Franklin Electric

Project | Contractor

Date | Rep Firm | Engineering

# **BAS** - Building Automation Starter

3Ø, 200 ~ 600V, 1/2-30HP


Special Instructions:

## FEATURES AND OPTIONS

- Designed for ease of integration with automation systems
  - Comprehensive inputs/outputs for building automation systems
  - Reduces installation costs
  - High reliability
- SMARTSTART™ patented superior motor protection
  - Electronic overload protection including locked rotor, cycle fault and maximum time to start (due to mis-sized motor or overload)
  - FLA out of calibration indication--ensures installer sets overload correctly based on calculated motor size
- Advanced control inputs eliminate interposing relays
  - Three dry inputs for auto-run, permissive auto and shutdown
  - Two voltage inputs (12-250VAC) for auto run and fireman's override
- Logging retains critical information
  - Logging information is obtainable for starter failure (Factory retrievable only)
  - Last 10 start conditions, including FLA setting, max inrush, run current, time to start, and safety start mode.
  - Last 10 fault conditions, including FLA setting, fault type, fault current, and run time.
- Universal application
  - Automatically detects voltage (200 to 600VAC)
  - Converts to 24V for control power
- UL Type 1, 3R, and 12 enclosures
  - Lockable enclosure
  - 3R features lockable keypad cover
  - Type 4 & 4X enclosure options available (consult factory)
- Hand/Off/Auto keypad with LED status indicators
  - Intuitive operation and control with Hand (manual run), Off, and Auto-run modes
- Combination versions include disconnect
  - Motor circuit protection disconnect provides short circuit protection
  - High interrupting ratings for maximum electrical system compatibility
  - No fuses required
  - Lockable handle for safety

### Optional Feature

- Single-Phase Wiring
  - Optional wiring scheme for single-phase applications

Franklin Electric Project Contractor

Date Rep Firm Engineering

# SIZING INFORMATION TABLE

[ ] is representative of the enclosure type, please insert either 1 (UL Type 1 enclosure), 3R (UL Type 3R outdoor enclosure), 4XS (UL Type 4X Stainless Steel), or 12 (UL Type 12 enclosure) when identifying your Part Number(s).

**Building Automation Starter** - 1 & 3-Phase, 50/60 Hz, 200~600 VAC
**UL Type 1/3R/12 Enclosed** - Combination Starter, Electronic Overload
**Includes MCP Disconnect**

| Part Number | UL HP Ratings | | | | | SCIC KAIC @ | | | Contactor NEMA Size | Contactor Type | Disconnect Part Number |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1Ø | 3Ø | | | | | | | | | |
| | 230V | 208V | 230V | 460V | 600V | 240V | 460V | 600V | | | |
| BAS[ ]-9/P-G1.6-40 | 1/10 | - | - | 3/4 | 3/4 | 100 | 65 | 25 | | | CMS-32HI-1.6 |
| BAS[ ]-9/P-G2.5-40 | 1/6 | 1/2 | 1/2 | 1 | 1.5 | 100 | 65 | 25 | | | CMS-32HI-2.5 |
| BAS[ ]-9/P-G4-40 | 1/3 | 3/4 | 3/4 | 2 | 3 | 100 | 65 | 25 | 00 | MRC-9B | CMS-32HI-4 |
| BAS[ ]-9/P-G6-40 | 1/2 | 1 | 1.5 | 3 | 3 | 100 | 65 | 25 | | | CMS-32HI-6 |
| BAS[ ]-9/P-G8-40 | 1 | 2 | 2 | 5 | 5 | 100 | 65 | 25 | | | CMS-32HI-8 |
| BAS[ ]-18/P-G10-40 | 1.5 | 2 | 3 | 5 | 7.5 | 100 | 65 | 25 | | | CMS-32HI-10 |
| BAS[ ]-18/P-G13-40 | 2 | 3 | 3 | 7.5 | 10 | 100 | 65 | 25 | 0 | MRC-18B | CMS-32HI-13 |
| BAS[ ]-18/P-G17-40 | 3 | 3 | 5 | 10 | 15 | 100 | 30 | 10 | | | CMS-32HI-17 |
| BAS[ ]-32/P-G22-40 | 3 | 5T | 7.5 | 15 | 20 | 100 | 30 | 10 | | | CMS-32HI-22 |
| BAS[ ]-32/P-G26-40 | 3 | 7.5 | 7.5 | 15 | 20 | 100 | 30 | 10 | 1 | MRC-32A | CMS-32HI-26 |
| BAS[ ]-32/P-G32-40 | 5 | 7.5 | 10 | 20 | 25 | 100 | 30 | 10 | | | CMS-32HI-32 |
| BAS[ ]-40/P-G40-40 | 7.5 | 10 | 10 | 30 | 30 | 100 | 30 | 10 | 1+ | MRC-40A | CMS-32HI-40 |

