
Model 5251-2 Power Supply

1.0 INTRODUCTION

Model 5251-2 is an open frame, 0-1A current regulated power supply for use with Magtrol hysteresis brakes and clutches. It has a high input impedance that allows for a variety of sensors and transducers to be used. It features a selectable 0-100 mV/0-5 VDC monitor out that allows connection to a PLC, voltmeter, display or other monitoring device. This allows the user to monitor the current applied directly to the brake or clutch, if desired. With regulated current, torque drift caused by temperature changes within the brake coil is eliminated. Braking control is enabled by using either a 10-turn potentiometer or by an external 0-5 VDC control signal.

1.1 SPECIFICATIONS

Current ranges	0-200 mA, 0-500 mA, 0-1000 mA (selectable)
Current regulation	± 1% of full scale range
Compliance voltage	45 VDC
Control input	10-Turn Potentiometer or 0-5 VDC External Control
Current monitor output	0-100 mVDC or 0-5 VDC (selectable)
Brake fuse	1.25 Amp, 250 V, 5 x 20 mm, T, IEC
Line fuses	5251-2: 115 VAC: 1 Amp, 250 V, 5 x 20 mm, T, IEC 5251-2A: 230 VAC: 400 mA, 250 V, 5 x 20 mm, T, IEC
Power requirements	115/230 VAC, 70 VA, 50-60 Hz

2.0 OPERATION

2.1 RANGES

Three current ranges are selectable by changing the position of two jumpers on the header.

- For 0-200 mA range, install jumpers on P1 and P4.
- For 0-500 mA range, install jumpers on P2 and P5.
- For 0-1000 mA range, install jumpers on P3 and P6.

2.2 INPUT POWER

The 5251-2 can be set for either 115 VAC or 230 VAC operation by the voltage selector switch located near the transformer. Connect AC power to the terminals marked GND (Earth), N (Neutral), and L (Line) (See connection diagram on page 4).

2.3 FUSES

The power supply is protected by dual 1A, 250V fuses (for 115V models) or 400mA, 250V fuses (for 230V models). Brake output is protected with a 1.25A, 250V time-delay fuse (see appendix A).



NOTE: When replacing fuses, use fuses rated for 250V ONLY.

2.4 CONTROL INPUT

The 5251-2 provides smooth application of current from zero up to a maximum of 1 amp by either a ten-turn, 5k ohm potentiometer, or by an external 0–5 VDC control signal (See connection diagram on page 4).

For potentiometer control:

1. Wire the CCW side of the pot to the terminal marked POT 1.
2. Wire the wiper to the terminal marked POT 2.
3. Finally, wire the CW side of the pot to the terminal marked POT 3.

If you wish to use an external source to control the current level:

1. Connect the low side of the source (GND) to the terminal marked POT 1.
2. Connect the high side of the source (positive going voltage) to the terminal marked POT 2.

An input voltage of 0 VDC corresponds to 0 mA; 5 VDC input corresponds to maximum current for the range selected.

2.5 BRAKE OUTPUT

1. Connect one lead from the hysteresis brake to the terminal marked OUTPUT –.
2. Connect the other lead to the terminal marked OUTPUT +.



Note: Both terminals are above ground potential. Do not ground either terminal. Doing so will cause brake fuse F1 to open.

2.6 CURRENT METERING

If you wish to monitor the current level with an external voltmeter, PLC or other monitoring device:

1. Connect the negative lead to the terminal marked METER –.
2. Connect the positive lead to the terminal marked METER +.
3. Current monitoring is selectable by using the selector switch (SW2).
 - a. To select the 0-5 VDC scale, slide the switch to the MON position. This will give you a voltage equivalent of the actual current, 0 VDC = 0 mA; 5 VDC = maximum current of the selected range.
 - b. To select the 0-200 mV, 0-500 mV or 0-1000 mV scale (depending on current range selected), slide the switch to the DIS position. In this position, the actual current to the brake will be the reading on the voltmeter times 10.

