USER MANUAL

Zenith ZTGSE/ZTSSE T-series

For ZTGSE/ZTSSE T-series automatic transfer switches, 30-2500A, 200-480 Vac Including OPEN, DELAYED and CLOSED TRANSITION

This document is not intended to completely replace document ZTG T-series 30-1200A 1SCC301109M0201, ZTS T-series 30-1200A 1SCC301107M0201, ZTG 1600-2500A 1SCC301107M0201 and ZTS 1600-2500A 1SCC301109M0201 full-length O&M, which is called out in some cases for further details.

Hazard Categories

The following important highlighted information appears throughout this document to warn of potential hazards or to call attention to information that clarifies a procedure.

Carefully read all instructions and become familiar with the devices before trying to install, operate, service or maintain this equipment.

Danger
Indicates a hazardous situation that, is not avoided, will result in death or serious injury.

Danger
Indique une situation dangereuse qui, si elle n'est pas évitée, entraînera la mort ou des blessures graves.

Warning
Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

Avertissement
Indique une situation dangereuse qui, si elle n'est pas évitée, peut entraîner la mort ou des blessures graves.

Caution
Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury. Failure to comply with these instructions may result in product damage.

Attention
Indique une situation dangereuse qui, si elle n'est pas évitée, peut entraîner des blessures mineures ou modérées. Le non-respect de ces instructions peut endommager le produit.

Notice
It is used to notify of practices not related to personal injury. Failure to comply with these instructions may result in product damage.

Avis
Il est utilisé pour notifier des pratiques qui ne sont pas liées à des blessures corporelles. Le non-respect de ces instructions peut endommager le produit.

User Manual

Automatic transfer switches
Zenith ZTGSE/ZTSSE T-series ATS

Receiving, handling and storage

Read these safety instructions carefully before using this product!

HAZARD OF EQUIPMENT OVERTURNING

Warning
Equipment overturning Hazard
Failure to follow this instruction may result in personal injury or equipment damage.

Avertissement
Risque de renversement de l'équipement
Le non-respect de cette instruction peut entraîner des blessures corporelles ou endommager l'équipement.

When moving with a fork lift, do not remove the shipping packaging until the device is in its final location.

Receiving and handling

Upon receipt, carefully inspect the transfer switch for damage that may have occurred during transit. If damage is evident, or there is visible indication of rough handling, immediately file a damage claim with the transportation company, and notify your local ABB sales office.

Do not remove the shipping packaging until ready to install the switch.

Storage

If the unit will not be placed into service immediately, store the transfer switch in its original package in a clean, dry location. To prevent condensation, maintain a uniform temperature. Store the unit in a heated building, allowing adequate air circulation and protection from dirt and moisture. Storing the unit outdoors could cause harmful condensation inside the transfer switch enclosure.

Recommended Operating / Storage Temperature

Do not store the automatic transfer switch in corrosive environments above LC1 (sea salt mist) and G1 as per ANSI/ ISA-S71.04-1985. Failure to comply with these instructions may result in product damage.

Store the automatic transfer switch and related accessories in a clean, dry location in their original packaging.

Environmental	Value
Environments category	E
EMC environment	A and B
Operating temperature (without derating)	-20... +40 °C
Operating temperature (with derating)	-25... +70 °C
Transportation and storage temperature	-40... +70 °C
Altitude (without derating)	Up to 2000 m

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Table 1 General technical data of automatic transfer switch

Introduction

This manual describes the installation, basic operation, and maintenance of the Zenith ZTGSE/ZTSSE T-series (30-2500A, 200-480 Vac) automatic transfer switches, manufactured by ABB.

Installation instructions for the transfer switch and available accessories can be found in the O&M Manual ZTG T-series 30-1200A 1SCC301109M0201, ZTS T-series 30-1200A 1SCC301107M0201, ZTG 1600-2500A 1SCC301107M0201 and ZTS 1600-2500A 1SCC301109M0201.

Warranty

This document is based on information available at the time of its publication. While efforts have been made to ensure accuracy, the information contained herein does not cover all details or variations in hardware and software, nor does it provide for every possible contingency in connection with installation, operation, and maintenance. Features may be described herein that are not present in all hardware and software systems.

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Contact your local sales office if further information is required concerning any aspect of the automatic transfer switch operation or maintenance.

Warranty Period
The Warranty Period for ZTGSE/ZTSSE T-series transfer switch products is twenty-four (24) months from the date of shipment.

NOTE: This warranty is valid only in the United States and for products sold and installed within seller-specified countries.

Replacement parts are warranted for a period of 90 days when installed by a factory or an authorized service station.

Contact Service team at: +1 800 637 1738 or epis.pqservice@abb.com for 24-hour support.

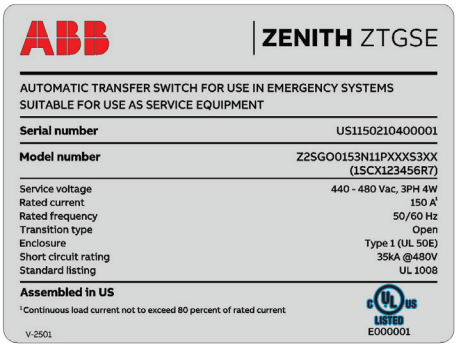
ABB | ZENITH ZTGSE

AUTOMATIC TRANSFER SWITCH FOR USE IN EMERGENCY SYSTEMS
SUITABLE FOR USE AS SERVICE EQUIPMENT

Serial number	US1150210400001
Model number	Z2SGO0153N11PXXXS3XX (1SCX123456R7)
Service voltage	440 - 480 Vac, 3PH 4W
Rated current	150 A[1]
Rated frequency	50/60 Hz
Transition type	Open
Enclosure	Type 1 (UL 50E)
Short circuit rating	35kA @480V
Standard listing	UL 1008

Assembled in US

[1] Continuous load current not to exceed 80 percent of rated current

c UL us LISTED E000001

V-2501

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Fig. 1 Sample nameplate

General overview

ATS SE 30-1200A[1]

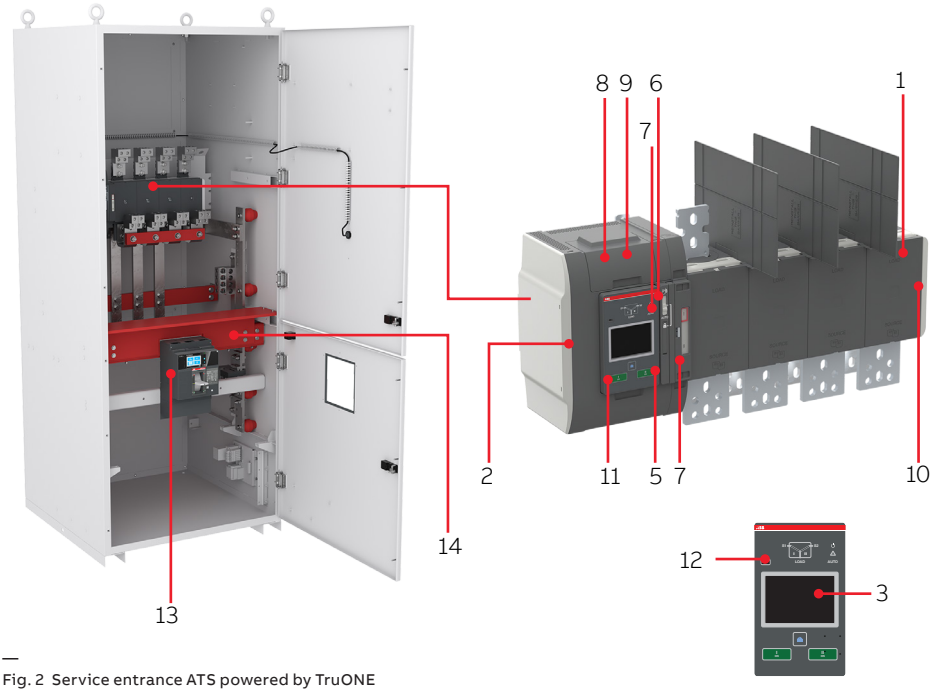


Fig. 2 Service entrance ATS powered by TruONE

1 Automatic transfer switch
2 Embedded ATS control unit and mechanism
3 Level 4 HMI unit, ZTS T-series color touchscreen LCD
4 Slide switch (Hand - Locking - AUTO) for selection of the operation mode
5 Padlocking the automatic transfer switch to prevent automatic and manual operation
6 Handle for manual operation
7 Position indication
8 Terminals for control circuit connections (behind the cover)
9 Place for connectivity modules (aux power supply, com and signaling)
10 Place for auxiliary contact block
11 Location of product identification label
12 Programming port, only for Ekip Programming module and Ekip Connect software
13 Circuit Breaker
14 Compartment barrier

[1]Note: 800-1200A used for illustration

ATS SE 1600-2500A

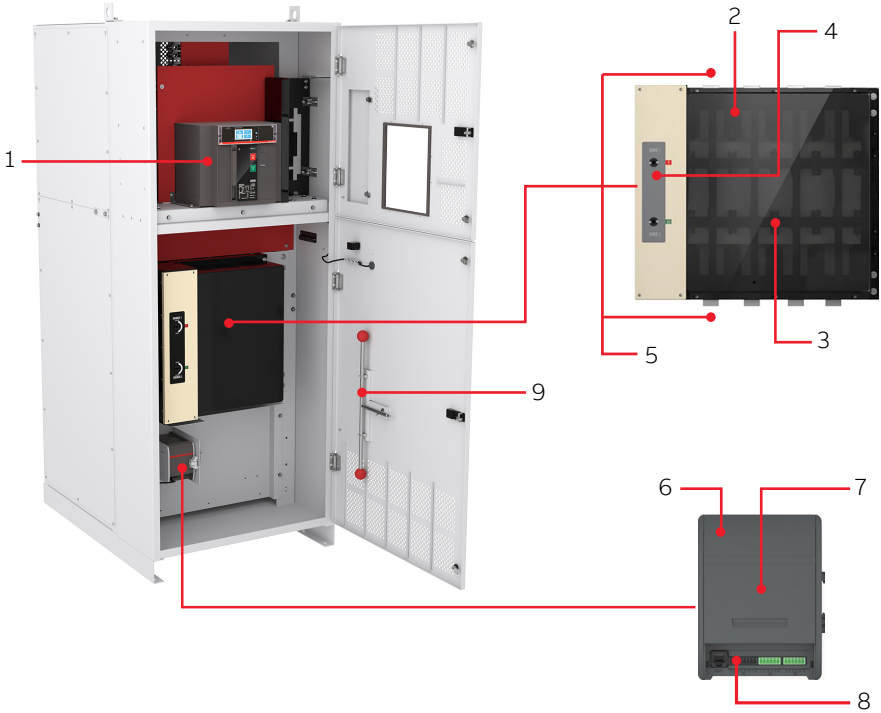


Fig. 3 Service entrance ATS powered by TruController

1 Circuit Breaker
2 Automatic transfer switch
3 Power poles
4 Position indication and manual operation point
5 Terminals
6 TruControl with embedded power supply
7 Connectivity module access
8 HMI and additional IO connections
9 Manual operating handle
10 Compartment barrier (not shown in picture)

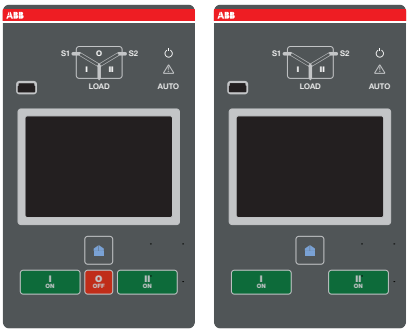
HMI

The HMI is the control interface (Human Machine Interface) of the ATS.

Zenith ZTG series has an LCD HMI with push buttons. The HMI is used for configuring parameters for automatic operation.

Zenith ZTS T-series has a color touch-screen LCD HMI with push buttons. The HMI is used for configuring parameters for automatic operation.

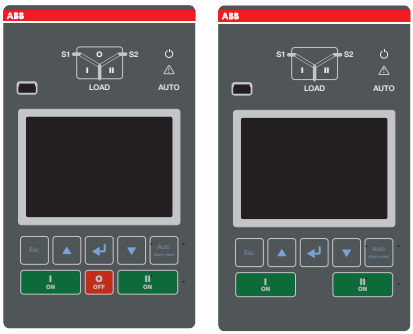
ZTS:
HMI with
Touch screen



I - O - II (or II - O - I)

Fig. 4 The HMI form will correspond to the type of ZTS T-series - open or delayed transition

ZTG:
HMI with
LCD screen



I - O - II (or II - O - I) I - II (or II - I)

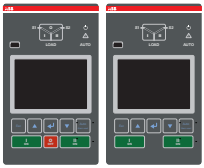
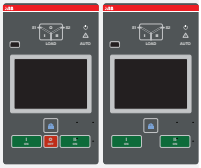
Fig. 5 The HMI form will correspond to the type of ZTG T-series - open or delayed transition

For further details, please refer the respective manual.

