



Condition Based Monitoring Brochure

Smart Vibration Analyzers ANALYZE • INTERPRET • SAVE

Condition based maintenance (CBM) is not just a technique for avoiding breakdowns. By identifying faults such as out of balance, misalignment, worn bearings etc. you can significantly reduce operating costs:

- Lower energy costs (out of balance and misaligned machines need a lot more unnecessary energy)
- Prolong component lifetimes (e.g. by reducing bearing wear)
- Lower repair costs (replacing worn bearings before they fail is a lot cheaper and much safer!)
- Reduce downtime (increase profitability)



The TPI Model 9041 Ultra II

represents the very latest in easy to use high specification maintenance tools, offering extremely high levels of functionality and capability at a very affordable price!

As an advanced data collector and Dynamic 2 plane rotor balancer designed for plant and asset inspections, the Ultra II does it all.

Smart Vibration Monitor 9034 & 9038: Online/Fixed Vibration Monitoring.

Single low-cost unit monitors plant with local alarms, connects to high functionality PC analysis software AND connects to cloud-based monitoring and analysis software.

Extremely cost effective: lowest cost/channel industrial vibration monitor/analyzer.



MEASURE • MANAGE

Solutions for Pumps, Fans & Motors



If you have Pumps, Motors and Fans you need TPI Vibration Analyzers

Traditionally vibration analysis has been a specialist field and typically performed by vibration consultants using very expensive equipment.

The vibration analyzers from TPI allow anyone to perform meaningful vibration analysis and at an unexpectedly low cost.

TPI Vibration Analyzers can detect worn bearings, faulty gearboxes, unbalance, misalignment and looseness.

Vibration Analysis is used to detect signs of machine failure, allowing machinery to be repaired or replaced before an expensive failure occurs.

TPI 9070 Vibration analysis simply at the touch of a button!

TPI 9070 analyzes & interprets readings:

- ISO machine alarms and Bearing Damage Units (BDU) reading indicate overall machine and bearing condition
- Clear picture of 1X, 2X & 3X machine problems detects imbalance, misalignment and looseness
- 800-line spectrum with zoom and cursor to identify complex issues

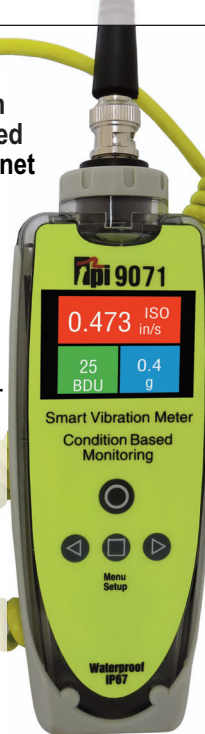


TPI 9071 Smart Vibration Analyzer with BNC Cabled Accelerometer with Magnet for consistent readings

TPI 9071 analyzes, interprets, and stores readings;

Everything the 9070 can do plus:

- BNC cabled accelerometer with magnet for hard to reach test points and repeatable results
- Collect and store readings; 10 memory blocks with 20 readings per block for a total storage of 200 readings.
- Stored data is easily recalled and displayed.

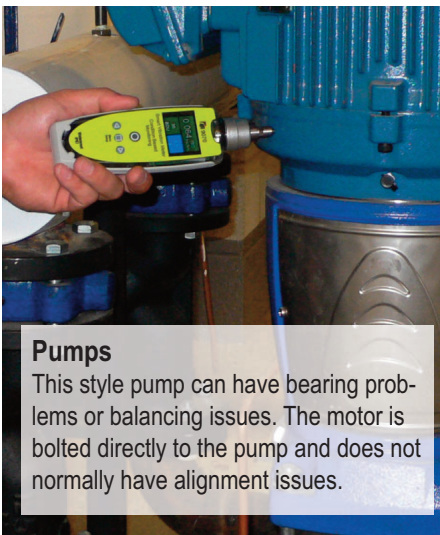


TPI 9080 Smart Trend Analyzer

TPI 9080 analyzes interprets & trends readings

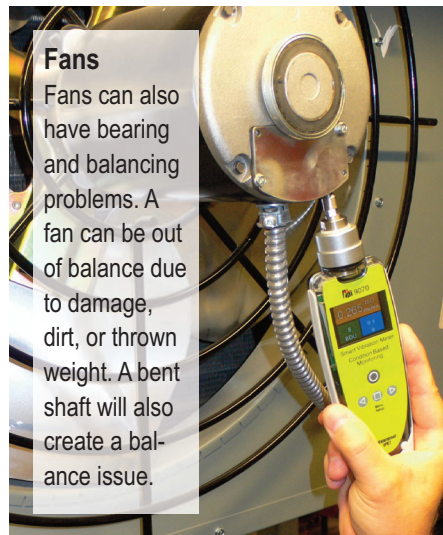
Everything the 9071 can do plus:

