

AIR COOLED SCROLL LIQUID CHILLERS

YLAA Series



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On the cover

Integrated professional services designed for your unique business needs.

We care about your business and understand that every organization has its unique requirements. Our comprehensive maintenance package is tailor-made to fit all financial and technical needs. It covers everything from planned routine equipment inspections and predictive maintenance routines to system performance checks and annual shutdowns.

Introduction

Tempo

Johnson Controls, the leader in equipment controls and HVAC equipment, is proud to offer the YORK air-cooled scroll chiller. This all-in-one package is a true plug and play system that provides superb efficiency and performance. The chiller is completely self-contained and is designed for outdoor (roof or ground level) installation. An optional hydronic pump kit makes service replacement or new building installations very convenient. Each unit includes zero-ozone-depletion refrigerant (R-410A), hermetic scroll compressors a liquid evaporator, air-cooled condenser, and a weather resistant microprocessor control center, all mounted on a formed steel base.

ENVIRONMENTAL RESPONSIBILITY...STANDARD

TEMPO makes you the leader in environmental practices through innovation, not added cost. With the combination of R-410A refrigerant and a 30-50% reduction of refrigerant used vs. similar chillers, the TEMPO chiller provides you with the most ecologically friendly equipment. Partnered with its low sound properties (for noise pollution control), this chiller is a true earth-friendly offering.

REDUCED TOTAL COST OF OWNERSHIP...

Industry leading energy efficiency, easy maintenance and durability minimize your cost of ownership. Efficiency; environmentally responsibility that pays you back...

- Real world energy efficiency is measured in IPLV (part load) performance
- Tempo's industry leading IPLV's deliver cash to your bottom line
- Serviceability...Easier maintenance pays twice: sustained chiller efficiency and lower cost maintenance contracts
- Corrosion resistant condenser coils extend life and improve performance

MORE BUILDING...LESS CHILLER

TEMPO offers a lighter, smaller and quieter chiller minimizing your installed cost and maximizing usable building space.

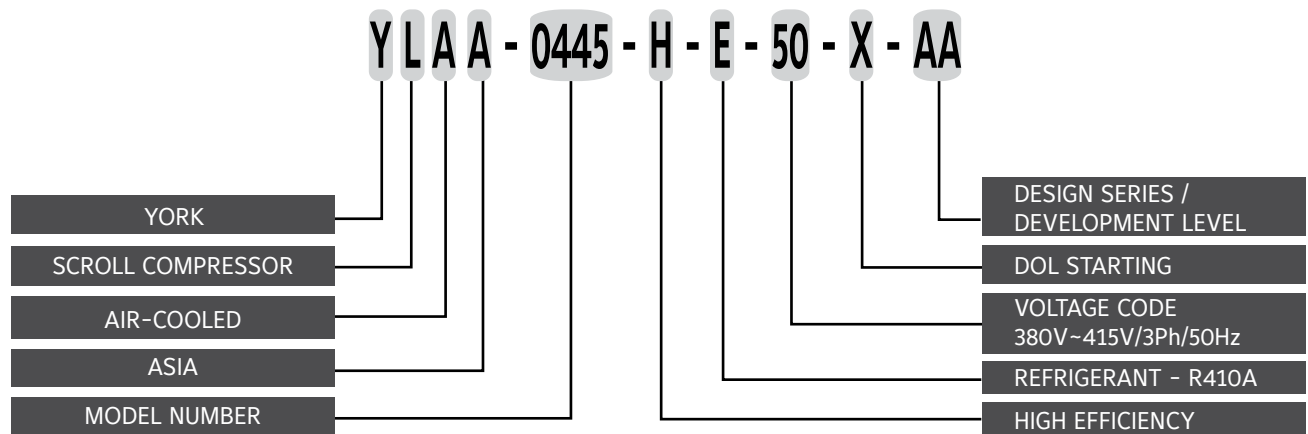
- More space for you
- Smaller chiller footprint saves valuable space
- Tempo is the lowest weight chiller available, lighter than our previous generation chiller by 20-35%
- Standard low sound and affordable sound attenuation options allow flexibility in locating chiller and reduce cost for field constructed sound barriers

MANY APPLICATIONS, ONE TEMPO!

Performance, sound and hydronic pump kits are all configurable to suit your many needs...Performance can be configured with standard and high full-load efficiency models (an industry first)

- Multiple sound configurations...only depend on what you need
- Pumps can be factory mounted
- Hydronic pump kits can be configured for a wide range of flow and head pressure with single or dual (standby) pump
- Standard corrosion resistance for coastal applications
- Small weight and footprint allow you maximum choice in locating the chiller

Nomenclature



Specifications

YLAA 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 a zero Ozone Depletion Potential Refrigerant R410A and includes an initial oil charge. After assembly, an operational test is performed with water flowing through the evaporator to assure that each refrigerant circuit operates correctly.

The unit structure is manufactured from heavy-gauge, galvanized steel coated with baked-on powder paint (Champagne (RAL7006)).

YLAA chillers comply with the applicable sections of the following Standards and Codes:

- GB standard, GB150/151 for the boiler and pressure vessel code.
- GB standard, GB/T18430.1 and JB8654 for the design and mechanical code.

Compressors

The unit has suction-cooled, hermetic scroll compressors. The compressors incorporate a compliant scroll design in both the axial and radial directions. All rotating parts are statically and dynamically balanced. A large internal volume and oil reservoir provides great liquid tolerance. Compressor-crankcase heaters are also included for extra protection against liquid migration.

The compressors are switched On and Off by the unit microprocessor to provide capacity control. Each compressor is fitted with a crankcase strap heater. All compressors are mounted on isolator pads to reduce transmission of vibration to the rest of the unit.

The motor terminal boxes have IP 54 weather protection.

Evaporator

The evaporator is equipped with a heater controlled by a separate thermostat. The heater provides freeze protection for the evaporator down to -29°C ambient. The evaporator is covered with 19mm flexible, closed-cell, foam insulation. The water baffles are constructed of galvanized steel to resist corrosion. The removable heads allow access to the internally enhanced, seamless, copper tubes. Vent and drain connections are included.

Water connection to the evaporator is the welded flanges connections.

Air Cooled Condensers

Condenser coils are made of a single material to avoid galvanic corrosion due to dissimilar metals. Coils and headers are brazed as one piece. Integral subcooling is included. The design working pressure is 45 bar. Condenser coil shall be pressure washable up to 100 bar washer.

The condenser fans are composed of corrosion resistant aluminum hub and glass-fiber-reinforced poly-propylene composite blades molded into a low-noise airfoil section. They are designed for maximum efficiency and statically and dynamically balanced for vibration free operation.

They are directly driven by independent motors, and positioned for vertical air discharge. The fan guards are constructed from heavy-gauge, corrosion resistant, coated steel.

The IP 54 fan motors are the totally enclosed air-over type with permanently lubricated double-sealed ball bearings. High ambient kit is required if units are to operate when the ambient temperature is above 46°C. Including the discharge pressure transducers.

Microcomputer Control Center

Microprocessor Controls

All controls are contained in a IP54 cabinet with hinged outer door and includes:

Liquid Crystal Display with light Emitting Diode back-lighting for outdoor viewing:

- Two display lines
- Twenty characters per line

Color coded 12-button non-tactile keypad with sections for:

DISPLAY/PRINT of typical information:

- Chilled liquid temperatures
- Ambient temperature
- System pressures (each circuit)
- Operation hours and stats (each compressor)

Print calls up to the liquid crystal display:

Operating data for the systems

History of fault shutdown data for up to the last six fault shutdown conditions

An RS-485 port, in conjunction with this press-to-print button, is provided to permit the capability of hard copy print-outs via a separate printer (by others).

ENTRY section to:

- ENTER setpoints or modify system values

SETPOINTS updating can be performed to:

- Chilled liquid temperature setpoint and range
- Remote reset temperature range
- Set daily schedule/holiday for start/stop
- Manual override for servicing
- Low and high ambient cutouts
- Number of compressors
- Low liquid temperature cutout
- Low suction pressure cutout
- High discharge pressure cutout
- Anti-recycle timer (compressor start cycle time)
- Anti-coincident timer (delay compressor starts)

UNIT section to:

- Set time
- Set unit options

UNIT ON/OFF switch

The microprocessor control center is capable of displaying the following:

- Return and leaving liquid temperature
- Low leaving liquid temperature cutout setting
- Low ambient temperature cutout setting
- Outdoor air temperature
- English or Metric data
- Suction pressure cutout setting
- Each system suction pressure
- Discharge pressure (optional)
- Liquid Temperature Reset via a Johnson Controls ISN DDC or Building Automation System (by others) via: - a 4-20 milliamp or 0-10 VDC input
- Anti-recycle timer status for each system
- Anti-coincident system start timer condition

- Compressor run status
- No cooling load condition
- Day, date and time
- Daily start/stop times
- Holiday status
- Automatic or manual system lead/lag control
- Lead system definition
- Compressor starts & operation hours (each compressor)
- Status of hot gas valves, evaporator heater and fan operation
- Run permissive status
- Number of compressors running
- Liquid solenoid valve status
- Load & unload timer status
- Water pump status

Provisions are included for: pumpdown at shutdown; optional remote chilled water temperature reset and two steps of demand load limiting form an external building automation system. Unit alarm contacts are standard. The operating program is stored in non-volatile memory (EPROM) to eliminate chiller failure due to AC powered failure/battery discharge. Programmed setpoints are retained in lithium battery-backed RTC memory for 5 years minimum.

COMMUNICATIONS

- Native communication capability for BACnet (MS/TP) and Modbus
- Optional communication available for N2 and LON via eLink option

STANDARD HIGH AMBIENT KIT

Allows units to operate when the ambient temperature is above 46°C .

BUILDING AUTOMATION SYSTEM INTERFACE

The factory addition of a Printed Circuit Board to accept a 4-20 milliamp or accept a 4-20 milliamp or 0-10 VDC input to reset the leaving chiller liquid temperature from a Building Automation System. (Factory-mounted)

- The standard unit capabilities include remote start-stop, remote water temperature reset via up to two steps of demand (load) limiting depending on model.
- The standard control panel can be directly connected to a Johnson Controls Building Automated System via the standard on-board RS-485 communication port.

POWER PANEL

Each panel contains:

- Compressor power terminals
- Compressor motor starting contactors
- Control power terminals to accept incoming or 115-1-50 control power
- Fan contactors & overload current protection

The power wiring is routed through liquid-tight conduit to the compressors and fans.

Accessories and Options

POWER OPTIONS:

SINGLE-POINT NON-FUSED DISCONNECT SWITCH – Unit mounted disconnect switch(es) with external, lockable handle(in compliance with Article 440-14 of N.E.C.), can be supplied to isolate the unit power voltage for servicing. Separate external fusing must be supplied, by others in the power wiring, which must comply with the NEC or local codes.

SINGLE-POINT CIRCUIT BREAKER – A unit mounted circuit breaker with external, lockable handle(in compliance with Article 440-14 of N.E.C.), can be supplied to isolate the power voltage for servicing. (This option includes the single-point power connection.)

CONTROL OPTIONS:

AMBIENT KIT (LOW) –This accessory includes fan speed control, on one fan per refrigerant circuit, to permit chiller operation below -4°C and down to -18°C ambient temperature. (Factory-mounted)

PIPING, EVAPORATOR OPTIONS:

SERVICE ISOLATION VALVE – Service suction and discharge (ball-type) isolation valves are added to unit per system. This option also includes a system high pressure relief valve in compliance with ASHARE 15. (Factory-mounted)

FLOW SWITCH – confirm flow through DX cooler. Paddle type vapor proof SPDT, NEMA 3R switch with 1" NPT pressure connection. (Field-mounted)

DIFFERENTIAL PRESSURE SWITCH –NEMA 3R switch(10.5 bar), with 1/4" NPT pressure connection for upright mounting in horizontal pipe. (Field-mounted)

ASME COOLER – ASME pressure vessel codes.

