

MONARCH INSTRUMENT

Instruction Manual



ACT-1B / ACT-1B-10 / ACT-1B-60

P/N 1071-4842-001
Rev 1.2 September 2000

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1.0 Description

The ACT-1B Series Digital Panel Mount/Bench Tachometers are used to display RPM from a single pulse per revolution (Model ACT-1B), 10 pulses per revolution (Model ACT-1B-10) or 60 pulses per revolution (Model ACT-1B-60). The units are powered by either 115 or 230 Vac, 50/60 Hz or an optional 12 Vdc. The ACT-1B Series has a "Universal Input", accepting input signals from optical, proximity, magnetic, infrared or laser sensors; direct TTL or an external AC source. The ACT-1B Series is primarily intended for permanent panel mount installation, and provides a 5 digit LED display of rotational speed. All connections are made on the rear of the instrument with easily accessible screw terminal connectors.

The tachometer has options for 4 to 20 mA or 0 to 5 Vdc output proportional to speed, and a pulse repeater output. These options will not be installed on your unit unless specifically ordered by you.

2.0 Installation

The ACT-1B Series Tachometers are housed in a 1/8th DIN enclosure and requires a 3.58 inch wide by 1.74 inch high mounting hole. (91x44mm)

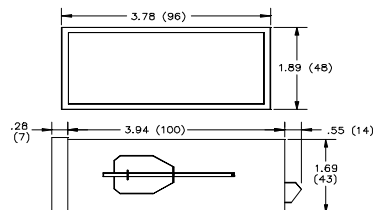


Fig 1 - Dimensions Inches (mm)

Check the power requirements listed on the rear panel. Remove the mounting clips, if fitted, and install the unit into the panel from the front. From the rear of the unit, install the mounting clips on each side then tighten the mounting screws against the rear of the front panel.

DO NOT OVER TIGHTEN THE MOUNTING SCREWS

Power is supplied to the unit via the 3 way screw terminal, marked **POWER**, on the rear panel.

If the unit is AC powered, 115 or 230 Vac, connect a power cable to the terminals marked **L** for Live (Hot) and **N** for Neutral (Return).

The earth is connected to the **GND** or Ground Terminal. Note: The ground connection is optional, the unit is totally isolated from the AC power. If you are using the optional PC-6 power cord, the connections are as follows:

- Brown - To **L** (Live - Hot)
- Blue - To **N** (Neutral)
- Green - To **GND** (Earth Ground)

If the unit is dc powered, connect the dc supply Positive to the "+" terminal and the dc supply Negative or Common to the "-" terminal. The ground connection is optional.

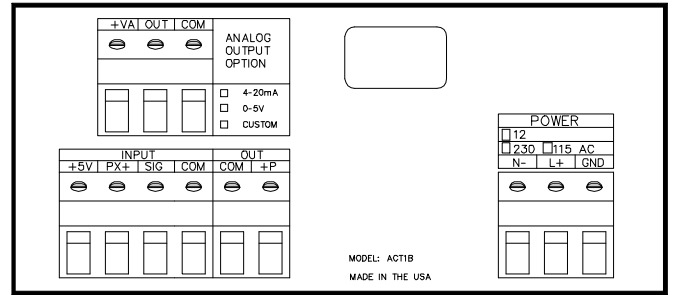


Fig 2 - ACT-1B Rear Panel

3.0 Sensor Connections

The ACT-1B has four input terminals on the rear panel. This group of terminals is marked INPUT. Refer to Figure 2 above. The four terminals are individually marked +5V, PX+, SIG and COM. They function as follows:

- +5V** Positive +5 Volt Supply Output. Used to power the remote optical, laser or infrared sensors. Maximum load is 75 mA dc.
- PX+** This is the positive supply for use with two wire proximity sensors. Output voltage is +8V DC. Maximum load for proper operation with two wire sensors is 5 mA.
- SIG** Signal Input. This is the input for most AC signals, both Unipolar and Bipolar, from 200 mV to 50 V. It is also TTL compatible. Connect the signal wire from three wire sensors or the positive side of two wire magnetic sensors to this terminal. Typical Impedance is 10 K.

