

YGWE

# Water-cooled Screw Chiller



CAPACITY: 100 ~ 430TR



**2003**

**YEWS-C**

R22

DXS Compressor

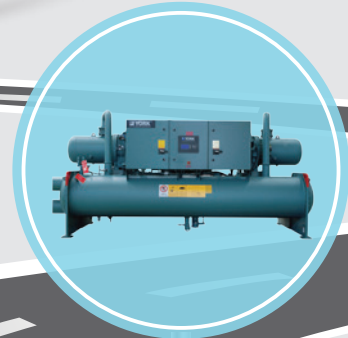


**2006**

**YEWS-D**

R134a

YFS Compressor



## INNOVATION

YEWS 15 years of innovation

- 2003 - YEWS debut
- 2006 - Apply R134a and new YFS compressor
- 2010 - Introduce highly efficient hybrid falling film evaporator
- 2014 - Tandem design to enlarge the capacity range
- 2018 - Brand NEW YGWE with NEW GT compressor



## EFFICIENCY

- Certified efficiency exceeds China level 2 and meets green building requirement
- Optimized motor and flow structure ensure high compressor efficiency
- Patented hybrid falling film evaporator delivers higher heat-exchange efficiency
- Advanced oil system design enables chiller operate stably and efficiently



## RELIABILITY

- Innovative design of rotor profile enhances reliable operation
- Wide operation fulfills various conditions and application needs
- Patented compressor dampening structure lowers the vibration and sound
- Rigorous qualification makes field operation more reliable

# YORK® High Efficiency Series

YGWE – the next generation of YORK® high efficiency water-cooled screw chiller applying the new GT compressor platform and built on the robust design and manufacturing experience will help the customers achieve valuable energy saving and green buildings.

**2010**

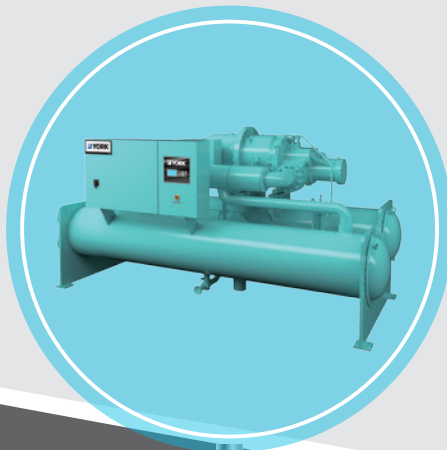
**YEWS-E**

Hybrid Falling  
Film Evaporator

**2014**

**YEWS-E Tandem**

Tandem Design  
260-415Ton



**2018**

**YGWE**

NEW GT  
Compressor



## SUSTAINABILITY

- Low R134a refrigerant charge protects the ozone layer
- Low power consumption achieves low carbon emission and contributes to green buildings

# Mechanical Specifications

## General

Each YORK® YGWE water-cooled screw chiller will be completely factory-packaged including evaporator, condenser, compressor, motor, touch-screen control center and all interconnecting unit piping and wiring. The chiller will be painted prior to shipment and will be packaged to protect the unit during shipment. Performance will be certified in accordance with AHRI Standard 550/590. The initial charge of refrigerant and oil will be supplied for each unit.

## Compressor

The new generation twin-screw, semi-hermetic compressor is highly efficient and reliable. The modular and compact design make the assembly and maintenance simple and easy.

Patented noise dampening structure design on slide valve improves compressor discharge pulsation transmission loss significantly and reduce chiller noise eventually.

The compressor housing is of grey iron which is optimized through Finite Element Analysis (FEA) and 100% qualified by pressure test. The rotors are manufactured from forged steel and use high efficiency profiles. The precise machining provides minimal clearance for the rotors and reduces the internal leakage significantly.

The compressor incorporates anti-friction bearings with SKF or FAG brand to reduce power and increase reliability. Cylindrical roller bearings to handle radial loads, point angular contact ball bearings to handle axial loads. An adequate supply of oil is available to the compressor at all times by advanced pressure-differential driven oil system.