38 MM EVAPORATOR INSULATION – Double thickness insulation on the DX cooler (38mm) provided in place of the standard thickness (19mm). The insulation surrounding the DX cooler to reduce sweating in humid locations or on low temperature brine applications (Factory-Mounted)

CLOSED CONTAINER SHIPMENT READY – Equipment will be loaded into a shipping container. (Factory-Mounted)

COMPRESSOR, CONDENSER, CABINET AND OTHER OPTIONS:

POST-COATED DIPPED CONDENSER COILS – The unit is built with dipped-cured condenser coils. This is the choice for corrosive applications (Factory-mounted)

WIRE PANELS (FULL UNIT) – Consists of welded wire-mesh guards mounted on the exterior of the unit. Prevents unauthorized access, yet provides free air flow. (Factory-mounted)

ACOUSTIC SOUND BLANKETS – Compressor sound attenuation package. Black, high-strength, rip-resistant, acoustic blankets. Material is UV & mildew protected, waterproof & fire resistant. (Factory-mounted)

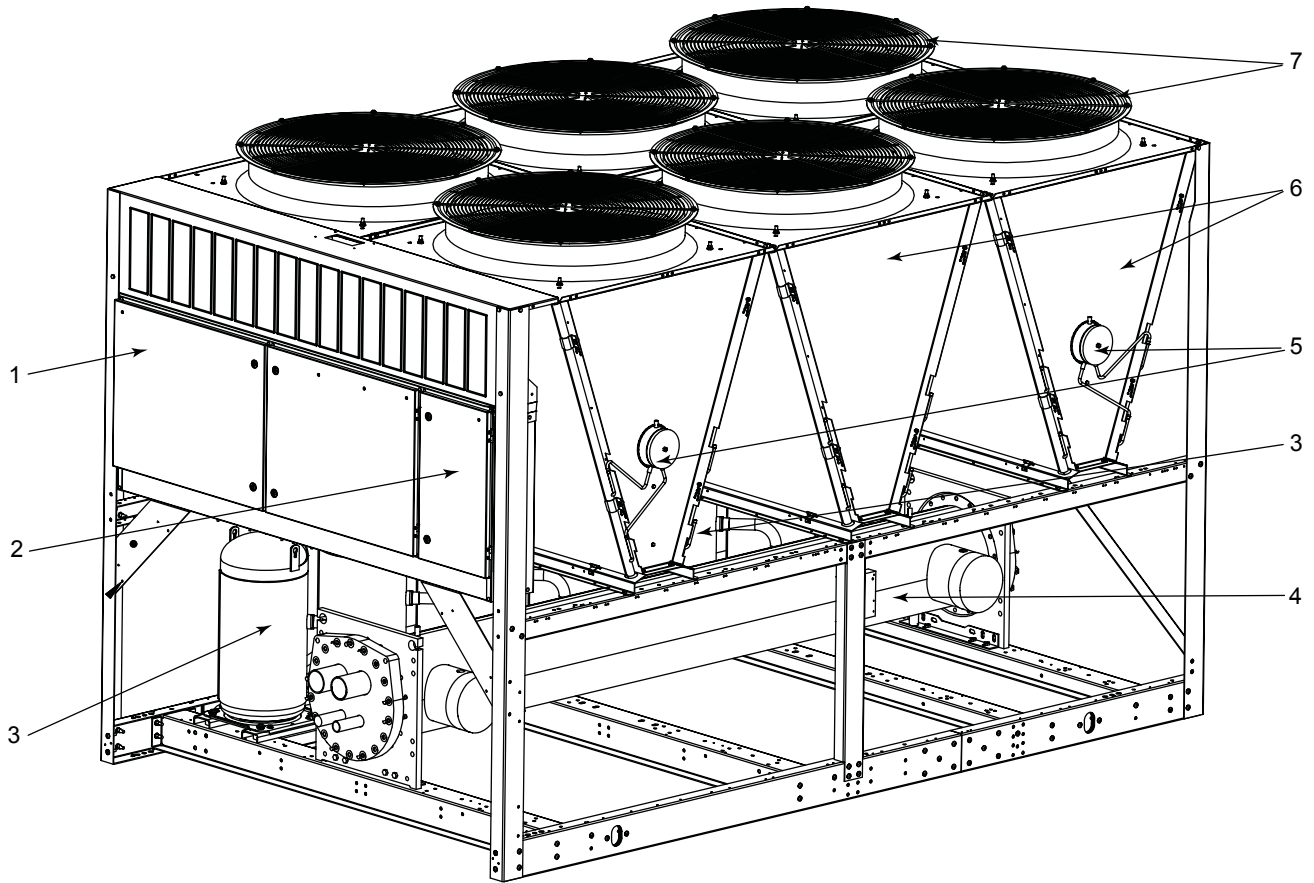
ULTRA QUIET FANS – Lower RPM, 8-pole fan motors are used with steeper-pitch fans. (Factory-mounted)

SPRING ISOLATORS – Level adjusting, spring and cage type isolators for mounting under unit base rails. (Field-mounted)

NEOPRENE PADS ISOLATORS – Recommended for normal installations. (Field-mounted)

HYDRO-KIT(SINGLE PUMP) – Factory fitted Hydrokit suitable for water glycol systems with up to 35% glycol at leaving liquid temperatures down to -18.8°C. The kit is available in single or dual motor configuration (dual as standby duty only), with totally enclosed permanently lubricated pump motors. (Factory-mounted)

Component Location Diagram



- 1 Power Panel
- 2 Control Panel
- 3 Compressor
- 4 Evaporator

- 5 Receiver
- 6 Condenser
- 7 Fans

Application Data

UNIT LOCATION

The YLAA chillers are designed for outdoor installation. When selecting a site for installation, be guided by the following conditions:

1. For outdoor locations of the unit, select a place having an adequate supply of fresh air for the condenser.
2. Avoid locations beneath windows or between structures where normal operating sounds may be objectionable.
3. Installation sites may be either on a roof, or at ground level. (See FOUNDATION.)
4. The condenser fans are the propeller-type, and are not recommended for use with duct work in the condenser air stream.
5. When it is desirable to surround the unit(s), it is recommended that the screening be able to pass the required chiller l/s (CFM) without exceeding 0.1" of water external static pressure.
6. Protection against corrosive environments is available by supplying the units with either copper fin, cured phenolic or epoxy coating on the condenser coils. The phenolic or epoxy coils should be offered with any units being installed at the seashore or where salt spray may hit the unit.

In installations where winter operation is intended and snow accumulations are expected, addition height must be provided to ensure normal condenser air flow.

Recommended clearances for units are given in DIMENSIONS. When the available space is less, the unit(s) must be equipped with the discharge pressure transducer options to permit high pressure unloading in the event that air recirculation was to occur.

FOUNDATION

The unit should be mounted on a flat and level foundation, ground or roof, capable of supporting the entire operating weight of the equipment. Operating weights are given in the PHYSICAL DATA tables.

ROOF LOCATIONS – Choose a spot with adequate structural strength to safely support the entire weight of the unit and service personnel. Care must be taken not to damage the roof during installation. If the roof is "bonded", consult the building contractor or architect for special installation requirements. Roof installations should incorporate the use of spring-type isolators to minimize the transmission of vibration into the building structure.

GROUND LEVEL INSTALLATIONS – It is important that the units be installed on a substantial base that will not settle, causing strain on the liquid lines and resulting in possible leaks. A one-piece concrete slab with footers extending below the frost line is highly recommended. Additionally, the slab should not be tied to the main building foundation as noises with telegraph.

Mounting holes (5/8" diameter) are provided in the steel channel for bolting the unit to its foundation. See DIMENSIONS.

For ground level installations, precautions should be taken to protect the unit from tampering by or injury to unauthorized persons. Screws on access panels will prevent 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.

CHILLED LIQUID PIPING

The chilled liquid piping system should be laid out so that the circulating pump discharges into the evaporator. The inlet and outlet evaporator liquid connections are given in DIMENSIONS.

Hand stop valves are recommended for use in all lines to facilitate servicing. Drain connections should be provided at all low points to permit complete drainage of the evaporator and system piping. Additionally, a strainer (40mesh) is recommended for use on the INLET line to the evaporator.

The chilled liquid lines that are exposed to outdoor ambient should be wrapped with a supplemental heater cable and covered with insulation. As an alternative, ethylene glycol should be added to protect against freeze-up during low ambient periods.

A flow switch is available as an accessory on all units. The flow switch (or its equivalent) must be installed in the leaving water piping of the evaporator and must not be used to start and stop the unit.

Guide Specifications

PART 1 - GENERAL

1.01 SCOPE

- A The requirements of the General Conditions, Supplementary Conditions, Division 1, and Drawings apply to all Work herein.
- B Provide Microprocessor controlled, multiple-scroll compressor, air-cooled, liquid chillers of the scheduled capacities as shown and indicated on the Drawings, including but not limited to:
1. Chiller package with Zero Ozone Depletion Potential Refrigerant R-410A
 2. Electrical power and control connections
 3. Chilled water connections
 4. Factory Start-up
 5. Charge of refrigerant and oil

1.02 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 Codes:
1. GB150 or GB151
 2. GB/T18430
 3. JB8654
- B Factory 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 vessel.
- C Chiller manufacturer shall have a factory trained and supported service organization that is within a 50 mile radius of the site.
- D Warranty: Manufacturer shall warrant all equipment and material of its manufacture against defects in workmanship and material for a period of one year from date of initial start-up or eighteen (18) months from date of shipment, whichever occurs first.

1.03 Delivery and Handling

- A Unit shall be delivered to job site fully assembled and charged with refrigerant and oil by the Manufacturer.
- B Unit shall be stored and handled per Manufacturer's instructions.
- C Protect the chiller and its accessories from the weather and dirt exposure during shipment.
- D During shipment, provide protective covering over vulnerable components. Fit nozzles and open ends with plastic enclosures.

PART 2 - PRODUCTS

2.01 CHILLER MATERIALS AND COMPONENTS

- A General: Install and commission, as shown on the schedules and plans, factory assembled, charged, and tested air cooled scroll compressor chiller(s) as specified herein. Chiller shall be designed, selected, and constructed using a refrigerant with Flammability rating of "1", as defined

by ANSI/ASHRAE STANDARD – 34 Number Designation and Safety Classification of Refrigerants. Chiller shall include not less than two refrigerant circuits above 35 tons, scroll compressors, direct –expansion–type evaporator, air-cooled condenser, refrigerant, lubrication system, interconnecting wiring, safety and operating controls including capacity controller, control center, motor starting components, and special features as specified herein or required for safe, automatic operation.

- B Cabinet: External structural members shall be constructed of heavy gauge, galvanized steel coated with baked on powder paint which, when subjected to GB10125, 400 hour 5% salt spray test, surface no pitting, no crackle, no fade, no rustiness.

- C Service Isolation valves: Service discharge (ball type) isolation valves are added to unit per system. This option also includes a system high-pressure relief valve (Factory-mounted).

- D. Pressure Transducers and Readout Capability

1. Discharge Pressure Transducers: Permits unit to sense and display discharge pressure.
2. Suction Pressure Transducers: Permits unit to sense and display suction pressure.
3. High Ambient Control: Allows units to operate when the ambient temperature is above 46°C. Includes discharge pressure transducers.

2.02 COMPRESSORS

Compressors: Shall be hermetic, scroll-type, including:

- 1 Compliant design for axial and radial sealing
- 2 Refrigerant flow through the compressor with 100% suction cooled motor.
- 3 Large suction side free volume and oil sump to provide liquid handling capability.
- 4 Compressor crankcase heaters to provide extra liquid migration protection.
- 5 Annular discharge check valve and reverse vent assembly to provide low-pressure drop, silent shutdown and reverse rotation protection.
- 6 Initial oil charge.
- 7 Oil Level sight glass.
- 8 Vibration isolator mounts for compressors.
- 9 Brazed-type connections for fully hermetic refrigerant circuits.
- 10 Compressor Motor overloads capable of monitoring compressor motor current. Provides extra protection against compressor reverse rotation, phase-loss and phase imbalance

2.03 REFRIGERANT CIRCUIT COMPONENTS

Each refrigerant circuit shall include: a discharge service ball type isolation valve, high side pressure relief, liquid line shutoff valve with charging port, low side pressure relief device, filter-drier, solenoid valve, sight glass with moisture indicator, thermostatic expansion valves, and flexible, closed-cell foam insulated suction line and suction pressure transducer.

2.04 HEAT EXCHANGERS

A Evaporator:

- 1 Direct expansion type with refrigerant inside high efficiency copper tubes, chilled liquid forced over the tubes by brass baffles.
- 2 Constructed, tested, and stamped in accordance with applicable sections of GB pressure vessel code for minimum 31.0 barg refrigerant side design working pressure and 10.3 barg water side design working pressure.
- 3 Shell covered with 19mm, flexible, closed cell insulation, thermal conductivity of 0.26k ([BTU/HR-Ft²-oF]/in.) maximum. Water nozzles with flanges for mechanical couplings, and insulated by Contactor after pipe installation.
- 4 Provide vent and drain fittings, and thermostatically controlled heaters to protect to -29°C ambient in off-cycle.