- Asset management and trending with included Vib-Trend software. Ten assets with ten readings per asset.
- VibTrend Pro license allows an unlimited number of assets with ten readings per asset.



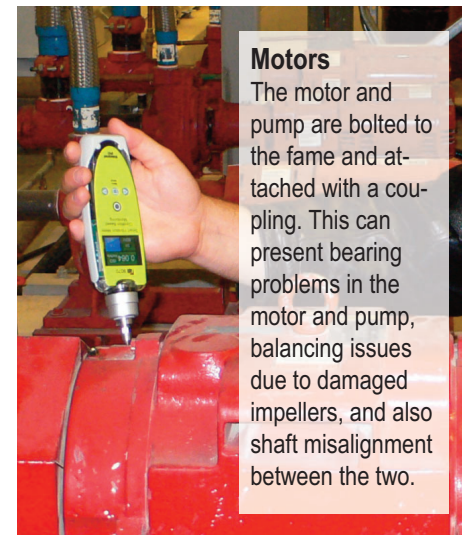
Pumps

This style pump can have bearing problems or balancing issues. The motor is bolted directly to the pump and does not normally have alignment issues.



Fans

Fans can also have bearing and balancing problems. A fan can be out of balance due to damage, dirt, or thrown weight. A bent shaft will also create a balance issue.



Motors

The motor and pump are bolted to the frame and attached with a coupling. This can present bearing problems in the motor and pump, balancing issues due to damaged impellers, and also shaft misalignment between the two.



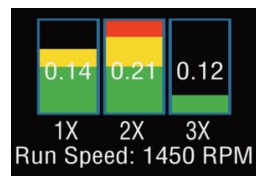


9070 & 9071 Smart Vibration Analyzer 9080 & 9080-Ex Smart Trending Vibration Analyzer

9070 & 9071 Smart Vibration Analyzer

Vibration Analysis at the touch of a button!

- **Affordable and easy to use**
9070 – Removable stinger to attach industry standard magnet with 1/4 28 thread; optional A9073. Provides faster, more reliable and repeatable readings.
9071 – Features BNC cable mounted accelerometer with magnet. Useful for hard to reach machines and test points.
- **Built to last: rugged, reliable, IP67 waterproof, long battery life**
 Not only does the rugged design and waterproof case keep the 9070 & 9071 working in demanding environments, but advanced technology ensures a long battery life - with 1,500 measurements (50 hours of normal use).
- **Helps prevent downtime and reduce maintenance costs**



1X, Unbalance
2X, Misalignment
3X, Looseness

A9080 Bluetooth® Headset

Industry approved ear defenders with built-in-Bluetooth headphones that allow you to listen to the bearing noise. You can also use with your smart phone. Comes with the 9080K2 kit and can be ordered separately.



For use with 9080

9080 & 9080-Ex Smart Trend Analyzer, Interprets and TRENDS

- **9080 Includes:** A9081A USB docking cradle & VibTrend standard software (up to ten assets with ten measurement points per asset), A9089 accelerometer with magnet and A9087 carrying case
- **9080-Ex Includes:** Intrinsically safe version of the 9080 with A9095 intrinsically safe boot, A9081A USB docking cradle & VibTrend Pro software (up to 1,000 assets with ten measurement points per asset), A9093 intrinsically safe accelerometer with magnet and A9087 carrying case
- **9080K1 Includes:** 9080 with A9086 protective boot, A9081A USB docking cradle & VibTrend Pro software (up to 1,000 assets with ten measurement points per asset), A9089 accelerometer with magnet, A9082 strobe and A9087 carrying case
- **9080K2 Includes:** 9080 with A9086 protective boot, A9081A USB docking cradle & VibTrend Pro software (up to 1,000 assets with ten measurement points per asset), A9089 accelerometer with magnet, A9082 strobe, A9080 headphones and A9087 carrying case
- Clear picture of 1X (unbalance), 2X (misalignment) and 3X (looseness) machine/bearing problems

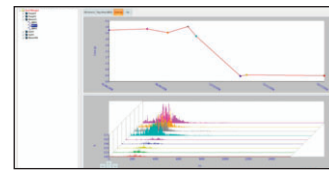


VibTrend Pro software gives you greater ease of use and flexibility. Windows™ compatible

- Store, analyze and report on all your vibration parameters in one place; unlimited assets with ten readings per asset.



