M100T / M5000T

Principle of Operation:

The M-Series Switches contain a sensor and switching electronics within the same heavy-duty explosionproof housing. A pulser disc, or an optional pulser wrap, rotating in front of the sensing surface produces a control signal which increases with advancing shaft speed. When the control signal is above the set point setting, the control relay is energized. When the control signal drops blow the set point setting, the relay deenergizes. The relay has Form C Dry contacts rated at 5 amps 230 Vac resistive, so the M100T/ M5000T may be used for switching motors and/or alarms.

Pulser Disc:

The end of the shaft to be monitored must be center drilled to a depth of ½ -inch with a No. 21 drill and tapped for 10-32UNF. After applying Loctite® or a similar adhesive on the threads to keep the pulser disc tight, the pulser disc should be attached, decal side out, with the supplied 10-32UNF machine screw and lock washer.

Pulser Wrap (optional)

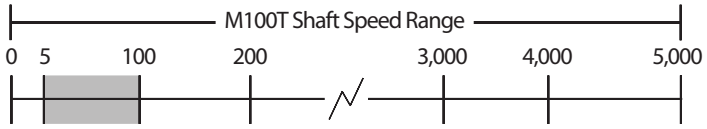
Pulser Wraps are custom manufactured to fit the shaft they will be mounted on. When the wrap is shipped, four allen-head cap screws hold the two halves of the wrap together. These screws must be removed so that the wrap is in two halves. Place the halves around the shaft, reinsert the screws and torque them to 5 foot pounds max.

Switch Selection Guide:

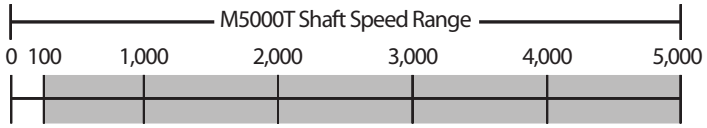
Refer to the Switch Selection Table, to determine which model is appropriate for your application. The primary difference between the M100T and the M5000T is the set point range. The actual operating speed of the monitored shaft can range from 5 to 5000 rpm with either switch. The main criteria for selecting a speed switch is the speed at which the relay energizes and deenergizes.

The M100T can be adjusted to trip from 5 rpm to 100 rpm. The M5000T can be adjusted to trip from 100 rpm to 5000rpm. For further help in selecting a switch appropriate to a specific application, consult an Electro-Sensors, Inc. Application Specialist.

Switch Selection Table:



M100T Adjustable Set Point Range 10-100 RPM



M5000T Adjustable Set Point Range 100-5000 RPM

Sensing Surface Gap Distance Table:

(Seeing Figures 1 and 2, below)

Model No.	Dimension "A" (inches)	Dimension "B" (inches)
M100T	1/16" to 3/8"	1-3/4"
M5000T	1/16" to 3/8"	7/8"

Note: The pulser disc supplied with the M100T switch is 4 inches in diameter, and the M5000T disc is 2-1/2 inches in diameter.

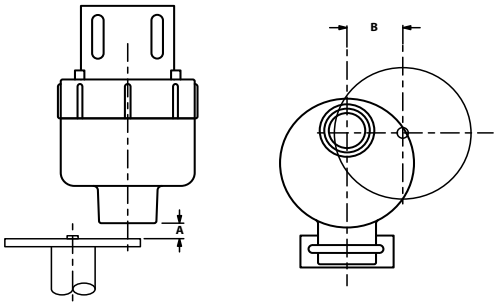


Figure 1: Speed Switch with 255 Pulser Disc

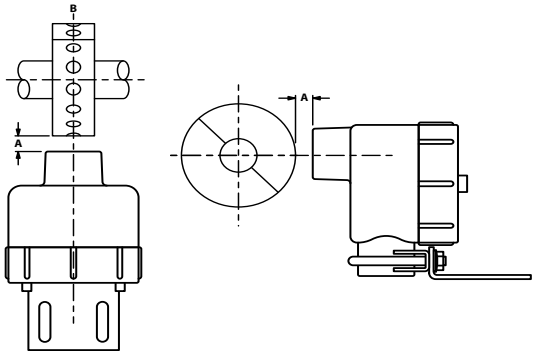


Figure 2: Speed Switch with Optional Pulser Wrap

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Set Point Adjustment:

Complete the installation of the pulser disc wrap and the speed switch with the correct gap distance "A" before adjusting the set point. The unit is shipped with the circuit potentiometer set for its lowest set point speed (turned all the way counterclockwise). The potentiometer is a single-turn type; turning it will make the device trip at speeds above the lowest setting (See fig. 3).