B Air Cooled Condenser

1. Coils: Condenser coils are made of a single material to avoid galvanic corrosion due to dissimilar metals. Coils and headers are brazed as one piece. Integral sub cooling is included. The design working pressure of the coil is 45 barg. Condenser coils shall be pressure washable up to 100 bar washer.
2. Low Sound Fans: Shall be dynamically and statically balanced, direct drive, corrosion resistant glass fiber reinforced composite blades molded into a low noise, full-airfoil cross section, providing vertical air discharge and low sound. Each fan in its own compartment prevents cross flow during fan cycling. Guards of heavy gauge, PVC (polyvinylchloride) coated or galvanized steel.
3. Fan Motors: High efficiency, direct drive, 6-pole, 3-phase, insulation class "F", current protected, Totally Enclosed Air-Over (TEAO), rigid mounted, with double sealed, permanently lubricated, ball bearings.

2.05 CONTROLS

A. General: Automatic start, stop, operating, and protection sequences across the range of scheduled conditions and transients.

B. Microprocessor Enclosure: Rain and dust tight IP55 powder painted steel cabinet with hinged, latched, and gasket sealed door.

C. Microprocessor Control Center:

1. Automatic control of compressor start/stop, anti-coincidence and anti-recycle timers, automatic pumpdown shutdown, condenser fans, evaporator pump, evaporator heater, unit alarm contacts, and chiller operation from -18°C to 52°C ambient. Automatic reset to normal chiller operation after power failure.
2. Remote water temperature reset via 0-10 VDC or 4-20 mA input signal or up to two steps of demand (load) limiting.
3. Software stored in non-volatile memory,

with programmed setpoints retained in lithium battery backed real time clock (RTC) memory for minimum 5 years.

4. Forty character liquid crystal display, descriptions in English, and numeric data in English (or Metric) units. Sealed keypad with sections for Setpoints, Display/Print, Entry, Unit Options & clock, and On/Off Switch
 5. Programmable Setpoints (within Manufacturer limits): display language; chilled liquid temperature setpoint and range, remote reset temperature range, set daily schedule/holiday for start/stop, manual override for servicing, low and high ambient cutouts, number of compressors, low liquid temperature cutout, low suction pressure cutout, high discharge pressure cutout, anti-recycle timer (compressor start cycle time), and anti-coincident timer (delay compressor starts).
 6. Display Data: Return and leaving liquid temperatures, low leaving liquid temperature cutout setting, low ambient temperature cutout setting, outdoor air temperature, English or metric data, suction pressure cutout setting, each system suction pressure, discharge pressure (optional), liquid temperature reset via a Johnson Controls ISN DDC or Building Automation System (by others) via a 4-20milliamp or 0-10 VDC input, anti-recycle timer status for each compressor, anti-coincident system start timer condition, compressor run status, no cooling load condition, day, date and time, daily start/stop times, holiday status, automatic or manual system lead/lag control, lead system definition, compressor starts/operating hours (each), status of hot gas valves, evaporator heater and fan operation, run permissive status, number of compressors running, liquid solenoid valve status, load & unload timer status, water pump status.
 7. System Safeties: Shall cause individual compressor systems to perform auto shut down; manual reset required after the third trip in 90 minutes. Include: high discharge pressure, low suction pressure, high pressure switch, and motor protector. Compressor motor protector shall protect against damage due to high input current or thermal overload of windings.
 8. Unit Safeties: Shall be automatic reset and cause compressors to shut down if low ambient, low leaving chilled liquid temperature, under voltage, and flow switch operation. Contractor shall provide flow switch and wiring per chiller manufacturer requirements.
 9. Alarm Contacts: Low ambient, low leaving chilled liquid temperature, low voltage, low battery, and (per compressor circuit): high discharge pressure, and low suction pressure.
- D. Manufacturer shall provide any controls not listed above, necessary for automatic chiller operation. Mechanical Contractor shall provide field control wiring necessary to interface sensors to the chiller control system.

2.06 POWER CONNECTION AND DISTRIBUTION

A Power Panels:

1. IP55 rain/dust tight, powder painted steel cabinets with hinged, latched, and gasket sealed outer doors. Provide main power connection(s), control power connections, compressor and fan motor start contactors, current overloads, and factory wiring.
2. Power supply shall enter unit at a single location, be 3 phase of scheduled voltage, and connect to individual terminal blocks per compressor. Separate disconnecting means and/or external branch circuit protection (by Contractor) required per applicable local or national codes.

B Compressor, control and fan motor power wiring shall be located in and enclosed panel or routed through liquid tight conduit.

2.07 ACCESSORIES and OPTIONS

Some accessories and options supersede standard product features. Your Johnson Controls representative will be pleased to provide assistance.

A. Outdoor Ambient Temperature Control

1. Low Ambient Control: Permits unit operation to -18°C ambient. Standard unit controls to -4°C ambient.

B. Power Supply Connections:

1. Single Point Power Supply: Single point Terminal Block for field connection and interconnecting wiring to the compressors. Separate external protection must be supplied, by others, in the incoming power wiring, which must comply with the National Electric Code and/or local codes.
2. Single Point Circuit Breaker: Single point Terminal Block with Circuit Breaker and lockable external handle can be supplied to isolate power voltage for servicing. Incoming power wiring must comply with the National Electric Code and/or local codes.

C. Protective Chiller Panels (Factory or Field Mounted): Wire Panels (full unit): Heavy gauge, welded wire-mesh, to protect condenser coils from incidental damage and restrict unauthorized access to internal components.

D. For standard unit, Johnson Controls model NEMA 3R switch (10.5 bar) DWP, -29°C to 121°C , with 1" NPT connection for upright mounting in horizontal pipe.

E. Differential Pressure Switch: NEMA 3R switch (10.5 bar) DWP, -7°C to 121°C , with 1" NPT connection for upright mounting in horizontal pipe. (This flow switch or equivalent must be furnished with each unit).

F. Evaporator options:

- 1 Provide 1-1/2" evaporator insulation in lieu of standard 3/4".
- 2 Provide Raised Face Flanges for field installation on cooler nozzles and field piping:
 - a. 150 PSIG, grooved.

G. Sound Reduction (Factory-mounted): Compressor Acoustic Sound Blankets

H. Vibration Isolation (Field-mounted):

- 1 Neoprene Pad Isolators.
- 2 1" Deflection Spring Isolators: Level adjustable, spring and cage type isolators for mounting under the unit base rails.

PART 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.

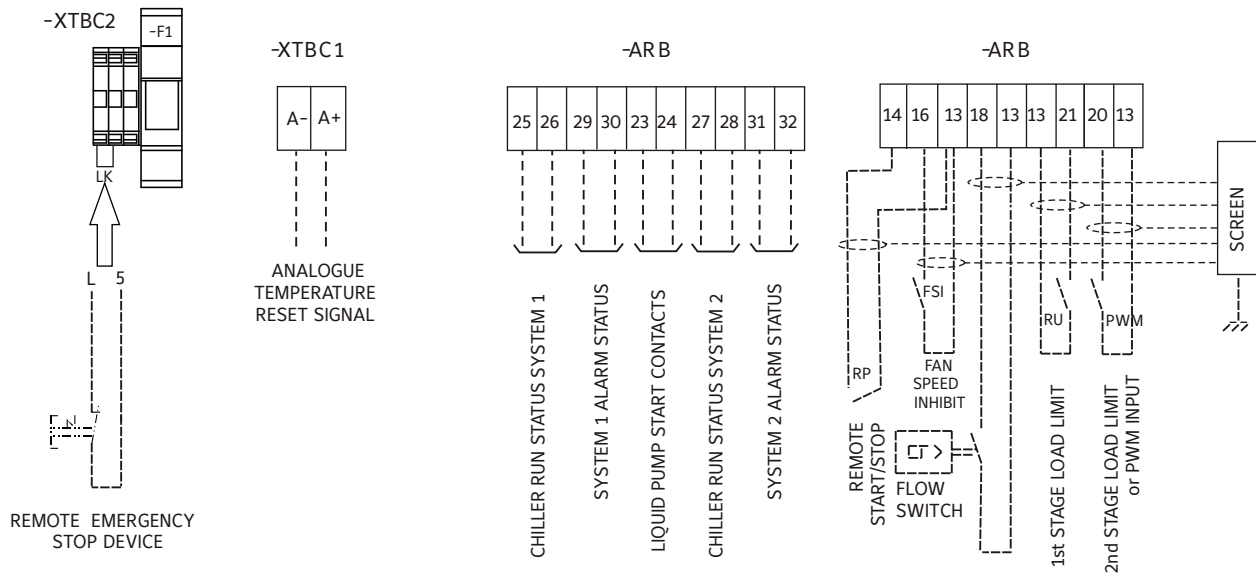
C Components: Installing Contractor shall provide and install all auxiliary devices and accessories for fully operational chiller.

D Electrical: Coordinate electrical requirements and connections for all power feeds with Electrical Contractor (Division 16).

E Controls: Coordinate all control requirements and connections with Controls Contractor.

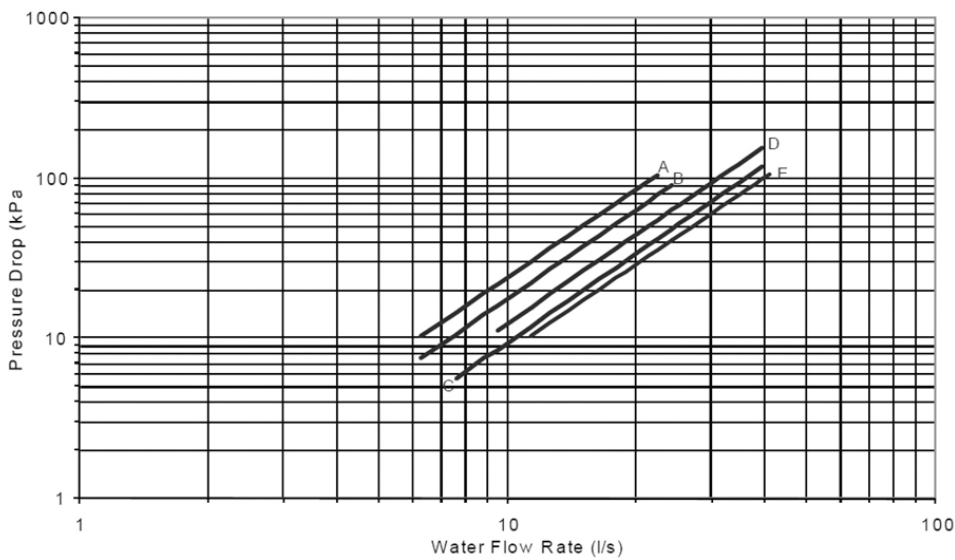
F Finish: Installing Contractor shall paint damaged and abraded factory finish with touch-up paint matching factory finish.

Connection Diagram



YLAA Customer Controls

Evaporator pressure drop graph



Curve	Model YLAA
A	195HE, 220HE
B	260HE, 300HE
C	350HE, 455HE
D	440HE
E	390HE, 515HE

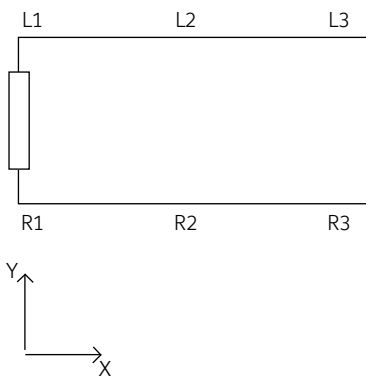
Operating Limitations

Model		Leaving Water Temperature	Leaving Water Temperature Range	Evaporator Flow Rate	Maximum Water Side Pressure	Air Temperature Standard Unit	Power Supply Voltage
		°C	°C	l/s	bar	°C	V
YLAA0195HE	MIN	5 - 15	3 - 8	6.31	10.3	-4 - 46	380 - 415
	MAX			22.4			
YLAA0220HE	MIN			6.31			
	MAX			22.4			
YLAA0260HE	MIN			6.31			
	MAX			24.2			
YLAA0300HE	MIN			6.31			
	MAX			24.2			
YLAA0350HE	MIN			7.57			
	MAX			39.4			
YLAA0390HE	MIN			11.4			
	MAX			41.0			
YLAA0440HE	MIN			9.47			
	MAX			39.4			
YLAA0455HE	MIN			120			
	MAX			7.57			
YLAA0515HE	MIN			11.4			
	MAX			41.0			

Notes:

1. For leaving brine temperature below 5°C, contact your nearest Johnson Controls Office for application requirements.
2. For leaving brine temperature higher than 13°C, contact your nearest Johnson Controls Office for application guidelines.
3. The evaporator is protected against freezing to -29°C with an electric heater as standard.
4. For operation at temperatures below -4°C, the optional Low Ambient Kit will need to be installed on the system.

