IBPS1 Rev.2

DYNAMIC BRAKE POWER SUPPLY

SPECIFICATIONS

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Model:	IBPS-1	IBPS-1.5
Supply Voltage	110/220 VAC, 50/60 Hz	110/220 VAC, 50/60 Hz
Supply Current	400mA @ 110V 290mA @ 220V	400mA @ 110V 290mA @ 220V
Output Voltage	60VDC Max across outputs, unloaded.	45VDC Max across outputs, unloaded.
Output Current	1 Amperes Max.	1.5 Amperes Max.
Control Signal	0-10VDC in Voltage Control Mode, 4-20mA in Current Control Mode	
Input Fuse Value	*(5 x 20mm Slow Blow)* F2 - 0.8A	*(5 x 20mm Slow Blow)* F2 - 0.8A
Output Fuse ** Maximum Value	*(5 x 20mm Slow Blow)* F1 - Output Current, 1A Max	*(5 x 20mm Slow Blow)* F1 - Output Current, 1.5 A Max

** - output fuse should be specified to protect the dynamic brake. Value should not exceed those presented in table.

SUPPLY VOLTAGE SELECTION

The IBPS power supplies can be operated from 110 to 220 VAC.

For 110 V operation, JP1 and JP2 should be installed, JP3 removed.
For 220 V operation, JP1 and JP2 should be removed, JP3 installed.

Note that the supply can be permanently damaged if powered with 220V when configured for 110V.

CUSTOM VERSIONS

Custom variations of the power supply can be obtained by contacting factory. Output open-circuit voltage, current rating, input control signals, can all be custom altered if required.

SPECIFICATIONS (Continued)

Voltage Control Mode	IBPS-1	IBPS-1.5
Input Impedance	200 Kilo-Ohms	
Input Voltage for 0 output current	0 Volts	
Full Scale input Voltage	10 Volts	
Span Adjustment Maximum ("Span Adjust" pot fully clockwise)	1.0 Amperes	1.6 Amperes
Span Adjustment Minimum ("Span Adjust" pot fully counter-clockwise)	420 milli-Amperes	560 milli-Amperes
Zero Adjustment	N/A	N/A

Current Control Mode	IBPS-1	IBPS-1.5
Input Impedance	500 Ohms	
Input Current for 0 output current	0 to 4 mA *(=2 Volts)*	
Full Scale input Current	20 mA *(= 10 Volts)*	
Span Adjustment Maximum ("Span Adjust" pot fully clockwise, 20 mA control current)	1.0 Amperes	1.6 Amperes
Span Adjustment Minimum ("Span Adjust" pot fully counter-clockwise, 20 mA control current)	420 milli-Amperes	560 milli-Amperes
Zero-Adjustment (Pot allows adjustment to compensate for up to a 10% errorcontrol circuit's 4 mA (Zero) input signal.)	+/- 0.4mA	+/- 0.4mA

CONNECTIONS

All connections to/from the IBPS power supplies are made via removable terminal blocks.

J1 Position	Signal Name	Description
J1-1	NEUTRAL	120 VAC Supply Input
J1-2	N/C	No connection
J1-3	LINE	120 VAC Supply Input, Fused (F2) 1.0 Amperes
J1-4	N/C	No connection
J1-5	BRAKE+	Brake Supply, Fused (F1). Connect to positive terminal of brake. **NOTE**: This terminal is always live unless fuse blown. It is normal to see a voltage on this terminal relative to common.
J1-6	BRAKE-	50 VDC Brake Return. Connect to negative terminal of brake. NOTE: This terminal is **not equivalent** to ground or common
J1-7	10V Ref	10.00 Volt Reference (Re. Ckt Common), 10mA maximum drive. This signal may be used to control brake via a potentiometer in **VOLTAGE MODE only**.
J1-8	CTRL IN	Input Control Signal, 0-10 VDC, Or 4-20 mA, depending on setting of switch S1.
J1-9	COMMON	COMMON for control input, = circuit Common. **DO NOT CONNECT TO BRAKE !!!**

** Note: Connections labelled on Printed Circuit Board, visible when terminal block removed.

Connector Type: Pheonix MBTA2.5/9-ST-5.08
External Drive Transistor: MJ423

INDICATORS

The IBPS power supplies are equipped with four LED indicators, providing status of the supply.

Indicator	Color	Description
POWER	Green	Indicator is lit if the supply is powered up and the BRAKE output fuse is intact. If LED not lit, either of the fuses could be blown or the unit is not powered
ACTIVE	Orange	Indicates that the supply is trying to supply current to the brake. Altenately, indicates that the control input is commanding current flow. (Useful for trimming zero in 4-20 mA mode)
TEMP	Red	Indicates that the supply is shut down due to high temperature of power transistor. Supply will resume operation when safe operating temperature is reached.
FAULT	Red	Indicates that the brake is not capable of delivering the requested current. This could be because of high load impedence, broken connection to load, or blown output fuse.

