

### Introduction

This instruction manual is related to installation, wiring using and maintenance of Contactor/Starter.

#### ■ Warranty period and contents

This Magnetic Contactor warranty period is one year after bought. If the items is broken by our company's responsibility, we change broken parts or repair it for free.

Even during warranty period, fee occurs in case of following.

- (1) Failure by inappropriate handling, using, and remodeling or repair other than our company.
- (2) Failure which are cause by other than our products, for example, external factor by the broken majeure and natural disasters.

“Warranty” means about we guarantee our products. Other damage induced by the broken items, which is out of warranty for our company.

### Notes of Safety

Before using this Contactor/Starter, you should first thoroughly read this manual, to understand appropriate usage and handling.

#### ⚠ DANGER

- Don't touch or come near when turn ON the power. Can cause burns or electric-shock.
- Inspect the energized parts of the main circuit regularly. Can cause burns or fire.
- Turn off power when maintenance. Can cause electric-shock.

#### ⚠ CAUTION

- At the time of Installation, line side of contactor install the line side up a vertical panel or wall where dust, moisture and vibration are small, and secure the space specified in the instruction manual. Can cause burns or fire.
- Use a wire size suitable for the applied voltage and energized current and tighten the wiring with the tightening torque specified in the instruction manual. Can cause fire.

#### 1. Before installation

Before installation, be sure whether type, rated current, coil voltage and, frequency marked on the name plate is agreed with ordered specifications and whether there are no fallen off parts or any damaged portions.

#### 2. Installation and wiring

At the time of installation, secure appropriate space shown by Table1.

Wiring must tighten appropriate tightening torque shown by Table2.

Table1. Clearance at installation

Frame		Clearance (minimum : mm)				Mounting space	
Contactor	Contactor Relay	A	B	C	D		
HC8M(-T) HC10M(-T)	XC4M	5	15	2	10		
HC8(-T) HC10(-T)	XC4	5	15	2	10		
HC20(-T)		5	15	2	10		
HC35(-T)		5	15	4	10		
HC55(-T)		5	15	4	10		
Mounting unit of Thermal Relay (TRC□)		5	15	5	10		

Table2. Wire size and tightening torque

	Terminal Type	Model	Screw size	Apply wire		Max. width of solderless terminal (mm)	Recommended torque (N·m)
				AWG	Stranded wire (mm <sup>2</sup> )		
Contactor Contactor Relay	All	XC4M, HC8M, HC10M	M3.5	18~12	1.25~2	7.6	1.1
	Main Contact	HC8	M3.5	18~10	1~6	7.6	1.1
		HC10	M3.5	16~10	1.5~10	7.6	1.1
		HC20	M4	14~8	2.5~10	9.6	2.2
		HC35	M5	12~8	2.5~10	12.8	2.9
		HC55	M6	10~4	6~25	14	4.0
	Aux. Contact	XC4, HC8~HC20	M3.5	18~12	0.75~2.5	7.6	1.1
Coil	HC35, HC55	(※1)	18~12	0.75~2.5	7.6	1.1	
Thermal Relay	All	TRC12M	M3.5	18~12	1.25~2	7.6	1.1
	Main Contact	TRC12	M3.5	24~10	1.25~2	7.6	1.1
		TRC32 (~RC27A)	M4	18~8	1~6	12	1.1 (※2)
		TRC32 (RC34A)	M5	18~8	6~10	12	2.2 (※2)
		TRC63	M6	18~6	10~16	15	3.9
	Aux. Contact	TRC12	M3.5	18	1	7.6	1.1
		TRC32, TRC63	M3.5	18	1	7.6	0.9

- (※1) The screw size is M4, but the diameter of the crimp terminal penetration part is about φ2.3 mm, so M3 and M3.5 crimp terminals can be used.
- (※2) The proper tightening torque of the main terminal (UZ-32) when use the mounting unit is 1.6 (N · m).
- There is a hole for screw tightening in the cover of the terminal part, but some terminals, such as auxiliary contact terminals, cannot penetrate the hole with a screwdriver with a large shaft diameter and cannot be tightened. The wiring work remove the terminal cover, or use a thin diameter shaft screwdriver. (φ5.5 or less recommended).
- When wiring using round crimp terminals, it is necessary to remove the cover of the terminal part to remove the screw from the main body once. The economy Magnetic Contactor has an integrated structure between the main body cover and the terminal cover, and it is difficult to remove the cover, so we will deliver it with the cover removed. When using a round crimp terminal, attach the cover after the wiring work is completed. (Please refer to the technical manual)

■ About coil terminal

The standard HC series has coil terminals in two places of one on the line side and one on the load side, and both can be used. (Line side terminal and load side terminal can be used together) Since the pins with the same terminal number between the line side and load side are electrically short-circuited, do not apply voltage between A1-A1 and A2-A2. A short-circuit accident occurs. In order to prevent incorrect wiring, the coil terminal part on the load side is protected by a lid, and the wiring cannot be done without removing the lid.

