



Type 8502-9004

APPLICATIONS

Monitoring the speed and direction of rotation of:

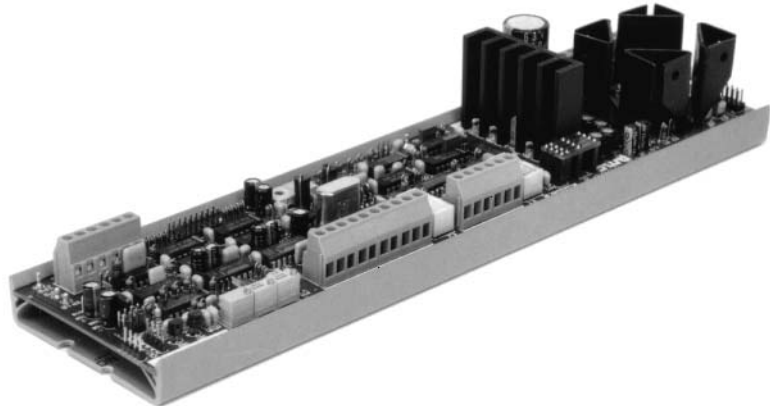
- Diesel Engines
- Propeller Shafts
- Electric Motors
- Speed Drives
- Pumps
- Conveyors
- Presses

FEATURES

- Easy installation to existing systems using magnetic tape
- Wide air gap between pickup and target
- Direction sensed from single magnetic pickup
- Waterproof magnetic pickup, cable and connector
- Senses wide speed range down to zero rpm
- Independent zero and span adjustments
- Drive capability for six panel meters in parallel
- Illuminated, DIN style, high quality panel meters, scaled to suit
- Ultrasonically cleaned and conformal coated printed circuit boards
- Optional alarm output for input signal failure, with remote arming capability
- Optional display of full astern on panel meters when input signal fails

BIDIRECTIONAL TACHOMETER SYSTEM

TYPE 8502-9004



PRIME MOVER CONTROLS INC.

GENERAL DESCRIPTION

The PMC type 8502 bidirectional rpm indicator system is designed to measure the speed of rotating machinery and to provide a linear analog output signal for remote displays. Also, as an option, it will provide digital failure signals for remote alarms.

A complete system consists of three units, as follows:

1. the sensor
2. the signal conditioner
3. the display.

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

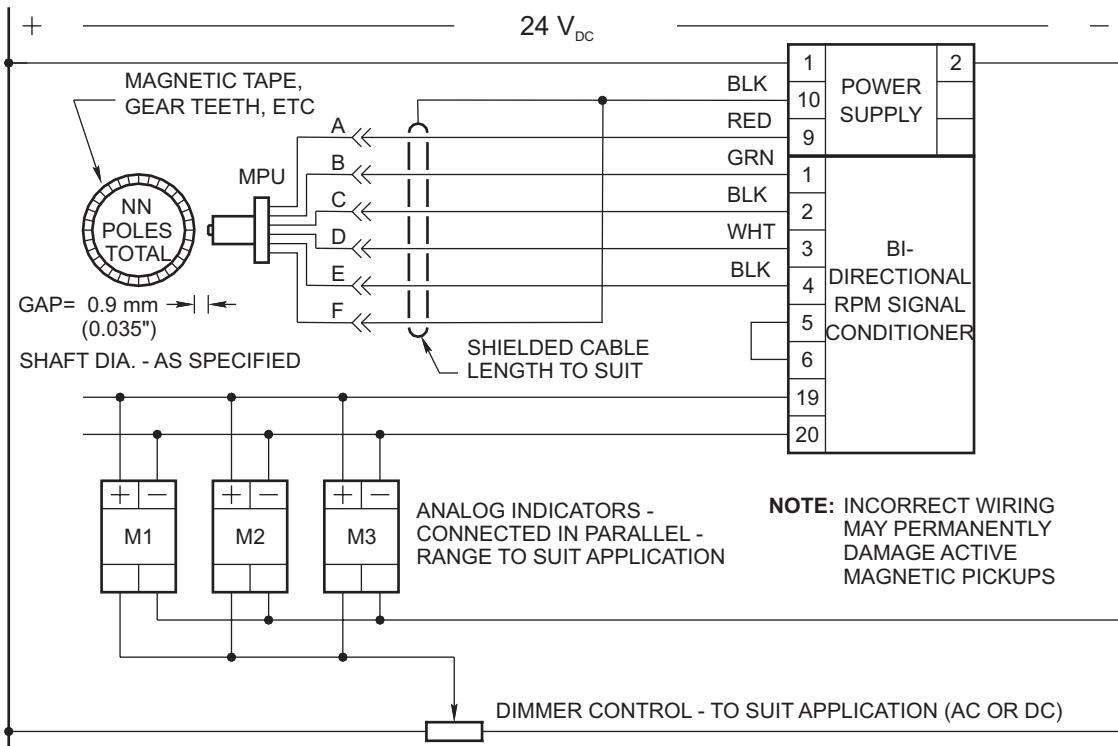
The signal conditioning unit consists of two printed circuit boards. One is a power supply PC board which generates various regulated voltages. The other is a bidirectional rpm PC board which takes the low level pulsating DC signals from the magnetic pickup and

