



USE AND MAINTENANCE HANDBOOK

HL-i Series
HL-i10~HL-i105



This manual has been prepared in compliance with CE certification and it is an essential part to every HL Cooling unit

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THIS MANUAL REFERS TO THE FOLLOWING UNIT:

UNIT

OPTIONAL

SERIAL No.

WIRING DIAGRAM No.

ATTENTION

HL Cooling units are only intended for professional uses.

The instructions contained herein and attached to the unit are to be strictly complied with whenever the unit is installed or serviced.

Any operation on this unit must be carried out by skilled personnel having themselves made fully conversant with these instructions.

The guarantee for this unit shall only be valid as long as the instructions contained herein are duly complied with.

This manual is intended for end users only in case of operations which can be carried out having the panels closed (fixed guards are not removed).

Data on this catalogue are only guideline data. **HL (Europe) Ltd** reserves the right to make changes without prior notice.

Before any operation inside the unit, turn OFF the main power safety switch; then turn OFF the unit main switch SW0.

Operations when power is still supplied to the electrical board and the panel is open are allowed to our skilled technicians only, who have been duly trained. In such conditions some of the system functions are not present.

ATTENTION

Fill the Commissioning Report (see appendix "A") enclosed to the handbook during the first start up and send a copy to HL (Europe) Ltd (Service Dept.) for warranty validity.

SAFETY

These instructions contain basic references to correctly and safely use and service our units. Besides general safety precautions, all specially marked points must be duly observed.

SAFETY MARKS CONTAINED IN THESE INSTRUCTIONS

This manual contains some information and references which are marked by symbols. If the safety precautions marked by the symbol **"danger from general cause"** are not complied with injuries to persons may be caused.



If the safety precautions marked by the symbol **"danger from electrical causes"** are not complied with injuries to persons or damages to things may be caused.



If the safety precautions highlighted by the word



are not complied with, damages to the unit or to its functions may be caused.

DANGERS FROM NON OBSERVANCE OF SAFETY REFERENCES

Non-observance of safety references may cause bodily harm to persons or damage to the equipment. Failure to comply with safety references shall invalidate warranty and/or damage claims.

Non-compliance could have the following dangerous consequences:

- Failure of important system functions;
- Risk for the operators' safety due to electrical and/or mechanical causes.

ACTIVE SAFETY

The operating logic of our units is controlled by a microprocessor.

This microprocessor also manages faults and malfunctions (if any) of every part of the unit, thus ensuring no risks are run by machinery, persons and the environment.

PASSIVE SAFETY

Our units are completely enclosed by panels, which prevent access to dangerous areas from outside, including fans which are equipped with suitable protection grilles.

DECLARATION EC OF CONFORMITY

Standards applied:

EN 50366:2003+A1:2006
EN55014-1:2006
EN55014-2:1997+A2:2008
EN60335-1:2002+A13:2008
EN60335-2-40:2003+A1:2006
EN61000-3-2:2006
EN61000-3-3:2008

Report No:

Uk091202049
Uk091201050
Uk091201051
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GENERAL INFORMATION

HL-I Series Chillers are available in different sizes and different cooling capacities ranging from 3KW to 180KW.

HL-i Series-Standard Air Cooled Water Chiller with Axial Fans

These chillers are supplied complete with:

- Control microprocessor;
- Water fill & vent tank;
- Special coated condenser fins for longer life;
- Integral stainless steel tank;
- Adjustable LP switch;
- Centrifugal pump-standard 3 bar(optional 5 bar);
- Heavy duties condenser fan;
- Reliable compressor.

NAME AND MODEL

The machines described in this manual are called "Air Cooled Water Chillers".
Model Range Code Guide

HL	i50
Company Name	Cooling Capacity(approx.:50KW)

Example: HL-i50

WORKING CONDITION

- 1). Ambient temperature: From -10°C to 43°C.
- 2). Water temperature: From -5°C to 35°C (LP Switch should be changed if it is below 0°C).

GENERAL SIGN INFORMATION

	Cooled water inlet		Cooled water outlet
	Indications for lifting the unit		Water drainage point from the machine
	Water filling point		Cooling air flow
	Direction of the refrigerant gas and water circuit flow		Direction of pump rotation(if installed) and of fan rotation
	Electric shock risk		Air vent

TRANSPORTATION

INSPECTION

All units are packed with protective materials in order to safeguard the structure and the panels.

Customer is therefore required to exam the exterior package upon delivery.

Any damages shall be immediately notified in details on the carrier's delivery document, and shall report to HL (Europe) Ltd. in writing.

TRANSPORT

To left and move the unit, please refer to Appendix “B” – Overall Dimension Diagram for details.

CAUTION: Do not stack the unit even if they are packed.

INSTALLATION

POSITIONING

The unit is designed to be installed both indoor and outdoor.

The following consideration should be taking into account when choose a suitable location

- Length and origin of hydraulic line;
- Length and origin of the power supply;
- Free flow of air in-take;
- Easy service access;
- Strong even surface.

CAUTION: Making sure the discharged air does NOT blow back into the inlet. In some case, vibration dampers may be applied to minimize the vibration been transmitted to the lower level.

HYDRAULIC CONNECTIONS

CAUTION: The inlet and outlet connections are NOT interchangeable, they must be connected as instructed in the overall dimension data (see Appendix "B").

The following suggestions should be considered when connect to the application system:

- Use vibration-damping joints to prevent vibration transmission and allow thermal expansion;
- Apply a shutoff valves on both inlet and outlet;
- Apply a By-pass valve.

IMPORTANT:

- When connection is completed, check for any water leakages;
- Drain the system thoroughly, making sure there is no air in the water circuit as it may damage the pump.

ELECTRICAL CONNECTIONS

Check power supply against name plate data on the unit (voltage, frequency, phase number). Relevant regulations must be strictly adhered to.

Use a power supply cable whose section shall not be smaller than the value indicated in the wiring diagrams (see appendix "C") and whose length shall be moderate to ensure there won't be excessive voltage drops.

Upstream cable shall be protected by means of an automatic circuit breaker or of three fuses whose nominal current is equal to that of the unit's main disconnecting switch inside the unit's electric panel.

The breaking power of these elements must be at least equal to the maximum short-circuit current which is generated if a failure occurs in the place where the unit is installed.

WORKING LIMITS

The water flow rate supplied by the unit is related to a 5°C temperature jump between input and output which depends on the supplied cooling power. The maximum allowable flow rate entails a 3°C jump (higher flow rates may cause too high evaporating temperatures and damage the evaporator). The minimum allowable flow rate entails a 7°C jump (lower flow rates may cause too low evaporating temperatures, as a consequence the safety devices would be tripped and the unit would stop).

COOL WATER TEMPERATURE:

The minimum outlet temperature of evaporator is 5°C not included "brine" versions (*); the maximum inlet temperature to the evaporator is 30°C.

(*) : Operation with low- temperature water:

If the cool water temperature is lower than 4°C (out of the evaporator) a water-ethyl glycol mixture should be used (see table below). The antifreeze thermostat (always 3-5°C above the mixture freezing point), the operating thermostat and the set point (4°C above the desired water temperature out of the evaporator) must also be set to new values.

OPERATION WITH WATER -ETHYL GLYCOL MIXTURE								
DESCRIPTION	PERCENTAGE OF ETHYL GLYCOL OUT OF MIXTURE WEIGHT							
	5%	10%	15%	20%	25%	30%	35%	40%
FREEZING TEMPERATURE	-2.1°C	-4.5°C	-7°C	-10°C	-13°C	-17°C	-21°C	-25°C

EXTERNAL AIR TEMPRATURE:

To ensure the unit can properly perform cooling, the external air temperature must be between -15°C and 40°C. For different requirements please contact our Engineering Division.

NOTE: Using the unit improperly forthwith voids the guarantee; moreover it may cause unit failures and the tripping of safety devices

NOTE: If the unit is installed outdoors, it is recommended that a min. 15% of glycol is added into the water circuit..

MAINTENANCE

IMPORTANT: BEFORE ANY OPERATION INSIDE THE UNIT TURN OFF THE MAIN SWITCH UPSTREAM THE UNIT POWER LINE. THEN OPEN THE FRONT PANEL AND TURN OFF THE UNIT MAIN SWITCH TOO.

IMPORTANT: ONLY OUR TRAINED TECHNICIANS ARE DULY QUALIFIED TO SERVICE THE UNIT WHEN POWER IS SUPPLIED TO THE ELECTRICAL BOARD AND THE PANEL IS OPEN. IN THESE CONDITIONS SOME OF THE SYSTEM FUNCTIONS ARE NOT PRESENT.

TYPE AND FREQUENCY OF ROUTINE MAINTENANCE

Periodical maintenance is a good practice to check if the unit works properly.

Please note that these services, including possible maintenance operations, should be carried out by qualified personnel only.

Every month:

- Check if the electrical terminals on the electric board and on the terminal boxes of the various electric parts are correctly clamped;
- Check if the contacts of the remote control switches are clean and in sound conditions (if necessary, replace them);
- Check if the water circuit is uniformly filled (no air inside of it);
- Check if the water differential pressure switch operates correctly;
- Clean fins of condensing coil by blowing compressed air or, if necessary, flushing them with water (operate in the opposite direction with respect to airflow);
- Check if the defrost procedure is correctly performed.

If, after a few working hours, the unit makes anomalous noises an extraordinary check shall be carried out to detect and eliminate their causes.

MAINTENANCE OF THE COOLING CIRCUIT

IMPORTANT: During any operation requiring the cooling circuit to be exhausted, it is necessary, to ensure environmental safety, that the gas is collected into a proper receiver.

After the cooling circuit is repaired, carry out the following operations:

- Tightness test;
- Cooling system draining and drying;
- Refrigerant charge.

