Zenith ATS

ZTS T-series Automatic Transfer Switches

30-3000 A

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Zenith ZTS T-series

Continuous power. Non stop innovation.

Simplify business operations

Business is complicated, so why not choose equipment that makes things simpler? The ZTS T-series is equipped with an intuitive full-color touchscreen HMI and is compatible with ABB-common Ekip™ Connect software to ease commissioning and operation, maximize flexibility with a wide 200-480V range and an array of standard programmable functions and IO, and finally, simplify service with unique modular components that are easier to stock and replace in the field. Whether you're an engineer, dealer, contractor, or end-user, Zenith ZTS T-series will help make your business simpler.

Maximize uptime

Whether it's to save lives, protect key assets, or maximize efficiency, emergency and standby power systems are meant to keep the power on. But they are only as strong as the weakest link… which is why ZTS T-series is built for high performance and incorporates design elements for simple service. Taking it to the next level, this advanced ATS range takes a proactive outage mitigation approach by monitoring temperature and contact health 24/7 and alerting to any anomalies, helping to ensure power keeps flowing. Don't let your ATS be the weak link in your power system.

Plan for a safe and sustainable future

A safer workplace not only protects personnel from injury but can also lower costs through increased productivity, quality, and employee well-being. The ZTS T-series lineup has unique advances in safety with faster switching and no line voltages connected at the door. Similarly, creating a sustainable operation is not just something owed to future generations, but a cultural shift becoming a key proposition of a successful business. ZTS leverages future proof upgradability features and ABB Ability™ Energy and Asset Manager to empower users to lower their carbon footprint. Plan for a safe and sustainable future, today.


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Zenith ATS

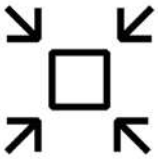
Greater safety, convenience and reliability

Proactive outage prevention

- Contact wear monitoring including real-time status and predicted contact end-of-life
- Minimum 3 embedded temperature sensors
- High current protection and alarm
- 24/7 monitoring and customizable text or email alerts available with ABB Ability™ Energy and Asset Manager

24/7
monitoring

Minimum
3
embedded temperature sensors



Simplified service

- Mechanism replacement in as little as 10 minutes - only 3 replacement parts in the 30-1200A range.
- Quick swap HMI
- 95% fewer spare parts than legacy Zenith offering
- ABB HMI navigation and programming tool common to all ABB LV components

95%
fewer spare parts

<10 minute
mechanism replacement

Easier to install, commission and operate

- Color touchscreen HMI with intuitive menu navigation, measurements display, and 250 event log
- Wide 200-480V range with auto-configuration of system settings for 30-1200A range
- Ekip Connect software helps reduce commissioning time by 50%
- Five factory programmed packages available; IO can be re-programmed in seconds

200-480V
in a single design

Up to
50%
faster commissioning with Ekip™ Connect

High performance

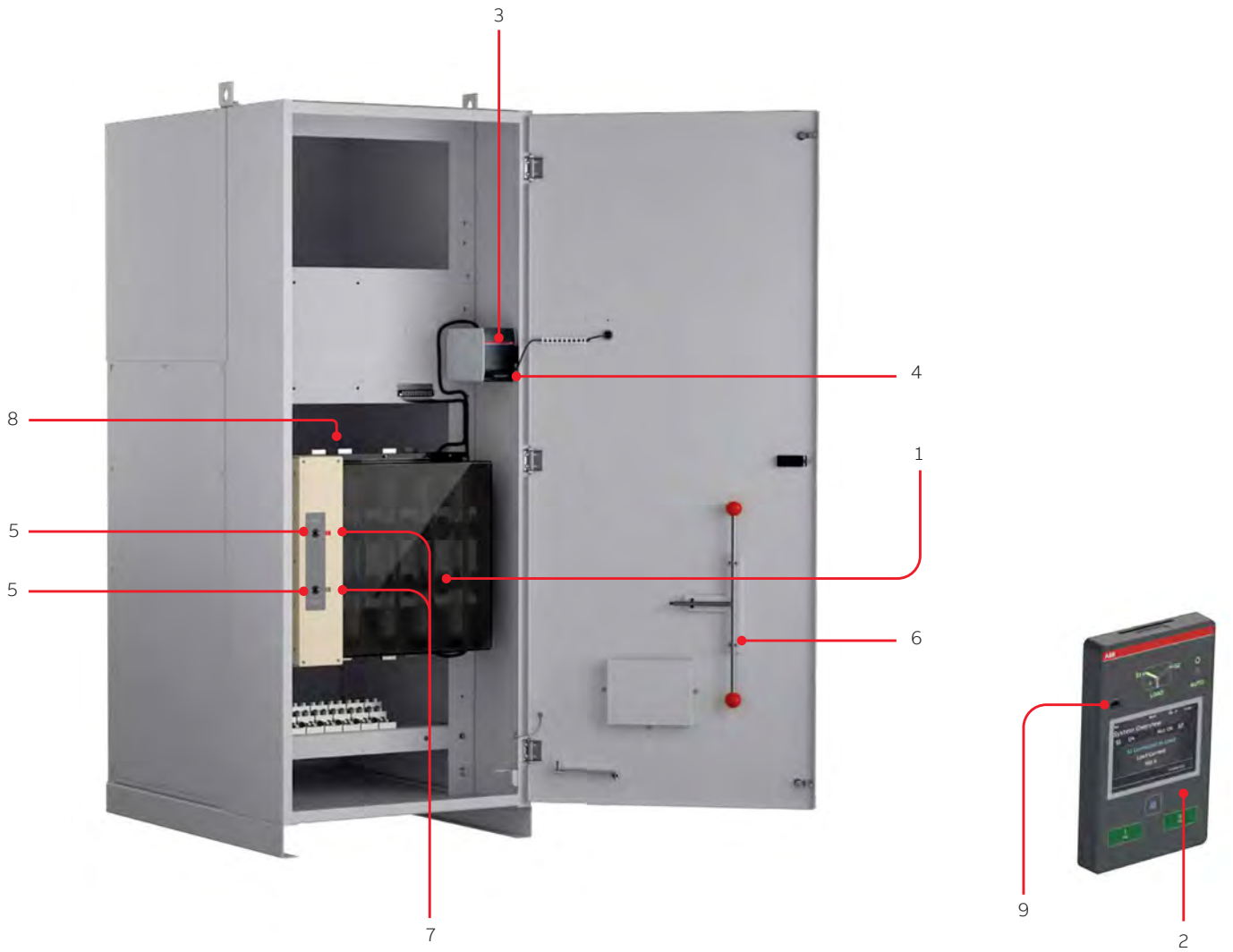
- High time-based withstand and closing ratings (WCR) and even higher coordinated WCR, minimum of 100kA in each frame
- Short-time withstand ratings in every frame
- Fast controller response to outage recovery and fast switching (<50ms)
- Overlapping neutral on 30-1200A range

Fast switching
<50ms

Construction 30-1200A open and delayed transition

1. Automatic transfer switch
2. Embedded ATS control unit and mechanism
3. HMI unit, type ZTS color touchscreen interface
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 indicator
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, for Ekip Programming module and Ekip Connect software

Construction 1600-3000A



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Zenith ZTS 1600-3000A

1. Automatic transfer switch power panel & mechanism
2. HMI unit, type ZTS color touchscreen interface
3. TruControl module
4. Place for customer control connections and connectivity modules (aux power supply, com and signaling)
5. Handle connection points for manual operation
6. Handle for manual operation
7. Position indicator
8. Phase and neutral terminal lugs, behind power panel
9. Programming port, for Ekip Programming module and Ekip Connect software

Note: 100-1200A closed transition designs utilize a smaller power panel construction similar to 1600-3000A

Main features

For more information, consult ABB

	ZTS Controls
Ampere sizes available	UL: 30-3000 A
Rated voltage	200-480Vac
Rated frequency	50 / 60 Hz
Phase system	Single and Three
Number of poles	2, 3 and 4
Neutral configuration	
Switched neutral	Yes
Overlapping neutral	30-1200A only
Solid neutral	Yes
Product type	
Open transition (I-II)	Yes
Delayed transition (I-O-II)	Yes
Closed transition (I-O-II)	Yes
Voltage and frequency settings	
Pick up Voltage Source 1	71-99%, 101-119%
Drop out Voltage Source 1*	70-98%, 102-120%
Pick up Voltage Source 2	71-99%, 101-119%
Drop out Voltage Source 2*	70-98%, 102-120%
Pick up Frequency Source 1	80.5-99.5%, 100.5-119.5%
Drop out Frequency Source 1	80-99%, 101-120%
Pick up Frequency Source 2	80.5-99.5%, 100.5-119. 5%
Drop out Frequency Source 2	80-99%, 101-120%
Time delay settings	
Override momentary Source 1 Outage, sec	0-60
Transfer from Source 1 to Source 2, sec	0-3600
Override momentary Source 2 Outage, sec	0-60
Transfer from Source 2 to Source 1, min	0-120
Generator stop delay, min	0-60
Center-OFF delay, sec	0-300
Pre-transfer delay S1 to S2, sec	0-300
Post-transfer delay S1 to S2 , sec	0-300
Pre-transfer delay S2 to S1, sec	0-300
Post-transfer delay S2 to S1, sec	0-300
Elevator Pre-signal delay S1 to S2, sec	0-60
Elevator Post-signal delay S1 to S2, sec	0-60
Elevator Pre-signal delay S2 to S1, sec	0-60
Elevator Post-signal delay S2 to S1, sec	0-60
Load shed delay, sec	0-300
Source failure detections	
No voltage	Yes
Undervoltage	Yes
Overvoltage	Yes
Phase missing	Yes
Voltage unbalance	Yes
Invalid frequency	Yes
Incorrect phase sequence	Yes

* Drop out voltage settings possible as low as 70% for 240V-480V systems.

Main features

For more information, consult ABB

	ZTS controls
Controls	Color touchscreen
LED indications for ATS, S1 and S2 status	Yes
Programmable digital inputs/outputs	Yes
Auto config (voltage, frequency, phase system)	Yes
Source priority	Source 1/2, No priority
Manual re-transfer	Yes
In-phase monitor (synchro check)	Yes
Genset exercising: on-load, off-load	Yes
In-built power meter module	Yes
Load shedding	Yes
Real time clock	Yes
Event log	Yes
Predictive maintenance	Yes
Voltage and current harmonics measuring	Yes
Field-mount accessories	
Auxiliary contacts for position indication	Yes
Digital input/output modules (factory programmed)	Yes
12-24 Vdc aux supply module for controller	Yes
Communication modules	Yes
Connectivity capability	
Modbus RTU (RS-485)	Yes
Modbus/TCP	Yes
Profibus DP	Yes
ProfiNet	Yes
DeviceNet	Yes
Ethernet IP	Yes
Monitoring via ABB Ability™ Energy and Asset Manager	Yes
For applications	
Mains - Mains	Yes
Mains - Generator (minimum size 20kVA)	Yes
UL short circuit withstand ratings	
Coordinated breaker WCR	Yes
Time-based WCR	Yes
Short-time ratings	Yes

Main features

For more information, consult ABB

The inputs and outputs in the following tables are available and programmable on all ZTS T-series transfer switches. When ordering a switch, an IO package must be selected. This package determines the number of IO and the functions that will be factory programmed. Although factory programmed, all included IO may be re-programmed by the user, password permitting, via the HMI, Ekip Connect, or via communications. See table titled "IO packages" in ordering information section for more details.

Type	Functions	Pre-configured IO packages				
		Base	Plus[1]	Controls	Flex[1]	Motor[1]
Input functions						
No function	Input disabled.	2	-	-	-	-
Emergency Stop	Transfers to O position in delayed transition I-O-II type switches. Disables automatic control mode in both delayed and open transition types.	-	-	-	-	-
Remote Test On Load / Peak shave	Start/stop test on load sequence in rising (NO) or falling (NC) edge of the input signal.	-	1	1	1	1
Remote Test Off Load	Start/stop test off load sequence in rising (NO) or falling (NC) edge of the input signal.	-	-	-	-	-
Inhibit AUTO Mode	Prevent switch control operations, configuration, test sequences and generator start in case of priority source failure.	-	-	1	-	1
Manual Retransfer	Disables automatic transfer back to priority source.	-	-	1	1	1
Source Priority S1	Sets priority for source 1 in transformer-transformer application.	-	-	-	-	-
Source Priority S2	Sets priority for source 2 in transformer-transformer application.	-	-	-	-	-
Inhibit Transfer	Disables automatic transfer from priority source to non-priority source.	-	-	1	-	1
Bypass Running Time Delays	Bypass any currently running time delay.	-	-	1	-	-
Load Shed ATS to S1	Allows back-up generator to signal to ATS to move to S1 to prevent overload. Stays in S1 if S1 restores and input removed.	-	-	1[2]	1[2]	1[2]
Load Shed ATS to OFF	Allows back-up generator to signal to ATS to move to O to prevent overload. If S1 restores, transfer to S1 will occur even it input is maintained.	-	-	1[3]	1[3]	1[3]
Remote Control to S1	Transfer to S1 when active. Overridden by activated 'Remote Control to OFF' signal.	-	-	-	-	-
Remote Control to OFF	Transfer to O position when active.	-	-	-	-	-
Remote Control to S2	Transfer to S2 when active. Overridden by activated 'Remote Control to OFF' or 'Remote Control to S1' signals.	-	-	-	-	-
Reset Alarm	Reset any active switch control alarms (open I failure, close I failure, open II failure, close II failure).	-	-	-	-	-
Manual-Auto Mode	Toggle automatic/HMI control mode, input is active only in rising/falling edge according to contact type.	-	-	-	-	-

[1] Three additional inputs available if selector switch option not selected
[2] Open transition configurations only
[3] Delayed transition configurations only

Main features

For more information, consult ABB

Type	Functions	Pre-configured IO packages				
Output functions		**Base**	**Plus[4]**	**Controls[4]**	**Flex[4]**	**Motor[4]**
No Function	Output disabled.	1	-	-	-	-
Alarm / Product availability	Signals any active alarms or ATS being disabled for automatic transfer operations.	-	-	-	-	-
Load Connected to S1	Signals switch in position I.	-	-	-	-	-
Load Disconnected	Signals switch in position O.	-	-	-	-	1
Load Connected to S2	Switch in position II.	-	-	-	-	-
Pre-transfer Signal	Signal is activated and transfer is delayed according to pre-transfer delay. Signal is kept activated according to post-transfer delay after transfer.	-	-	1	1	2
Source 1 Available	Signals no anomalies in S1 voltage supply.	-	1	1	1	1
Source 2 Available	Signals no anomalies in S2 voltage supply.	-	1	1	1	1
Load Shed 1	Used for shedding non-essential loads before transferring to non-priority source. The signal is activated before transferring to non-priority source according to load shed delay and kept activated until load is transferred back to priority source.	-	-	-	-	-
Elevator pre-signal	The signal is activated and transfer is delayed according to Elevator pre-signal delay. The signal is kept activated according to Elevator post-signal delay after transfer.	-	-	1	1	1

[4] One additional output available if transfer alarm option not selected

Zenith ZTS T-series 30-3000A ordering information

Part number codes

Understanding the type code keys below will help you quickly identify the correct product for your needs. The simple naming system allows you to see the product type, ampere rating, standard classification and number of poles, all in one table.

Explanation of the types ZTS T-series

Z	S	A	O	1	2	0	N	S	1	S	5	T	P	T	X	X	0
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

1	**Zenith**
Z	ABB Zenith Labeled
2	**Product Family**
S	ZTS T-series
3	**Application**
A	ATS
4	**Transition Type**
O	Open Transition
D	Delayed Transition
C	Closed Transition
567	**Amperage**
003	30 A
006	60 A
010	100 A
012	125 A [1]
015	150 A [1]
016	160 A
020	200 A
022	225 A [1]
026	260 A
040	400 A
060	600 A
080	800 A
100	1000 A
120	1200 A
160	1600 A
200	2000 A
260	2600 A
300	3000 A
8	**System voltage**
B	208 V 1 Ph
C	220-240V 1 Ph
E	380-415V 1 Ph
F	440-480V 1 Ph
J	208 V 3 Ph
K	220-240V 3 Ph
M	380-415V 3 Ph
P	440-480V 3 Ph

9	**Neutral**
S	Switched Neutral
O	Overlapping MFBL Neutral
X	No Neutral
B	Solid Neutral Bar
10	**Enclosure**
X	No Enclosure (configured open style) [2]
1	NEMA 1
2	NEMA 12
3	NEMA 3R
4	NEMA 4
5	NEMA 4X
6	NEMA 1 + heater
7	NEMA 12 + heater
8	NEMA 3R + heater
9	NEMA 4 + heater
0	NEMA 4X + heater
11	**Lugs**
S	Mechanical lugs (30-1200 Amperes)
M	Mechanical lugs 600 MCM (1600-4000A)
L	Mechanical lugs 750 MCM (1600-4000A)
X	No lugs (1600-4000A)
C	2-Bolt Compression (30-260A reference table for size/qty)
D	2-Bolt Compression (400-4000A reference table for qty)
E	2-Bolt Compression 750 MCM (1600-4000A reference table for qty)
12	**Ground Bar**
1	(3) #8-1/0 cables
2	(6) #8-1/0 cables
3	(6) #6-250MCM
4	(12) #6-250MCM
5	(8) #2-600MCM
6	(12) #2-600MCM
7	(24) #2-600 MCM
8	(36) #2-600 MCM
X	No ground bar, lug on cabinet
13	**Metering options**
T	Embedded power meter
1	M91 Meter

[1] Ratings available only with closed transition

[2] Available initially only for 1600-3000A

Zenith ZTS T-series 30-3000A ordering information

Part number codes

Understanding the type code keys below will help you quickly identify the correct product for your needs. The simple naming system allows you to see the product type, ampere rating, standard classification and number of poles, all in one table.

Explanation of the types ZTS T-series

Z	S	A	O	1	2	0	P	S	1	S	5	T	P	T	X	X	0
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

14	**IO and indication packages**
B	Base
P	Plus
C	Controls
F	Flex
M	Motor
15	**Communications**
X	None
R	Modbus RTU
T	Modbus TCP
E	Ethernet/IP
D	DeviceNet
B	Profibus
N	Profinet
A	ABB Ability EDCS Hub
1	Modbus RTU + Modbus TCP
2	Modbus TCP + Ethernet/IP
3	Modbus RTU + EDCS Hub
4	Modbus TCP + EDCS Hub
5	Ethernet/IP + EDCS Hub
6	DeviceNet + EDCS Hub
7	Profibus + EDCS Hub
8	Profinet + EDCS Hub
16	**Other Options (Switches, Surge protection)**
X	None
S	Switch - Test/Auto/inhibit/Start (keyed)
A	Audible Transfer Alarm
T	SPD Type 1, Load Side
1	S & A
2	S & T
3	A & T
4	S, A & T
17	**Extra**
X	None
18	**Extra**
X	None

Technical data

ZTS T-series 30-3000A

Zenith ZTS T-series technical data 30-200 A

			Zenith switch size (A)					
Data according to UL1008			**30**	**60**	**100**	**125**	**160**	**200**
Rated operational voltage		Vac	200 - 480					
Operating voltage range		Vac	160 - 576					
Rated frequency		Hz	50-60					
Emergency systems - Motor loads or total system		A	30	60	100	125	160	200
Optional standby systems - Motor loads or total system		A	30	60	100	125	160	200
Short-circuit withstand/closing and short-time current ratings		kA	See table on following page					
Contact transfer time I-II, II-I	Load interrupting time	ms	<50					
Operating transfer time I-II, II-I		ms	<500					
ATS current draw during transfer / time duration		A / ms	35 / <110					
Suitable for applications			Transformer - Transformer, Transformer - Generator					

Zenith ZTS T-series technical data 260-1200 A

			Zenith switch size (A)					
Data according to UL1008			**260**	**400**	**600**	**800**	**1000**	**1200**
Rated operational voltage		Vac	200 - 480					
Operating voltage range		Vac	160 - 576					
Rated frequency		Hz	50-60					
Emergency systems - Motor loads or total system		A	260	400	600	800	1000	1200
Optional standby systems - Motor loads or total system		A	260	400	600	800	1000	1200
Short-circuit withstand/closing and short-time current ratings		kA	See table on following page					
Contact transfer time I-II, II-I	Load interrupting time	ms	<50					
Operating transfer time I-II, II-I		ms	<500					
ATS current draw during transfer / time duration		A / ms	35 / <110	40 / <130				
Suitable for applications			Transformer - Transformer, Transformer - Generator					

Zenith ZTS T-series technical data 1600-3000 A

			Zenith switch size (A)			
Data according to UL1008			**1600**	**2000**	**2600**	**3000**
Rated operational voltage		Vac	200-480			
Operating voltage range		Vac	160 - 576			
Rated frequency		Hz	50-60			
Emergency systems - Motor loads or total system		A	1600	2000	2600	3000
Optional standby systems - Motor loads or total system		A	1600	2000	2600	3000
Short-circuit withstand/closing and short-time current ratings		kA	See table on following page			
Contact transfer time I-II, II-I	Load interrupting time	ms				
Operating transfer time I-II, II-I		ms				
ATS current draw during transfer / time duration		A / ms				
Suitable for applications			Transformer - Transformer, Transformer - Generator			

Technical data

ZTS T-series 30-3000A

ZTS T-series Withstand and Close-on Ratings (WCR) and Short-time Ratings (STR)

			Coordinated fuse ratings			Coordinated breaker ratings				Time-based ratings		Short-time ratings	
ATS frame	**ATS rating**	**Transition types**	**480V Max withstand**	**Class**	**Max fuse size**	**240V Max withstand**	**Max breaker size**	**480V Max withstand**	**Max breaker size**	**480V Max withstand**	**Time-period**	**480V Max withstand**	**Time-period**
R2	30-200A	OT, DT	200kA	RK5	100A	200kA	250A	200kA	125A	18kA	0.1 sec	18kA[1]	0.3 sec
			50kA	RK5	200A								
			200kA	Class J or T	200A			100kA	250A				
			100kA	Class J or T	400A								
R2	260A	OT, DT	200kA	RK5	100A	200kA	600A	200kA	250A	25kA	0.1 sec	25kA[1]	0.3 sec
			100kA	RK5	200A								
			200kA	Class J or T	200A			100kA	600A				
			100kA	Class J or T	400A								
			50kA	Class J or T	600A								
R3	400A	OT, DT	200kA	Class J or T	400A	200kA	600A	200kA	250A	35kA	0.1 sec	30kA[1]	0.3 sec
			100kA	Class J or T	600A			100kA	600A				
			200kA[1]	Class J or T	600A			150kA[1]	600A				
R3	600A	OT, DT	200kA	Class J or T	400A	200kA	600A	100kA	600A	42kA	0.1 sec	30kA[1]	0.3 sec
			100kA	Class J or T	600A								
			200kA[1]	Class J or T	800A			200kA[1]	600A				
			200kA[1]	Class L	800A			65kA[1]	800A				
R4	800-1200A	OT, DT	100kA[1]	Class L	2000A	200kA[1]	1600A	100kA[1]	1200A	50kA	0.1 sec	50kA[1]	0.5 sec
			200kA[1]	Class J or T	800A			65kA[1]	1600A	65kA	0.05 sec		
			200kA[1]	Class L	1200A								
63L	100-1200A	CT	200kA	Class L	3000A	-	-	85kA	1600A	50kA	0.05 sec	-	-
R5	1600-3000A	OT, DT, CT	200kA	Class L	4000A	100kA	no max	100kA	no max	100kA	0.05 sec	65kA	0.5 sec

[1] 3 phase applications only

[2] For detailed WCR ratings by ATS and breaker type, please refer to document number 1SCC303015C0201, Zenith short circuit ratings

ZTS T-series Testing and Standards Compliance

Description	Standard
UL, cUL listing	UL 1008
Conducted and radiated emissions	CISPR 11:2009, Class A
ESD immunity test	IEC/EN 61000-4-2 Class B
Radiated RF, electromagnetic field immunity test	IEC/EN 61000-4-3 10 V/m
Electrical fast, transient/burst immunity test	IEC/EN 61000-4-4
Surge immunity test	IEC/EN 61000-4-5 0.5 to 2 kV
Conducted immunity test	IEC/EN 61000-4-6
Voltage dips and interruption immunity	IEC/EN 61000-4-11
Harmonic voltage immunity test	IEC/EN 6100-4-13

Technical data

ZTS T-series 30-3000A

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

Model	Amperage	Cables per phase & neutral	Range of wire sizes	
ZTS ZTSD ZTSCT	30-60	1	12 - 2/0 AWG	(3 - 67 mm²)
	100-200	1	6 AWG - 300 kcmil	(14 - 152 mm²)
	260-400	1 / 2	1x 4 AWG - 600 kcmil / 2x 1/0 - 250 kcmil	(1x 25 - 304 mm² / 2x 55 - 127 mm²)
	600	2	2 AWG - 600 kcmil	(34 - 304 mm²)
	800-1200	4	2 AWG - 600 kcmil	(34 - 304 mm²)
	1600-3000	8	2 AWG - 600 kcmil	(34 - 304 mm²)
		8	750 kcmil	(380 mm²)

