

PS20 DC Power Supply

Overview

The vast majority of circuit breaker failures are caused by improper operation of the breaker operating mechanism.

Circuit breakers are designed to trip at around 50% of rated nameplate DC voltage. This specification is extremely important when several circuit breakers are required to trip simultaneously, (i.e.: Bus Differential Faults) because the battery supply voltage drops due to the heavy current demand for these operations.

Several factors can affect proper trip operations:

- Improper lubrication
- Old (sticky) lubrication
- Shorted trip coil turns
- Bad bearings
- Improper adjustments on trip linkage
- Bad (sticky) trip latch
- High termination resistance's
- Rust, etc.

The **PS20** determines the minimum voltage and current (power) required to operate the circuit breaker. It is designed to plug into any 110VAC duplex outlet in the operating cabinet. The output is filtered with very low ripple and has adequate current to fully simulate the battery supply for tripping purposes.

To test an operating mechanism:

1. With the breaker cleared, open the DC supply voltages at the circuit breaker operating cabinet.
2. With the **PS20** voltage at minimum, connect the output positive and negative leads to the load side of the supply switch.
3. Set The PS20 for 50% of rated trip voltage.
4. Momentarily jumper positive lead to the trip wire. If trip occurs, test was successful. If not, raise the voltage and try again until trip occurs.
5. Record this value for future reference.

Note: DC voltage should only be applied to the trip coil momentarily. Extended energization time could damage the trip coil.

Ideally the breaker should be tested upon installation for later comparison. Any future deviation of operating minimums is cause for concern and the mechanism should be checked for abnormalities. If

the minimum to operate is near the 50% nameplate rating, the operating mechanism is functioning properly.

Other uses for the PS20

The "heart" of the substation is the battery bank and charging system. The **PS20** can also be used as an emergency battery charging system due to the isolated 20 amp continuous duty rating. It will function in this capacity for short periods while repairs to the charging system are expedited.

To use as an emergency charger:

1. Connect the negative output from the PS20 to a negative output on the battery bank.
2. Connect a portable voltmeter from the positive output of the PS20 to the positive output of the battery bank. Adjust the output voltage of the PS20 to read 0 VDC on the above voltmeter. The PS20 Volt Meter will read approx. 132 volts for a 60 cell system. (This insures that the battery and PS20 voltages are matched.)
4. Connect the positive output from the PS20 to the positive output of the battery bank. Adjust the current output of the PS20 to float charge the battery system. (Maximum Duty is 20 Amps)

Note: The 110 VAC outlet plug supplied is rated @ 15 Amps to allow the user to use any convenient duplex outlet available. For continuous duty at 20 Amps the supplied plug should be changed to meet requirements.

The **PS20** is also ideal for general shop use i.e.: operating & determining minimums for DC motors, relays, communications equipment, auxiliary DC equipment etc.

Output	0-140 VDC Filtered 0-20 Amp Continuous Unregulated
Ripple	Approx. 1% @ Full Load
Isolation DC-GRD	1500VRMS
Input	115VAC
Metering (Analog)	0-150 VDC,0-20AMP DC

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