

SWIMMING POOL HEAT PUMP UNIT

Installation & Instruction Manual

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1. PREFACE



- In order to provide our customers with quality, reliability and versatility, this product has been made to strict production standards. This manual includes all the necessary information about installation, debugging, discharging and maintenance. Please read this manual carefully before you open or maintain the unit. The manufacture of this product will not be held responsible if someone is injured or the unit is damaged, as a result of improper installation, debugging, or unnecessary maintenance. It is vital that the instructions within this manual are adhered to at all times. The unit must be installed by qualified personnel.
- The unit can only be repaired by qualified installer centre , personnel or an authorised dealer.
- Maintenance and operation must be carried out according to the recommended time and frequency, as stated in this manual.
- Use genuine standard spare parts only.
 Failure to comply with these recommendations will invalidate the warranty.
- Swimming Pool Heat Pump Unit heats the swimming pool water and keeps the temperature constant. For split type unit, The indoor unit can be Discretely hidden or semi-hidden to suit a luxury house.

Our heat pump has following characteristics:

1 Durable

The heat exchanger is made of PVC & Titanium tube which can withstand prolonged exposure to swimming pool water.

2 Installation flexibility

The unit can be installed outdoors or indoors.

3 Quiet operation

The unit comprises an efficient rotary/ scroll compressor and a low-noise fan motor, which guarantees its quiet operation.

4 Advanced controlling

The unit includes micro-computer controlling, allowing all operation parameters to be set. Operation status can be displayed on the color screen wire controller. Remote controller can be chosen as future option.



2.1 Performance data of Swimming Pool Heat Pump Unit

*** REFRIGERANT: R32

UNIT		CH-HP060LTIRM	CH-HP080LTIRM	
*Rated Heating Capacity	kW	24.4	34.7	
	Btu/h	82960	117980	
*Range	kW	5.8~24.4	8.2~34.7	
	Btu/h	19720~82960	27880~117980	
*Rated Heating Power Input	kW	4.65	6.90	
*Range	kW	0.437~4.65	0.66~6.90	
*Rated Running Current Input	A	7.77	10.96	
*Range	A	0.8~7.77	1.41~10.96	
**Rated Heating Capacity	kW	19	27.7	
	Btu/h	64600	94180	
**Range	kW	4.5~19	6.5~27.7	
	Btu/h	15198~64600	22100~94180	
**Rated Heating Power Input	kW	4.39	6.46	
**Range	kW	0.68-4.39	0.97-6.46	
**Rated Running Current Input	A	7.58	10.37	
**Range	A	1.2-7.58	2.07-10.37	
Power Supply		380V/3N~/50Hz	380V/3N~/50Hz	
Compressor Quantity		1	1	
Compressor		rotary	rotary	
Fan Quantity		1	1	
Fan Power Input	W	150	200	
Fan Rotate Speed	RPM	600-800	500-800	
Fan Direction		vertical	vertical	
Noise	dB(A)	48-58	50-61	
Water Connection	mm	50	50	
Water Flow Volume	m³/h	8.1	11.5	
Water Pressure Drop(max)	kPa	11	20	
Unit Net Dimensions(L/W/H)	mm	See the drawi	ng of the units	
Unit Ship Dimensions(L/W/H)	mm	See pack	age lable	
NetWeight	kg	see nameplate		
Shipping Weight	kg	see package label		

Rated Heating: *Outdoor air temp: 27°C/24.3°C, Inlet/Outlet water temp:26°C/28°C **Outdoor air temp: 15°C/12°C, Inlet/Outlet water temp:26°C/28°C During heating: Running ambient temperature: -15°C~35°C



$2.2\ {\rm The\ dimensions\ for\ Swimming\ Pool\ Heat\ Pump\ Unit}$

CH-HP060LTIRM

unit: mm



CH-HP080LTIRM

unit: mm





2.SPECIFICATION

2.3How to disassemble the units.





