

Operating Instructions for the POWRSOFT®

General

The POWRSOFT type PWRS-2(4)R-(KVA) is designed to control the inrush (starting) current of a rotary phase converter. The 2R in the type number indicates the unit is for 240 Volt operation, 4R for 480 Volt operation. The number in the KVA part of the type number indicates the maximum size of rotary the POWRSOFT is designed to start. See the selection chart for additional information.

Definition of Components

Timer T1	Set to the amount of time it takes the rotary to come up to speed.
Timer T2	Set a second or two longer than T1.
Pot. P1	Potentiometer sets current inrush on the rotary.
Trigger CB	Trigger circuit board controls power module.
Power mod.	Power module chops waveform during starting.
Contactors	Shunt contactor bypasses the solid state components after T1 times out.
Switch S1	'Bypass' POWRSOFT to start rotary at full inrush. 'On' for automatic soft starting.
F1	Solid state fuse protects module against short circuit.
R1	Relay energizes Trigger CB when control voltage present.

Connection

The POWRSOFT is designed to connect between the rotary base unit and the rotary panel. It is very important that this be done correctly. The POWRSOFT will reduce the in-rush **single phase** current during rotary startup if connected as shown in the diagrams supplied. The wiring should be sized to match the BASE 3Ø AMPS rating that appears on the rotary's nameplate. For rotary converters with contactor start or automatic start features, the A_{IN}, B_{IN}, and C_{IN} wires of the POWRSOFT must be connected to the rotary side of the contactor in Capacitor Panel #1.

Identifying the A, B, & C phases of the rotary before attempting to connect the POWRSOFT is very important. Improperly connecting the POWRSOFT can lead to malfunction or damage to the unit. The phases can be identified by measuring the phase to phase and phase to ground voltages when the rotary is idling. The highest phase to phase voltage is V_{A-B} and the highest phase to ground voltage is V_{A-GND}. The POWRSOFT is not designed to be installed into the single phase supply line for the entire system. Nor is it designed to be installed into the three phase output or to soft start any three phase loads. Call RONK if you need assistance.

For rotary converters with contactor start or automatic start features, the delay contact in the POWRSOFT must be connected in series with existing delay timers. This assures that no motors will attempt to start before the POWRSOFT completes start-up of the rotary. The terminals 4 and 5 in the POWRSOFT are a normally open isolated contact to be used for this connection. Refer to the diagram for more details.

Operation

The POWRSOFT is pre-adjusted to start the rotary at a 50% reduction in inrush. On rare occasion, some final adjustments may be needed to meet the specific field conditions. Potentiometer P1 is located on the trigger circuit board. It controls the magnitude of current flow into the rotary. Relay R1 energizes the Trigger CB when the rotary turns on. Timer T1 is set for the amount of time it takes to start the rotary. Timer T2 disables the current reduction circuitry if Timer T1 fails to energize the shunt contactor, shutting down the system. Toggle switch S1 provides for an override capability. In the 'Bypass' position, it will allow the motor to start straight across the line without in-rush reduction. This feature allows the POWRSOFT to be removed from the circuit for troubleshooting purposes. The Contactor will engage as soon as power is applied to start the rotary. Leave S1 in the 'On' position for automatic soft starting.

In-Rush Adjustment

The multi-turn Potentiometer P1 is located on the trigger circuit board. A small screwdriver will be needed to adjust it. Clockwise rotation will increase the start-up amperage and counter-clockwise rotation will decrease it. **Note: The setting of the potentiometer should be approximately correct from the factory. Therefore, be careful that you do not turn the potentiometer setting too far in either direction.** Most adjustments should not require more than 1 or 2 turns in either direction. Turning the potentiometer too far clockwise will give an across-the-line start which may blow the solid state fuse. Turning the potentiometer too far counter-clockwise will not allow enough amperage to the rotary so that it can come to speed and may just hum. Call RONK if you have any questions about the proper setting of this potentiometer.

Built-in Protection

There is a solid state fuse which protects the circuit under fault conditions, i.e. a line to line or a line to ground short. This fusing is only located in the 'C' line of the rotary and will only be operable during the start-up phase of the rotary.

Note that once the shunt Contactor is energized, no current flows through the solid state fuse and power module. Once T2 times out, the Trigger Circuit Board is de-energized.

Troubleshooting

- Ohm all coils and contacts to verify relay, timers, and contactor are in good working order. Check fuse (control transformer fuse if applicable). Check for loose wires and burnt connections.
- Set Switch S1 to 'Bypass'. This will remove the soft starting components from the circuit. The Contactor should activate as soon as power is applied to start the rotary.
 - If the Contactor does not engage, SHUT OFF POWER. Check coil and control wiring to coil. Remove cover plate from Contactor and check contacts. Verify functionality. Replace if damaged.
 - If the Contactor engages and the rotary still fails to start, check incoming and outgoing power wiring for problems. Refer to Troubleshooting Instructions for the rotary converter. Call RONK for assistance.
 - If the Contactor engages and the rotary starts normally, the problem is most likely with a component in the POWRSOFT. Call RONK for assistance.

POWRSOFT SELECTION CHART

POWRSOFT Type	Voltage	Approx. Wt. (lbs)	Frame	ROTO-CON®		ROTOVERTER®	
				KVA (P)	KVA (D-1)	KVA (C)	KVA (D)
PWRS-2R-30	240	30	256 and smaller	30 and less	12 and less	30 and less	12 and less
PWRS-2R-100	240	33	326 to 284	40 to 100	14 to 35	40 to 100	14 to 35
PWRS-2R-150	240	38	365 to 364	120 to 150	42 to 52.5	120 to 150	42 to 52.5
PWRS-4R-60	480	34	286 and smaller	60 and less	21 and less	60 and less	21 and less
PWRS-4R-150	480	38	365 to 324	80 to 150	28 to 52.5	80 to 150	28 to 52.5

For assistance contact our Service Department: Phone (217) 563-8333