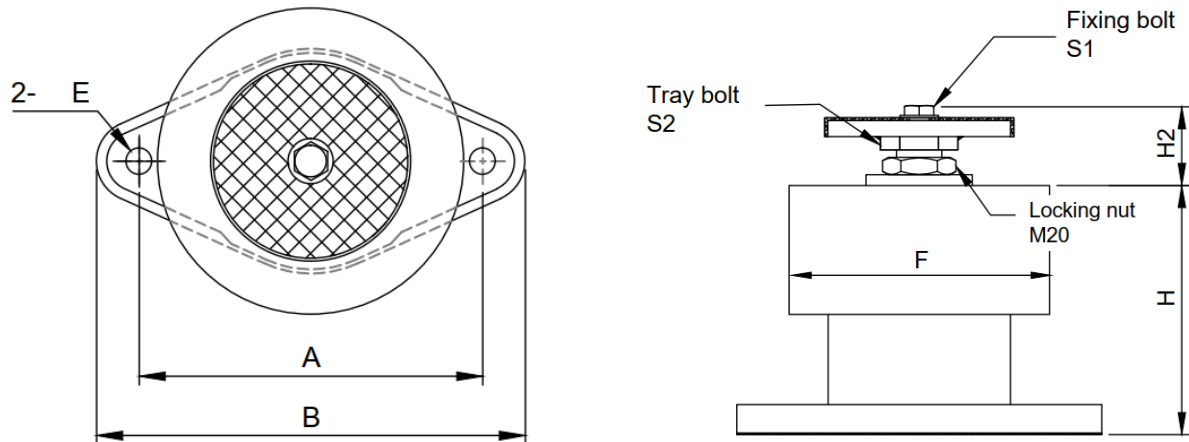
	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		1042	880	965	–
1260YE-B	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1814	HA-1814	HA-1814	–
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		1019	1099	973	–
	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1814	HA-1814	HA-1814	–
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		973	1099	1019	–
	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1814	HA-1814	HA-1814	–
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		965	880	1042	–
	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1814	HA-1814	HA-1814	–

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		930	857	863	–
1290YE-B	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1361	HA-1361	HA-1361	–
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		916	964	843	851
	Neoprene	Colour	Black	Black	Black	Black
		Type	HA-1361	HA-1361	HA-1361	HA-1361
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		855	918	960	–
	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1361	HA-1361	HA-1361	–
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		929	879	715	982
	Neoprene	Colour	Black	Black	Black	Black
		Type	HA-1361	HA-1361	HA-1361	HA-1361

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		1042	880	965	–
1400YE-B	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1814	HA-1814	HA-1814	–
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		916	964	843	851
	Neoprene	Colour	Black	Black	Black	Black
		Type	HA-1361	HA-1361	HA-1361	HA-1361
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		973	1099	1019	–
	Neoprene	Colour	Black	Black	Black	–
		Type	HA-1814	HA-1814	HA-1814	–
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		929	879	715	982
	Neoprene	Colour	Black	Black	Black	Black
		Type	HA-1361	HA-1361	HA-1361	HA-1361

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		982	715	879	929
1540YE-B	Neoprene	Colour	Black	Black	Black	Black
		Type	HA-1361	HA-1361	HA-1361	HA-1361
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		916	964	843	851
	Neoprene	Colour	Black	Black	Black	Black
		Type	HA-1361	HA-1361	HA-1361	HA-1361
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		851	843	964	916
	Neoprene	Colour	Black	Black	Black	Black
		Type	HA-1361	HA-1361	HA-1361	HA-1361
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		929	879	715	982
	Neoprene	Colour	Black	Black	Black	Black
		Type	HA-1361	HA-1361	HA-1361	HA-1361

25 mm Deflection Spring Isolator



Part number	SAP	Model	Load (kg)	Deflection (mm)	Vertical rigidity k(kg/mm)	Dimension (±2 mm)							
						A	B	φE	F	H	H2	S1	S2
029W23386-000	144121	MHD-1350	1350	25±2	54.00	165	206	12.5	147	141	42	M12 X 25	M20 X 60
028G00031-034	562221	MHD-1550	1550	25±2	62.00	165	206	12.5	147	141	42	M12 X 25	M20 X 60

