

4. Re-assemble the metal protection plate and Ekip Aware protection release.

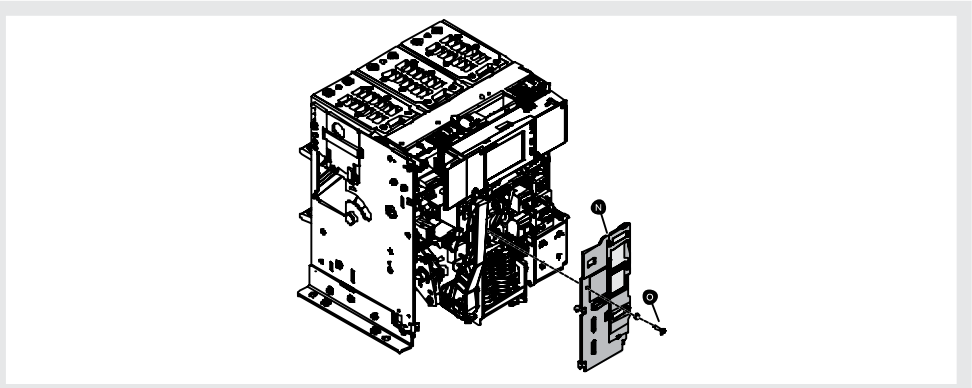


Figure 284 - Reassembly of the protection plate



WARNING! risk of breakage during operation. Risk of serious injury to persons and damage to equipment. In the case of deformed or rusty springs, rings missing or severe wear of the operating device, contact ABB.

Inspection of electrical and mechanical accessories

Check the accessories:

1. Check that the accessories are securely fixed to the circuit-breaker.
2. Check that the accessories are connected correctly to the circuit-breaker.
3. Make sure that the coils (YU-YO-YC) are in good condition (no excessive wear and tear, overheating, rupture).
4. Make sure that the mechanical operation counter functions correctly (if present) by operating the circuit-breaker.
5. Check the wear on the brushes of the gearmotor and if necessary replace them.



IMPORTANT: it is advisable to replace the gear motor if it has performed more than 10000 spring charging operations or reached 50% of the declared mechanical life of the circuit-breaker.

Check for wear on the contacts

With the circuit-breaker open and springs discharged:

1. Remove the arc chutes

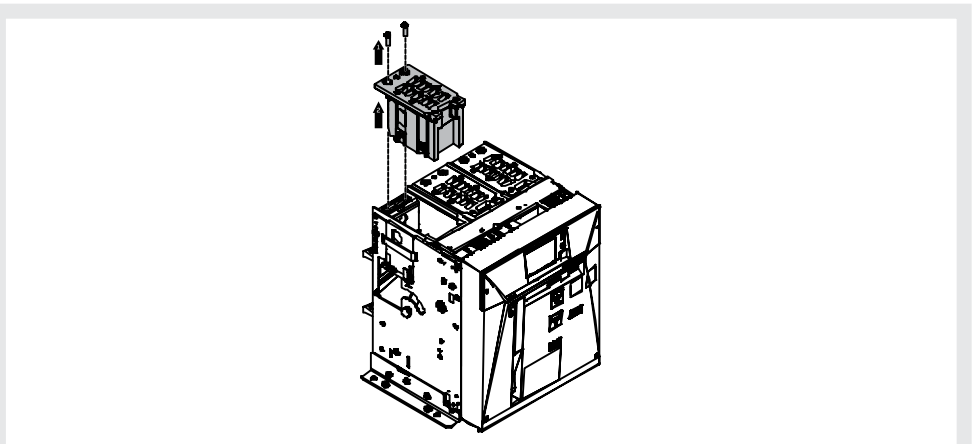


Figure 285 - Removing the arc chutes

Continued on the next page

2. Check the condition of the arc-breaking chutes: the base of the chute must be undamaged and the plates must be neither corroded nor indented.
3. Remove the dust with compressed air, then clean off all traces of fumes and slags with a brush.
4. Make sure that the contacts are in good condition.
5. Visually check to make sure that the main and arc-breaking plates are in place.
6. Check for tarnishing or beading. If such defects are discovered, ask for assistance from a qualified ABB Technician (*).
7. Check the arc-breaking gaps (dimension A).
8. Close the circuit-breaker and check dimension A. Contact ABB (*) if dimension A is incorrect. If dimension A is correct, open the circuit-breaker again and re-assemble the arc chutes.