A9082 stroboscope, tachometer and flashlight comes with 9080K1 and 9080K2 kits.

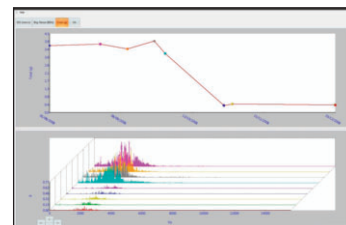


VibTrend Pro Software powerful and easy to use asset management and fault diagnosis software

VibTrend Pro Software comes with the 9080K1 and 9080K2.

Unlimited assets.....

All information is just a click away. Color coded alarms highlight problems. Trend lines show problems before they happen.





The 9041 Ultra II does it all...

9041 Ultra II: vibration analyzer, balancing, inspections

Benefits

- Analyzes, interprets and trends vibration data. Automatically detects out of balance, misalignment, looseness and bearing defects
- Predictive analysis capabilities that accurately calculate time frame to failure
- Condition based monitoring analyzes bearing wear and gear degradation
- Built-in single plane balancing enables correction of the most common cause of vibration (Dual plane balancing with additional accelerometer)

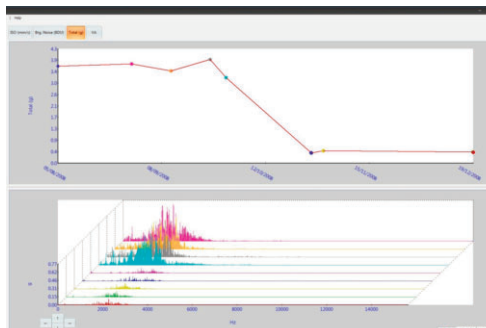
Features

- Set up routes that include inspections
- User selectable defined envelope filters and demodulation functionality
- True simultaneous 3 channel capture
- High resolution (0.2 Hz) frequency spectra from 2 Hz to 10 kHz
- Rugged fully waterproof construction meets IP68 and MIL-STD-810F requirements

C-Trend II Software gives you greater ease of use and flexibility.

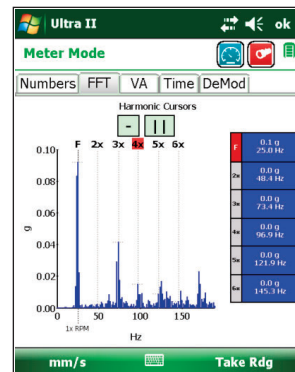
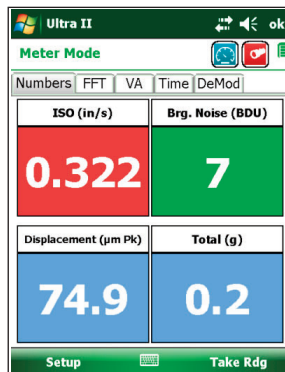
- Store, analyze and report on all your vibration and process parameters (e.g. oil pressures, temperature, run hours, etc.) in one place.
- All information is just a click away. Color coded alarms highlight problems. Trend lines show problems before they happen.
- Data can be accessed anywhere on any machine, with networking software. Plant history is everything and C-Trend II turns it into useful information with the click of a mouse!

Includes C-Trend II powerful and easy to use asset anagement and fault diagnosis software



9041 Ultra II Included:

- Tacho, accelerometer (one) and cables
- Carrying case with shoulder strap
- The 9041 has a 1 year limited warranty



