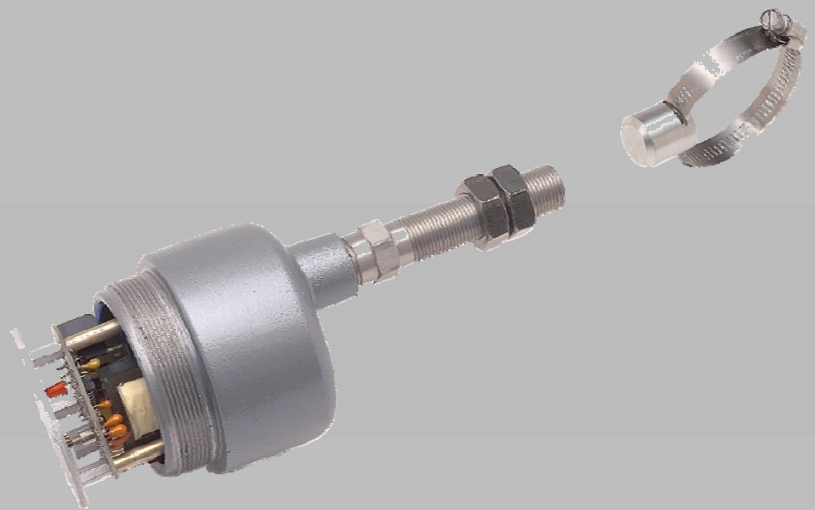




A22

Speed Switch



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1.0 GENERAL DESCRIPTION

- 1.1 The K-TEK Kasichok Model A22 precisely monitors the speed of rotating equipment and provides an output for "loss of speed." The speed switch measures the time of each equipment rotation and either alarms or shuts equipment down if the rotation is too slow.
- 1.2 The Kasichok standard package includes adjustable speed setting, 10-second start-up time delay, optional latching or non-latching output relay, magnet, magnet clamps and explosion proof enclosure. The standard unit operates from a 12 volt DC power source. Optional power converters allow operation from 120 Volts AC or 24 Volts DC power sources are available.
- 1.3 The unit is highly accurate in spite of its low purchase and installation cost, and simple calibration allows the unit to monitor speeds from 2 to 250 RPM. An optional speed range from 200 to 1000 RPM is available. To install the speed switch, simply strap the magnet to the shaft or any other convenient rotating portion of the equipment. Mount the speed switch so that the magnet will pass within approximately 1/4" of the end of the probe. Critical alignment of the magnet to the sensor is not required.

2.0 SPECIFICATIONS

Environmental

Operating Temperature -40°C to +85°C (-40°F to + 185°F)

