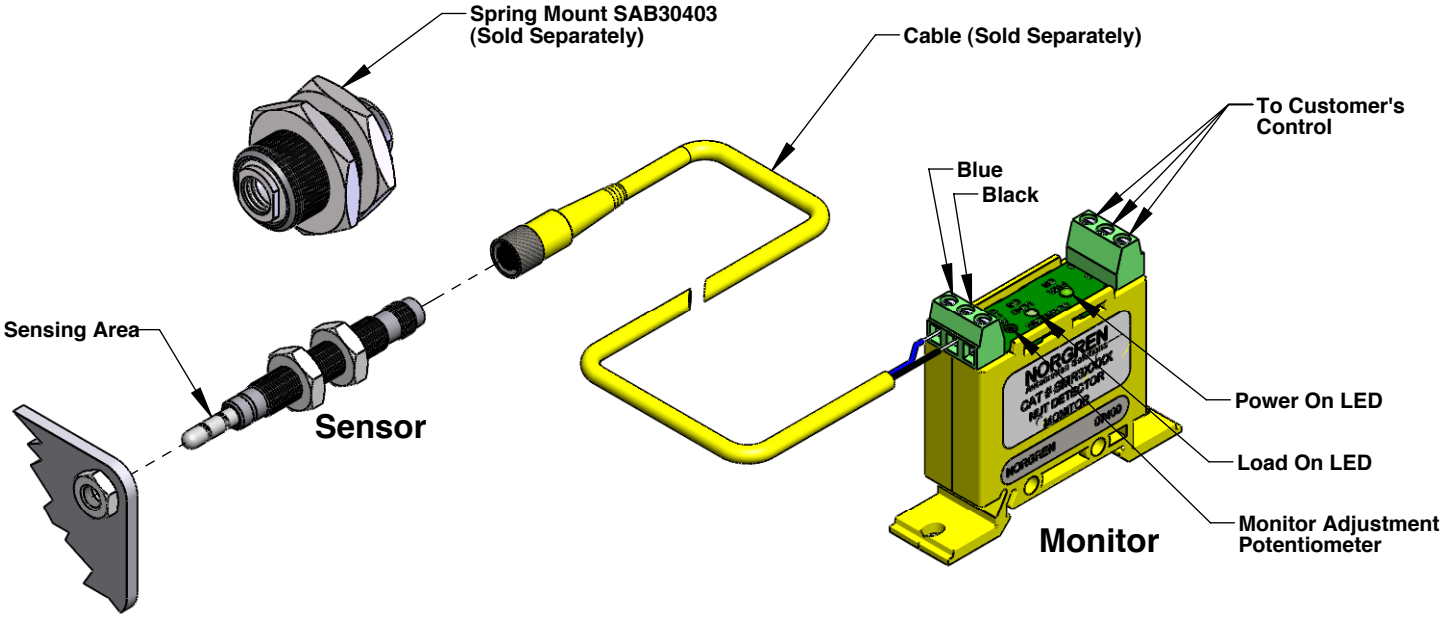
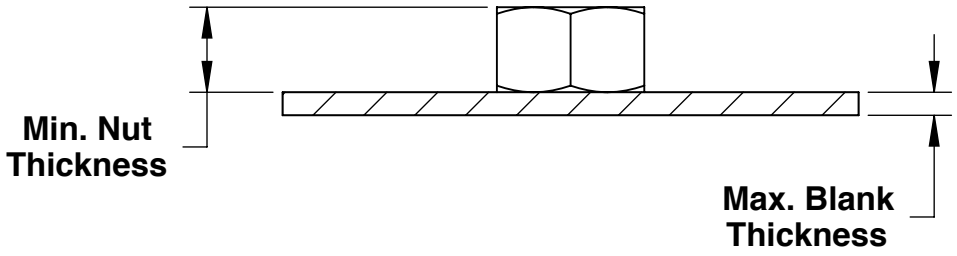
1. System Components



