Mercury Free Tilt Sensor
User's Guide

REC 4274 Rev. C Part Number 092241

RAMSEY MERCURY FREE TILT SENSORS

FOR NON-HAZARDOUS AREAS

CONTROL UNITS
Model 20-35-NM-F
Model 20-35-NM-DIN

PROBES
Model 20-54-NM-SS
Model 20-52-NM
Model 20-59-NM
Model 20-55-NM-P

Manufacturer:
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Revision History

Revision Number	Date Released	ECO Number	Release Specifics
A	March 2008	1819	Manual first release
B	September 2013	3369	Correct Output Names
C	September 2013	3381	Add specifications

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About this Manual

This manual contains the information necessary in order to guarantee a safety an correct use of the *Ramsey Mercury Free Tilt Sensor* system (*Control Units* with *Probe).*

Read this manual before working with the product. For personal and system safety and for best product performance, make sure you thoroughly understand the contents before using this product.

The manufacturer has a policy of constantly developing and upgrading its products and hence may make changes without prior notice.

Who Should Use this Manual?

This manual is a learning resource and reference for specialised technical personnel concerned with installing, operating or maintaining the probe and control.

Standards Applied and Technical Specifications

The system has been made in compliance with the EC, standards.
The products are supplied complete with all the documentation required by these standards. The installation, use and maintenance manual is an integral part of this documentation and contains all the informations needed to ensure the efficent operation of the system, with particular regard to personnel safety.

The following standards have been referred to the design of the *Ramsey Mercury Free Tilt Sensor* system:

CAN/CSA-C22.2 No. 61010-1-04	Safety Requirements for electrical equipment for Measurement, Control, and Laboratory: Use- Part 1 General Requirements
UL Std. No. 61010-1	Safety Requirements for electrical equipment for Measurement, Control, and Laboratory: Use- Part 1 General Requirements
EC 93/68	Low Voltage Directive
EN 61010 : 2001	Safety Requirements for Electrical Equipment for Measurement
EN 61326-1 :2006	(EMC)

Organization of the Manual

This manual is organized into 8 chapters.

Chapter 1: Introduction - provides a functional overview of the system and the technical specifications.

Chapter 2: Installation - provides the steps and instructions necessary to install the equipment

Chapter 3: Operation – provides information on equipment operation.

Chapter 4: Maintenance and Troubleshooting – provides information on any maintenance of the equipment and troubleshooting if appropiate.

Chapter 5: Service, Repair, and Replacement Part – discusses how to contact *Thermo Fisher Scientific* service departments for assistance and how to order parts for the equipment.

Chapter 6. Decommissioning and Dismantling

Chapter 7 Labels - provides information on labels description and position.

Documentation Conventions

The following conventions are used in this manual to help easily identify certain types of information:

- *Italic* is used to introduce new terms and for emphasis.
- *Italic/blue* type is used for references to other sections of the manual and serve as links in electronic documents.
- The names of setup, calibration displays, menu displays, and variables are shown in FULL CAPITALS.
- The names of keys are shown in **BOLD CAPITALS.**

  ▪ **Note:** Provides information of special importance to the reader.

- This symbol indicates a **HINT** in the text that may be of value but not necessary for operation.

Safety Messages

Instructions in this manual may require special precautions to ensure the safety of the personnel performing the operations.

Please read the safety information before performing any operation preceded by this symbol. ⚠

There are two levels of safety messages: warnings and cautions. The distinction between the two is as follows:

⚠ WARNING
Failure to observe could result in death or serious injury.

⚠ CAUTION
Failure to observe may cause minor injury or damage the equipment

General Precaution

Do not install, operate, or perform any maintenance procedures until you have read the safety precautions presented.

The manufacturer is deemed absolved of all liability in the following circumstances:

- If the products is used improperly
- If the product has not been installed in accordance with the instructions in this manual
- If the product has been installed in an environment that does not comply with the conditions set by the manufacturer
- If the product has been altered by the customer in any way without the express written authorisation of the manufacturer
- If the user has not followed the instructions given in this manual
- If the product has suffered the consequences of exceptional events such as floods, earthquakes, etc. And has been put back into operation without the necessary checks being made

WARNING

Failure to follow safe installation and servicing procedures could result in death or serious injury.

- Make sure only qualified personnel perform installation and maintenance procedures in accordance with the instructions in this manual.
- Allow only qualified electricians to open and work in the electronics enclosure

WARNING

High voltage that may be present on leads could cause electrical shock.

- All switches must be OFF when checking input AC electrical connections, removing or inserting printed circuit boards, or attaching voltmeters to the system.
- Use extreme caution when testing in, on, or around the electronics cabinet, PC boards, or modules. There are voltages in excess of 115 V or 230 V in these areas.

WARNING

Use only the procedures and new parts specifically referenced in this manual to ensure specification performance and certification compliance. Unauthorized procedures or parts can render the instrument dangerous to life, limb, or property.

Safety in Use

Once the products has been installed before starting work check:

- For **visible defects** on the safety devices
- For **correct operation** of the device

Safety in Maintenance

Before carrying out any maintenance operation on the products it is mandatory:

- **Read** this instruction manual
- **Use** the correct tools for the maintenance operations that have to be done
- **Do not clean** the electrical parts with water or other fluid
- **On completing the repair work**, then that all the tools have been collected up

WARNING

Only qualified personnel are allowed to carry out maintenance work.

Maintenance staff must wear working clothes and individual protective equipment in conformity with safety legislation and binding safety standards.

Any alteration to the product or replacement of any parts made without the manufacturer's authorisation may cause an accident hazard and absolves the manufacturer from all civil and criminal liability.

If an emergency situation arises because of a fire, it is forbidden to use water toput the fire out, always user powder-type extinguishers.

How to Get Help

WARNING

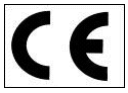
Unless you are directed to do so by an authorized service representative of *Thermo Fisher Scientific*, you should not attempt to perform any troubleshooting or maintenance procedures that are not described in this manual.

Failure to comply with these warnings can result in exposure to high voltages or high temperatures, which can cause personal injury.

Certifications

CONTROL UNIT

Model : 20-35-NM-F

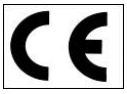
		TAG MARKING
CE Certification		**CE**
CSA International		**-40°F (-40°C) ≤ Ta ≤ +122°F (+50°C)** **Master Contract : 158791**

Model : 20-35-NM-DIN

		TAG MARKING
CE Certification		**CE**
CSA International		**-40°F (-40°C) ≤ Ta ≤ +122°F (+50°C)** **Master Contract : 158791**

PROBE

Models : 20-54-NM-SS / 20-52-NM / 20-59-NM / 20-55-NM-P

		TAG MARKING
CE Certification		**CE**

Chapter 1
Introduction

This chapter describes the applications appropiate for the control units for *Mercury Free Tilt Sensor* system and their respective specifications.

1.1 Applications

The strong and simple structure allows for safety in operation and ease of installation. The principal use conditions are:

- Silos and hopper
- Stock pilings
- Blocking in the charge/discharge areas of conveyor belt openings
- Signal for material's presence or lack-of on a conveyor belt
- In other applications where the effect is tilt of the probe. The probe actuates when it is tilted 15 degrees or more from it's vertical position.

1.2 Probe Models

Model 20-54-NM-SS	Stainless Steel Probe (AISI 304)
Model 20-52-NM	Heavy Duty 2" Metal Probe
Model 20-59-NM	Standard Probe, Nickel Chrome Plated Casting
Model 20-55-NM-P	Standard Probe, PVC

ACCESSORY AVAILABLES ON REQUEST :

For Model 20-52-NM	*WEAR PADDLE* for extension or anti-abrasion
For Model 20-59-NM	*WEAR PADDLE* for extension or anti-abrasion
	STAINLESS STEEL FLOAT BALL
	PLASTIC FLOAT BALL
For Model 20-55-NM-P	*PLASTIC FLOAT BALL*

1.2.1 Probe Specifications

Operating Voltage: (From Control Units Model 20-35-NM-F / Model 20-35-NM-DIN)

Current Flow: Vertical Position 18 mA approx.

