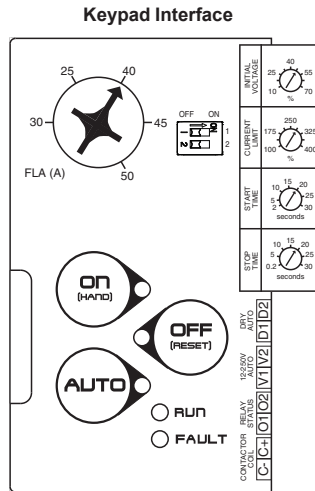


Operation

- Intended for use with 3-Phase, 50/60Hz
- Accepts 208-600VAC $\pm 10\%$
- Ambient Operating Temperature = -20°C to 60°C
- Ambient Storage Temperature = -40°C to 85°C

DANGER

- Ensure that all connections are properly torqued and enclosure is closed prior to applying 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



Operation Modes

ON (HAND)

Press the ON mode button to manually engage motor.

OFF (RESET)

Press the OFF mode button to manually disengage the motor. Additionally, the OFF button serves as a manual Reset. Press and hold OFF for 5 seconds to Reset the starter after a fault trip.

AUTO

When utilizing AUTO mode, the starter is controlled by a remote Start/Stop command.

LED Status Indicators

MODE LEDs

Illuminates with corresponding mode selection (HAND/OFF/AUTO). Flashing mode LED signals a fault trip during the last operating mode.

RUN LED

Illuminates when starter is given a Run signal and 20% of FLA is detected. LED will flash when Run signal is present without proof of flow to the motor.

FAULT LED

Blinks when current reaches 1.15% of FLA or greater and illuminates upon a fault condition or overload trip. Starter must be returned to the OFF mode in order to Reset.

I/O Descriptions

| Use 14-26AWG wire for I/O Terminals, Torque to 3.5 lb-in | |
|--|--|
| TERMINAL | DESCRIPTION |
| D1 / D2 | Dry Auto Input - When closed, the starter will run when in Auto Mode. (N.O. dry contact or transistorized input) |
| V1 / V2 | Wet Auto Input - Accepts wetted customer input. Input voltage must be within 12 - 250 VAC/VDC (4.2mA Max.). Sending voltage to the contact will send a run command to the starter when in Auto Mode. |
| O1 / O2 | Status Relay Output - Normally open relay contacts that close when the motor draws 60% of the FLA current. 120VAC, 0.6A |
| C - / C+ | Contactor Output - Provides a 24V output to the contactor when the motor starter is commanded in either Hand or Auto mode after ramp time. (Wired from manufacturer) 24V, 0.42A Max. for FCS contactor with 24VAC coil. |

Setting Adjustments

The SPS-RV will soft start a motor by ramping up the voltage from the initial voltage setting to full line voltage over the selected time period. If the current limit is reached the voltage ramp will hold its progress until the current is reduced below the set level. If the current limit is set too low the motor may fail to reach full speed before bypassing. If this occurs either increase the start time or the current limit.

| Setting Knob | DESCRIPTION |
|-----------------|--|
| Initial Voltage | Determines the initial voltage of the voltage ramp, in % of the RMS line voltage (10% - 70%). |
| Current Limit | Determines the current limit to hold the voltage ramp if it is reached, in % of FLA current (100% - 400%). |
| Start Time | Determines the start ramp time period. The start ramp is a linear voltage ramp from the initial voltage setting to full line voltage. (2s - 30s) |
| Stop Time | Determines the stop ramp time period. The stop ramp is a linear ramp from full line voltage down to the cut off voltage of 10% RMS.(0.2s - 30s) |
| Overload | Class 10 - To be set to FLA of motor nameplate. Trips according to I ² t trip curve. |

Soft starter is rated for:

- 6 starts/hour -
- 20 seconds max start time @ 400%current limit
- 30 seconds max start time @ 300% current limit

- To conform to the EMC directive a ferrite core is required on the input of the starter module. Consult the factory for the recommended part number. For a CE compliant installation, all electrical connections must be made by a qualified electrical technician.

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SPS-RV™

STANDARD PUMP SOFT-STARTER

Installation & Operation Guide

This manual is available for download at www.franklin-controls.com



Precautions

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 outlined 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.



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.

Safety Instructions

DANGER

Equipment can start automatically. Lockout/tagout before servicing.

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.

Installation



HAZARDOUS VOLTAGE

- 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.



- To maintain overcurrent and short-circuit protection, the manufacturer's instructions for selecting current elements and setting the instantaneous-trip circuit breaker must be followed.
- Tripping of the instantaneous-trip circuit breaker is an indication that a fault current has been interrupted. Current-carrying components of the magnetic motor controller should be examined and replaced if damaged to reduce the risk of fire or electric shock.
- 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

Wire main power input and motor leads to the appropriate terminals tightened to specified torques indicated in the Torque Table below. Use only copper conductors rated at least 60°C for applications less than 100A and at least 75°C ≥ 100A. Maintain proper clearances and verify that no possibility of an electrical short exists between the power conductors or enclosure. Ensure that wires are not under stress and all insulation is intact. Verify voltage input matches label and the control power is tapped per schematic.