ZTG- 1SCC303023M0201

ZTS- 1SCC303039M0201

TruONE ATS feature comparison

Feature comparison	Level 3 controls (LCD)	Level 4 controls (TOUCH)
		
Amperes sizes available	UL: 30...2500 A	UL: 30...2500 A
Rated voltage, three phase	200...480 Vac	200...480 Vac
Rated voltage, single phase	200...240 Vac	200...240 Vac
Rated frequency	50 / 60 Hz	50 / 60 Hz
Phase system	Single and Three	Single and Three
Number of poles	2, 3 and 4	3 and 4
Neutral configuration		
Switched	Yes	Yes
Overlapping	Yes	Yes
Product type		
Open transition (I-II or II-I)	Yes	Yes
Delayed transition (I - O - II or II - O - I)	Yes	Yes
Voltage and frequency settings		
Pick up Voltage Source 1	71...99%, 101...119%	71...99%, 101...119%
Drop out Voltage Source 1	70...98%, 102...120%	70...98%, 102...120%
Pick up Voltage Source 2	71...99%, 101...119%	71...99%, 101...119%
Drop out Voltage Source 2	70...98%, 102...120%	70...98%, 102...120%
Pick up Frequency Source 1	80,5...99,5%, 100,5...119,5%	80,5...99,5%, 100,5...119,5%
Drop out Frequency Source 1	80...99%, 101...120%	80...99%, 101...120%
Pick up Frequency Source 2	80,5...99,5%, 100,5...119,5%	80,5...99,5%, 100,5...119,5%
Drop out Frequency Source 2	80...99%, 101...120%	80...99%, 101...120%

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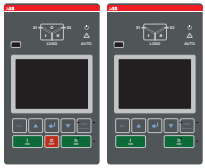
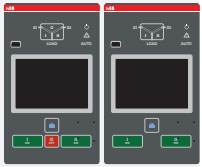
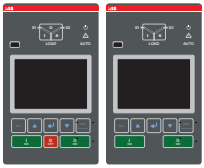
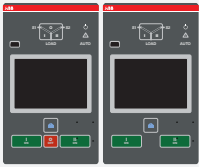
Feature comparison	Level 3 controls (LCD)	Level 4 controls (TOUCH)
		
Time delay settings		
Override momentary Source 1 Outage, sec	0…60	0…60
Transfer from source 1 to source 2, sec	0…3600	0…3600
Override momentary Source 2 Outage, sec	0…60	0…60
Transfer from source 2 to source 1, min	0…120	0…120
Generator stop delay, min	0…60	0…60
Center-OFF delay, sec	0…300	0…300
Pre-transfer delay S1 to S2, sec	0…300	0…300
Post-transfer delay S1 to S2, sec	0…300	0…300
Pre-transfer delay S2 to S1, sec	0…300	0…300
Post-transfer delay S2 to S1, sec	0…300	0…300
Elevator Pre-signal delay S1 to S2, sec	0…60	0…60
Elevator Post-signal delay S1 to S2, sec	0…60	0…60
Elevator Pre-signal delay S2 to S1, sec	0…60	0…60
Elevator Post-signal delay S2 to S1, sec	0…60	0…60
Load shed delay, sec	0…60	0…60
Source failure detections		
No voltage	Yes	Yes
Undervoltage	Yes	Yes
Overvoltage	Yes	Yes
Phase missing	Yes	Yes
Voltage unbalance	Yes	Yes
Invalid frequency	Yes	Yes
Incorrect phase sequence	Yes	Yes

Continued on the next page

Feature comparison	Level 3 controls (LCD)	Level 4 controls (TOUCH)
		
Features		
Controls	LCD + keys	Touch + keys
LED indications for ATS, S1 and S2 status	Yes	Yes
Open transition - Standard digital inputs/outputs	1 / 1	2 / 1
Delayed transition - Standard digital inputs/outputs	2 / 1	3 / 1
Programmable digital inputs/outputs	Yes	Yes
Auto config (voltage, frequency, phase system)	Yes	Yes
Source priority	Source 1/2, No priority	Source 1/2, No priority
Manual retransfer	Yes	Yes
In-phase monitor (synchro check)	Yes	Yes
Genset exercising: on-load, off-load	Yes	Yes
In-built power meter module	No	Yes
Load shedding	Yes	Yes
Real time clock	Yes	Yes
Event log	Yes	Yes
Predictive maintenance	No	Yes
Harmonics measuring	Voltage	Voltage, current

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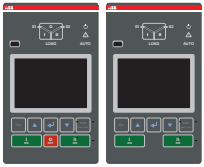
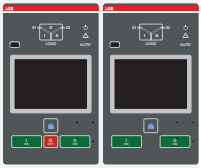
Feature comparison	Level 3 controls (LCD)	Level 4 controls (TOUCH)
		
Field-mount accessories		
Auxiliary contacts for position indication	Yes	Yes
Digital input/output modules	Yes	Yes
12-24 Vdc aux supply module for controller	Yes	Yes
Communication modules	Yes	Yes
Connectivity		
Modbus RTU (RS-485) [2)]	Yes	Yes
Modbus/TCP [2)]	Yes	Yes
Profibus DP [2)]	Yes	Yes
ProfiNet [2)]	Yes	Yes
DeviceNet [2)]	Yes	Yes
Ethernet IP [2)]	Yes	Yes
Ekip Com Hub (monitoring via ABB Ability™: EAM)	Yes	Yes
For applications		
Mains - Mains	Yes	Yes
Mains - Generator[1)]	Yes	Yes

[1)] Contact ABB for applications with smaller than 20 kVA gensets

[2)] Includes support for redundant module

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Table 2 ATS feature comparison, main features - but not limited to - in the table above

Operation

Sequence of operation

SOURCE1 Priority (SOURCE2 = Generator)

The switching sequence can be summarized in the following steps:

1. An anomaly occurs on SOURCE 1
2. Override momentary S1 outage delay
3. Generator start
4. SOURCE 2 OK
5. Transfer from S1 to S2 delay
6. Pre-transfer signal on
7. Load shed signal on
8. Pre-transfer S1 to S2 delay
9. Load shed delay
10. Transfer switch (SOURCE 1) to position O
11. Center-off delay (only with Delayed transition I - O - II type)
12. Transfer switch (SOURCE 2) to position II
13. Post-transfer S1 to S2 delay
14. Pre-transfer signal off

The re-transfer sequency can be summarized in the following steps:

1. SOURCE 1 is restored
2. Transfer from S2 to S1 delay
3. Pre-transfer signal on
4. Pre-transfer S2 to S1 delay
5. Transfer switch (SOURCE 2) to position O
6. Center-off delay (only with Delayed transition I - O - II type)
7. Transfer switch (SOURCE 1) to position I
8. Load shed signal off
9. Generator stop delay
10. Post-transfer S2 to S1 delay
11. Pre-transfer signal off
12. Generator stop
13. SOURCE 2 off

SOURCE2 Priority (No generator)

The switching sequence can be summarized in the following steps:

1. An anomaly occurs on SOURCE 2
2. Override momentary S2 outage delay
3. Transfer from S2 to S1 delay
4. Pre-transfer signal on
5. Load shed signal on
6. Pre-transfer S2 to S1 delay
7. Load shed delay
8. Transfer switch (SOURCE 2) to position O
9. Center-off delay (only with Delayed transition I - O - II type)
10. Transfer switch (SOURCE 1) to position I
11. Post-transfer S2 to S1 delay
12. Pre-transfer signal off

The re-transfer sequence can be summarized in the following steps:

1. SOURCE 2 is restored
2. Transfer from S1 to S2 delay
3. Pre-transfer signal on
4. Pre-transfer S1 to S2 delay
5. Transfer switch (SOURCE 1) to position O
6. Center-off delay (only with Delayed transition I - O - II type)
7. Transfer switch (SOURCE 2) to position I
8. Load shed signal off
9. Post-transfer S1 to S2 delay
10. Pre-transfer signal off

Test diagrams for systems with integral ground fault protection

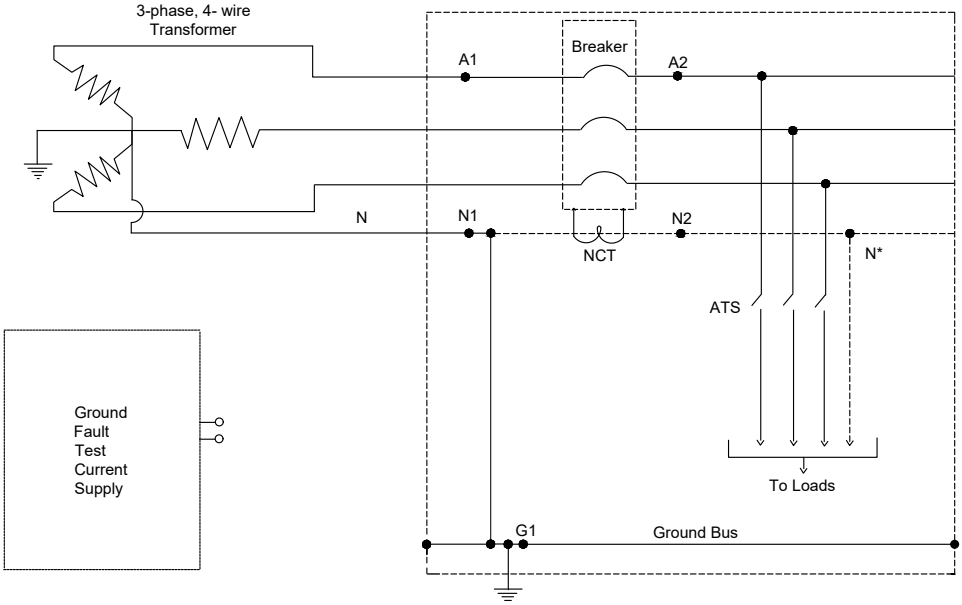


Fig. 6 Main circuit breaker with integral ground fault protection - 3-Phase, 4-wire

Test no.	Connect Test Current Supply to Points	Connect Jumper between points	Results expected	Comments
10-1	A1 and N1	A2-N2	Circuit breaker should not trip	This confirms that polarity and ampere rating of the neutral sensor match those of the phase sensors in the circuit breaker
10-2	A1 and N1	A1-G1	Circuit breaker should trip at ground fault setting.	Confirms continuity of round path from ground bus to neutral

Table 3

* In 3-wire equipment the load neutral is not furnished. Omit Test 10-1.

Transformer wiring diagram shown as reference only.
This figure is indicated for Internal ground fault protection EKip TU with ABB provided external ground fault neutral sensor.

NOTE: High Current supply capable of delivering up to .2x ATS amperage, jumper cables.

Service Entrance Disconnect

This Transfer Switch is suitable for use as a Service Entrance ATS. Factory will provide the unit with Neutral to Ground bonding can be installed in the field as per the requirement.
3-pole units are available with Solid Neutral and 4-pole units are available with Switched Neutral. 3-pole breaker is provided as standard on 4-pole ATS. Sales dimension drawing of the unit shows overall layout of switch components, Neutral and Ground link location.

Instruction for Service Disconnect operation
For the unit without Shunt Trip option
To Disconnect the power:
(1) Operate the Breaker handle manually to "Trip/open position" to trip the breaker.
(2) At this situation, there is no power to the source 1 side of the ATS. Operator must take appropriate action to remove the Source 2 power.
(3) Verify the power is OFF.

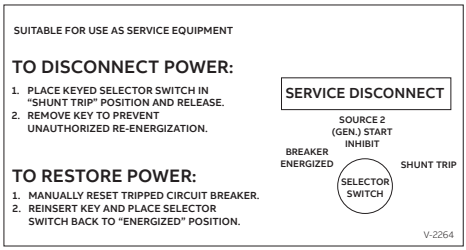
To Restore the Power:
(1) Operate the Breaker handle manually to "Close position" to connect the breaker to Source 1.
(2) At this situation, there is power at Source 1 side of ATS.
(3) Operate must take appropriate action to enable Source 2.

For the unit with Shunt Trip option:
To Disconnect the power:
(1) Turn the selector switch to "Shunt Trip" location. This will trip the Source 1 side breaker. At this situation, there is no power to the source 1 side of the ATS.
(2) Move the Selector switch to "Source 2 (GEN) Start Inhibit. This will INIHIT the Generator to start so Source 2 (GEN) power will no available.
(3) verify the power is OFF.