Isolator Locations



Model	Isolator Mounting Location(mm)					
	L1	L2	L3	R1	R2	R3
195HE	(495 , 2207)	(2441 , 2207)	-	(495,35)	(2441 , 35)	-
220HE	(495 , 2207)	(2441 , 2207)	-	(495,35)	(2441 , 35)	-
260HE	(495 , 2207)	(2441 , 2207)	-	(495,35)	(2441 , 35)	-
300HE	(194 , 2207)	(3170 , 2207)	-	(194,35)	(3170 , 35)	-
350HE	(194 , 2207)	(3170 , 2207)	-	(194,35)	(3170 , 35)	-
390HE	(194 , 2207)	(3170 , 2207)	-	(194,35)	(3170 , 35)	-
440HE	(194 , 2207)	(1947 , 2207)	(3864 , 2207)	(194,35)	(1947 , 35)	(3864 , 35)
455HE	(194 , 2207)	(1947 , 2207)	(3864 , 2207)	(194,35)	(1947 , 35)	(3864 , 35)
515HE	(194 , 2207)	(1947 , 2207)	(3864 , 2207)	(194,35)	(1947 , 35)	(3864 , 35)

Cooling Capacities - Water Cooling

LCIT °C	YLAA Model	Condenser Coil Entering Air Temperature °C																	
		25			30			35			40			45			46		
		Cooling Capacity kW _e	Compressor Input Power kW _e	COP	Cooling Capacity kW _e	Compressor Input Power kW _e	COP	Cooling Capacity kW _e	Compressor Input Power kW _e	COP	Cooling Capacity kW _e	Compressor Input Power kW _e	COP	Cooling Capacity kW _e	Compressor Input Power kW _e	COP	Cooling Capacity kW _e	Compressor Input Power kW _e	COP
5°C	195HE	206.5	46.7	4.0	196.2	51.8	3.4	185.1	57.5	3.0	171.7	63.3	2.5	133.0	54.5	2.2	130.7	55.6	2.1
	220HE	222.9	48.6	4.0	212.2	53.8	3.5	200.7	59.7	3.0	186.6	65.8	2.6	171.8	72.6	2.2	168.7	74.0	2.1
	260HE	265.8	61.8	3.9	252.7	68.2	3.4	238.6	75.6	2.9	221.1	83.2	2.5	202.7	91.6	2.1	198.9	93.4	2.0
	300HE	342.9	73.8	4.0	309.2	81.5	3.4	292.4	90.2	3.0	271.6	99.3	2.5	249.7	109.4	2.1	245.1	111.6	2.0
	350HE	363.0	82.2	3.9	345.5	90.5	3.4	326.8	100.1	3.0	303.6	110.2	2.5	279.4	121.5	2.1	274.3	124.0	2.1
	390HE	406.2	94.7	3.9	385.7	104.4	3.4	363.8	115.5	2.9	338.5	127.2	2.5	309.1	140.0	2.1	303.4	142.7	2.0
	440HE	451.0	104.5	3.9	420.7	115.2	3.4	404.8	127.3	2.9	375.8	140.2	2.5	345.2	154.5	2.1	339.0	157.5	2.0
	455HE	472.6	107.9	3.9	449.9	119.0	3.4	425.7	131.6	2.9	396.1	144.9	2.5	365.1	159.7	2.1	358.8	162.9	2.0
	515HE	547.6	126.7	3.9	520.6	139.6	3.4	491.5	154.4	2.9	455.9	169.8	2.5	418.5	187.0	2.1	410.8	190.7	2.0
	195HE	206.5	46.7	4.0	196.2	51.8	3.4	185.1	57.5	3.0	171.7	63.3	2.5	133.0	54.5	2.2	130.7	55.6	2.1
6°C	220HE	229.6	49.0	4.1	218.6	54.1	3.6	206.9	60.0	3.1	192.3	66.2	2.6	177.2	73.0	2.2	174.0	74.5	2.1
	260HE	273.7	62.3	4.0	260.2	68.8	3.5	245.7	76.2	3.0	228.0	83.8	2.6	209.1	92.2	2.1	205.2	94.0	2.0
	300HE	334.4	74.5	4.0	318.3	82.1	3.5	301.0	90.8	3.0	279.9	100.0	2.6	257.3	110.1	2.2	252.7	112.3	2.1
	350HE	373.8	82.9	4.0	355.8	91.3	3.5	336.5	100.9	3.0	312.8	111.0	2.6	287.9	122.3	2.2	282.7	124.7	2.1
	390HE	418.2	95.7	4.0	397.2	105.3	3.4	374.7	116.5	3.0	347.7	128.0	2.5	318.6	140.9	2.1	312.7	143.6	2.0
	440HE	464.3	105.5	4.0	441.4	116.2	3.5	416.9	128.3	3.0	387.1	141.2	2.5	355.8	155.5	2.1	349.3	158.5	2.1
	455HE	486.5	108.8	4.0	463.2	119.9	3.5	438.4	132.6	3.0	408.0	145.9	2.6	376.2	160.6	2.2	369.7	163.8	2.1
	515HE	563.7	127.9	4.0	535.9	140.8	3.5	506.0	156.6	3.0	469.5	171.0	2.5	431.1	188.3	2.1	423.2	191.9	2.1
	195HE	218.5	47.6	4.1	207.7	52.7	3.6	196.2	58.4	3.1	182.1	64.2	2.6	141.1	55.2	2.3	138.7	56.3	2.3
	7°C	220HE	236.4	49.4	4.2	225.2	54.5	3.7	213.1	60.4	3.2	198.2	66.6	2.7	182.6	73.5	2.3	179.4	74.9
260HE		281.6	62.9	4.0	267.7	69.4	3.5	252.9	76.8	3.0	234.8	84.4	2.6	215.5	92.9	2.2	211.5	94.7	2.1
300HE		344.1	75.1	4.1	327.5	82.8	3.6	309.7	91.5	3.1	287.9	100.7	2.6	265.0	110.8	2.2	260.3	113.0	2.1
350HE		384.7	83.6	4.1	366.2	92.0	3.6	346.4	101.6	3.1	322.0	111.8	2.6	296.5	123.1	2.2	291.2	125.5	2.2
390HE		430.6	96.6	4.0	408.9	106.3	3.5	385.8	117.4	3.0	357.6	129.0	2.6	328.2	141.9	2.2	322.1	144.6	2.1
440HE		479.9	106.5	4.0	454.4	117.2	3.5	429.1	129.4	3.0	398.6	142.2	2.6	366.4	156.5	2.2	359.8	159.5	2.1
455HE		500.6	109.7	4.1	476.6	120.8	3.6	451.2	133.5	3.1	420.0	146.8	2.6	387.4	161.6	2.2	380.8	164.8	2.1
515HE		580.0	129.1	4.1	551.4	142.1	3.6	520.7	156.9	3.1	483.2	172.3	2.6	443.9	189.5	2.2	435.8	193.2	2.1
195HE		224.6	48.0	4.2	213.6	53.1	3.7	201.8	58.9	3.1	187.4	64.7	2.7	146.0	55.6	2.4	142.9	56.6	2.3
8°C		220HE	243.3	49.8	4.3	231.8	55.0	3.8	219.5	60.9	3.3	204.2	67.1	2.8	188.2	73.9	2.3	184.9	75.3
	260HE	289.6	63.5	4.1	275.4	70.0	3.6	260.2	77.4	3.1	241.6	85.0	2.6	222.0	93.5	2.2	218.0	95.3	2.1
	300HE	354.0	74.3	4.2	336.9	83.5	3.7	318.6	92.3	3.2	296.3	101.4	2.7	272.7	111.6	2.3	267.9	113.7	2.2
	350HE	395.9	84.3	4.2	376.8	92.8	3.7	356.4	102.4	3.2	331.4	112.5	2.7	305.2	123.9	2.3	299.8	126.3	2.2
	390HE	443.1	97.5	4.1	420.8	107.2	3.6	397.0	118.4	3.1	368.1	130.0	2.6	337.9	142.9	2.2	331.3	145.6	2.1
	440HE	491.6	107.5	4.1	467.5	118.2	3.6	441.6	130.4	3.1	410.1	143.3	2.7	377.2	157.6	2.2	370.4	160.6	2.2
	455HE	514.9	110.6	4.2	490.4	121.8	3.6	464.2	134.5	3.1	432.2	147.8	2.7	398.8	162.6	2.3	392.0	165.7	2.2
	515HE	596.6	130.4	4.2	567.1	143.4	3.6	535.6	158.2	3.1	497.0	173.7	2.7	456.7	190.9	2.2	448.4	194.5	2.2
	195HE	237.2	48.9	4.4	225.7	54.0	3.8	213.2	59.8	3.3	198.2	65.7	2.8	154.1	56.3	2.5	151.5	57.3	2.4
	10°C	220HE	257.5	50.7	4.5	245.5	55.8	3.9	232.5	61.7	3.4	216.4	67.9	2.9	199.6	74.8	2.5	196.2	76.3
260HE		306.2	64.7	4.3	291.2	71.2	3.7	275.2	78.6	3.2	255.6	86.3	2.8	235.1	94.9	2.3	230.9	96.7	2.2
300HE		374.0	77.3	4.4	356.0	85.0	3.8	336.7	93.8	3.3	313.2	103.0	2.8	288.5	113.1	2.4	206.4	78.5	2.4
350HE		418.5	85.9	4.4	398.4	94.4	3.8	376.9	104.1	3.3	350.6	114.2	2.8	323.0	125.5	2.4	317.3	128.0	2.3
390HE		468.8	99.5	4.3	445.1	109.3	3.7	419.9	120.4	3.2	389.5	132.1	2.7	357.6	145.0	2.3	321.9	145.0	2.3
440HE		519.6	109.6	4.3	494.1	120.3	3.7	466.9	132.7	3.2	433.8	145.5	2.8	399.1	159.8	2.2	392.0	162.9	2.2
455HE		544.4	112.6	4.3	518.5	123.8	3.8	490.8	136.5	3.3	457.2	149.9	2.8	422.1	164.7	2.4	415.0	167.8	2.3
515HE		630.4	133.0	4.3	599.1	146.1	3.8	565.9	161.0	3.2	525.3	176.5	2.8	482.9	193.7	2.3	445.0	120.6	2.6
195HE		256.9	50.5	4.6	244.5	55.5	4.0	231.3	61.3	3.5	215.1	67.3	3.0	167.7	57.3	2.7	131.5	40.3	2.9
13°C		220HE	279.4	52.2	4.8	266.5	57.3	4.2	252.7	63.2	3.6	235.5	69.4	3.1	217.4	76.3	2.6	136.1	41.6
	260HE	331.9	66.7	4.5	315.6	73.2	4.0	298.4	80.7	3.4	277.2	88.4	2.9	255.2	97.0	2.5	94.7	26.0	2.9
	300HE	405.3	79.6	4.6	385.6	87.4	4.0	364.8	96.2	3.5	339.4	105.4	3.0	228.3	78.5	2.6	224.5	80.0	2.5
	350HE	450.4	88.4	4.6	432.0	97.0	4.0	408.6	106.8	3.5	380.2	117.0	3.0	350.5	128.3	2.5	344.4	130.7	2.5
	390HE	508.7	102.6	4.5	482.8	112.5	3.9	455.6	123.8	3.4	422.5	135.5	2.9	236.6	73.4	2.8	232.6	74.8	2.7
	440HE	563.2	112.9	4.5	535.4	123.8	4.0	506.0	136.2	3.4	470.5	149.1	2.9	433.0	163.5	2.6	359.3	127.3	2.6
	455HE	590.3	115.6	4.6	562.2	126.9	4.0	532.3	139.8	3.5	496.1	153.1	3.0	458.4	168.0	2.5	386.6	132.9	2.6
	515HE	683.0	137.2	4.5	648.8	150.4	4.0	612.9	165.4	3.4	569.0	181.0	2.9	383.2	120.7	2.9	376.6	123.0	2.8

Notes: 1) kW₀=Full load cooling capacity in kW. kW_{cl}=input power to all compressors in kW. COP= Energy Efficiency Ratio (includes compressors and fans).
 2) Data based on 5°C chilled liquid temperature difference, 35°C ambient temperature and 0.018m² °C/kW fouling factor.