The 3-phase asynchronous induction motor utilizes suction gas cooling. The motor design is optimized for better efficiency and adapted for wide application range. NTC sensors embedded in each phase winding can monitor motor temperature and provide effective protection for compressor operation.

## Heat Exchanger

**Condenser** – The refrigerant circuit water-cooled condenser is a cleanable shell and tube type heat exchanger with seamless external finned copper tubes rolled into tube plates. The design working pressure on the water side is 1MPa. The factory offers standard groove type water pipe connections. Meanwhile HG20615 flange type connections can be offered as an option. The refrigerant side has a safety valve with trip pressure of 2.07MPa. The condenser is manufactured and tested according to China National Standard GB151.

**Evaporator** – The evaporator utilizes a hybrid falling film design which contains a balance of flooded and falling film technology to optimize efficiency, minimize refrigerant charge,

and maintain reliable control. A specifically designed spray distributor provides uniform distribution of refrigerant over the entire length to yield optimum heat transfer. The hybrid falling film evaporator design has suction baffles around the sides and above the falling film section to prevent liquid refrigerant carryover into the compressor. A sight glass of 40mm diameter is also equipped on the shell side for refrigerant level observation. The design working pressure is 2.1MPa for shell and 1.0MPa for tube side. The refrigerant side has a safety valve with trip pressure of 2.07MPa. The refrigerant side is manufactured and tested according to China National Standard GB151. The evaporator shell is covered with 19mm closed-cell insulation. The factory offers groove type water pipe connections as standard. Meanwhile HG20615 flange type connections can be offered as an option. During the installation the contractor should furnish the insulation layer.

**Compact Water Box** – A removable Compact Water Box is fabricated from steel pipe with 1.0MPa design working pressure. Steel diaphragms are welded inside the water box as per the number of the flow pass. The factory offers groove type water pipe connections as standard. Meanwhile HG20615 flange type connections can be offered as an option. Vent and drain plugs are provided on each evaporator and condenser water box as standard.

## Capacity Control

The compressor slide valve modulates the capacity from 100% to 25% or 12.5% of the full load. The slide valve will be adjusted according to the system's load requirement.

## Oil System

The high efficient oil separation system provides adequate protection to the unit's compressor. It is equipped with an oil heater in oil sump to avoid refrigerant and oil mix when the chiller is not operating. During the chiller operation, the system operation pressure automatically transfers the oil in the oil sump back to the compressor. An oil filter is installed in the oil pipeline to prevent any particles from entering the compressor.

## Refrigerant System

Liquid line components include a manual shut-off valve, refrigerant recovery valve, moisture sight glass and orifice plate. Suction lines are covered with closed-cell insulation. The orifice of the refrigerant system automatically adjusts to the continuously changing pressure condition and modulates refrigerant flow to the evaporator accordingly.

The condenser shell is capable of storing the entire system refrigerant charge during servicing. The optional service valves need to be selected to facilitate removal of refrigerant charge from the system.

The unit is equipped with a suction strainer to prevent any foreign debris introduced to the system during maintenance or service to be allowed into the motor housing. Motors cooled by refrigerant is protected by means of filter or strainer to protect the motor and prolong motor life.

## Codes & Standards

YGW meets the following codes & standards:

- AHRI550/590 and 551/591
- GB25131-Safety requirements for water chillers (heat pumps) using the vapor compression cycle
- GB/T18430.1-Water chilling (heat pump) packages using the vapor compression cycle – part 1: Water chilling (heat pump) packages for industrial & commercial and similar application



## Isolation Mounting Pads

The four 3/4 inch (19.05 mm) thick neoprene pads are shipped loose, for field mounting under the heat exchanger foot supports. The pads are suitable for typical equipment rooms located on the ground floor.

## Factory Insulation of Evaporator

Factory-applied thermal insulation of the flexible, closed-cell plastic type, 3/4" (19mm) thick is attached with vapor-proof cement to the evaporator shell, flow chamber, evaporator tube sheets, suction connection, and (as necessary) to the auxiliary tubing. This insulation will normally prevent condensation in environments with relative humidity up to 75% and dry bulb temperatures ranging from 50° F to 90° F (10° C to 32° C). 1-1/2" (38mm) thick insulation is also available for relative humidity up to 90% and dry bulb temperatures ranging from 50° F to 90° F (10° C to 32° C).