Isolator Details			L1	L2	L3	L4
Model	Operating Weight (kg)		1103	1138	—	—
0400YE-B	25mm Spring	Colour	Grey	Grey	—	—
		Type	MHD-1550	MHD-1550	—	—
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		1075	1046	—	—
	25mm Spring	Colour	Grey	Grey	—	—
		Type	MHD-1550	MHD-1550	—	—

Isolator Details			L1	L2	L3	L4
Model	Operating Weight (kg)		960	918	855	—
0520YE-B	25mm Spring	Colour	Grey	Grey	Grey	—
		Type	MHD-1350	MHD-1350	MHD-1350	—
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		863	857	930	—
	25mm Spring	Colour	Grey	Grey	Grey	—
		Type	MHD-1350	MHD-1350	MHD-1350	—

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		1019	1099	973	–
0630YE-B	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1550	MHD-1550	MHD-1550	–
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		965	880	1042	–
	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1550	MHD-1550	MHD-1550	–

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		916	964	843	851
0770YE-B	25mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	MHD-1350	MHD-1350	MHD-1350	MHD-1350
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		929	879	715	982
	25mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	MHD-1350	MHD-1350	MHD-1350	MHD-1350

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		1046	1075	–	–
0920YE-B	25mm Spring	Colour	Grey	Grey	–	–
		Type	MHD-1550	MHD-1550	–	–
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		960	918	855	–
	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1350	MHD-1350	MHD-1350	–
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		1138	1103	–	–
	25mm Spring	Colour	Grey	Grey	–	–
		Type	MHD-1550	MHD-1550	–	–
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		863	857	930	–
	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1350	MHD-1350	MHD-1350	–

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		930	857	863	–
1040YE-B	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1350	MHD-1350	MHD-1350	–
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		960	918	855	
	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1550	MHD-1350	MHD-1350	–
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		855	918	960	–
	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1350	MHD-1350	MHD-1350	–
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		863	857	930	–
	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1350	MHD-1350	MHD-1350	–

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		930	857	863	–
1150YE-B	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1350	MHD-1350	MHD-1350	–
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		1019	1099	973	–
	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1550	MHD-1550	MHD-1550	–
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		855	918	960	–
	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1350	MHD-1350	MHD-1350	–
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		965	880	1042	–
	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1550	MHD-1550	MHD-1550	–

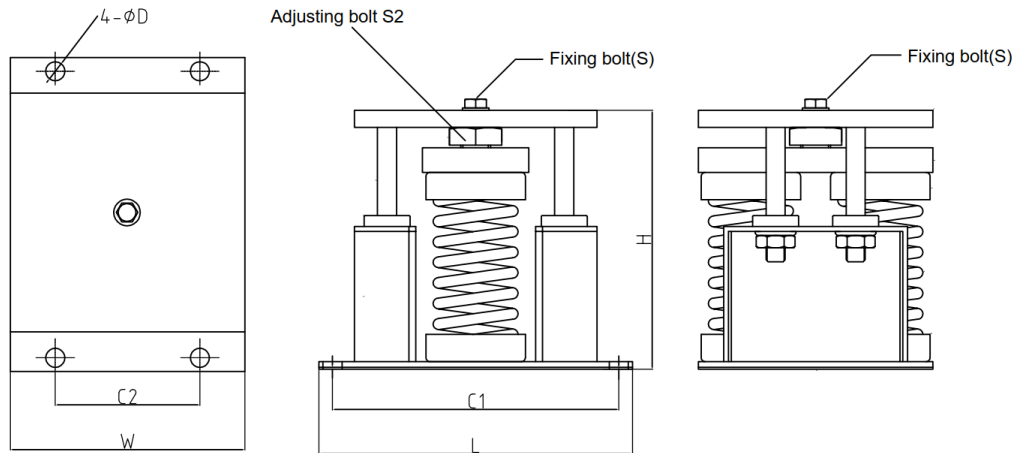
	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		1042	880	965	–
1260YE-B	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1550	MHD-1550	MHD-1550	–
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		1019	1099	973	–
	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1550	MHD-1550	MHD-1550	–
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		973	1099	1019	–
	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1550	MHD-1550	MHD-1550	–
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		965	880	1042	–
	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1550	MHD-1550	MHD-1550	–

