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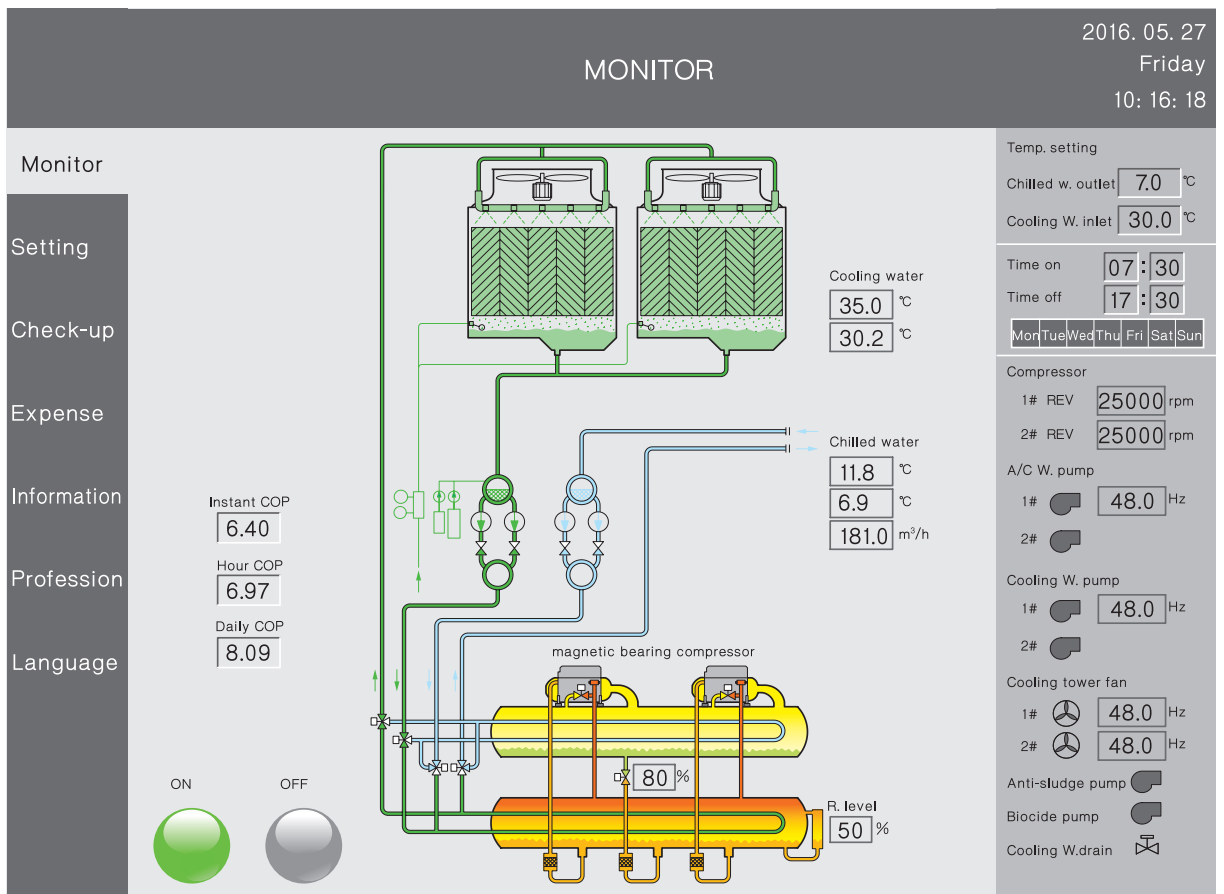
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Supply Scope

Products	Category	Item	Remarks
Chiller	Chiller	Heat exchanger	Include condenser, evaporator (cold insulation included)
		Compressor	Magnetic bearing, VFD centrifugal type ,oil free operation
		Throttling valve set	Include electronic expansion valve, drying filter, shut-off valve, regulating valve
		Check valve	Prevent refrigerant vapor flow-back to protect compressor
		Motor cooling device	Include drying filter, control valve set etc
	Control system	Low voltage control cabinet	Include low voltage electric parts, control board, PLC, etc
		Power control cabinet	Includes switch gear, instant, reactor etc
		Touch screen	For operation
		External control elements	Include temperature & pressure sensors, flow switches, solution level probes and actuators
		BMS interface (optional)	Connect to BMS system through dry contact or serial communication
Refrigerant	R134a	Used for cooling	
Pumpset system	Pumpset	A/C water pump	Two units
		Cooling water pump	Two units
		Accessories	Include zero resistance filter, check valve, soft connectors, valves and vibration isolator etc
		Piping *	Include all piping between pumpset and chiller
		Piping accessories	Include flow switches, auto air vent & its socket, soft connectors
		Motor drain valve	When water quality becomes poor, this valve automatically drains the cooling water. It also drains cooling water automatically in winter to avoid freeze
		A/C W. flowmeter	For precise management of chiller load and efficiency
		Water softener	Improve A/C water and cooling water quality
		Auto dosing device	Automatically charge biocide corrosion inhibitor and anti-sludge to the cooling water
		Pumpset control cabinet	Include inverters for A/C W. pump, cooling W. pump, cooling fan soft starter, low voltage electric parts, etc
		Electric wiring *	Include wires, cables, cable conduit, cable supporters, etc.
Option	Enclosure	Enclosure	Include stainless steel panel, roof cover, structural frame, baseframe, as well as accessories