## Flow Switch

The design working pressure of paddle type flow switch is 1.03MPa (Gauge). It is suitable for chilled liquid and condenser liquid pipes.

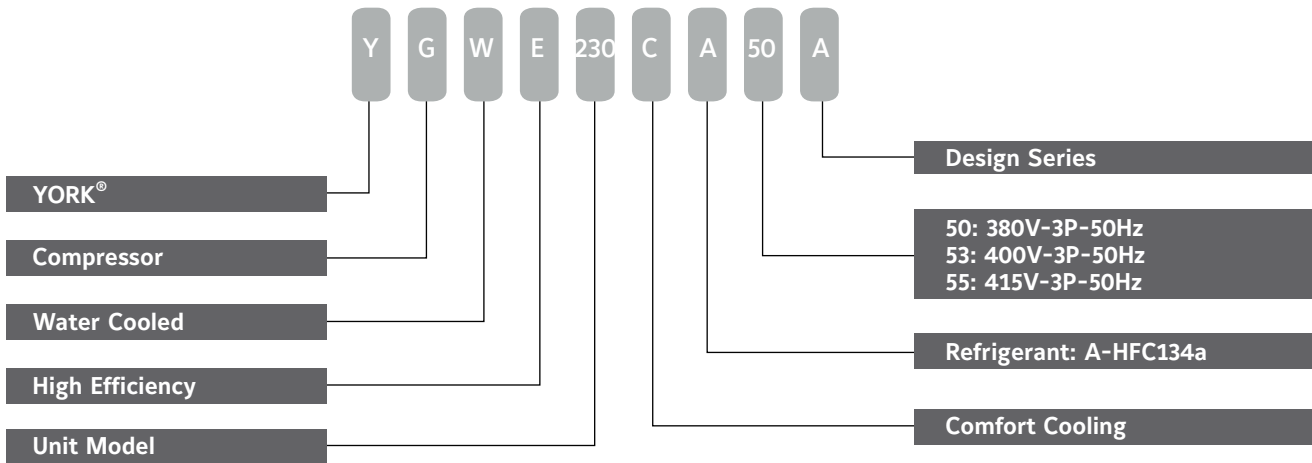
## Paint

The chiller surface is painted with anticorrosion and durable Caribbean blue epoxy primer and propionic acid one-component top coat.

## Shipment

Production covers are provided for the control center and controller on the unit. Plastic caps or fabrics cover plate are provided for all water pipe connectors.

# Nomenclature—YGWE230CA50A





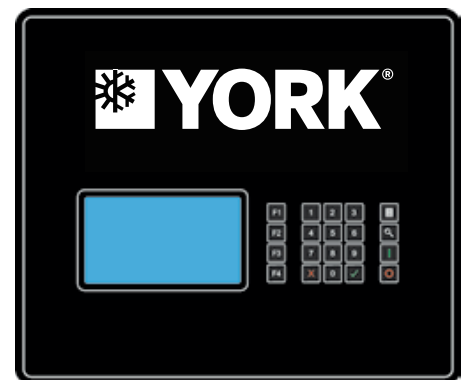


# Control Center

## Electronics

**Starter and Control Panel** – The unit comes equipped with unit mounted wye-delta starter and control panel. All wiring is completed and tested by the factory but does not include any field installation.

The painted galvanized steel panel enclosure is designed and meets the need of IP22 protection. The control panel is divided into a power section and a control section. Power and control sections have separated hinged, latched and gasket sealed doors. The power panel is a single power connection. Each power compartment contains compressor starting contractors, control circuit serving compressor capacity control, compressor contractor coils and compressor motor overloads. The compressor motor overloads contain current transformers as an input to the microprocessor Compressor power supply protection modular protects high input voltage, low input voltage, phase reversal and lack of phase. The control section contains key pad, HML and microprocessor board.