TIGHTNESS TEST

Fill the cooling circuit with gaseous R407C and reach a 1 bar pressure. Then add nitrogen through bombs equipped with a reducing valve and reach a 15 bar pressure. Check leaks with the leak detector. If leaks are detected exhaust the cooling circuit before welding (with copper-phosphor alloy and 2% silver).

It is important that the cooling system is completely exhausted before welding, to prevent explosions. Never use oxygen as a substitute of nitrogen, otherwise explosions might occur.

COOLING CIRCUIT DRAINING AND DRYING

For a good vacuum condition use a suitable pump (1.4 mbar absolute pressure, 30 l/min. capacity). When the circuit is opened for a very short time, with this pump you normally need only one vacuum operation to reach the absolute pressure of 1.4 mbar.

If such a vacuum pump is not available, or if the circuit remains open for a long time, we strongly recommend that you follow the three-fold pumping method.

Such method is also advisable if moisture is present in the circuit.

The vacuum pump must be connected to the intake openings.

Comply with the following procedure:

- Evacuate the circuit up to a 35 mbar absolute pressure at least, then fill the cooling circuit with R407 C and reach an about 1 bar pressure;
- Repeat the above described operation and reach an absolute pressure of 35 mbar;
- Repeat the above described procedure a third time and reach an absolute pressure which should be as low as possible.

REFRIGERANT CHARGE

Always follow this procedure:

- Connect the refrigerant bomb to the 1/4" SAE male intake on the liquid line, blow out some gas to exhaust air from the interconnection tube;
- Capsize the bomb and fill the circuit with liquid refrigerant: fill 75% of total charge;
- Now connect it to the intake on the suction line and, holding the bomb upright, fill the line completely until in the chiller the temperature of the liquid tube, before the filter, is 7-8°C lower (or 4°C lower in case of heat pumps) than the °C temperature read on the R407C pressure gauge on the distribution tube.

DISMANTLING

When the unit is to be dismantled, drain the cooling circuit and collect the gas through a suitable receiver. This operation ensures safety to persons and environment.

IMPORTANT: DO NOT DISPOSE OF GAS CONTAINED IN THE COOLING CIRCUIT IMPROPERLY FOR ANY REASON.

When the unit is dismantled or the compressor is replaced carefully pour compressor's oil into a suitable receiver and send it to a specialised centre for oil disposal.

IMPORTANT: DO NOT DISPOSE OF COMPRESSOR OIL IMPROPERLY FOR ANY REASON.

EMERGENCIES

By:

Floods: Immediately cut out the automatic circuit breaker that is located upstream the power supply line to the unit and turn off the water pump (if it is part of the hydraulic system). Then repair the defective part of the water circuit.

Fire: Immediately cut out the automatic circuit breaker which is located upstream the power supply line to the unit and use a powder-based or CO₂-based fire extinguishing product.

MAIN COMPONENTS

PANELS AND FRAME

IMPORTANT: Panels (fixed guards) enclose potentially dangerous areas in case of failure or damage; before they are removed disconnect the unit power supply from the main switch and turn OFF the water inlet supply.

The panels enclosing the various parts of the unit are made up of painted galvanised steel plate.

The technical compartment is closed. It contains the compressors and the main components of the unit.

COMPRESSOR

A highly reliable compressor with high-efficiency in performance, protected by an internal thermal overload.

COATED CONDENSER FINS

The aluminium fins on the condenser are coated with special anti-corrosion material ensuring the endurance of the condenser.

INTEGRAL STAINLESS STEEL WATER TANK

The high volume integral stainless steel tank help maintaining an optimum water temperature to minimise the compressor starts for reaching a longer compressor life.

AXIAL FANS

Axial fans are directly coupled to an electric 8-6 pole motor with overload protection, electronic balancing, and blades with low-sound-level wing contour and complete with a special air conveyor and protection grilles.

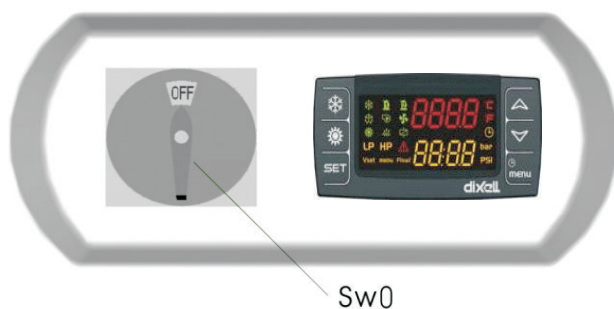
IMPORTANT:

- The protection grille for fans is a fixed guard enclosing a risk zone of the unit;
- Do not remove it, replace it if damaged.

Electronic Controller

It is the same size as a normal thermostat, for the complete management of chillers and heat pumps: it can control air-air, air-water, water-water and condensing units. The user manual of this controller is also supplied to users with this manual.

Display



The display feature 3 digits, with the display of the decimal point between -99.9 to 99.9.

Outside of its range of measurement, the value is automatically displayed without the decimal (even if internally the unit still operates considering the decimal part).

In normal operation, the value displayed corresponds to the temperature read by probe B1, that is, the evaporator water inlet temperature (for water chillers) or the ambient air temperature for direct expansion units.

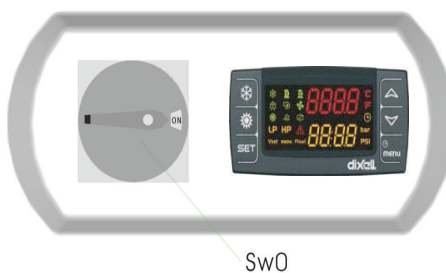
The parameters are divided into 4 different types, according to their level of access by the user (password) and their function.

For each level, only the access to the parameters of the same or lower level can be set. This means that through the "factory" password, accessing the menu "levels" (L-P), it is possible to set the desired level for each parameter.

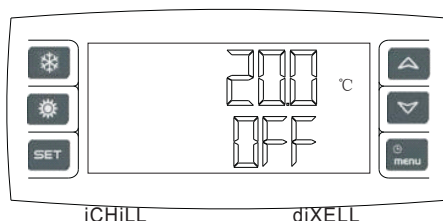
For detailed parameter setting, please refer to the **CAREL μ C²SE User Manual** attached with every unit.

Start up

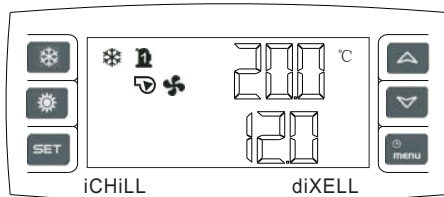
- 1) Turn the main switch SW0 to "ON",



The display shown as:

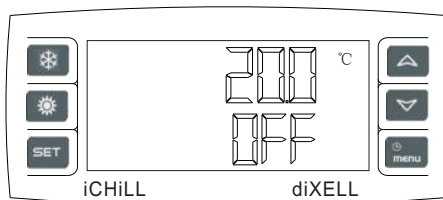


2) Press and hold  for 5 seconds, then wait about 3 minutes, the display shown as:



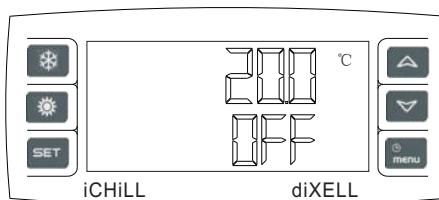
Standby

Press and hold  for 5 seconds, the display shown as:



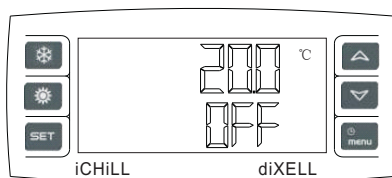
Shut Down

- 1) Press and hold  for 5 seconds;
- 2) Turn the main switch SW0 to “OFF”.

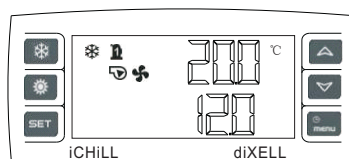


How to change water outlet cooling set point

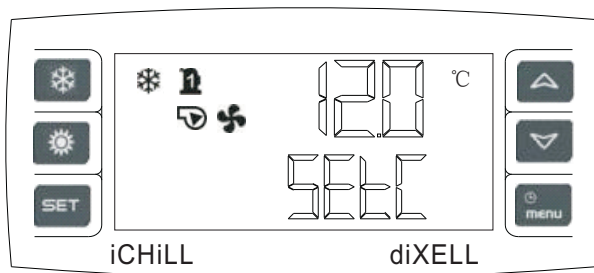
- 1) Turn the swo to “ON” →



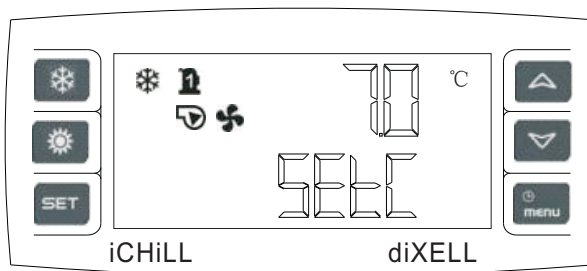
Press and hold  for 5 seconds; →



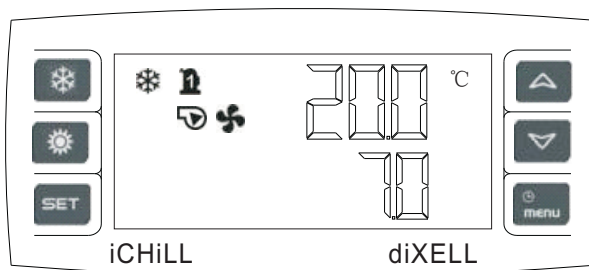
2) Press **SET** for 5 s →



3) Press **▲** or **▼** Until Set temp →



4) Press **SET** that is ok. →



How to change parameters (User level)

1) Access to “Pr1” parameters (User level) To access the parameters (Pr1):

1.1 Press the **SET** + **▼** key for a few seconds. The **❄** and **☀** icons will flash and the upper display will show “ALL” (general set of parameters) .