converts them to a high level -10 to 0 to +10 V_{DC} linear output signal for remote displays. It includes direction sensing decoders with outputs, scaling options, selector circuits, meter drivers with zero and span adjustments (ahead and astern) and failure output options with disarm capability.

The display unit is typically an analog panel meter capable of displaying the bidirectional speed signal provided by the signal conditioner. Up to six remote panel meters may be powered simultaneously, with electrical span and mechanical zero on each meter. Internal illumination is also provided for night applications and AC or DC dimmer controls are available with 0-100% brilliance control. Various analog display options are available, including various meter sizes, bar graphs, etc.

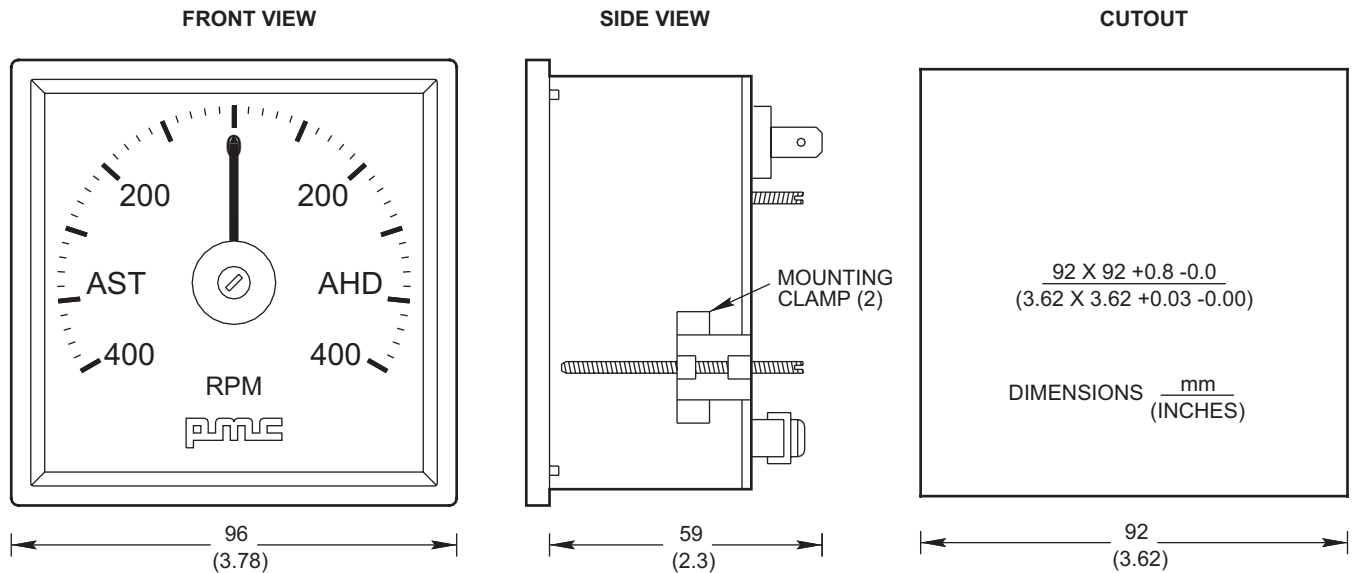
All components in the system are carefully selected for maximum quality and reliability. Printed circuit boards are CAD designed, carefully loaded and inspected, power tested, ultra-sonically cleaned and conformal coated. All components of the system are interconnected and powered for full operational testing at PMC prior to shipment. Instruction manuals are included.