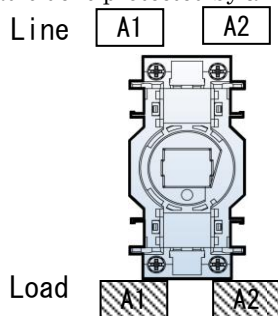
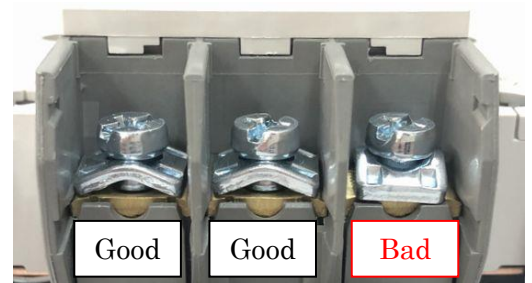


Table3. Coil terminal connectable position combinations

	A1	A2	A1	A2
A1	X	⏏	X	⏏
A2	⏏	X	⏏	X
A1	X	⏏	X	⏏
A2	⏏	X	⏏	X

■ About screw

Screws are directional. Please pay attention to the mounting direction. Installing screws in the wrong direction, may lead to abnormal overheating of the terminals or, falling, or disconnection of the wiring.



### 3. Using

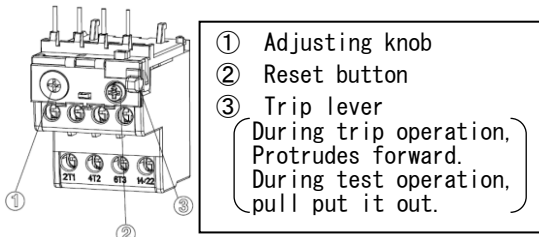
#### ■Normal service condition

- (1) Ambient temperature : -5°C to 55°C (-5°C to 40°C in the case of DC operation type)
- (2) Relative humidity : 45 to 85% (No condensation)
- (3) Altitude : 2000m or lower
- (4) Atmosphere : Must be free from corrosive gas, combustible gas, dust, vapor, salt, oil-mist etc.

#### ■Usage notes

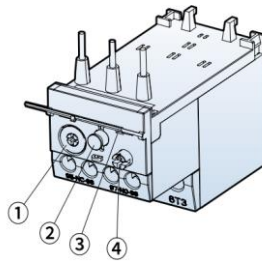
- (1) Don't touch or approach the product while it is energized. There is a risk of electric-shock or burns.
- (2) Don't operation when the insulation cover is removed. There is a risk of short circuit.
- (3) The Thermal Relay must set the motor's rated current by the adjusting knob, and use.
  - The " · " near the number in the dial indicates the setting position of the median, minimum, and maximum values. (Since individual adjustments are made, the position of " · " may vary.)
  - Please note that the initial position of the adjusting knob varies depending on the specification.
- (4) Don't set Thermal Relay beyond the range of the scale indicated on the product. Doing so may cause malfunction during overload or malfunction during no load. If it works frequently, be sure to investigate and eliminate the cause.
- (5) Connecting wire of Thermal Relay has a play to facilitate position adjustment when working in combination with Contactors. Therefore, there are some models with variations in the initial position and line length, but it is not bad.

#### ■Thermal Relay Operating Instructions



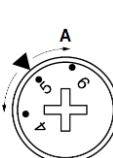

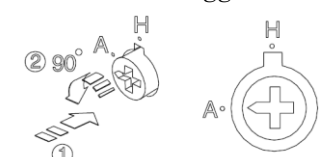


- ① Adjusting knob
- ② Reset button
- ③ Trip lever  
(During trip operation, Protrudes forward. During test operation, pull put it out.)