Calibration:

Remove the back cover of the speed switch. Apply power to the speed switch (see figure 3). With the shaft turning at normal operating speed, turn the potentiometer clockwise until the relay deenergizes. Turn the potentiometer counterclockwise ¼-turn, which will energize the relay. With this setting, the M-Series Switch will deenergize its relay when the shaft speed slows below normal operating speed. Turning the potentiometer further counterclockwise will make the unit less sensitive to a slowdown in speed. The green LED is illuminated when the relay is energized.

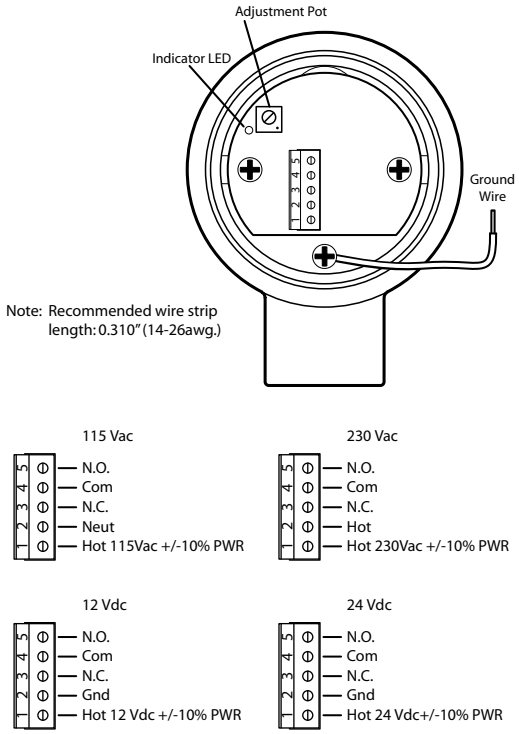
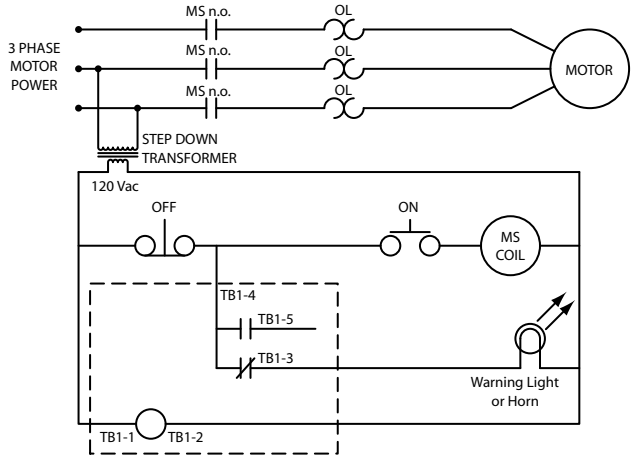


Figure 3: Set Point Adjustment

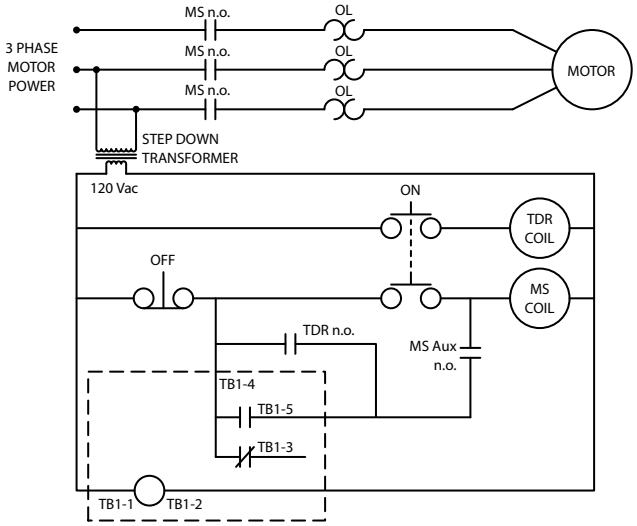
Wiring Diagrams:

These are typical wiring diagrams. Other circuits may be used and some equipment may require different wiring.