**Microprocessor and display** – The user can program and modify set points as well as general using the keypad. Additional changes such as cut-outs for low suction pressure, high discharge pressure, high oil temperature or high discharge pressure unloading set points and compressor motor current percent limit require a password.

Through standard RS485 interface, the microprocessor can be connected to any Building Management System via MODBUS Protocol.

## Chiller Control Center

- Available display languages are Chinese and English
- Chilled liquid entering and leaving temperature
- Condenser liquid entering and leaving temperature
- Day, date and time, daily start/stop time, holiday and manual override status
- Compressor operating hours and starts
- Compressor run status
- System suction and oil pressure
- Up to 10 records for shut downs due to faults
- Compressor motor current
- Load limit set points for high discharge pressure and high motor current
- Anti-recycle timer counting the timing of the next compressor start
- Percent of full load compressor motor current
- Cut-out status and set-points for entering chilled liquid
- Discharge pressure and temperature

# Options

## Spring Isolators

The unit comes with four lose 19mm thick anti-vibration neoprene pads as standard for field installation. When the unit is installed on the floor, Spring Isolators are recommended to replace the standard neoprene pads. 4 level adjustable Spring Isolators with non-slip mat will be delivered lose and can be conveniently mounted under the tube sheet.

## Left/Right Pipe Connection

Left or right piping connection can be chosen according to specific project requirement for easy installation.

## Thicker Evaporator Insulation

The 38mm thicker insulation is an option in case of relative humidity up to 90% and dry bulb temperatures ranging from 10 to 32°C. It is recommended for low temperature or high humidity areas and helps to avoid the sweat on the surface of the unit.