2.4 How the power cord go



2.5 How to replace the wire controller



Notes: Touch display installation for magnetic adsorption, can be directly removed

3.INSTALLATION AND CONNECTION



3.1 Installation illustration



Installation items:

The factory only provides the main unit and the water unit; the other items in the illustration are necessary spare parts for the water system ,that provided by users or the installer.

Attention:

Please follow these steps when using for the first time

- 1.Open valve and charge water.
- 2. Make sure that the pump and the water-in pipe have been filled with water.
- 3.Close the valve and start the unit.
- ATTN: It is necessary that the water-in pipe is higher than the pool surface.

The schematic diagram is for reference only. Please check the water inlet/outlet label on the heat pump while plumbing installation.



3.2 Swimming Pool Heat Pumps Location

The unit will perform well in any outdoor location provided that the following three factors are presented:

1. Fresh Air - 2. Electricity - 3. Pool filter piping

The unit may be installed virtually anywhere outdoors. For indoor pools please consult the supplier. Unlike a gas heater, it has no draft or pilot light problem in a windy area.

DO NOT place the unit in an enclosed area with a limited air volume, where the units discharge air will be re-circulated.

DO NOT place the unit to shrubs which can block air inlet. These locations deny the unit of a continuous source of fresh air which reduces it efficiency and may prevent adequate heat delivery.



3.3 How Close To Your Pool?

Normally, the pool heat pump is installed within 7.5 metres of the pool. The longer the distance from the pool, the greater the heat loss from the piping. For the most part ,the piping is buried. Therefore, the heat loss is minimal for runs of up to15 meters(15 meters to and from the pump = 30 meters total), unless the ground is wet or the water table is high. A very rough estimate of heat loss per 30 meters is 0.6 kW-hour,(2000BTU) for every 5 °C difference in temperature between the pool water and the ground surrounding the pipe, which translates to about 3% to 5% increase in run time.



3.4 Swimming Pool Heat Pumps Plumbing

The Swimming Pool Heat Pumps exclusive rated flow titanium heat exchanger requires no special plumbing arrangements except bypass(please set the flow rate according to the nameplate). The water pressure drop is less than 10kPa at max. Flow rate. Since there is no residual heat or flame Temperatures, The unit does not need copper heat sink piping. PVC pipe can be run straight into the unit.

Location: Connect the unit in the pool pump discharge (return) line downstream of all filter and pool pumps, and upstream of any chlorinators, ozonators or chemical pumps.

Standard model have slip glue fittings which accept 32mm or 50 mm PVC pipe for connection to the pool or spa filtration piping. By using a 50 NB to 40NB you can plumb 40NB

Give serious consideration to adding a quick coupler fitting at the unit inlet and outlet to allow easy draining of unit for winterizing and to provide easier access should servicing be required.



Condensation: Since the Heat pump cools down the air about $4 -5^{\circ}$, water may condense on the fins of the horseshoe shaped evaporator. If the relative humidity is very high, this could be as much as several litres an hour. The water will run down the fins into the basepan and drain out through the barbed plastic condensation drain fitting on the side of the basepan. This fitting is designed to accept 20mm clear vinyl tubing which can be pushed on by hand and run to a suitable drain. It is easy to mistake the condensation for a water leak inside the unit.

NB: A quick way to verify that the water is condensation is to shut off the unit and keep the pool pump running. If the water stops running out of the basepan, it is condensation. AN EVEN QUICKER WAY IS to TEST THE DRAIN WATER FOR CHLORINE - if the is no chlorine present, then it's condensation.



3.5 Swimming Pool Heat Pumps Electrical Wiring

NOTE: Although the unit heat exchanger is electrically isolated from the rest of the unit, it simply prevents the flow of electricity to or from the pool water. Grounding the unit is still required to protect you against short circuits inside the unit. Bonding is also required.

The unit has a separate molded-in junction box with a standard electrical conduit nipple already in place. Just remove the screws and the front panel, feed your supply lines in through the conduit nipple and wire-nut the electric supply wires to the three connections already in the junction box (four connections if three phase). To complete electrical hookup, connect Heat Pump by electrical conduit, UF cable or other suitable means as specified (as permitted by local electrical authorities) to a dedicated AC power supply branch circuit equipped with the proper circuit breaker, disconnect or time delay fuse protection.