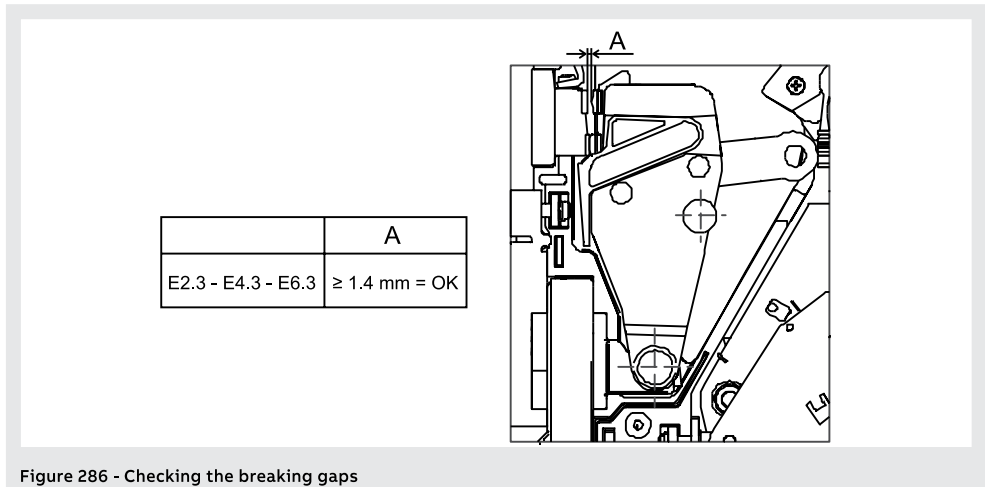


Figure 286 - Checking the breaking gaps



IMPORTANT: (*) After approval from the customer, ABB can proceed with replacement of the worn parts.

Inspection of the protection trip unit

Check that the trip unit is in good condition:

1. Energize the protection release by means of a powerbank (at the customer's charge).
2. Check the correct operation of the protection trip unit: tripping test with "Trip Test" and "Autotest".
3. Check the display and front LEDs to make sure there are no alarms.
4. Make sure that the cables are correctly connected to the modules and to the trip unit (if applicable).
5. Check the percentage of wear on the circuit-breaker contacts.
6. Remove the powerbank upon termination.

-
- Final checks** Reassemble and check the circuit-breaker:
1. Reassemble all the parts by performing all the operations indicated in the paragraph “Disassembly Operations” in reverse order. If necessary, reconnect the auxiliary power supply.
 2. Put the movable part (breakers) in the test position (see indication TEST).
 3. Perform the following operations 10 times:
 - Opening (in both local and remote modes, if applicable)
 - Closing (in both local and remote modes, if applicable)
 - Tripping via Trip Test
 4. Perform the operations in the following sequence:
 - Open - Springs discharged
 - Open - Springs charged
 - Closed - Springs discharged
 - Closed - Springs charged
 5. Make sure the following components function properly, if present:
 - accessories
 - gear motor
 - undervoltage coil (standard or Sense)
 - opening coil (standard or Sense)
 - closing coil (standard or Sense)
 - auxiliary contacts of circuit-breaker
 - lock for locking circuit-breaker in open position (key or padlock).
-

Interlock check Check that the vertical or horizontal interlocking devices (if provided) are installed and that they operate correctly.

! IMPORTANT: the interlocks cannot be tested in the Test or Disconnected positions.

Perform maintenance periodically as indicated in the table below.

Activity	Frequency	Maintenance operations
Functionality	1 year or	See kit sheet
Check tightness	20% of mechanical life or	
Lubrication ^(*)	20% of electrical life	As shown in the figure
Cables	Three years or 50% of the mechanical life or 50% of the electrical life of the largest circuit-breaker involved in the interlock. After a trip due to a short-circuit.	Replacement is advisable

^(*) Use ABB greasing kit or grease of the Mobilgrease 28 type.

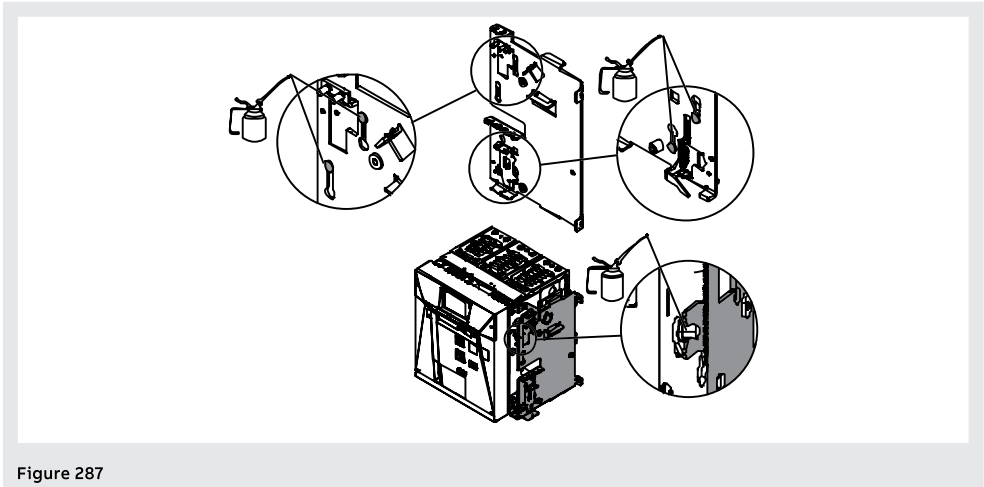


Figure 287

5 - Lubrication of jaw-type isolating contacts of withdrawable circuit-breaker

Lubrication operations must be performed as indicated in the maintenance schedule on page 343.