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		930	857	863	–
1290YE-B	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1350	MHD-1350	MHD-1350	–
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		916	964	843	851
	25mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	MHD-1350	MHD-1350	MHD-1350	MHD-1350
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		855	918	960	–
	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1350	MHD-1350	MHD-1350	–
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		929	879	715	982
	25mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	MHD-1350	MHD-1350	MHD-1350	MHD-1350

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		1042	880	965	–
1400YE-B	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1550	MHD-1550	MHD-1550	–
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		916	964	843	851
	25mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	MHD-1350	MHD-1350	MHD-1350	MHD-1350
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		973	1099	1019	–
	25mm Spring	Colour	Grey	Grey	Grey	–
		Type	MHD-1550	MHD-1550	MHD-1550	–
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		929	879	715	982
	25mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	MHD-1350	MHD-1350	MHD-1350	MHD-1350

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		982	715	879	929
1540YE-B	25mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	MHD-1350	MHD-1350	MHD-1350	MHD-1350
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		916	964	843	851
	25mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	MHD-1350	MHD-1350	MHD-1350	MHD-1350
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		851	843	964	916
	25mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	MHD-1350	MHD-1350	MHD-1350	MHD-1350
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		929	879	715	982
	25mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	MHD-1350	MHD-1350	MHD-1350	MHD-1350

50 mm Deflection Spring Isolator



Part Number	SAP	Model	Load (kg)	Deflection (mm)	Vertical rigidity k(kg/mm)	Dimension (±3mm)						
						L	W	H	C1	C2	D	S
029G23002A056	1058364	LAT2-1300E	1300	45~50	26	230	172	200	210	110	14	M12
029G23002A057	1070556	LAT2-1500E	1500	45~50	30	230	172	200	210	110	14	M12

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		1103	1138	—	—
0400YE-B	50mm Spring	Colour	Grey	Grey	—	—
		Type	LAT2-1500E	LAT2-1500E	—	—
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		1075	1046	—	—
	50mm Spring	Colour	Grey	Grey	—	—
		Type	LAT2-1500E	LAT2-1500E	—	—

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		960	918	855	—
0520YE-B	50mm Spring	Colour	Grey	Grey	Grey	—
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	—
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		863	857	930	—
	50mm Spring	Colour	Grey	Grey	Grey	—
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	—

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		1019	1099	973	–
0630YE-B	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1500E	LAT2-1500E	LAT2-1500E	–
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		965	880	1042	–
	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1500E	LAT2-1500E	LAT2-1500E	–

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		916	964	843	851
0770YE-B	50mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	LAT2-1300E
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		929	879	715	982
	50mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	LAT2-1300E

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		1046	1075	–	–
0920YE-B	50mm Spring	Colour	Grey	Grey	–	–
		Type	LAT2-1500E	LAT2-1500E	–	–
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		960	918	855	–
	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	–
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		1138	1103	–	–
	50mm Spring	Colour	Grey	Grey	–	–
		Type	LAT2-1500E	LAT2-1500E	–	–
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		863	857	930	–
	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	–

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		930	857	863	–
1040YE-B	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	–
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		960	918	855	
	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	–
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		855	918	960	–
	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	–
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		863	857	930	–
	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	–

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		930	857	863	–
1150YE-B	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	–
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		1019	1099	973	–
	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1500E	LAT2-1500E	LAT2-1500E	–
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		855	918	960	–
	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	–
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		965	880	1042	–
	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1500E	LAT2-1500E	LAT2-1500E	–

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		1042	880	965	–
1260YE-B	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1500E	LAT2-1500E	LAT2-1500E	–
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		1019	1099	973	–
	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1500E	LAT2-1500E	LAT2-1500E	–
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		973	1099	1019	–
	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1500E	LAT2-1500E	LAT2-1500E	–
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		965	880	1042	–
	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1500E	LAT2-1500E	LAT2-1500E	–