Physical Data

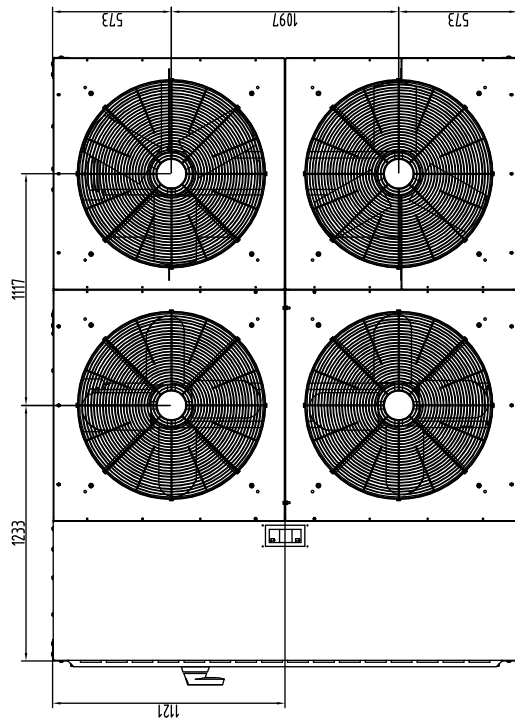
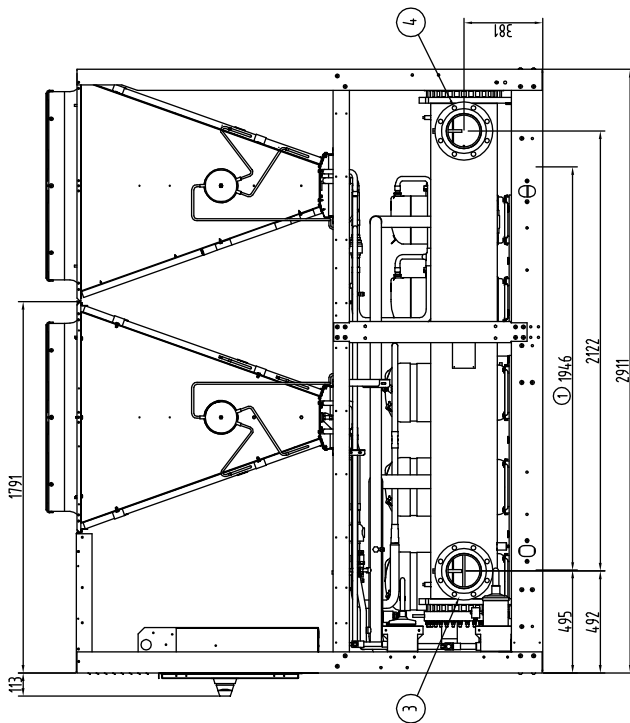
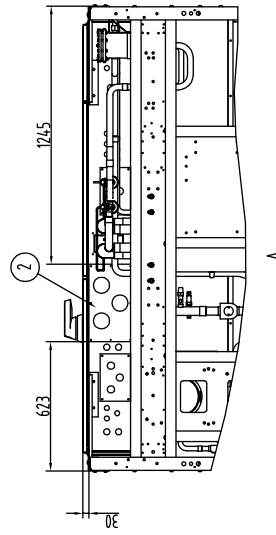
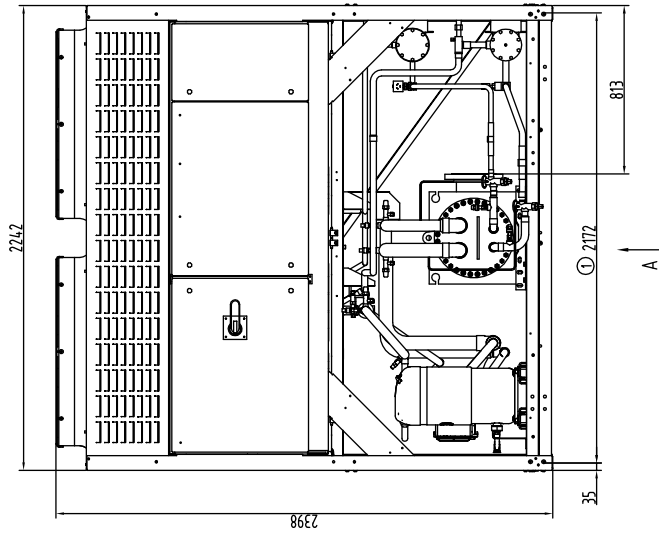
R410A High Efficiency Unit	YLAA0195HE	YLAA0220HE	YLAA0260HE	YLAA0300HE	YLAA0350HE	YLAA0390HE	YLAA0440HE	YLAA0455HE	YLAA0515HE
General Unit Data									
Cooling Capacity (kW) ⁽¹⁾	196	213	253	310	346	386	429	451	521
Input Power (kW)	63.8	67.2	83.5	100	111.7	127.5	141.1	147	170.3
COP	3.08	3.17	3.03	3.10	3.10	3.03	3.04	3.07	3.06
Length (mm)	3024	3024	3024	3727	3727	3727	4844	4844	4844
Width (mm)	2242	2242	2242	2242	2242	2242	2242	2242	2242
Height (mm)	2398	2398	2398	2398	2398	2398	2398	2398	2398
Shipment Weight (kg)	1921	2042	2134	2416	2598	2859	3171	3281	3488
Operation Weight (kg)	2106	2227	2328	2610	2805	3151	3421	3489	3779
Number of Refrigerant Circuits	2	2	2	2	2	2	2	2	2
Compressor, Scroll Type									
Compressors per circuit	3/2	2/2	2/2	2/2	2/2	3/2	3/2	3/3	3/3
Compressors per unit	5	4	4	4	4	5	5	6	6
Evaporator									
Flow Rate (l/s)	9.4	10.2	12.1	14.8	16.6	18.5	20.5	21.6	24.9
Water Pressure Drop (kPa)	21.9	25.4	25	37	24	25	47	39	43
Water Connections (inch)	6	6	6	6	8	8	8	8	8
Water Volume (liters)	185	185	194	193	208	293	250	208	293
Condenser									
Total Coil Face Area (m ²)	7.5	10	10	12.6	15.1	15.1	17.6	20.1	20.1
Number of Rows	1	1	1	1	1	1	1	1	1
Condenser Fans									
Number of Fans (Circuit1/Circuit2)	2/2	2/2	2/2	3/2	3/3	3/3	4/3	4/4	4/4
Fan hp	2	2	2	2	2	2	2	2	2
Fan RPM	950/850	950	950	950	950	950	950	950	950
Total Air Flow (m ³ /s)	19	26	26	32.5	39	39	45.5	52	52

Notes: (1) Data based on 5°C chilled liquid temperature difference and 7°C leaving water temperature, 35°C ambient temperature and 0.018m² • °C/kW fouling factor.

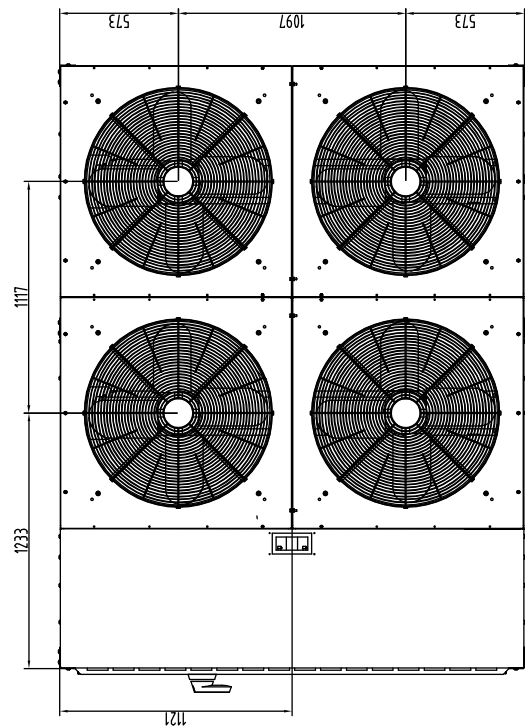
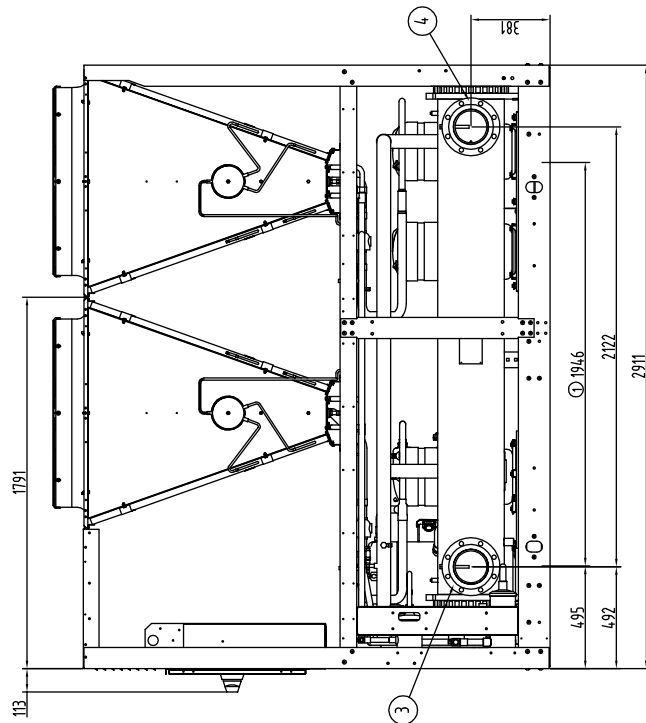
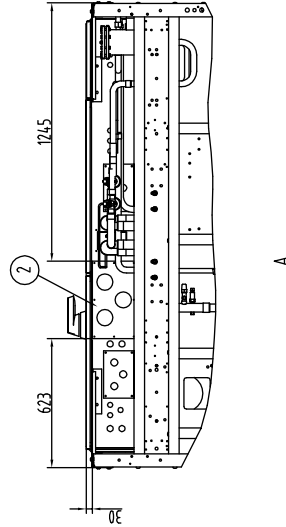
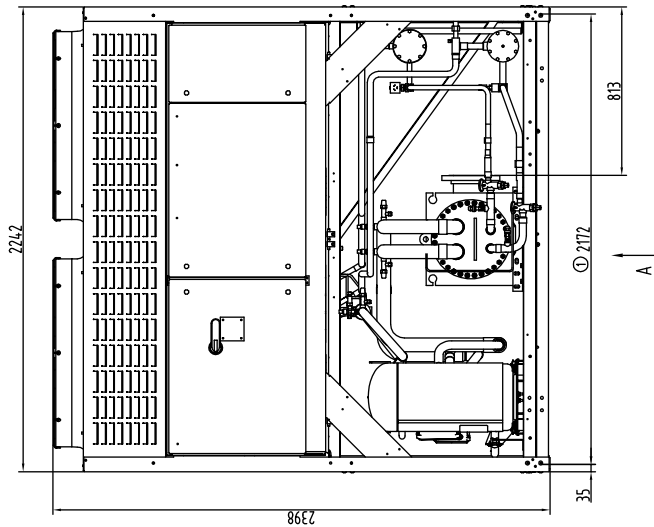
Electrical Data

Model		YLAA0195HE	YLAA0220HE	YLAA0260HE	YLAA0300HE	YLAA0350HE	YLAA0390HE	YLAA0440HE	YLAA0455HE	YLAA0515HE
Votalge		400V/3Ph/50Hz								
Single Point Data	Min.Circuit Amps	136	159	189	222	256	281	314	335	373
	Min.N/F DISC SW	150	200	250	250	400	400	400	400	600
	Min. Dual ELEM Fuse & Min. CB	150	175	225	250	300	300	350	350	400
	Max. Dual ELEM Fuse & Max.CB	150	200	225	250	300	300	350	350	400
System 1	Compressor 1	RLA	25.1	54.5	54.5	54.5	54.5	54.5	54.5	54.5
		LRA	198	310	310	310	310	310	310	310
	Compressor 2	RLA	25.1	25.1	25.1	54.5	54.5	54.5	54.5	54.5
		LRA	198	198	198	310	310	310	310	310
	Compressor 3	RLA	25.1	-	-	-	-	54.5	54.5	54.5
		LRA	198	-	-	-	-	310	310	310
System 2	Compressor 1	RLA	21.8	25.1	54.5	54.5	54.5	54.5	54.5	41.9
		LRA	140	198	310	310	310	310	310	272
	Compressor 2	RLA	21.8	25.1	25.1	25.1	54.5	25.1	54.5	41.9
		LRA	140	198	198	198	310	198	310	272
	Compressor 3	RLA	-	-	-	-	-	-	-	41.9
		LRA	-	-	-	-	-	-	-	272
System 1	Condenser Fans	QTY	2	2	2	3	3	4	4	4
		FLA	4	4	4	4	4	4	4	4
		LRA	19	19	19	19	19	19	19	19
System 2	Condenser Fans	QTY	2	2	2	2	3	3	4	4
		FLA	1.4	4	4	4	4	4	4	4
		LRA	3.4	19	19	19	19	19	19	19