Notes: 1. * only for standard size. Special offer is available

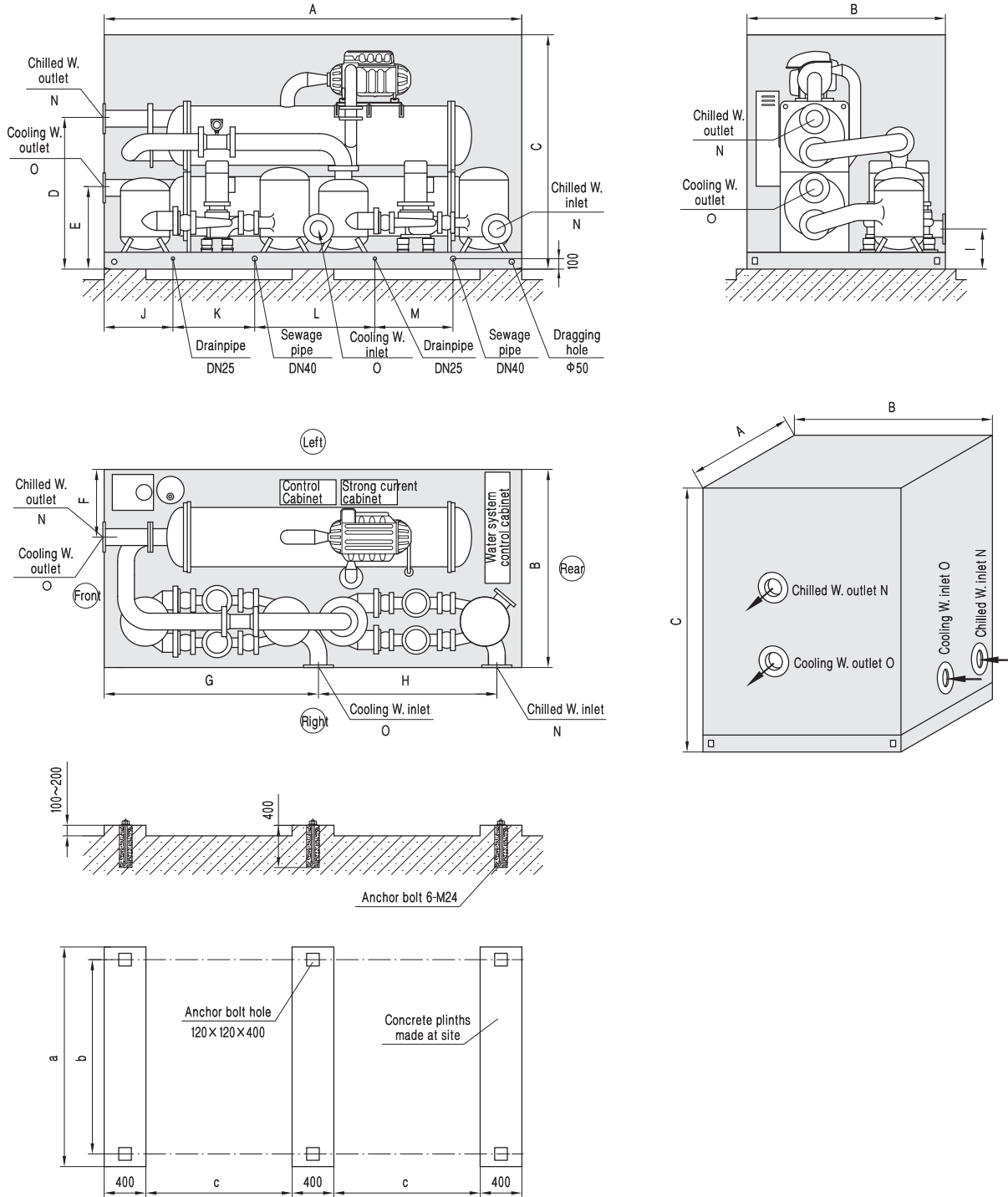
2. If the customer does not order cooling tower, a control signal linkage to cooling fan will be provided



