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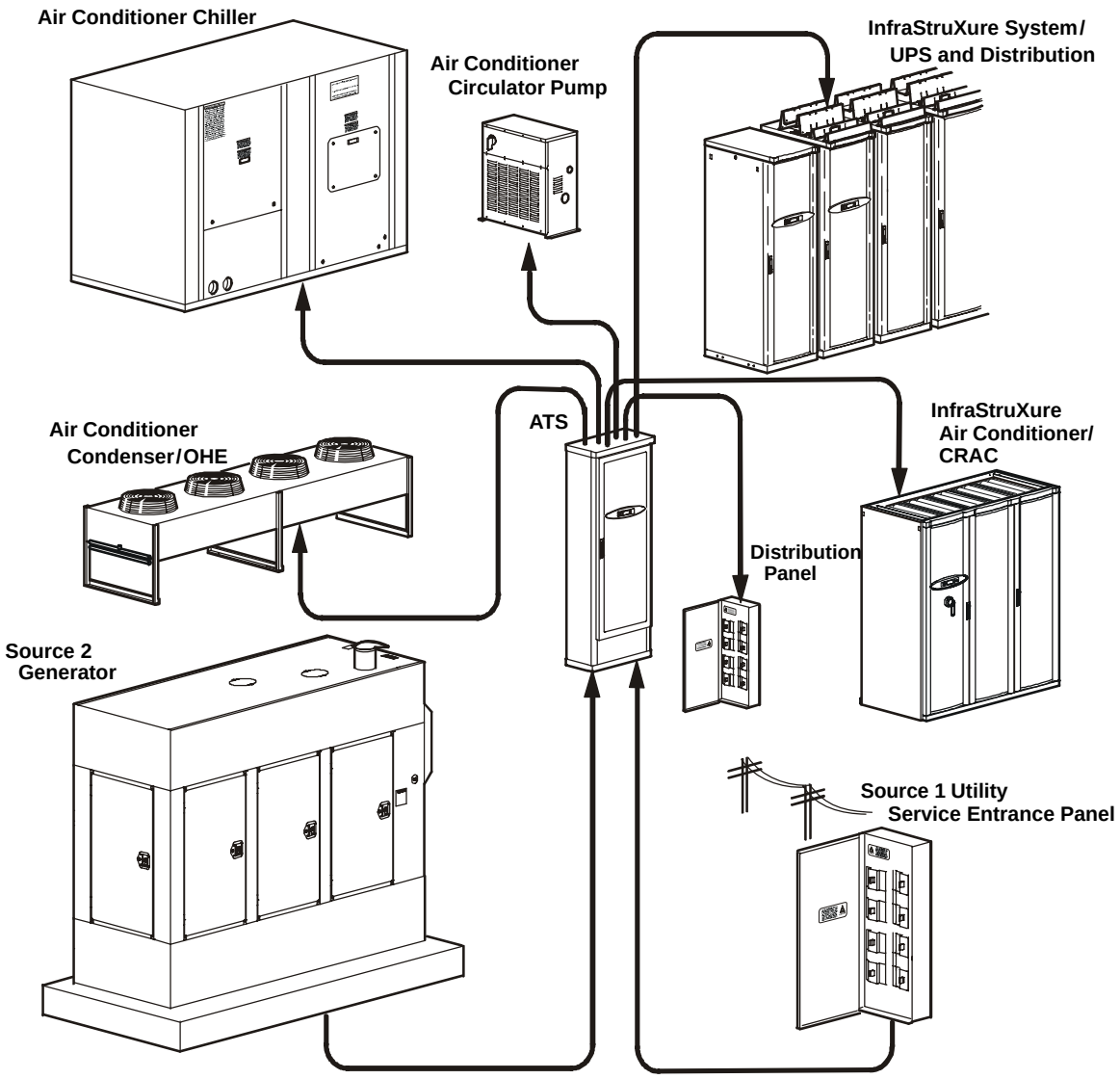
InfraStruXure™ Power Generation System