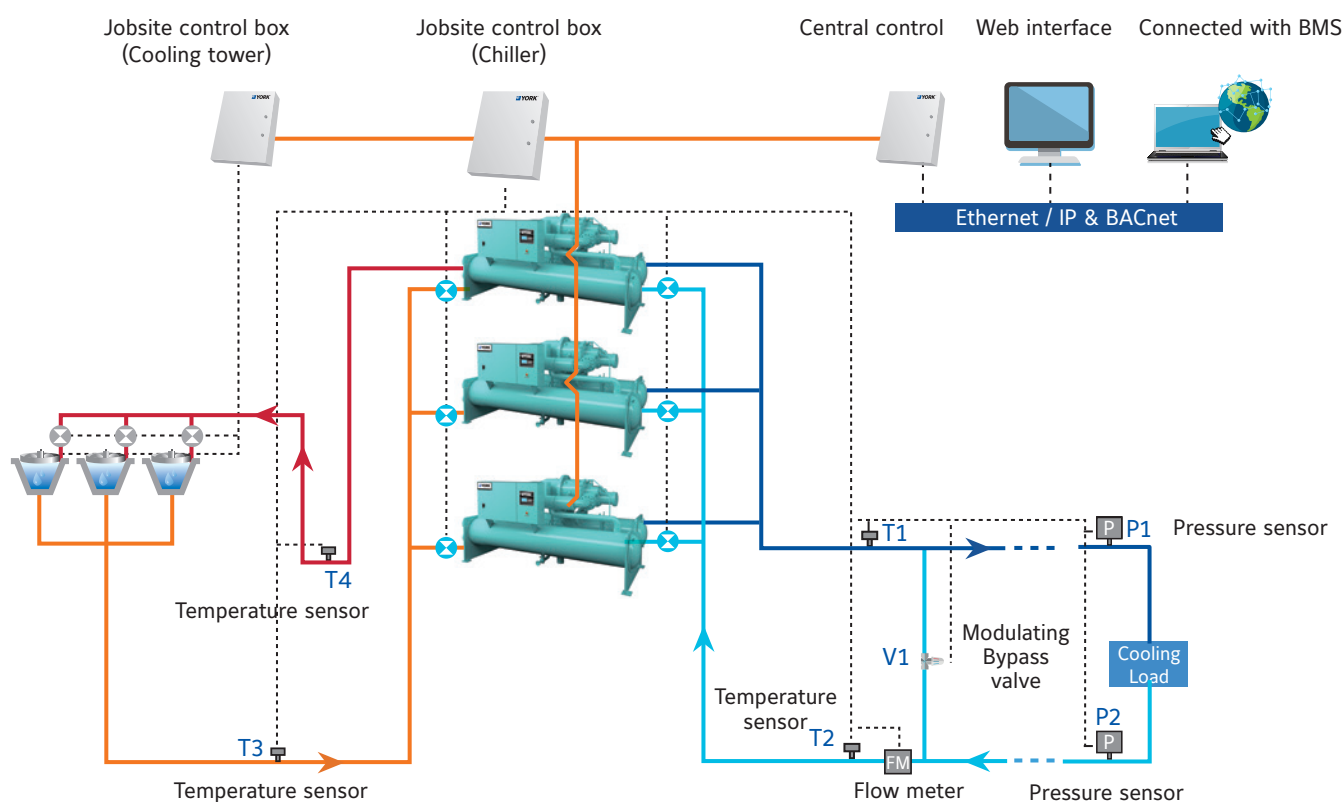
## Refrigerant Isolation Valve

The condenser shell is capable of storing the entire system refrigerant charge during servicing if the unit is equipped with the optional isolation valve.

## Refrigerant Storage / Recycling System

A refrigerant storage/recycling system is a self-contained package consisting of a refrigerant compressor with oil separator, storage receiver, water-cooled condenser, filter drier and necessary valves and hoses to remove, replace and distill refrigerant. All necessary controls and safety devices are a permanent part of the system. Typically not required if unit isolation valves are provided.

## Central Control System



# Technical Data

## Chiller Performance Data

Model	Capacity		Power	COP	FLA	Full load Consulation Index	Evaporator				Condenser			
	TR	kW	kW	kW/kW	A	kW/TR	Pass	Flow rate l/s	Piping Dimension mm	Pressure Dorp kPa	Pass	Flow rate l/s	Piping Dimension mm	Pressure Dorp kPa
YGWE100	102.6	360.8	67.02	5.386	111	0.6530	3	15.47	100	47.8	2	19.89	100	28.1
YGWE130	127.0	446.6	82.37	5.421	134	0.6488	2	19.13	125	37.4	2	24.58	100	74.1
YGWE170	165.7	582.7	103.6	5.621	182	0.6257	2	24.97	125	42.4	2	31.85	125	46.6
YGWE200	200.9	706.5	125.7	5.619	214	0.6259	2	30.28	150	47.5	2	38.63	150	38.3
YGWE230	228.3	802.9	142.9	5.617	239	0.6261	2	34.40	150	77.7	2	43.96	150	79.5
YGWE270	270.0	949.5	168.8	5.625	283	0.6252	2	40.70	150	76.8	2	51.92	150	77.4
YGWE310	311.6	1096	186.1	5.890	310	0.5971	2	46.97	150	73.5	2	59.59	200	77.7
YGWE355	353.3	1243	207.7	5.982	347	0.5879	2	53.25	150	76.5	2	67.41	200	81.9
YGWE390	387.0	1361	227.8	5.975	212/180	0.5886	2	58.32	200	70.2	2	73.71	200	76.8
YGWE430	426.0	1498	250.8	5.973	212/212	0.5888	2	64.20	200	65.8	2	81.14	200	81.3

- Note:
1. Chilled liquid leaving temperature 44F, entering temperature 54F, fouling factor 0.0001000h-ft<sup>2</sup>-F/Btu
  2. Condenser liquid entering temperature 85F, leaving temperature 94.3F, fouling factor 0.000250h-ft<sup>2</sup>-F/Btu
  3. The above data is based on Johnson Control's selection software: AECworks9.20. Please refer to the latest version of the software for specific projects.

