Air-cooled Screw Chiller Unit

Installation Operation and Maintenance Manual

Please keep this manual carefully for future reference and read it carefully before operation

Notice

- The installation section of this manual is designed for qualified persons only.
- Be sure to read the operating section before conducting operation in order to prevent unit damage and unnecessary accidents.
- The contents of this manual are subject to change without prior notice for further improvement of related models.
- Standard: The water cooled units are designed and manufactured in accordance with the following applicable codes:

Machinery Directive	2006/42/EC (MD)
Low Voltage	2006/95/EC (LVD)
Electromagnetic Compatibility	2004/108/EC (EMC)
Electrical & Safety standard	EN 60204-1 & EN 378-2

- Report to and register in the local corresponding administrative organization before and after operating the pressure vessel unit.
- The Air-cooled Screw Chiller Unit is designed based on the following conditions:

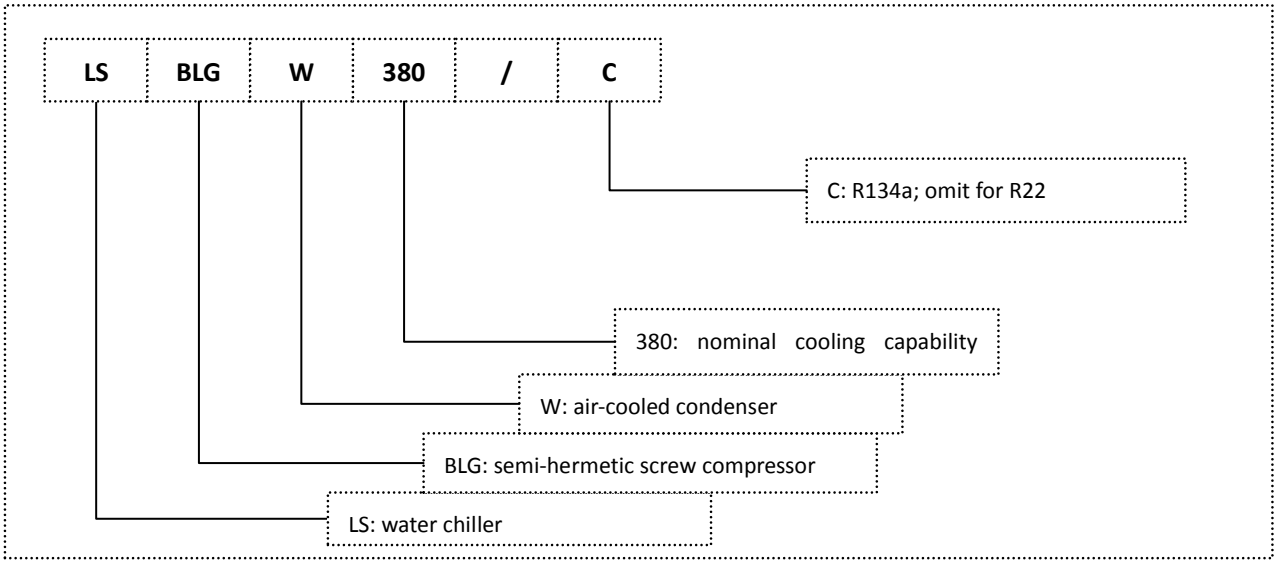
		Refrigeration condition
		R134a
Water side outlet temperature		5°C ~ 15°C
Air side inlet temperature	**DB**	15°C ~ 43°C

Warning

Personnel must be fully acquainted with the operation manual before operating the refrigerant system

CONTENT

1. Nomenclature



2. Introduction

The LSBLGW units are designed to cool water for the air conditioning of buildings and industrial processes.

Prior to the initial start-up of the LSBLGW units, the people involved in the on-site installation, start-up, operation, and maintenance of this unit should be thoroughly familiar with these instructions and the specific project data for the installation site.

The LSBLGW liquid chillers are designed to provide a very high level of safety during installation, start-up, operation and maintenance. They will provide safe and reliable service when operated within their application range.

This manual provides the necessary information to familiarize yourself with the control system before performing start-up procedures. The procedures in this manual are arranged in the sequence required for machine installation, start-up, operation and maintenance.

Always ensure that all required safety measures are followed, including those in this document, such as: wearing protective clothing (gloves, shoes) and safety glasses, using appropriate tools, employing qualified and skilled technicians(electricians, refrigeration engineers) and following local regulations.

3. Safety considerations

3.1 Installation safety considerations

Access to the unit must be reserved to authorized personnel, qualified and trained in monitoring and maintenance. The access limitation device must be installed by the customer.

After the unit has been received, when it is ready to be installed or reinstalled, and before it is started up, it must be inspected for damage. Check that the refrigerant circuit(s) is (are) intact, especially that no components or pipes have shifted (e.g. follow-ing a shock). If in doubt, carry out a leak tightness check and verify with the manufacturer that the circuit integrity has not been impaired. If damage is detected upon receipt, immediately file a claim with the shipping company.

Strongly recommend employing a specialized company to unload the machine.

The units can be lifted with slings, using only the designated lifting points marked on the unit.

Use slings with the correct capacity, and always follow the lifting instructions on the certified drawings supplied with the unit.

Safety is only guaranteed, if these instructions are carefully followed. If this is not the case, there is a risk of material deterioration and injuries to personnel.

Ensure that the valves are correctly installed, before operating the unit.

In certain cases the relief valves are installed on isolating valves. These valves are factory-supplied lead-sealed in the open position. This system permits isolation and removal of the relief valves for checking and replacing. The relief valves are designed and installed to ensure protection against overpressure caused by fire.

Ensure good ventilation, as accumulation of refrigerant in an enclosed space can displace oxygen and cause asphyxiation or explosions.

Inhalation of high concentrations of vapour is harmful and may cause heart irregularities, unconsciousness, or death. Vapour is heavier than air and reduces the amount of oxygen available for breathing. These products cause eye and skin irritation. Decomposition products are hazardous.

3.2 Maintenance safety considerations

Engineers working on the electric or refrigeration components must be authorized, trained and fully qualified to do so.

All refrigerant circuit repairs must be carried out by a trained person, fully qualified to work on these units. He must have been trained and be familiar with the equipment and the installation. All welding operations must be carried out by qualified specialists.

Any manipulation (opening or closing) of a shut-off valve must be carried out by a qualified and authorized engineer. These procedures must be carried out with the unit shut-down.

NOTE: The unit must never be left shut down with the liquid line valve closed, as liquid refrigerant can be trapped between this valve and the expansion device. (This valve is situated on the liquid line before the filter drier box.)

During any handling, maintenance and service operations the engineers working on the unit must be equipped with safety gloves, glasses, shoes and protective clothing.

Never work on a unit that is still energized.

Never work on any of the electrical components, until the general power supply to the unit has been cut using the disconnect switch(es) in the control box(es).

If any maintenance operations are carried out on the unit, lock the power supply circuit in the open position ahead of the machine.

If the work is interrupted, always ensure that all circuits are still deenergized before resuming the work.

ATTENTION:

Even if the unit has been switched off, the power circuit remains energized, unless the unit or circuit disconnect switch is open. Refer to the wiring diagram for further details. Attach appropriate safety labels.

At least once a year thoroughly inspect the protection devices (valves). If the machine operates in a corrosive environment, inspect the protection devices more frequently.

3.3 Repair safety considerations

All installation parts must be maintained by the personnel in charge, in order to avoid material deterioration and injuries to people. Faults and leaks must be repaired immediately.

The authorized technician must have the responsibility to repair the fault immediately. Each time repairs have been carried out to the unit, the operation of the safety devices must be re-checked.

If a leak occurs or if the refrigerant becomes contaminated remove the complete charge using a recovery unit and store the refrigerant in mobile containers.

Repair the leak detected and recharge the circuit with the total R-134a charge, as indicated on the unit name plate polyolester oil.

Do not use oxygen to purge lines or to pressurize a machine for any purpose. Oxygen gas reacts violently with oil, grease, and other common substances.

Never exceed the specified maximum operating pressures. Verify the allowable maximum high- and low-side test pressures by checking the instructions in this manual and the pressures given on the unit name plate.

Do not unweld or flamecut the refrigerant lines or any refrigerant circuit component until all refrigerant (liquid and vapour) has been removed from chiller. Traces of vapour should be displaced with dry air nitrogen. Refrigerant in contact with an open flame produces toxic gases.

The necessary protection equipment must be available, and appropriate fire extinguishers for the system and the refrigerant type used must be within easy reach.

Do not siphon refrigerant.

Avoid spilling liquid refrigerant on skin or splashing it into the eyes. Use safety goggles. Wash any spills from the skin with soap and water. If liquid refrigerant enters the eyes, immediately and abundantly flush the eyes with water and consult a doctor.

Never apply an open flame or live steam to a refrigerant container. Dangerous overpressure can result. If it is necessary to heat refrigerant, use only warm water.

Do not re-use disposable (non-returnable) cylinders or attempt to refill them. It is dangerous and illegal. When cylinders are empty, evacuate the remaining gas pressure, and move the cylinders to a place designated for their recovery. Do not incinerate.

Do not attempt to repair or recondition any safety devices when corrosion or build-up of foreign material (rust, dirt, scale, etc.) is found within the valve body or mechanism.

If necessary, replace the device. Do not install safety valves in series or backwards.

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Ensure that you are using the correct refrigerant type before recharging the unit.

Charging any refrigerant other than the original charge type (R-134a) will impair machine operation and can even lead to a destruction of the compressors. The compressors operating with this refrigerant type are lubricated with a synthetic

ATTENTION:

No part of the unit must be used as a walkway, rack or support. Periodically check and repair or if necessary replace any component or piping that shows signs of damage.

The refrigerant lines can break under the weight and release refrigerant, causing personal injury.

Do not climb on a machine. Use a platform, or staging to work at higher levels.

Use mechanical lifting equipment (crane, hoist, winch, etc.) to lift or move heavy components. For lighter components, use lifting equipment when there is a risk of slipping or losing your balance.

Use only original replacement parts for any repair or component replacement. Consult the list of replacement parts that corresponds to the specification of the original equipment.

Do not drain water circuits containing industrial brines, without informing the technical service department at the installation site or a competent body first.

Close the entering and leaving water shutoff valves and purge the unit water circuit, before working on the components installed on the circuit (screen filter, pump, water flow switch, etc.).

Do not loosen the water box bolts until the water boxes have been completely drained.

Periodically inspect all valves, fittings and pipes of the refrigerant and hydronic circuits to ensure that they do not show any corrosion or any signs of leaks.

It is recommended to wear ear defenders, when working near the unit and the unit is in operation.

WARNING

The introduction of this manual knowledge does not mean that anyone read this manual can assume installation, commissioning, operation and maintenance of any job. The installation work must be performed by a qualified professional installation company to undertake. Commissioning, operation and maintenance work only by training and approved by the company of professional personnel.

Because of the relative pressure inside the equipment, electrical components, and installation location and other factors, operation must pay attention to safety, and must first see clearly interrelated manual, and various tag listed on the safety precautions. If a failure to comply with this manual for the steps or guidance, and cause damage or destruction of the unit, the company will not undertake the responsibility.

4. Installation

4.1 Freight and storage

4.1.1 Consignment

The air-cooled screw chiller is usually assembled completely in the factory. Before shipment the units have passed through assembling, wiring, helium leak testing, refrigerant charging, performance testing, insulating and all-process quality inspecting.

WARNING

The unit may be damaged if it was disassembled by the person, customers or contractors who have not been trained and qualified to perform this job.

4.1.2 Delivery

The unit will be transported to the jobsite by the company and when it is shipped to the jobsite by the logistics company, both local dealer and user will be responsible for unloading it, with the coordination of the local office. And checking by refer to the nameplate, accessories, certificates and other items listed in the packing list. And in case of no-objection, signing the invoice for confirmation with the user. Company is not responsible for any miss of certificate or accessories thereafter. If any problem found before sign-in, please notify the technical service department of the company on time. If fail to follow this principle, factory will not be responsible for the warranty.

CAUTION

Please check if there is any damage with the unit at arrival. Both consignee and carrier are required to fill in the invoice correctly, completely and in detail and note it on the invoice in case of any visible or notable damage.

The performance parameters of the air-cooled screw chiller will be provided upon the standard-designed working conditions, if there is no specify from the customer and delivery will be done upon the packing list attached to the unit.

4.1.3 Storage

The user, after signing in the invoice, shall be responsible for correctly storing and installing the unit.

The following precautions shall be taken when the unit needs to be stored before installation:

1. Ensure to have protective cover over all the opens such as the water pipe, and do not rip off the protective film on the electric control cabinet.
2. Keep the unit in a dry place without vibration and with less people activities.
3. Set up rainproof measures for the unit when it is kept outdoors and do not leave the unit under the sunlight directly if the unit is insulated.
4. Do not clean the dust, if any on the unit, with steam or water.
5. Carry out regular check on the unit and, particularly, check the refrigerant once every month to see if there is leakage. It is a signal for the leak happens when an extra-low pressure or non-pressure is shown on the high and low

pressure gauges. Contact the after sales serviceman for overhaul if that happened.

4.2 Preparations before installation

1. Select an installation place where it is good ventilated and easy for heat emission.
2. Install the unit on a rigid foundation which shall not be deformed, such as a concrete basis, and shall be a flat surface and capable of bearing the weight of the unit at running.
3. Set a draining ditch around the basis which shall have sufficient drainage capacity at the seasonal stop or at the repair of the unit.
4. Leave a space in the machine room which shall be enough for both installation and maintenance of the unit and for pullout of the pipe and do not lay down any pipeline and wire above the compressor.
5. It is recommended to leave a space between the water pipe and the nozzle of the unit so as to get a proper space for both installation and regulation of the unit when it arrives at the site.
6. To guarantee the normal working of electric components, do not place the unit in place with density dust, dirt, corrosive gas or a heavy humidity. In case such a place is installed, settle the existing problems.
7. The materials and tools required: flexible connection, shockproof pad, lifting equipment, lifting beam, lifting chains, jack, sliding wood, roller and pinch bar.

CAUTION

Any change or reform done on the unit in installation without approval from producer will make the warrantee invalid.

4.3 Unit lifting and location

4.3.1 Lifting

It is suggested to do lifting with a lifter.

1. The unit has been correctly packed and inspected before shipment to ensure the unit arrives at the destination safely and normally. And the person in charge of installation, handle and lifting shall also be responsible for protecting it against damage caused by crude operations. Especially protect the angle valves and pipelines against collision so as to prevent the refrigerant inside of the unit from leak.
2. When handle the unit, keep it in level without slope. When a lifter is used, use the bottom lifting lug with a lifting mark and set a supporting object for isolating the contacting part between the lifting rope and the unit. Make sure the lifting rope capable of bearing the weight of the integrated unit, or serious damage of the unit or personal injury would be caused. Do not use a fork truck to lift or move the unit.
3. When the vertical lifting is unavailable, roller can be used, that means to jack both ends of the unit to a certain height with a jack, place the roller under the sliding wood support and, after rolling the unit into the right position, take out the sliding wood.

4.3.2 Location

When getting the unit in place, remove the sliding wood, calibrate the levelness with a bubble leveler and fix the unit on the foundation with foundation bolts. It is suggested to place a 15~20mm thick shockproof pad between the unit feet and the basis.

CAUTION

Never let the unit damaged. Leave it on the sliding chock when to handle or lift it and do not take out the sliding chock until it is placed correctly.

The unit on the foundation with foundation bolts. It is suggested to place a 15~20mm thick shockproof pad between the unit feet and the basis.

When locate the unit on a higher floor, first make sure if the floor structure is strong enough to bear its weight at running and solidify the floor if necessary. Then make sure if the floor levelness meet the requirement. It is suggested to place the spring insulator upon the distribution of weight of the unit at running.

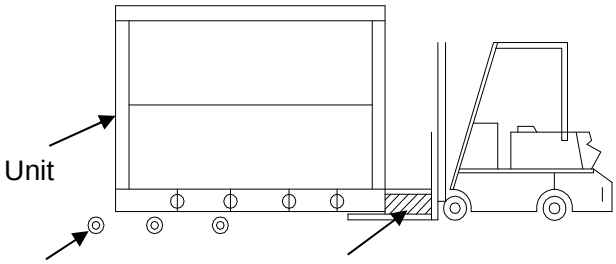
CAUTION

Notice the affection of the unit noise to the surroundings.

4.4 Unloading and hoisting

To avoid the unit from being damaged during the moving process, it is recommended to load or unload the unit by care. If it is a short-haul moving, fork truck can be used, and the unit bears the symmetrical horizontal force with the entire gasket wood. It is recommended that put 3 to 6 easy-roll bar under the unit for the slow-moving, as follows:

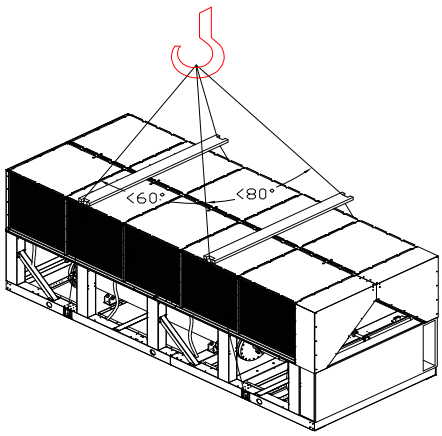
Move horizontally schemes



Unit Lifting

- Choose a suitable crane according to the unit's weight (Buy an insurance for it if it is convenient) ;
- Hoist the unit according to the following chart strictly. The steel rope shall wind the lifting hook one circle to prevent steel rope slipping and causing danger when the weight is unbalanced.
- Must use enlargement pole prevent sling damage to the unit

Security guard circle should be set up when hoist the unit, and also abide by the local safety regulations when hoist the unit. Prohibit non-staff from entering the security guard circle or staying under the unit and the hoisting crane.



4.5 Requirements on foundation and unit appearance

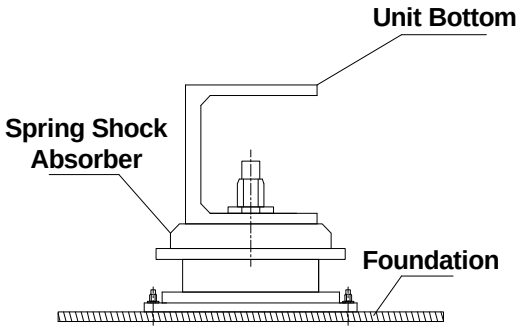
4.5.1Requirements on foundation

Air-cooled screw unit should be installed outdoor, for example, on the roof, ground or near the buildings. Units must be installed on a solid basis. A block of concrete slab is recommended to use , whose load-bearing capacity must be sufficient to withstand all the units, as well as the weight of maintenance personnel.

CAUTION

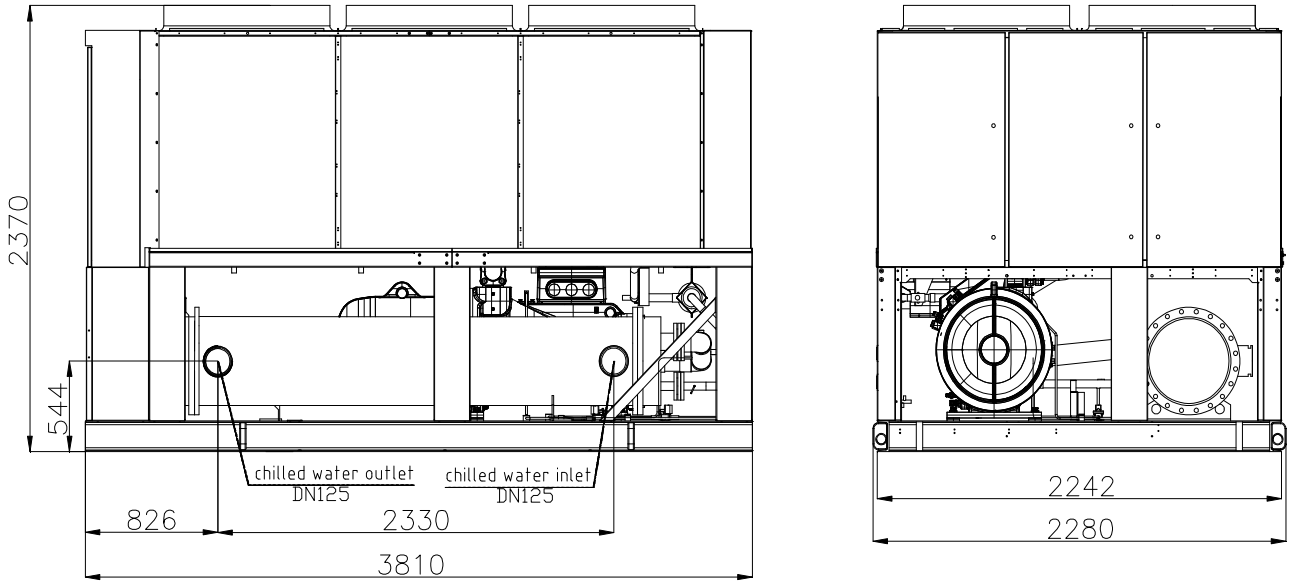
The unit is positioned in area that is easily accessible by persons or animals, it is advisable to fit guards for condenser coil guards and, when necessary, guards for evaporator area.

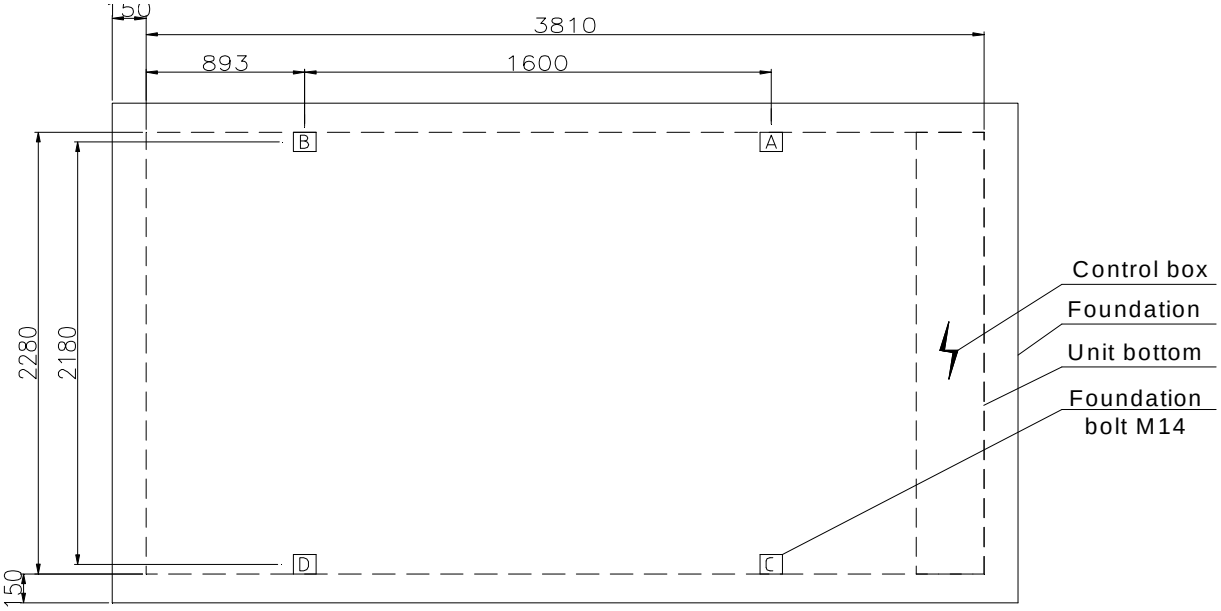
It is necessary that using spring isolators as absorber, in order to avoid transmitting vibration and noise during the runtime of the unit. Anti-vibration pad shall be placed between the base frame and base, please refer to following diagram:



4.6 Dimensions

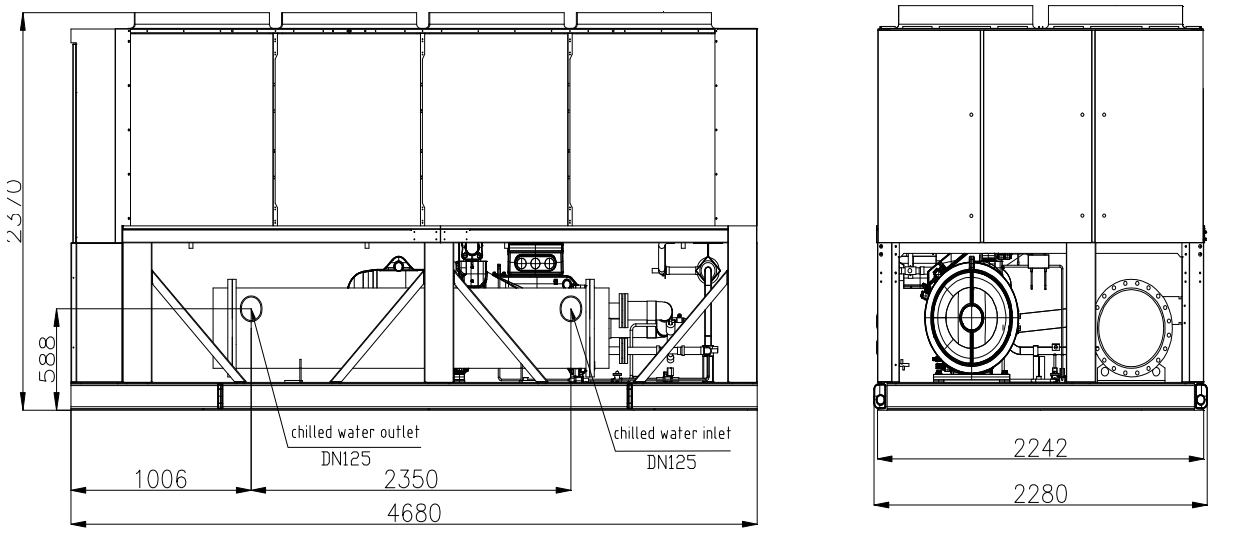
(1) LSBLGW380/C unit

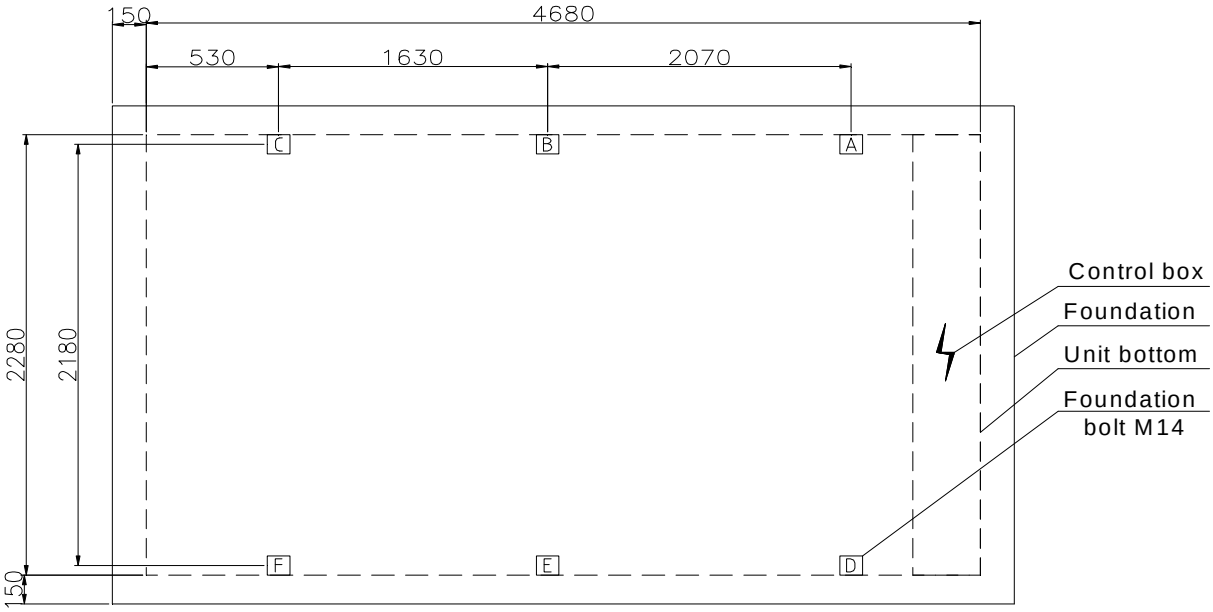




Model	Weight to be supported by spring isolator(kg)			
	A	B	C	D
LSBLGW380/C	869	901	869	901

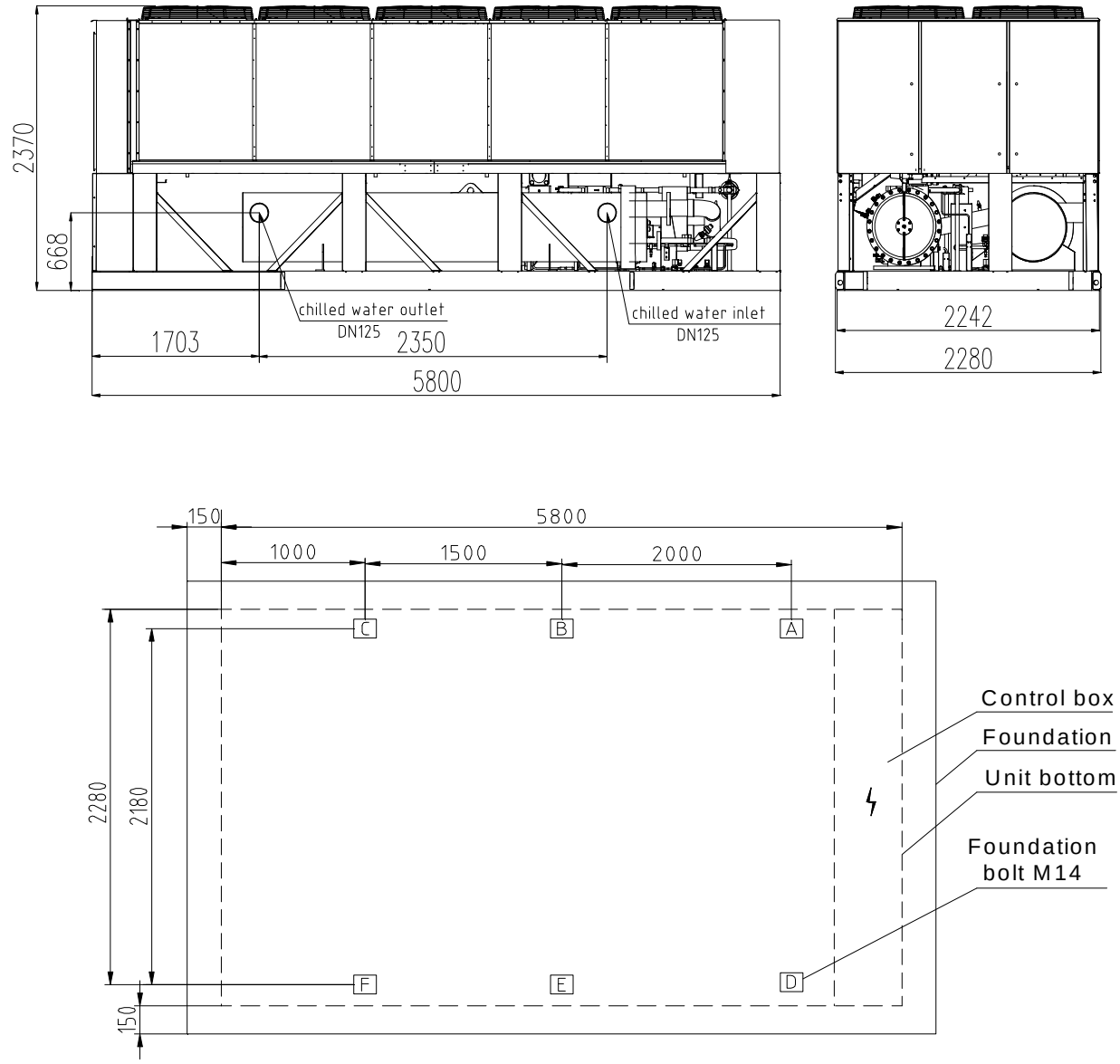
(2) LSBLGW500/C unit





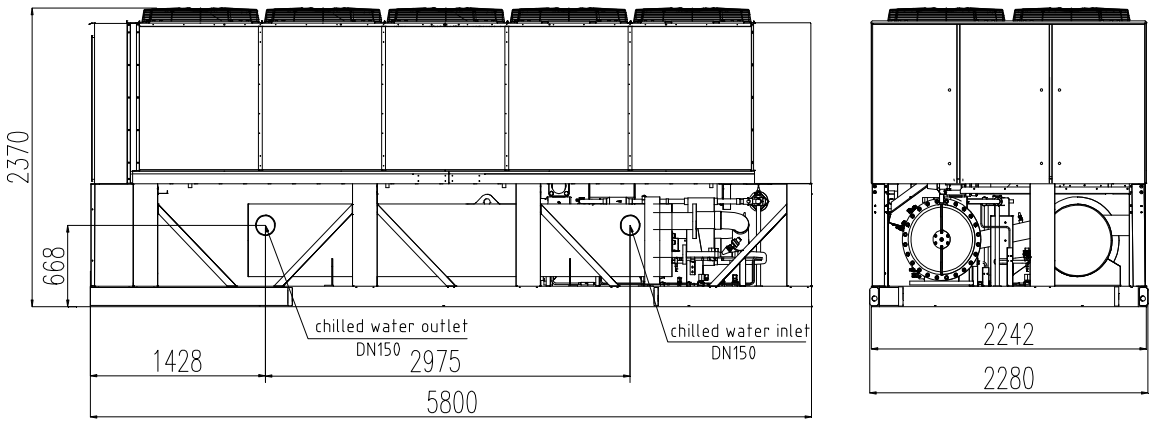
Model	Weight to be supported by spring isolator(kg)					
	A	B	C	D	E	F
LSBLGW500/C	633	855	832	633	855	832

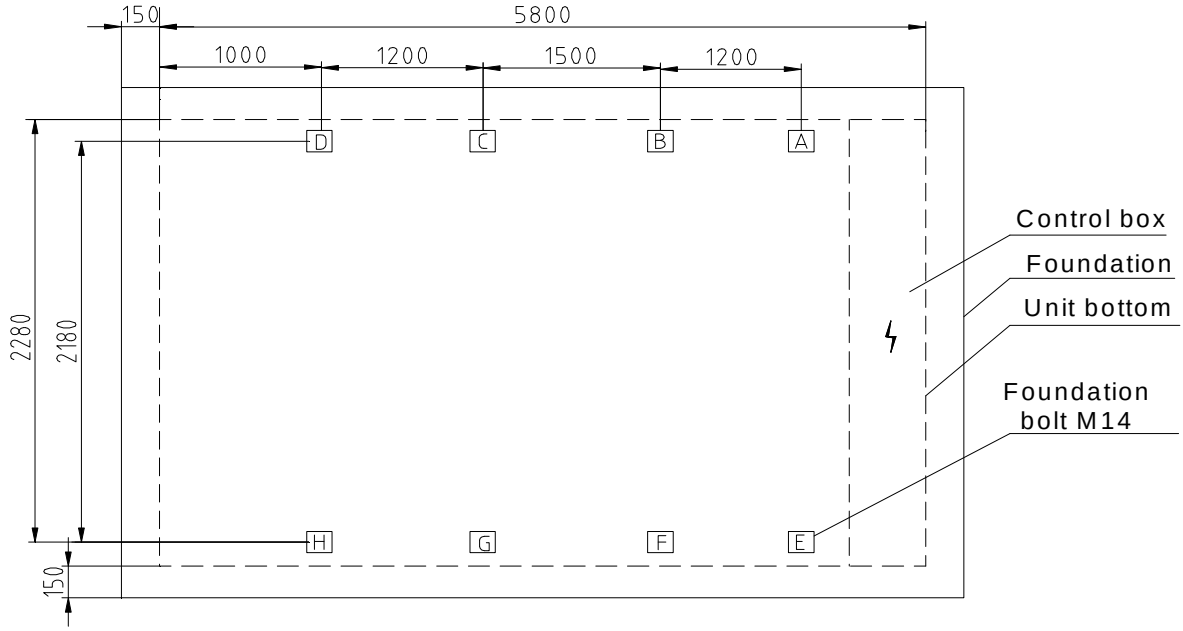
(3) LSBLGW600/C unit



Model	Weight to be supported by spring isolator(kg)					
	A	B	C	D	E	F
LSBLGW600/C	815	934	921	815	934	921

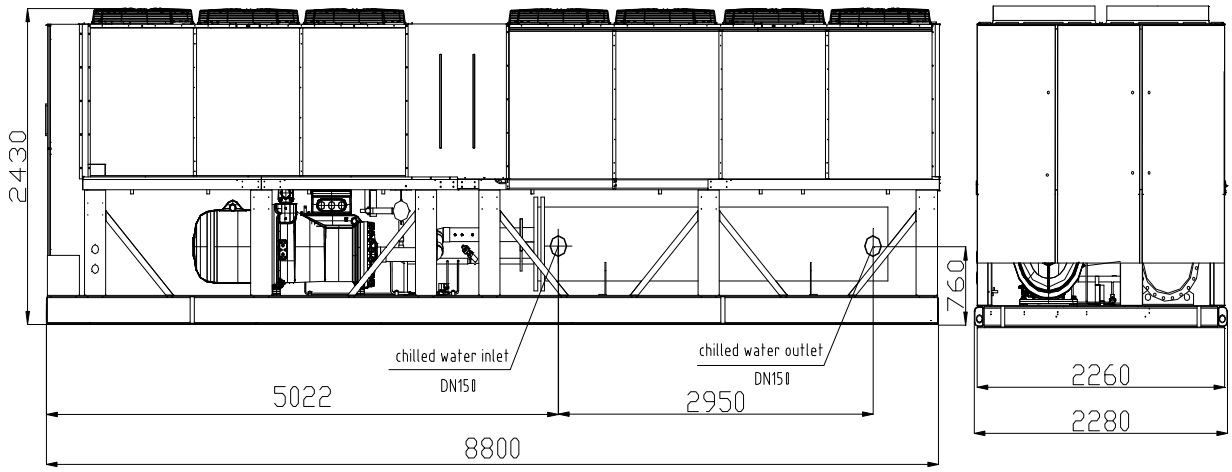
(4) LSBLGW720/C unit

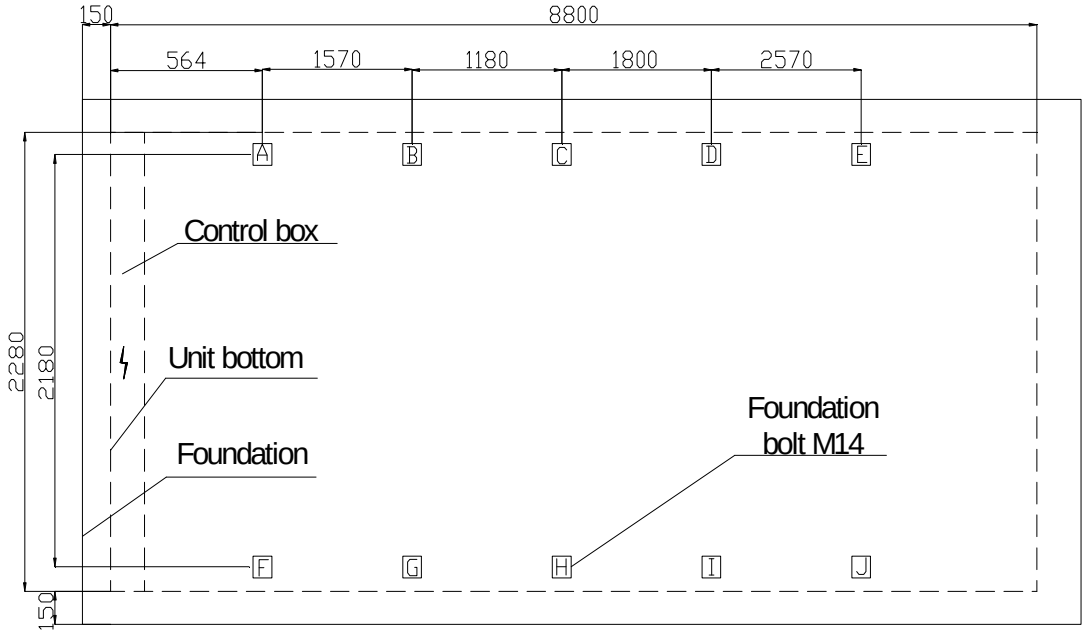




Model	Weight to be supported by spring isolator(kg)							
	A	B	C	D	E	F	G	H
LSBLGW720/C	687	765	800	758	687	765	800	758

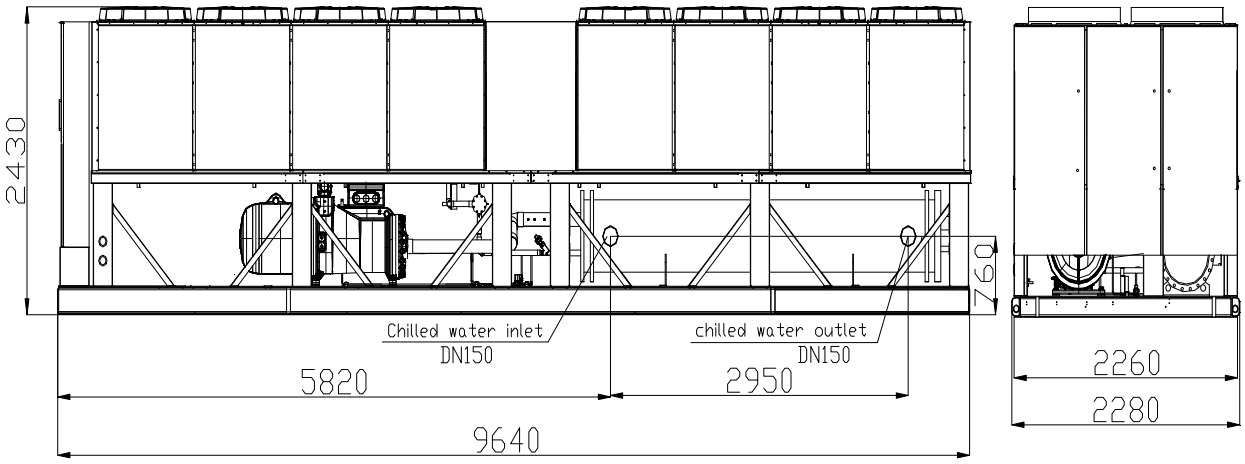
(5) LSBLGW900/C unit

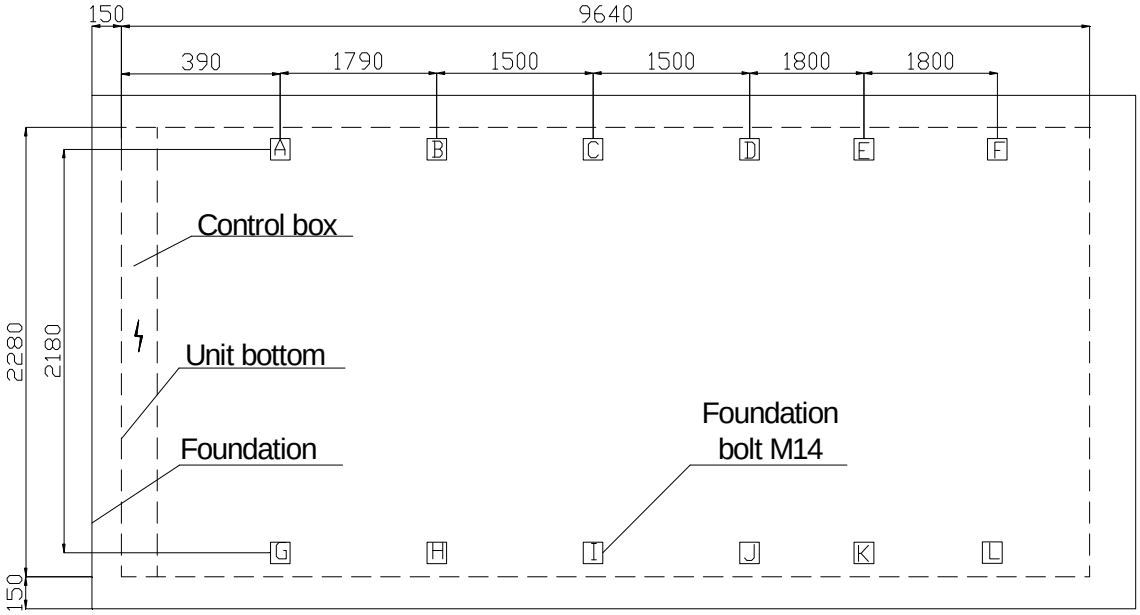




Model	Weight to be supported by spring isolator (kg)									
	A	B	C	D	E	F	G	H	I	J
LSBLGW900/C	814	944	947	747	733	814	944	947	747	733

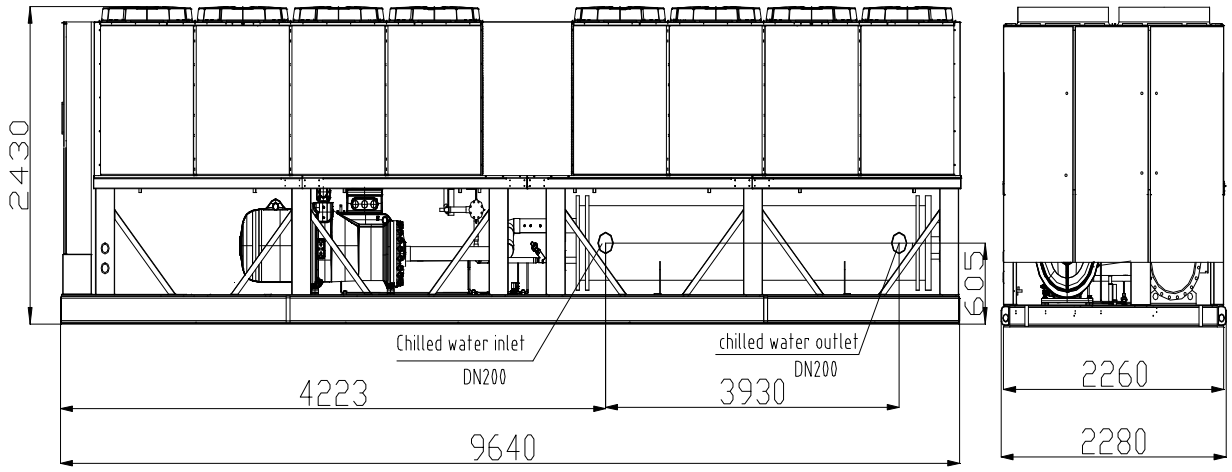
(6) LSBLGW1000/C unit

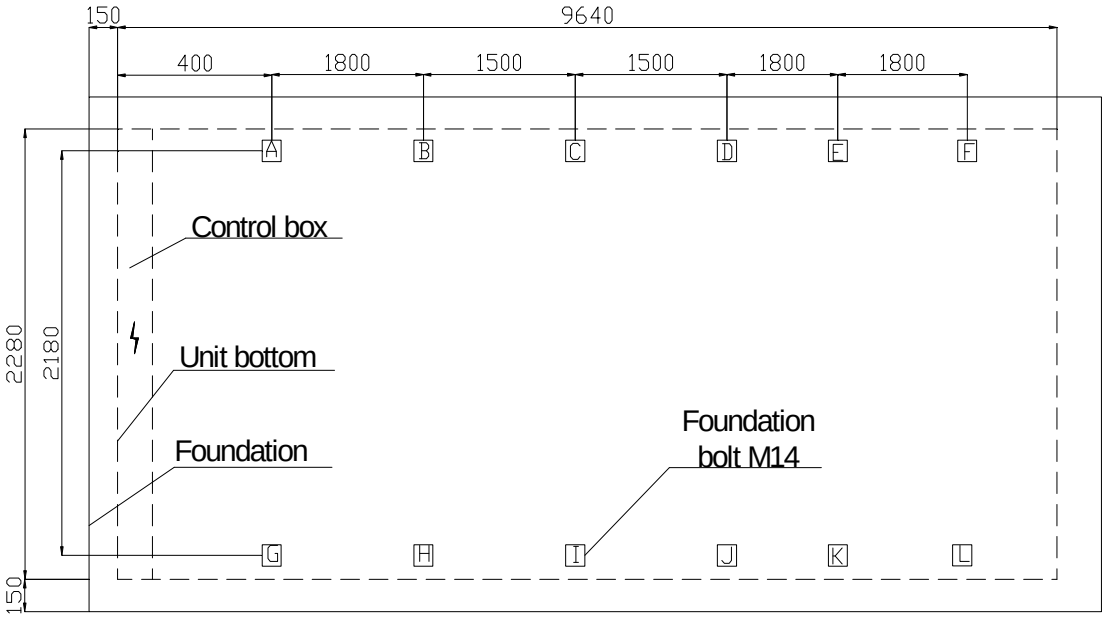




Model	Weight to be supported by spring isolator (kg)											
	A	B	C	D	E	F	G	H	I	J	K	L
LSBLGW1000/C	726	912	917	732	731	732	726	912	917	732	731	732

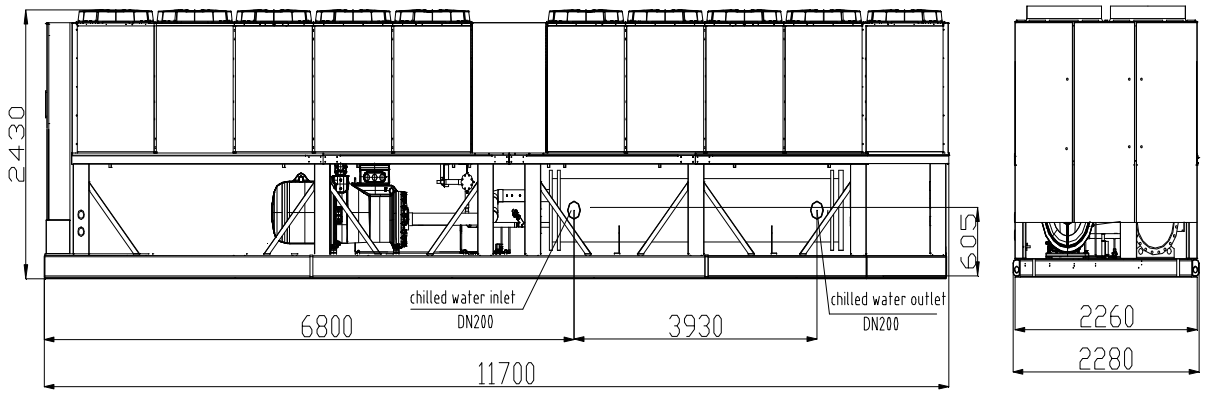
(7) LSBLGW1200/C unit

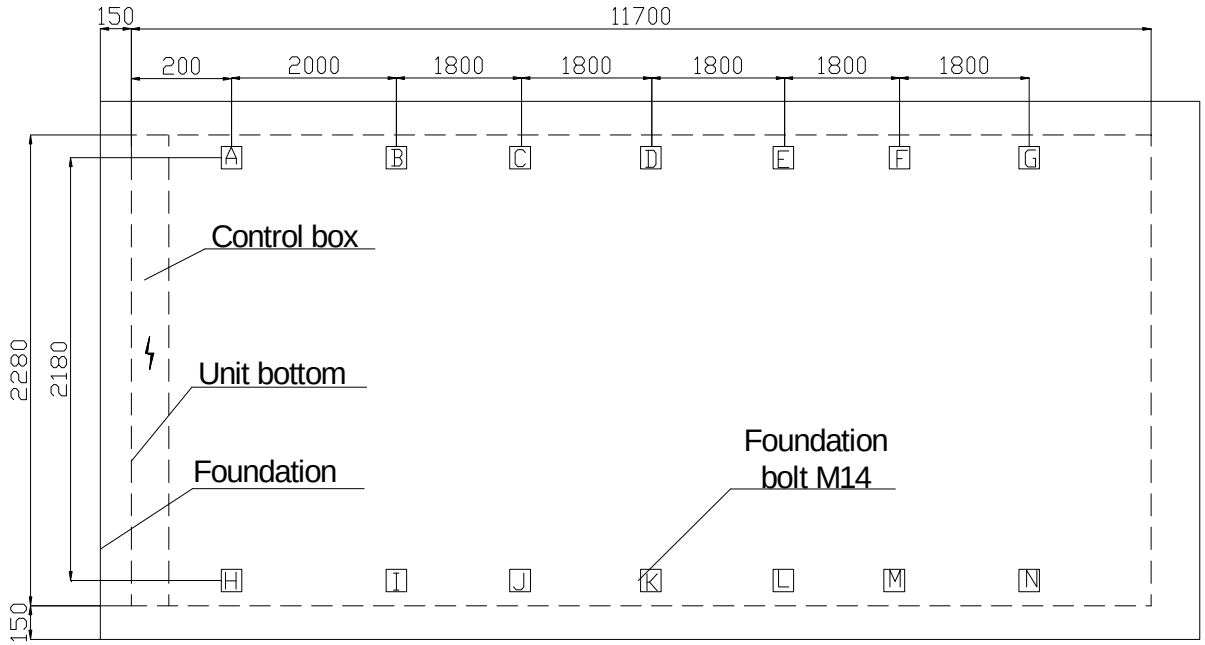




Model	Weight to be supported by spring isolator (kg)											
	A	B	C	D	E	F	G	H	I	J	K	L
LSBLGW1200/C	789	912	905	779	777	773	789	912	905	779	777	773

(8) LSBLGW1420/C unit





Model	Weight to be supported by spring isolator (kg)													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
LSBLGW1420/C	794	925	954	936	800	798	798	794	925	954	936	800	798	798

4.7 Installation space

Due to the unit needs enough fresh air for heat exchanger, so unit around and units between units must have enough space. In addition, in order to repair the maintenance convenience, the unit should not sundry around accumulation, units around and units and between units must have enough maintenance space.

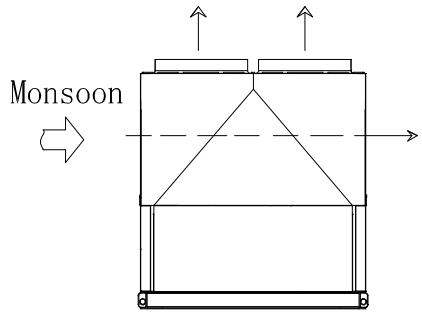
For the area where might be get snow during winter season, the following should be noticed:

(1)Do not install the unit under an eave of a house

(2)Raise the foundation according to the possible snow height. (The foundation must be at least 1m higher than the max. snow height) .

(3) Do not install the unit at place where might be piled with snow

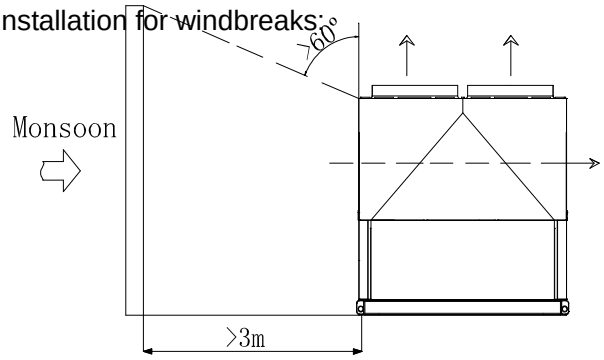
For area where strong monsoon exists, if the unit's heat-exchanger directly faces the monsoon, when the monsoon wind velocity is higher than the fan blowing velocity, there will be direct airflow occurs as shown in dashed arrow below.