2. Technical Data

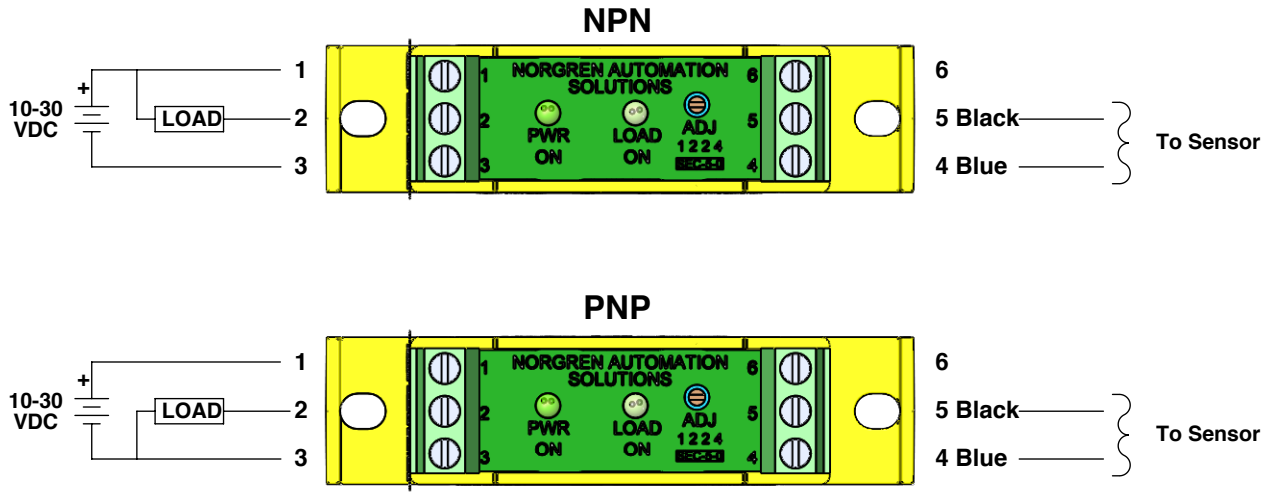
Monitor Power/Sensor Connectors:	3 Position Terminal Blocks
Sensor Connector:	3-Pin (male) 8mm Pico Type Connector
Supply Voltage Range:	10-30 VDC
Maximum Continuous Load Current:	150mA
Operating Temperature Range	0°C to +60°C
Response Time:	25ms
Green LED:	On When Power Supply is Active
Yellow LED:	On When Target is Detected
Target Material:	Ferrous/Non-Ferrous
Target Size:	See Target Size Tables
Short Circuit Protection:	Yes (self resetting)
Overload Protection:	Current Limits at .8ª Typ.
Reverse Polarity Protection:	Yes, Up to 50 VDC
Interface:	3-Wire Device: NPN Output (Current Sinking) PNP Output (Current Sourcing)
Monitor Housing:	Plastic housing sealed to IP65
Sensor Housing:	All Steel construction. Housing sealed To IP67
Sensor Housing, Axial Loading:	75lbs. Maximum
Sensor Housing, Side Loading:	50lbs. Maximum
Missing Probe Detection:	Output turns off when probe is disconnected or damaged
Patent Number	5617025

Sensor Catalog #	Monitor Catalog #	Nut Size	Minimum Nut Thickness	Maximum Blank Thickness	Output
SNP50608 For M5, M6 & M8	SMR36005	5mm	4.0mm (0.16")	1.6mm (0.06")	NPN
	SMR37005				PNP
	SMR36006	6mm	5.0mm (0.20")		NPN
	SMR37006				PNP
	SMR36008	8mm	6.5mm (0.26")		NPN
	SMR37008				PNP
SNP01012 For M10 & M12	SMR36010	10mm	8.0mm (0.31")	2.5mm (0.10")	NPN
	SMR37010				PNP
	SMR36012	12mm	10.0mm (0.39")		NPN
	SMR37012				PNP

