HITACHI

FUSE-FREE BREAKERS 30 to 4000A Frame instruction manual

Send to end-user this instruction manual certainly.

(S-21-02J)

Introduction

Thank you for bought HITACHI FUSE-FREE BREAKERS.
This instruction manual is related to installation, wiring using and maintenance of circuit breaker.

■ Warranty period and contents

This Circuit Breakers warranty period is one year after bought. If it break for responsibility about our company, 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 force 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 Circuit Breaker, you should first thoroughly read this manual, in order to understand appropriate usage and handling.
This instruction manual classifies rank of safe heading to Danger and Caution.

⚠ CAUTION : In case of using by mistake, it's possible to be got a alight wound, or to be damaged physically.

Written by CAUTION, according to circumstance, it's possible to result in serious damage.

Notes of Installation

⚠ CAUTION

- Construct electrical construction by qualified person.
- At the time of wiring, Check the wire is un-energized. There is in danger of electric shock.
- At the time of installation, secure insulation clearance on line end of Circuit Breaker.
- Don't install at abnormal environment about high temperature, high humidity, dust, corrosive gas, vibration and shock. There is in danger of electric shock and a fire.
- Be careful so that foreign article and rain may not get in when install.
- Separate the inter-phase of line end. There is in danger of a fire.
- At the time of wiring, Tighten appropriate Tightening torque. There is in danger of a fire.
- At the time of wiring, don't tighten more than appropriate tightening torque. There is in danger of Circuit Breaker is damaged.
- Use the bolts of the attachment. There is in danger of a fire when using excluding the bolts of the attachment.
- Don't coat lubricant at bolt part. If coat lubricant bolt part, friction decrease and cause slack and heating.

Notes of Safety

CAUTION

- Construct electrical construction by qualified person.
- In case Circuit Breaker has tripped. Operate it after get rid of the cause.
- Don't touch electric connecting terminal. There is in danger of electric shock.
- Prevent refuse, foreign matter and rain to getting inside.

Notes of maintenance

CAUTION

- Maintenance should be done a professional.
- At the time of wiring, Check the wire is un-energized. There is in danger of electric shock.
- Loosening of conductor connection screws may cause local overheating.
  Tighten as necessary periodically. There is in danger of a fire.
- Don't push strongly trip button. It causes failure.

1. Before installation

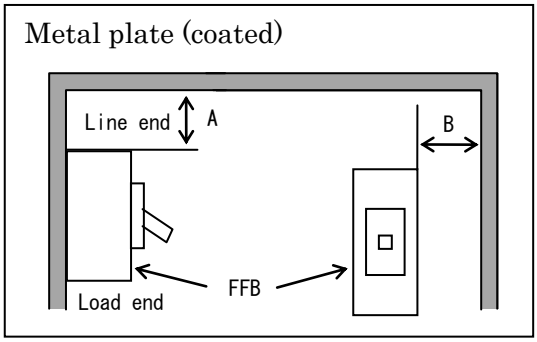
   Before installation, be sure whether Type, Rating current, Frequency marked on the name plate are agree with ordered specifications and whether there are no fallen off parts or any damaged portions.

2. Installation

   To do install keep at following insulation distance.

(1) Installation

Insulation clearance on line end of FFB is as follows :



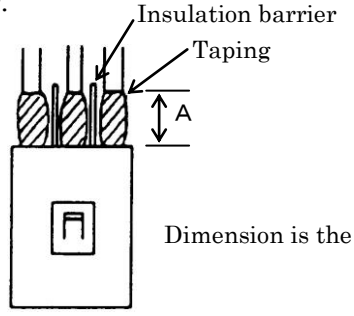
The dimensions within ( ), in the case of 400V grade.

Classi-fication	Model, Frame	Minimum Dimensions (mm)	
		A	B※
1	30A Frame, 50A Frame(Excluding F-50KB,L-50E) 60A Frame, FXK100-SA(50A or less) FXK100-S(50A or less), FXK100-H(50A or less)	30	25
2	F-50KB, L-50E, 100A Frame	40	40
3	FXK100-SA(excess 50A), FXK100-S(excess 50A) FXK100-H(excess 50A), 125A Frame 225A Frame, 250A Frame	50	40
4	F-225KC(400V Grade)	100	40
5	400A Frame, 600A Frame, 800A Frame	80 (110)	50
6	1000A Frame, 1200A Frame, 1600A Frame, 2000A Frame 2500A Frame, 3200A Frame, 4000A Frame	150 (190)	100

※ S series of 225A frame or less, possible to install make close contact of breaker fellow.

(2) Insulation of line side's living parts

It is recommended that line side's live parts of front connected type Breakers are insulated by insulation tape or insulation barrier.



Dimension is the same as A of above table

CAUTION

- Separate the inter-phase of line end. There is in danger of a fire.

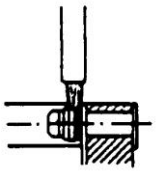
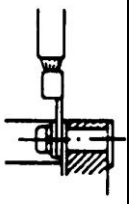
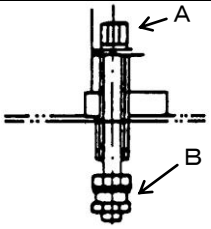
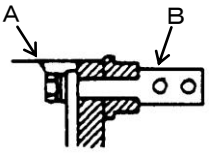
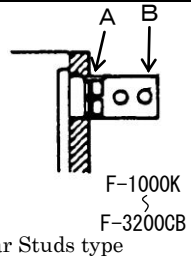
(3) Connection

⚠ CAUTION
• At the time of wiring, Check the wire is un-energized. There is in danger of electric shock.

Tighten conductor connecting screw appropriate tightening torque, showed instruction manual.