Disconnect - A disconnect means (circuit breaker, fused or un-fused switch) should be located within sight of and readily accessible from the unit, This is common practice on commercial and residential air conditioners and heat pumps. It prevents remotely-energizing unattended equipment and permits turning off power at the unit while the unit is being serviced.

3.6 Initial startup of the Unit

NOTE- In order for the unit to heat the pool or spa, the filter pump must be running to circulate water through the heat exchanger.

Start up Procedure - After installation is completed, you should follow these steps:

1. Turn on your filter pump. Check for water leaks and verify flow to and from the pool.

2. Turn on the electrical power supply to the unit, then press the key ON/OFF of wire controller, It should start in several seconds.

3. After running a few minutes make sure the air leaving the top(side) of the unit is cooler(Between 5-10 $^\circ\!\!\!C)$

4. With the unit operating turn the filter pump off. The unit should also turn off automatically, 5. Allow the unit and pool pump to run 24 hours per day until desired pool water emperature is reached. When the water-in temperature reach setting, The unit just shuts off. The unit will now automatically restart (as long as your pool pump is running)when the pool temperature drops more than 2°C below set temperature.

Time Delay- The unit is equipped with a 3 minute built-in solid state restart delay included to protect control circuit components and to eliminate restart cycling and contactor chatter. This time delay will automatically restart the unit approximately 3 minutes after each control circuit interruption. Even a brief power interruption will activate the solid state 3 minute restart delay and prevent the unit from starting until the 5 minute countdown is completed. Power interruptions during the delay period will have no effect on the 3 minute countdown.



4.1 Color screen wire controller interface introduction

(1) Main interface



(2) Button Description

NO.	Name	The button function
1	ON/OFF	Press to start /shut off the unit
2	Parameter	Click this button to view the unit state and the parameter
3	CLOCK	Press to set the clock, the timer on or timer off
4	Fault display	Click to view fault history
5	Silent setting	Click to turn on/off silent function and to set timingLow speed function.
6	MODE	Click to enter the mode switch interface
0	Temp. curve	Click to view the temp. and power curve
8	Water Inlet Temp.	Click to enter mode setting and the target temp. Setting interface
9	LOCK	Click to lock the screen , Input "22" to unlock the screen by press the "lock button"



4.2 Color screen wire controller function introduction

(1) Booting and shutdown

As shown in figure 1.1:

In shutdown status, press (1) then the unit will be booted

In booting status, press ① then the unitt will be shut down.

(2) Mode switch and target temperature Setting

2-1 Mode switch

In the main screen, click mode button or inlet water temperature setting button, interface displays as follows:



Click the refrigeration mode button ①, automatic mode button② or heating mode button ③then you can select the corresponding mode .

Note: when the unit is designed for single automatic mode or single thermal mode, the mode can not be switched.

2-2Target temp setting

Click the temperature set button (4), you can set the target temperature.



(3) Clock setting

In the main interface, click on the clock Settings button, interface displays as follows:



3-1The operation of time setting

Click on the time Settings button (1), interface displays as follows:



Click the value to set time directly, the click confirm button to save the Settings.

For example: setup time: the 30-11-2016 16:00:00, input 30 11 16 16 00 00 , the time change then click confirm button.

Note: if the input format is not correct, the wrong time will be saved by clicking confirm button.



3-2 The operation of timing setting

Click the timing set button ② to enter timing set interface.

	0:00	D 1:0	8 10 12 14 16 18 18 20 10 10 10 10 10 10 10 10 10 1
1	2 (;	3 (1)	
NO.	Name	Button color	Button function
1	Timing start button	Start: green End: gray	Click this button to start or end timing start setting function
2	Timing on setting		Click to set start time of the timing
3	Timing end button	Open: red End: gray	Click this button to start or end timing end setting function
4	Timing off setting		Click to set end time of the timing



When the timer was starting, the clock button is green in the main interface



(4) Silent setting and silent timing setting

Click the silent setting button ,and the interface displays as follows:



4-1The silent button

Click the silent button ①, the unit will enter the silent mode,

and interface displays as follows:



Click the silent button ① again, to exit the silent mode.