3.0 SETUP

When using a potentiometer to control output current, the voltage applied to the CW end of the pot is approximately 5 VDC. This voltage is obtained from the internal supply of the 5251-2.

If an external current monitoring is used, each range of the 5251-2 may be calibrated individually.

Calibration of the 5251-2 was done at the factory prior to shipping and is usually not required. If calibration needs to be performed, follow the steps as outlined below.

3.1 ADJUSTMENT OF THE OUTPUT CURRENT

Setup:

1. Connect a 25 ohm, 30 watt minimum load resistor to the terminals marked OUTPUT.
2. Connect a digital voltmeter to the terminals marked METER. Observe polarity.
3. Attach a standard ammeter in series with the load resistor.
4. An input voltage must be applied to the unit to perform the adjustment. This can be done by using either the internal voltage reference or by using an external voltage source.
 - a. To use the internal voltage reference, connect a 5 K, 10-turn potentiometer to the terminals marked POT 1, 2, & 3 with the wiper going to the POT 2 terminal.
 - b. To use an external voltage source, connect a 0-5 VDC voltage source to the terminals marked POT 1 & 2 with the positive going to the POT 2 terminal.
5. Set the MON/DIS switch to the DIS position.
6. Power up the 5251-2 and adjust the potentiometer (or external voltage source) so that the voltage at the POT 1 & 2 terminals equals 5.00 VDC.
7. Select one of the ranges below that you wish to calibrate.
 - a. For the 1 Amp Range:
 - i. Position the jumpers at P3 & P6 (1 Amp range).
 - ii. Adjust the GAIN pot (R30) so that the ammeter reads 1.00 Amp.
 - iii. Adjust the 1A pot (R20) so that the voltmeter reads 100 mV (if current monitoring is used).
 - b. For the 500 mA Range:
 - i. Position the jumpers at P2 & P5 (500 mA range).
 - ii. Adjust the GAIN pot (R30) so that the ammeter reads 500 mA.
 - iii. Adjust the .5A pot (R21) so that the voltmeter reads 50 mV (if current monitoring is used).
 - c. For the 200 mA Range:
 - i. Position the jumpers at P1 & P4 (200 mA range).
 - ii. Adjust the GAIN pot (R30) so that the ammeter reads 200 mA.
 - iii. Adjust the .2A pot (R22) so that the voltmeter reads 20 mV (if current monitoring is used).

3.2 ADJUSTMENT OF THE 0-5 VDC MONITOR OUT

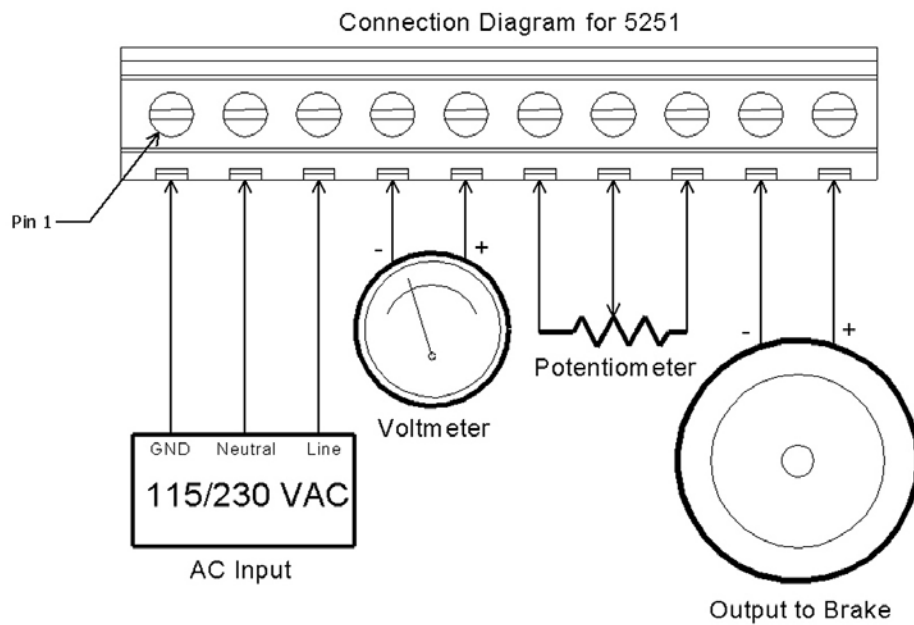


NOTE: You must perform the procedure above for adjusting the output current before adjusting the monitor out.