Tilted (Inclination Probe Higher 15°) 8 mA approx.

Supply Shorted 26 mA approx.

Failure Supply (Circuit Open) 0 mA

Temperature Ratings: -40°F(-40°C) ≤ Ta ≤ +122°F(+50°C)

Dimensions: See Figures Chapter 2

Tilt Angle: > 15°

Probe Cable Length: Standard 8m (25 ft); Other lengths on request

1.3 Control Unit

1.3.1 Model 20-35-NM-F (Field Mount Version)

The Control Unit is housed in an enclosure with green ("normal") and red ("alarm") indicating lights on the front cover. An adjustable selection of 1, 2, 4, or 6 seconds of time delay in the control unit circuit will prevent false or premature contact transfer caused by momentary tilting of probe.

Tilt Probe alarm position: Two SPDT output contacts for connection to external alarms and/or controls.

Probe failure or supply short: One normally open (NO) contact.

SPECIFICATIONS:

Power Requirements

Voltage: 115/230 VAC +/- 10%, by selector switch

Frequency: 50/60Hz

Consumption: 7VA

Fusing: (F1) 0.05A SB Type T (F2) 0.1A SB Type T

Outputs

Alarm: Two (2) SPDT contact.

Rated at 10 Amp at 115/230 VAC or 7 Amp at 30 VDC non-inductive

Probe Fault or Supply Short: One (1) NO contact 115/230 VAC 2 Amp, 24VDC 3 Amp.

Time Delay: Adjustable 1, 2, 4, or 6 seconds.

Dimensions: See Figure 2-1

Humidity: 50 to 80%

Altitude: Up to 2000m

Temperature Rating: -40°F(-40°C) ≤ Ta ≤ +122°F(+50°C)

Protection: NEMA 4, Optional NEMA4X Stainless Steel

Pollution Degree: 2

Installation Category: II

1.3.2 Model 20-35-NM-DIN (Internal Cabinet Version)

This Control Unit version must be used ONLY inside an electrical cabinet or a enclosure with degree of protection IP 65 min.

The Control Unit is housed in an enclosure with the following indicating lights on the front cover:

- led (red) OFF for Probe Tilted
- led (red) ON for Probe Alarm (Failure or Probe supply short)

An adjustable selection of 1, 2, 4, or 6 seconds of time delay circuit in the control unit prevents momentary tilting of probe from causing a false or premature contact transfer.

Tilt Probe alarm position: One normally open (NO) contact.

Probe failure or supply short: One normally open (NO) contact.

SPECIFICATIONS:

Power Requirements

Voltage: 115/230 VAC +/- 10%

Frequency: 50/60Hz

Consumption: 3,3VA

Fusing: (F1) 0.05A SB Type T (F2) 0.1A SB Type T

Outputs

Probe Tilted: One (1) NO contact 115/230 VAC 2 Amp, 24VDC 3 Amp.

Probe Alarm (Fault or Supply Short) : One (1) NO contact 115/230 VAC 2 Amp, 24VDC 3 Amp.

Time Delay: Adjustable 1, 2, 4, or 6 seconds.

ENCLOSURE

Dimensions: See Figure 2-2

Protection: IP20

Temperature Rating: -40°F(-40°C) ≤ Ta ≤ +122°F(+50°C)

Material Self-Extinguishing: UL94 – V0

Humidity: 50 to 80%

Altitude: Up to 2000m

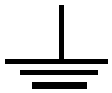
Pollution Degree: 2

Installation Category: II

1.4 Symbol Identification

Table 1-1 describes the symbols used in this manual.

Table 1-1: Symbol Identification

Symbol	Description
	ALTERNATING CURRENT
	EARTH (GROUND) TERMINAL
	PROTECTIVE CONDUCTOR TERMINAL
	CAUTION, RISK OF ELECTRIC SHOCK
	CAUTION (REFER TO ACCOMPANYING DOCUMENTS)

Chapter 2
Installation

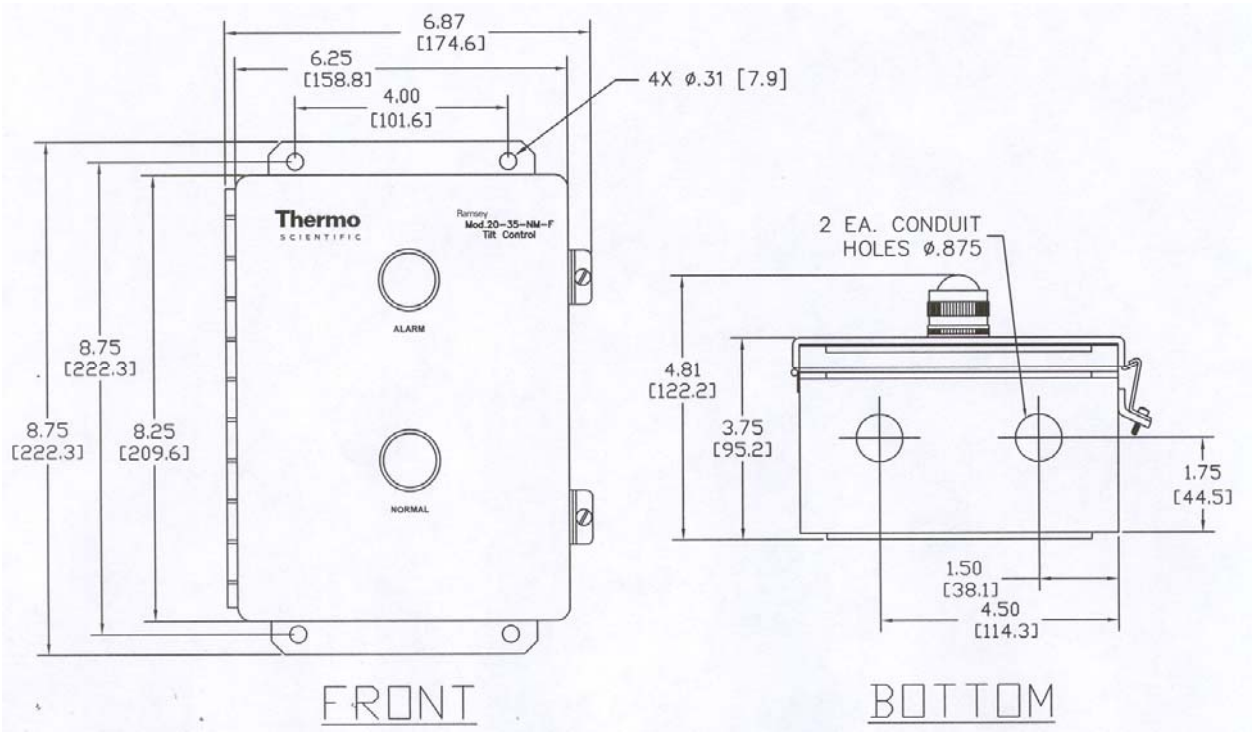
This chapter contains information regarding the installation of the *Ramsey Mercury Free Tilt Sensor* system.

2.1 Control Unit Installation

Model 20-35-NM-F & 20-35-NM-F-4X

1. The Control Unit should be mounted in a vibration-free area where the ambient temperature does not fall below -40°C (-40°F) or exceed 50°C (122°F).
2. The unit enclosure will accept two holes in the bottom for input of 3/4" diameter conduits/cable gland.
3. Use two separate conduits/cable glands, one for the probe and one for the control and/or power circuits.
4. The terminals will accept a 12 AWG stranded wire (maximum)
5. For electrical connections, refer to Figure 2-7.