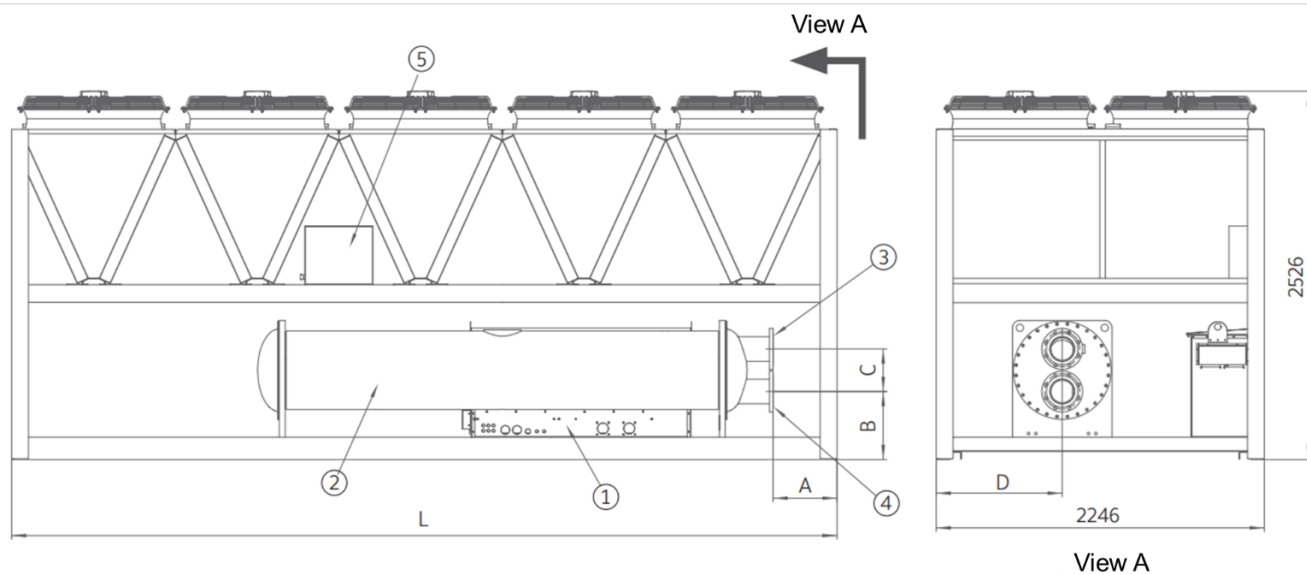
	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		930	857	863	–
1290YE-B	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	–
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		916	964	843	851
	50mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	LAT2-1300E
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		855	918	960	–
	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	–
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		929	879	715	982
	50mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	LAT2-1300E

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		1042	880	965	–
1400YE-B	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1500E	LAT2-1500E	LAT2-1500E	–
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		916	964	843	851
	50mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	LAT2-1300E
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		973	1099	1019	–
	50mm Spring	Colour	Grey	Grey	Grey	–
		Type	LAT2-1500E	LAT2-1500E	LAT2-1500E	–
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		929	879	715	982
	50mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	LAT2-1300E

	Isolator Details		L1	L2	L3	L4
Model	Operating Weight (kg)		982	715	879	929
1540YE-B	50mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	LAT2-1300E
	Isolator Details		L5	L6	L7	L8
	Operating Weight (kg)		916	964	843	851
	50mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	LAT2-1300E
	Isolator Details		R1	R2	R3	R4
	Operating Weight (kg)		851	843	964	916
	50mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	LAT2-1300E
	Isolator Details		R5	R6	R7	R8
	Operating Weight (kg)		929	879	715	982
	50mm Spring	Colour	Grey	Grey	Grey	Grey
		Type	LAT2-1300E	LAT2-1300E	LAT2-1300E	LAT2-1300E