GENERAL DESCRIPTION

The IBPS1 power supply is intended to drive a highly inductive load with a current determined by its input control signal. The input can be voltage controlled (0-10 Volts) or current controlled (4-20 mA). Full scale output of the device is 1 ampere for the IBPS1, 1.5 Amperes for the IBPS1.5.

With electromagnetic brakes, the braking action is a function of current. The response time of the brake to a change in input is affected by the highly inductive nature of the brakes. The rate of change of input current through the brake is proportional to the applied voltage, and inversely proportional to the brake's inductance.

The IBPS power supplies have been designed to shorten the response time of an electromagnetic brake by applying a high voltage (60 V) across the load until it achieves the brake's desired program current. The circuit is designed to be symmetrical (in time) for both increases and decreases in program load current.

Powered by standard line voltages, (110/220VAC), the supply has a two wire connection to the brake. An input analog signal (from PLC or D/A converter) controls the current through the brake.

The IBPS power supplies come standard with four LED indicators. These indicators provide status/troubleshooting information about the supply. A power LED indicates that the brake is live and all fuses are intact. An 'ACTIVE' LED indicates that the brake is being commanded to push current through the brake.

A 'FAULT' LED indicates that the supply is incapable of drawing the commanded current. This could be be because there is no connection to the load, the impedence of the load is too high, or the output fuse is blown.

A 'TEMPERATURE' LED indicates that the supply is shut down due to high temperature of power transistor. Supply will resume operation when safe operating temperature is reached.

CALIBRATION

The power supply can be configured for voltage or current control. Calibration procedures are different for Voltage and Current modes of operation of the supply.

For both methods of operation, the device should be connected to a load similar to the intended load, or short the BRAKE+ signal to the BRAKE- signal.

The IBPS1 power supply has a calibration test point, TP1, whose voltage corresponds with the brake current. Ie. 1V on this pin corresponds with 1A, 350mV corresponds with 350 mA.

Voltage Mode Calibration/Trim

To calibrate the board in voltage mode, the brake supply should be connected to its intended load or short the BRAKE+ signal to the BRAKE- signal. Ensure that dip switch S1 is set to the **VOLTAGE mode** setting (depressed on side that says 'Voltage'). There is only trimpot which will affect voltage mode calibration. There is no calibration of zero volts in in voltage mode. The brake responds to positive input voltages between 0 and 10 Volts DC.

Maximum Output (Span) Trim

This calibration should be performed with the power supply connected to its intended load. Some caution should be taken with in this step, as the Span trim, R10 will allow the the amplifier to exceed its maximum rated output (resulting in the blowing of fuse F1).

The output current can be measured with an ammeter, or by measuring the voltage between TP1 and TP3, circuit ground. Test point TP1 produces one volt per ampere of brake current. The following steps should be taken to perform the span trim for the device:

Apply a control voltage to the IBPS power supply corresponding to desired full scale ouput current (Designed for 10 Volts maximum input).

Trim potentiometer R10 (labelled SPAN) until the desired full scale current is measured from the brake ouput.

Current Mode Calibration/Trim

To calibrate the board in voltage mode, the brake supply should be connected to its intended load and input control signal. Ensure that dip switch S1 is set to the **CURRENT mode** setting (depressed on side that says 'Current'). There are two trimpots which will affect current mode calibration.

Calibration of Zero

The supply's output current can be measured via a milli-ammeter or by measuring the voltage between test points TP1 and TP3.

1. Set power supply input control current to its zero input signal (4mA)

2. Trim Zero Adjust potentiometer (R7) until LED indicator labelled 'ACTIVE' just turns on.

3. Trim potentiometer R7, labelled 'ZERO' back one turn or until LED remains off.

The LED indicator, labelled 'ACTIVE' should remain off until the supply is being commanded to draw current.

Maximum Output (Span) Trim

This calibration should be performed with the power supply connected to its intended load or short terminals BRAKE+ to BRAKE- on the power supply outlet. Some caution should be taken with in this step, as the Span trim, R10 will allow the the amplifier to exceed its maximum rated output (resulting in the blowing of fuse F1).

The output current can be measured with an ammeter, or by measuring the voltage between test points TP1 and TP3. Test point TP1 produces one volt per ampere of brake current. The following steps should be taken to perform the span trim for the device:

1. Apply a control current to the SRABPS power supply corresponding to desired full scale ouput current (Designed for 20 mA maximum input).

