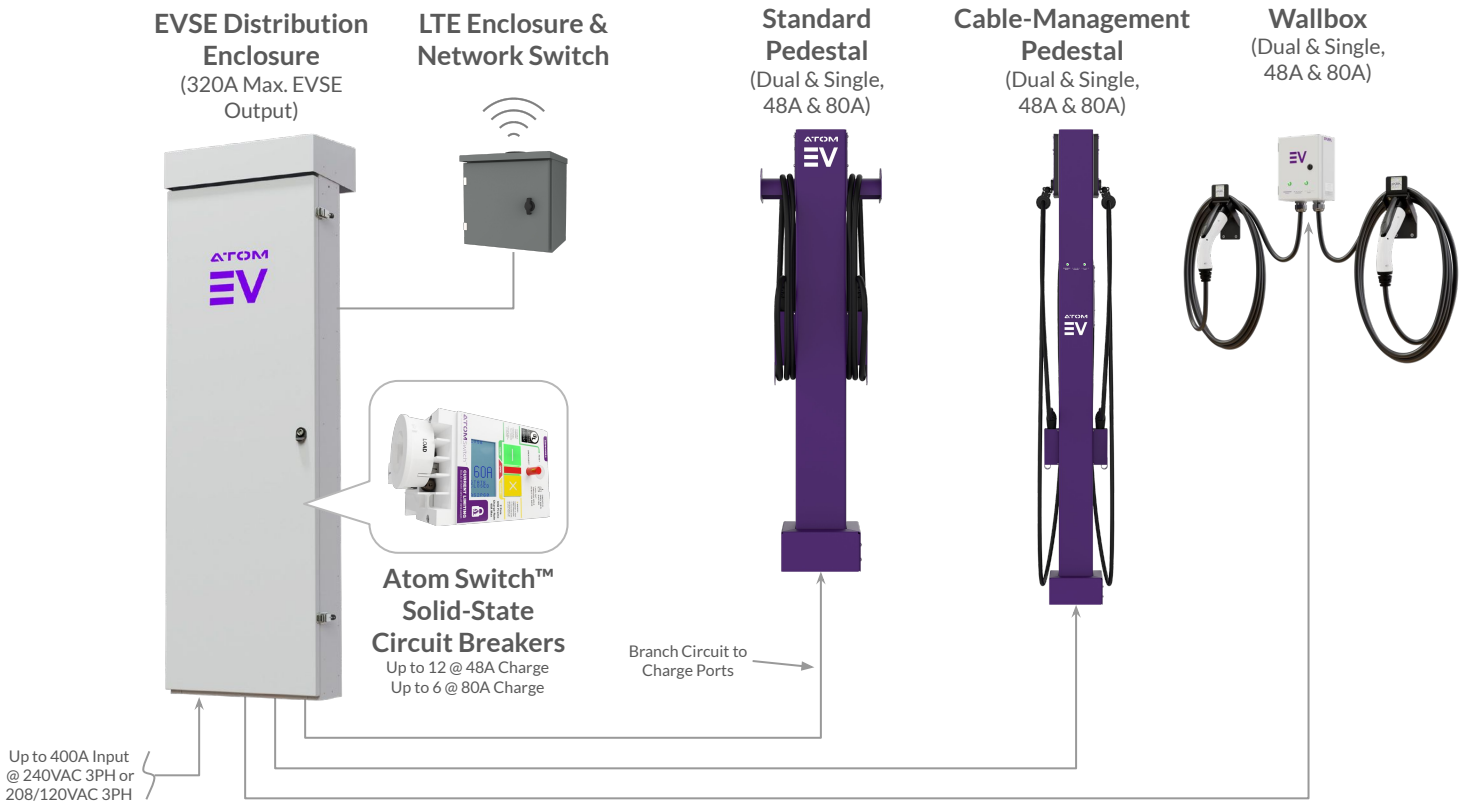
ATOM EV E50 CHARGING SYSTEM
Product Datasheet

DISTRIBUTED LEVEL 2 EV CHARGING INFRASTRUCTURE

The Atom EV E50 Charging System is built for high-power, high-density, high-reliability customers. Using a distributed architecture, the EVSE Distribution Enclosure provides the charging functions while pedestals and wallboxes are simple devices with wire termination blocks. This enables simplified energy management (EMS), network connectivity, and reliability across your critical infrastructure.



POWER

High density output at 133KW per EVSE Enclosure.

240V delta input capable for full 11.5KW or 19.2KW charging per port.

No power at pedestals when not in operation.

High SCCR at 200kA.

INTEGRATION

Integrated on-premise Energy Management System (EMS).

As little as a single LTE connection per site with LTE Enclosure.

On-premise OCPP 1.6J

RELIABILITY

Solid-State Circuit Breaker (SSCB) charging, tested to >1,000,000 fully loaded cycles.

Fewer network connections.

Pedestals and wallboxes built like a brick.

Designed and Manufactured in North Carolina, USA.

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ORDERING CHART

48A Charge Rate	Dual Port			Single Port		
	Standard Pedestal	Cable Management Pedestal	Wallbox	Standard Pedestal	Cable Management Pedestal	Wallbox
Catalog #	AEV-48PED-D	AEV-48CMPED-D	AEV-48WB-D	AEV-48PED-L/R	AEV-48CMPED-L/R	AEV-48WB-S
Quantity						
18' Cable Length	☐	☐	☐	☐	☐	☐
25' Cable Length	☐	☐	☐	☐	☐	☐

80A Charge Rate	Dual Port			Single Port		
	Standard Pedestal	Cable Management Pedestal	Wallbox	Standard Pedestal	Cable Management Pedestal	Wallbox
Catalog #	AEV-80PED-D	AEV-80CMPED-D	AEV-80WB-D	AEV-80PED-L/R	AEV-80CMPED-L/R	AEV-80WB-S
Quantity						
18' Cable Length	☐	☐	☐	☐	☐	☐
25' Cable Length	☐	☐	☐	☐	☐	☐

Peripheral Equipment (fill out if you know, otherwise Atom Power can determine)	EVSE Distribution Enclosure				Network Connection			
	48A Charge Rate		80A Charge Rate		LTE Enclosure w/ Modem*		LTE Enclosure without Modem	
Catalog #	AP3P400-EVSE	AP3P400-EVSE-L	AP3P400-EVSE	AP3P400-EVSE-L	AP-LTE-SW1 (7 ports)	AP-LTE-SW2 (14 ports)	AP-LTEX-SW1 (7 ports)	AP-LTEX-SW2 (14 ports)
Quantity								

Options	*Atom Insight Plus* Software	3-Phase Energy Meter (150-600A)	3-Phase Energy Meter (400-2,000A)
Catalog #	AP-Atom_Plus_LX	AP-MTR1-4X-SOC	AP-MTR2-4X-SOC
Quantity			

*Modem purchase requires three (3) year term for cellular connectivity, independent of software utilization.