Dimensions

YSAA0400/0520/0630/0770YE-B



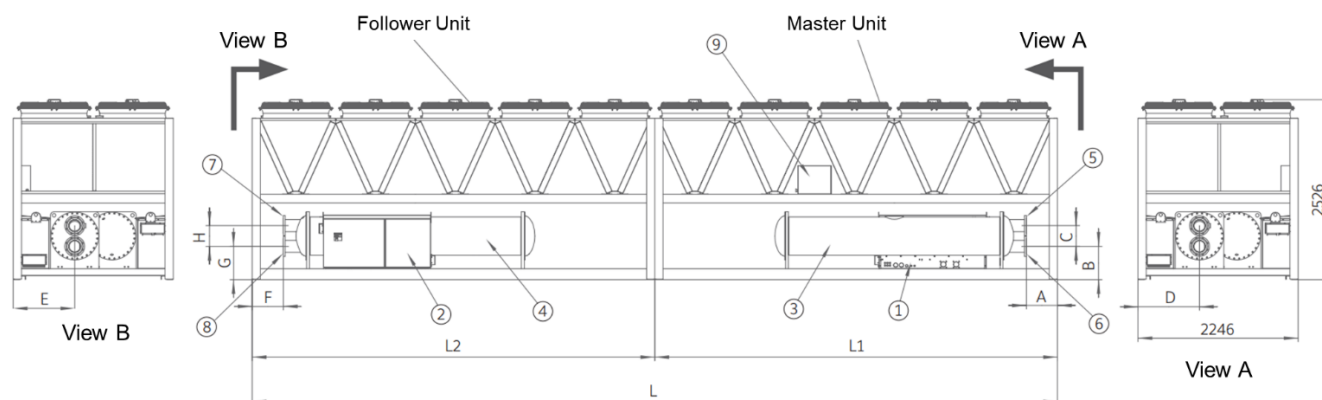
1	Starter
2	Evaporator
3	Water outlet
4	Water inlet
5	Control panel

Dimension in: mm

Model	A	B	C	D	L	Water piping connection size, inch
0400YE-B	71	467	290	909	4015	4
0520YE-B	71	467	290	803	4528	6
0630YE-B	237	467	290	863	5595	6
0770YE-B	186	467	290	833	6712	6

Fan numbers on the diagram is for reference only. For the specific fan numbers of each model, please refer to the table of "Physical Data".

YSAA0920/1040/1150/1260/1290/1400/1540YE-B



1	Master unit starter
2	Follower unit starter
3	Master unit evaporator
4	Follower unit evaporator
5	Master unit water outlet
6	Master unit water inlet
7	Follower unit water outlet
8	Follower unit water inlet
9	Control panel

Dimension in: mm

Model	A	B	C	D	E	F	G	H	L1	L2	L	Water piping connection size, inch
0920YE-B	71	467	290	803	909	71	467	290	4528	4015	8543	6 / 4
1040YE-B	71	467	290	803	803	71	467	290	4528	4528	9056	6 / 6
1150YE-B	237	467	290	863	803	71	467	290	5595	4528	10123	6 / 6
1260YE-B	237	467	290	863	863	237	467	290	5595	5595	11190	6 / 6
1290YE-B	186	467	290	833	803	71	467	290	6712	4528	11240	6 / 6
1400YE-B	186	467	290	833	863	237	467	290	6712	5595	12307	6 / 6
1540YE-B	186	467	290	833	833	186	467	290	6712	6712	13424	6 / 6

Fan numbers on the diagram is for reference only. For the specific fan numbers of each model, please refer to the table of "Physical Data".

Guide specifications

AIR-TO-LIQUID SCREW CHILLER - YORK YSAA-B R134a 50Hz Guide Specifications

1. GENERAL

1.01. GENERAL REQUIREMENTS

The requirements of this Section shall conform to the general provisions of the Contract, including General and Supplementary Conditions, Conditions of the Contract, and Contract Drawings.