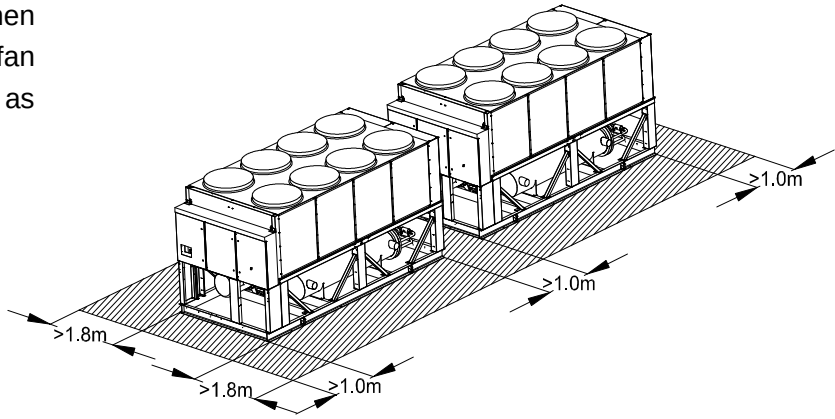
Thus will cause air was again from one heat exchanger to another heat exchange, consequently the cooling capacity will drop, even will cause malfunction sometimes. In order to reduce this phenomena, the Air-cooled Screw Chiller Units are designed seriously considered. Even so,in order to reduce the unnecessary malfunction ,the unit's heat-exchanger should not face the monsoon.

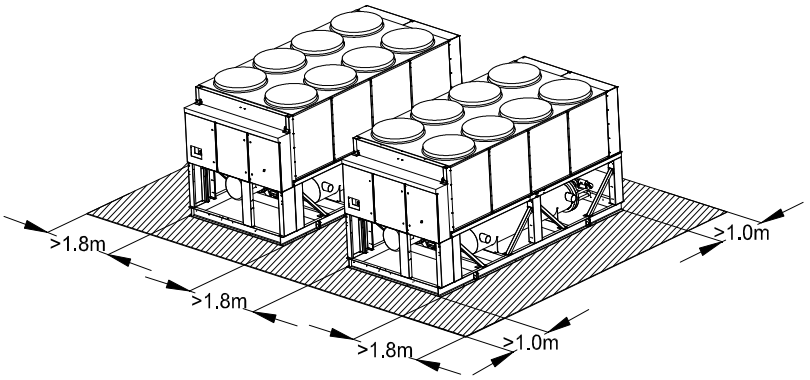
If the aforementioned situation can not be avoided, it has to be installed like that, please install a windbreak as follow:

Installation for windbreaks:



Many units when installed, if the installation place restrictions, also can choose below installation, but unit must conform to the maintenance space between below requirements:



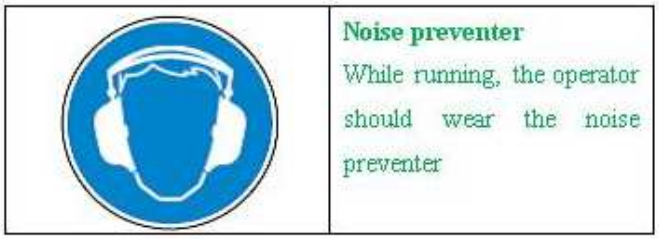


5. Specifications (R134a units)

Unit Model		LSBLGW380/C	LSBLGW500/C
Cooling capacity	kW	376	496
Power supply		380V,3P+N+PE,50HZ	
Rated power consumption	kW	124	159
Compressor Type		Semi- hermetic, twin screw compressor	
Quantity		1	1
Energy adjustable range	%	25%,50%,75%,100% 4-step	
Refrigerant Type		R134a	R134a
Charge	kg	76	90
Air Side Heat-exchanger Type		M shape Heat exchanger, High efficient exchanger tube +aluminum fins	
Fans Quantity		6	8
Air Volume	m^3/h	23000×6	23000×8
Motor input	kW	2.4×6	2.4×8
Water Side Heat-exchanger Type		Shell-and-tube heat-exchanger	
Water Volume	m^3/h	65.4	86
Water pressure drop	kPa	39	54
Inlet/outlet Pipe diameter	mm	DN125	DN125
Water side fouling factor	$m^2.□/kW$	0.086	0.086
Length	mm	3810	4680
Width	mm	2280	2280
Height	mm	2370	2370
Shipping weight	kg	3320	4330
Running weight	kg	3540	4640

Notes：

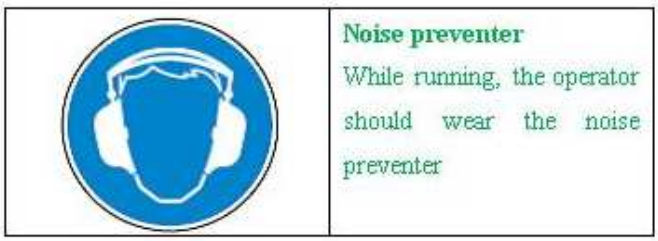
1) Nominal cooling capacities are based on the following conditions:
Chilled water inlet/outlet temp: 12□/7□; Outdoor temp (DB):35□.
2) The applicable ambient temperature range of R134a air-cooled screw units is 15□~43□, Please refer to the technical manual for detailed performance table.
3) Caution: noise preventer required.
4) The factory keeps the right to improve the product and parameters above without notice, Please refer to the actual parameters on the nameplate.



Unit Model		LSBLGW600/C	LSBLGW720/C
Cooling capacity	kW	594	720
Power supply		380V,3P+N+PE,50HZ	
Rated power consumption	kW	187	234
Compressor Type		Semi- hermetic, twin screw compressor	
Quantity		1	1
Energy adjustable range	%	25%,50%,75%,100% 4-step	
Refrigerant Type		R134a	R134a
Charge	kg	105	140
Air Side Heat-exchanger Type		M shape Heat exchanger, High efficient exchanger tube +aluminum fins	
Fans Quantity		10	10
Air Volume	m^3/h	23000×10	23000×10
Motor input	kW	2.4×10	2.4×10
Water Side Heat-exchanger Type		Shell-and-tube heat-exchanger	
Water Volume	m^3/h	103.2	123.8
Water pressure drop	kPa	56	58
Inlet/outlet Pipe diameter	mm	DN125	DN150
Water side fouling factor	$m^2.□/kW$	0.086	0.086
Length	mm	5800	5800
Width	mm	2280	2280
Height	mm	2370	2370
Shipping weight	kg	5000	5500
Running weight	kg	5340	6020

Notes：

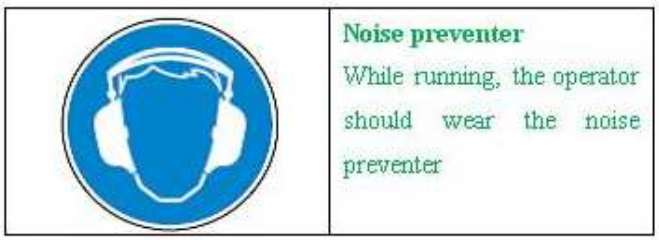
1) Nominal cooling capacities are based on the following conditions:
Chilled water inlet/outlet temp: 12□/7□; Outdoor temp (DB):35□.
2) The applicable ambient temperature range of R134a air-cooled screw units is 15□ ~ 43□, Please refer to the technical manual for detailed performance table.
3) Caution: noise preventer required.
4) The factory keeps the right to improve the product and parameters above without notice, Please refer to the actual parameters on the nameplate.



Unit Model		LSBLGW900/C	LSBLGW1000/C
Cooling capacity	kW	902	996
Power supply		380V,3P+N+PE,50HZ	
Rated power consumption	kW	285	318
Compressor Type		Semi- hermetic, twin screw compressor	
Quantity		2	2
Energy adjustable range %		12.5%、25%、37.5%、50%、62.5%、75%、87.5%、100%	
Refrigerant Type		R134a	R134a
Charge	kg	76+90	90+90
Air Side Heat-exchanger Type		M shape Heat exchanger, High efficient exchanger tube + aluminum fins	
Fans Quantity		14	16
Air Volume	m^3/h	23000×14	23000×16
Motor input	kW	2.4×14	2.4×16
Water Side Heat-exchanger Type		Shell-and-tube heat-exchanger	
Water Volume	m^3/h	154.8	172
Water pressure drop	kPa	74	75
Inlet/outlet Pipe diameter	mm	DN150	DN150
Water side fouling factor	$m^2.□/kW$	0.086	0.086
Length	mm	8800	9640
Width	mm	2280	2280
Height	mm	2430	2430
Shipping weight	kg	7750	8900
Running weight	kg	8370	9500

Notes：

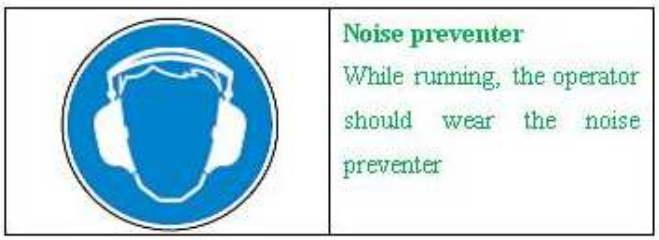
1) Nominal cooling capacities are based on the following conditions:
Chilled water inlet/outlet temp: 12□/7□; Outdoor temp (DB):35□.
2) The applicable ambient temperature range of R134a air-cooled screw units is 15□ ~ 43□, Please refer to the technical manual for detailed performance table.
3) Caution: noise preventer required.
4) The factory keeps the right to improve the product and parameters above without notice, Please refer to the actual parameters on the nameplate.



Unit Model		LSBLGW1200/C	LSBLGW1420/C
Cooling capacity	kW	1203	1419
Power supply		380V,3P+N+PE,50HZ	
Rated power consumption	kW	381	466
Compressor Type		Semi- hermetic, twin screw compressor	
Quantity		2	2
Energy adjustable range %		12.5%、25%、37.5%、50%、62.5%、75%、87.5%、100%	
Refrigerant Type		R134a	R134a
Charge	kg	105+105	140+140
Air Side Heat-exchanger Type		M shape Heat exchanger, High efficient exchanger tube + aluminum fins	
Fans Quantity		16	20
Air Volume	m^3/h	23000×16	23000×20
Motor input	kW	2.4×16	2.4×20
Water Side Heat-exchanger Type		Shell-and-tube heat-exchanger	
Water Volume	m^3/h	206.4	244.2
Water pressure drop	kPa	71	69
Inlet/outlet Pipe diameter	mm	DN200	DN200
Water side fouling factor	$m^2.□/kW$	0.086	0.086
Length	mm	9640	11700
Width	mm	2280	2280
Height	mm	2430	2430
Shipping weight	kg	9100	11100
Running weight	kg	9870	12010

Notes：

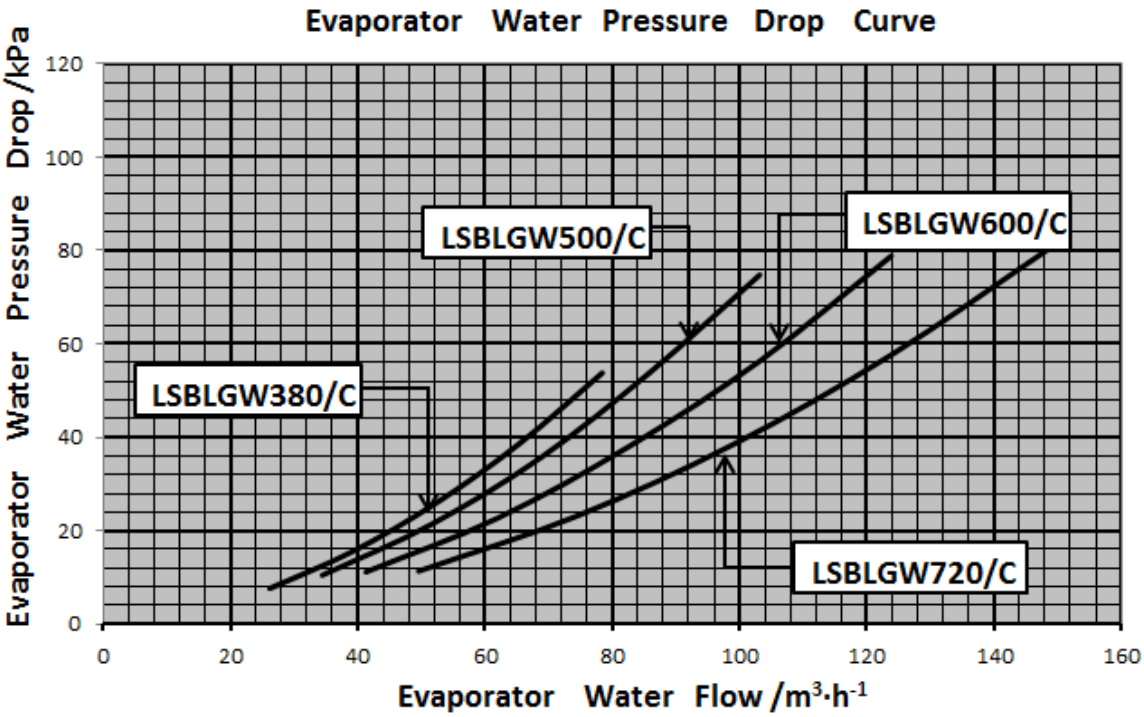
1) Nominal cooling capacities are based on the following conditions:
Chilled water inlet/outlet temp: 12□/7□; Outdoor temp (DB):35□.
2) The applicable ambient temperature range of R134a air-cooled screw units is 15□ ~ 43□, Please refer to the technical manual for detailed performance table.
3) Caution: noise preventer required.
4) The factory keeps the right to improve the product and parameters above without notice, Please refer to the actual parameters on the nameplate.

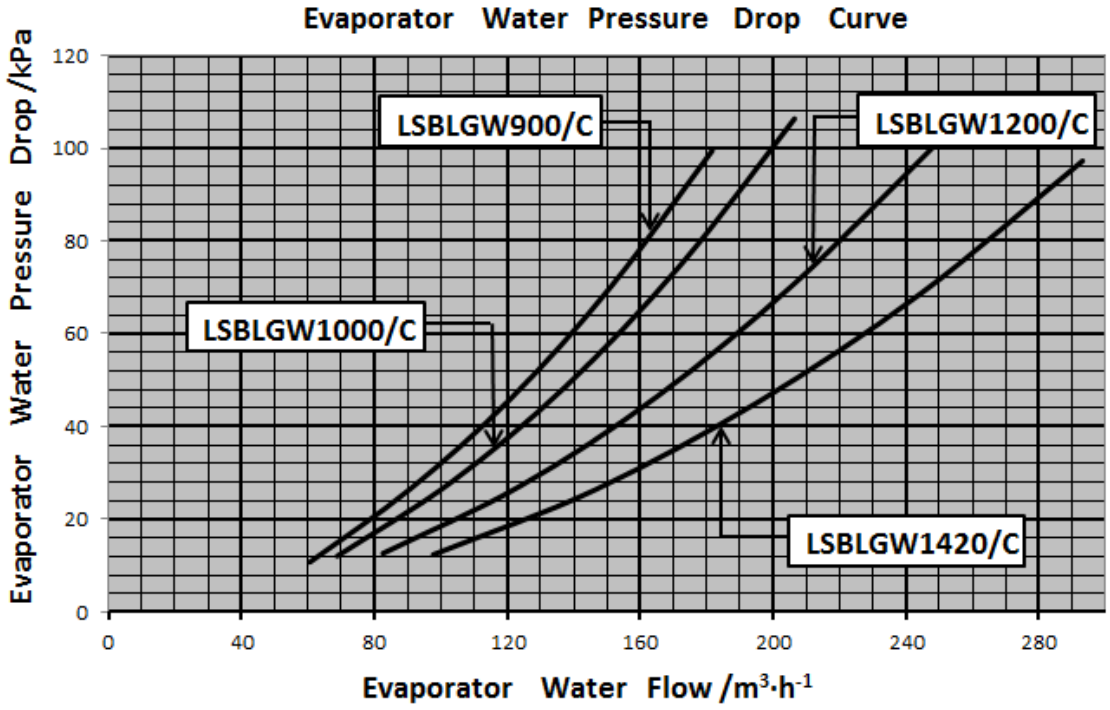


6. Application Range

Content	Running range
Ambient TEMP.	15□ ~ 43□
Out water TEMP.	5□ ~ 15□
Water flow volume	Rating flow volume±20%
Max inlet/outlet water TEMP. difference	8□
Fouling factor (m^{2}·℃/kW)	0.086
Voltage tolerance	Rating Voltage±10%
Phase tolerance	±2％
Power supply frequency	Rating frequency±2%
Evaporator max working pressure on water side	1.0MPa
Compressor max. start count	4 times/h
Environment quality	High corrosive environment and high humidity should be avoided.
Drainage system	The height of water drainage should not be higher than the base of the unit on the spot
Storage and transport temperature	-25□ ~ 55□
RH(relative air humidity)	In + 40℃ does not exceed 50%, + 25℃ no more than 90%
Applicable altitude range：	No more than 2000m

7. Evaporator pressure drop curve





8. Power supply

WARNING

In order to prevent any accident of injury and death during the site wiring, the power supply shall be cut off before the line is connected to the unit.

8.1 Power section

1. It is required to connect the power supply cable to the control cabinet of the unit, when it arrives at the jobsite. The power supply cable is connected to the terminals of L1, L2, L3, N and PE and the terminals need to be fixed again after 24h running (the minimum allowed time). Please seal the entering wiring hole after users installed the main power wires, in order to avoid the dust entering into electric control cabinet.

Caution: it is suggested that to use appropriate tools to make sure that a enough height to install the main power wires if the basement is higher than 200 mm.

CAUTION

An independent power supply box needs to be equipped with the power supply of the water pump.

2. The power supply components inside of the control cabinet includes: wiring terminal, the electric component for Y-Δ starter.

3. The power supply for the unit is AC 3P+N+PE~380V , 50Hz。The external power supply shall conform to the electric performance of the unit.

4. All the power supply circuits shall be mounted according to the local and national electric standard.

5. The power supply cable to be connected to the control cabinet shall be selected upon the RLA current on the nameplate. Certain margin shall be left with the general power supply, recommended to be more than 1.4~1.5 times of the unit'rated power. The ampacity of the power supply cable (wire) shall be a little bit more than the maximum running current of the unit and the affection of working environment shall be taken into consideration. There is ground-wire and automatic cut-off device Inside of the electric control box and the user power supply shall be supplied with these two measures. For the unit of a heavy current, use two equal-diameter power supply cables to lead the power to the unit.

6. The maximum allowed phase voltage unbalance is 2% and phase current unbalance is 10%. Start of the unit is strictly forbidden in case of phase voltage unbalance is over 2%. Please notify the power supply department at once an extra-big measured unbalance rate happens.

The formula used to calculate the percentage phase voltage unbalance:

$$\text{Voltage unbalance \%} = \frac{\text{Maximum deviation to the average voltage}}{\text{Average voltage}}$$

For instance: the nominal voltage comes as 3N~,AC380V,50Hz, the measured U_{AB}=376V,U_{AC}=379V,U_{BC}=385V.

The gained average voltage =(376+379+385)/3= 380V.

Decide the deviation value to the average voltage: $\triangle U_{AB}$=380-376=4V,$\triangle U_{AC}$=380-379=1V,$\triangle U_{BC}$=385-380=5V,The maximum deviation value is 5V, 5/380=1.3%, the gained maximum phase voltage unbalance is 1.3%.

WARNING

The damage arising from the starting operation with the phase voltage unbalance over 2% shall be regarded as improper operation and exclusive of the warranty of this product.

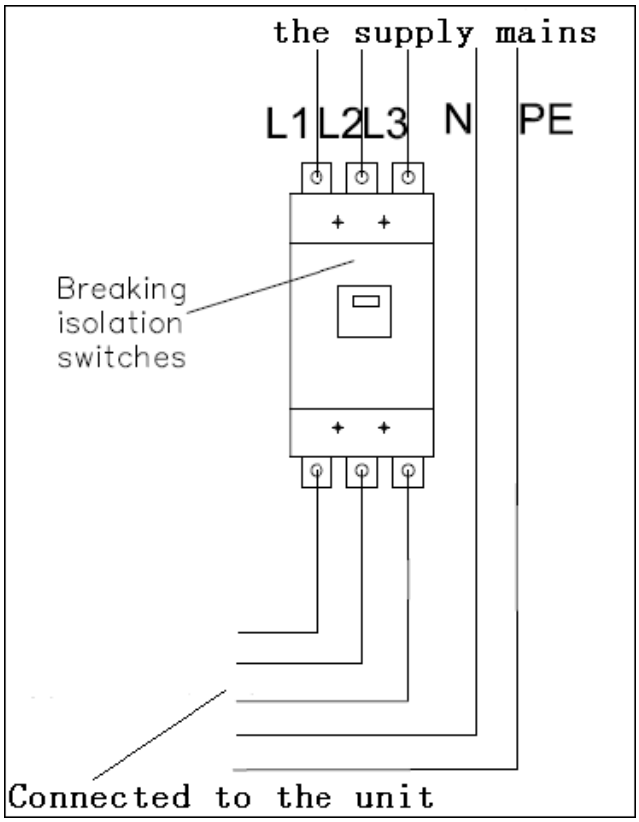
8.2 Control

MICRO-CONTROLLER is adopted as the core part of the control system of the air-cooled screw chiller and a touchable screen is used as the operation interface. The operation interface adopts interactive mode, easy for operation. The integral control system features a high automation level and a high reliability.

1. There are relays, power supply wiring fault indicator, wiring terminals and MICRO-CONTROLLER inside the control cabinet. Hinge and lock are set on the door of the control cabinet to prevent it from accident opened, but it can be opened for maintenance.
2. On the front of the electric control cabinet there are the touchable screen and the emergency stop switch of the unit.
3. The electric wiring shall be done according to the local and national technical standard and the wiring diagram attached to the unit can be referred while carry out the wiring.
4. All the site diameter of control output wires should be 1 mm2, control signal wires should use shielded wire which diameter is 0.5 mm2.

Caution: please in strict accordance with the wiring diagram to perform the wiring work; the water flow switch wires should use two core ordinary cable (0.5mm2) , The normally open point of flow switch means there is no water; the interlocking of chilled water pump is according to the active contacts which supplied by the electric control wiring. Remote start and remote stop can be achieved by connecting with two inching button.

Breaking isolation switches should be added between the power cord of users and the unit.

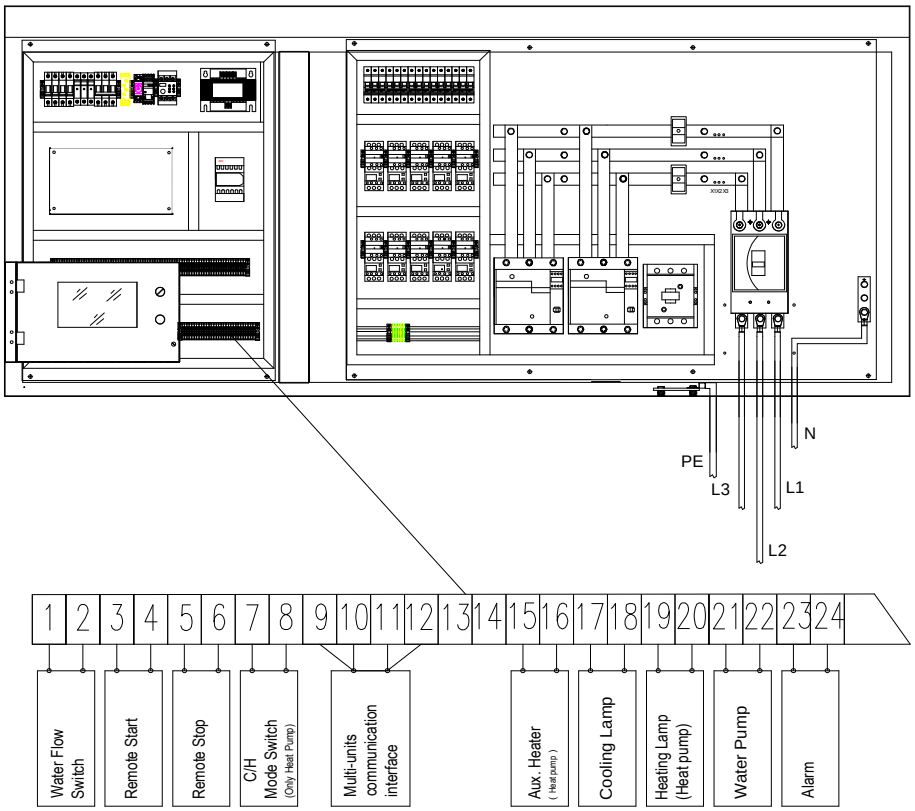


The capacities of the breaking isolation switches recommended are as follows.

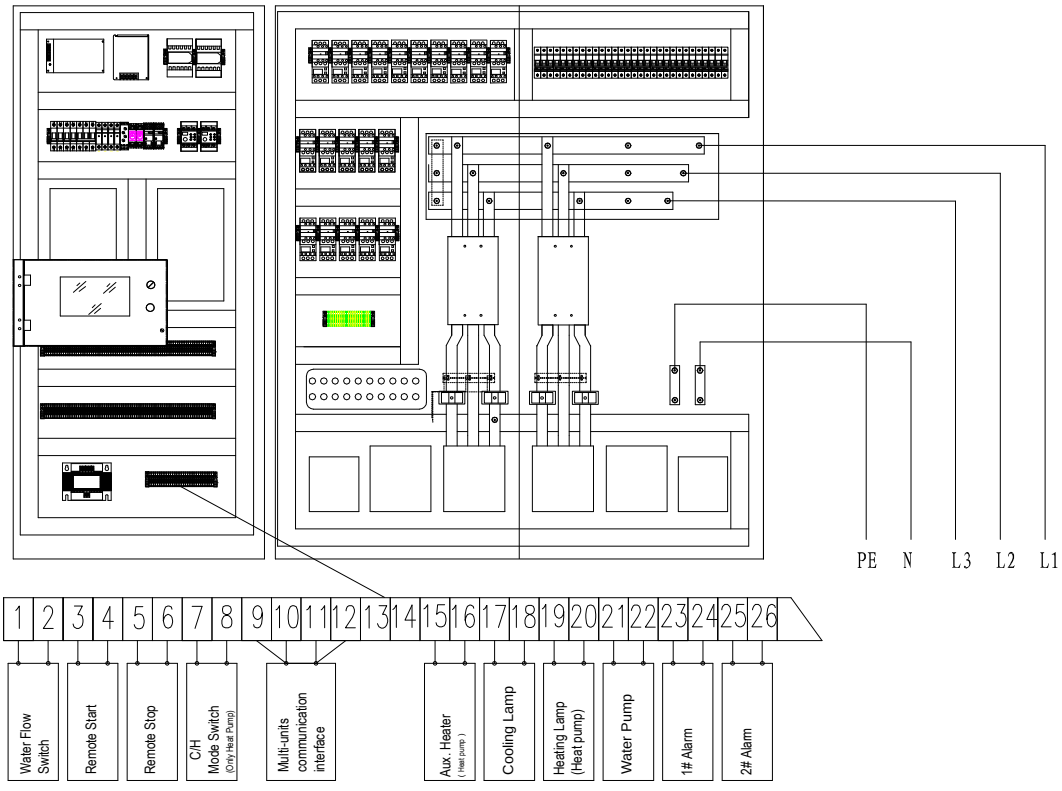
8.3 Main power supply wiring diagram

Main power supply cable must refer to correlative national regulation. Dust guard must be installed on power supply cable inlet to avoid dust into wiring box when wiring is completed. Main power supply wiring measures as following diagram:

LSBLGW380/C 、LSBLGW500/C、LSBLGW600/C、LSBLGW720/C：



LSBLGW900/C 、LSBLGW1000/C、 LSBLGW1200/C、LSBLGW1420/C:



Cable , isolated breaker selection criteria:

Model	Recommended Cable	Recommended breaker	Note
LSBLGW380/C	BVR120*4+BVR70*1	330A	The electric cable must be copper core. If units are used in high temperature conditions, the breaker needs larger capacity.
LSBLGW500/C	BVR240*4+BVR120*1	500A	
LSBLGW600/C	BVR240*4+BVR120*1	500A	
LSBLGW720/C	2*(BVR185*4+BVR120*1)	630A	
LSBLGW900/C	(BVR185*4+BVR120*1)+ (BVR240*4+BVR120*1)	830A	
LSBLGW1000/C	2* (BVR240*4+BVR120*1)	1000A	
LSBLGW1200/C	(BVR240*4+BVR120*1)+ (BVR300*4+BVR150*1)	1000A	
LSBLGW1420/C	2* (BVR400*4+BVR240*1)	1260A	

Cable introduction

BVR：Copper core PVC insulated soft wire					
Domestic model	Conductor material	Insulator material	Nominal section area (MM ²)	UL model	Note
BVR70	Cu	PVC	70	2/0	The electric cable must be copper core.
BVR95	Cu	PVC	95	4/0	
BVR120	Cu	PVC	120	250	
BVR150	Cu	PVC	150	300	
BVR185	Cu	PVC	185	400	
BVR240	Cu	PVC	240	500	
BVR300	Cu	PVC	300	600	
BVR400	Cu	PVC	400	800	

The max economical conveying distance:

The max loading time in a year (h)	Copper core length(m)
<3000h	264
3000 ~ 5000h	294
>5000h	331

1. All the control output cables required to be connected on the jobsite shall be 1mm^2 and the control signal line shall be 0.5mm^2 shielded one.

2. Precautions: carefully read the wiring diagram and do wiring strictly per the diagram. Use two-core cable 0.5mm^2 for wiring the flow switch and connect it to the normal-open points of the switch. The interlock of the chilled water pump is performed by the contact signal inside of the control cabinet. Two buttons can be connected to the outside to realize remote start and stop.

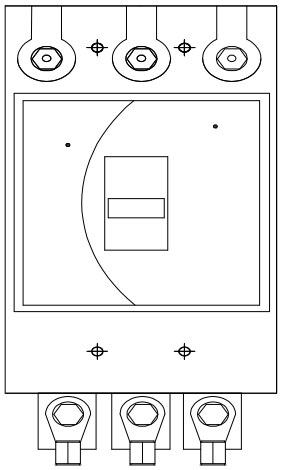
8.4 Usage of main switch

To avoid short circuit accident do harm to electric appliance such as transformer , cable and considering convenience for maintenance and control, proper capacity breaker must be installed on each power supply cable. Note: One breaker for one unit, and one breaker for multi-units is forbidden.

The supply disconnecting device shall fulfill all of the following requirements:

1. In accordance with IEC/EN 60947-2 or IEC/EN60947-3
2. Isolate the electrical equipment from the supply and have one OFF and one ON position marked with “O” and “I”
3. Have an external operating means.
4. Be provided with a means permitting it to be locked in the OFF position.
5. Disconnect all live conductors of its power supply circuit.
6. Have a breaking capacity sufficient to interrupt the current of the largest motor when stalled together with the sum of the normal running currents of all other motors and/or loads.

Note: Main switch must be cut off before maintenance, and make sure main switch is on OFF state.



WARNING

Serious result would be caused in case of a shorted control line!

8.5 Control accessories

1. Connections between the control cabinet with the main motor, electric components, pressure and temperature sensors have been carry out in the factory, therefore the wiring on the jobsite becomes very simple.

The control connecting terminal of the chilled water flow switch is a contact without electric and that of the chilled is a contact electric (220VAC).

2. Water flow switch is required to set with the chilled water pipelines. It shall be mounted on the outlet pipeline of condenser. The normal-open contacts of

the water flow switches of chilled water system shall be connected into the control cabinet per the wiring chart.

3. Lubricant or other greases which will not being solidified at the temperature below the chilled water outlet one shall be charged into the sensor tube for the benefit of heat transmission and be insulated and sealed.

9. Pipeline connection

After the unit is located, carry out the water piping system, or connect the finished water system pipeline to the nozzles of evaporator and condenser.

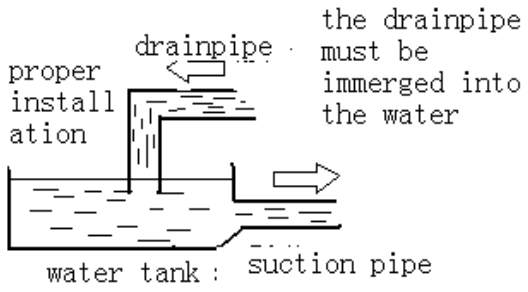
9.1 General requirements

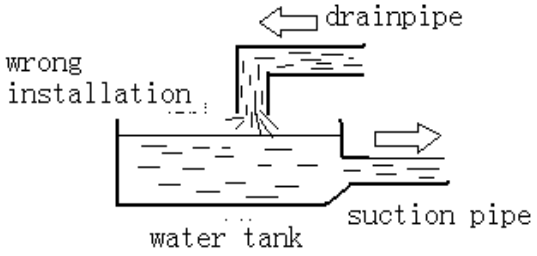
Water system installation must follow routine installing rule to achieve max working efficiency. Inner pipe should have no foreign matter and all chilled water Pipe must be accord with local pipeline engineering rules.

- Safety valve (opening pressure not below 1.0MPa) must be installed.

Chilled water pipeline must be cleaned by by-pass, do not connect evaporator into water system before pipeline washing. Must installed bypass clean pipe like water system diagram and use unit evaporator clean the system piping is banned

- Piping construction must set aside enough space for maintenance. Besides it should be able to carry through draining valve maintenance on pipeline.
- Water pumps are not equipped with the Unit. Be sure to install a pump matching the piping system. The pump must be installed in the water side of unit evaporator.
- For decrease of pump capacity by tee joints, valves, all pipelines should be installed straightly and simple.
- It's recommended to install manual shutoff valve for facility of maintenance operation.
- All low position must install drain pipe to ensure thorough drainage of evaporator and pipelines.
- Deflation valve must be installed on the top position of chilled pipe in order to drain inner air to ensure water system without air, then unit may exert maximum capacity. Deflation and drain pipe is no need of thermal insulation for convenience of maintenance.
- Anti-freezing measures (drainage, water circulation pump running, heater heating) should be taken to avoid damages of dry expansion evaporator when ambient temperature lower than 0℃ in winter or chiller off working. Please base on the using condition take effective measures.
- Measures should be taken to ensure the water pipe of cold-preservation, heat-preservation, as well as damp proof. Must be installed above 10mm heat preservation cotton on the chilled water pipe. If measures are not sufficient, besides heat loss, the machine also will be damaged due to the freeze in the winter.
- The circulating water standard is equaled as chilled water quality standard. Any water leakage can cause corrosion.
- Water quality must be accord with chilled water quality standard of JRA-GL-02.
- The amount of water retained in the system should be in the operating range. A lacking of water can result in scale deposition to cause the performance loss or pitting corrosion, finally lead to refrigerant leakage. Excessive water can cause corrosion.
- Do not let internal pipe water expose to air.





- Water is exposed to air will cause dissolved oxygen increases and atmosphere pollutants into water, thus make water corrosive.
- Any electric appliance earthing do not use unit water pipeline which can arouse electrolytic corrosion of pipeline.
- Anticorrosive measure must be taken for buried pipeline
- Do pay attention to water flow speed, expansion tank position and exhaust plug position to ensure no air pocket
- If the PH value of the water exceeds the standard, it will accelerate the corrosion rate of copper, and therefore do change the water before the PH value reaches the standard. If the heat storage tank of extended use, heat storage tank can cause cracks and leaks of water splashing. Water leakage will not cause serious problems of water quality control, but if the sea water or contaminated ground water spills, it can cause the breeding of microorganisms in water heat storage tank, which will generate debris in the system and cause the adhesion of calcium carbonate.
- Flexible tube should be equipped on water pump inlet/outlet of unit and to avoid vibration transmit to building.
- Install drain pipes on all drain outlets. Note: The inlet / outlet position, in order not to mistaken, please observe the identification label carefully.
- Design inlet/outlet pipes of evaporator must adhere to following rules:

a) Circulation pump outlet should connect with inlet of evaporator; pump inlet should connect to return water pipeline rather than evaporator.

b) One water stainless steel strainer with more than 40 mesh should be installed on chilled water inlet of evaporator.

c) All chilled water pipeline must be thoroughly cleaned without foreign matter before unit running, do not crush any foreign matter into evaporator.

d) Thermometer and pressure gauge should be installed on water inlet and outlet to make it easily for maintenance. In the evaporator import and export must install a globe valves.

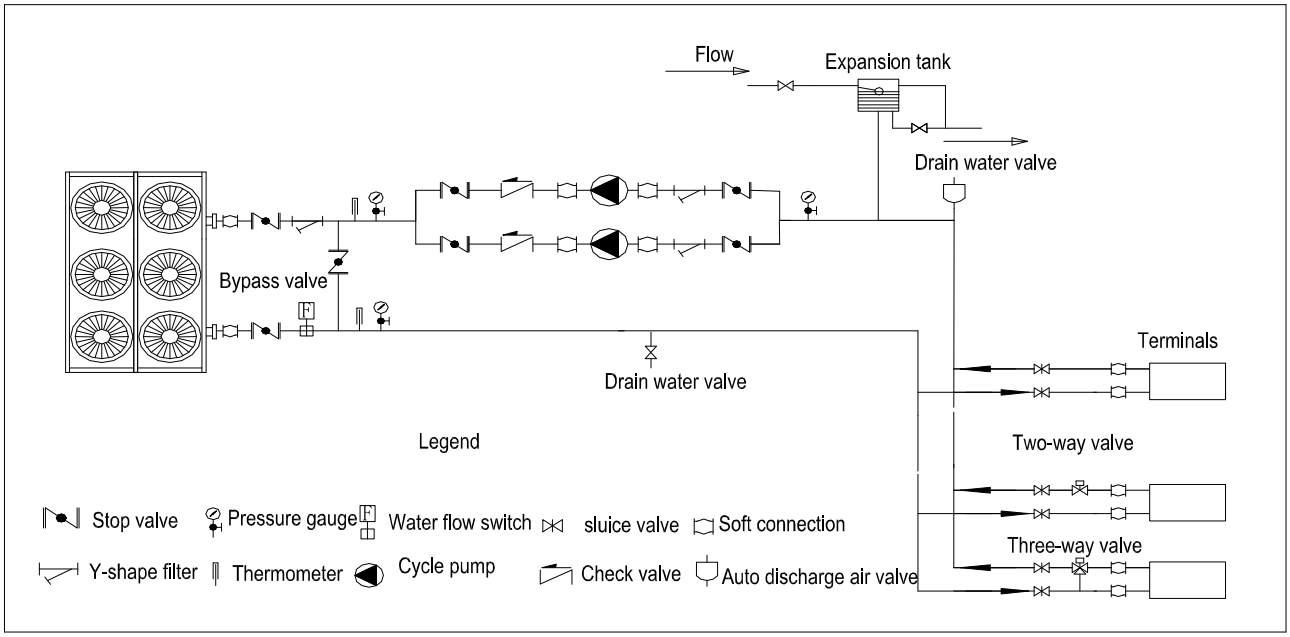
e) One water switch must be installed on outlet and cleaning by-pass piping of each evaporator as water system diagram shown, the water switch should be installed at horizontal straight pipe and the two end of the water switch must more than 5 times diameter of pipeline. The water switch is connected with terminal on control box. According to the specifications of the pipe to adjust current switch, reference manufacturer's current switch manual. The switch connects with the control panel on the terminal, for detail please refer to wiring diagram.

WARNING

Connect the pipeline to the unit before clean is completely forbidden.

9.2 Piping connection of the evaporator

1. The chilled water system should be installed with soft connection, thermometer, pressure gauge, water filter, check valve, water flow switch, target flow meter, auto discharge valve, expansion tank, sluice valve, drain water valve etc.



2. The expansion water tank shall be set above 1~1.5m to the highest point in the water piping system and the volume of the water tank should be 1/10 of the water in the whole system.

3. The water volume of the water system shall not be lower than the minimum required for the unit, or a water storage tank shall be set at the return water pipe.

4. The water pipeline shall avoid the change in the vertical direction. An automatic air exhaust valve shall be set on the highest point of the pipeline.

5. Both thermometer and pressure gauge shall be mounted on the straight section of the water inlet and outlet pipelines and better not near any bend. A drainage connection shall be set on each low point for the discharge of dirt.

6. The chilled water pipeline shall be insulated and a space for maintenance and operation shall be left at the connection joint

7. Do the insulation the water pipeline before tightness test, the insulation layer shall be covered with wet proof seal.

8. The quantity of the two-way valve on the terminals shall not be over 50% of the total terminals.

9.3 Water treatment

Use of untreated water or incorrect water makes unit operation low efficiency and could lead to heat exchanger damage. If the resulting from equipment scaling, corrosion, rust, produce the algae or siltation etc, must ask qualified water treatment engineering company or personnel to handle.

WARNING

Manufactory is not responsible for any corrosion, erosion or decreased performance of the unit arising from the use of the untreated or improperly treated water!

The table below for the recommended water quality standards is reference:

	Project	Unit	Water supplement	Chiller water	Tendency	
					corrosion	scaling
Basic project	PH（25℃）		6.5-8.0	6.5-8.0	0	0
	conductivity（25℃）	μS/cm	<200	<800	0	0
	Chlorine ion Cl^-	mg Cl^-/L	<50	<200	0	
	Sulfuric acid root ion SO_4^{-2}	mg SO_4^{-2}/L	<50	<200	0	
	Acid consumption（PH4.8）	mg$CaCO_3$/L	<50	<100		0
	All the hardness	mg$CaCO_3$/L	<50	<200		0
Reference project	Iron（Fe）	mg Fe/L	〈0.3	<1.0	0	0
	Sulfur ion（S^{2-}）	mgS^{2-}/L	Check out	Check out	0	
	Ammonium ion（NH_4^+）	mgNH_4^+/L	〈0.2	<1.0	0	
	silica（SiO_2）	mgSiO_2/L	<30	<50		0

10. Product components

10.1 Compressor

LSBLGW units Adopts twin-screw compressor designed with the most advanced, industrial third-generation asymmetric technology of 5 gear teeth to 6 gear teeth.

The compressors equipped with a variable capacity slide valve for continuous control between 25% and 100% of full load.

10.2 Condenser

Copper-fin heat exchanger adopts high- efficiency heat transfer tubes with the feature of high efficiency and so on. The unit is able to adjust the capacity matching with load change to advance the efficiency of compressor, reduce the energy consumption, and increase the unit's service life.

Fans are installed on the top of condensers which are low-noise, balance-running and small-shaking.

Aluminous-fin cupreous corrosion resistant tube is cross banding to supply high coefficient of heat transfer.

10.3 Evaporator

Shell-and-tube evaporator adopts high-efficiency heat transfer tubes, special tube layout design, and the state change, the flow velocity, the pressure drop of the refrigerant are seriously considered in refrigerant condition to ensure sufficient evaporation, in order to strengthen the refrigerating capacity.

10.4 Electronic expansion valve (EXV)

The EXV is equipped with a stepper motor that is controlled via the EXV board.

The EXV is also equipped with a sight glass that permits verification of the mechanism movement and the presence of the liquid gasket.

10.5 Refrigerant

The LSBLGW series water chiller operating only with refrigerant R-134a.

10.6 Lubricant

The LSBLGW screw compressor is approved for use with the following lubricant: BSE170.

10.7 Filter drier

The role of the filter drier is to keep the circuit clean and moisture-free. The moisture indicator shows, when it is necessary to change the element. A difference in temperature between the filter inlet and outlet shows that the element is dirty.

10.8 Dual high pressure switch

Dual high pressure switch installed in the discharge circuit with double protection function, can make sure the unit running in a normal pressure.

11. Options and accessories

11.1 Standard accessories list

NO.	Standard Accessories	LSBLGW380/C	LSBLGW500/C	LSBLGW600/C	LSBLGW720/C
1	Qualified certification	1	1	1	1
2	User manual	1	1	1	1
3	Water flow switch connectors	1	1	1	1
4	Packing list	1	1	1	1
NO.	Standard Accessories	LSBLGW900/C	LSBLGW1000/C	LSBLGW1200/C	LSBLGW1420/C
1	Qualified certification	1	1	1	1
2	User manual	1	1	1	1
3	Water flow switch connectors	1	1	1	1
4	Packing list	1	1	1	1

11.2 Available Accessories List

No.	Name	Model	Introduction
1	Water flow switch	WFS-1001-H (Honeywell)	Installed on evaporator outlet pipe to prevent heat exchange pipe from frost crack.
2	Vibration damper	MHD Series	To avoid vibration and noise, it must be used between base and foundation when install the unit.
3	Remote control cabinet	YCKZ-P	Can be installed in the control room. Through the cable connected to the unit touch screen, it can display all states information and complete all the operations of unit (startup/shutdown, error confirm, etc.)

12. Commissioning

Items to be checked before starts the units

12.1 Check of the power supply and the electric control meter system

1. When to start the unit for the first time, check if the power capacity conforms to the required power of the unit and whether the diameter of the selected cable can meet the requirement.

2. Check whether the power system conforms to the unit, the required power system : **three-phase five-wire system** (three phases, one neutral wire, one ground-wire, 380V±10%) .

3. Check whether the power supply for the compressor is connected securely and, if loose, retighten it. The torque used at the compressor terminals is 500kg.cm。The screws may become loose after a long way transportation and lifted installation, which may cause damages to the electric components inside of the control cabinet (such as : air switch, AC contactor etc.) and the compressor.

4. Carefully check whether the electric wirings are all made correctly with a millimeter. Check whether the casing is short circuit, check whether the ground-wire is connected normally and the dielectric resistance to the earth shall be over 2MΩ, and check whether the power supply cable meets with the capacity requirement.

5. Check whether there is a circuit break switch set on the power supply cable to the unit.

6. Do not energize the system before carefully checked the power supply system and the control system wiring(such as the compressor oil heater, power protection module, water temperature sensor, wiring of the target flow switch, interlocked control of the water pump etc.).Check whether the bolts on the terminal are tightened, if the electric control meters and electric components are set correctly, complete and effective, and if both outside and inside of the electric control cabinet, especially the wiring terminals are clean without any foreign matters.

7. When the power of the control cabinet is turned on after the above checks, the power indicator is energized and the oil heater starts working. Check if the power protection module is in right condition, if not, reverse any of the two phase wires.

8. Check whether the external system meets with the starting requirement before start the unit (such as: if the chilled water pump and cooling water pump are externally controlled or interlocked), and, in case of an external control, the water pump shall be started ahead of the unit.

12.2 Check the compressor and the refrigerant pipeline system

1. Check whether the oil level inside of the compressor is normal. In general, is should be in the middle of the sight glass.

2. Check whether the capacity adjusting solenoid valve coil of the compressor is locked and whether the capillary is broken.

3. All the refrigerant valves in the refrigerating system (the angle valve at the discharge pipe of the condenser, refrigerant gas suction and discharge stop valves of the compressor) shall be opened so as to have the refrigerant system unobstructed.

4. Check whether the high and low pressure values set with the pressure relay are right, users are not allowed to change the set values without authorization.

R134a : the high pressure value is set to be 2.0MPa , the low pressure value is set to be 0.1MPa

5. Check whether the lubricating oil of the compressor is preheated over 8h. The oil heater shall be turned on to heat for at least 8h before the test running so as to prevent the formation of bubbles. In case of a lower ambient temperature, the heating time shall be relatively extended. When started in a low temperature, the unit may not be well started and the compressor may improperly load or unloaded due to a heavy viscosity of the lubricating oil. For the reliable working of the lubrication system

the lowest oil temperature shall be over 23℃usually.

6. Check whether the fan is in the right condition and if it is collided with the net-cover.

7. Check whether the compressor is correctly wired. After the compressor is started, the discharge pressure is supposed to increase and the suction pressure to decrease. If not, the compressor may be rotate in the wrong direction.

8. Carry out test running with the main power supply cut off to check whether the control logic is correct. The correct starting sequence comes like this: 3 minutes after the power is turned on and the start signal is send to the unit, the star AC contactor switches in and then switch out in a short time, and the delta AC contactor switches in, the unit is started and gradually loading to full load.

12.3 Check of the water system

1. Check whether the chilled water pipeline is cleaned to required condition.

2. Check whether the pressure gauge and the thermometer on the water side are correctly connected. The pressure gauge shall be mounted perpendicularly to the water pipe and the thermometer sensing probe shall be inserted directly into the water pipe.

3. Check whether the flow switch on the chilled water outlet side is set correctly and confirm that the switch has been correctly connected to the control cabinet.

4. Check the chilled water pump rotation which shall be clockwise and, if not, recheck the wiring of the pump.

5. Start chilled water pump to make the water circulating in the pipe system and check whether there is any leak spot or any notable water dropping.

6. Start chilled water pump to check whether the water pressure is stable. In case of a stable water pressure, the reading of the gauge will be stable and there will no big change in the pressure difference between the pressure gauge before and after the pump. Check whether the running current of the water pump is within the rated range and in case of a big difference with the rated value, check whether there is an excessively heavy resistance in the system and settle any possible fault to have the actual running current up to the requirement.

7. Check whether the automatic air release valve in the water system is in the right condition, in case of a manual air release valve, open the valve on chilled water pipelines to have the air in the pipe system discharged completely.

8. Adjust the water flow and check whether the water pressure drop in the evaporator can meet with the requirement for the normal operation of the unit.

13. Unit operation

13.1 Start-up of the unit

1. The control cabinet provides digital output signal to control start and stop of the chilled water pump and, when several units are interlocked, the water flow through each unit needs to be adjusted to meet with the requirement.

2. Check whether the settings on the touchable screen conform to the requirements (generally already set as the best status before ship out the factory, it is unnecessary to be changed).

3. When the chilled water pump is interlocked to the control cabinet, the control logic below will be executed: After confirming the start at the touchable screen, first start the chilled water pump and then in 3min later the 25% solenoid valve get power, after 35s, start the unit. The fans will start up later according to the present condition. When detected the water flow switch keep on off for more than 5s, stop running and send out a fault alarm.

4. After the unit starts running, make sure there is no abnormal vibration or noise.

5. Use a clip-on ammeter, when the unit is running in normal, to check if all the running current conforms to the designed requirement.

13.2 Stop of the unit

1. When confirm the stop on the touchable screen, the unit will unload first, then stop the compressor and energize the oil heater. The compressor will run 30s at 25% capacity before stop, 1min later stop the fans and 3min later stop the chilled water pumps. When the emergency stop button on the

electric control cabinet is pressed, the unit will force the compressor stopped immediately regardless of the current running status. Do not use this button unless some urgent situation happened.

2. Manually turn off the chilled water pump a certain time after the compressor stops, if it is not interlocked to control cabinet.

13.3 Start/Stop process control

Step 1：Energize the control cabinet to have oil heater working for at least 8 hours before start the compressor.

Step 2：When the oil heater has preheat more than 8 hours, first turn on the water pump(chilled water pump).

Step 3：After the chilled water pump started, press the start key on the touchable screen.

Remark: The chiller can be started only if the system be energized longer than the limitation [minimum compressor stop time], chilled water temperature higher than the settings and water flow in the right condition.

Step 4：The starting process comes like this: first start the chilled water pump,3min later the 25% solenoid valve get power, 35s later start the unit. 6s after the Y connection will switch to △ connection. After the compressor start, it will run for 30s in 25% capacity before load to 50% capacity, 3min later carries out the loading control according to the temperature.

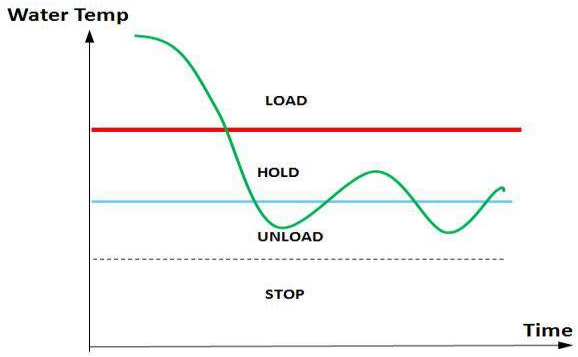
Step 5：check whether the chilled water inlet and outlet temperatures are normal (while the unit in running, the chilled water inlet temperature is higher than the water outlet one) and check if the running current of the unit is within the unit rated range.

Step 6：press the stop key on the touchable screen for direct stop .The process comes as: compressor runs for 30s with 25% capacity before stop, 1min later the fan stops, 3min later the chilled water pump stops.

Step 7：if the chilled water pump is not interlocked, it needs to be manually stopped 5min after the compressor stops.

13.4 Capacity adjustment

The unit adjusts the capacity of the compressor by fuzzy adjustment per the chilled water temperature. The control logic comes as:



14. Daily use and maintenance

14.1 Use of the unit

14.1.1 Start of the unit

14.1.1.1 Daily start of the unit

1．Check whether the power supply to the unit is stable and meet the requirement.

2．Start the chilled water pump to check whether its voltage and current are normal.

3．Start the unit.

14.1.1.2 Seasonally use of the unit

1．Carry out the maintenance and check according to the operation and maintenance regulations set forth by the water pump and other auxiliary equipment manufacturers.

2．Close the drainage valve on the water system,

open the stop valve and the air release valve on the water loop. Then charge full water into it the water system, after the air is discharged completely close the air release valve.

3 . Check if any parts loose on the electric system happened, if the switch-in and switch-out motions of the contactors are smooth and if the insulating layer is broken, and blow off the dust.

4 . Supply power to the start cabinet and confirm that the oil heater worked over 8h.

5 . Start and run the unit per the daily start-up procedure.

14.1.2 Stop the unit

14.1.2.1 Daily stop of the unit

1 . When conform the stop on the touchable screen, the unit will unload first, then stop the compressor and energize the oil heater,1min later stop the fans and 2min later stop the chilled water pumps.

2 .Manually turn off the chilled water pump a certain time after the compressor stops, if it is not interlocked to control cabinet.

14.1.2.2 Seasonal stop of the unit

1 . After the water pump stops running, close the stop valve of the water system close to the unit.

2 . Close the suction and discharge stop valves of the compressor.

3 . Open the drainage and air release valves on the water system to drain out the water completely. To prevent the water system pipeline from get corrosion or rusted due to the exists of air, charge nitrogen into the pipeline a little bit higher than the atmospheric pressure to discharge the air and close the air release valve.

4 . Maintain unit and system.

14.1.3 Precautions at use of the unit

14.1.3.1 Precautions for run and management of the unit

1. Normal start and stop of the unit shall be carried out strictly following the steps set forth in the operation instruction provided by the manufacturer.
2. During the running of the unit record correctly parameters on time.
3. In case of an protective stop during the running of the unit, notify the related people on time to check. If the fault cannot be settled by the user, please directly contact the manufacturer.
4. It is prohibited to shorten the water flow switch during the running of the unit to prevent the water pipe from frozen.
5. Have special technician in charge of the machine room and never let any irrelevant people get in or operate the unit.
6. The machine room shall be equipped with safety protectors, repair and check tools, such as pressure gauges, thermometers etc. And keep them in fixed positions.

14.1.3.2 Precautions at stop of the unit

1. Cut off the main power supply switch after the unit stopped.
2. When the unit keep unused for a long time, drain out the water completely inside chilled water and cooling water systems to prevent rust and corrosion. Keeps the water piping system and the unit well sealed
3. In case of a long time stop, get the unit well maintained.
4. During the stop period, cover the unit completely to prevent dust deposition.
5. During the stop period, do not let any irrelevant people touch the unit.

WARNING

Take serious about freezing protection of the unit in winter.

14.2 Maintenance of the unit

14.2.1 Daily maintenance

1. Follow the regulated procedure to start and stop every day.

2. Record the running parameters of the unit per a certain interval of time.

3. Check the evaporator pressure and condenser pressure in the pressure gauge on the control cabinet.

4. Check the refrigerant dry-filter and in case of a big temperature difference between inlet and outlet of the dry-filter or frost at the outlet, it indicates the dry-filter may be possibly blocked.

5. Check the oil level in the oil sight glass and the normal oil level is at the middle of the sight glass

3. In case of a severe fault, it shall be done to notify the local service section of this company for settlement.

14.2.2 Regular maintenance

WARNING

To prevent any personal injury or death due to touching any of the moving or electrified part, cut off the main power supply prior to maintenance and check, and set a notable mark of “switch-in prohibited” on the switch position!

Regular maintenance means to carry out maintenance per week, per season and per year. Referring to the following instruction to draw up a scientific plan of regular maintenance and carefully performing is very important to prevent alarms or protection happen.