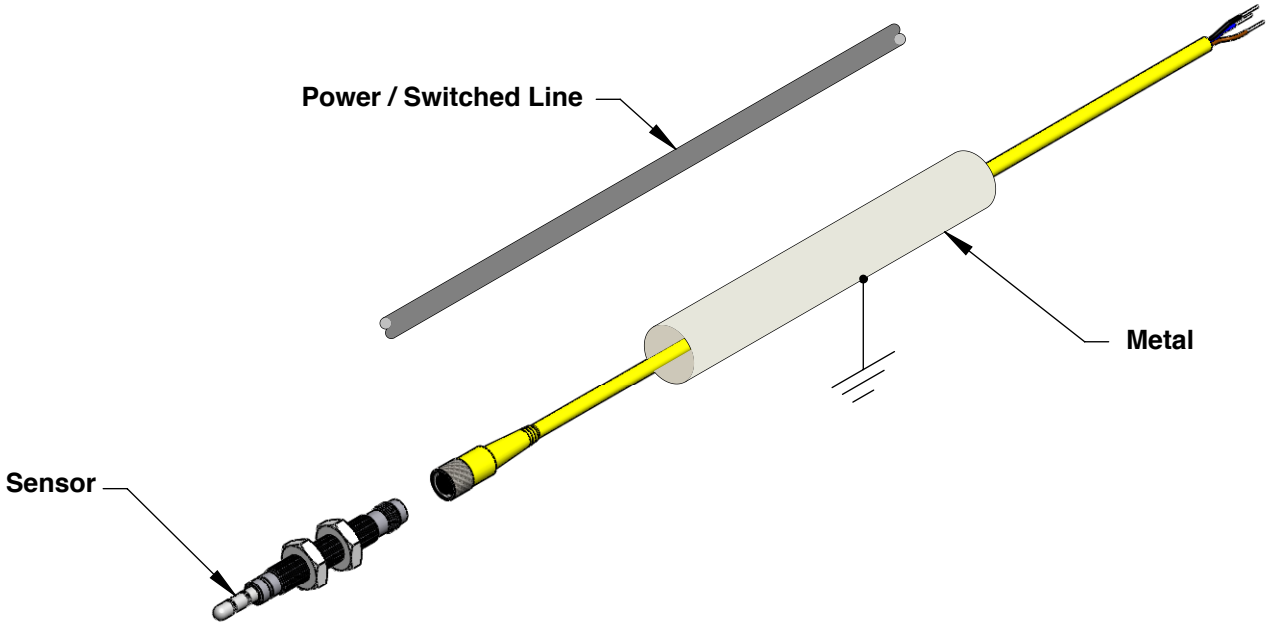


3. Wiring

Electrical loads up to 150mA, such as control relays, can be driven directly. Power supply voltages may range between 10 and 30 volts DC, and must match the relay or PLC input requirements.



The sensor cable should not be run near any wires which contain high voltage, high current or a switching load. This can be avoided by running the sensor cable through a metal conduit as shown below, or using a shielded cable for the power / switching line. The sensor cables of multiple nut sensors should not be bundled together (at least 1 cable diameter apart); however, the power/signal cables of multiple monitors may be bundled.



4. Adjusting the Monitor

Each monitor is factory assembled to closely match its intended metric nut sensing size (M5, M6, M8, M10 & M12). In addition a fine tuning adjustment (25 turn adjustment potentiometer) is provided to optimize each monitor for variations in clearance hole size, plate thickness, nut thickness, sensor interchangeability, fixture positioning, and usage with English nut sizes. Turning the adjustment potentiometer clockwise will increase the sensitivity (smaller thickness or larger diameter nuts will illuminate the "Load On" LED). Turning the adjustment potentiometer counter-clockwise will decrease the sensitivity (thicker plate thickness or tighter clearance holes will not illuminate the “Load On” LED in the absence of the nut).

Mechanical Alignment of Sensor:

A. The typical sized “standard” and smaller “jam” or “half” nuts should be centered within the lines that mark the sensing region on the probe tip for best performance.

B. The larger “Heavy Duty” nuts should cover the entire sensing region including the lines marked on the sensor’s probe tip.