To Restore the Power:
(1) Operate the Breaker handle manually to "Close position" to connect the breaker to Source 1.
(2) Place selector switch to "Breaker Energized" position.

Ground fault protection is equipment protection from the effects of ground faults. The National Electrical Code® (NEC®) has specific ground fault equipment protection requirements. Ground Fault Protection (GFP) is an available option in breaker. For 30-800A SE unit, customer has an option to order the breaker with GFP option. For 1000A and higher amperage SE unit, breaker has GFP option as standard.

GFP option monitor the current passes through circuit and automatically trip the breaker if the current value is out side of set parameter. Refer to breaker manual to get more details about GFP option.



Automatic configuration

Auto configure is the first step to take after the panel is initially energized. This function recognizes the electrical system, then automatically sets all the system parameters: system voltage, frequency, and phase sequence.

Follow the steps in the figure on the HMI to run auto configure. The ATS must have at least one source available to complete this step.

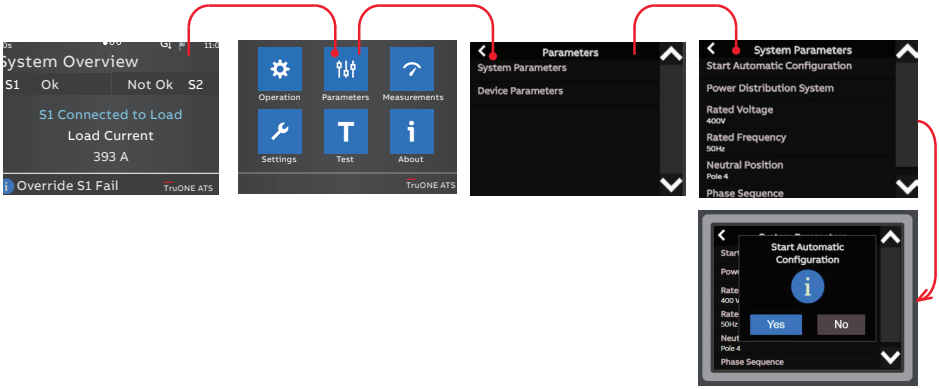


Fig. 7

Service Entrance Rated ATS / ATS with Breaker upstream

This Transfer switch is shipped with the kit to make it “Service Entrance Rated” ATS.

Kit includes following items

- Label “SUITABLE FOR USE AS SERVICE EQUIPMENT”
- Label "SERVICE DISCONNECT"
- Cable or copper bus to create bond between Neutral bar and Ground bar assembly
- Mounting hardware
- Instruction document

RELT Option

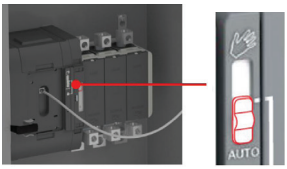
RELT option is standard for 1200A and above amperage ATS.
Refer respective electrical schematic drawing of the unit for more details.

Confirm Automatic Operation

To put your ATS into Auto mode, confirm the slide switch is in “AUTO” before the enclosure door is closed. This slide switch overrides the Auto/Manual mode set from the HMI. To place the ATS controller in AUTO mode through HMI screen, set "Automatic mode" to "ON" in the operations menu.

Confirm the ATS is in Auto mode by validating that the “AUTO” LED above and to the right of the LCD screen is solid green.

1.



2.

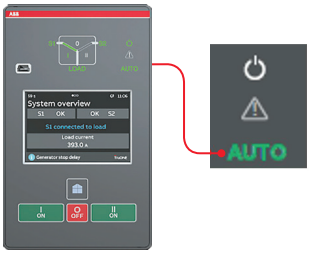


Fig. 8

For further details, please refer the respective manual.

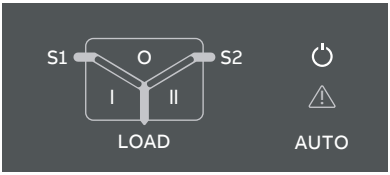
ZTG- 1SCC303023M0201

ZTS- 1SCC303039M0201

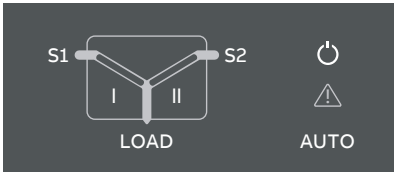
LED functionality in HMI

At the top of HMI, there is a set of LEDs intended to model the state of the transfer switch sources, position, alarms, and mode.

A considerable amount of information can be deciphered from the LED states. See the tables below for more information.

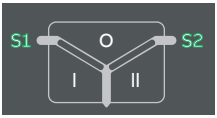


I - O - II



I - II

Fig. 9 On left: LEDs in ZTSD, delayed transition, I - O - II. On right: LEDs in ZTS, open transition I - II.

LED	Indication	Description
Power led		
	ON, fixed light	Power supply and communication present
	2 quick flashes/1 s	Power supply present, communication absent between switch and the HMI
	OFF	No power available for HMI.
S1 and S2 leds		
	ON, fixed light	S1 or / and S2 is present and within user defined limits
	2 quick flashes/1 s	Undervoltage
	Flash/1 s, 90 %/10 %	Invalid frequency
	Flash/1 s, 10 %/90 %	Unbalance
	5 flashes/1 s, 50 %/50 %	Overvoltage
	Flash/2 s, 50 %/50 %	Incorrect phase sequence
	Flash/4 s, 50 %/50 %	Phase missing
	Flash/1 s, 50 %/50 %	Generator stop delay ongoing
	OFF	No voltage

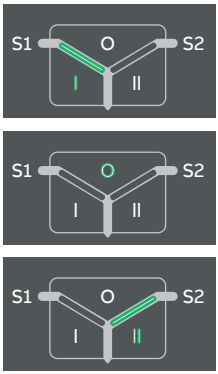
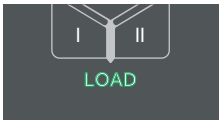
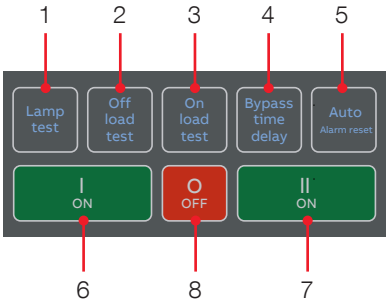
I, II and 0 leds		
	ON, fixed light	Switch position is indicated with fixed light in I, O or II led. Only one can be on simultaneously
	Flash/1 s, 50 %/50 %	Delay ongoing. Going to move away from the blinking status
Load led		
	ON	Supply ok and connected to load
	OFF	Not connected to load
Auto led		
	ON, fixed light	Switch is in automatic mode
	Flash/1 s, 50 %/50 %	Test on load
	Flash/1 s, 90 %/10 %	Test off load
	Flash/1 s, 10 %/90 %	If blinks simultaneously with Alarm led then 'Remote control to S1','Remote control to S2', 'Remote control to OFF' or 'Inhibit transfer' digital input is activated.
	5 flashes/1 s, 50 %/50 %	Autoconfig completed
Alarm led		
	OFF	No alarms
	ON, fixed light	Handle attached, locked, other alarm
	2 quick flashes/1s	Control Alarm
	5 flashes/1 s, 50 %/50 %	Auto configuration ongoing
	Flash/1 s, 50 %/50 %	Control Retry
	Flash/1 s, 10 %/90 %	Auto mode off
	Flash/1 s, 10%/90 %	If blinks simultaneously with Alarm led then 'Remote control to S1', 'Remote control to S2', 'Remote control to OFF' or 'Inhibit transfer' digital input is activated. If Auto led is fixed light then manual retransfer is required.

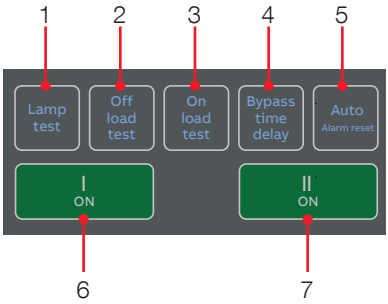
Table 4 LED functionality

Using Level 3 control interface HMI

Keypad



OXB_, delayed transition, I - O - II



OXA_, open transition, I - II

Fig. 10 Keypad in Level 2 HMI with DIP-switches

1 **Lamp test:** Turns on all LEDs simultaneously to confirm all LEDs are operational

2 **Off load test:** Initiates off load test (Starts generator but does not transfer the load to the generator)

1+2 **Lamp test + Off load test:** Hold for 3 seconds to automatically program a repeating off load weekly test at current time, 20 minutes run time

3 **On load test:** Initiates on load test (Starts the generator and transfers the load to the generator)

1+3 **Lamp test + On load test:** Hold for 3 seconds to automatically program a repeating on load weekly test at current time, 20 minutes run time

4 **Bypass time delay:** Bypass any currently running time delay

5 **Auto (Alarm reset):** In the event of active switch control alarm (open I failure, close I failure, open II failure, close II failure), resets to no alarm state. If no active alarms, toggle between Automatic operation mode and Momentary manual operation mode. If the Manual Retransfer DIP-switch is set to "On", toggle between Manual retransfer and Momentary manual operation modes.
Note: When automatic mode is switched by this button, there is 3 second delay before entering automatic mode.

6 **I ON:** Operate switch to I position

7 **II ON:** Operate switch to II position

8 **O OFF:** Operate switch to O position and disable automatic control mode (only in delayed transition I-O-II type)

Using Level 4 (touch) control interface HMI

Keypad

1 **Home Button:** Opens up the root menu or brings user to the homepage if defined. While viewing a specific page, it can be defined as the home page by pressing the home button for 3 seconds. All pages, except for the menus, can be set as home page. Home page is automatically shown after inactivity.

2 **I ON:** Operate switch to I position.

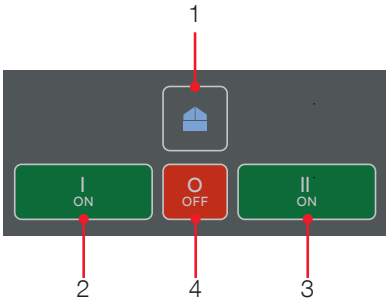
3 **II ON:** Operate switch to II position.

4 **O OFF:** Operate switch to O position and disable automatic control mode (only in delayed transition I-O-II type).

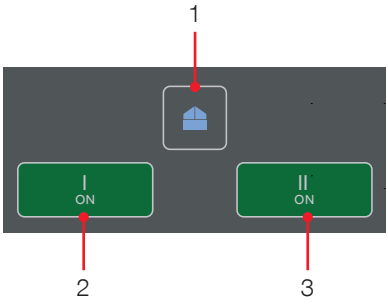
Navigating menu

Menus and parameters- Refer detailed catalog.

1SCC303049M0201



OXB_, delayed transition, I - O - II



OXA_, open transition, I - II

Fig. 11 Keypad in Level 4 HMI with touch screen

Service entrance breaker

30-1200A unit
30-1200A service entrance units utilize the ABB XT MCCB. For further details on the breaker settings and the trip unit information, please refer to the below link
1SXU210248C0201

1600-2500A unit
1600-2500A service entrance units utilize the ABB Emax 2 ACB. For further details on the breaker and the trip unit information, please refer to the below link
1SXU200040C0201

Neutral CT (NCT)
1000A and above SE ATS, the Neutral CT is a standard offering. For for further details on the NCT, please refer to the links below

1000-1600A unit
1SDH001000R0506

2500A unit
1SDH001000R0515

Troubleshooting

Warning
Shock, Voltage and Arc Flash hazard
Any troubleshooting should be conducted by trained and authorized personnel only. Appropriate personal protective equipment (PPE) shall be used when troubleshooting the service equipment. Hazardous voltage may be present. Disconnect all power sources before performing work inside the service equipment.
Failure to do so may result in serious injury or death.

Avertissement
Risque de choc, de tension et d'arc électrique
Tout dépannage doit être effectué uniquement par du personnel formé et autorisé. Un équipement de protection individuelle (EPI) approprié doit être utilisé lors du dépannage de l'équipement de service. Des tensions dangereuses peuvent être présentes. Débranchez toutes les sources d'alimentation avant d'effectuer des travaux à l'intérieur de l'équipement de service. Le non-respect de cette consigne peut entraîner des blessures graves, voire mortelles.