DESIGN & CONSTRUCTION TIPS

Dimensions

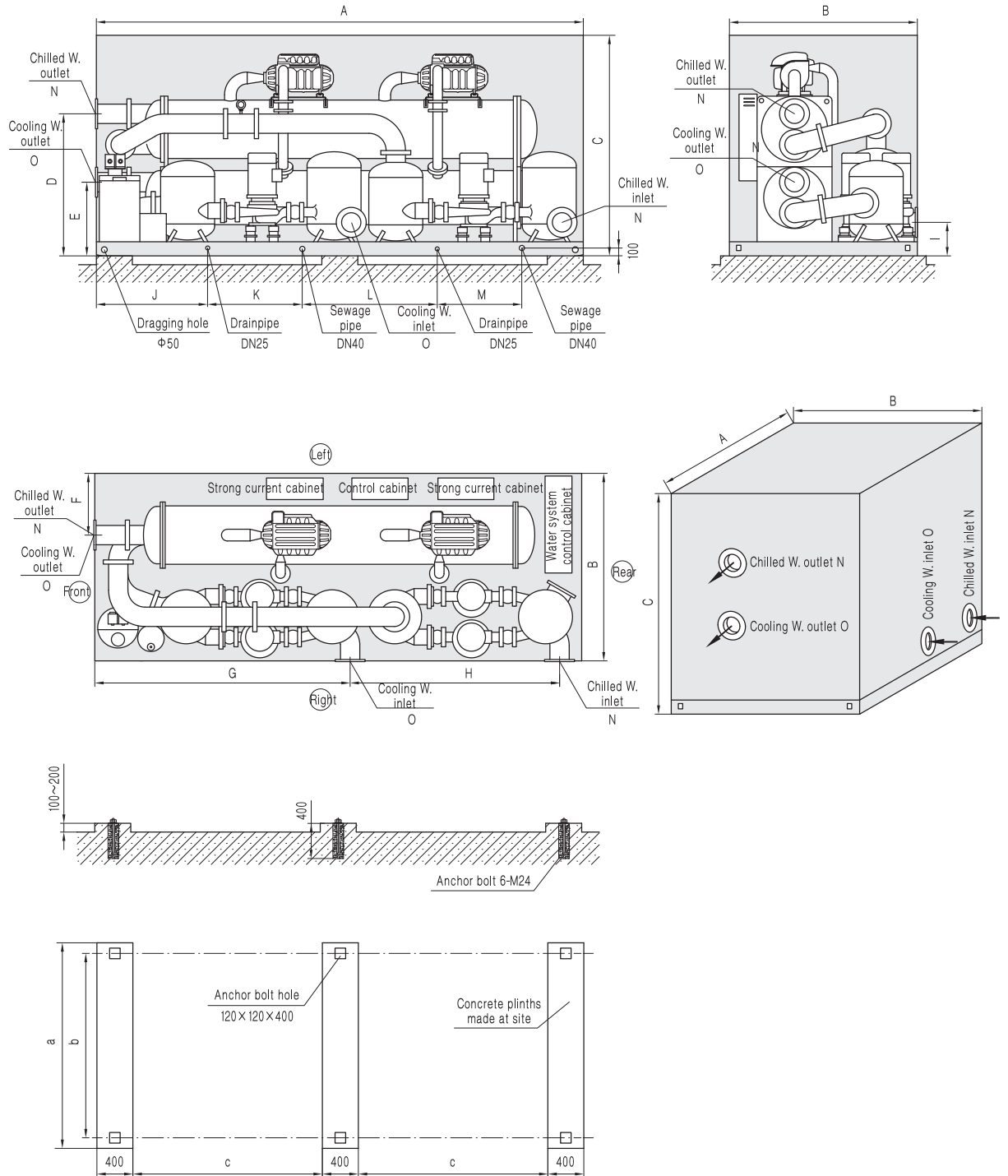
CY45 / CY60



Model	A	B	C	D	E	F	G	H	I
CY45	3960	1880	2360	1435	780	640	1825	1895	380
CY60	4220	2130	2660	1695	800	710	1885	2120	420

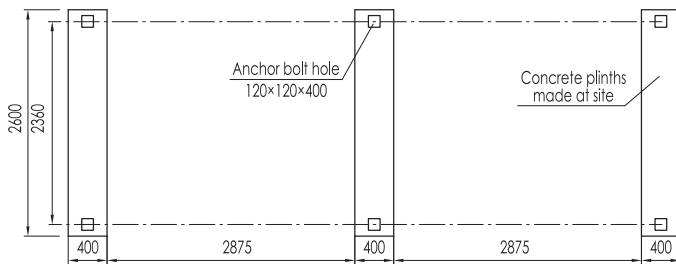
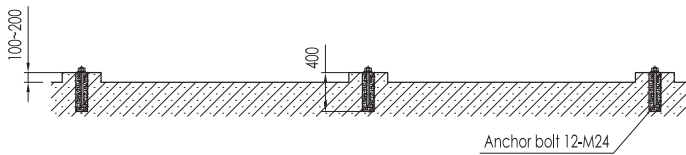
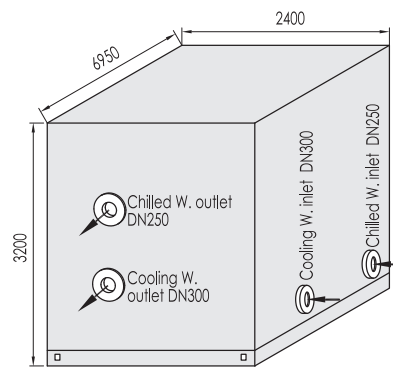
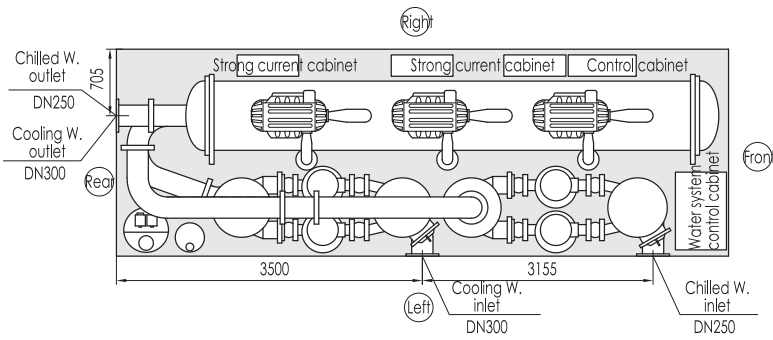
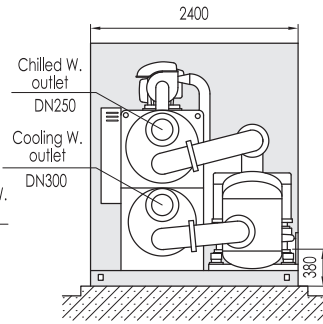
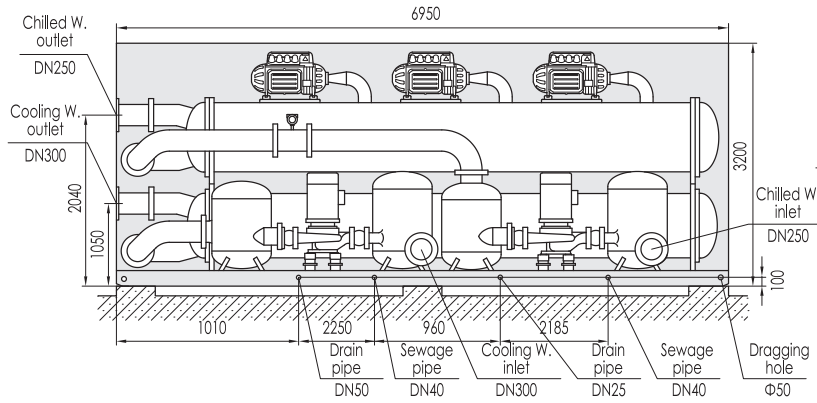
Model	J	K	L	M	N	O	a	b	c
CY45	765	645	1090	935	DN150	DN150	2080	1840	1380
CY60	800	640	1170	935	DN150	DN150	2330	2090	1510