1.2 Scroll through the sets of parameters using the **▼** and **▲** keys. Select the set you want to modify and press **SET** to see the list of parameters in that set.

1.3 The lower display shows the parameter label and the upper display shows the value.

2) How to modify the value of a parameter

2.1 Enter the programming procedure.

2.2 Select the desired parameter.

2.3 Press the **SET** key to enable the value modification function.

2.4 Change the value using the **▼** and **▲** keys.

2.5 Press **SET** to store the new value and move on to the code of the next parameter.

2.6 To exit the procedure: press **SET** + **▲** while viewing a parameter, or wait for the time-out period to elapse.

3) Thermoregulation parameters

Parameter	Description	Min.	Max.	Udm	Factory settings	
St01	Summer setpoint	St05	St06	°C	12	
St02	Summer differential	00.0	25.0	°C	4	
St05	Summer min. set	-40.0	St01	°C	1	
St06	Summer max. set	St01	110	°C	45	

4) Parameters for antifreeze heaters - support

Parameter	Description	Min.	Max.	Udm	Factory settings	
Ar01	Lower limit of antifreeze heating setting values (Ar03 and Ar27)	-50.0	AR03	°C	1	
Ar02	Upper limit of antifreeze heating setting values (Ar03 and Ar27)	AR03	110	°C	7	
Ar03	In cooling mode, the antifreeze heating setting values (Ar01... Ar02) When the value is less than this, the controller issues an antifreeze alarm: Pb1 air/air system external environment low temperature detection probe. Pb2 air/air system low outlet temperature detection probe.	-40.0	110	°C	3	
Ar04	In cooling mode, the difference in antifreeze alarm reset: when the temperature rises above Ar03+Ar04, the antifreeze alarm is reset	0	25.0	°C	4	
Ar05	Antifreeze alarm delay time	0	25.0	°C	Dec	

Commissioning Report

Customer	
Address	
Post code	
Site address (if different)	

Product	
Make	
Model	
Serial No:	

PRELIMINARY CHECKS (✓) if checked			
1) Positioning -----surface / access			6) Water system connection
2) Adequate ventilation to condenser			7) Isolating valves fitted
3) Power connection			8) Glycol added
4) Phase rotation			9) Refrigerant leak test
5) Load available			10) System filled and air vented

Start up				
1) Control display light up				
2) Pump ON				
3) Compressor ON				
4) Condenser Fan ON				

Control settings				
1). Cooling setting point (r01) °C				
2). Cooling differential point (r02) °C				

Electrical system				
1) Main supply voltage				
2) Control circuit voltage				
3) Compressor running Amps				
4) Compressor Overload setting at				
5) Pump running Amps				
6) Pump Overload setting at				
7) Condenser fan running Amps				
8) Condenser fan overload setting at				

Refrigeration circuit				
1) Liquid line sight glass				
2) Oil level				
3) Refrigeration charge				
4) Suction pressure at (bar)				
5) Discharge pressure at (bar)				
6) Antifreeze cut out point at °c				
7) High pressure cut out at (bar)				
8) Low pressure cut out at (bar)				

Evaporator				
1) Glycol mixture %				
2) Leaving Temperature °c				
3) Return temperature °c				
4) Water pressure in (bar)				
5) Water pressure out (bar)				
6) Pressure drop (bar)				
7) Flow switch operation				
8) Low level sensor				

Condenser				
1) Fin coil condiction				
2) Filter condition				
3) Condenser fan cut in at (bar)				
4) Condenser fan cut out at (bar)				

Remarks:	

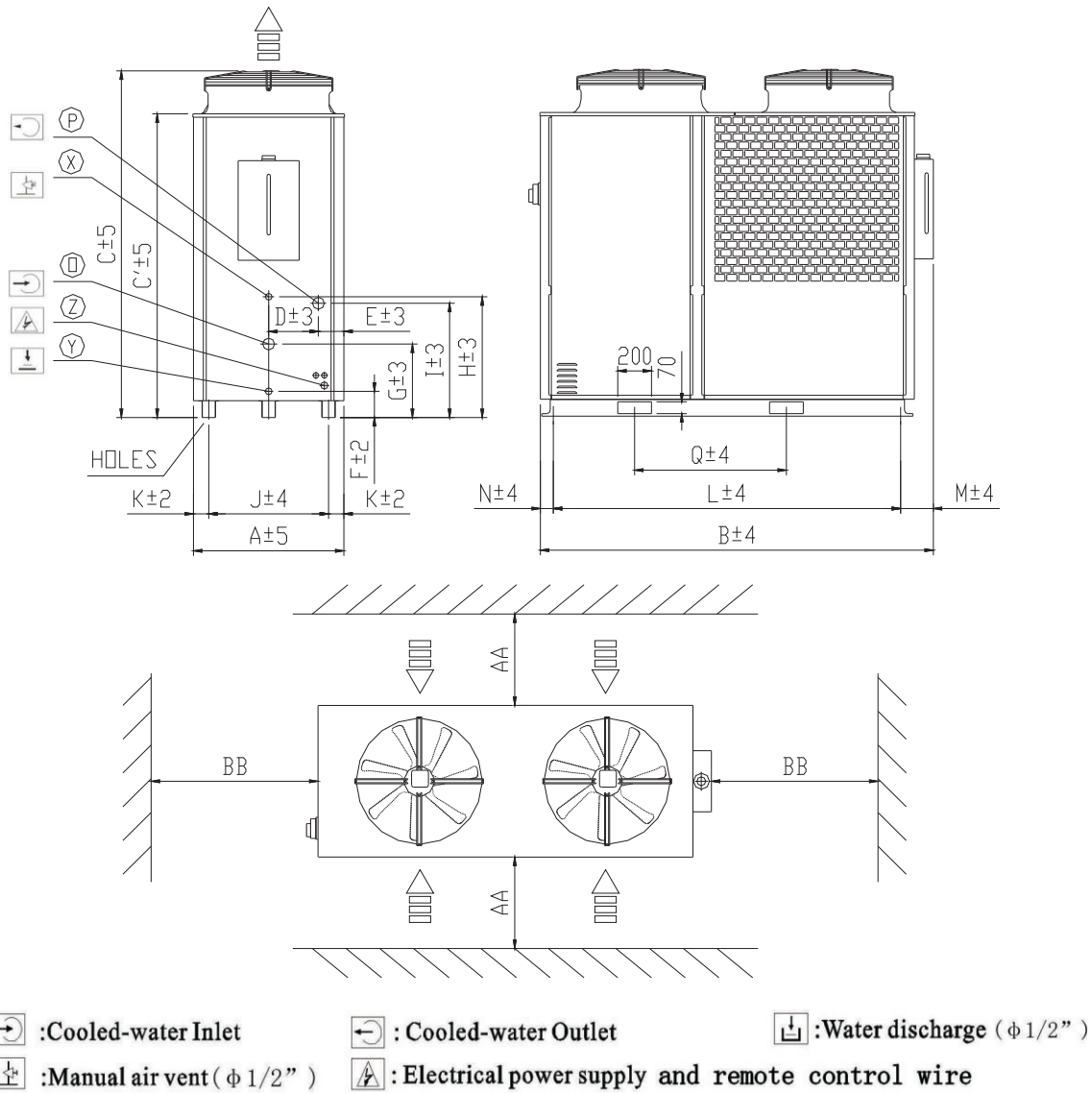
Installed by:			
Company		Print name	
Address		Signed	
post code		Date	

Commissioned by:			
Company		Print name	
Address		Signed	
post code		Date	

Appendix B

OVERALL DIMENSION

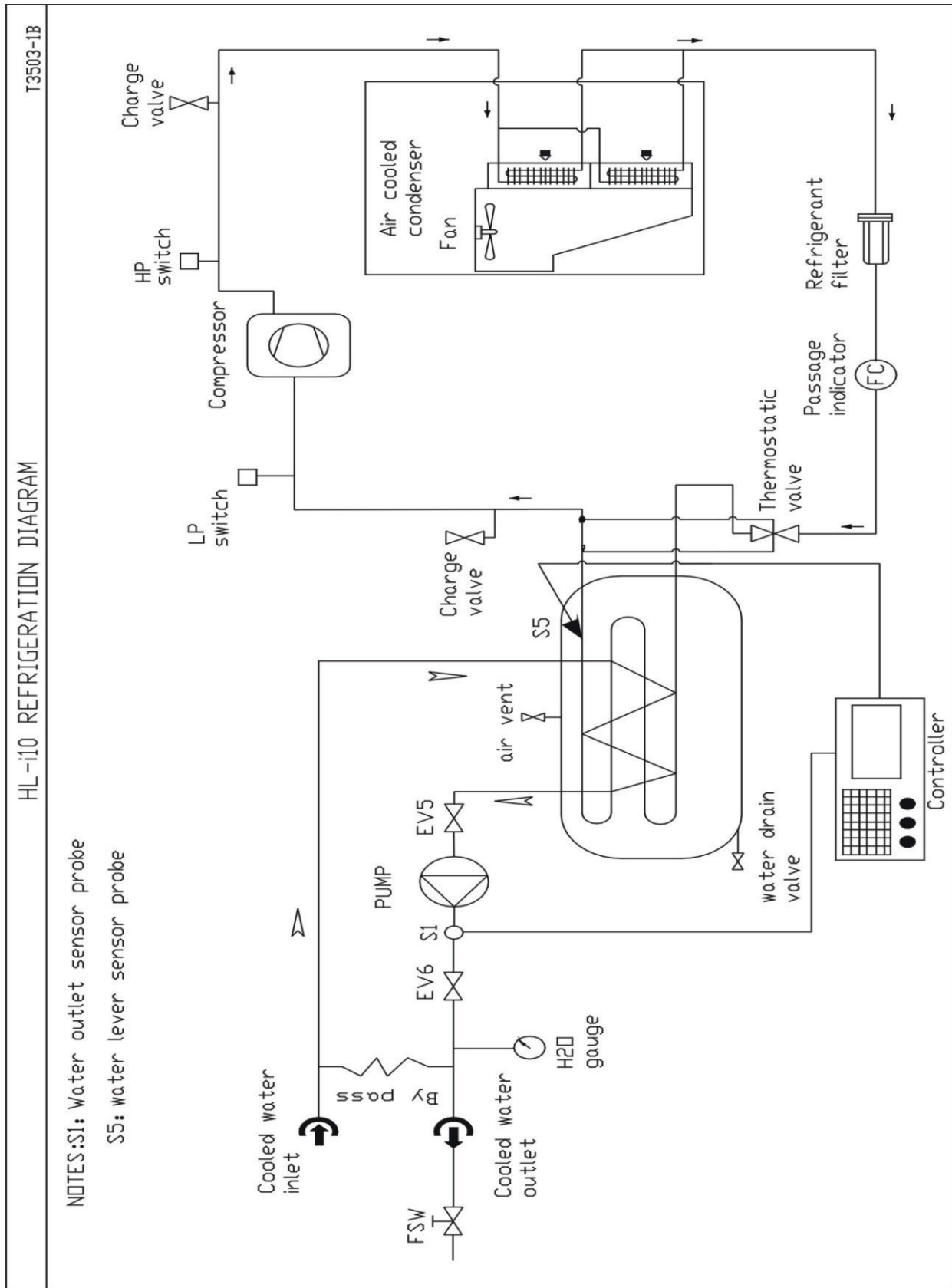
3). HL-i10 to HL - i105/ HL-i15c ~ HL-i50c Overall Dimension