Alarms

LCD Touch

Message	Fault	Action
Locked, Alarm LED on	Lock input activated	Unlock
Switch not in AUTO mode, Alarm LED on	Slide switch is in handle or lock position	Turn slide switch into the AUTO position
Phases crossed	Phase rotation of sources 1 and 2 are different	Connect the phases of both sources in the same order
S1 undervoltage	Voltage of source 1 is under the threshold level set in parameter “Drop-out voltage, lower threshold“	Check the correlation between power source and device configuration
S1 overvoltage	Voltage of source 1 is over the threshold level set in parameter “Drop-out voltage, upper threshold“	Check the correlation between power source and device configuration
S1 phase missing	One or two phases of source 1 are missing	Check the power source and connections
S1 unbalance	Phases of source 1 are not symmetric	Check the power source
S1 phase rotation	Phase rotation of source 1 is different from the value of parameter “Phase sequence“	Connect the phases according to the configuration
S1 invalid frequency	Frequency of source 1 is out of range set in parameters “Drop-out frequency, upper threshold“ and “Drop-out frequency, lower threshold“	Check the correlation between power source and device configuration
S2 undervoltage	Voltage of source 2 is under the threshold level set in parameter “Drop-out voltage, lower threshold“	Check the correlation between power source and device configuration
S2 overvoltage	Voltage of source 2 is over the threshold level set in parameter “Drop-out voltage, upper threshold“	Check the correlation between power source and device configuration
S2 phase missing	One or two phases of source 2 are missing	Check the power source and connections

Table 5 Alarm-list in level 3 and 4, LCD and touch control interfaces

Alarm symbol for LVL-3 LVI

Alarm symbol for LVL-4 LVI

Message	Fault	Action
S2 unbalance	Phases of source 2 are not symmetric	Check the power source
S2 phase rotation	Phase rotation of source 2 is different from the value of parameter “Phase sequence“	Connect the phases according to the configuration
S2 invalid frequency	Frequency of source 2 is out of range set in parameters “Drop-out frequency, upper threshold“ and “Drop-out frequency, lower threshold“	Check the correlation between power source and device configuration
Frequency Difference	Frequency difference of voltage sources is greater than 3 Hz while in-phase monitor is on	Alarm is active and transfer operations disabled as long as the frequency difference is above the accepted level
High current alarm	Measured current is higher than ten times the nominal value	Alarm is active and transfer operations disabled as long as the high current status remains
Open I failure, Alarm LED blinking	Switch transfer from position I to O or II failed	Reset alarm by pressing Auto button or via menu page Operation / Alarm Reset
Close I failure, Alarm LED blinking	Switch transfer to position I failed	Reset alarm by pressing Auto button or via menu page Operation / Alarm Reset
Open II failure, Alarm LED blinking	Switch transfer from position II to O or I failed	Reset alarm by pressing Auto button or via menu page Operation / Alarm Reset
Close II failure, Alarm LED blinking	Switch transfer to position II failed	Reset alarm by pressing Auto button or via menu page Operation / Alarm Reset
Switch position alarm, Alarm LED on	More than one switch position indication inputs are activated	Switch service needed
Pole temperature alarm	Measured pole temperature is too high	Switch service needed
Contact wear alarm	Switch contact wear is near the limit that requires maintenance	Switch service needed
Ekip Com Hub Alarm	Ekip Com Hub failure	Check configuration
HMI Not Compatible	Firmware versions of HMI and device are not compatible to be used together	Check current versions and update compatible versions
Local bus	Communication between HMI and switch controller is off	Check connection
Ethernet disconnected	Ethernet module not connected	Check connection
Fire Fighting	Fire fighting input activated	Alarm is active and disables transfer operations as long as the input is active
Control Voltage Failure	Control voltage dropped during switch control	Check power source
Control Voltage Low	Switch control voltage is below the minimum	Check power source
Configuration Error	Invalid configuration	Check parameter values
IEC 61850 Error	IEC 61850 failure	Check configuration file
Ekip Com Hub Alarm	Ekip Com Hub failure	Check configuration
HMI Not Compatible	Firmware versions of HMI and device are not compatible to be used together	Check current versions and update compatible versions

—
Table 6 Alarms-list in level 3 and 4, LCD and touch control interfaces

Warnings

LCD Touch

Message	Reason
S1 and S2 not in sync	Voltage sources are not synchronized
Voltage Not Calibrated	Calibration data in power module is invalid or unavailable
Current Not Calibrated	Calibration data in current measurement module is invalid or unavailable
Pole temperature warning	Measured pole temperature is near the alarm level
Control Retry	Failed transfer sequence retry activated
Auto Control Disabled	Device is in manual operating mode
Local Bus	Module heartbeat error. Check connection. Can be cleared using "Alarm Reset".
Configuration	Configuration session ports are open
Clock capacitor charging	Real time clock is not yet operational, date & time setting is disabled as long as this warning is active. Clock capacitor is charged from source voltage (not AUX) and takes about 10 minutes

Table 7 Warnings-list in level 3 and 4, LCD and touch control interfaces


Warning symbol for LVL-3 HMI


Warning symbol for LVL-4 HMI

LCD Touch

Message	Description
Invalid Date	Date not set
Test on Load	Test on load sequence active
Test off Load	Test off load sequence active
Alarm/Product Availability	Digital output function activated
In Position I	Digital output function activated
In Position O	Digital output function activated
In Position II	Digital output function activated
Pre-transfer Signal 1	Digital output function activated
Pre-transfer Signal 2	Digital output function activated
Pre-transfer Signal 3	Digital output function activated
Pre-transfer Signal 4	Digital output function activated
Source 1 Available	Digital output function activated
Source 2 Available	Digital output function activated
Load Shed	Digital output function activated
Emergency Stop	Digital input function activated
Remote Test on Load	Digital input function activated
Remote Test off Load	Digital input function activated
Inhibit ATS	Digital input function activated
Manual Retransfer	Digital input function activated
Priority S1	Digital input function activated
Priority S2	Digital input function activated
Inhibit Transfer	Digital input function activated
Bypass Running Delays	Digital input function activated
Remote Control to S1	Digital input function activated
Remote Control to Off	Digital input function activated
Remote Control to S2	Digital input function activated
Alarm Reset	Digital input function activated
Manual-Auto Mode	Digital input function activated

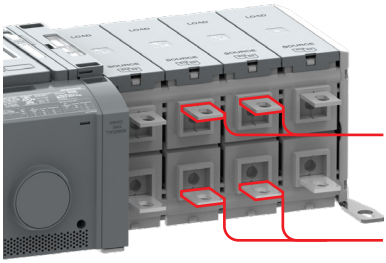
—

Table 8 Info statements in level 3 and 4, LCD and touch control interfaces

Warning symbol for LVL-3 HMI

Warning symbol for LVL-4 HMI

Technical data



Operating voltage for control circuit 200-480 Vac. Generator supply; min. power rating 20 kVA

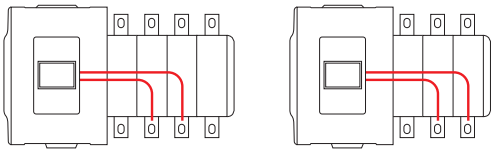
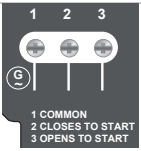
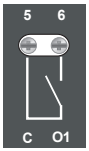
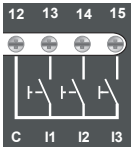


Fig. 12 Power supply for control and power switching circuits

Automatic transfer switch, power circuit	Value	
Rated operational voltage	200-480 Vac	
Rated frequency	50 / 60 Hz	
Rated impulse withstand voltage	12 / 8 kV	
Operating times	See respective manuals	
Automatic transfer switch, control circuit	**Value**	**Remark**
Voltage supply	200-480 Vac	Integrated, see Fig. 12
Operating voltage range	±20 %	
Voltage measurement accuracy	1 %	
Rated frequency	50 / 60 Hz	
Operating frequency range	±20 %	
Frequency measurement accuracy	0.5 %	
Rated impulse withstand voltage	6 kV	

Table 9

Automatic transfer switch, I/O contacts		Cabling	Rating / Remark
Generator start/stop	Cable size:	0.5…2.5 mm² 24...14(12) AWG	Stripping length; 6,5 mm, 0,255"
	Common, voltage supply	1	5 A@250 Vac (AC-1), 5 A@30 Vdc
	Generator start/stop NO	2	
	Generator start/stop NC	3	
Output relay features	Cable size:	0.5…2.5 mm² 24...14(12) AWG	
Common, voltage supply		5	5 A@250 Vac (AC-1), 5 A@30 Vdc
	Programmable output (default; Alarm/Product available)	6	
Fire Fighting applications	Cable size:	0.5…2.5 mm² 24...14(12) AWG	Only in ZTSD-types, delayed transition, I – O – II or II – O – I
	Fire fighting input 24 Vdc (+)	10	SELV
	Fire fighting input 24 Vdc (-)	11	Transfers to O/OFF position, locks the logic and signals alarm
Input contact features	Cable size:	0.5…2.5 mm² 24...14(12) AWG	Do not connect to any power supply
Common input		12	24 Vdc 5 mA
	Level 4		Level 4 = HMI with touch screen
	Programmable input (default; Emergency stop)	13	
	Programmable input (default; Remote test on load)	14	
	Programmable input (default; Remote test off load)	15	Only in ZTSD-types, delayed transition, I – O – II or II – O – I

AC15		AC12			AC13	
Ue/[V]	Ie/[A]	Ue/[V]	Ie/[A]	P/[W]	Ie/[A]	P/[W]
230	6	24	10	240	2	50
400	4	72	4	290	0.8	60
415	4	125	2	250	0.55	70
690	2	250	0.55	140	0.27	
		440	0.1	44		

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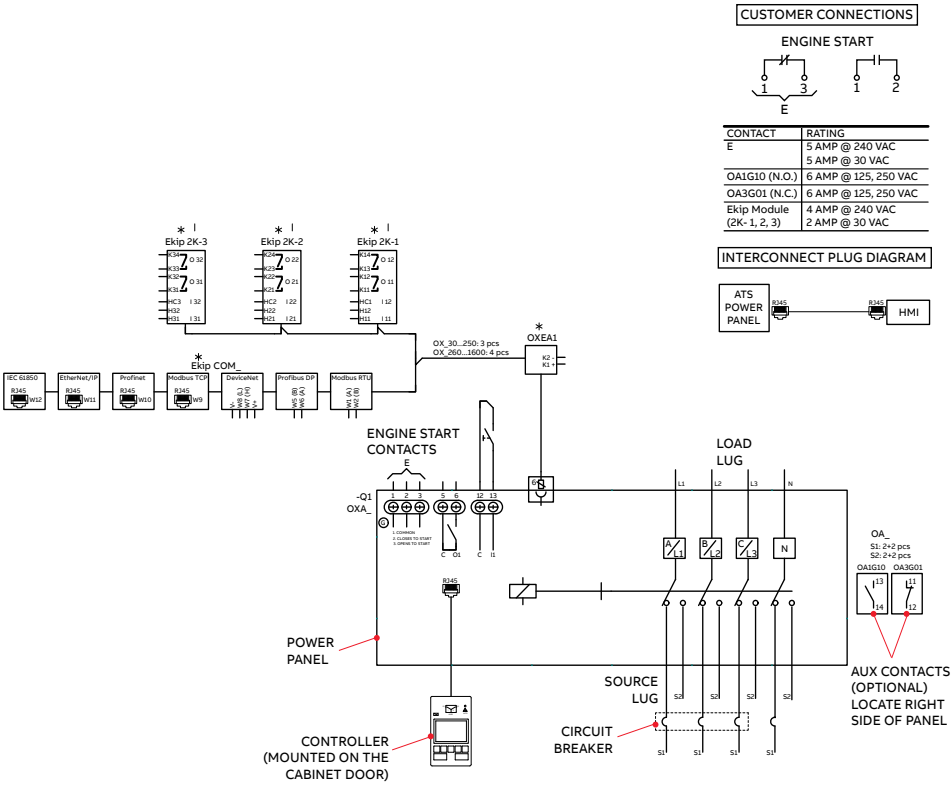
Table 10 Technical data for auxiliary contacts according to IEC 60947-5-1, for OA1G_, OA3G_