CY90 / CY120

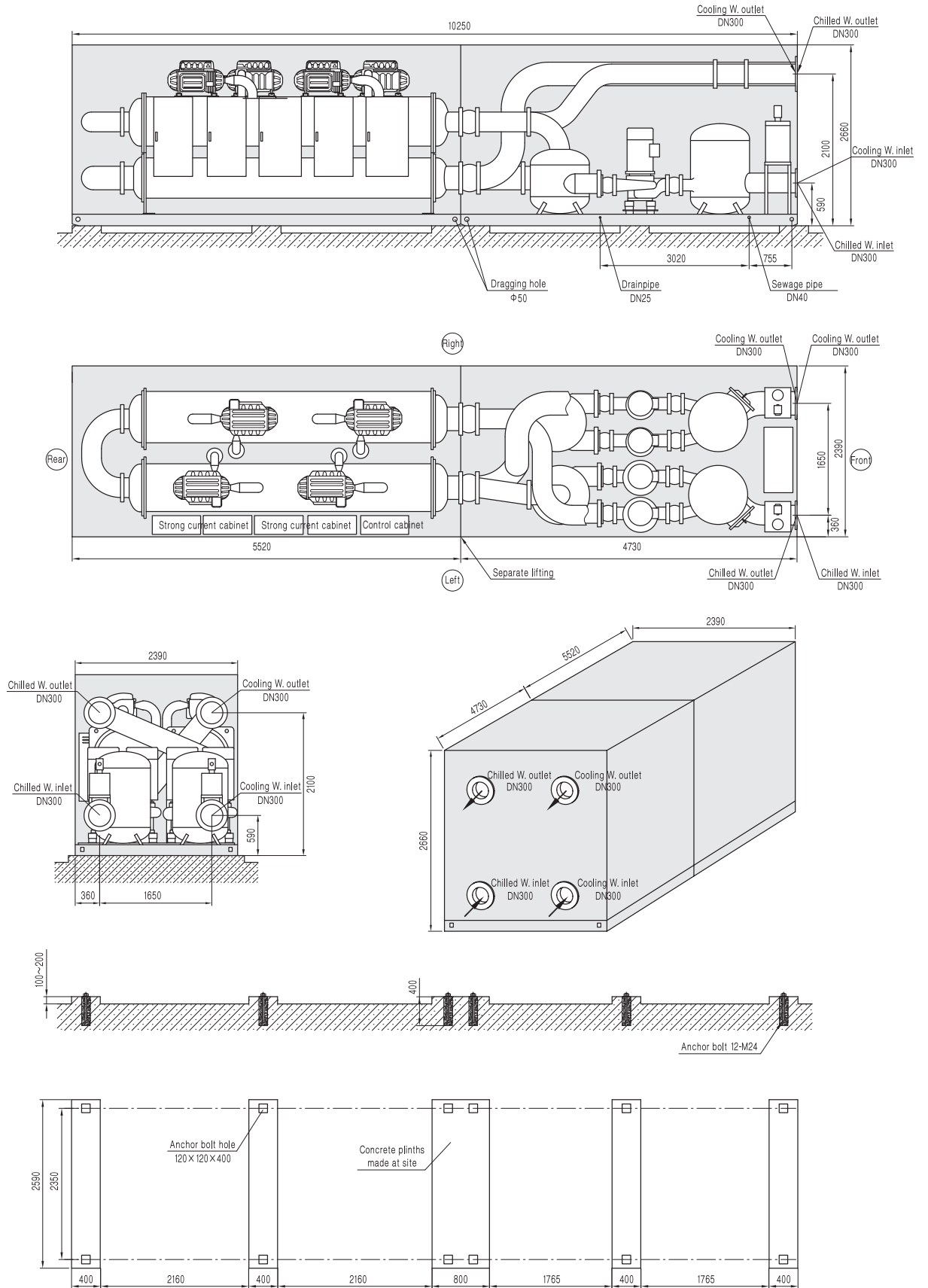


Model	A	B	C	D	E	F	G	H	I
CY90	5520	2130	2660	1610	840	705	2880	2590	380
CY120	5780	2130	2660	1640	790	665	2925	2530	380
Model	J	K	L	M	N	O	a	b	c
CY90	1625	645	1520	935	DN200	DN200	2330	2090	2160
CY120	1585	645	1670	935	DN200	DN200	2330	2090	2290