Dimensions

ZTS T-series 30-3000A

ZTS T-series dimensions

Model	ATS Rating (A)	Poles	Dimensions,[2] in (mm)			Reference figure
			Height (A)	Width (B)	Depth (C)	
ZTS ZTSD	30-200	2	32 (813)	24 (610)	12 (305)	1
		3	32 (813)	24 (610)	12 (305)	1
		4	32 (813)	24 (610)	12 (305)	1
	260	2	46 (1168)	24 (610)	14 (356)	1
		3	46 (1168)	24 (610)	14 (356)	1
		4	46 (1168)	24 (610)	14 (356)	1
	400	2	46 (1168)	24 (610)	14 (356)	1
		3	46 (1168)	24 (610)	14 (356)	1
		4	54 (1372)	28 (711)	19.5 (495)	1
	600	2	54 (1372)	28 (711)	19.5 (495)	2
		3	54 (1372)	28 (711)	19.5 (495)	2
		4	54 (1372)	28 (711)	19.5 (495)	2
	800-1200	3	74 (1880)	40 (1016)	19.5 (495)	3
		4	74 (1880)	40 (1016)	19.5 (495)	3
ZTSCT	100-1200	2	74 (1880)	40 (1016)	19.5 (495)	3
		3	74 (1880)	40 (1016)	19.5 (495)	3
		4	74 (1880)	40 (1016)	19.5 (495)	3
ZTS ZTSD ZTSCT	1600-3000	3	90 (2290)	35.5 (900)	48 (1220)	4
		4	90 (2290)	35.5 (900)	48 (1220)	4

Dimensions

ZTS T-series 30-3000A

Figure 1 30-400A

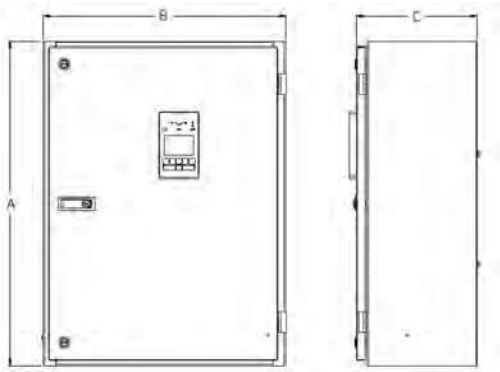


Figure 2 600A

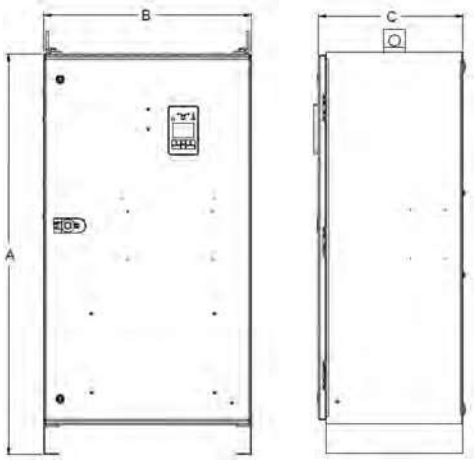


Figure 3 800-1200A

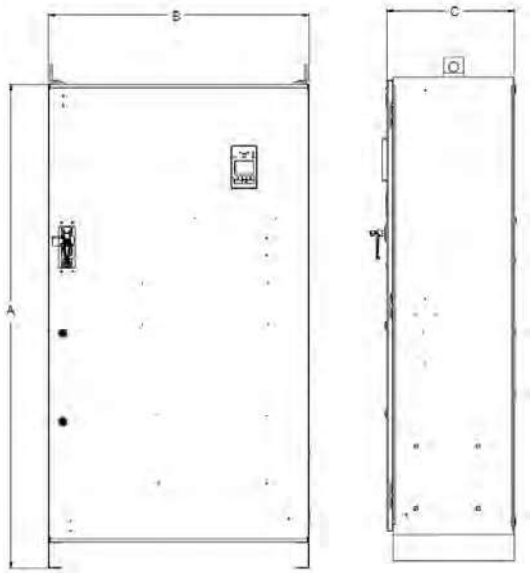
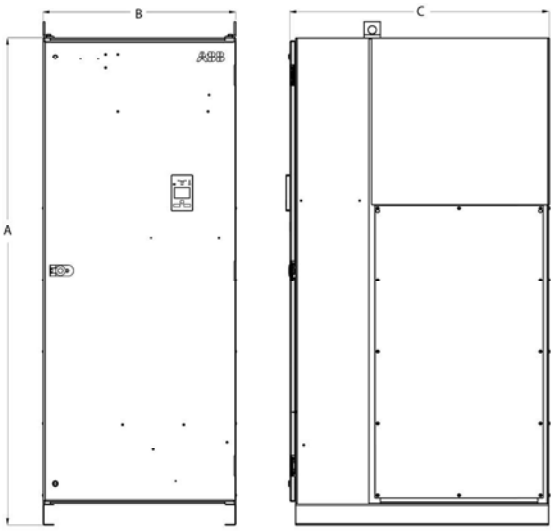
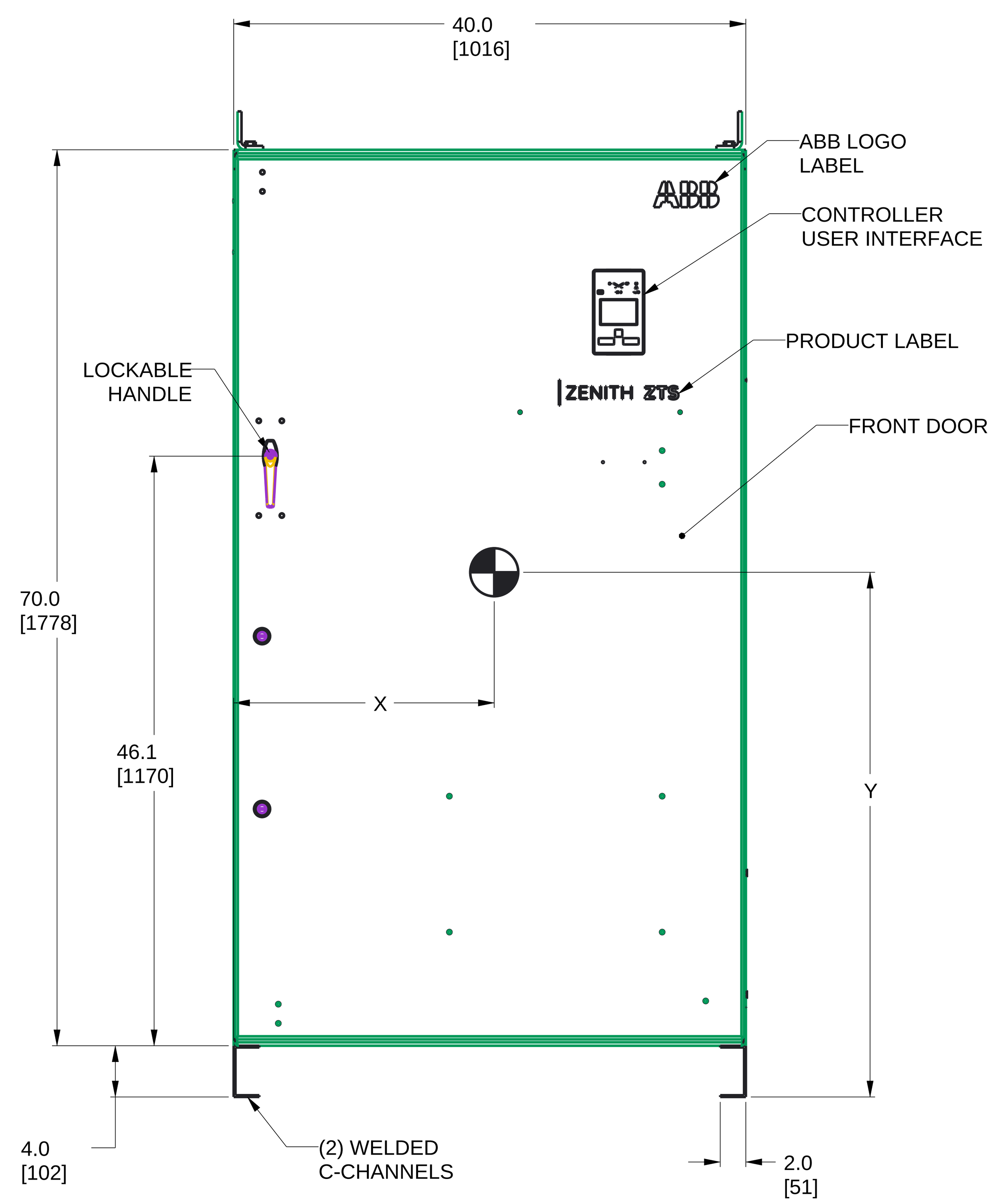
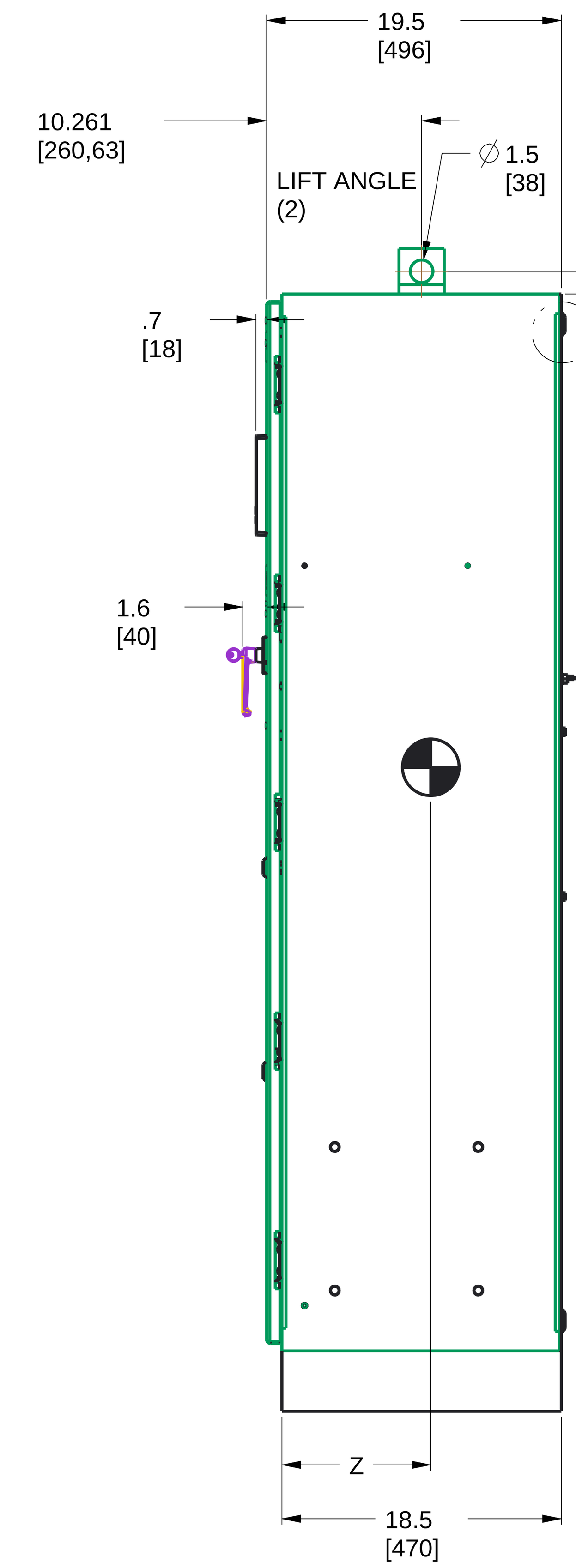


Figure 4 1600-3000 A

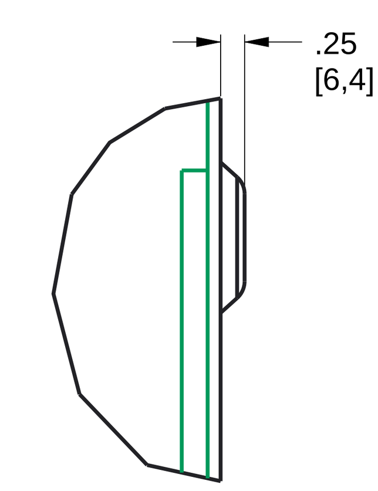




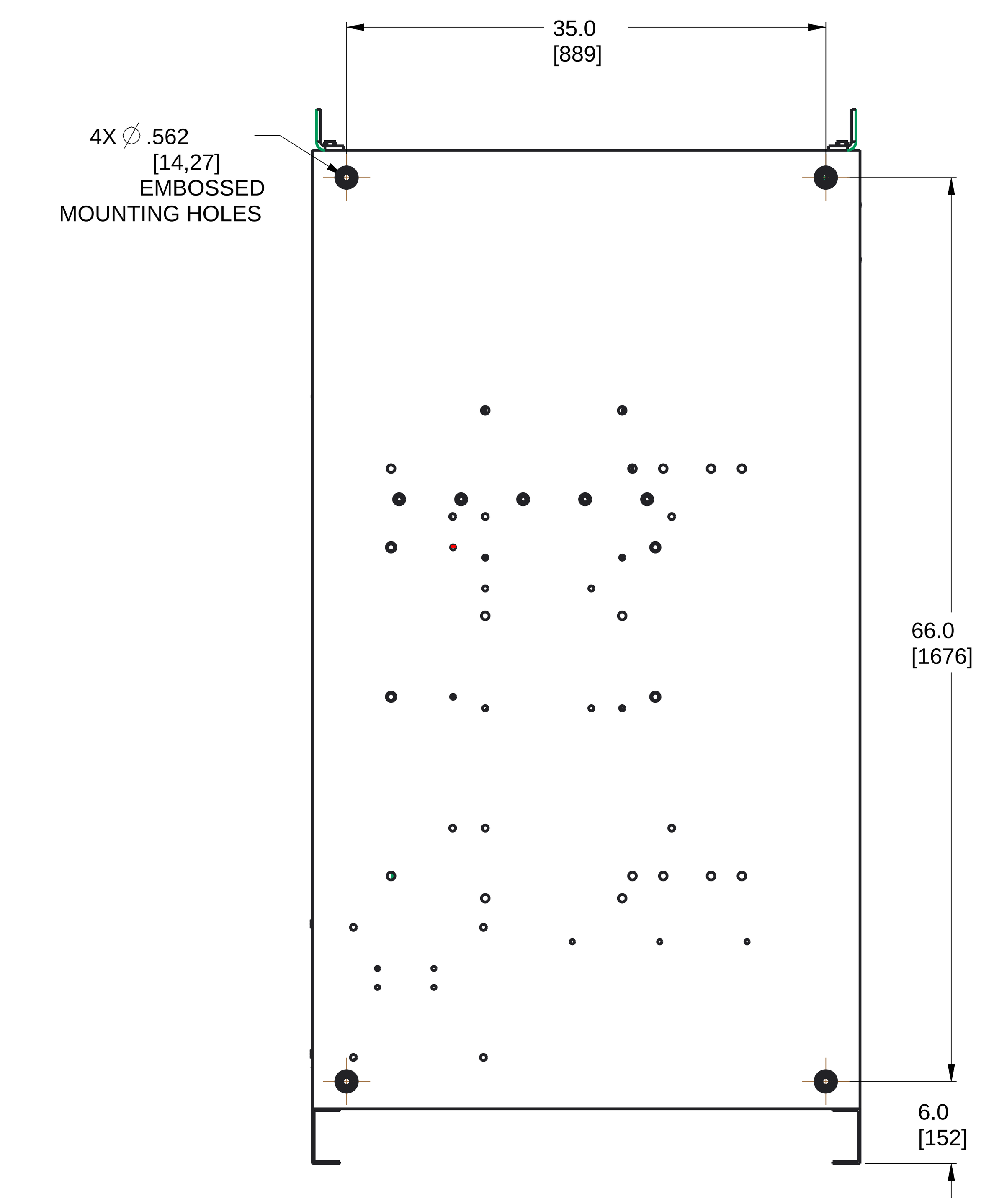
FRONT VIEW



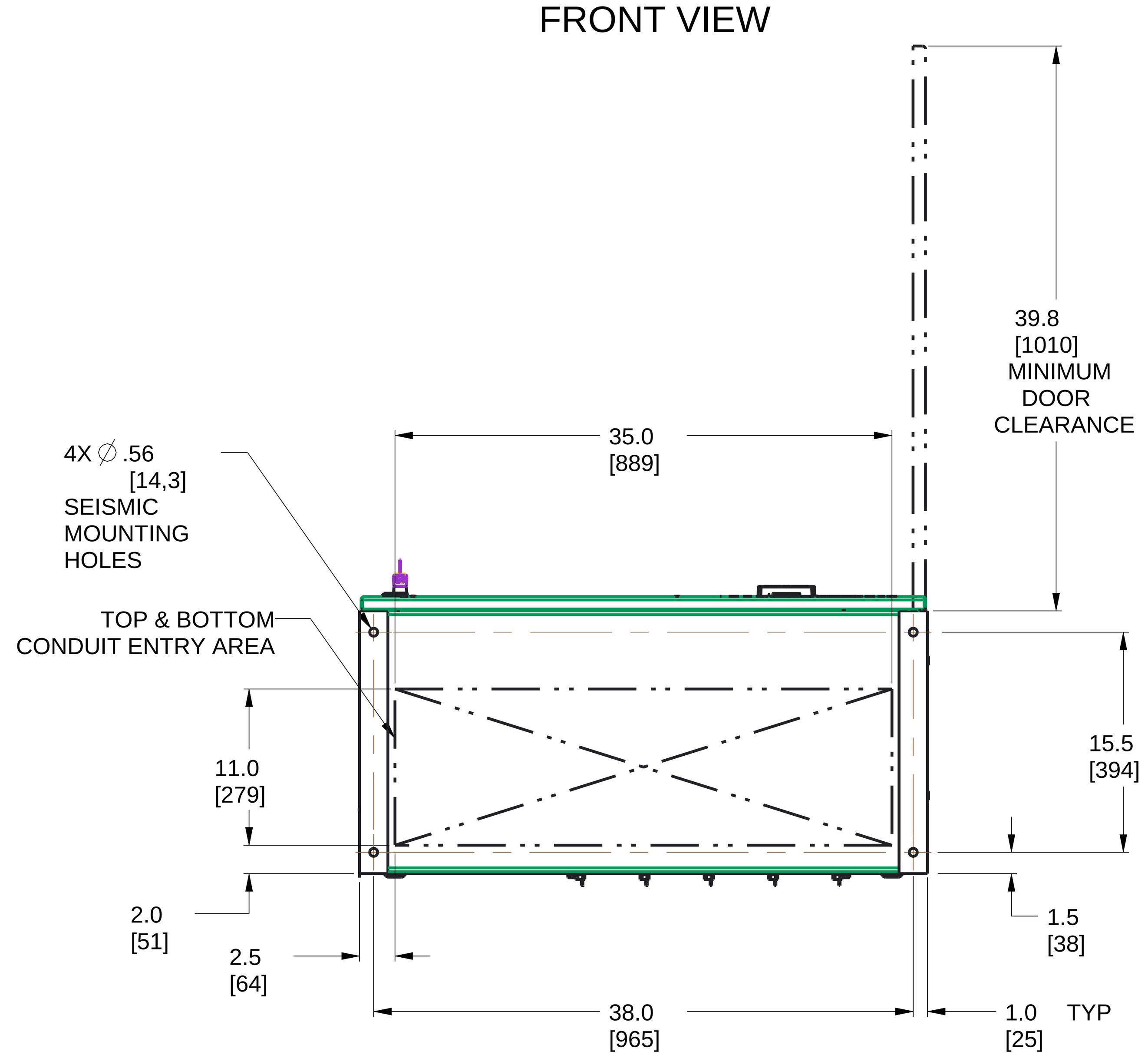
SIDE VIEW



DETAIL A
SCALE 1:2
4 PLACES



REAR VIEW



BOTTOM VIEW

	AMP	POLE	CONTROLLER TYPE	CABINET #	LUG RANGE
MECHANICAL LUG ASSEMBLY	800-1200A	3	SEE TABLE A	F-2016MP	QTY 4 2 AWG-600 KCMIL
		4			
COMPRESSION LUG ASSEMBLY	800A	3			QTY 3 500 KCMIL
		4			
	1200A	3			QTY 4 500 KCMIL
		4			

TABLE A - HMI

TYPE	TRANSITION	LEVEL	PART NO.
ZTS	OPEN	4	OXAMI1-L4
ZTSD	DELAYED	4	OXBMI1-L4

POLE	WEIGHT	CENTER OF GRAVITY IN(MM)		
	LB(KG)	X	Y	Z
3	510(231)	20.4 (518)	38.6 (980)	9.7 (246)
4	552(250)			

NOTES
1. ENCLOSURE : NEMA-1 TYPE, FREE STANDING, FLOOR MOUNT.
2. MATERIAL:12 GA (.105) 1018 HRS REF.
3. FINISH : ANSI 61 GREY
4. CONSTRUCTION PER UL 1008 STANDARD.
5. FRONT ACCESSIBLE UNIT. NO SIDE OR REAR ACCESS REQUIRED.
6. SUITABLE WIRE BENDING SPACE PROVIDED PER THE SAFETY AGENCY STANDARDS.
7. UL AND CSA RECOGNIZED/CERTIFIED MECHANICAL LUGS ARE STANDARD.
8. UL AND CSA RECOGNIZED/CERTIFIED COMPRESSION LUGS ARE AVAILABLE AS OPTION.
9. EQUIPMENT GROUND LUG IS PROVIDED IN ALL UNITS. REFER SHEET 2 FOR DETAILS.
10.ALL DIMENSIONS ARE FOR REFERENCE ONLY AND SHOWN IN INCHES(MILLIMETERS).
11.100% RATED SOLID/SWITCHED NEUTRAL PROVIDED PER THE SWITCH CONFIGURATION.
12.SUITABLE FOR TOP AND/OR BOTTOM CABLE ENTRY.
13.FOR CABLE CONNECTIONS TO MECHANICAL LUG, REFER O&M MANUAL FOR TORQUE DETAILS
14.FOR WORKING CLEARANCE REFER TO NATIONAL AND LOCAL CODES AND STANDARDS.

SEISMIC NOTES:

1. BOLT ENCLOSURE FROM C-CHANNEL BASE USING THE FOLLOWING SEISMIC CERTIFIED MOUNTING HARDWARE PER MOUNTING HOLE: (HARDWARE PROVIDED BY INSTALLER).
*1/2-13 GRADE 5 BOLT TORQUE TO 75 FT-LBS. (102 NEWTON METERS).
*1/2-13 STANDARD FLAT WASHER.
*1/2 (13) HELICAL SPRING LOCK WASHER.
2. CENTER OF GRAVITY DIMENSIONS ARE FOR REFERENCE ONLY.

Third Angle Projection

	DRAWING FILE 50C-1085	MODEL FILE 50C-1085	ABB
	DATE MODIFIED 29-Mar-21 07:41:23 PM	DESIGNED BY AN	
Calculated for: VOLUME 0.000 in^3	CN# C108929	APPROVED BY SR	TITLE ZTS(D) 800-1200A, TYPE 1
	◇ Critical to Quality Characteristic		
MASS 0.000 lbm	MATERIAL SPECIFICATION ---	FINISH SPECIFICATION ---	UNITS in; LOCAL TITLE ---
UNLESS OTHERWISE SPECIFIED TOLERANCE ON: 1 PL DECIMALS ± 0.1 2 PL DECIMALS ± 0.02 3 PL DECIMALS ± 0.005 ANGLES ± 1.0	MATERIAL DESCRIPTION ---		SIZE D; ROOT NUMBER 50C-1085; REV 1; RELEASE STATE Released
	FINISH DESCRIPTION ---		SCALE 1:10; PRODUCT LINE ZENITH ZTS T-SERIES; SHEET 1 of 3

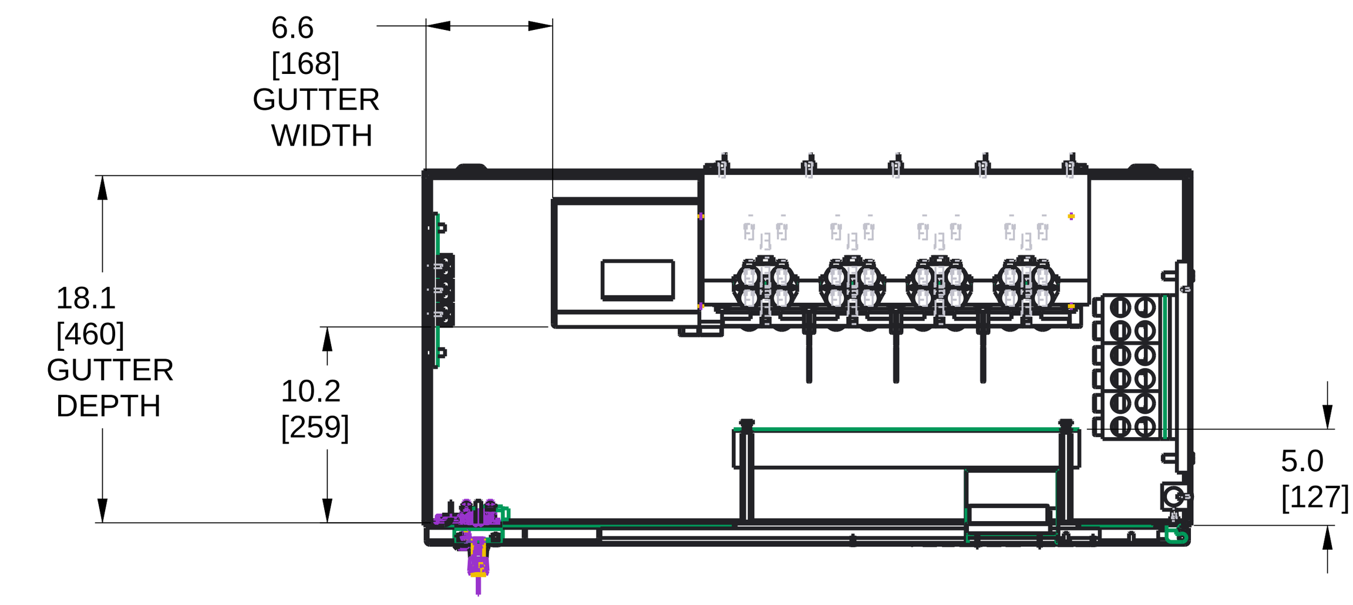
NOTE:
1. REFER TO SHEET (1) FOR COMPLETE NOTE DETAILS
2. MECHANICAL LUGS SHOWN IN ABOVE VIEWS ARE FOR REFERENCE ONLY.