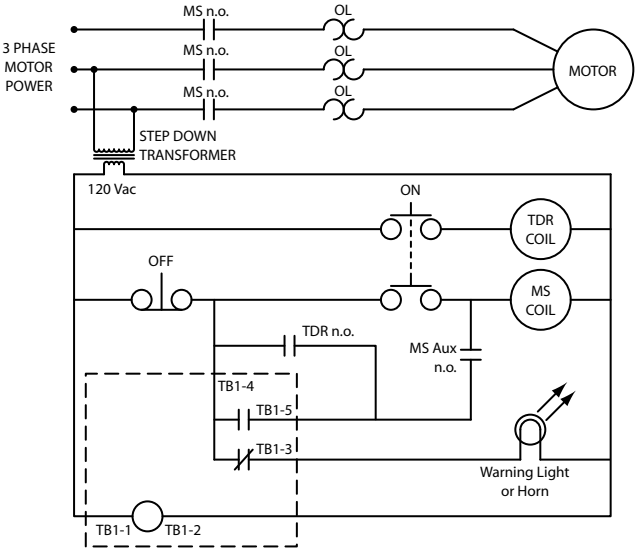
Alarm only Circuit
Miniature Speed Switch • M100T/M5000T



Motor Shutdown Control without Alarm
Miniature Speed Switch • M100T/M5000T



Motor Shutdown with Alarm
Miniature Speed Switch • M100T/M5000T



Wiring Diagram Key	
MS	Motor Starter (not supplied)
OL	Overload contacts
n.o.	Normally open (relay is in a deenergized state).
TDR	Time Delay "OFF" Relay(not supplied). If the shaft being monitored comes up to speed slowly, a TDR can be used so the operator will not have to hold the START button in.

WARNING

During a stopped condition, even a slight movement of the shaft or magnetic disc could energize the control relay and start the motor if the Motor Auxiliary Normally Open Contact (MS Aux n.o.) is not wired in series as shown in these typical wiring diagrams. This situation could cause equipment damage or PERSONAL INJURY! To prevent starting the motor accidentally, ALWAYS USE PROPER LOCK OUT - TAG OUT PROCEDURES

M100T/M5000T Dimensional Drawings:

Dimensions in Inches

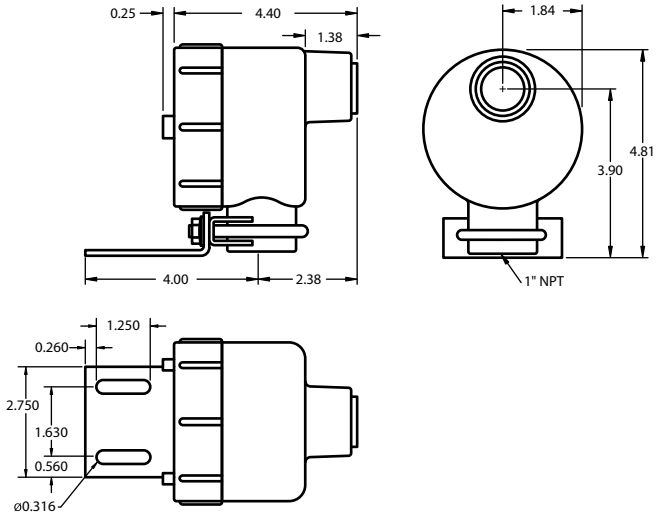


Figure 4: M100T/M5000T dimensions

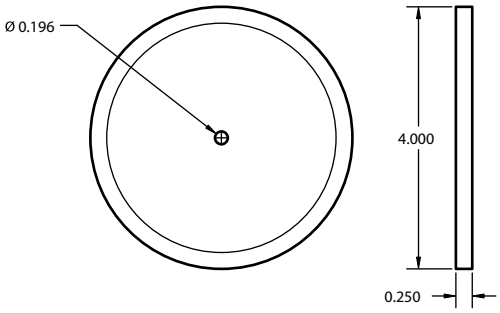


Figure 5: 255 Pulser Disc (M100T)

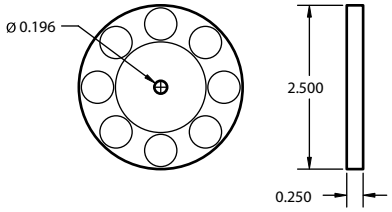


Figure 6: 256 Pulser Disc (M5000T)

Troubleshooting Guide:

Symptom: Relay will not energize	
Possible Causes:	Possible Solutions
Power is not applied to the M100T/M5000T correctly	See page 2, figure 3.
Switch is not aligned, or gapped properly.	See page 1, figures 1 and 2
The set point potentiometer is not turned fully counterclockwise	See page 3, Calibration
Shaft is not turning faster than the set point	Check actual RPM