Speed Range Standard 2-250 RPM
 Optional 200-1000 RPM

Enclosure Class I, Groups C&D, Div. 1
 Class II, Groups E, F & G, Div. 1

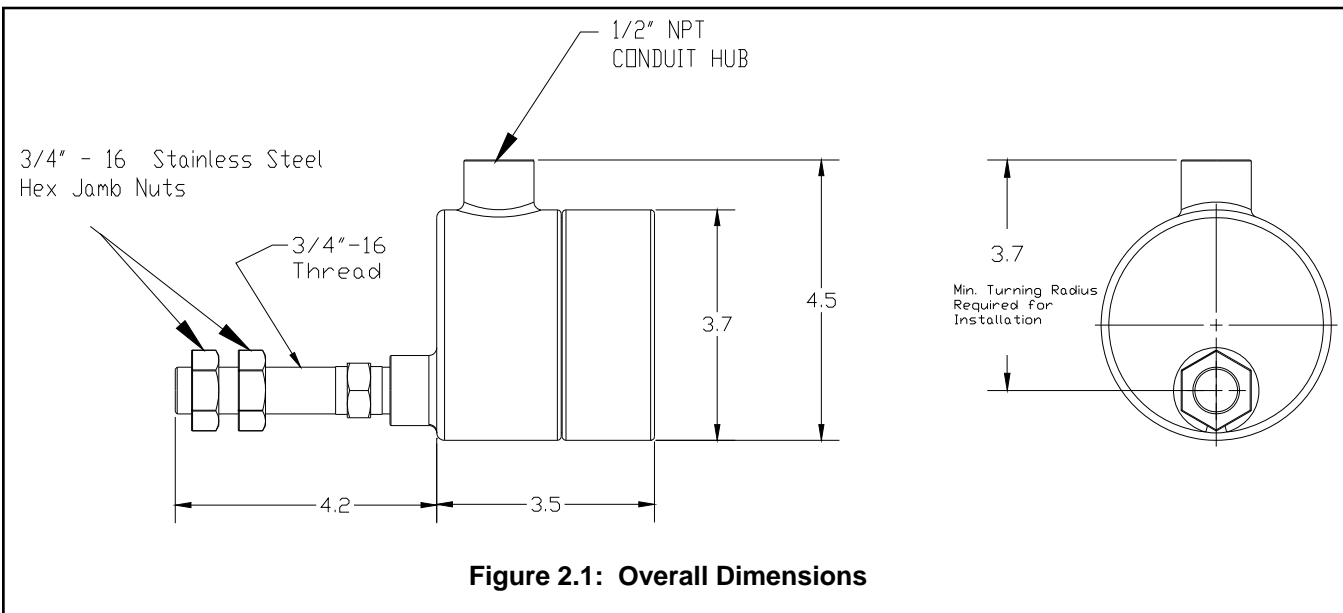
Electrical

Input Power Standard 95-130 VAC, 50-60 Hertz, 2 Watts
 Optional 10-18 volts DC @ 150 mA MAX
 Optional 18-35 volts DC @ 150 mA MAX

Relay Contact Rating 1 Form C, dry, rated 3 amps @ 120 volts AC or 30 volts DC, resistive

Mechanical

Overall Size 8" X 3¼" X 4½"
 Weight 2.3 lbs (1.04 kg)



3.0 Installation and Calibration

- 3.1 After unpacking the unit, inspect it for any evidence of shipping damage. Any claims for damage due to shipping must be filed with the carrier who handled the package(s).
- 3.2 Attach the magnet to a convenient place on the rotating shaft to be monitored using the stainless steel clamp supplied.
- 3.3 Fabricate a sturdy bracket to hold the speed switch in such a position that the magnet will pass within $\frac{1}{4}$ " to $\frac{3}{4}$ " of the end of the probe. See Figure 3.1 showing a typical field fabricated bracket mounting arrangement.
- 3.4 Wire the unit in accordance with the needs of the machine to be monitored and any associated control system. Figure 3.2 shows some simple wiring diagrams which may be useful in certain applications. Figure 3.3 shows the location and identification of the wiring terminals. Consult your distributor, representative or the K-TEK factory if you desire help with your specific application.



CAUTION: The unit is supplied to operate on either 12 volts DC, 24 Volts DC or 120 Volts AC as ordered by the user. Connect to only one power source.

CAUTION: Be sure that all wiring conforms to the requirements of the national code and any enforcing authorities or agencies having jurisdiction over the installation. Be sure that any specific conditions such as areas having explosion hazards are given full consideration.

- 3.5 The Model A22 Speed Switch contains two timers, a start-up timer and a rotation timer. The start-up timer is fixed at approximately 10 seconds. Its purpose is to allow machinery to reach normal speed before the speed switch is "armed" to perform its alarm or shutdown function. It is effective only for shafts rotating faster than about 10 RPM. A start-up timer is usually not required for very low speed machinery. The rotation timer checks to see that each shaft rotation does not take longer than it should. When a shaft rotation takes too long to complete it may indicate that a machine is jammed or overloaded.
- 3.6 Calibrate the Kasichek unit using the procedure which follow. Two different procedure are described, one for very low speed machines operating at 20 RPM or less and one for higher speed machine operating at speeds above 20 RPM. Use the procedure that applies to your particular machine. See Figure 3.4 for location of controls and indicators.
- 3.7 The purpose of this adjustment procedure is to set the speed switch in such a manner that it will trip the relay when the speed of the monitored machinery falls below a predetermined RPM.
- 3.8 The CALIBRATION POTENTIOMETER is used to set the speed to a particular RPM. Once it is set, it should not require re-adjustment unless it is desired to change the trip speed.
- 3.9 The INDICATOR LIGHT is used to determine the proper setting of the calibration potentiometer. When the speed switch is properly calibrated, the indicator light will report any loss of speed below the set point of the rotating equipment.
- 3.10 Once the speed switch is properly installed, used the following steps to calibrate the unit to a particular application. The only equipment required is a small screwdriver to adjust the calibration potentiometer and, if using the low speed procedure, a watch with a sweep second hand or a stop watch.