CONNECTION DETAILS - BASIC CIRCUIT



NOTE: TYPICAL CONNECTION DIAGRAM
DO NOT USE FOR
CONSTRUCTION.

ANALOG DISPLAY



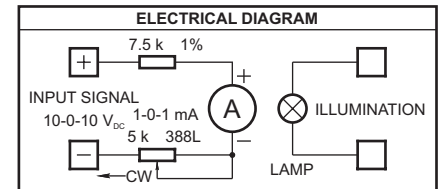
TECHNICAL SPECIFICATIONS

- Scales: standard and custom scales are available
- Movement: pivot and spring jewels, vibration damped for marine applications.
- Travel: 240° pointer travel.
- Accuracy: $\pm 1\%$ of full scale.
- Relative humidity: 75% RH average for year.
- Temperature: -20 to +60 °C.
- Housing: dust protected with glass front.
- Mounting: two mounting clamps are included
- Adjustments: zero (mechanical) and span (electrical).
- Illumination: standard, with single rear mounted bulb, easily replaced.
- Weight: 0.275 kg (9.7 oz)

ORDERING DATA

Each system includes, as standard supply, the following:

- one active magnetic pickup.
- one adjustable mounting bracket.
- one power supply
- one track mount extrusion
- one cable waterproof connector.
- one cable assembly, 6 m (20') long.
- one bidirectional signal conditioner.
- one panel meter, scaled to suit.
- one instruction manual.
- one set of spare lamps and fuses.



SPARE PARTS		
LAMP 12 VOLTS 2.0 WATTS	P/N 3898	
LAMP 24 VOLTS 3.0 WATTS	P/N 3899	
LAMP 32 VOLTS 1.2 WATTS	P/N 3630S	
GLASS WITH ZERO ADJUST	P/N GOS10P	
WHITE METER CASE	P/N GOS11P	
BLACK BEZEL	P/N GOS15P	
BLANK METER SCALE	P/N GOS16P	
SCALE SCREW	P/N GOS40P	
LAMP SOCKET	P/N VDO 600-813	
MOUNTING CLAMP	P/N MTG CLAMPS	

The following additional data is required to configure the system:

- magnetic pickup cable length.
- number of target teeth per revolution.
- magnetic tachometer tape required.
- shaft diameter (for magnetic tape).
- signal failure alarm output option.
- signal failure full reverse display option
- supply voltage, 22-38 V_{DC}, 120 V_{AC} or 240 V_{AC}.
- dimmer control option.
- total number of panel meters.
- meter scale range
- meter custom scale arrangement.
- additional spare lamps.
- additional instruction manuals.

SIGNAL CONDITIONER

SPECIFICATIONS

The Signal Conditioner unit consists of a power supply PC board and a bidirectional rpm PC board. Both are joined together by a small plug-in connector PC board. The complete unit is snapped into a track mounting channel which is a non-conductive, rigid, extruded PVC chassis with dual mounting slots on 51 mm (2") centers. The mounting channel is provided long enough for both PC boards plus an additional 13 mm (½") minimum on each end so that the PC boards need not be removed for mounting.