Preliminary operations



WARNING! Dangerous voltage and mechanical hazards. Risk of serious injury to persons and damage to equipment. Before proceeding with any maintenance operation, it is mandatory to:

- Set the circuit-breaker to the open position and make sure that the springs of the operating mechanism are discharged.
- Perform the operations with the circuit-breaker withdrawn from the fixed part (the withdrawal operations are described in section Circuit breaker racking-in/racking-out operations).
- Disconnect the power circuit and auxiliary circuits and earth the terminals in a visible way, on both the supply side and load side.
- Use adequate personal protection equipment, ensure that the apparatus is in a safe condition and proceed in accordance with the Laws in force.

Clean and lubricate the jaw-type isolating contacts

Perform maintenance periodically where grease is already present and if its properties have been impaired due to the environment.

The safety shutters must be disassembled before the isolating contacts are cleaned and lubricated.

For information about removal, see the document [1SDH002309R0717](#) for circuit breakers E1.3 or the document [1SDH002310R0717](#) for circuit breakers E2.3-E4.3-E6.3 or request the intervention of a technician ABB.

1. Clean the indicated parts of the isolating contacts. Use a solvent such as Chemma 18 or equivalent if they are thickly caked.
2. Lubricate the indicated points, using the ABB greasing kit or Mobilgrease 28.

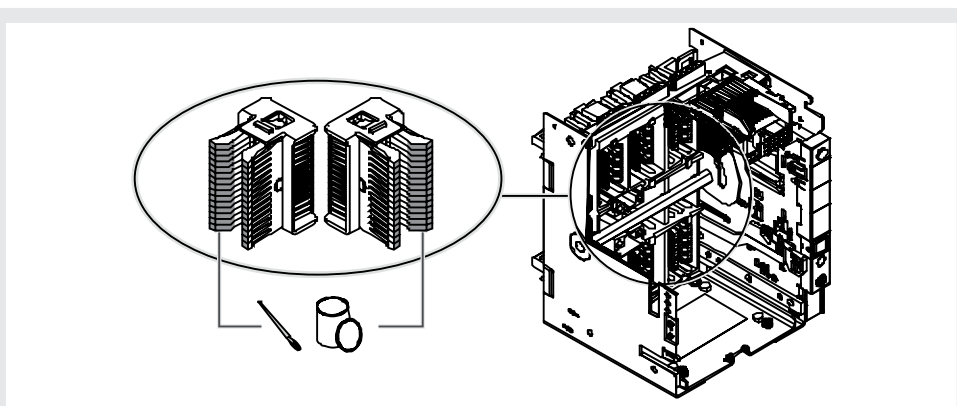


Figure 288 - IEC

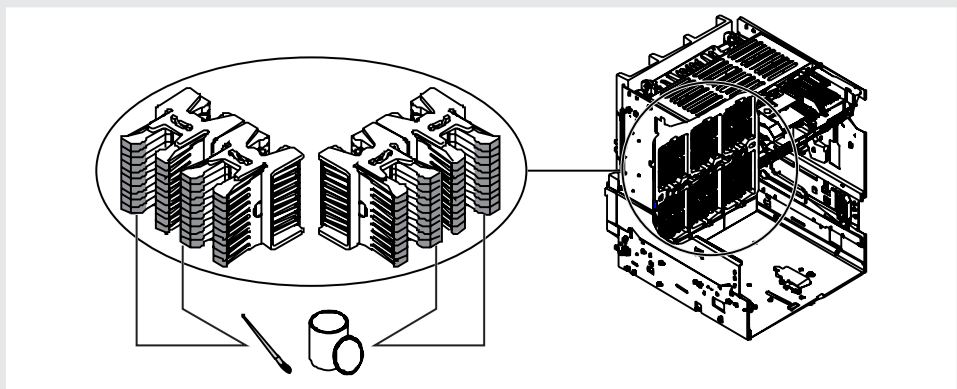


Figure 289 - IEC

Alarms or failures

1 - Management of alarms and faults

Introduction Correct maintenance of the unit and connected devices ensures they operate correctly over time. The maintenance operations must be performed by expert personnel, as required by the safety regulations and maintenance schedule provided in this document. If faults are discovered, find out what is causing them and eliminate them before putting the unit back into service.