Figure 2-1: Control Unit Model 20-35-NM-F & 20-35-NM-F-4X Dimensions

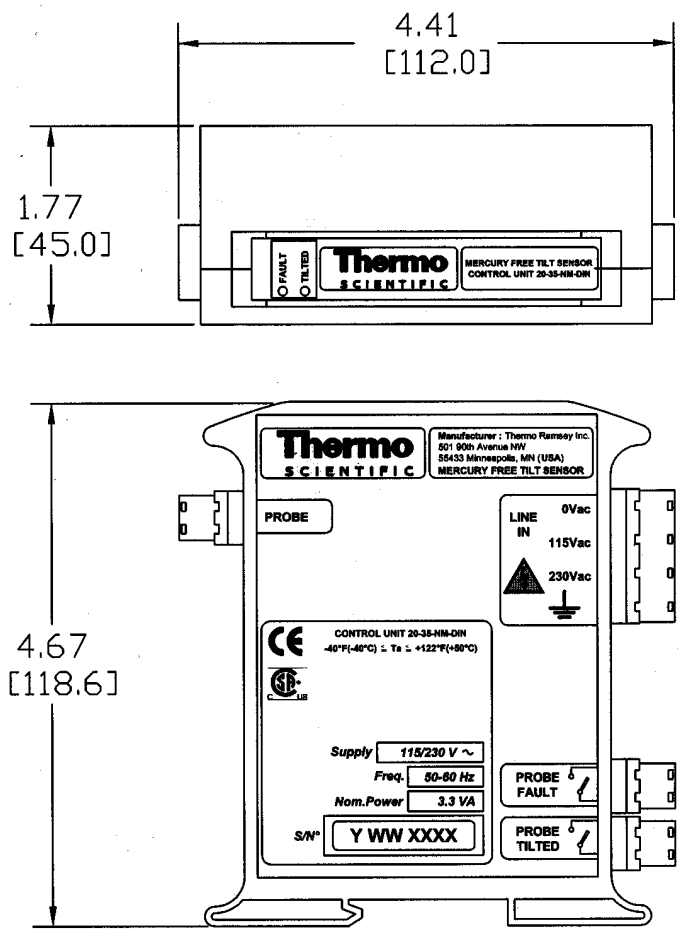


Model 20-35-NM-DIN

This model is suitable for installation ONLY inside an enclosure with proper mechanical protection.

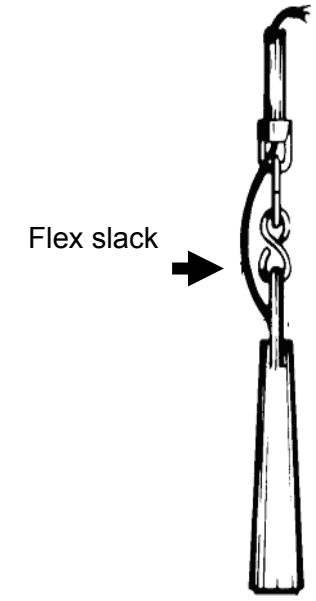
1. The Control Unit should be mounted in a vibration, heat and humidity free area where the ambient temperature does not fall below -40°C (-40°F) or exceed 50°C (122°F).
2. The unit enclosure is supplied with external terminal blocks for electrical connections.
3. Use two separate conduits, one for the probe and one for the control and/or power circuits.
4. The terminals will accept a 12 AWG stranded wire (maximum)
5. For electrical connections, refer to Figure 2-9.

Figure 2-2: Control Unit Model 20-35-NM-DIN Dimensions



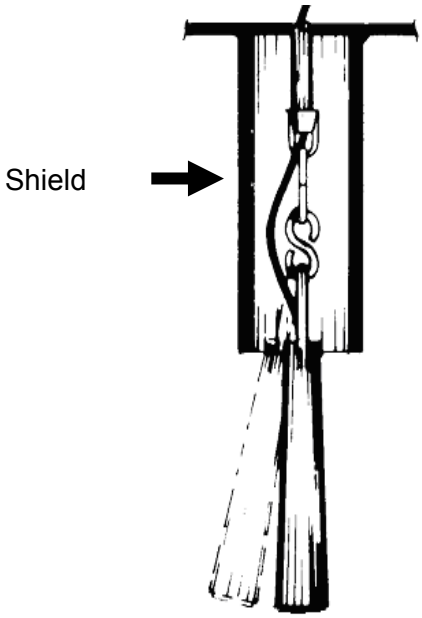
2.2 Probe Installation

1. The probe must be installed in a vertical position, suspended at a flexible joint that allows free movements in all directions.
2. Carefully chose the location of the Probe. It is very important to choose the right installation position so the material flow will cause a tilt action and not bury the probe.



Normal Installation

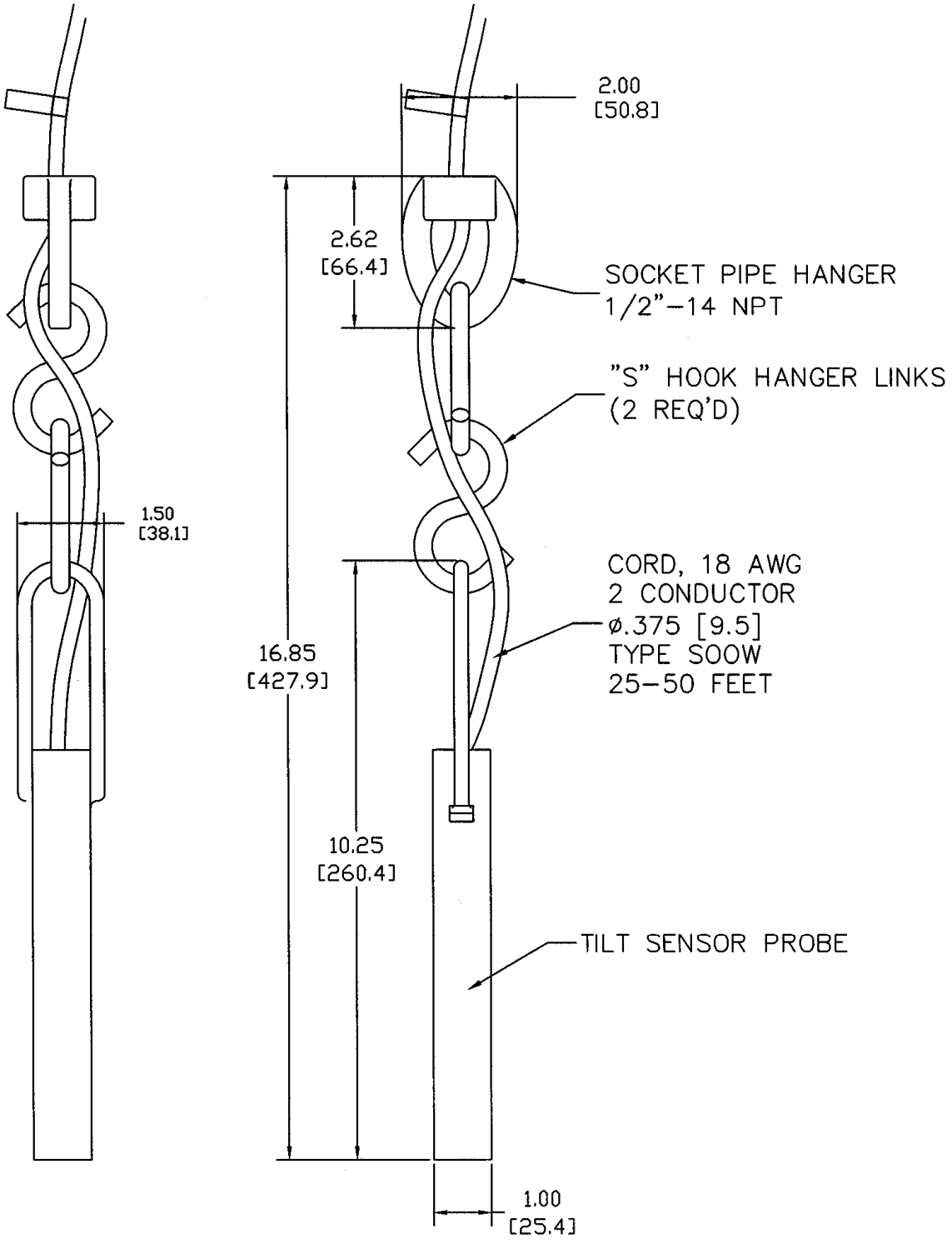
When there is no chance of material damaging the flex.