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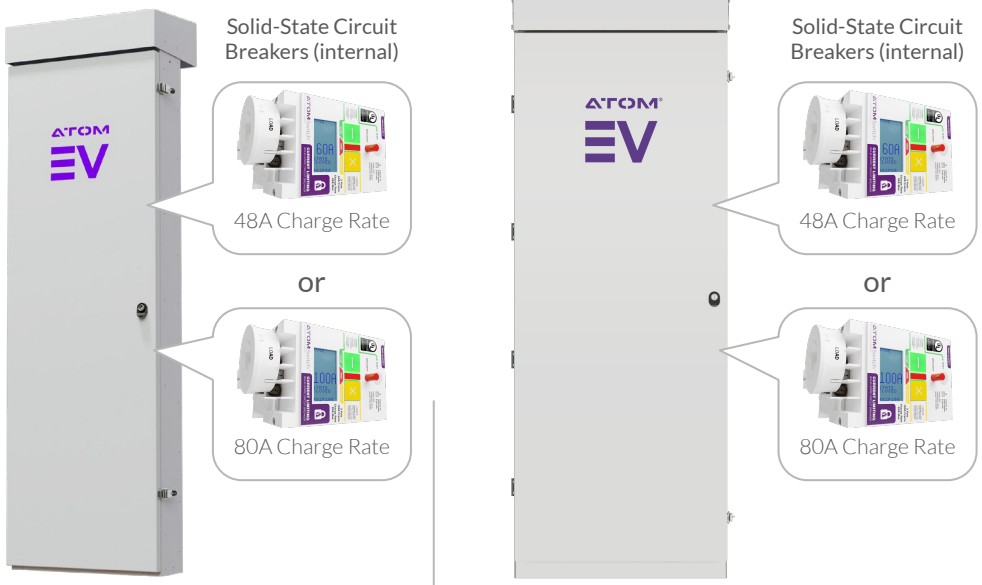

EVSE Distribution Enclosure

Core Technical Specifications

Product Catalog Number	AP3P400-EVSE		AP3P400-EVSE-L	
Charge Rate per Port	48A	80A	48A	80A
Max Power Output per Port	11.52KW @ 240VAC	19.2KW @ 240VAC	11.52KW @ 240VAC	19.2KW @ 240VAC
Max # of Ports per Enclosure (max # of internal Atom Switches)	12	6	12	6
Max EVSE Current Output as a System[2] (for NEC 625.41 calculations)	320A			
MOCP[2] Supply (by others)	400A			
Input Voltage	208VAC 3PH/3W or 240VAC 3PH/3W			
Input Frequency	60Hz			
Input Lugs	#6AWG – #300KCMIL CU/AL (2 per phase)			
Output Wiring to charge port (power)	#10-1 AWG CU (L-L) **+** #10-6 AWG CU (G) 90°C Rated			
Output Wiring to charge port (signal)	see E50 Charging System Design Guide (this document) for configuration and maximum run distances			
Dimensions	20"W x 13"D x 68"H		25"W x 13"D x 68"H	
Enclosure Rating	NEMA 3R			
Weight (lbs) - Fully Loaded	281	245	329	293
Field Conduit Entry	Bottom, Sides			
SCCR	200kA			
Load Output Peak Let-Through (current-limiting)	<1.5kA			
Ambient Operating Temp.[1]	-30°C to +50°C (-22°F to +122°F)			
Humidity	0-95%, non-condensing			
Storage Temperature	-40°C to +85°C (-40°F to +185°F)			
Base Standards	UL 2594, UL 2231-1/2, NEC Article 625, Energy Star, OCPP 1.6j			
Internal Referenced Standards	UL 489/489i, UL 67			
EMC Compliance	FCC Part 15 Class A			
Ground Fault Protection	20mA CCID with auto-retry			
Connectivity	Ethernet			
Metering Accuracy (load side)	Voltage +/-3V, Current +/-1A			

1 - Operating temperature is -30°C to +40°C without derating. Temperature derating applies above +40°C.
2 - See *Energy Management System (EMS) Software* page for EMS implementation and relationship to maximum current output and MOCP device.

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Pedestals

Core Technical Specifications

Product Catalog Number	AEV-48PED-D (dual port) AEV-48PED-L/R (single port)	AEV-80PED-D (dual port) AEV-80PED-L/R (single port)	AEV-48CMPED-D (dual port) AEV-48CMPED-L/R (single port)	AEV-80CMPED-D (dual port) AEV-80CMPED-L/R (single port)
Cable Rating	48A	80A	48A	80A
Max Power Output	11.52KW @ 240VAC	19.2KW @ 240VAC	11.52KW @ 240VAC	19.2KW @ 240VAC
Input Voltage	208VAC or 240VAC	208VAC or 240VAC	208VAC or 240VAC	208VAC or 240VAC
Connector Type	SAE J1772 Type 1	SAE J1772 Type 1	SAE J1772 Type 1	SAE J1772 Type 1
Charge Port Cable Length	18' or 25'	18' or 25'	18' or 25'	18' or 25'
Cable Management	Manual		Automatic Self-retracting Dampered Spring Motor	
Dimensions	6"x52" (with 9" square base)		6"x84" (with 9" square base)	
Enclosure Rating	NEMA 3R			
Weight (lbs.) w/ 25' cordset	82 (Dual), 67 (Single)	84 (Dual), 68 (Single)	117 (Dual), 96 (Single)	119 (Dual), 97 (Single)
Ambient Operating Temp.[1]	-30°C to +50°C (-22°F to +122°F)			
Standards	UL 2594, UL 2251, NEC Article 625, ADA Compliant			
Field Wiring (power)	#10-1 AWG CU (L-L) + #10-6 AWG CU (G) 90°C Rated			
Field Wiring (signal)	see E50 Charging System Design Guide (this document) for configuration and maximum run distances			

Wall Boxes

Core Technical Specifications

Product Catalog Number	AEV-48WB-D (dual port) AEV-48WB-S (single port)	AEV-80WB-D (dual port) AEV-80WB-S (single port)
Cable Rating	48A	80A
Max Power Output	11.52KW @ 240VAC	19.2KW @ 240VAC
Input Voltage	208VAC or 240VAC	208VAC or 240VAC
Connector Type	SAE J1772 Type 1	SAE J1772 Type 1
Charge Port Cable Length	18' or 25'	18' or 25'
Cable Management	Manual	
Dimensions	6"W x 4"D x 8"H	
Enclosure Rating	NEMA 3R	
Weight (lbs.) w/ 25' cordset	32.7 (Dual), 18.6 (Single)	34.7 (Dual), 19.6 (Single)
Ambient Operating Temp.[1]	-30°C to +50°C (-22°F to +122°F)	
Standards	UL 2594, UL 2251, NEC Article 625	
Field Wiring (power)	#10-1 AWG CU (L-L) + #10-6 AWG CU (G) 90°C Rated	
Field Wiring (signal)	see E50 Charging System Design Guide (this document) for configuration and maximum run distances	

1 - Operating temperature is -30°C to +40°C without derating. Temperature derating applies above +40°C.

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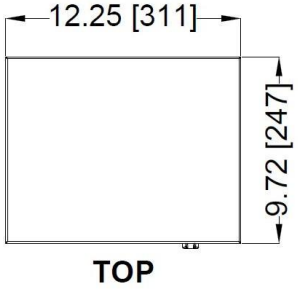
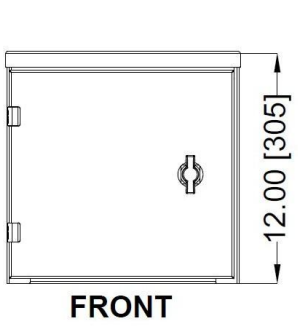
LTE Enclosure
Core Technical Specifications

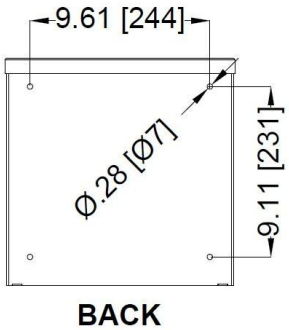
Product Catalog Number	AP-LTE-SW1	AP-LTE-SW2	AP-LTEX-SW1	AP-LTEX-SW2
Customer Ethernet Ports (usable)	7	13	7	13
Network Switch(es)	Trendnet TI-E80 V2 Industrial Ethernet Switch (unmanaged)			
LTE Modem	Digi IX 10 Dual SIM Industrial Cellular Router		None	
Services Carrier	Multi-carrier. Carrier determined at commissioning		N/A	
Input Voltage	24VDC (from EVSE Distribution Enclosure)			
Communication Connections	RJ45 CAT 5/6			
Dimensions	12.25"W x 9.75"D x 12"H			
Enclosure Rating	NEMA 3R			
Weight (lbs.)	21	22.1	20	21.1
Field Conduit Entry	Bottom, Sides			
Ambient Operating Temp.[1]	-30°C to +50°C (-22°F to +122°F)			
Humidity	0-95%, non-condensing			
Storage Temperature	-40°C to +85°C (-40°F to +185°F)			
Standards (LTE Modem)	IEC 62368-1, CB, EN6 2311, CE; RED; FCC Part 15, Subpart B; ICES-003; AU/NZS CISPR32			