Monitor Adjustment:

A. If the monitor’s “Load On” LED (yellow) does not illuminate with the nut present, then slowly turn the monitor’s adjustment potentiometer clockwise until the LED turns on. Turn an additional 4 full turns clockwise. Check that the monitor’s “Load On” LED does not illuminate when the nut is **NOT** present.

B. If the monitor’s “Load On” LED (yellow) remains illuminated with no nut present and the fixtures are engaged, then slowly turn the monitor's adjustment potentiometer counter-clockwise until the LED turns off. Turn an additional 4 full turns counter-clockwise. Check that the monitor’s “Load On” LED does illuminate when the nut is present.

Adjustment for Thread Detection

Adjusting the monitor for thread detection requires a sample part with threads and a sample without threads.

Monitor selection follows the same criteria that is used for nut detection if the threads are in nuts or sheet metal.

Monitor Selection for detecting threads in thick plate steel is often a trial and error process. Field trials have shown that the maximum differential between a thread and no thread condition is often a monitor that is not the one normally used for nut or sheet metal thread detection which is based on the thread size.

An example would be a 6mm (0.25" thick) steel plate with M10 threaded through hole. Some installations have found that the M10 probe with M6 monitor provided the greatest number of turns of the sensitivity adjustment between detecting threads and no threads.

Monitor Adjustment

A. Insert probe into part that has threads. Rotate sensitivity adjustment potentiometer counter- clockwise until the load on/nut present light turns off. Slowly rotate clockwise until light turns on and stop rotating.

B. Insert probe into part that does not have threads. Rotate sensitivity adjustment clockwise counting the number of rotations. Stop rotating when the load on/nut present light turns on. Record the number of rotations required.

C. Divide the number of rotations by 2 and rotate the sensitivity adjustment counter-clockwise that number of turns.

This calibration procedure sets the sensitivity halfway between sensing the part with threads and sensing the part without threads. Most applications result in 4 to 6 turns between sensing the part with and without threads.

The result will be an output that turns on when threads are present in the part and no output if the threads are not present.