NOTE:
FOR SINGLE PHASE SWITCHED NEUTRAL(3-POLE) UNIT,THE NEUTRAL POLE WILL BE NEXT TO MECHANISM AND PHASE A AND PHASE B POLES WILL BE NEXT TO NEUTRAL POLE

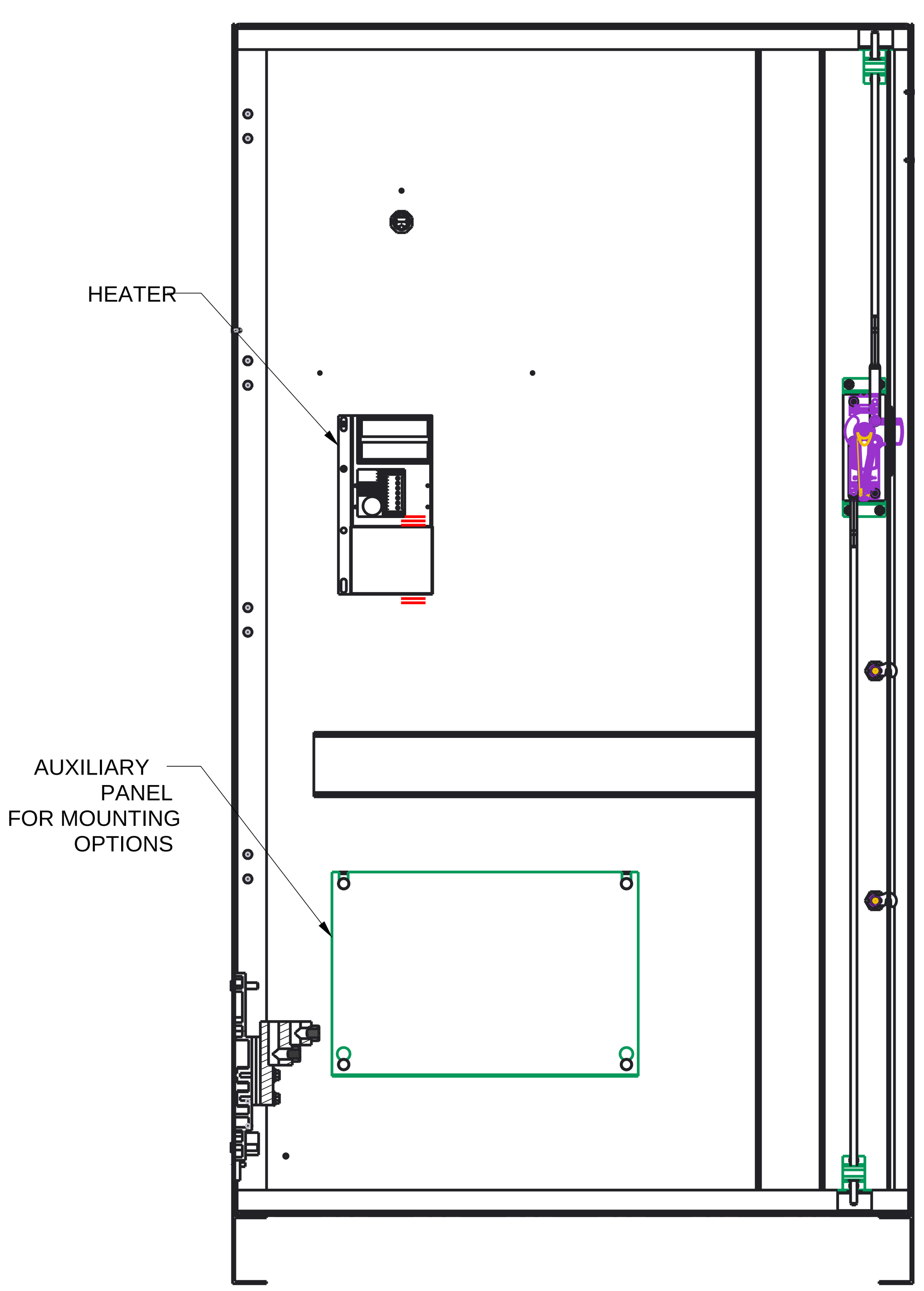
Third Angle Projection

ABB
SIZE D | NUMBER 50C-1085 | REV 1
SCALE 1:10 | PRODUCT LINE ZENITH ZTS T-SERIES | SHEET 2 of 3

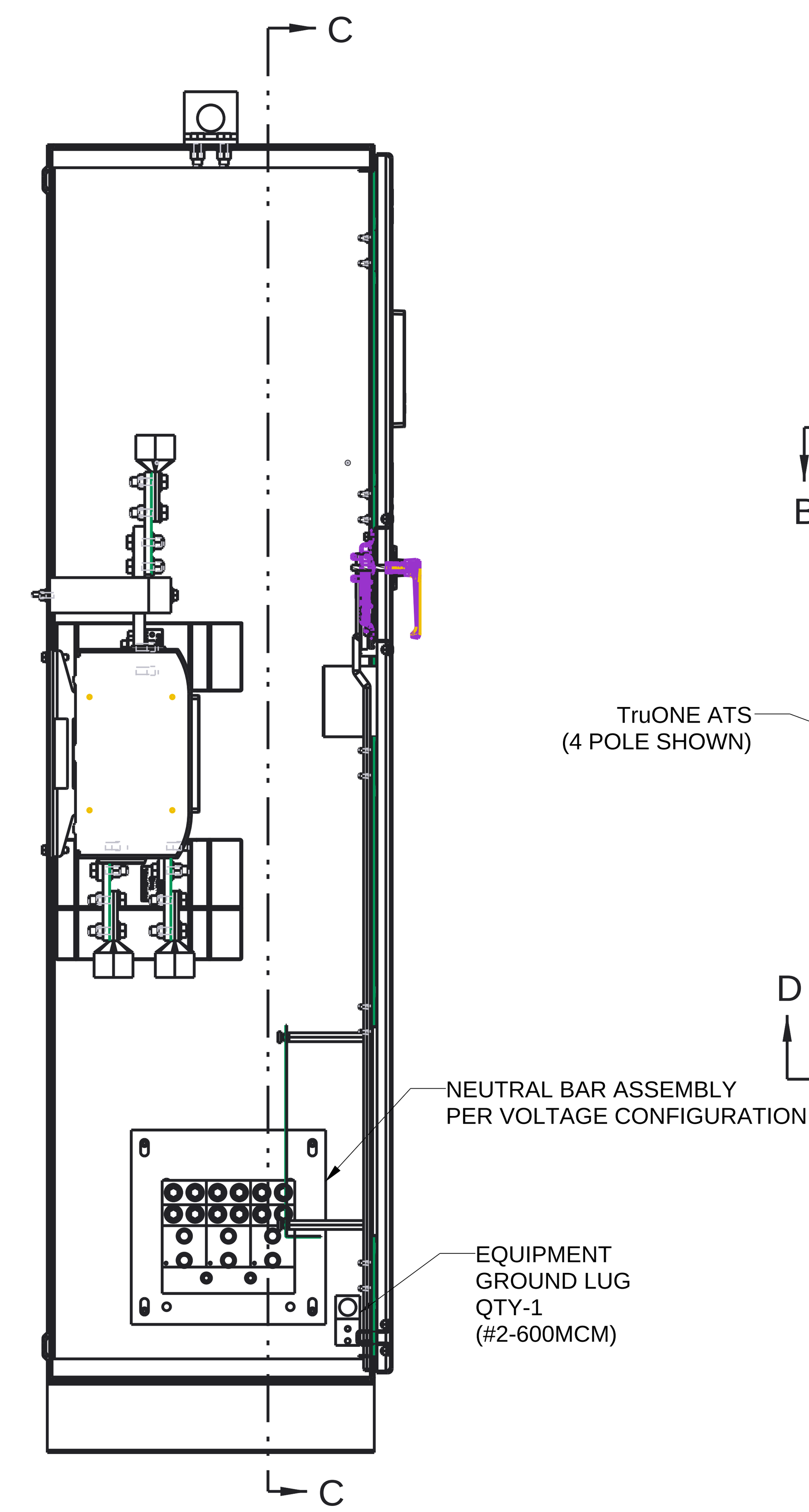
CABINET WITH COMPRESSION LUG ASSEMBLY
(AVAILABLE AS OPTION)



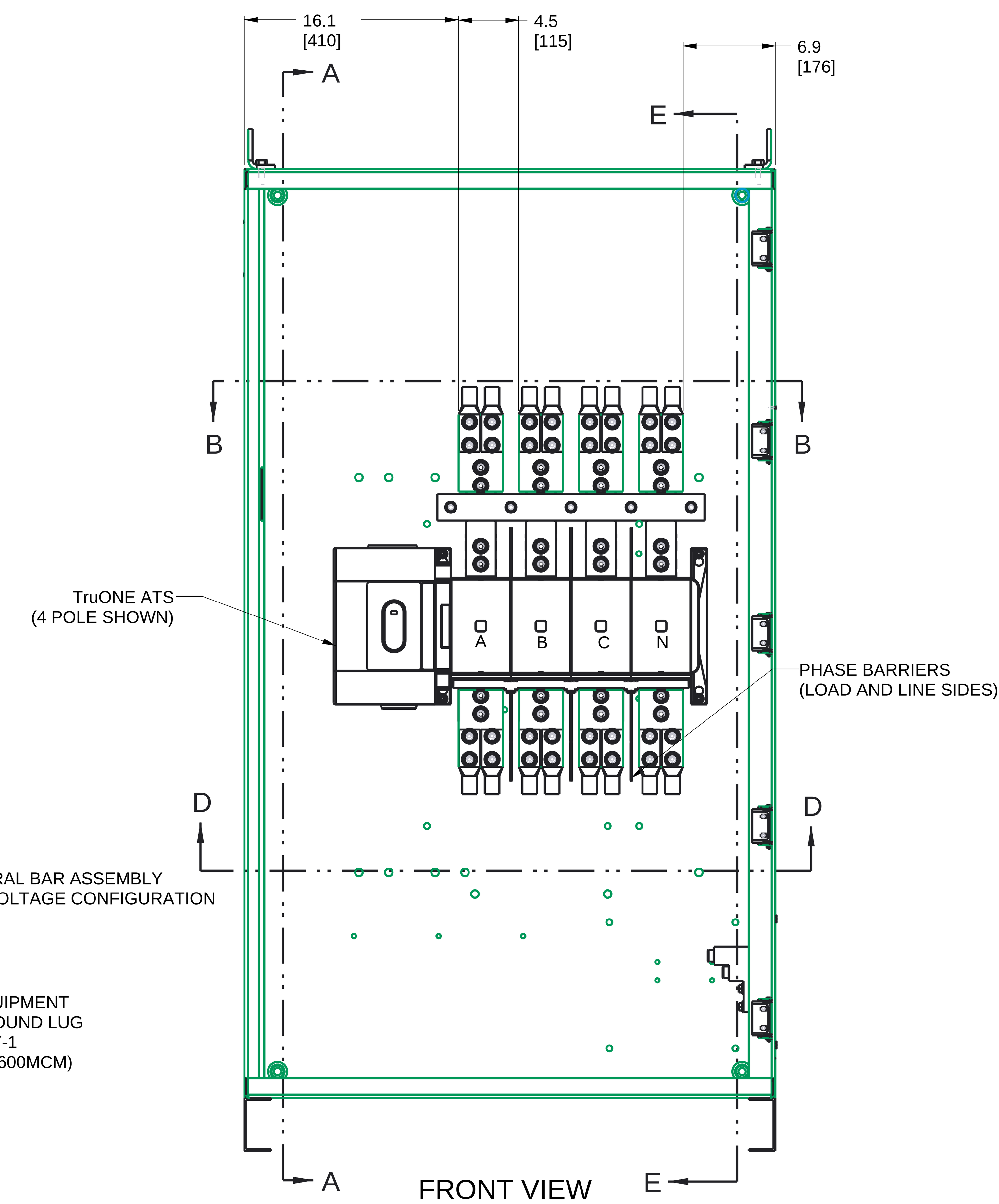
SECTION B-B
TOP VIEW
WITHOUT TOP PANEL



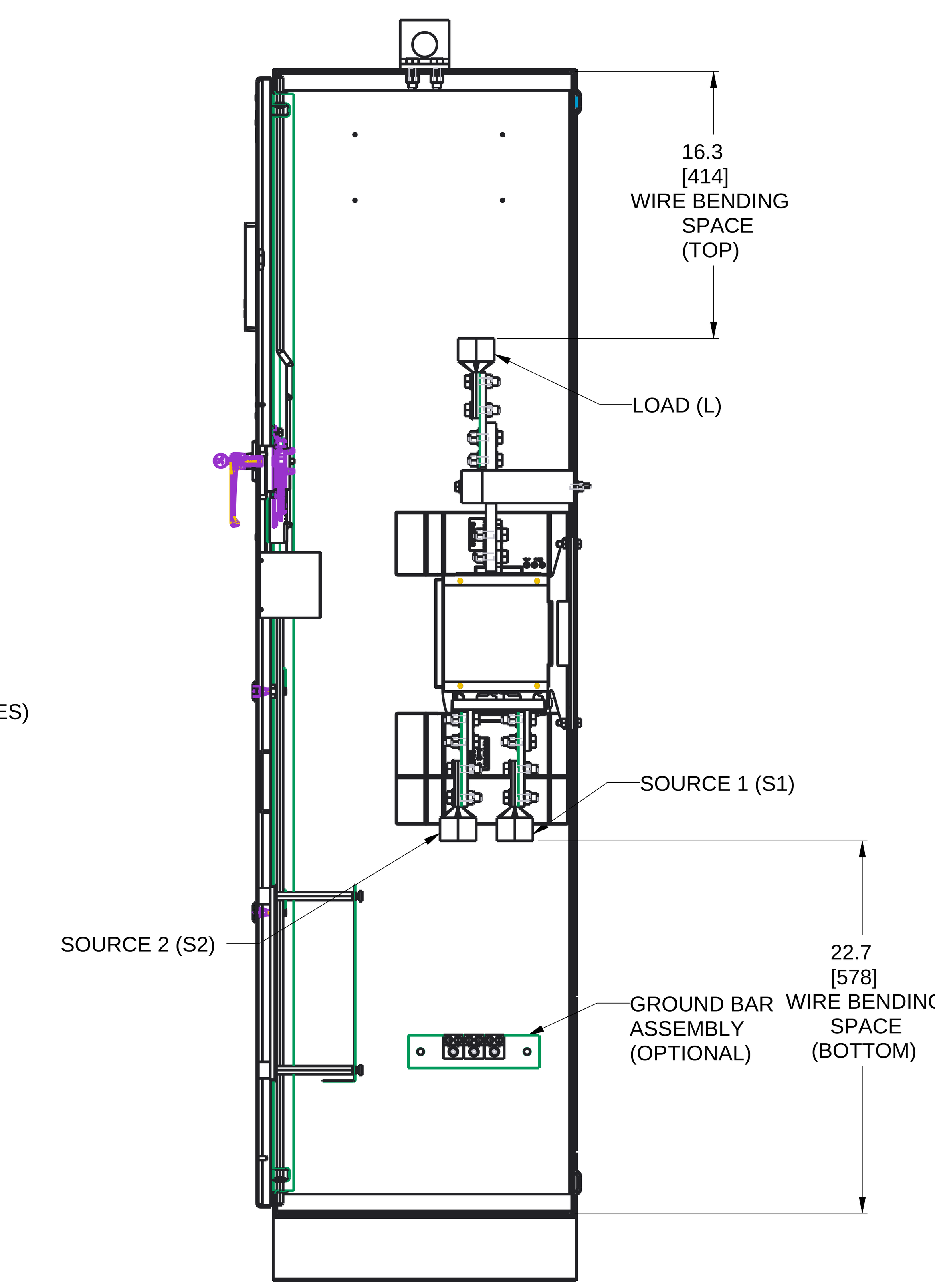
SECTION C-C
DOOR INSIDE VIEW



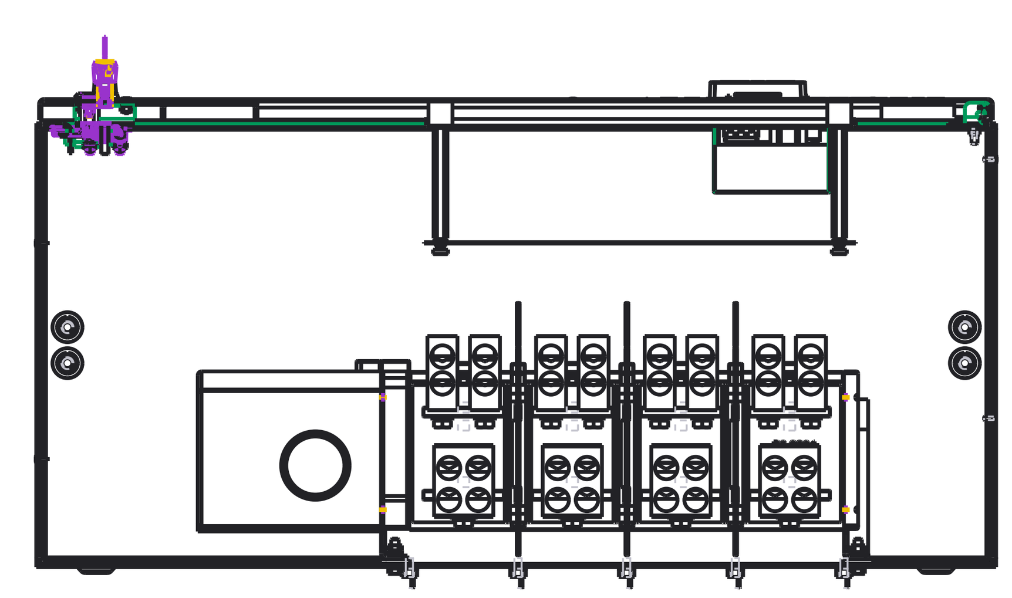
SECTION A-A
LEFT SIDE
WITHOUT SIDE PANEL



FRONT VIEW
WITHOUT DOOR
(4 POLE SWITCH SHOWN)



SECTION E-E
RIGHT SIDE
WITHOUT SIDE PANEL



SECTION D-D
BOTTOM VIEW
WITHOUT BOTTOM PANEL

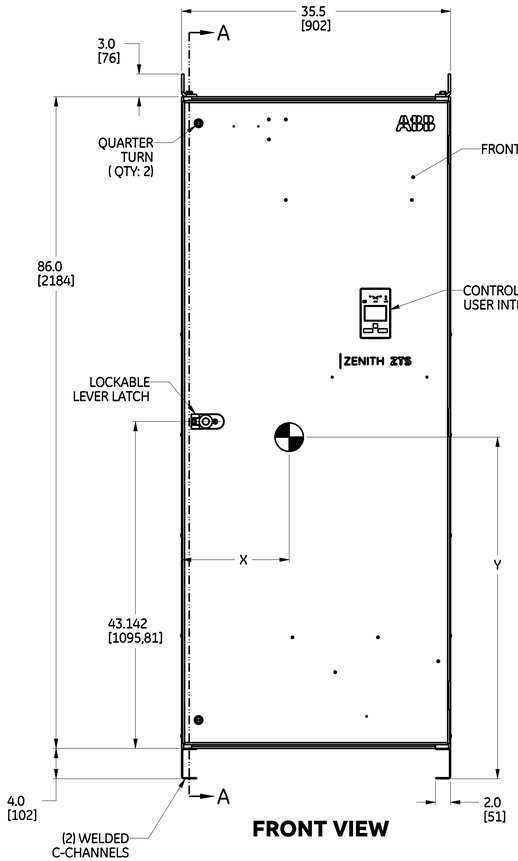
NOTE:
1. REFER TO SHEET (1) FOR COMPLETE NOTE DETAILS
2. MECHANICAL LUGS SHOWN IN ABOVE VIEWS ARE FOR REFERENCE ONLY.

NOTE:

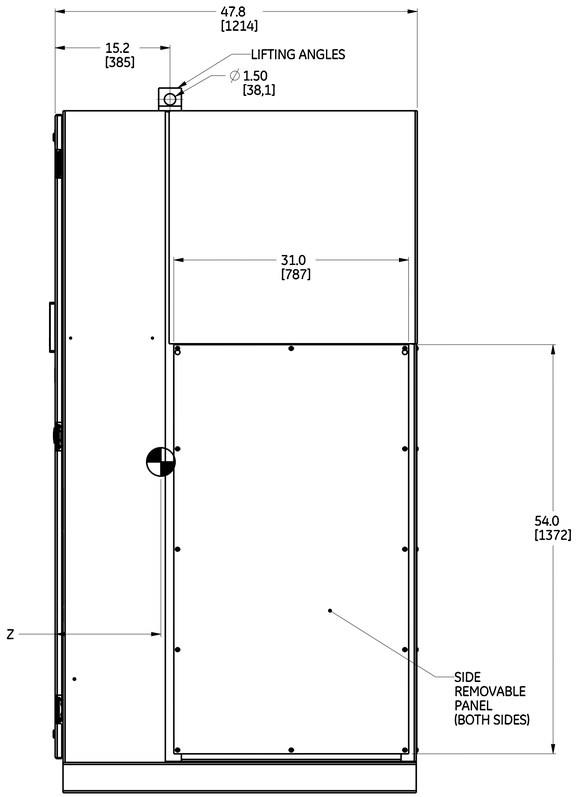
FOR SINGLE PHASE SWITCHED NEUTRAL(3-POLE) UNIT,THE NEUTRAL POLE WILL BE NEXT TO MECHANISM AND PHASE A AND PHASE B POLES WILL BE NEXT TO NEUTRAL POLE

Third Angle Projection

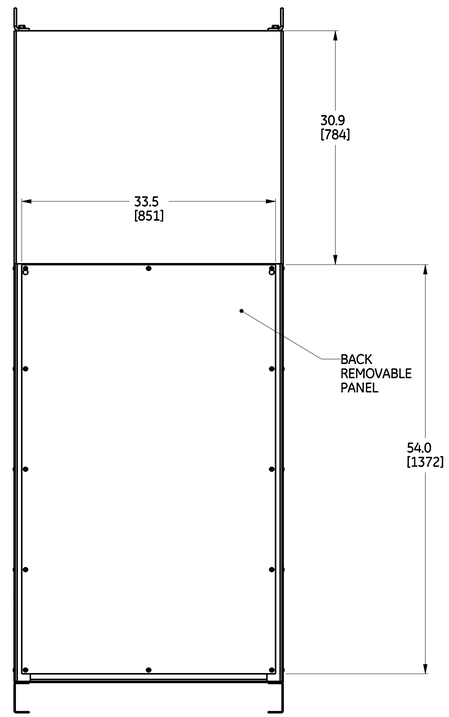
ABB		
SIZE D	NUMBER 50C-1085	REV 1
SCALE 1:10	PRODUCT LINE ZENITH ZTS T-SERIES	SHEET 3 of 3



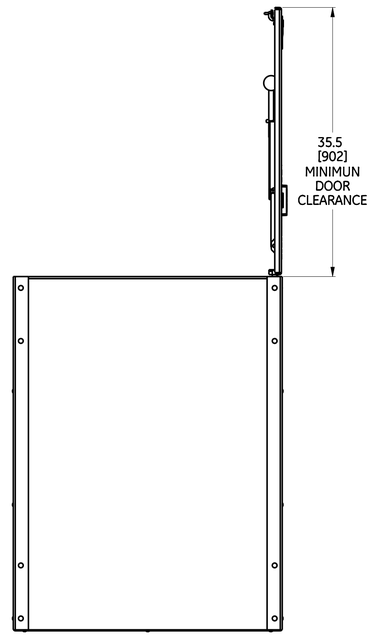
FRONT VIEW



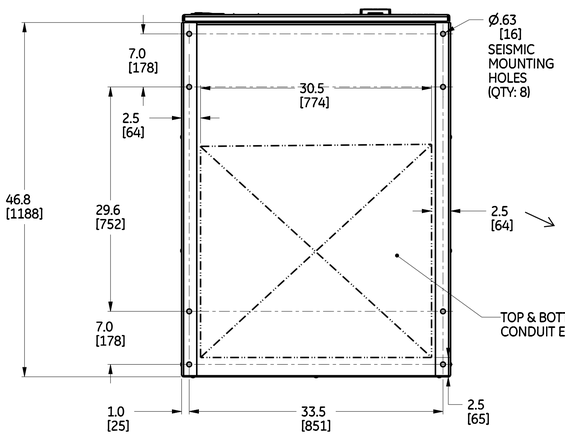
SIDE VIEW



REAR VIEW



BOTTOM VIEW



BOTTOM VIEW

AMP	POLES	CONTROLLER TYPE	CABINET #	CABLE RANGE	WEIGHT LB(KG)	CENTER OF GRAVITY IN(MM) X	Y	Z
1600-3000	3	OXAMI1-L4	F-2018MP	QTY 8 #2-600 MCM (33-304 MM2)	1375(624)	18.5 (470)	38.0 (965)	15.0 (381)
	4				1480(671)			

NOTES
1. ENCLOSURE : NEMA-1 TYPE, FREE STANDING, FLOOR MOUNT.
2. MATERIAL:10 GA (.134) 1018 HRS REF.
3. FINISH : ANSI 61 GREY
4. CONSTRUCTION PER UL 1008 STANDARD.
5. ALL CABLE ENTRY FOR LUG CONNECTION IS IN REAR OF CABINET.
6. SUITABLE WIRE BENDING SPACE PROVIDED PER UL 1008.
7. UL AND CSA RECOGNIZED/CERTIFIED MECHANICAL LUGS ARE STANDARD.
8. EQUIPMENT GROUND LUG IS PROVIDED IN ALL UNITS. REFER TO SHEET 2 FOR DETAILS.
9. ALL DIMENSIONS ARE FOR REFERENCE ONLY AND SHOWN IN INCHES(MILLIMETERS).
10. 100% RATED SOLID/SWITCHED NEUTRAL PROVIDED PER THE SWITCH CONFIGURATION.
11. SUITABLE FOR TOP AND/OR BOTTOM ATS CABLE ENTRY.
12. SIDE AND REAR SKINS ARE REMOVABLE FOR CABLE CONNECTIONS

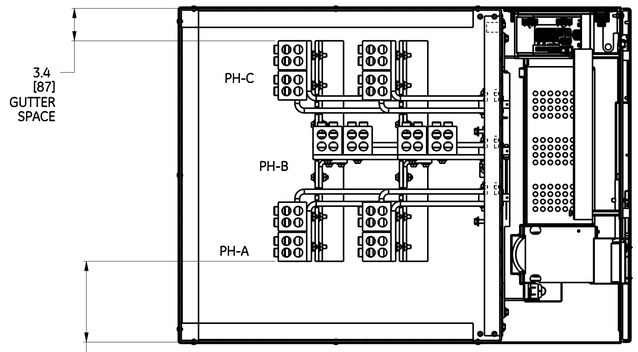
SEISMIC NOTES:

1. BOLT ENCLOSURE FROM C-CHANNEL BASE USING THE FOLLOWING SEISMIC CERTIFIED MOUNTING HARDWARE PER MOUNTING HOLE: (HARDWARE PROVIDED BY INSTALLER).
*1/2-13 GRADE 5 BOLT TORQUE TO 70 FT-LBS. (95 NEWTON METERS).
*1/2-13 STANDARD FLAT WASHER.
*1/2 (13) HELICAL SPRING LOCK WASHER.
2. CENTER OF GRAVITY DIMENSIONS ARE FOR REFERENCE ONLY.
3. FOR WORKING CLEARANCE REFER TO NATIONAL AND LOCAL CODES AND STANDARDS.