Shielded Installation

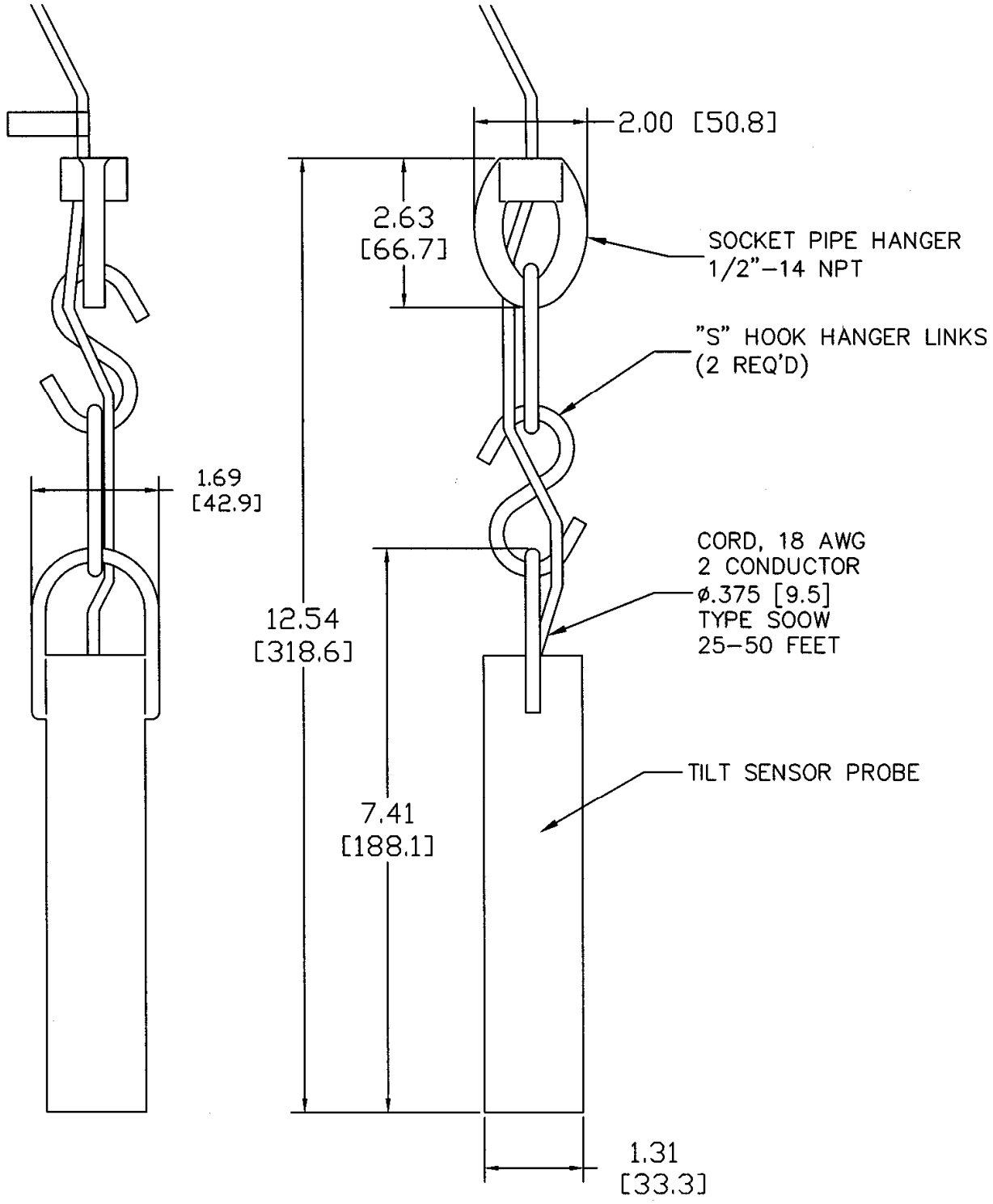
When flex protection is needed and the probe can traverse to alarm position.

Figure 2-3: Probe Model 20-54-NM-SS – Stainless Steel Probe



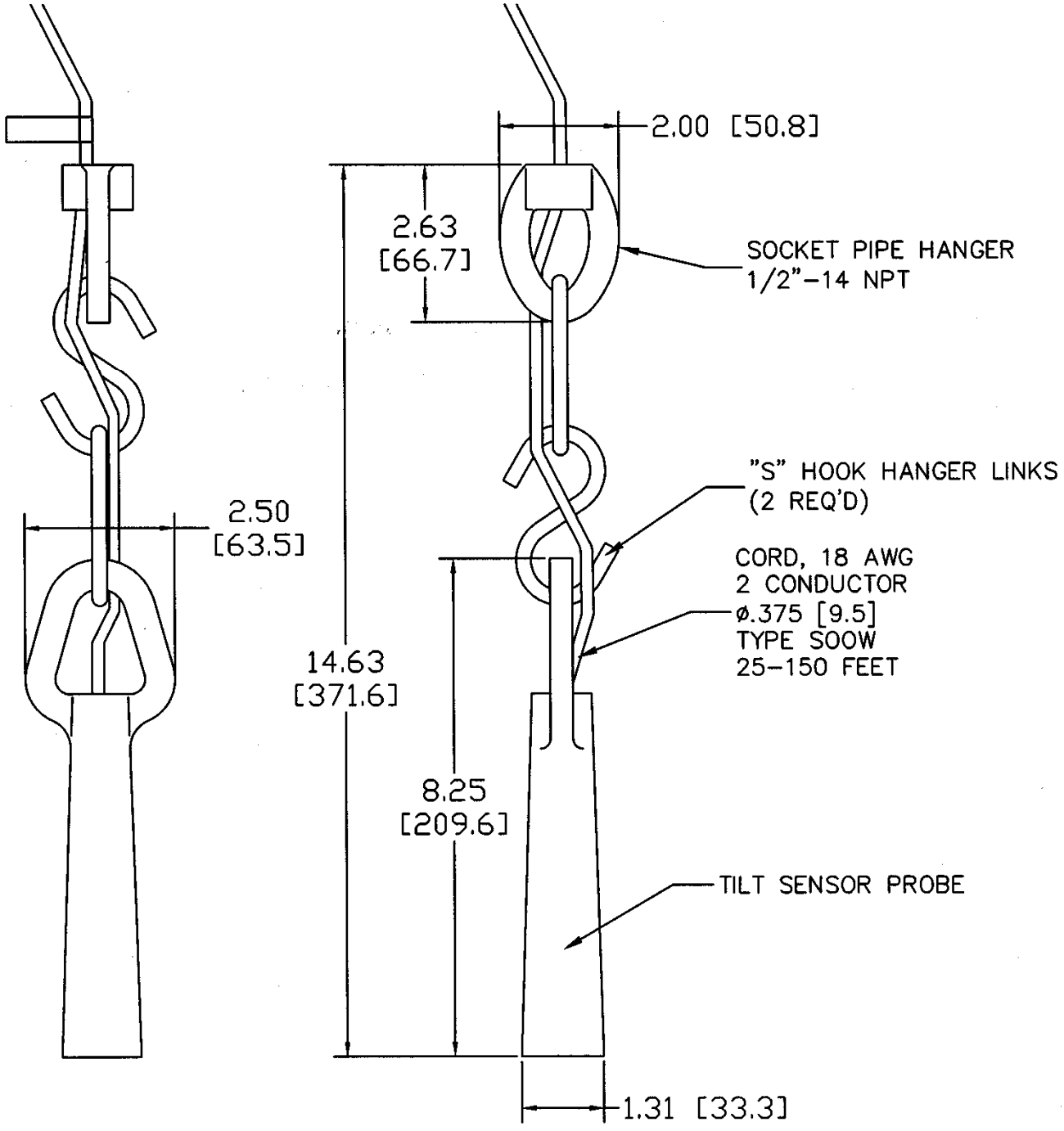
Dimensions are inches and [mm]