**Building Automation Starter** - 1 & 3-Phase, 50/60 Hz, 200~600 VAC
**UL Type 1/3R/12 Enclosed** - Standard Starter, Electronic Overload
**Disconnect Not Included**

| Part Number | UL HP Ratings | | | | | SCIC KAIC @ | | | Contactor NEMA Size |
|---|---|---|---|---|---|---|---|---|---|
| | 1Ø | 3Ø | | | | | | | |
| | 230V | 208V | 230V | 460V | 600V | 240V | 460V | 600V | |
| BAS[ ]-9/P-40 | 1 | 2 | 2 | 5 | 7.5 | 5 | 5 | 5 | 00 |
| BAS[ ]-18/P-40 | 3 | 5 | 5 | 10 | 15 | 5 | 5 | 5 | 0 |
| BAS[ ]-32/P-40 | 5 | 7.5 | 10 | 20 | 25 | 5 | 5 | 5 | 1 |
| BAS[ ]-40/P-40 | 7.5 | 10 | 10 | 30 | 30 | 5 | 5 | 5 | 2 |

NEMA 1/3R Factory Installable Options

| Part Number | Description |
|---|---|
| BAS-1PH | Single Phase Wiring for BAS Starters |

*Consult factory for type 4 & 4X enclosed EMS starters*


Franklin Electric

| Project | | Contractor | |
|---|---|---|---|
| Date | | Rep Firm | | Engineering | |

# BAS Specifications

## BAS Specification

| | | | |
|---|---|---|---|
| **Starter Type** | | | |
| BAS - Building Automation Starter | | | |
| 200-600VAC, 3-Phase, 50/60Hz input, Across the line, full-voltage non-reversing | | | |
| UL Type 1, 3R, or 12 Enclosed | | | |
| **User Interface** | | | |
| Hand/Off/Auto Keypad with LED mode indication | | | |
| **Standard Control Operations** | | | |
| Inputs | Voltage Auto-Run | Accepts 12-250VAC/DC. Applying voltage will send a run command to the starter when in Auto mode. | |
| | Dry Contact Auto-Run | Normally Open dry contact. When closed, the starter will be commanded to run when in Auto mode. | |
| | Fireman's Override | Accepts 12-250VAC/DC. Applying voltage will cause the starter to run in all modes and all LEDs will flash. | |
| | Shutdown | Normally Closed dry contact. When closed, the starter will disengage the contactor and will not accept a run command (except Fireman's Override). Hand/Off/Auto LEDs will flash. | |
| | Permissive Auto | Normally Closed dry contact. When closed, the starter will not accept run commands in Auto mode (except Fireman's Override) | |
| | Damper Limit Switch | Normally Open dry contact. When used with the damper motor output, the contactor coil is in series with customer provided damper contacts which disable the motor starter until the damper is in position. | |
| Outputs | Status Relay | Normally Open relay contacts.<br>Status Relay will close when the motor draws 60% of the FLA dial setting. | <u>Contact Ratings:</u><br>110VDC, 0.3A Resistive<br>125VDC, 0.5A GP<br>30VDC, 2.0A Resistive<br>120VAC 50/60Hz, 0.5A Resistive<br>125VAC 50/60Hz, 1.0A GP<br>240VAC 50/60Hz, 0.25A Resistive |
| | Fault Relay | Fault Relay will close in the event of a fault trip. | |
| | Damper/Actuator | 24VDC, 1A max. | |
| Operational | Overload Type | Electronic $I^2t$ trip curve | |
| | Fault Reset | Manual (default) or Automatic | |
| | Power Fail Modes | Return to last mode the starter was placed in (Hand/Off/Auto) with no delay (default) | |
| | | Return to last mode the starter was placed in (Hand/Off/Auto) with a 10 second delay | |
| | | Return to Off mode (LED of last mode the starter was placed in will be flash) | |
| **Environmental** | | | |
| Ambient Operating Temp | | -5° to 140° F (-20° to 60° C) | |
| Ambient Storage Temp | | -5° to 185° F (-20° to 85° C) | |
| Relative Humidity | | 5% to 95% non-condensing | |