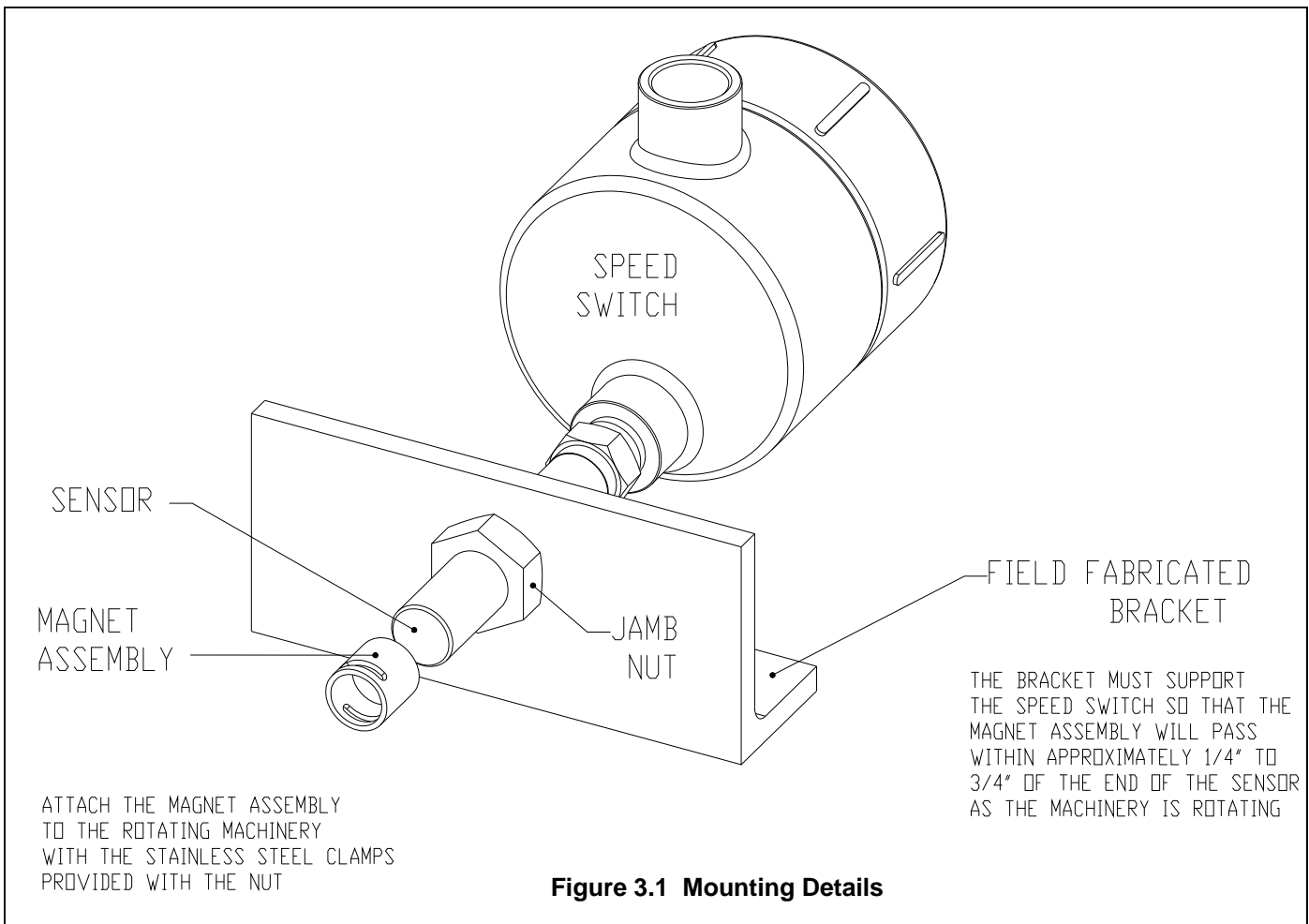


Figure 3.1 Mounting Details

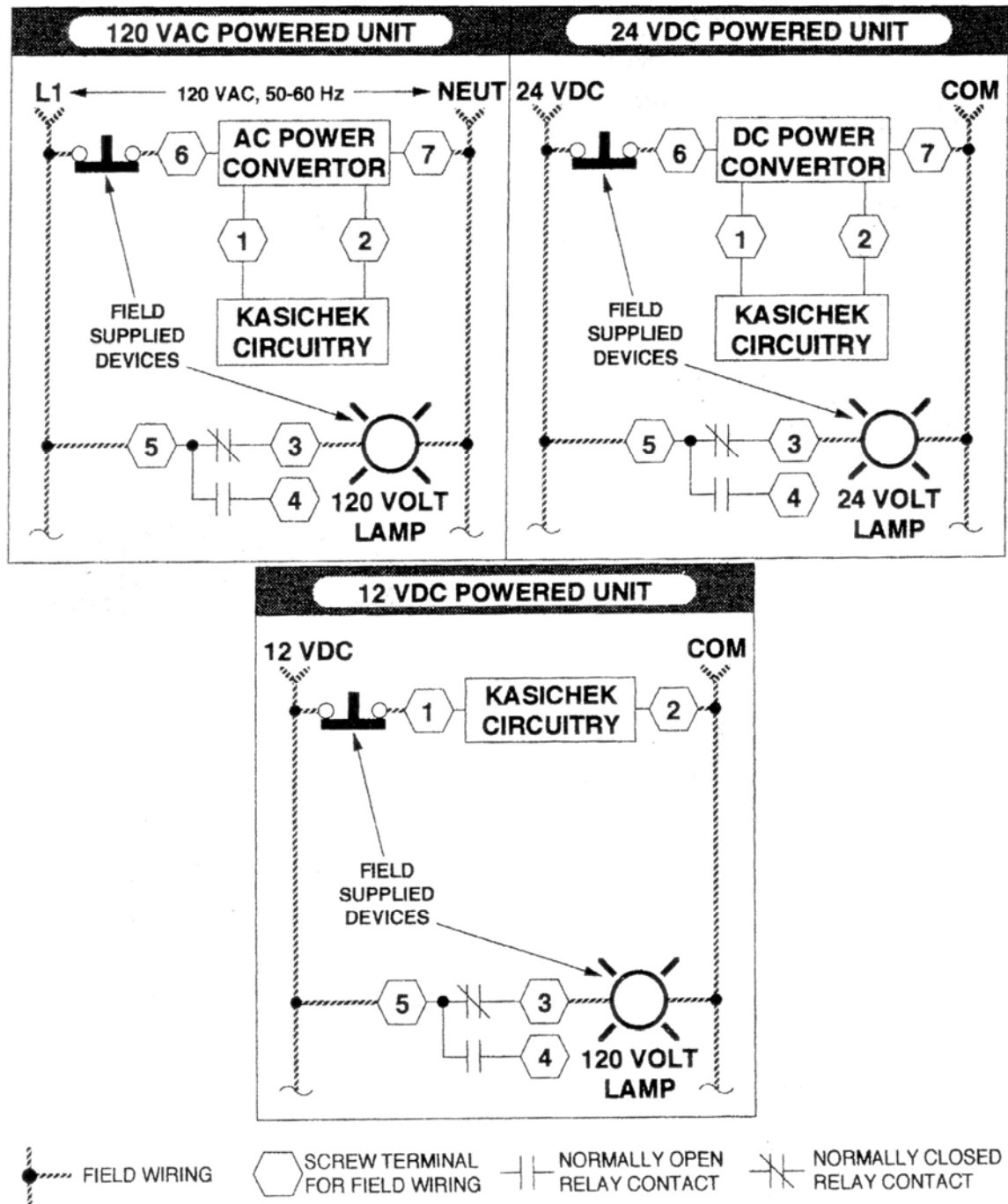


Figure 3.2: Typical field wiring diagrams. These wiring diagrams represent typical hookups which may be useful in certain field applications. Many other wiring arrangements are possible. Consult your distributor, representative or the K-TEK factory if you desire help with your application.