M100T/M5000T General Specifications:

Electrical	Parameters
Input Power	
115V model	115 Vac, 60Hz ±10% @ 55mA Max
Fuse	80mA
230V model	230 Vac, 50Hz ±10% @ 50mA Max
Fuse	80mA
230V model	230 Vac, 60Hz ±10% @ 60mA Max
Fuse	100mA
+12V model	12 Vdc ±10% @ 30mA Max
Fuse	50mA
+24V model	24 Vdc ±10% @ 35mA Max
Fuse	50mA
Relay Contact	1 SPDT, isolated
Relay Contact Rating	5 Amp @ 30 Vdc, or 230 Vac resistive
Sensing Head	Integral
Electrical Connections	5 pos. Terminal Strip, de-pluggable
Set Point Range	M100T: 5 to 100 RPM M5000T: 100 to 5000 RPM
Set Point Accuracy	+/- 0.5%
Set Point Adjustment	1-turn potentiometer

Physical/Environment	Parameters
c UL us LISTED	Class I, Div 1, Group C, D Class II Groups E, F, G UL File: E249019 CE
Gasket	Provided for waterproofing
Enclosure Dimensions	See Figure 4
Operating Temperature	-40ºC to +60ºC
Storage Temperature	-65ºC to +60ºC
Shipping Weight	2.5 lbs
Mounting Bracket	Zinc Plated Steel

255 Pulser Disc M100T	Parameters *
Material	Nylon 12 Std, (opt; PVC, Alum, Stainless-Steel)
Dimensions	4-inch diameter x 1/4-inch thick
Operating Temperature	-40ºC to +60ºC* (Nylon, PVC)
Operating Temperature	-40ºC to +150ºC* (Alum, SS)

256 Pulser Disc M5000T	Parameters *
Material	PVC Std, (opt; Alum, Stainless-Steel)
Dimensions	2.5-inch diameter x 1/4-inch thick
Operating Temperature	-40ºC to +60ºC* (PVC)
Operating Temperature	-40ºC to +150ºC* (Alum, SS)

Pulser Wrap (optional)	Parameters *
Material	PVC Std. (opt; Aluminum or Stainless-Steel)
Operating Temperature	-40ºC to +60ºC* (PVC)
Operating Temperature	-40ºC to +150ºC* (Aluminum, SS)

Specifications are subject to change without notice.

**** For details on Discs, Wraps and Sensors, consult factory or visit our website.***

Spare Parts List	Stock No.	Part No.
Pulser Disc (M100T)	700-000200	255
Pulser Disc (M5000T)	700-000300	256
Pulser Wraps	Consult Factory	
Internal Electronics:		
M100T 115 Vac	750-001700	
M5000T 115 Vac	750-001710	
M100T 12 Vdc	750-001720	
M5000T 12 Vdc	750-001730	
M100T 24 Vdc	750-001740	
M5000T 24 Vdc	750-001750	
M100T 230 Vac	750-001760	
M5000T 230 Vac	750-001770	

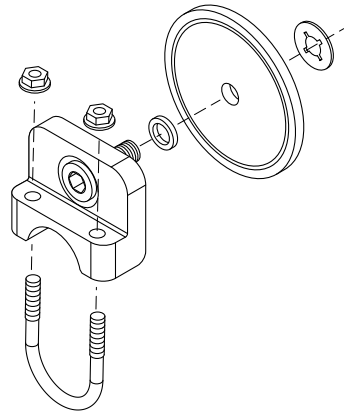


Figure 7: Optional EZ-Mount Bracket w/255-EZ Pulser Disc

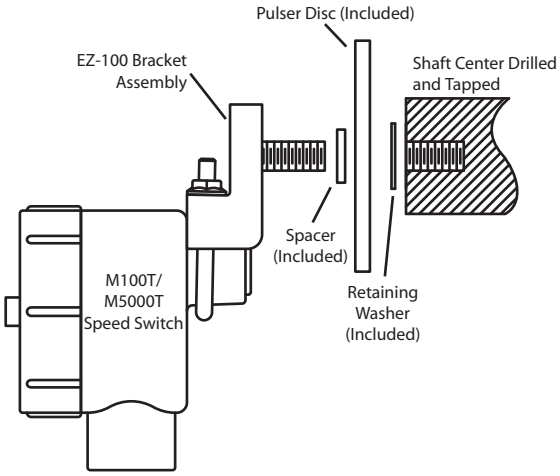


Figure 8: EZ-Mount Bracket installation