Overview

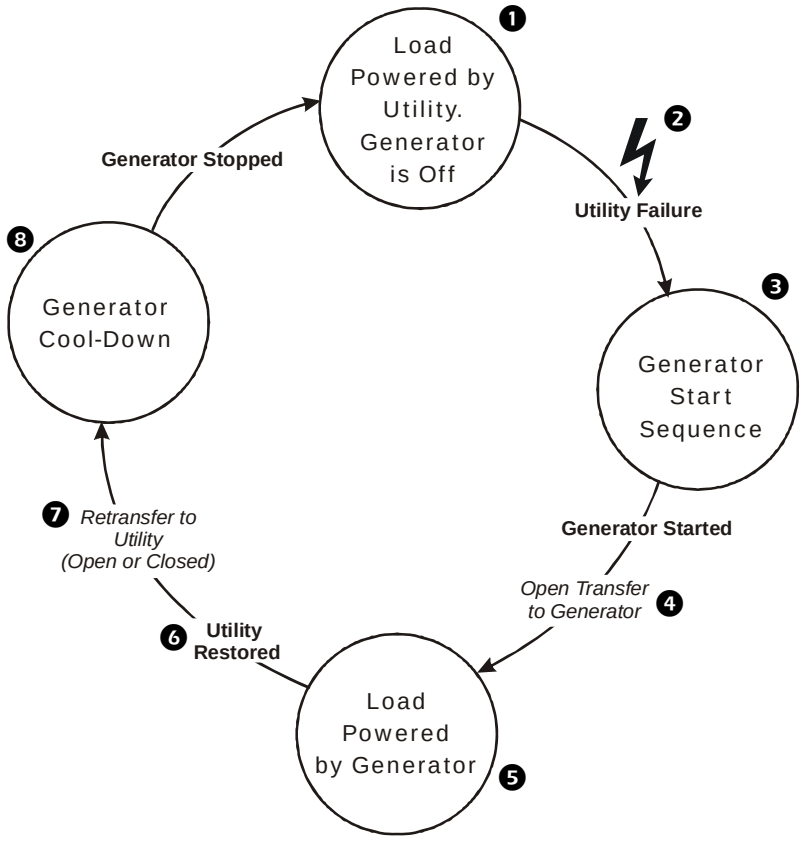
The InfraStruXure™ Power Generation System consists of a diesel-powered generator and a Smart Distribution Panel with Automatic Transfer Switch (ATS). The ATS is connected to both the utility (Source 1) and the generator (Source 2), with the utility as the preferred source. The ATS can alternatively be connected to a second utility. The ATS is designed for installation on the data center floor, which places power distribution closer to your data center equipment. Labels provide a quick visual indication of which ATS sub-feed breaker is supplying power to each piece of equipment. The diagram below provides examples of data center equipment that can be connected to the ATS.



How the InfraStruXure Power Generation System Operates

Operation of the ATS during a utility failure when automatic operation is enabled

Your data center equipment is typically powered by the utility [Source 1] (❶), while the generator [Source 2] remains off. When the level of incoming utility power falls below a specified threshold (❷), the ATS signals the generator to start (❸). After the generator starts and attains the necessary power to support the load, the ATS performs an open transfer to the generator (❹).

