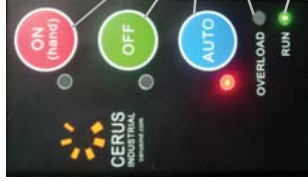


## OPERATION

- Ensure that all connections are properly torqued and enclosure is closed prior to connecting power to the device.
- Ensure all mechanical equipment operated by the starter is clear for safe operation in case of starter activation.
- When in AUTO mode, starter may be activated remotely by the control system

### Initializing Starter

Upon applying power to the starter, the LEDs on the keypad will blink. As soon as hand or auto modes are engaged



### Standard operation

The Cerus BAS starter uses microprocessor logic to enhance safety, operation, and reliability. Using simple dip switches, you can select a range of options to suit your application.

ON (HAND): Manual Start, LED is "on" when in this mode.

OFF: Manual Off, LED is "on" when in this mode.

AUTO: Starter is controlled ON/OFF by control signal. LED is "on" when in this mode.

OVERLOAD LED: ON if starter has tripped due to overload by control signal

RUN LED: ON if contactor coil is energized

**Hand Mode** - Depressing the Hand button on the front cover operates the motor starter. The Red LED adjacent to the Hand button indicates Hand is selected. The Green Run LED indicates the Motor Starter is on.

**Automatic Mode** - Depressing the Auto button on the front cover enables the control inputs to operate the motor starter. The Red LED adjacent to the Auto button indicates the Automatic mode is selected. The Green Run LED indicates the Motor Starter is on when the control inputs are commanded.

**OFF** - The motor starter is off when this button on the front cover is selected. The Green LED adjacent to the Off button indicates this mode is selected and the Run LED should be off.

**Overload** - When the starter is in an overload condition the red Overload LED is on and the mode selected (Hand, Off or Auto) LED will be blinking. In default mode the overload may be reset from the front panel (see program options).

**Overload Reset** - The motor starter may be reset from the front panel by depressing the hand and off button for five seconds. This function is enabled as a default configuration through the program switches. When the overload is reset the motor starter will return to the Off mode.

**Shutdown** - All mode LED's flash (HAND/OFF/AUTO) indicating shutdown operation

**Fireman's Override** - All mode LED's flash and RUN LED on, indicating fireman's override operation.

### CAUTION

Always inspect and determine the cause of an overload trip. Failure to correct the problem may result in permanent damage to the motor or motor starter. If possible, determine the overload trip mode by observing the LED's on the overload relay (see overload relay).

**Cycling Fault** - In the event the controller detects an unusually high amount motor starts and stops (a rate greater than 1200 per hour), a cycling fault will occur. This function is enabled as a default configuration through the program switches and can be disabled if necessary. When there is a cycling fault the Run LED will be off and the OFF mode LED will blink on and off.

**Cycling Fault Reset** - A cycling fault can be reset by depressing the Off button for 10 seconds. When cleared the last mode LED blinking will turn off and the motor starter will be in the Off mode.

## Electronic Overload Operation

### Protective Features

**Overcurrent:** The electronic overload will trip the motor starter when the load is greater than the Full Load Ampere setting and the time setting selected by the two adjustments on the front of the relay labeled RC(A)- Ampere setting and Time- Class trip time (1-30).

**Phase Failure:** The electronic overload relay will trip in the event of a phase failure or phase unbalanced greater than 70%.

**Stall Condition:** If load is greater than 170% of Ampere setting for more than 3 seconds the electronic overload will detect a stall condition and trip.

### Indicators

The electronic overloads will indicate actual phase loss or overload conditions by the LED's on the relay as indicated in the following chart. The Motor Starter will only indicate a overload trip on the front panel as a steady red LED.

Protection	RE D (O.L.) (F.A.M.P)	GR EN (F.A.M.P)	LED
Over Current			
R			
S			
T			



\*See www.cerusind.com for warranty terms. Contact life ratings vary by model.



**CERUS**  
INDUSTRIAL

# BAS Enclosed Starter

with electronic overload & optional MCP

## Manual

Thank you for purchasing Cerus Industrial's Building Automation HVAC Starter! Please read this manual thoroughly to ensure a safe installation and proper operation.



UL listed & built to the highest standards!



## SAFETY INSTRUCTIONS

To prevent injury and property damage, follow these instructions. Failure to adhere to installation/operation procedures and all applicable codes may result in hazards as indicated by warning codes below:

**DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

**WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Follow these safety indications:

 This is the safety alert symbol. Read and follow instructions carefully to avoid a dangerous situation.