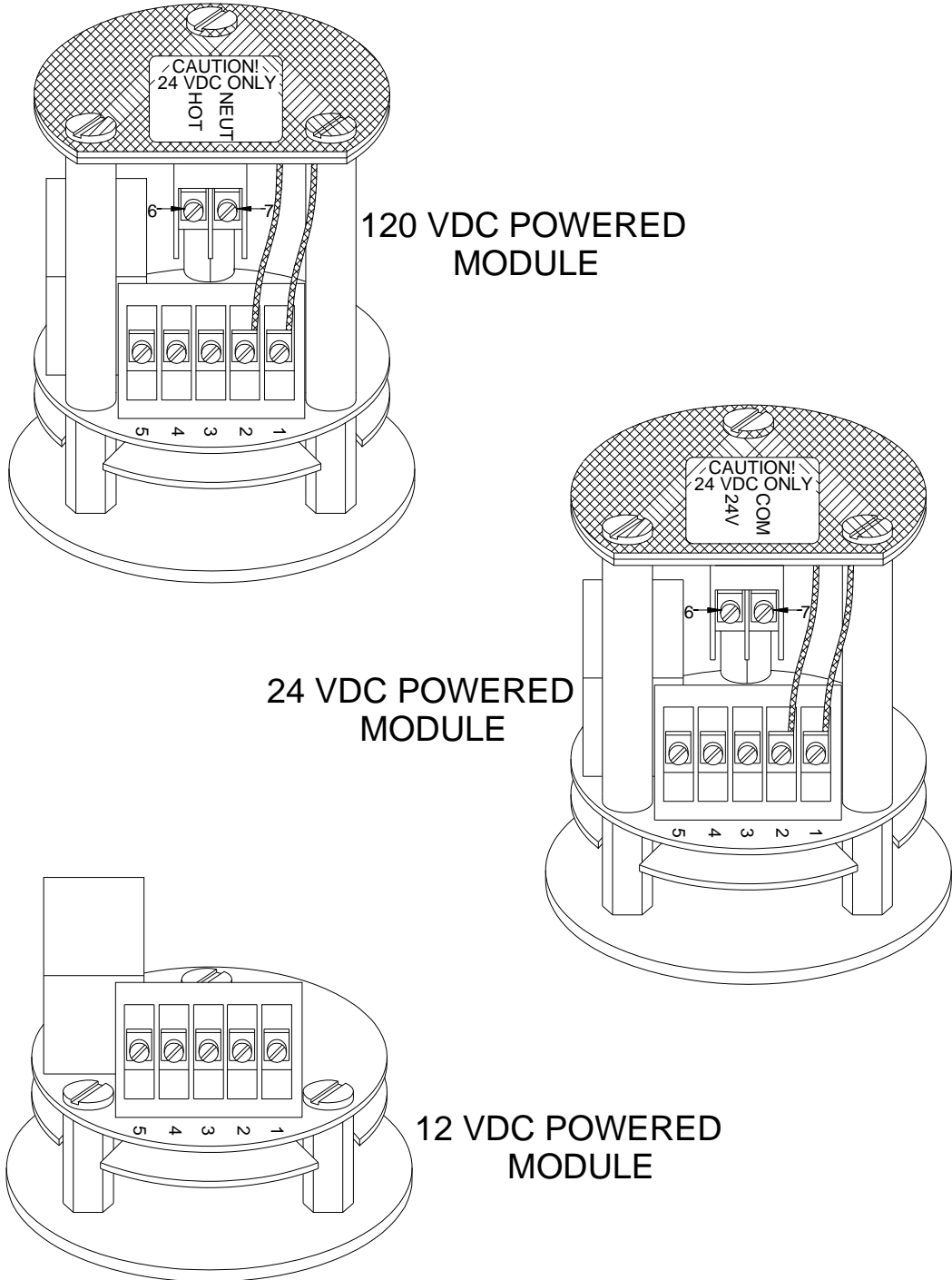


Figure 3.3: Wiring Terminal Locations

3.11 **READ ALL STEPS BEFORE BEGINNING.**

3.12 Procedure for machines operating ABOVE 20 RPM:

Step 1

With the machine operating at normal speed, hold the internal PRESS-TO-TEST pushbutton operated.

Note: There are 20 complete turns of the calibration potentiometer from one end to the other. When one or the other end is reached, the adjustment screw will continue to turn and “freewheel” (without damage) until the direction of the rotation is reversed. After turning the potentiometer to either extreme end, it may require up to a full turn in the reverse direction before actual change is noted.

Step 2

Observe the indicator light.

If the light is **ON** or **FLASHING**:

Rotate the potentiometer counterclockwise until the light just goes out.

If the light is **OFF**:

Rotate the potentiometer clockwise until the light begins to flash, and then turn the potentiometer counterclockwise until the light just goes out.

Step 3

Finally, turn the potentiometer one-half turn further counterclockwise. Release the pushbutton. After approximately ten seconds the speed switch will become active and a loss of speed of about 20 percent will cause the speed switch to alarm.

This completes the calibration of the speed switch unit, and it is now ready to operate.