PRODUCT DIMENSIONS

LTE Enclosure - AP-LTE-SW* and AP-LTEX-SW*







Dimensions shown in inches [mm]

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Energy Management System (EMS) Software

Atom Power's Energy Management System (EMS) is an integrated and internal software algorithm that adjusts the rate of charge based on certain conditions and site limitations. These conditions/limitations could be upstream feeder limit of a single EVSE Distribution Enclosure or multiple Enclosures, or the limits could be on the site as a whole. The Atom EMS configuration is setup at the time of site commissioning, is custom to the installation site, and is stored within the internal Gateway of each EVSE Distribution Enclosure. That is, the control system for the EMS is on-premise and not dependent on cloud connectivity for operation. The setup of the EMS profile(s) is limited to the commissioning personnel of Atom Power and therefore is limited to qualified personnel only, in compliance with 2023 National Electrical Code (NEC) Article 750.30(C)(3)(5). Further compliance with 2023 NEC requirements around EMS is as follows:

- 625.42(A) - The EMS shall be permitted to be integral to one piece of equipment or integral to a listed system consisting of more than one piece of equipment.
- 625.42(B) - EVSE with restricted access to an ampere adjusting means complying with 750.30(C) shall be permitted.
- 750.30(C) - An energy management system shall not cause a branch circuit, feeder, or service to be overloaded.
    - (1) - A single value equal to the maximum ampere setpoint of the EMS shall be permitted for one or more of the following:
        - (1) - For calculating the connected load per 220.70
        - (2) - For maximum source current permitted by EMS control
    - (2) - The EMS shall use monitoring and controls to automatically cease current flow upon malfunction of the EMS.
    - (3) - Adjustable settings shall be permitted if access to the settings is accomplished by at least one of the following:
        - (5) - Software that has password protected access to the adjusting means accessible to qualified personnel only.
- 220.70 - If an energy management system (EMS) is used to limit the current to a feeder or service in accordance with 750.30, a single value equal to the maximum ampere setpoint of the EMS shall be permitted to be used in load calculations for the feeder or service. The setpoint value of the EMS shall be considered a continuous load for the purposes of load calculations.

The Atom EMS has four (4) profiles available for setup:

1. **Profile 0 - Panel Limit Fixed** - limits the total EVSE output (in amps) of an individual EVSE Distribution Enclosure (see table below) based on the upstream breaker feeding the EVSE Distribution Enclosure. There will always be a Profile 0 setting on the EVSE Distribution Enclosure, even if other profiles are used.
2. **Profile 1 - Charge Port Limit Fixed** - Limits the output of the individual charge ports to a predefined fixed value (e.g. 24A, 32A, 40A, etc)
3. **Profile 2 - Balanced Power Fixed** - Limits the output of a group (more than 1) of EVSE Distribution Enclosures, typically fed from the same upstream feeder or distribution panel. See example diagram, next page.
4. **Profile 3 - Balanced Power Dynamic** - Limits the output of a single or group of EVSE Distribution Enclosures based on real-time feedback loop from energy meter connected to the limited equipment. This configuration requires optional 3-Phase Energy Meter(s) (see Ordering Chart) with ethernet connection between the meter and Atom LTE Enclosure network switch. See example diagram, next page.

Profile 0 - Panel Limit Fixed

Upstream 3-Phase Breaker/Fuse Size Feeding Atom EVSE Distribution Enclosure	Total EVSE Output* will be Set by Atom Power and Limited to:	EVSE Power (KW) @ 208V	EVSE Power (KW) @ 240V
400A	**320A**	115.2	133.0
350A	**280A**	100.8	116.4
300A	**240A**	86.4	99.7
250A	**200A**	72.0	83.1
225A	**180A**	64.8	74.8
200A	**160A**	57.6	66.5
175A	**140A**	50.7	58.2
150A	**120A**	43.2	49.9
125A	**100A**	36.0	41.6
110A	**88A**	31.7	36.6
100A	**80A**	28.8	33.2

**Safety Critical Limit*

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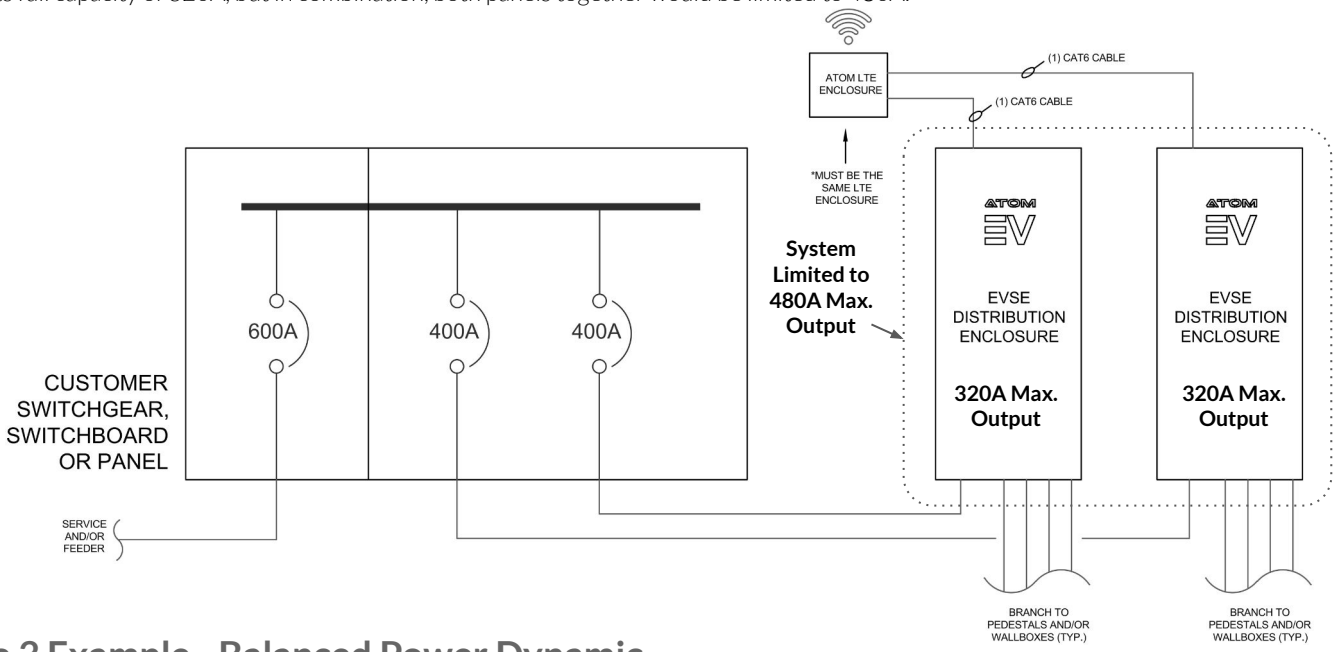
Energy Management System (EMS) Software (cont.)