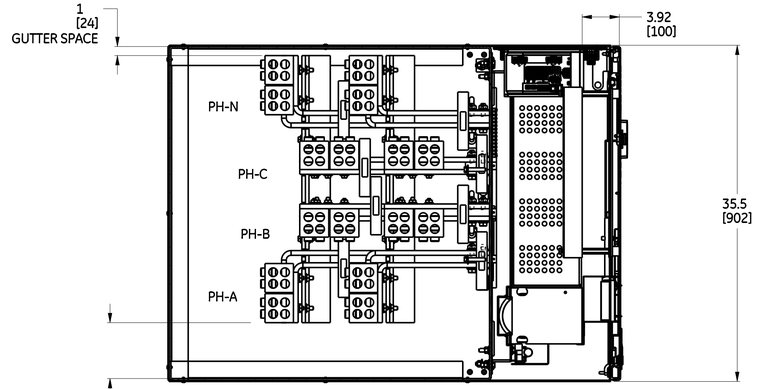
Third Angle Projection

DRAWING FILE 50C-1093	MODEL FILE 50C-1093	ABB	
DATE MODIFIED 30-Jun-21 02:04:59 PM	DESIGNED BY DV		
Calculated for: VOLUME 0.000 in^3	CN# C118108	APPROVED BY AP	TITLE ZTS(D/CT) LAYOUT, 1600-3000A NEMA 1
	◇ Critical to Quality Characteristic		
MASS 0.000 lbm	MATERIAL SPECIFICATION ----	FINISH SPECIFICATION ----	UNITS in / LOCAL TITLE ----
UNLESS OTHERWISE SPECIFIED TOLERANCE ON: 1 PL DECIMALS = 0.1, 2 PL DECIMALS = 0.03, 3 PL DECIMALS = 0.005, ANGLES = 1.0	MATERIAL DESCRIPTION ---		SIZE D / ROOT NUMBER 50C-1093 / REV 1 / RELEASE STATE Released
	FINISH DESCRIPTION ---		SCALE 1/10 / PRODUCT LINE ZENITH T-SERIES / SHEET 1 of 3

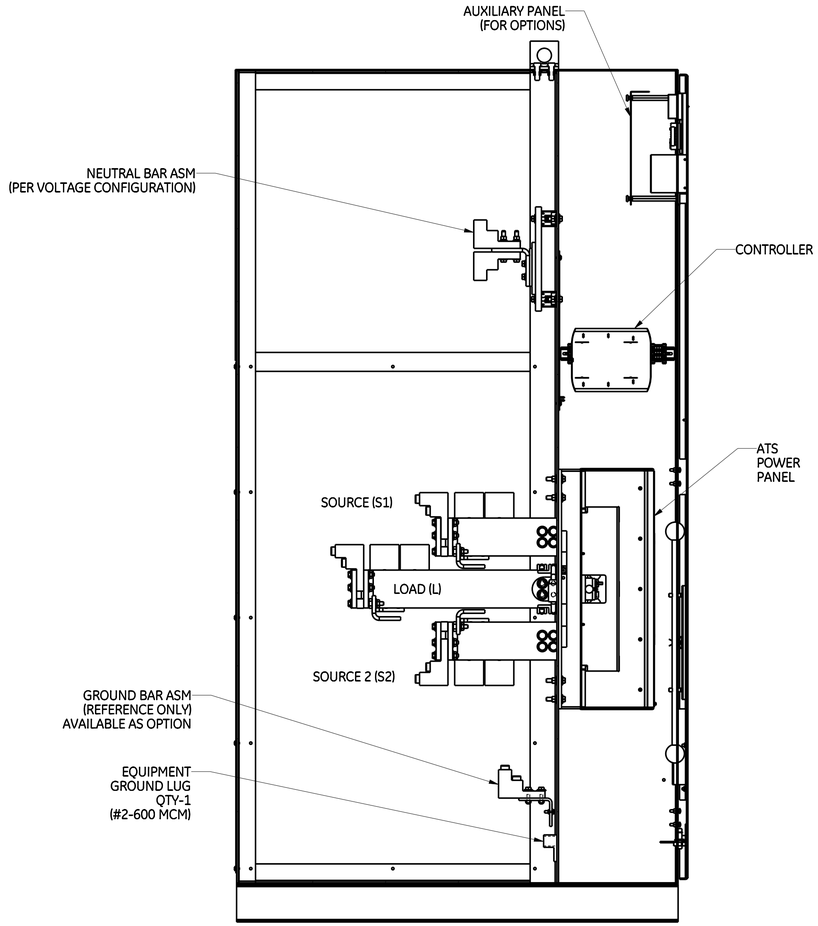
us_3rd_d.frm



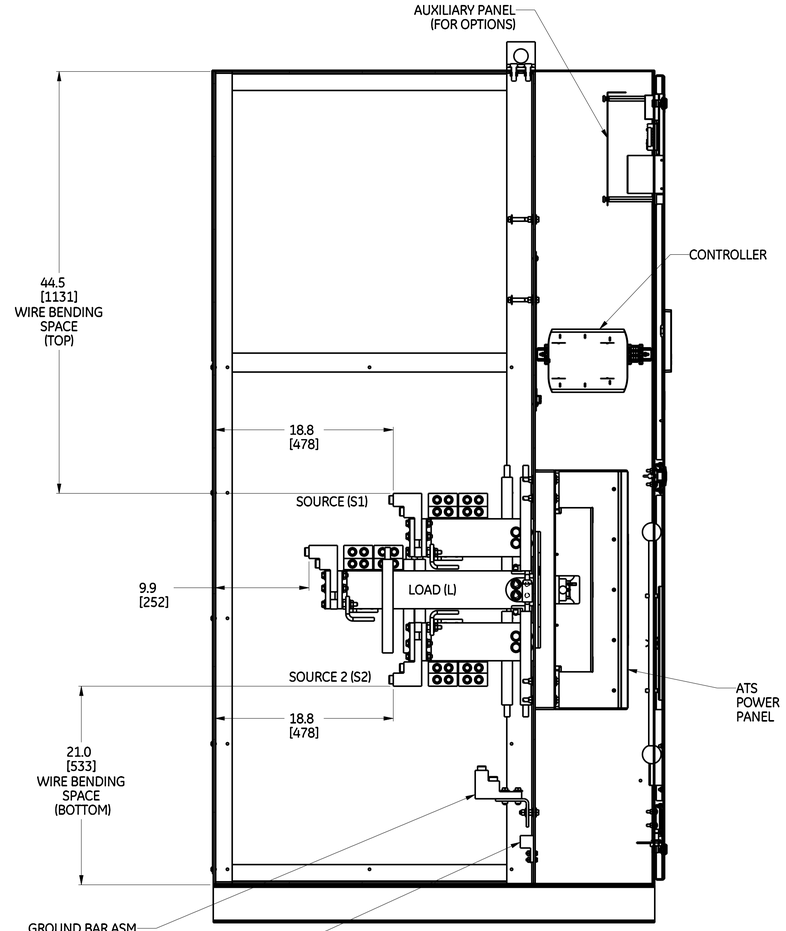
TOP VIEW
PANEL REMOVED
(3 POLE UNIT)



TOP VIEW
PANEL REMOVED
(4 POLE UNIT)



LEFT SIDE VIEW
PANEL REMOVED
(3 POLE UNIT)

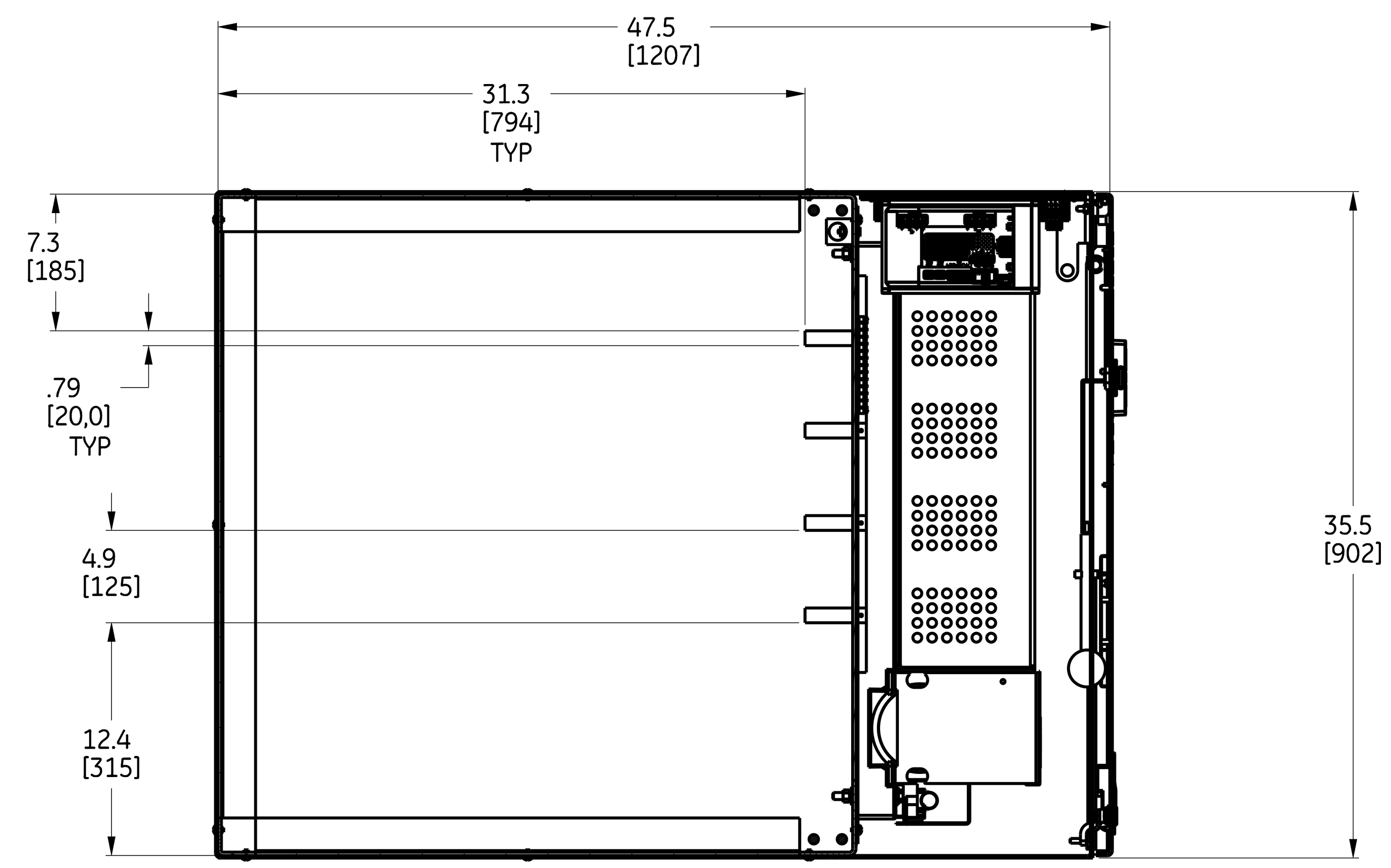


LEFT SIDE VIEW
PANEL REMOVED
(4 POLE UNIT)

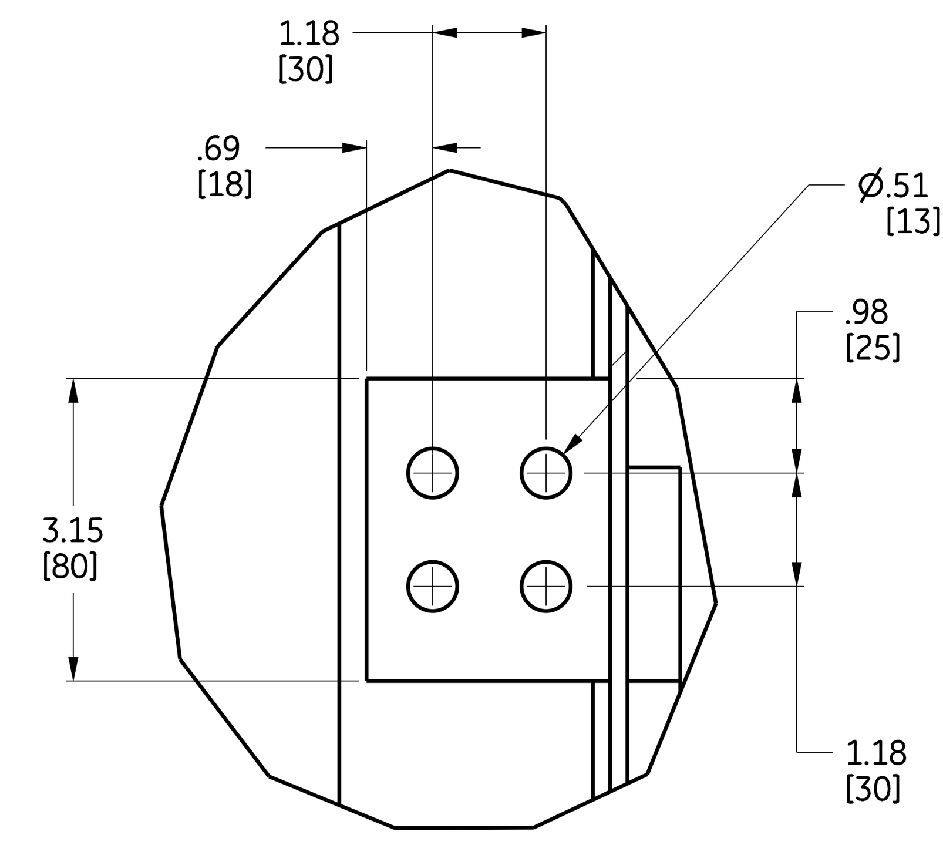
NOTES:
1. SEE SHEET 1 FOR COMPLETE NOTES
2. MECHANICAL LUGS SHOWN IN ABOVE VIEWS ARE FOR REFERENCE

Third Angle Projection

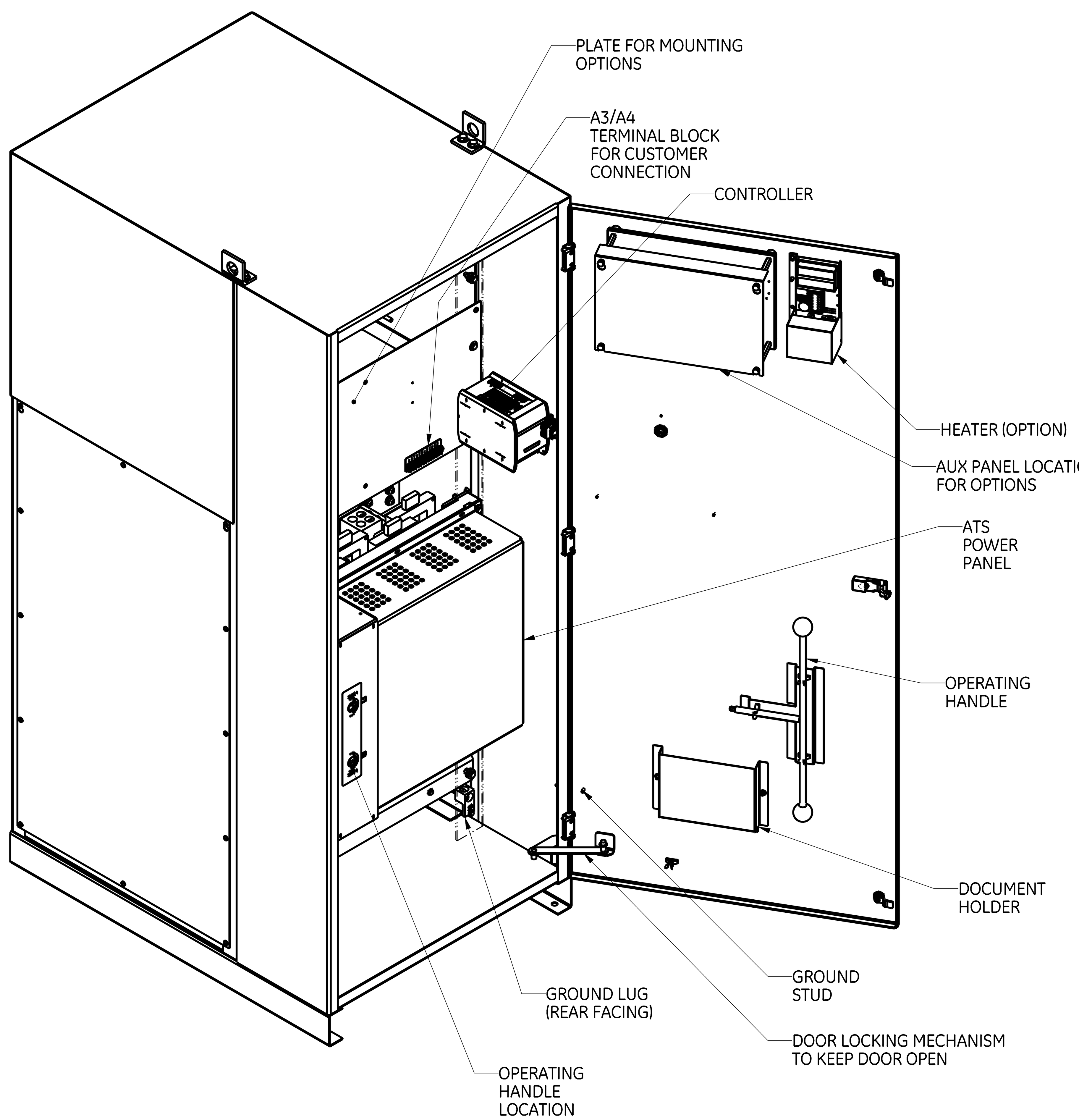
ABB		
SIZE D	NUMBER 50C-1093	REV 1
SCALE 1/8	PRODUCT LINE ZENITH T-SERIES	SHEET 2 of 3

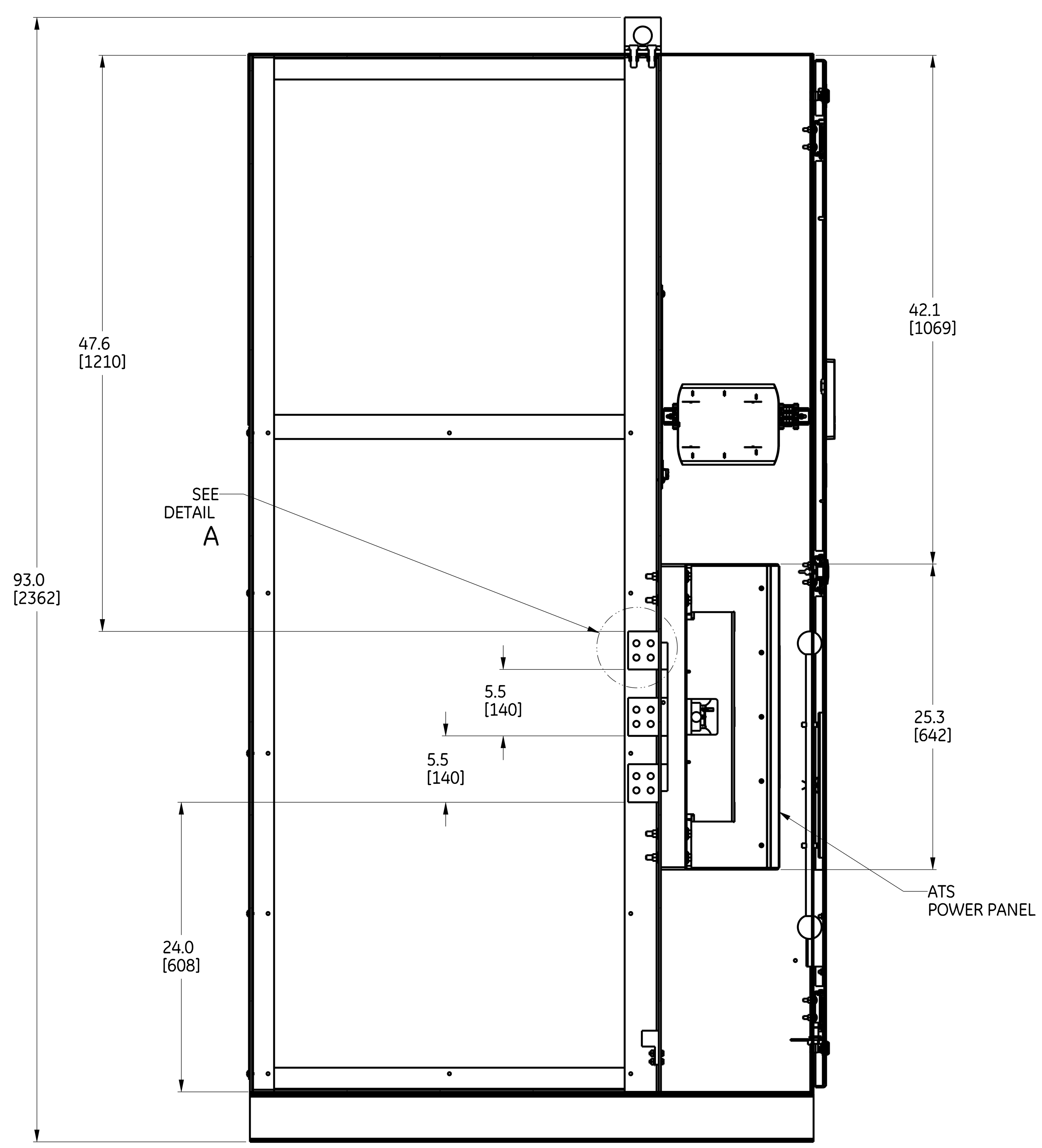


TOP VIEW
PANEL REMOVED
(4 POLE UNIT)



DETAIL A
SCALE 1/2





LEFT SIDE VIEW
PANEL REMOVED
(4 POLE UNIT)

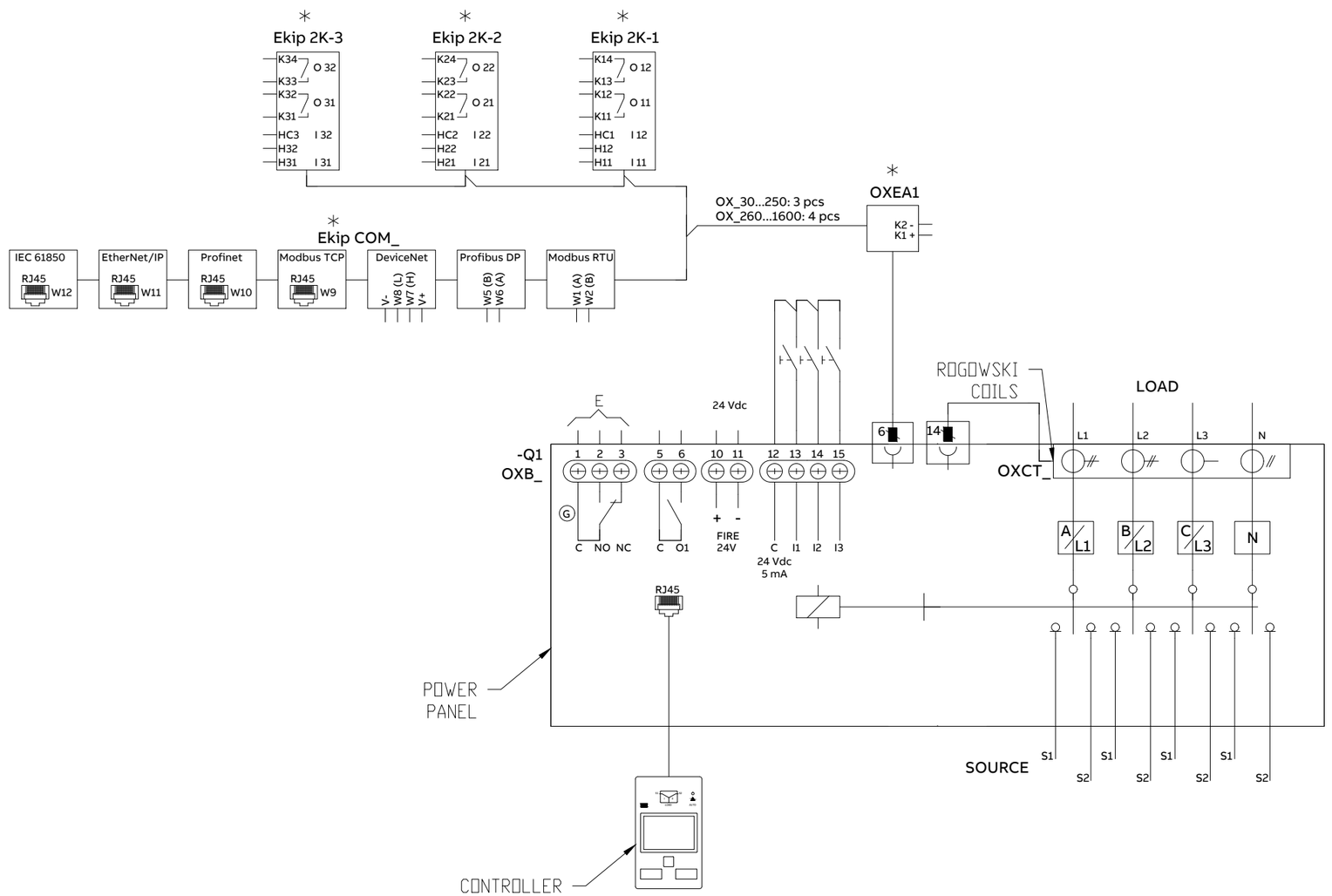
NOTES:

1. REFER TO SHEET(1) FOR MORE DETIALS.
2. VIEW SHOWN ON THIS SHEET ARE WITHOUT LUGS.
3. THIS CONFIGURATION CAN BE USED FOR BUS CONNECTION.