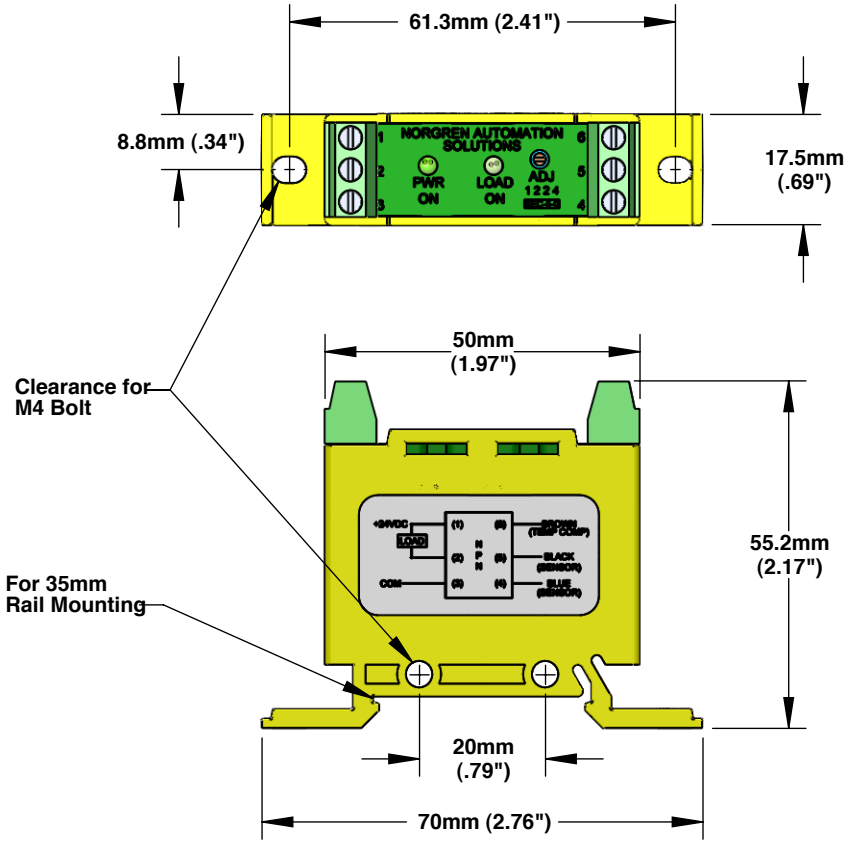
5. Installation Considerations

The adjustment potentiometer of the monitor may have to be adjusted to compensate for plate and/or nut thickness. (see section 4 “Adjusting the Monitor”).

To avoid mutual interference between two nut sensors, a minimum distance of 16mm (0.63") for the M5, M6 & M8 sensors and 21mm (0.83") for the M10 & M12 sensors must be provided.

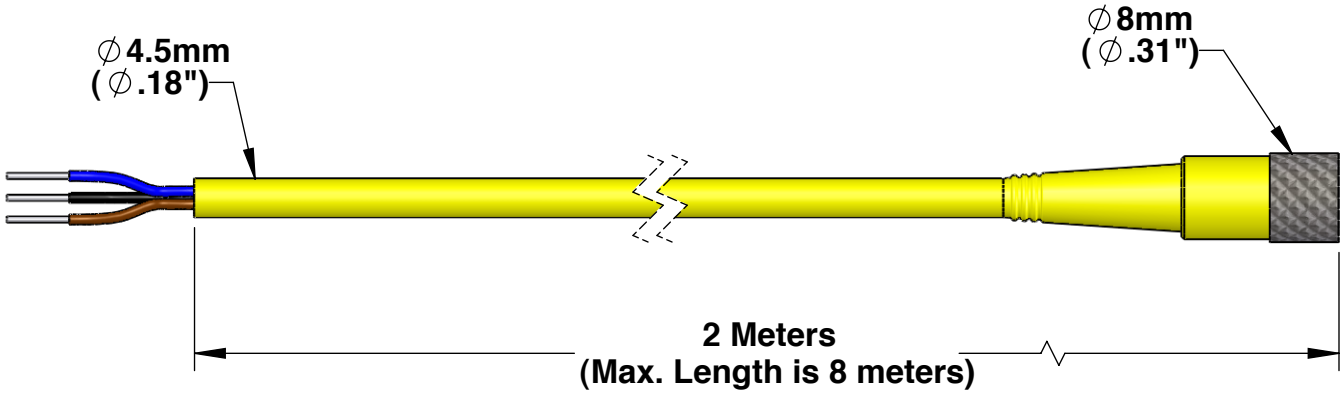
Nearby welding operations will not damage the sensor and monitor, but the monitor may give a false part present indication while the welder is active. All nut detection operations should be performed while the welder is off.