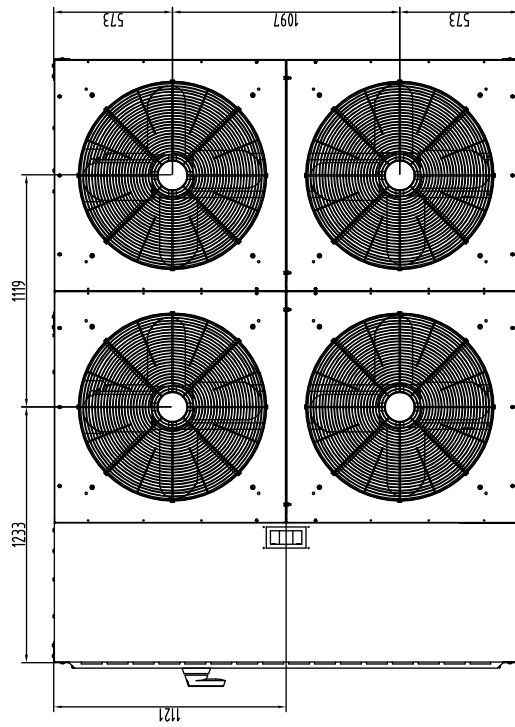
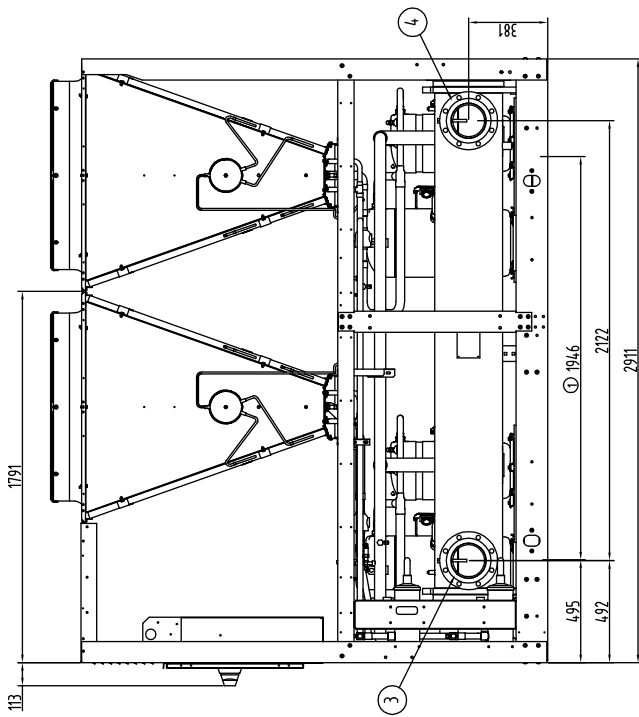
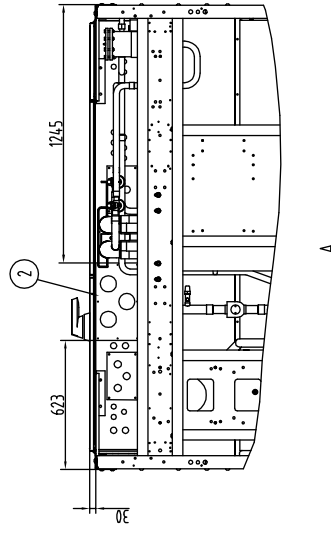
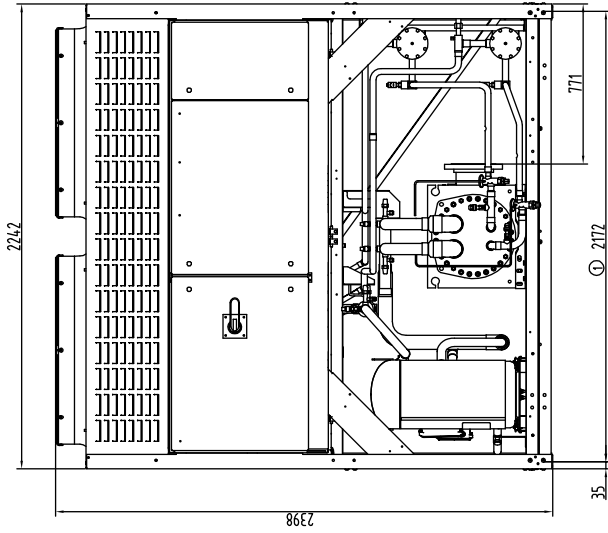
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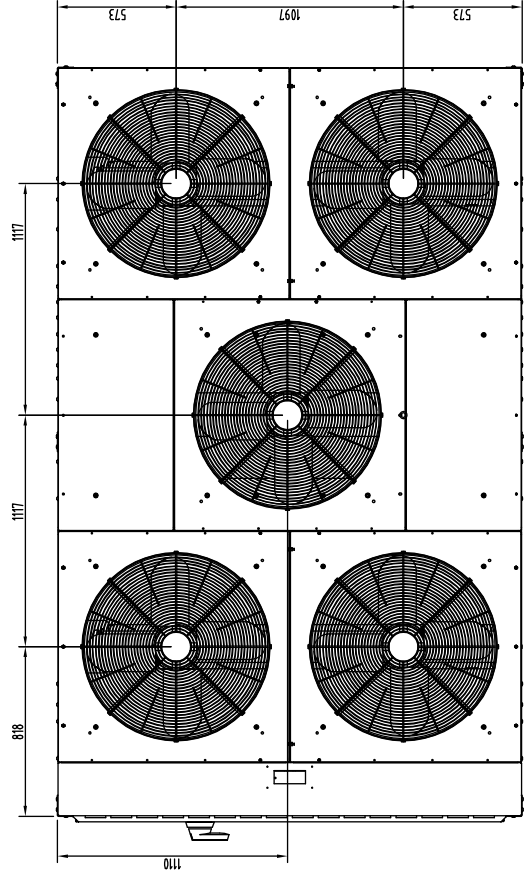
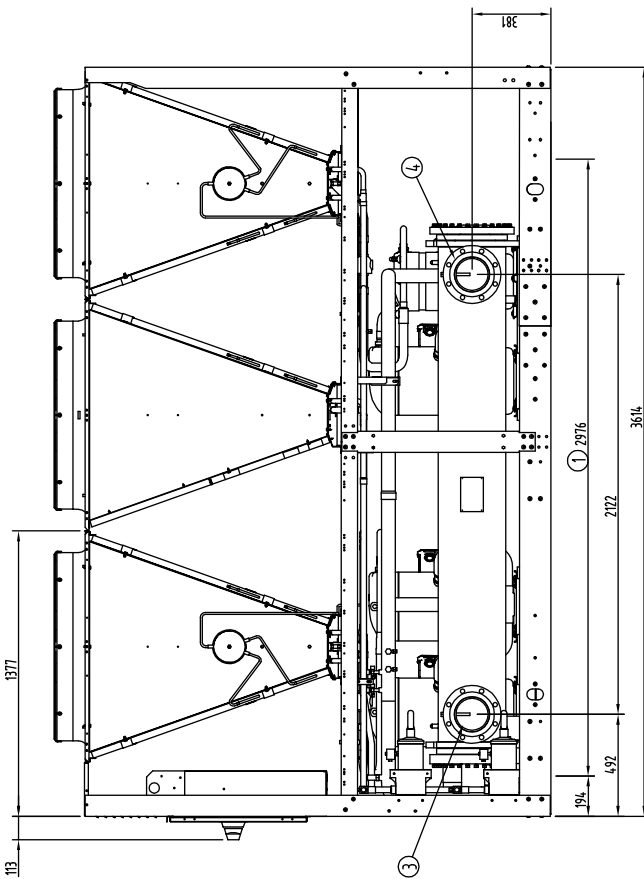
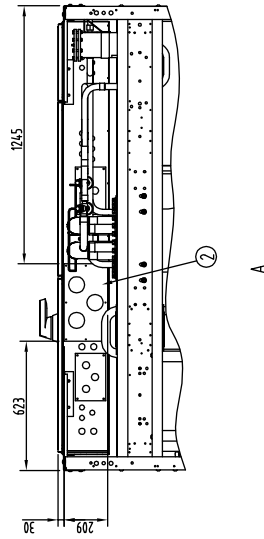
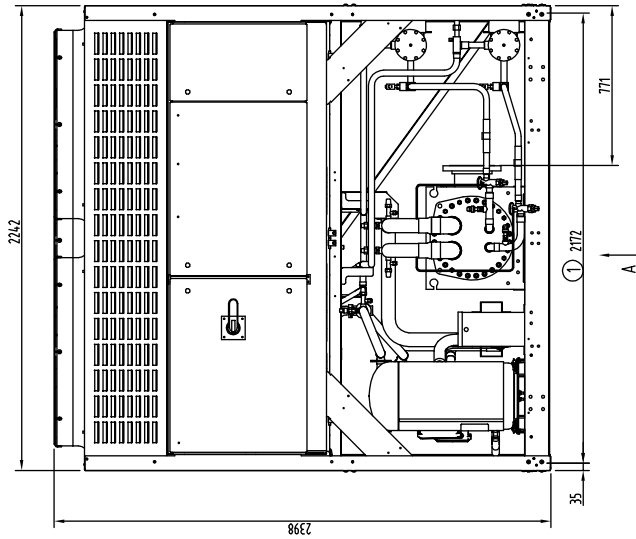
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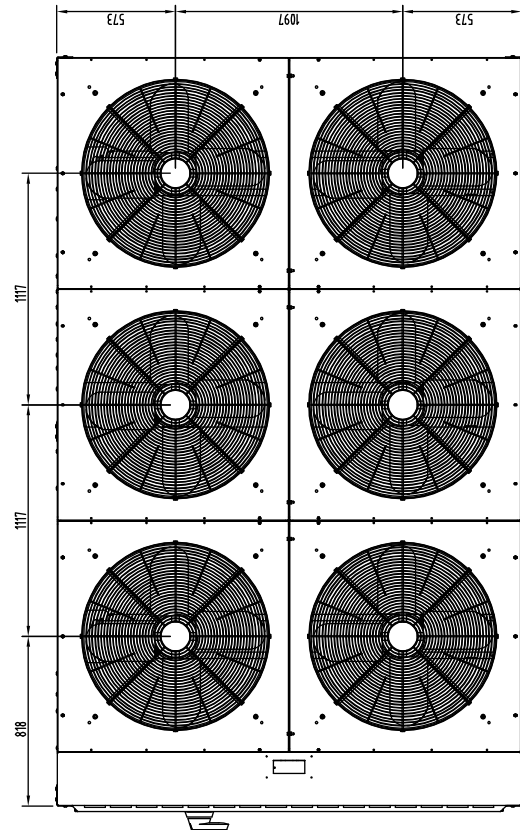
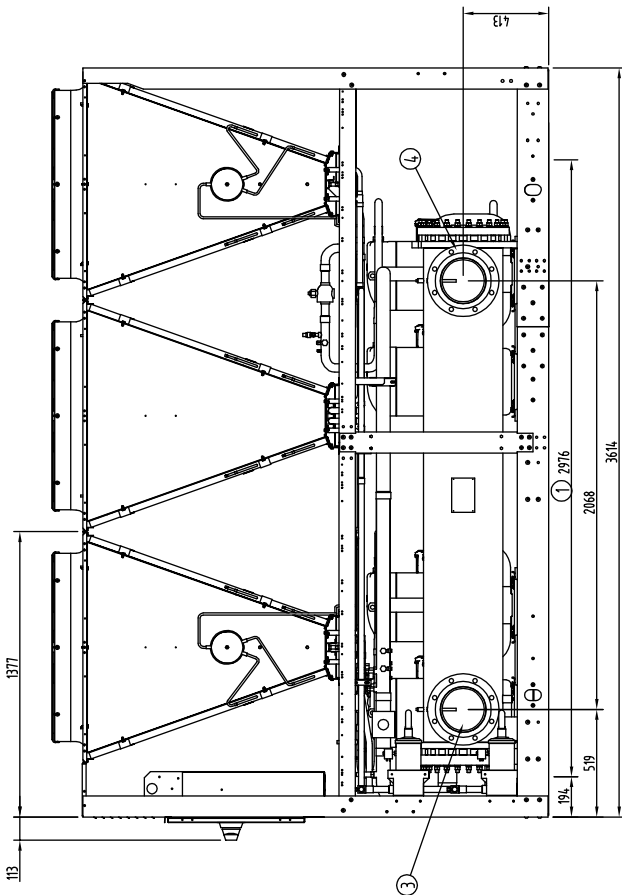
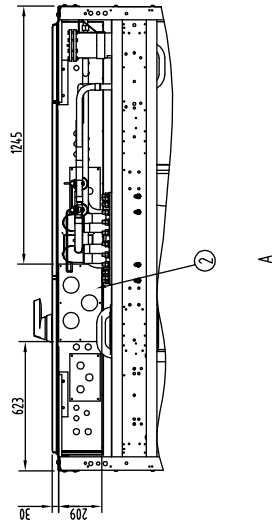