1.02. SCOPE

Provide Microprocessor controlled, screw compressor, air-cooled chillers of the scheduled capacities as shown and indicated on the Drawings, including but not limited to:

1. Chiller package
2. Charge of refrigerant and oil
3. Electrical power and control connections
4. Liquid connections
5. Manufacturer start-up

1.03. QUALITY ASSURANCE

- A. Products shall be Designed, Tested, Rated and Certified in accordance with, and Installed in compliance with applicable sections of the following Standards and Directives:
 1. Performance Ratings AHRI 550/590 and 551/591
 2. Performance Ratings GB 18430.1
 3. Pressure Equipment Directive NB/T47012
 4. Safety Code GB 25131
 5. Electrical GB-T 19517
 6. Sound GB/T 4330-1999 or AHRI 370
 7. Conform to GB Testing Services and provide GB listed mark
- B. Factory Run Test: Chiller shall be pressure-tested, evacuated and fully charged with refrigerant and oil, and shall be factory operational run tested with water flowing through the vessels.
- C. Chiller manufacturer shall have a factory trained and supported service organization.
- D. Warranty: Manufacturer shall Warrant all equipment and material of its manufacture against defects in workmanship and/or material for a period of eighteen (18) months from date of shipment or twelve (12) months from date of start-up, whichever occurs first.

1.04. DELIVERY AND HANDLING

- A. Unit shall be delivered to job site fully assembled with all interconnecting refrigerant piping and internal wiring ready for field installation and charged with refrigerant and oil by the Manufacturer.
- B. Provide protective covering over vulnerable components for unit protection during shipment. Fit nozzles and open ends with enclosures.
- C. Unit shall be stored and handled per Manufacturer's instructions.

2. PRODUCTS

2.01. MANUFACTURERS

The design shown on the Drawings is based on YORK model AIR TO LIQUID SCREW CHILLERS manufactured by Johnson Controls / YORK. Alternate equipment will be acceptable if the manufacturer's equipment meets the scheduled performance and complies with these specifications. If equipment manufactured by the manufacturer other than that scheduled is utilized, then the Mechanical Contractor shall be responsible for coordinating with the General Contractor and all affected Subcontractors to insure proper provisions for installation of the furnished unit. This coordination shall include, but not be limited to, the following:

1. Structural supports for units.
2. Piping size and connection/header locations.
3. Electrical power requirements and wire/conduit and overcurrent protection sizes.
4. Chiller physical size on plant layout.
5. Site noise considerations.

2.02. GENERAL

- A. Description: Furnish, Install, and Commission factory assembled charged, and operational run tested AIR TO LIQUID SCREW CHILLER as specified herein and shown on the Drawings. Chiller shall include, but is not limited to: a complete system including semi-hermetic screw compressors, shell and tube heat exchanger, round tube & plate fin ambient coils, R134a refrigerant, interconnecting wiring, safety and operating controls and special features as specified herein or required for safe, automatic operation.
- B. Operating Characteristics:
 - Ensure unit is capable of operation in cooling mode from 5°C to 52°C ambient temperature.
- C. Cabinet: Unit panels, structural elements, control boxes and heavy gauge structural base shall be constructed of painted galvanized steel. All exposed sheet steel shall be coated with baked on powder paint to meet 500-hour salt spray test in accordance with the ASTM B117 standard.

2.03. COMPRESSORS

- A. Twin helical semi-hermetic screw compressor is provided to ensure high operational efficiency and reliable performance. Capacity control is achieved through a single slide valve. The compressor is a positive displacement type characterized by two helically grooved rotors which are manufactured from forged steel. The 50 Hz motor operates at 2950 rpm to direct drive the male rotor which in turn drives the female rotor on a light film of oil.
- B. Each compressor should be integrated with the oil separator and includes the following items:
 1. Two screw rotors, with asymmetric profiles, manufactured from forged steel.
 2. A cast iron compressor housing precision machined to provide optimal clearance for the rotors.
 3. An integral discharge check valve (to prevent rotor backspin during shutdown) and a suction gas screen within the compressor housing.
 4. A reliable suction gas cooled high efficiency, accessible hermetic motor with overload protection using both thermistor and over current protection.

2.04. REFRIGERANT CIRCUIT COMPONENTS

- A. Refrigerant: R134a.
- B. Independent refrigerant circuit(s) are provided on each unit. Each circuit uses copper refrigerant pipe formed on computer controlled bending machines to reduce the number of brazed joints resulting in a reliable and leak resistant system.