Circuit diagrams

ZTGSE 30-1200A Open transition schematics

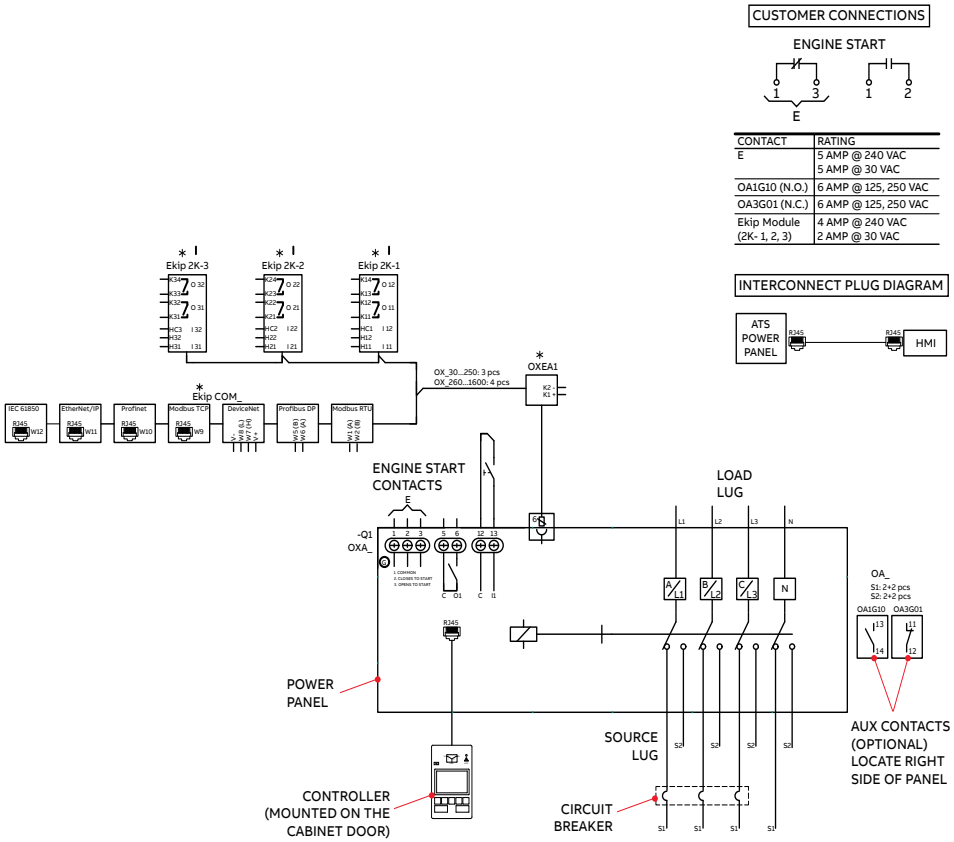


Notes:

1. ATS shown in Source 1 position with no power available.
2. Refer to operation and maintenance manual to configure the options.
3. # of N.O. and N.C. contacts on power panel as well as com modules and Ekip-2K module, offering will be different based on the switch amperage. Review the product brochure for the details. Review the product brochure for the details.
4. 4-pole ATS shown for reference.

Fig. 13

ZTSSE 30-1200A Open transition schematics

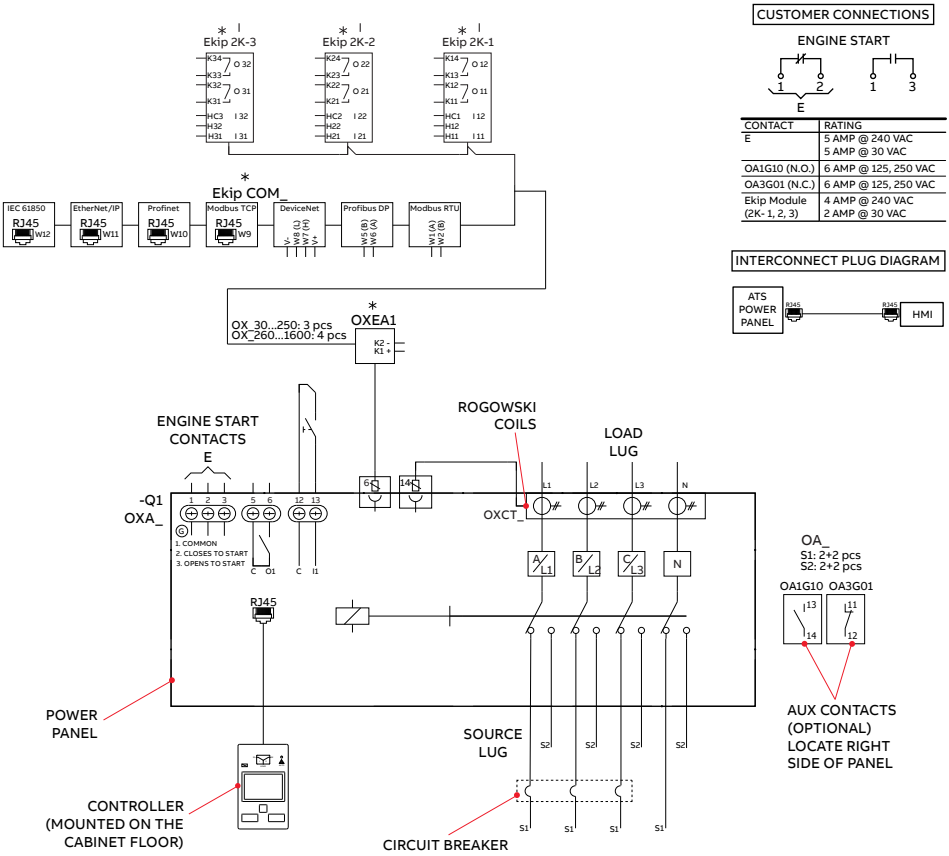


Notes:

1. ATS shown in Source 1 position with no power available.
2. Refer to operation and maintenance manual to configure the options.
3. # of N.O. and N.C. contacts on power panel as well as com modules and Ekip-2K module, offering will be different based on the switch amperage. Review the product brochure for the details. Review the product brochure for the details.
4. 4-pole ATS shown for reference.

Fig. 14

ZTGSE 30-1200A Delayed transition

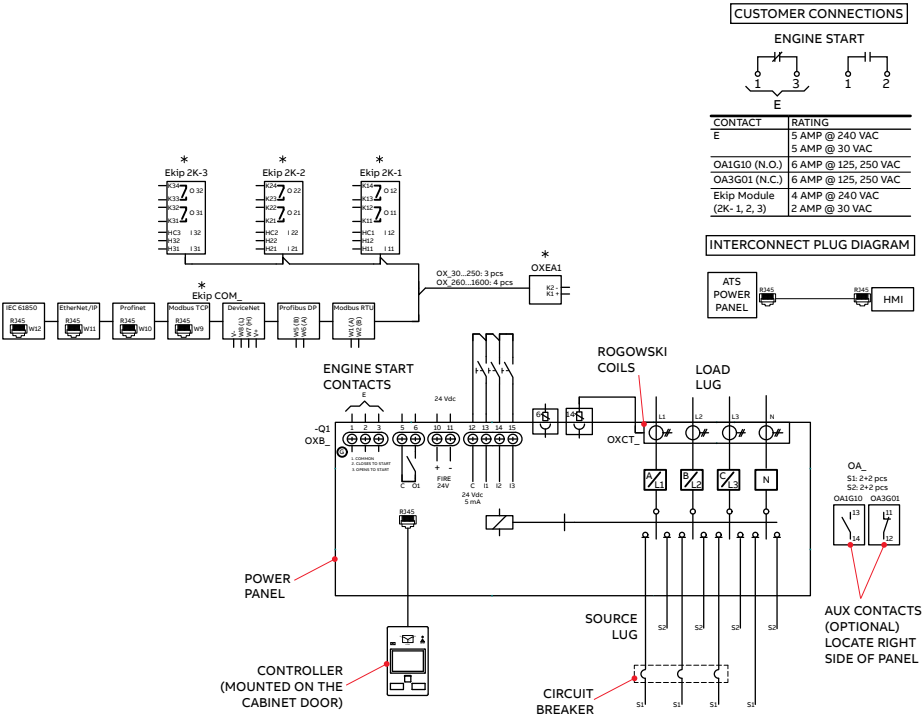


Notes:

1. ATS shown in source 1 position with power available.
2. Refer to operation and maintenance manual to configure the options.
3. # of N.O. contacts on power panel will be different based on the switch amperage. Review the product brochure for the details.

Fig. 15 ZTSSE
Please refer 77A-2006 for further details

ZTSSE(D) 30-1200A Delayed Transition



Notes:

1. ATS shown in Source 1 position with no power available.
2. Refer to operation and maintenance manual to configure the options.
3. # of N.O. and N.C. contacts on power panel as well as com modules and Ekip-2K module, offering will be different based on the switch amperage. Review the product brochure for the details. Review the product brochure for the details.
4. 4-pole ATS shown for reference.

Fig. 16 ZTSSE(D)
Please refer 77A-2008 for further details

ZTGSE/ZTSSE 1600-2500A

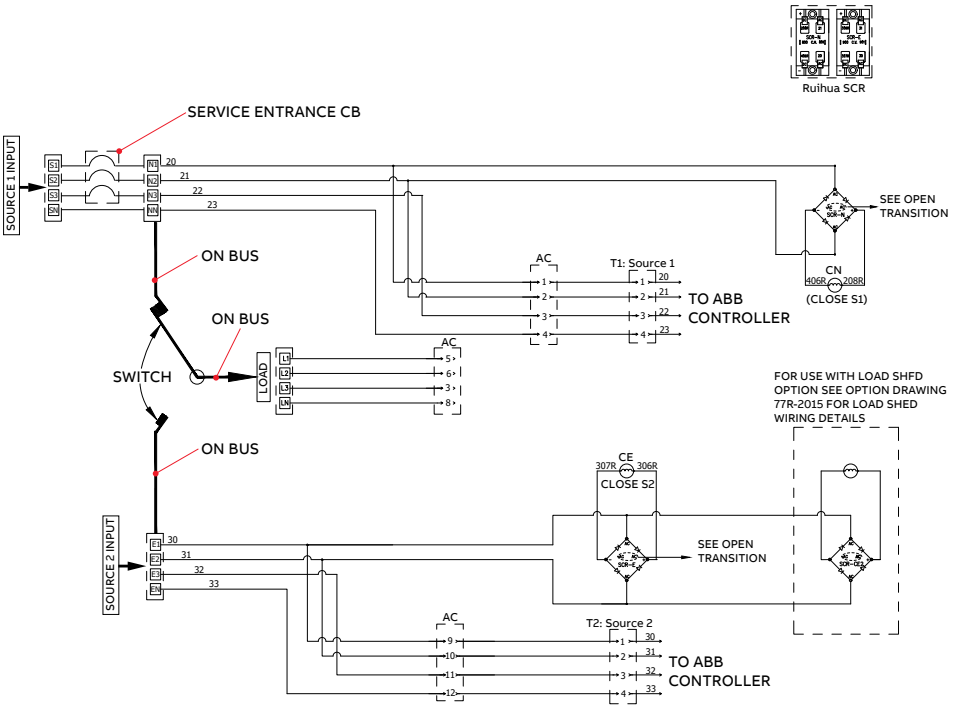


Fig. 17 ZTGSE/ZTSSE
Above diagram is for reference only, for further details please refer to electrical schematic document 77A-2009

Maintenance

Warning
Shock, Voltage and Arc Flash hazard
Any maintenance should be conducted by trained and authorized personnel only.
Appropriate personal protective equipment (PPE) shall be used when performing maintenance on the service equipment.
Hazardous voltage may be present. Disconnect all power sources before performing work inside the Service equipment.
Failure to do so may result in serious injury or death.

Avertissement
Risque de choc, de tension et d'éclair d'arc électrique
Toute opération de maintenance doit être effectuée par uniquement par du personnel formé et autorisé.
L'équipement de protection individuelle (EPI) approprié doit être utilisé lors de l'entretien de l'équipement de service.
Une tension dangereuse peut être présente. Débranchez toutes les sources d'alimentation avant d'effectuer des travaux à l'intérieur de l'équipement de service.
Le non-respect de cette consigne peut entraîner des blessures graves ou la mort.

Maintenance Principle

The Zenith ZTGSE/ZTSSE T-series 30-2500A, 200-480 Vac automatic transfer switches, powered by TruONE™, are designed so that the contacts last their designed lifetime without any routine maintenance needs. If there are abnormal conditions such as a fault or overload without adequate protection, or extreme environment conditions, a failure of ATS components may occur.
Fortunately, all critical modules, including complete mechanism with electronics (controller, power module, and solenoid mechanism), HMI, and accessories are easily replaceable. Refer to page 51 for replacement parts.

On the other hand, when the contacts have seen an event, or have met the end of their lifetime, the whole switch should be replaced – which can be done easily by replacing the complete TruONE™ power panel within the enclosure.

In the case you suspect a failure may be due to manufacturer defect and covered under warranty, see page 6.

Refer to page 30 technical data for ATS contact endurance and note that the number of operations can be viewed in the information menu from the HMI.

ABB recommends a routine (such as annual) inspection to, e.g. , check electrical termination temperatures, ensure unit is clean, check voltage levels, test transfers, # of operations, etc. to ensure everything is in proper working order.