Figure 2-4: Probe Model 20-52-NM – Heavy Weight Probe



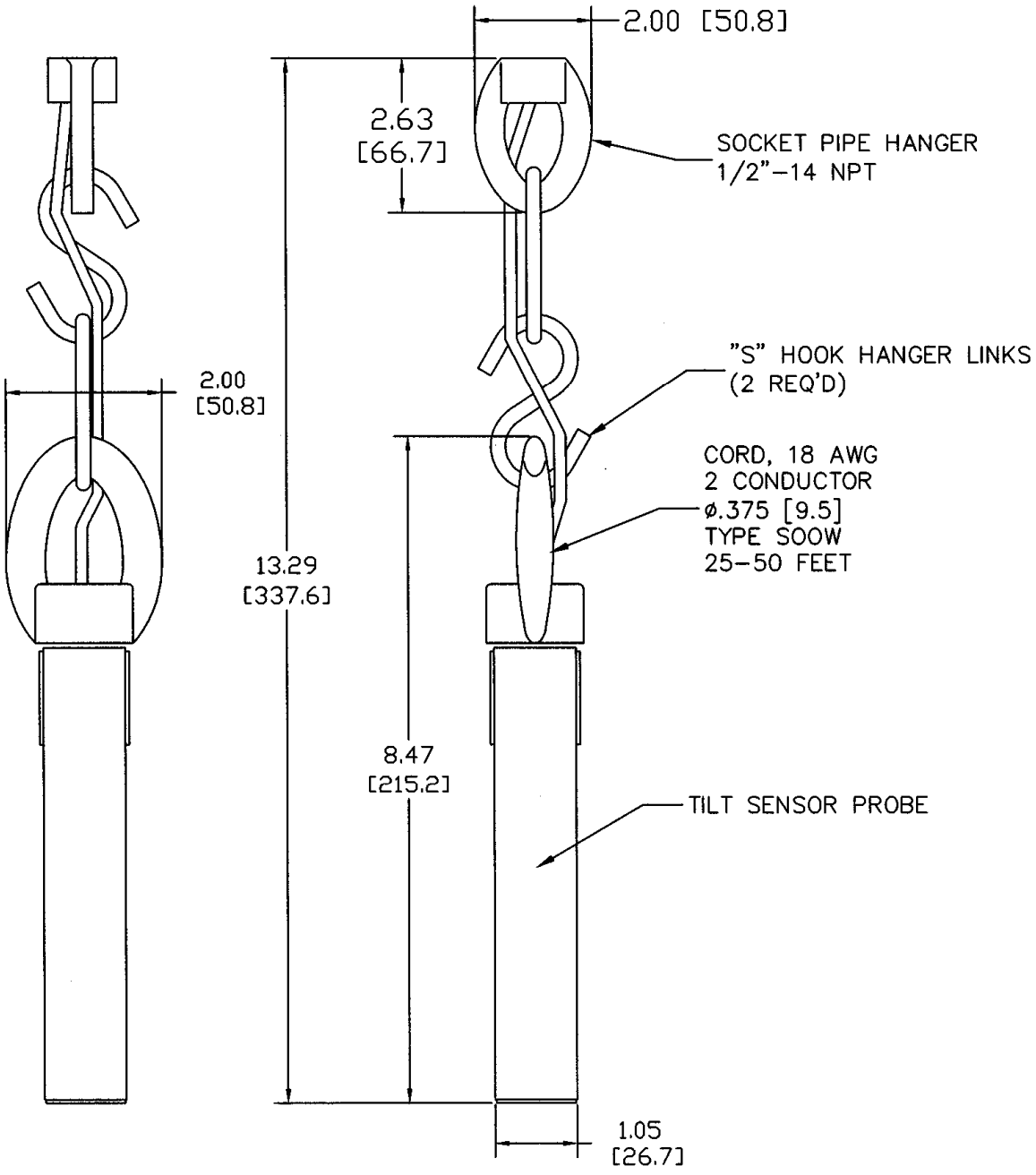
Dimensions are inches and [mm]

Figure 2-5: Probe Model 20-59-NM – Steel Probe



Dimensions are inches and [mm]

Figure 2-6: Probe Model 20-55-NM-P – Plastic Probe



Dimensions are inches and [mm]

