



Type 8118-1000

APPLICATIONS

Monitoring Speed and Direction of Rotation of:

- Diesel Engines
- Gas Turbines
- Propeller Shafts
- Electric Motors
- Speed Drives
- Bow Thrusters
- Pumps

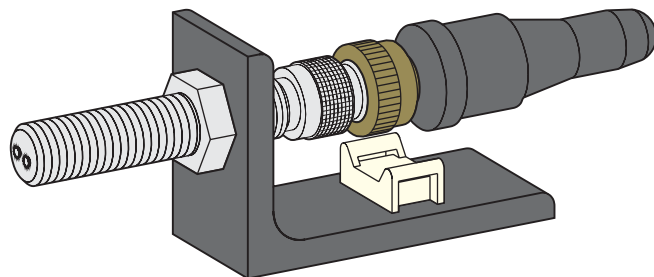
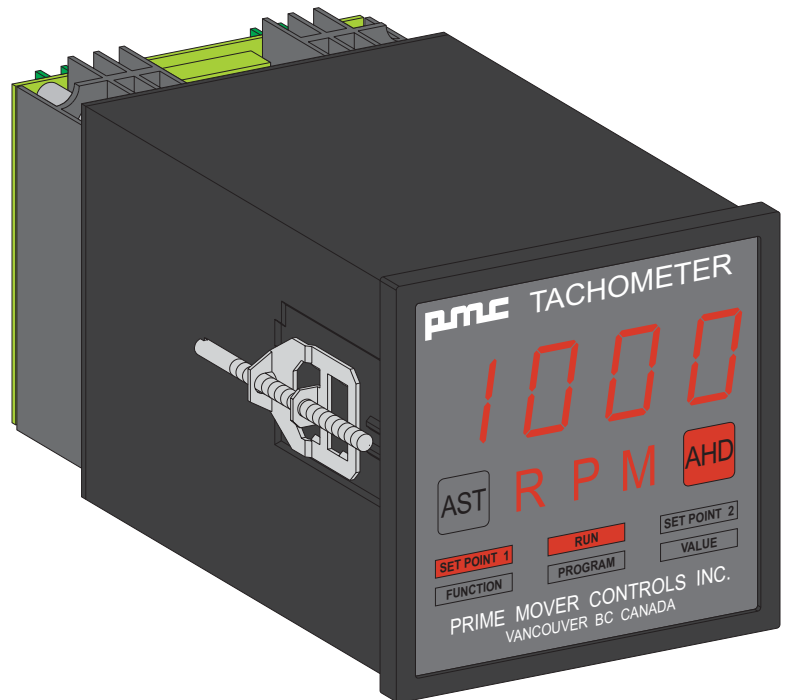
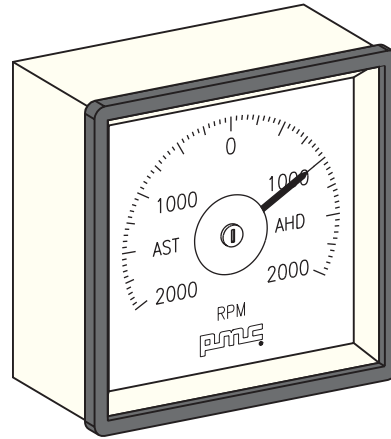
FEATURES:

- Retrofits easily into existing vessels
- Display update rate is proportional to change in rpm
- Many scale options available
- Senses from 0 to 9999 rpm
- Dimmable illumination for night operation on ship's bridge
- Synchronized update for side by side indicators
- Microprocessor controlled digital accuracy
- Field adjustable with rear pushbuttons
- Four programmable set points for external logic or interlocks
- Programmable over speed trip with safe test option
- Drive output for many digital tachometers
- Drive output for six analog tachometers
- Can be configured as a switchboard style frequency meter

Optional Equipment:

- Illuminated, DIN style, analog tachometers are available
- Non-contact speed sensor
- Magnetic pickup, cable and connector are waterproof

DIGITAL TACHOMETER SYSTEM



PRIME MOVER CONTROLS INC.

DESCRIPTION

The PMC type 8118 Digital Tachometer is designed to accurately display the speed of rotating machinery sensed by remote magnetic pickups. It also provides a linear analog output signal for remote analog tachometers. Included with the tachometer are four set point open collector outputs which can be used for over speed trips, engine run indication, interlocks and any other digital speed functions.