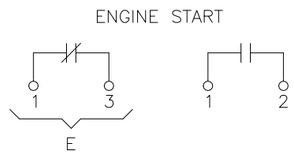
Third Angle Projection

ABB		
SIZE D	NUMBER 50C-1093	REV 1
SCALE 1/8	PRODUCT LINE ZENITH T-SERIES	SHEET 3 of 3

Article or Material Must Conform to REACH Procedure SI900000 Sec.14
Article or Material Must Conform to ROHS Procedure SI900000 Sec.13
Part Must Conform to SI900000 Sec.4 Toxicity Procedure.
Geometric Dimensioning & Tolerancing as per ASME Y14.5-2009



CUSTOMER CONNECTIONS



CONTACT	RATING
E	5 AMP @ 240 VAC 5 AMP @ 30 VDC
OA1G10 (N.O.)	6 AMP @ 125, 250 VAC
OA3G01 (N.C.)	6 AMP @ 125, 250 VAC
Ekip Module (2K-1, 2, 3)	4 AMP @ 240 VAC 2 AMP @ 30 VDC

INTERCONNECT PLUG DIAGRAM

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. CONTACTS ON POWER PANEL WILL BE DIFFERENT BASED ON THE SWITCH AMPERAGE. REVIEW THE PRODUCT BROCHURE FOR THE DETAILS.

LEGEND	NOTES
* OPTIONAL	

Third Angle Projection

Calculated for: VOLUME 0.000 in^3	DRAWING FILE 77A-2004	MODEL FILE 77A-2004	ABB
	DATE MODIFIED 19-Nov-2020	DESIGNED BY ---	
	CN# C104374	APPROVED BY ---	TITLE DELAY TRANSITION ATS SCHEMATIC FOR 30-1200A ZTSD PRODUCT
	◇ Critical to Quality Characteristic		
MASS 0.000 lbm	MATERIAL SPECIFICATION UNASSIGNED	FINISH SPECIFICATION ---	UNITS in / LOCAL TITLE ---
UNLESS OTHERWISE SPECIFIED TOLERANCE ON: 1 PL DECIMALS ± 0.1 2 PL DECIMALS ± 0.02 3 PL DECIMALS ± 0.005 ANGLES ± 1.0	MATERIAL DESCRIPTION ---		SIZE B / ROOT NUMBER 77A-2004 / REV 1 / RELEASE STATE RELEASED
	FINISH DESCRIPTION ---		SCALE 1:1 / PRODUCT LINE ZTSD / SHEET 1 of 1

CUST

Article or Material Must Conform to REACH Procedure SI900000 Sec.14
Article or Material Must Conform to ROHS Procedure SI900000 Sec.13
Part Must Conform to SI900000 Sec.A Toxicity Procedure
Geometric Dimensioning & Tolerancing as per ASME Y14.5-2009

REVISIONS

REV.	DESCRIPTION	DATE	APPROVED
1	C120219 Create drawing set	07/12/21	MASMAS

ZENITH T-SERIES AUTOMATIC TRANSFER SWITCHES: 1600-3000A (R5)

FOR ADDITIONAL INFO REFER TO	SIGNATURES	DATE
APPLIED PRACTICES	MODEL MAS	07/12/21
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DETAIL	
TOLERANCES ON:	CHECKED	
2 PL. DECIMALS ± .020	ENGRG MAS	07/12/21
3 PL. DECIMALS ± .005	MFG	
ANGLES ± 1°	QUALITY	
FRACTIONS ± 1/64	ISSUED	
FINISH ✓	DRAWING FILE: 77a-3000.dwg	
	MODEL / ASSEMBLY FILE:	
AutoCad Generated	# CTQs ⊖ CRITICAL TO QUALITY CHARACTERISTIC	

ABB

TITLE

Electrical diagram

ABB Integrated Controller design

FIRST MADE FOR: ABB for Zenith

SIZE	CAGE CODE	DWG NO
D		77A-3000

SCALE: - SHEET 1 of 13

THIRD ANGLE PROJECTION

Article or Material Must Conform to REACH Procedure SI900000 Sec.14
Article or Material Must Conform to ROHS Procedure SI900000 Sec.13
Part Must Conform to SI900000 Sec.4 Toxicity Procedure
Geometric Dimensioning & Tolerancing as per ASME Y14.5-2009

DESIGNATION	DESCRIPTION
A3-1,2	ACTIVATED WHEN ATS IS LOCKED IN BOTTOM SOURCE (SOURCE 2) POSITION
A4-1,2	ACTIVATED WHEN ATS IS LOCKED IN TOP SOURCE (SOURCE 1) POSITION
AC,DC PLUGS	HARNESS PLUGS – AC / DC INPUT POWER TO TRU CONTROL SYSTEM
ATS	AUTOMATIC TRANSFER SWITCH
CE	SOURCE 2 CLOSE TRANSFER COIL
CEO	SOURCE 2 OPEN TRANSFER COIL
CN	SOURCE 1 CLOSE TRANSFER COIL
CNO	SOURCE 1 OPEN TRANSFER COIL
DT TIMER	CUSTOMER CONFIGURABLE TIMER. ALLOWS ATS TO REMAIN IN NEUTRAL STATE BEFORE INITIATING A CONTACT TRANSFER TO THE PRIMARY SOURCE – DELAY TRANSITION ONLY.
DW TIMER	CUSTOMER CONFIGURABLE TIMER. ALLOWS ATS TO REMAIN IN A NEUTRAL STATE BEFORE INITIATING A CONTACT TRANSFER TO THE ALTERNATE SOURCE – DELAY TRANSITION ONLY.
E CONTACTS	ENGINE START CONTACTS.
E1,2,3,N	SOURCE 2 INPUT TERMINALS
HMI	HUMAN MACHINE INTERFACE PANEL.
J1,2,3, ETC	HARNESS PLUGS
L1,2,3,N	LOAD TERMINAL (ATS OUTPUT TERMINALS)
N1,2,3,N	SOURCE 1 INPUT TERMINALS
P TIMER	CUSTOMER CONFIGURABLE TIMER. TIME DELAY BEFORE ENGINE START
S1, S2	SOURCE 1, SOURCE 2 DESIGNATIONS.
SCR-CE2	LOAD SHED RELAY MODULE
SCR-E	SOURCE 2 CLOSE TRANSFER MODULE
SCR-EO	SOURCE 2 OPEN TRANSFER MODULE
SCR-N	SOURCE 1 CLOSE TRANSFER MODULE
SCR-NO	SOURCE 1 OPEN TRANSFER MODULE
SN-1	SOURCE 1 LIMIT SWITCH. ACTIVATED WHEN ATS IN SOURCE 1 CLOSE POSITION
SNO-1	SOURCE 1 LIMIT SWITCH. ACTIVATED WHEN ATS IS IN THE SOURCE 1 OPEN POSITION
SNO-2	SOURCE 1 LIMIT SWITCH. ACTIVATED WHEN ATS IS IN THE SOURCE 1 OPEN POSITION
SE-1	SOURCE 2 LIMIT SWITCH. ACTIVATED WHEN ATS IS IN THE SOURCE 2 CLOSE POSITION
SEO-1	SOURCE 2 LIMIT SWITCH. ACTIVATED WHEN ATS IS IN THE SOURCE 2 OPEN POSITION
SEO-2	SOURCE 2 LIMIT SWITCH. ACTIVATED WHEN ATS IS IN THE SOURCE 2 OPEN POSITION
T TIMER	CUSTOMER CONFIGURABLE TIME. ALLOWS PREFERRED SOURCE TO STABILIZE BEFORE INITIATING AN ATS TRANSFER TO THE PREFERRED SOURCE.
T1	TRU CONTROLLER NAMING DESIGNATION.
TB1	TERMINAL BLOCK. PROVIDES CUSTOMER INPUT TO SOURCE 2 AUXILIARY CONTACTS
TB2	TERMINAL BLOCK. PROVIDES CUSTOMER INPUT TO SOURCE 1 AUXILIARY CONTACTS
TB3	TERMINAL BLOCK. ENCLOSURE MOUNTED. TO BE USED BY CUSTOMER TO CONNECT AUXILIARY A3 AND A4 CONTACTS.
U TIMER	CUSTOMER CONFIGURABLE TIMER. COOL-DOWN TIMER. ALLOWS ENGINE TO RUN UNLOADED BEFORE SHUTTING DOWN.
W TIMER	CUSTOMER CONFIGURABLE TIMER. ALLOWS ALTERNATE SOURCE TO STABILIZE BEFORE INITIATING AN ATS TRANSFER TO THE ALTERNATE SOURCE

DESIGNATION	DESCRIPTION

FOR ADDITIONAL INFO REFER TO	SIGNATURES	DATE
APPLIED PRACTICES		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		
TOLERANCES ON:		
2 PL. DECIMALS ± .020	MODEL MAS	07/12/21
3 PL. DECIMALS ± .005	DETAIL	
ANGLES ± 1°	CHECKED	
FRACTIONS ± 1/64	ENGRG MAS	07/12/21
FINISH ✓	MFG	
	QUALITY	
	ISSUED	
AutoCad Generated	DRAWING FILE:	
	MODEL / ASSEMBLY FILE:	
	# CTQs ⊖ CRITICAL TO QUALITY CHARACTERISTIC	

ABB

TITLE
Acronyms and Definitions
ABB Integrated Controller Design

FIRST MADE FOR: ABB for ZENITH

SIZE	CAGE CODE	DWG NO
D		77A-3000

SCALE: -

SHEET 2 of 13

THIRD ANGLE PROJECTION

SEQUENCE OF OPERATION – OPEN TRANSITION

1) WHEN SOURCE 1 LINE VOLTAGE OR FREQUENCY DROPS BELOW THE PRESET "FAIL" VALUES, THE SOURCE 1 VOLTAGE SENSING CIRCUIT INITIATES THE ENGINE START CIRCUIT THRU THE ENGINE START TIMER "P".

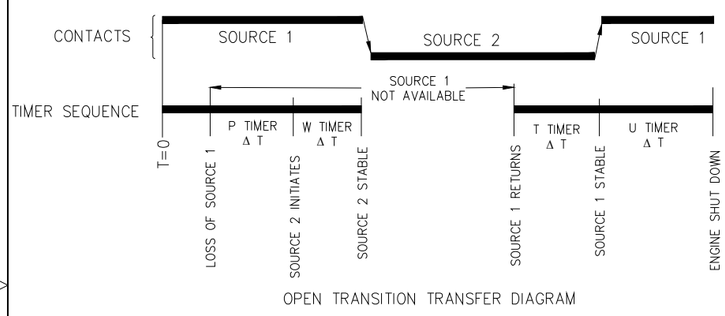
2) WHEN SOURCE 2 LINE VOLTAGE AND FREQUENCY REACH THE PRESET "RESTORE" VALUES (ESTABLISHED DURING THE W TIMER ELAPSE CYCLE), THE MX CONTROLLER INITIATES A TRANSFER SIGNAL THROUGH THE SCR-E DEVICE TO OPERATE THE CE TRANSFER OPERATOR.

3) THE LOAD WILL BE TRANSFERRED TO THE SOURCE 2 POSITION. THE TRANSFER SWITCH IS MECHANICALLY LOCKED AND ACKNOWLEDGED THRU THE SE LIMIT SWITCH.

4) WHEN THE SOURCE 1 LINE VOLTAGE AND FREQUENCY REACH THE PRESET "RESTORE" VALUES (ESTABLISHED BEFORE THE T TIMER ELAPSE CYCLE), THE MX CONTROLLER INITIATES A TRANSFER SIGNAL THROUGH THE SCR-N MODULE TO OPERATE THE CN TRANSFER OPERATOR.

5) THE LOAD WILL BE TRANSFERRED TO THE SOURCE 1 POSITION. THE TRANSFER SWITCH IS MECHANICALLY LOCKED AND ACKNOWLEDGED THRU THE SN LIMIT SWITCH.

6) THE MX CONTROLLER WILL INITIATE AN ENGINE COOL-DOWN SEQUENCE. THE ENGINE COOL DOWN SEQUENCE WILL ALLOW THE GENERATOR TO OPERATE UNLOADED UNTIL THE U TIMER SETTING HAS ELAPSED. ONCE COMPLETE, THE CONTROLLER WILL AUTOMATICALLY SHUT DOWN THE ENGINE.



OPEN TRANSITION TRANSFER DIAGRAM

NOTE: A MANUAL "BYPASS" PUSHBUTTON IS AVAILABLE ON THE MX CONTROLLER. THIS FEATURE ALLOWS CERTAIN TIMERS TO BE BYPASSED IF THE PRE-SET CONDITIONS HAVE NOT BEEN SET CORRECTLY.

DISCONNECT CONTROL SWITCH (DS):
WHEN THE DISCONNECT CONTROL SWITCH IS PLACED IN THE INHIBIT POSITION, THE CIRCUITS TO THE TRANSFER OPERATORS ARE OPENED AND TRANSFER CANNOT TAKE PLACE

TEST SWITCH:
THE TEST SWITCH SIMULATES A SOURCE 1 LINE FAILURE WHEN ACTIVATED. TO TEST THE ATS, ACTIVATE THE TEST SWITCH ALLOWING THE TRANSFER SWITCH TO TRANSFER TO THE SOURCE 2 POSITION FOLLOWING THE ABOVE DESCRIBED OPERATION. RELEASING THE TEST SWITCH WILL ALLOW THE ATS TO TRANSFER BACK TO THE SOURCE 1 POSITION. TESTING AT LEAST ONCE PER MONTH IS RECOMMENDED. FOR HOSPITAL EMERGENCY SYSTEMS IT IS RECOMMENDED TO TEST ONCE PER WEEK.

SEQUENCE OF OPERATION – DELAY TRANSITION

1) WHEN SOURCE 1 LINE VOLTAGE OR FREQUENCY DROPS BELOW THE PRESET "FAIL" VALUES, THE SOURCE 1 VOLTAGE SENSING CIRCUIT INITIATES THE ENGINE START CIRCUIT THRU THE ENGINE START TIMER "P".

2) WHEN SOURCE 2 LINE VOLTAGE AND FREQUENCY REACH THE PRESET "RESTORE" VALUES (ESTABLISHED DURING THE W TIMER ELAPSE CYCLE), THE MX CONTROLLER INITIATES A TRANSFER SIGNAL THROUGH THE SCR-NO MODULE TO OPERATE THE CNO TRANSFER OPERATOR.

3) THE LOAD WILL BE TRANSFERRED TO THE OPEN POSITION. ONCE THE SNO / SEO LIMIT SWITCHES HAVE BEEN ACTIVATED, THE MX CONTROLLER WILL INITIATE THE DW TIME DELAY. AFTER A SET TIME DELAY (ESTABLISHED THRU THE DW TIMER), THE MX CONTROLLER INITIATES A TRANSFER SIGNAL THROUGH THE SCR-E MODULE TO OPERATE THE CE TRANSFER OPERATOR.

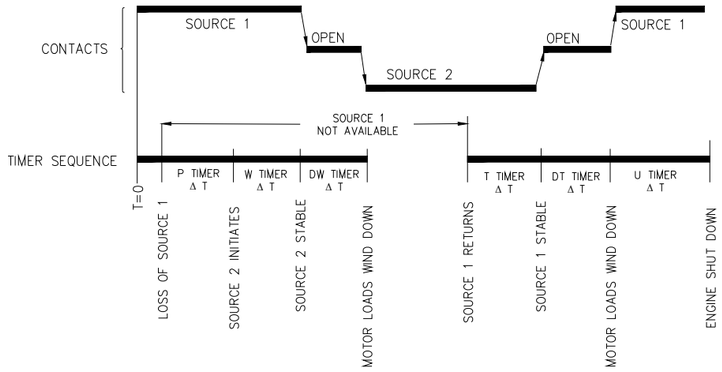
4) THE LOAD WILL BE TRANSFERRED TO THE SOURCE 2 POSITION. THE TRANSFER SWITCH IS MECHANICALLY LOCKED AND ACKNOWLEDGED THRU THE SE LIMIT SWITCH.

5) WHEN SOURCE 1 LINE VOLTAGE AND FREQUENCY REACH THE PRESET "RESTORE" VALUES (ESTABLISHED DURING THE T TIMER ELAPSE CYCLE), THE MX CONTROLLER INITIATES A TRANSFER SIGNAL THROUGH THE SCR-EO MODULE TO OPERATE THE CEO TRANSFER OPERATOR.

6) THE LOAD WILL BE TRANSFERRED TO THE OPEN POSITION. ONCE THE SNO / SEO LIMIT SWITCHES HAVE BEEN ACTIVATED, THE MX CONTROLLER WILL INITIATE THE DT TIME DELAY. AFTER A SET TIME DELAY (ESTABLISHED THRU THE DT TIMER), THE MX CONTROLLER INITIATES A TRANSFER SIGNAL THROUGH THE SCR-N MODULE TO OPERATE THE CN TRANSFER OPERATOR.

7) THE LOAD WILL BE TRANSFERRED TO THE SOURCE 1 POSITION. THE TRANSFER SWITCH IS MECHANICALLY LOCKED AND ACKNOWLEDGED THRU THE SN LIMIT SWITCH.

8) THE MX CONTROLLER WILL INITIATE AN ENGINE COOL-DOWN SEQUENCE. THE ENGINE COOL DOWN SEQUENCE WILL ALLOW THE GENERATOR TO OPERATE UNLOADED UNTIL THE U TIMER SETTING HAS ELAPSED. ONCE COMPLETE, THE CONTROLLER WILL AUTOMATICALLY SHUT DOWN THE ENGINE.



DELAY TRANSITION TRANSFER DIAGRAM

NOTE: A MANUAL "BYPASS" PUSHBUTTON IS AVAILABLE ON THE MX CONTROLLER. THIS FEATURE ALLOWS CERTAIN TIMERS TO BE BYPASSED IF THE PRE-SET CONDITIONS HAVE NOT BEEN SET CORRECTLY.

DISCONNECT CONTROL SWITCH (DS):
WHEN THE DISCONNECT CONTROL SWITCH IS PLACED IN THE INHIBIT POSITION, THE CIRCUITS TO THE TRANSFER OPERATORS ARE OPENED AND TRANSFER CANNOT TAKE PLACE

TEST SWITCH:
THE TEST SWITCH SIMULATES A SOURCE 1 LINE FAILURE WHEN ACTIVATED. TO TEST THE ATS, ACTIVATE THE TEST SWITCH ALLOWING THE TRANSFER SWITCH TO TRANSFER TO THE SOURCE 2 POSITION FOLLOWING THE ABOVE DESCRIBED OPERATION. RELEASING THE TEST SWITCH WILL ALLOW THE ATS TO TRANSFER BACK TO THE SOURCE 1 POSITION. TESTING AT LEAST ONCE PER MONTH IS RECOMMENDED. FOR HOSPITAL EMERGENCY SYSTEMS IT IS RECOMMENDED TO TEST ONCE PER WEEK.

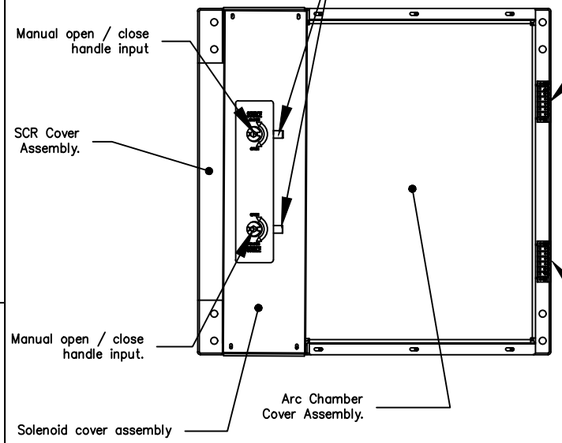
THIRD ANGLE PROJECTION

FOR ADDITIONAL INFO REFER TO	SIGNATURES		DATE
APPLIED PRACTICES	MODEL	MAS	07/12/21
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DETAIL		
TOLERANCES ON:	CHECKED		
2 PL. DECIMALS ± .020	ENGRG	MAS	07/12/21
3 PL. DECIMALS ± .005	MFG		
ANGLES ± 1°	QUALITY		
FRACTIONS ± 1/64	ISSUED		
FINISH ✓	DRAWING FILE:		
	MODEL / ASSEMBLY FILE:		
AutoCad Generated	# CTQs	⊖ CRITICAL TO QUALITY CHARACTERISTIC	

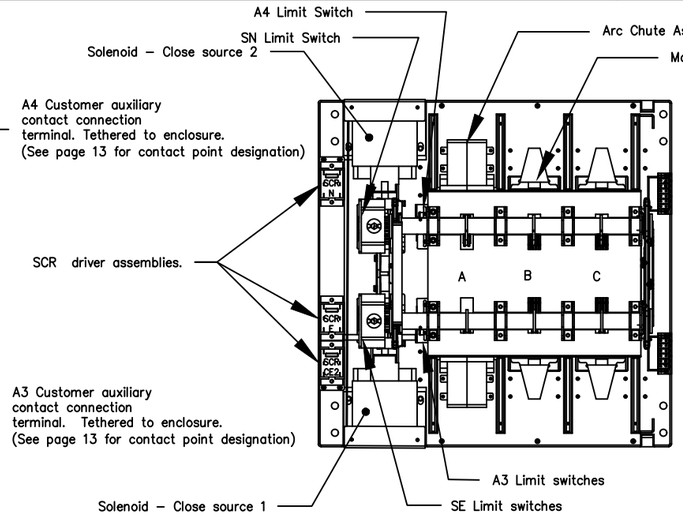
ABB

TITLE
Sequence of Operations
ABB Integrated Controller Design
FIRST MADE FOR: ABB for ZENITH

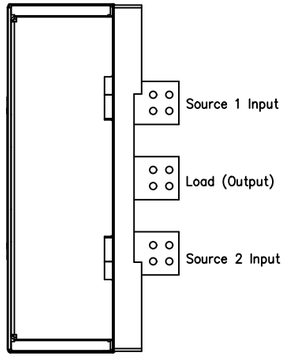
SIZE	CAGE CODE	DWG NO
D		77A-3000
SCALE: -		SHEET 3 of 13



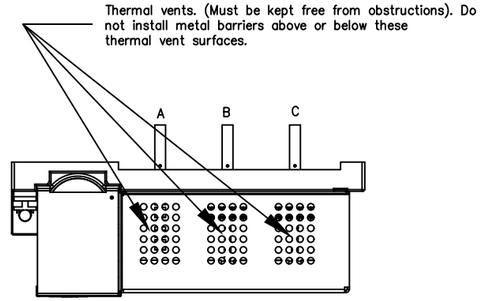
ATS – 3 POLE OPEN TRANSITION. FULL ASSEMBLY.