4.0 Output Options

There are two output options available:

- Analog Output, 4 to 20 mA or 0 to 5 Vdc.
- Pulse Repeater Output

4.1 Analog Output Option

The Analog Output is 4 to 20 mA dc or 0 to 5 Vdc. The low and high endpoints **must be specified when ordering from the factory**. Specify the value for 4.00mA or 0 Vdc say 0 RPM and the value for 20.00mA or 5 Vdc (full Scale) say 3600 RPM. The output will then be linear over the range 0 to 3600 RPM and will vary from 4 to 20 mA or 0 to 5 Vdc in 4096 discrete steps.

The current output (mA) is a sink, and requires an external source voltage. A voltage source (+15V) is provided at the +VA terminal of the analog output. The ACT-1B controls the amount of current that flows from the external source. Typically you would connect the load to the "OUT" terminal of the ACT-1B and the "COM" when using an external source or from the "+VA" terminal through the load to the "mA" terminal when using the internal voltage source. Refer to Figure 3. Note that the Voltage Source you use will determine the maximum resistance of the load. This voltage is referred to as the compliance voltage and must be equal to the maximum current through the load (20 mA) multiplied by the load resistance plus 4 volts. For example, if the load is 1000 ohms, the external voltage source must be:
 $(1000\Omega \times .020A) + 4V = 24 \text{ Volts.}$

Thus, for an external source voltage of 24 Volts dc, the maximum loop load (the sum of all resistances in the loop) is 1000W. 24 Volts is in fact a recommended voltage. In any event the external voltage should **NOT** exceed 40 Volts dc. The internal voltage is +15V and permits the use of a load not exceeding 500W (ohms). The voltage output, 0 to 5Vdc connects to the "OUT" terminal which is the +5V output and the "COM" which is the return common.

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4.2 Pulse Repeater Output Option

The pulse output option is essentially a conditioned repeater output. It gives a 5 V pulse out for each pulse in. The output is on the rear terminal marked Out. Connections are - pulse out (+P) and Common (COM).

5.0 Specifications

Range:	5 RPM to 99,999 RPM
Resolution:	± 1 RPM
Power Supply:	115 or 230 Vac $\pm 10\%$ 50/60 Hz (Specify when ordering) dc Option: 12 Vdc at 1.75 Watts Maximum Input. "Universal Input" for Optical, Proximity, and Magnetic Sensors, two wire or three wire. TTL input. AC input from 200 mV to 50 Volts. All inputs 1, 10 or 60 pulses per revolution depending on model of instrument.
Sensor Excitation:	"PX+" 8 V dc at 5 mA "+5V" 5 V dc at 75 mA.
Sensitivity:	Two wire sensors: 1 mA off, >3 mA on (e.g. Monarch P5-11) Signal Input : 200 mV into 10 KW
Recommended Sensors:	Optical - Monarch ROS-5W Proximity - Monarch P5-11 Magnetic - Monarch M-190 Infrared - Monarch IRS-3 Laser - Monarch RLS-3
Options:	
Analog Output:	4 to 20 mA dc with a maximum external excitation voltage of 40 Volts dc or 0 to 5 Vdc.
Linearity:	$<\pm 0.5\%$
Resolution:	12 bits or 4096 steps (.025%)
Pulse Output:	5V pulse out. One pulse out for 1 pulse in.

For wider input range applications (to 500,000 RPM), programmable alarm limits, analog outputs, or RS232 output, or scaling, consider the ACT3 series of panel tachometers.

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COM Common or Negative Terminal. This is the common for both signal and power on most sensors.

Refer to Figure 3 for connection of Monarch standard Sensors. The connections are typical for these types of sensors.

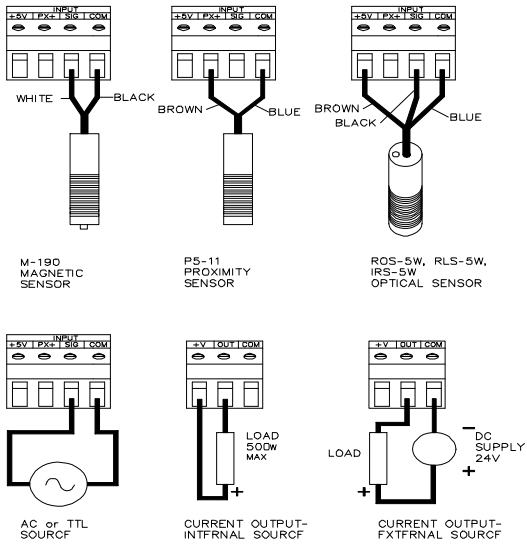


Fig 3 - ACT-1B Connections

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