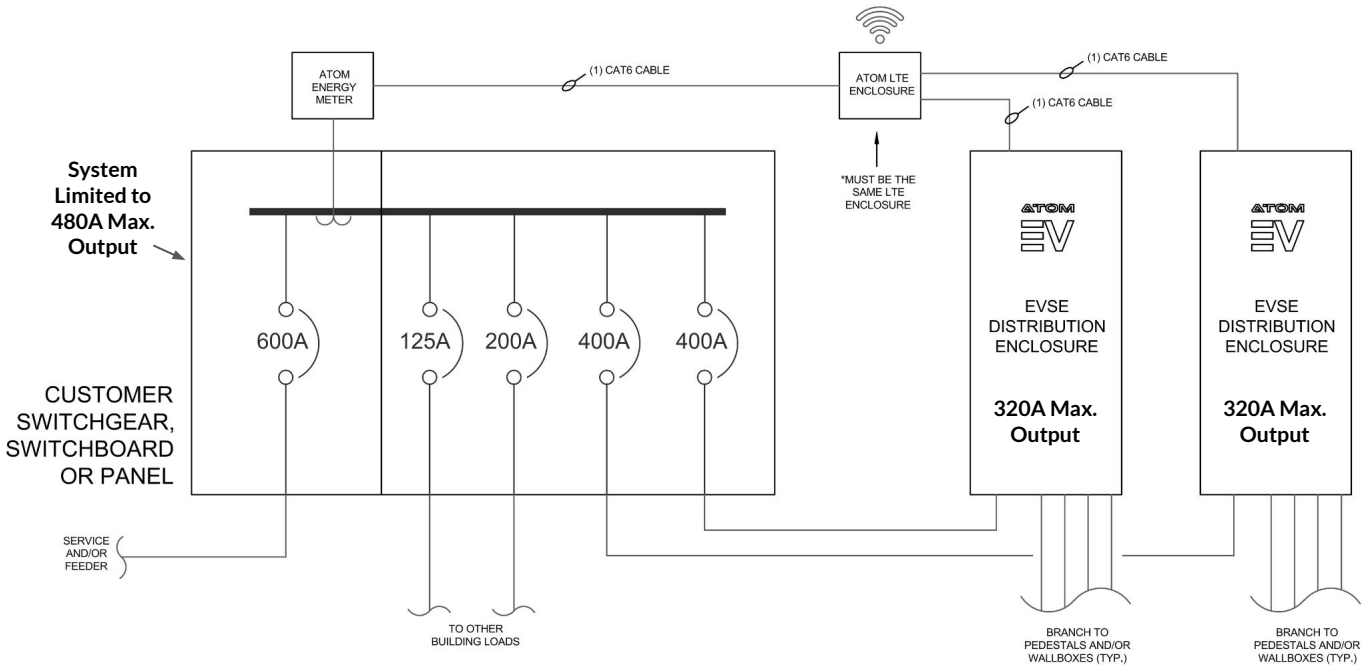
Profile 2 Example - Balanced Power Fixed

In this example, the customer switchboard or panel is limited overall to 480A maximum output (600A x 0.8) but each of the EVSE feeder breakers (400A) are capable of 320A EVSE output each (400A x 0.8). In combination, the two (2) EVSE Distribution Enclosures could pull up to 640A which would exceed the rating of the customer switchboard or panel. Therefore, Profile 2 is implemented to allow for each panel to output its full capacity of 320A, but in combination, both panels together would be limited to 480A.



Profile 3 Example - Balanced Power Dynamic

In this example, the customer switchboard or panel is limited overall to 480A maximum output (600A x 0.8) but each of the EVSE feeder breakers (400A) are capable of 320A EVSE output each (400A x 0.8) and there is existing building load to account for. In combination, the EVSE load and building loads could exceed the rating of the customer switchboard or panel, independent of any fixed limit on the EVSE Distribution Enclosures. Therefore, Profile 3 is implemented with a feedback loop to determine what the overall load is on the customer switchboard or panel to throttle the EVSE load when the overall load meets 480A.



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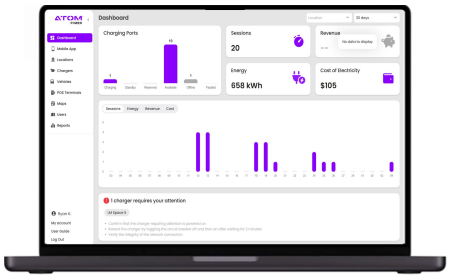
Options

Atom Insight Plus Software



Mobile App Download:

Android iOS

Core Technical Specifications	
Product Catalog Number	AP-Atom_Plus_LX
Desktop Interface	Web-based/HTML
Mobile App Interface	Native Android, Native iOS, Web-based/HTML
Driver Access Controls	Charge Port QR Code through Mobile App
Host Management	Multi-Site, Multi-user account management, driver access groups, set rates, set policy at site, department, or enterprise level, make chargers private or public
Point of Sale Support	Payter
Customer Data Compliance	SOC-2
Standards	OCPP, NEVI (uptime), OpenADR
Vehicle State of Charge (L2)	Yes with Geotab integration
3rd Party Software Integrations	Zendesk, GeoTab
Scheduling	Time-of-Use, Session Limits, On/Off peak
Fee structures offered	Energy, Time-of-use, Idle, Parking/Activation, Tiered, Discounts
Analytics	Uptime, Interval Reports, Sessions, Energy Usage, Status, Faults, Utilization, Revenue, Energy Costs

User Guide

3-Phase Energy Meters

Core Technical Specifications		
Product Catalog Number	AP-MTR1-4X-SOC	AP-MTR2-4X-SOC
Manufacturer	Socomec	
Amp Range	150-600A	400-2,000A
Electrical Network Configuration	50-300 VAC L-N / 87-520 VAC (Ph-Ph) Single-phase (1P2W) / Two-phase (2P2W) / Two-phase with neutral (2P3W) / Three-phase (3P3W) / Three-phase with neutral (3P4W)	
Frequency	45-65Hz	
Energy Metering	±kWh, ±kvarh, kVAh, ∑P (kW), ∑Q (kvar), ∑S (kVA), PF, P (kW), Q (kvar), S (kVA), PF per phase	
Power & Energy Metering Accuracy Class	Class 0.5	
Multi-Measurement	Amps, Volts, Frequency, Unbalance U, V, I	
Power Quality Measurement	THD U, V, I, Individual Harmonics V, U, I (up to 63rd), PQ Events (sags, swells, interruptions and overcurrents)	
Enclosure Rating	NEMA 3R, 4, 4X, 12	
Current Sensors	Flexible Rogowski Coil w/ 6' leads (x3)	
Dimensions	12" x 10" x 6"	
Communication	Ethernet: ModbusTCP/IP, BACnet IP	
Standards	cULus 508A, ANSI C12.20, UL 61010-1, CSA-C22.2 No. 61010-1, IEC 61557-12, Guide PICQ File E257746, PBI Meter per CA Energy Commission	