Recommended annual inspection includes:

Routine Inspection
- Review event log
- Check number of operations and other switch status figures
- Visual inspection both inside and outside of enclosure for damage or debris
- Test transfer of load
- Observe voltage levels of both sources within expected range
- Cable lug torque verification

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Danger
Shock, Explosion or Arc Flash hazard
Failure to follow the instruction will result in death or serious injury.

Danger
Risque de choc, d'explosion ou d'arc électrique
Le non-respect des instructions peut entraîner la mort ou des blessures graves.

- Apply appropriate personal protective equipment and follow safe electrical work practices.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Before performing visual inspections, tests, or maintenance on the equipment, disconnect all sources of electric power. Assume that all circuits are live unless they are completely de-energized, tested, grounded, and tagged. Pay particular attention to the design of the power system. Consider all sources of power, including the possibility of backfeeding.
- Disconnect all sources of electric power before removing or making source side or load side connections to the transfer switch.
- Always use a properly rated voltage sensing device at all line and load connections to confirm transfer switch is disconnected from all live electrical sources.
- Turn off power supplying transfer switch before doing any other work on or inside switch.

Panel installation

Before mounting the product, please, check the product identification from the product identification label, which is located on the front panel under the control interface unit (HMI). This label indicates the product model (type number), some important technical data information, minimum enclosure size, suitable wire information, etc.

Notice

Final inspection of the equipment should be performed prior to energizing the automatic transfer. Remove any dirt or debris that may have collected during shipment or installation. NEVER use compressed air. Doing so could drive dirt or other foreign objects into electrical or mechanical components, which could cause damage. Use an industrial-quality vacuum cleaner to remove any dirt or foreign objects.

Be certain all cable connections are correct and that the phase rotation of both sources match.

Inspect the engine start connections and verify the correct connection of all control wire

Check all programmable set points and adjust as necessary. In addition, adjust any optional accessories as required.

Be certain that the actual lug torque values are in keeping with the requirements outlined in the instruction book to ensure the integrity of power connections.

Check to be sure that all covers and barriers are properly installed and fastened.

If any damage is found or suspected, file a claim as soon as possible with the carrier, and notify the nearest ABB Zenith representative, or call 1-800-637-1738.]

Avis

Une inspection finale de l'équipement doit être effectuée avant de mettre le transfert automatique sous tension. Enlever toute saleté ou tout débris qui aurait pu s'accumuler pendant le transport ou l'installation. N'utilisez JAMAIS d'air comprimé. Des saletés ou d'autres corps étrangers risqueraient de pénétrer dans les composants électriques ou mécaniques, ce qui pourrait les endommager. Utilisez un aspirateur de qualité industrielle pour enlever toute saleté ou tout objet étranger.

Assurez-vous que toutes les connexions de câbles sont correctes et que la rotation des phases des deux sources correspond.

Inspectez les connexions de démarrage du moteur et vérifiez la connexion correcte de tous les fils de commande.

Vérifiez tous les points de consigne programmables et ajustez-les si nécessaire. En outre, réglez tous les accessoires en option, le cas échéant.

Assurez-vous que les valeurs de couple de serrage des cosses sont conformes aux exigences énoncées dans le manuel d'instructions afin de garantir l'intégrité des connexions électriques.

Vérifiez que tous les couvercles et barrières sont correctement installés et fixés.

Si vous constatez ou soupçonnez des dommages, déposez une réclamation dès que possible auprès du transporteur et informez le représentant ABB Zenith le plus proche ou appelez le 1-800-637-1738].

Basic Tools for Installation and Maintenance

Tool	Task
1/4" to 1/2" Allen head socket driver	Power cable connection
Torque wrench	Torqueing of the lugs and other hardware as required. Range of device to be 50 - 500 in-lbs (5-57 N-m)
Torque screwdriver	Torqueing of control wire terminations, auxiliary contact input terminals. 5 - 25 in-lbs (0.5 - 2.8 N-m)
Wire cutters/wire crimpers	Auxiliary contacts wire installation, Options installation
Voltmeter	Trouble shooting tool for measuring incoming voltage, frequency, continuity and control signal transmission.
Controller default password 00001	Changing parameters within the controller

Table 11 Required tools for common installation and maintenace tasks

Lifting, Mounting and Installation

Danger
Shock and Voltage hazard
Turn OFF all power before installation, adjustment, or removal of transfer switch or any of its components. Failure to do so will result in death or serious injury. Service Equipment must be electrically grounded.

Failure to do so may result in malfunction of the switch, possible damage to surrounding equipment and will cause death or serious injury.

Danger
Risque de choc et de tension
Couper l'alimentation électrique avant d'installer, de régler ou de retirer le commutateur de transfert ou l'un de ses composants.
Le non-respect de cette consigne entraînera la mort ou des blessures graves. L'équipement de service doit être mis à la terre.

Le non-respect de cette consigne peut entraîner un dysfonctionnement du commutateur, des dommages éventuels aux équipements environnants et des blessures graves ou mortelles.

Warning
Shock and Voltage hazard
ABB recommends that an ABB Certified technician or a qualified electrician perform the installation & maintenance of the switch. Before drilling conduit entry holes or any accessory mounting holes, cover and protect the switch, breaker, and control panel to prevent dirt and metal fragments from entering the mechanical and electrical components.
Failure to do so could result in death or serious injury.

Avertissement
Risque de choc et de tension
ABB recommande qu'un technicien certifié ABB ou un électricien qualifié effectue l'installation et la maintenance de l'interrupteur.
Avant de percer les trous d'entrée des conduits ou les trous de montage des accessoires, couvrir et protéger l'interrupteur, le disjoncteur et le panneau de commande afin d'éviter que des saletés et des fragments de métal ne pénètrent dans les composants mécaniques et électriques.
Le non-respect de cette consigne peut entraîner la mort ou des blessures graves.

Lifting guidelines
Adequate lifting means must be used to mount the transfer switch into place. The recommended method for moving the ATS, up to 2500 A, is with lifting strap and lifting equipment rated for the equipment weight.

Lifting, Mounting and Installation
The safe operation of your switch at all times is paramount to ABB. Please recognize that hazardous voltages and currents can exist during normal operation, and any maintenance on the transfer switch must be performed utilizing appropriate safety measures. Installation, adjustment, maintenance or removal of the switch must only be carried out by qualified personnel and with all power to the switch turned off. It is recommended that only qualified electricians be allowed to install or provide maintenance on the switch. Prior to installation, store the transfer switch in a clean dry location, protected from dirt and water. Provide ample air circulation and heat if necessary to prevent condensation. See table 1 for recommended storage and ambient operating temperatures.

ABB Zenith automatic transfer switches are packaged as per the standard packaging regulatory standards requirement suitable for domestic and international shipment through all modes of transportation (air, sea and road). Once you unpack the units, please make sure all the components are received as per the BOM. For any missing items, contact your local ABB Zenith service representative.

Lifting Guidelines for Service Entrance Automatic Transfer Switches

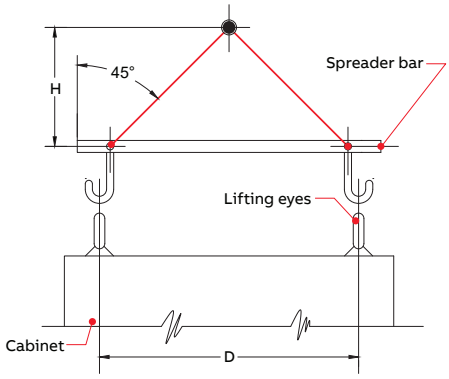
Warning:
Lifting hazard
Failure to follow these instructions could result in death or serious injury.

Avertissement:
Risque de levage
Le non-respect de ces instructions peut entraîner la mort ou des blessures graves.

1. ABB Zenith Service entrance equipment are mounted onto a wooden pallet using bolts and nuts. Please remove the bolts and nuts prior to lifting.
2. ABB Zenith Service entrance equipment enclosures have the provisions for lifting through the standard overhead lifting device.
3. Wall mount unit need to be listed with fork lift from bottom or through suitable lifting straps. Engage the lifting hooks and adjust lifting positions such that the hooks are pointing outward.
4. Refer to Table 12 for the weight information, or the dimensional drawing for the center of gravity (denoted as CG), weight information, lifting provision, and anchoring hole pattern on lower mount C-channels.
5. While lifting the unit using lifting chains, it is recommended to maintain a 45° angle as shown in Fig. 19.
6. Refer to Fig. 18 for lifting provisions on the enclosure top.
7. ABB Zenith Service entrance equipment units should be lifted using propely-rated lifting devices.

Lifting eyelets

Fig. 18 Automatic Transfer Switch Enclosed Assembly Lifting locations



Note: When lifting the switch using a spreader bar, height H must be equal to half of distance D

Fig. 19 Recommended Lifting Angle

Assembly weights

AMP	ENCLOSURE TYPE	POLES	Weight LB (KG)
30-60A	NEMA-1	2	147 (67)
		3	151 (69)
		4	156 (71)
100-200A	NEMA-1	2	147 (67)
		3	151 (69)
		4	156 (71)
30-60A	NEMA-3R/4/12/4X	2	394 (179)
		3	399 (181)
		4	403 (183)
100-200A	NEMA-3R/4/12/4X	2	394 (179)
		3	399 (181)
		4	403 (183)
225-260A	NEMA-1	2	287 (131)
		3	291 (133)
		4	296 (135)
400A	NEMA-1	2	287 (131)
		3	291 (133)
		4	296 (135)
225-260A	NEMA-3R/4/12/4X	2	399 (181)
		3	403 (183)
		4	407 (185)
400A	NEMA-3R/4/12/4X	2	399 (181)
		3	403 (183)
		4	407 (185)
600A	NEMA-1	2	463 (211)
		3	468 (213)
		4	479 (217)
600A	NEMA-3R/4/12/4X	2	585 (265)
		3	591 (268)
		4	622 (282)
800-1200A	NEMA-1	3	1112 (504)
		4	1142 (518)
800-1200A	NEMA-3R/4/12/4X	3	1232 (559)
		4	1262 (572)
1600-2000A	NEMA-1	3	1650 (748)
		4	1755 (796)
2500A	NEMA-1	3	1842 (836)
		4	1947 (883)

Table 12

Mounting the automatic transfer switch

Mounting hole dimensions

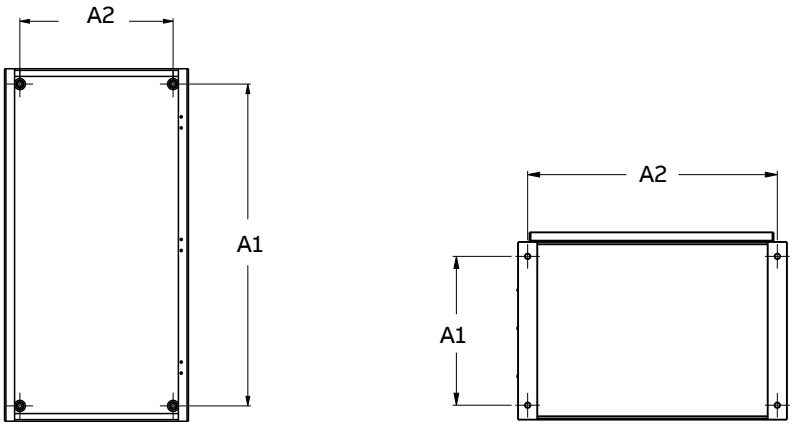


Fig. 20 Automatic transfer switches, Mounting hole dimensions, refer to Table 13 and 14

	Poles	NEMA Type	Height A1	Width A2	Mount type
30-200A NEMA 1	2, 3, 4	TYPE 1	42	20	Wall
260-400A NEMA 1	2, 3, 4	TYPE 1	50	24	Wall
260-400A NEMA 1	2, 3, 4	TYPE 1	15,5	26	Floor
600A NEMA 1	2, 3, 4	TYPE 1	66	35	Wall
600A NEMA 1	2, 3, 4	TYPE 1	15,5	38	Floor
800-1200A NEMA 1	3, 4	TYPE 1	32,4	32	Floor

Table 13

	Poles	NEMA Type	Height A1	Width A2	Mount type
30-200A NEMA 3R	2, 3, 4	TYPE 3R	55,25	22	Wall
30-200A NEMA 3R	2, 3, 4	TYPE 3R	15,5	26	Floor
260-400A NEMA 3R	2, 3, 4	TYPE 3R	55,25	22	Wall
260-400A NEMA 3R	2, 3, 4	TYPE 3R	15,5	26	Floor
600A NEMA 3R	2, 3, 4	TYPE 3R	71,5	34	Wall
600A NEMA 3R	2, 3, 4	TYPE 3R	15,5	38	Floor
800-1200 NEMA 3R	3, 4	TYPE 3R	38	38	Floor

—
Table 14

	Poles	NEMA Type	Height (A1)	Width A2	A3	Mount type
1600-2500A NEMA 1	3, 4	TYPE 1	29,62	33,5	7	Floor
1600-2500A NEMA 3R	3, 4	TYPE 3R	29,75	33,5	7	Floor

—
Table 15

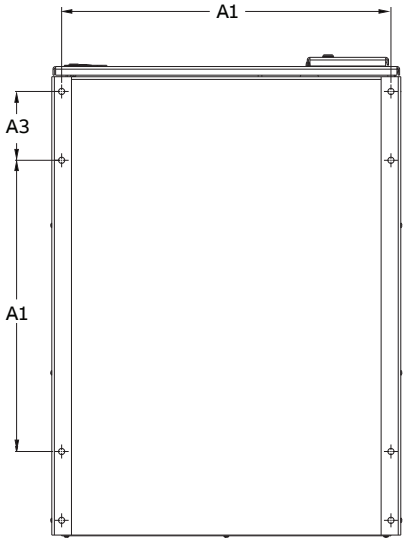


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Fig. 21 Automatic transfer switches, Mounting hole dimensions, refer to Table 15

Neutral Bonding and Wire Connection

Neutral Bonding

Warning

Shock, Voltage and Arc Flash hazard

Any troubleshooting including the installation of Neutral bondingshould be conducted by trained and authorized personnel only. Appropriate personal protective equipment (PPE) shall be used when troubleshooting the service equipment. Hazardous voltage may be present. Disconnect all power sources before performing work inside the service equipment.