14.2.2.1 Maintenance per week

1. Check and analyze the running parameter records.

14.2.2.2 Seasonally maintenance

1. Check and analyze the running parameter records.

2. Clean the water filter.

3. Check whether there is any loosen point on the power supply and the electric components.

4. Check whether the moving parts of the unit are running normally, any abnormal noise.

5. Check whether the high and low pressure values of the refrigerating system are normal.

6. Check whether the running current of each motor is normal.

7. Check whether the dry-filter and the sight glass are normal.

8. Check whether the lubricating oil of the compressor is normal.

14.2.2.3 Annually maintenance

1. Check and analyze the running parameter records.

2. Check whether the dry-filter and the sight glass are normal and in case of a big temperature difference between inlet and outlet of the filter or frost at the outlet, it indicates the filter is dirty and blocked and the filtering core needs to be cleaned. When the sight glass shows humidity inside the system (the color turns to red) the filter core needs to be replaced.

3. Check the oil sight glass, add lubricaion oil when the oil level is below 1/2 of the sight glass. Clean the oil filter as well as the dry-filter core when there is dirt inside. Carry out physical and chemical analysis when the oil color is found to be abnormal. If the oil is go bad, replace the oil and the filter core.

WARNING

Confirm the lubricant oil first when add or replace it. Replacement with other kinds of lubrication oil without being confirmed may cause the unit to get damaged!

4. Replace the pipe connected to safety valve and carefully check the valve body to see if there is corrosion, rust, scale formation inside. And/or replace the valve if any leakage is found.

5. Check up the condenser high pressure setpoint and make sure the switch acting smoothly.

6. Check insulation resistance between the windings and the winding to the earth.

WARNING

The overhaul in annual maintenance shall be done by qualified professional technician!

14.2.2.4 Maintenance per three years

1. The items in the abovementioned yearly check and maintenance.

2. Launch an all-respect check on the unit and particularly check the vibration status of the compressor to make sure that every part inside of the compressor at a good status.
3. Inspect the unit and check whether the heat exchange copper tube leaks.
4. Check both electric operation and safety control to make sure electric components in a good status.

WARNING

According where the unit is used, sometimes this every-three-years maintenance frequency may need increased. Especially if any severe safety will caused due to the units stop, for instance, the industrial process used air-conditioning field.

15. Maintenance and repair

15.1 Items of maintenance and repair

15.1.1 Filter drier maintenance and replacement

1. Close the angle valves on both sides of the filter and discharge the refrigerant.
2. Disassemble the filter drier.
3. Clean or replace the filter core.
4. Assemble the filter drier.
5. Exhaust the interior air with refrigerant.
6. Open the angle valves on both sides of the filter drier.
7. Finish maintenance and replacement of the filter drier.

15.1.2 Refrigerant charge on site

Chiller needs to recharge refrigerant for some reasons such as leakage, take the following method:

1. Start the chiller normally.
2. Connect, with rubber tube, the refrigerant tank to the needle valve at the inlet of the evaporator.
3. Use an electronic scale to determine the refrigerant recharge volume.
4. When the electronic scale is unavailable, the refrigerant recharge volume can be determined by others reference data, such as: suction temperature, discharge temperature, voltage, current and sight glass, etc..
5. Remove the rubber tube, finish refrigerant recharge.

15.1.3 Refrigerant recycling

The Refrigerant in the system needs to be recycled for maintenance and other reasons, the methods listed as following:

1. Confirm shutdown of the unit.
2. Connect the inlet of the refrigerant recycler with any needle valve, and the outlet into the refrigerant jar.
3. Open all the cut off valve of the system
4. Start the refrigerant recycler, recycle the refrigerant.

15.1.4 Refrigerant charge

Chiller need to charge refrigerant for some reasons such as unit repair, take the following method:

1. Exhaust refrigerant in the chiller completely.
2. Vacuum the chiller.
3. Pressure-keeping, make sure that the pressure does not rise and there is no leaking point.
4. Turn on the water pump to circuit the water in the evaporator.
5. Charge the refrigerant at the angle valve of the condenser.
6. Charge the refrigerant according to the refrigerant volume in the chiller nameplate.

In case of the refrigerant is not enough, it needs to recharge after start the chiller. The recharge method should refer to 15.1.2.

16. Chiller use and controller operation guide

WARNING

To prevent any people from injury or death due to touching any of the moving or live part, cut off the main power supply, prior to maintenance and check, and set a notable mark of “switch-in prohibited” on the switch position!

Note: The instruction below is for dual head chiller as an example. The content may be modified

without notice for specific purposes. Please take reference to the actual interface.

16.1 Homepage

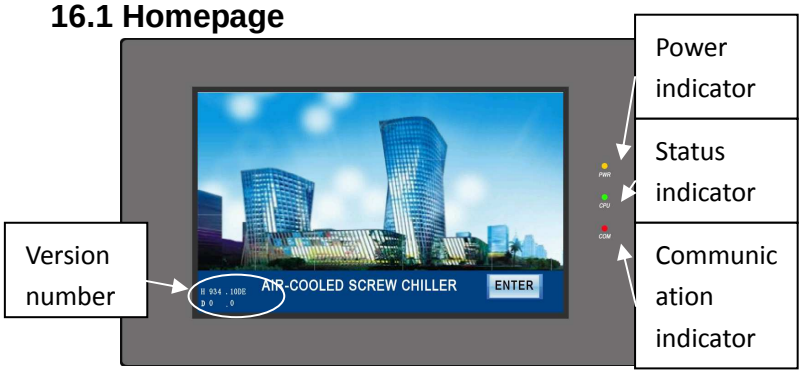
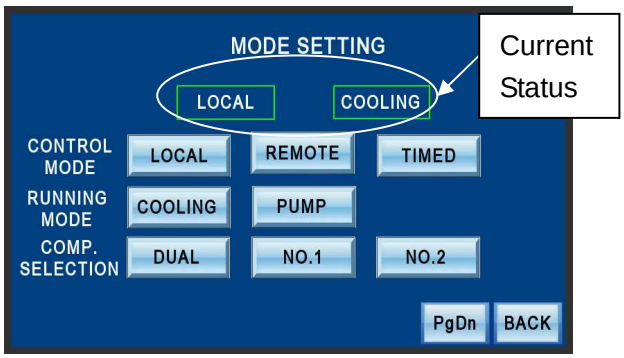
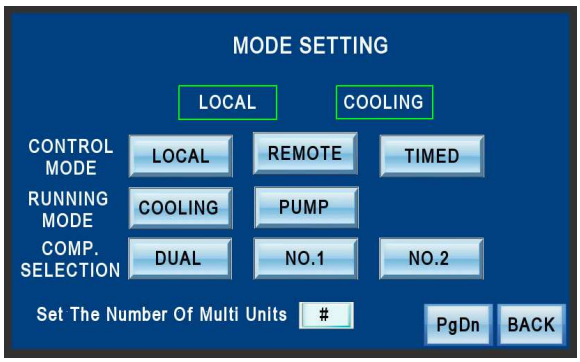


Diagram 1 Homepage

Please click on ENTER and the “Password Input” dialog will be popped up, please input the User Password (58806) or User Manage Password (40828), and click “ENTER” into the next interface (Main Page)



Single Unit



Multi-combination Chiller

Diagram 2 Mode setting

Note:

1、Power indicator (yellow): Be on when the power is on. If off, please check whether the power wiring is properly connected.

2、Status indicator (green): Keep flashing at low frequency when display is working normally, otherwise it is off.

3、Communication indicator (red): Keep flashing at high frequency when display and controller communicates normally. If not, please check whether the wires are tightly fastened.

16.2 Mode Setting Page

Note:

①Only the control mode is available when the unit is running. The running mode is invalid.

② Control Mode: Select the ways of start/stop. “LOCAL” indicates that you can only start or stop the unit through “Start/Stop” button on the touch screen. “REMOTE” indicates you can only achieve start/stop through the hardware interfaces of “Remote Start” or “Remote Stop”; “TIMED” indicates the unit can achieve timing start/stop set by the user.

③Only dual heads chiller has “single/dual heads option”.

④ In multi-combination mode, master chiller decides the quantity of the slave. It is prohibited to allow excessive slaves involved into operation system.

16.3 Main Page

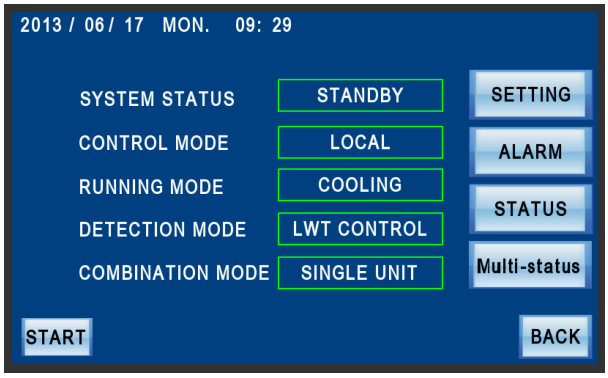


Diagram 3.1 Main Page

Note:

① No 

in single unit mode. Click on 

to check the status of the unit.

②In single unit mode, the “temperature control” is outlet water control. While in multi-combination mode, the “temperature control” must be constant inlet water control.

③”Single unit” is indicated on the screen before units are formally combined. Select combination mode via hardware switch (Note: Do not set combination mode with only one unit available).

Starting Operation:

Diagram 3.2

Click on 

, and “Confirm startup” dialog will be popped up, demonstrated in diagram 3.2. Click “Confirm” to start the unit. If the compressor fails to meet the startup requirements, the system enters pause status. The interface indicates “Failure to start, please check the status.”

Shutting Down Operation:

Click on 

button, and the “Confirm Shutdown” dialog will be popped up, shown in Diagram 3.3. Click on “Confirm”, and the system status indicates “Shutting down”. (Note: The system status indicates “shutting down” even though the requirements of shutting down are not met. The unit will execute shutdown action automatically after all of the requirements have been satisfied.)

Diagram 3.3

System Status:

①Standby status: “Standby status” is indicated after the unit is powered on.

②Running status: the starting of unit compressors has been finished.

③ Pause status: the unit enters “Pause” status when the setting water temperature is lower than the temperature required for “Pause” status. When the setting water temperature is higher than that required for starting the compressor, the unit enters “Running” status.

④ Shutting down status: the status displays "shutting down" after the unit has been confirmed to execute shutdown action. After shutdown, the unit enters "Standby" Status.

⑤Protection status: "Fault" is shown when there is an alarm.

16.4 Status Information

Click on STATUS to check the current unit status.

Diagram 4.1 Status Information

The upper left in the page displays the refrigerant type. The upper right in the page displays the actual address of the unit. No.1 unit is the master.

Note:

To start up, following conditions are required:

① "Restart Delaying" needs to display "NO". If "YES", it indicates the delaying for start has not been met.

② "Water Temp. Allow Compressor Start" needs to display "YES". If "NO", it indicates the current temperature is not able to meet the compressor starting requirements. Please take reference to Diagram 5.3.

③"Time for Oil Heating" should be "0". If excesses "0", it indicates that the unit is still under oil heating.

To shutdown, following conditions are required

"Min. Running Time Elapsed" needs to display "YES". If "NO", it indicates the delaying for shutdown has not been met.

(1)Status Information-Current Data Display

Please click on PgDn to enter the current data interface, as shown in diagram 4.2. User can enter this interface to check the temperature when there are temperature/pressure fault alarms (temperature or pressure is too high or too low).

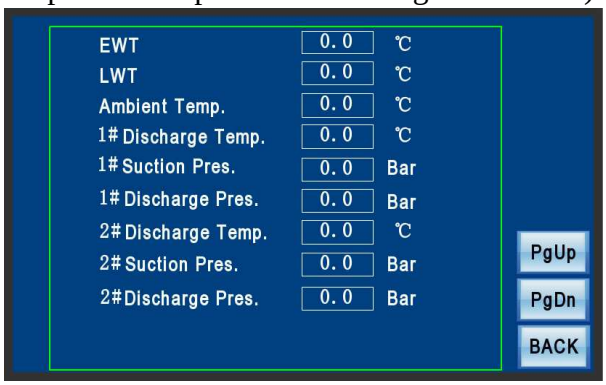


Diagram 4.2 Current Data Display

(2)Status Information-Input

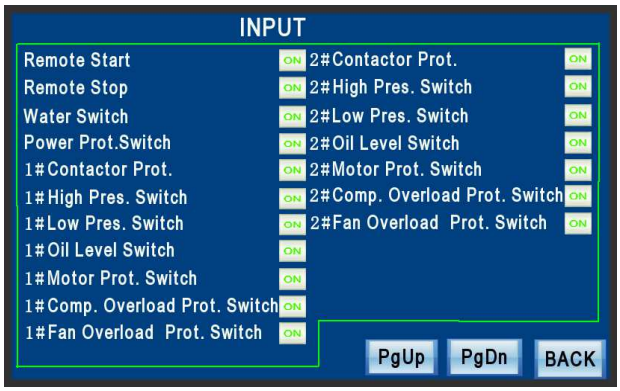


Diagram 4.3 Input Status

"ON" as displayed indicates the input point is closed; "OFF" as displayed indicates the input point is open.

Note:

① "Remote Start/Stop" is available only in REMOTE mode.

② "Water Switch": "OFF" is displayed in no water flow state, otherwise "ON".

③ "Contactor Protection": As the compressor starts to run and the contactor acts normally, "OFF" is switched into "ON".

④ "Comp. Overload Prot. Switch" and "Fan Overload Prot. Switch" are "OFF" in normal status and "ON" in failure status.

(3) Status Information – Output Status

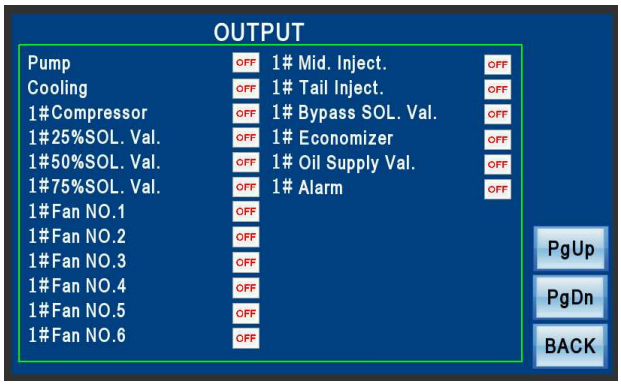


Diagram 4.4 Output Status

"ON" indicates that the output point is energized; "OFF" indicates the output point is de-energized.

16.5 Setting Parameter

Click on SETTING in main page to enter the password page. Click on the password dialogue, and a keyboard will be popped up in the interface. Please input user manage password (40828), then click on "Enter" to enter "User Parameter Setting Page".

Diagram 5.1 User Parameter Setting

Diagram 5.2 Password Error Page

"Password Error Page" will be popped up when the password is wrong, as shown in diagram 5.2. Click on Confirm to return to "Password Input Interface", and input password again to enter the next page.

User Parameter Setting：

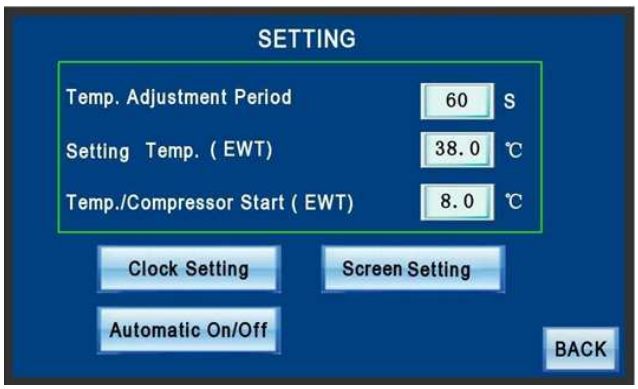


Diagram 5.3 User Parameter Setting Interface

Note：

① “Max” in the upper left indicates the upper limit of the setting parameter; “Min” indicates the lower limit. Click on “ENT” to confirm the input; Click “ESC” to delete the input and the keyboard disappears.

② Automatic On/Off displays only in TIMED Mode.

Explanation:

① Target Temp. (Chilled Leaving Water) : The target temperature of the chilled leaving water

② Temp. / Compressor Start (Chilled LWT): water temperature requirement of to start the compressor. In cooling mode, the compressor can start when the current chilled leaving water temperature > Temp. / Compressor Start. In heating mode, the current chilled leaving water temperature < Temp. / Compressor Start.

③ Temp. Adjustment Period: The time interval between each loading/ unloading judgment. For example when it is set to 60s, it indicates that the system will measure the temperature every 60s to decide whether loading/unloading is necessary. If so, execute immediately.

16.6 Setting Page-“Clock Setting”

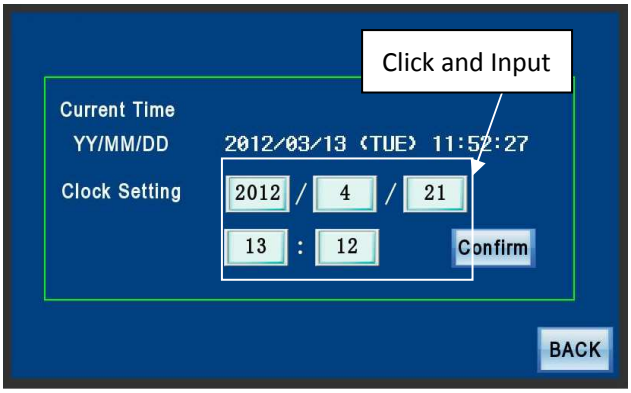


Diagram 6 Clock Setting

Click on the numerical box, the numeric keyboard will appear. Please input the time. Click on “ENT” to save or ESC to delete the input values.

Note: It is not allowed to set non-existent data or time. If so, we pay no responsibility for the ill consequence resulting from this setting.

16.7 Setting Page-“Automatic On/Off”

If the automatic On/Off function is needed, please switch to “TIMED” mode (as shown in Diagram 7). Enter user parameters setting page and click on Automatic On/Off button to enter the following page, and set the starting time and shutdown time.

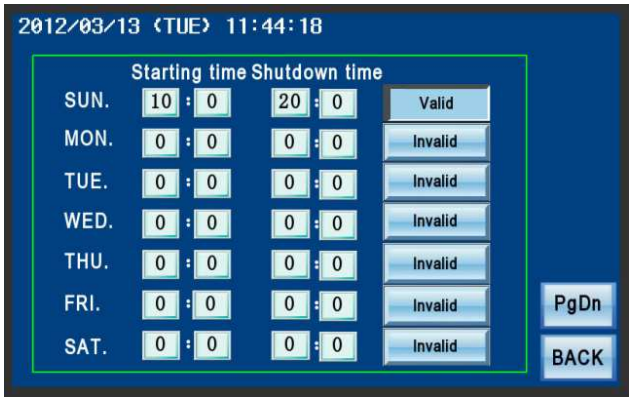


Diagram 7 Automatic On/Off

Any time is accessible for automatic On/Off. After time setting, please click on Invalid to switch to Valid, finishing the automatic On/Off setting. Click on Valid to switch to Invalid to cancel the setting. When a period of continuous running (for example from 10:00 Tuesday to 16:00 Thursday) is necessary, you can set the starting time to 10:00 on Tuesday and

shutdown time to 0:0 (Note: the shutdown time should be set ahead of startup time) and then click on "Invalid to switch to Valid. Set the starting time to 0:0 and shutdown to 16:00 on Thursday (Note: the shutdown time should be set ahead of startup time). Click on Invalid to switch to Valid. Please set the buttons to Invalid in the rest of time.

Since the time on time-switch should be coherent with the system time, please check the time on the upper left corner when start the TIMED. If the system time does not match the actual time, please reset it.

16.8 Alarm

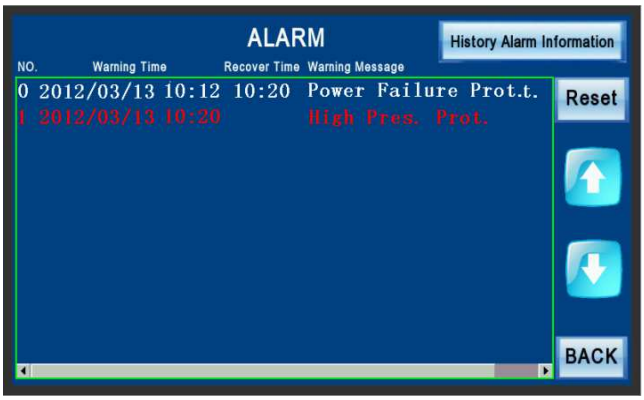


Diagram 8.1 Alarm Interface

Click on ALARM button in Main Page to enter the alarm information page. If there is any alarm, the unit will execute alarm procedure action. The unit alarm status can't be removed until all of the alarms have been eliminated and alarm shutdown process has been done. Click on Reset button so that "Fault" in main page disappears. If there exists a few warning messages, please click on to check. These in red indicate the alarms which have not been eliminated; these in white indicate the alarms which have been eliminated.

Explanation:

① High-Pressure Protection is unable to reset in alarm page. Please manually reset high pressure switch (installed on unit).

① Compressor and fan overload protection are unable to be reset automatically. Please check the relevant thermal relay in the control box to reset manually.

History Alarm Information

Click on History Alarm Information button in Alarm Page for historical alarm record, as shown in Diagram 8.2. Max.5 warning messages can be recorded. The messages will be updated automatically if excess 5.

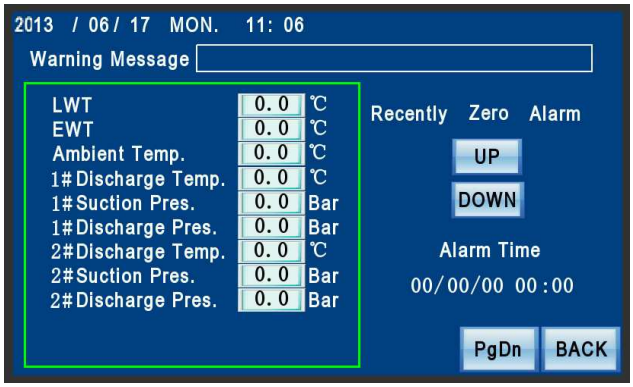


Diagram 8.2 Historical Alarm Record

Note:

Compressor malfunction parameter is recorded in historical alarm system.

16.9 Multi-Combination Status Enquiry

Diagram 9.1Multi-combination Status

The communication status is shown as "Connected" and Unit Protection Status, Unit Running Status and Total running time are displayed as well in normal condition. If the communication fails, the information related will not be demonstrated.

Note:

① Connect united control system in "Multi-control" mode. Please take reference to "7.4.10 multi-combination status"

② Max.8 units are available in multi-control system. Unconnected unit can access to the combination control any time once the power is supplied. Communication wires can be connected with unified control system, if is correctly operated.

③ "Running" will be displayed only in the condition that unit has been started and entered into capacity adjustment.

④ The operation of affiliated unit is the same as the host except for the Start/Shut down operations. The loading/ unloading operation is executed by the host based on the inlet water temperature.

⑤ Lag behind in transmitting the signal from the master. Please take reference directly to the current status on the touch screen of slave.

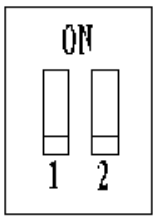
⑥ Multi-combination unit decides the maximum quantity of slave. It is not accessible for excessive quantity of units to be involved into multi-combination system.

Note:

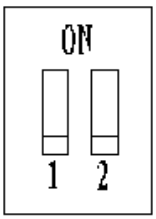
Each unit connected to the system has unique address, otherwise fails to communicate and control. No.1 unit is the master.

Input the address of slave. If the unit is connected properly, "Data is loading" will be displayed. Click on "Enter" for further information including input/output status, temperature or pressure.

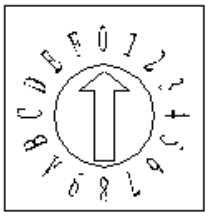
16.10 DIP Switch Setting



S1



S2



S3

Diagram 10.1Mode Code (S1、S2)

Diagram 10.2 Address Code

Note:

① Either combination control or upper computer control is available.

② In single head mode, set 1 "ON", 2 "OFF" on S1.

③ For the master of dual heads unit (A1), please set 1 "OFF",2 "ON" on S1.

For the slave of dual heads unit (A2), please set 1 "OFF", 2 "ON" on S1.

④ For the independent single chiller, please set 1 "OFF", 2"OFF" on S2. If connect the upper

computer, S3 is in its address.

⑤ In multi-combination mode, please set 1 “ON” on S2, 2 “ON” on master S2, and 2 “OFF” on slave S2.S3 is the unit address (Note: Available address ranges from 1-8, and each unit has a unique address, otherwise fails to communicate) No.1 unit is the master.

⑥ In multi-combination mode, once the unit is energized and connected properly, the master identifies the mode automatically. If the unit remains to be adjusted, please set “single unit” mode.

⑦ Please energize again after the switches are reset.

Note：

① In remote control, please adopt preservation type switch to guarantee the expected mode.

② Forbid disassembling the screen and extending the communication lines, since it may disrupt the signal transmitted. We are out of responsibility for any consequences resulting from the ill-advised operation. Should there are demands for remote control, please apply for customization.

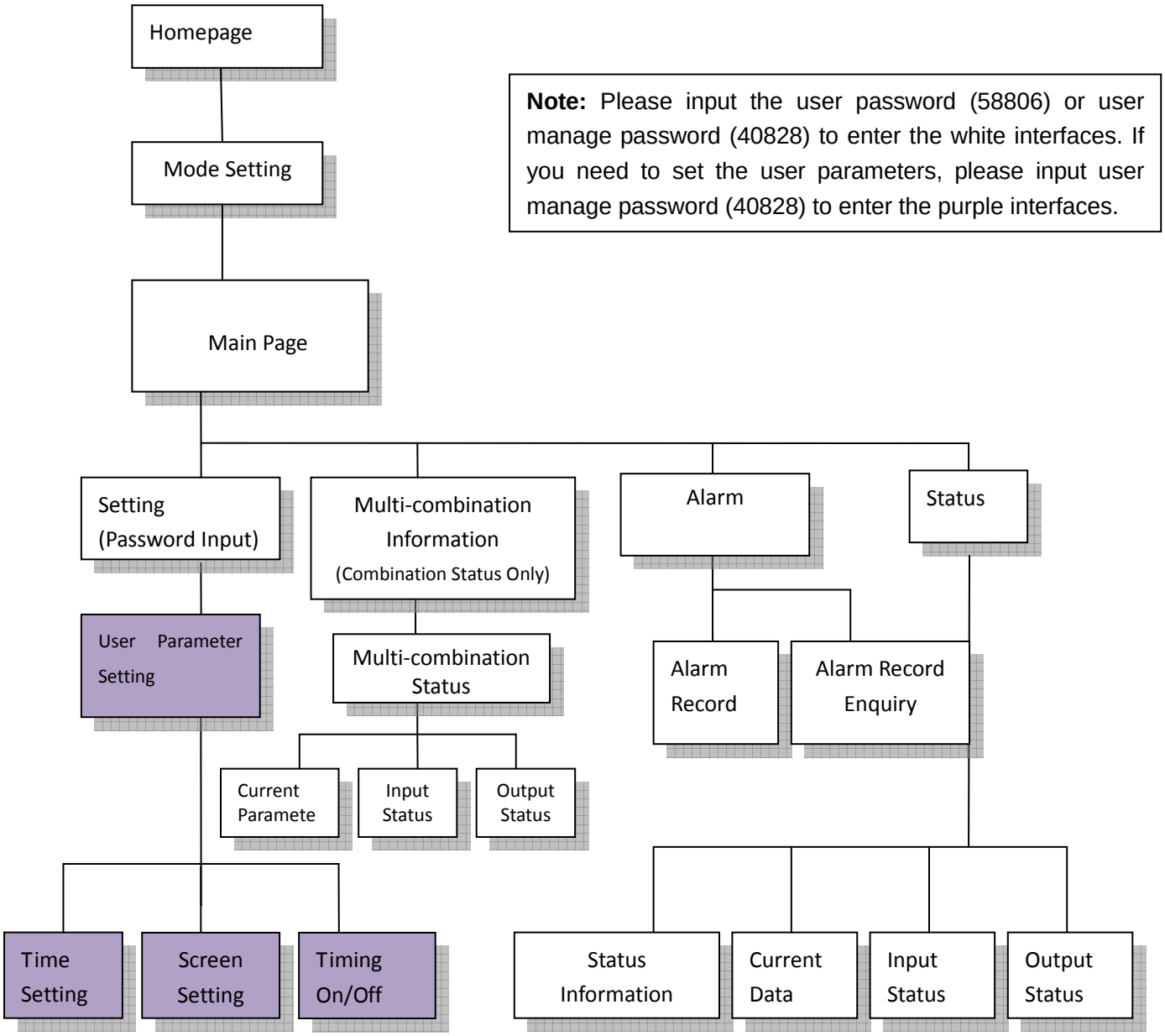
Diagram 10.3 IP Switch Setting for Dual/Single Head Unit

	Master for Dual Heads Unit	Slave for Dual Heads Unit	Single Head Unit
S1:1	OFF	OFF	ON
S1:2	OFF	ON	OFF

Diagram 10.4 DIP Switch Setting for Single Unit in Multi-combination

	Single Unit （No Upper Computer）	Single Unit (Upper Computer）	Multi-combination (Slave)	Multi-combination （Master）
S3	0	Unit Address	Unit Address	0
S2:1	OFF	OFF	ON	ON
S2:2	OFF	OFF	OFF	ON

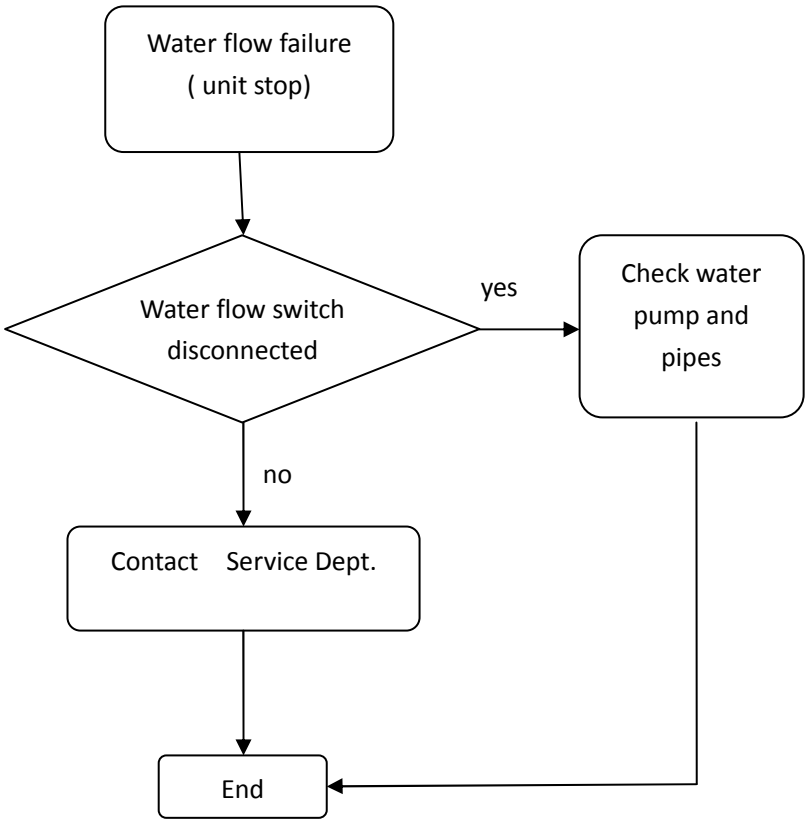
17. Control interface structures



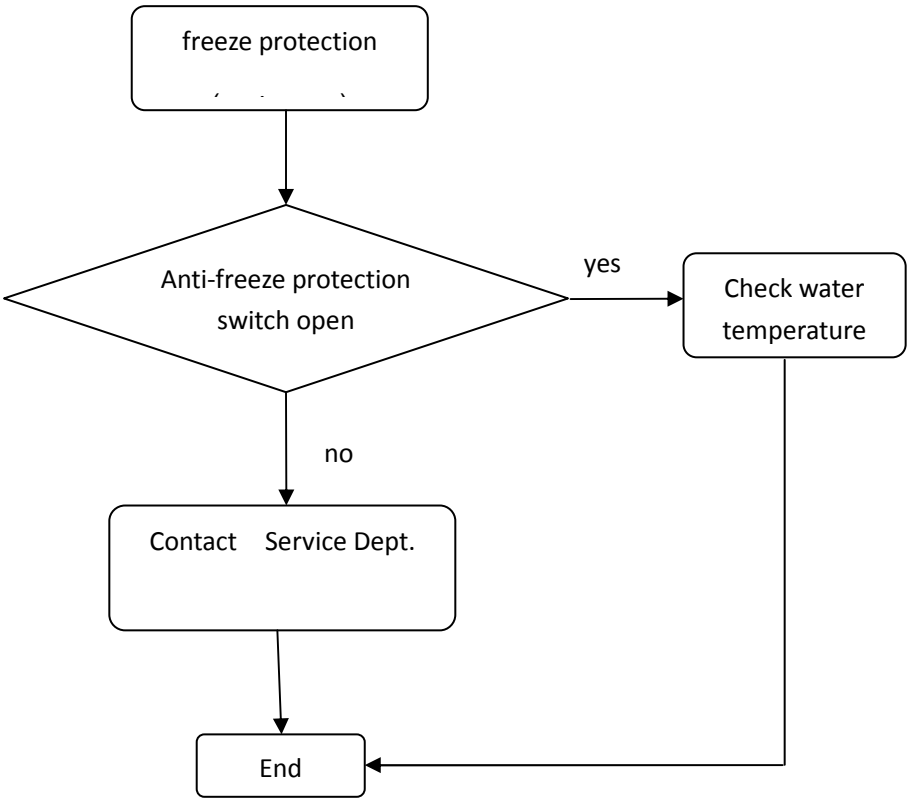
Note: Please input the user password (58806) or user manage password (40828) to enter the white interfaces. If you need to set the user parameters, please input user manage password (40828) to enter the purple interfaces.

18. Safety protection flow chart

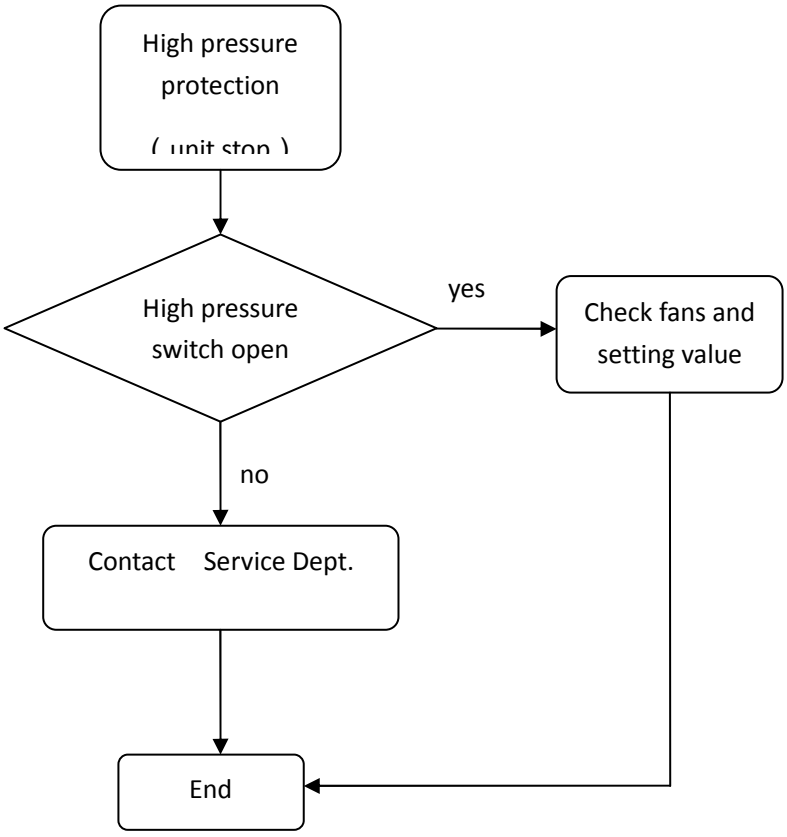
1. Water flow failure



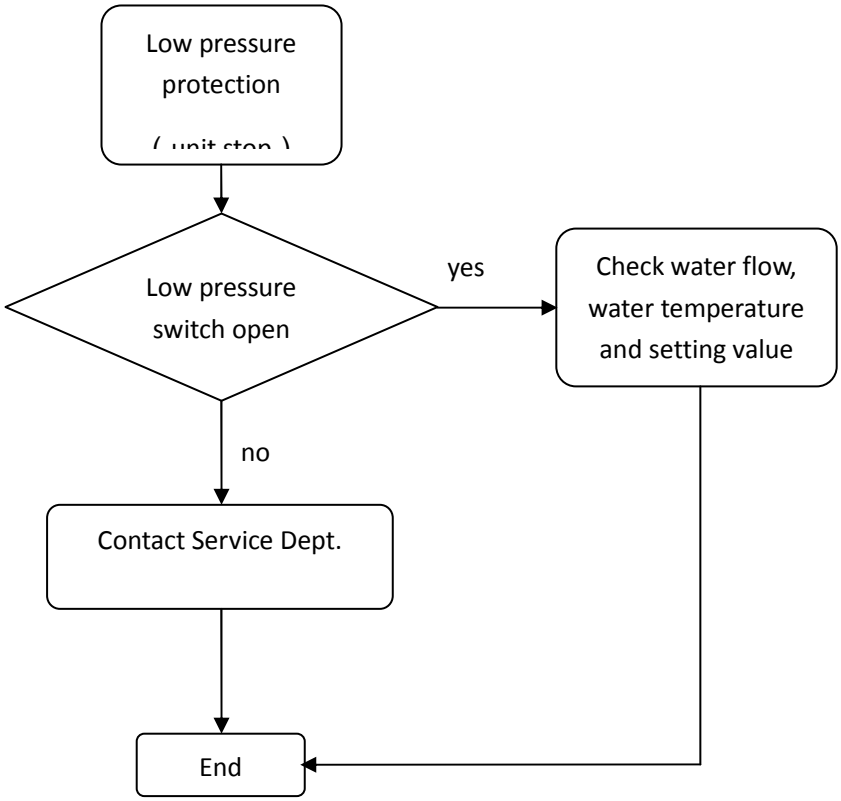
2. Freeze protection



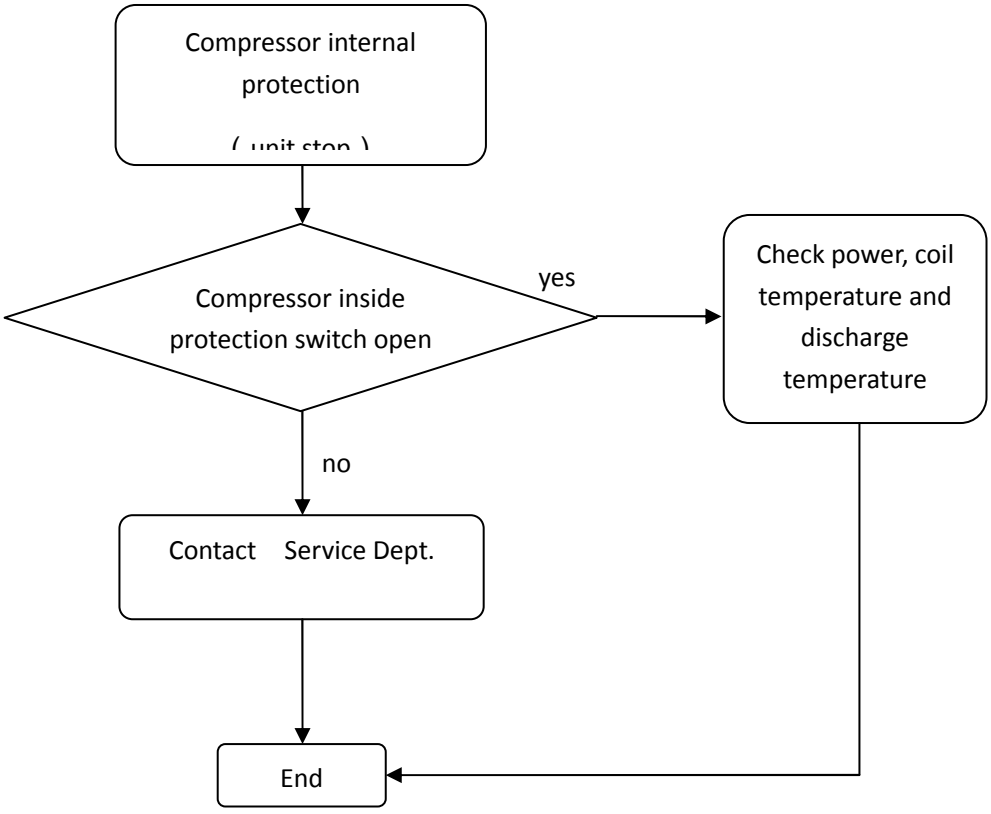
3.High pressure protection



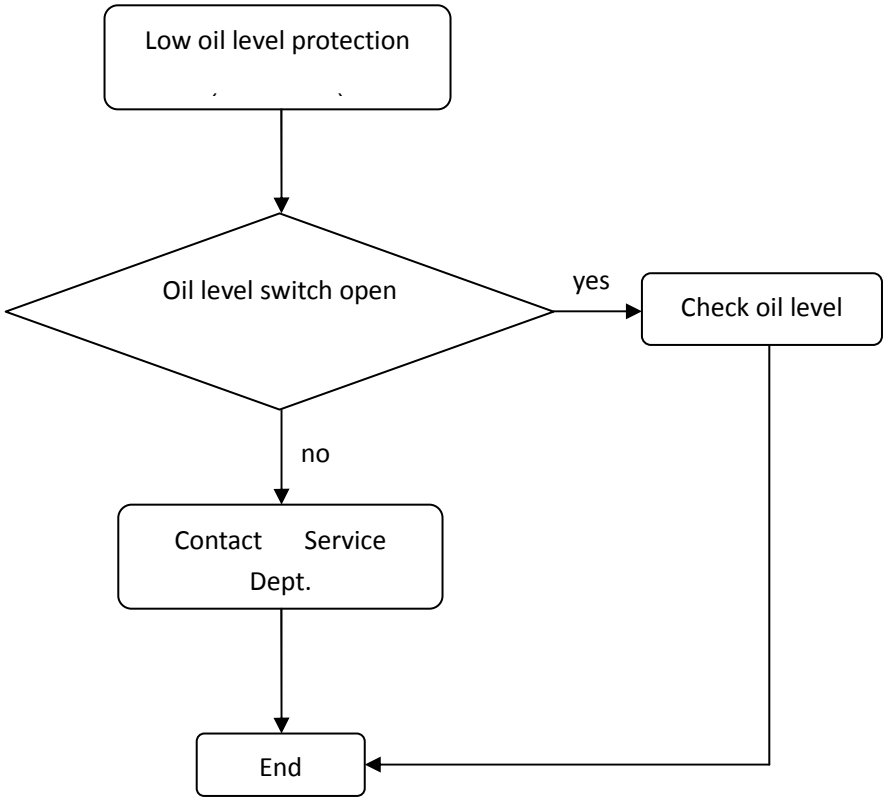
4. Low pressure protection



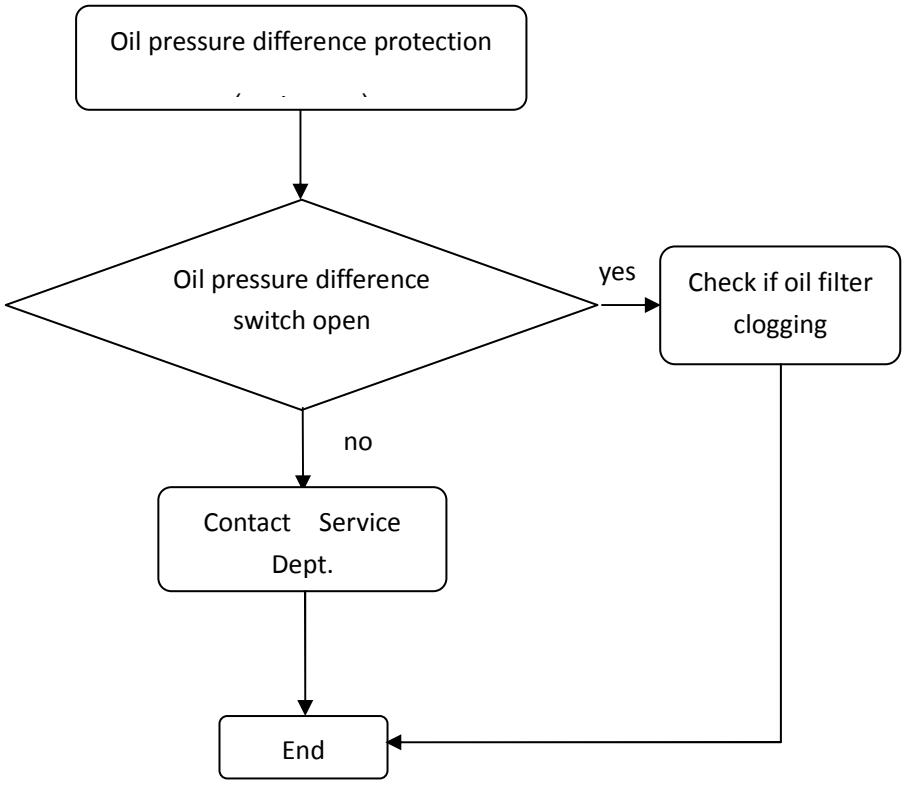
5. Compressor internal protection



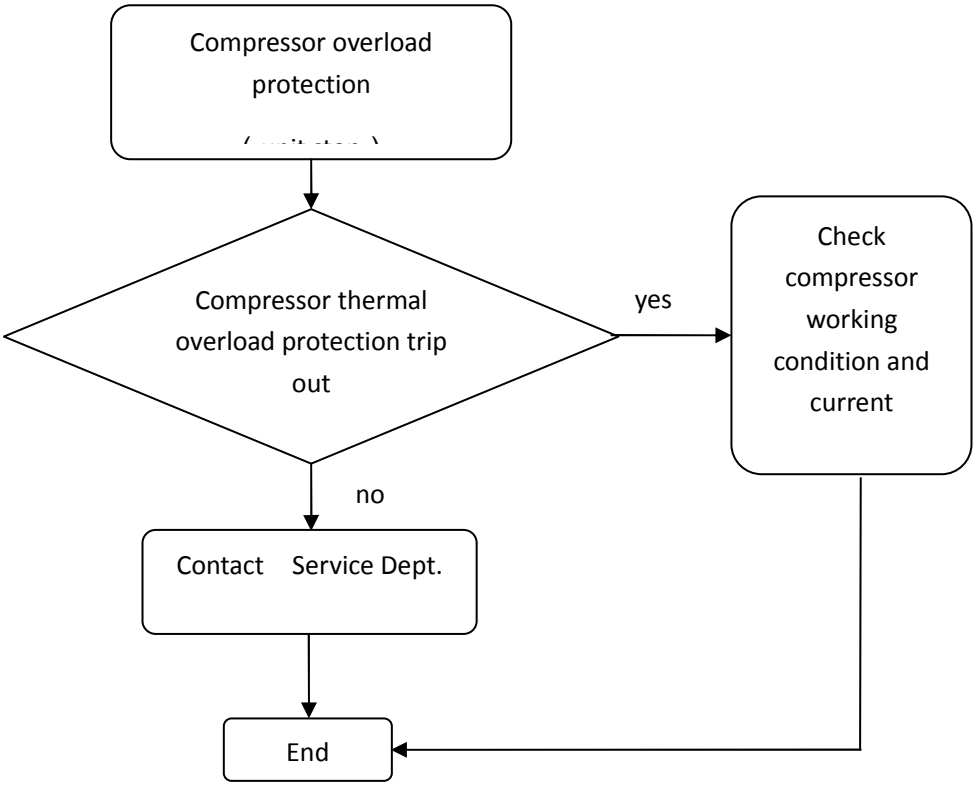
6.Low oil level protection



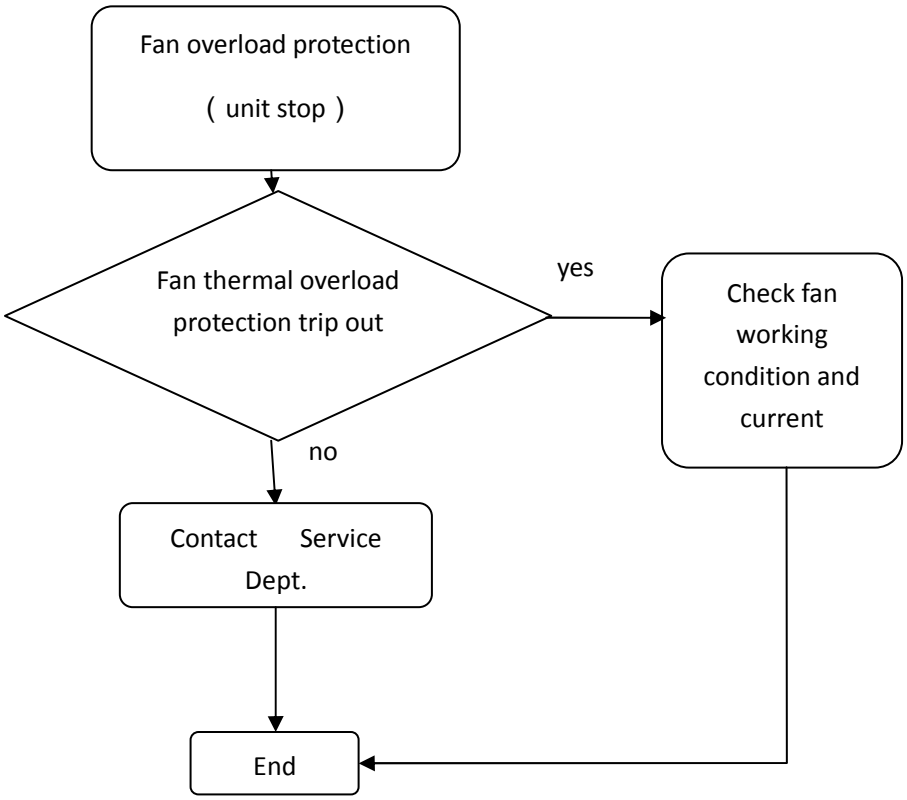
7.Oil pressure difference protection



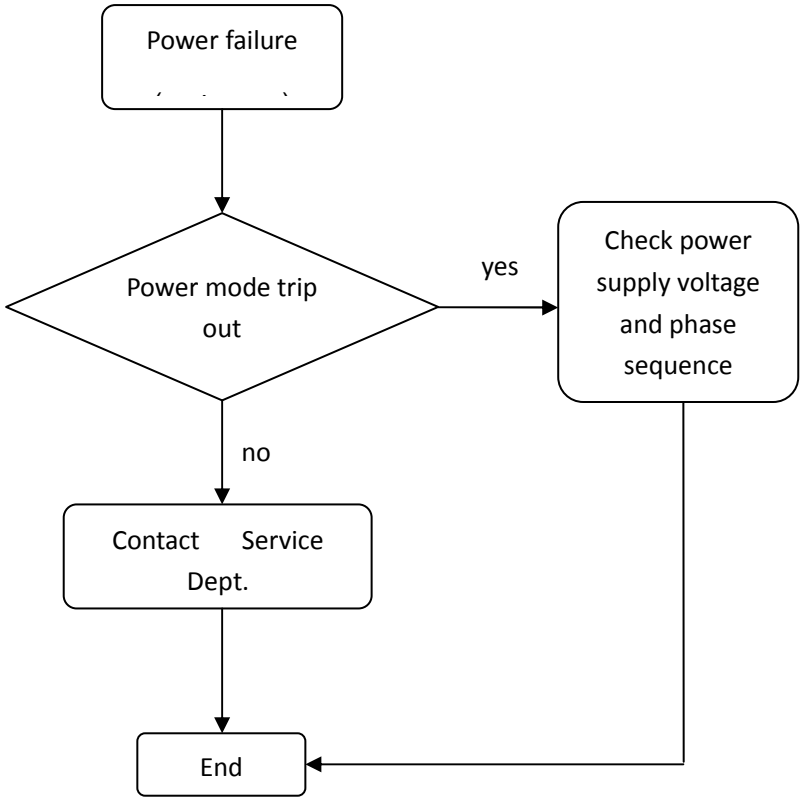
8.Compressor overload protection



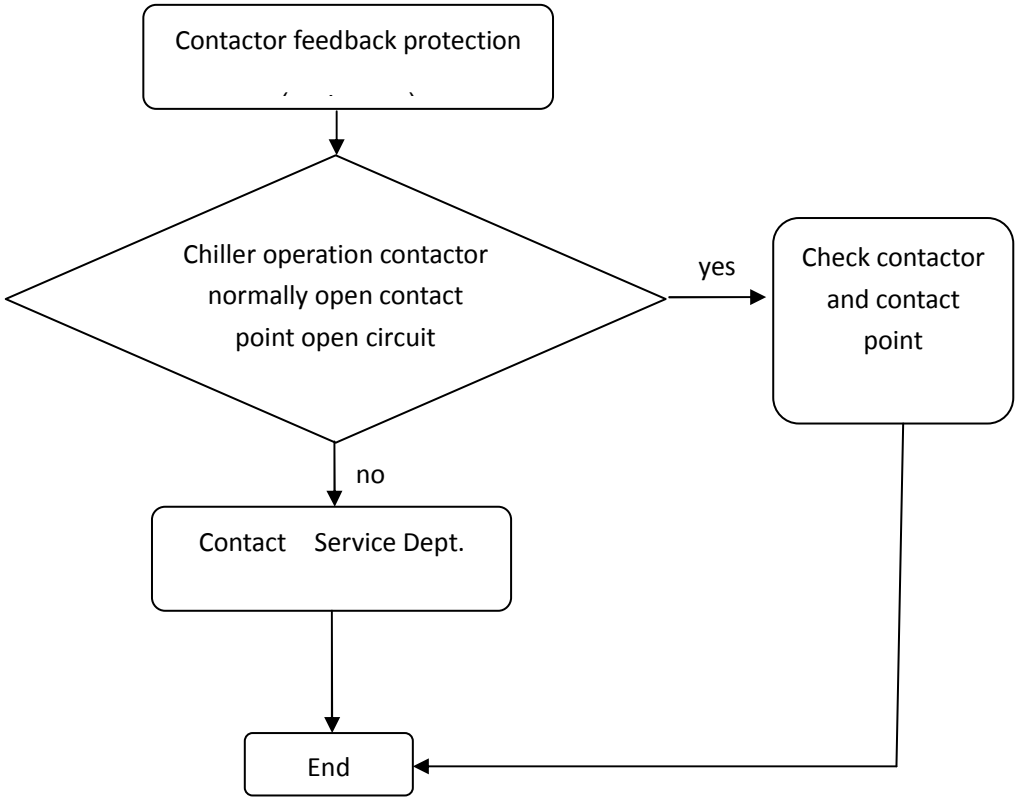
9.Fan overload protection



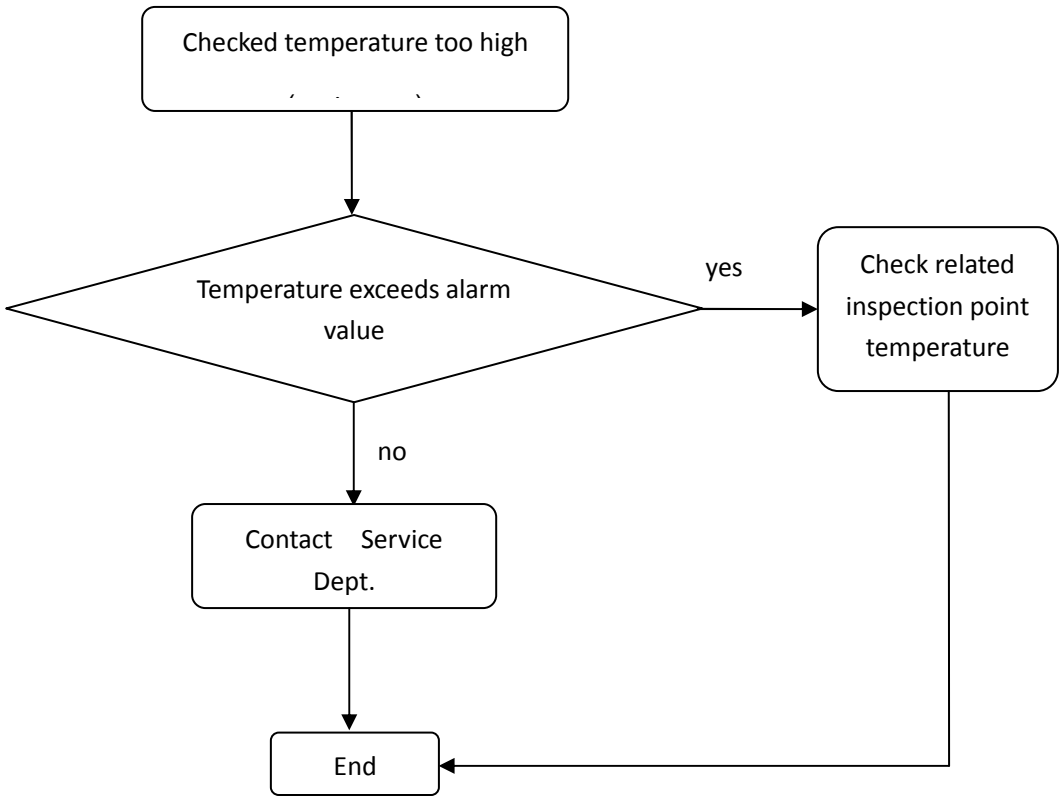
10.Power failure protection



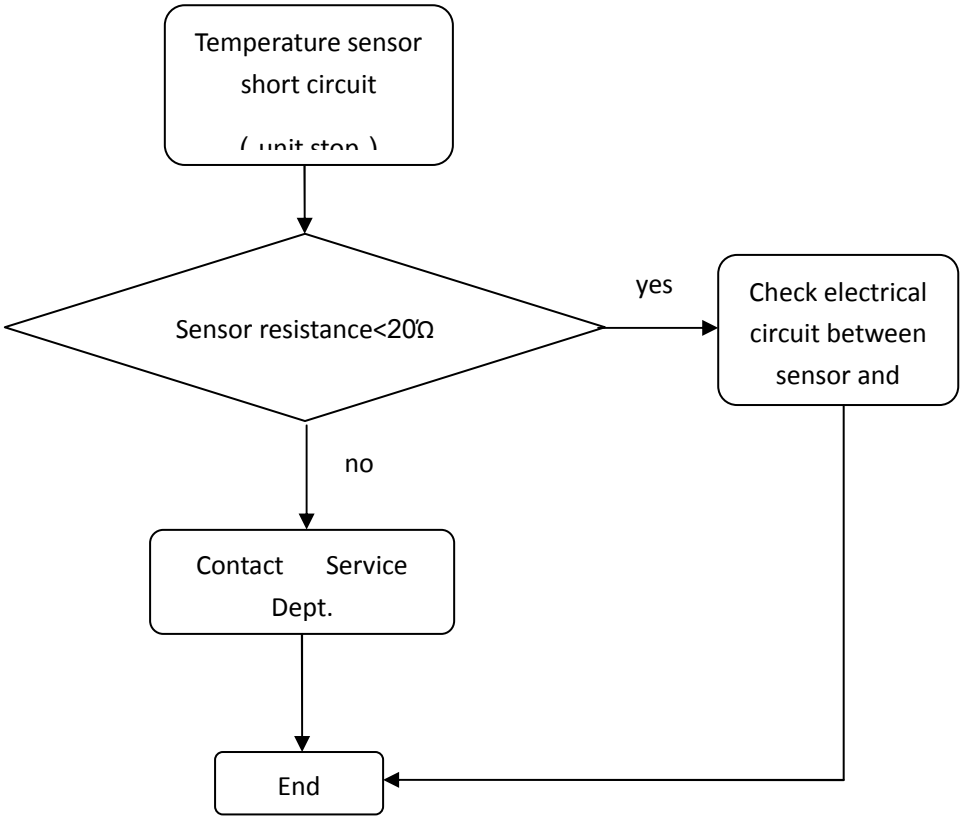
11.Contactor feedback protection



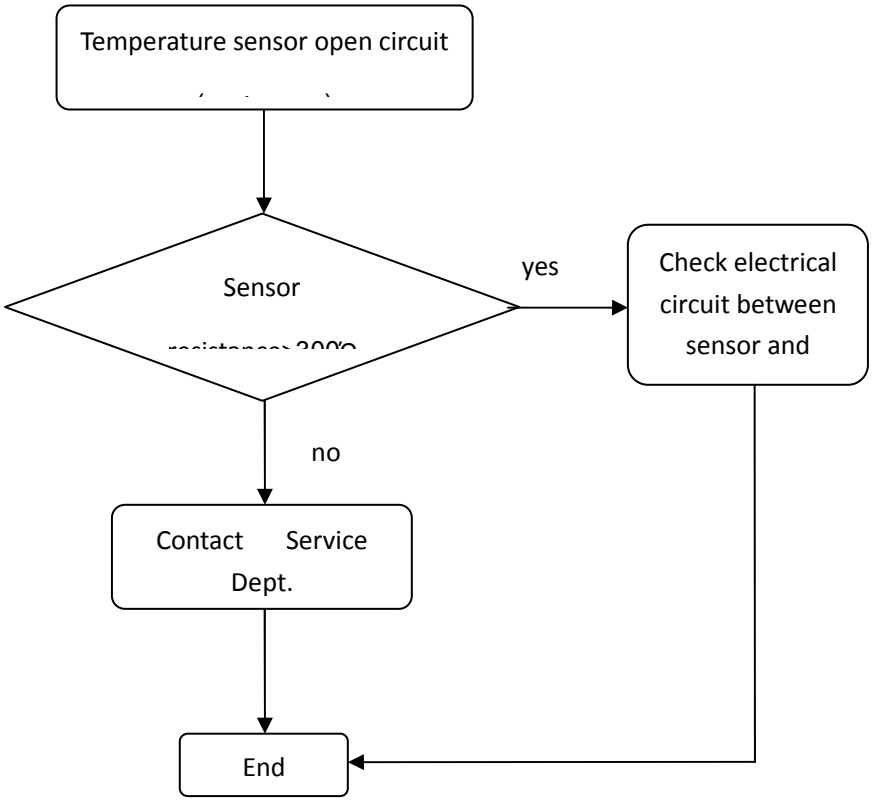
12. High discharge



13. Leaving water /entering water/ambient/discharge temperature sensor short circuit



14. Leaving Water /entering water /ambient/discharge temperature sensor open circuit



19. Fault handling

Fault content	Reason and fault handling
Water flow failure	Please confirm whether operation flow of water pump system, and whether water meet the system requirements;
	Please check the water flow switch installed direction correctly, water flow switch value is proper
	Please confirm whether water flow switch properly connected in according to principle chart shows,
Freeze protection	Please confirm whether the system outlet water temperature to less than 3℃
	If the system water temperature no more than 10℃, please confirm whether lower than ever before 3℃
	Please confirm the wiring of switch which protected from freezing properly connected in accordance with principle chart shows.
High pressure protection	Please confirm the high-pressure sampling valve is opening
	Please confirm the high pressure protection, pressure value is greater than setting value
	Please confirm the wiring of switch which protected from high pressure properly connected in accordance with principle chart shows.