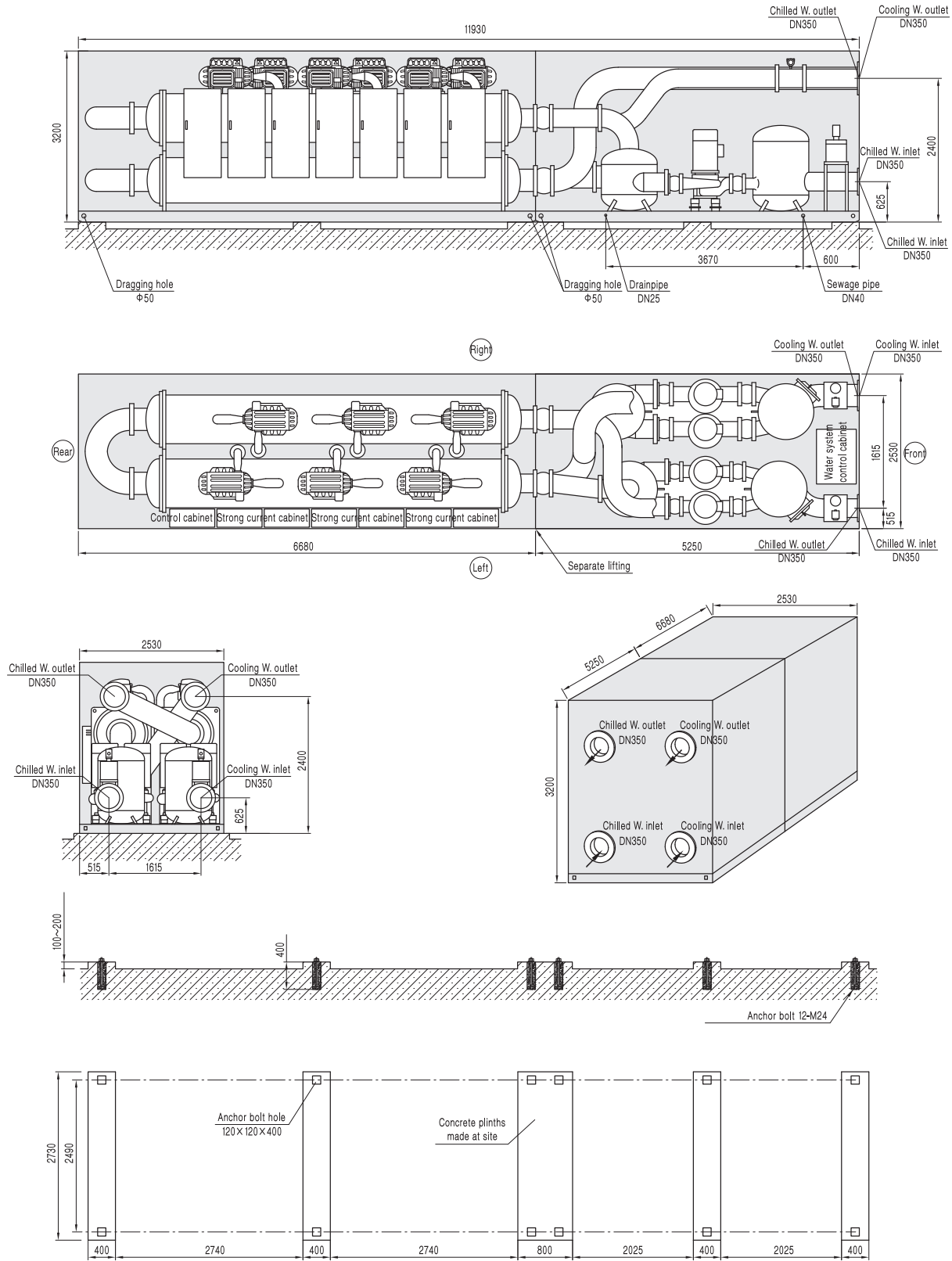
CY180



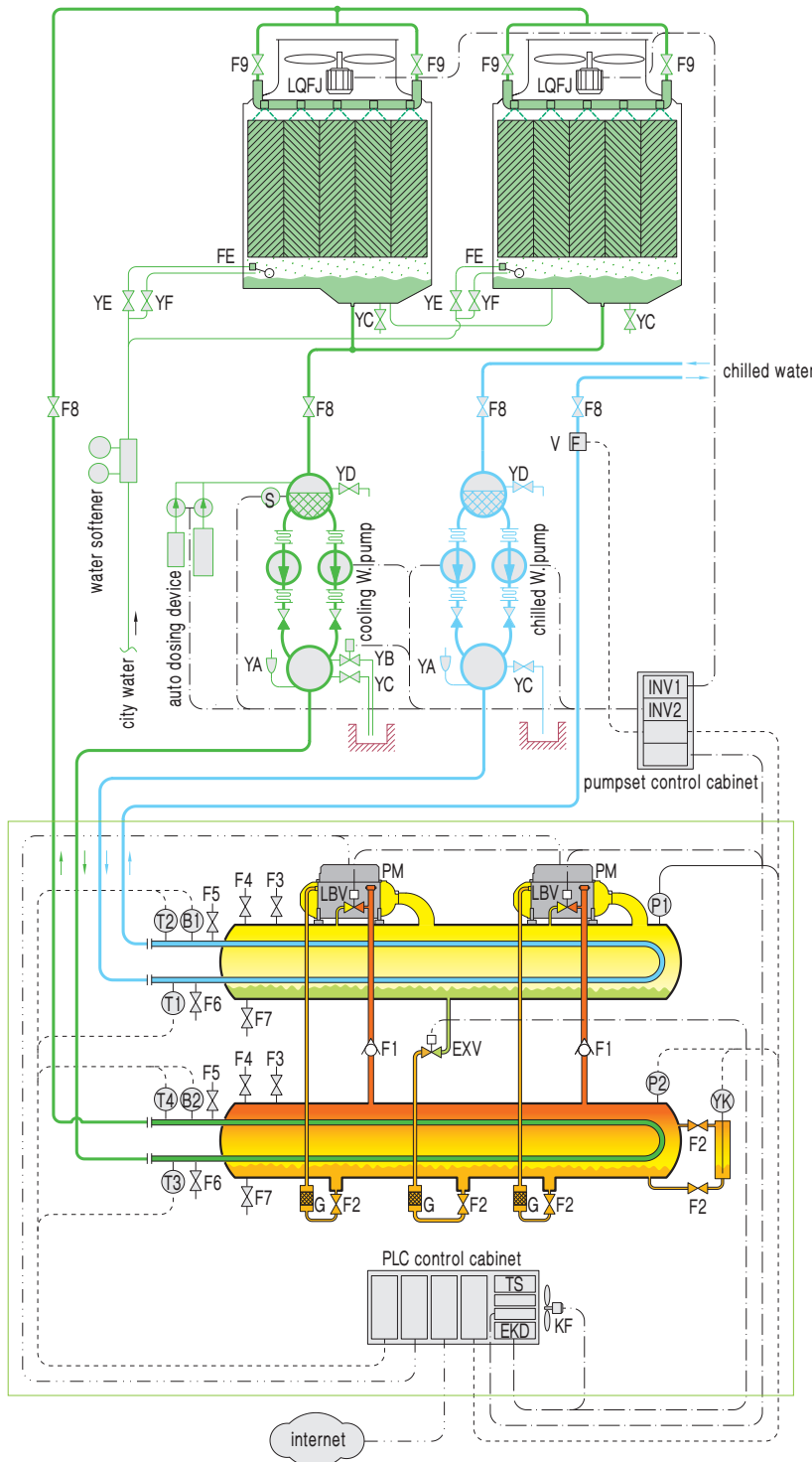
CY240



CY360



P&I Diagram



Control devices:

- EKD electronic throttle valve controller
- INV1 cooling tower fan inverter
- INV2 cooling water pump inverter
- PLC Programmable Logic Controller
- TS Touch screen

Controlled objects:

- EXV electronic throttle valve
- KF control cabinet fan
- LBV load balancing valve
- LQFJ cooling tower fan
- PM compressor
- YB motor drain valve

Sensors:

- T1 chilled W. inlet temp. sensor
- T2 chilled W. outlet temp. sensor
- T3 cooling W. inlet temp. sensor
- T4 cooling W. outlet temp. sensor
- B1 chilled W. flow switch
- B2 cooling W. flow switch
- P1 evaporation pressure sensor
- P2 condensation pressure sensor
- S conductivity sensor
- V A/C W. flowmeter

Others:

- F1 check valve
- F2 shutoff valve
- F3 safety valve
- F4 purge valve
- F5 vent valve
- F6 drain valve
- F7 refrigerant discharge valve
- F8 shutoff valve
- F9 balance valve
- FE auto water makeup valve
- YA auto vent valve
- YC manual drain valve
- YD pollution discharge valve
- YE water makeup valve
- YF manual water makeup valve
- YK level probe
- G dry filter

Notes:

1. Chiller scope
2. Line type:
 - actuator signal output
 - sensor signal input
 - communication

Scope of Supply / Work

Category	Item	producer	Customer	Remarks
Transportation & Location	Factory to port		✓	producer can arrange transportation upon request
	Jobsite settlement (eg. positioning)		✓	producer provides guidance
Electric engineering	Power supply to enclosure		✓	3 phase, 4 wires
	Internet connection	✓		Network cable to the enclosure is to be provided by customer
	Grounding		✓	
Construction & Installation	Foundation		✓	
	Pipe connection between chiller and pumpset for order with pumpset	✓		A crane must be provided by customer
	External piping installation		✓	Include chilled water pipes, water make-up and drain pipes
	Chiller cold insulation and chilled water pumps cold insulation	✓		Factory-mounted
	Piping cold insulation in enclosure	✓		For order with pumpset
	Pipeline cold insulation		✓	
	Anti-freezing		✓	Water anti-freeze treatment is recommended when the ambient temp. is below 0°C
Commissioning	Jobsite chiller commissioning	✓		Customer provides energy and air conditioning load
Operation & Maintenance	Operator training on site	✓	✓	producer provides free professional site training; the customer pays the accommodations and transportation for producer engineer
	Regular maintenance	✓		Service contract can be signed after the warranty period

Machine Room Construction

Machine Room

producer Packaged Power-efficient Chiller can be placed outdoor directly, no additional construction of machine room. Make the foundation in accordance with the drawings

Foundation

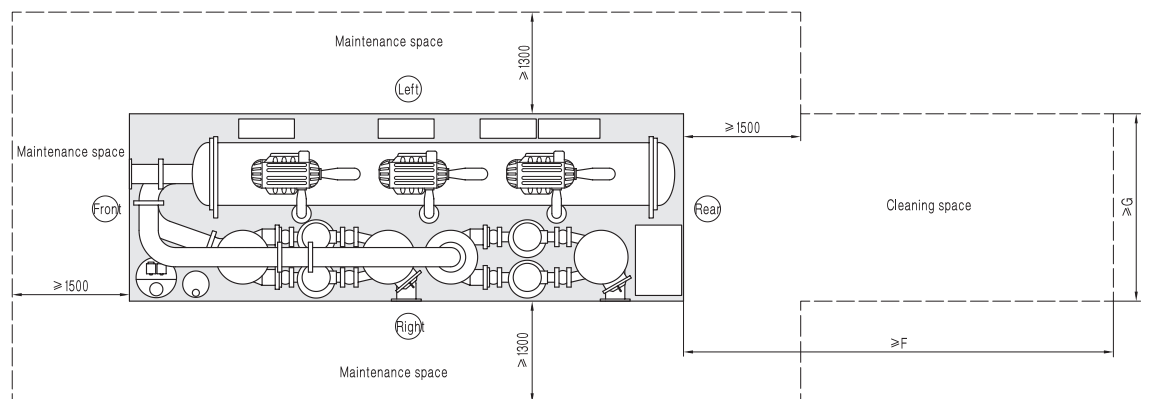
- Please refer to dimension drawings for plinth dimensions
- Load capacity:
 - ①The machine room foundation load is recommended as 1.5 times of the operation weight
 - ②Make sure that the foundation is level without sinking or overload (for rooftop installation)
 - ③Chiller load should be evenly distributed on the contact surface between the frame base rolling steel and the plinth
- Anchor bolts:
 - ①Anchor bolts must be pre-installed in foundation per dimension drawings
 - ②Place the chiller on the foundation directly and fix it with anchor bolts

Machine room built by customer

- Ventilation: poor ventilation leads to high humidity in the machine room, which may erode the unit. Please ventilate 3 times machine rooms every hour
- Drainage:
 - ①Chiller foundation must be on a high level in the machine room
 - ②All discharge pipes and drainpipes must be visible above the drainage
 - ③Machine room in basement must be built above a water ditch, which is equipped with an auto level-controlled submerged pump
- Temperature:

Machine room temperature must be controlled within 5~43°C. Lower temperature may crack heat exchange tubes and water box when the chiller is shut off. Higher temperature may damage electrical components. Thermometer and over temperature alarm must be installed in machine room
- Humidity:

Machine room humidity must be lower than 85%. Higher humidity may impair insulation of electrical components
- See maintenance space requirements as below:

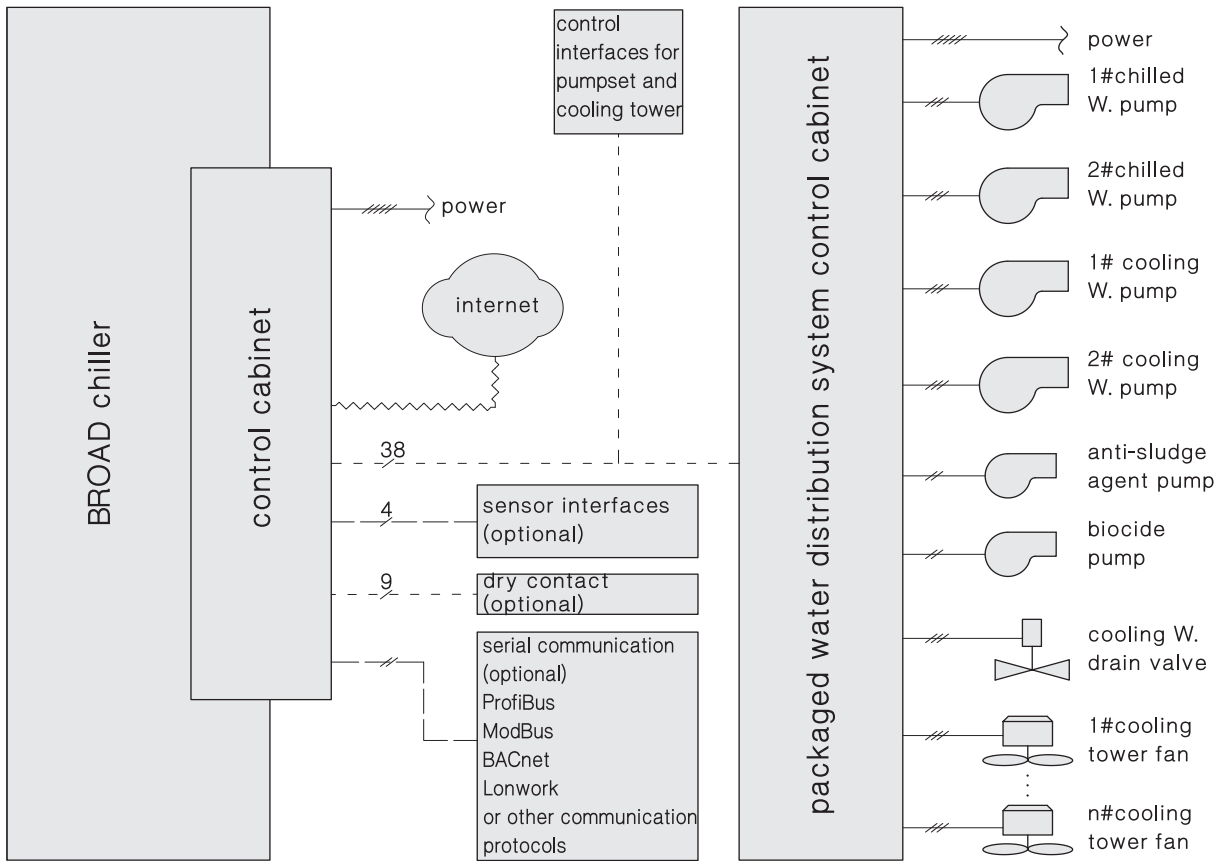


Model	CY45	CY60	CY90	CY120	CY180	CY240	CY360
F	3000	3000	4500	4500	5500	4500	5500
G	1880	2130	2130	2130	2400	2260	2400

Notes:

1. F, G is the space for tube service clearance. It could be the space of water pumps, doors or windows and also can be shared by two chillers.
2. The checking and washing work can be done by removing flexible joint and water cover in the front of chiller without dismantling pipeline system.
3. If the machine room is smaller than the above size, please contact with producer for a solution.
4. It is recommended that the height of the machine room be 500mm higher than that of chillers.

Control System



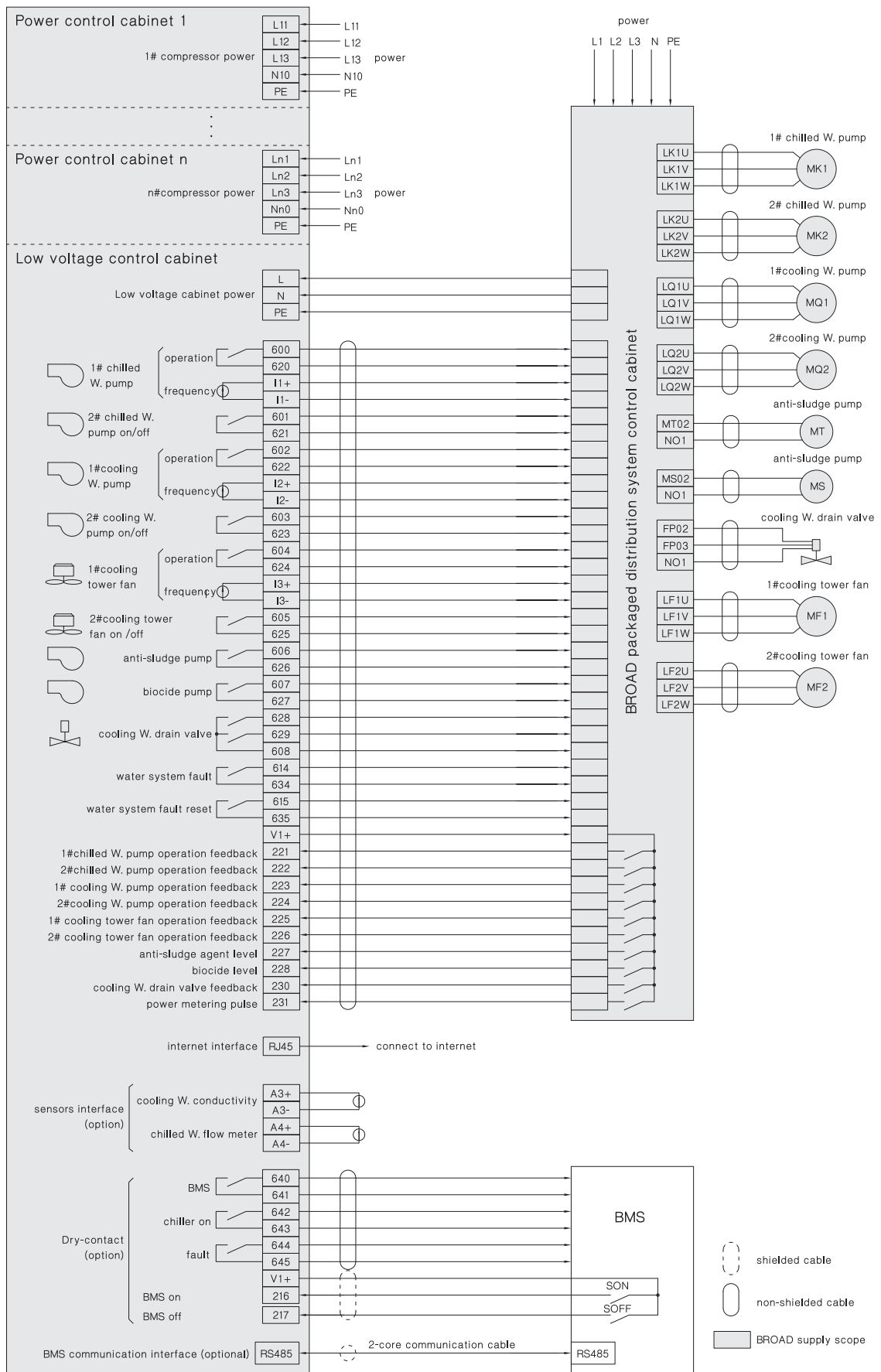
Notes:

1. producer packaged chiller control system includes interfaces for chiller / pumpset / cooling tower fan / internet / BMS etc
2. Pumpset and cooling tower control interface and water distribution system control cabinet are supplied with pumpset
3. BMS control interface includes Serial Communication and Dry Contact options. Serial Communication interface can be ModBus / ProfiBus / BACnet or Lonwork
4. Only control interfaces will be provided to customers who only order chiller without pumpset and cooling tower

cable:

- power cable —————
- control wire - - - - -
- communication cable - - - - -
- internet connection ~~~~~

Exterior Wiring Diagram



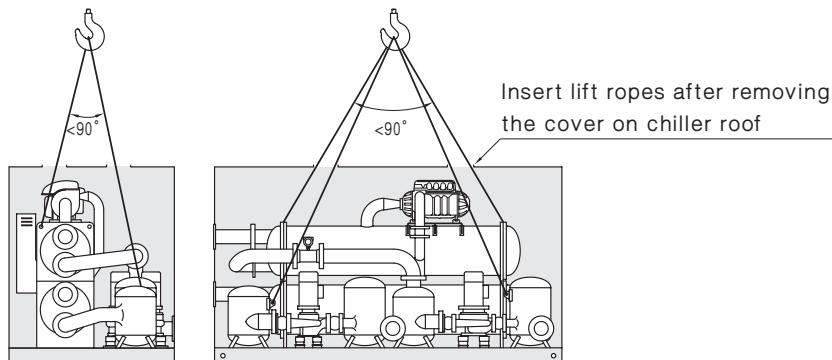
Notes:

1. Instead of a control cabinet, only control interfaces will be provided to customers who only order chiller without pumpset and cooling tower
2. DC4-20mA signal is provided for frequency control and sensors

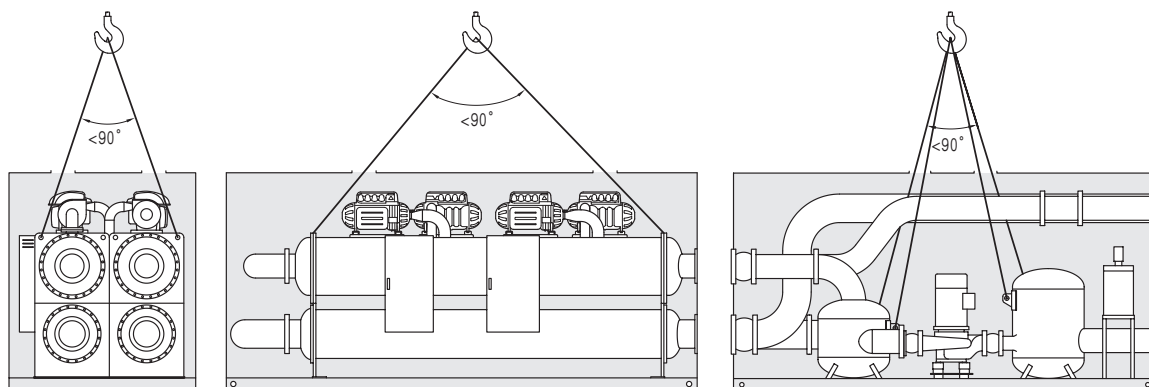
Lifting & Leveling Tips

1. Before the chiller is positioned, concrete foundation plinths must be molded and leveled. The level degree is $<1.5\%$, height of foundation is 100~200mm. Then fix the chiller with anchor bolts on the foundation.
2. Lifting must be done by qualified lifting companies that are properly insured.
3. The crane must be supported by crossties and firm foundation to avoid sinking. Check the crane steel ropes and hooks before lifting to prevent any accident. The lifting intersection angle must be less than 90° . It is strictly prohibited to lift the chiller with a single steel rope. When the chiller is lifted 20mm above the carriage or the ground, it should be kept for a little while. Lift the chiller slowly if everything is fine.
4. If limited by loading height, loading angle or machine room access, the professional lifting company must make special plan with producer team together to avoid any risk.
5. The landing of the chiller must be with care. Crash landing is strictly forbidden.
6. When moving the chiller, only round steels or thick steel tubes can be used as rollers instead of wooden sticks.
7. Only drag the dragging hole on the rolling steel. Do not place forces on other part of the chiller. Lift the unit first with jacks under the rolling steel before rigging.
8. After chiller positioning, please adjust leveling and lay thin steel plate where it is uneven to guarantee compact contact between the chiller and base. Take tube sheet as the leveling point and make front/rear and left/right leveling (check level height of every part by acrylic tube). It should be leveled within 1% both lengthwise and sidewise. Leveling must be done within 2 hours after locating the chiller; otherwise the chiller base will be damaged.
9. The chiller must be located levelly and its steel frame bases must match the plinth, the weight of the chiller must be evenly balanced on the plinth.
10. The chiller should be protected by full time personnel during transportation & installation. No access allowed for unauthorized persons. Valves of the chiller are forbidden to be screwed. If the machine room is still under construction, precautions are essential to avoid chiller get damaged or dirty. No scraping the paint or insulation layer.

Sketch of lifting



CY45/60/90/120/180 lifting sketch



CY240/360 chiller lifting sketch

CY240/360 pumpset lifting sketch

List of Control System Installation

Item	Object	Installation position and requirement	Material	Source	producer scope	Customer scope
Chiller	Chiller power	Chiller control cabinet and water system	5-core cable	Customer	/	Cable installation and wiring inside chiller control cabinet
	Touch screen	Built-in	/	producer	/	/
	Ambient temperature sensor	Ventilation and avoid direct sunlight	3-core shielded cable (10m standard suppl)	producer	Wiring inside chiller control cabinet	Temperature sensor installation and cable installation
	Network monitor	Built-in	Network cable	Customer	Wiring inside chiller control cabinet	Cable installation Wiring at building side
	BMS interface (optional)	Chiller control cabinet	Communication cable (for serial communication), 11-core cable (for dry contact)	Customer	Wiring inside chiller control cabinet	Cable installation wiring at building side
	Chiller and pumpset grounding	Grounding resistance $\leq 4\Omega$	Grounding / wire	Customer	/	Grounding setup and wiring
Pumpset	Main power supply connection	Water distribution system control cabinet	5-core cable	Customer	Wiring inside chiller control cabinet	Cable installation
	Wire between chiller and water distribution system cabinet	Between chiller and water distribution system cabinet	Cable supply as per package chiller	producer	installation and wiring inside chiller control cabinet	/





Power-efficient chillers and packaged water distribution system are ISO, CE, ETL, ASME, AHRI certified