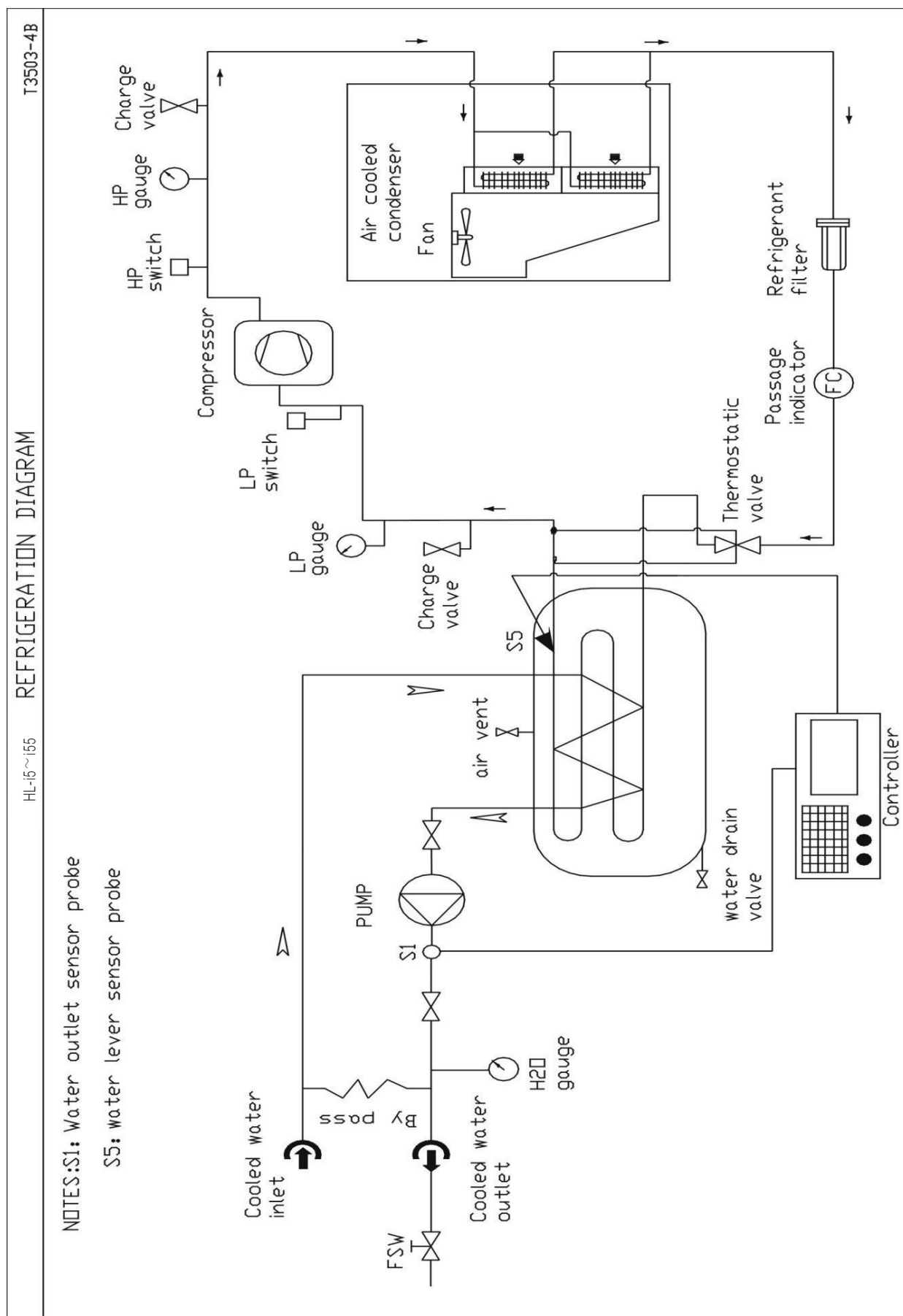
MODEL	A	B	C	C'	D	E	F	G	H	NO.OF FAN
10	538	1096	1219	1099	165	105	148	328	506	1
15~20	743	1203	1412	1220	265	107	150	355	600	1
30	743	1766	1415	1217	228	130	150	400	653	1
40~50	743	1766	1409	1217	248	124	150	400	653	2
55	743	1966	1519	1220	248	124	150	400	715	2
70	892	2330	2055	1770	295	150	155	435	715	2
105	892	2330	2055	1770	295	150	155	435	715	2

MODEL	I	J	K	L	M	N	ΦHLOES	O~P	Q	AA	BB
10	500	389	74.5	894	157	45	8.5	3/4"	600	500	1000
15~20	508	590	76.5	1001	157.5	44.5	8.5	1"	600	500	1000
30	567	590	76.5	1560	159.5	46.5	12	1.1/2"	900	500	1000
40~50	620	590	76.5	1560	159.5	46.5	12	1.1/2"	900	500	1000
55	620	590	76.5	1760	159.5	46.5	12	1.1/2"	900	500	1000
70~105	676	710	91	2120	161	49	12	2"	900	1000	1500