4-2Timing silent function setting

Click timing silent button ②, and interface displays as follows:



NO.	Name	Colur	Function
1	Timing silent off	Used: red Unused:gray	Click to use or unuse timing off function
2	Timing silent on	Use:green Unused:gray	Click to use or unuse timing on function
3	Timing silent start time		Click this button to set the timing silent start time
4	Timing silent end time		Click this button to set the timing silent end time

Start time and end time setting value must be among the range of 0:00-23:00, and setting value can be precise to hour digit.

For example above, click "ON"to use timing silent, the unit will start the silent at 0:00 points and end at 4:00; click "OFF" to unuse the timing silent, but if the unit is in timing silent mode, it will exit silent timing immediately.



(5) History of the fault

In the main screen click fault display key, interface displays as follows:

Fault code	The fault name	day - month - year hour:min
Pro		Clean Clean
E08 Com	munication Fault	11-11-15 03:06

(6) Color Display Calibration

Keep click quickly at the blank area on any interface till you hear a long beep. Then you will enter the calibration interface. Click "+" to start calibration.When you hear the beep again, you will finish calibration and exit.

Remark: the wire controller can display the temperature unit as " ${}^{\circ}F$ " or " ${}^{\circ}C$ " according to the unit model you bought.

4.USAGE AND OPERATION

(7) Temperature curve

In the main interface, click the curve display button, interface displays as follows:



6-1 Temperature recording curve is as follows:

6-2 The average power curve



Temperature curve automatically updates every one hour, and the curve record can be stored for 60 days; Start from the latest curve saved time, if power is off and curve data collecting time is less than one hour, the data in this period will not be saved;



4.3 Parameter list and breakdown table

(1) Electronic control fault table

Can be judged according to the remote controller failure code and troubleshooting

Protect/fault	Fault display	Reason	Elimination methods
Standby	Non		
Normal boot	Non		
Inlet Temp. Sensor Fault	P01	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Outlet Temp. Sensor Fault	P02	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Amibent Temp. Sensor Fault	P04	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Coil Temp. Sensor Fault	P05	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Suction Temp. Sensor Fault	P07	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Discharge Temp. Sensor Fault	P081	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
High Pressure Prot.	E01	The high-preesure switch is broken	Check the pressure switch and cold circuit
Low Pressure Prot.	E02	Low pressure1 protection	Check the pressure switch and cold circuit
Flow Switch Prot.	E03	No water/little water in water system	Check the pipe water flow and water pump
Anti-freezing Prot	E07	Water flow is not enough	Check the pipe water flow and whether water system is jammed or not
Primary Anti-freezing Prot.	E19	The ambient temp. Is low	
Secondary Anti-freezing Prot.	E29	The ambient temp. Is low	
Inlet and outlet temp. too big	E06	Water flow is not enough and low differential pressure	Check the pipe water flow and whether water system is jammed or not
Low temperature protection	Non	The environment temp. is low	
Comp. Overcurrent Prot.	E051	The compressor is overload	Check whether the system of the compressor running normally
Exhaust Air over Temp Prot.	P082	The compressor is overload	Check whether the system of the compressor running normally
Communication Fault	E08	Communicat ion failure between wire controller and mainboard	Check the wire connection between remote wire controller and main board
Antifreeze Temp. Sensor Fault	P09	antifreeze temp sensor is broken or short circuited	check and replace this temp sensor
Waterway Anti-freezing Prot.	E05	water temp.or ambient temp. is too low	
EC fan feedback Fault	F051	There is something wrong with fan motor and fan motor stops running	Check whether fan motor is broken or locked or not
Pressure sensor Fault	PP	The pressure Sensor is broken	Check or change the pressure Sensor or pressure
Fan Motor1 Fault	F031	1. Motor is in locked-rotor state 2.The wire connection between DC-fan motor module and fan motor is in bad contact	1.Change a new fan motor 2.Check the wire connection and make sure they are in good contact