The display is easily readable, stable, filtered and averaged. It uses a smart time base whereby the display is updated every $\frac{1}{2}$ seconds if the rpm is changing rapidly, but only every 4 seconds if the difference between displayed and measured rpm is within 1% of full scale rpm.

A complete system consists of a sensor, multi-core shielded cable with waterproof connector, mounting bracket, Digital Tachometer, and optional remote Analog Tachometers.

The sensor is usually a magnetic pickup that scans gear teeth and generates a frequency signal that is proportional to the speed of rotation of the machinery. As an alternative to gear teeth, the scanned target may be magnetic tape. For applications involving rotation in two directions, a bidirectional pickup is used. This pickup generates two signals that can be compared to obtain the direction of rotation.

The Digital Tachometer is self-contained. It includes all circuitry and logic required to interface with the magnetic pickups, display rpm, repeat measured values to remote locations, control over speed trip and set point relays and signal condition the output for remote analog displays. All adjustments, such as number of teeth on sensed gear or tape, are field adjustable through rear-mounted push buttons. Adjustment of the over speed set point is made intentionally complex to prevent casual alteration of this critical engine function.

The over speed set point can be tested by putting the digital tachometer into over speed test mode. In this mode, an over speed shut down will occur when the measured speed reaches 85% of the over speed trip setting.

An indicator on the front of the tachometer flashes when in over speed test mode.

Optional remote meters may be Digital Tachometers or Analog Tachometers.

When Digital Tachometers are used as remote meters they receive an amplified frequency signal generated by the main Digital Tachometer (usually located in the engine control room). They have the same accuracy and capability as the main tachometer. Bridge located tachometers use an externally mounted, low wattage, dimmer potentiometer. This controls the level of illumination of the display and, by means of an internal computer, provides maximum sensitivity at low intensity levels. A minimum intensity adjustment is provided.

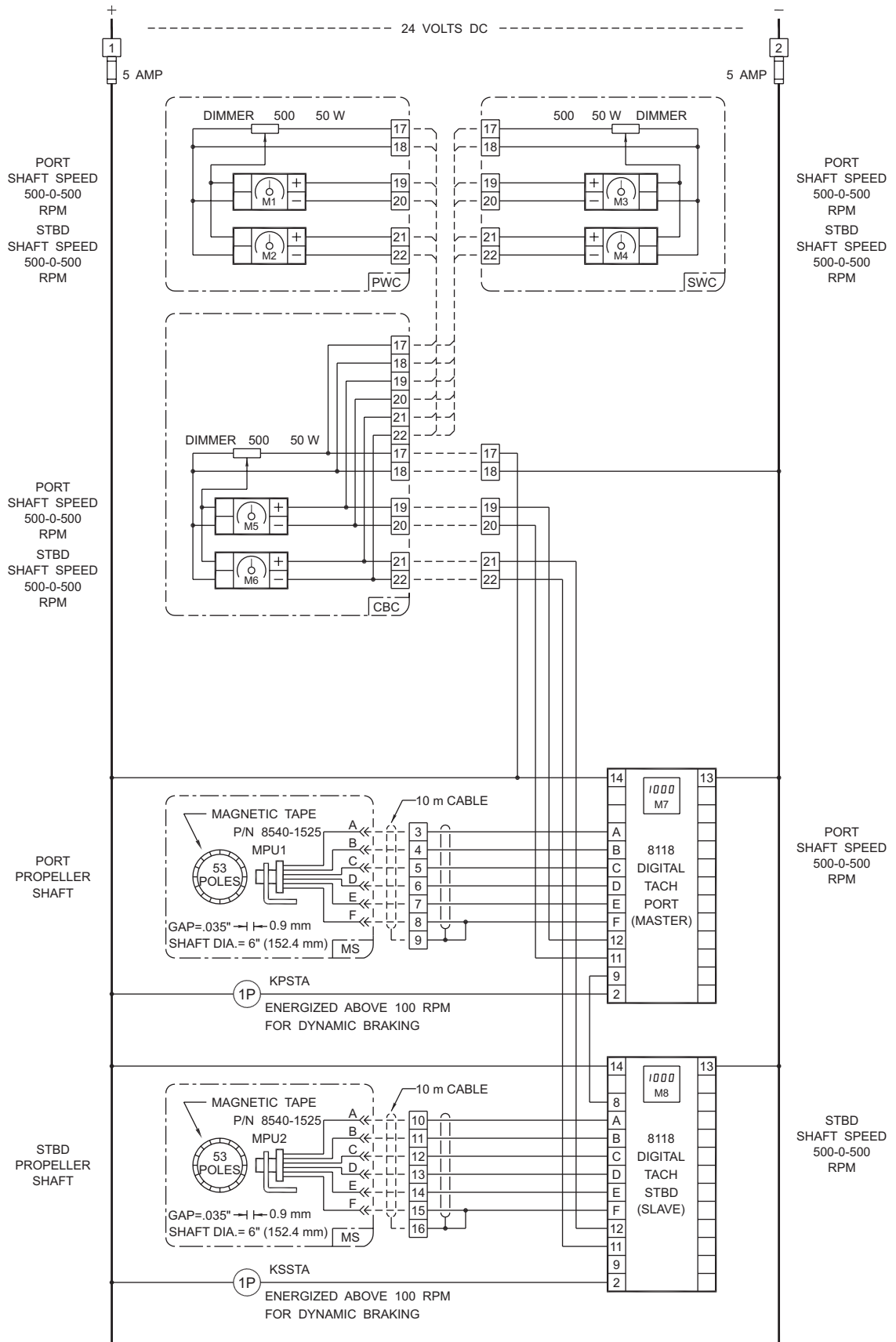
Remote Analog Tachometers operate from a high-resolution 0-10 V_{DC} signal provided by the Digital Tachometer. Up to six analog tachometers can be connected in parallel to each Digital Tachometer. The 8540-1230 (zero left) and 8540-1231 (zero center) analog tachometers have 240° movement, custom scales, front mechanical zero and rear span adjustments. They can be illuminated for night operation and will operate with the DC or AC dimmers available from PMC.