WARNING! Dangerous voltage May cause death and serious injury to persons. Detecting faults must only be managed by (electrically) skilled persons (IEV 195-04-01: person with relevant education and experience to enable him or her to perceive risks and to avoid hazards which electricity can create), as it may be necessary to perform insulation and dielectric tests on part or all the installation

2 - Faults, causes and remedies

Faults, causes and remedies

The following is a list of possible fault situations, their possible causes and suggestions for resolving them.

Faults	Possible causes	Suggestions
The circuit-breaker doesn't close when the closing pushbutton is pressed	The trip signal of the protection trip unit has not been reset	Press the TU mechanical reset pushbutton or operate the electrical reset remotely.
	The open-position key lock or padlock is activated	Unlock the lock in open position using the relevant key
	The circuit-breaker is in an intermediate position between connected and isolated for test or between isolated for test and disconnected (withdrawable version)	Complete the rack-in operation
	The undervoltage coil is not energized	Check the supply circuit and supply voltage. Check the polarity of the connections
	The undervoltage coil is in thermal memory	Wait for the time specified in the catalog before re-connecting to the auxiliary circuit
	The opening coil is permanently energized	Correct operating condition.
	The trip unit pushbutton is pressed (withdrawable version)	Turn the handle to complete the already started racking-in or racking-out operation.

Continued on the next page

Faults	Possible causes	Suggestions
The circuit-breaker doesn't close when the closing coil is powered	The trip signal of the protection trip unit has not been reset	Press the TU Reset button
	The power supply voltage of the auxiliary circuits is too low	Measure the voltage: it should not be lower than 70% of the rated voltage of the coil
	The power supply voltage is different from that indicated on the rating plate	Check the voltage on the rating plate
	The cables of the coil are not inserted correctly in the terminals	Make sure there is continuity between cable and terminal and if necessary reconnect the cables of the coil to the terminals
	The connections in the power supply circuit are wrong	Check connections on relevant circuit diagram. Check the polarity of the connections
	The coil is in thermal memory	Wait for the time specified in the catalog before re-connecting to the auxiliary circuit
	Circuit-breaker springs not charged	Charge the springs
	The closing coil is damaged	Replace the coil
	The open position key lock is activated	Unlock the lock in open position using the relevant key
	The circuit-breaker is in an intermediate position between connected and test or the trip unit pushbutton is pressed (withdrawable version)	Complete the rack-in operation
	The undervoltage coil is not energized	Make sure that undervoltage coil is energized properly
	The opening coil is permanently energized	Correct operating condition. If necessary, disconnect the power from the opening coil
	The racking out crank handle is inserted (withdrawable version)	Remove the crank
	If the Sense version closing coil is present: • Vaux not present • the coil has not been configured properly • the wiring is damaged	Connect to the protection release and check that the coil has been detected correctly (enabled and detected in the "Sense Obs configuration" page) and configure
	Operating mechanism is locked (does not move)	Perform closing operation in the manual mode: charge the springs (if not already charged) and press the closing button; contact ABB if the fault persists

Continued on the next page

Faults	Possible causes	Suggestions
The circuit-breaker doesn't open when the opening pushbutton is pressed	The operating mechanism is blocked	Contact ABB
The circuit-breaker doesn't open when the opening coil is powered	The power supply voltage of the auxiliary circuits is too low	Measure the voltage: it should not be lower than 85 % of the rated voltage of the coil
	The power supply voltage is different from that indicated on the rating plate	Use the correct voltage
	The cables of the coil are not inserted correctly in the terminals	Make sure there is continuity between cable and terminal and if necessary reconnect the cables of the coil to the terminals
	The connections of the power supply circuit are wrong	Check the connections using the relevant wiring diagram Check the polarity of the connections
	The opening coil is damaged	Replace the coil
	The coil is in thermal memory	Wait for the time specified in the catalog before re-connecting to the auxiliary circuit
	If the Sense version closing coil is present: • Vaux not present • the coil has not been configured properly • the wiring is damaged	Connect to the protection release and check that the coil has been detected correctly (enabled and detected in the "Sense Obs configuration" page) and configured
The circuit-breaker doesn't open despite the command of the undervoltage coil	The operating mechanism is blocked	Contact ABB
		Perform opening operation in the manual mode: charge the springs (if not already charged) and press the closing button; contact ABB if the fault persists
It is not possible to charge the closing springs by means of the manual charging lever	The operating mechanism is blocked	Contact ABB
It is not possible to charge the closing springs by means of the gearmotor	The cables of the gearmotor are not inserted correctly in the terminals	Make sure there is continuity between cable and terminal and if necessary reconnect the cables of the gearmotor to the terminals
	The connections of the power supply circuit are wrong	Check the connections using the relevant wiring diagram
	Circuit-breaker is in the racked-out position (withdrawable version)	Switch the circuit-breaker to the test or connected position
	The gearmotor protection internal fuse has tripped	Replace the fuse
	The gearmotor is damaged	Replace the gearmotor
It is not possible to press the button in order to insert the racking out crank handle	The circuit-breaker is closed	Press the opening pushbutton in order to allow the insertion of the crank with the circuit-breaker open
It is not possible to insert the moving part in the fixed part	The racking-in/racking-out operation is not performed correctly	See the paragraphs "Circuit breaker racking-in/racking-out operations", pages 22 and 30
	The moving part is incompatible with the fixed part	Check the compatibility between the moving part and the fixed part