Fault content	Reason and fault handling
Low pressure protection	Please confirm the low-pressure sampling valve is opening
	Please confirm the low-pressure protection, pressure value is lower than setting value
	Please confirm the wiring of switch which protected from low-pressure properly connected in accordance with principle chart shows.
Differential pressure protection	Please confirm the low-pressure sampling valve is opening
	Please confirm the pressure difference protection, pressure value is lower than setting value
	Please confirm the wiring of switch which protected from pressure difference properly connected in accordance with principle chart shows.
Compressor overload	Please confirm the compressor overload protection setting value is the same factory parameters
	Wait for startup condition fulfilled, startup again, confirm the compressor current is overloaded
Fan overload	Please confirm the fan overload protection setting value is the same factory parameters
	Check whether the fin dirty plugging, whether any other sundry winding fan motor.
Compressor internal protection	Please confirm whether normal compressor power supply (including phase sequential, voltage, phase lack, three unequal voltage), not normal word will protect.
	Other causes compressor motor high temperature;
	Please confirm the modules of compressor protection switch is properly connected in accordance with principle chart shows
Low oil level protection	Check compressor lubricant position through the visual liquid mirrors
	Please confirm the wiring of switch which protected from oil level properly connected in accordance with principle chart shows
Oil differential pressure protection	Check the oil filter clogging
	Please confirm the oil pressure difference sampling valve is not opening
	Please confirm the wiring of switch which protected from oil pressure difference properly connected in accordance with principle chart shows
Contactor failure	Check relay setting time is in 5 ~ 7sec.
	Please truly contactor can normally suction close, thermal relay are working properly
	Please confirm the wiring of contactor properly connected in accordance with principle chart shows
Power failure	Check power protection settings value, whether same with default settings

protection	Measuring the actual power quality of customer used
	Please confirm whether the wiring of pressure difference switch wiring is correct connection.
Fault content	**Reason and fault handling**
High discharge temperature protection	Check electronic expansion valves are normal
	Check whether the pipeline had blocked
	Check whether system lacks the oil
	Check whether spray valve movements is normal
	Check refrigerants leaks
	Check whether the operation scope beyond unit.
Leaving water temp. sensor failure	Check the temperature sensor is correct connection and whether is damaged
Entering water temp. sensor failure	Check the temperature sensor is correct connection and whether is damaged
Ambiant temp. sensor failure	Check the temperature sensor is correct connection and whether is damaged
Discharge temp. sensor failure	Check the temperature sensor is correct connection and whether is damaged
Compressor does not work	No power (power cut off);
	Switch action (current overload);
	Trouble of startup switch;
	Fuse of the control circuit power source burnt out;
	Chain control part does not run;
	High and low pressure switch action
Low discharge pressure protection	Refrigerant not enough;
	Super heat of expansion valve is too high ;
	Ambient temperature too low;
	Suction pressure too low
High Discharge pressure protection	Too much Refrigerant;
	Incondensable gas enters;
	Fin heat exchanger is dirty;
	Air temperature that through the fins heat exchanger is high
	Air volume that through the fins heat exchanger is insufficient
	High pressure gauge not accurate;
	Suction pressure too high;

Fault content	Reason and fault handling
High Suction pressure protection	Refrigeration load too big;
	Super heat of expansion valve is small ;
Low Suction pressure protection	Refrigeration media not enough;
	Dry filter is blocked;
	Refrigeration load too small;
	Cooling water not enough;
	Cooling water filter is blocked;
High Suction pressure (Heating conditions)	Air temperature that through the fins heat exchanger is high
	Super heat of expansion valve is small ;
Stop soon after it starts up	High and low pressure switch action;
Automatic capacity adjustment device does not work	Thermoregulation device trouble;
	Magnetic valve power off;
	Capillary pipe blocks;
Compressor overheat	Compressor bearing not good
	Pressure of the high pressure side is too high;
	Pressure and temperature of the refrigerant at the low pressure side too high
	Motor overheat;
NFB tripping	Layout short trouble;
	Layout grounding;
	Compressor motor trouble;
Compressor motor overload relay action	Single-phase running due to NFB tripping;
	The voltage too high or too low or without balance;
	Single-phase running due to bad magnetic switch;
	Motor not good;
	Motor not good;
	Running pressure too high;
	Compressor starts up too frequently;
	Refrigerator oil in the compressor not enough;

20. Maintenance Schedule

Maintenance Items		Maintenance Frequency	Qualify Standards (Settlement)	Note
I. General	Noise	Anytime	Judge whether there is abnormal sound by hearing;	Watch from one meter away from the center of the Chiller;
	Vibration	Anytime	Watch whether the swings of distribution pipes and components are too large	
	Voltage	Anytime	Rated voltage is within ±10%	
II. Appearance	Clean	Anytime	Keep it clean anytime	
	rust	Anytime	using an iron brush to remove rust, besmear again the antirust paint	
	Calm	Anytime	Lock each snail	
	Insulation material flakes	Anytime	Using adhesives sticky	
	Water leak	Once/ Month	Check whether the exhaust water pipe is blocked	
III. Compressor	Noise	Anytime	Whether there is abnormal sound when starts up, runs or stops	
	Insulation resistance	Once/ Year	Above 5MΩ is required when testing with DV500V high resistance meter	
	Shockproof rubber gets old	Once/ Year	Flexible when pressed with hands is qualified	
	Medium check	Once/3000 hours	Pay attention to the noise libation and oil level	
	Medium check	Once/6000 hours	Confirm the action of safety device and protection device	
IV. Fin heat exchanger	Fan	Anytime	Normal wind amount, high pressure within the normal range	
	Clean situation	Once/Month	Normal wind amount, high pressure within the normal range	
V. Shell-and-tube heat exchanger	Water flow of the user side	Anytime	Within ±5% of the standard	
	Temperature	Anytime	Within the standard	
	Antifreeze concentration	Once/Month	Make sure it is set above the set concentration	
	Water quality	Once/Month	Within the standard	Refer to water quality furring relations drawing
	Purity	Anytime	The low pressure is within the standard when refrigerating	

Maintenance Items		Maintenance Frequency	Qualify Standards (Settlement)	Note
	Drainage	Anytime	Drain all the water if it is not used for a long time	Drain water in the distribution pipe
VI. High and low pressure switch	Action	Once/Month	Check according to 'Protection Devices Action Value'	Whether the match point is good
VII. Pressure Gauge	Finger	Once/ Half of a year	Compare with correct pressure gauge	
VIII. Globe valve	Action	Once/Month	Smooth action on globe valve switch	
IX. Refrigeration circle	Refrigeration media leak	Once/Month	Check whether there is refrigeration media leakage inside the Chiller or at the distribution pipe connecting points. Let out all the water inside the shell-and-tube heat exchanger, and check whether there is any leakage at the water inlet or outlet.	Use the electronic leak detector, or blowtorch leak detector, or soap water.
X. Electrical machine control	Insulation resistance	Once/Month	Above 5MΩ is required when testing with DV500V high resistance meter	
	Wire contact	Once/Month	Insulation layer of the wire must be under good contact condition, without damage, bolt well fixed.	
	Assistant relay	Once/Month	No abnormal action	
	Time-limited relay	Once/Month	Act according to the time set	

21. Check list

a) Chiller site installation check list (debugging application form)

Chiller types: Compressor types: Product code:

(Such as quantity, please send Chiller types and product coding separate appendix)

Installation location: City Provinces National

Name of employer: Contact/phone:

Install the Chiller: Contact/phone:

Dealer: Contact/phone:

Required commissioning date： Before day months years

Please fill in the following items, and fax to our after-sales service department confirm and arrange debugging personnel and travel. Such as actual conditions and the table below discrepancy, the customer must assume relevant debugging artificially and travel expense.

1,Examination before installation

- Transport process whether have damage yes ( ) no ( )
- If has the damage, the damage at
- If has the damage, do affect Chiller boot or not yes ( ) no ( )

2,Installation position

- Whether there is a foundation and shock absorption steps yes ( ) no ( )
- Whether Chillers installed horizontally yes ( ) no ( )
- Whether there will be enough space for chiller overhaul and satisfy the requirement of manual yes ( ) no ( )
- Whether chiller cooling ventilation drainage content yes ( ) no ( )

3. Chiller appearance confirmation

- Whether chiller appearance have damage yes ( ) no ( )
- Whether chiller refrigerants leaks yes ( ) no ( )

4. Chiller electrical system confirmation

- Power pull-up type, air switch capacity, the power cord diameter whether to conform to the chiller

requirements yes ( ) no ( )

- electrical wiring correctly, all terminals, without shake whether fastening yes ( ) no ( )
- chiller grounding yes ( ) no ( )
- chiller low voltage and power cable wiring whether to conform to the anti-interference specification yes ( ) no ( )

5. Chiller of chilled water system confirmation

- Whether chilled water pump selection is correct yes ( ) no ( )
- Whether chilled water system water capacity accord with the requirement yes ( ) no ( )
- Chilled water system water capacity _____L
- Whether filter is installed in the backwater side yes ( ) no ( )
- Whether water flow switch installed correctly, and with chiller interlocking yes ( ) no ( )
- Whether shockproof hose, thermometers, pressure gauges etc fittings is installed yes ( ) no ( )
- Whether water supplement and pressure fixing system is reasonable installation yes ( ) no ( )
- Whether installation water treatment devices yes ( ) no ( )
- Whether chilled water system is separate chiller cleaning and drainage yes ( ) no ( )
- Whether chilled water system pressure-tested and ensure no leakage yes ( ) no ( )
- Whether chilled water system is filled with water and without air yes ( ) no ( )
- Whether local temperature below 0□ at winter yes ( ) no ( )
- If local air temperature is below 0□, whether have antifreezeλ protection measures yes ( ) no ( )
- terminal installations
- Chiller uses _____
- Whether terminal installations is installed two-way valve yes ( ) no ( )
- The percentage of two-way valve for terminal installations _ _ %
- Preparatory work before debugging yes ( ) no ( )
- Whether power is temporary power supply yes ( ) no ( )
- Whether supply voltage within the normal range L1 _ L2 _ L3 _ yes ( ) no ( )
- Whether voltage unbalance factor is less than 2% yes ( ) no ( )
- Whether customer acceptance personnel and sellers in place yes ( ) no ( )
- Other circumstance explains: yes ( ) no ( )

Customer signature: Unit:	Sellers signature: Unit:

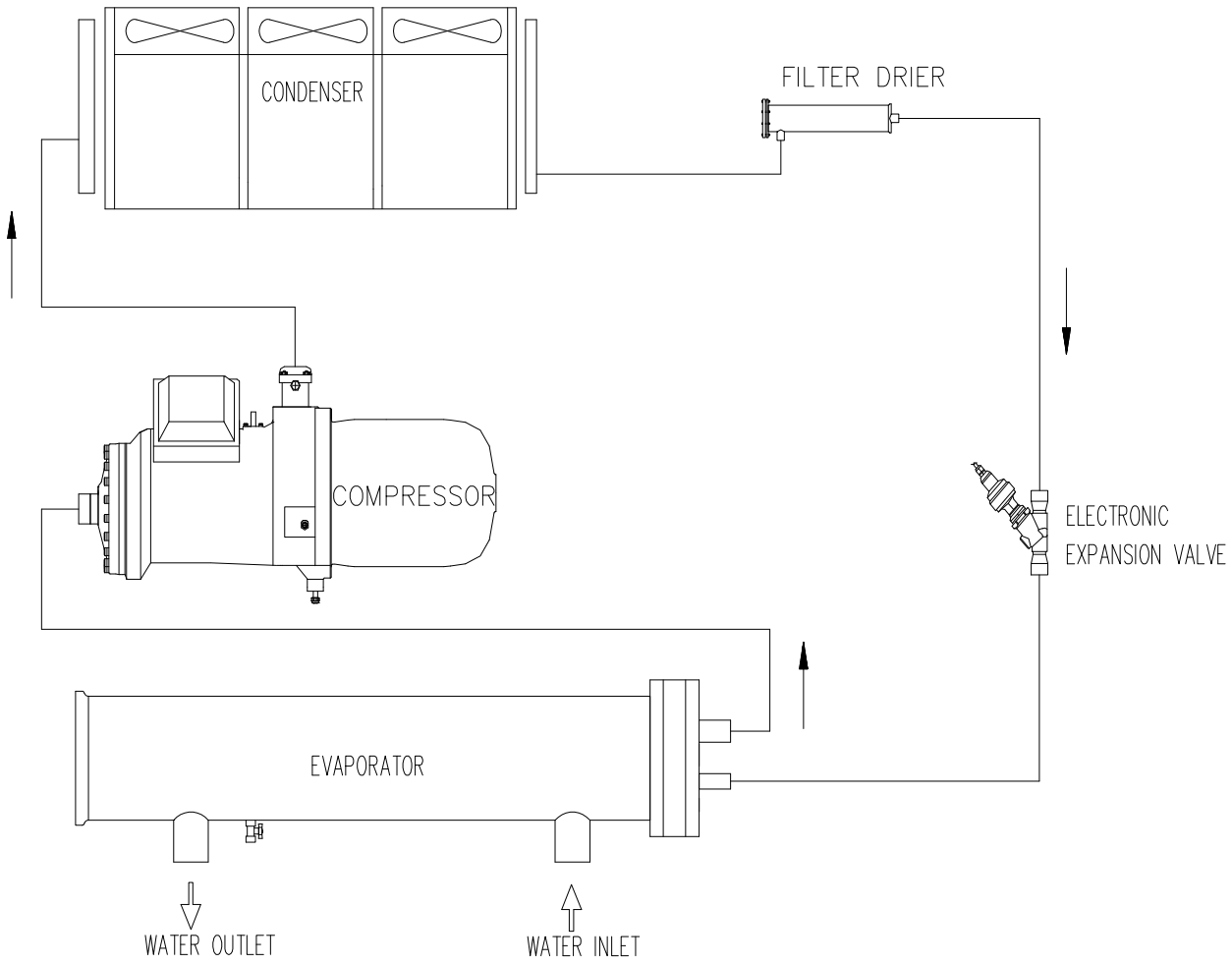
The date	The date

22. Chiller commissioning section record

Chiller type: Compressor type: Product code:					
User power type V--3PH-- HZ					
Installation location: City Provinces National Name of employer: Contact/phone: Install the unit: Contact/phone: Dealer: Contact/phone:					
Debugging date City Provinces National					
The following projects parameters for confirmation chiller acceptance basis, please fill out the, should be carefully checked					
The total power	Phase voltage	L1L2 /V			
		L1L3 /V			
		L2L3 /V			
	Phase current	L1 /A			
		L2 /A			
		L3 /A			
Compressor	1#	L1phase current /A			
		L2phase current /A			
		L3phase current /A			
		Exhaust temperature /℃			
		Exhaust pressure/MPa			
		Inhaled temperature /℃			
		Inhaled pressure/MPa			

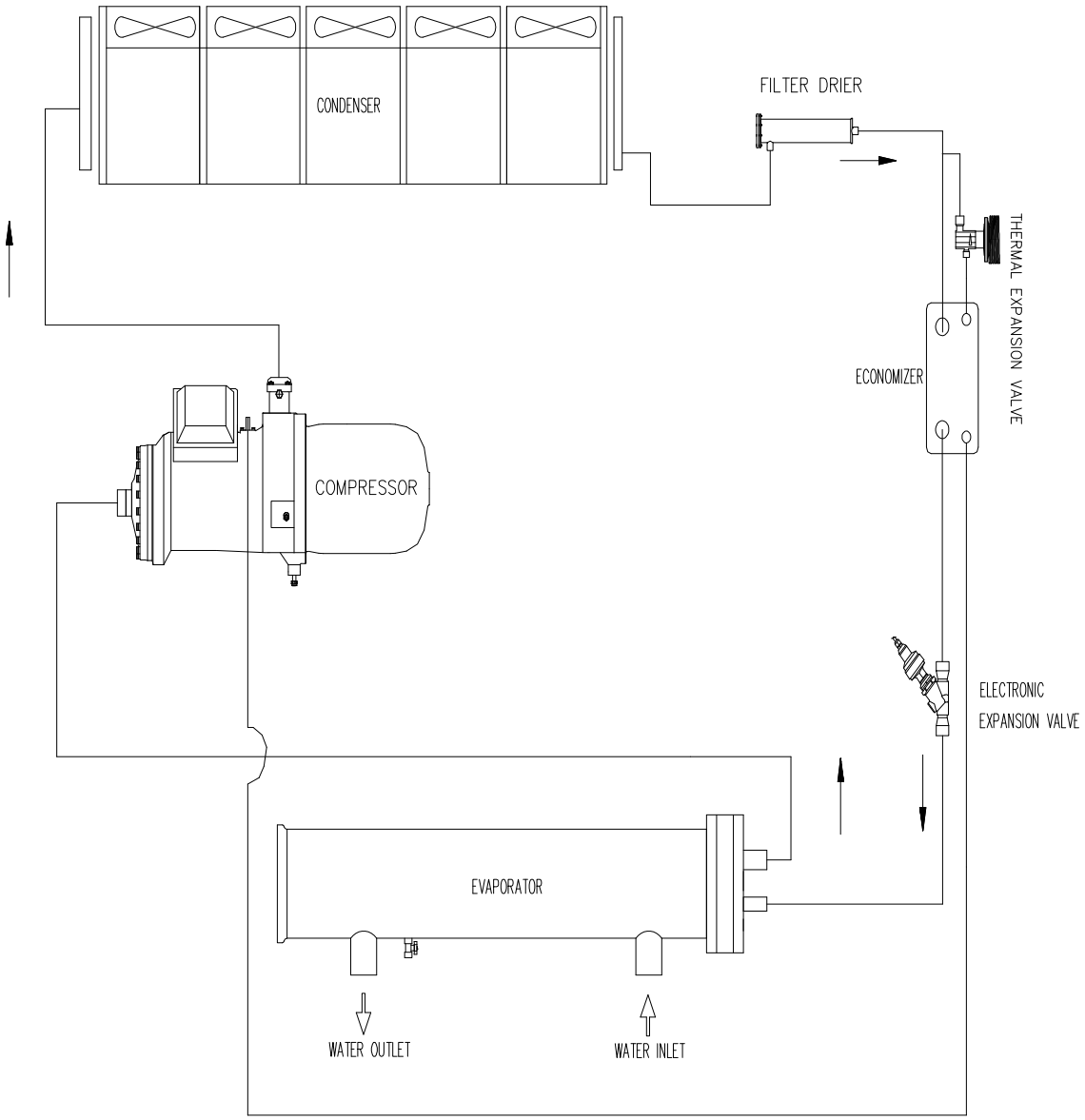
	2#	L1phase current /A			
		L2phase current /A			
		L3phase current /A			
		Exhaust temperature /℃			
		Exhaust pressure /MPa			
		Inhaled temperature /℃			
		Inhaled pressure/MPa			
evaporator		Imported water temperature/℃			
		Imported water pressure/MPa			
		Export water temperature /℃			
		Export water pressure/MPa			
Recording time					
Whether maintenance status					
Annotation					
Supervision/consulting signature:		Sellers signature	Debugging personnel signature		Customer signature

Unit: Date:	Unit: Date:	Unit: Date:	Unit: Date:



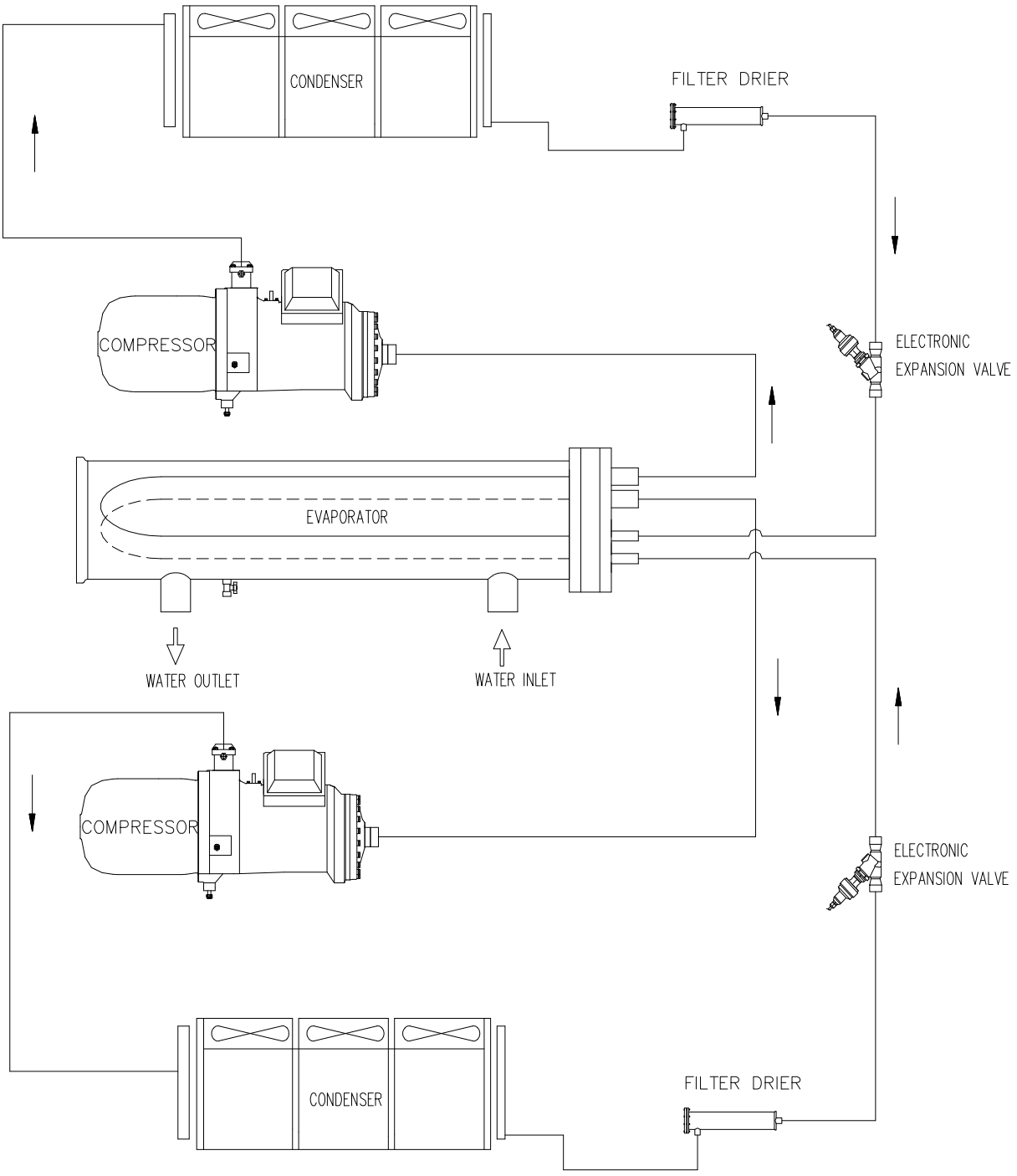
APPENDIX — SINGLE COMPRESSOR UNITS PIPING AND INSTRUMENTATION

(Apply to LSBLGW380/C，LSBLGW500/C)



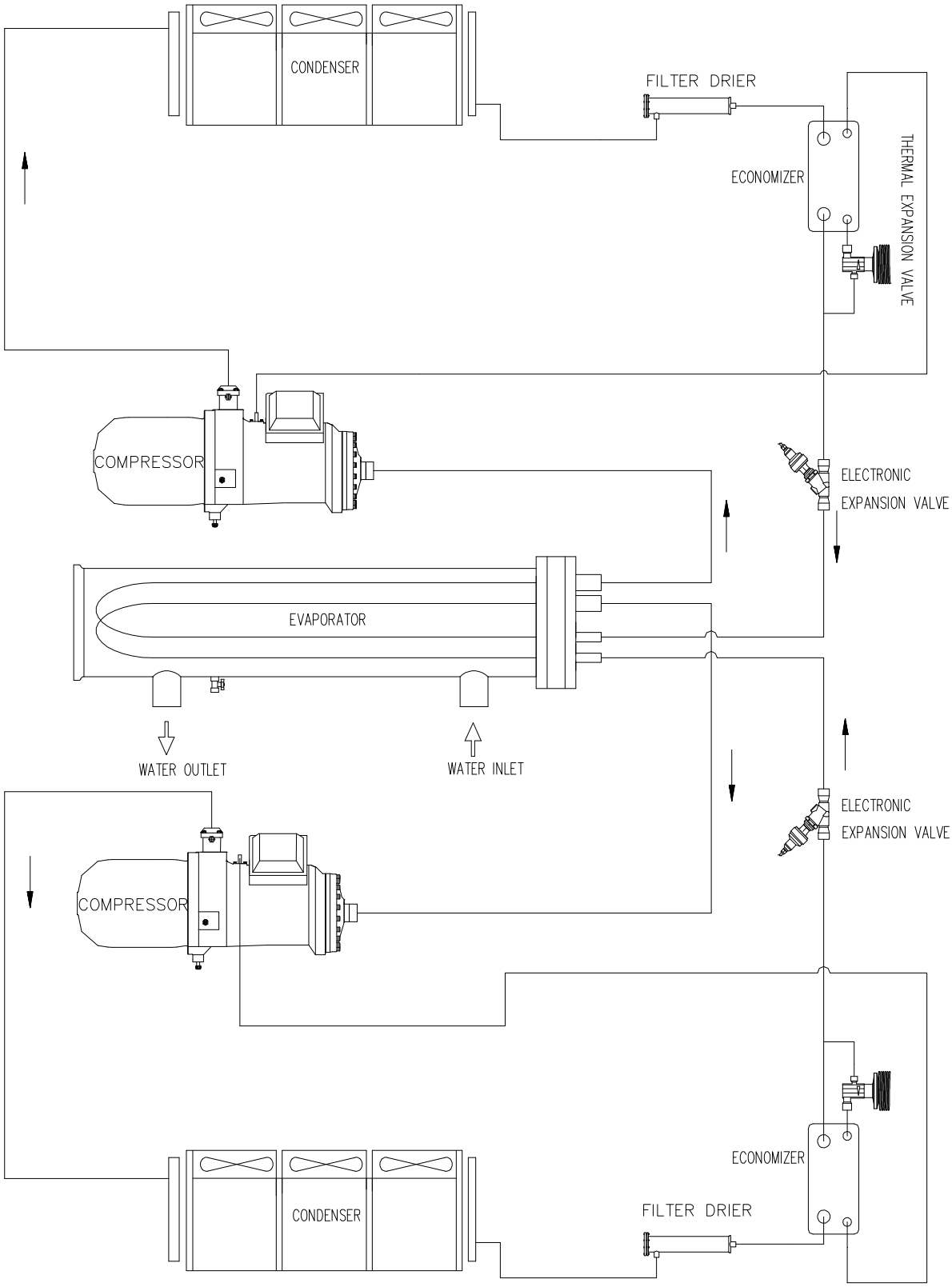
APPENDIX — SINGLE COMPRESSOR UNITS PIPING AND INSTRUMENTATION

(Apply to LSBLGW600/C , LSBLGW720/C)



APPENDIX— DUAL COMPRESSOR UNITS PIPING AND INSTRUMENTATION

(Apply to LSBLGW900/C，LSBLGW1000/C)

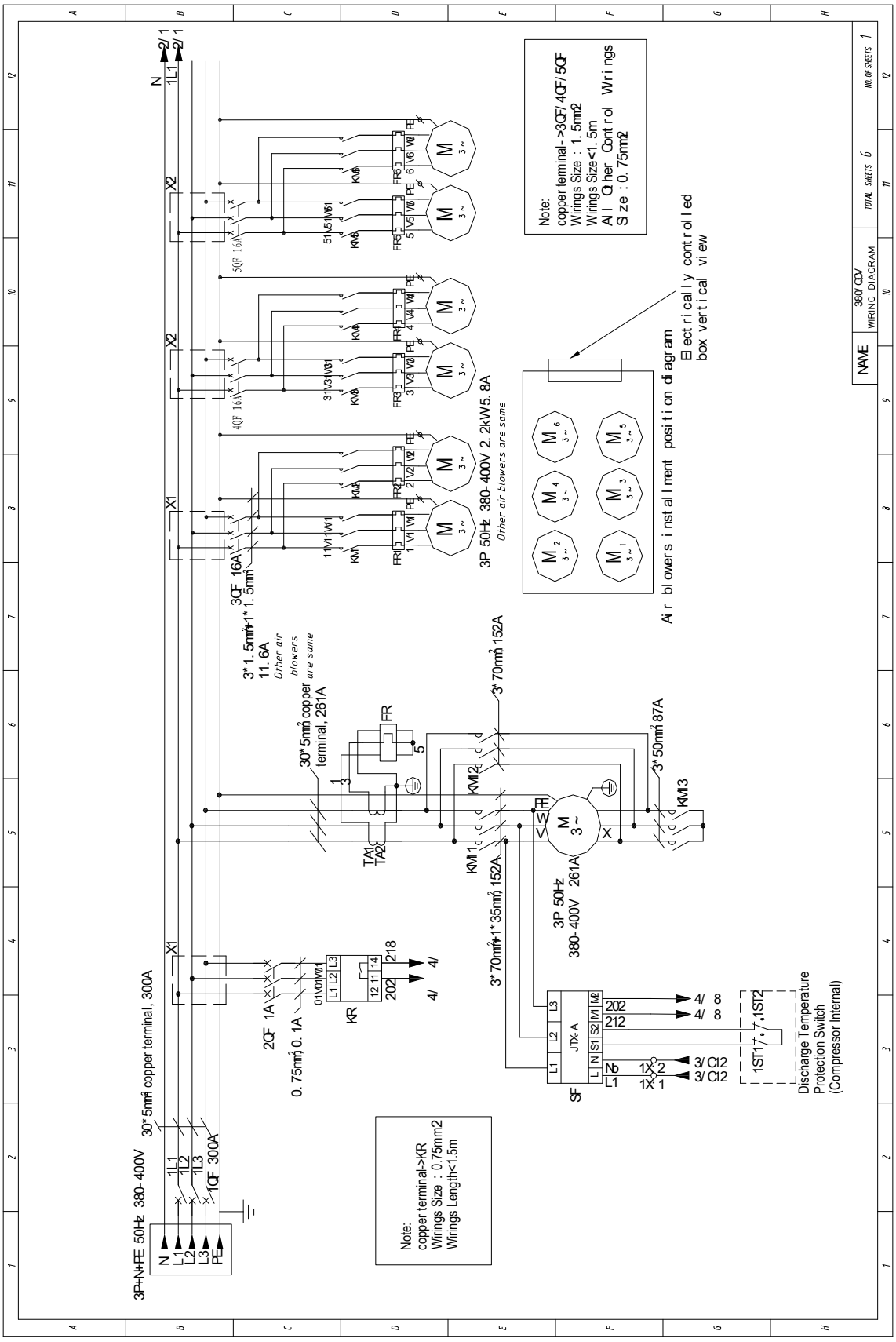


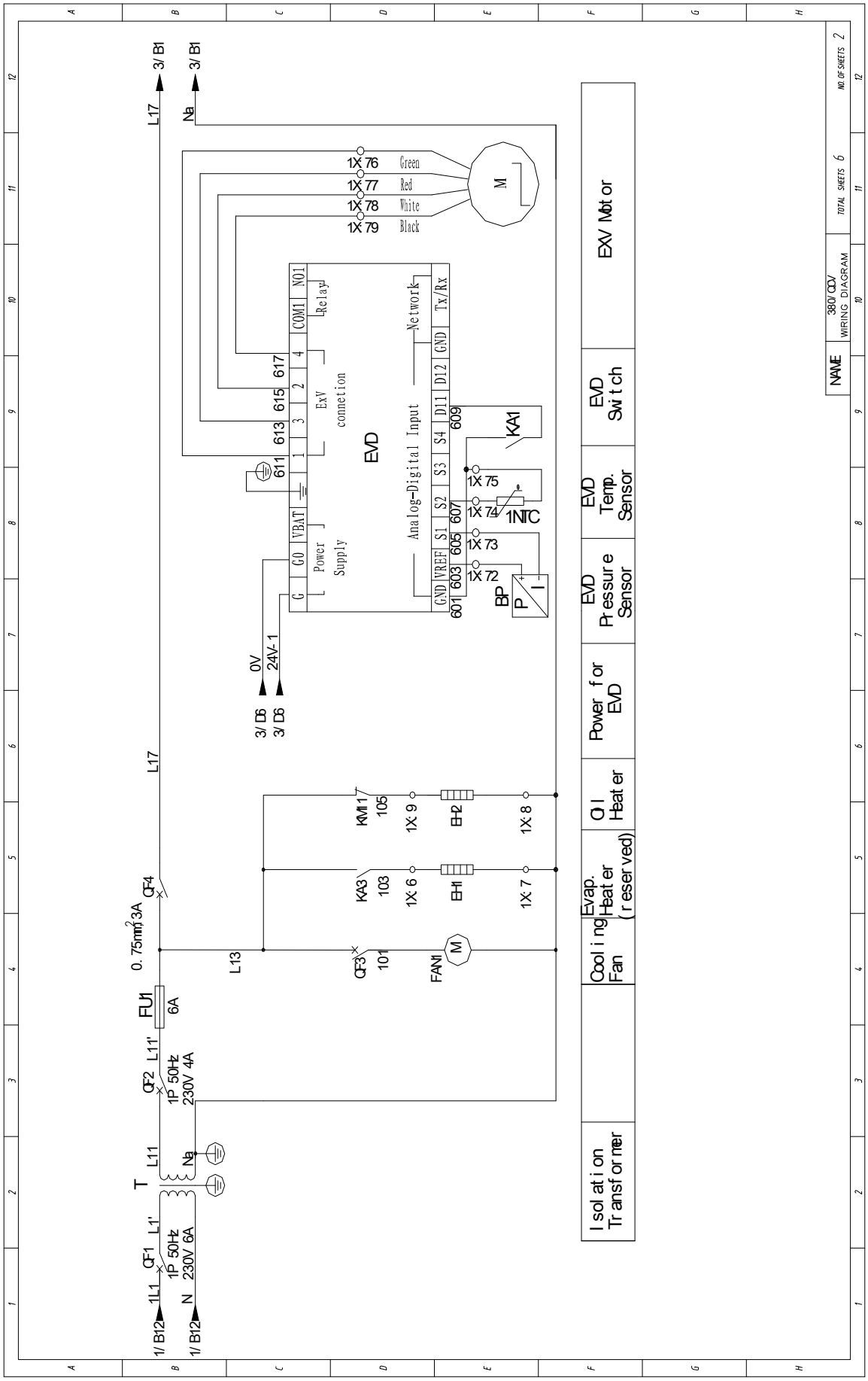
APPENDIX— DUAL COMPRESSOR UNITS PIPING AND INSTRUMENTATION

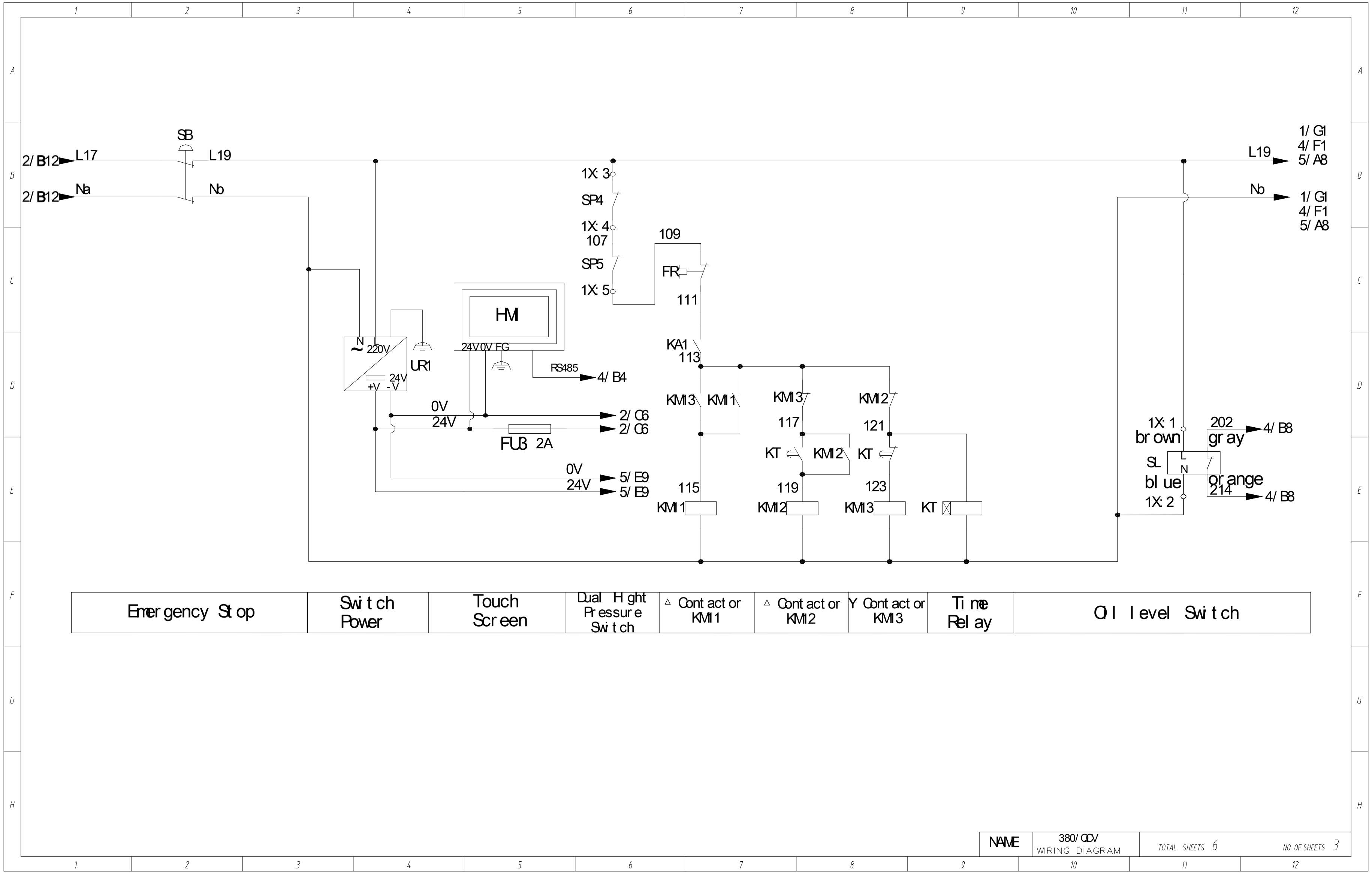
(Apply to LSBLGW1200/C , LSBLGW1420/C)

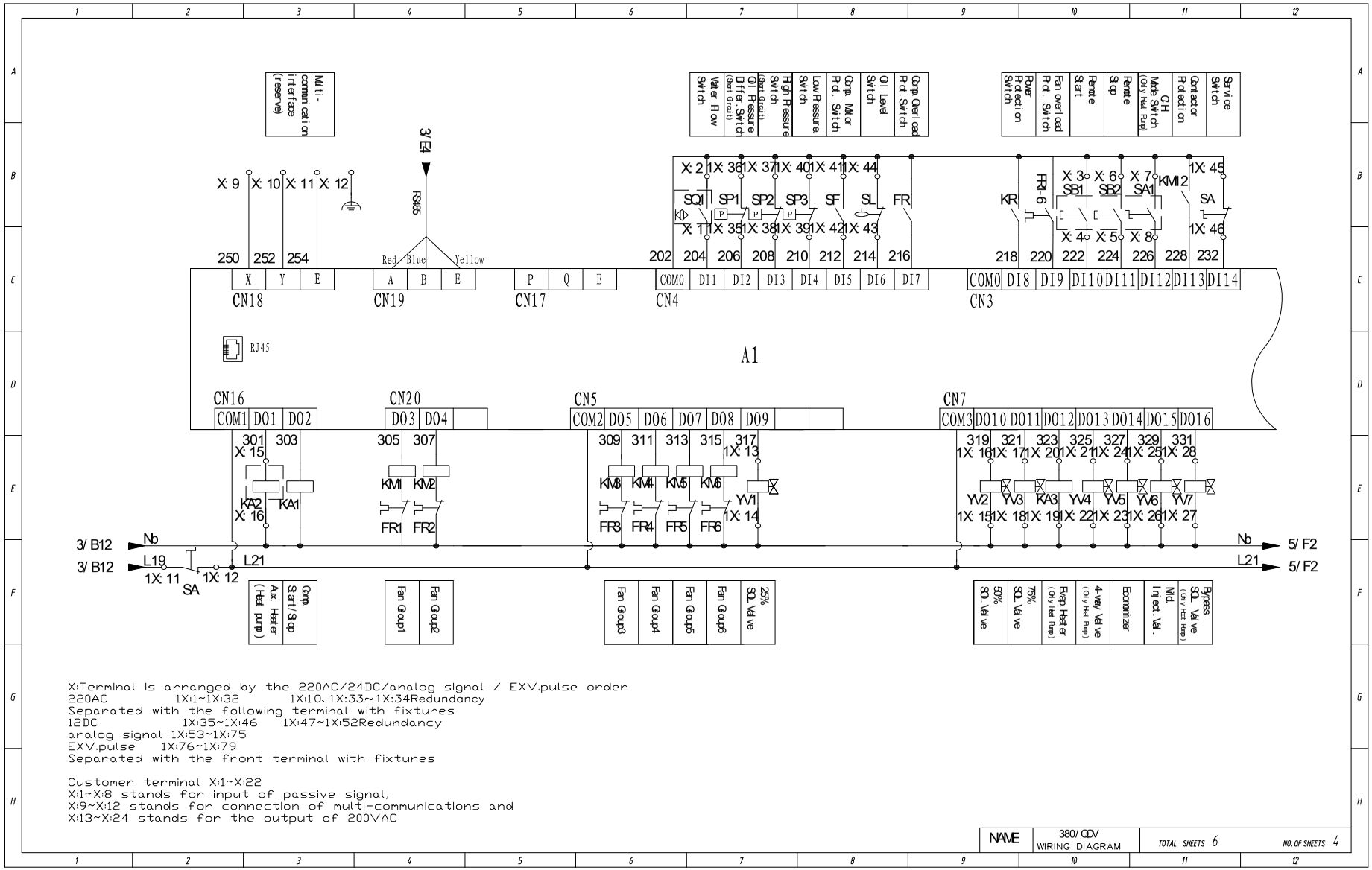
23. Typical wiring diagram

LSBLGW380/C WIRING DIAGRAM




1/ B12
1L1
N
1/ B12
QF1
L1'
1P 50Hz
230V 6A
T
L11
Na
QF2
L11'
1P 50Hz
230V 4A
FU1
6A
0. 75mm²
3A
QF4
L17
L13
QF3
101
KA3
103
KM11
105
1X: 6
1X: 9
EH1
EH2
1X: 7
1X: 8
FAN1
M
3/ B1
L17
Na
3/ B1
0V
24V-1
3/ D6
3/ D6
1X: 76
1X: 77
1X: 78
1X: 79
Green
Red
White
Black
M
611
613
615
617
1
3
2
4
ExV
connection
EVD
C
G0
VBAT
Power
Supply
COM1
NO1
Relay
GND
VREF
S1
S2
S3
S4
D11
D12
GND
Tx/Rx
Analog-Digital Input
Network
601
603
605
607
609
1X: 72
1X: 73
1X: 74
1X: 75
BP
P
I
1NTC
KA1
Isolation Transformer
Cooling Fan
Evap. Heater (reserved)
Oil Heater
Power for EVD
EVD Pressure Sensor
EVD Temp. Sensor
EVD Switch
EXV Motor
NAME
380/ 60V
WIRING DIAGRAM
TOTAL SHEETS 6
NO. OF SHEETS 2

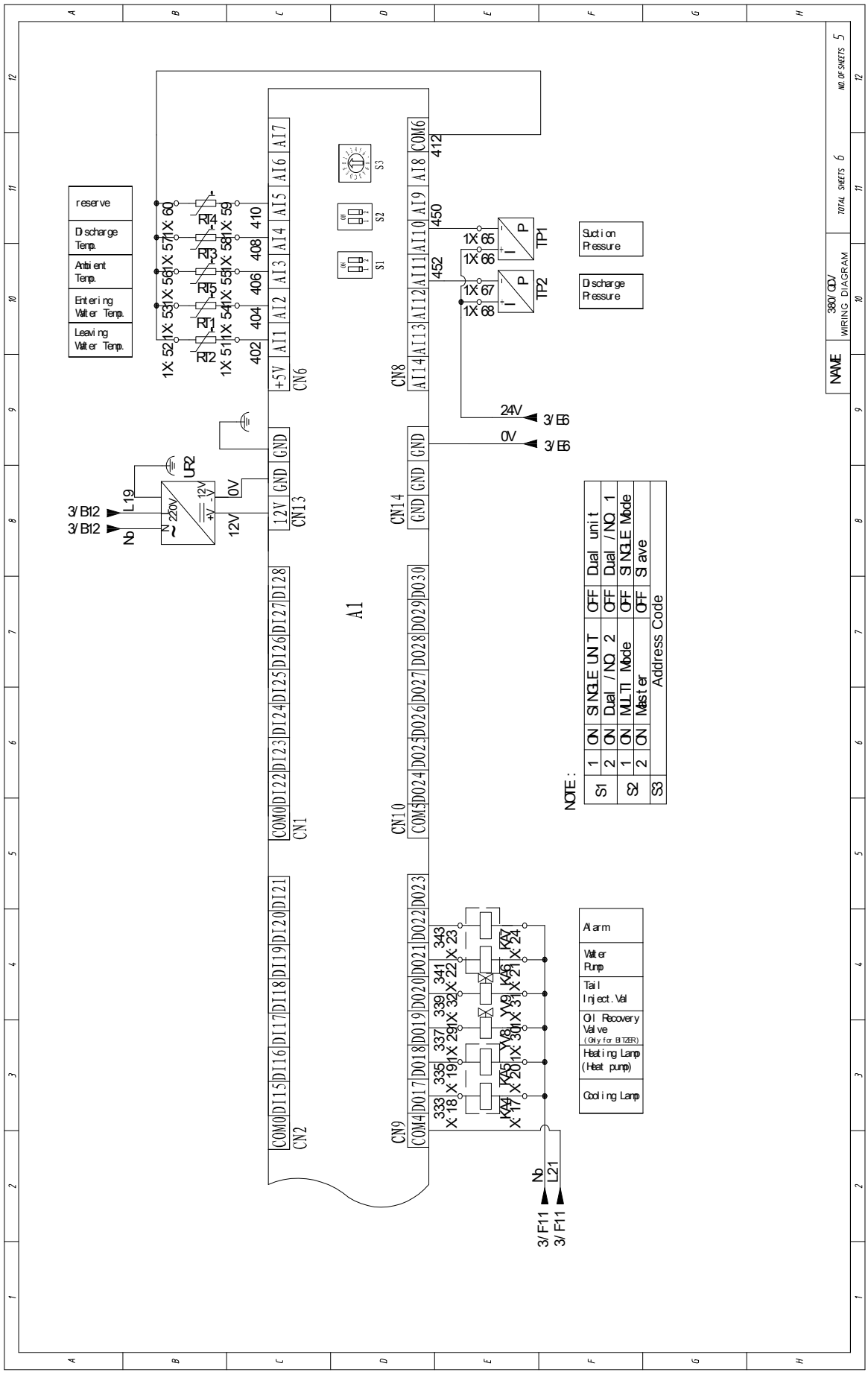

2/B12
L17
2/B12
Na
SB
L19
Nb
N
L
220V
24V
+V -V
UR1
HMI
24V 0V FG
RS485
4/B4
0V
24V
2/C6
2/C6
FU3 2A
0V
24V
5/E9
5/E9
1X:3
SP4
1X:4
107
SP5
1X:5
109
FR
111
KA1
113
KM13
KM11
115
KM11
KM13
117
KT
KM12
119
KM12
KM12
121
KT
123
KM13
KT
L19
1/G1
4/F1
5/A8
Nb
1/G1
4/F1
5/A8
1X:1
brown
SL
L
N
blue
1X:2
202
gray
4/B8
orange
214
4/B8
Emergency Stop
Switch Power
Touch Screen
Dual Hight Pressure Switch
△ Contactor KM11
△ Contactor KM12
Y Contactor KM13
Time Relay
Oil level Switch
NAME
380/CCV
WIRING DIAGRAM
TOTAL SHEETS 6
NO. OF SHEETS 3

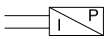
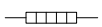


X:Terminal is arranged by the 220AC/24DC/analog signal / EXV.pulse order
220AC 1X:1~1X:32 1X:10. 1X:33~1X:34Redundancy
Separated with the following terminal with fixtures
12DC 1X:35~1X:46 1X:47~1X:52Redundancy
analog signal 1X:53~1X:75
EXV.pulse 1X:76~1X:79
Separated with the front terminal with fixtures