All components in the system are carefully selected and assembled for maximum quality and reliability. Printed circuit boards are carefully tested and conformally coated, all to PMC's standard quality assurance procedures. All components of the system are interconnected and powered for full operational tests, at PMC, prior to shipments.

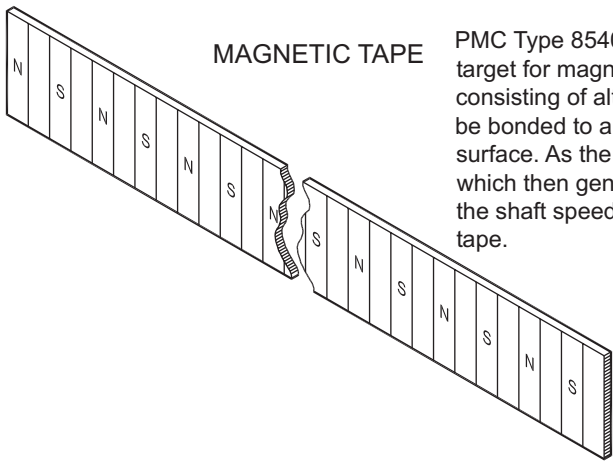
Instruction manuals complete with typical wiring diagrams, programming details and installation data, are included with each Digital Tachometer system.

SHAFT TACHOMETER SYSTEM

Typical Twin Screw System
Three Bridge Stations - One Engineerroom Station



SPEED SENSOR COMPONENTS

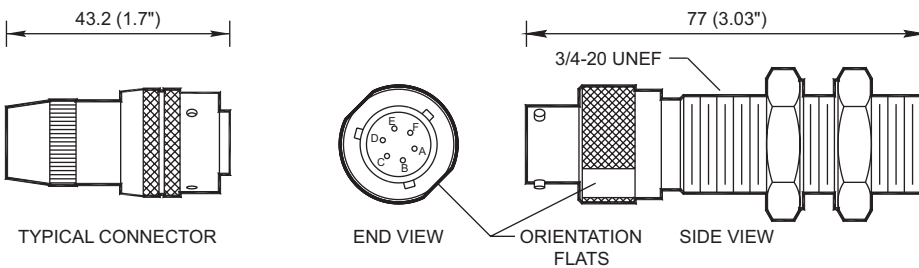


MAGNETIC TAPE

PMC Type 8540-1531 magnetic tape provides a convenient, simple and low cost target for magnetic pickups. The magnetic tape is a flexible permanent magnet consisting of alternating north and south poles arranged along the tape. The tape can be bonded to a rotating shaft and a magnetic pickup placed perpendicular to the tape surface. As the tape rotates, the magnets interact with the magnetic field of the pickup which then generates the pulsating output signals whose frequency is proportional to the shaft speed. An adhesive bonding kit is provided for installation of the magnetic tape.

