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INSTRUCTION MANUAL
MODEL TR-5 TENSION READOUT

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1.0 Introduction

The MAGPOWR Model TR-5 Tension Readout is a device for measuring the tension in a moving web or strand. The TR-5 can be used with any style MAGPOWR tension sensor. The tension sensor signal is relayed to the analog meter on the door of the enclosure. A switch selectable, tension reference signal of 4 to 20 madc or 0 to 10 vdc can also be sent to a separate recording device or MAGPOWR tension control.

2.0 Installation

Mounting

Mount the unit in a protected area with a temperature range of 0 to 40ºC (32 to 104ºF). NOTE: All external electrical connections should be made through conduit or through sealing type cord connectors to prevent contamination of the low level circuits, which would reduce system accuracy.

3.0 Setup

When MAGPOWR, or other 2.1 mvdc/vdc tension sensors are used, no setup is necessary. If 100 mvdc/vdc tension sensors are used, then JP1 and JP2 must be cut (See Figure 1) on the TSA amplifier which is the DIN rail mounted unit located inside the TR-5 enclosure. The amplifier enclosure may be opened by inserting a flat blade screwdriver under one of the retaining tabs in the base and lifting the cover (See Figure 2).

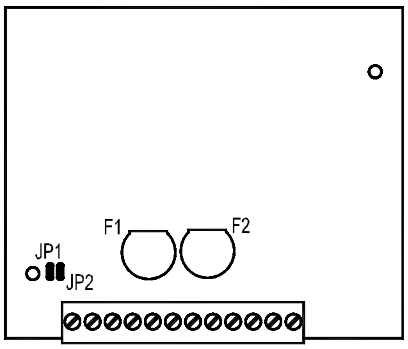


Figure 1
Location of JP1 & JP2

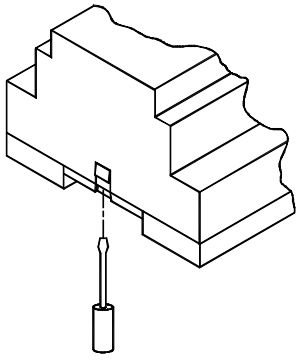


Figure 2
Amplifier Enclosure Top Removal

4.0 Electrical Connections

Figure 3 shows the wiring connections that are required for the basic system. They are:

115/230 vac power cable
Tension Sensor cables
Output cable
Meter cable

Wiring to and from the TR-5 must be done with double or reinforced insulation or protective screening which provides protective separation. All wiring should comply with the essential requirements of the appropriate standard(s) and is the responsibility of the installer.

Route AC power away from sensor wiring. Run all wiring in shielded cable. Connect shields to the terminals indicated as "SHIELD". Maximum shield length and maximum length of wires outside of the shield is 3 in. (75 mm).

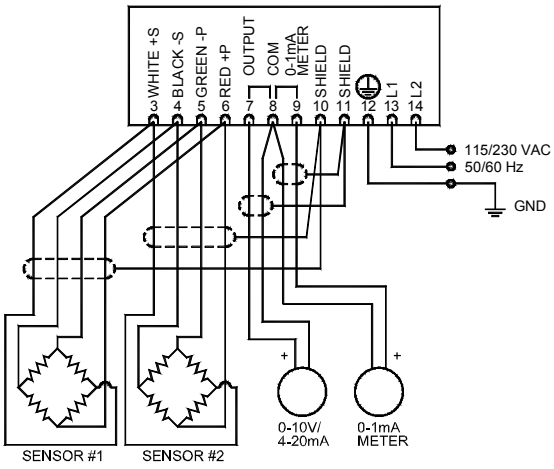


Figure 3
Wiring Connections

5.0 Tension Sensor Connections

After installing the web tension sensors per the appropriate tension sensor manual, connect sensor cable leads to the appropriate terminals.

Connect sensor cable leads to terminals 3 through 6. For two sensor applications the sensor cable leads are wired in parallel. Both white wires to terminal 3, both black wires to terminal 4, both green wires to terminal 5 and both red wires to terminal 6.