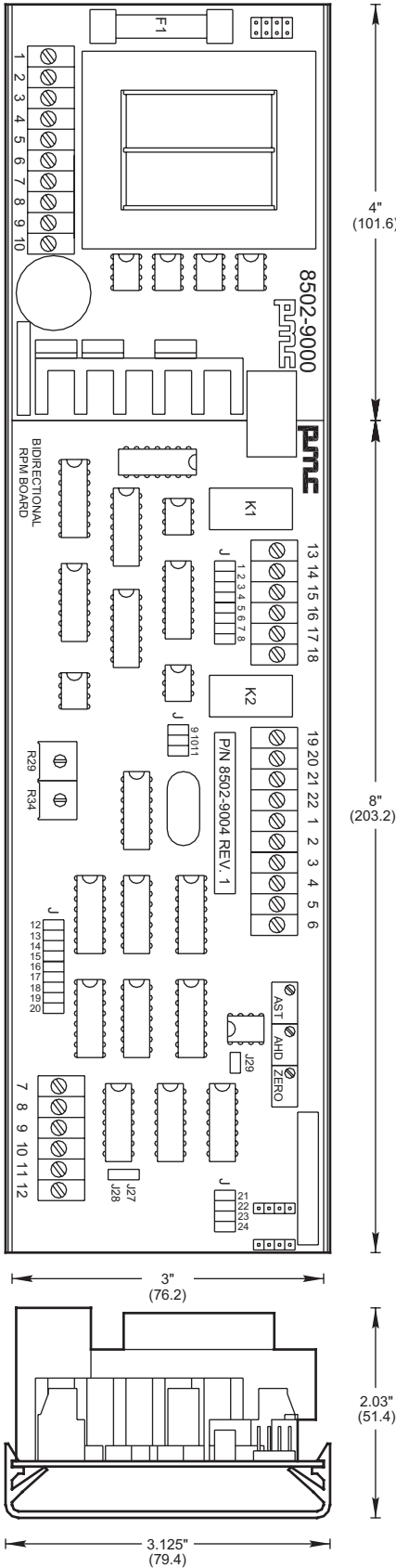
The Power Supply PC board may be supplied with either a 120/240 V_{AC} input or a 21-36 V_{DC} input. Normal power requirements is 5.7 W. AC units provide isolation between inputs and outputs. DC units are provided with input circuit reverse polarity protection. Regulated outputs are provided to terminals and connector pins.

The bidirectional rpm PC board accepts two input signals with a range of 0 to 100,000 Hz and generates an output signal of -10 to 0 to +10 V_{DC} @ 6 mA maximum for driving analog panel meters. Inputs may be any AC or pulsed DC signal sources generated by active or passive magnetic pickups, open collectors, frequency sources, magnetos, etc. Both input signals are compared and the larger of the two is used. The resultant signal is provided with a zero adjustment potentiometer and separate ahead and astern span adjustment potentiometers. The output is positive when ahead and negative when astern. An open collector output is provided and pulled low when the output signal is positive. Various ranges of input pulses for each revolution are jumper selectable on the PC board. If either input fails, the output reads in the ahead direction only. If both inputs fail the output is zero.

An optional failure detection alarm is offered and becomes armed when terminal 5 is pulled low. If either input circuit fails to receive incoming pulses, an open collector is pulled low (or optional relay contact 1 Form C is actuated) for each. If both input circuits fail to receive incoming pulses, another open collector is pulled low. Additionally, the failure option provides the following jumper selectable meter display output choices.

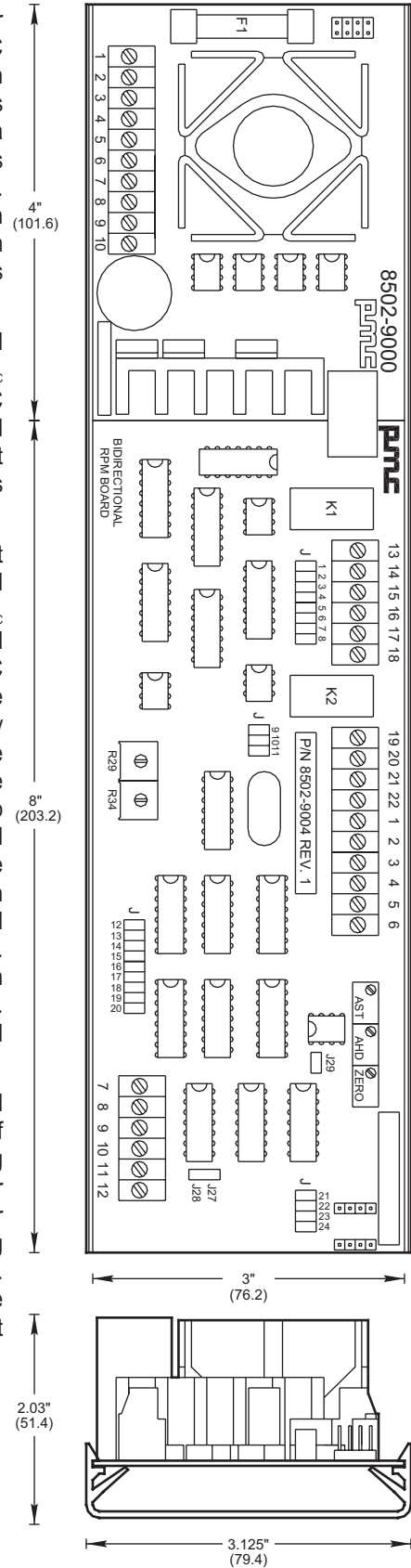
JUMPER	INPUTS	OUTPUTS	TERMINAL 11
J9	either fail both fail	full astern full astern	low low
J10	either fail both fail	full ahead zero	high Z high Z
J11	either fail both fail	full ahead full astern	high Z low

