

ZHRA2

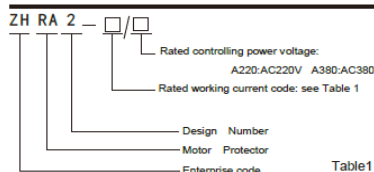
Operating Instructions for ZHRA2 Motor Protector

ZHRA2

Function Features

- Wide current setting range. Adjustable C.T. ratio. True current value displayed.
- High performance microprocessor with strong anti-interference capabilities and high reliability.
- Current display accuracy $\leq 2\%$
- Inverse time limit / definite time limit options.
- Phase failure, Phase unbalance, Overloading, Stall protection functions
- Three phases current value could be monitored; Protection parameters set using front panel keys.
- No-voltage release function, providing No load start.
- Installed on the 35mm standard guide rails

Model and Connotation



Rated working current code	Rated working current	Applicable motor power
6	0.5A...6A	0.25kW...3kW
60	5A...60A	3kW...30kW
240	20A...240A	11kW...110kW

The transformation ratio of CT for ZHRA2-6 can be set. The CT transformation ratio can be set when secondary current is adopted, for example, 100/5 is set as 20.

Please contact us for any special specifications.

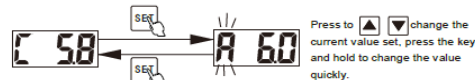
Main Technical Parameters

Rated control supply voltage	AC220V, AC380V 50/60Hz Allowable fluctuation range: $\pm 20\%$
Main circuit rated frequency	~50Hz/60Hz
Current display accuracy	$\pm 2\%$
Rated operating voltage	AC380V
Rated insulation voltage	AC690V
Power consumption	$\leq 1.5\text{VA}$
Reset mode	Reset upon power off or press RST key
Type and number of pairs of contacts	95 — 96 97 — 98
Electrical durability	100000 cycles
Mechanical durability	1000000 cycles
Conventional heat current	5A
Utilization category	AC-15
Contact capacity	AC-15: Ue/Ie AC240V/1.5A, AC380V/0.95A
Height above sea level	$\leq 2000\text{m}$
IP degree of protection	IP20
Pollution degree	3
Operation temperature	$-20 \dots +60^\circ\text{C}$
Permissible relative humidity	$\leq 50\%$ (40°C)
Storage temperature	$-25 \dots +75^\circ\text{C}$

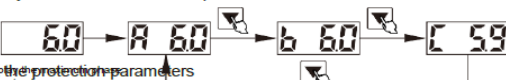
Operating Instructions

T/R	Press this key to provide failure protection testing function. Press this key when the motor stops. 95 and 96 will be disconnected. In order to prevent the motor from stopping by mistake, pressing this key when the motor is operating is invalid. Press this key when there is a failure to reset the protector.
SET	Press this key for a short time to set the current. Press this key for 3s or longer to enter menu to set parameters.
▲ ▼	Under normal operation conditions, the digital tube displays the maximum phase current value. Press this key to display the current values of the three phases in turn. Under setting conditions, press this key to change the setting parameters. Under failure protection, press this key to display the failure current values of the three phases.

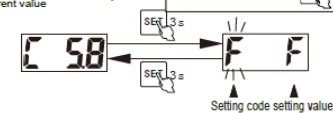
Set the current value



Inquiry the current of the three phases



Set the protection parameters



Setting steps	Setting options	Setting code	Factory value	Press ▲ ▼ to change the setting value
1	Inverse time limit/ definite time limit options	F	F	F → D: Inverse time limit D: definite time limit
2	Inverse time limit: tripping grade setting	2	2	1 → 2 → 3 → 4 → 5
	Definite time limit: tripping time setting	t	05	Setting Range: 0...30s
3	Startup time	q	04	Setting Range: 2...60s
4	Under-load protection	u	OFF	Setting Range: OFF/30%...70%
5	Stall	S	OFF	OFF/ON
6	Lock	L	OFF	Setting Range: OFF/2.0...9.0
7	Phase failure / unbalance	P	OFF	OFF/ON
8	Transformation ratio setting	C	OFF	Setting Range: 1...150 (ZHRA6-S6)

- Press the setting keys for a short time to change the setting steps under setting status.
- If no operation is carried out on the keys within 60s under setting status, the protector will exit the setting status automatically.
- Under setting status, the protection function of the protector is invalid. Therefore, it is suggested for the users to set the parameters of the motors when the motor stops. Start up the motor when the setting is completed.
- Please contact us for any problems in protector parameters setting.

Operating Instructions

- Definite time limit overload protection: when the working current of the motor exceeds the setting value, the protector will act according to the setting action time.
- Inverse time limit overload protection: when the protector detects that the working current is 1.1 times larger than the setting current, the protector will carry out delay protection according to the setting tripping curve (see Table 1).