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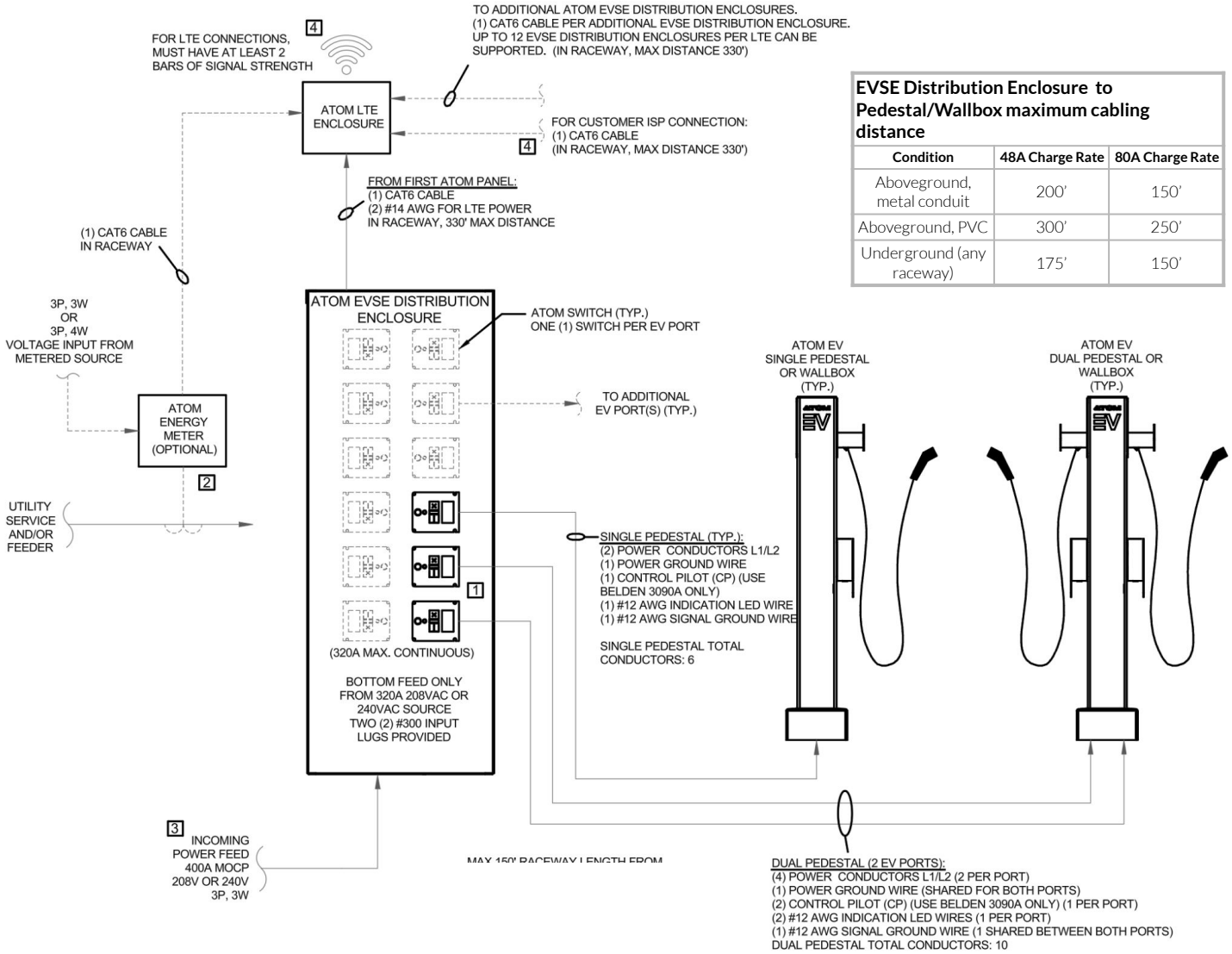
E50 CHARGING SYSTEM DESIGN GUIDE

*For reference only.



EVSE Distribution Enclosure to Pedestal/Wallbox maximum cabling distance

Condition	48A Charge Rate	80A Charge Rate
Aboveground, metal conduit	200'	150'
Aboveground, PVC	300'	250'
Underground (any raceway)	175'	150'

KEY NOTES:

1. ATOM EVSE DISTRIBUTION ENCLOSURES CAN BE CONFIGURED AS FOLLOWS:
   - 1.1. 48A (11.2KW) CHARGING - UP TO 12 ATOM SWITCH CIRCUIT BREAKERS CONFIGURED FOR 60A OVERCURRENT PROTECTION
   - 1.2. 80A (19.2KW) CHARGING - UP TO 6 ATOM SWITCH CIRCUIT BREAKERS CONFIGURED FOR 100A OVERCURRENT PROTECTION.
2. REQUIRED FOR SERVICE OR FEEDER LEVEL ENERGY MANAGEMENT. MULTIPLE METERS CAN BE INSTALLED, DEPENDING ON LEVELS OF ENERGY TO BE MONITORED (E.G. SERVICE ONLY, FEEDER ONLY, SERVICE AND FEEDERS)
3. 400A IS THE MAXIMUM OVERCURRENT PROTECTION (MOCP), HOWEVER, SMALLER OVERCURRENT DEVICES CAN BE USED AS LONG AS *EMS PROFILE 0* SOFTWARE FEATURE IS ENABLED TO LIMIT ENERGY OUTPUT TO THE SYSTEM (SEE E50 SERIES DATASHEET).
4. CONNECTIVITY OPTIONS:
   - 4.1. LTE NETWORK CONNECTION: NO ACTION REQUIRED OTHER THAN WHAT'S SHOWN AND VERIFICATION OF SIGNAL STRENGTH.
   - 4.2. CUSTOMER INTERNET SERVICE PROVIDER (ISP) CONNECTION: PROVIDE CABLING AS SHOWN RUN FROM CUSTOMER ISP NETWORK SWITCH TO NETWORK SWITCH WITHIN THE ATOM LTE ENCLOSURE. DISABLE LTE MODEM (IF PROVIDED) BY UNPLUGGING NETWORK CABLE GOING TO LTE.

Note for Specifying Engineers, Inspectors, and AHJ's: the Atom Power E50 Charging System has achieved multiple listings throughout its history including solid-state circuit breaker (UL 489i), panelboard (UL 67), and EVSE (UL 2594, UL 2231-1/2, and UL 2251) . For the purposes of how to view the E50 System, it should be viewed as *Electric Vehicle Supply Equipment* and therefore guided by Article 625 of the National Electrical Code (NEC) - *Electric Vehicle Power Transfer System*. Additionally and for clarification, the Atom EVSE Distribution Enclosure should be viewed as a single EVSE with the maximum EMS current output of the EVSE Distribution Enclosure being used in the calculations of Articles 625.41 and 625.42.

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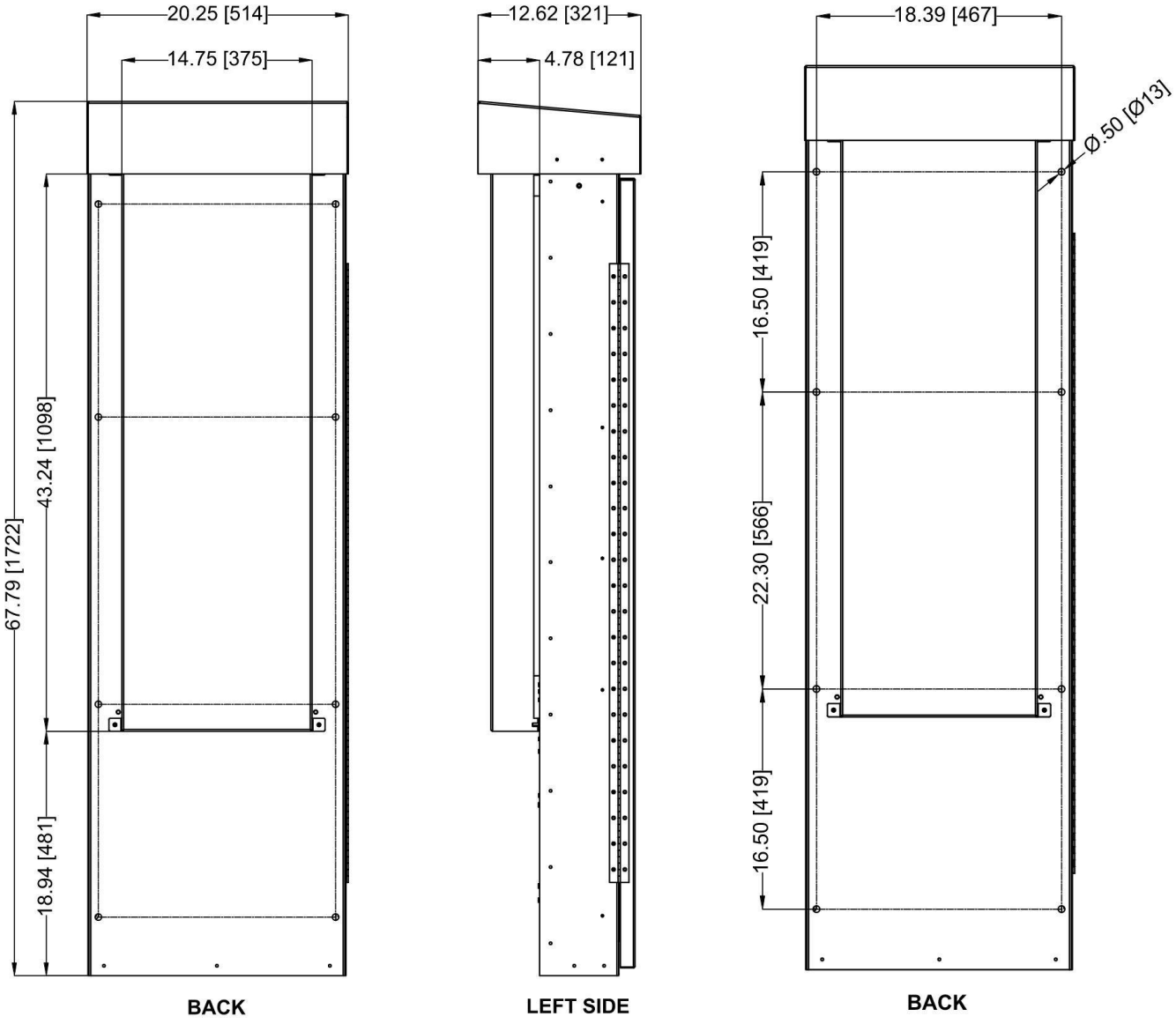
PRODUCT DIMENSIONS