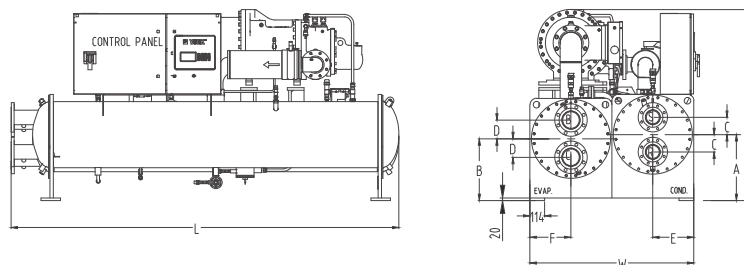
## Physical Data

Model	Refrigerant Ciriut	Compressor Qty	Capacity Control%	Refrigerant Charge (kg)	Oil Charge (L)	Weight	
						Shipping Weight (kg)	Operating Weight (kg)
YGWE100	1	1	25-100%	100	17	2586	2787
YGWE130	1	1	25-100%	110	30	3300	3506
YGWE170	1	1	25-100%	120	30	3630	3927
YGWE200	1	1	25-100%	140	30	3900	4262
YGWE230	1	1	25-100%	200	35	5081	5493
YGWE270	1	1	25-100%	200	35	5168	5630
YGWE310	1	1	25-100%	280	40	6010	6624
YGWE355	1	1	25-100%	280	40	6090	6750
YGWE390	1	2	12.5-100%	310	40	7006	7786
YGWE430	1	2	12.5-100%	320	40	7500	8324