Customer terminal X:1~X:22
X:1~X:8 stands for input of passive signal,
X:9~X:12 stands for connection of multi-communications and
X:13~X:24 stands for the output of 200VAC

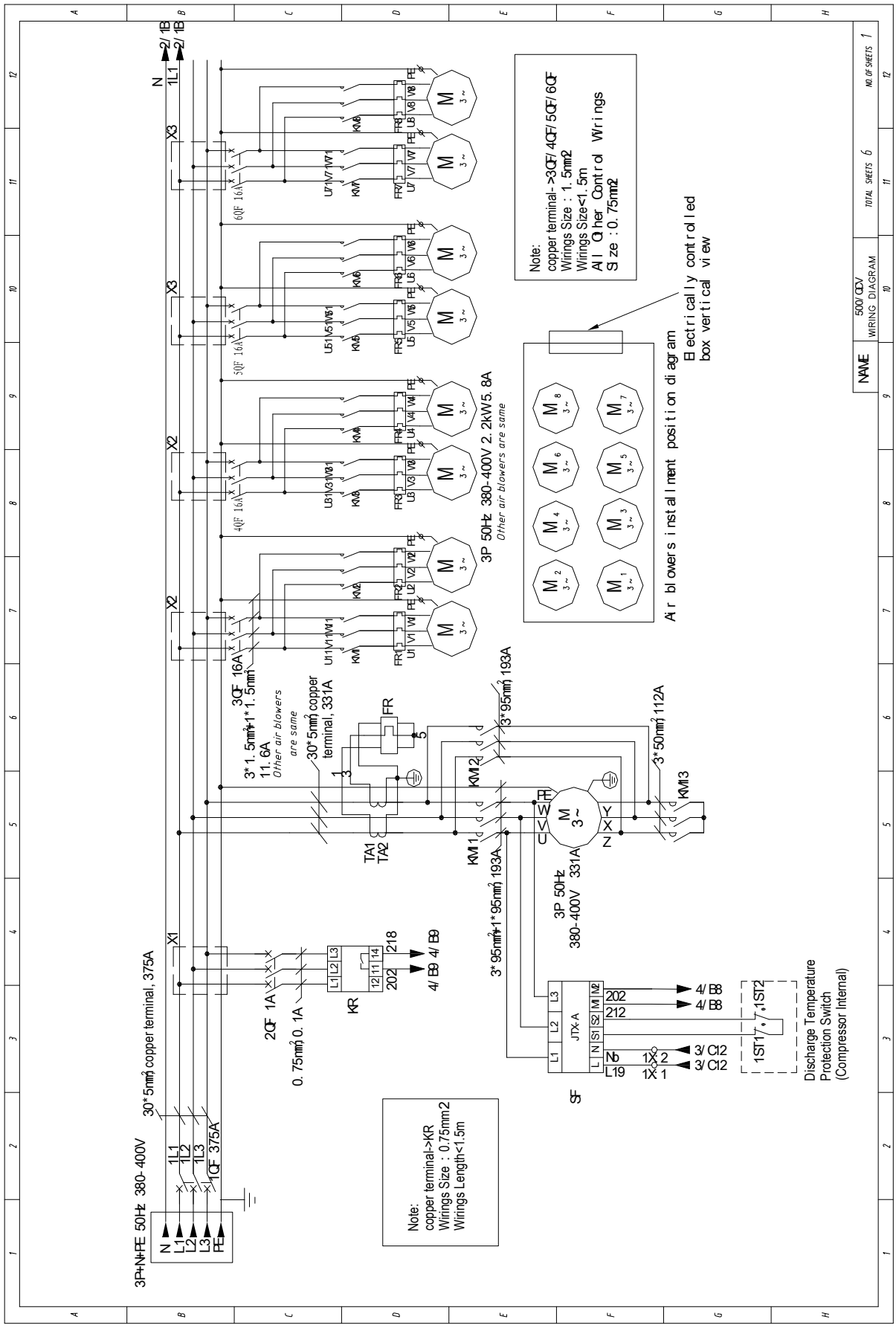
NAME	380/ CDV WIRING DIAGRAM	TOTAL SHEETS 6	NO. OF SHEETS 4

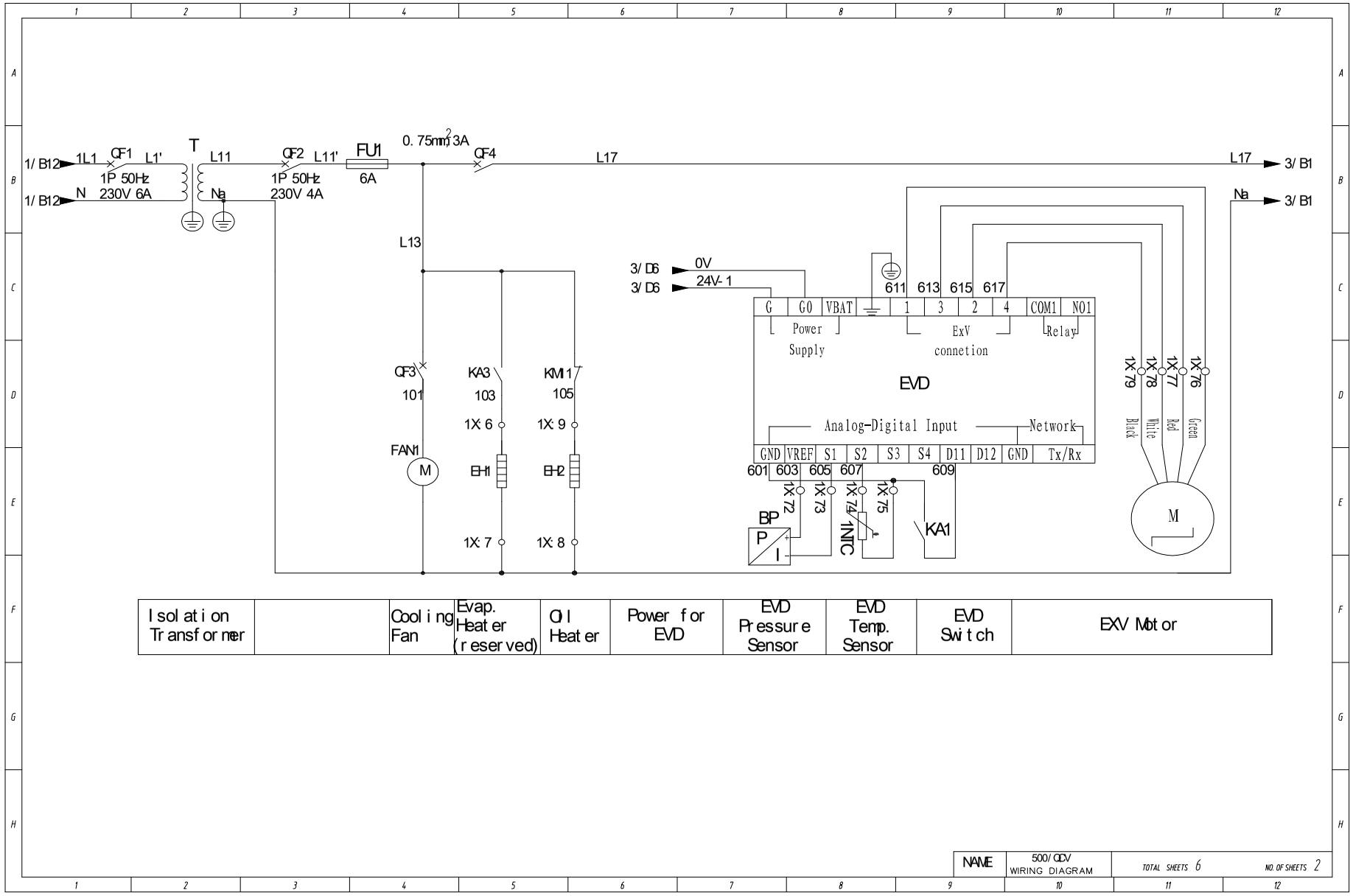

NAME
380/ CO/
WIRING DIAGRAM
TOTAL SHEETS 6
NO. OF SHEETS 5
reserve
Discharge Temp.
Ambient Temp.
Entering Water Temp.
Leaving Water Temp.
Suction Pressure
Discharge Pressure
Alarm
Water Pump
Tail Inject. Val
Oil Recovery Valve (Only for BITZER)
Heating Lamp (Heat pump)
Cooling Lamp
A1
CN1
CN2
CN6
CN8
CN9
CN10
CN13
CN14
NOTE:
S1 1 ON SINGLE UNIT OFF Dual unit
2 ON Dual / NO. 2 OFF Dual / NO. 1
S2 1 ON MULTI Mode OFF SINGLE Mode
2 ON Master OFF Slave
S3 Address Code

ITEM	SYMBOL	ITEM	DESCRIPTION	ITEM	SYMBOL	ITEM	DESCRIPTION
1	TA1 TA2		Current Transformer	15	ST1		Anti-Freeze Switch
2	1QF		Moulded Case Circuit Breaker	16	KA1~KA7		Intermediate Relay
3	QF1 QF2 QF3 QF4		Air Switch	17	SA1		C/H Mode Switch
4	FU1 FU3		Fuse	18	SL		Oil Level Switch
5	KR		Power Protection Module	19	SF		Compressor Motor Prot. Switch
6	KM1 KM2 KM3		Compressor Contactor	20	RT1~RT5		Temperature Sensor
7	FR FR1~FR6		Overload Relay	21	YV1~YV9		Solenoid Valve
8	M		Motor	22	SP1 SP2 SP3		Pressure Switch
9	KT		Time Relay	23	TP1 TP2		Pressure Sensor
10	KM1~KM6		Fan Contactor	24	A1		Main Controll board
11	SB		Emergency Stop	25	HMI		Touch Screen
12	SB1 SB2		Remote Start Switch/Remote Stop Switch	26	EVD		Electrical Expansion Valve Module
13	EH1 EH2		Compressor Heater	27	UR1 UR2		Switch Power
14	SQ1		Water Flow Switch	28	T		Isolation Transformer

NAME	380/ QDV WIRING DIAGRAM	TOTAL SHEETS 6	NO. OF SHEETS 6

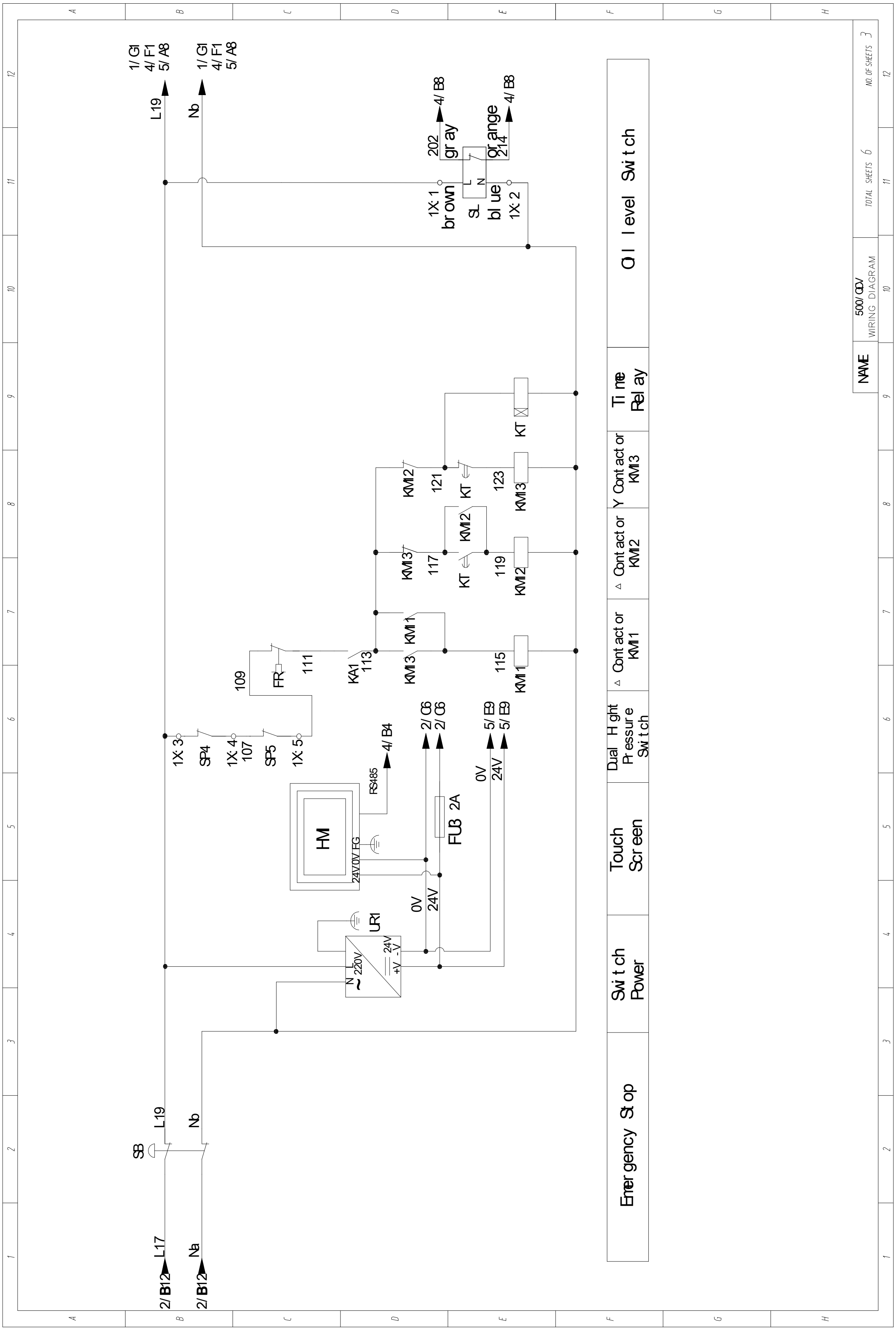
LSBLGW500/C WIRING DIAGRAM

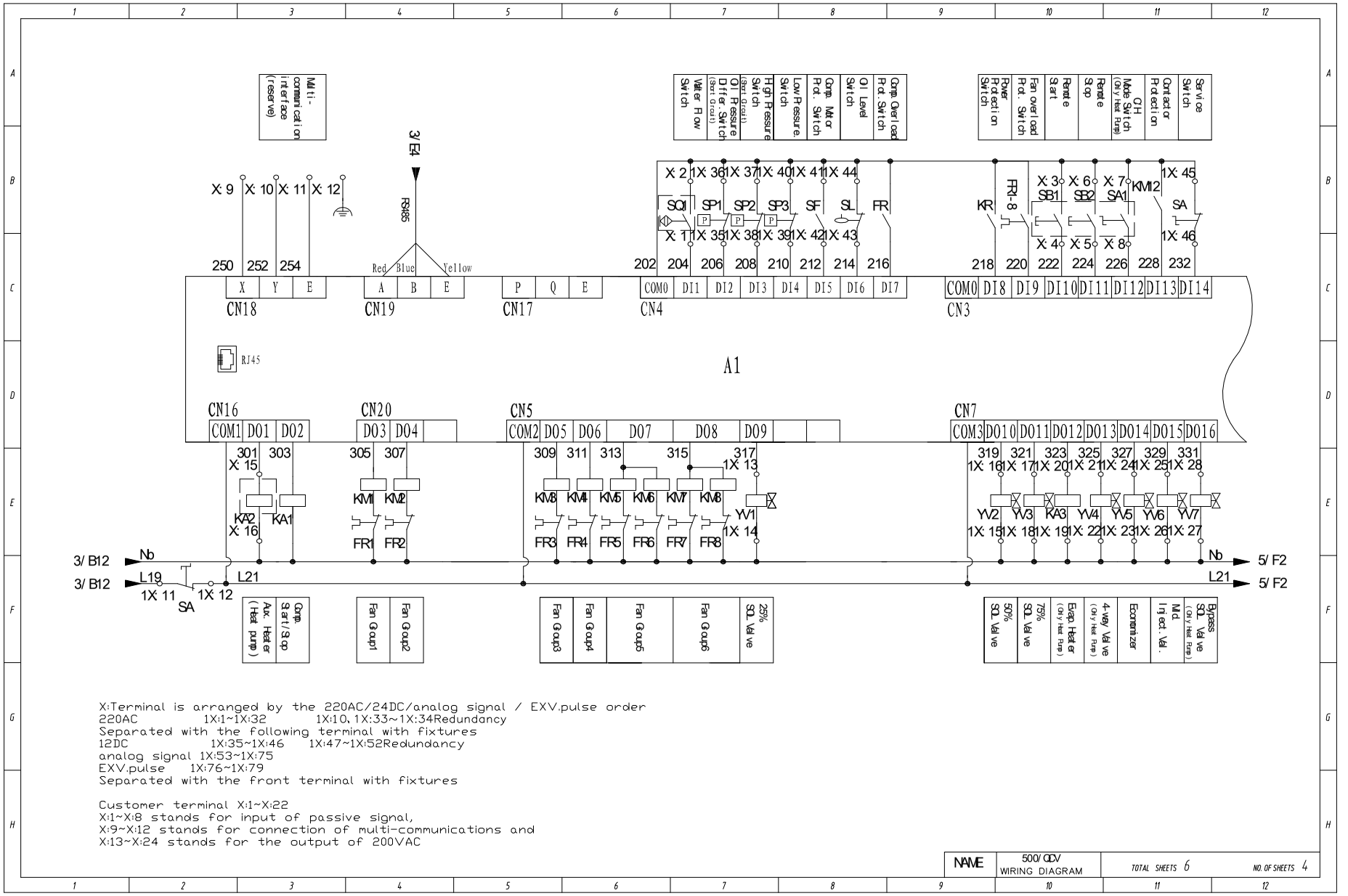




Isolation Transformer		Cooling Fan	Evap. Heater (reserved)	Oil Heater	Power for EVD	EVD Pressure Sensor	EVD Temp. Sensor	EVD Switch	EXV Motor

NAME	500/QCV WIRING DIAGRAM	TOTAL SHEETS 6	NO. OF SHEETS 2

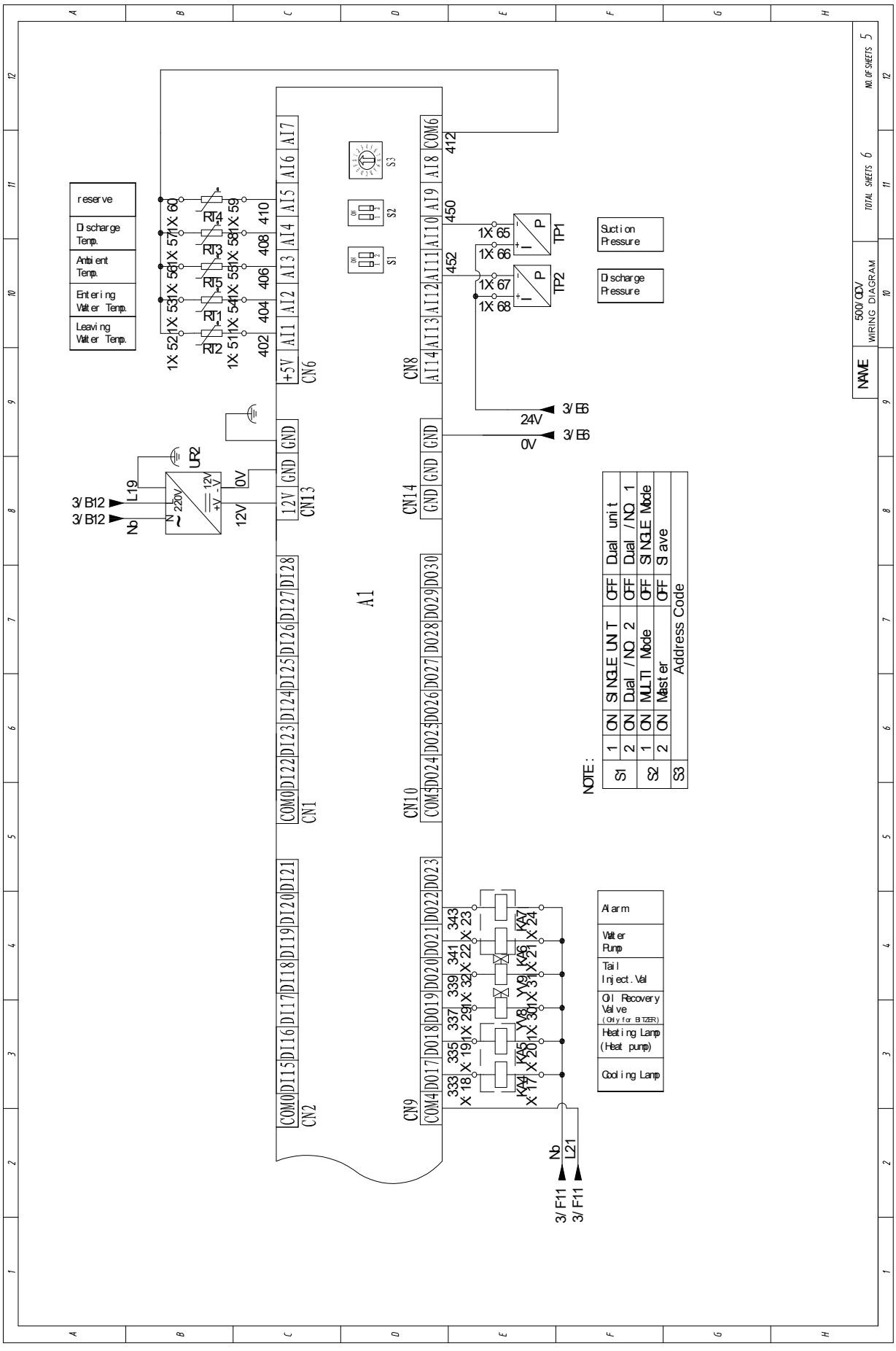

Emergency Stop
Switch Power
Touch Screen
Dual Hight Pressure Switch
△ Contactor KM1
△ Contactor KM2
Y Contactor KM3
Time Relay
Oil level Switch
NAME
500/CDV
WIRING DIAGRAM
TOTAL SHEETS 6
NO. OF SHEETS 3
SB
L17
L19
Na
Nb
2/B12
1/G1
4/F1
5/A8
UR1
220V
24V
+V -V
0V
24V
HMI
24V 0V FG
RS485
4/B4
FU3 2A
2/C6
5/E9
1X:3
SP4
1X:4
107
SP5
1X:5
109
FR
111
KA1
113
KM3
KM1
115
KM3
117
KT
KM2
119
121
123
KT
1X:1
brown
SL
L
N
blue
1X:2
202
gray
orange
214
4/B8

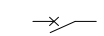
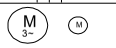
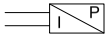
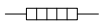


X:Terminal is arranged by the 220AC/24DC/analog signal / EXV.pulse order
220AC 1X:1~1X:32 1X:10、1X:33~1X:34Redundancy
Separated with the following terminal with fixtures
12DC 1X:35~1X:46 1X:47~1X:52Redundancy
analog signal 1X:53~1X:75
EXV.pulse 1X:76~1X:79
Separated with the front terminal with fixtures

Customer terminal X:1~X:22
X:1~X:8 stands for input of passive signal,
X:9~X:12 stands for connection of multi-communications and
X:13~X:24 stands for the output of 200VAC

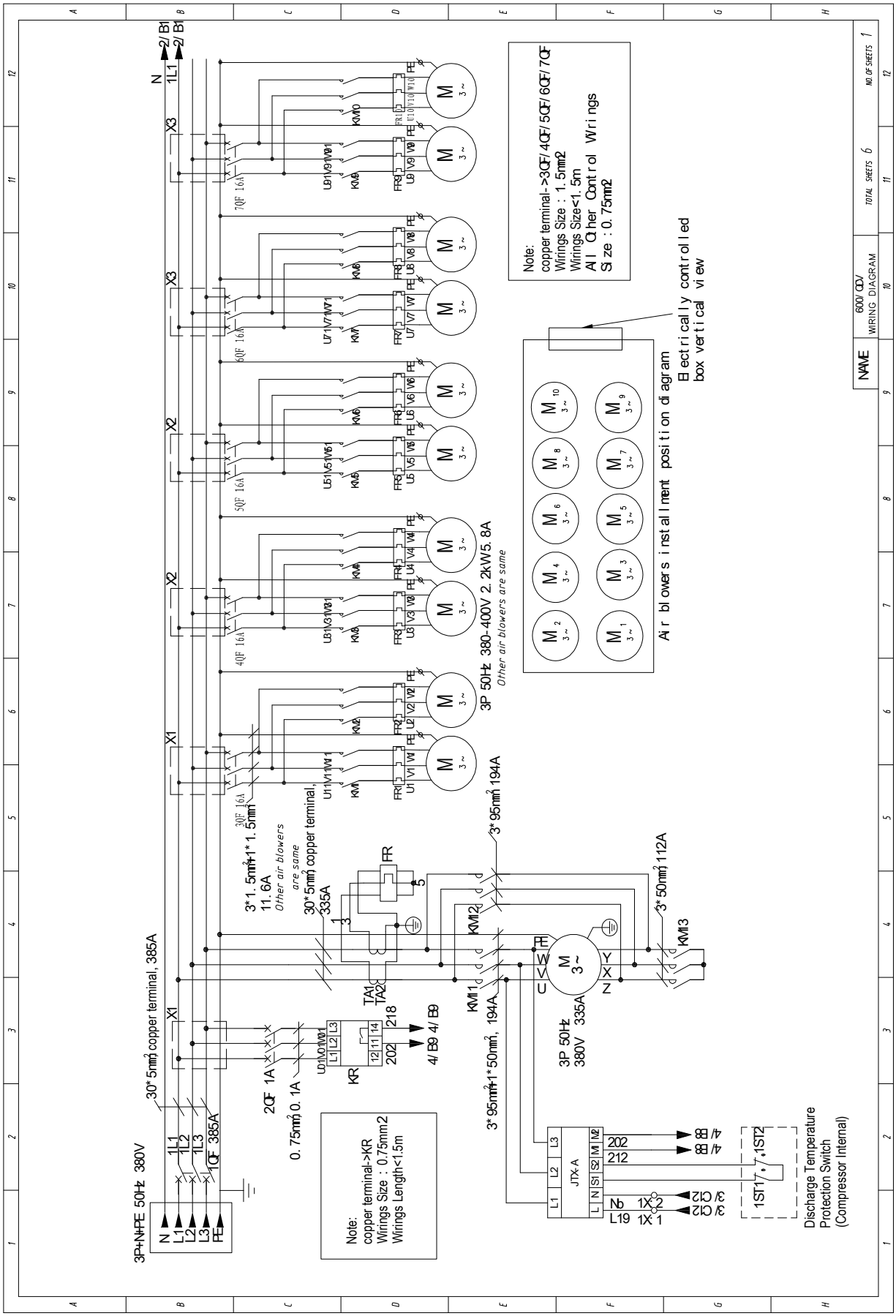
NAME	500/ QDV WIRING DIAGRAM	TOTAL SHEETS 6	NO. OF SHEETS 4

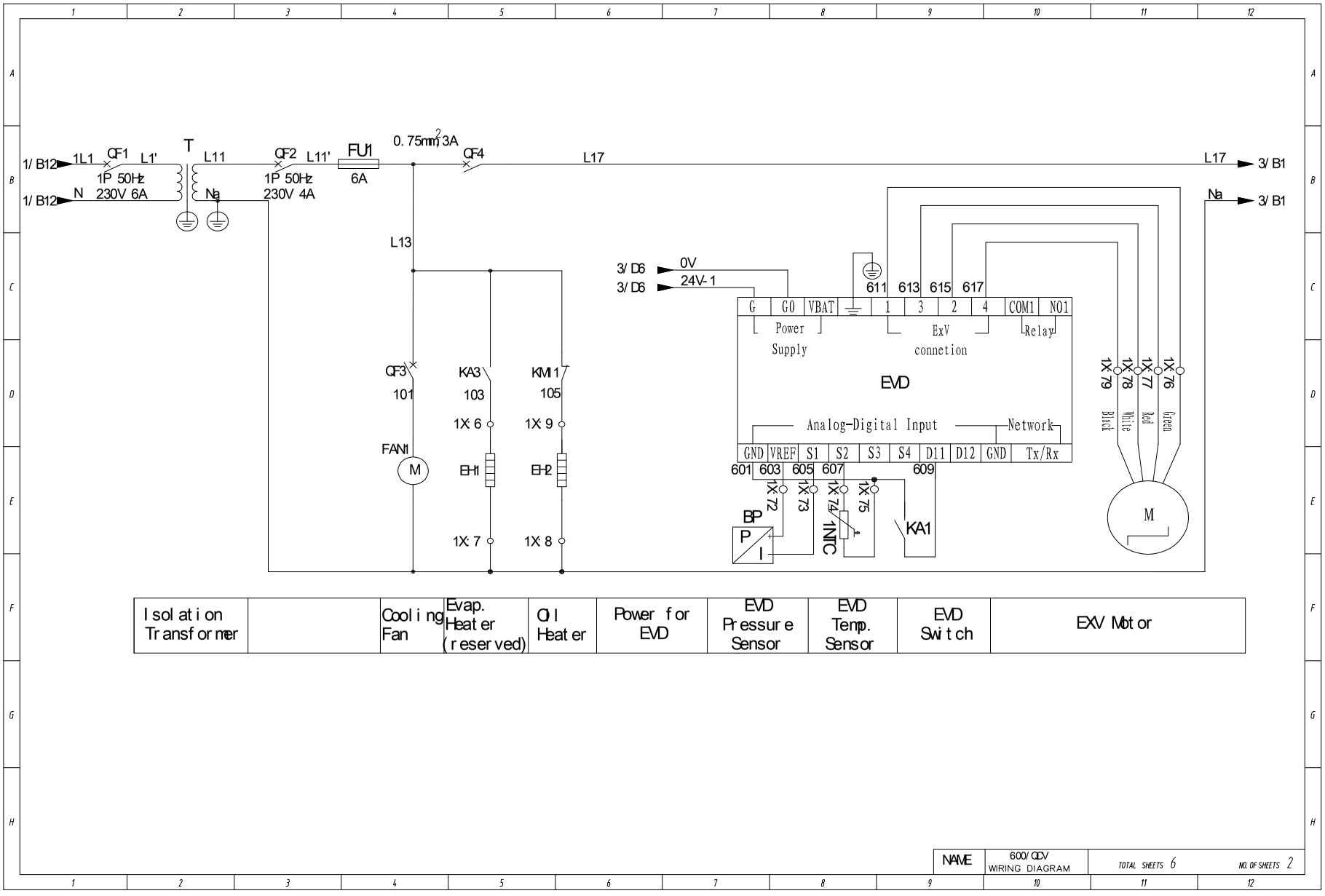

NAME
500/ODV
WIRING DIAGRAM
TOTAL SHEETS 6
NO.OF SHEETS 5
A1
CN1
CN2
CN6
CN8
CN9
CN10
CN13
CN14
reserve
Discharge Temp.
Ambient Temp.
Entering Water Temp.
Leaving Water Temp.
Suction Pressure
Discharge Pressure
Alarm
Water Pump
Tail Inject. Val
Oil Recovery Valve (Only for BITZER)
Heating Lamp (Heat pump)
Cooling Lamp
NOTE:
Address Code
Dual unit
Dual / NO. 1
SINGLE Mode
Slave
SINGLE UNIT
Dual / NO. 2
MULTI Mode
Master

ITEM	SYMBOL	ITEM	DESCRIPTION	ITEM	SYMBOL	ITEM	DESCRIPTION
1	TA1 TA2		Current Transformer	15	ST1		Anti-Freeze Switch
2	1QF		Moulded Case Circuit Breaker	16	KA1~KA7		Intermediate Relay
3	QF1 QF2 QF3 QF4		Air Switch	17	SA1		C/H Mode Switch
4	FU1 FU3		Fuse	18	SL		Oil Level Switch
5	KR		Power Protection Module	19	SF		Compressor Motor Prot. Switch
6	KM11 KM12 KM13		Compressor Contactor	20	RT1~RT5		Temperature Sensor
7	FR FR1~FR8		Overload Relay	21	YV1~YV9		Solenoid Valve
8	M		Motor	22	SP1 SP2 SP3		Pressure Switch
9	KT		Time Relay	23	TP1 TP2		Pressure Sensor
10	KM1~KM8		Fan Contactor	24	A1		Main Controll board
11	SB		Emergency Stop	25	HMI		Touch Screen
12	SB1 SB2		Remote Start Switch/Remote Stop Switch	26	EVD		Electrical Expansion Valve Module
13	EH1 EH2		Compressor Heater	27	UR1 UR2		Switch Power
14	SQ1		Water Flow Switch	28	T		Isolation Transformer

NAME	500/QDV WIRING DIAGRAM	TOTAL SHEETS 6	NO.OF SHEETS 6

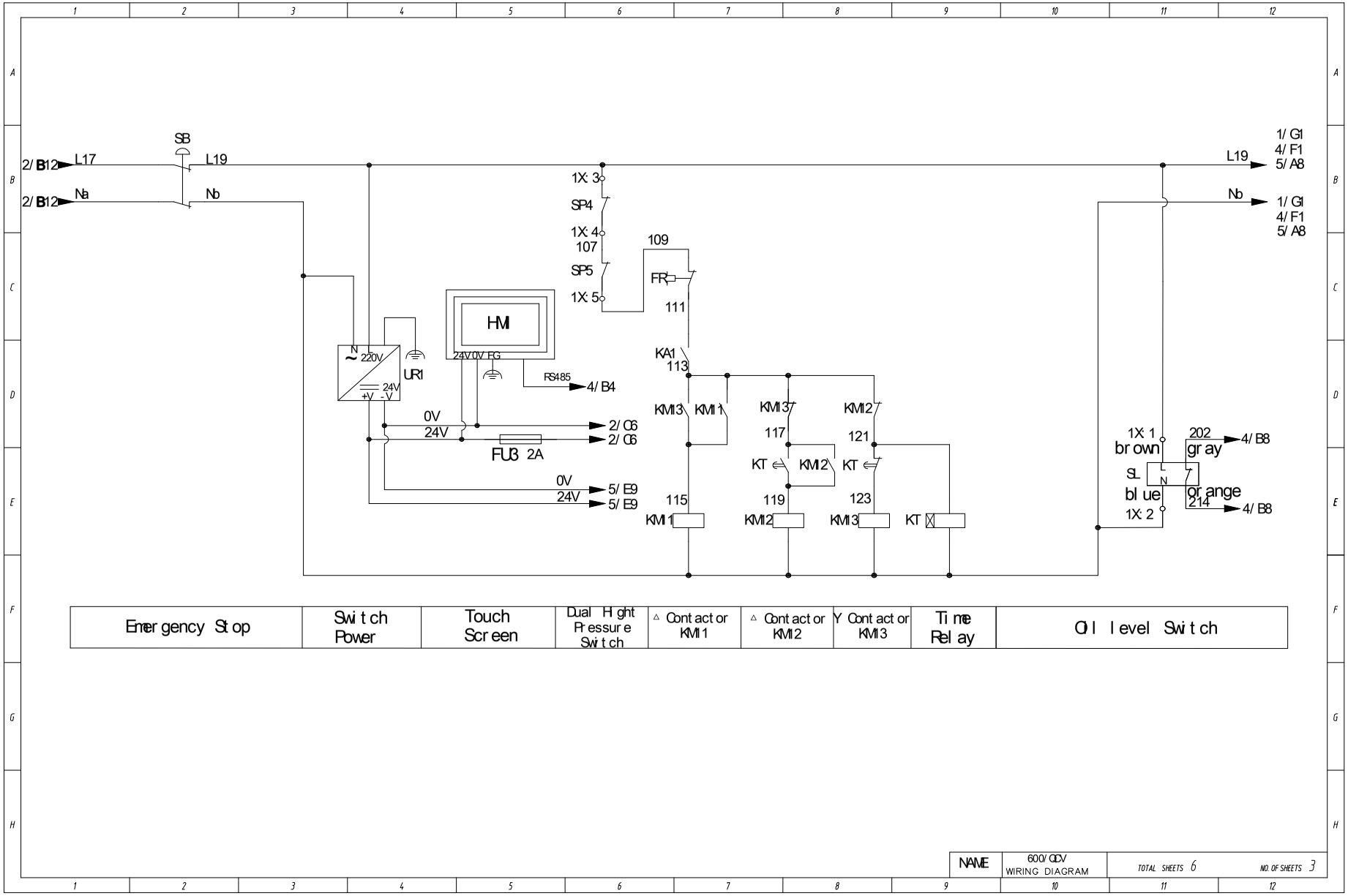
LSBLGW600/C WIRING DIAGRAM





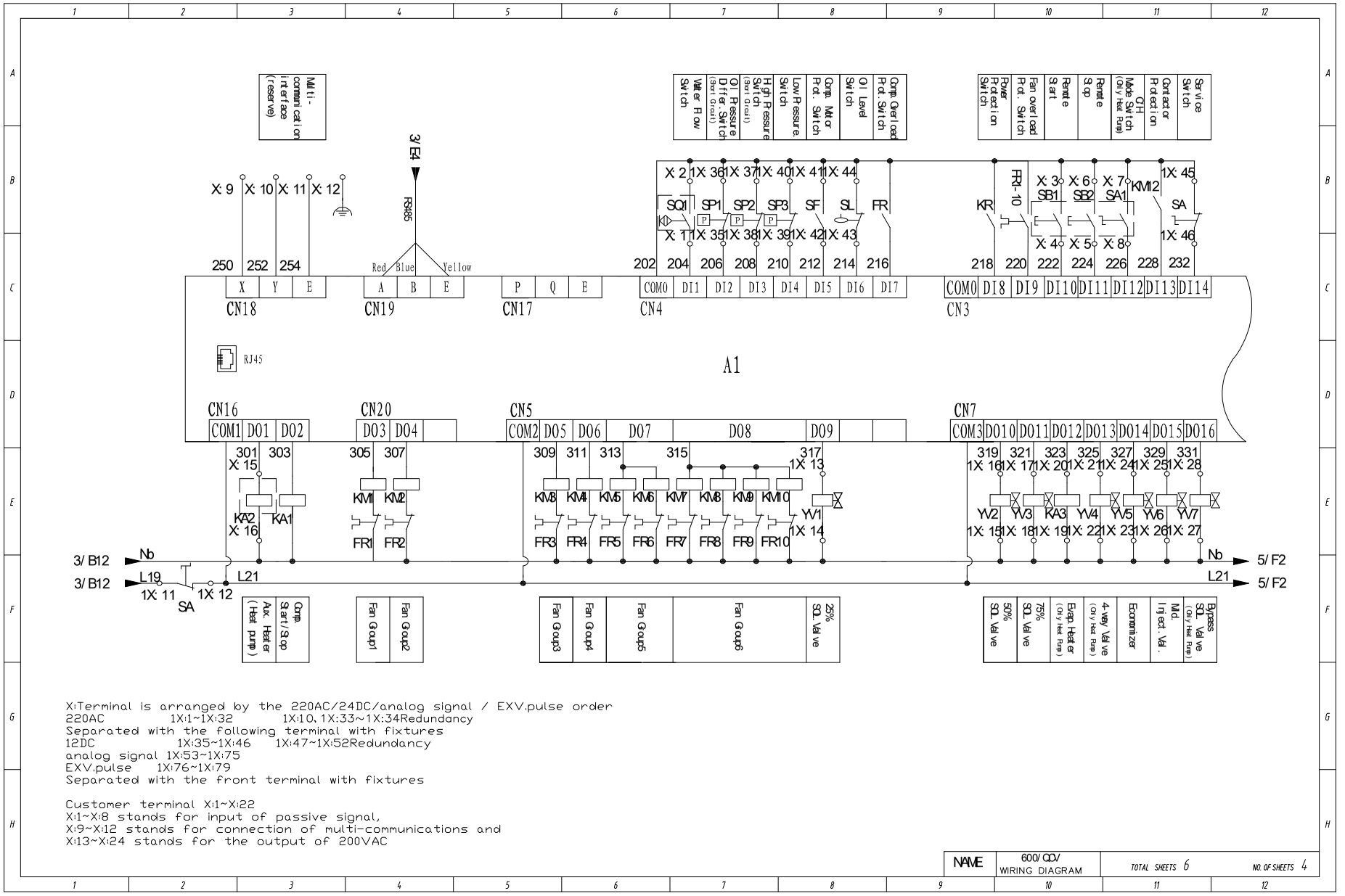
Isolation Transformer		Cooling Fan	Evap. Heater (reserved)	Oil Heater	Power for EVD	EVD Pressure Sensor	EVD Temp. Sensor	EVD Switch	EXV Motor

NAME	600/QDV WIRING DIAGRAM	TOTAL SHEETS 6	NO. OF SHEETS 2



Emergency Stop	Switch Power	Touch Screen	Dual Hight Pressure Switch	△ Contactor KM1 1	△ Contactor KM1 2	Y Contactor KM1 3	Time Relay	Oil level Switch

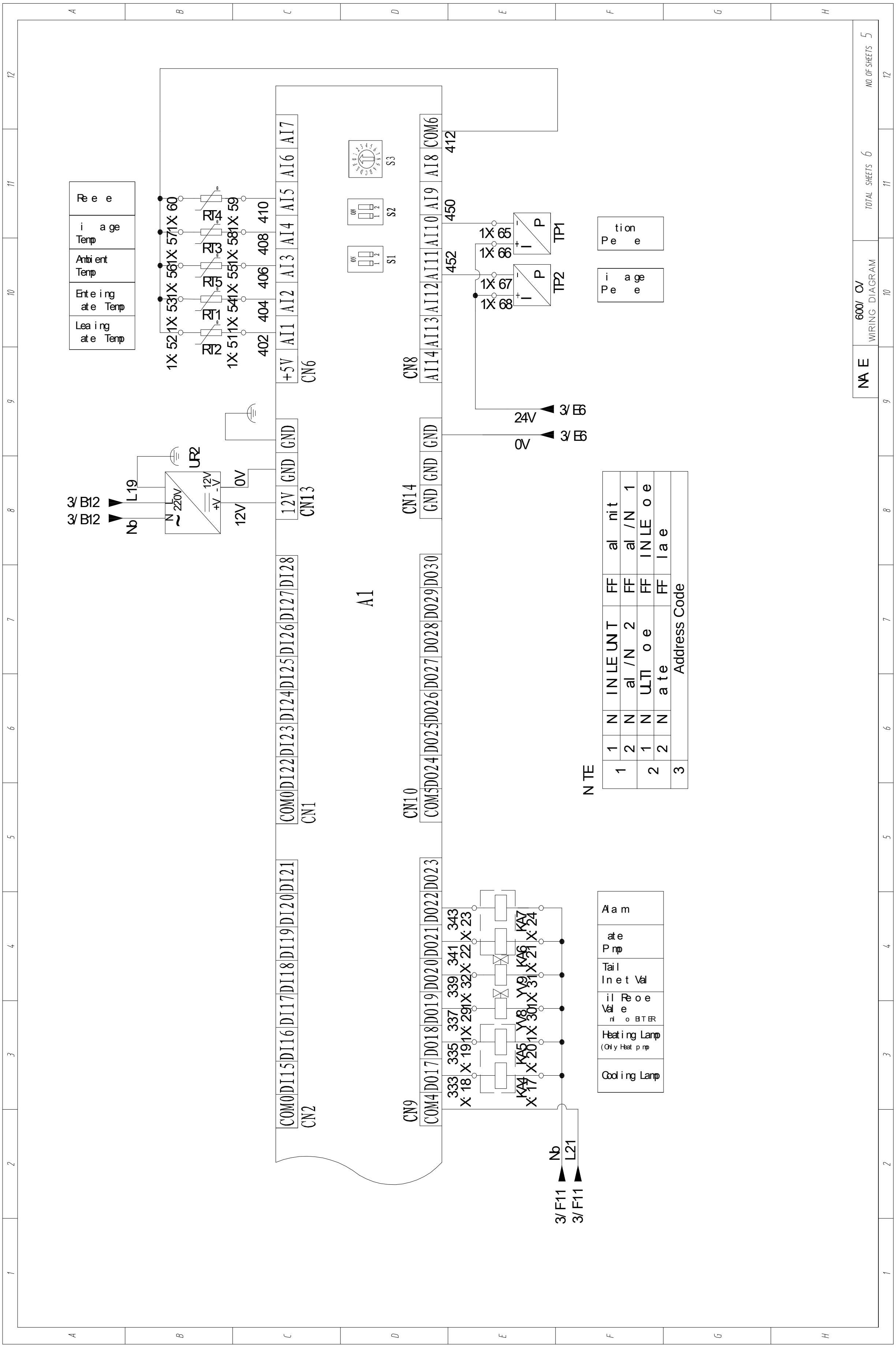
NAME	600/ QDV WIRING DIAGRAM	TOTAL SHEETS 6	NO. OF SHEETS 3

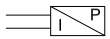
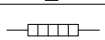


X:Terminal is arranged by the 220AC/24DC/analog signal / EXV.pulse order
220AC 1X:1~1X:32 1X:10、1X:33~1X:34Redundancy
Separated with the following terminal with fixtures
12DC 1X:35~1X:46 1X:47~1X:52Redundancy
analog signal 1X:53~1X:75
EXV.pulse 1X:76~1X:79
Separated with the front terminal with fixtures

Customer terminal X:1~X:22
X:1~X:8 stands for input of passive signal,
X:9~X:12 stands for connection of multi-communications and
X:13~X:24 stands for the output of 200VAC

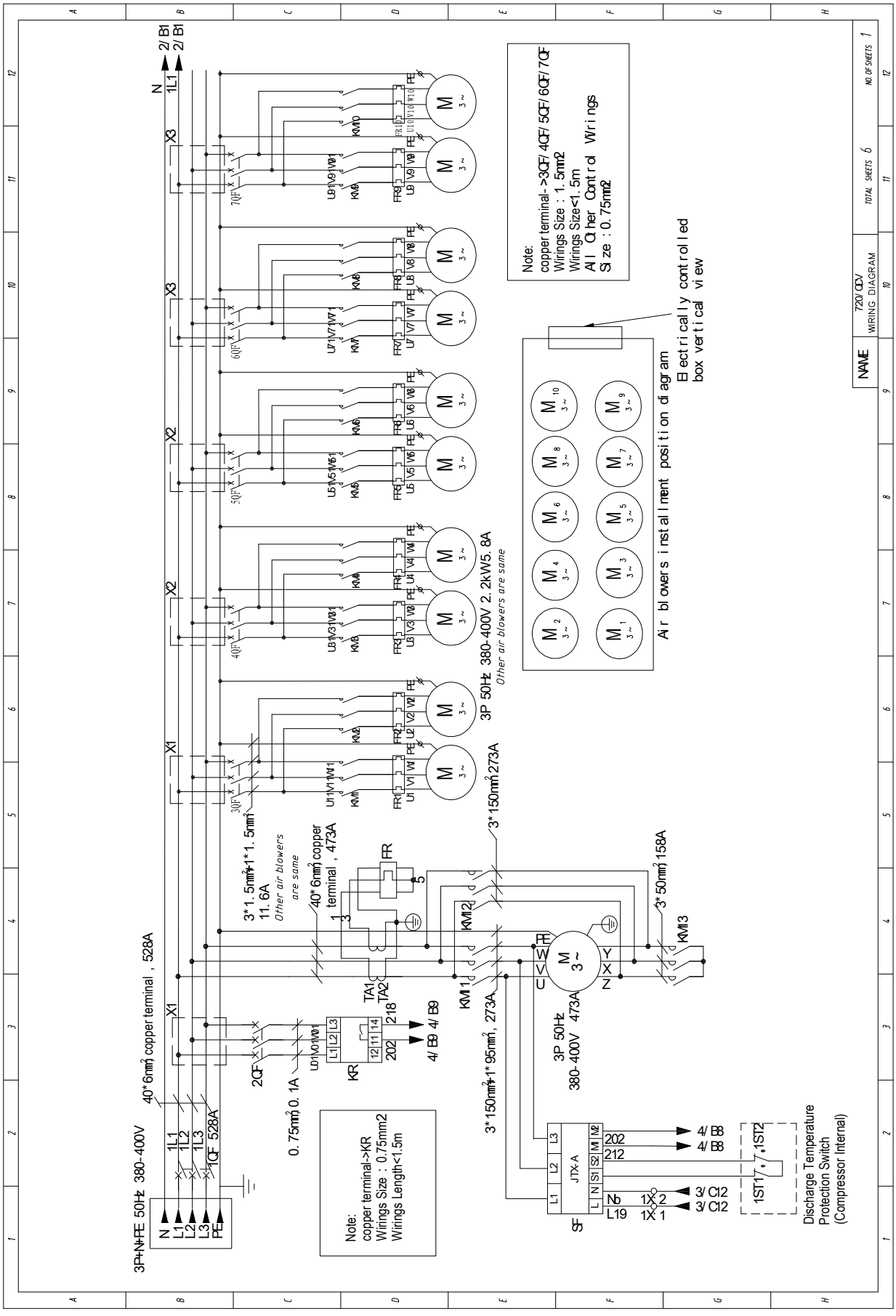
NAME	600/QCV WIRING DIAGRAM	TOTAL SHEETS 6	NO. OF SHEETS 4

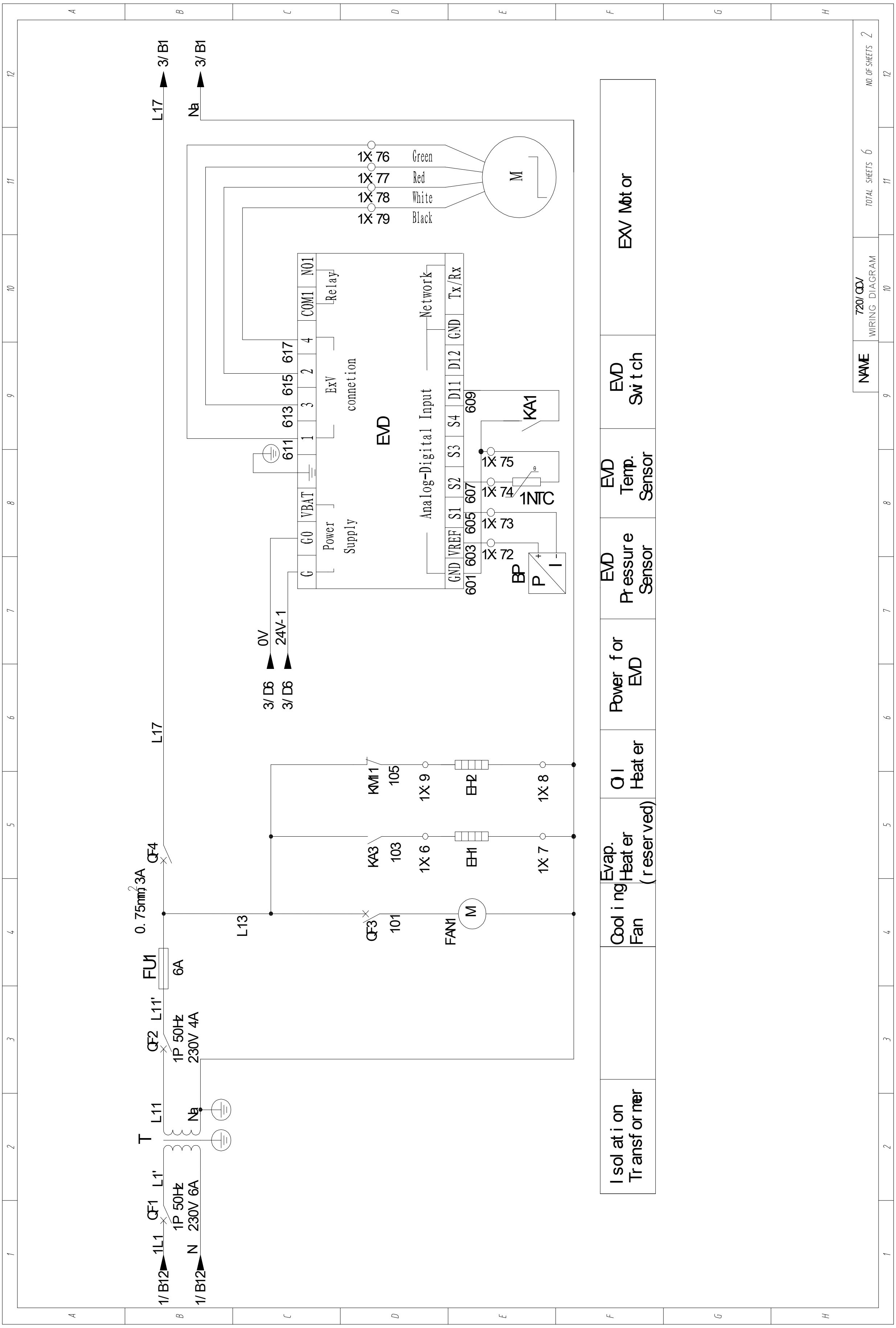

A1
CN1
CN2
CN6
CN8
CN9
CN10
CN13
CN14
TP1
TP2
UR2
WIRING DIAGRAM
TOTAL SHEETS 6
NO OF SHEETS 5
Address Code
Ambient Temp
Heating Lamp
Cooling Lamp
24V
0V
12V

ITEM	SYMBOL	ITEM	DESCRIPTION	ITEM	SYMBOL	ITEM	DESCRIPTION
1	TA1 TA2		Current Transformer	15	ST1		Anti-Freeze Switch
2	1QF		Moulded Case Circuit Breaker	16	KA1~KA7		Intermediate Relay
3	QF1 QF2 QF3 QF4		Air Switch	17	SA1		C/H Mode Switch
4	FU1 FU3		Fuse	18	SL		Oil Level Switch
5	KR		Power Protection Module	19	SF		Compressor Motor Prot. Switch
6	KM1 KM2 KM13		Compressor Contactor	20	RT1~RT5		Temperature Sensor
7	FR FR1~FR10		Overload Relay	21	YV1~YV9		Solenoid Valve
8	M		Motor	22	SP1 SP2 SP3		Pressure Switch
9	KT		Time Relay	23	TP1 TP2		Pressure Sensor
10	KM1~KM10		Fan Contactor	24	A1		Main Controll board
11	SB		Emergency Stop	25	HMI		Touch Screen
12	SB1 SB2		Remote Start Switch/Remote Stop Switch	26	EVD		Electrical Expansion Valve Module
13	EH1 EH2		Compressor Heater	27	UR1 UR2		Switch Power
14	SQ1		Water Flow Switch	28	T		Isolation Transformer