120/240 V_{AC} INPUT



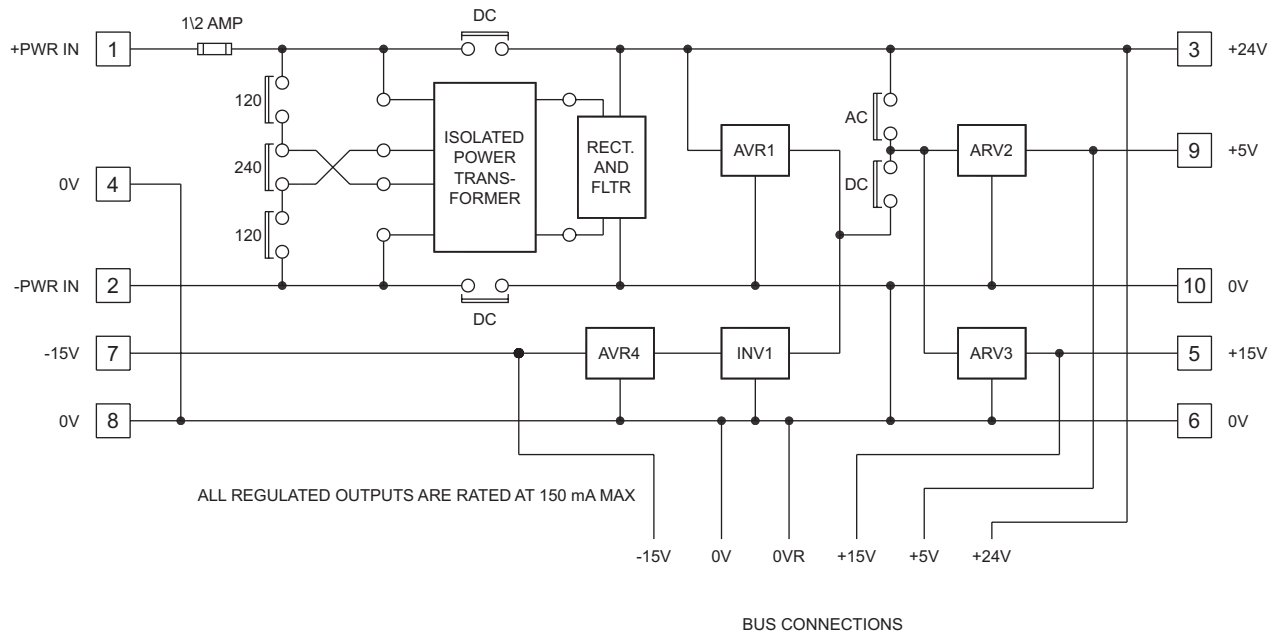
AC weight total=780 g (1.72 lbs)