| **Motor Protection** | **Adjustment / Description** | **Default Setting** |
|---|---|---|
| Overload Current Setting Range | 1-40A | Per FLA |
| Overload Trip Class | Adjustable: Class 10 or 20, Trip current = 115% of FLA setting | Class 10 |
| Cycle Fault | Trip if cycle rate exceeds 20 starts/minute | Always On |
| Stall | Trips within 0.5 seconds (disabled during startup) | Always On |

| **Protection** | **Adjustment / Description** | | **Default Setting** |
|---|---|---|---|
| Current Phase Unbalance | On/Off | Trips within 3 sec @ 25% current unbalance.<br>*Trip threshold changes to 80% unbalance when switched to Off | On |
| Locked Rotor | | Trips within 0.5 seconds | |
| Out of Calibration | | Trips after 10 seconds if the FLA dial setting is incorrect (set above calculated FLA range), ie. Start current is outside of an acceptable range (fla setting * 5 < inrush < fla setting * 14). | |
| Max Time to Start | | Regardless of FLA or $I^2t$ curve, always trip at start if starting current is outside of an acceptable range (inrush / 5) and still decreasing after 10 seconds. | |

Franklin Electric

| | | | |
|---|---|---|---|
| Project | | Contractor | |
| Date | | Rep Firm | | Engineering | |

# SUBMITTED EQUIPMENT SCHEDULE

| QTY | Tag | Part # | HP | Voltage | Phase | Enclosure | Starter Type | Nema Size |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