EVSE Distribution Enclosure - AP3P400-EVSE



Dimensions shown in inches [mm]

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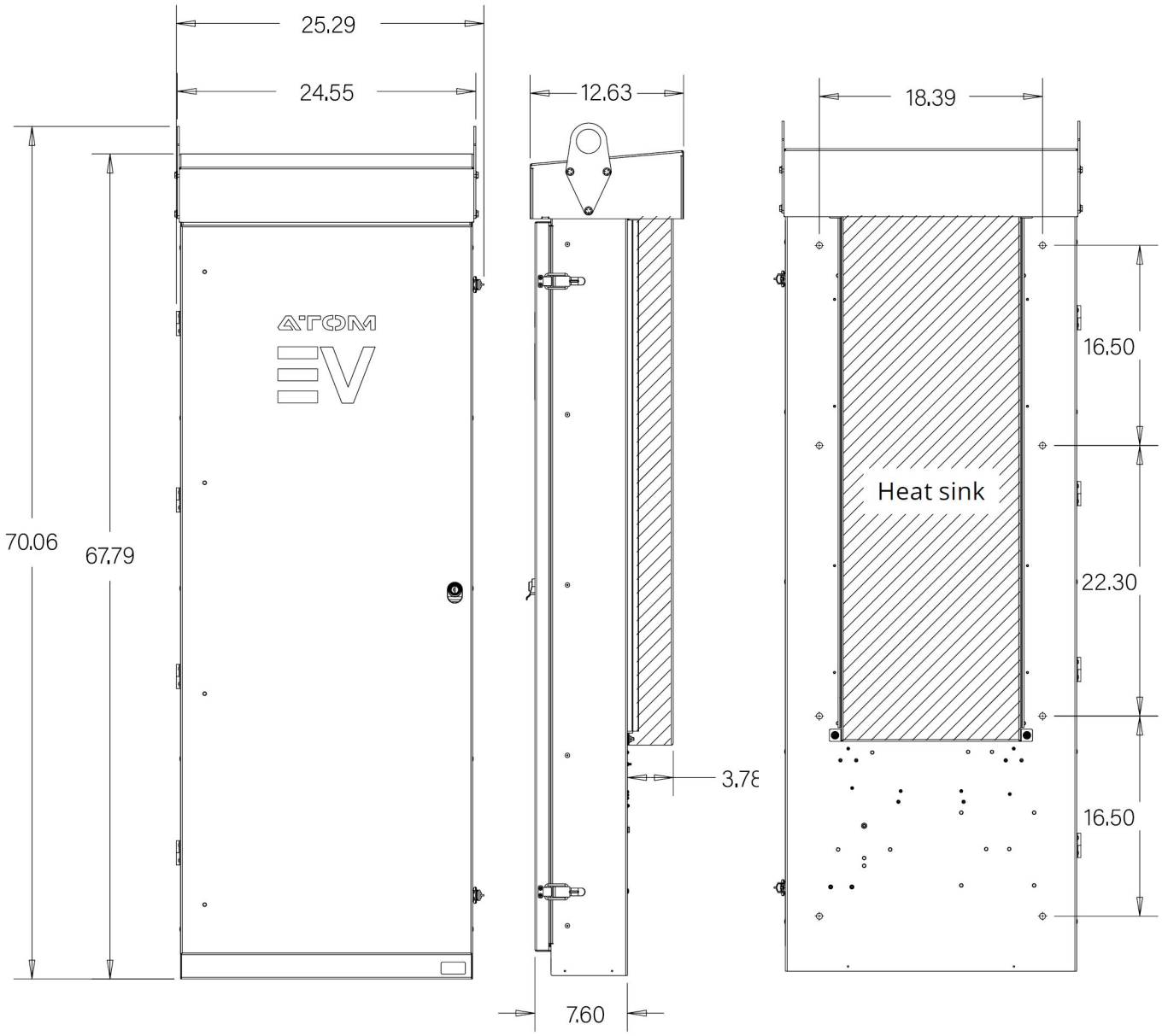
PRODUCT DIMENSIONS

EVSE Distribution Enclosure - AP3P400-EVSE-L



Dimensions shown in inches

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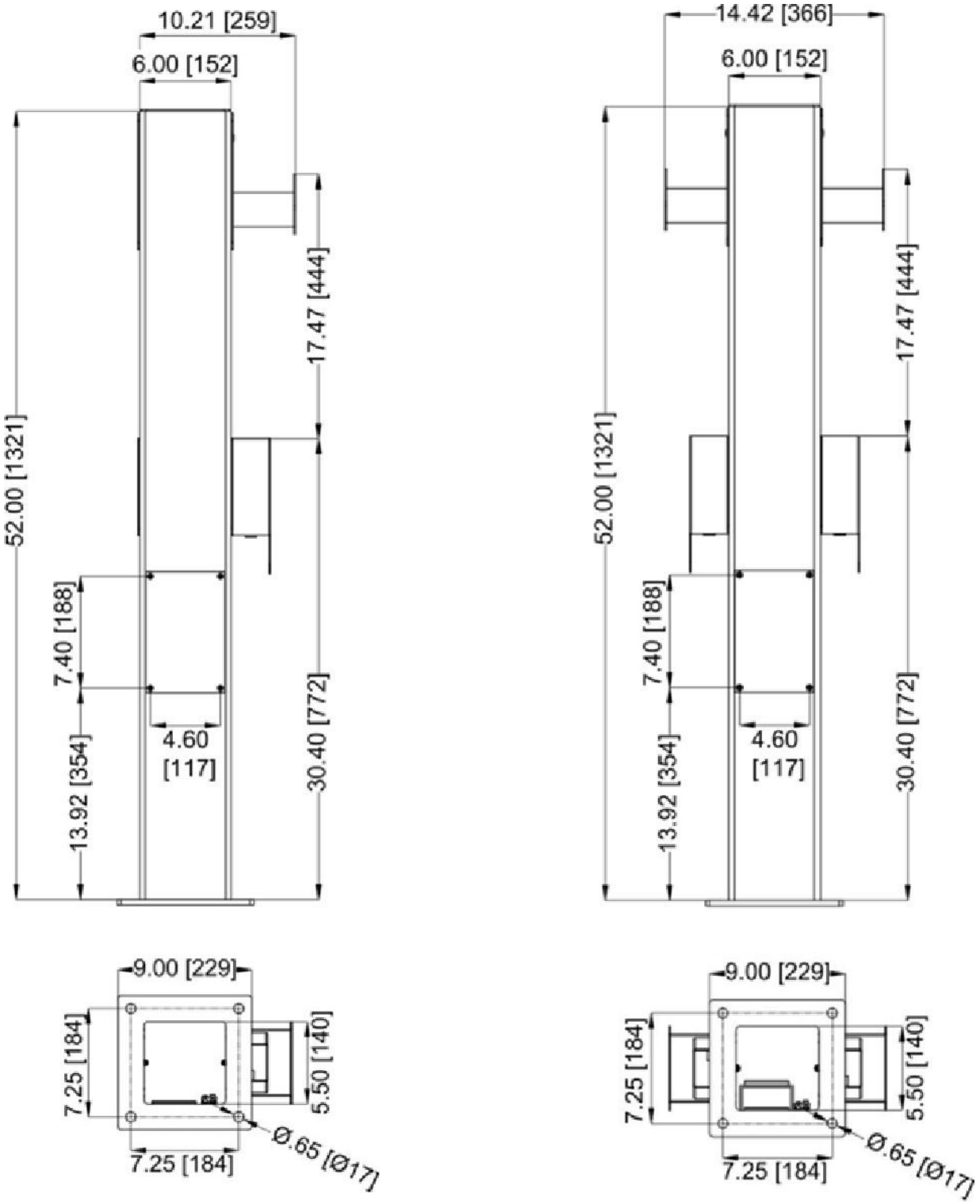
PRODUCT DIMENSIONS