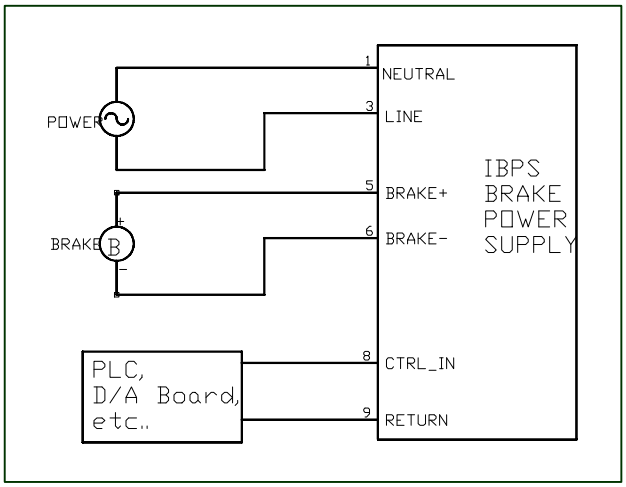
2. Trim potentiometer R10 (labelled SPAN) until the desired full scale current is measured from the brake ouput.

Typical connections to the IBPS Series Brake Control Amplifier

The IBPS series power supplies are designed to interface easily with 0 to 10 Volt and 4 to 20 mA control systems. The basic connection to the brake power supply involves powering the unit from 110/220 Volts AC, a two-wire connection to a control circuit, and a two-wire connection to the electromagnetic brake. This connection allows precise, continuous control over the brake current.

The circuit's control input signal is isolated from the line input, but not from the brake outputs. Neither of the brake outputs are equal to the circuit common. Therefore, neither of the brake outputs should be connected to circuit common or any other external connection relative to the control system's common. If there is a requirement for one of the brake's terminals to be connected relative to the control system's common signal, the power supply's control signal should be electrically isolated.

Figure 1: Typical Connection to IBPS Power Supply



A simpler method of control where continuous control is not required, involves feeding the module's ten volt reference output back to the control input in **voltage control mode**. The amplifier's current would be adjusted via the span adjustment potentiometer on the board. The power supply could then be operated/controlled via an external relay or switching device.

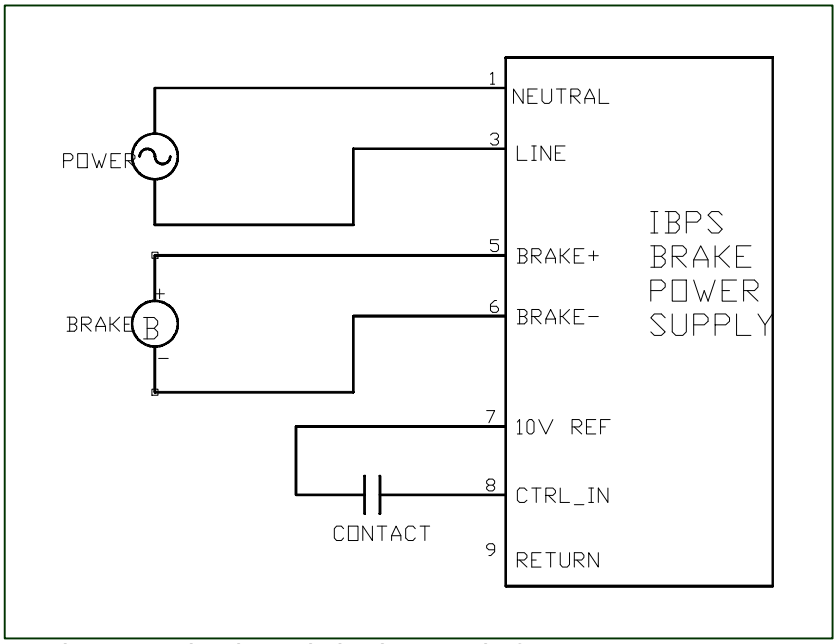
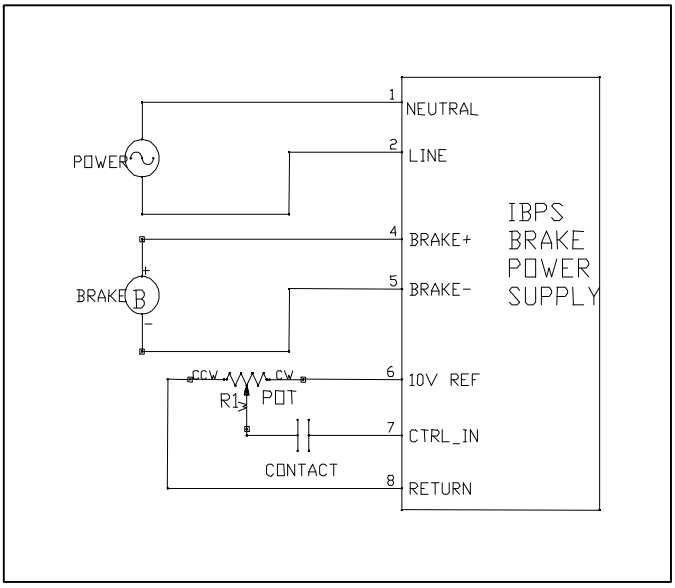


Figure 2: Simple Switched Control of IBPS

A variation of the above circuit allows a greater range of control over the brake power supply. Note that the supply must be in voltage control mode.