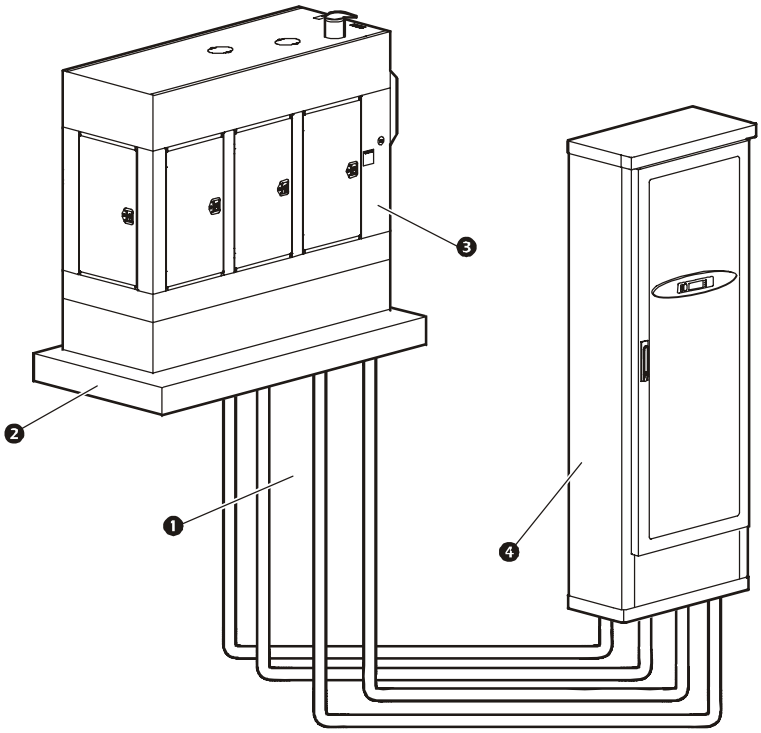


The generator then continues to support your data center equipment (❺) until an acceptable flow of utility power is restored (❻). The utility power must remain stable for a specified length of time (**Line Stable** setting) and the generator must run for at least the duration of its minimum run-time (**Min on Gen** setting) before the load will be retransferred to the utility (❼). The retransfer to the utility can be either open or closed. Following retransfer, the generator cools down (❽) and eventually stops.

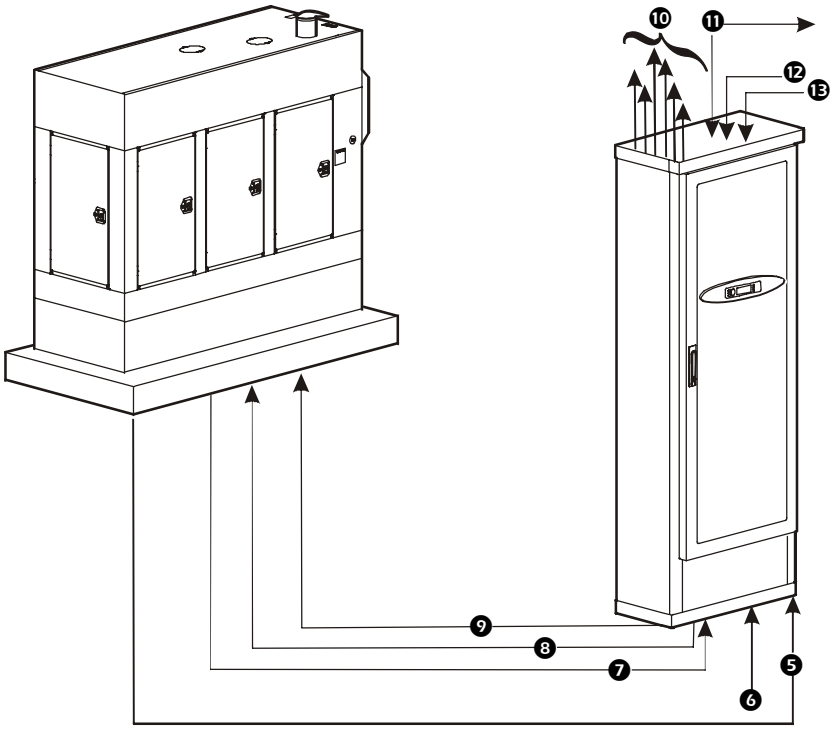
Installation Overview

❶ Run conduit from the generator to the ATS.
❷ Pour the generator pad.
❸ Install the generator.
❹ Install the ATS.
❺ Connect power from the generator to the ATS.
❻ Connect utility inputs to the ATS.
❼ Connect DC input, start, and emergency stop contacts from the generator to the ATS.
❽ Connect communication cable from the ATS to the generator.
❾ Connect AC inputs for the heater and the battery charger from the ATS to the generator.
❿ Connect branch distribution equipment to the ATS panel board.
⓫ Connect the EPO switch to the user interface board.
⓬ Connect user contacts and relay outputs to the user interface board.
⓭ Connect to the network at the surge-protected ethernet port.