21-36 V_{DC} INPUT

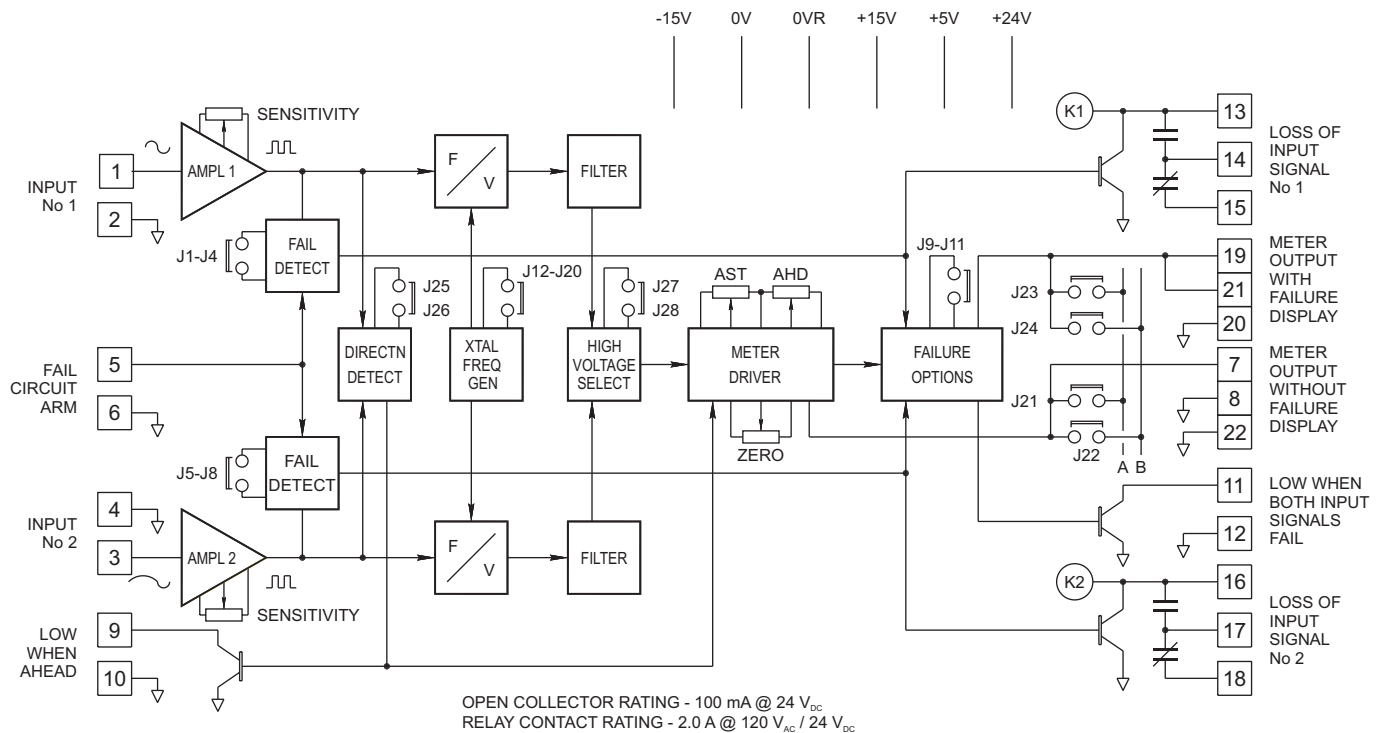


DC weight total=460 g (1.01 lbs)

BLOCK DIAGRAM - POWER SUPPLY



BLOCK DIAGRAM - SIGNAL CONDITIONER



SENSOR

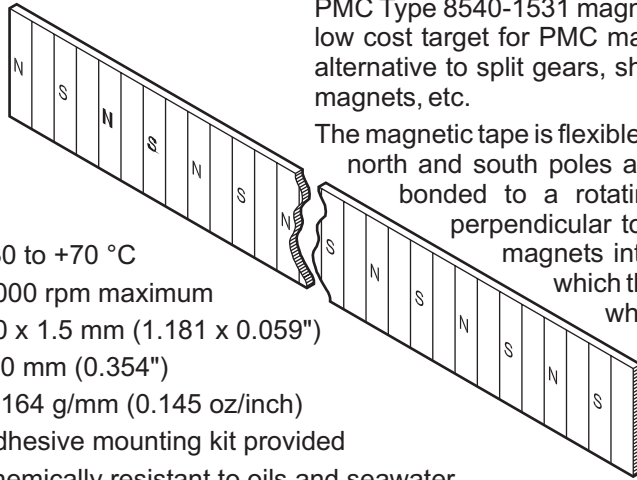
MAGNETIC TAPE

PMC Type 8540-1531 magnetic tape provides a convenient, simple and low cost target for PMC magnetic pickups. It is offered as a low cost alternative to split gears, shaft slots, drilled holes, individually installed magnets, etc.