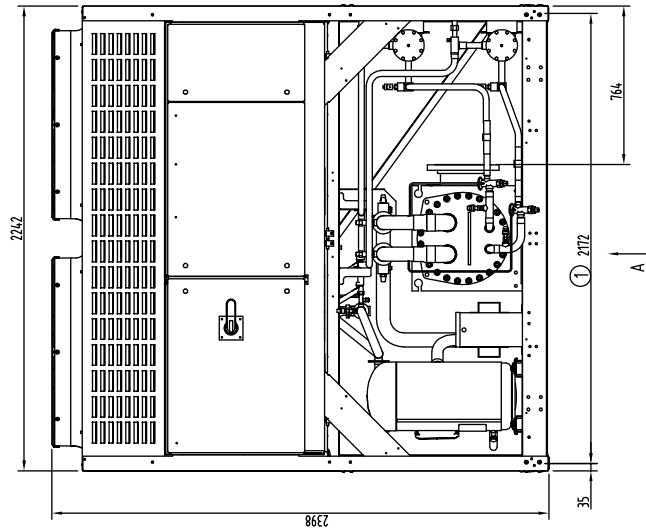
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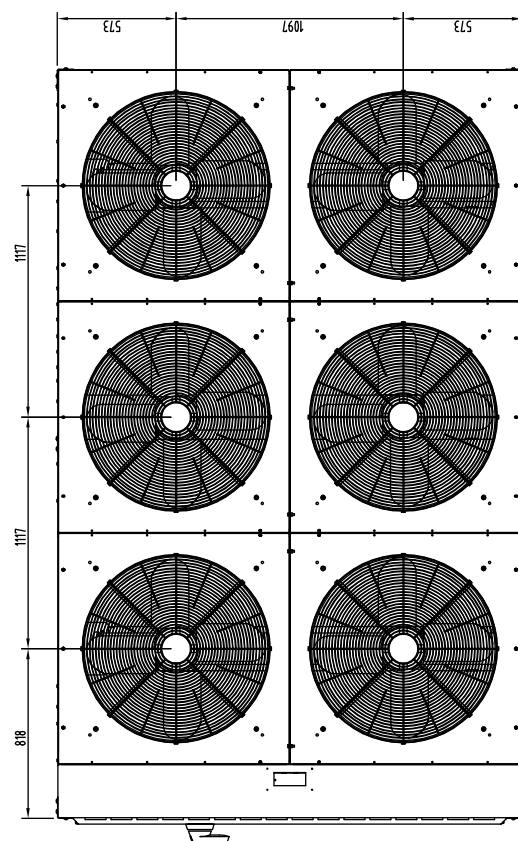
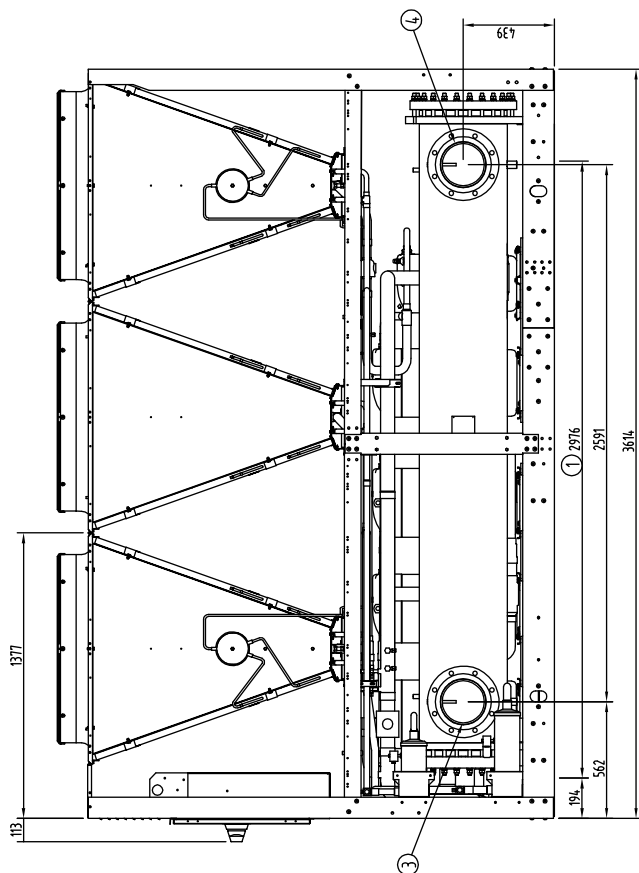
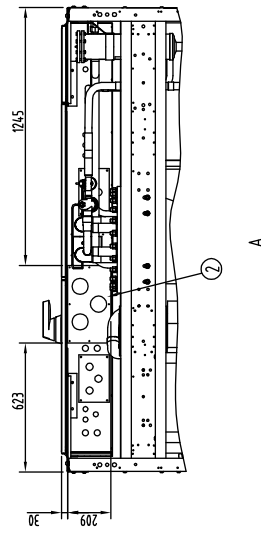
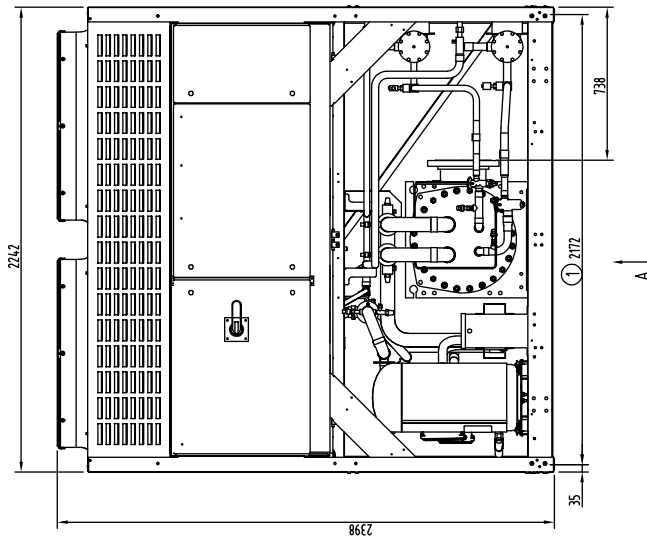
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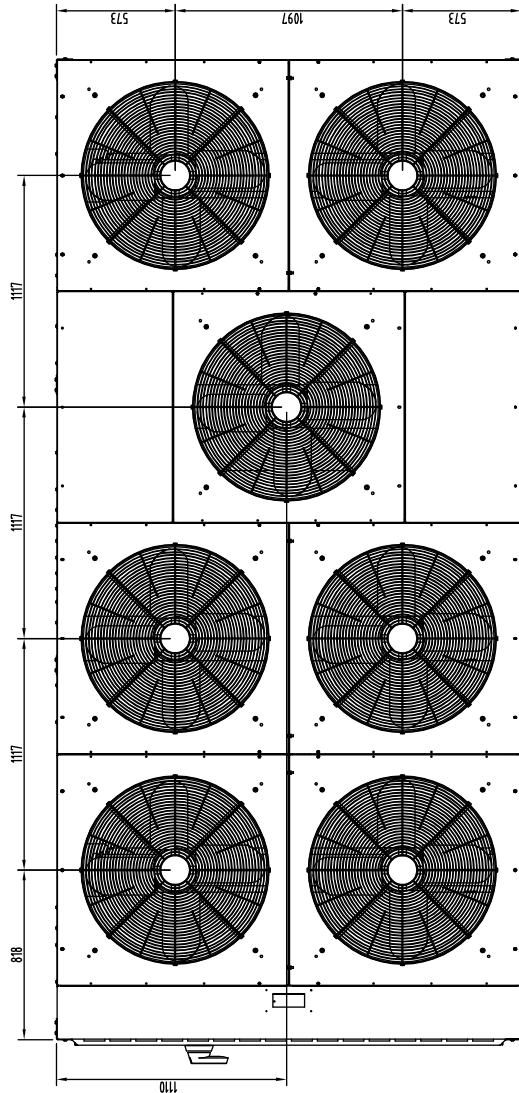
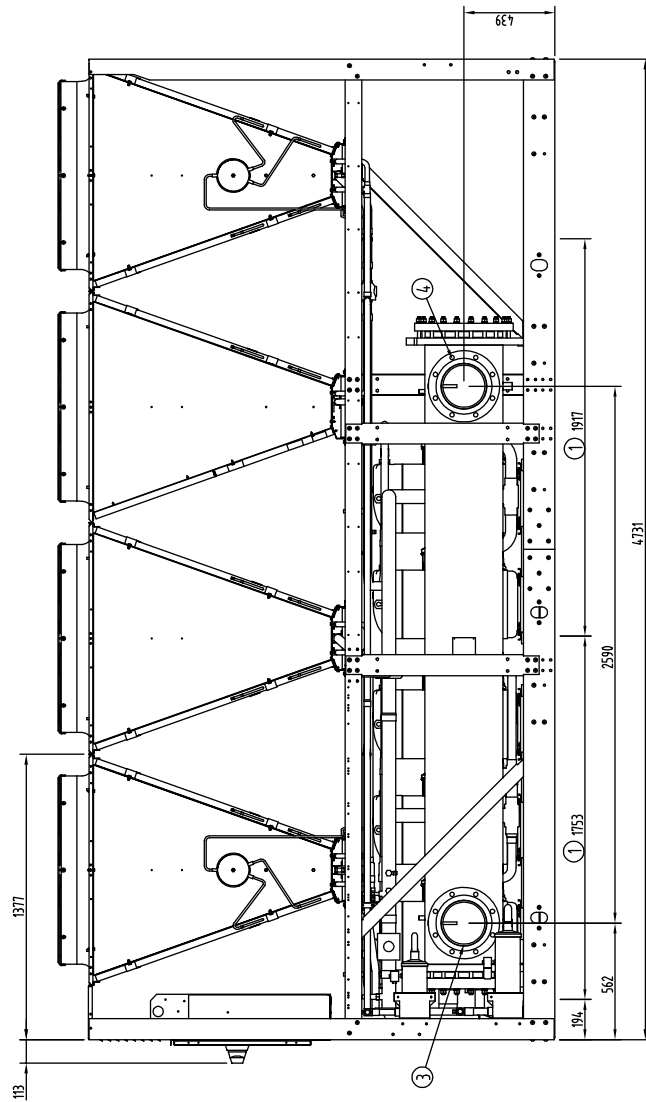
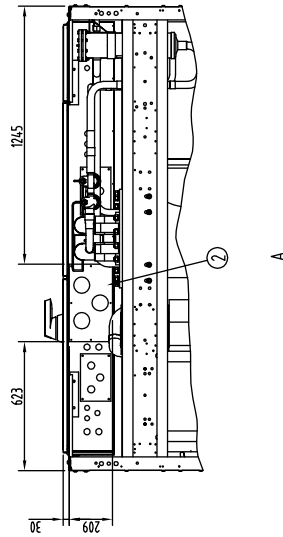
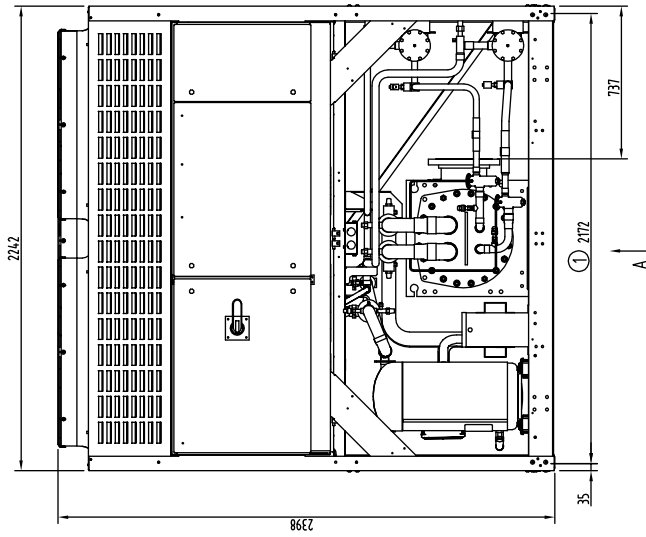
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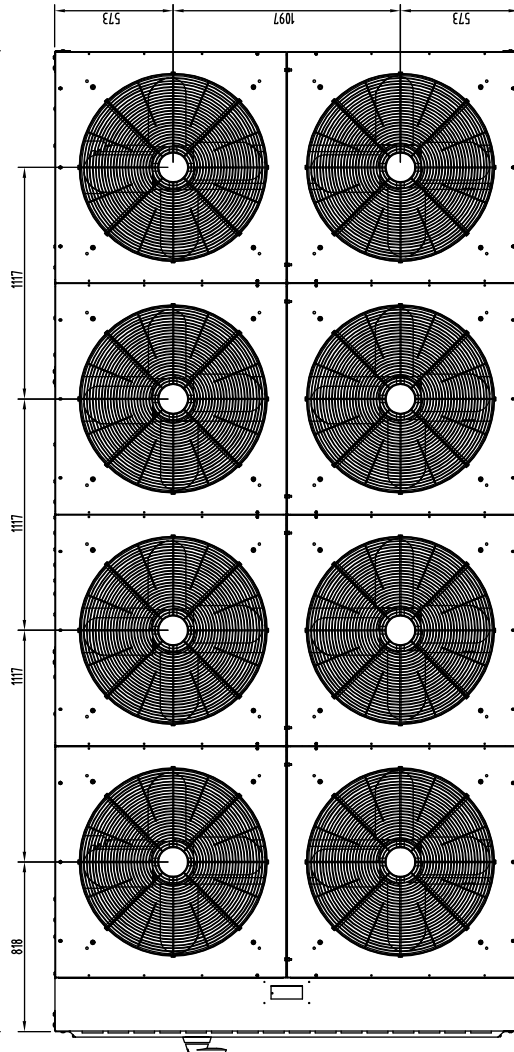