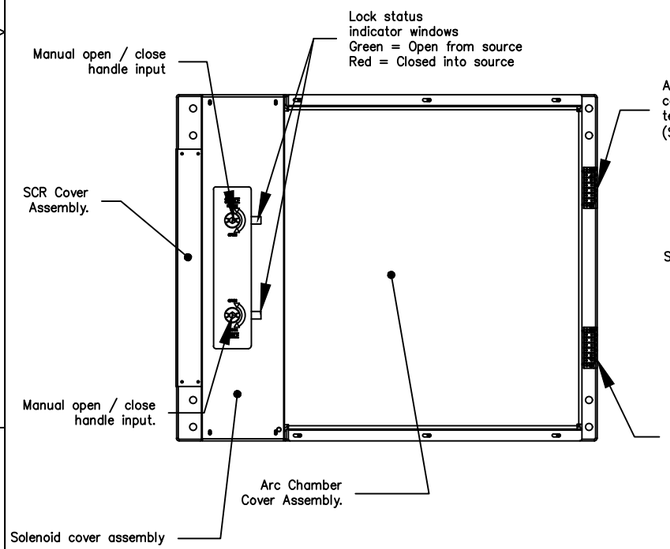
ATS – 3 POLE OPEN TRANSITION. COVERS REMOVED



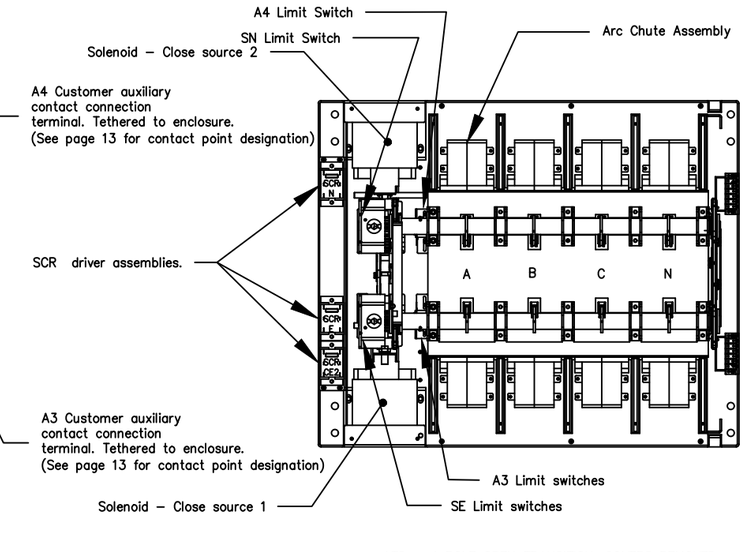
ATS – 3 POLE OPEN TRANSITION. SIDE VIEW
(BUS CONNECT IS STANDARD. PLEASE CONSULT FACTORY OPTIONAL LUGS CONNECT).



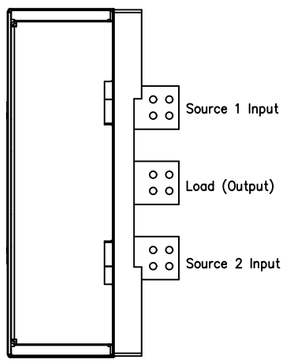
ATS – 3 POLE OPEN TRANSITION. TOP VIEW



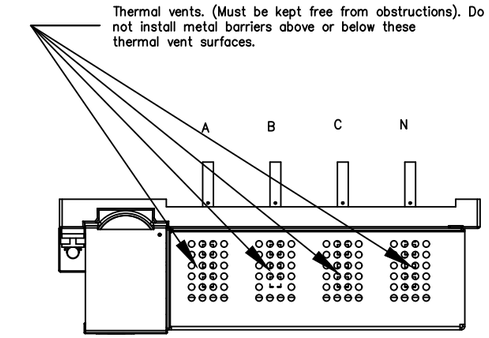
ATS – 4 POLE OPEN TRANSITION. FULL ASSEMBLY.



ATS – 4 POLE OPEN TRANSITION. COVERS REMOVED



ATS – 4 POLE OPEN TRANSITION. SIDE VIEW
(BUS CONNECT IS STANDARD. PLEASE CONSULT FACTORY OPTIONAL LUGS CONNECT).



ATS – 4 POLE OPEN TRANSITION. TOP VIEW

FOR ADDITIONAL INFO REFER TO	SIGNATURES	DATE
APPLIED PRACTICES	MODEL MAS	07/12/21
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DETAIL	
TOLERANCES ON:	CHECKED	
2 PL. DECIMALS ± .020	ENGRG MAS	07/12/21
3 PL. DECIMALS ± .005	MFG	
ANGLES ± 1°	QUALITY	
FRACTIONS ± 1/64	ISSUED	
FINISH ✓	DRAWING FILE:	
AutoCad Generated	MODEL / ASSEMBLY FILE:	
	# CTQs ⊖ CRITICAL TO QUALITY CHARACTERISTIC	

ABB

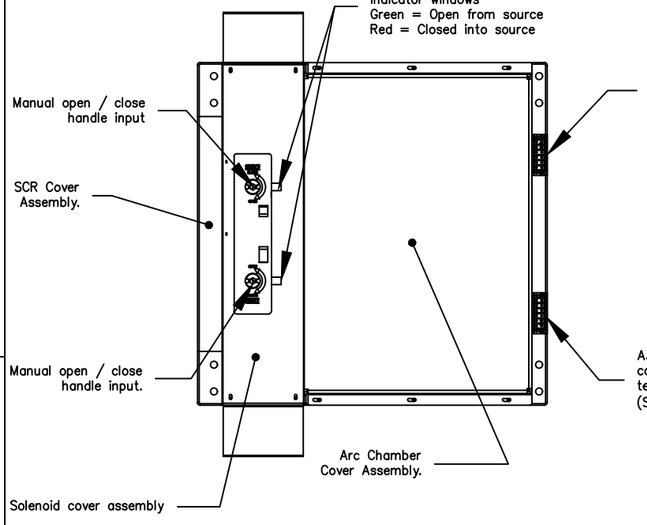
TITLE
Mechanical layout
Open Transition ATS

FIRST MADE FOR: ABB for ZENITH

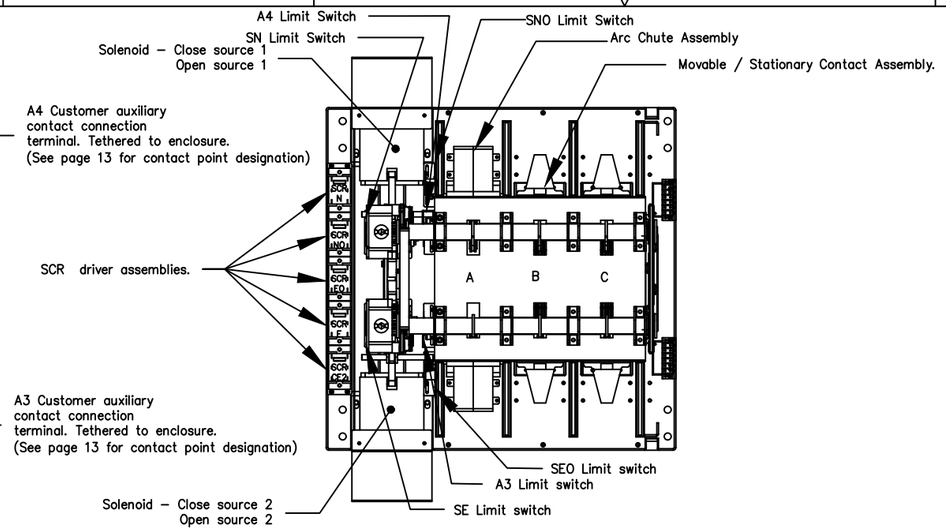
SIZE	CAGE CODE	DWG NO
D		77A-3000

SCALE: - SHEET 4 of 13

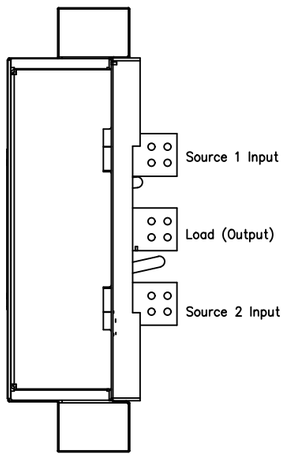
THIRD ANGLE PROJECTION



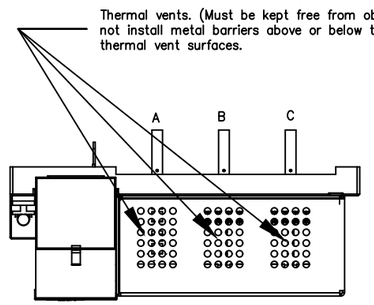
ATS – 3 POLE DELAY TRANSITION. FULL ASSEMBLY.



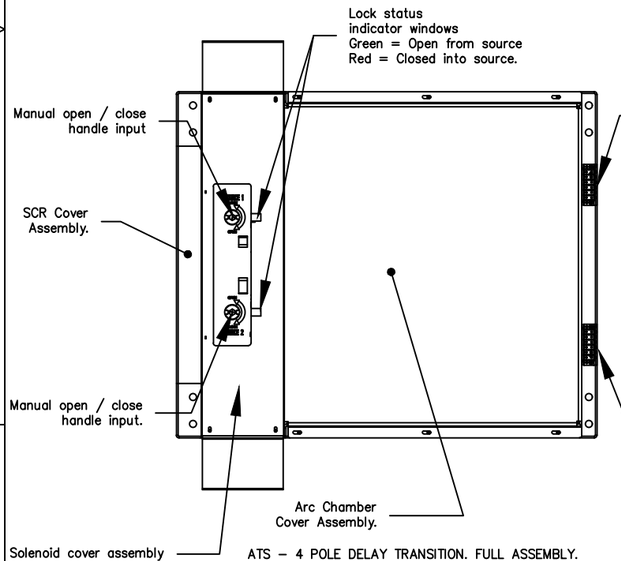
ATS – 3 POLE DELAY COVERS REMOVED



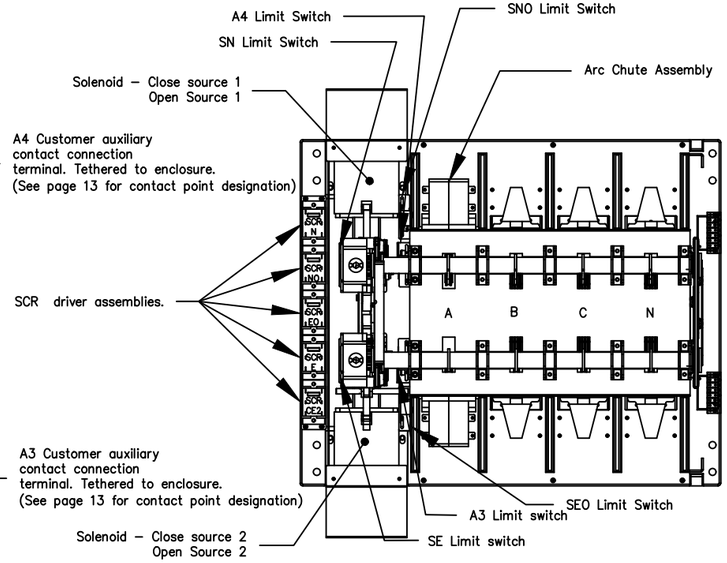
ATS – 3 POLE DELAY / CLOSE TRANSITION. SIDE VIEW
(BUS CONNECT IS STANDARD. PLEASE CONSULT FACTORY OPTIONAL LUGS CONNECT).



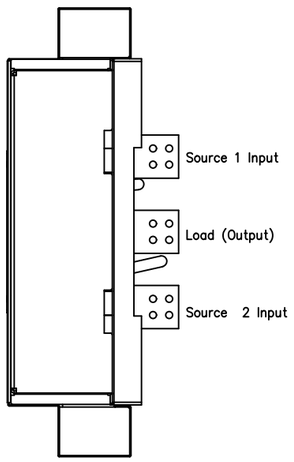
ATS – 3 POLE DELAY TRANSITION. TOP VIEW



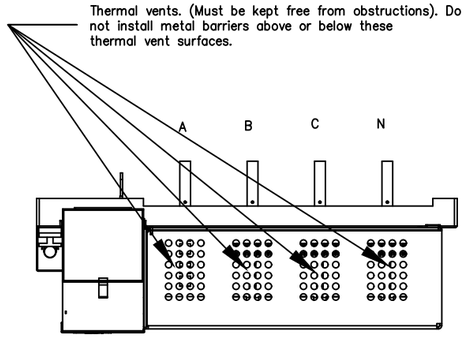
ATS – 4 POLE DELAY TRANSITION. FULL ASSEMBLY.



ATS – 4 POLE DELAY . COVERS REMOVED



ATS – 4 POLE DELAY TRANSITION. SIDE VIEW
(BUS CONNECT IS STANDARD. PLEASE CONSULT FACTORY OPTIONAL LUGS CONNECT).



ATS – 4 POLE DELAY TRANSITION. TOP VIEW

FOR ADDITIONAL INFO REFER TO	SIGNATURES		DATE
APPLIED PRACTICES	MODEL	MAS	07/12/21
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DETAIL		
TOLERANCES ON:	CHECKED		
2 PL. DECIMALS ± .020	ENGRG	MAS	07/12/21
3 PL. DECIMALS ± .005	MFG		
ANGLES ± 1°	QUALITY		
FRACTIONS ± 1/64	ISSUED		
FINISH ✓	DRAWING FILE:		
	MODEL / ASSEMBLY FILE:		
AutoCad Generated	# CTQs ⊖ CRITICAL TO QUALITY CHARACTERISTIC		

ABB

TITLE
Mechanical Layout
Delay Transition ATS

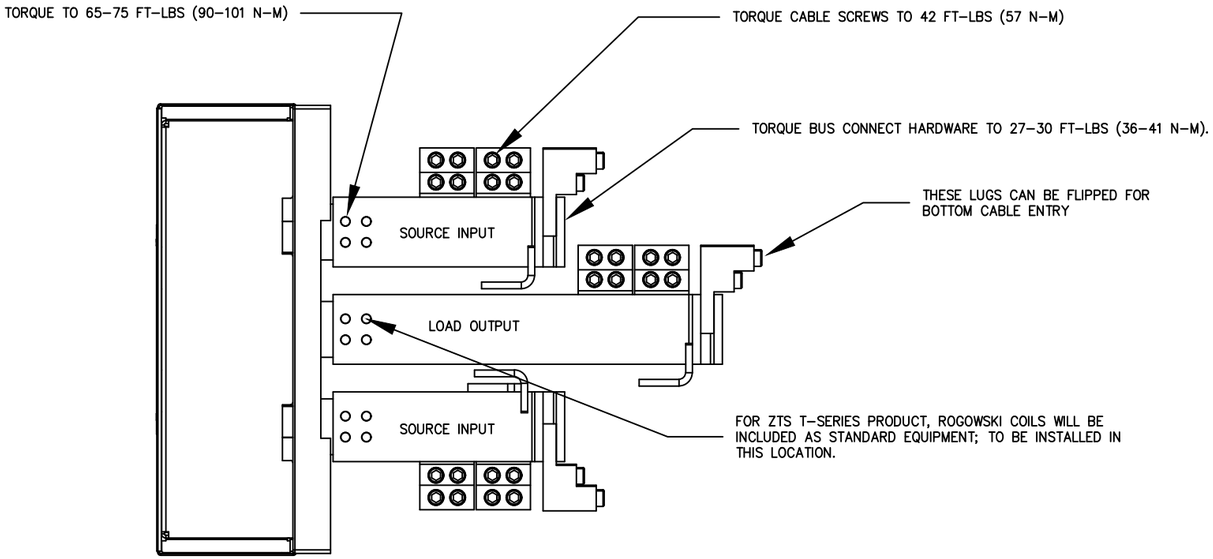
FIRST MADE FOR: ABB for ZENITH

SIZE	CAGE CODE	DWG NO
D		77A-3000

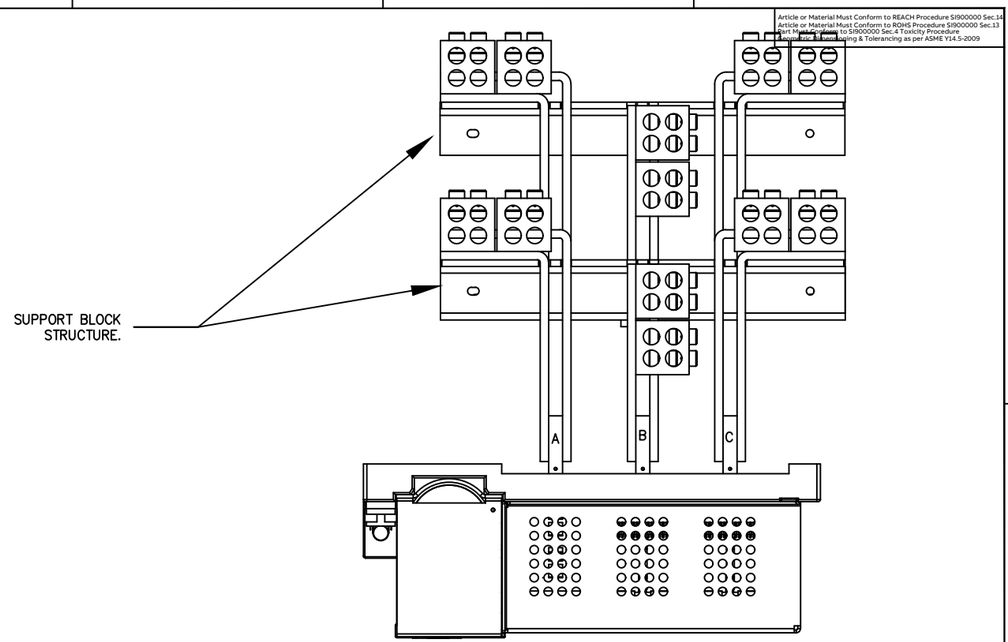
SCALE: -

SHEET 5 of 13

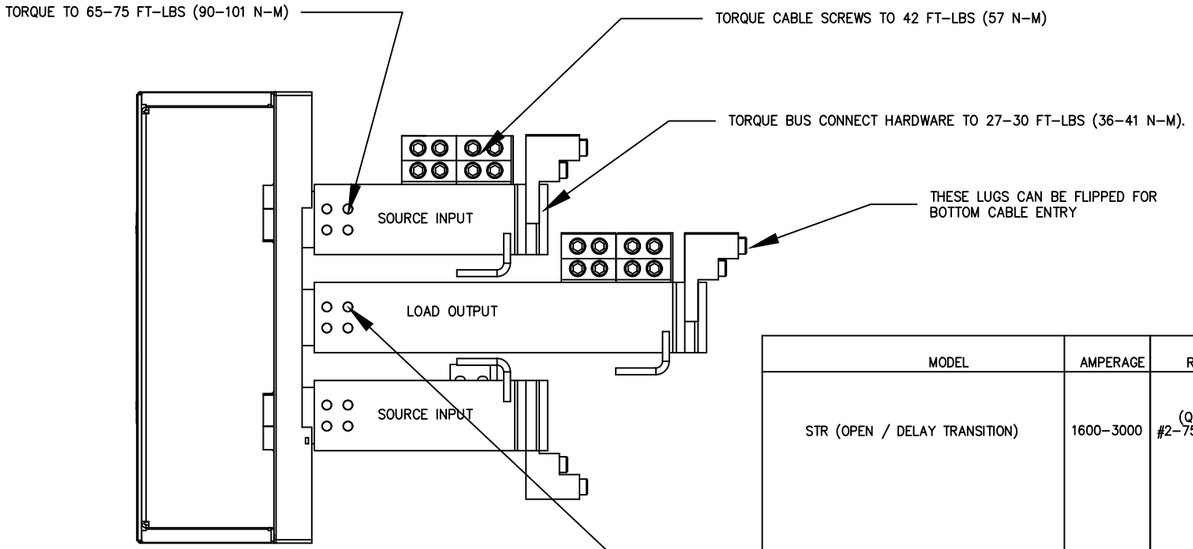
THIRD ANGLE PROJECTION



ATS – 3 POLE OPEN TRANSITION WITH MECHANICAL LUG ASSEMBLIES ATTACHED.

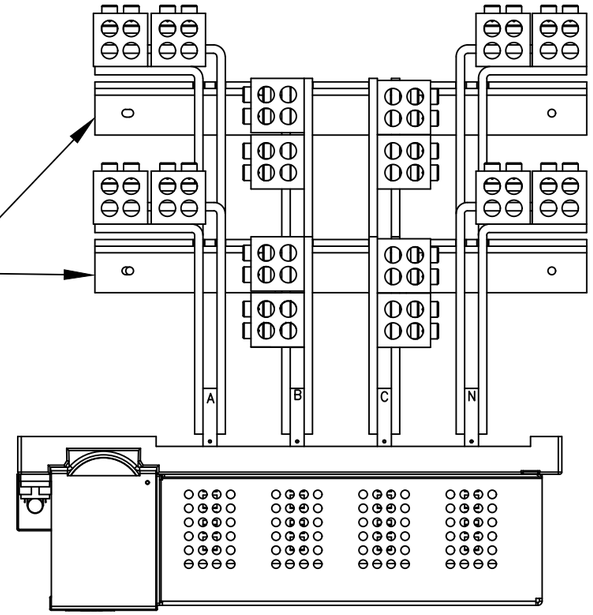


ATS – 3 POLE OPEN TRANSITION. WITH MECHANICAL LUG ASSEMBLIES ATTACHED.



MODEL	AMPERAGE	LUG RANGE	
STR (OPEN / DELAY TRANSITION)	1600–3000	(QTY 8) #2–750 MCM	LUGS ARE SUITABLE FOR AL/CU BUS CONNECTION LUG CONFIGURATIONS SHOWN FOR REFERENCE ONLY. COMPRESSION LUG CONFIGURATION IS ALSO AVAILABLE. CONTACT FACTORY FOR DETAILS. (COMPRESSION CONFIGURATION NOT SHOWN)

ATS – 4 POLE OPEN TRANSITION WITH MECHANICAL LUG ASSEMBLIES ATTACHED.



ATS – 4 POLE OPEN TRANSITION WITH MECHANICAL LUG ASSEMBLIES ATTACHED.