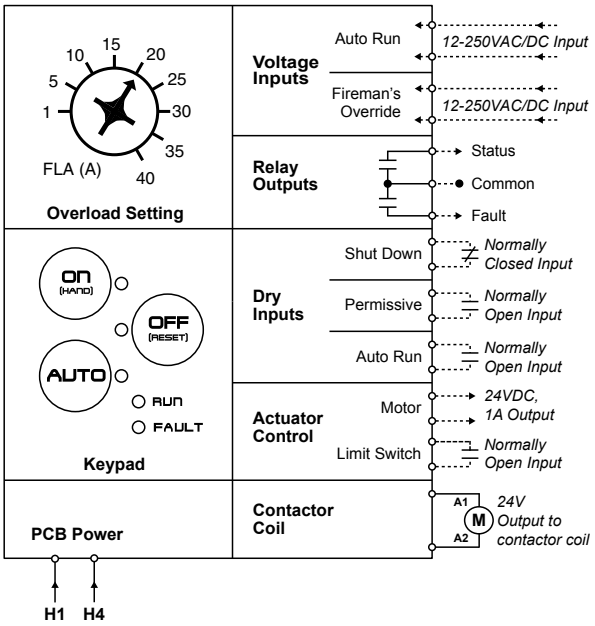
## Part Number Anatomy

BAS1-18/P-G17-40

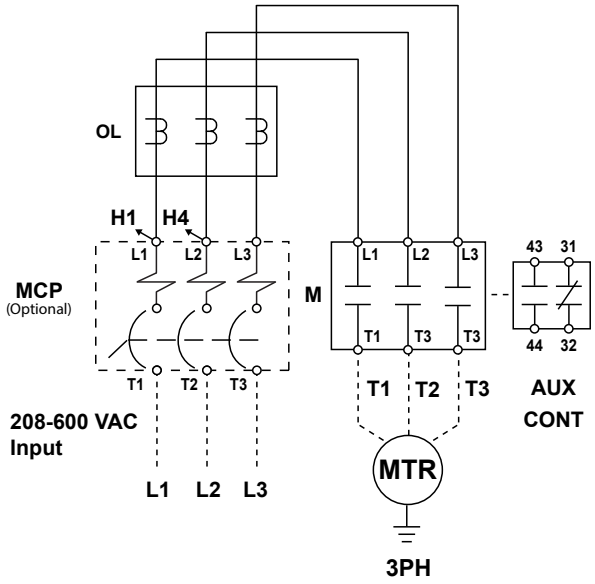
- 1 — Enclosure Rating (Type 1, 3R, or 12)
- 18 — Contactor Size (9, 18, 32, or 40)
- G17 — Disconnect Amperage
- 40 — Overload Rating

# WIRING DIAGRAMS

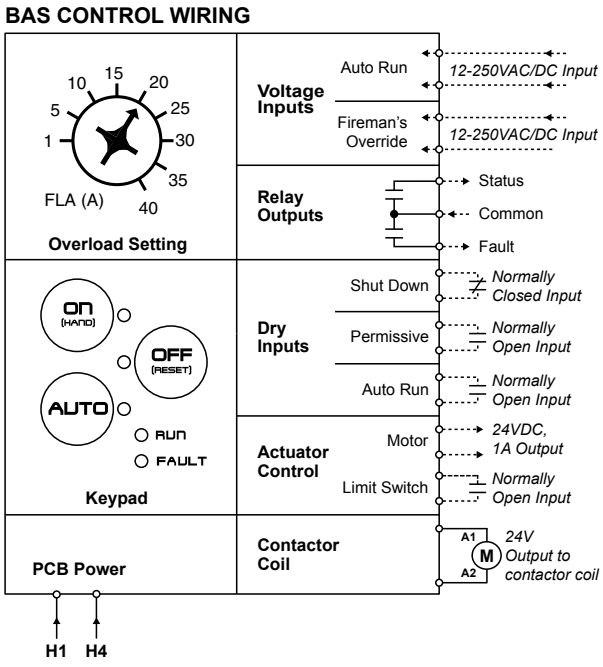
## BAS CONTROL WIRING



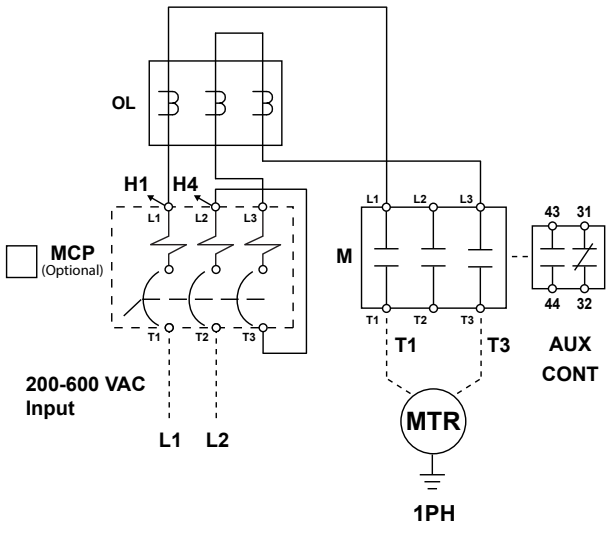

## BAS POWER WIRING




## BAS 1-PHASE CONTROL WIRING




## BAS 1-PHASE POWER WIRING




SCHM-BAS/1PH-V3

Franklin Electric

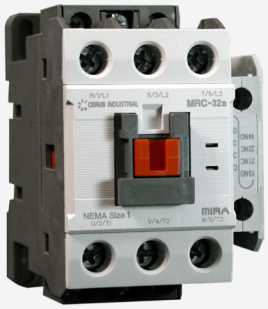
Project | Contractor

Date | Rep Firm | Engineering

# COMPONENT SPECIFICATIONS

The following section details the various components' sizing and ratings. To locate your component part numbers for the BAS reference the sizing information table above.