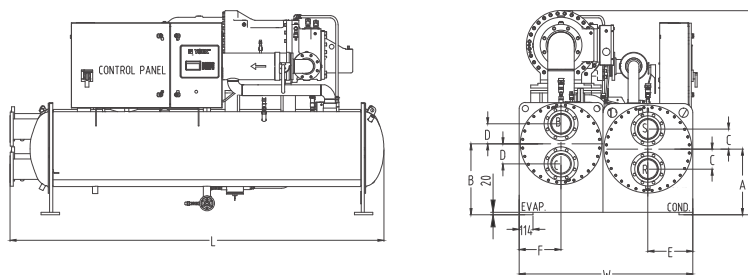


# Dimensions

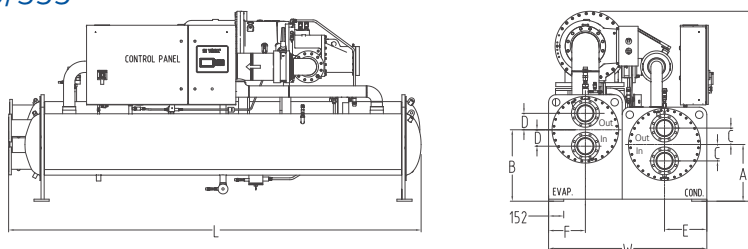
## YGWE 100/130



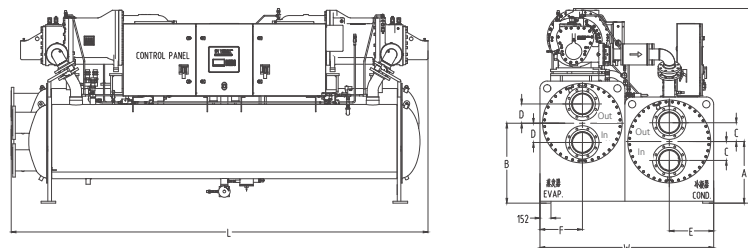
## YGWE 170/200



## YGWE 230/270/310/355

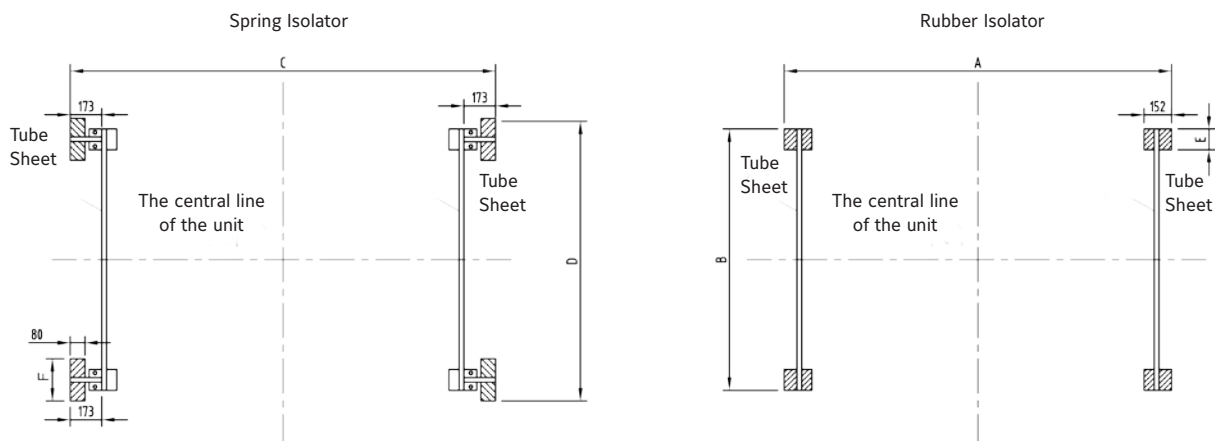


## YGWE 390/430



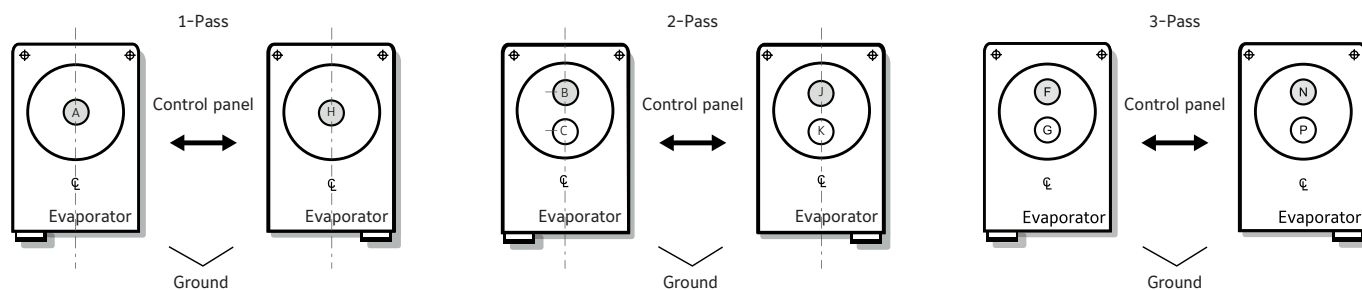
Model	L(mm)	W(mm)	H(mm)	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)
YGWE100	2427	1280	1483	515	483	135	145	320	320
YGWE130	3032	1280	1492	515	483	135	145	320	320
YGWE170	3055	1350	1654	540	583	155	145	345	330
YGWE200	3065	1430	1679	540	583	165	165	370	345
YGWE230	4144	1590	1908	570	718	165	165	425	370
YGWE270	4144	1590	1908	570	718	165	165	425	370
YGWE310	4206	1680	2003	640	788	200	170	445	395
YGWE355	4206	1680	2003	640	788	200	170	445	395
YGWE390	4256	1750	2017	638	195	180	460	415	395
YGWE430	4320	1800	2017	638	195	200	460	440	395

## Isolator Floor Layout



Model	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)
YGWE100	2126	1280	2332	1366	114	200
YGWE130	2731	1280	2937	1366	114	200
YGWE170	2731	1350	2937	1436	114	200
YGWE200	2731	1430	2937	1516	114	200
YGWE230	3798	1590	4004	1668	152	230
YGWE270	3798	1590	4004	1668	152	230
YGWE310	3798	1680	4004	1758	152	230
YGWE355	3798	1680	4004	1758	152	230
YGWE390	3798	1750	4004	1828	230	230
YGWE430	3798	1800	4004	1878	230	230

## Evaporator Water Pipe Connection



Pipe configuration		
pass	Evaporator	
	Entering water	Leaving water
1	A	H
	H	A

Pipe configuration		
pass	Evaporator	
	Entering water	Leaving water
2	C	B
	K	J

Pipe configuration		
pass	Evaporator	
	Entering water	Leaving water
3	G	N
	P	F



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