

# QUICK REFERENCE GUIDE

**altronic®**  
DET-1600 DETONATION  
SENSING MONITOR

TIPS AND HINTS TO ASSIST WITH INSTALLATION AND/OR OPERATION

1/6/09

## Overview

The **Altronic DET-1600 Detonation Sensing Monitor** is an electronic instrument designed to detect and eliminate engine damaging detonation. It also monitors for engine misfires or engine combustion abnormalities. This is accomplished via broadband piezoelectric vibration sensors mounted to the engine block. These vibration signals are transformed into electrical signals that are sent to an internal **32-bit** microprocessor for evaluation. The **DET-1600** displays reference numbers for both detonation and misfire. If the reference numbers fall outside of the adjustable alarm and shutdown setpoints, the output switches will trip. These switches are commonly used to control load, change engine ignition timing and/or shut down the engine to prevent damage from occurring. Additionally, a **4-20ma** current loop output or **Modbus RTU** communications can be used for adjusting engine timing or controlling load.

*This guide is provided to both clarify and add information to the current Installation and Operating Manual, DET-1600 IOM 11-07. This manual can be found on the Altronic website at: [www.altronicinc.com](http://www.altronicinc.com).*

## Tips and hints to assist with installation and operation of the DET 1600

Vibration sensors are most commonly used (one) per cylinder. However, sensors can be shared between cylinders or even banks. This is possible because the **DET 1600** uses “**windowing**” to look at each cylinder only during the time frame that detonation is likely to happen for a given cylinder. However, one sensor per cylinder is required for misfire detection.

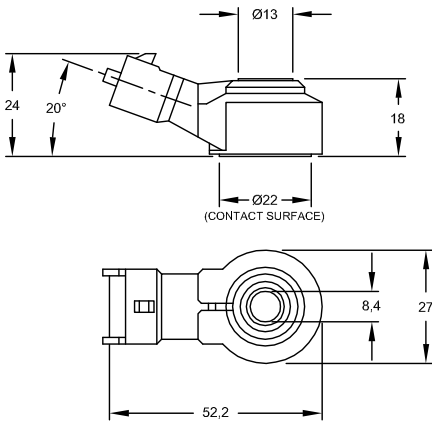
Location for mounting the vibration sensors should be on the engine block just below the cylinder head to a smooth surface. Mounting the sensors on a cylinder head or head bolt could result in false readings from valve train noise. The sensors have an 8mm thread. Some **Waukesha** engines with pre-existing OEM sensors work best with adapters machined to accept the **8mm** sensor bolt and use existing **10mm** holes cast in the engine block.



Waukesha 10mm to 8mm adapter

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In preparing a block for sensor mounting, it is recommended to use a spot facing tool to give the surface a smooth surface. This will require a 1" spot facing tool with the pilot machined to a diameter of .264 inches. After drilling the pilot hole with a size "H" (.266") drill bit to the proper depth, use the spot facing tool to smooth the surface. The hole can then be tapped with the proper 8mm x 1.25 bottom tap. Be sure the hole is drilled and tapped deep enough so the sensor mounting bolts do not bottom out.



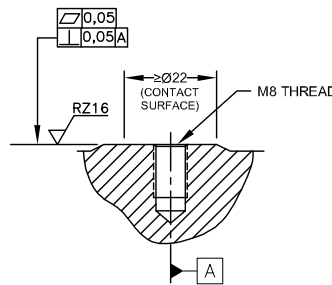
NOTE: DIMENSIONS ARE IN MILLIMETERS.

### SPECIFICATIONS:

- FREQUENCY RANGE: 1-20kHz
- MEASURING RANGE: 0.1 - 400 g
- SENSITIVITY AT 5 kHz: 26 ± 8 mV/g
- OPERATING TEMPERATURE RANGE: -40°C - +150°C

### INSTALLATION:

- MOUNTING BOLT: GREY CAST IRON: M8 X 25; GRADE 8.8  
ALUMINUM: M8 X 30; GRADE 8.8
- TIGHTENING TORQUE (OILED PERMITTED): 20 ± 5 N·m
- MOUNTING POSITION: ARBITRARY



MOUNTING HOLE

### INSTALLATION INSTRUCTIONS:

MOUNT THE DETONATION SENSORS TO A SMOOTH SURFACE (COUNTERBORE IF NECESSARY) ON THE ENGINE CRANKCASE JUST BELOW THE CYLINDER HEAD. A SURFACE THAT IS NOT SMOOTH WILL GIVE ERRATIC READINGS. THE SENSORS SHOULD BE AS SYMMETRIC AS POSSIBLE. ANGULAR MOUNTING POSITION IS ARBITRARY. DRILL AND TAP THE BLOCK PERPENDICULAR TO THE SURFACE. TAKE CARE NOT TO PENETRATE THE WATER JACKET.

During installation, be sure to keep all secondary ignition wiring as well as any other high voltage wiring at least **8"** from the vibration sensor wiring.

The **DET-1600** has been designed for use on negative ground ignitions using both progressive and inverse acting **4-20mA** control loops for timing control.

Resistor spark plugs are recommended with the use of any digital instrumentation including the **DET-1600** to prevent unwanted signal noise.

**Typical wiring of inputs/outputs:**