THIRD ANGLE PROJECTION

FOR ADDITIONAL INFO REFER TO	SIGNATURES	DATE
APPLIED PRACTICES	MODEL MAS	07/12/21
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DETAIL	
TOLERANCES ON:	CHECKED	
2 PL. DECIMALS ± .020	ENGRG MAS	07/12/21
3 PL. DECIMALS ± .005	MFG	
ANGLES ± 1°	QUALITY	
FRACTIONS ± 1/64	ISSUED	
FINISH ✓	DRAWING FILE:	
AutoCad Generated	MODEL / ASSEMBLY FILE:	
	# CTQs ⊖ CRITICAL TO QUALITY CHARACTERISTIC	

ABB

TITLE
Option Rear Bus Bar Confg.
ABB Integrated Controller Design
FIRST MADE FOR: ABB for ZENITH

SIZE	CAGE CODE	DWG NO
D		77A-3000

SCALE: - SHEET 6 of 13

STANDARD PLUG CONNECTION SCHEME – LOCATED ON TRU CONTROLLER

J1 – Source 1

7						1
23		22		21		20

J2 – Source 2

7						1
33		32		31		30

J11 – ATS STAT SW

6						1
25ZA	25ZZ	25B	36	35B	26	

J5: ATS command out

1								8
808	901	900	908	801	800	-24V (453A)	-24V	

J8 – GEN 1, GEN 2

6						1
G2_NO	G2_COM	G2_NC	G1_NO	G1_COM	G1_NC	

J4: Current Sensors

1								8
IL1	IL1	IL2	IL2	IL3	IL3	INE	INE	

STANDARD PLUG CONNECTION SCHEME – LOCATED ON R5 ATS TO T1 INTERFACE HARNESS

DC (PLUG)

1					5
800	801	808	901	908	
26	36	25B	35B		
	25ZA	453A	900		

11 15

FOR USE ON 1ø/3ø SYSTEMS

AC (PLUG)

1				4
20	21	22	23	
30	31	32	33	

9 12

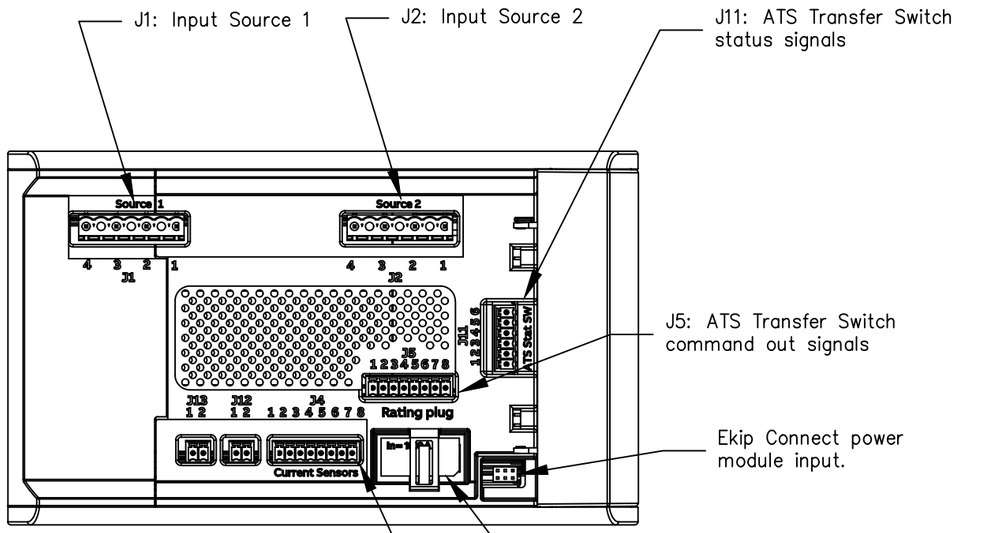
FOR USE ON 3ø SYSTEMS

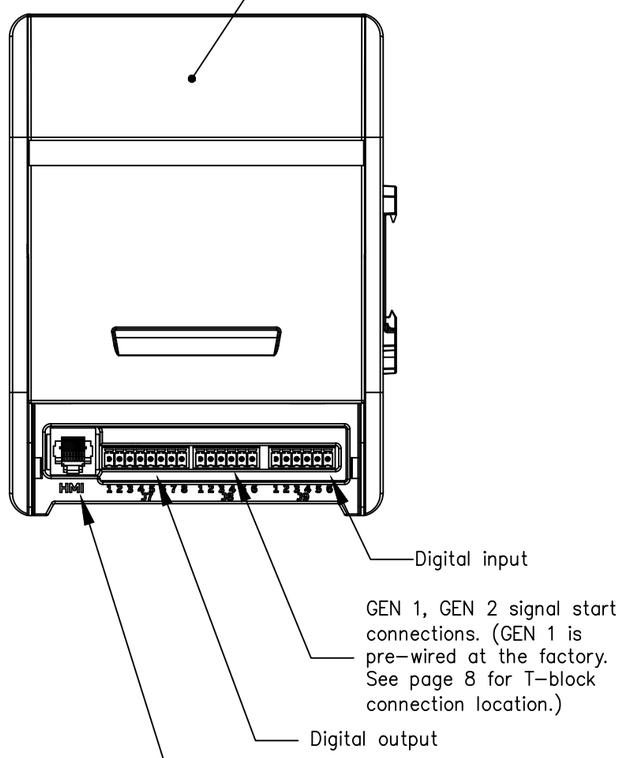
AC (PLUG)

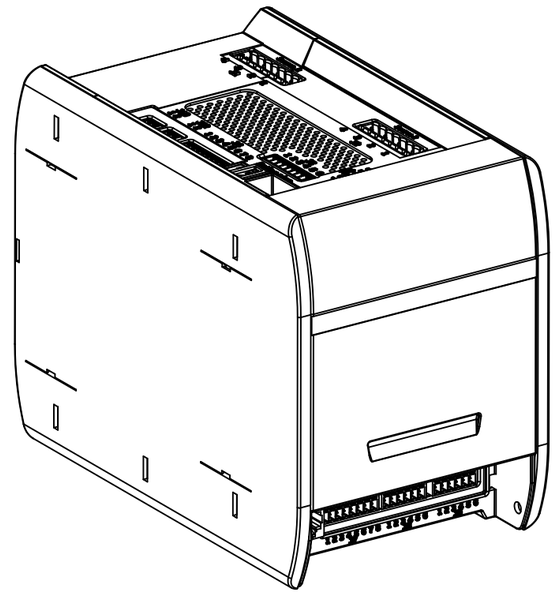
1				4
20	21			
30	31			

9 12

FOR USE ON 1ø SYSTEMS ONLY







Notes:

1) ABB Zenith TruControl is a fully integrated electrical module that has no field replaceable components. Units that are not operating as intended will require complete replacement. Any attempts to perform hardware repair or maintenance of internal components is not recommended.

THIRD ANGLE PROJECTION

FOR ADDITIONAL INFO REFER TO	SIGNATURES		DATE
APPLIED PRACTICES	MODEL	MAS	07/12/21
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DETAIL		
TOLERANCES ON:	CHECKED		
2 PL. DECIMALS ± .020	ENGRG	MAS	07/12/21
3 PL. DECIMALS ± .005	MFG		
ANGLES ± 1°	QUALITY		
FRACTIONS ± 1/64	ISSUED		
FINISH ✓	DRAWING FILE:		
	MODEL / ASSEMBLY FILE:		
AutoCad Generated	# CTQs	CRITICAL TO QUALITY CHARACTERISTIC	

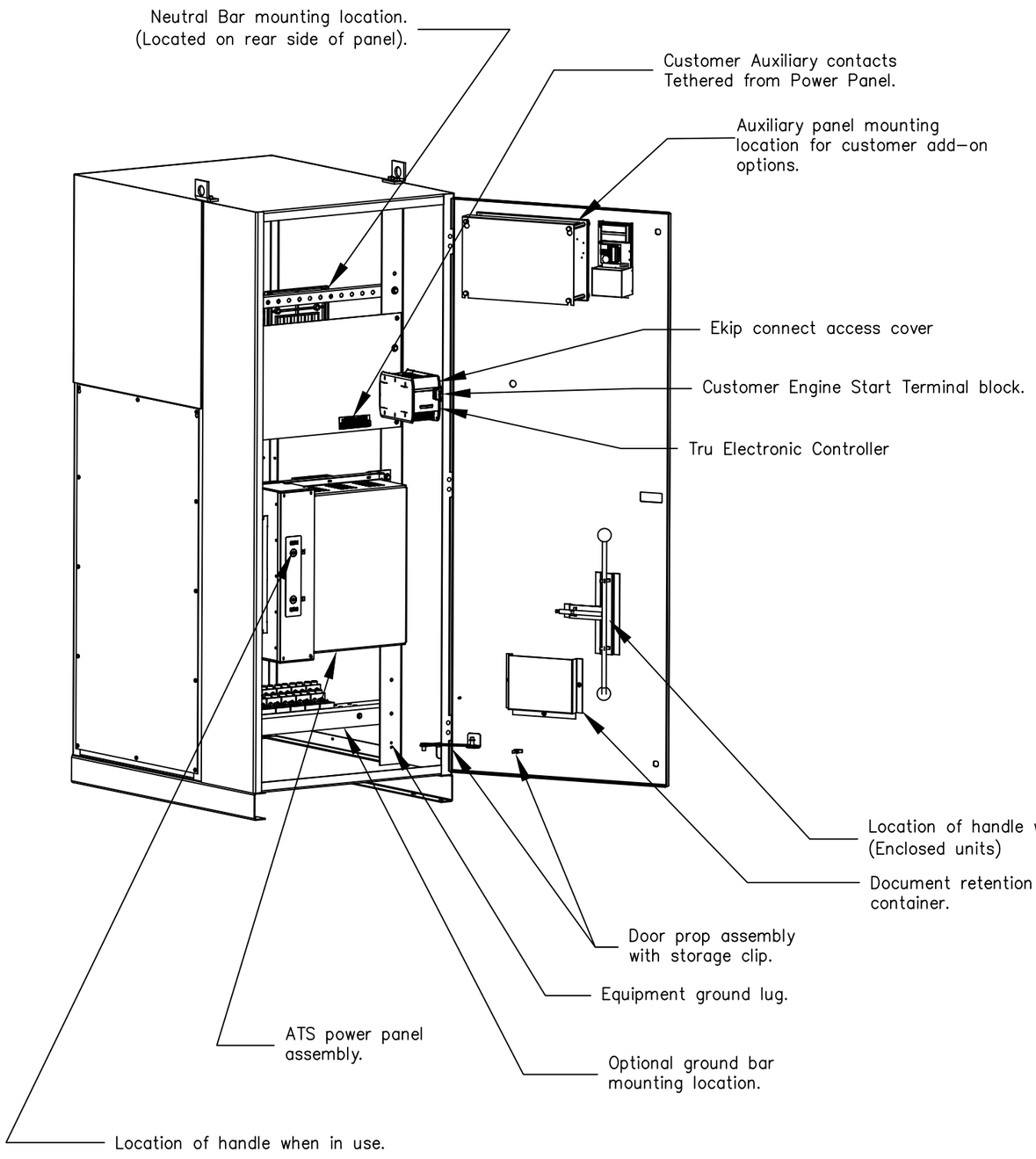
ABB

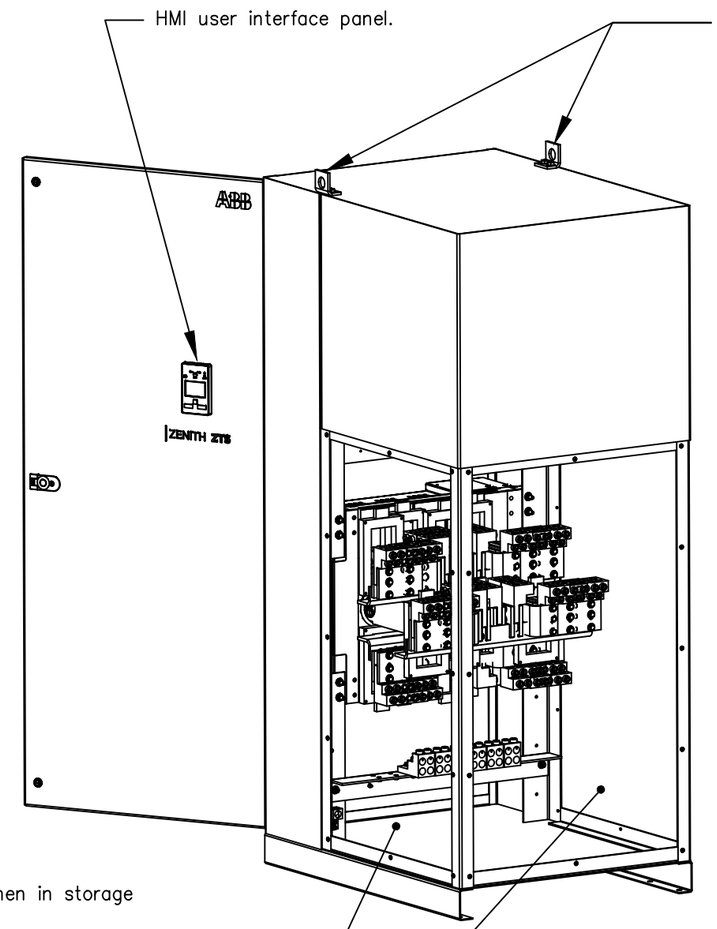
TITLE
Tru Control System
ABB Integrated Controller Design
FIRST MADE FOR: ABB for ZENITH

SIZE	CAGE CODE	DWG NO
D		77A-3000

SCALE: - SHEET 7 of 13

Article or Material Must Conform to REACH Procedure SI900000 Sec.14
Article or Material Must Conform to ROHS Procedure SI900000 Sec.13
Part Must Conform to SI900000 Sec.4 Toxicity Procedure
Geometric Dimensioning & Tolerancing as per ASME Y14.5-2009





FOR ADDITIONAL INFO REFER TO	SIGNATURES		DATE
APPLIED PRACTICES	MODEL	MAS	07/12/21
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DETAIL		
TOLERANCES ON:	CHECKED		
2 PL. DECIMALS ± .020	ENGRG	MAS	07/12/21
3 PL. DECIMALS ± .005	MFG		
ANGLES ± 1°	QUALITY		
FRACTIONS ± 1/64	ISSUED		
FINISH ✓	DRAWING FILE:		
	MODEL / ASSEMBLY FILE:		
AutoCad Generated	# CTQs	⊖ CRITICAL TO QUALITY CHARACTERISTIC	

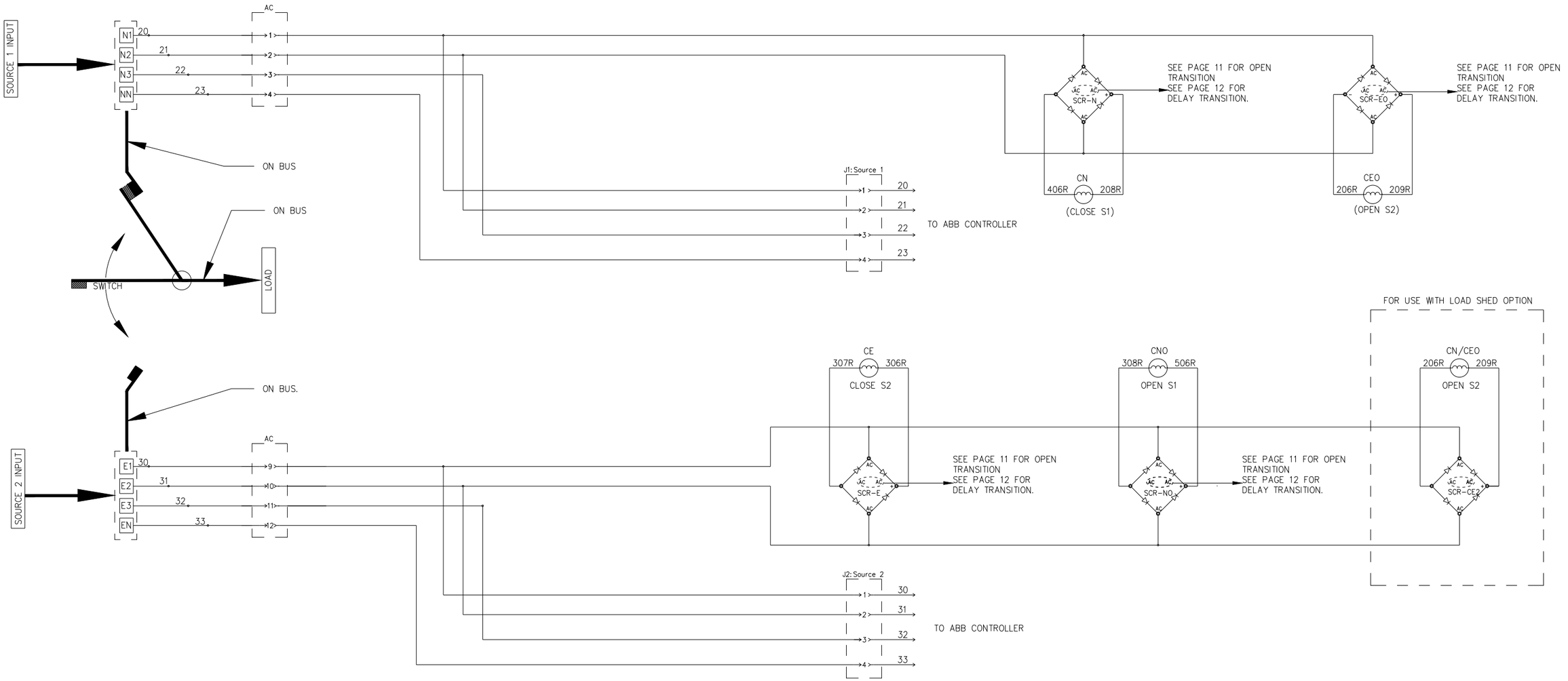
ABB

TITLE
Nema enclosed landscape
ABB Integrated Controller Design
FIRST MADE FOR: ABB for ZENITH

SIZE	CAGE CODE	DWG NO
D		77A-3000
SCALE: -		SHEET 8 of 13

THIRD ANGLE PROJECTION

Article or Material Must Conform to REACH Procedure SI900000 Sec.14
Article or Material Must Conform to ROHS Procedure SI900000 Sec.13
Part Must Conform to SI900000 Sec.4 Toxicity Procedure
Geometric Dimensioning & Tolerancing as per ASME Y14.5-2009



FOR ADDITIONAL INFO REFER TO	SIGNATURES	DATE
APPLIED PRACTICES	MODEL MAS	07/12/21
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DETAIL	
TOLERANCES ON:	CHECKED	
2 PL. DECIMALS ± .020	ENGRG MAS	07/12/21
3 PL. DECIMALS ± .005	MFG	
ANGLES ± 1°	QUALITY	
FRACTIONS ± 1/64	ISSUED	
FINISH ✓	DRAWING FILE:	
AutoCad Generated	MODEL / ASSEMBLY FILE:	
	# CTQs ⊖ CRITICAL TO QUALITY CHARACTERISTIC	

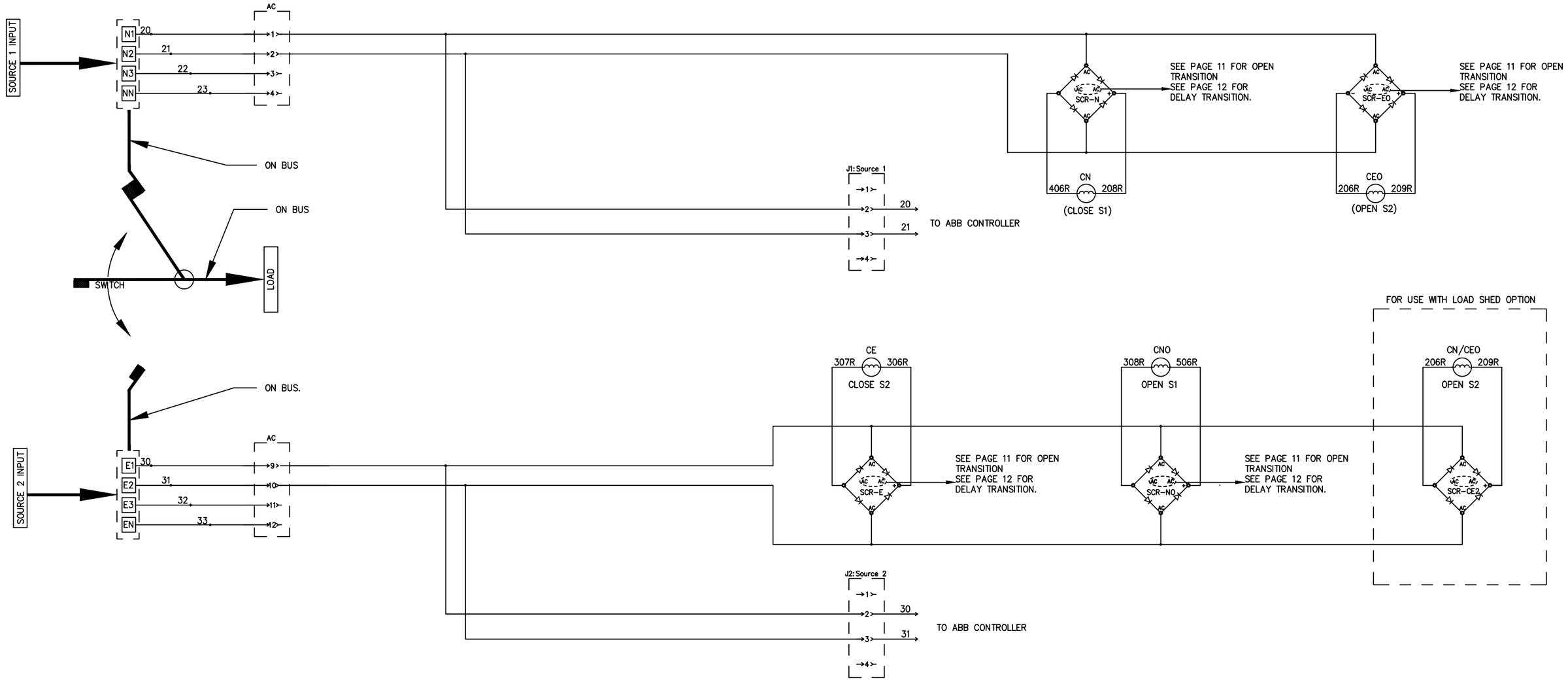
ABB

TITLE
3Ø ELECTRICAL DIAGRAM
ABB Integrated Controller Design

FIRST MADE FOR: ABB for ZENITH

SIZE	CAGE CODE	DWG NO
D		77A-3000
SCALE: -		SHEET 9 of 13

THIRD ANGLE PROJECTION



FOR ADDITIONAL INFO REFER TO	SIGNATURES	DATE
APPLIED PRACTICES	MODEL MAS	07/12/21
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DETAIL	
TOLERANCES ON:	CHECKED	
2 PL. DECIMALS ± .020	ENGRG MAS	07/12/21
3 PL. DECIMALS ± .005	MFG	
ANGLES ± 1°	QUALITY	
FRACTIONS ± 1/64	ISSUED	
FINISH ✓	DRAWING FILE:	
	MODEL / ASSEMBLY FILE:	
AutoCad Generated	# CTQs ⊖ CRITICAL TO QUALITY CHARACTERISTIC	

ABB

TITLE
1Ø ELECTRICAL DIAGRAM
ABB Integrated Controller Design

FIRST MADE FOR: ABB for ZENITH

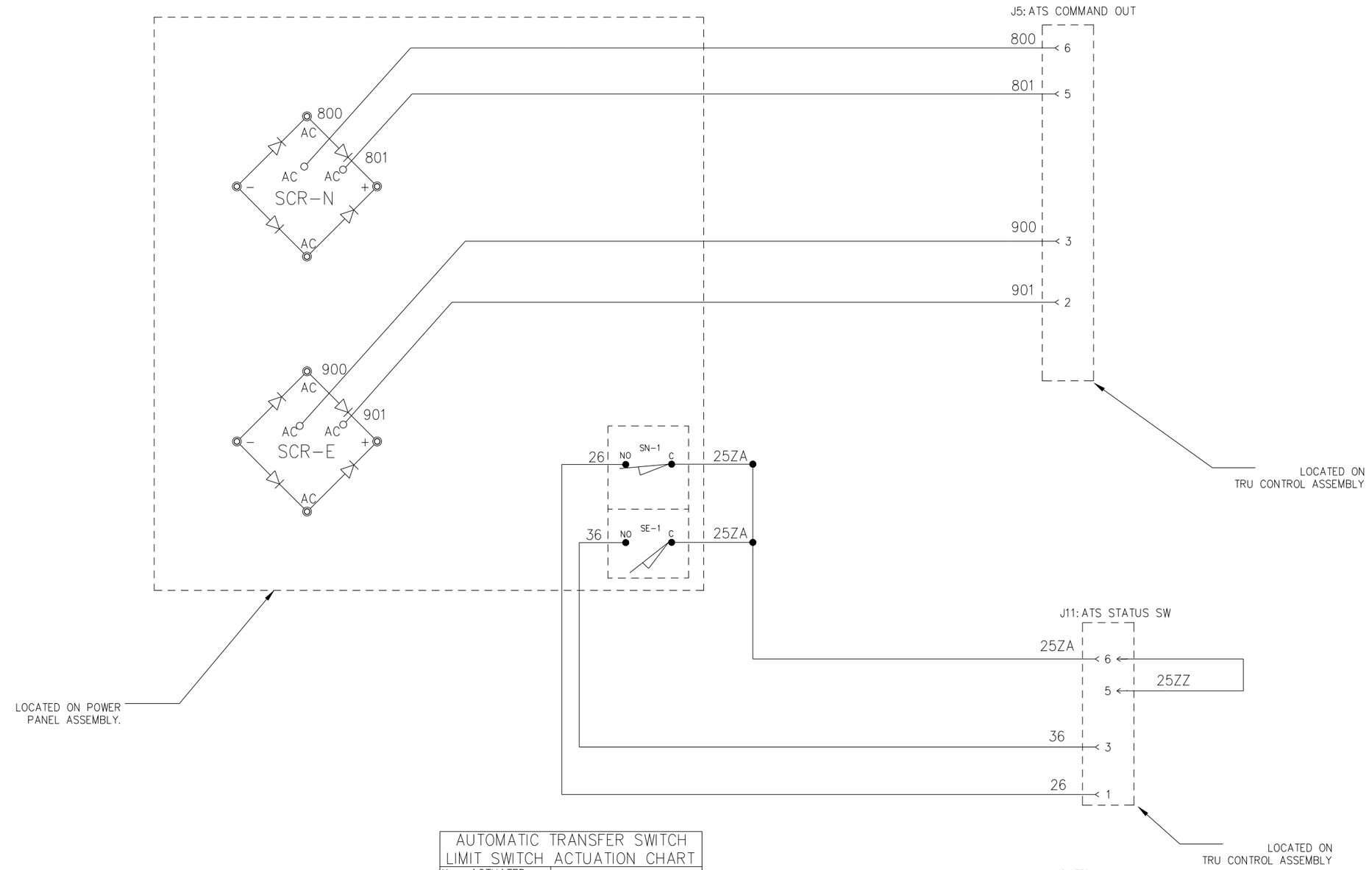
SIZE	CAGE CODE	DWG NO
D		77A-3000

SCALE: - SHEET 10 of 13

THIRD ANGLE PROJECTION

Article or Material Must Conform to REACH Procedure SI900000 Sec.14
Article or Material Must Conform to ROHS Procedure SI900000 Sec.13
Part Must Conform to SI900000 Sec.4 Toxicity Procedure
Geometric Dimensioning & Tolerancing as per ASME Y14.5-2009