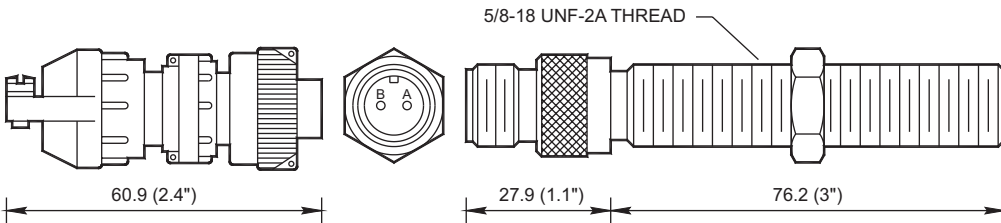
BIDIRECTIONAL MAGNETIC PICKUP

The PMC Type 8540-1525 magnetic pickup contains two passive, non-contact, self-powered speed transducers in a single package that convert mechanical motion into AC output signals. The relation of the phase of the two signals provides the direction of rotation. The target may be gear teeth, bolts, magnets, holes or PMC magnetic tape.

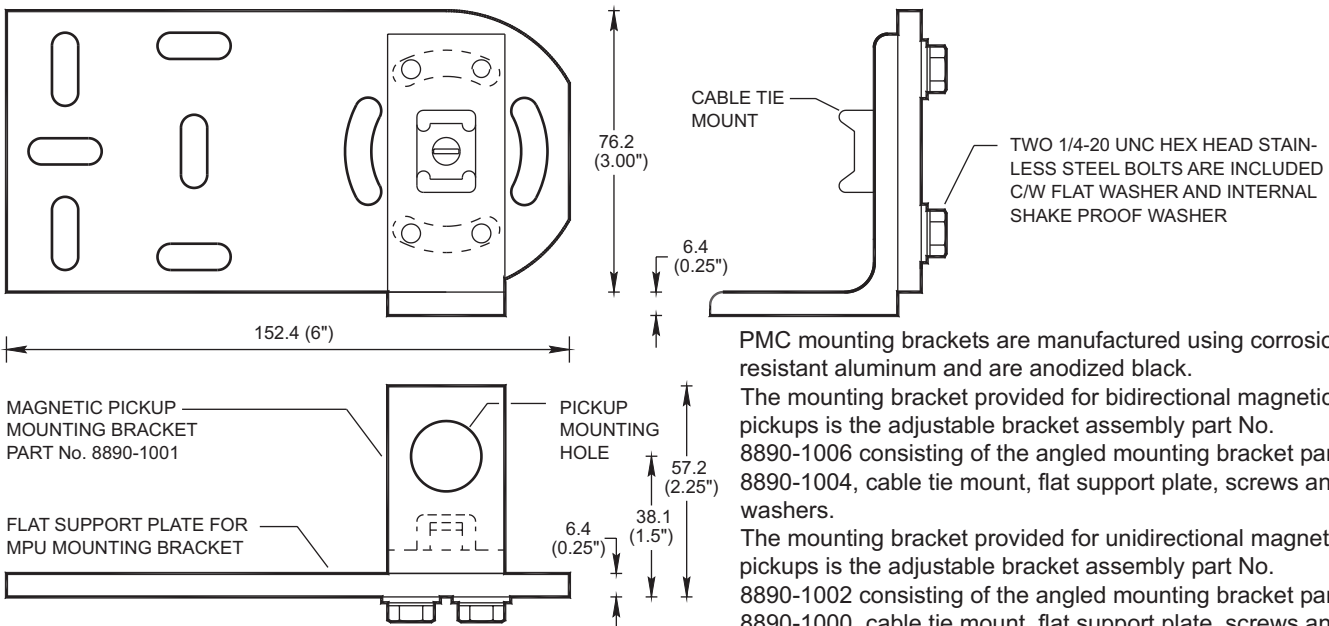


UNIDIRECTIONAL MAGNETIC PICKUP

The PMC Type 8540-1521 magnetic pickup is a passive, non-contact, self-powered speed transducer that converts mechanical motion into an AC output signal. The target may be gear teeth, bolts, magnets, holes or PMC magnetic tape.