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- C. Each circuit incorporates all the components necessary for the designed operation including: ball and solenoid valves, filter-driers with removable filter cartridge, economizer and electrical expansion valve, temperature and pressure sensors, and pressure relief valves.

2.05. HEAT EXCHANGERS

A. Refrigerant-to-Liquid:

1. Refrigerant-to-liquid heat exchanger shall be constructed, tested, and stamped in accordance with applicable sections of GB pressure vessel code for 1000kPa waterside design working pressure and 1900kPa refrigerant side design working pressure. The refrigerant side is protected by pressure relief valve(s).
2. Water nozzle connections suitable for welded water flange connection. [OPTIONAL]: grooved ring

B. Ambient Coils:

1. Ambient coils shall be internally enhanced seamless copper tubes, arranged in staggered rows, mechanically expanded into aluminum fins.
2. Low Sound Fans: Should be designed for maximum efficiency and statically and dynamically balanced for vibration free operation. They should be directly driven by independent motors, and positioned for vertical air discharge. The fan guards should be constructed from heavy gauge, corrosion resistant, coated steel.
3. Fan motors: should be totally enclosed air-over type with high efficiency, direct drive, 3-phase, insulation class F, thermally protected, IP55, with double sealed, permanently-lubricated ball bearings

2.06. INSULATION

- A. Material: Closed-cell, flexible, UV protected, thermal insulation GB Standard.
- B. Factory-applied insulation over cold surfaces of unit components including vessel shell, water boxes, and suction line. Liquid nozzles shall be insulated by Contractor after pipe installation.
- C. Adhesive: As recommended by insulation manufacturer and applied to 100 percent of insulation contact surface including all seams and joints.

2.07. ACOUSTICAL DATA

- A. Provide acoustical sound power or sound pressure level data in decibels (dB) at the scheduled eight (8) octave band center frequencies. A-weighted sound data alone is not acceptable.
- B. Supplied equipment shall not exceed scheduled sound power or sound pressure level data at any load point. The mechanical Contractor shall be responsible for any additional costs associated with equipment deviation.
- C. Acoustical performance ratings shall be in accordance with GB/T4330-1999 or AHRI 370.

2.08. POWER AND ELECTRICAL REQUIREMENTS

A. Power/Control Panel:

1. Factory installed and wired IP55, powder painted steel cabinets with tool lockable, hinged, latched, and gasket sealed outer doors equipped with wind struts for safer servicing. Provide main power connection(s), compressor starters and fan motor contactors, fuses, and factory wiring.
2. Panel shall include control display access door.

B. Supply Power:

1. Provide supply power connection to unit, shall be 3 phase of scheduled voltage.
2. Disconnect: A circuit breaker with lockable external handle shall be provided at the point of incoming connection for field connection, interconnecting wiring to the compressors, and isolating the unit power voltage for servicing and emergency stop. Separate external fusing must be supplied, by others, in the incoming power wiring which must comply with local codes.

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- C. Short Circuit Withstand Rating of the unit electrical enclosure shall be (380, 400, & 415V: 50,000 Amps.) Rating shall be published in accordance with GB-T19517.
 - D. Motor Starters: Motor starters shall be star / delta type.
 - E. All exposed power wiring shall be routed through liquid-tight, UV-stabilized, non-metallic conduit.

2.09. CONTROLS

A. General:

- 1. Provide automatic control of cooling mode operation including compressor start/stop and load/un-load, fans, unit alarm contacts and run signal contacts etc.
- 2. Unit shall automatically reset to normal unit operation after power failure.
- 3. Unit operating software shall be stored in non-volatile memory. Field programmed set points shall be retained in lithium battery backed regulated time clock (RTC) memory for minimum 5 years.
- 4. Alarm contacts shall be provided to remote alert for any unit or system safety fault.
- 5. Remote on/off and mode selection contacts shall be provided to remote communication.