4.USAGE AND OPERATION



Fan Motor2 Fault	F032	1. Motor is in locked-rotor state 2. The wire connection between DC-fan motor module and fan motor is in bad contact	1.Change a new fan motor 2.Check the wire connection and make sure they are in good contact
Communication Fault (speed control module)	E081	Speed control module and main board communication fail	Check the communication connection

Frequency conversion board fault table:

Fault display	Reason	Elimination methods
F01	MOP drive alarm	Recovery after the 150s
F02	Frequency conversion board and main board communication failure	Check the communication connection
F03	IPM modular protection	Recovery after the 150s
F04	Lack of phase, step or drive hardware damag	Check the measuring voltage check requency conversion board hardware
F05	Motor current feedback open circuit or short circuit	Check whether current return wires connected motor
F06	IPM Input current is large	Check and adjust the current measurement
F07	DC bus voltage>Dc bus over-voltage protection value	Check the input voltage measurement
F08	DC bus voltage <dc bus="" over-voltage<br="">protection value</dc>	Check the input voltage measurement
F09	The input voltage is low, causing the input current is high	Check the input voltage measurement
F10	The input voltage is too high, more than outage protection current RMS	Check the input voltage measurement
F11	The input voltage sampling fault	Check and adjust the current measurement
F12	DSP and PFC connect fault	Check the communication connection
F26	The equipment load is too large	
F27	The PFC circuit protection	Check the PFC switch tube short circuit or not
F15	The IPM module is overheat	Check and adjust the current measurement
F16	Compressor magnetic force is not enough	
F17	The input voltage lost phase	Check and measure the voltage adjustment
F18	IPM sampling electricity is fault	Check and adjust the current measurement
F19	Sensor is short circuit or open circuit	Inspect and replace the sensor
F20	The transducer is overheat	Check and adjust the current measurement
F22	Transducer temperature is too high	Check and adjust the current measurement
F23	Compressor electricity is large	The compressor over-current protection
F24	Input current is too large	Check and adjust the current measurement
F25	MCU error	Check whether the chip is damaged Replace the chip
F28	The V15V is overload or undervoltage	Check the V15V input voltage in range 13.5v~16.5v or not
	display F01 F02 F03 F04 F05 F06 F07 F08 F09 F10 F11 F12 F26 F17 F18 F19 F20 F22 F23 F24 F25 F28	GisplayReasonF01MOP drive alarmF02Frequency conversion board and main board communication failureF03IPM modular protectionF04Lack of phase, step or drive hardware damagF05Motor current feedback open circuit or short circuitF06IPM Input current is largeF07DC bus voltage>Dc bus over-voltage protection valueF08DC bus voltage <dc bus="" over-voltage<br=""></dc> protection valueF09The input voltage is low, causing the input current is highF10The input voltage is too high, more than outage protection current RMSF11The input voltage is too largeF26The equipment load is too largeF27The PFC circuit protectionF15The IPM module is overheatF16Compressor magnetic force is not enoughF17The input voltage lost phaseF18IPM sampling electricity is faultF20The transducer is overheatF22Transducer temperature is too highF23Compressor electricity is largeF24Input current is too largeF25MCU errorF28The V15V is overload or undervoltage



(2) Parameter list

Meaning	Default	Remarks
Refrigeration target temperature set point	27 ⁰	Adjustable
Heating the target temperature set point	27 ⁰	Adjustable
Automatic target temerature set point	27º	Adjustable

4.4 Interface drawin

(1) Wire control interface diagram and definition

	Sign	Meaning
	V	12V-power +~
R	R	Nouse
T	Т	Nouse
A	A	485A
G	В	485B
	G	GND (power -)