Features: 9041, 9080, 9080-Ex, 9070 & 9071



Features	9041	9080	9080-Ex	9070	9071
Analyzes and displays ISO vibration levels, bearing wear, unbalance, misalignment and looseness	✓	✓	✓	✓	✓
Color coded display with alarm status (red, amber, and green)	✓	✓	✓	✓	✓
Fully zoom-able frequency spectrum	✓	✓	✓	✓	✓
True simultaneous three channel capture	✓	-	-	-	-
USB computer interface	✓	✓	✓	-	-
C-Trend software to store analyze and report vibration, lube, and inspection parameters (temperature, oil pressures, run hours, etc.)	✓	Optional	Optional	-	-
VibTrend software for data trending and analysis	-	✓	✓	-	-
Automatic reporting and email generation of alerts for any parameter	✓	✓	✓	-	-
Bluetooth enabled	✓	✓	-	-	-
Bluetooth headphones (optional, p/n A9080)	-	✓	-	-	-
Strobe accessory (optional, p/n A9082)	✓	✓	-	-	-
Optional RFID asset management (RFID tags p/n A9007 required)	✓	-	-	-	-
Built-in single plane balancing	✓	-	-	-	-
Optional dual plane balancing with additional accelerometer	✓	-	-	-	-
Includes laser tachometer for balancing	✓	-	-	-	-
Accelerometer connection	BNC, uses IEPE accelerometers	BNC, uses IEPE accelerometers	BNC, uses IEPE accelerometers	Built-in with stinger (magnet optional)	BNC, uses IEPE accelerometers
Input range	+/- 50g	+/- 50g	+/- 50g	+/- 50g	+/- 50g
Frequency ranges	2Hz to 1KHz 2Hz to 10KHz	2Hz to 1KHz 2Hz to 10KHz	2Hz to 1KHz 2Hz to 10KHz	2Hz to 1KHz 2Hz to 10KHz	2Hz to 1KHz 2Hz to 10KHz
Frequency resolution	400, 800, 1600, 3200, 6400, 12,800, 25,600, 51,200 lines FFT	100, 800, lines FFT	100, 800, lines FFT	100, 800 lines FFT	100, 800 lines FFT
Displayed frequency units	Hertz (Hz), RPM, CPM	Hertz (Hz), RPM, CPM	Hertz (Hz), RPM, CPM	Hertz (Hz), RPM, CPM	Hertz (Hz), RPM, CPM
Displayed amplitude units	Acceleration in g Velocity in mm/s or inches/s Displacement in microns or mils	Acceleration in g Velocity in mm/s or inches/s Displacement in microns or mils	Acceleration in g Velocity in mm/s or inches/s Displacement in microns or mils	Acceleration in g Velocity in mm/s or inches/s	Acceleration in g Velocity in mm/s or inches/s
Dynamic range	96dB	96dB	96dB	72dB	72dB
User interface	Numeric keypad and touch screen	Keypad	Keypad	Keypad	Keypad
Environmental rating	IP68 Waterproof	IP67 Waterproof	IP67 Waterproof	IP67 Waterproof	IP67 Waterproof
Operating temperature	-22°F to 149°F (-30°C to 65°C)	32°F to 122°F (0°C to 50°C)	32°F to 122°F (0°C to 50°C)	32°F to 122°F (0°C to 50°C)	32°F to 122°F (0°C to 50°C)
Power supply	Rechargeable battery (charger included)	AA Batteries (2)	AA Batteries (2)	AA Batteries (2)	AA Batteries (2)
Battery life	20 hours typical	50 hours typical	50 hours typical	50 hours typical	50 hours typical
Size	8.7" x 3.7" x 1.8" (220mm x 95mm x 45mm)	8" x 2.4" x 1.3" (203mm x 61mm x 33mm)	8" x 2.4" x 1.3" (203mm x 61mm x 33mm)	8" x 2.4" x 1.3" (203mm x 61mm x 33mm)	8" x 2.4" x 1.3" (203mm x 61mm x 33mm)
Weight (unit only)	1.1lb (500g)	9.8oz (280g)	9.8oz (280g)	9.8oz (280g)	9.8oz (280g)
Intrinsically Safe	-	-	✓	-	-





Smart Vibration Monitor 4 channel & 8 channel

Online/Fixed Vibration Monitoring

Features:

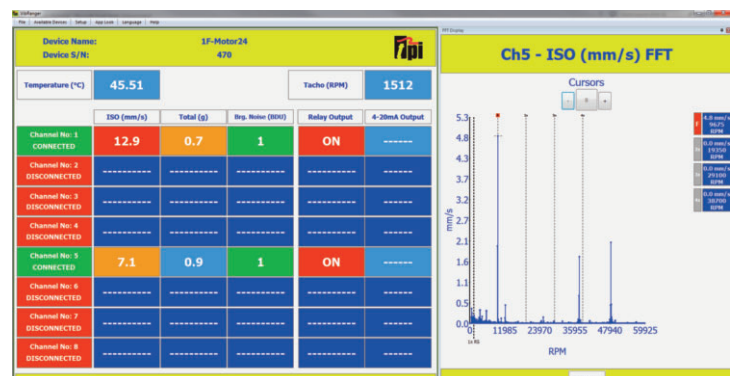
- 4 accelerometer channel & 8 accelerometer channel versions
- 24VDC (relay drive) switched output for each channel (warning/critical, g or velocity)
- 4 to 20mA output for each channel (g or velocity)
- Temperature input
- Tacho Input
- USB or Ethernet connection to Smart Vibration Monitor PC software and optional Vibration Analysis software

Advantages:

- Extremely cost effective – lowest cost/channel industrial vibration monitor/analyzer
- Very easy to set up using Smart Vibration Monitor PC software (Included free)
- 24/7 monitoring of critical plant operations

Benefits:

- Single low-cost unit monitors plant with local alarms and connects to optional C-Trend II high functionality PC analysis software.
- The 9034 and 9038 Smart Vibration Monitor are the new generation of low price-high performance installed vibration analyzers from TPI. With up to 8 accelerometer inputs, 8 digital outputs, 8 analog outputs, temperature and tacho inputs as well as USB and Ethernet connectivity the 9034 and 9038 offer unrivaled price per channel performance. The analyzers can be used in several different ways:
 - **Standalone Operation** – Connect up to 8 accelerometers and up to 8 relays and instantaneously monitor and alarm on-key vibration points. Using the included Smart Vibration Monitor PC software the alarms can each independently be set to trigger on/either a velocity level or a g level. If a tacho is connected, a speed range can be set so as not to activate during machine start-up or shut-down.
 - **Legacy Systems Operation** – for each connected accelerometer, the Smart Vibration Monitor units can also output levels of vibration (g or velocity) as 4 to 20mA signals for connection to existing monitoring systems such as PLCs, etc.
 - **PC Operation** – If a laptop/PC is connected via a USB or Ethernet, up to 64 modules can be monitored and the vibration levels displayed on screen. With the PC connected more detailed vibration analysis can be carried out with optional C-Trend II software.
 - **C-Trend II** – By purchasing optional C-Trend II software it's possible to view and analyze the long term trend of all readings as well as being able to see FFT's of all logged data.



The Smart Vibration Monitor modules are perfect for extremely cost-effective monitoring of critical plants operations and when used in conjunction with the TPI 9070, 9080 and 9041, vibration analyzers provide the complete CBM solution.



Smart Vibration Monitor 4 channel & 8 channel

Online/Fixed Vibration Monitoring



	Smart Vibration 4 channel		Smart Vibration 8 channel
Measurement			
IEPE Accelerometer Input Channels	4		8
Accelerometer Sampling Frequency		25.6kHz	
4-20mA Output Channels	4		8
24VDC Digital Outputs	4		8
24VDC Dig. Output Current Max		100mA	
Digital Output Alarm		Acceleration or Velocity (Channel Selectable)	
Tachometer Input		1 (0V to any voltage upto +24VDC)	
Frequency Dependent Alarms		Yes (using Tachometer)	
Temperature Input		1 (Typically 10mV/°C)	
PC Connection		USB	
Internet Connection		Ethernet	
PC Software			
Vibration Alarms	4	Vibration	8
Temperature Alarm	1	Temperature	1
Alarm Choice		Acceleration AND/OR Velocity (channel selectable)	
FFT		Up to 12,800 lines	
Time Waveform		Yes, with optional C-Trend II Software	
Electrical			
Supply Voltage		USB or 24VDC	
Supply Current		500mA	
Mechanical			
Environmental		IP50	
Operating Temperature °C		0-55°C (32-151°F)	
Storage Temperature °C		0-55°C (32-151°F)	
Mounting		DIN Rail	
Part Number	9034		9038