OPEN TRANSITION POWER PANEL COMPONENT DIAGRAM



AUTOMATIC TRANSFER SWITCH LIMIT SWITCH ACTUATION CHART		
X = ACTUATED	ATS CONTACT LOCATION	
	SOURCE 1	SOURCE 2
SN–1	X	
SE–1		X

NOTES;

1) ATS SHOWN IN SOURCE 1 POSITION WITH NO POWER AVAILABLE

FOR ADDITIONAL INFO REFER TO	SIGNATURES	DATE
APPLIED PRACTICES	MODEL MAS	07/12/21
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DETAIL	
TOLERANCES ON:	CHECKED	
2 PL. DECIMALS ± .020	ENGRG MAS	07/12/21
3 PL. DECIMALS ± .005	MFG	
ANGLES ± 1°	QUALITY	
FRACTIONS ± 1/64	ISSUED	
FINISH ✓	DRAWING FILE:	
	MODEL / ASSEMBLY FILE:	
AutoCad Generated	# CTQs ⊖ CRITICAL TO QUALITY CHARACTERISTIC	

ABB

TITLE
Open Trans. System dia.
ABB Integrated Controller Design
FIRST MADE FOR: ABB for ZENITH

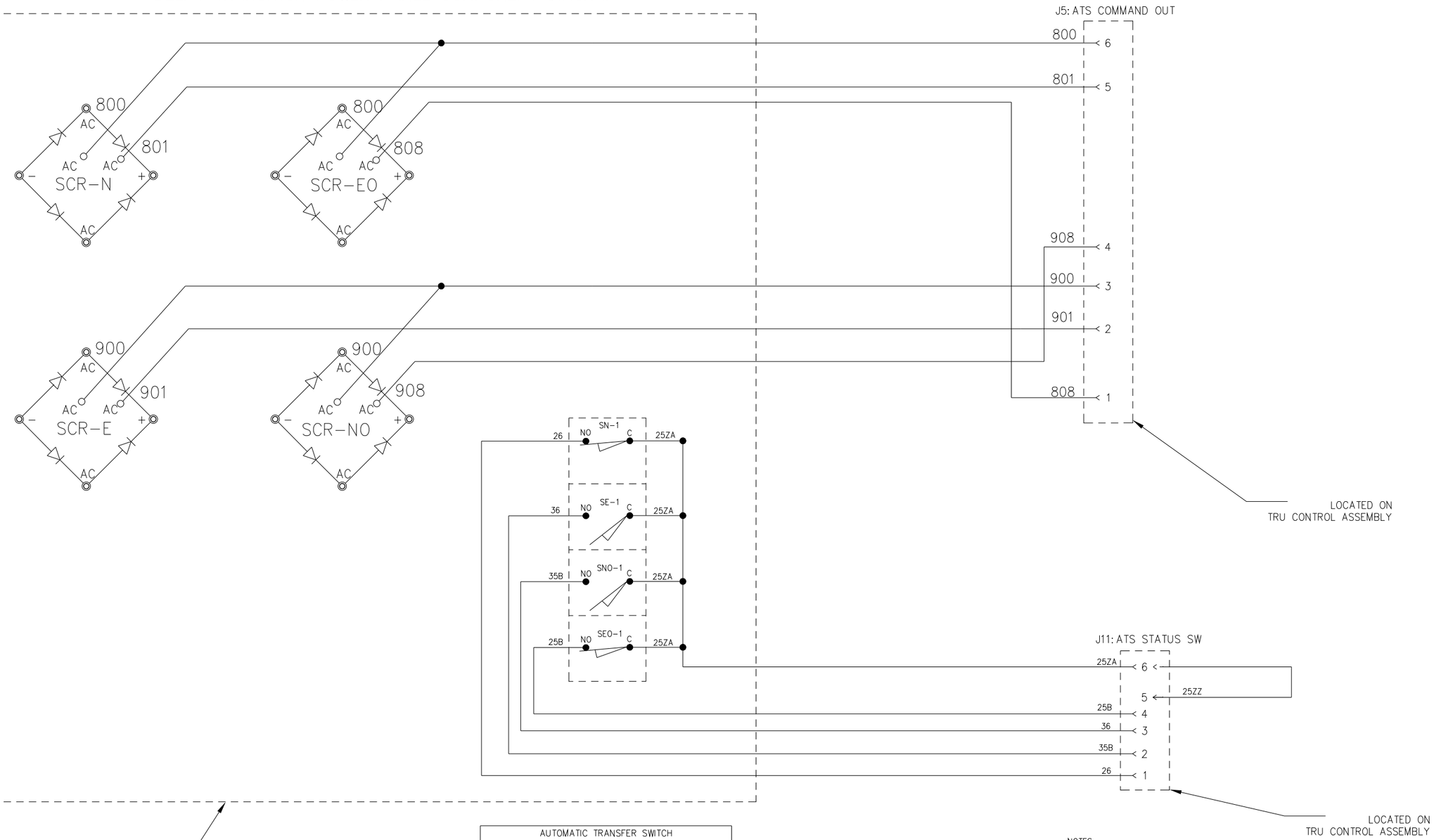
SIZE	CAGE CODE	DWG NO
D		77A-3000

SCALE: - SHEET 11 of 13

THIRD ANGLE PROJECTION

Article or Material Must Conform to REACH Procedure SI900000 Sec.14
Article or Material Must Conform to ROHS Procedure SI900000 Sec.13
Part Must Conform to SI900000 Sec.4 Toxicity Procedure
Geometric Dimensioning & Tolerancing as per ASME Y14.5-2009

DELAY TRANSITION POWER PANEL COMPONENT DIAGRAM



AUTOMATIC TRANSFER SWITCH LIMIT SWITCH ACTUATION CHART – Delay Trans.			
X = ACTUATED	ATS CONTACT LOCATION		
	SOURCE 1	OPEN	SOURCE 2
SN-1	X		
SNO-1		X	X
SEO-1	X	X	
SE-1			X

NOTES;

1) ATS SHOWN IN SOURCE 1 POSITION WITH NO POWER AVAILABLE

FOR ADDITIONAL INFO REFER TO	SIGNATURES	DATE
APPLIED PRACTICES		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DETAIL	
TOLERANCES ON:	CHECKED	
2 PL. DECIMALS ± .020	ENGRG MAS	07/12/21
3 PL. DECIMALS ± .005	MFG	
ANGLES ± 1°	QUALITY	
FRACTIONS ± 1/64	ISSUED	
FINISH ✓	DRAWING FILE:	
	MODEL / ASSEMBLY FILE:	
AutoCad Generated	# CTQs ⊖ CRITICAL TO QUALITY CHARACTERISTIC	

MODEL MAS 07/12/21

ABB

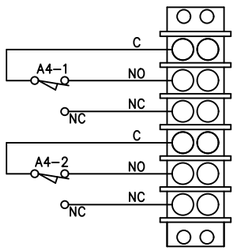
TITLE
Delay Trans. system diag.
ABB Integrated Controller Design
FIRST MADE FOR: ABB for ZENITH

SIZE	CAGE CODE	DWG NO
D		77A-3000

SCALE: - SHEET 12 of 13

THIRD ANGLE PROJECTION

TB1

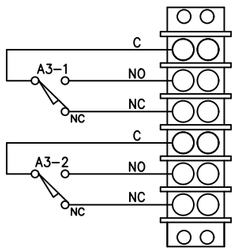


CUSTOMER AUXILIARY CONTACT CONNECTIONS SOURCE 1. (THIS ITEM IS LOCATED ON THE ATS PANEL)

AUTOMATIC TRANSFER SWITCH LIMIT SWITCH ACTUATION CHART			
X = ACTUATED	ATS CONTACT LOCATION		
	SOURCE 1	OPEN	SOURCE 2
A3–1,2		X	X
A4–1,2	X	X	

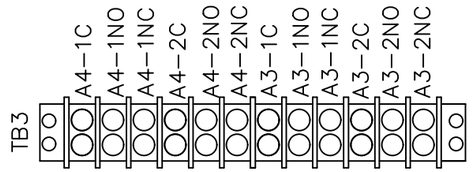
CONTACT RATINGS		
RELAY	CONTACT	RATING
P	E	5 AMP @ 240 VAC 5 AMP @ 30 VDC
AUXILIARY CONTACTS	A3, A4	15 AMP @ 125, 250 VAC

TB2



CUSTOMER AUXILIARY CONTACT CONNECTIONS SOURCE 2. (THIS ITEM IS LOCATED ON THE ATS PANEL)

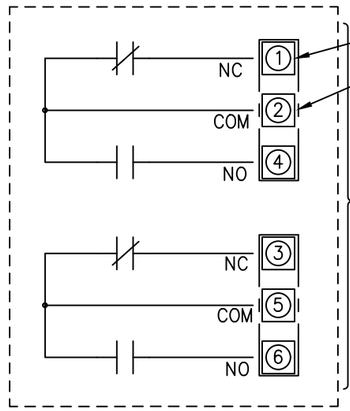
NOTE: DIAGRAMS SHOWN WITH ATS IN SOURCE 1 POSITION AND NO POWER AVAILABLE.



AUXILIARY CONTACT TERMINAL BLOCK. ATTACHED ON THE ENCLOSURE ASSEMBLY AND TETHERED FROM TB1 AND TB2 AUXILIARY BLOCKS LOCATED ON THE ATS PANEL. SEE PAGE 8 FOR TB3 INSTALLED LOCATION.

(SEE PAGE 7 FOR ENGINE START CONTACT LOCATION)

TYPICAL ENGINE CONNECTIONS.



CUSTOMER ENGINE START CONTACTS

NOTE: DIAGRAM SHOWN WITH ATS IN NORMAL POSITION AND NO POWER AVAILABLE.

NOTES

1. ATS SHOWN IN SOURCE–1 POSITION WITH NO POWER AVAILABLE.
2. UNLESS OTHERWISE SPECIFIED ALL CUSTOMER CONNECTION WIRES TO BE MINIMUM #14 AWG., 600V.

Ekip Connect Input / Output User Modules

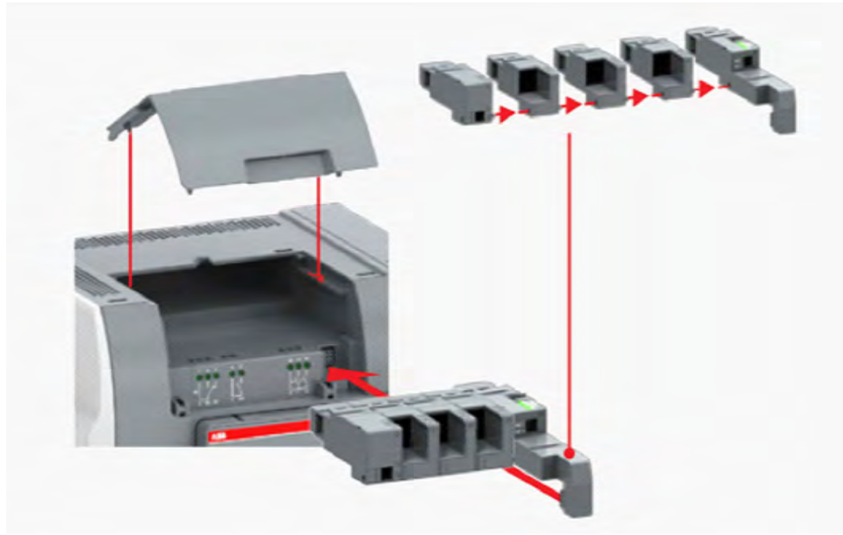


ABB TruControl Automatic Transfer Switch Equipment makes use of ABB Ekip Connect option modules. Please refer to the ABB TruControl Operation and Maintenance Guide for detailed part numbers, operation and settings description for each, and related software for ease of programming.

FOR ADDITIONAL INFO REFER TO	SIGNATURES	DATE
APPLIED PRACTICES	MODEL MAS	07/12/21
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DETAIL	
TOLERANCES ON:	CHECKED	
2 PL. DECIMALS ± .020	ENGRG MAS	07/12/21
3 PL. DECIMALS ± .005	MFG	
ANGLES ± 1°	QUALITY	
FRACTIONS ± 1/64	ISSUED	
FINISH ✓	DRAWING FILE:	
	MODEL / ASSEMBLY FILE:	
AutoCad Generated	# CTQs ⊖ CRITICAL TO QUALITY CHARACTERISTIC	

ABB

TITLE
Customer I/O connection diag.
ABB Integrated Controller Design
FIRST MADE FOR: ABB for ZENITH

SIZE	CAGE CODE	DWG NO
D		77A-3000
SCALE: -		SHEET 13 of 13

THIRD ANGLE PROJECTION

3.6 Using Level 4 (touch) control interface HMI

3.6.1 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.

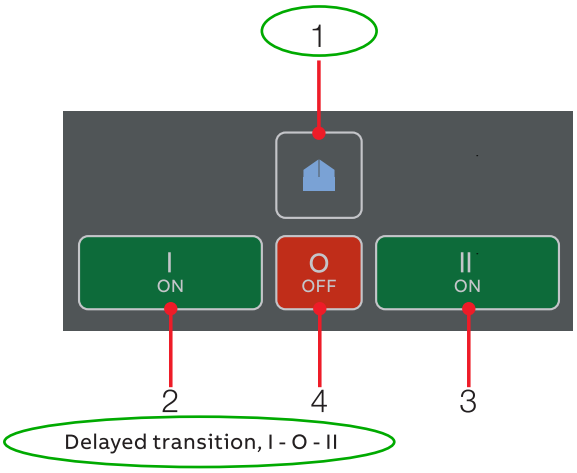
2 **I ON:** Operate switch to I position.

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).

3.6.2 Navigating in menu

See the menu tree in Chapter 4.



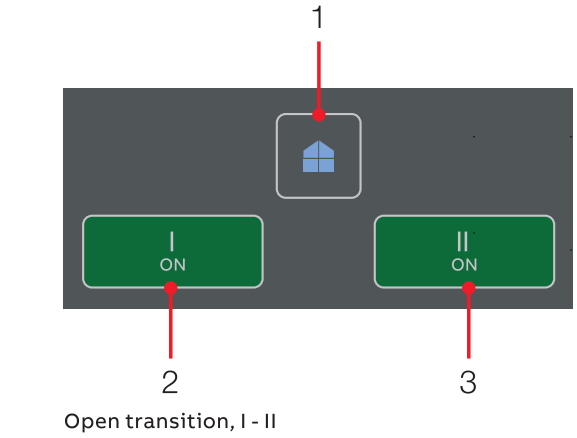


Fig. 3.8 Keypad in Level 4 HMI with touch screen

4.2 Using main menu and setting parameters

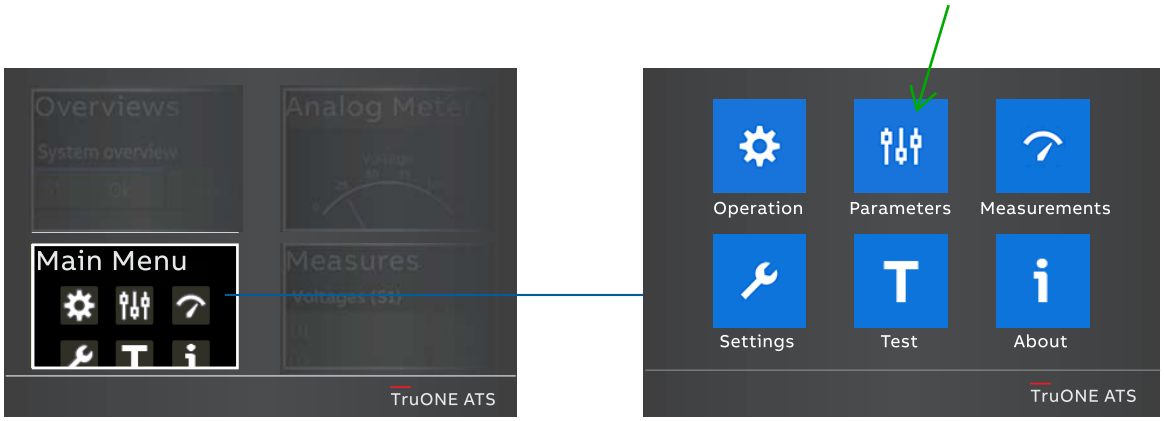
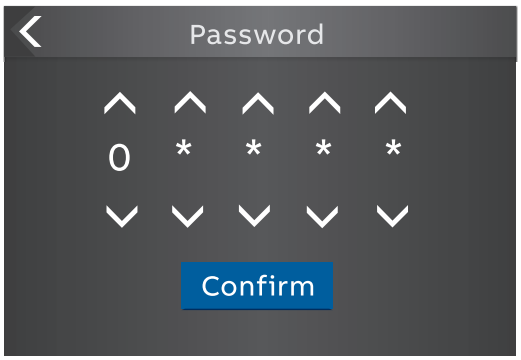


Fig. 4.6
By touching on Start Menu lower left corner -image you can move to the Main Menu page of Operation, Parameters, Measurements, Settings, Test and About, see the table below for the selections.

Information
When you have changed the parameter, go always back in the menu and confirm the change always when asked.

Information
The default values are marked in the menu tree by *-marking.

Password



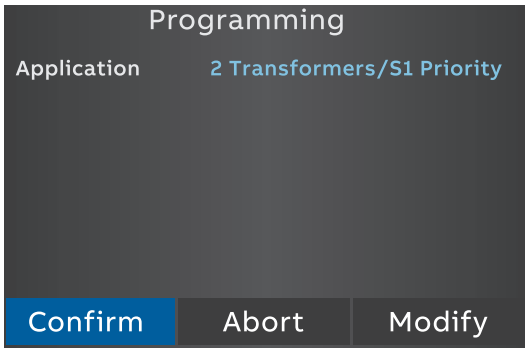


Fig. 4.7
Enter the password when asked, choose the right number by arrowheads and confirm, go forward entering number after number.

The default password is 00001, enter the password when prompted (see Fig. 4.1).

Parameters (continued)			***Default**
Device Parameters			
In-phase Monitor			
	Enable	Off*	
		On	
	Synchronization Window	±1...10 % (±1* %)	A phase angle difference limits to restrict live to live source transfers unless both sources are within this certain window of electrical degrees.
Time Delays			
	Override S1 Failure	0...60 s (2* s)	S1 priority: How long the device is waiting S1 recovery before starting transfer sequence to S2. S2 priority: How long the device is keeping the load on failed S1 although S2 is already available.
	Transfer from S1 to S2	0...60 min (2* s)	S1 priority: How long the device is keeping the load on failed S1 after S2 becomes available. S2 priority: How long the device waits before transfer sequence back to available S2 begins. This delay is bypassed by 'Override S1 Failure' in case of S1 failure.
	Pre-transfer signal 1 / 2 / 3 / 4		
	Pre-transfer S1 to S2 Post-transfer S1 to S2 Pre-transfer S2 to S1 Post-transfer S2 to S1	0*...300 s	Enabled only when any digital outputs is configured as 'Pre-transfer Signal'. Pre-transfer: How long the device is keeping pre-transfer signal activated before transferring from S1 to S2 or S2 to S1. Post-transfer: How long the device is keeping pre-transfer signal activated after transferring from S1 to S2 or S2 to S1.
	Center-Off	0*...300 s	Only delayed transition I-O-II type. How long the switch is stopped at position O while transferring from S1 to S2 or from S2 to S1 and the original source is not completely down. Center-OFF delay is bypassed in case all phases are missing from the original source which we are leaving.

Continued on the next page

Parameters (continued)			***Def** t
Device Parameters (contuned)			
Time Delays (continued)			
	Override S2 Failure	0...60 s (2* s)	S1 priority: How long the device is keeping t e load on failed S2 although S1 is already available. S2 priority: How long the device is waiting S recovery before starting transfer sequence to S1.
	Transfer from S2 to S1	0...120 min (2* s)	S1 priority: How long the device waits before transfer sequence back to available S1 begins. This delay is overridden by 'Override S2 Failure' in case of S2 failure. S2 priority: How long the device is keeping the load on failed S2 although S1 is already available.
	Elevator Pre-transfer signal	1 / 2 / 3 / 4	
	Elevator Pre-signal S1-S2 Elevator Post-signal S1-S2 Elevator Pre-signal S2-S1 Elevator Post-signal S2-S1	0*...60 s	Enabled only when any digital output is configured as 'Elevator pre-signal'. Pre-transfer: How long the device is keeping pre-signal activated before transferring from S1 to S2 or from S2 to S1. Post-transfer: How long the device is keeping pre-signal activated after transferring from S1 to S2 or from S2 to S1.
	Generator Stop	0...60 min (5* min)	Enabled only when generator is in use. Generator cooling time, how long the device is keeping the generator running without load after returning to priority source.
	Load Shed	0*...60 s	Enabled only when any digital output is configured as 'Load Shed'. How long before the transfer from priority to non-priority source the device activates load shed signal.

Continued on the next page

Parameters (continued)			***Default**	
Device Parameters (continued)				
Voltage & Frequency Setpoints			Defines the voltage and frequency limits for source being acceptable. Source has an anomaly when measured voltage/frequency goes out of range drop-out lower/drop-out Upper. Source becomes acceptable when measured voltage/ frequency goes back in range pick-up lower/ pick-up higher.	
	S1 Setpoints			
		S1 Drop-out Voltage	Upper Threshold	102...120 % Un (115* % Un)
			Lower Threshold	70...98 % Un (85* % Un)
		S1 Pick-up Voltage	Upper Threshold	101...119 % Un (114* % Un)
			Lower Threshold	71...99 % Un (86* % Un)
		S1 Drop-out Frequency	Upper Threshold	101...120 % fn (115* % fn)
			Lower Threshold	80...99 % fn (85* % fn)
		S1 Pick-up Frequency	Upper Threshold	100.5...119.5 % fn (114* % fn)
			Lower Threshold	80.5...99.5 % fn (86* % fn)
	S2 Setpoints			
		S2 Drop-out Voltage	Upper Threshold	102...120 % Un (115* % Un)
			Lower Threshold	70...98 % Un (85* % Un)
		S2 Pick-up Voltage	Upper Threshold	101...119 % Un (114* % Un)
			Lower Threshold	71...99 % Un (86* % Un)
		S2 Drop-out Frequency	Upper Threshold	101...120 % fn (115* % fn)
			Lower Threshold	80...99 % fn (85* % fn)
		S2 Pick-up Frequency	Upper Threshold	100.5...119.5 % fn (114* % fn)
			Lower Threshold	80.5...99.5 % fn (86* % fn)

Continued on the next page

Parameters (contunued)			***Default**
Device Parameters (continued)			
Generator Exercisers			Switch and generator functioning can be tested automatically and also periodically by using four independent exerciser events. Test on load function starts the generator and transfers the load to it. Test off load function only starts the generator for the duration of the event. Overlapping events are prioritized, event 1 has the highest priority.
	Exerciser 1 / 2 / 3 / 4		
		Status	Disabled*
			Non-periodic
			Daily
			Weekly
			Bi-weekly
			Monthly
			Yearly
		Function	No Function*
			Test on Load
			Test off load
		Duration (hh:mm:ss)	00:00:00...24:00:59 (00:01:00*)
		Time (hh:mm)	Starting time of the event. 00:00*...23:59
		Date (month day, year)	Starting date of the event Jan 01, 2020... (---*)
	Application		
	S1-Transformer/S2-Generator*		
	S2-Transformer/S1-Generator		
	2 Transformers/S1 Priority		
	2 Transformers/S2 Priority		
	2 Transformers/No Priority		
	Commit Transfer		
	Off*		If priority source fails, device cancels the transfer sequence to non-priority source (generator) if priority source returns before non-priority source becomes acceptable.
	On		If priority source fails, device countinues transfer sequence to non-priority source (generator) even if priority returns before non-priority souce becomes acceptable. Retransfer sequence according to time delays.

Continued on the next page

Parameters (continued)			***Default**
Device Parameters (continued)			
	High current alarm		
		Status	
			Enabled	If measured current is higher than ten times the nominal value device will prevent all operations and show high current alarm on-screen. After high current status is over, device will start operating normally.
			Disabled*	
		Alarm reset required	
			Yes	User confirmation is required before re-entering normal operation after high current status.
			No*	Normal operation is started automatically after high current status.
	Transfer to Dead Source		
			On*	User can transfer to an unavailable source by using HMI keys I/II or by a remote command.
			Off	Transfer to an unavailable source is disabled.
	Source Loss Center-Off Delay		
			On*	User can select whether to always run the 'center-off' timer or skip it if there is no voltage on any of the phases on the source from where the ATS is transferring from.
			Off	
	Source Loss Pre-Signal Delay		
			On*	User can select whether to always run the pre-signal delays 'elevator pre-signal S1-S2', 'elevator pre-signal S2-S1', 'pre-transfer S1 to S2', 'pre-transfer S2 to S1' timers or skip these if there is no voltage on any of the phases on the source from where the ATS is transferring from.
			Off	