Failure to do so may result in serious injury or death.

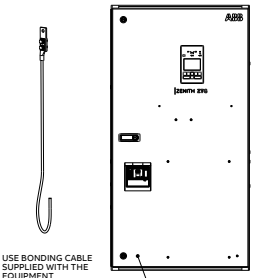
Avertissement

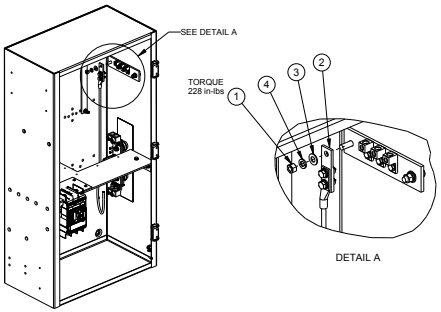
Risque de choc, de tension et d'arc électrique

Tout dépannage, y compris l'installation de la liaison neutre, ne doit être effectué que par du personnel formé et autorisé. Un équipement de protection individuelle (EPI) approprié doit être utilisé lors du dépannage de l'équipement. Des tensions dangereuses peuvent être présentes. Déconnectez toutes les sources d'alimentation avant d'effectuer des travaux à l'intérieur de l'équipement.Le non-respect de cette consigne peut entraîner des blessures graves, voire mortelles.

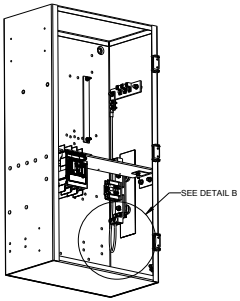
BONDING CABLE/BAR IS SUPPLIED LOOSE ALONG WITH THE UNIT. IF THE UNIT IS USED AS SERVICE EQUIPMENT, INSTALL THE BONDING BAR AS PER THE BELOW INSTRUCTION. APPLY THE "SERVICE DISCONNECT" LABEL NEAR THE CIRCUIT BREAKER DISCONNECT HANDLE.

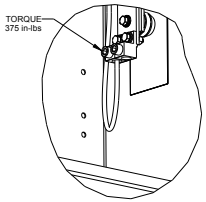
30-400A



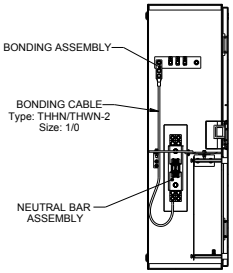


STEP-1:
ASSEMBLE BONDING ADAPTER ASSEMBLY TO THE GROUND BAR.





STEP-2:
ASSEMBLE BONDING CABLE TO NEUTRAL ASSEMBLY LUG.



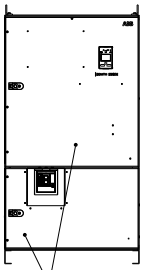
VIEW SHOWING BONDING CABLE CONNECTION

BILL OF MATERIAL

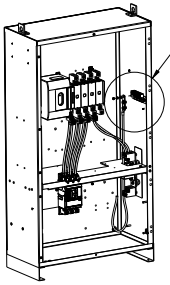
ITEM NO	PART NO	DESCRIPTION	QTY
1	HMH-541	3/8-16 GRADE 8 HEX NUT	5
2	S-1688	200-400A BONDING ADAPTER ASSY	1
3	HMH-89	3/8 X .812 PLAIN WASHER	7
4	HMH-87	3/8 HELICAL SPRING LOCK WASHER	3
5	V-2508	LABEL-SERVICE DISCONNECT	1

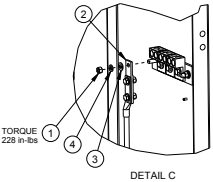
600A

USE BONDING CABLE SUPPLIED WITH THE EQUIPMENT



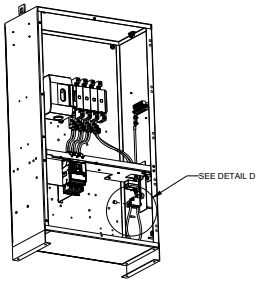
OPEN ENCLOSURE TOP AND BOTTOM DOOR TO ACCESS GROUND BAR AND NEUTRAL BAR

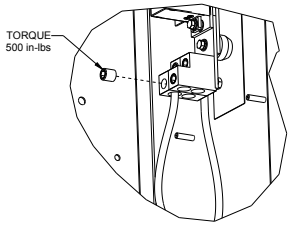




DETAIL C

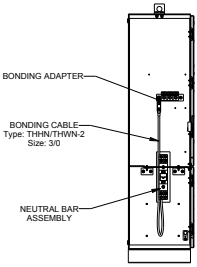
STEP-1:
ASSEMBLE BONDING ADAPTER ASSEMBLY TO THE GROUND BAR.





DETAIL D

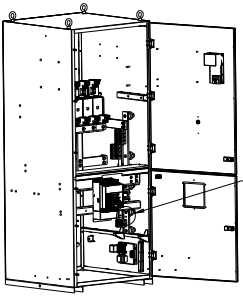
STEP-2:
ASSEMBLE BONDING CABLE TO NEUTRAL ASSEMBLY LUG



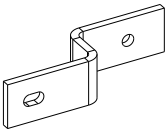
VIEW SHOWING BONDING CABLE CONNECTION

BILL OF MATERIAL			
ITEM NO	PART NO	DESCRIPTION	QTY
1	HMH-541	3/8-16 GRADE 8 HEX NUT	5
2	S-1755	600A BONDING ADAPTER ASSY	1
3	HMH-89	3/8 X .812 PLAIN WASHER	7
4	HMH-87	3/8 HELICAL SPRING LOCK WASHER	3
5	V-2508	LABEL-SERVICE DISCONNECT	1

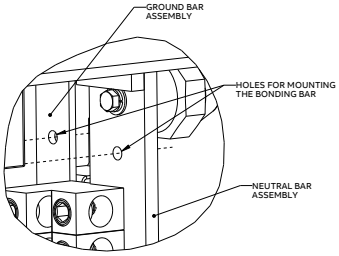
800-1200A



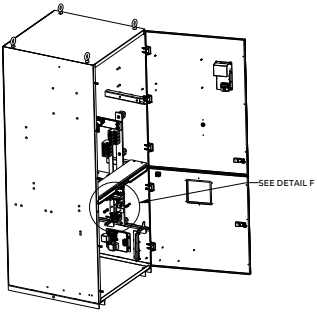
STEP 1:
OPEN THE TOP AND BOTTOM DOOR.
MOUNTING LOCATION SHOWN FOR BONDING BAR



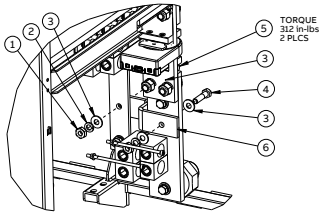
USE BONDING BAR SUPPLIED WITH THE EQUIPMENT



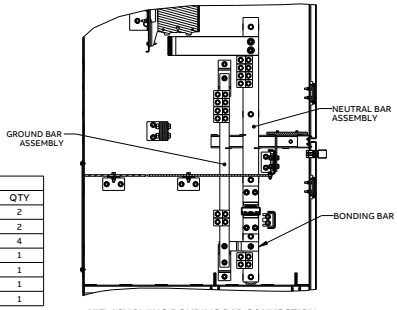
DETAIL E



STEP 2:
ASSEMBLE THE BONDING BAR BETWEEN GROUND BAR AND NEUTRAL BAR ASSEMBLY.
PARTS HIDDEN FOR REPRESENTATION PURPOSE



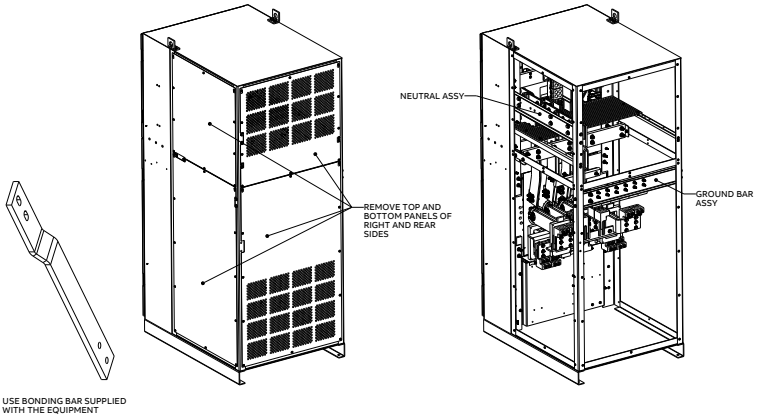
DETAIL F



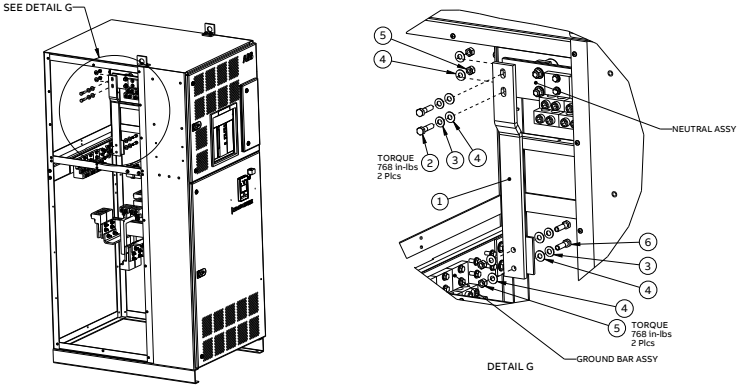
VIEW SHOWING BONDING BAR CONNECTION

BILL OF MATERIAL			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	MMH-28	3/8-16 HEAVY HEX JAM NUT	2
2	MMH-87	3/8 SPLIT LOCK WASHER	2
3	MMH-90	3/8 X .875 BRASS WASHER	4
4	MMH-339	3/8-16 X 1.25 HEX HD C/S	1
5	MMH-340	3/8-16 X 1.50 HEX HD C/S	1
6	S-1700	BONDING BAR-800-1200A	1
7	V-2508	LABEL-SERVICE DISCONNECT	1

1600-2500A



STEP-1: REMOVE RIGHT AND REAR SIDE PANELS



STEP-2: ASSEMBLE BONDING BUSBAR

BILL OF MATERIAL			
ITEM	PART NO	DESCRIPTION	QTY
1	S-1564	GROUND AND NEUTRAL BONDING BAR	1
2	HMH-356	1/2-13 X 2.00 HEX HD C/S	2
3	PS-1832	1/2-13 COMPRESSION WASHER SmOD	4
4	HMH-94	1/2 X 1.125 PLAIN WASHER	8
5	HMH-545	1/2-13 GRD8 HEX NUT	4
6	HMH-353	1/2-13 X 1.75 HEX HD C/S	2
7	V-2508	LABEL-SERVICE DISCONNECT	1

Wire Connection

Notice
Lugs come pre-installed and torqued.

Avis
Les cosses sont préinstallées et serrées.