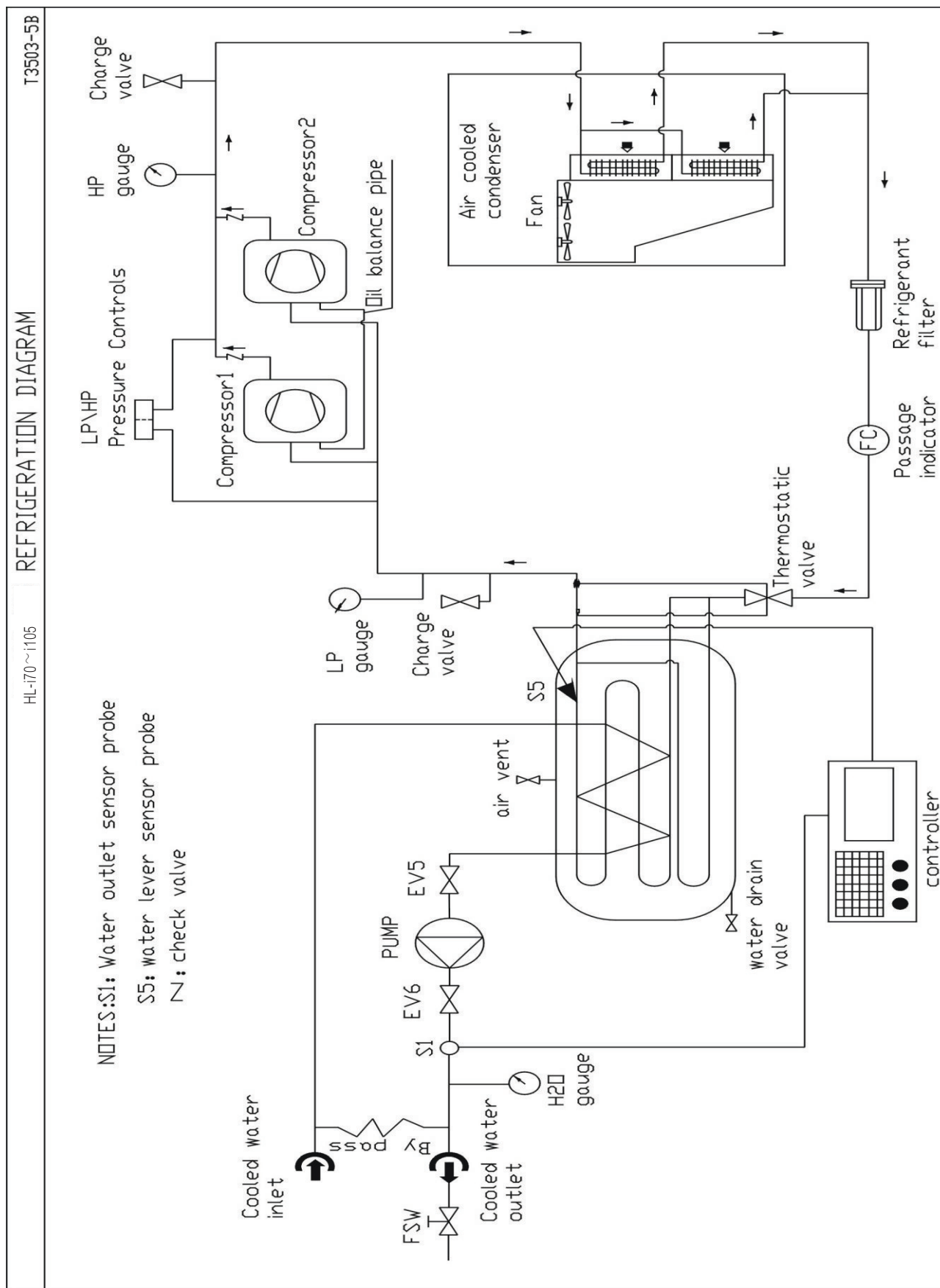
1) FOR HL-i10



2) FOR HL-i15~i55

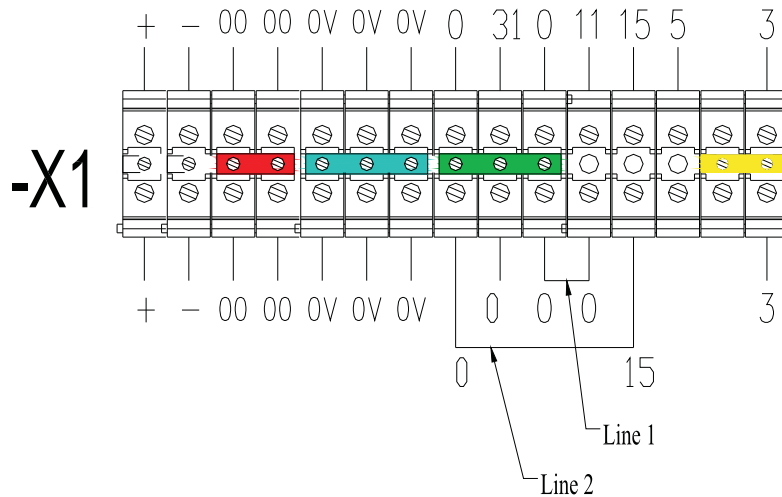


3) FOR HL-i70~i105



1). X1 Factory Setting Wiring Diagrams

a. HL-i10 ~ HL-i105/HL-i15c ~ HL-i50c



2). The Remote Switch and Flow Switch (FSW)

Flow Switch (FSW):

- 1) Remove line 1 (link between 0 & 11) before connecting the FSW;
- 2) The FSW wiring connecting point is with COM & NO only (this is to say that the FSW is OFF when no water pass through).

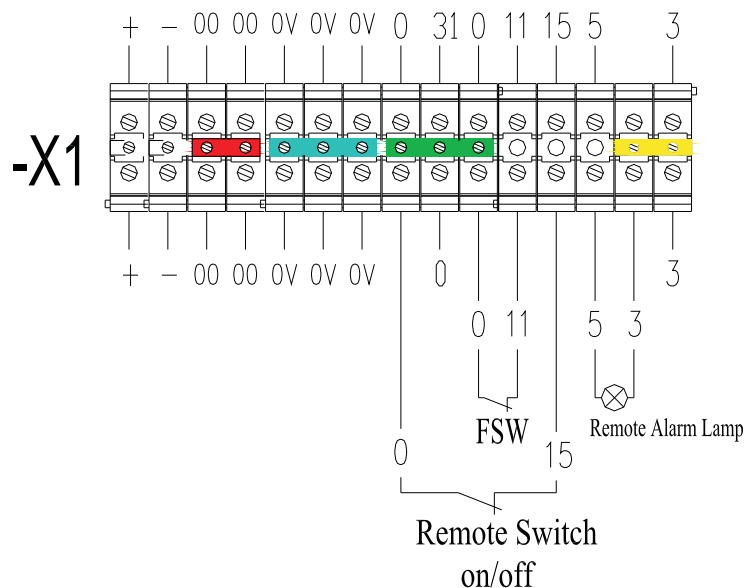
Remote ON/OFF Switch:

- 1) Remove line 2 (link between 0 & 15) before connecting the Remote ON/OFF Switch.

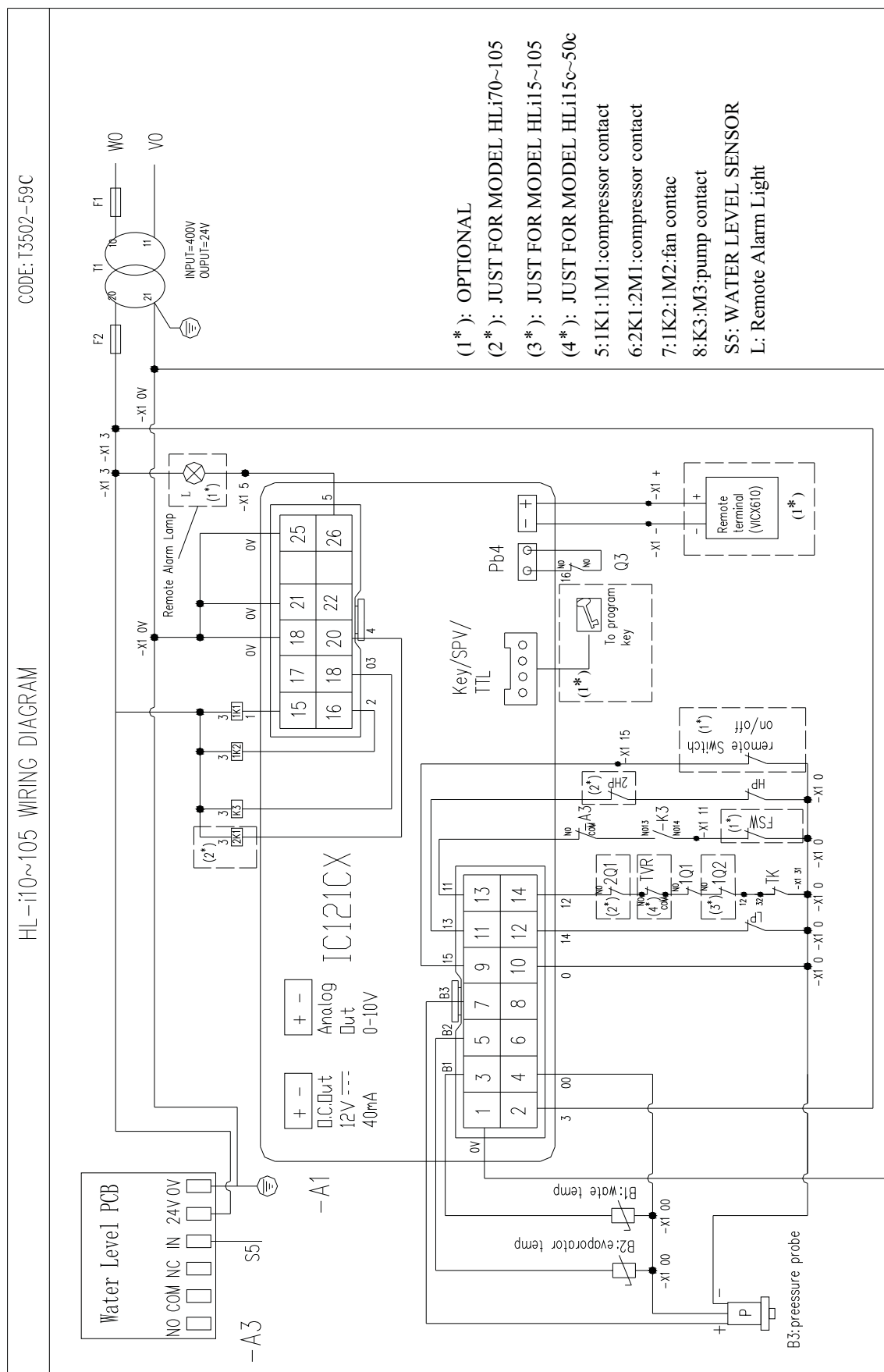
Remote Alarm Lamp:

- 1) Connect Remote Alarm Lamp accordingly.