2.3 Electrical Installation

CONTROL UNIT Model 20-35-NM-F

1 The Control Unit enclosure is supplied with (2) .875 dia. conduit holes in the bottom.

2 Use separate conduits/cable glands for probe and power circuits connection.

Figure 2-7: Control Unit Model 20-35-NM-F Terminal Wiring

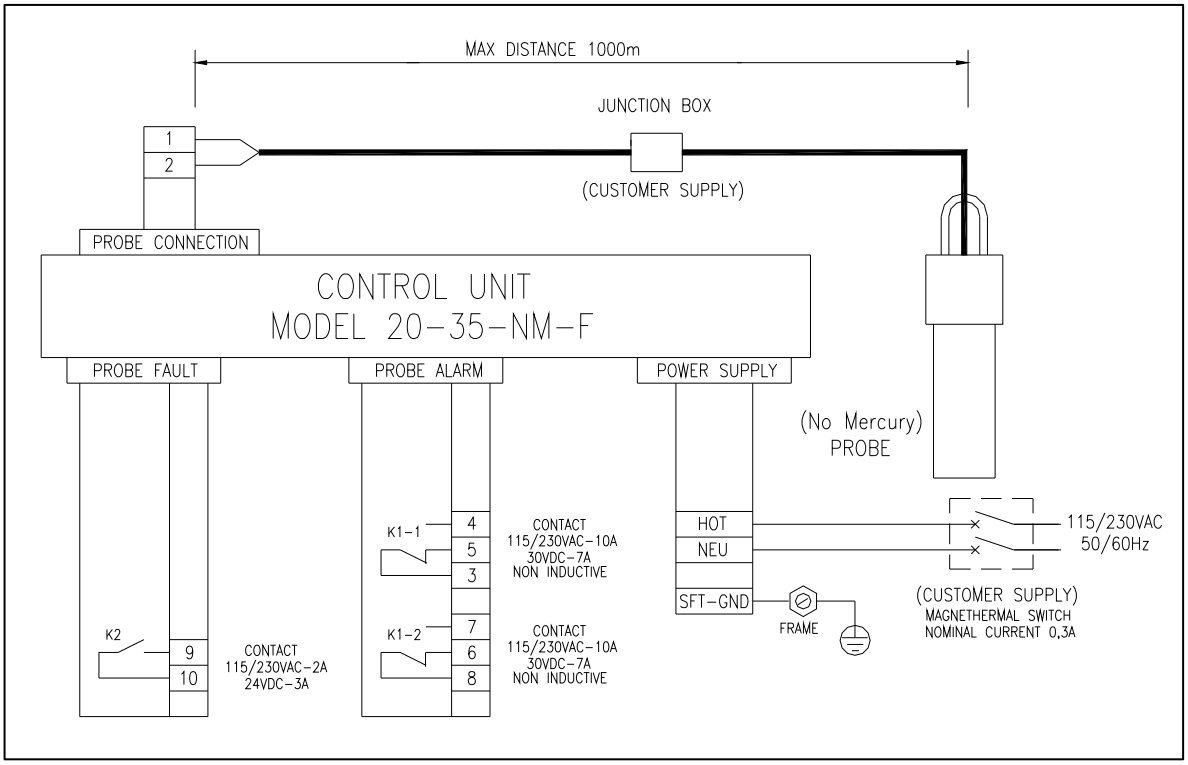
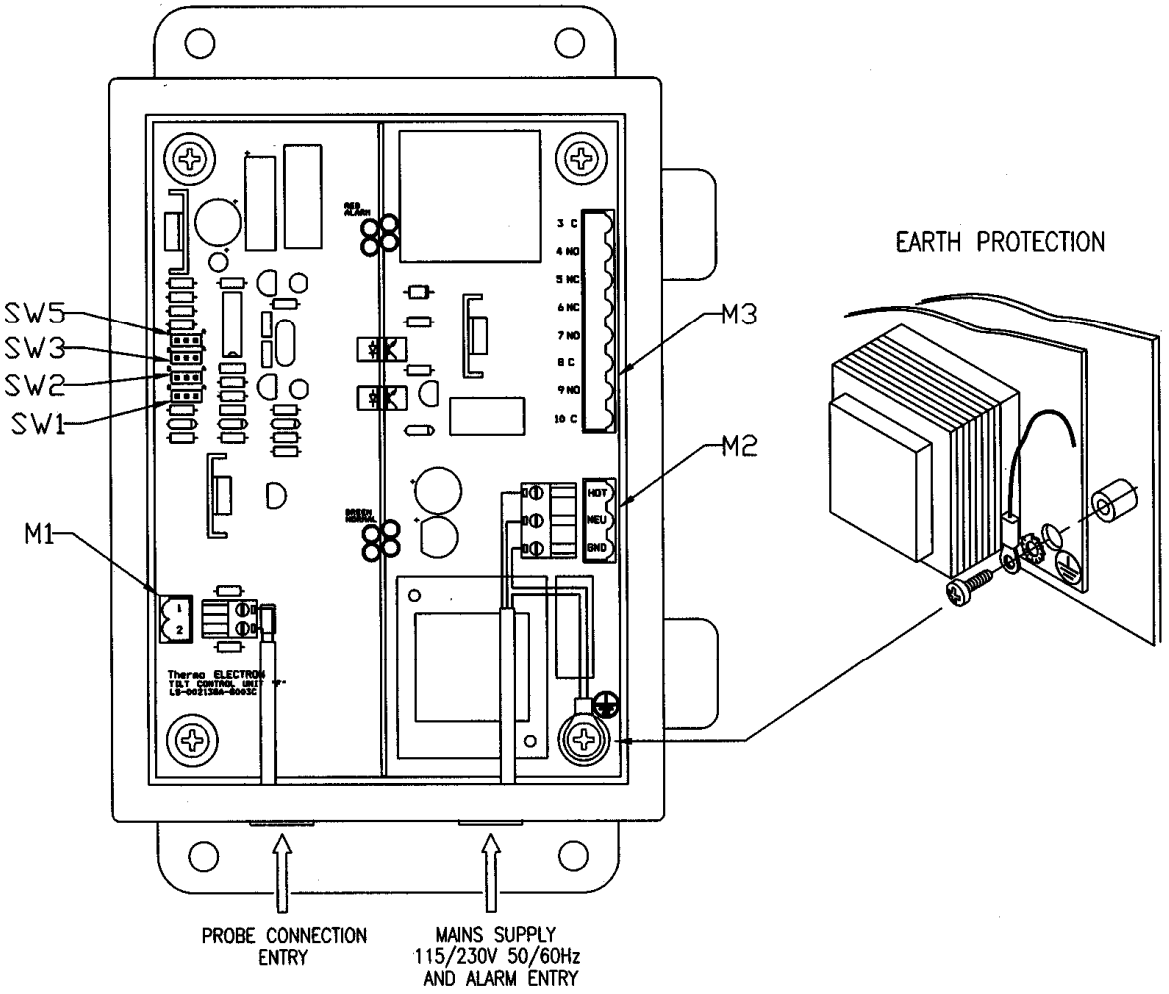