 This symbol alerts the user to the presence of "dangerous voltage" inside the product that might cause harm or electrical shock.

**CAUTION** As with all electrical products, read manual thoroughly. Only qualified, expert personnel should perform maintenance and installation. Contact the nearest authorized service facility for examination, repair, or adjustment. Do not disassemble or repair unit unless described in this manual; death or injury to electrical shock or fire hazard may result. Specifications and manual data subject to change. Consult factory for additional information.

For all your motor control products and replacement parts please call



3101 SW 153rd Drive, Beaverton OR 97006, USA.

800-962-3787

# INTRODUCTION

This manual contains installation and maintenance instructions for Cerus Building Automation Starters. See back panel for parts ordering information.

## Comprehensive Pilot Lights

Bright LED annunciation for all conditions including hand, off, auto, overload, and run.

Optional UL Type F Motor Circuit Protector Ratings as high as 65 KAIC Coordinated padlockable operator

## Building Automation Ready

Includes provision for fireman's override, run permissive input & damper control.

## Superior Motor Protection

Class 1-30 electronic overload with phase loss protection and manual reset.

## Universal Automatic Control

Accepts direct digital inputs; dry or wet. No interposing relays required!

## Available Options

Current sensor output (proof of flow) & a full range of disconnects

## Space & Time Saving Enclosure

NEMA 1 construction mounts & wires easily. Narrow design conserves valuable wall space.



# PROGRAM SWITCHES

SWITCH	1	2	3	4	5	6	7	8
SWITCH 1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
SWITCH 2	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
SWITCH 3	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
SWITCH	4	5	6	7	8	9	10	11
Electronic Overload Modes	(ON)	(ON)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)
Electronic Overload Reset	(ON)	(ON)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)
Default Mode	(ON)	(ON)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)
Automatic Electronic Overload Reset	(ON)	(ON)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)
Overload alarm disabled	(ON)	(ON)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)
Power Fail Modes	(ON)	(ON)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)
Default Mode	(ON)	(ON)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)
Always return to last mode with a 10 second delay in the event of a power failure.	(ON)	(ON)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)
Upon a power failure, display last mode blinking until hand, off or auto button is pushed.	(ON)	(ON)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)
Return to last mode w/o delay if power failure is less than 1 second.	(ON)	(ON)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)
Return to last mode with a 10 second delay if power failure is greater than 1 second.	(ON)	(ON)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)
Always to off if power failure is greater than 1 second.	(ON)	(ON)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)
Program setting - do not use unless instructed by Cerus (Reserved, treat as Default Mode)	(ON)	(ON)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)	(OFF)

## Input/Output

Shutdown Input - NC dry contact or transistorized input. When the input is open the Motor Starter will open in all modes (except Fireman's Override), and all mode LEDs will flash indicating a shutdown.

Damper Motor Output - 24 VAC 1A maximum. Provides a 24VAC damper motor output when the motor starter is commanded in either auto or hand mode. The damper motor output must be wired with a damper open switch input as noted below to prevent overloading of control circuit.

Damper Switch Input - NO open dry contact. Switch input dry contacts must be rated for 24VAC, 1A. When used with the damper motor output this wires the contactor coil in series with customer provided damper contacts which disable the motor starter until the damper is in position.

Permissive Auto Input - NC dry contact input. When the input is open, the Automatic input is disabled. This is not a logic input.