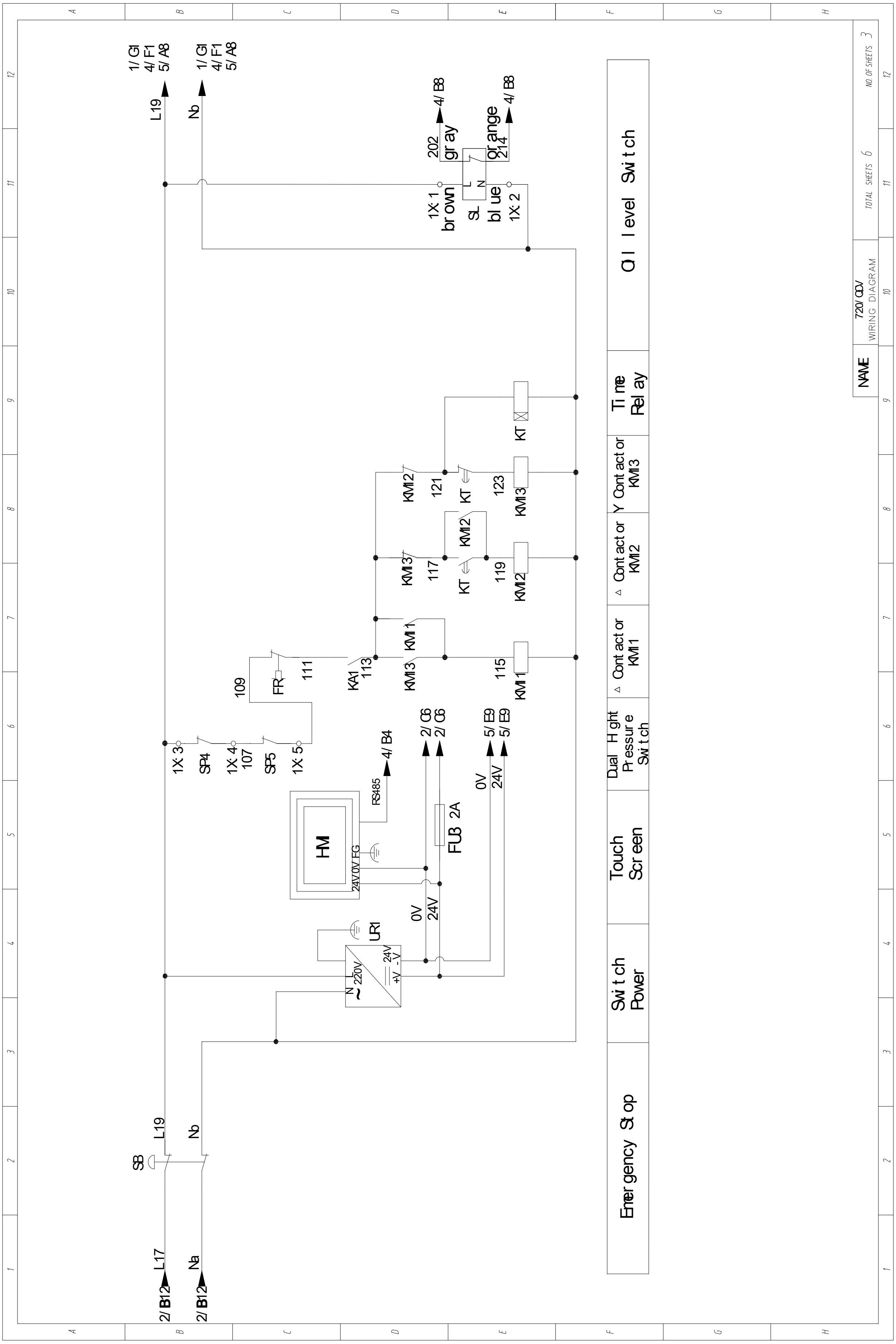
NAME	600/QDV WIRING DIAGRAM	TOTAL SHEETS 6	NO. OF SHEETS 6

LSBLGW720/C WIRING DIAGRAM

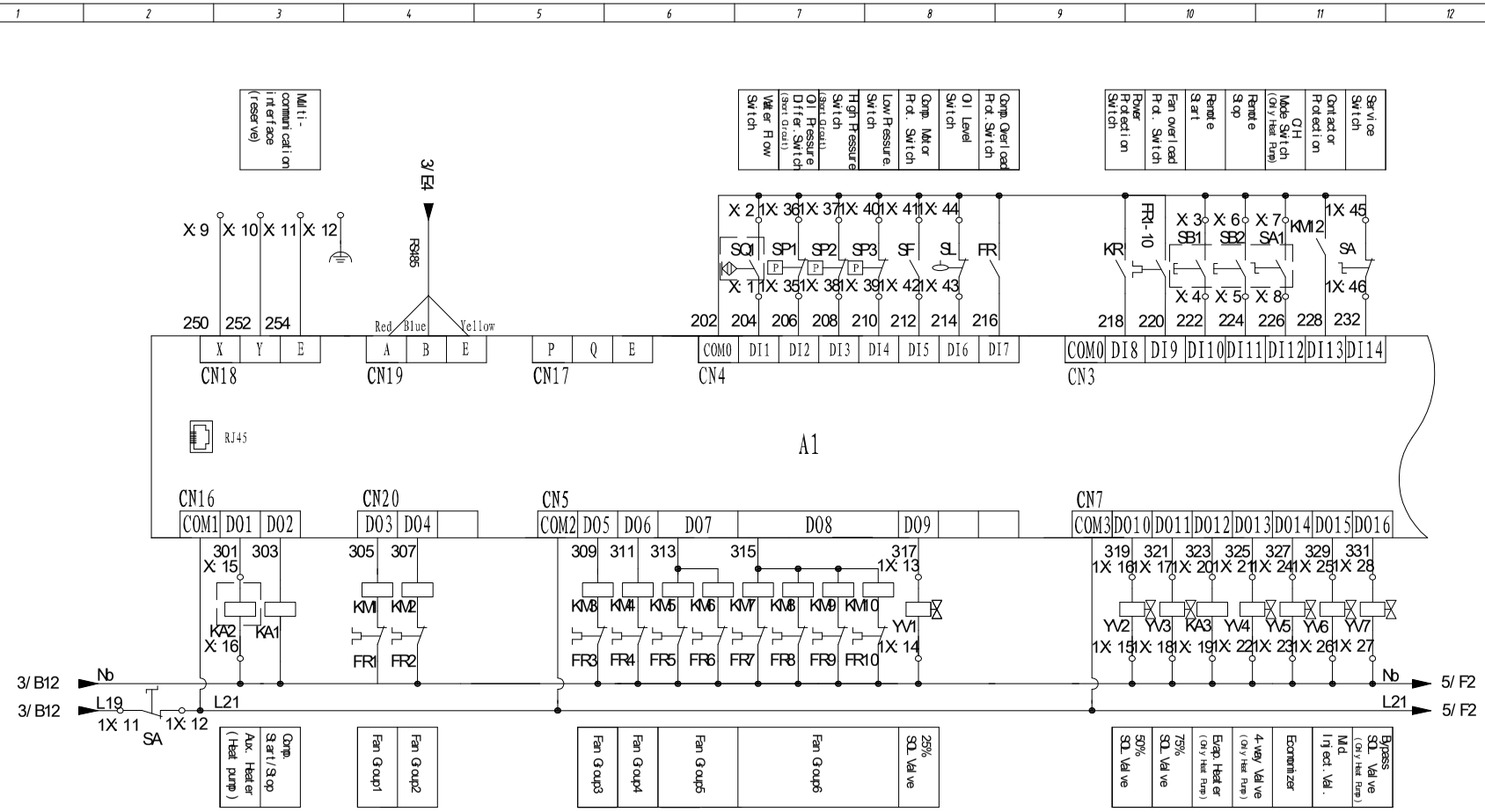




3/ B1
3/ B1
L17
Na
1X 76 Green
1X 77 Red
1X 78 White
1X 79 Black
M
EXV Motor
N01
COM1
Relay
Tx/Rx
GND
Network
D12
D11
S4
S3
S2
S1
VREF
GND
EXV connetion
Analog-Digital Input
EVD
VBAT
G0
G
Power Supply
611
613
615
617
609
607
605
603
601
KA1
1X 75
1X 74
1NTC
1X 73
1X 72
BP
P
I
EVD Switch
EVD Temp. Sensor
EVD Pressure Sensor
0V
24V-1
3/ D6
3/ D6
Power for EVD
KM11
105
1X 9
EH2
1X 8
Oil Heater
KA3
103
1X 6
EH1
1X 7
Evap. Heater (reserved)
QF3
101
FAN1
Cooling Fan
L13
QF4
0.75mm2 3A
FU1
6A
QF2
L11'
1P 50Hz
230V 4A
L11
T
Na
QF1
L1'
1P 50Hz
230V 6A
1L1
N
1/ B12
1/ B12
Isolation Transformer
NAME
720/ CQV
WIRING DIAGRAM
TOTAL SHEETS 6
NO OF SHEETS 2



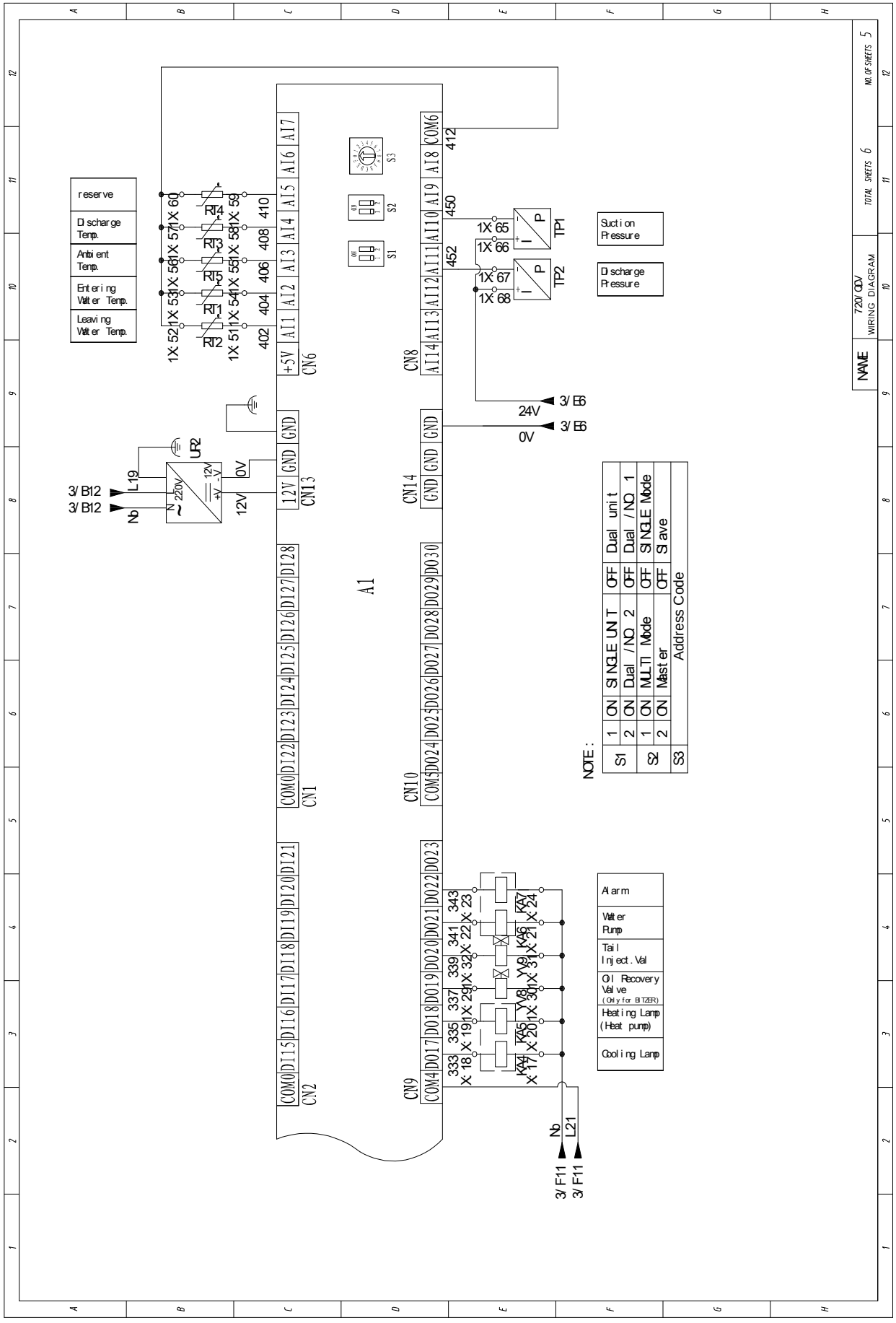
Emergency Stop
Switch Power
Touch Screen
Dual Hight Pressure Switch
Contactor KM1
Contactor KM2
Y Contactor KM3
Time Relay
Oil level Switch
SB
L17
Na
L19
Nb
2/B12
1/G1
4/F1
5/A8
UR1
220V
24V
HM
RS485
4/B4
FU3 2A
0V
24V
2/C6
5/E9
1X3
SP4
1X4
107
SP5
1X5
109
FR
111
KA1
113
KM3
KM1
115
KM2
117
119
KT
121
123
1X1
brown
SL
blue
1X2
202
gray
orange
214
4/B8
NAME
720/QDV
WIRING DIAGRAM
TOTAL SHEETS 6
NO OF SHEETS 3

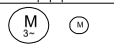
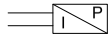
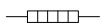


X:Terminal is arranged by the 220AC/24DC/analog signal / EXV.pulse order
220AC 1X:1~1X:32 1X:10、1X:33~1X:34Redundancy
Separated with the following terminal with fixtures
12DC 1X:35~1X:46 1X:47~1X:52Redundancy
analog signal 1X:53~1X:75
EXV.pulse 1X:76~1X:79
Separated with the front terminal with fixtures

Customer terminal X:1~X:22
X:1~X:8 stands for input of passive signal,
X:9~X:12 stands for connection of multi-communications and
X:13~X:24 stands for the output of 200VAC

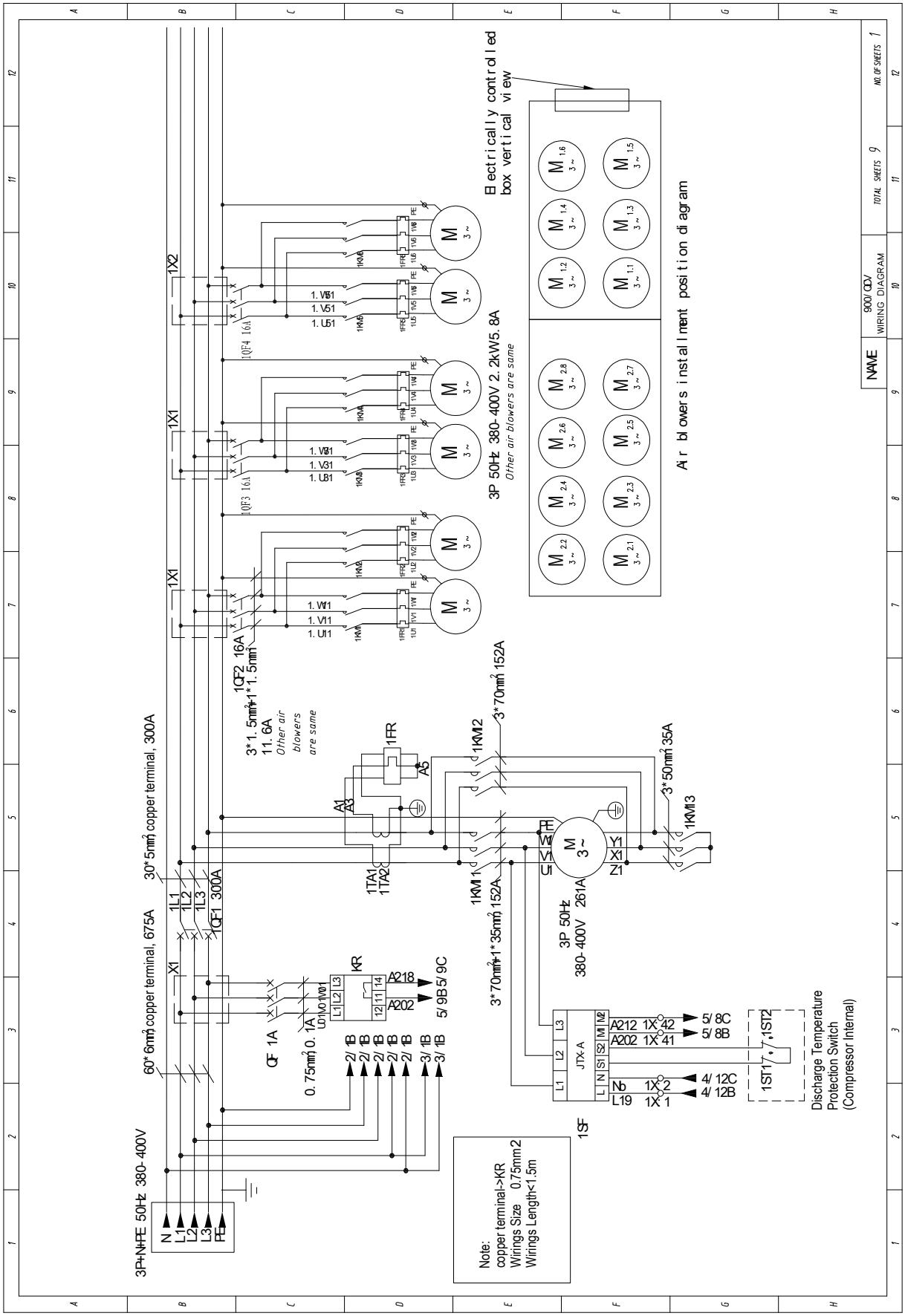
NAME	720/ QDV WIRING DIAGRAM	TOTAL SHEETS 6	NO. OF SHEETS 4

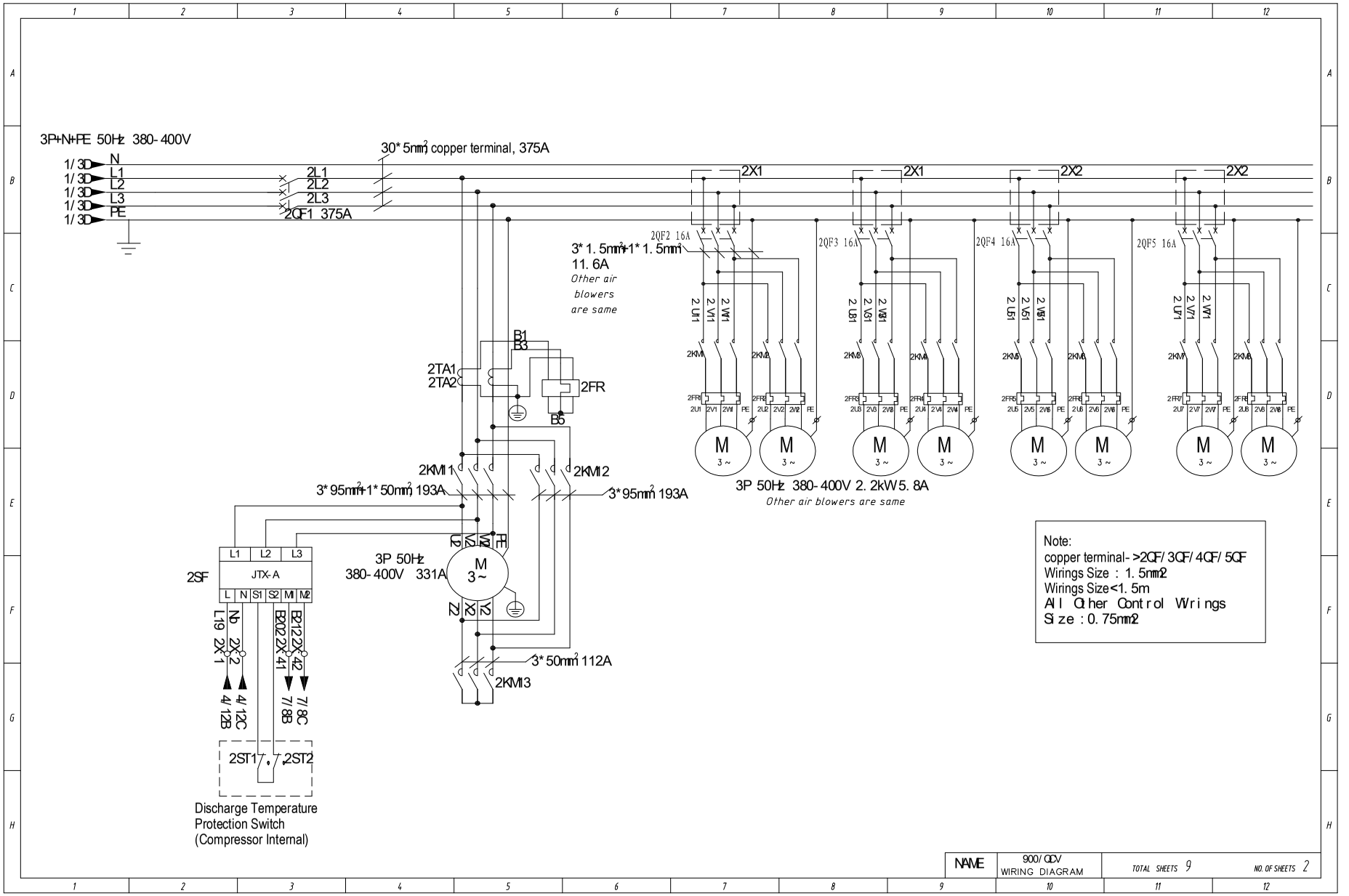

NAME
720/ CDV
WIRING DIAGRAM
TOTAL SHEETS 6
NO. OF SHEETS 5
A1
CN1
CN2
CN6
CN8
CN9
CN10
CN13
CN14
reserve
Discharge Temp.
Ambient Temp.
Entering Water Temp.
Leaving Water Temp.
Suction Pressure
Discharge Pressure
Alarm
Water Pump
Tail Inject. Val
Oil Recovery Valve (Only for BITZER)
Heating Lamp (Heat pump)
Cooling Lamp
NOTE :
S1 1 ON SINGLE UNIT OFF Dual unit
2 ON Dual /NO. 2 OFF Dual /NO. 1
S2 1 ON MULTI Mode OFF SINGLE Mode
2 ON Master OFF Slave
S3 Address Code

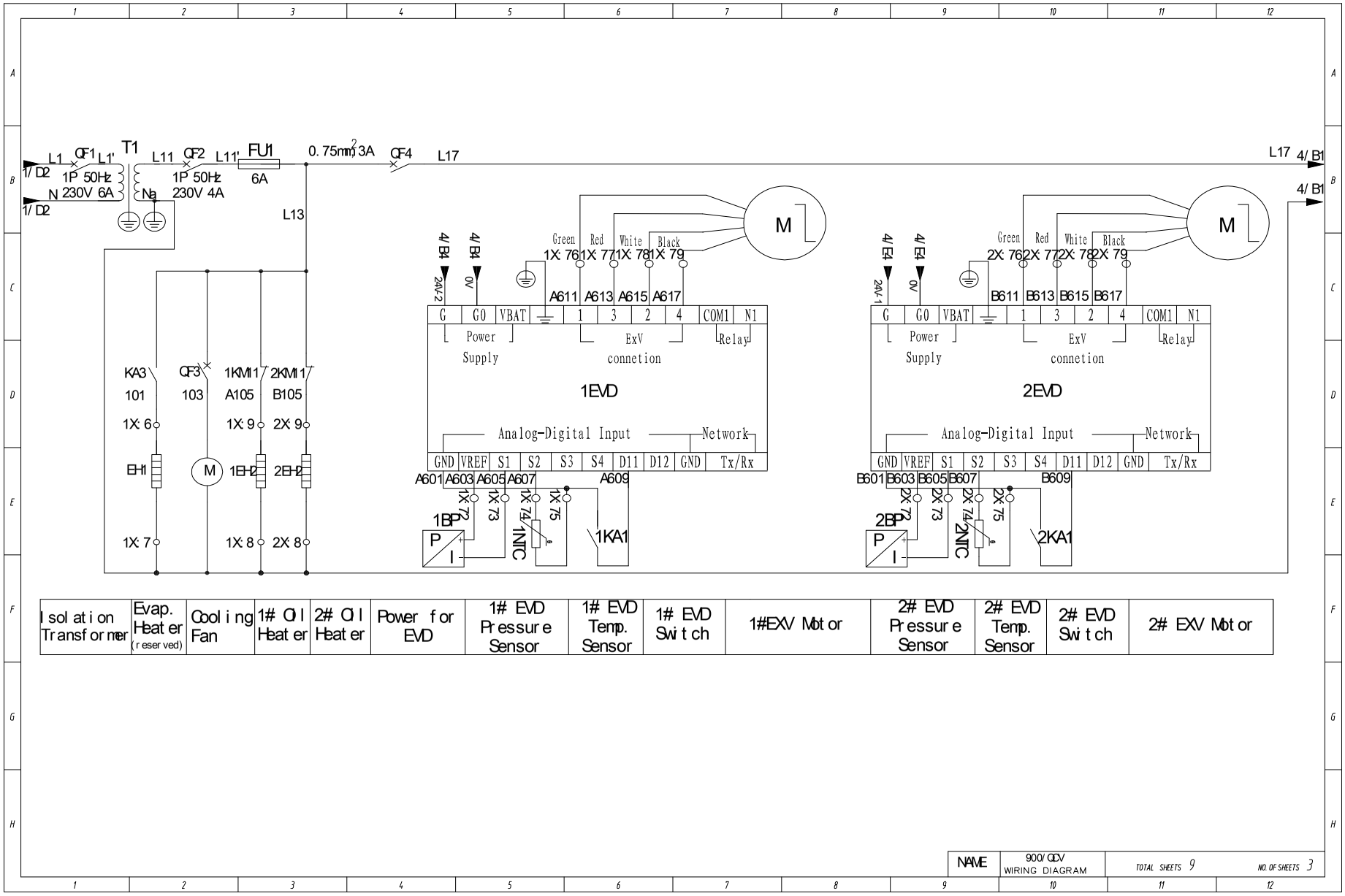
ITEM	SYMBOL	ITEM	DESCRIPTION	ITEM	SYMBOL	ITEM	DESCRIPTION
1	TA1 TA2		Current Transformer	15	ST1		Anti-Freeze Switch
2	1QF		Moulded Case Circuit Breaker	16	KA1~KA7		Intermediate Relay
3	QF1 QF2 QF3 QF4		Air Switch	17	SA1		C/H Mode Switch
4	FU1 FU8		Fuse	18	SL		Oil Level Switch
5	KR		Power Protection Module	19	SF		Compressor Motor Prot. Switch
6	KM1 KM2 KM13		Compressor Contactor	20	RT1~RT5		Temperature Sensor
7	FR FR1~FR10		Overload Relay	21	YV1~YV9		Solenoid Valve
8	M		Motor	22	SP1 SP2 SP3		Pressure Switch
9	KT		Time Relay	23	TP1 TP2		Pressure Sensor
10	KM1~KM10		Fan Contactor	24	A1		Main Controll board
11	SB		Emergency Stop	25	HMI		Touch Screen
12	SB1 SB2		Remote Start Switch/Remote Stop Switch	26	EVD		Electrical Expansion Valve Module
13	EH1 EH2		Compressor Heater	27	UR1 UR2		Switch Power
14	SQ1		Water Flow Switch	28	T		Isolation Transformer

NAME	720/QDV WIRING DIAGRAM	TOTAL SHEETS 6	NO. OF SHEETS 6

LSBLGW900/C WIRING DIAGRAM

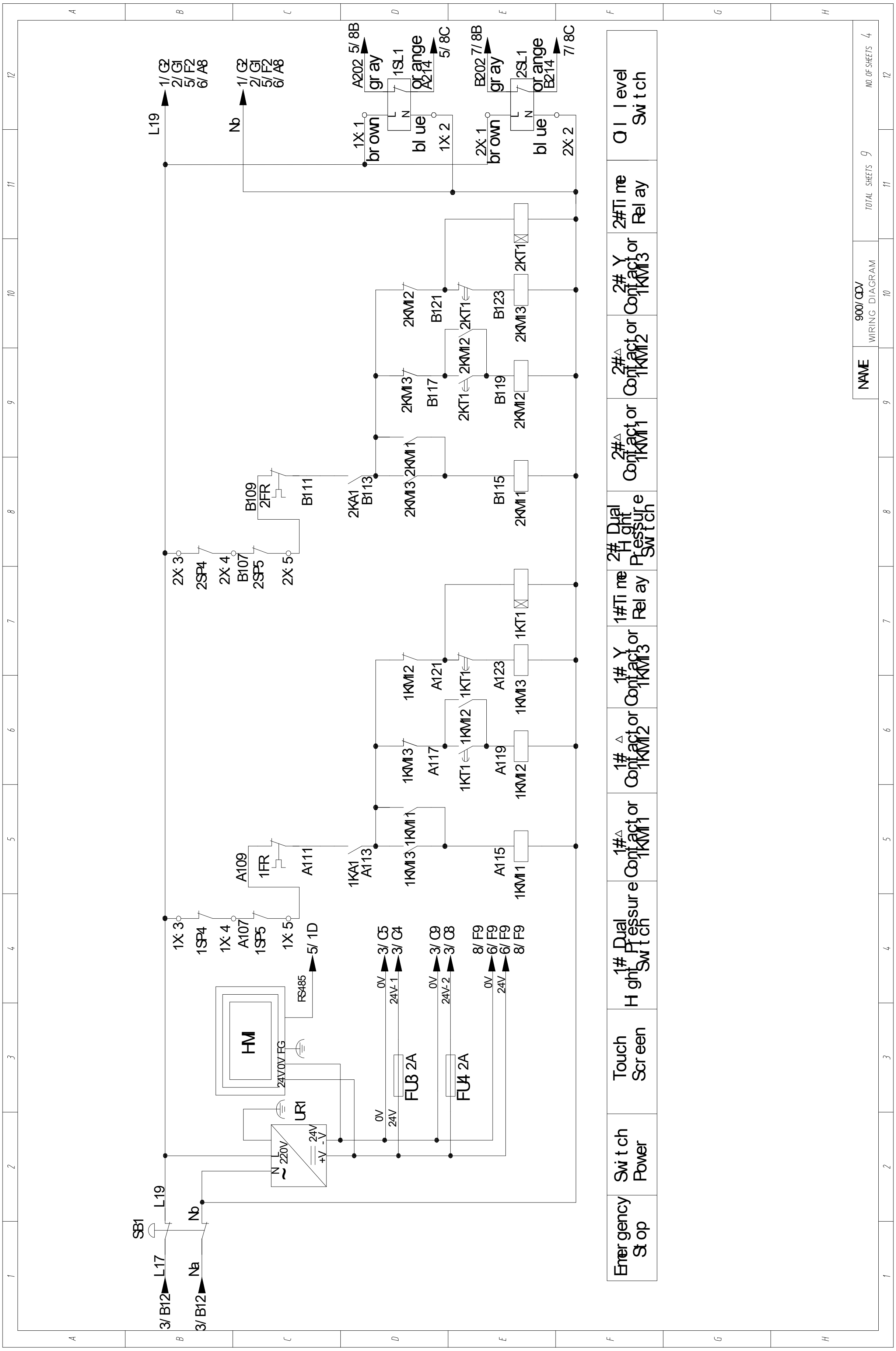


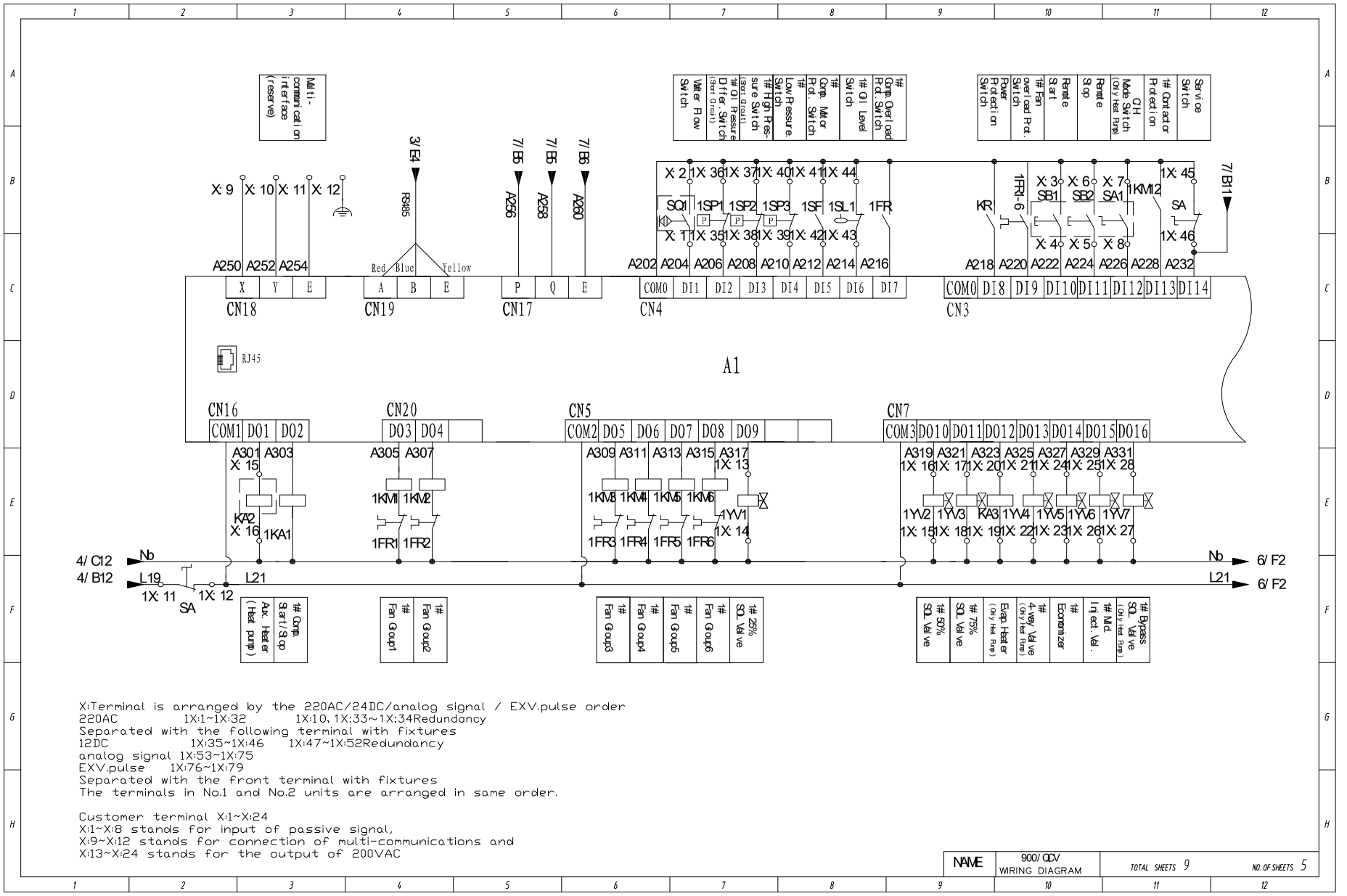

3P+N+PE 50Hz 380-400V
30*5mm² copper terminal, 375A
N
L1
L2
L3
PE
2L1
2L2
2L3
2QF1 375A
2X1
2X1
2X2
2X2
2QF2 16A
2QF3 16A
2QF4 16A
2QF5 16A
3*1.5mm²+1*1.5mm²
11.6A
Other air blowers are same
2U1 2V1 2W1
2U31 2V31 2W31
2U51 2V51 2W51
2U71 2V71 2W71
2KM1
2KM2
2KM5
2KM6
2KM7
2KM8
2FR1
2FR2
2FR5
2FR6
2FR7
2FR8
PE
M 3~
3P 50Hz 380-400V 2.2kW 5.8A
Other air blowers are same
B1
B3
B5
2TA1
2TA2
2FR
2KM11
2KM12
2KM13
3*95mm²+1*50mm² 193A
3*95mm² 193A
3*50mm² 112A
3P 50Hz
380-400V 331A
U2 V2 W2 PE
U1 V1 W1
2SF
JTX-A
L1 L2 L3
L N S1 S2 M1 M2
L19 2X1
Nb 2X2
B02 2X41
B12 2X42
4/12B
4/12C
7/8B
7/8C
2ST1
2ST2
Discharge Temperature
Protection Switch
(Compressor Internal)
Note:
copper terminal->2QF/3QF/4QF/5QF
Wirings Size : 1.5mm2
Wirings Size<1.5m
All Other Control Wirings
Size : 0.75mm2
NAME
900/QDV
WIRING DIAGRAM
TOTAL SHEETS 9
NO. OF SHEETS 2



Isolation Transformer	Evap. Heater (reserved)	Cooling Fan	1# Oil Heater	2# Oil Heater	Power for EVD	1# EVD Pressure Sensor	1# EVD Temp. Sensor	1# EVD Switch	1#EXV Motor	2# EVD Pressure Sensor	2# EVD Temp. Sensor	2# EVD Switch	2# EXV Motor

NAME	900/QCV WIRING DIAGRAM	TOTAL SHEETS 9	NO. OF SHEETS 3

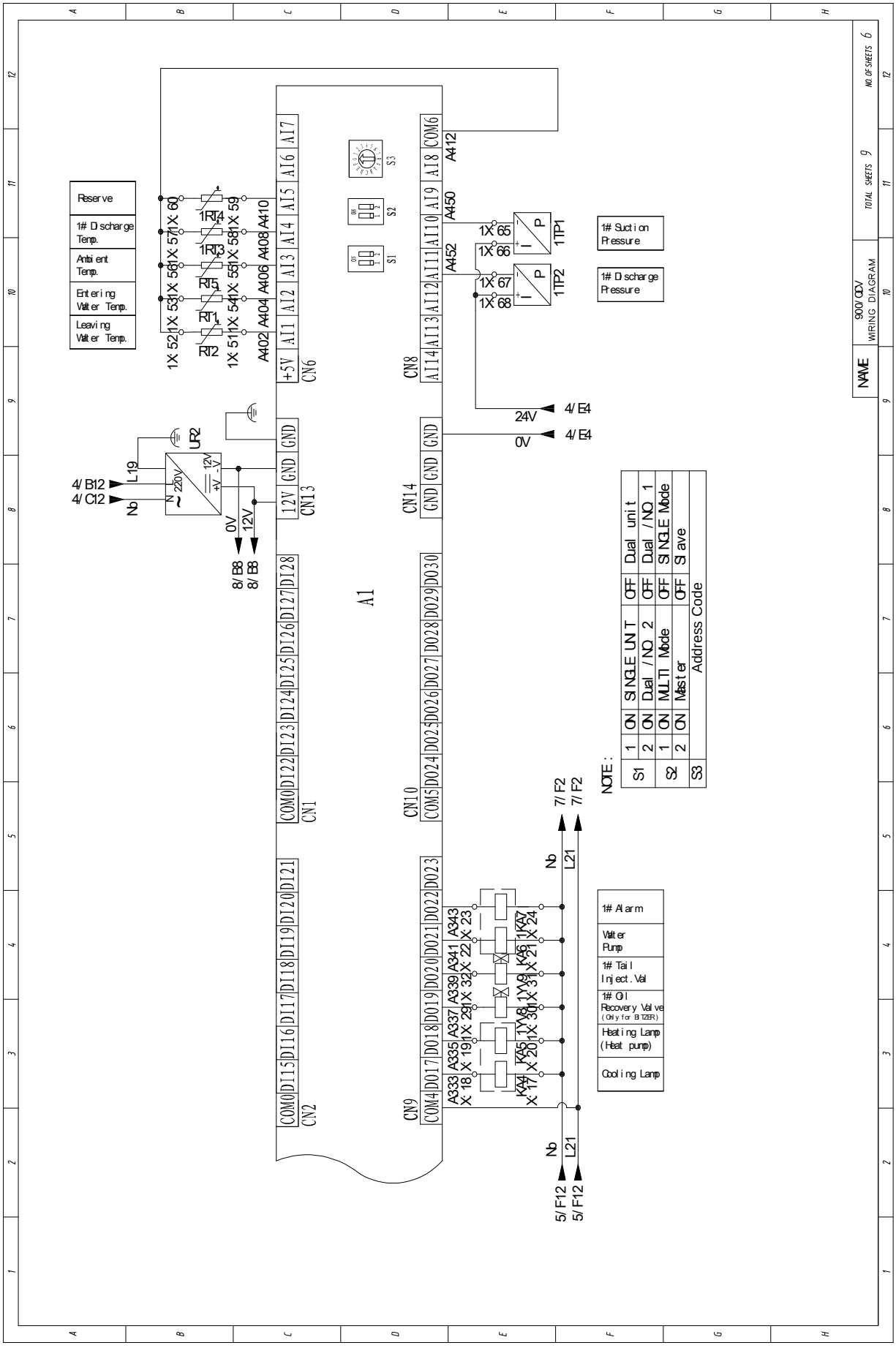

Emergency Stop
Switch Power
Touch Screen
High Pressure Dual Switch
1# Delta Contactor 1KM1
1# Delta Contactor 1KM2
1# Y Contactor 1KM3
1# Time Relay
2# High Pressure Dual Switch
2# Delta Contactor 1KM1
2# Delta Contactor 1KM2
2# Y Contactor 1KM3
2# Time Relay
Oil level Switch
NAME
900/QGV
WIRING DIAGRAM
TOTAL SHEETS 9
NO. OF SHEETS 4
SB1
L17
L19
Na
Nb
UR1
HMI
RS485
FU3 2A
FU4 2A
1SP4
1SP5
2SP4
2SP5
1FR
2FR
1KA1
2KA1
1KT1
2KT1
1SL1
2SL1
brown
blue
gray
orange

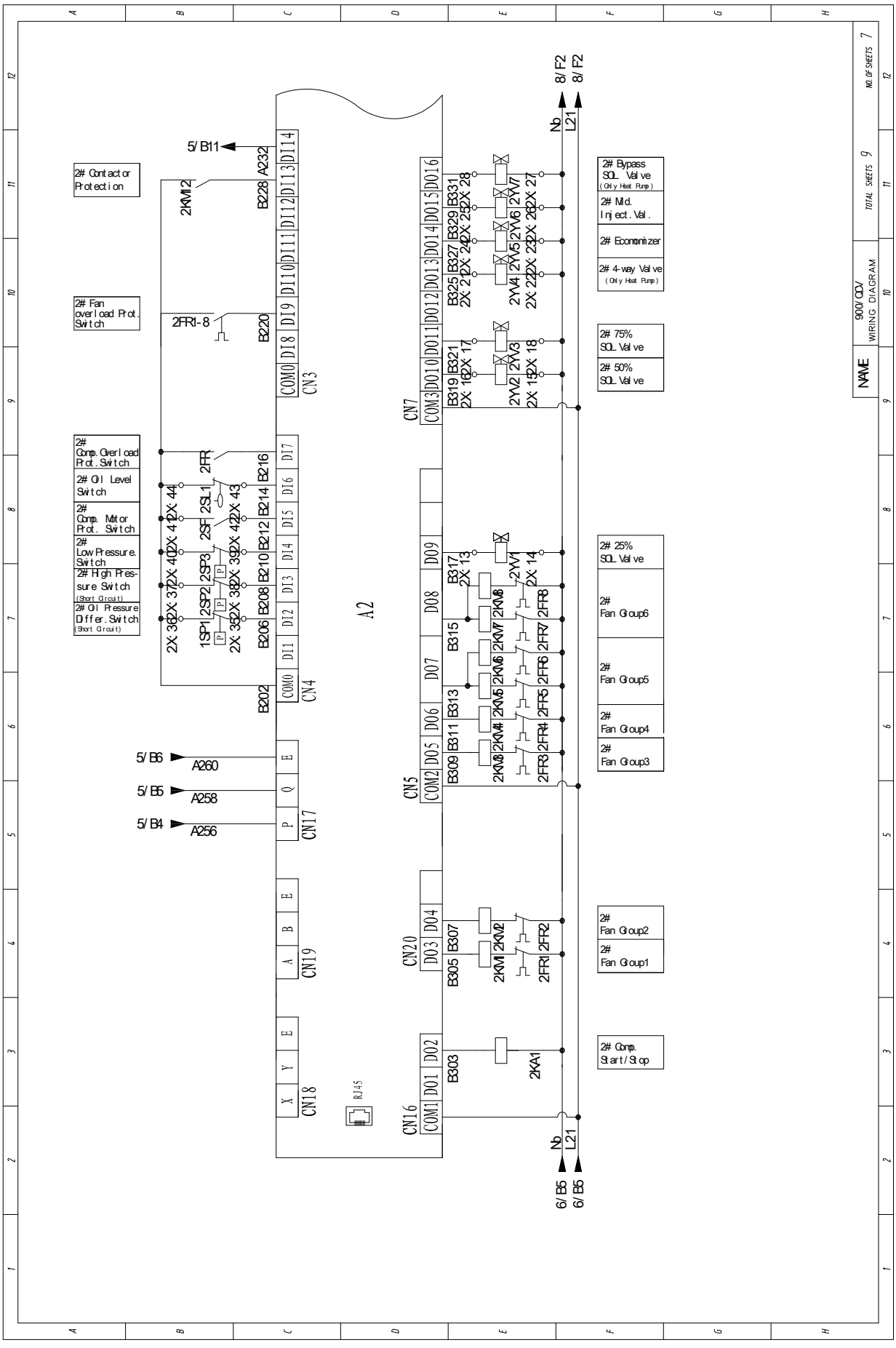


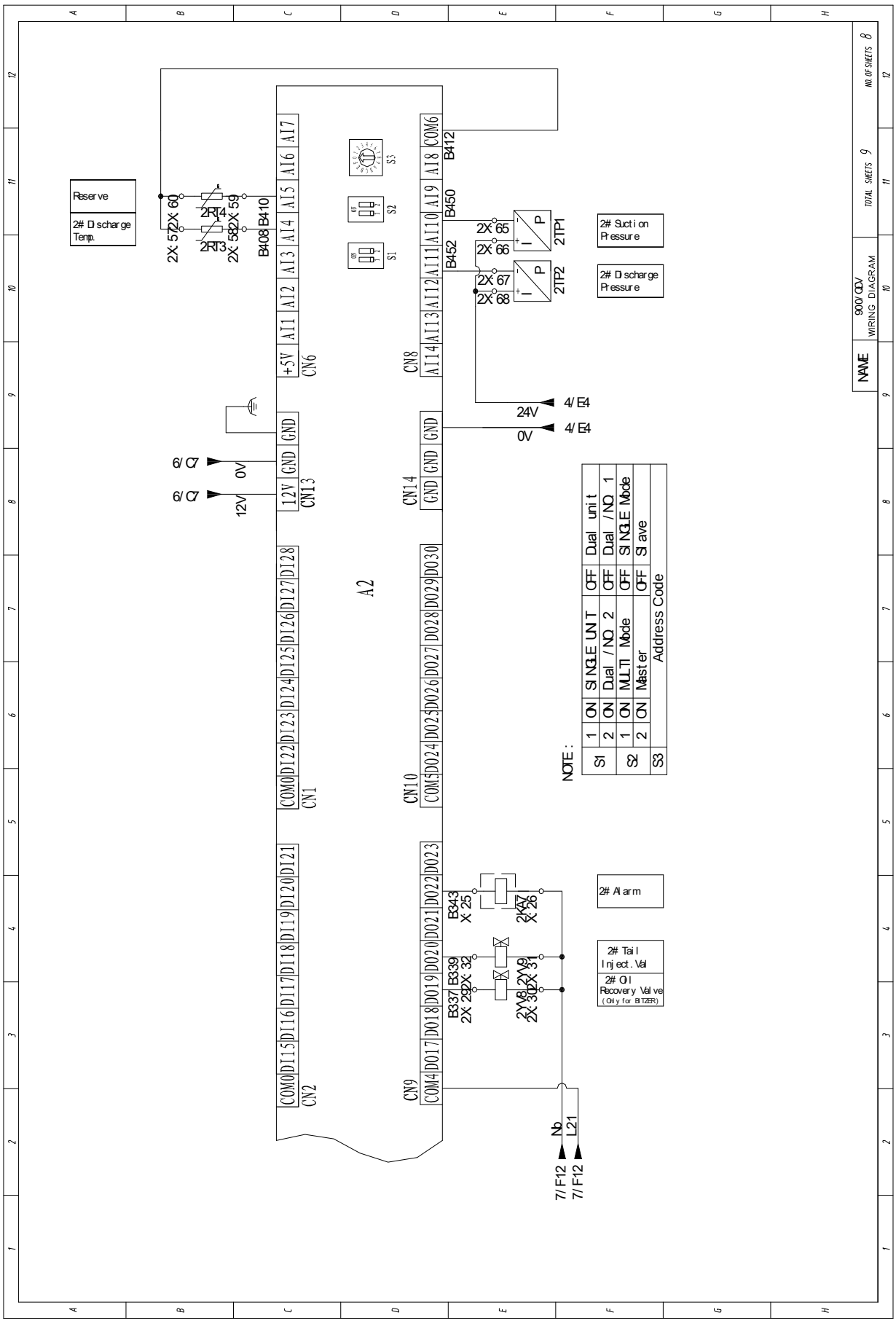
X:Terminal is arranged by the 220AC/24DC/analog signal / EXV.pulse order
220AC 1X:1~1X:32 1X:10、1X:33~1X:34Redundancy
Separated with the following terminal with fixtures
12DC 1X:35~1X:46 1X:47~1X:52Redundancy
analog signal 1X:53~1X:75
EXV.pulse 1X:76~1X:79
Separated with the front terminal with fixtures
The terminals in No.1 and No.2 units are arranged in same order.