Piping



Wiring



Power and Communication Connections

AC Power Input to ATS from Generator

Voltage (L-L)	**208 V**	**480 V**
Output power of generator	80 kW	125 kW
Size of generator output circuit breaker	250 A	200 A
Connection type	4W + G	3W + G or 4W + G
Recommended wire size if 30°C†	4/0 AWG	3/0 AWG
Recommended wire size if 40°C†	300 kcmil	3/0 AWG
Recommended equipment grounding conductor (EGC) size†	4 AWG	6 AWG

AC Power Input to ATS from Utility

Voltage (L-L)	**208 V**	**480 V**
Size of upstream utility circuit breaker	250 A	200 A
Connection type	4W + G	3W + G or 4W + G
Recommended wire size if 30°C†	4/0 AWG	3/0 AWG
Recommended wire size if 40°C†	300 kcmil	3/0 AWG
Recommended equipment grounding conductor (EGC) size†	4 AWG	6 AWG

12 VDC to ATS from Generator

Recommended wire size†	Two 12 AWG stranded copper
Voltage	12 VDC
Connection point	Hard-wire to generator controller terminal block

Communication Connection from Generator to ATS

Recommended wire size†	Belden® 9830 cable or equivalent (24 AWG; 3 twisted, shielded pairs; 100 ohms nominal impedance; 60 pF/ft nominal capacity)
Connection point	RS485/RS232 converter on ATS to identical converter on generator (requires installation)

AC Power from ATS to Generator Heater and Battery Charger

Recommended wire size†	Two 12 AWG stranded copper
Voltage	120 VAC
Connection style	Hard-wire from transformer in ATS to double duplex NEMA 5-20 outlet box on generator

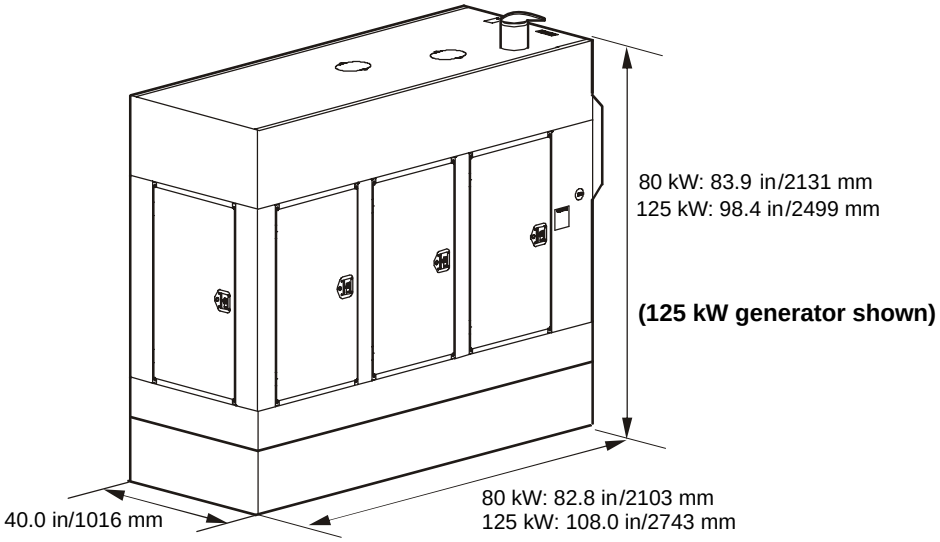
Start Signal Connection to Generator from ATS	
Recommended wire size†	Two 12–28 AWG stranded copper
Connection point	Hard-wire to generator controller terminal block
Emergency Stop Signal Connection to Generator from ATS	
Recommended wire size†	Two 12–28 AWG stranded copper
Connection point	Hard-wire to generator controller terminal block
ATS Branch Distribution to Equipment††	
Circuit breaker style	MCCB ABB Tmax T1 or T3 up to 225 A
ATS Ethernet Connection	
Connection type	CAT-5 network cable connected to the surge-protected ethernet port on the ATS user connection plate
ATS EPO Connection	
Connection type	Voltage-free contact (NO or NC) or 24 VDC on the ATS user interface board
ATS User Input Contacts/Relay Outputs	
Connection type	Voltage-free contact (NO or NC) on the ATS user interface board