3.12 Procedure for machines operating AT or BELOW 20 RPM:

Measure the time of one rotation of the shaft to be monitored.

If possible, use a stop watch. However, it is entirely practical to make a reasonably accurate measurement using an ordinary watch with a sweep second hand by timing for ten rotations of the shaft and dividing the result by ten. For example, if you time one rotation of a shaft that is turning at 4.8 RPM, you will find that it takes about 12 seconds to complete the rotation. It would be difficult to determine any fractions of one second. If, however, you time the shaft for 10 rotations, you will find that it takes 125 seconds to complete 10 rotations. $125 \text{ seconds} / 10 \text{ rotations} = 12.5 \text{ seconds per rotation}$.

$60 \text{ seconds (1 minute)} / 12.5 \text{ seconds} = 4.8 \text{ RPM}$

The following steps may be performed on a test bench or with the speed switch installed on a machine. If this procedure is performed with the unit installed on a machine, the machine must be locked out to prevent accidental start-up during this procedure. If the sensing magnet is installed on the machine shaft, it must be positioned at least 2" away from the end of the sensor.

You will need a hand-held magnet and the same watch that was used to time the rotation of the machine. The magnet that will be used on the machine can be used for this purpose or any other magnet of about the same strength. There is nothing critical about the magnet as long as it is strong enough to activate the sensor.

If the speed switch is a latching type, you must hold the Press-To-Test button while activating the sensor with the magnet as described below. If the speed switch is a non-latching type it is not necessary to use the Press-To-Test button at all.

The object of this calibration procedure is to set the time of the rotation timer on the speed switch to be some amount of time longer than the time of one shaft rotation. How much longer this time must be depends upon the machinery being monitored. Some machines may have a relatively wide variation in speed under normal conditions, while others may be very close to a constant speed. The rotation timer must be set slightly longer than the time of one rotation at the **LOWEST NORMAL SPEED** of the monitored machine.

Step 1

Turn the calibration potentiometer at least 20 full turns counterclockwise.

This sets the rotation timer to its maximum amount of time. If you are making a small adjustment to a speed switch that has previously been calibrated using this procedure, this step may be skipped.

Step 2

Apply power to the speed switch and wait for the red indicator light to come on.

Step 3

Touch the hand held magnet to the end of the sensor probe. (If latching type, hold Press-To-Test button.)

The red indicator light should go out for a period of time. The time required for the light to come back on is the time period of the rotation timer.

The hand held magnet should work on the side of the sensor within $\frac{3}{4}$ " of the end as well as on the end of the sensor.

After the red light goes out on a latching unit, the Press-To-Test button may be released until the next test.

Step 4

Adjust the calibration potentiometer to set the time of the rotation timer.

Turning the potentiometer clockwise decreases the time. Turning the potentiometer counterclockwise increases the time. Repeat steps 3 & 4 until the rotation timer is set to the desired time.

This completes the calibration procedure for very low speed machines. If the unit was calibrated on a bench, it may now be installed on the machine and placed in operation without further adjustment. If the unit was calibrated on a locked out machine and speed may now be placed in operation without further adjustment to the speed switch.