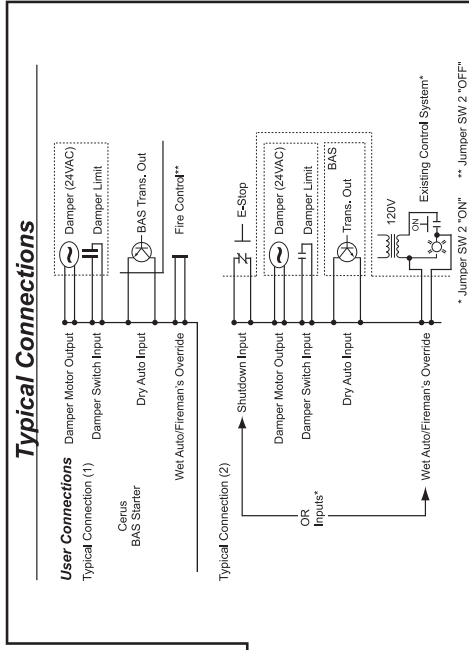
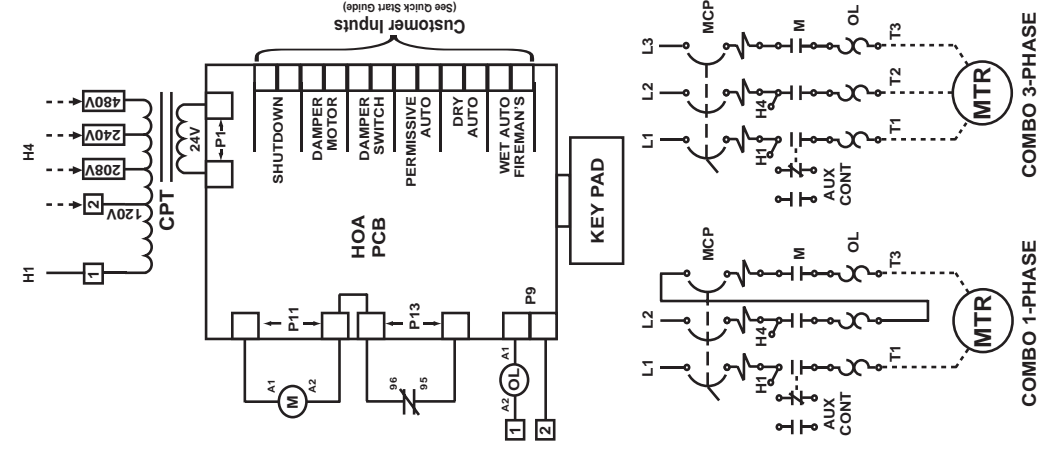
Dry Auto Input - NO dry contact or transistorized input. When closed, the starter will operate when automatic mode is selected.

Wet Auto Input/Fireman's Override - NO input. Accepts wetted customer input. Input voltage must be within 20 - 138 VAC or VDC. In Fireman's Override, a closed input will operate the contactor in all modes including OFF @ Shutdown/ Input. When active all mode LEDs flash and the Run LED will be on. When programmed as a Wet Auto input, applying 20-138VAC/DC will operate the starter in auto mode. Fireman's Override has priority over all modes except EPO.

## User Connections

Shutdown	(NC) Input
Damper Motor	24 VAC / 20VAC Damper Output (optional)
Damper Switch	Dry Contact (NO) Damper Input
Permissive Auto	Input
Dry Auto	Input
Wet Auto/Fireman's Override	Input (20-138V)

# WIRING DIAGRAM - Schematic



This manual contains installation and maintenance instructions for Cerus Building Automation Starters. See back panel for parts ordering information.

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NEMA 1 construction mounts & wires easily. Narrow design conserves valuable wall space.

## INSTALLATION



- Disconnect and lock out all power before installing or servicing equipment.
- This equipment may require locking out multiple power sources prior to service
- Install and wire in accordance with all applicable local & national electrical and construction codes

FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN DEATH OR SERIOUS INJURY

Mounting  
Mount the starter on a vertical surface, with the line terminals facing up. Install using bolts, 1/4" diameter, suitable for the mounting surface.

## WARNING

- Do not locate starter in an environment subject to flammable gases, dusts, or materials. Contact arcing can induce explosion or fire.
- Locate starter in a location appropriate to enclosure ratings and operational ratings (e.g. NEMA 1 should only be located in a dry, protected environment).
- Do not allow any metal shavings or debris from installation to enter enclosure.

## Wiring

Use only copper wiring for power wiring. Rated at 60°C < 100A and 75°C ≥ 100A. Ensure appropriate clearances are maintained and there is not possibility for shorting between any power conductors and enclosure. Ensure that wires are not under stress and all insulation is intact. Terminals must be tightened to appropriate torques when installing, assembling, or adjusting the device, and indicated in TABLE 2. Low voltage automation system control wiring should be run in a separate conduit. Verify voltage input matches label and CPT Taps as in TABLE 1.

TABLE 1. CPT Voltage Taps

Terminal Positions	H1	H2	Voltage
1	2	120	9
1	3	208	22
1	4	240	40
1	5	480	50
2			26-39
3			35-53

TABLE 2. Torque Table

AC Rating	NEMA Size	L1	L2	L3	T1	T2	T3
9	00	7-22	7-15				
22	0	7-22	7-15				
40	1	26-39	15-22				
50	2	26-39	30-40				
85	3	35-53	30-40				