(2) Controller interface diagram and definition

	AC-N OUT5 OUT4 OUT3 OUT2	T1
	PC1002	GND 85_B1 85_A1 12V GND
CN9	GND +12V GND +5V GND -10V-OUT GND PWM-OUT GND PWM-OUT GND PWM-OUT GND PWM-OUT GND PVM-IN GND PVM-IN GND AI/D109 GND AI/D101 GND AI/D101	.85_B2 .85_A2 12V



Main board of the input and output interface instructions below

Number	Sign	Meaning					
01	OUT1	Compressor (output 220-230VAC)					
02	OUT2	Water pump (output 220-230VAC)					
03	OUT3	4-way valve (output 220-230VAC)					
04	OUT4	High speed of fan (output 220-230VAC)					
05	OUT5	Low speed of fan (output 220-230VAC)					
06	AC-L	Live wire (input 220-230VAC)					
07	AC-N	Neutral wire (input 220-230VAC)					
08	AI/DI01	Emergency switch (input)					
09	AI/DI02	Water flow switch (input)					
10	AI/DI03	System low pressure (input)					
11	AI/DI04	System high pressure (input)					
12	AI/DI05	System suction temperature (input)					
13	AI/DI06	Water input temperature (input)					
14	AI/DI07	Water output temperature (input)					
15	AI/DI08	System fan coil temperature (input)					
16	AI/DI09	Ambient temperature (input)					
17	AI/DI10	Mode switch (input)					
18	AI/DI11	Master-slave machine switch / Antifreeze					
10		temperature (input)					
19	AI12(50K)	System Exhaust temperature (input)					
20	0_5V_IN	Compressor current detection/Pressure sensor(input)					
21	PWM IN	Master-slave machine switch / Feedback signal of EC					
21		fan (input)					
22	PWM_OUT	AC fan control (output)					
23	0_10V_OUT	EC fan control (output)					
24	+5V	+5V (output)					
25	+12V	+12V (output)					
26	GND						
27	485_B1	Frequency conversion board communications					
28	485_A1						
29	12V						
30	GND						
31	485_B2	Color line controller communication					
32	485_A2						
33	12V						
34	CN9	Electronic expansion valve					
35	GND						
36	485_B3	The port for centralized control					
37	485_A3						
38	12V						

5. MAINTENANCE AND INSPECTION



- Check the water supply device and the release often. You should avoid the condition of no water or air entering into system, as this will influence unit's performance and reliability. You should clear the pool/spa filter regularly to avoid damage to the unit as a result of the dirty of clogged filter.
- The area around the unit should be dry, clean and well ventilated. Clean the side heating exchanger regularly to maintain good heat exchange as conserve energy.
- The operation pressure of the refrigerant system should only be serviced by a certified technician.
- Check the power supply and cable connection often, .Should the unit begin to operate abnormally, switch it off and contact the qualified technician.
- Discharge all water in the water pump and water system ,so that freezing of the water in the pump or water system does not occur. You should discharge the water at the bottom of water pump if the unit will not be used for an extended period of time. You should check the unit thoroughly and fill the system with water fully before using it for the first time after a prolonged period of no usage.



6.1 Caution & Warning

- 1. The unit can only be repaired by qualified installer centre personnel or an authorised dealer(for Europe market).
- 2. This appliance can used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved(for Europe market). Children shall not play with the appliance .Cleaning and user maintenance shall not be

made by children without supervision.

- 3. Please make sure that the unit and power connection have good earthing, otherwise may cause electrical shock.
- 4. If the supply cord is damaged, it must be replaced by the manufacturer or our service agent or similarly qualified person in order to avoid a hazard.
- 5. Directive 2002/96/EC (WEEE):

The symbol depicting a crossed-out waste bin that is underneath the appliance indicates that this product, at the end of its useful life, must be handled separately from domestic waste, must be taken to a recycling centre for electric and electronic devices or handed back to the dealer when purchasing an equivalent appliance.