B. Display and Keypad:

- 1. Provide minimum 40 character liquid crystal display (2 lines of 20 characters) that is both viewable in direct sunlight and has LED backlighting for nighttime view-ing. Provide one touch keypad and display panel per unit.
- 2. Display and keypad shall be accessible through display access door without opening main Power section cabinet doors.
- 3. Display shall provide a minimum of unit setpoints, status, temperature data, pressures, safety lockouts and diagnostics without the use of a coded display.
- 4. Descriptions in Chinese or English (or available language options), numeric data in Metric or (English) units.
- 5. Sealed keypad shall include unit On/Off switch.

C. Programmable Setpoints (within Manufacturer limits):

Display language, chilled fluid cooling mode, local/remote control mode, display units mode, system lead/lag control mode, remote temperature reset, remote load limit, leaving chilled fluid setpoint and range, maximum remote temperature reset.

D. Display Data:

Chilled fluid leaving temperature, outside ambient air temperature, lead system, pump status, active remote control, compressor suction, discharge, pressures per refrigerant circuit, fan status, compressor number of starts, run time, operating hours, vessel heater status, history data for last six shutdown faults.

E. Predictive Control Points:

Unit controls shall avoid safety shutdown when operating outside design conditions by optimizing the unit controls and load output to stay online and avoid safety limits being reached. The system shall monitor the following parameters and maintain the maximum load output possible without shutdown of the equipment: suction pressure, discharge pressure and ambient temperature.

F. System Safeties:

Shall cause individual compressor systems to perform auto-reset shut down if high discharge pressure or low suction pressure.

G. Unit Safeties:

Shall be automatic reset and cause compressors to shut down if high or low ambient temperature, low leaving chilled fluid temperature, under voltage, flow switch operation. Contractor shall provide flow switch and wiring per unit manufacturer requirements.

H. Manufacturer shall provide any controls not listed above, necessary for automatic cooling mode. Mechanical Contractor shall provide field control wiring necessary to interface sensors to the cooling mode control system.

2.10. ACCESSORIES AND OPTIONS

Some accessories and options supersede standard product features. All options are factory-mounted unless otherwise noted.

A. GENERAL OPTIONS:

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1. 38 mm Heat Exchanger Insulation: Double thickness insulation provided for enhanced efficiency, and low temperature applications.
 2. Flow Switch: Vapor Proof, paddle-type with 1"NPT connection for upright mounting in horizontal pipe (field installed). This flow switch or its equivalent must be supplied with each unit to protect the heat exchanger from loss of liquid flow (field installed). Can be supplied as 1, 2 or 3 flow switches as required.
 3. Differential Pressure Switch: Alternative to the paddle type flow switch. 0 - 300 kPa range with 1/4" NPTE pressure connections (field installed).
 4. Neoprene Pads Isolators: Mount under the unit base rails (field mounted). Suitable for ground level installations or rooftop installations, in locations where vibration will not affect people or equipment.
 5. 25 mm / 50 mm Spring Isolators: Level adjustable, spring and cage type isolators for mounting under the unit base rails (field mounted). Spring isolators are recommended for rooftop installations. For locations where vibration isolation is critical 50 mm spring isolators should be used.
 6. Compressor Acoustic Blanket: Factory fitted acoustic blanket on the screw compressor for sound attenuation.
 7. Compressor Acoustic Enclosure: Factory fit acoustically lined, painted galvanized steel, enclosure with removable panels for maintenance purposes.
 8. Compressor Service Isolation Valve: Factory fitted isolation valves for compressor suction and discharge port for convenient maintenance.

3. EXECUTION

3.01. INSTALLATION

- A. General: Rig and Install in full accordance with Manufacturer's requirements, Project drawings, and Contract documents.
- B. Location: Locate chiller as indicated on drawings, including cleaning and service maintenance clearance per Manufacturer instructions. Adjust and level chiller on support structure.
- C. Components: Installing Contractor shall provide and install all auxiliary devices and accessories for fully operational chiller.
- D. Electrical: Coordinate electrical requirements and connections for all power feeds with Electrical Contractor.
- E. Controls: Coordinate all control requirements and connections with Controls Contractor.
- F. Finish: Installing Contractor shall paint damaged and abraded factory finish with touch-up paint matching factory finish.