## THREE POLE CONTACTORS




## MANUAL MOTOR STARTERS


# 3-POLE CONTACTOR SPECIFICATIONS

| Type | | | | MRC-9B | MRC-18B | MRC-32A | MRC-40LA |
|---|---|---|---|---|---|---|---|
| **Frame Size** | | | | **22AF** | | **40AF** | |
| Terminal Type | | | | Screw | | Screw | |
| Number of poles | | | | 3 pole | | 3 pole | |
| Rated operation voltage, Ue | | | | 690V | | 690V | |
| Rated insulation voltage, Ui | | | | 690V | | 1000V | |
| Rated frequency | | | | 50/60Hz | | 50/60Hz | |
| Rated impulse withstand voltage, Uimp | | | | 6kV | | 8kV | |
| Max. operating rate in operating cycles per hour (AC3) | | | | 1800 operations per hour | | 1800 operations per hour | |
| **Durability** | Mechanical | | | 15 mil. operations | | 12 mil. operations | |
| | Electrical | | | 2.5 mil. operations | | 2 mil. operations | |
| **Current and power** | AC-1, Thermal current | | A | 25 | 40 | 50 | 60 |
| | †AC-3 | 200/240V | kW<br>A | 2.5<br>11 | 4.5<br>18 | 7.5<br>32 | 11<br>40 |
| | | 380/440V | kW<br>A | 4<br>9 | 7.5<br>18a | 15<br>32 | 18.5<br>40 |
| | | 500/550V | kW<br>A | 4<br>7 | 7.5<br>13 | 18.5<br>28 | 22<br>32 |
| | | 690V | kW<br>A | 4<br>6 | 7.5<br>9 | 18.5<br>20 | 22<br>23 |
| **UL rating (50/60Hz)** | Continuous current | | A | 25 | 40 | 50 | 60 |
| | Single Phase | 110~120V | HP | 0.5 | 1 | 2 | 3 |
| | | 220~240V | HP | 1.5 | 3 | 5 | 7.5 |
| | Three Phase | 200~208V | HP | 2 | 5 | 7.5 | 15 |
| | | 220~240V | HP | 3 | 7.5 | 10 | 15 |
| | | 440~4 80V | HP | 5 | 10 | 20 | 30 |
| | | 550~600V | HP | 7.5 | 15 | 25 | 30 |
| | NEMA size | | | 00 | 0 | 1 | - |
| **Size and weight** | MRC | Weight<br>Size (WxHxD) | lbs<br>in | 0.73 lbs<br>1.77 x 2.89 x 3.39 in | | 0.88 lbs<br>1.77 x 3.27 x 3.54 in | |
| | MRD | Weight<br>Size (WxHxD) | lbs<br>in | 1.12 lbs<br>1.77 x 2.89 x 4.63 in | | 1.32 lbs<br>1.77 x 3.27 x 4.61 in | |
| **Auxiliary (standard)** | | | | **1NO & 1NC** | | **1NO & 1NC** | |
| **Auxiliary** | Side mount | | | MA-1 | | MA-1 | |
| | Front mount | | | CA-2, CA-4 | | CA-2, CA-4 | |