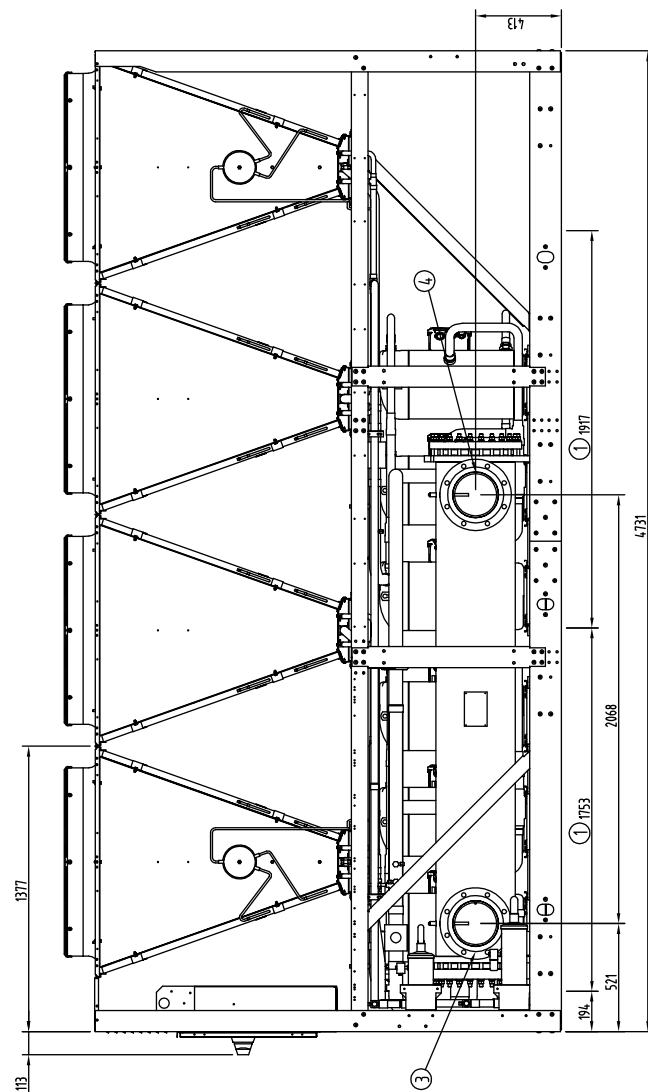
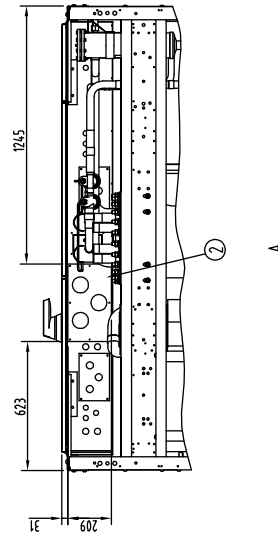
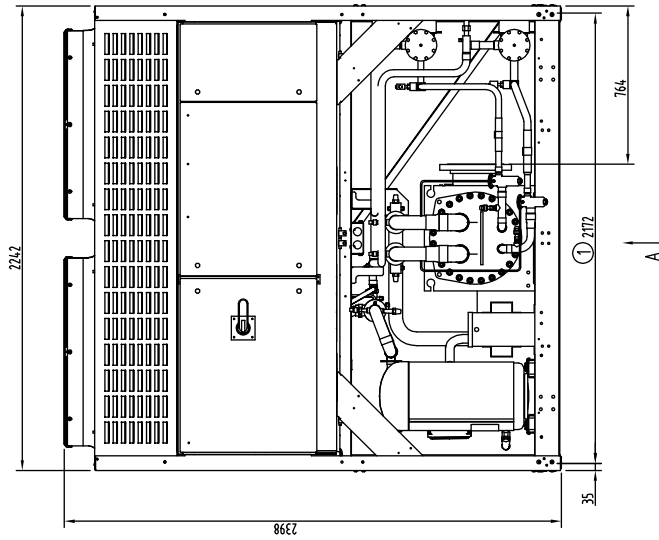
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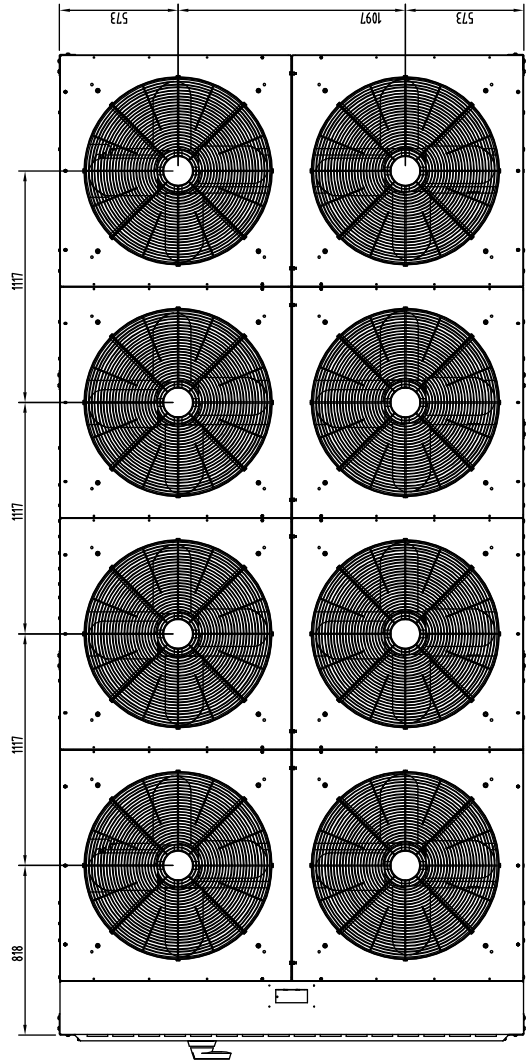
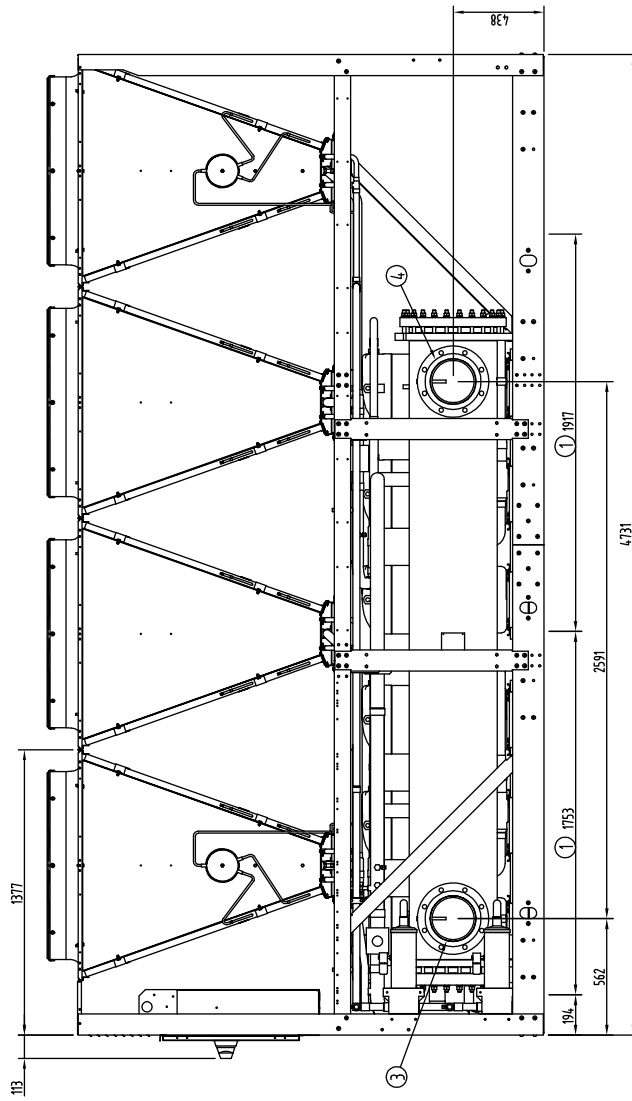
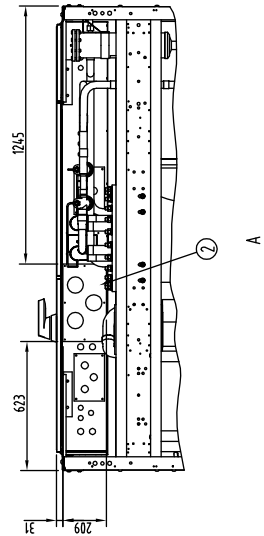
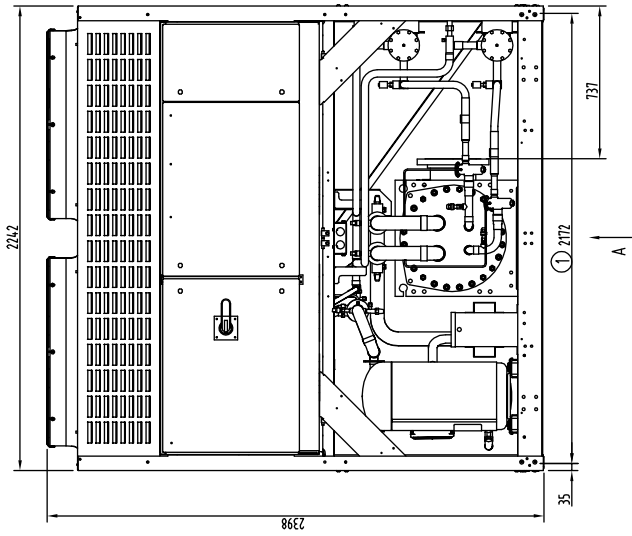
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Asia Centre of Engineering & Technology (CET): Hong Kong

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