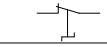
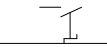
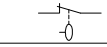
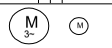
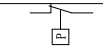
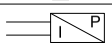
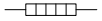
Customer terminal X:1~X:24
X:1~X:8 stands for input of passive signal,
X:9~X:12 stands for connection of multi-communications and
X:13~X:24 stands for the output of 200VAC

NAME	900/ QDV WIRING DIAGRAM	TOTAL SHEETS 9	NO. OF SHEETS 5


NAME
900/ ODV
WIRING DIAGRAM
TOTAL SHEETS 9
NO. OF SHEETS 6
A1
CN1
CN2
CN6
CN8
CN9
CN10
CN13
CN14
Reserve
1# Discharge Temp.
Ambient Temp.
Entering Water Temp.
Leaving Water Temp.
1# Suction Pressure
1# Discharge Pressure
1# Alarm
Water Pump
1# Tail Inject. Val
1# Oil Recovery Valve (Only for BITZER)
Heating Lamp (Heat pump)
Cooling Lamp
NOTE :
Address Code
SINGLE UNIT
Dual / NO. 2
MULTI Mode
Master
Slave
Dual unit
Dual / NO. 1
SINGLE Mode

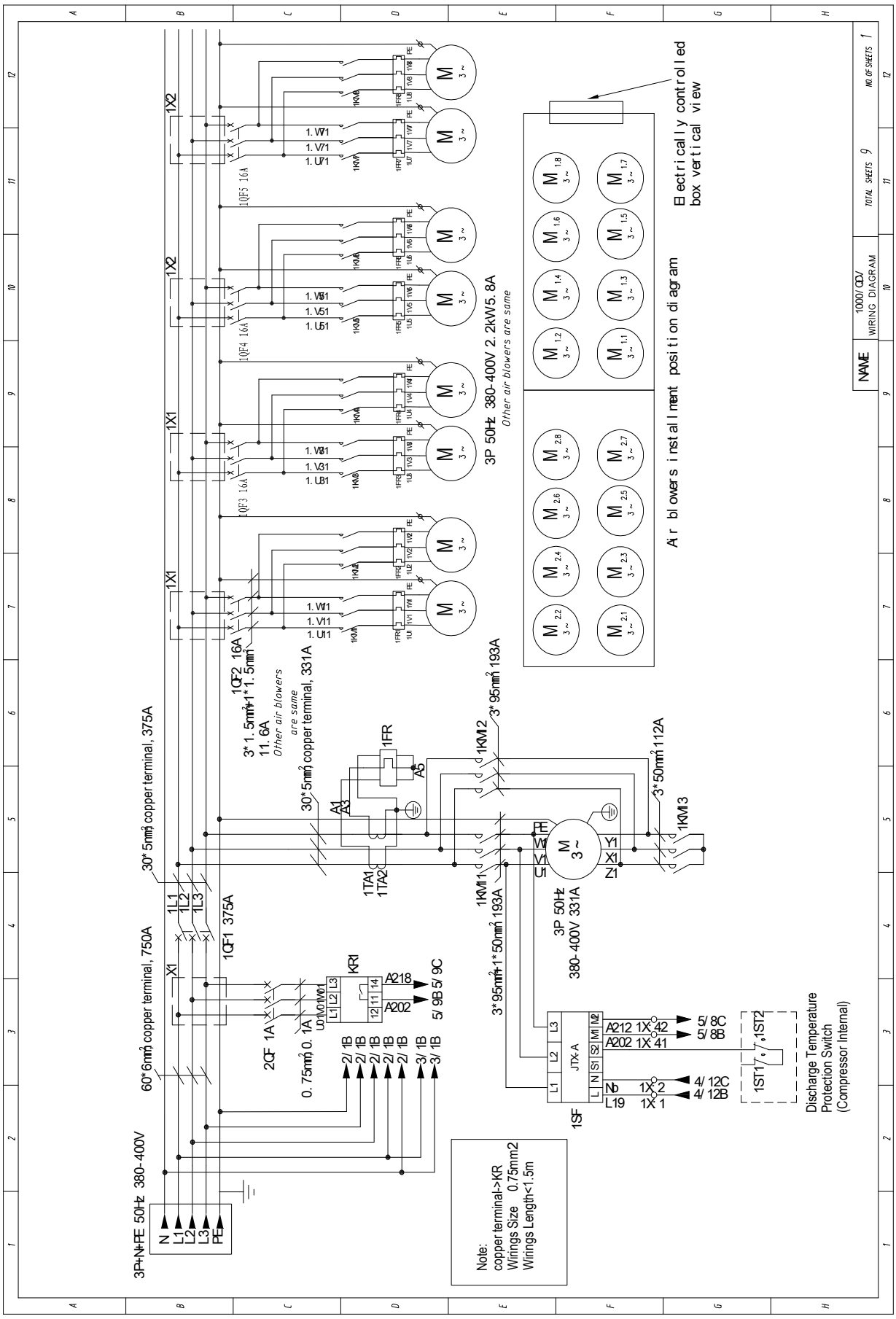

NAME
900/CDV
WIRING DIAGRAM
TOTAL SHEETS 9
NO.OF SHEETS 7
A2
CN3
CN4
CN5
CN7
CN16
CN17
CN18
CN19
CN20
2# Contactor Protection
2# Fan overload Prot. Switch
2# Comp. Overload Prot.Switch
2# Oil Level Switch
2# Comp. Motor Prot. Switch
2# Low Pressure. Switch
2# High Pressure Switch (Short Circuit)
2# Oil Pressure Differ.Switch (Short Circuit)
2# Bypass SOL. Valve (Only Heat Pump)
2# Mid. Inject. Val.
2# Economnizer
2# 4-way Valve (Only Heat Pump)
2# 75% SOL. Valve
2# 50% SOL. Valve
2# 25% SOL. Valve
2# Fan Group6
2# Fan Group5
2# Fan Group4
2# Fan Group3
2# Fan Group2
2# Fan Group1
2# Comp. Start/Stop
RJ45
5/B11
5/B6
5/B5
5/B4
8/F2
6/B5

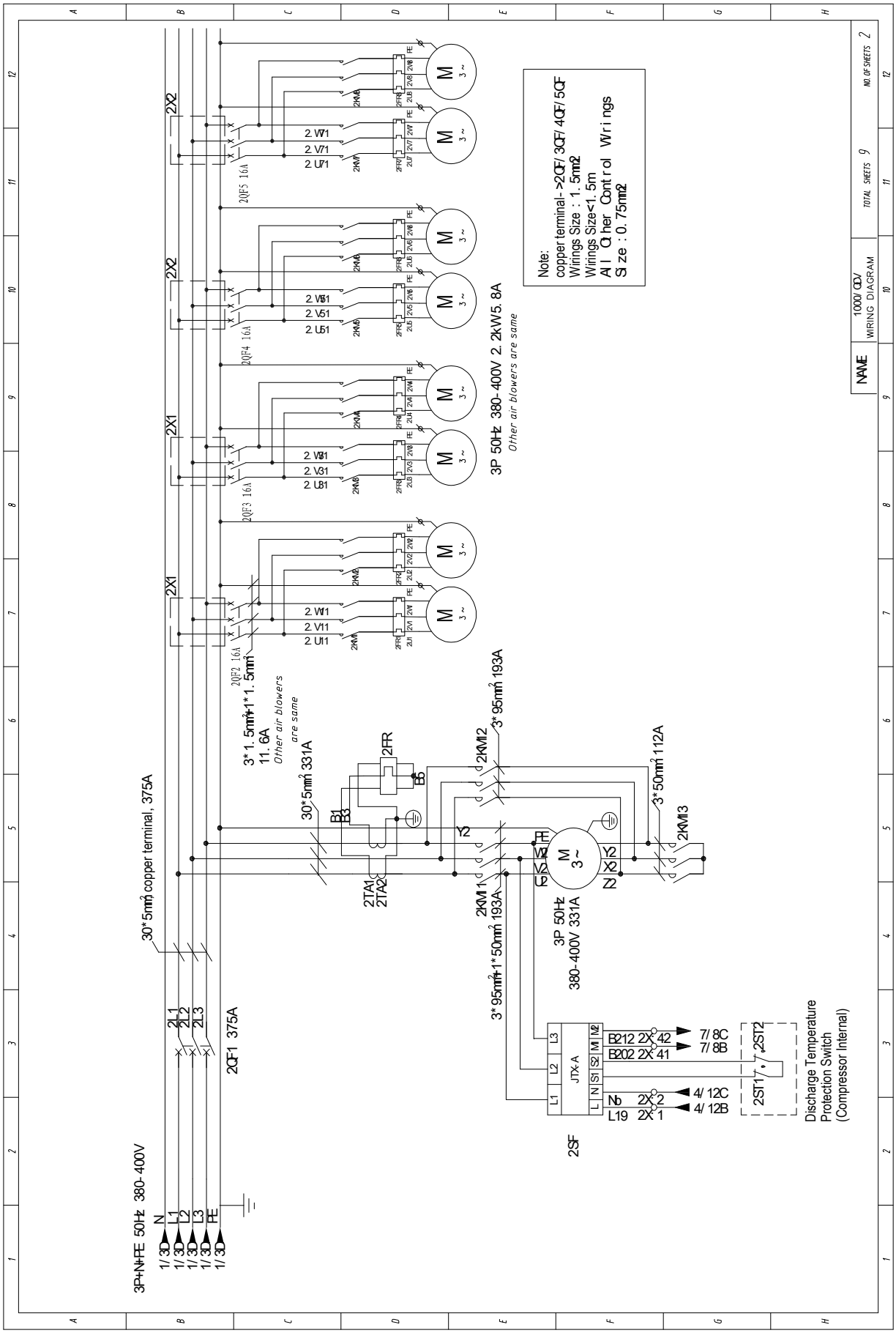

NAME
900/CDV
WIRING DIAGRAM
TOTAL SHEETS 9
NO. OF SHEETS 8
A2
CN1
CN2
CN6
CN8
CN9
CN10
CN13
CN14
Reserve
2# Discharge Temp.
2RT4
2RT3
2X 57
2X 60
2X 58
2X 59
B408
B410
S1
S2
S3
B412
B450
B452
2X 65
2X 66
2X 67
2X 68
2TP1
2TP2
2# Suction Pressure
2# Discharge Pressure
24V
0V
4/E4
6/C7
12V
B343
X 25
2X 26
B337
2X 29
B339
2X 32
2X 30
2X 31
2# Alarm
2# Tail Inject. Val
2# Oil Recovery Valve
(Only for BITZER)
7/F12
L21
Nb
NOTE :
Address Code
Dual unit
Dual /NO. 1
SINGLE Mode
Slave
Dual /NO. 2
MULTI Mode
Master

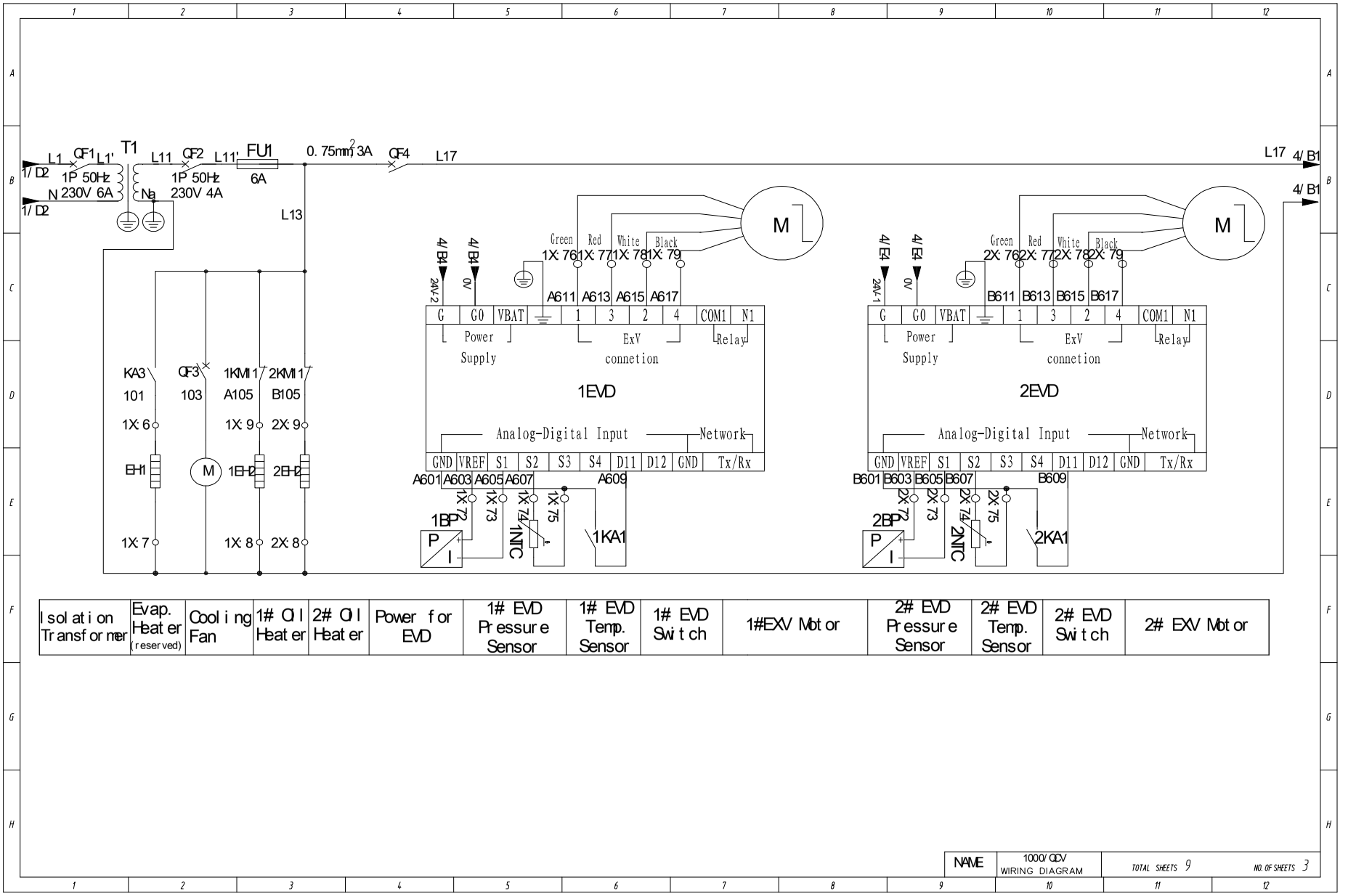
ITEM	SYMBOL	ITEM	DESCRIPTION	ITEM	SYMBOL	ITEM	DESCRIPTION
1	TA1 TA2		Current Transformer	15	KA1~KA7		Intermediate Relay
2	1QF		Moulded Case Circuit Breaker	16	SA		Service Switch
3	QF1 QF2 QF3 QF4		Air Switch	17	SA1		C/H Mode Switch
4	FU1 FU3 FU4		Fuse	18	SL1		Oil Level Switch
5	KR		Power Protection Module	19	SF		Compressor Motor Prot. Switch
6	KM1 KM2 KM3		Compressor Contactor	21	QF QF2 QF3 QF4 QF5 QF6		Miniature Circuit Breaker
7	FR FR1~FR8		Overload Relay	22	RT1~RT5 NTC		Temperature Sensor
8	M		Motor	23	YV1~YV9		Solenoid Valve
9	KT1		Time Relay	24	SP1 SP2 SP3		Pressure Switch
10	KM1~KM8		Fan Contactor	25	TP1 TP2		Pressure Sensor
11	SB		Emergency Stop	26	A1 A2		Main Controll board
12	T1		Isolation Transformer	27	HMI		Touch Screen
13	EH1 EH2		Compressor Heater	33	EVD		Electrical Expansion Valve Module
14	SQI		Water Flow Switch	34	UR1 UR2		Switch Power

NAME	900/QDV WIRING DIAGRAM	TOTAL SHEETS 9	NO. OF SHEETS 9

LSBLGW1000/C WIRING DIAGRAM

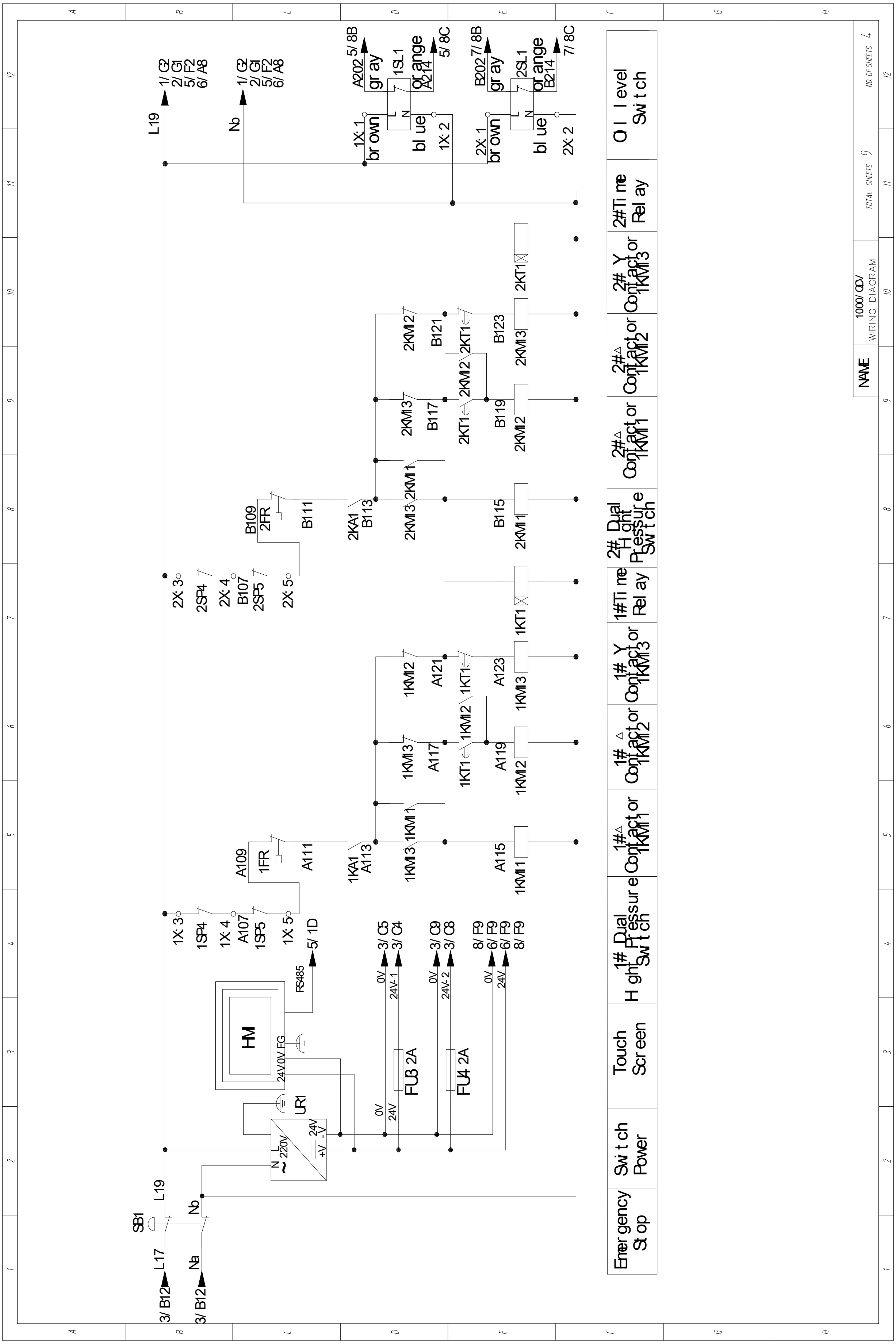


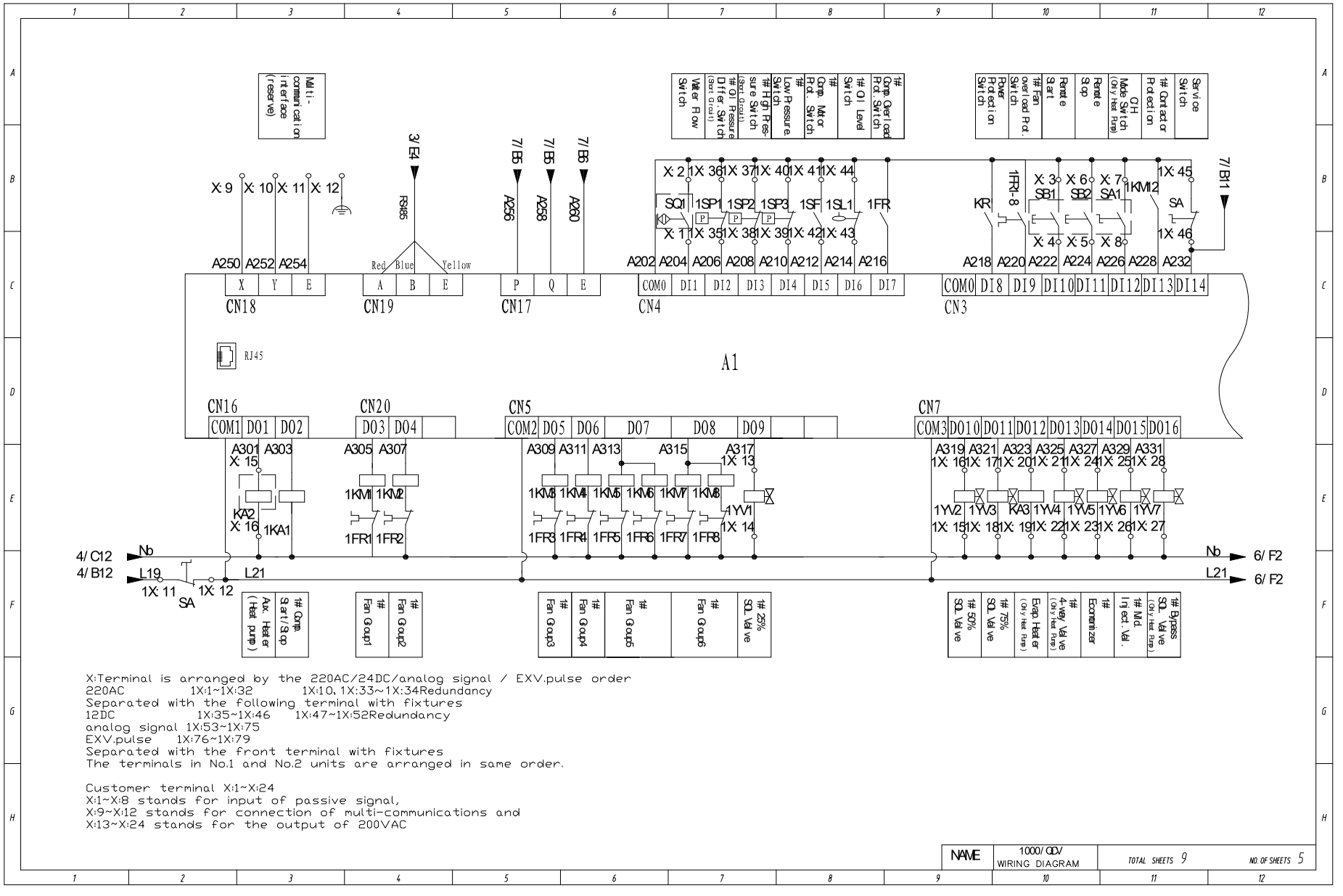

3P+N+PE 50Hz 380-400V
N
L1
L2
L3
PE
30*5mm² copper terminal, 375A
2L1
2L2
2L3
2QF1 375A
2QF2 16A
2QF3 16A
2QF4 16A
2QF5 16A
2X1
2X2
3*1.5mm²+1*1.5mm²
11.6A
Other air blowers are same
30*5mm² 331A
B1
B3
B5
2FR
2TA1
2TA2
2KM1
2KM2
2KM3
3*95mm² 193A
3*95mm²+1*50mm² 193A
3*50mm² 112A
3P 50Hz
380-400V 331A
2SF
JTX-A
B212 2X:42
B202 2X:41
7/8C
7/8B
Nb 2X:2
L19 2X:1
4/12C
4/12B
2ST1
2ST2
Discharge Temperature Protection Switch (Compressor Internal)
3P 50Hz 380-400V 2.2kW 5.8A
Other air blowers are same
Note:
copper terminal- >2QF/ 3QF/ 4QF/ 5QF
Wirings Size : 1.5mm2
Wirings Size<1.5m
All Other Control Wirings
Size : 0.75mm2
NAME
1000 CCV
WIRING DIAGRAM
TOTAL SHEETS 9
NO. OF SHEETS 2



Isolation Transformer	Evap. Heater (reserved)	Cooling Fan	1# Oil Heater	2# Oil Heater	Power for EVD	1# EVD Pressure Sensor	1# EVD Temp. Sensor	1# EVD Switch	1#EXV Motor	2# EVD Pressure Sensor	2# EVD Temp. Sensor	2# EVD Switch	2# EXV Motor

NAME	1000/ QDV WIRING DIAGRAM	TOTAL SHEETS 9	NO. OF SHEETS 3

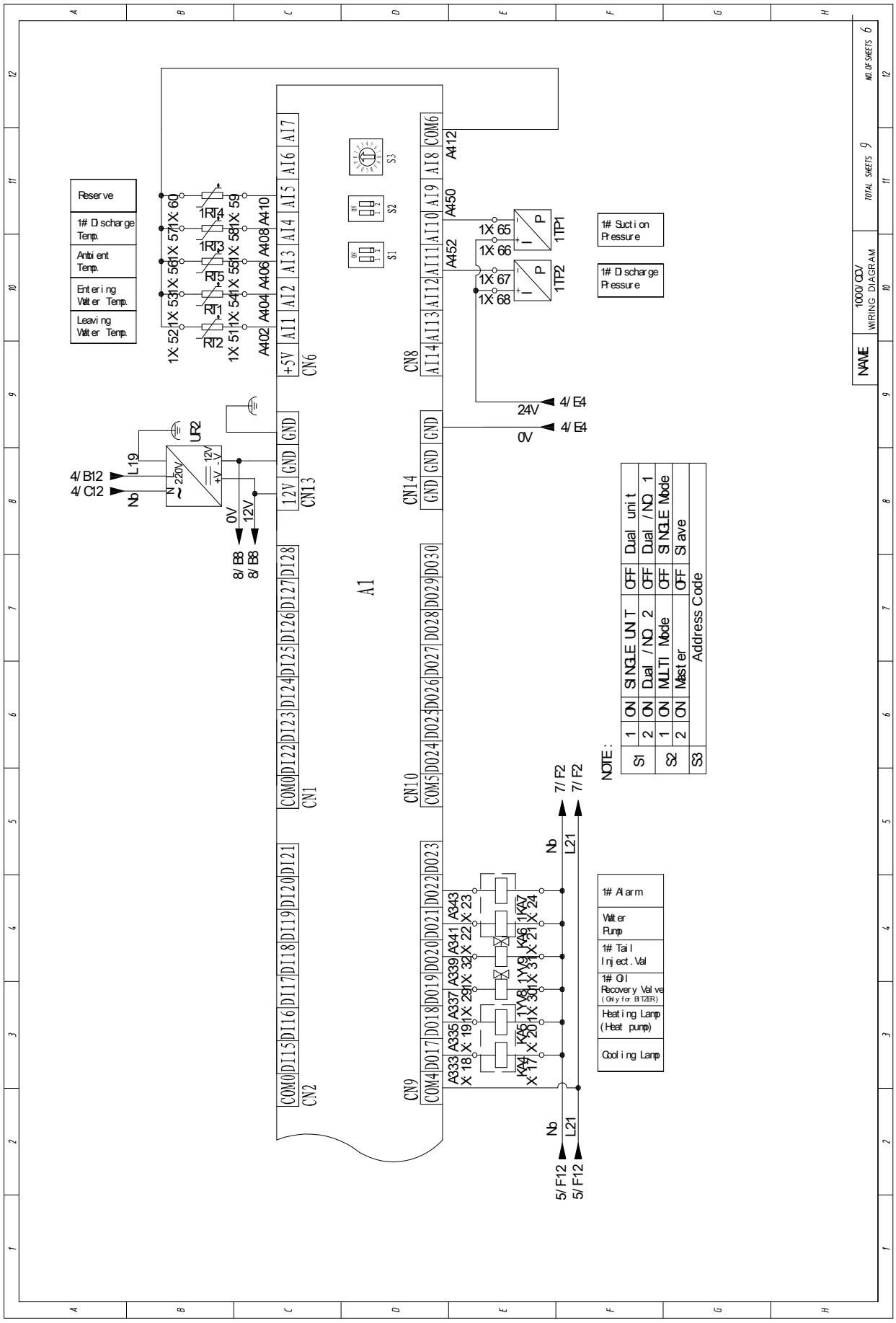

Emergency Stop
Switch Power
Touch Screen
HMI
Oil level Switch
NAME
WIRING DIAGRAM

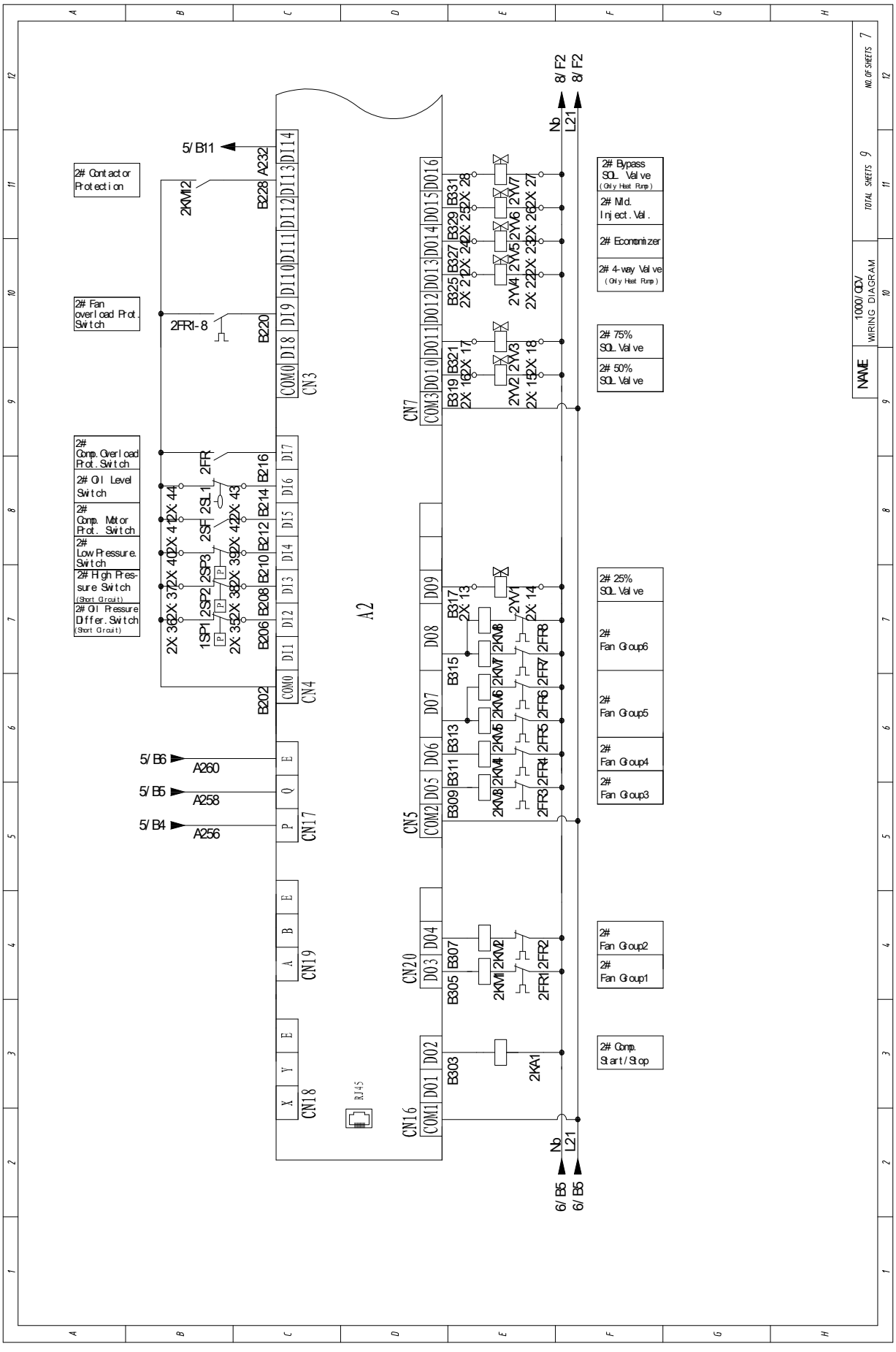


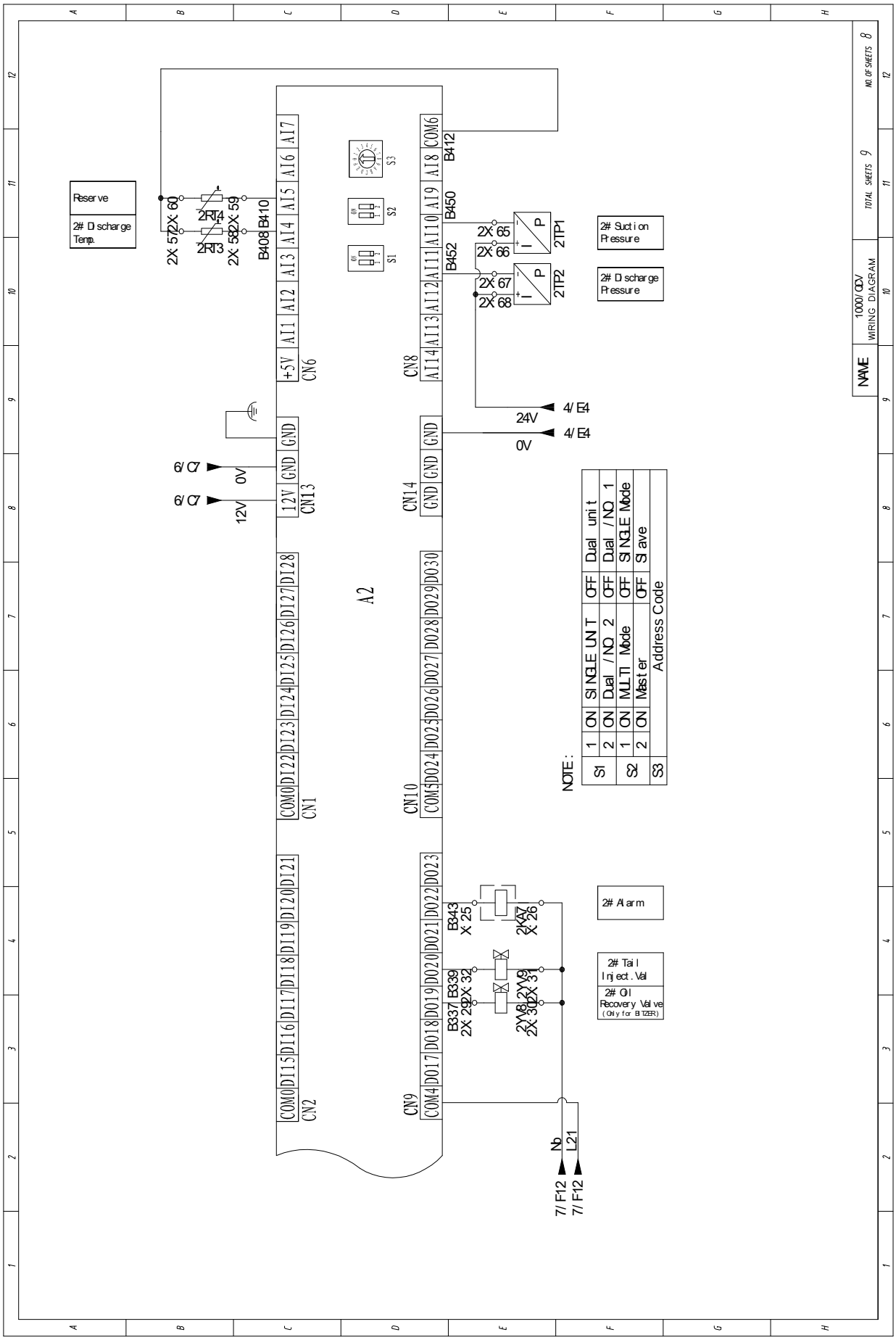
X:Terminal is arranged by the 220AC/24DC/analog signal / EXV.pulse order
220AC 1X:1~1X:32 1X:10, 1X:33~1X:34Redundancy
Separated with the following terminal with fixtures
12DC 1X:35~1X:46 1X:47~1X:52Redundancy
analog signal 1X:53~1X:75
EXV.pulse 1X:76~1X:79
Separated with the front terminal with fixtures
The terminals in No.1 and No.2 units are arranged in same order.

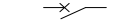
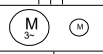
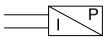
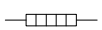
Customer terminal X:1~X:24
X:1~X:8 stands for input of passive signal,
X:9~X:12 stands for connection of multi-communications and
X:13~X:24 stands for the output of 200VAC

NAME	1000/ QDV WIRING DIAGRAM	TOTAL SHEETS 9	NO. OF SHEETS 5


NAME
1000/ CCV
WIRING DIAGRAM
TOTAL SHEETS 9
NO. OF SHEETS 6
A1
CN1
CN2
CN6
CN8
CN9
CN10
CN13
CN14
Reserve
1# Discharge Temp.
Ambient Temp.
Entering Water Temp.
Leaving Water Temp.
1RT4
1RT3
RT5
RT1
RT2
1X 52
1X 53
1X 56
1X 57
1X 60
1X 51
1X 54
1X 55
1X 58
1X 59
A402
A404
A406
A408
A410
S1
S2
S3
UR2
L19
Nb
4/ B12
4/ C12
0V
12V
8/ B8
8/ B8
1X 65
1X 66
1X 67
1X 68
1TP1
1TP2
1# Suction Pressure
1# Discharge Pressure
24V
0V
4/ E4
4/ E4
NOTE :
S1 1 ON SINGLE UNIT OFF Dual unit
2 ON Dual / NO. 2 OFF Dual / NO. 1
S2 1 ON MULTI Mode OFF SINGLE Mode
2 ON Master OFF Slave
S3 Address Code
1# Alarm
Water Pump
1# Tail Inject. Val
1# Oil Recovery Valve (Only for BITZER)
Heating Lamp (Heat pump)
Cooling Lamp
KA4
KA5
KA6
KA7
1YV8
1YV9
5/ F12
5/ F12
7/ F2
7/ F2
L21
Nb

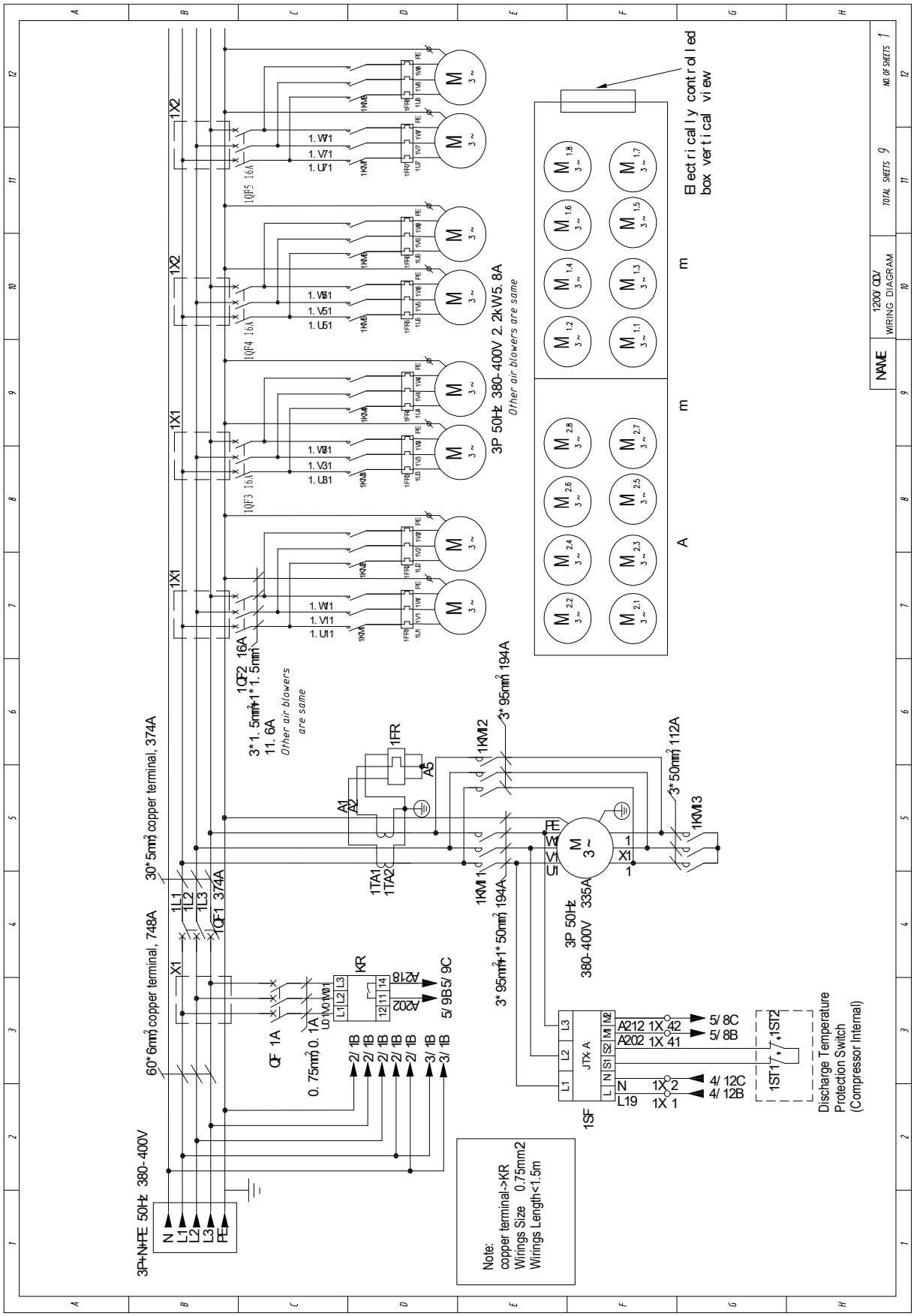

NAME
1000/ CDV
WIRING DIAGRAM
TOTAL SHEETS 9
NO. OF SHEETS 7
A2
CN3
CN4
CN5
CN7
CN16
CN17
CN18
CN19
CN20
2# Contactor Protection
2# Fan overload Prot. Switch
2# Comp. Overload Prot. Switch
2# Oil Level Switch
2# Comp. Motor Prot. Switch
2# Low Pressure. Switch
2# High Pressure Switch (Short Circuit)
2# Oil Pressure Differ. Switch (Short Circuit)
2# Bypass SOL. Valve (Only Heat Pump)
2# Mid. Inject. Val.
2# Economizer
2# 4-way Valve (Only Heat Pump)
2# 75% SOL Valve
2# 50% SOL Valve
2# 25% SOL Valve
2# Fan Group6
2# Fan Group5
2# Fan Group4
2# Fan Group3
2# Fan Group2
2# Fan Group1
2# Comp. Start/Stop
5/ B11
5/ B6
5/ B5
5/ B4
8/ F2
6/ B5
RJ45

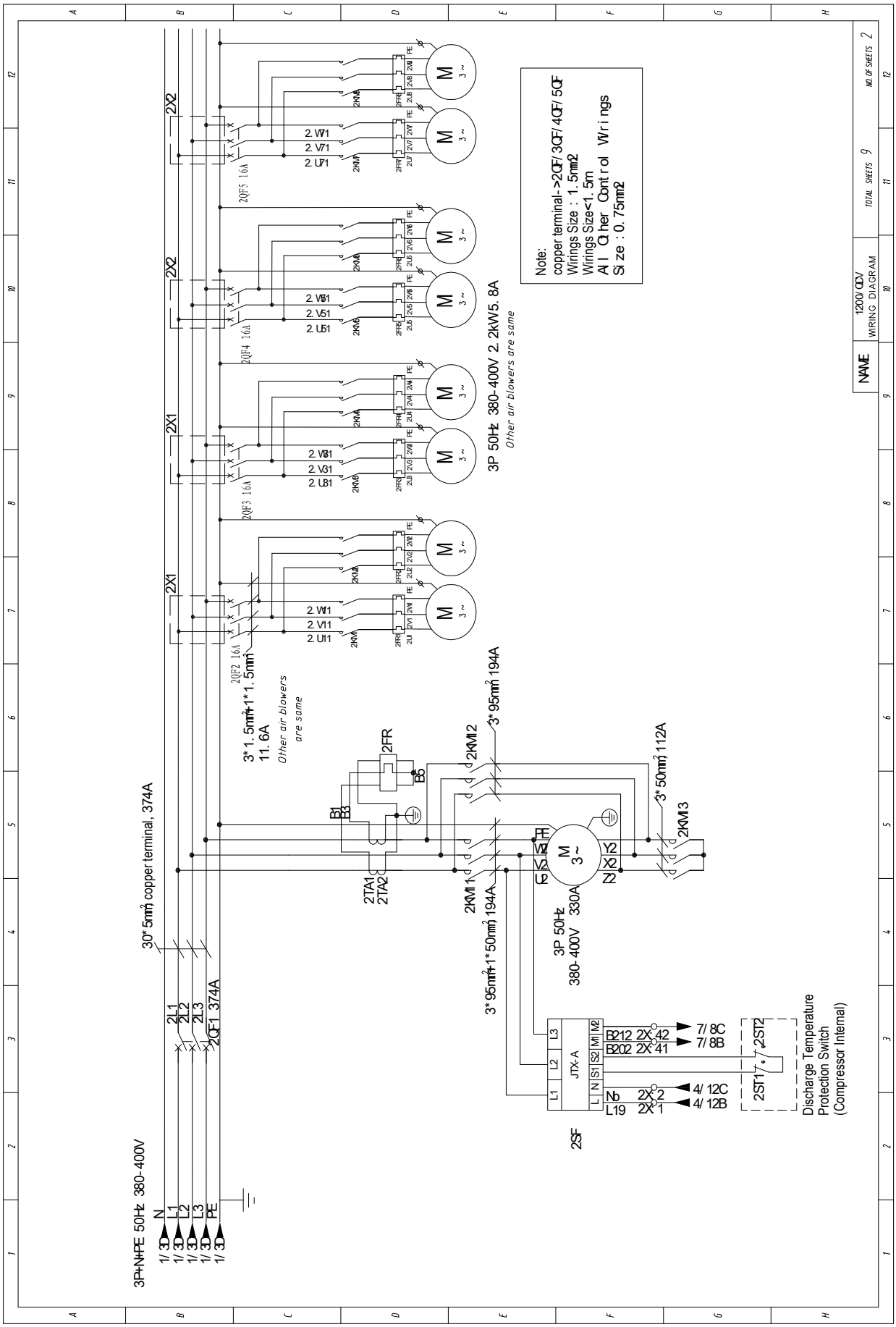

Reserve
2# Discharge Temp.
2RT4
2RT3
2X 57
2X 60
2X 58
2X 59
B408
B410
S1
S2
S3
A2
CN1
CN2
CN6
CN8
CN9
CN10
CN13
CN14
COM0 DI15 DI16 DI17 DI18 DI19 DI20 DI21
COM0 DI22 DI23 DI24 DI25 DI26 DI27 DI28
+5V AI1 AI2 AI3 AI4 AI5 AI6 AI7
A1 14 A1 13 A1 12 A1 11 A1 10 A1 9 A1 8 COM6
COM4 DO17 DO18 DO19 DO20 DO21 DO22 DO23
COM3 DO24 DO25 DO26 DO27 DO28 DO29 DO30
GND GND 12V
GND GND GND
B412
B450
B452
2X 65
2X 66
2X 67
2X 68
2TP1
2TP2
2# Suction Pressure
2# Discharge Pressure
24V
0V
4/ E4
6/ C7
12V
0V
B343
X 25
2KA7
X 26
B337 B339
2X 29 2X 32
2X 30 2X 31
2YV8 2YV9
2# Alarm
2# Tail Inject. Val
2# Oil Recovery Valve
(Only for BITZER)
Nb
L21
7/ F12
NOTE:
S1 1 ON SINGLE UNIT OFF Dual unit
2 ON Dual /NO. 2 OFF Dual /NO. 1
S2 1 ON MULTI Mode OFF SINGLE Mode
2 ON Master OFF Slave
S3 Address Code
NAME
1000/ CCV
WIRING DIAGRAM
TOTAL SHEETS 9
NO. OF SHEETS 8

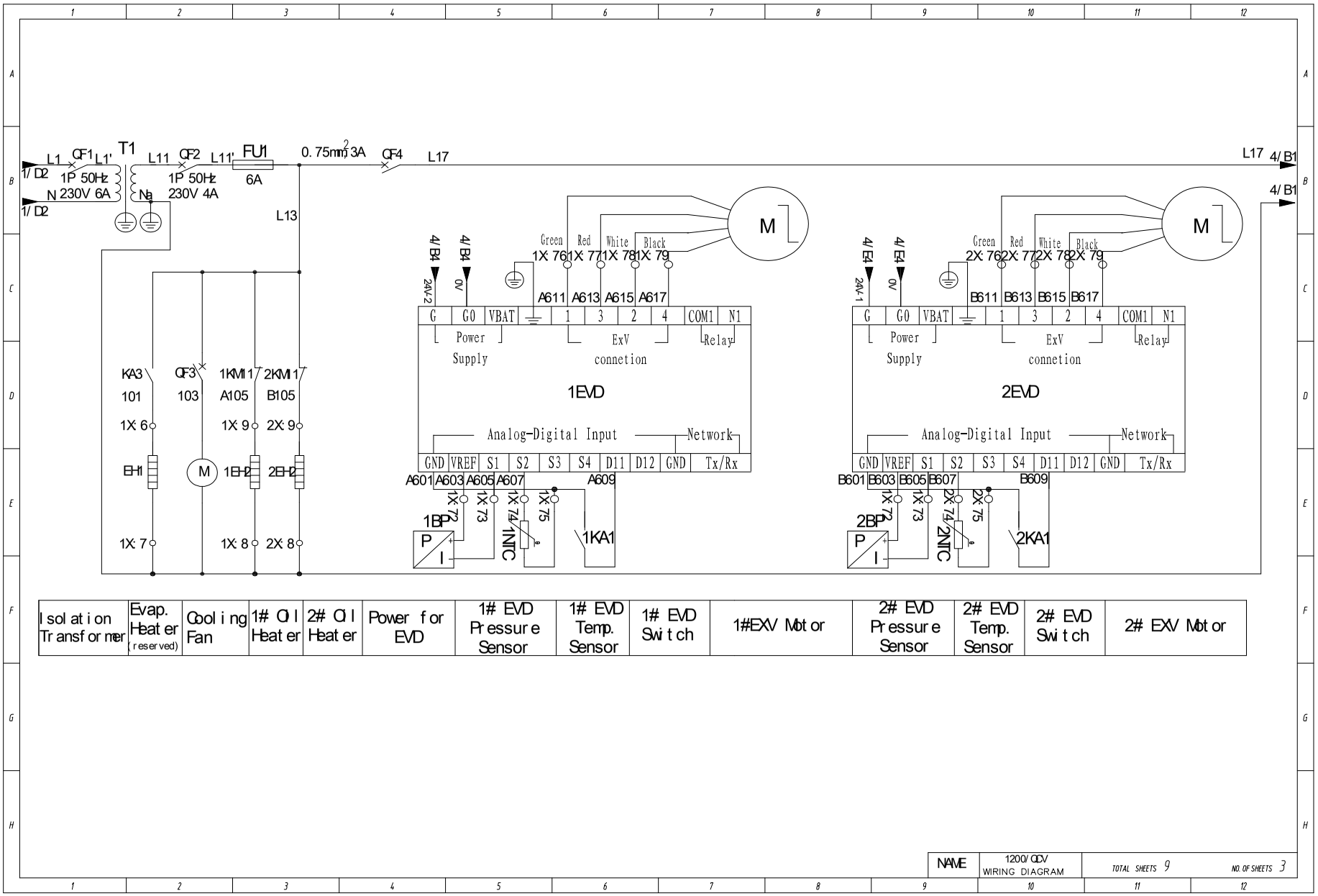
ITEM	SYMBOL	ITEM	DESCRIPTION	ITEM	SYMBOL	ITEM	DESCRIPTION
1	TA1 TA2		Current Transformer	15	KA1~KA7		Intermediate Relay
2	1QF		Moulded Case Circuit Breaker	16	SA		Service Switch
3	QF1 QF2 QF3 QF4		Air Switch	17	SA1		C/H Mode Switch
4	FU1 FU3 FU4		Fuse	18	SL1		Oil Level Switch
5	KR		Power Protection Module	19	SF		Compressor Motor Prot. Switch
6	KM1 KM2 KM3		Compressor Contactor	21	QF QF2 QF3 QF4 QF5 QF6		Miniature Circuit Breaker
7	FR FR1~FR8		Overload Relay	22	RT1~RT5 NTC		Temperature Sensor
8	M		Motor	23	YV1~YV9		Solenoid Valve
9	KT1		Time Relay	24	SP1 SP2 SP3		Pressure Switch
10	KM1~KM8		Fan Contactor	25	TP1 TP2		Pressure Sensor
11	SB		Emergency Stop	26	A1 A2		Main Controll board
12	T1		Isolation Transformer	27	HMI		Touch Screen
13	EH1 EH2		Compressor Heater	33	EVD		Electrical Expansion Valve Module
14	SQ1		Water Flow Switch	34	UR1 UR2		Switch Power

NAME	1000/ QDV WIRING DIAGRAM	TOTAL SHEETS 9	NO. OF SHEETS 9

LSBLGW1200/C WIRING DIAGRAM

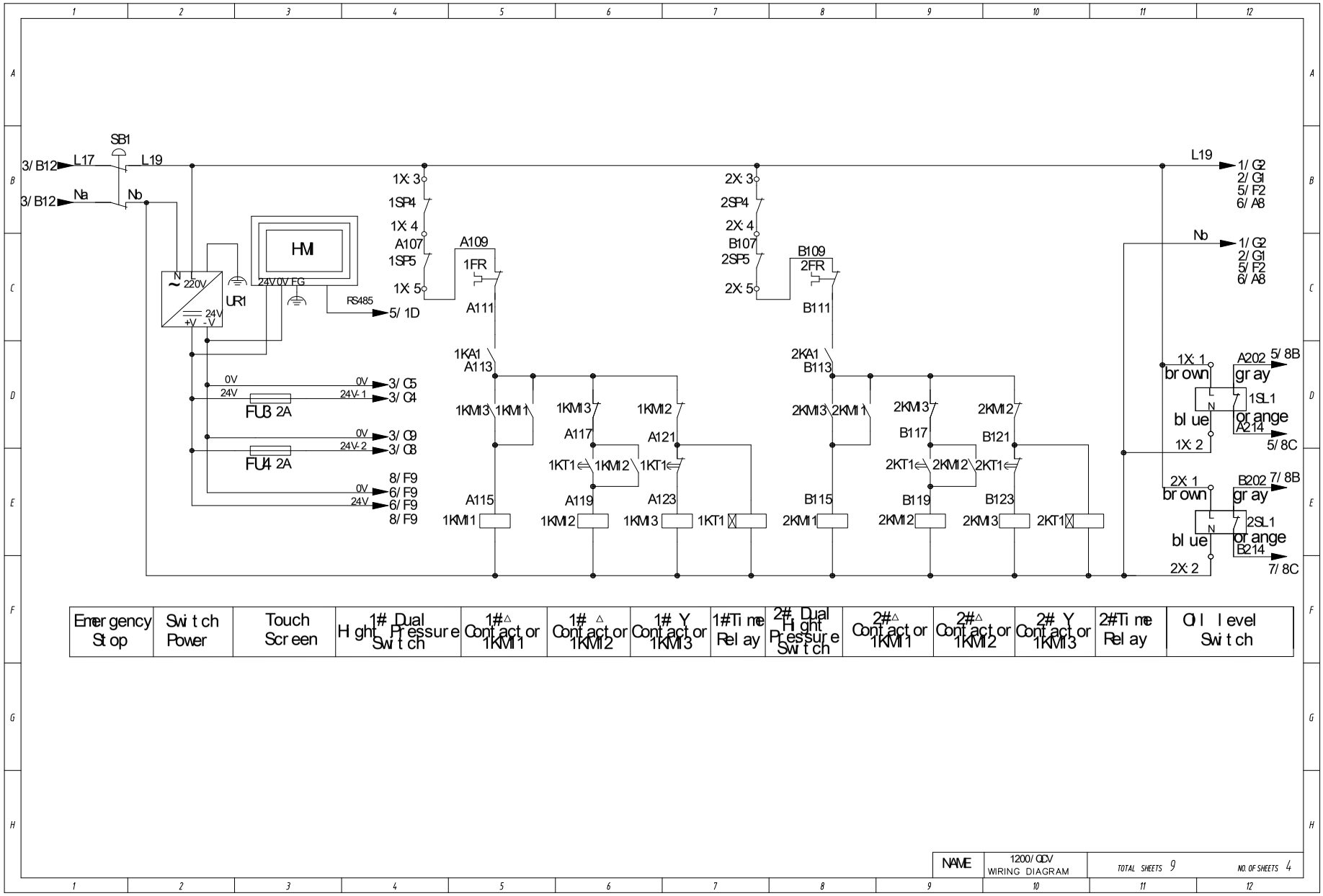



3P+N+PE 50Hz 380-400V
N
L1
L2
L3
PE
2L1
2L2
2L3
2QF1 374A
30*50mm² copper terminal, 374A
2X1
2X2
2QF2 16A
2QF3 16A
2QF4 16A
2QF5 16A
2.W11
2.V11
2.U11
2.W21
2.V21
2.U21
2.W31
2.V31
2.U31
2.W51
2.V51
2.U51
2.W71
2.V71
2.U71
3*1.5mm²+1*1.5mm²
11.6A
Other air blowers are same
3P 50Hz 380-400V 2.2kW 5.8A
Other air blowers are same
Note:
copper terminal->2QF/3QF/4QF/5QF
Wirings Size : 1.5mm2
Wirings Size<1.5m
All Other Control Wirings
Size : 0.75mm2
2FR
B5
B1
B3
2TA1
2TA2
2KM2
3*95mm² 194A
2KM1
3*95mm²+1*50mm² 194A
3*50mm² 112A
2KM3
PE
W2
V2
U2
Y2
X2
Z2
M 3~
3P 50Hz
380-400V 330A
2SF
JTX-A
L1 L2 L3
L N S1 S2 M1 M2
B212 2X42
B202 2X41
Nb 2X2
L19 2X1
7/8C
7/8B
4/12C
4/12B
2ST1
2ST2
Discharge Temperature Protection Switch (Compressor Internal)
NAME
1200/QDV/
WIRING DIAGRAM
TOTAL SHEETS 9
NO.OF SHEETS 2



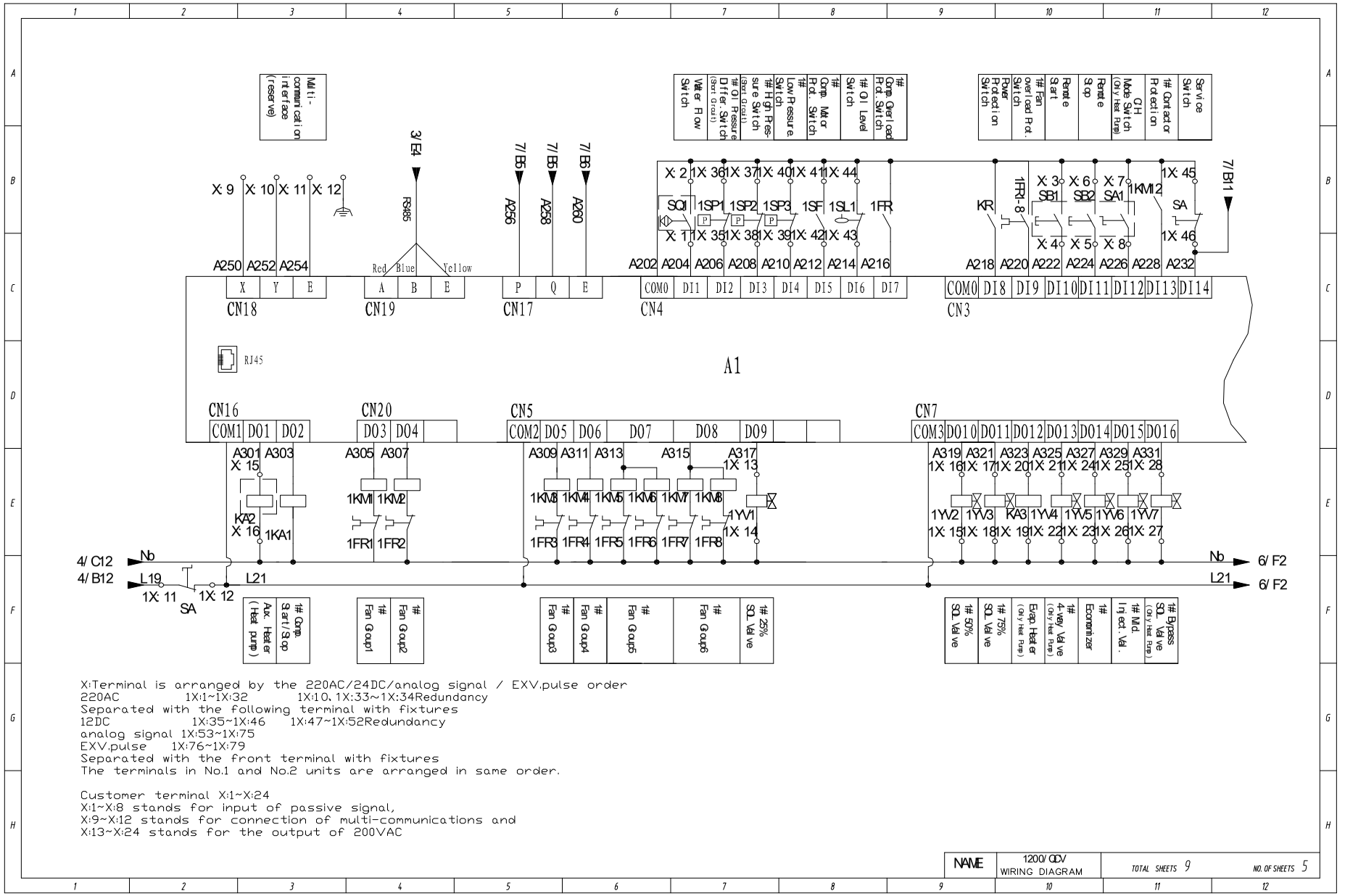
Isolation Transformer	Evap. Heater (reserved)	Cooling Fan	1# Oil Heater	2# Oil Heater	Power for EVD	1# EVD Pressure Sensor	1# EVD Temp. Sensor	1# EVD Switch	1#EXV Motor	2# EVD Pressure Sensor	2# EVD Temp. Sensor	2# EVD Switch	2# EXV Motor

NAME	1200/ QCV WIRING DIAGRAM	TOTAL SHEETS 9	NO. OF SHEETS 3



Emergency Stop	Switch Power	Touch Screen	1# Dual Hight Pressure Switch	1#△ Contactor 1KM11	1# △ Contactor 1KM12	1# Y Contactor 1KM13	1#Time Relay	2# Dual Hight Pressure Switch	2#△ Contactor 1KM11	2#△ Contactor 1KM12	2# Y Contactor 1KM13	2#Time Relay	Oil level Switch