Franklin Electric

Project | Contractor

Date | Rep Firm | Engineering

# MANUAL MOTOR STARTER SPECIFICATIONS

| Frame Size | Part # | Rated operational current Ie (A) | Magnetic release operating current (A) | Branch Motor Protection (UL508) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1-phase [HP] (50/60Hz) | | 3-phase [HP] (60Hz) | | | | KAIC Ratings [kA] | | |
| | | | | 115V | 230V | 200V | 230V | 460V | 575V | 240V | 480V | 600V |
| 32AF | CMS-32HI-0.16 | 0.16 | 2.1 | - | - | - | - | - | - | 100 | 65 | 25 |
| | CMS-32HI-0.25 | 0.25 | 3.3 | - | - | - | - | - | - | 100 | 65 | 25 |
| | CMS-32HI-0.4 | 0.4 | 5.2 | - | - | - | - | - | - | 100 | 65 | 25 |
| | CMS-32HI-0.63 | 0.63 | 8.2 | - | - | - | - | - | - | 100 | 65 | 25 |
| | CMS-32HI-1 | 1 | 13 | - | - | - | - | - | 1/2 | 100 | 65 | 25 |
| | CMS-32HI-1.6 | 1.6 | 20.8 | - | 1/10 | - | - | 3/4 | 3/4 | 100 | 65 | 25 |
| | CMS-32HI-2.5 | 2.5 | 32.5 | - | 1/6 | 1/2 | 1/2 | 1 | 1.5 | 100 | 65 | 25 |
| | CMS-32HI-4 | 4 | 52 | 1/8 | 1/3 | 3/4 | 3/4 | 2 | 3 | 100 | 65 | 25 |
| | CMS-32HI-6 | 6 | 78 | 1/4 | 1/2 | 1 | 1.5 | 3 | 5 | 100 | 65 | 25 |
| | CMS-32HI-8 | 8 | 104 | 1/3 | 1 | 2 | 2 | 5 | 5 | 100 | 65 | 25 |
| | CMS-32HI-10 | 10 | 130 | 1/2 | 1.5 | 2 | 3 | 5 | 7.5 | 100 | 65 | 25 |
| | CMS-32HI-13 | 13 | 169 | 1/2 | 2 | 3 | 3 | 7.5 | 10 | 100 | 65 | 25 |
| | CMS-32HI-17 | 17 | 221 | 1 | 3 | 3 | 5 | 10 | 15 | 100 | 50 | 10 |
| | CMS-32HI-22 | 22 | 286 | 1.5 | 3 | 5 | 7.5 | 15 | 20 | 100 | 30 | 10 |
| | CMS-32HI-26 | 26 | 338 | 2 | 3 | 7.5 | 7.5 | 15 | 20 | 100 | 30 | 10 |
| | CMS-32HI-32 | 32 | 416 | 2 | 5 | 7.5 | 10 | 20 | 30 | 100 | 30 | 10 |
| | CMS-32HI-40 | 40 | 520 | 3 | 7.5 | 10 | 10 | 30 | 30 | 100 | 30 | 10 |
| 63AF | CMS-63HI-10 | 10 | 130 | 1/2 | 1.5 | 2 | 3 | 5 | 7.5 | 100 | 65 | 25 |
| | CMS-63HI-13 | 13 | 169 | 1/2 | 2 | 3 | 3 | 7.5 | 10 | 100 | 65 | 25 |
| | CMS-63HI-17 | 17 | 221 | 1 | 3 | 3 | 5 | 10 | 15 | 100 | 50 | 10 |
| | CMS-63HI-22 | 22 | 286 | 1.5 | 3 | 5 | 7.5 | 15 | 20 | 100 | 50 | 10 |
| | CMS-63HI-26 | 26 | 338 | 2 | 3 | 7.5 | 7.5 | 15 | 20 | 100 | 50 | 10 |
| | CMS-63HI-32 | 32 | 416 | 2 | 5 | 7.5 | 10 | 20 | 30 | 100 | 50 | 10 |
| | CMS-63HI-40 | 40 | 520 | 3 | 7.5 | 10 | 10 | 30 | 30 | 100 | 50 | 10 |
| | CMS-63HI-50 | 50 | 650 | 3 | 10 | 15 | 15 | 30 | 40 | 100 | 50 | 10 |
| | CMS-63HI-63 | 63 | 819 | 5 | 10 | 20 | 20 | 40 | 60 | 100 | 50 | 10 |
| | CMS-63HI-65 | 65 | 845 | 5 | 10 | 20 | 20 | 40 | 60 | 100 | 50 | 10 |
| 100AF | CMS-100H-17 | 17 | 221 | 1 | 3 | 3 | 5 | 10 | 15 | 100 | 65 | 25 |
| | CMS-100H-22 | 22 | 286 | 1.5 | 3 | 5 | 7.5 | 15 | 20 | 100 | 65 | 25 |
| | CMS-100H-26 | 26 | 338 | 2 | 3 | 7.5 | 7.5 | 15 | 20 | 100 | 65 | 25 |
| | CMS-100H-32 | 32 | 416 | 2 | 5 | 7.5 | 10 | 20 | 30 | 100 | 65 | 20 |
| | CMS-100H-40 | 40 | 520 | 3 | 7.5 | 10 | 10 | 30 | 30 | 100 | 65 | 20 |
| | CMS-100H-50 | 50 | 650 | 3 | 10 | 15 | 15 | 30 | 40 | 100 | 65 | 20 |
| | CMS-100H-63 | 63 | 819 | 5 | 10 | 20 | 20 | 40 | 60 | 100 | 50 | 10 |
| | CMS-100H-75 | 75 | 975 | 5 | 15 | 20 | 25 | 50 | 60 | 100 | 50 | 10 |
| | CMS-100H-90 | 90 | 1170 | 7.5 | 20 | 25 | 30 | 60 | 75 | 100 | 50 | 10 |