1. Perform steps 1-4 from the procedure above.
2. Set the MON/DIS switch to the MON position.
3. Power up the 5251-2 and adjust the potentiometer (or external voltage source) so that the voltage at the POT 1 & 2 terminals equals 5.00 VDC.

4. Select one of the ranges below that you wish to calibrate.
 - a. For the 1 Amp Range:
 - i. Assure the jumpers are at P3 & P6 (1 Amp range).
 - ii. Adjust the MON pot (R26) to get 5.000 V at the METER terminals.
 - b. For the 500 mA Range:
 - i. Assure the jumpers are at P2 & P5 (500 mA range).
 - ii. Adjust the MON pot (R26) to get 5.000 V at the METER terminals.
 - c. For the 200 mA Range:
 - i. Assure the jumpers are at P1 & P4 (200 mA range).
 - ii. Adjust the MON pot (R26) to get 5.000 V at the METER terminals.
5. When the following conditions are met, the unit is properly adjusted.
 - a. Control Voltage (POT 1 and 2) = 5.00 VDC.
 - b. Ammeter = max current for selected range.
 - c. Meter Out = 5.000 VDC.

4.0 CONNECTION DIAGRAM

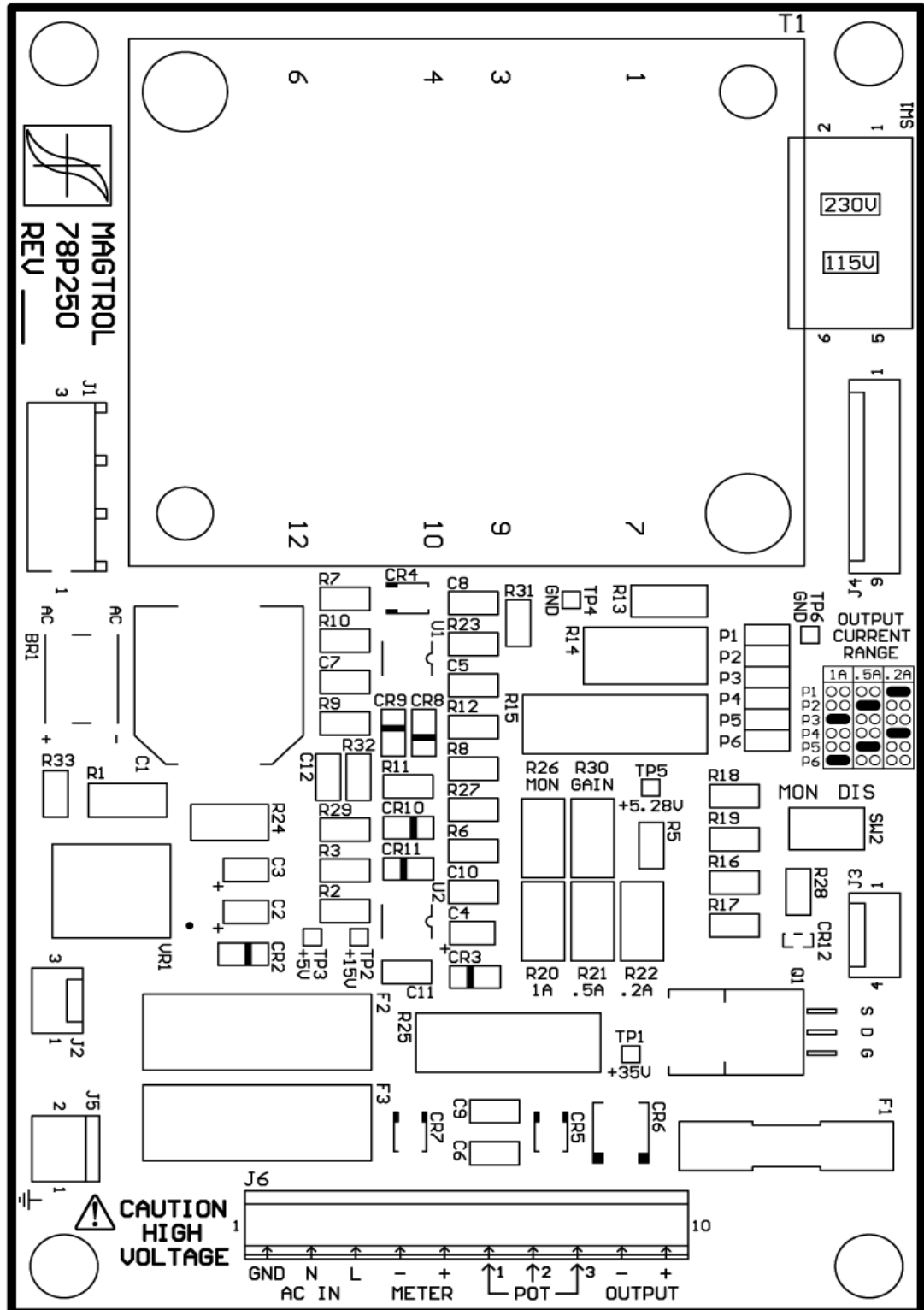


A.0 APPENDIX A: PARTS LIST

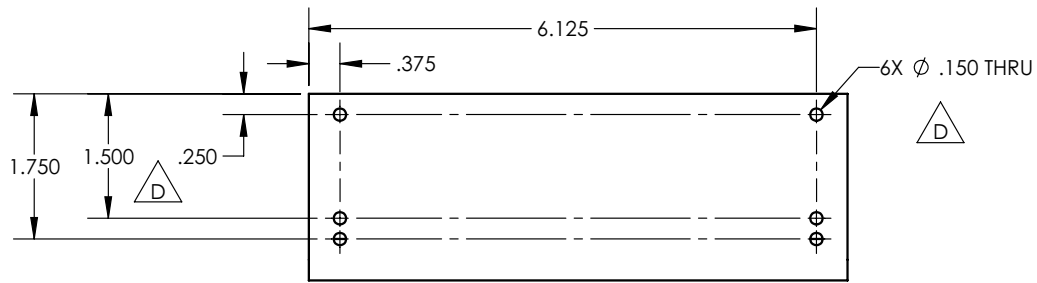
Qty.	Reference	Part Description	Magtrol P/N	Manufacturer	Manufacturer's P/N
1	F1	FUSE, 1.25A, 250V, 5X20mm, T, IEC	72F033	LITTELFUSE	02181.25HXP
2	F2, F3	FUSE, 1A, 250V, 5X20mm, T, IEC (For 115V models only)	72F027	LITTELFUSE	0218001.HXP
2	F2, F3	FUSE, 400mA, 250V, 5X20mm, T, IEC (For 230V models only)	72F023	LITTELFUSE	0218.400HXP
2	@ P1 – P6	SHUNT, JUMPER, 0.100" CTR, BLUE	85F187	3M	929952-10
2	@ F2, F3	FUSE COVER, WINDOWED	72H026	KEYSTONE	4628C
1	----	FEMALE DISCONNECT, CRIMP, 0.25", 18-22AWG	85F150	PANDUIT	DPF18-250FIB-M

B.0 APPENDIX B: DRAWINGS

B.1 5251-2 LAYOUT



B.3 MOUNTING BRACKET



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Testing, Measurement and Control of Torque-Speed-Power • Load-Force-Weight • Tension • Displacement

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