Continued on the next page

Faults	Possible causes	Suggestions
It is not possible to lock the circuit-breaker in the open position	The opening pushbutton is not pressed	Press the opening pushbutton and activate the lock
	The lock in open position is defective	Contact ABB
It is not possible to perform the trip test	Trip coil is not connected properly	Check Trip coil connection and messages on display
	Trip coil on CB has not been reset	Press the TU Reset button
	The busbar current is greater than zero	Correct operating condition.
It is not possible to remove the circuit-breaker from the disconnected position	Withdrawal locking lever activated (only for withdrawable E1.3)	Press the release lever
Trip times different than expected	Wrong threshold/time/curve selected	Correct parameters
	Thermal memory enabled	Disable it if it is not necessary
	Zone selectivity enabled	Disable it if it is not necessary
	Incorrect neutral selection	Modify the neutral selection
	Operating conditions not correct	Consult the manual to make sure that the conditions described for correct operation of the protection system are present
Rapid trip with Protection I, RELT, MCR (if present)= OFF	Inst trip	Correct operating condition with short circuit at high current
High ground-fault current, but no trip occurs	Incorrect selection of the sensor	Set internal or external sensor
	Function G inhibited owing to high current	Correct operating condition (see use cases in the chapter that describes the protection)
	Protection configured with Trip disabled	Activate Trip Enabled for the protection
	Sensor not connected correctly	Check connections and absence of alarms
Display off and/or not backlit	Temperature outside range	Correct operating condition., check limits in protection chapter Trip Unit Temperature Control (TU T) (see page 110)
Measurements incorrect or absent (current, voltage, etc)	Current below the minimum threshold that can be displayed	Correct operating condition.
	Incorrect frequency setting	Set frequency
	Harmonic distortion and/or crest factor off range	Correct operating condition.
	Rated voltage parameter setting Error	Set the correct parameters
The expected trip does not occur	Protection configured with Trip disabled	Correct operating condition. Enable trip if necessary
Opening data not displayed	No auxiliary power supply and/or battery low	Correct operating condition.

Continued on the next page

Faults	Possible causes	Suggestions
Trip data reception via Beaconsing has failed	BLE not activated or absent	Activate BLE in protection release
	Maximum time for data transmission has elapsed	Press iTEST button
	EPiC app not present on your smartphone	Download and install EPiC
The PIN is not required	The PIN has been disabled or has already been entered in the same programming session	Operating condition correct; consult chapter relating to the PIN
Impossible to change any of the parameters	Protection release in alarm status	Correct operating condition.
	Cybersecure package is present	Correct operating condition.
	Protection release is configured with Local/Remote = Remote	Correct operating condition.
PIN error	PIN wrong or lost	Consult chapter 10 - PIN and security on page 78 or contact ABB
Communication problems with Ekip terminal box modules	Circuit-breaker in racked-out position, Vaux absent or modules not connected properly, Local bus = OFF	Connect modules, set circuit-breaker to Connected position, connect Vaux, configure Local bus = ON
State of CB Position field not aligned with circuit-breaker position	Absence of Ekip Com or Ekip Supply Evo Modbus TCP modules, or contact S75I	Check for presence of Ekip Com or Ekip Supply Evo Modbus TCP modules and connect contact S75/I
Circuit-breaker fails to react to opening/closing command in Test menu of Ekip Aware	Connections or POWER supplies of the opening/closing Sense coils are not correct	Check supply, enabling and detecting connections of coils
	Absence of auxiliary power supply to Ekip Aware	Check supplies and status of Power LEDs
	Circuit-breaker is in a condition which fails to enable the selected command	Check in this list for other causes for failure to execute command
TRIP fail signaling: <i>Trip Fail command (BF)</i>	One or more of the following conditions: • Trip coil not working • status contacts not working • faulty internal wiring	1. If closed, open CB in the manual mode and check changed status. 2. Press iTest, check that the signal has disappeared from the display and the general status of the alarms. 3. Check the conditions of the wiring and internal contacts 4. Working in safety conditions, close the CB and perform a trip test via the protection release Contact ABB if problems persist