A9031 Grub screw

1/4"-28 UNF 1/2" Male to 1/4"-28 UNF 1/2" Male



A9032 Grub screw

1/4"-28 UNF Male to M6 Male



A9033 Glue face stud

1/4"-28 UNF Male



A9034 Spot Facing Installation Kit

1/4"-28 UNF thread



A9035 Spot Facing Installation Kit

M6thread



A9014 Accelerometer with 2-pin connector



Straight 2 Pin MS Connector and Flying Leads

A9019: 16ft (5m) with straight 2 Pin MS connector and flying leads

A9028: 32ft (10m) with straight 2 Pin MS connector and flying leads

A9029: 49ft (15m) with straight 2 Pin MS connector and flying leads

A9036: 16ft (5m) with angled 2 Pin MS connector and flying leads

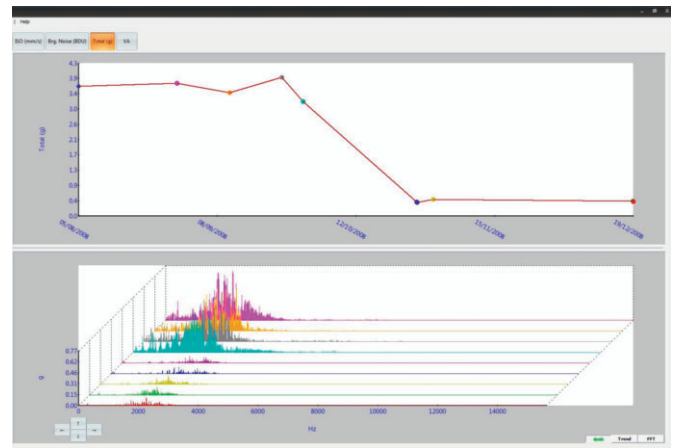
A9037: 32ft (10m) with angled 2 Pin MS connector and flying leads

A9038: 49ft (15m) with angled 2 Pin MS connector and flying leads



C-Trend II Software gives you greater ease of use and flexibility.

- C-Trend II comes standard with the 9041 and is available optionally for the 9080 and 9034/9038 series.
- Store, analyze and report on all your vibration, lube and process parameters
- All information is just a click away.
- Data can be accessed anywhere on any machine, with networking software.
- Allows the user to create Plants, Areas, Locations, Sub Locations, Machine Trains, Machines, Machine Components, Vibration Measurement Points, and Inspection Measurement Points.
- Vibration readings are uploaded back to PC and synced up against the correct asset.
- Trending graphs will be created and various other vibration information can be viewed.
- Alarm levels can be set and e-mails sent if a reading triggers an alarm after docking and syncing data back to the PC.



C-Trend II asset management and fault diagnosis software comes standard with the 9041 and is available optionally for the 9080 series and 9034/9038 series.

A9080 Bluetooth® Headset

Industry approved ear defenders with built-in-Bluetooth headphones that allow you to listen to the bearing noise. You can also use with your smart phone. Comes with the 9080K2 kit and can be ordered separately.



For use with 9080 only

A9082 Strobe

Stroboscope/flashlight attachment used to determine the speed of rotating equipment. Included with 9080K1 and 9080K2 kits.



For use with 9080 only

377BT Infrared Thermometer

- Bluetooth Communication
- Laser Sighting to confirm target.
- Adjustable emissivity for maximum accuracy on all surfaces.
- °F or °C Selectable
- 11.5:1 Distance to Spot Ratio
- 3 Year Limited Warranty
- Temperature Ranges from -58 to 1,832 degrees Fahrenheit.
- K-Type thermocouple input for optional K-Type probe measurement.
- 0.1 Degree Resolution provides increased accuracy of reading.



505L Digital Handheld Tachometer

The 505L is a combination photo and contact tachometer that also measures surface speeds of belts and wheels. Up to 25 feet in photo target mode.

Use Your 505L For These Applications

- Measure motor input and output shaft speed
- Determine conveyor belt speed
- Confirm fan, motor, and gear RPM
- Measure RPM of flywheels and pumps
- Monitor pulley rotation RPM and turbine speeds

Features:

- Target (Photo mode) is 25 feet
- Multifunction's: Photo Tach & Contact Tach & Surface Speed
- 3 Year Limited Warranty
- Wide Measuring Range: 6 to 30,000 RPM
- Last Value, Max Value, Min Value: Automatically Saved and Recalled



Test Products International Inc.
9615 SW Allen Boulevard Suite 104
Beaverton, Oregon 97005 USA
www.testproductsintl.com



For Customers & Product Inquiry
(800) 368-5719, (503) 520-9197
Fax: (503) 520-1225