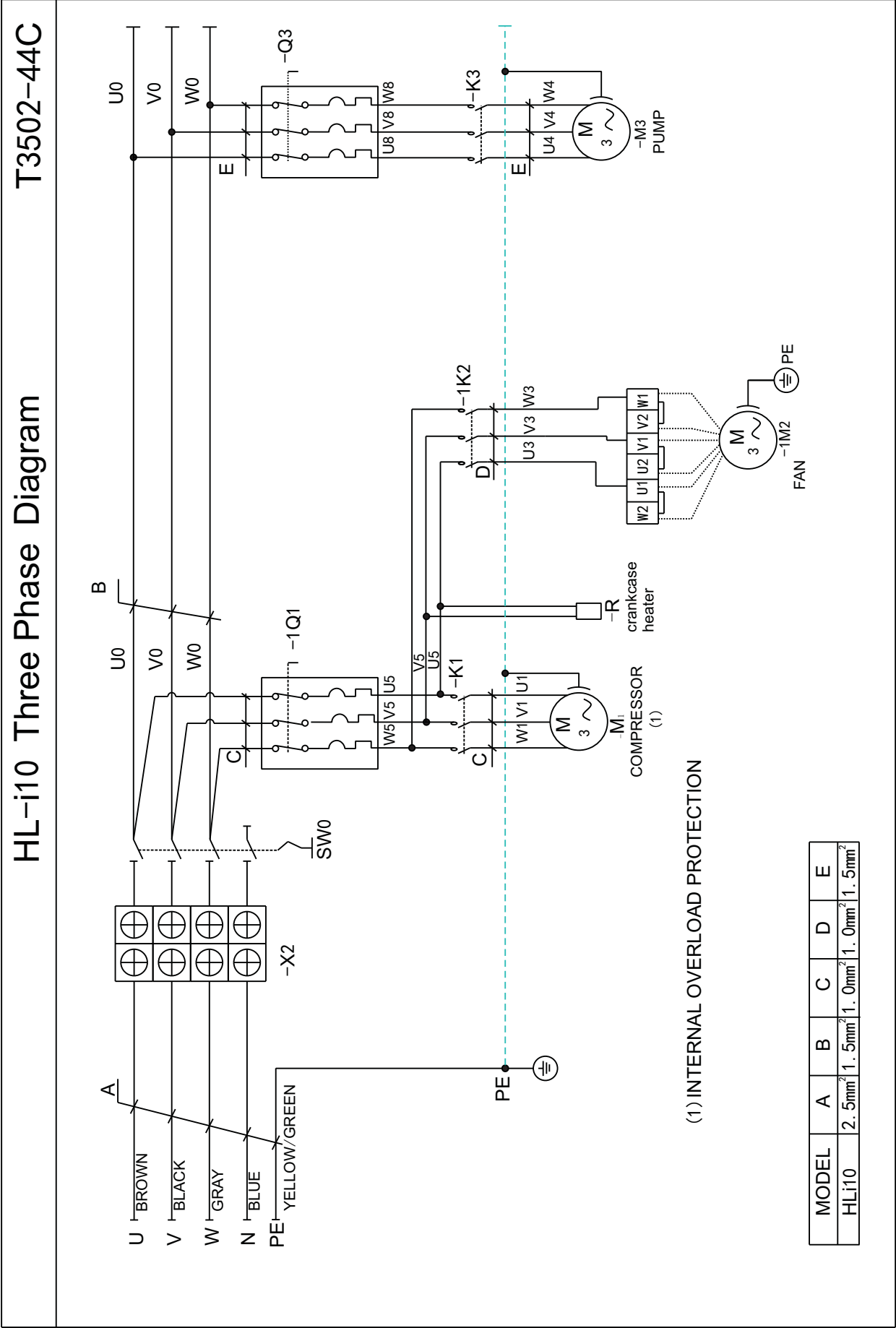
a. HL-i10 ~ HL-i105/HL-i15c ~ HL-i50c



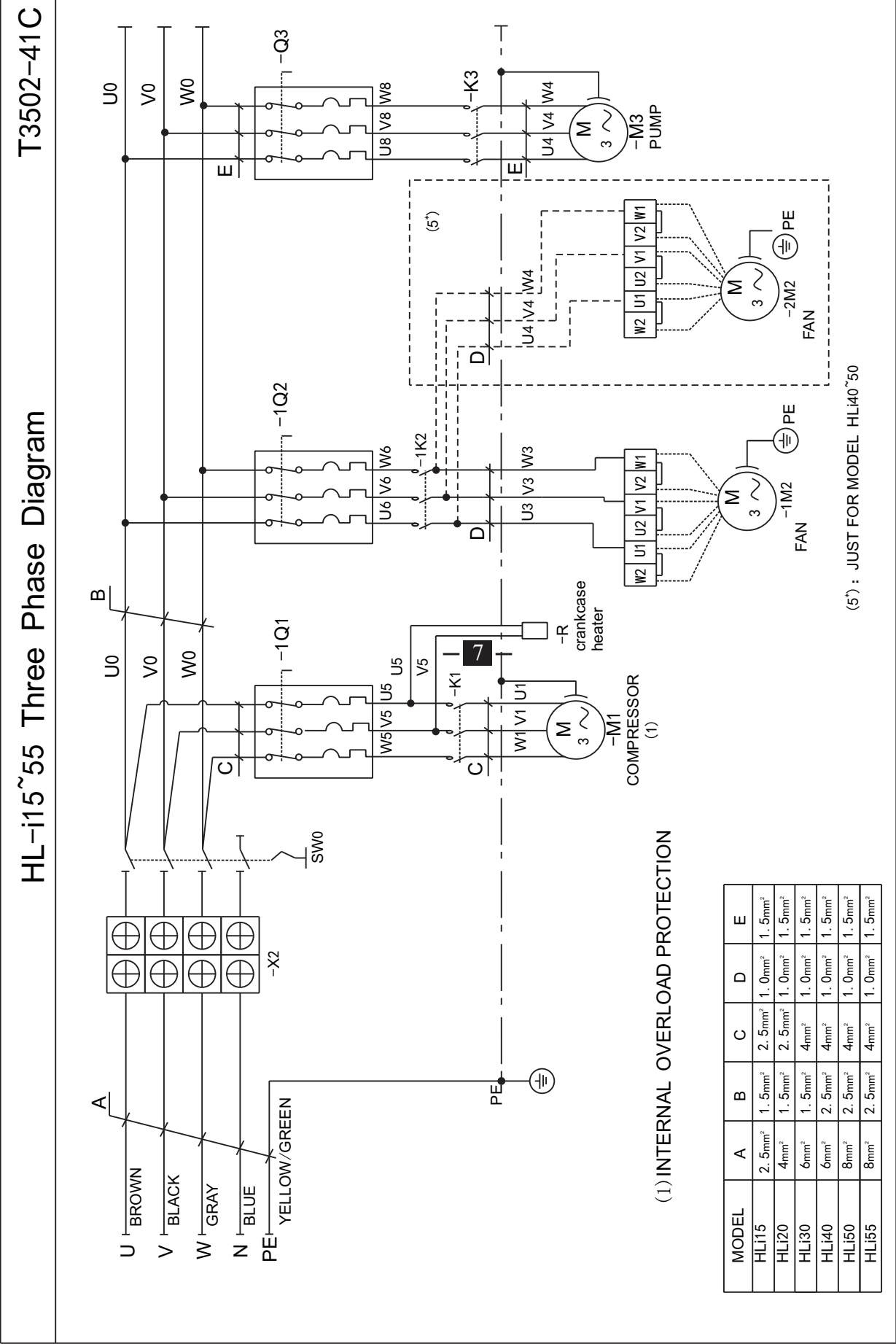
4). HL-i10 ~ HL-i105/HL-i15c ~ HL-i50c Wiring Diagram