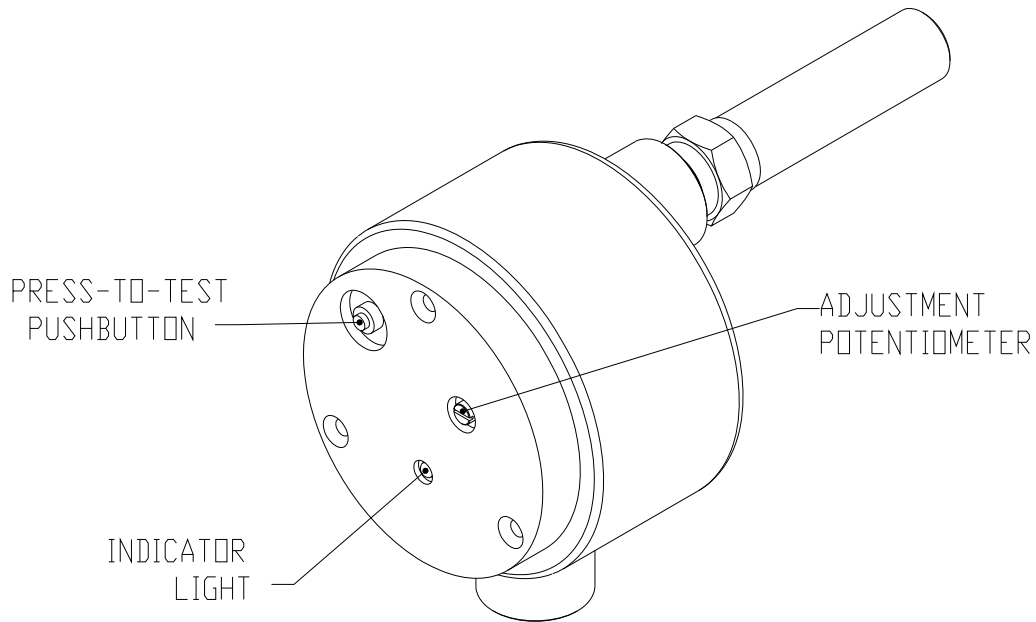


Figure 3.4: Location of Adjustments and Controls

4.0 Operation

- 4.1 No operator actions are required to use this unit. When the rotating machinery is operating at normal speed, the relay will be energized. Upon loss of speed below, the calibrated setting the relay will de-energize. Since the relay contacts may be used in a number of different ways, the operator should know what to expect when a change of condition occurs and be prepared to take any action required by the system in which the Kasichek is used.

5.0 WARRANTY INFORMATION

3 YEAR WARRANTY FOR:

ShieldPoint™300 & ShieldPoint™400 capacitance switches.

2 YEAR WARRANTY FOR:

WT2000 radar level transmitters; RP paddle switches; A02, A75, & A77 RF capacitance level switches and A33 & A38 RF capacitance level transmitters; A22 Speed Switch; CP2 Conductance Switch.

1 YEAR WARRANTY FOR:

LaserTrak™ and EasyTrak™ series laser transmitters; DPM100 digital indicators; KVIEW series digital indicators and controllers; GranuPoint™ and SlurryPoint™ vibrating fork switches, SoliTrak™ Electro-Mechanical Continuous Measuring Devices, SonikTrak™ ultrasonic level transmitters & transducers.

SPECIAL WARRANTY CONSIDERATIONS:

ASI will honor OEM warranties for items not manufactured by ASI (i.e. Palm Pilots).

ASI will repair or replace, at ASI's election, defective items which are returned to ASI by the original purchaser within the period specified above from the **shipment date** of the item and which is found, upon examination by ASI, to its satisfaction, to contain defects in materials or workmanship which arose only under normal use and service and which were not the result of either alterations, misuse, abuse, improper or inadequate adjustments, applications or servicing of the product. **ASI's warranty does not include onsite repair or services.** Field service rates can be supplied on request.

If a product is believed to be defective, the original purchaser shall notify ASI and request a Returned Material Authorization before returning the material to ASI, with transportation **prepaid** by the purchaser. (Request door to door delivery via Houston International Airport located in Houston, TX, USA.) The product, with repaired or replaced parts, shall be returned to the purchaser at any point in the world with transportation prepaid by ASI for best-way transportation only. ASI is not responsible for expedited shipping charges. If the product is shipped to ASI freight collect, then it will be returned to the customer freight collect.

If inspection by ASI does not disclose any defects in material or workmanship, ASI's normal charges for repair and shipment shall apply (minimum 100.00 USD).

The materials of construction for all ASI products are clearly specified and it is the responsibility of the purchaser to determine the compatibility of the materials for the application.

THE FOREGOING WARRANTY IS ASI'S SOLE WARRANTY AND ALL OTHER WARRANTIES EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OF FITNESS FOR A PARTICULAR PURPOSE, ARE EXCLUDED AND NEGATED TO THE MAXIMUM EXTENT PERMITTED BY LAW. NO PERSON OR REPRESENTATIVE IS AUTHORIZED TO EXTEND ANY OTHER WARRANTY OR CREATE FOR ASI ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF ASI'S PRODUCTS. THE REMEDIES SET FORTH IN THIS WARRANTY ARE EXCLUSIVE OF ALL OTHER REMEDIES AGAINST ASI. ASI SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, OR SPECIAL DAMAGES OF ANY KIND. ASI'S SOLE OBLIGATION SHALL BE TO REPAIR OR REPLACE PARTS (FOUND TO BE DEFECTIVE IN MATERIALS OR WORKMANSHIP) WHICH ARE RETURNED BY THE PURCHASER TO ASI.





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