AL/CU UL Listed Solderless Screw-Type Terminals for External Power Connections

Model	ATS Rating (A)	Source/Load	Lug Type	Wire Range	Cables per pole	Cables Tightening Torque[1], lb-in (N-m)
ZTGSE(D) ZTSSE(D)	30 - 60	Source 1	OZXA-24	14 - 2/0 AWG	1	50/5.7
		Source 2 / Load	OZXA-100	12 - 2/0 AWG	1	132/15.0
	100 - 200	Source 1	OZXA-25	6 AWG - 300 MCM	1	275 / 31.1
		Source 2 / Load	OZXA-200	4 AWG - 300 MCM	1	200 / 22.6
	260 - 400	Source 1	OZXA-412L	1x4 AWG - 600 MCM or 2 x 1/0 AWG - 250 MCM	1/2	500 / 56.5
		Source 2 / Load	OZXA-412	1x 4 AWG - 600 MCM or 2 x 1/0 AWG - 250 MCM	1/2	500 / 56.5
	600	Source 1	OZXA-800L	2 AWG - 600 MCM	2	500/56.5
		Source 2 / Load	OZXA-800E	2 AWG - 600 MCM	2	500/56.5
	800 - 1200	Source 1	OZXA-1200	2 AWG - 600 MCM	4	500/56.5
		Source 2	OZXA-800S	2 AWG - 600 MCM	4	500/56.5
		Load	OZXA-1200	2 AWG - 600 MCM	4	500/56.5
ZTS ZTSD ZTSCT	1600-3000	Source1 / Source2 / Load	S-1399R	2 AWG - 600 MCM	8	500/56.5
		Source1 / Source2 / Load	S-1399R	2 AWG - 600 MCM	8	500/56.5
		Source1 / Source2 / Load	S-1399R	2 AWG - 600 MCM	8	500/56.5

[1]Notice. Do not exceed this value - may cause damage to switch, voiding warranty

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Table 16 Power Cable Torque Requirements

NOTE: Above table shows ATS lug details for source 1, source 2 and load.
The factory connects the breaker to the ATS on the NORMAL side. refer the respective Sales Dimension drawing to get breaker lug range details

Final Equipment Inspection

Prior to energizing the transfer switch:

1. Remove any debris incurred, with a vacuum, due to shipment or installation.
2. Verify that all cabled connections are correct and that phase rotation of both sources match.
3. Check engine start connections.
4. Verify the correct connection of all control wires.
5. Check settings of all timers and adjust as necessary.
6. Adjust any optional accessories as required.
7. Check the lug torque values of the power connections.
8. Make sure that all covers and barriers are installed and properly fastened.

Each ABB Zenith transfer switch is factory wired and tested. A complete information package is furnished with each switch which includes:

- Sequence of operation.
- Description and operation of all accessories supplied.
- Power panel connection diagram and schematic.
- Description and identification of all customer field connections.

Installation of ABB Zenith transfer switches includes:

- Mounting the transfer switch cabinet.
- Connection of Source 1, Source 2, and Load cables or busbars.
- Connection of external control circuits as required.

Initial Energizing

Before proceeding, refer to the information package supplied with the ATS and read and understand the information on all accessories provided, including this complete document.

Before energizing the panel

1. Confirm that installation has been performed by a qualified person and in accordance with NFPA 70 (NEC).

Warning
Shock, Voltage and Arc Flash hazard
Lines of this instructions must be followed as listed.
Failure to follow these instructions could result in death or serious injury.

Avertissement
Risque de choc, de tension et d'arc électriqu
Les lignes de ces instructions doivent être suivies comme indiqué.
Le non-respect de ces instructions peut entraîner la mort ou des blessures graves.

Notice
This installation should be properly operated and maintained in accordance with the safety practices of NFPA 70E and/or CSA Z462

Avis
Cette installation doit être correctement utilisée et entretenue conformément aux pratiques de sécurité de la norme NFPA 70E et/ou de la norme CSA Z462.

2. Confirm rating label matches the installed application. Rating label is located inside the panel enclosure.
3. Confirm that cables are connected properly and torqued according to the ATS labeling.
4. Verify that the enclosure ground connection is properly terminated.
5. If the equipment require to be “Service Entrance Rated” then follow the instruction mentioned on page #20.
6. If the equipment require to be “Service Entrance Rated” then follow the instruction mentioned on page #20.
7. Confirm that control wiring for engine start is properly terminated to the engine start contact (located in Fig. 2, number 8). Additionally, connect all applicable digital I/O, communications, and auxiliary contact wiring.
8. Flip slide switch (Fig. 2, number 4) to AUTO.
9. Ensure that all objects and debris are removed from enclosure, and enclosure is closed and latched.

Energizing the panel

1. Close Source 1 circuit breaker.

NOTE: The HMI should illuminate if line voltage is present and S1 LED should light up.

2. Verify the phase to phase voltages at the Source 1 terminals.
3. Initiate auto configure from HMI default screen: Main Menu > Parameters > System Parameters > Start Automatic Configuration and allow a few seconds for system parameters to set"
4. Close the Source 2 circuit breaker.
5. Perform TEST function through HMI to conform that engine start and all other timer setting is working as intended

NOTE: If generator voltage is present at Source 2 terminals, S2 LED should light up.

6. Verify phase rotation of S1 matches that of S2.

NOTE: The ATS will not allow transfer if phase rotation does not match.

7. Shut down the generator engine.

Accessories

Warning
Shock, Voltage and Arc Flash hazard
Any accessories troubleshooting should be conducted by trained and authorized personnel only. Appropriate personal protective equipment (PPE) shall be used when troble-shooting the service equipment. Hazardous voltage may be present. Disconnect all power sources before performing work inside the service equipment.
Failure to do so could result in serious injury or death.

Avertissement
Risque de choc, de tension et d'arc électrique
Le dépannage des accessoires ne doit être effectué que par du personnel formé et autorisé. Un équipement de protection individuelle (EPI) approprié doit être utilisé lors du dépannage de l'équipement de service. Des tensions dangereuses peuvent être présentes. Débranchez toutes les sources d'alimentation avant d'effectuer des travaux à l'intérieur de l'équipement de service.
Le non-respect de cette consigne peut entraîner des blessures graves, voire mortelles.

More information, see animation: Installation of accessories - TruONE™ ATS (https://youtu.be/qV2KoIv38GY).

Auxiliary contact blocks for 30-1200A

Refer to Figure 15 for auxiliary contact ratings.

Position	OA1G10	OA3G01
SOURCE 1 (S1), max 2+2		
I		
O		
II		
SOURCE 2 (S2), max 2+2		
I		
O		
II		

Table 17 Contact positions

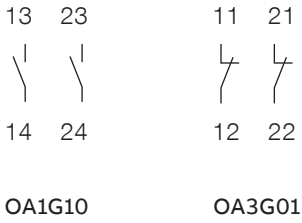

Fig. 22 Labels for contact numbering

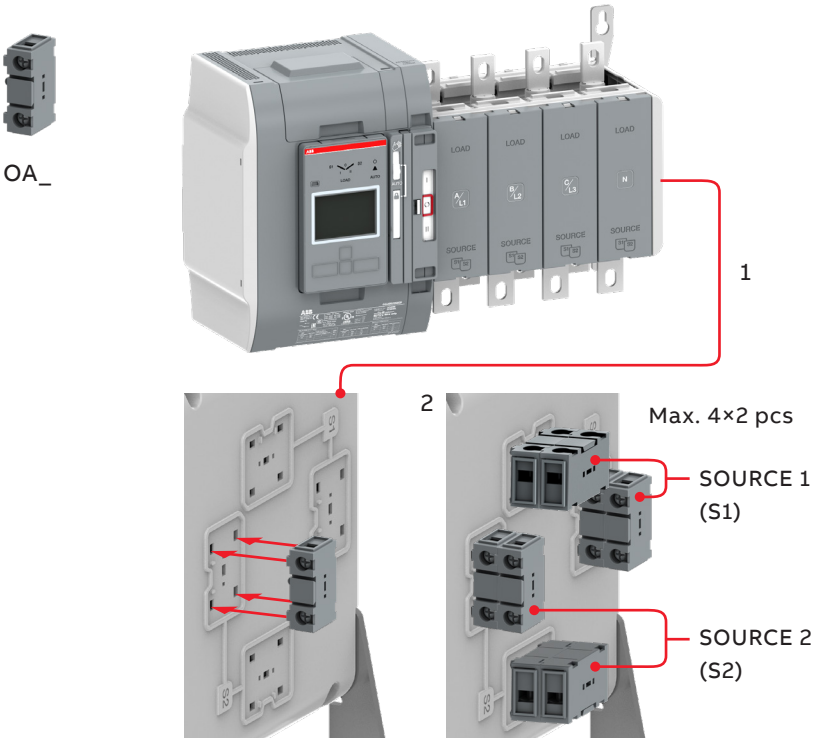

Fig. 23 Mounting of the auxiliary contact blocks, type OA_

Auxiliary power supply and Ekip -modules

ZTGSE/ZTSSE 30-2500A, 200-480 Vac Automatic transfer switches can be equipped with Ekip-modules. Ekip-modules are mounted with a auxiliary power supply module, OXEA1.
Suitable Ekip-modules are: Ekip link, signalling and connectivity modules.

For more information, see manual 1SCC303039M0201 Chapter 5, Electronic accessories.
The maximum number of Ekip-modules varies by panel ampacity :

- 30-200A: 3 Ekip modules
- 260-400A: 4 Ekip modules

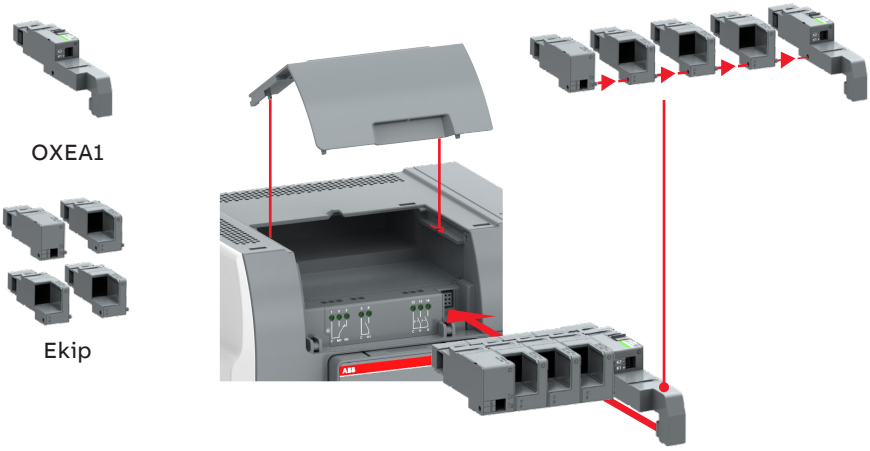

Fig. 24 Mounting of the auxiliary power supply module OXEA1 and Ekip -modules for 30-1200A.

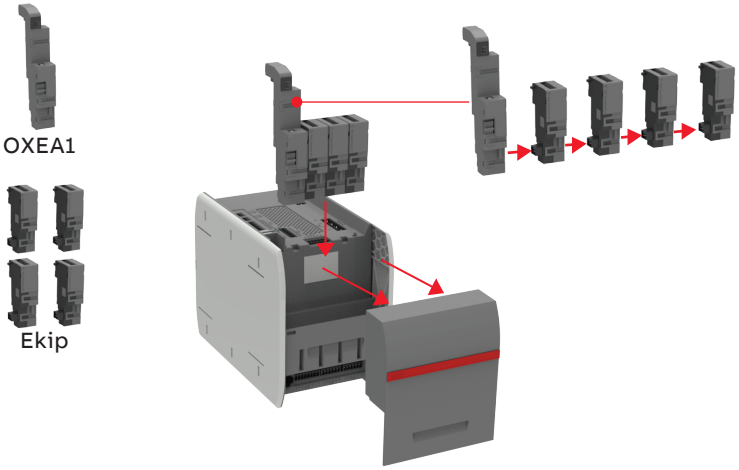

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Fig. 24 Mounting of the auxiliary power supply module OXEA1 and Ekip -modules for 1600-2500A.

ZTGSE/ZTSSE T-series 1600-2500A and 208-480 Vac
Automatic transfer switches can be equipped with Ekip-modules. Ekip-modules are mounted with a auxiliary power supply module, OXEA1. Suitable Ekip-modules are: Ekip link, signalling and connectivity modules.

For more information, refer 1SCC303049M0201.

Spare parts

For further details on spare parts, please follow the link below.

Replacement parts

For Tmax XT Breakers, please refer to the following document
1SXU210248C0201

For Emax Breakers, please refer to the following document
1SXU200040C0201

For TruOne ATS 30-1200A, please refer to the following document
1SXU523001C0201

For ZTG ATS 1600-2500A, please refer to the following document
1SCC301109M0201

For ZTS ATS 1600-2500A, please refer to the following document
1SCC301107M0201

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