Figure 2-8: Control Unit Model 20-35-NM-F Internal Layout



CONTROL UNIT Model 20-35-NM-DIN

1 The Control Unit enclosure is supplied with terminals for connection.

2 Use separate conduits/cable glands for probe and power circuits connection.

Figure 2-9: Control Unit Model 20-35-NM-DIN Terminal Wiring

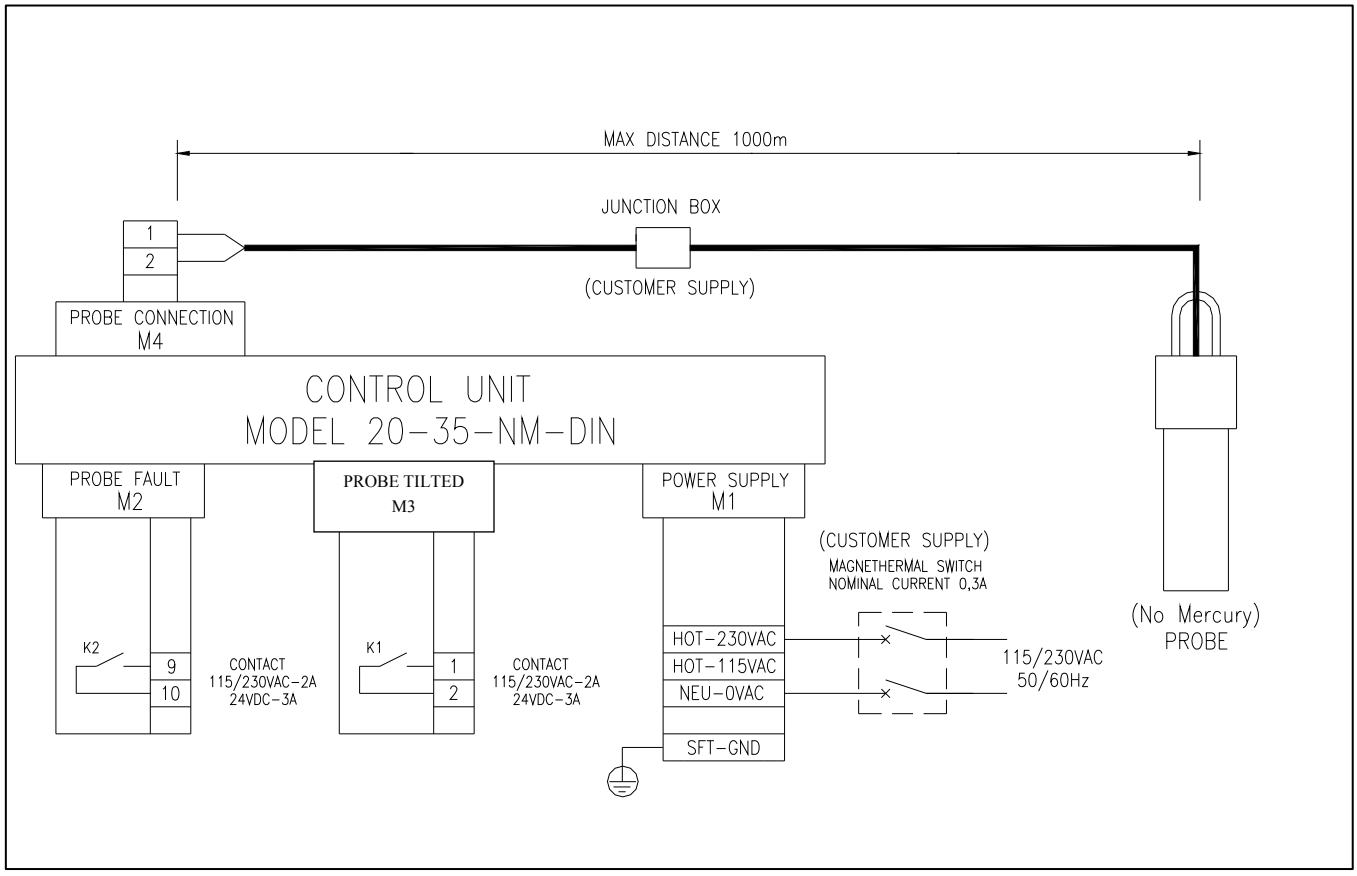
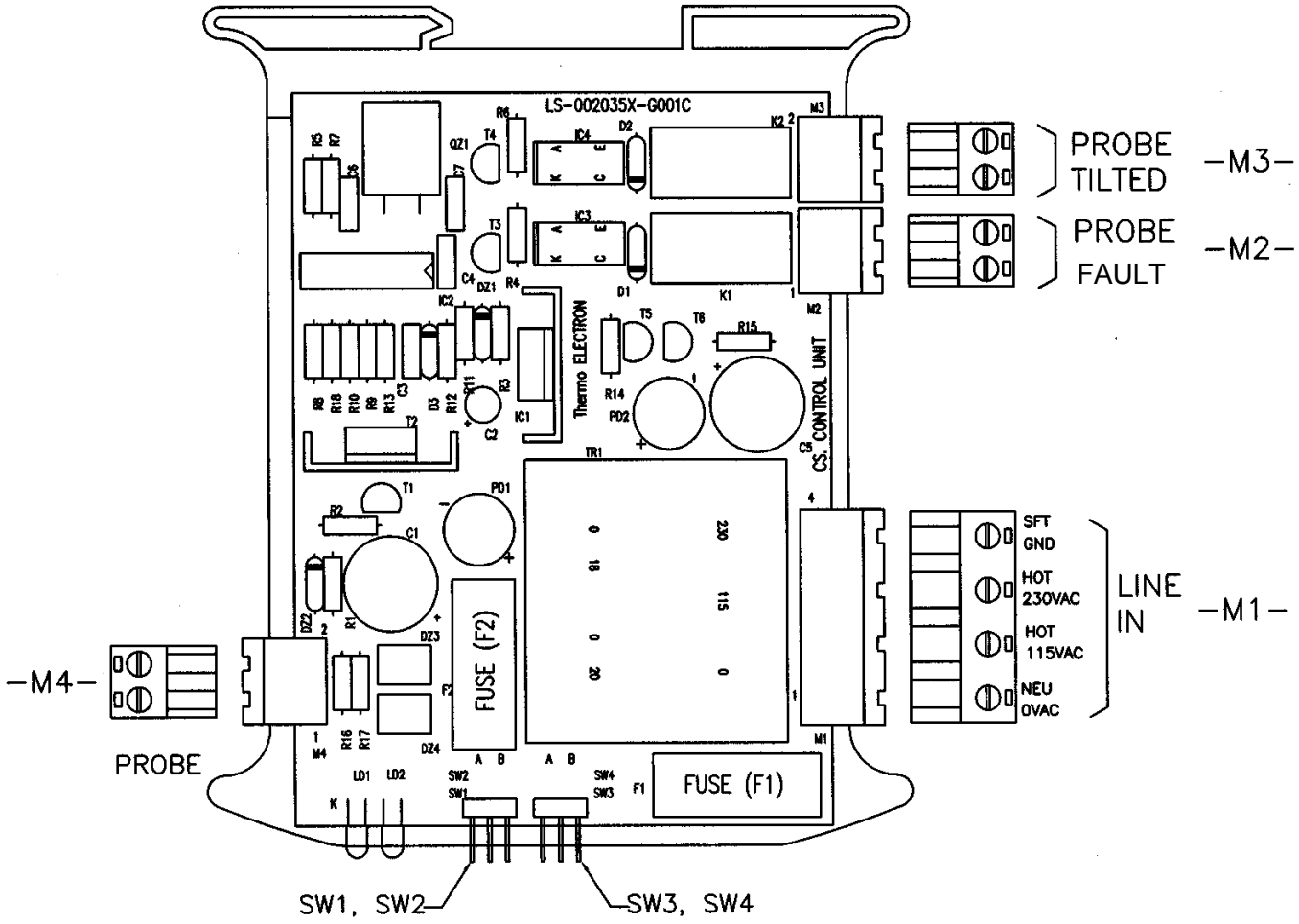


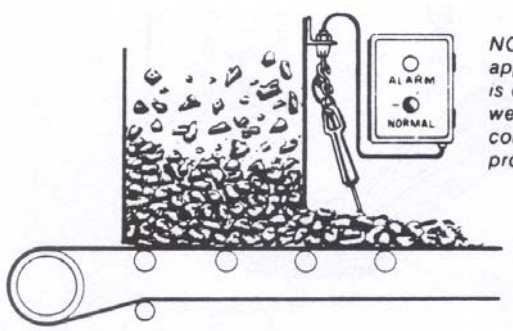
Figure 2-10: Control Unit Model 20-35-NM-DIN Internal Layout



Chapter 3
Operation

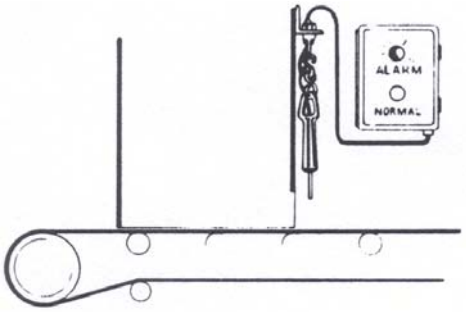
When the *Ramsey Mercury Free Tilt Sensor* system is used as a no-flow detector, the normal position of the probe is tilted. When used as a level detector, the normal position is vertical (not tilted). In both cases the tilted condition indicates the presence of material.

Flow Application Examples

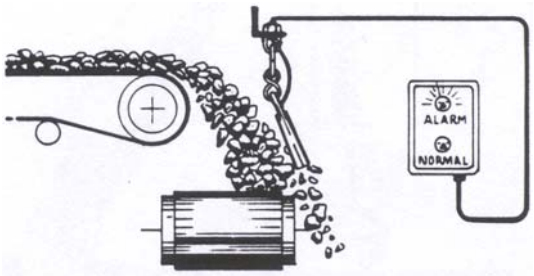


NOTE: In this application probe is equipped with a wear plate for contact with product.