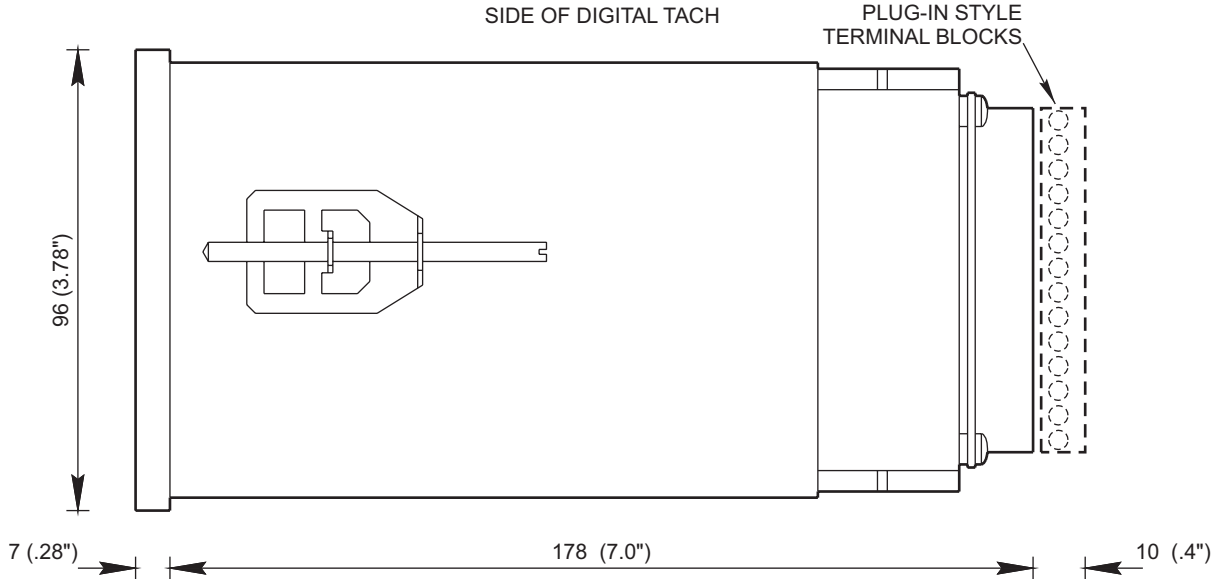
MOUNTING BRACKETS FOR MAGNETIC PICKUPS



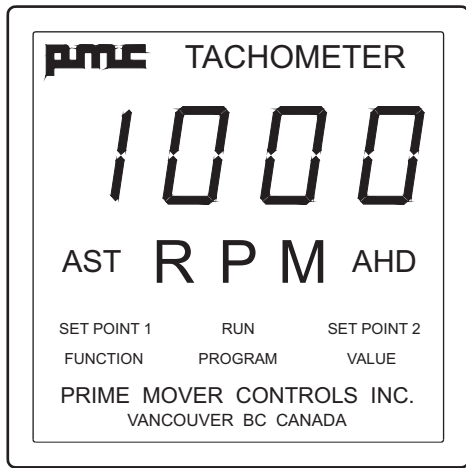
TWO 1/4-20 UNC HEX HEAD STAINLESS STEEL BOLTS ARE INCLUDED C/W FLAT WASHER AND INTERNAL SHAKE PROOF WASHER

PMC mounting brackets are manufactured using corrosion resistant aluminum and are anodized black. The mounting bracket provided for bidirectional magnetic pickups is the adjustable bracket assembly part No. 8890-1006 consisting of the angled mounting bracket part No. 8890-1004, cable tie mount, flat support plate, screws and washers. The mounting bracket provided for unidirectional magnetic pickups is the adjustable bracket assembly part No. 8890-1002 consisting of the angled mounting bracket part No. 8890-1000, cable tie mount, flat support plate, screws and washers.