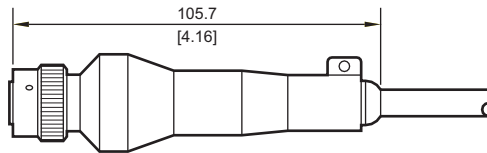
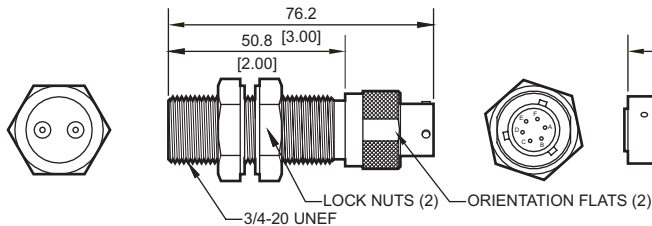
The magnetic tape is flexible permanent magnet consisting of alternating north and south poles arranged along the tape. The tape can be bonded to a rotating shaft and a magnetic pickup placed perpendicular to the tape surface. As the tape rotates, the magnets interact with the magnetic field of the pickup which then generates the pulsating AC output signal whose frequency is proportional to the shaft speed.

SPECIFICATIONS:

- Temperature: -30 to +70 °C
- Rotational Speed: 3000 rpm maximum
- Dimensions: 30 x 1.5 mm (1.181 x 0.059")
- Pulse Spacing: 9.0 mm (0.354")
- Weight: 0.164 g/mm (0.145 oz/inch)
- Installation: adhesive mounting kit provided
- Material: chemically resistant to oils and seawater
- Reference: PMC bulletin IM-8540-1531



MAGNETIC PICKUP

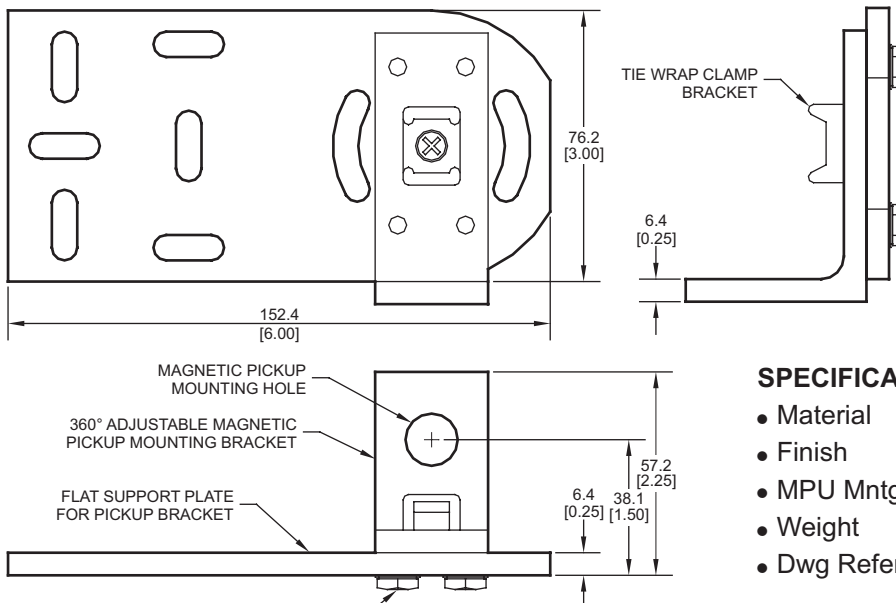


The PMC type 8540-1525 and 8540-1526

Magnetic Pickups are bidirectional sensors which, when powered, generates a magnetic field. When this magnetic field is altered by a moving ferrous object (the sensor target), the sensor generates two, out-of-phase, pulsating DC output signals. The relation of the phase of the two signals provides the direction of rotation. When the pickup is positioned close to a target mounted on a rotating shaft, the output signal has a frequency which is proportional to rpm. The target may be gear teeth, bolts, magnets, holes or PMC magnetic tape.

SPECIFICATIONS:

- Sensing Frequency: 10 Hz to 20 kHz (8540-1525)
- Sensing Frequency: 0 Hz to 25 kHz (8540-1526)
- Operating Temp.: -35 to +70 °C
- Typical Air Gap: 0.020" (0.5 mm)
- Housing Material: stainless steel
- Cable: three pair - shielded
- Dwg Reference: B-8540-1525



PICKUP MOUNTING BRACKET ADJUSTABLE

SPECIFICATIONS:

- Material: aluminum
- Finish: black anodize
- MPU Mntg Hole: sized to fit MPU diameter
- Weight: 0.240 g (8.5 oz)
- Dwg Reference: A-8890-1002

PRIME MOVER CONTROLS INC.

3600 GILMORE WAY, BURNABY BC CANADA V5G 4R8

TEL 604 433-4644 FAX 604 433-5570 www.pmc-controls.com