6. Dimensional Information:

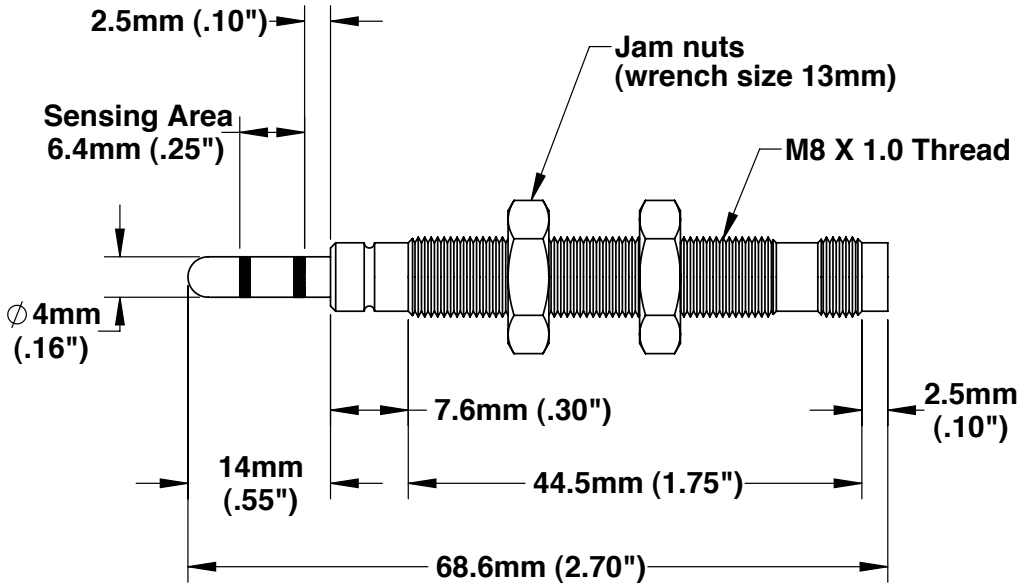


English equivalents are approximate.

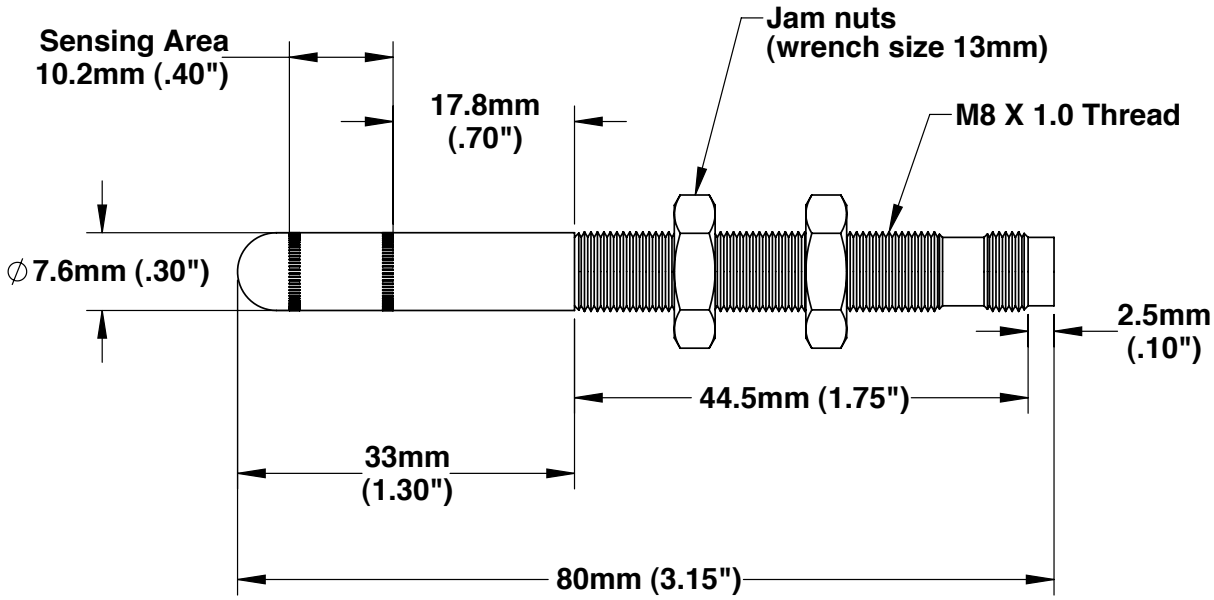
NAS Part Number SCE13000 = 2M Cable
SCE13005 = 5M Cable



M5, M6 or M8 Sensor



M10 or M12 Sensor



Warning
Improper selection, misuse, age or malfunction of components used in systems can cause failure in various modes. The system designer is warned to consider the failure modes of all component parts and to provide adequate safeguards to prevent personal injury or damage to equipment or property in the event of such failure modes. System designers and end users are cautioned to consult instruction sheets and specifications available from the factory. The system designer/end user is responsible for verifying that all requirements for the application are met.

Proposition 65: These products may contain chemicals known to the state of California to cause cancer, or birth defects, or other reproductive harm.

Warranty
The products described herein are warranted subject to seller's Standard Terms and Condition of Sale, available at seller's website.