DIMENSIONAL DETAILS



FRONT OF DIGITAL TACH

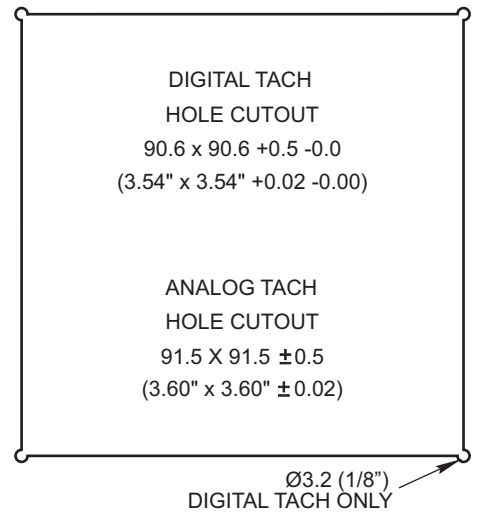


96 (3.78")

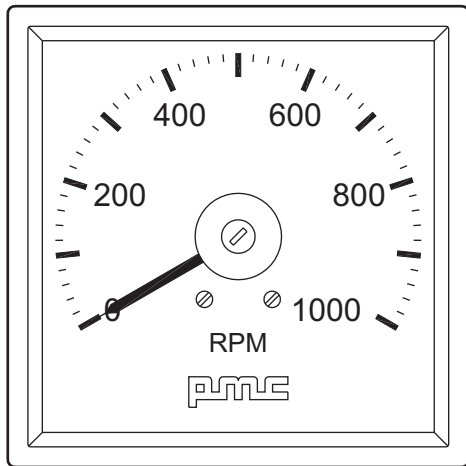
DIGITAL AND ANALOG
TACHOMETERS ARE
STANDARD 1/4 DIN SIZE
- 96 mm SQUARE -

MOUNTING CLAMPS,
SPARE LAMPS AND
SPARE FUSES ARE
INCLUDED WITH EACH
TACHOMETER INDICATOR

CUTOUT DETAILS

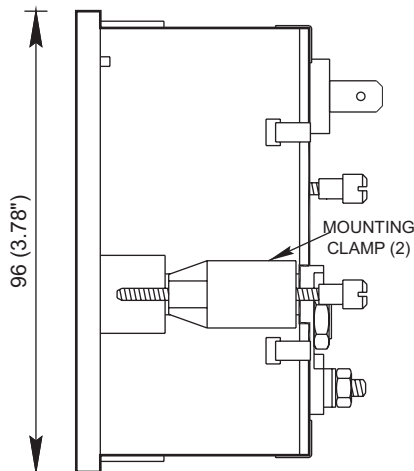


FRONT OF UNIDIRECTIONAL ANALOG TACH



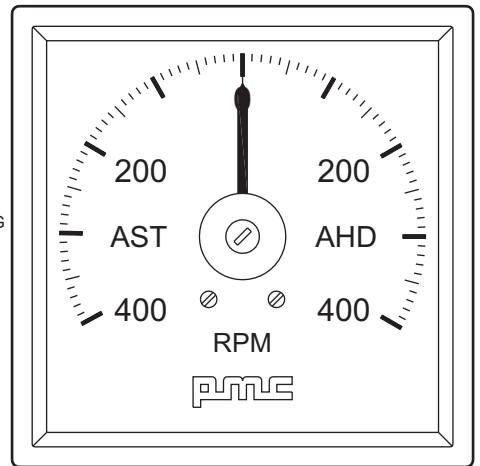
96 (3.78")

SIDE OF ANALOG TACH



59 (2.3")

FRONT OF BIDIRECTIONAL ANALOG TACH



96 (3.78")

