

Tilt Switches

MTS-20H/30H Tilt Switch Probes and SCU-200 Control Unit

Description

The Electro Sensors' Tilt Switch is a simple system consisting of a control unit and a sensing probe. It is widely used in the process industry to sense the presence or absence of any bulk material. Typical applications include: high or low bin level alarms, detection of transfer chute plug-up, control of material depth in crusher bowls and the sensing of alarm conditions in rock box, screen classifiers and more. Normal or safe condition may be vertical, as in a screen classifier properly loaded — an excessive level tilts the probe to indicate an alarm. Normally tilted condition is typified by material flowing on a conveyor belt — loss of material drops the probe to the vertical position to indicate alarm.

Principle of Operation

The MTS Tilt Switch Probes feature rugged welded steel construction. They are airtight, waterproof, dust and dirtproof, and have a stress relieved cable. The mercury switch inside the probe is epoxy encapsulated to seal it from even the most severe environmental conditions. The probe mounted in a vertical position has closed contacts. As it is tilted to approximately 15 degrees, contacts will open. The contacts have a maximum capacity rating of 230 Vac, 1.7 Amps. The probe is supplied with a flexible 8-foot Neoprene jacketed 18-gauge, two-wire conductor cable suitable for conduit or stand-alone wiring.

The SCU-200 Control Unit provides a safe low voltage power source for any probe. Input from the probe is switch selectable so that either tilted or vertical position may be selected as "safe." The opposite position results in alarm, following an adjustable 1-99 second relay output delay. The delay assures reliable performance, free from false alarms, because only a sustained change in the probe position will initiate an alarm. Lamps are mounted on the face of the enclosure to indicate the SAFE/ALARM status of the output relay (5 amp DPDT). The control is "fail-safe," relay failure or power loss causes an immediate alarm.

Installation Instructions

The MTS Tilt Switch Probes may be suspended from the threaded conduit adapter hanger. Cable length should be adjusted so it won't affect tilting of the probe body. Tilt switch hangers (supplied as standard) are all welded steel to match the probe body and are threaded to screw directly onto 1/2-inch NPT conduit. Optional stainless steel hangers and probes are also available.

The SCU Control unit may be remotely located in any convenient place. See wiring diagram for terminal block layout.

Auxiliary Sensor Power

The SCU-200 Control Unit has a sensor input feature that adds to its versatility. Terminal TB2-1 is a 12 Vdc sensor supply terminal that enables the use of open collector sensors such as Hall-effect and proximity sensors with the control unit. This feature may be used in a wide variety of sensing applications where an adjustable relay output is desired when the sensor detects a target.

6111 Blue Circle Drive
 Minnetonka, MN 55343
 Phone: 952.930.0100
 Fax: 952.930.0130
 ISO 9001:2000 Certified

Time Delay Adjustment

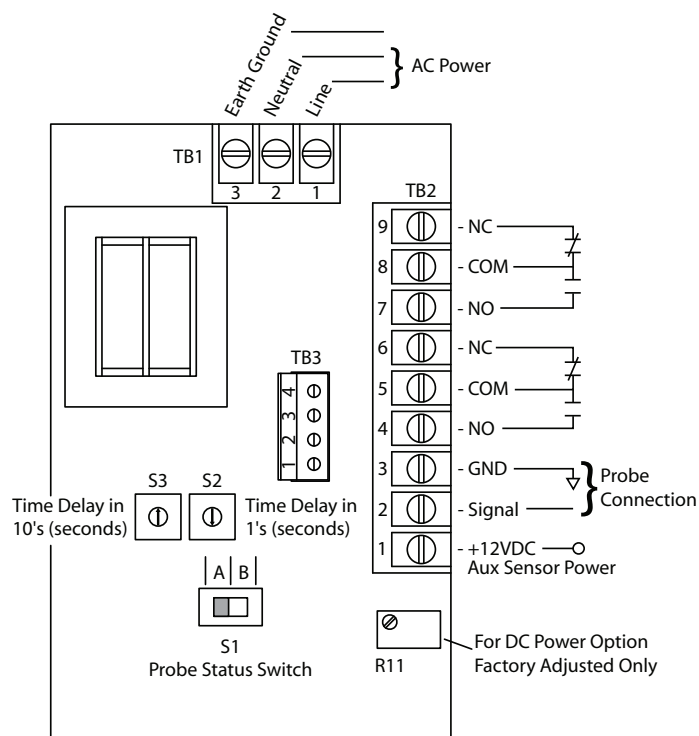
The Relay Output Time Delay function is adjustable from 1-99 seconds. Use a small screwdriver to turn the rotary switches S2 and S3 for the desired time delay interval. Switch S2 adjusts for single seconds, and switch S3 adjusts for tens.

Example: A time delay of 14 seconds would require S3 to be set at 1 and S2 to be set at 4.

Probe Status Switch

With the probe status switch in the "A" position, the relay is energized, and the green "SAFE" lamp is lit when the probe is tilted. With the probe status switch in the "B" position, the relay is energized and the green "SAFE" lamp is lit when the probe is in a vertical position.

Electrical Connections



TB1 is used to connect input power to the SCU-200 Control Unit.

TB1			
Power	1	2	3
115 Vac	Line	Neu	Gnd
230 Vac	Line	Line	Gnd
12 Vdc	Pos	Neg	Gnd
24 Vdc	Pos	Neg	Gnd

TB2 is used for the relay output and probe connection.



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Probe Connection

TB2		
1	2	3
+12VDC (Aux Sensor Power)	MTS Probe or Signal	MTS Probe or Ground

Relay Output

TB2					
4	5	6	7	8	9
N.O.	COM	N.C.	N.O.	COM	N.C.

TB3 is used to connect the LED indicators.

TB3			
1	2	3	4
Green (+)	Green (-)	Red (+)	Red (-)

SCU-200 Control Unit Specifications

Input Power	115 VAC $\pm 10\%$ 50/60 Hz. 230 VAC Optional 12/24 VDC Optional
Probe Signal Voltage	+12 VDC (10K Ω Pull-up to +12VDC)
Aux Sensor Supply	+12VDC @ 17mA Max.
Relay Output	DPDT Form C Relay 5 Amp @ 250VAC Resistive load
Relay Status	Switch Selectable
Relay Status Lamps	LED Indicators
Wiring Connections	Screw barrier terminals 14 AWG Max.
Enclosure	NEMA 12 NEMA 4 Optional
Operating Temperature	0 °C to +70 °C
Storage Temperature	-20 °C to +70 °C
Options	Intrinsically safe available

MTS Probe Specifications

Contact Rating	1.7 Amp Max @ 250VAC SPST
Contact Type	Mercury
Probe Actuation Angle	15° \pm 5°
Weight	MTS-20H: 18Oz. MTS-30H: 75Oz.
Cable Supplied	8Ft. 18 AWG 2 Conductor Neoprene jacket.
Housing Material	Steel Stainless Steel Optional

Specifications are subject to change without notice.

WARNING
CONTAINS MERCURY
DISPOSE ACCORDING TO LOCAL, STATE AND FEDERAL LAWS

Part Dimensions