TRC12,TRC12M



- ① Adjusting knob
- ② Trip and stop button
- ③ Behavior display  
(Change to orange in trip mode)
- ④ Reset button

TRC32,TRC63

<p>▪ Adjusting knob</p>  <p>The " · " show the position that the median, minimum, and maximum value. The arrow position set the rated current of the motor.</p>	<p>▪ Reset button(Manual/Automatic reset toggle button)</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p><u>Manual Reset</u></p> </div> <div style="text-align: center;">  <p><u>Automatic Reset</u></p> </div> </div>
<p>▪ Trip and stop button(TRC32,TRC63)</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Stop</p> </div> <div style="text-align: center;">  <p>Test</p> </div> </div> <ul style="list-style-type: none"> <li>▪ <b>Stop operation (※) ;</b> Push the button.</li> <li>▪ <b>Test operation (Trip) ;</b> Open the top cover, and pull the button.</li> </ul>	

(※) This function allows the motor to be stopped in an emergency by pressing a button. The Normal close contact leaves only while the button is pressed, but the Normal open contact doesn't switch. For details See Table4.

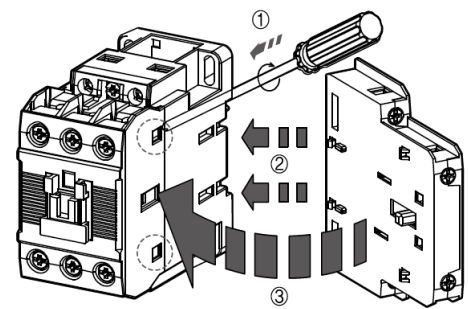
Table4. TRC32, TRC63 Auxiliary Terminal Behavior Diagram

Terminal No.	Normal	Stop	Trip / Test	Reset
95-96 (Normal close contact)				
97-98 (Normal open contact)				

■Optional installation

- (1) When applying the option, check the catalog and technical manual, etc. for the applicable model and the number of installable models and use it correctly.
- (2) Side-on type options of the standard HC series

(Auxiliary Relay unit CXS-2 and interlock unit UR-02) when installing, Remove the lid of the groove next to the main unit with a tool such as a flat-blade screwdriver before installing. (See figure on the right.)



※The Auxiliary Relay unit can't be installed on the right side of the HC20. The groove on the right side of the HC20 is dedicated to the interlock unit, so remove the lid only when using the interlock unit. If the Auxiliary Relay unit is accidentally installed on the right side, it will be damaged during operation and may cause a malfunction.

- (3) The Auxiliary contact unit can be installed side-on and head-on at the same time, but please note that the number of additional contacts is limited.

Table5. Auxiliary Relay unit maximum number of installations

Model	Economy model			Standard model		
	XC4M, HC8M, HC10M	HC10M-GP		XC4, HC8, HC10	HC20	HC35, HC55 (※)
Coil Type	AC	DC	DC	AC and DC		AC   DC
Side-on	Per side 1pcs			Per side 1pcs	<b>Left side 1pcs</b>	2pcs each side   1pcs each side
Head-on	1pcs			1pcs(Can't be attached with latches )		
Maximum installations	4contacts	4contacts	2contacts	6contacts (NO : Max 3contacts NC : Max 3contacts)	6contacts (NO : Max 3contacts NC : Max 3contacts)	8contacts(※) (NO : Max 4contacts NC : Max 4contacts)

(※) The HC35 and HC55 don't have Auxiliary contacts on the main body, and there is one side-on unit on each side as standard, making it 2NO+2NC. The maximum number of installations is 8 contacts, including the standard 2NO+2NC.

4. Maintenance

- (1) Turn off power when maintenance. Can cause electric-shock.
- (2) Check whether screw is fully tightened. If a loose, tighten more. Can cause heating.
- (3) Check the insulation resistance between phases and ground. If it is degraded, replace the product.
- (4) Check by manually operation that the Contactor is not got into foreign substance, such as a washer and wire.
- (5) Don't disassemble Contactor and Thermal Relay. The contacts of Contactor other than HC55 cannot be visually checked unless they are completely disassembled. Inspect the contact parts only for electrical inspections such as continuity inspections and visual inspections near the contacts.
- (6) Remove dirt and dust from each part. Be careful not to disconnect the contacts.
- (7) During trial running, check whether there occurs abnormal noise, abnormal smell.
- (8) For maintenance details, please refer to the instructions described in the technical manual.

5. Notes

Detailed handling information and installation procedures related to options are also described in the technical manual. You can download it from the following, so please refer to it as well. We are sorry, but the technical manual is only available in the Japanese version.

(URL : <https://www.hitachi-ies.co.jp/products/hdn/mgsw/download/index.html>)