Table 1 Inverse time limit features (delay action error $\leq \pm 10\%$)

Overload times Action time(s)	1.0	1.2	1.5	2	5	6	7.2	Remark
Tripping curve								
K=1	No action	63	40	22	3.6	2.5	1.8	Grade 5
K=2		125	80	45	7.2	5	3.5	Grade 10A
K=3		250	160	90	14	10	6.9	Grade 10
K=4		500	320	180	29	20	14	Grade 20
K=5		750	480	270	43	30	21	Grade 30

BRANCH CONTACT DETAILS

Johannesburg	010 202 3300
Germiston	011 418 9600
Cape Town	021 510 0710
Pinetown	031 700 4215
Riverhorse	031 492 4800

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Sales	010 202 3400
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- Under load protection: The factory setting is off. Users can turn it on and set the
- Under load ratio. Under load current = setting current x underload rate % . When the operating current of the protector is lower than the under load current, the action time of the protector is 3s.
- Rotation blockage protection: The factory setting is off. Users can turn it on. After the start-up delay, if the starting current does not decrease to the rotation blockage current value (1.8 times of the setting current), the protector will judge it as motor rotation blockage. The action time is 5s.
- Blocking protection: The factory setting is off. Users can turn it on and set the blocking times. Blocking current = setting current x blocking times. The protector will act when the operating current is larger than the blocking current. The action time is 0.5s.
- Phase failure/ unbalance protection: The factory setting is on. It could be turned off if necessary. When the protector detects the unbalance ratio of the current of three phases is over 40%, the protector will carry out unbalance protection. The action time is 5s. When the protector detects that any phase is 0, the protector will carry out phase failure protection. The action time is 3s.

$$\text{Unbalance ratio of three-phase current} = \frac{\max |I_i - I_{avg}|}{I_{avg}} \times 100\%$$

I_i : phase current; I_{avg} : average of 3 phase current

- Short circuit protection: when the operating current exceeds 10 times of the setting current value, the action time of the protector is 0.1s in order to ensure the prior tripping of the circuit breaker.

Directions for use

- Examine the performance of the protector and carry out protection function test on regular basis. The tests shall be carried out by qualified personnel.
- The protector has power-fail protection function. 95 and 96 will close when the protector is energised. 95 and 96 will be disconnected when not energised.
- When the actual operating current value is lower than 25% of the minimum setting current value, the protector will display 0A.
- Secondary current transformation ratio adjusting function: for example, the secondary current mutual inductor is 200/5, the transformation ratio is 200/5 = 40. The transformation ratio of the protector shall be 40. The setting current range of the protector is 20A~240A. The current displayed is the actual current value. If secondary current is not adopted, do not change the transformation ratio setting of CT; otherwise, measuring error will be generated.
- Please take serious consideration about Phase failure and unbalance function.

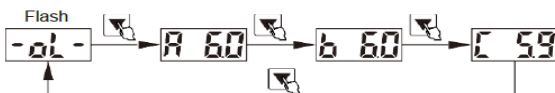
Directions for use

A1		
A2		
The protector not electrified	Operate normally	Motor fault
95		
96		
97		
98		

Failure code

When the motor breaks down, the failure cause will be displayed and flashes. Press key to inquire the failure current value of each phase. Reset by pressing the reset key after the failure is removed.

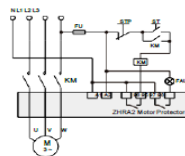
For example: over load failure



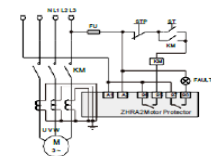
Fault Display Code	Failure cause	Fault Display Code	Failure cause
-OL-	Overload	-LC-	Lock
-UL-	Under load	-St-	Stall
-PF-	Phase Failure /Unbalance	-LH-	Short circuit

Wiring diagram

Wiring diagram for direct start (used with 220V contactor)

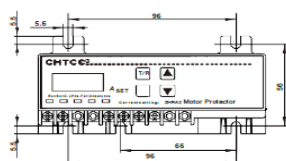
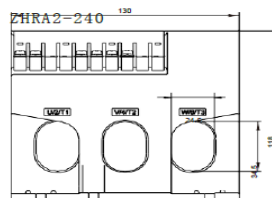
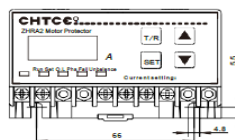
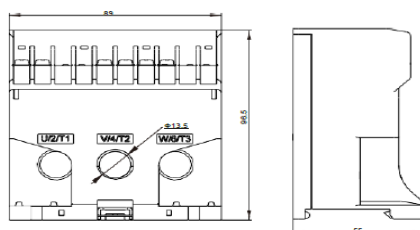


Wiring diagram for secondary current (used with 220V contactor)



Overall Dimensions

ZHRA2-6, ZHRA2-60



Warning

- This product shall be installed, operated and maintained by professional personnel.
- Whether or not the product functions normally, user shall not dismantle or repair the said product without permission, and we shall not assume any responsibility for the accident as a result thereof.
- Please refer to the wiring diagram in Operation Instructions when arranging wires.
- Never place power input line in the same conduit with other wires with heavy current. Please use shielded wire if necessary so as not to bring about interference that may influence the normal operation of relay.
- Do not use this product in areas with dust, corrosive gases and with exposure to direct sunlight and rain.
- Never use this product in medium with explosion hazard and with gases that may corrode metals and destroy the insulation, and do not use this product in a space with conductive dust.
- Please store and use this product at rated supply voltage and stated temperature, height above sea level and humidity.
- Failure to follow these instructions can result in death, serious injury, or equipment damage.
- The warranty period of this product shall be 18 months under normal use.

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