Standard Pedestals - AEV-48PED-D, AEV-48PED-L/R, AEV-80PED-D, AEV-80PED-L/R



Dimensions shown in inches [mm]

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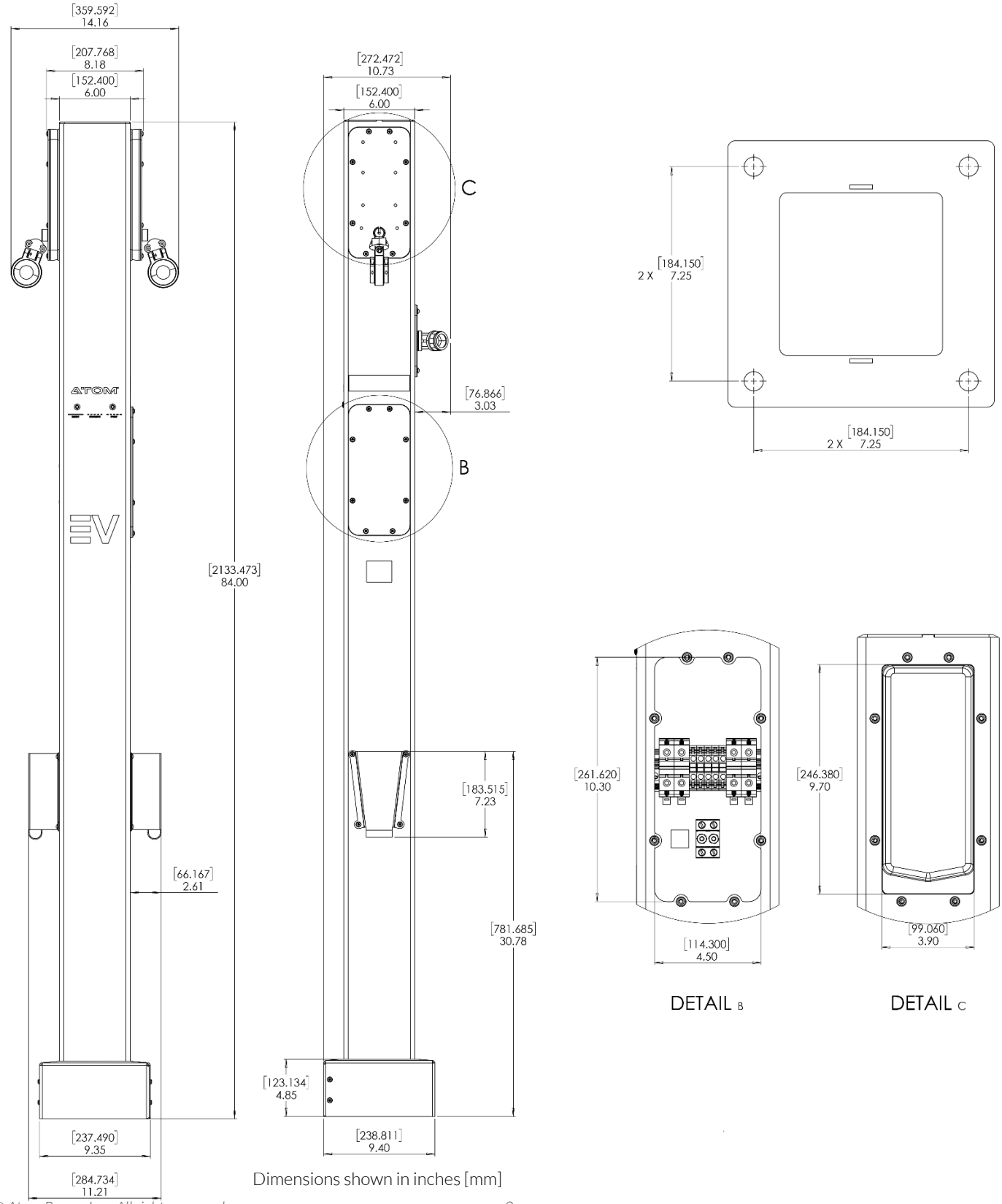
PRODUCT DIMENSIONS

Cable Management Pedestals - AEV-48CMPED-D, AEV-48CMPED-L/R, AEV-80CMPED-D, AEV-80CMPED-L/R



Dimensions shown in inches [mm]

