

Troubleshooting

1 Troubleshooting for circuit-breaker proper (MCCB/ELCB)

Trouble		Cause		Countermeasure	
Abnormal operation	Closing impossible	Foreign matter in switching mechanism		Foreign matters to be removed	
		No resetting		To be reset once again	
		Resetting impossible	See below (*)	See below	
	(*) Resetting impossible Tripping impossible OFF impossible	Wear due to trip endurance	Incessant use of voltage trip operation		To be replaced with new one, Voltage trip to be replaced by electric operation
			End of service life		To be replaced with new one
		Poor reset mechanism	Poor adjustment		To be returned for repairing
		Non-excitation of undervoltage coil		Carelessness	To be excited
		Resetting time has not elapsed			Wait until the bimetal is cooled down
		Breakage and/or fatigue of the switching spring	Breakage by initial trouble		To be returned for repairing
			End of service life		To be replaced by new one
Fusion of contact due to excessive interruptive current			To be replaced by circuit-breaker with large breaking capacity		
Broken handle	Excessive operation power		Handle to be replaced		
	Poor positional relationship between the external handle and the circuit-breaker		Handle to be replaced Revision of positional relationship		
	Excessive shock from exterior		To be replaced with new one		
Poor electrification	Insulating material mingled between contacts		Foreign matter to be removed (with removable cover) To be returned for repairing (with unremovable cover)		
	Corrosion by infiltrating rain water, etc.		To be replaced with new one		
	Fused conductive portion	Excessive interrupting current		To be replaced by new one with larger breaking capacity	
	Large consumption of contact	Short-circuit current cut off. End of service life		To be replaced with new one	
		Application of overcurrent			
Breakage of rated changeover screw		Excessive tightening torque (tighten with 3 to 4.5 kg-cm of torque)		To be returned for repairing	
Troublesome operation	Troublesome operation under normal load	Too high an ambient temperature	Erroneous selection (temperature correction)		Rating selection to be changed
			Board hermetically closed		Ventilation
		Too high a temperature rise	Loosened connection to terminal		Retighten
			Deviation of applied frequency (thermaladjustable electromagnetic type 800AF or higher)	Erroneous selection (frequency)	
		Load current strained with much high component			Distortion factor to be decreased by reactor Selection of rating to be changed
		Rather small measurements by error of measuring instrument due to distorted current			To be measured correctly by a meter with true effective value, and correct selection of rating
		Electronic type MCCB	Overcurrent display LED is on	Too small a setting of rated current	
	Tightening forgotten of the changeover screw of rated current			Correct retightening of the rated current changeover screw with tightening torque: 3 to 4.5 kg-cm	
	Failure of rated current changeover portion			To be returned for repairing	
	Erroneous action while starting	Exothermic reaction due to repeated starting current		Erroneous selection	To be replaced by a unit with higher rating
		Too long a starting time		Erroneous selection	To be replaced by a unit with higher rating
	Instantaneous action during starting	Too high a starting current			Electromagnetic setting to be change or the unit to be replaced by one with higher rating
		Too high a starting rush current			Electromagnetic setting to be change or the unit to be replaced by one with higher rating
		Transient current when changing delta connection to star one. Transient current due to reversible operation			Electromagnetic setting to be change or the unit to be replaced by one with higher rating
		Rush current at the time of instantaneous restart			Electromagnetic setting to be change or the unit to be replaced by one with higher rating
		Rare short-circuit of motor			Motor to be repaired
		Bimetal reset incomplete after instantaneous tripping			To be fully restored
Operating while in use	Abnormal current running simultaneously with closing (short-circuit closing)			Circuit to be checked to remove the cause	
	Transmission was made with antenna of transceiver (5W or higher) closely mounted on the electronic MCCB and earth leakage breaker			Transceiver to be used at a distance at least 1 m from the electronic MCCB	
Short-circuit on line side	Shift from the short-circuit of another conductor			Cause to be removed To be replaced with new one	
	Accumulated dust			Cause to be removed To be replaced with new one	
	Fall of conductor on line side			Cause to be removed To be replaced with new one	