- 6. Directive 2002/95/EC (RoHs): This product is compliant with directive 2002/95/EC (RoHs) concerning restrictions for the use of harmful substances in electric and electronic devices.
- 7. The unit CANNOT be installed near the flammable gas. Once there is any leakage of the gas , fire can be occur.
- 8. Make sure that there is circuit breaker for the unit, lack of circuit breaker can lead to electrical shock or fire.
- 9. The heat pump located inside the unit is equipped with an over-load protection system. It does not allow for the unit to start for at least 3 minutes from a previous stoppage.
- 10. The unit can only be repaired by the qualified personnel of an installer center or an authorized dealer(for North America market).
- 11. Installation must be performed in accordance with the NEC/CEC by authorized person only (for North America market).
- 12. Use supply wires suitable for $75^\circ\!\mathbb{C}.$
- 13. Caution: Single wall heat exchanger is not suitable for potable water connection.
- 14. The appliance shall be installed in accordance with national wiring regulations.
- 15. The appliance must be fitted with means for disconnection from the supply mains having a contact separation in all poles that provide full disconnection under overvoltage category III conditions, and these means must be incorporated in the fixed wiring in accordance with the wiring rules.
- 16. An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring.



6.2 Cable specification

(1) Single phase unit

Nameplate maximum current	Phase line	Earth line	МСВ	Creepage protector	Signal line
No more than 10A	$2 \times 1.5 \text{mm}^2$	1.5mm ²	20A	30mA less than 0.1 sec	
10~16A	$2 \times 2.5 \text{mm}^2$	2.5mm ²	32A	30mA less than 0.1 sec	
16~25A	$2 \times 4 \text{mm}^2$	4mm ²	40A	30mA less than 0.1 sec	
25~32A	$2 \times 6 \text{mm}^2$	6mm ²	40A	30mA less than 0.1 sec	
32~40A	$2 \times 10 \text{mm}^2$	10mm ²	63A	30mA less than 0.1 sec	
40~63A	$2 \times 16 \text{mm}^2$	16mm ²	80A	30mA less than 0.1 sec	$n \times 0.5 mm^2$
63~75A	$2 \times 25 \text{mm}^2$	25mm ²	100A	30mA less than 0.1 sec	
75~101A	$2 \times 25 \text{mm}^2$	25mm ²	125A	30mA less than 0.1 sec	
101~123A	$2 \times 35 \text{mm}^2$	35mm ²	160A	30mA less than 0.1 sec	
123~148A	$2 \times 50 \text{mm}^2$	50mm ²	225A	30mA less than 0.1 sec	
148~186A	$2 \times 70 \text{mm}^2$	70mm ²	250A	30mA less than 0.1 sec	
186~224A	$2 \times 95 \text{mm}^2$	95mm ²	280A	30mA less than 0.1 sec	

(2) Three phase unit

Nameplate maximum current	Phase line	Earth line	МСВ	Creepage protector	Signal line
No more					
than 10A	3×1.5mm ²	1.5mm ²	20A	30mA less than 0.1 sec	
10~16A	3×2.5mm ²	2.5mm ²	32A	30mA less than 0.1 sec	
16~25A	3×4mm ²	4mm ²	40A	30mA less than 0.1 sec	
25~32A	3×6mm ²	6mm ²	40A	30mA less than 0.1 sec	
32~40A	3×10mm ²	10mm ²	63A	30mA less than 0.1 sec	
40~63A	$3 \times 16 \text{mm}^2$	16mm ²	80A	30mA less than 0.1 sec	$n \times 0.5 mm^2$
63~75A	$3 \times 25 \text{mm}^2$	25mm ²	100A	30mA less than 0.1 sec	
75~101A	$3 \times 25 \text{mm}^2$	25mm ²	125A	30mA less than 0.1 sec	
101~123A	$3 \times 35 \text{mm}^2$	35mm ²	160A	30mA less than 0.1 sec	
123~148A	$3 \times 50 \text{mm}^2$	50mm ²	225A	30mA less than 0.1 sec	
148~186A	3×70mm ²	70mm ²	250A	30mA less than 0.1 sec	
186~224A	$3 \times 95 \text{mm}^2$	95mm ²	280A	30mA less than 0.1 sec	

When the unit will be installed at outdoor, please use the cable which can against UV.





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