3 - Programming errors

Programming errors If during the programming of the parameters an attempt is made to violate certain limitations, the trip unit blocks the saving procedure and signals the error:

Type of error	Error description
RELT Th > 15 kA	Threshold I31 (protection RELT) > 15 kA
30006	Parameter change not completed on display within five minutes
30007	Attempt at remote control with Trip unit configuration in the local mode
30008	Attempt at local control with Trip unit configuration in the remote mode
30011	Error in list of Link actors
30012	More than one Time Sync source (IEEE 1588 or SNTP) on one single module or between different modules
30013	Network Analyzer parameter control unsuccessful
Active Power Fail	Threshold P23 (protection UP) $\geq$ Threshold P26 (protection OP)
DLog not stopped	Modification of datalogger parameters not allowed with datalogger function not stopped
D Th $\geq$ I Th	Threshold I7 (protection D) $\geq$ Threshold I3 (protection I)
Zone Sel Config = On while S / S2 / I / G / Gext / MDGF = On	Zone selectivity enabling of protection D not allowed with zone selectivity already active for one among protections S, S2, I, G, Gext or MDGF
In MDGF > CB Nominal Current	Set size of sensor MDGF exceeds Iu size of circuit-breaker
G FT time = 50 ms is not valid	Trip time I4 (protection G) = 50 ms
Gext FT time = 50 ms isn't valid	Trip time I41 (protection G) = 50 ms
RP CHANGE UNAUTHORIZED	Change size in unauthorized Size
RP ERROR FAILCODE	Change size not valid
High priority alarm	Modification of parameters not allowed during protection times
I and MCR enabled together	Protections I and MCR are mutually exclusive
L Th $\geq$ S Th	Threshold I1 (protection L) $\geq$ Threshold I2 (protection S)
L Th $\geq$ S2 Th	Threshold I1 (protection L) $\geq$ Threshold I5 (protection S2)
Neutral configuration error	Configuration of neutral protection must conform to formula: $I1 (A) \geq Iu (A) \times Ne \text{ config} / 100$
OV Threshold > 828 V	Threshold U9 (Protection OV) > 828 V (690 x1.2)
OV2 Threshold > 828 V	Threshold U16 (Protection OV2) > 828 V (690 x1.2)
RC toroid error	Activation of Rc toroid is not allowed without the presence of the Rc Protection
RQ Q24 $\geq$ Q25	Threshold Q24 $\geq$ Threshold Q25 (Protection RQ)
S Th $\geq$ I Th	Threshold I2 (Protection S) $\geq$ Threshold I3 (Protection I)
S2 Th $\geq$ I Th	Threshold I5 (Protection S2) $\geq$ Threshold I3 (Protection I)
S(V) or S2(V) parameters	Error in configuration of parameters of protection S (V) or S2 (V); consult user manual of Trip unit for the limits
SYNCHRO parameters error	Inconsistency of Synchrocheck protection parameters: $\Delta \text{ phase} \geq 180 \times \Delta \text{ freq} \times [\text{minimum correspondence time} + 0.0023]$
V DIR Th > 690*1.2	Protection threshold VDIR > 828 V (690 x1.2)
VS Th > 690*1.2	One of the two thresholds of protection VS Warning > 828 V (690 x1.2)

4 - Self-diagnosis

- Alarms and signals** Ekip Aware provides a series of signals that indicate its operating state, alarms present, or configuration errors in progress.
- The signals are provided:
- by LEDs, as described on page 59;
 - by messages on the diagnosis bar.
- The messages on the diagnostics bar can be divided into three categories: self-diagnosis, protection or measurement alarms, and programming error.

5 - Alarms displayed and suggestions

- Alarms displayed and suggestions** A list of faults that may appear on the Ekip Aware display is given below along with suggestions on how to resolve them:

Signal	Suggestions
AF1 Configuration Error AF2 Configuration Error	Protection AF1 or AF2 error due to configuration or fault
Numerical alarm (e.g. 30002)	Consult the Events page of the System Interface to identify the error. Contact ABB if the code is not included in the list.
ArcFlash connection alarm	Alarm of sensors connected to Arc Flash 6F module
Battery low	Replace the battery  CAUTION! Caution the battery may explode unless it is handled correctly: do not charge, disassemble or burn. Only use batteries supplied by ABB. Use of other batteries could lead to the risk of fire or explosion.
Local bus	Unit on with auxiliary supply, Local Bus parameter enabled but connection to modules not present, incorrect or communication lost (for more than five seconds); check: • connection and powering of modules in terminal box or external • that the modules connected are compatible with Ekip Aware
CB undefined	Check the circuit-breaker status signal contacts
Configuration	Check: • thresholds of activated protections in conflict with the limitations specified in the chapters of each • Neutral protection configuration consistent with I_u size and I_n Size of CB
Custom logic	Problems concerning Customs Logic settings (Parser error, Resource allocation or presence)
Invalid Date	Wrong date and time: set values in <i>Date-Device Settings</i> and <i>Time-Device Settings</i> menu
Datalogger or Datalogger Pro available / saved	Datalogger or Datalogger Pro has stopped recording / recording has been saved
DisplayOFF(Temp)	Display off due to temperature outside the set operating range, check limits in protection chapter Trip Unit Temperature Control (TU T)(see page110)
Ekip Link Bus	<i>Ekip Supply Evo Modbus TCP</i> module fault: check for loss of connection to one or more actors (modules) connected to Link Bus
Ekip Sign 4T connection	Alarm concerning connection of one or more analog inputs to <i>Ekip Temperature 4T</i> module
Ekip Sign 4T threshold	One or more thresholds of the <i>Ekip Temperature 4T</i> module has/have been exceeded

Continued on the next page

Signal	Suggestions
Ekip Synchro absent	If Ekip Synchrocheck is present, alarm of connection / mode V0
Internal error	Internal error; contact ABB if this type of error occurs
SNTP error	Fault concerning <i>Ekip Supply Evo Modbus TCP</i> modules: synchronization difficulties of SNTP synchronization reference module
Ethernet disconnected	No external cable on one or more <i>Ekip Supply Evo Modbus TCP</i> modules with Ethernet connection
IEEE 1588 synch	Synchronization problem of IEEE 1588 synchronization reference module
IEC 61850 Error	Configuration file error from Ekip Com IEC 61850 module
Input GOOSE Error Alarm	Error of GOOSE Input (absent, mismatch, decode error) from Ekip Com IEC 61850 module
MAC Address	<i>Ekip Supply Evo Modbus TCP</i> module detected with incorrect / not allowed MAC address, contact ABB.
L timing > thr % Alarm	L timing above threshold setting exceeded
Loads Cumulative Alarm	Present if Power Controller or Adaptive Load Shedding detect a load alarm
Maintenance	Maintenance alarm: carry out maintenance and then reset the alarm via Ekip Connect(see page132)
Advanced MDGF warning	Configuration or operating error of Advanced MDGF protection
PC Power exceed	The average power limit setting of the Power Controller has been exceeded
Zone Selectivity Diag	Error in zone selectivity connections (Hardware Selectivity)
Sense Accessories Config	Sense accessories enabled but not detected by protection release
Sense Coil	Alarm information about Sense version coils (high temperature of device, error in communication with protection release, last launch failed)
Sense Motor	Alarm information from M-SENSE ENABLER (high temperature of device, communication error, alarm charge time)
Sense Sensor	Information from internal temperature sensors for Predictive Maintenance on-premise, CB Internal Temperature Control protection alarm (high temperature of device, error in communication with protection release) packages
Sense Sensor Connection alarm	Sense Sensor has been enabled, but module does not appear to be present
Sense Sensor Warning	At least one temperature sensor disconnected from Sense accessories for Predictive Maintenance on-premise and CB Internal Temperature Control protection packages
Sensor L1/L2/L3/Ne/Gext	Fault in connection of sensors to Ekip Aware device. Check state of sensors, including external neutral and Earth fault or MDGF if present. Alternatively, contact ABB. In addition, the user must check the current sensors, the state of the terminal and cables for connecting to Ekip Aware device.
Configuration Session	TFTP server enabled and/or configuration session open in <i>Ekip Com IEC61850</i> module
CB status	CB state incorrect (esample: current present but CB in open state)
Switchboard Actor communication Error	Check configuration and connection of <i>Ekip Supply Evo Modbus TCP</i> module
TC disconnected	Disconnection of Trip coil detected, check functionality Check Trip coil, state of terminal and cables connecting to Ekip Aware
S.G.R. Toroid	Check connection and state of toroid
Contact Wear	Make sure that the contacts/poles are in good condition.

Protections In the event of protection or measurement alarms, the associated signals are reported:

Signal	Type of alarm
5th harmonic above Th / I sopra Th / THD I above Th / THD V above Th	Single or total harmonic measurement above threshold
Load LC1 / Load LC2	Current threshold 1 I1 / 2 I1 exceeded and in alarm state
CB Temperature Alarm, Warning, Blocked Trip	Notification related to CB Internal Temperature Control (CB T)
Phase cycle	Phase sequence protection in alarm state
Trip fail command (BF)	CB has not opened and/or current still present after a TRIP command: comply with the procedure described in chapter Faults, causes and remedies
Harmonic dist.	Harmonic Distortion protection in alarm state (> 2.1)
Power factor	Power factor measurement ($\cos\phi$) less than set threshold
Frequency Stability	Frequency measurements are within set limits for function of the same name
Frequency	Frequency measured off range (<30 Hz or >80 Hz)
Hardware trip	Trip or Hardware trip signalling for one or more of the envisaged conditions
Prealarm Protection (example: Prealarm G)	Specific protection in prealarm
Protection (Trip off) [example: S (Trip off)]	Specific protection, configured with trip disabled, in alarm state
X protection (example: G protection)	Trip of specific protection
RELT activated	RELT Protection Active
Temporizz. Protection (example: Temporizz. L)	Specific protection in time delay mode
RC test	Trip from test command of Rc sensor
External trip	Trip by external Trip programmable function
Trip Test	Trip test performed signal. Press iTEST to reset the message
Voltage Stability	Voltage measurements are within limits set for function of the same name
Iw1 Warning / Iw2 Warning	Current threshold Iw1 / Iw2 exceeded and in alarm state

Service

1 - ABB Electrification Service

We can tackle any challenge thanks to our global team of experts and broad range of assistance, retrofitting and advisory services.

Care services We're available 24/7 to care for your electrical products and infrastructure.

From installation and commissioning to repair – we maximize your electrical supply for improved productivity and profitability.

Modernization services ABB takes the efficiency and reliability of electrical assets to the next level through extensions, upgrades and retrofits. Our modernization services reduce total cost of ownership, maximize ROI and deliver safer and smarter solutions that extend asset's lifespan for another 20-30 years.

Advisory services Our global network of engineers and advisors harness smart thinking and new technologies.

We recommend the most appropriate business decisions to guarantee the availability, reliability and sustainability of critical assets and meet your evolving needs.

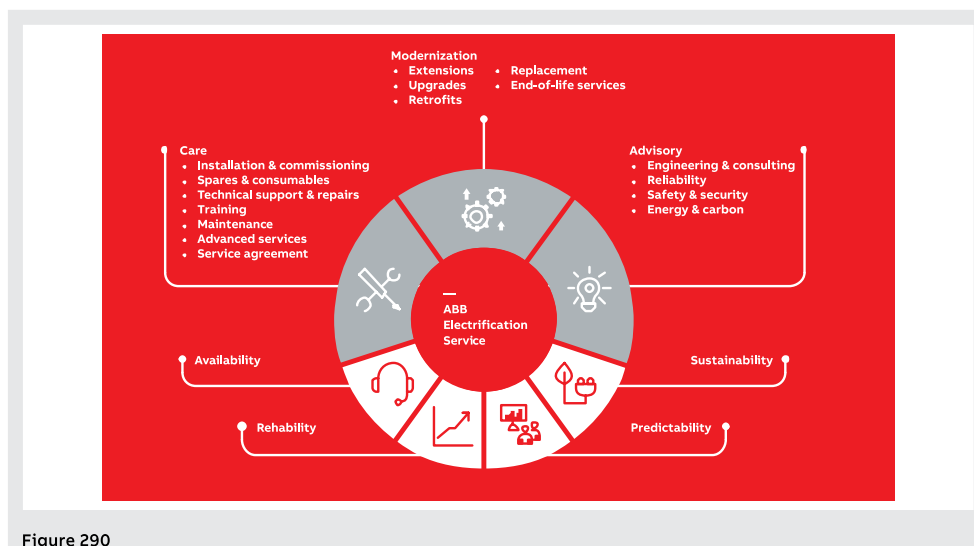


Figure 290

Installation & commissioning

Streamline power systems from the start. Ensure lower risks, quicker startups and peak performance

Service agreements

Service agreements Power Care covers skills development, condition assessment, maintenance, emergency assistance and sustainability services.

Training

Improve your team's expertise in managing and maintaining electrical installations with ABB training programs.

Maintenance

Our certified experts partner with you to develop maintenance strategies to meet your needs.

Spare parts

Get essential spares and consumables for quick, efficient upkeep.

Continued on the next page

Technical support & repairs

Expert support anytime, anywhere with on-site help, AR remote support and self-troubleshooting guides.

Upgrades & retrofits

Modernize systems with the latest technology with our upgrading and retrofitting solutions.

Extensions

Extend switchgear systems to support additional loads, integrate new equipment or add functionalities.

Replacements

Replace products with the same models for compatibility and reduced adjustments.

End-of-life services

Enable circularity with our “take-back” program for safety and environmental protection.

Reliability assessments

We assess and advise on electrical system health to ensure new levels of reliability.

Safety & security services

Enhance personnel safety and cyber security of operational technology systems.

Energy & carbon

Optimize your energy use and reach sustainability goals with ABB’s expertise.

Find out more <https://new.abb.com/service/electrification>



[ABB TOUCHPOINTS](#)



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