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Temperature rise	Too high a temperature on the terminal side	Poor tightening	Poor maintenance	Retighten
		Contact heavily consumed	End of service life	To be replaced by new one
		Increased contact resistance	Intrusion of rust and dust	Foreign matters to be removed
	Too high a temperature on the lateral side of the mould	Complete electromagnetic type used in high frequency (400 Hz, for instance)		Suitable frequency to be selected To be changed into thermal type
		Load current distorted containing much high frequency component		Distortion factor to be decreased by reactor Selection of rating to be changed
		Erroneous measurement dependent on feeling		To be measured with a measuring instrument
Exothermic reaction of the tightened portion of stud	Loosened stud		Retighten	
	Poor contact between the conductive portion of stud and the body terminal		Reassemble the stud	
	Groove machining forgotten for reduction of eddy-current exothermic reaction of rear-connected type iron mount plate (400AF or higher)		Groove to be provided	
No operation	No tripping with over current	Too high a rated current selected		To be replaced by a unit with lower rating
		Wrong frequency applied		Suitable frequency to be selected
		Tripping of backup circuit-breaker	Too low a current for instantaneous tripping of backup breaker	Instantaneous electromagnetic switch to be lowered Raise the electromagnetic setting of backup breaker or change the rating
No operation with tester (electronic MCCB)	Overcurrent display LED does not come on. Or, though it comes on, it goes off sooner than normal.	The battery of breaker tester has come at the end of its service life		Battery to be replaced
	Overcurrent display LED comes on and goes off after prescribed time. But, no tripping	Poor tripping mechanism		To be returned for repairing

2 Troubleshooting for leakage operation portion

Trouble		Cause		Countermeasure
Troublesome action	Operates simultaneously with closing (such operation of leakage mechanism as popping-out of the leakage display button)	Too long a wire and too large a ground electrostatic capacity causes the leak current to flow		Rated sensitivity current to be changed, or ELCB to be installed near load
		Normal operation due to leak current		Leak point to be repaired
	Operates during use	Refer to 5.4		
Abnormal operation	Leakage operation and the like by test button, but no display	Poor lamp or its end of service life		To be replaced by new one
		Display button does not come out due to poor adjustment		To be returned for repairing
No operation	Depressing the test button does not lead to operation	Trouble in electronic circuit		To be replaced by new one
		No voltage applied		Apply specified voltage
		Poor continuity of contact		Remove foreign matter on the contact

3 Troubleshooting of accessories

Trouble		Cause		Countermeasure
NFM/NVM (electric operation device)	Operation disabled	Voltage drop of operational power supply	Too low a capacity of the wire of operational circuit	Increase the diameter of the wire
			Too low a capacity of the operational power supply	Improve the operational power supply
		Burnt resistor/motor	Excessive continuous operation	To be returned for repairing (replacement of resistor/motor)
		Erroneous wiring		Regularize the wiring
		Erroneous voltage applied		Regular operational voltage to be applied
	Continuous idling	Operation of ON and OFF circuits at the same time or erroneous manipulation		Push button to be provided with interlock
		Self-sustaining auxiliary switch contact to be used for automatic resetting		The contact for automatic resetting to be used as that for alarm switch
	One turn of idling when closing	Voltage tripping in OFF state or tripping by undervoltage		OFF operation once to reset and ON operation again
The circuit-breaker proper has automatically cut off and tripped				
UVT (undervoltage tripping device)	Closing disabled	Erroneous frequency or voltage applied		Power supply to be improved
		No pulling	Too large a voltage drop	Voltage to be improved
	No tripping even with no voltage	Trouble in circuit-breaker tripping mechanism		To be returned for repairing
SHT (voltage tripping device)	No tripping action	Insufficient voltage	Operational voltage drop	Power supply to be improved
			Erroneous voltage applied	Power supply to be improved
		Coil burnt out	Continous excitation of coil	To be returned for repairing (replacement of coil, auxiliary contact to be provided for protection from burning)
			Continuous excitation under a voltage inferior to the operating voltage	To be returned for repairing (replacement of coil), power supply to be improved
			Poor auxiliary contact for prevention of burning	To be returned for repairing (replacement of coil, contact to be repaired)
			Abnormal voltage applied	To be returned for repairing (replacement of coil)
AL (alarm switch), AX (auxiliary switch), EAL (earth-leakage alarm, switch), MG (Insulation switch) PAL (pre-alarm)	Malfunction	Poor contact due to overcurrent		To be returned for repairing
		Erroneous wiring	Erroneous wiring when installing	Regular wiring to be made referring to the name plate
		Microload	Erroneous selection	To be returned for repairing (to be replaced with that for microload)
		Loosened attaching screws	Insufficient tightening Vibration during transportation	To be returned for repairing (re-adjustment)