SPECIFICATIONS

DIGITAL TACHOMETER P/N 8118

- Display - update rate dependant on change in rpm
Update - a difference greater than 1% of full scale between measured and displayed rpm causes a change from slow to fast update speed
- Slow Speed - update every 4 seconds
Fast Speed - update every 1/2 second
Synch - display update synchronization available between meters located in the same console by wire jumper
- Power - 24/32 V_{DC} nominal, 19.2-38.4 V_{DC} range
Current - 0.7 A nominal - 2 A surge
Protection - reverse and over voltage to 120 V_{AC}
Fuse - for power input - 3 A type ABC-3
Analog o/p - rated ± 10 V_{DC} at 6 mA maximum
Pickup o/p - 5, 10, 12 or 15 V_{DC} @ 100 mA max (program)
- Accuracy - front display - $\pm 0.1\%$
- analog output - $\pm 0.5\%$
Resolution - front display - $\pm 1/2$ least significant digit
- analog output - $\pm 0.03\%$
- Illumination - LED display c/w internal μ P dimming circuit
- Set points
Quantity - four (No.1 and No.2 are displayed on front)
Type - open collector-100 mA at 38.2 V_{DC} maximum
- all programmable (No.1 can be over speed trip)

Environmental

- Storage - -40 °C to +70 °C
Operating - -25 °C to +55 °C

Physical

- Dimensions - 96 mm H x 96 mm W x 200 mm D
Weight - 750 g

ANALOG TACHOMETER P/N 8540

- Display - 240° meter movement
Accuracy - 2% full scale deflection
Resolution - infinite
Input - 8540-1230 0-10 V_{DC} at 1 mA
- 8540-1231 10-0-10 V_{DC} at 1-0-1 mA
Adjustment - mechanical zero
- rear span potentiometer

Environmental

- Storage - -20 °C to +85 °C
Operating - 0 to +55 °C

Physical

- Dimensions - 96 mm H x 96 mm W x 65 mm D
Weight - 205 g

MAGNETIC TAPE TYPE 8540-1531

Operation

- Speed - of rotation - 3000 rpm maximum
Magnets - spacing - one pulse each 9.0 mm (0.354")

Environmental

- Operating - -30 °C to +70 °C
Material - chemically resistant to oils and seawater

Physical

- Dimensions - 30 mm W x 1.5 mm T (1.181" x 0.059")
Weight - 0.164 grams per mm - 0.145 oz per inch
Installation - adhesive mounting kit provided

BIDIRECTIONAL MAGNETIC PICKUP P/N 8540-1525

Operation & P/N 8540-1526

- Frequency - 10 to 20 kHz (8540-1525)
0 to 25 kHz (8540-1526)
Power - 5-10 V_{DC} at 52 mA average
Air Gap - recommended 0.9 mm (0.035")

Environmental

- Storage - -30 °C to +160 °C
Operating - -30 °C to +160 °C

Physical

- Dimensions - 76.2 mm L x 19 mm D (3.0" x 0.75")
Weight - 130 g
Thread - 3/4 - 20 UNEF

UNIDIRECTIONAL MAGNETIC PICKUP P/N 8540-1521

Operation

- Frequency - sensed 10 Hz to 15 kHz
Power - none
Air Gap - recommended 0.5 mm (0.020")

Environmental

- Storage - -20 °C to +85 °C
Operating - -20 °C to +85 °C

Physical

- Dimensions - 108 mm L x 15.8 mm D (4.25" x 0.625")
Weight - 82 g
Thread - 5/8 - 18 UNF

PICKUP MOUNTING BRACKETS

Physical

- Material - corrosion resistant aluminum
Finish - anodized black
Weight - p/n 8890-1001 60 g (4.2 oz)
- p/n 8890-1002 240 g (8.5 oz)
Mntg. Hole - sized and threaded to suit the magnetic pickup selected

ORDERING DATA

TYPICAL SYSTEM ITEMS SUPPLIED

- one magnetic pickup
- one mounting bracket
- one waterproof connector, pre-wired
- one pre-assembled cable 10 m (30') long
- one digital tachometer, scaled to suit
- one (or more) analog panel tachometer
- one optional dimmer control
- one optional power supply
- one set of spare lamps and fuses
- three sets of instruction manuals

INFORMATION REQUIRED

- magnetic pickup cable length (if longer than 10 m)
- sensing device - gear teeth or magnetic tape
- number of teeth per revolution (when target is gear teeth)
- accurate shaft diameter (when target is magnetic tape)
- digital tachometer displayed speed range
- total number of analog tachometers
- analog tachometer scale range
- analog tachometer special scale markings
- nominal applied volts, AC or DC
- bidirectional (fixed pitch) or unidirectional (cpp or engine)

PRIME MOVER CONTROLS INC.

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