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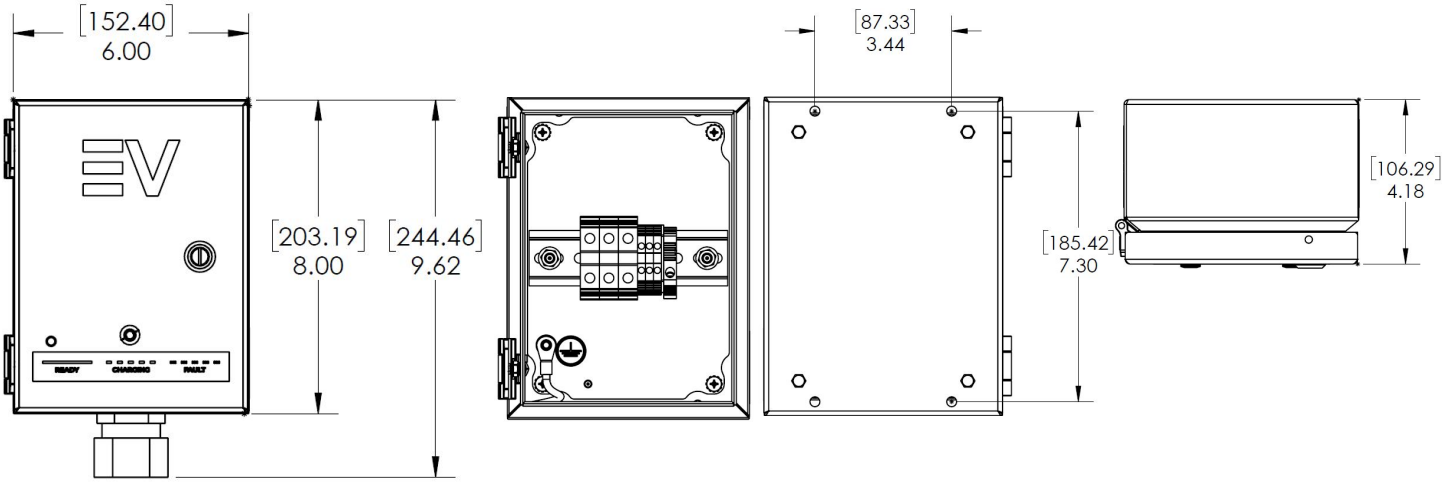
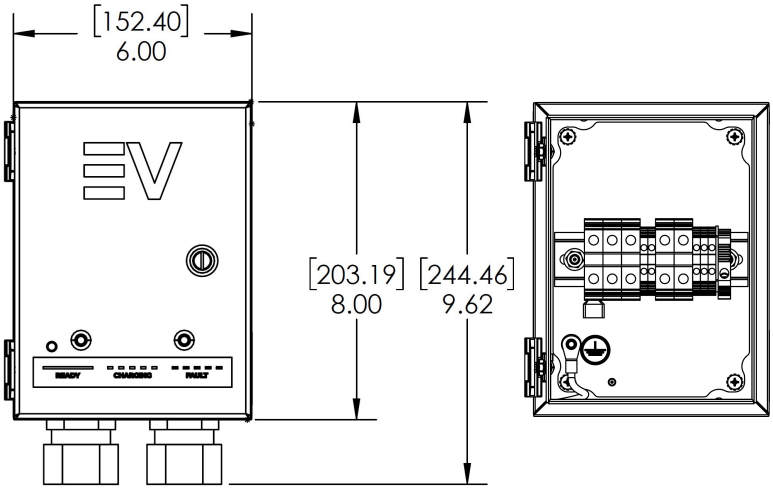
PRODUCT DIMENSIONS

Wallboxes - AEV-48WB-S, AEV-80WB-S, AEV-48WB-D, AEV-80WB-D





Dimensions shown in inches [mm]

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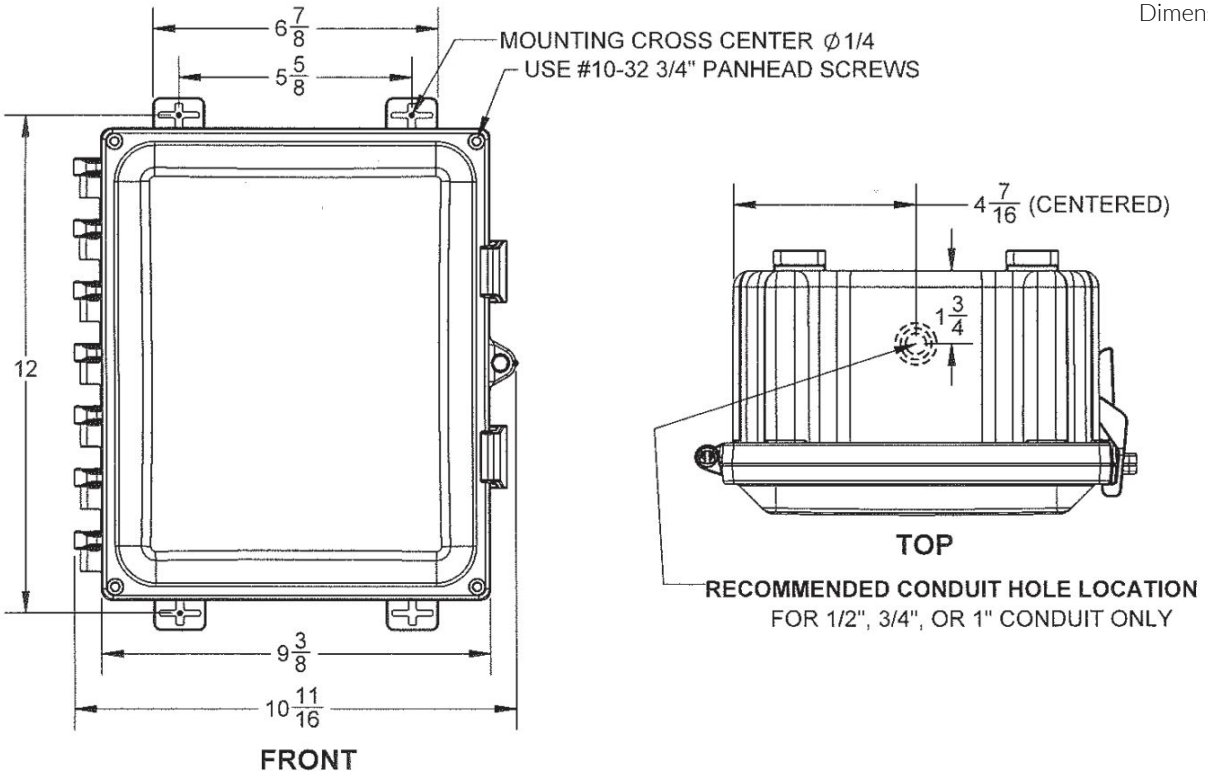
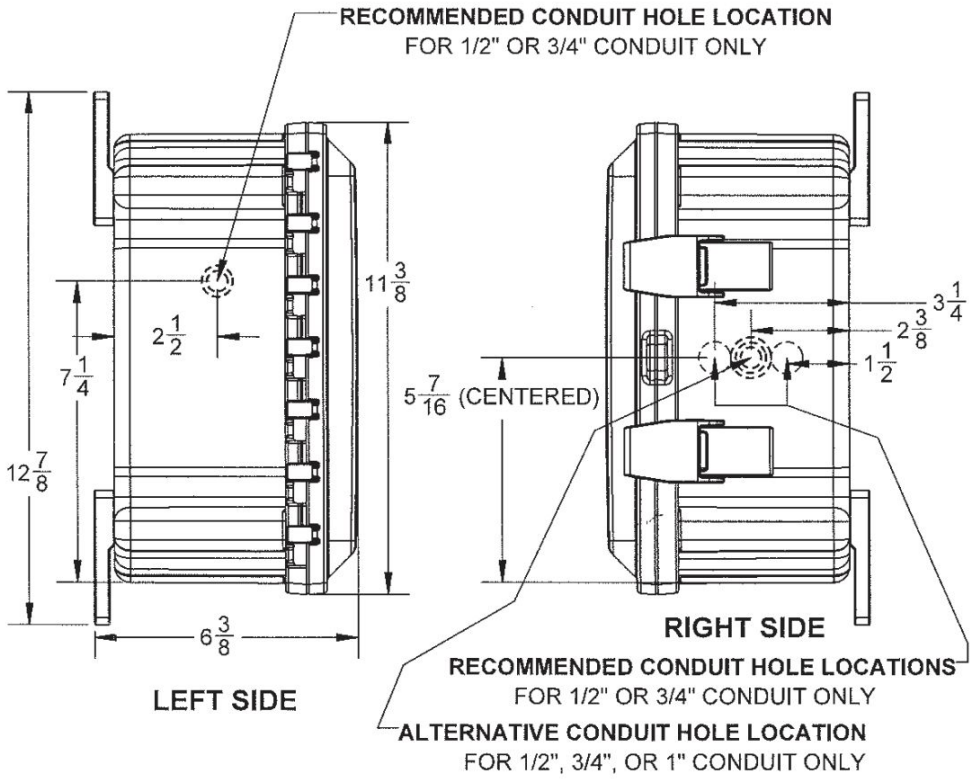
PRODUCT DIMENSIONS

3-Phase Energy Meters - AP-MTR1-4X-SOC, AP-MTR2-4X-SOC

Dimensions shown in inches





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