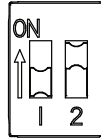
Low Voltage Wiring

Automation system control wiring should be run in a separate conduit. The control terminals accept 26~14AWG wire torqued to 3.5 lb-in.

Torque Table

| Starter Size | Input (lb-in) | | Output (lb-in) |
|--------------|---------------|-------------|----------------|
| | Standard | Combination | Motor Leads |
| S1 | 15.6 | 60 | 20 |
| S1P | 15.6 | 60 | 35 |
| S2 | 15.6 | 60 | 35 |
| S3 | NA | 90 | 45 |
| S3P | 50 | 150 | 45 |

Program Switches



| | |
|---------------------------|--|
| SWITCH 1 Default = OFF | Direct start enabled. When set to ON this switch will bypass the reduced voltage starting feature and turn the device into a direct on the line starter. The bypass contactor will immediately engage when a run command occurs. This feature should not be used if your utility requires a soft starter for your application. This feature should be set to OFF for normal operation. |
| SWITCH 2 Default = ON | (ON) - Fault reset: Depress the "OFF" button for 5 seconds to reset a fault trip. Starter will return to "OFF" mode. (OFF) - Automatic Fault Reset: The starter will make 3 attempts at an auto overload reset separated by 5 minute intervals. Also allows manual reset as above. |

* In the event of a power failure, the starter will return to the last mode it was placed in before loss of power. (HAND/OFF/AUTO)

Protective Features

| | |
|------------------|---|
| Cycle Fault | Trips when the starter is activated at a rate exceeding 20 starts per minute. |
| Gate Drive Fault | Trips if the system detects an error with the soft start mechanism. |
| Locked Rotor | Trips when a locked rotor condition is detected for 0.5 seconds. |
| Over Temperature | Trips if the SCR Temperature exceeds 125 degrees Celsius. |
| Stall | Trips if a STALL condition is detected. (0.5 sec @ 300% FLA and current slope not decreasing.) Disabled during startup. |
| Overload | Trip current = 115% of FLA. Trips when the load is greater than the trip current. (I2t trip curve) |
| Phase Unbalance | Trips the in the event of a phase failure or if any phase deviates by more than 50% from the average. |
| Board Fault | Trips if the Gate Drive circuit board is not detected when a run command occurs. |

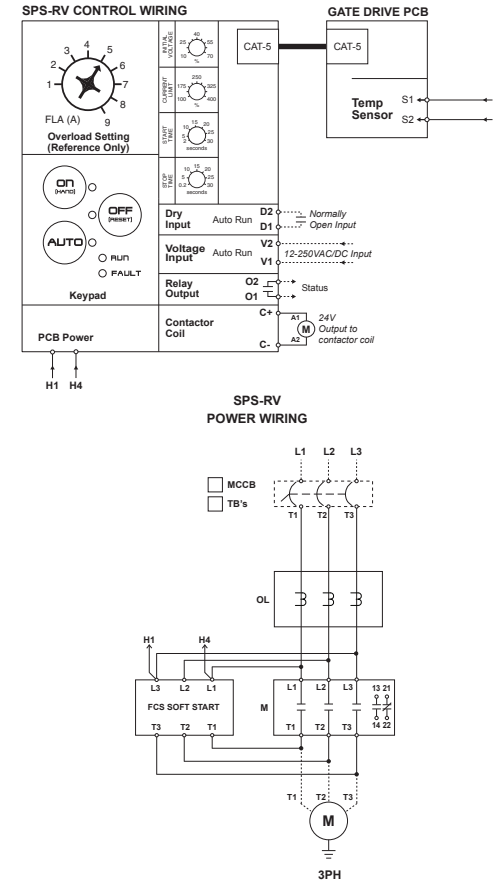
Electronic Overload Operation

When an alarm occurs, the fault LED will illuminate. The type of alarm will be indicated by flashing a combination of the HAND/OFF/AUTO/RUN LED's as indicated in the table below.

| FAULT | FLASHING LED |
|-----------------------|------------------------|
| Cycle Fault Alarm | NONE |
| Gate Drive Board | AUTO LED |
| Locked Rotor Alarm | OFF LED |
| Over Temperature | OFF & AUTO LEDs |
| Stall Alarm | HAND & AUTO LEDs |
| Overload Alarm | HAND & OFF LEDs |
| Phase Unbalance Alarm | HAND, OFF, & AUTO LEDs |
| Board | RUN LED |

*Run and Fault LED's will flash together in the event of a hardware fault.

Wiring Schematic*



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*Standard product wiring diagram shown. As-built product wiring may vary. Product wiring diagram located on starter enclosure.