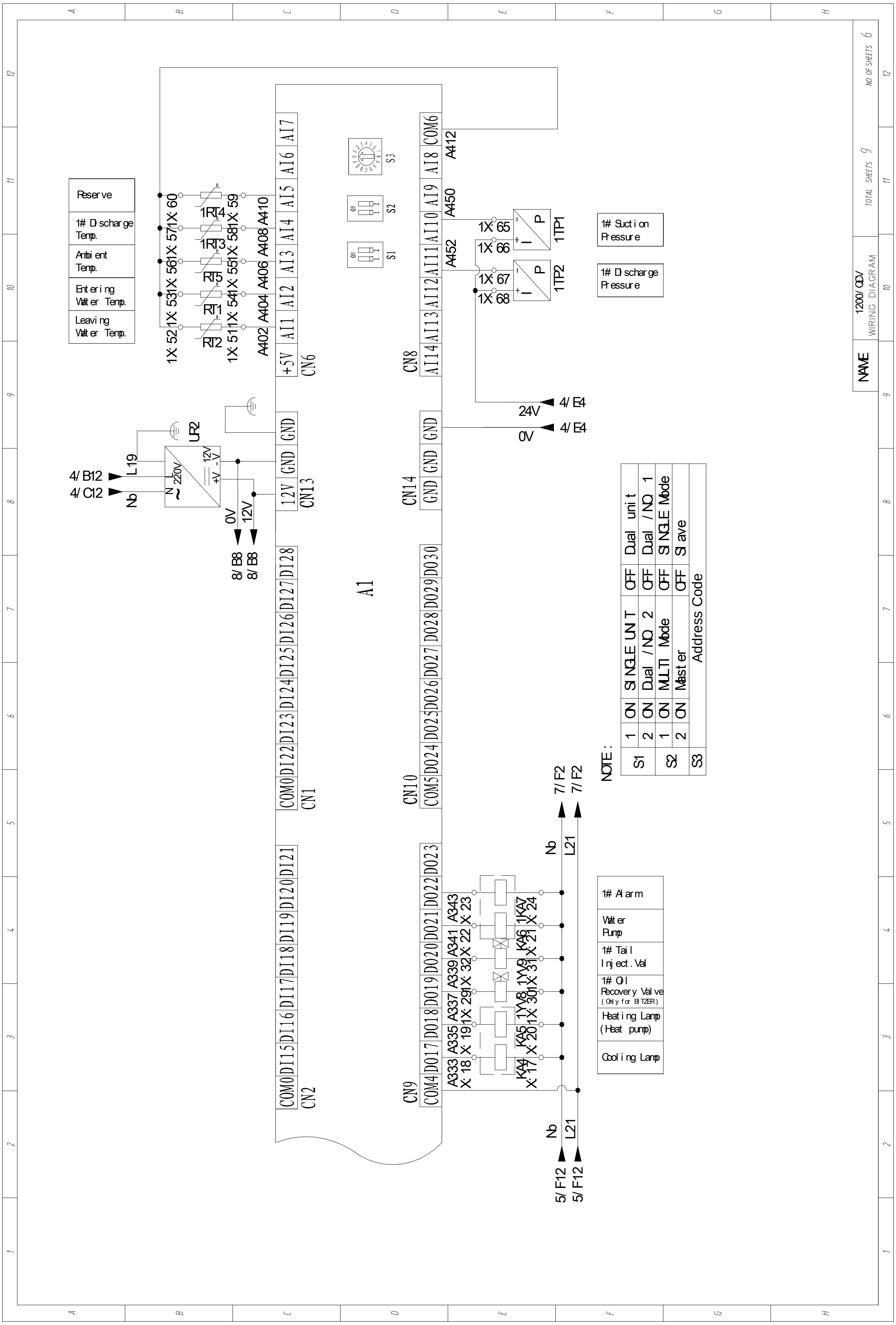
NAME	1200/ QDV WIRING DIAGRAM	TOTAL SHEETS 9	NO. OF SHEETS 4

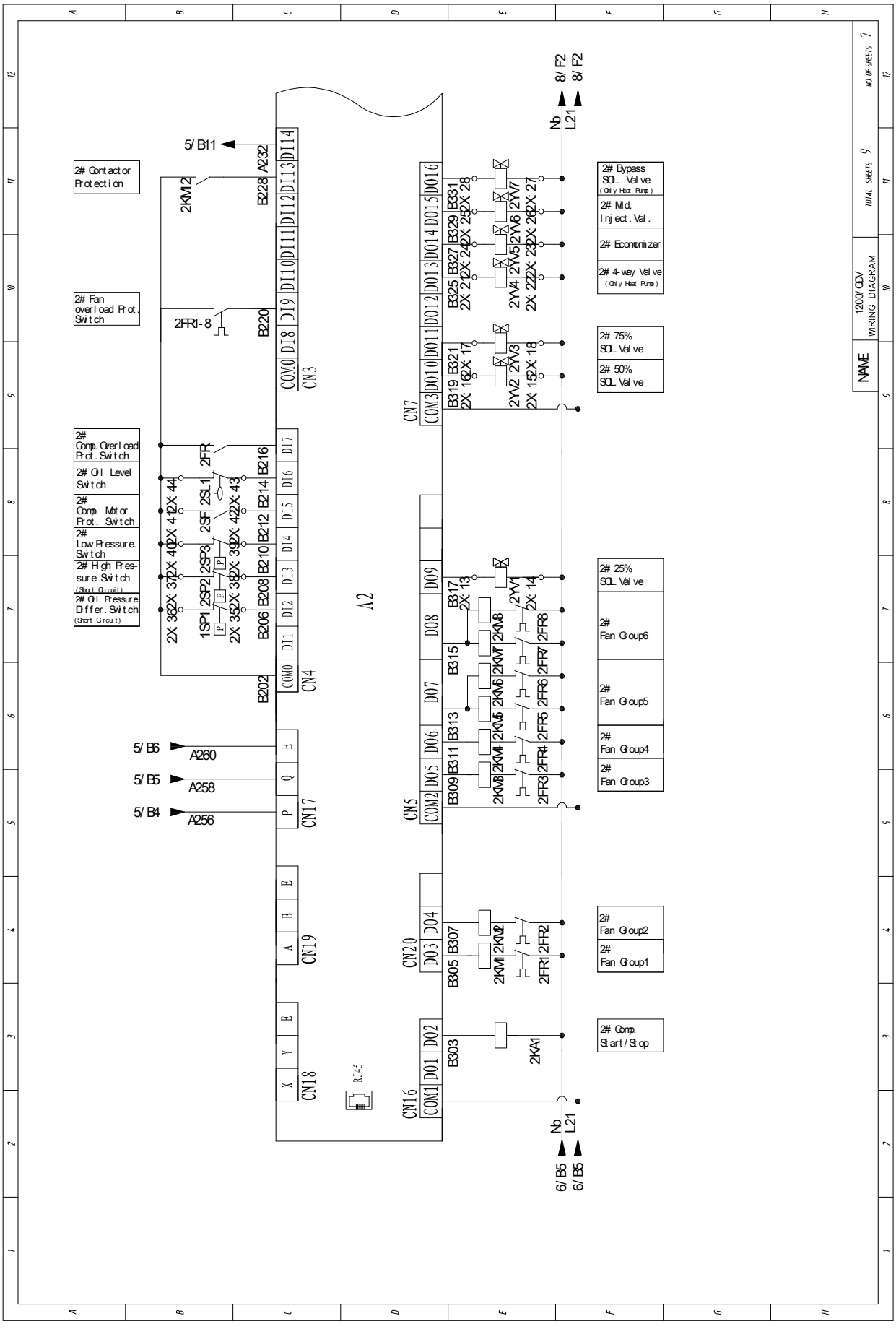


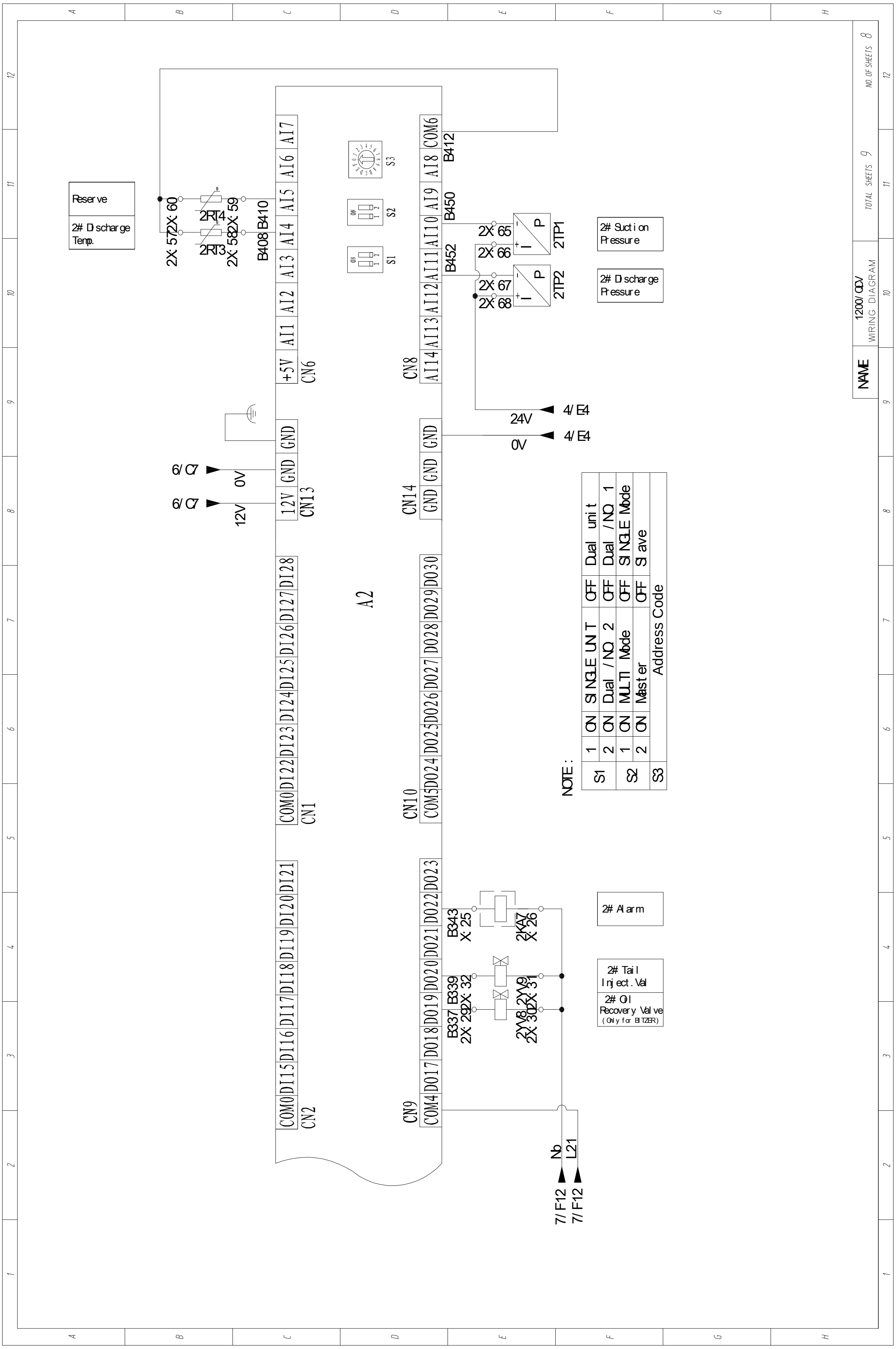
X:Terminal is arranged by the 220AC/24DC/analog signal / EXV.pulse order
220AC 1X:1~1X:32 1X:10、1X:33~1X:34Redundancy
Separated with the following terminal with fixtures
12DC 1X:35~1X:46 1X:47~1X:52Redundancy
analog signal 1X:53~1X:75
EXV.pulse 1X:76~1X:79
Separated with the front terminal with fixtures
The terminals in No.1 and No.2 units are arranged in same order.

Customer terminal X:1~X:24
X:1~X:8 stands for input of passive signal,
X:9~X:12 stands for connection of multi-communications and
X:13~X:24 stands for the output of 200VAC

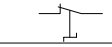
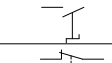
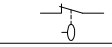
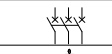
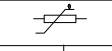
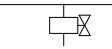
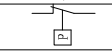
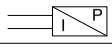
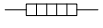
NAME	1200/ QDV WIRING DIAGRAM	TOTAL SHEETS 9	NO. OF SHEETS 5


Reserve
1# Discharge Temp.
Ambient Temp.
Entering Water Temp.
Leaving Water Temp.
1# Suction Pressure
1# Discharge Pressure
1TP1
1TP2
A1
CN1
CN2
CN6
CN8
CN9
CN10
CN13
CN14
S1
S2
S3
UR2
24V
0V
12V
1# Alarm
Water Pump
1# Tail Inject.Val
1# Oil Recovery Valve (Only for BITZER)
Heating Lamp (Heat pump)
Cooling Lamp
NOTE:
S1 1 ON SINGLE UNIT OFF Dual unit
S1 2 ON Dual / NO. 2 OFF Dual / NO. 1
S2 1 ON MULTI Mode OFF SINGLE Mode
S2 2 ON Master OFF Slave
S3 Address Code
NAME
1200/QCV
WIRING DIAGRAM
TOTAL SHEETS 9
NO OF SHEETS 6


NAME
1200'CCV
WIRING DIAGRAM
TOTAL SHEETS 9
NO OF SHEETS 7
A2
CN3
CN4
CN5
CN7
CN16
CN17
CN18
CN19
CN20
2# Contactor Protection
2# Fan overload Prot. Switch
2# Comp. Overload Prot. Switch
2# Oil Level Switch
2# Comp. Motor Prot. Switch
2# Low Pressure. Switch
2# High Pressure Switch (Short Circuit)
2# Oil Pressure Differ. Switch (Short Circuit)
2# Bypass SOL. Valve (Only Heat Pump)
2# Mild. Inject. Val.
2# Economizer
2# 4-way Valve (Only Heat Pump)
2# 75% SOL. Valve
2# 50% SOL. Valve
2# 25% SOL. Valve
2# Fan Group6
2# Fan Group5
2# Fan Group4
2# Fan Group3
2# Fan Group2
2# Fan Group1
2# Comp. Start/Stop
5/ B11
6/ B5
8/ F2
RJ45

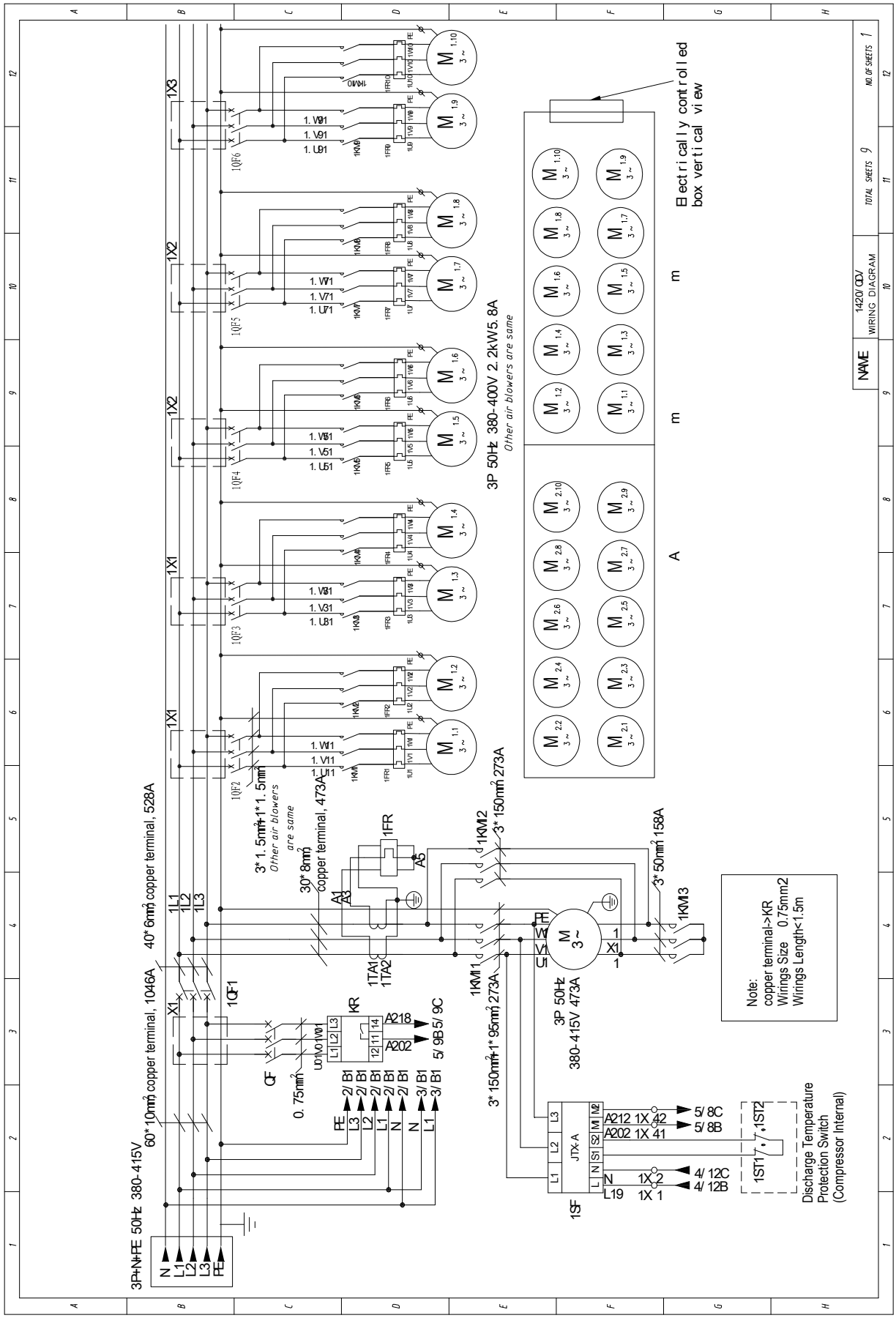


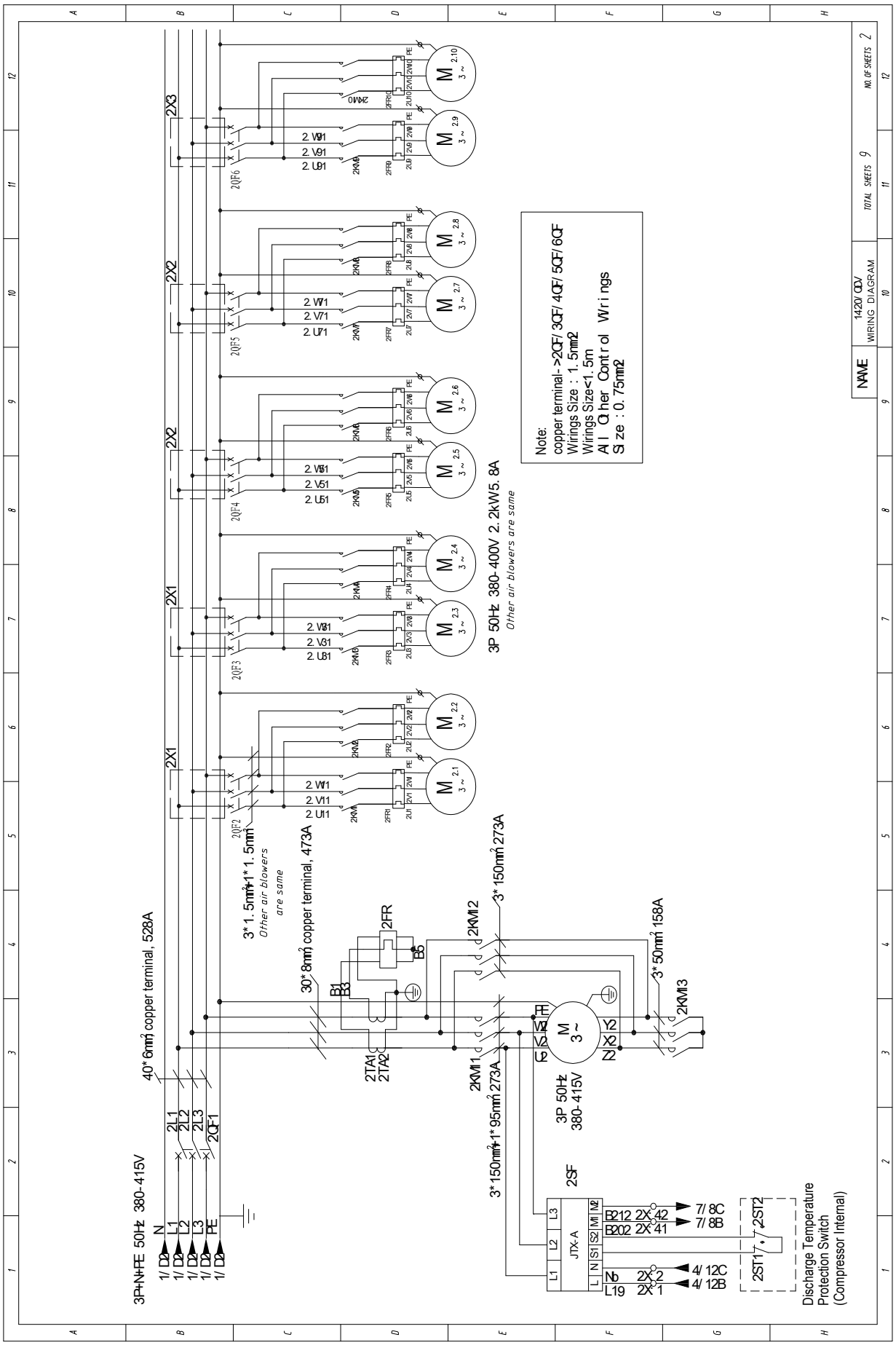
Reserve
2# Discharge Temp.
2X57 2X60
2RT4
2RT3
2X58 2X59
B408 B410
AI7 AI6 AI5 AI4 AI3 AI2 AI1 +5V
CN6
S3
S2
S1
COM6 AI8 AI9 AI10 AI11 AI12 AI13 AI14
CN8
B412
B450
B452
2X65
2X66
2X67
2X68
2TP1
2TP2
2# Suction Pressure
2# Discharge Pressure
24V
0V
4/E4
4/E4
GND GND 12V
CN13
6/C7
6/C7
0V
12V
GND GND GND
CN14
A2
COM0 DI22 DI23 DI24 DI25 DI26 DI27 DI28
CN1
COM5 DO24 DO25 DO26 DO27 DO28 DO29 DO30
CN10
COM0 DI15 DI16 DI17 DI18 DI19 DI20 DI21
CN2
COM4 DO17 DO18 DO19 DO20 DO21 DO22 DO23
CN9
B343 X25
2KA7 X26
2# Alarm
B337 B339 2X29 2X32
2YV8 2YV9 2X30 2X31
2# Tail Inject. Val
2# Oil Recovery Valve (Only for BITZER)
Nb
L21
7/F12
7/F12
NOTE:
S1 1 ON SINGLE UNIT OFF Dual unit
S1 2 ON Dual /NO 2 OFF Dual /NO 1
S2 1 ON MULTI Mode OFF SINGLE Mode
S2 2 ON Master OFF Slave
S3 Address Code
NAME
1200/COV
WIRING DIAGRAM
TOTAL SHEETS 9
NO OF SHEETS 8

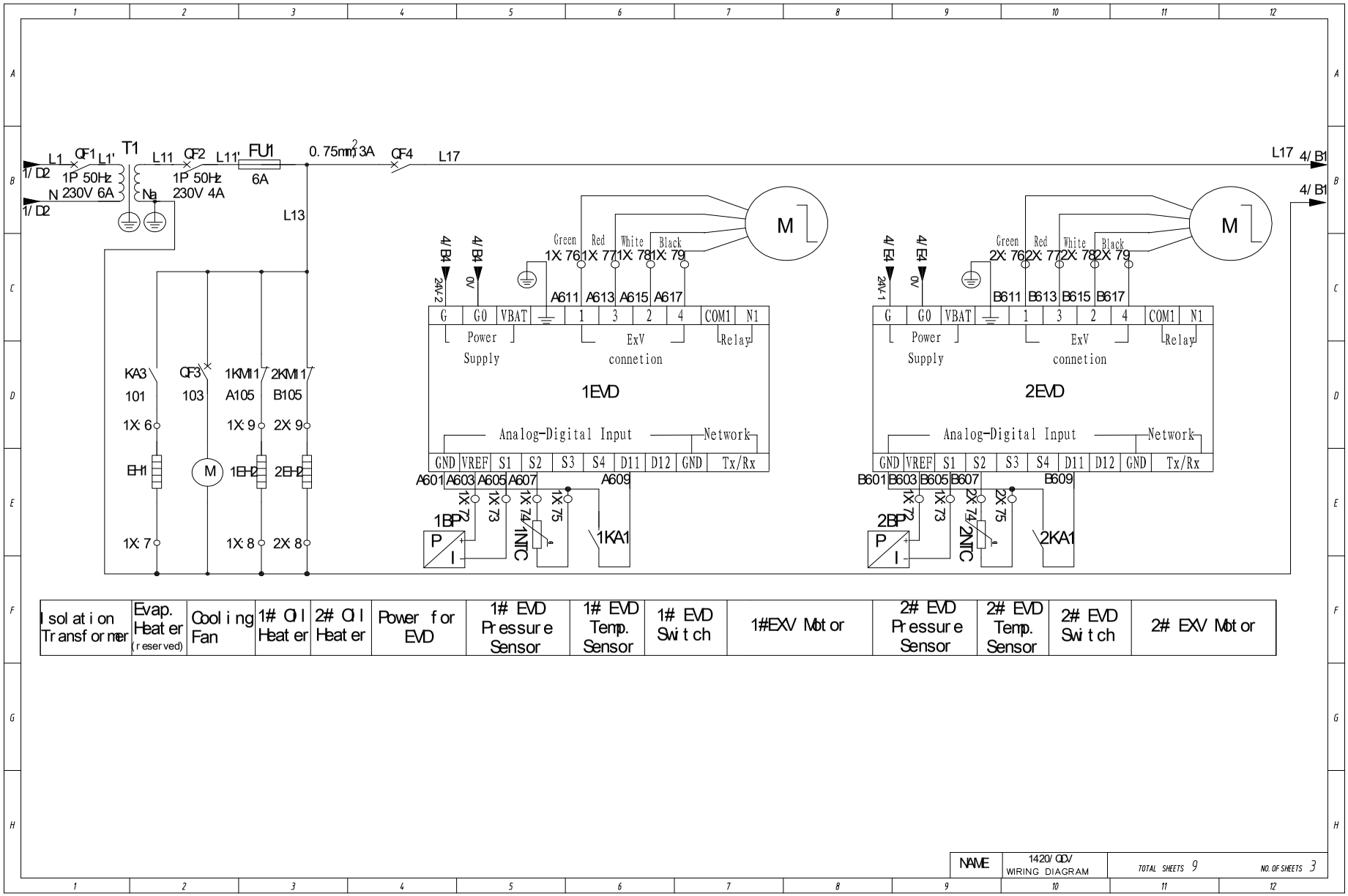
ITEM	SYMBOL	ITEM	DESCRIPTION	ITEM	SYMBOL	ITEM	DESCRIPTION
1	TA1 TA2		Current Transformer	15	KA1~KA7		Intermediate Relay
2	1QF		Moulded Case Circuit Breaker	16	SA		Service Switch
3	QF1 QF2 QF3 QF4		Air Switch	17	SA1		C/H Mode Switch
4	FU1 FU3 FU4		Fuse	18	SL1		Oil Level Switch
5	KR		Power Protection Module	19	SF		Compressor Motor Prot. Switch
6	KM11 KM12 KM13		Compressor Contactor	21	QF QF2 QF3 QF4 QF5 QF6		Miniature Circuit Breaker
7	FR FR1~FR8		Overload Relay	22	RT1~RT5 NTC		Temperature Sensor
8	M		Motor	23	YV1~YV9		Solenoid Valve
9	KT1		Time Relay	24	SP1 SP2 SP3		Pressure Switch
10	KM1~KM8		Fan Contactor	25	TP1 TP2		Pressure Sensor
11	SB		Emergency Stop	26	A1 A2		Main Controll board
12	T1		Isolation Transformer	27	HMI		Touch Screen
13	EH1 EH2		Compressor Heater	33	EVD		Electrical Expansion Valve Module
14	SQ1		Water Flow Switch	34	UR1 UR2		Switch Power

NAME	1200/QDV WIRING DIAGRAM	TOTAL SHEETS 9	NO. OF SHEETS 9

LSBLGW1420/C WIRING DIAGRAM

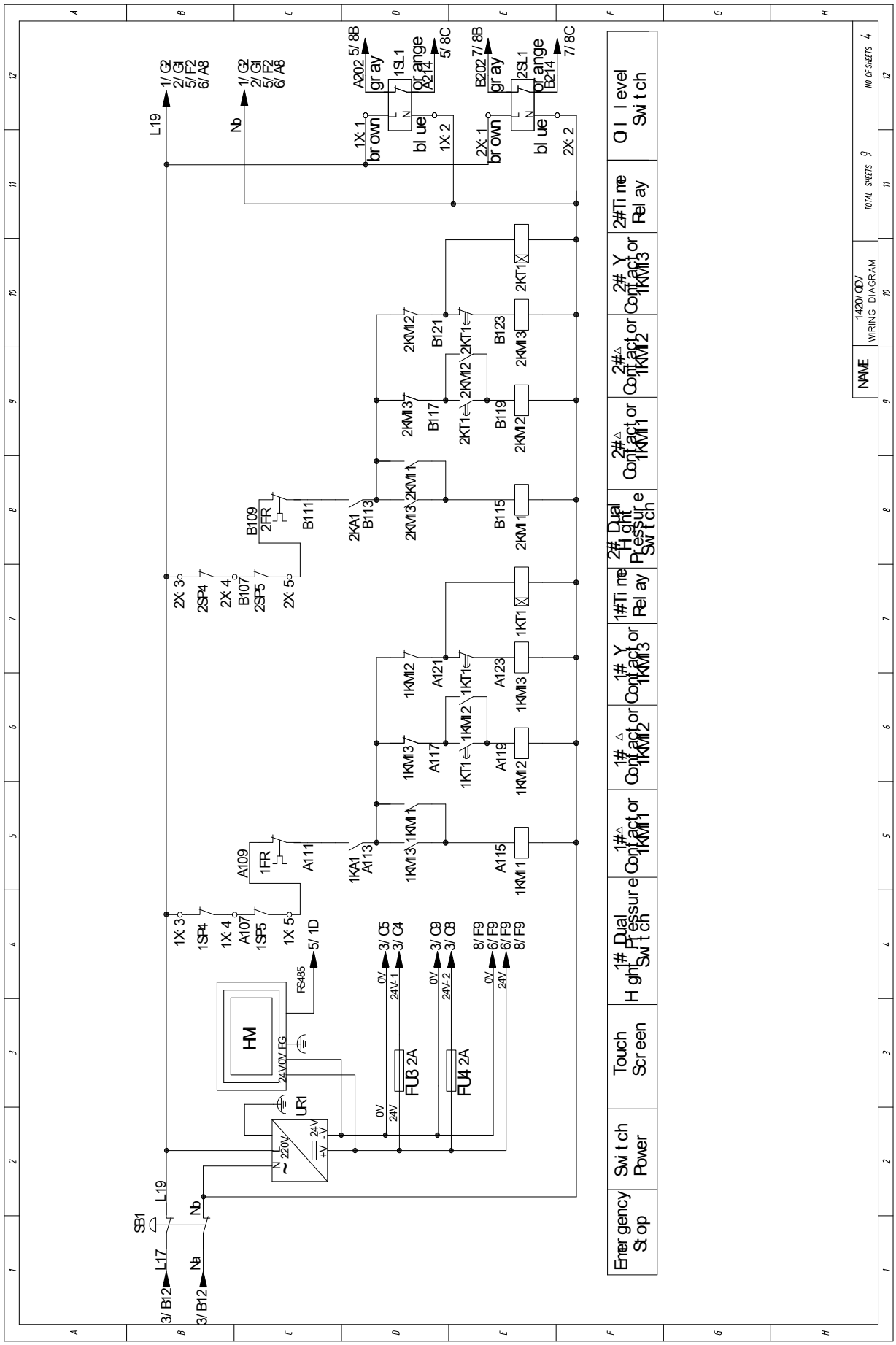


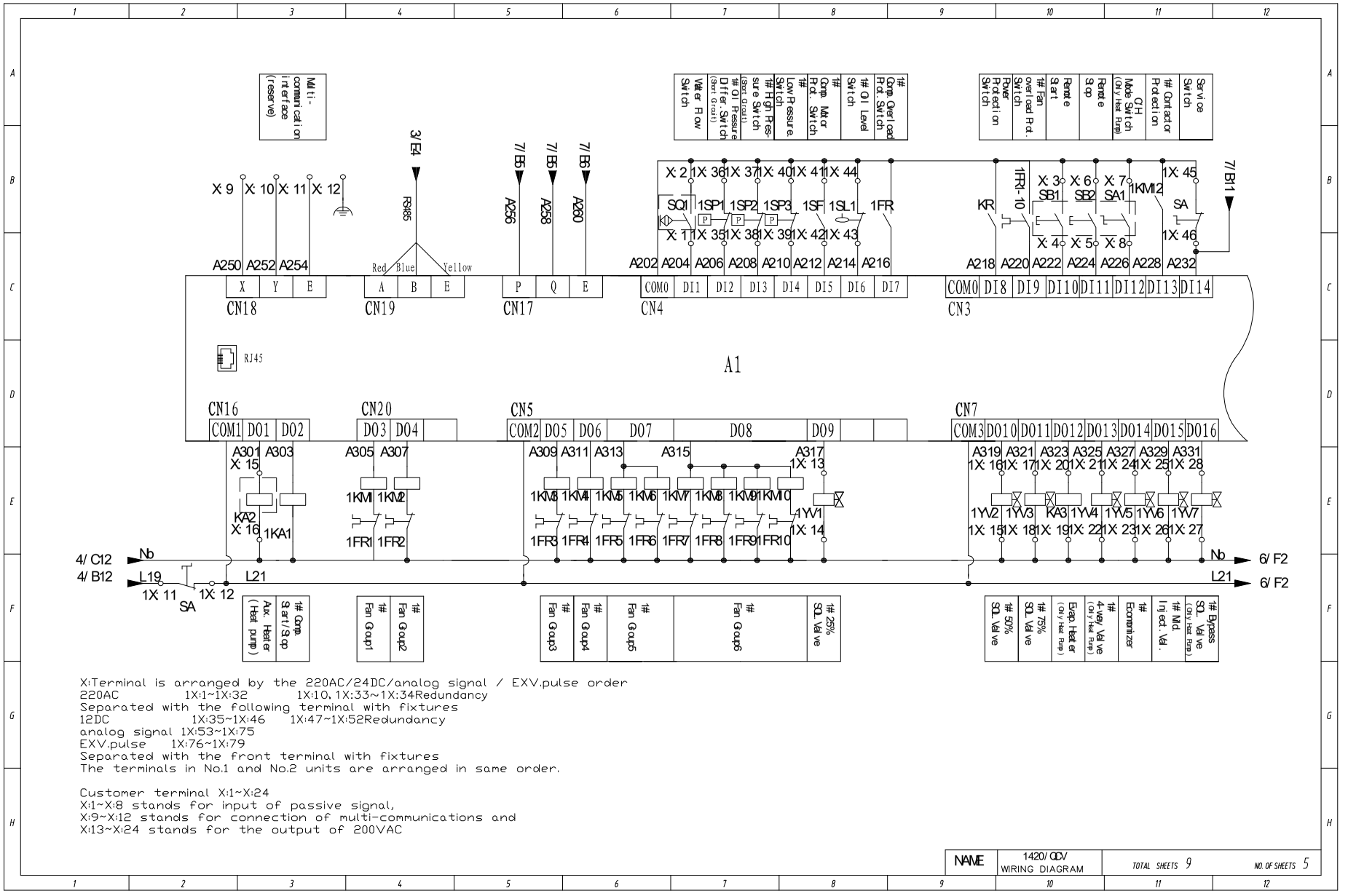

3P+N+PE 50Hz 380-415V
40*6mm² copper terminal, 528A
2L1
2L2
2L3
2QF1
3*1.5mm²+1*1.5mm²
Other air blowers are same
30*8mm² copper terminal, 473A
2QF2
2X1
2X2
2X3
2QF3
2QF4
2QF5
2QF6
3P 50Hz 380-400V 2.2kW5.8A
Other air blowers are same
2FR
B1
B3
B5
2TA1
2TA2
2KM1
2KM2
2KM3
3*150mm² 273A
3*150mm²+1*95mm² 273A
3*50mm² 158A
2SF
3P 50Hz 380-415V
JTX-A
B212 2X:42
B202 2X:41
7/8C
7/8B
Nb
L19
2X:2
2X:1
4/12C
4/12B
2ST1
2ST2
Discharge Temperature Protection Switch (Compressor Internal)
Note:
copper terminal->2QF/3QF/4QF/5QF/6QF
Wirings Size : 1.5mm2
Wirings Size<1.5m
All Other Control Wirings
Size : 0.75mm2
NAME
1420V CDV
WIRING DIAGRAM
TOTAL SHEETS 9
NO.OF SHEETS 2



Isolation Transformer	Evap. Heater (reserved)	Cooling Fan	1# Oil Heater	2# Oil Heater	Power for EVD	1# EVD Pressure Sensor	1# EVD Temp. Sensor	1# EVD Switch	1#EXV Motor	2# EVD Pressure Sensor	2# EVD Temp. Sensor	2# EVD Switch	2# EXV Motor

NAME	1420/ QDV WIRING DIAGRAM	TOTAL SHEETS 9	NO. OF SHEETS 3

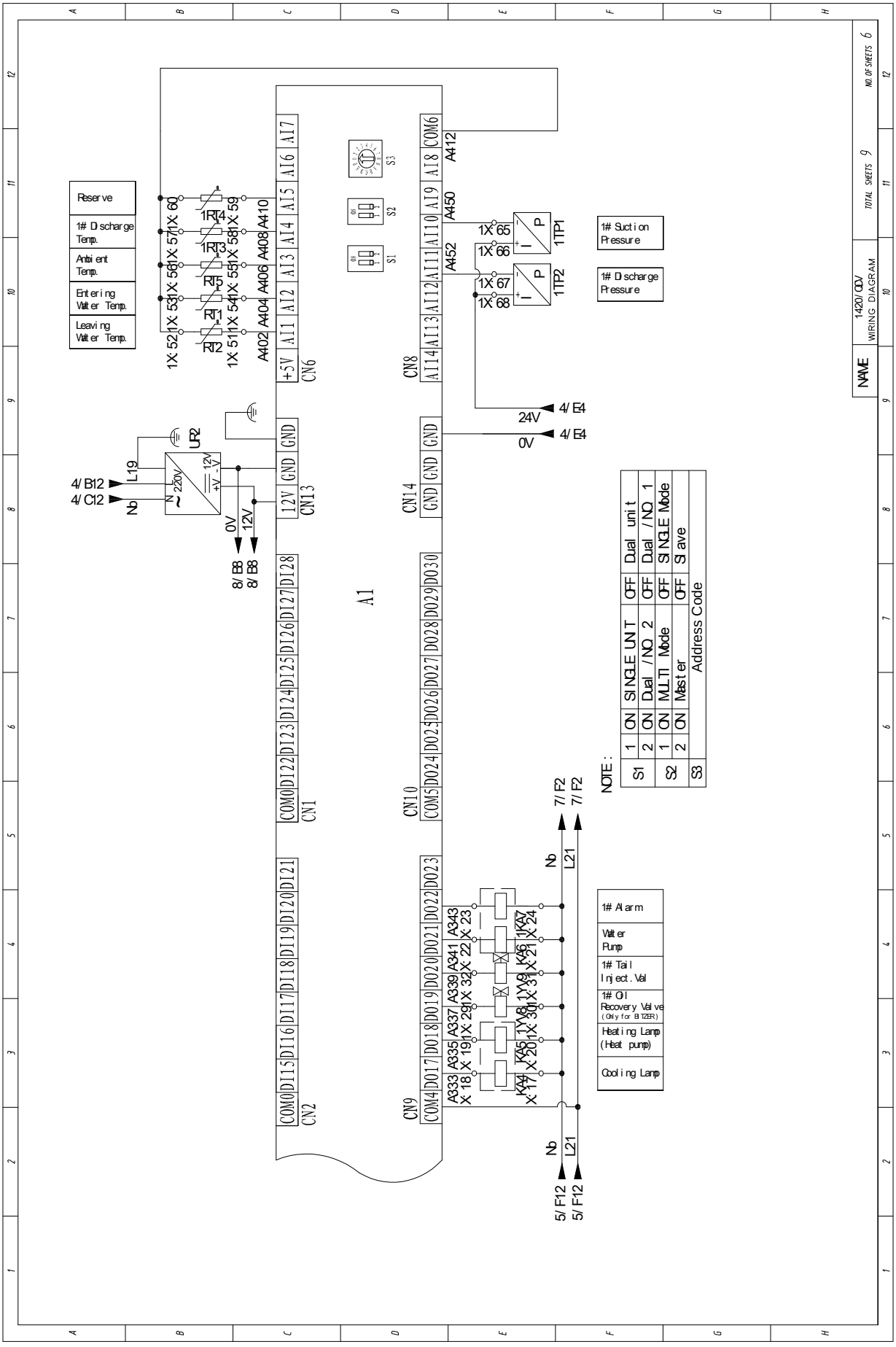

Emergency Stop
Switch Power
Touch Screen
1# Dual Pressure Switch
1#△ Contactor 1KM1
1# △ Contactor 1KM2
1# Y Contactor 1KM3
1#Time Relay
2# Dual Pressure Switch
2#△ Contactor 1KM1
2#△ Contactor 1KM2
2# Y Contactor 1KM3
2#Time Relay
Oil level Switch
NAME
1420/CDV WIRING DIAGRAM
TOTAL SHEETS 9
NO. OF SHEETS 4
L19
Nb
L17
Na
SB1
HMI
UR1
FU3 2A
FU4 2A
1FR
2FR
1KA1
2KA1
1KM1
1KM2
1KM3
2KM1
2KM2
2KM3
1KT1
2KT1
1SP4
1SP5
2SP4
2SP5
1SL1
2SL1
RS485
24V
0V

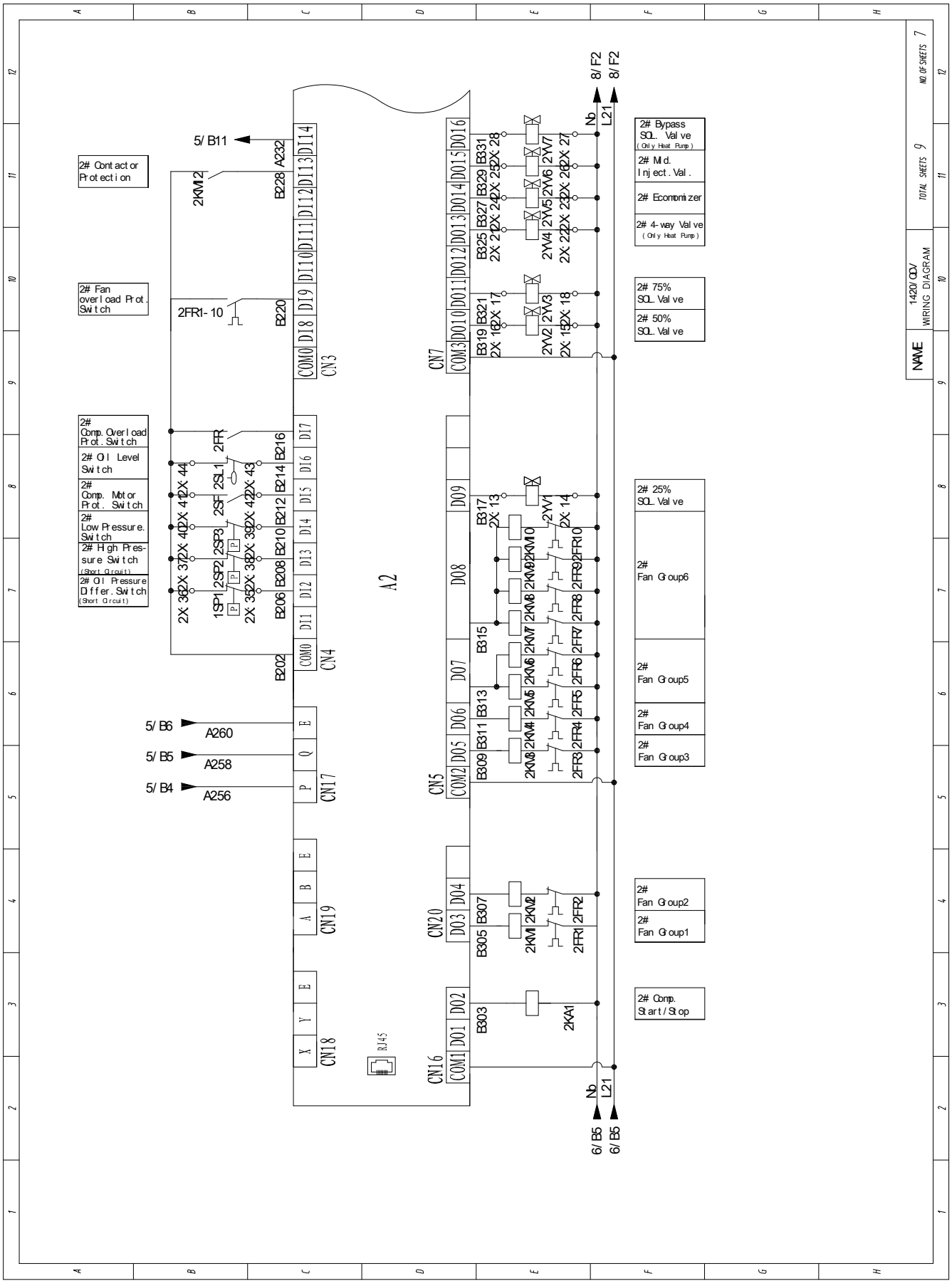


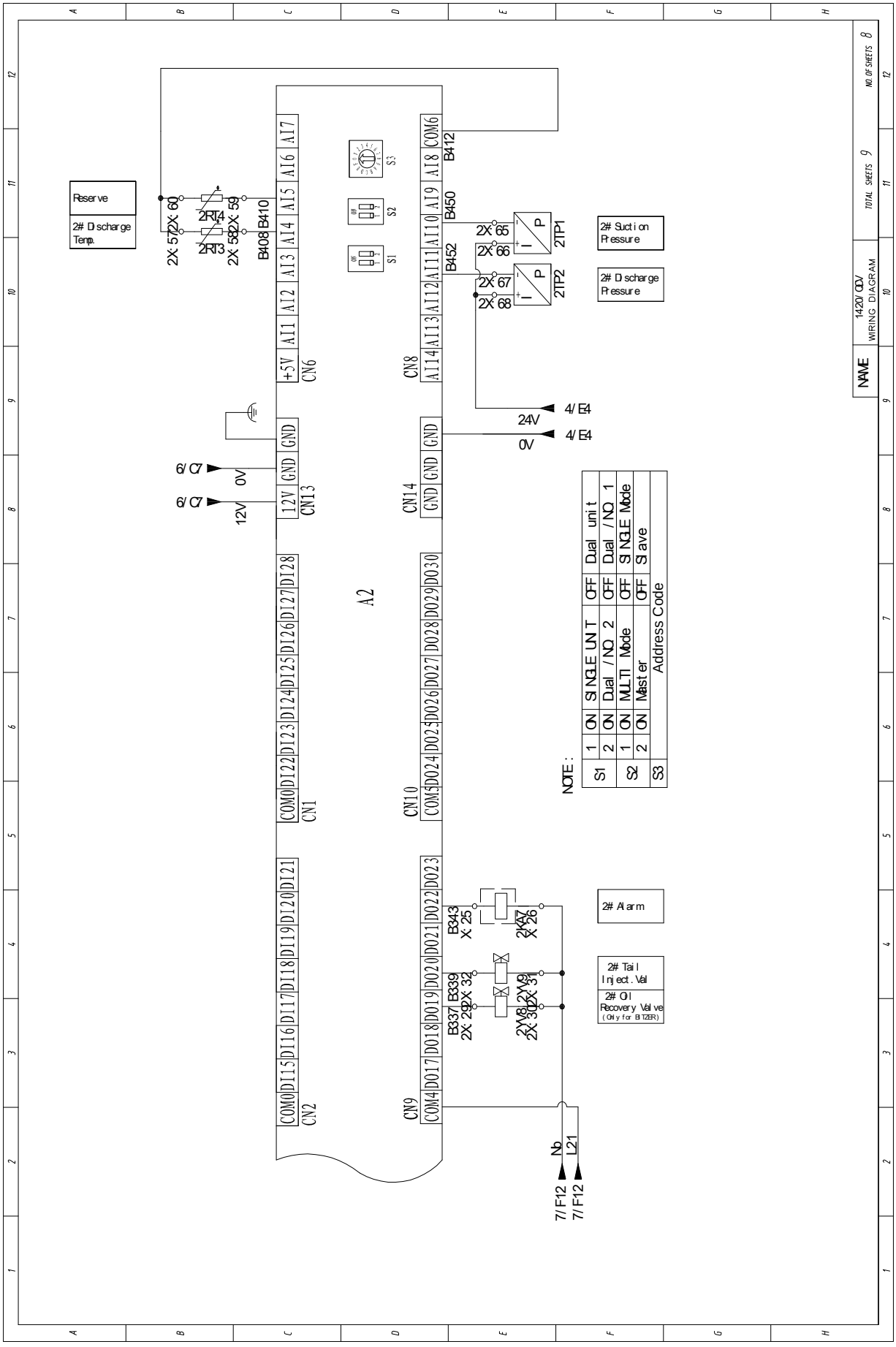
X:Terminal is arranged by the 220AC/24DC/analog signal / EXV.pulse order
220AC 1X:1~1X:32 1X:10, 1X:33~1X:34Redundancy
Separated with the following terminal with fixtures
12DC 1X:35~1X:46 1X:47~1X:52Redundancy
analog signal 1X:53~1X:75
EXV.pulse 1X:76~1X:79
Separated with the front terminal with fixtures
The terminals in No.1 and No.2 units are arranged in same order.

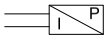
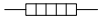
Customer terminal X:1~X:24
X:1~X:8 stands for input of passive signal,
X:9~X:12 stands for connection of multi-communications and
X:13~X:24 stands for the output of 200VAC

NAME	1420/ QCV WIRING DIAGRAM	TOTAL SHEETS 9	NO. OF SHEETS 5


NAME
1420/60V
WIRING DIAGRAM
TOTAL SHEETS 9
NO.OF SHEETS 6
A1
CN1
CN2
CN5
CN6
CN8
CN9
CN10
CN13
CN14
COM0 DI15 DI16 DI17 DI18 DI19 DI20 DI21
COM0 DI22 DI23 DI24 DI25 DI26 DI27 DI28
COM4 DO17 DO18 DO19 DO20 DO21 DO22 DO23
COM5 DO24 DO25 DO26 DO27 DO28 DO29 DO30
+5V AI1 AI2 AI3 AI4 AI5 AI6 AI7
A114 AI13 AI12 AI11 AI10 AI9 AI8 COM6
12V GND GND
GND GND GND
Reserve
1# Discharge Temp.
Ambient Temp.
Entering Water Temp.
Leaving Water Temp.
RT1
RT2
RT3
RT4
RT5
1X 51
1X 52
1X 53
1X 54
1X 55
1X 56
1X 57
1X 58
1X 59
1X 60
A402 A404 A406 A408 A410
UR2
L19
Nb
4/ B12
4/ C12
220V
12V
0V
12V
8/ B8
8/ B8
S1
S2
S3
A450
A452
A412
1X 65
1X 66
1X 67
1X 68
1TP1
1TP2
1# Suction Pressure
1# Discharge Pressure
24V
0V
4/ E4
4/ E4
NOTE :
S1
S2
S3
1 ON SINGLE UNIT OFF Dual unit
2 ON Dual /NO. 2 OFF Dual /NO. 1
1 ON MULTI Mode OFF SINGLE Mode
2 ON Master OFF Slave
Address Code
A333 A335 A337 A339 A341 A343
X 18 X 19 X 29 X 32 X 22 X 23
K44 K45 1K8 1K9 K46 K47
X 17 X 20 X 30 X 31 X 21 X 24
Nb
L21
5/ F12
5/ F12
7/ F2
7/ F2
1# Alarm
Water Pump
1# Tail Inject. Val
1# Oil Recovery Valve
(Only for BITZER)
Heating Lamp
(Heat pump)
Cooling Lamp


NAME
1420/CCV/
WIRING DIAGRAM
TOTAL SHEETS 9
NO. OF SHEETS 7
A2
CN3
CN4
CN7
CN5
CN20
CN16
CN17
CN19
CN18
5/ B11
2# Contactor Protection
2# Fan overload Prot. Switch
2# Comp. Overload Prot. Switch
2# Oil Level Switch
2# Comp. Motor Prot. Switch
2# Low Pressure. Switch
2# High Pressure Switch (Short Circuit)
2# Oil Pressure Differ. Switch (Short Circuit)
5/ B6
5/ B5
5/ B4
A260
A258
A256
RJ45
8/ F2
8/ F2
Nb
L21
6/ B5
6/ B5
2# Bypass SOL. Valve (Only Heat Pump)
2# Mid. Inject. Val.
2# Economizer
2# 4-way Valve (Only Heat Pump)
2# 75% SOL. Valve
2# 50% SOL. Valve
2# 25% SOL. Valve
2# Fan Group6
2# Fan Group5
2# Fan Group4
2# Fan Group3
2# Fan Group2
2# Fan Group1
2# Comp. Start / Stop


NAME
1420/60V WIRING DIAGRAM
TOTAL SHEETS 9
NO. OF SHEETS 8
A2
CN1
CN2
CN6
CN8
CN9
CN10
CN13
CN14
Reserve
2# Discharge Temp.
2# Suction Pressure
2# Discharge Pressure
2# Alarm
2# Tail Inject. Val
2# Oil Recovery Valve (Only for BITZER)
24V
0V
12V
NOTE :
S1 1 ON SINGLE UNIT OFF Dual unit
2 ON Dual / NO. 2 OFF Dual / NO. 1
S2 1 ON MULTI Mode OFF SINGLE Mode
2 ON Master OFF Slave
S3 Address Code

ITEM	SYMBOL	ITEM	DESCRIPTION	ITEM	SYMBOL	ITEM	DESCRIPTION
1	TA1 TA2		Current Transformer	15	KA1~KA7		Intermediate Relay
2	1QF		Moulded Case Circuit Breaker	16	SA		Service Switch
3	QF1 QF2 QF3 QF4		Air Switch	17	SA1		C/H Mode Switch
4	FU1 FU3 FU4		Fuse	18	SL1		Oil Level Switch
5	KR		Power Protection Module	19	SF		Compressor Motor Prot. Switch
6	KM11 KM12 KM13		Compressor Contactor	21	QF QF2 QF3 QF4 QF5 QF6		Miniature Circuit Breaker
7	FR FR1~FR10		Overload Relay	22	RT1~RT5 NTC		Temperature Sensor
8	M		Motor	23	YV1~YV9		Solenoid Valve
9	KT1		Time Relay	24	SP1 SP2 SP3		Pressure Switch
10	KM1~KM10		Fan Contactor	25	TP1 TP2		Pressure Sensor
11	SB		Emergency Stop	26	A1 A2		Main Controll board
12	T1		Isolation Transformer	27	HMI		Touch Screen
13	EH1 EH2		Compressor Heater	33	EVD		Electrical Expansion Valve Module
14	SQ1		Water Flow Switch	34	UR1 UR2		Switch Power

NAME	1420/QDV/ WIRING DIAGRAM	TOTAL SHEETS 9	NO. OF SHEETS 9

Edition:MCSM14-C-72A-WM(in replacement of MCSM13-C-72B-WM)
202090290293

Midea®

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