† Always follow the National Electrical Code (NFPA 75) or the Canadian Electrical Code (CSA C22.1-02) and local codes when installing the InfraStruXure Power Generation System. The AC Power Input wire sizes provided in this document are recommendations only. The ATS is provided with a panel board to supply power to multiple loads. Since loading could increase after the product's initial installation, the AC Power Input wires were selected for the maximum current that can be delivered by the panel board. If the ATS is purchased to supply a calculated load rated less than the panel board, and the load will never increase, smaller wires can be used if the requirements specified in the NEC, the CEC, and local codes are followed.

†† Wire sizes to loads shall be in accordance with the ratings of the circuit breakers selected to power the loads.

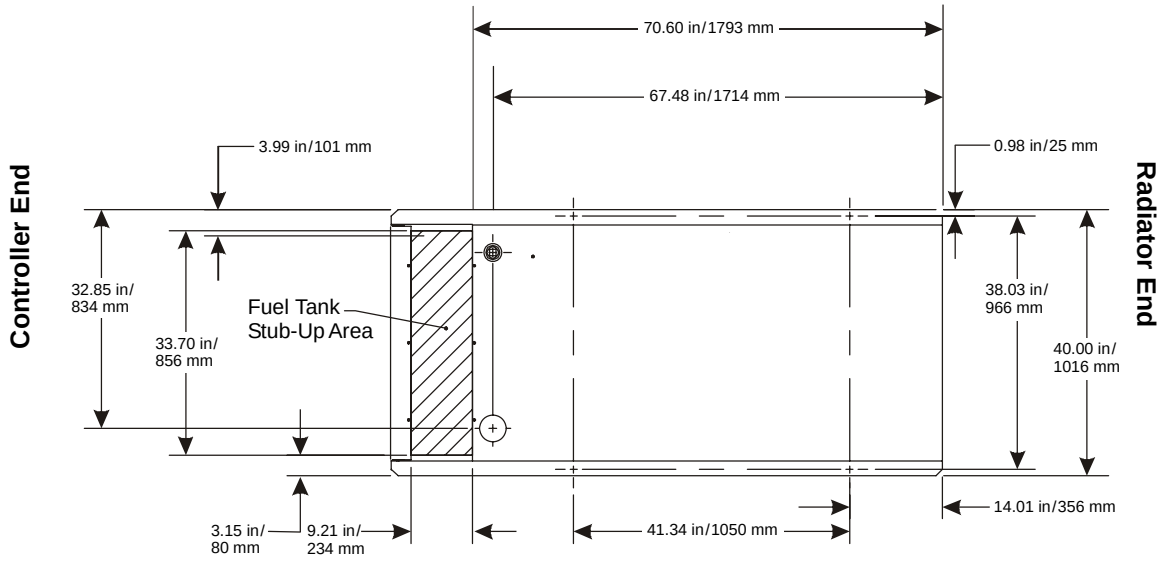