6.0 Meter Adjustment

On the TR-5, mechanically zero the tension meter using the zero adjust screw on the face of the meter.

7.0 Maintenance

The only maintenance that may be required is fuse replacement on the TSA inside of the TR-5. Replacement of the fuse(s) requires first removing AC power, then opening the amplifier enclosure. The amplifier enclosure may be opened by inserting a flat blade screwdriver under the retaining tabs in the base (See Figure 2).

8.0 Calibration

Use the "SELECT OUTPUT" switch to choose the desired tension reference output. There are two choices, 0 to 10 vdc or 4 to 20 madc.

Tension reference output calibration is accomplished by two adjustments (**ZERO** and **GAIN**). The **ZERO** adjustment is used to cancel the weight of the sensing roll. The **ZERO** adjustment will adjust out a sensing roll weight of up to 50% of the combined sensor(s) load rating(s).

After suspending a known weight with a temporary web (See Figure 4), adjust **GAIN** until the desired tension reference output is reached. The maximum load on the sensors must be less than or equal to the total sensor rating and greater than 1/8 of the total sensor rating. When two sensors are used the total sensor rating is the combined rating of both sensors (i.e. 100 lb for two 50 lb sensors).

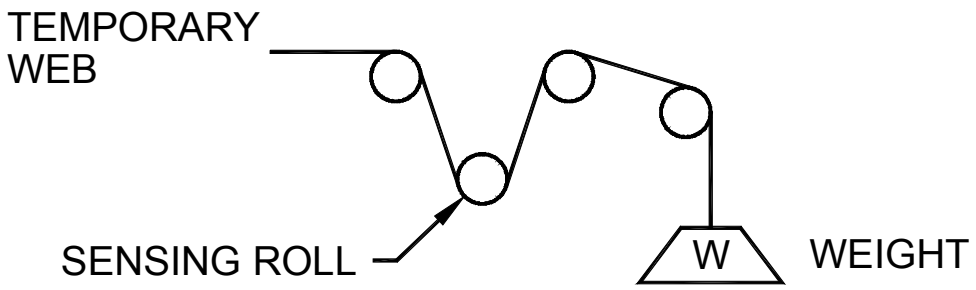


Figure 4
Dead Weight Calibration

9.0 Troubleshooting

PROBLEM	DIAGNOSTIC
Cannot ZERO the meter	1) The total weight of the sensor idler roller and shaft must be less than ½ of total sensor rating. When two sensors are used this is the combined rating of both (i.e. 100 lb for two 50 lb sensors). 2) Verify "SELECT OUTPUT" switch set for the appropriate tension reference output. 3) Verify tension sensors cables are connected correctly to the TSA. 4) Verify JP1 and JP2 are set correctly for the tension sensor(s) being used.
GAIN adjustment does not give the desired output	1) Calibration load is greater than the sensor(s) rating. 2) Verify 115/230 vac power select switch is set to the appropriate voltage. 3) Verify "SELECT OUTPUT" switch set for the appropriate tension reference output. 4) Verify tension sensors cables connected correctly. (See Figure 3) 5) Verify JP1 and JP2 are set correctly for the tension sensor 6) The impedance load on the output is not within specifications (0 to 10 vdc - 10 kohm min.) (4 to 20 madc - 500 ohm max.)

10.0 Specifications

Supply Voltage:	115/230vac, +/- 10%, 50/60 Hz, Switch selectable
Fuses: F1, F2	1.6 amp, Littelfuse Part No. 21601.6, or Wickmann Part No. 19194-053-FS
Enclosure:	IP20
Temperature Range:	
Operating:	0º C to 40º C
Storage:	-30º C to 65º C
Relative Humidity:	5% to 85%
Altitude:	0 to 2000 m
Compatible Residual Current Device Types:	A or B (IEC755)
Worst Case Fault Current:	1.6 amp ac
Sensor Excitation:	5 or 10 vdc, 64 madc maximum
Tension Sensor Input:	0 to 21 mvdc or 0 to 500 mvdc jumper selectable
Outputs:	
Tension Reference Output:	0 to 10 vdc or 4 to 20 madc
Meter Signal:	0 to 1 madc