6). HL-i10 Three Phase Diagram

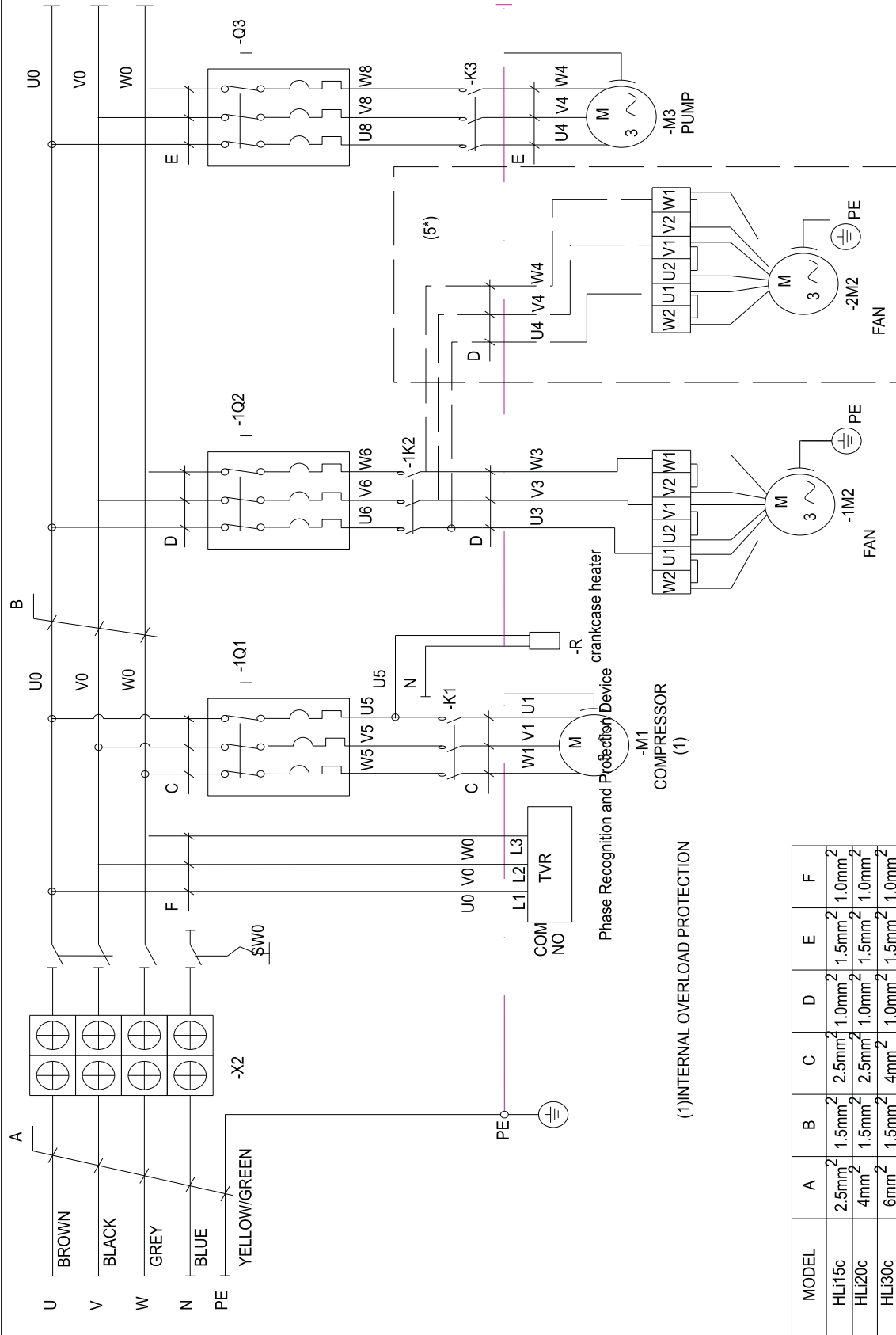


7). HL-i15 ~ HL-i55 Three Phase Diagram



HL-i15c~50c Three Phase Diagram

T3502-41C

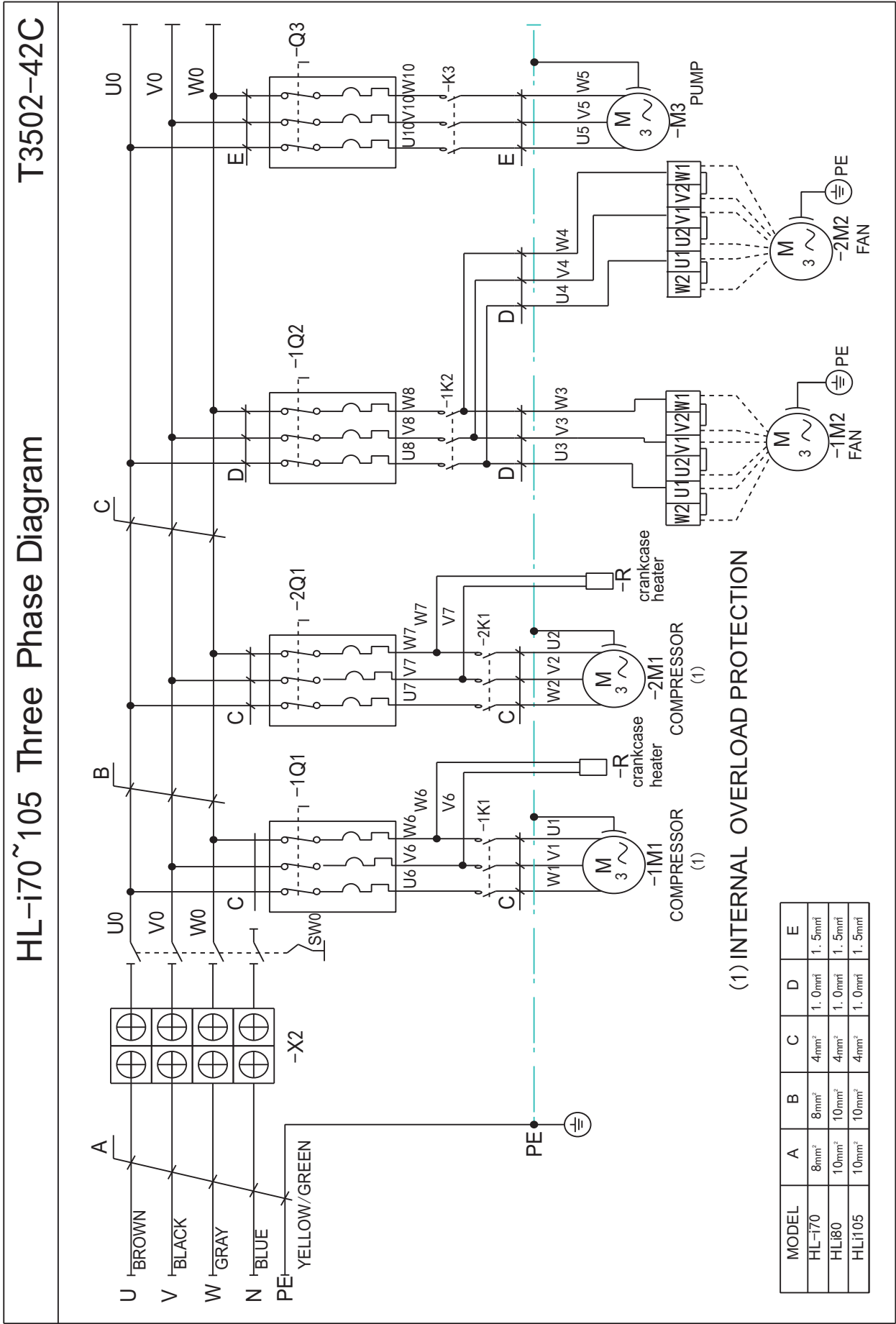


(5*) : JUST FOR MODEL HLi40~50

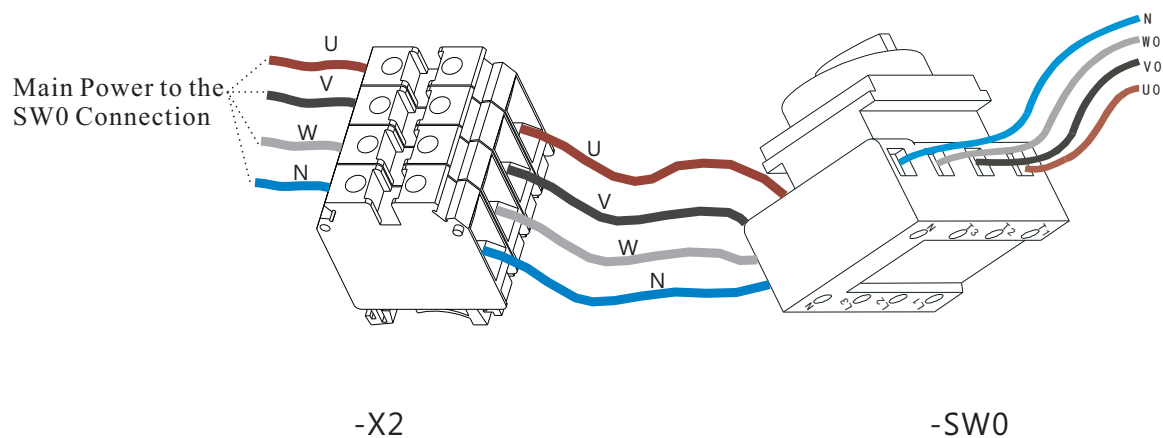
(1)INTERNAL OVERLOAD PROTECTION

MODEL	A	B	C	D	E	F
HLi15c	2.5mm ²	1.5mm ²	2.5mm ²	1.0mm ²	1.5mm ²	1.0mm ²
HLi20c	4mm ²	1.5mm ²	2.5mm ²	1.0mm ²	1.5mm ²	1.0mm ²
HLi30c	6mm ²	1.5mm ²	4mm ²	1.0mm ²	1.5mm ²	1.0mm ²
HLi40c	6mm ²	2.5mm ²	4mm ²	1.0mm ²	1.5mm ²	1.0mm ²
HLi50c	8mm ²	2.5mm ²	4mm ²	1.0mm ²	1.5mm ²	1.0mm ²

8). HL-i70 ~ HL-i105 Three Phase Diagram



11). HL-i10 ~ HL-i105/ HL-i15c ~ HL-i50c Main Power to the SW0 Connection Wiring Diagram



TROUBLESHOOTING

TROUBLE	PROBABLE CAUSE	POSSIBLE CURE
A) The unit doesn't start up	Defective connection or open contacts	Check voltage and close contacts
	The unit doesn't start up	Press and hold  for 5 seconds
	Compress delay timer	Wait for set delay time
	Safety device response is missing	
	The unit alarms	Check for the Error Code and do the relevant cure
	Wrong parameters setting	Reset
B) Compressor doesn't start	Burned or seized compressor	Replace compressor
	Compressor remote control switch is de energised	Check voltage at compressor coil's ends and check out for coil continuity
	Power circuit open	Try to find out the reason why protection is activated dose compressor's circuit
	The unit alarms	See point A
	Compressor's thermal overload circuit breaker acts	Reset
C) Compressor starts and stops repeatedly	Control temperature return diffirence setting is too small	Raise the return diffirence setting ('r02" parameter)
D) Compressor doesn't start Because the max. pressure switch has been actuated (HP1 or HP2 alarm)	Pressure switch out of order	Check and replace
	Excessive refrigerant charge	Recover excessive gas
	Clogged air condenser Too limited air capacity	Clean with compressed air or water jet
	Condenser fans are not working	See point F
	Condenser fans rotate in wrong direction	See Electric Connections paragraph
	Ambient air temperaturais too high	Reduce ambient temperature within design limits, for example by increasing local ventilation.
E) Compressor does not start because the min. pressure switch has been actuated	Pressure switch out of order	Check and replace
	Lack of refrigerant	Call a qualified refrigeration engineer to check for leaks and replenish refrigerant
	Water outlet sensor probesets too low so that the water freezes	Raise the set valueor change the LP Switch
	Water pump doesn't work	Check for the water pump
	Water flow isn't enough	Check for whether the water filteris dirty or clogged or not
	Clogged freon filter	Check and replace
	Thermostatic expansion valve is not working correctly	Check, clean or, if necessary, replace

F) Fans don't start	Burned or seized fans	Replace fans
	Pressure sensors are damaged	Replace pressure sensors
	Fans' thermal overload circuit breaker acts	Reset
G) The unit works and never stops	Lack of refrigerant	Call a qualified refrigeration engineer to check for leaks and replenish refrigerant
	Excessive thermal load	Reduce thermal load
	Compressor cooling capacity isn't as high as expected	Check, replace or reset
H) Pump doesn't start	Fans' thermal overload circuit breaker acts	Reset
	Burned pump	Check or replace
	No water inside the circuit	Check for hydraulic system to find leaks, if any, and refill
	The unit alarms	See point A
I) Signal of water differential pressure switch is not present	Pump set for low speed	Increase speed through variator on the pump
	Limited water capacity of the system	Check pressure drops in the system
	Shut-off valve of water circuit is closed	Open the closed valve