Physical Data

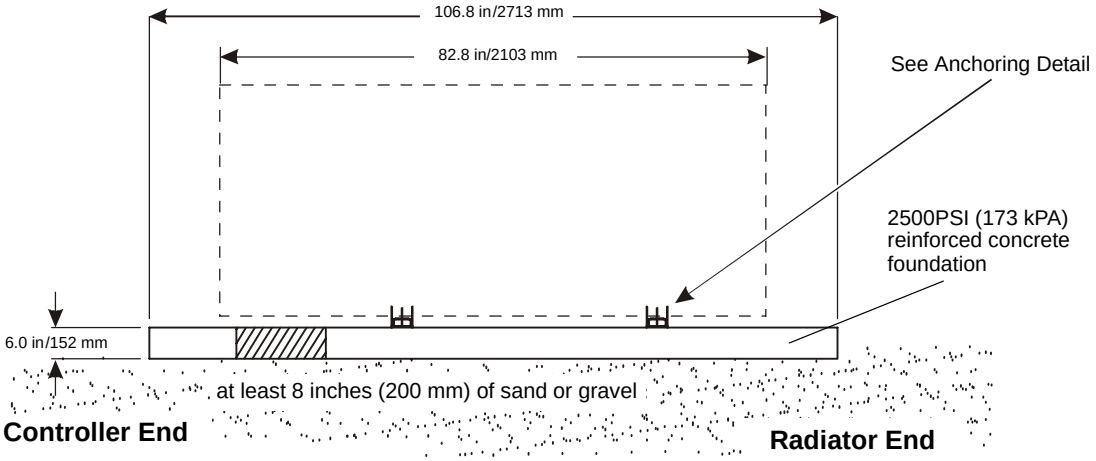
Generator

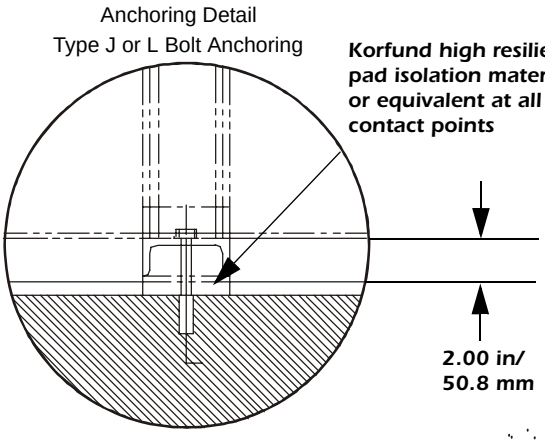


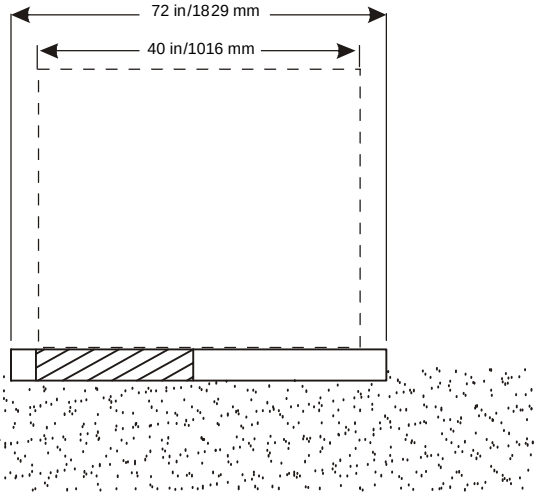
	80 kW	125 kW
Height	83.9 in/2131 mm	98.4 in/2499 mm
Width	40.0 in/1016 mm	40.0 in/1016 mm
Length	82.8 in/2103 mm	108.0 in/2743 mm
Weight	3294 lb/1494 kg	5109 lb/2317 kg
Operating Temperature Range	–30 to 40°C	–30 to 40°C
Operating Relative Humidity	5 to 100%	5 to 100%
Operating Elevation	12,800 ft/3900 m	12,800 ft/3900 m
Tank Type	Double-wall, steel base	Double-wall, steel base
Fuel Type	Diesel	Diesel
Tank Size	70 gal/265 L	173 gal/655 L
NEC Access Clearances	• Three feet to an insulated surface • Three feet to grounded parts, including concrete walls, if 208/120 V • Three and 1/2 feet to grounded parts, including concrete walls, if 480/277 V • Three feet to other live parts, if 208/120 V • Four feet to other live parts, if 480/277 V	