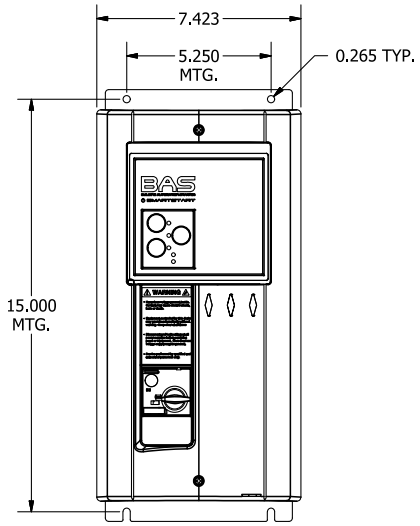
*Associated product part numbers can be found in the Sizing Information Table.*

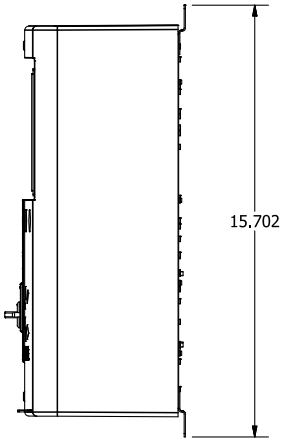
Franklin Electric Project Contractor

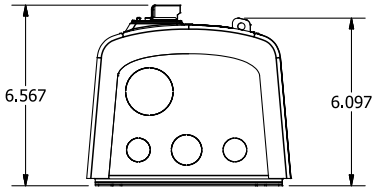
Date Rep Firm Engineering

# STARTER ENCLOSURE DIMENSIONS

## UL Type 1 Dimensions

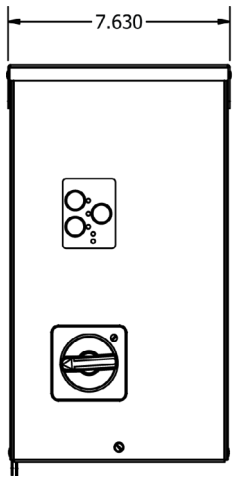


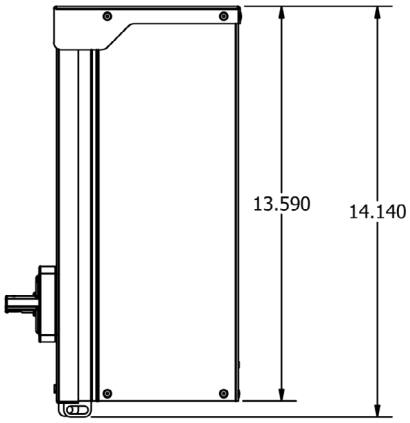



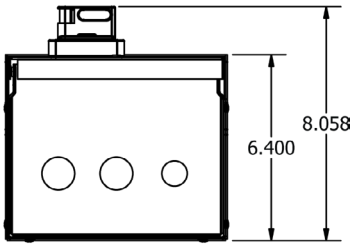




*All dimensions are in inches*

## UL Type 3R Dimensions




*All dimensions are in inches*

# STARTER ENCLOSURE DIMENSIONS CONT.

UL Type 12 Dimensions