Appropriate Tightening Torque of Terminal Screw

(unit N・m)

Type \ Appearance	Front connecting type		Rear connecting type			
	 Clamping wire type	 Compression terminal connector type	 Rear connecting Studs type (less than 125A frame※3)	 Rear connecting Bar Studs type (more than 225A frame)		
	Screw・bolt diameter	Tightening torque	A		B	
			Screw・bolt diameter	Tightening torque	Screw・bolt diameter	Tightening torque
S-30E, S-50EB, B-50E	M5	2.5～3.5	—	—	—	—
F-30FB, S-50SB, SXK50-C F-50FC, F-50HB, FXK50-S F-50H, S-60SB※1, SXK60-C※1 F-60FC※1, F-60HB※1, FXK60-S※1 S-100EB※1, S-100SB※1 SXK100-C※1, FXK100-SA※1	M5	2.5～3.5	M4	1.5～2.0	M6	2.5～3.5
FXK50-H, FXK50-HU, F-50KB L-50E, S-100S※1 FXK100-S※1, FXK100-H※1 F-100S※1, F-100KB※1, L-100E※1	M6	4.0～5.0	M5	2.5～3.5	M8	5.5～7.5
S-100EC, B100-E	M8	5.5～7.5	—	—	—	—
S-60SB※2, SXK60-C※2, F-60FC※2 F-60HB※2, FXK60-S※2, S-100EB※2, S-100SB※2, SXK100-C※2, S-100S※2 FXK100-SA※2, FXK100-S※2 FXK125-H※2, F-100S※2 F-100KB※2, L-100E※2 SXK125-C, FXK125-SA, FXK125-S, FXK125-H	M8	5.5～7.5	M6	4.0～5.0	M10	8.0～10
S-225SB, SXK225 FXK225-S, FXK225-H, F-225KC FXE225-S, FXE225-H FXK250-S, FXK250-H	M10	10～13	M6	8.0～10	M8	10～13
L-225E, S400-S, SX400 F-400FB, FX400, L-400E	M12	20～27	M8	10～13	M8	10～13
S-600S, SX600, F-600F, FX600 L-600E, S-800S, SX800, F-800F FX800, F-800KB, L-800E	M12	40～50	M12	40～50※4	M12	40～50
F-1000K, FX1000 F-1200K, FX1200	M12	40～50	M6	5.0～6.5	M12	40～50
L-1000B, L-1200B	M12	40～50	—	—	M12	40～50
F-1600E, F-1600ED	M12	40～50	—	—	M10	23～38
F-1600CB, F-1600B	M10	20～27	M8	10～13	M10	23～38
F-2000E	M10	20～27	—	—	M10	23～38
F-2500E	—	—	—	—	M10	23～38
F-3200CB	—	—	M10	23～38	M12	40～50
F-4000E	—	—	—	—	M16	80～110

※1. Rated current less than 50A. ※2. Rated current excess 50A.

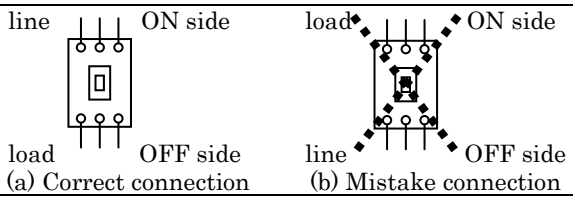
※3. FXK100-S, FXK100-H, FXK125-S, FXK125-H : Bar studs type.

※4. 600A Flame, 800A Flame should tighten after open the body cover.

If necessary retightening, to ask service department of our company.

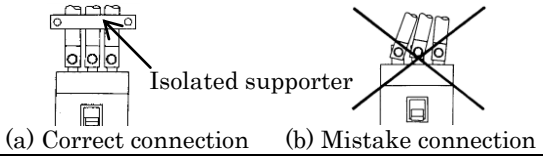
⚠ CAUTION

- Please connect line to ON side, and connect load to OFF side.
  Don't connect reversely.
  Because it may not act normally.
  (Except for reversible connection type)



⚠ CAUTION

- Please install each connection conductors parallel.
  and fix conductors strongly in preparation of large electromagnetic force caused from by accident current.



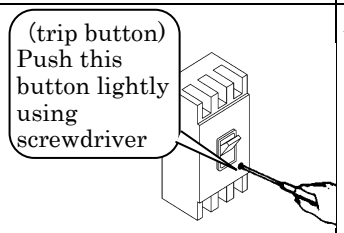
3. Using

Normal service condition

(1) Ambient temperature : −10℃ to 40℃
(2) Relative humidity : 45% to 85%
(3) Altitude : 2,000m or lower
(4) Atmosphere : must be free corrosive gas, combustible gas, dust, vapor, salt, etc.

4. Maintenance

Inspection and Countermeasure

	Inspection Head	Countermeasure
1	Confirm that a terminal screw and a screw which tightens a electric wire don't loose.	If a loosed, please tighten more. (The most suitable torque to tighten is shown in page 3.)
2	Inspect that terminal and part of conductor joint don't become faded by raise in unusual temperature or there is no crack on molded case and cover.	When you inspect on your eyes, if terminal, part of conductor joint and mold become faded (by overheated), or crack, change new product.
3	Inspect that there is no dust, adherent oil or cutting waste and wiring waste as conductive foreign substance on the surface of Circuit Breaker, especially around terminal of upper power source.	After absorb the dust with cleaner, wipe the Circuit Breaker with dry and clean cloth.
4	Confirm that you can open and close smoothly using handle. And almost all of Circuit Breaker has a trip button, so confirm Shunt Trip by pushing button. 	About Circuit Breaker which is "ON" position for a long time, handling switch is effective for prevention of increasing friction by hard of lubricant which is spread on switching mechanism and of unusual fever by movement action of contact.