80 kW generator pad



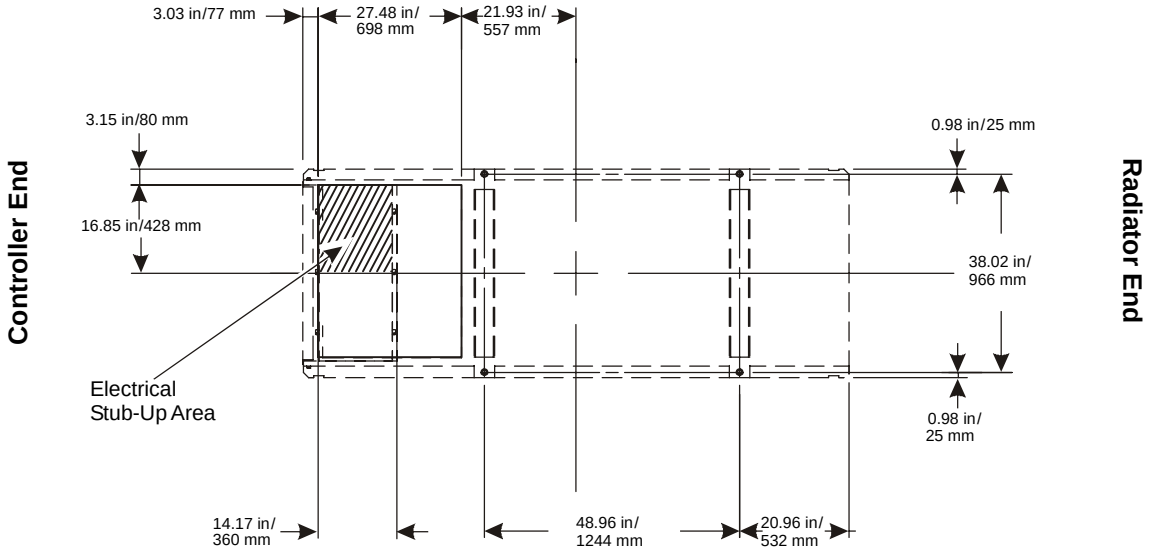


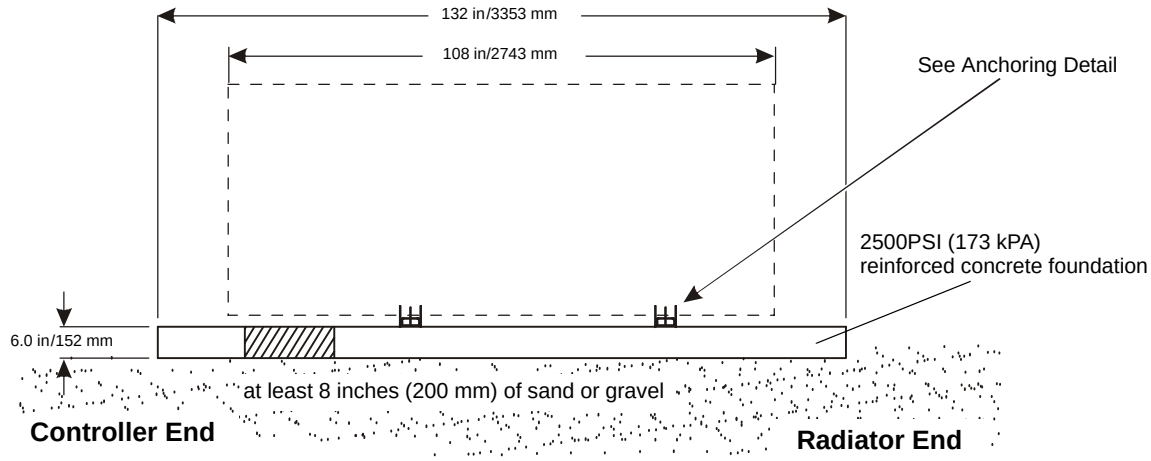




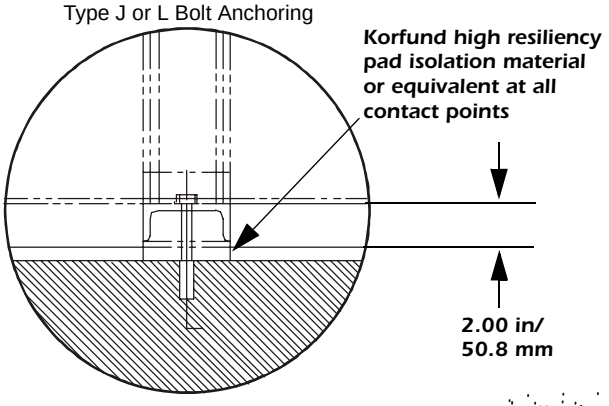
The above drawing is only a representation. The actual bolt length shall be determined by the mechanical contractor.

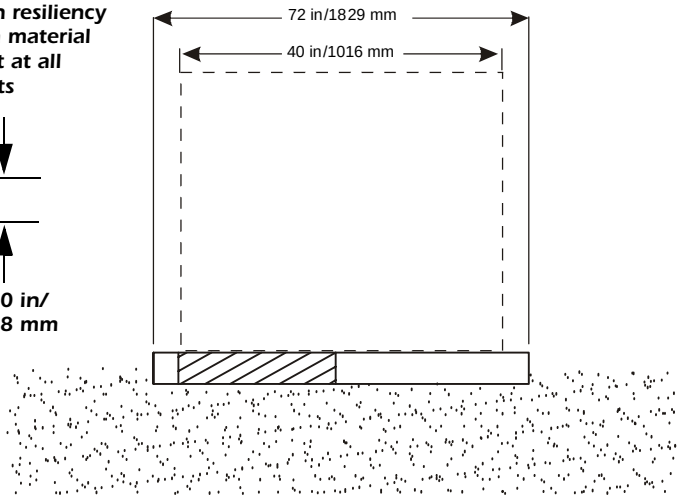
125 kW generator pad





Anchoring Detail
Type J or L Bolt Anchoring





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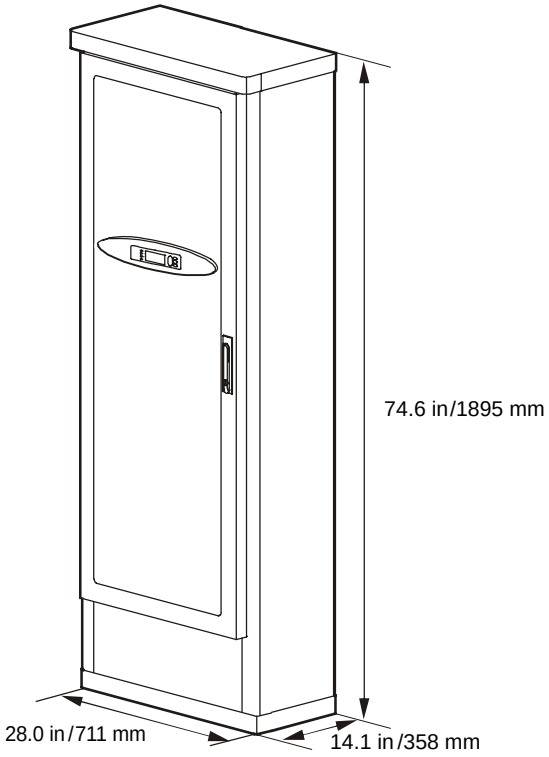
Smart Distribution Panel with ATS



Height	74.6 in/1895 mm
Width	28.0 in/711 mm
Depth	14.1 in/358 mm
Weight (lb/kg)	482 lb/218 kg
Operating Temperature Range	23 to 104°F (-5 to 40°C)
Operating Relative Humidity	5 to 95%, non-condensing
Operating Elevation	0 to 6562 ft/0 to 2000 m
NEC Access Clearances	• Three feet to an insulated surface • Three feet to grounded parts, including concrete walls, if 208/120 V • Three and 1/2 feet to grounded parts, including concrete walls, if 480/277 V • Three feet to other live parts, if 208/120 V • Four feet to other live parts, if 480/277 V


CERTIFIED
InfraStruXure
by APC