Alarm codes and actions

Error codes on the front control panel display

COD E	MEANING	CAUSE	ACTION	RESET
P1	Alarm of PB1 probe	Probe damaged or resistive value out of range	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Automatic If the resistive value returns within the envisaged range.
P2	Alarm of PB2 probe	Probe damaged or resistive value out of range	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Automatic If the resistive value returns within the envisaged range.
P3	Alarm of PB3 probe	Probe damaged or resistive value / power value out of range	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Automatic If the resistive value returns within the envisaged range.
P4	Alarm of PB4 probe	Probe damaged or resistive value out of range	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Automatic If the resistive value returns within the envisaged range.
A01	High pressure switch alarm or Phase Monitor tripping	Digital input / high pressure switch enabled or Phase Monitor digital input tripping. Possible tripped transformer fuse or relay malfunction.	Open collector / alarm relay output activated. Buzzer activated. High pressure alarm icon flashing. Code shown on display.	Manual When the pressure value has returned to normal or the alarm signalled by the Phase Monitor has been resolved, the manual reset procedure can be followed.
A02	Low pressure switch alarm	Digital input / low pressure switch enabled	Open collector / alarm relay output activated. Buzzer activated. Low pressure alarm icon flashing. Code shown on display.	Automatic It becomes manual after the value set of "tripping per hour" Manual The digital input is disabled and the resetting procedure is carried out
A03	Low ambient air temperature alarm	Analogue input enabled If CF01=0,1 with PB1 < AL20 for AL24 sec.	Open collector / alarm relay output activated. Buzzer activated. Low pressure alarm icon flashing. Code shown on display.	Automatic If PB1 > (AL20+AL21)
A04	Low air outlet temperature alarm	Analogue input enabled If CF01=0,1 with PB2 < AL20 for AL24 sec.	Open collector / alarm relay output activated. Buzzer activated. Low pressure alarm icon flashing. Code shown on display.	Automatic It becomes manual after the value set of "tripping per hour" Manual Disabled if PB2 > (AL20+AL21) and the resetting procedure is carried out
A05	High temperature High pressure	Analogue input enabled if PB3 or PB4 > of "set value"	Open collector / alarm relay output activated. Buzzer activated. High pressure alarm icon flashing. Code shown on display.	Manual Disabled if PB3 or PB4 < "set value" and the resetting procedure is carried out
A06	Low pressure / temperature alarm	Analogue input enabled if PB3 or PB4 < "set value"	Open collector / alarm relay output activated. Buzzer activated. Low pressure alarm icon flashing. Code shown on display.	Manual Disabled if PB3 or PB4 > "set value" and the resetting procedure is carried out

CODE	MEANING	CAUSE	ACTION	RESET
A07	Antifreeze alarm	Analogue input enabled if PB2 < "set value"	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Automatic Becomes manual after "trips per hour" value Manual Deactivation: - when the antifreeze adjustment probe PB2 > (AL20+AL21) plus reset procedure
	NOTE <i>To lower the antifreeze setpoint, contact the MTA after-sales service. Use a suitable amount of antifreeze solution in the system.</i>			
A07	Antifreeze alarm	Activation via digital input	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Automatic Becomes manual after "trips per hour" value Manual Deactivation: digital input disabled, plus reset procedure
A08	Flow meter alarm (air/water or water/water units)	Digital input enabled Active for "time set"	Open collector / alarm relay output activated. Buzzer activated. The icon for flow meter alarm flashes Code shown on display.	Automatic Becomes manual after "trips per hour" value Manual Deactivation: Digital input disabled for "time set" and reset procedure
A09	Compressor 1 thermal protection	Digital input enabled	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Manual Deactivation: digital input disabled, plus reset procedure
A10	Compressor 2 thermal protection	Digital input enabled	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Manual Digital input disabled and the resetting procedure is carried out
A09-A10	Compressor 1-2 thermal alarm	The alarm is visualized but not enabled during "compressor thermal delay time" after compressor start up	Alarm relay + buzzer activated.	If ID is not activated Manual To reset the alarm enter the programming
A11	Condensation fan alarm	Digital input enabled	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Manual Deactivation: digital input disabled, plus reset procedure
A12	Defrosting error alarm	End of defrosting due to maximum time	Code shown on display. Info only.	Automatic With next correct defrosting cycle Manual Reset procedure
A13	Compressor 1 maintenance alarm	Operating hours > "set threshold"	Open collector / alarm relay output activated. Buzzer activated. Code shown on display.	Manual Reset operating hours
A14	Compressor 2 maintenance alarm	Operating hours > "set threshold"	Open collector / alarm relay output activated. Buzzer activated. Code shown on display.	Manual Reset operating hours
A15	Water pump maintenance alarm	Operating hours > "set threshold"	Open collector / alarm relay output activated. General alarm icon flashing. Code shown on display.	Manual Reset operating hours

CODE	MEANING	CAUSE	ACTION	RESET
A17	Alarm on evaporator water pump thermoswitch / delivery fan thermoswitch	Digital input enabled	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Manual Deactivation: reset procedure
A20	Low water temperature at evaporator outlet	Activation via PB2 < of AL31 with unit switched on	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Automatic
A21	High water temperature at evaporator outlet	Activation via PB2 < of AL32 with unit switched on	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Automatic
EE	EEPROM error alarm	Memory data lost	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Manual Resetting procedure If after resetting the alarm persists the device remains blocked
noL	Alarm for failed communication with remote keypad	No communication between the controller and the remote keypad	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Automatic When communication problems between device and keypad are resolved
ACF1	Configuration alarm	Unit configured as heat pump, with commutation valve not configured if dF2=3	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Automatic With correct re-programming
ACF2	Configuration alarm	Air/air unit or water/air unit and: FA02 = 0 ventilation control probe not configured. Parameter configuration different from FA12 < FA13 and FA09+FA11+FA12 < FA10. Parameter configuration different from FA21 < FA22 and FA19+FA20+FA21 < FA18.	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Automatic With correct re-programming
ACF3	Configuration alarm	Two digital inputs with the same configuration	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Automatic With correct re-programming
ACF4	Configuration alarm	CF38=1 and digital input not configured, or CF38=2 PB4 probe other than 3.	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Automatic With correct re-programming
ACF5	Configuration alarm	CF02=1 and (CF04= 2,3 and CF05= 3) or (CF04=2 and CF05=3). If CF01=6 and CF02=1.	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Automatic With correct re-programming

CODE	MEANING	CAUSE	ACTION	RESET
FErr	Operating manual	CF04=3 and CF05=2 with digital inputs simultaneously active.	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Manual Disabling of the not active digital inputs + reset procedure
AFr	Net frequency alarm	Net frequency out of range	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Automatic When frequency returns within working range
ALOC	General machine shutdown alarm	Activation of digital input (indicated with a delay set in AL28). Alarm enabled in info mode only with AL30=1.	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Automatic Becomes manual after AL27 “trips per hour” value Manual Deactivation: digital input disabled for continuous time > AL29 + reset procedure
bLOC	General “info only” alarm	Activation of digital input (indicated with a delay set in AL28). Alarm enabled in info mode only with AL30=0.	Open collector / alarm relay output activated. Buzzer activated. General alarm icon flashing. Code shown on display.	Automatic Deactivation: digital input disabled for continuous time > AL29

Outlet blocking

Alarm code	Alarm Description	Comp. 1	Comp. 2	Antifreeze Resistances	Pump
P1	PB1 probe	Yes	Yes	Yes with Ar12 =0	
P2	PB2 probe	Yes	Yes	Yes with Ar12 =0	
P3	PB3 probe	Yes	Yes	Yes with Ar12 =0	
P4	PB4 probe	Yes	Yes	Yes with Ar12 =0	
A01	High pressure switch or phase monitor intervention	Yes	Yes	Support heater Yes	
A02	Low pressure switch	Yes	Yes		
A03	Low ambient air temperature				
A04	Low air outlet temperature	Yes	Yes	Yes	
A05	High temperature High pressure	Yes	Yes	Support heater Yes	
A06	Low pressure Low temperature	Yes	Yes		
A07	Analogue input antifreeze	Yes	Yes		
A07	Digital input antifreeze	Yes	Yes		
A08	Pump flow switch / thermoswitch	Yes	Yes	Boiler Res. Yes	Yes
A09	Compressor 1 thermal protection	Yes			
A10	Compressor 2 thermal protection		Yes		
A09-A10	Compressor 1 and 2 thermal protection	Yes			
A11	Condensation fan thermoswitch	Yes	Yes		
A12	Defrosting error				
A13	Compressor 1 maintenance				
A14	Compressor 2 maintenance				
A15	Water pump maintenance				
A17	Evaporator water pump thermoswitch	Yes	Yes		Yes

Alarm code	Alarm Description	Comp. 1	Comp. 2	Antifreeze Resistances	Pump
A17	Delivery fan thermoswitch	Yes	Yes	Support heater Yes	
A20	Low water temperature PB2				
A21	High water temperature PB2				
EE	Eeprom error	Yes	Yes	Yes	Yes
ACF1	Configuration alarm	Yes	Yes	Yes	Yes
ACF2	Configuration alarm	Yes	Yes	Yes	Yes
ACF3	Configuration alarm	Yes	Yes	Yes	Yes
ACF4	Configuration alarm	Yes	Yes	Yes	Yes
ACF5	Configuration alarm	Yes	Yes	Yes	Yes
ACF6	Configuration alarm	Yes	Yes	Yes	Yes
FErr	Operating error	Yes	Yes		Yes
AFr	Net frequency alarm	Yes	Yes	Yes	Yes
ALOC	General alarm	Yes	Yes	Yes	Yes
bLOC	General alarm				
AEUn	Evaporator unloading		Yes		
ACUn	Condenser unloading		Yes		
noL	Alarm on communication with remote keypad	Yes	Yes	Yes	Yes



Note: The warning relay differs from the alarm relay as it is only activated for warnings, that is, signals only, which have no direct effect on the operation of the unit, and the display does not show the alarm symbol (bell).

T3601-4F



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