Figure 3: Simple Control, External Adjustment



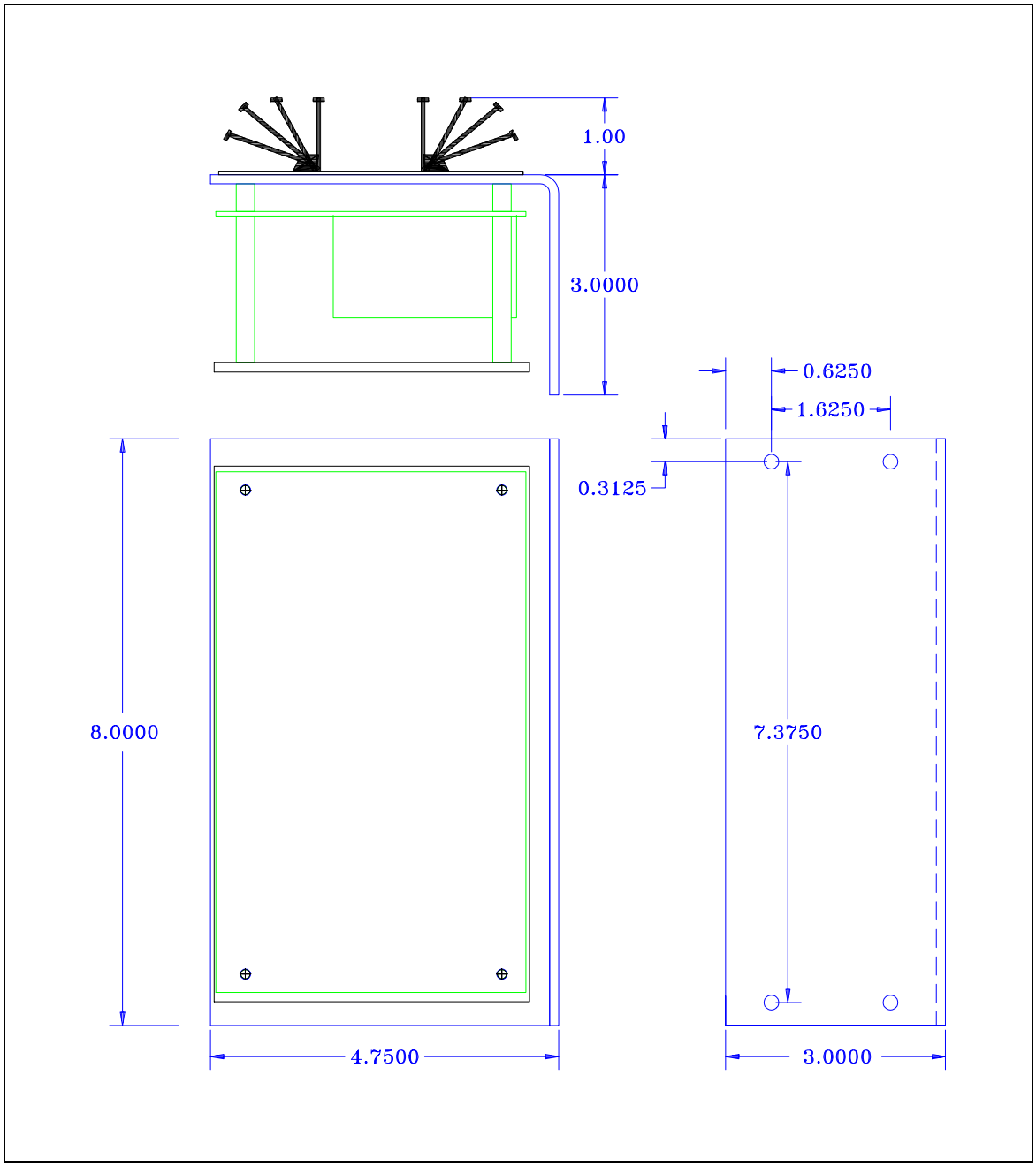


Figure 4 Dimensions of IBPS Power Supply