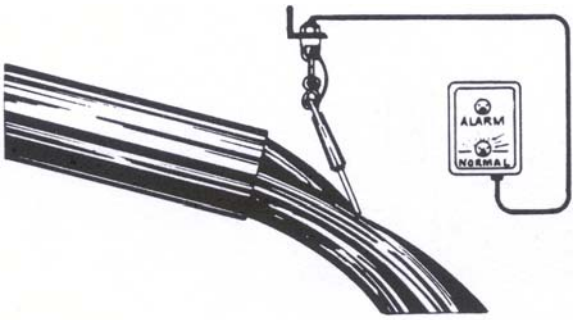
Material Flow "Normal"



Material No Flow "Alarm"

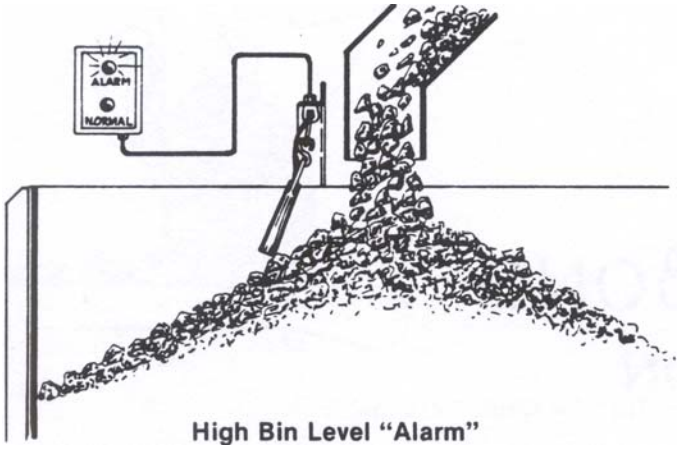


Material Overshooting Transfer Conveyor "Alarm"

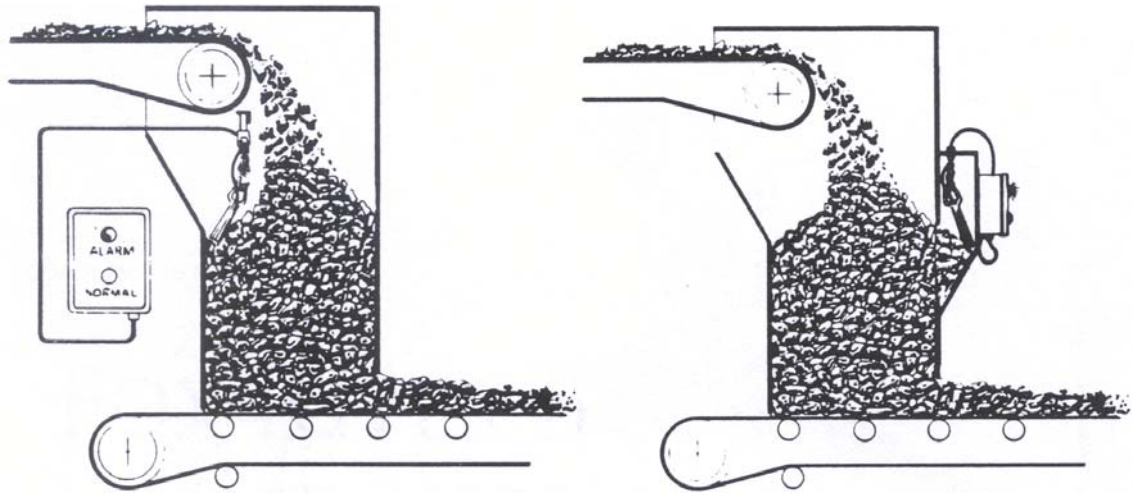


Material Flow "Normal"

Low Application Examples



High Bin Level "Alarm"



Typical Plugged Transfer Chute "Alarms"

3.1 System Configuration

Different applications may have different probe positions that indicate a "normal" condition (vertical vs. tilted). There are two jumpers on the circuit board to control the behavior of the alarm lights and contacts in regard to probe position. Use the following Function Mode tables to determine the correct jumper settings for your application.

3.1.1 Model 20-35-NM-F Function Modes

Table 3-1: Model 20-35-NM-F Function Modes Switch Settings

SW3 (See table 3-3)	**SW5 (See table 3-4)**	**Function Mode**	**Probe Position**	**Condition**	**Lamp Alarm**	**Delay on Transition to (See table 3-2)**
DEFAULT SETTING		Alarm for High Level Detection	Tilted	Alarm	ON	X
Level (B)	High (A)					
			Vertical	Normal	OFF	
Level (B)	Low (B)	Alarm for Low Level Detection	Tilted	Normal	OFF	
			Vertical	Alarm	ON	X
Flow (A)	Low (B)	Alarm for No Flow Detection	Tilted	Normal	OFF	
			Vertical	Alarm	ON	X
Flow (A)	High (A)	Alarm for Flow Detection	Tilted	Alarm	ON	X
			Vertical	Normal	OFF	

3.1.2 Model 20-35-NM-F Switches Setting

SW1 and SW2 Settings are used to delay the indication of alarm conditions. This will prevent alarms due to material momentarily moving the probe.

Table 3-2: SW1 and SW2 Settings

SW1	SW2	Delay in Seconds
B	B	1
A	B	2
B	A	4
A	A	6

SW3 determines whether the alarm functions of the control unit respond like a Flow or Level application.

Table 3-3: SW3 Settings

SW3	Mode
A	Flow
B	Level

SW5 determines whether the alarm functions of the control unit respond like a High or Low Level application.

Table 3-4: SW5 Settings

SW5	Mode
A	High Level
B	Low Level

SW4 defines the instrument electrical power supply

Table 3-5: SW4 Selector Setting

SW4	Power Supply
Position	115VAC
Position	230VAC

3.1.3 Model 20-35-NM-DIN Function Modes

Table 3-6: Model 20-35-NM-DIN Function Modes Switch Settings

SW3 (See table 3-8)	SW4 (See table 3-9)	Function Mode	Probe Position	Condition	Tilted LED	Delay on Transition to (See table 3-7)	Relay K1 Contact
DEFAULT SETTING		Alarm for High Level Detection	Tilted	Alarm	OFF	X	Open
Level (B)	High (A)						
			Vertical	Normal	ON		Closed
Level (B)	Low (B)	Alarm for Low Level Detection	Tilted	Normal	ON		Closed
			Vertical	Alarm	OFF	X	Open
Flow (A)	Low (B)	Alarm for NO Flow Detection	Tilted	Normal	ON		Closed
			Vertical	Alarm	OFF	X	Open
Flow (A)	High (A)	Alarm for Flow Detection	Tilted	Alarm	OFF	X	Open
			Vertical	Normal	ON		Closed

3.1.4 Model 20-35-NM-DIN Switches Setting

SW1 and SW2 Settings are used to delay the indication of alarm conditions. This will prevent alarms due to material momentarily moving the probe.

Table 3-7: SW1 and SW2 Settings

SW1	SW2	Delay in Seconds
B	B	1
A	B	2
B	A	4
A	A	6

SW3 determines whether the alarm functions of the control unit respond like a Flow or Level application.

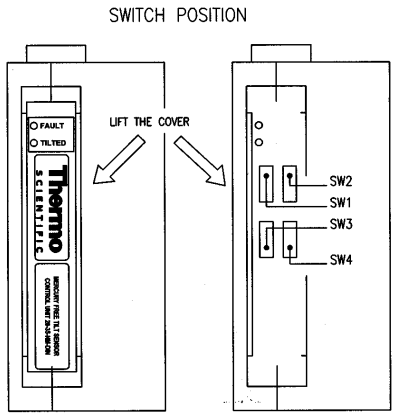
Table 3-8: SW3 Settings

SW3	Mode
A	Flow
B	Level

SW5 determines whether the alarm functions of the control unit respond like a High or Low Level application.

Table 3-9: SW4 Settings

SW4	Mode
A	High Level
B	Low Level



Chapter 4
Maintenance and Troubleshooting

INFORMATION
The manufacturer accepts no liability for any cause, either direct or indirect, of injury to persons and damage to objects resulting from the incorrect, improper, or negligent use of the unit, or from inexperience or negligent running and/or maintenance of the unit itself.

4.1 Indication of Maintenance

The *Ramsey Mercury Free Tilt Sensor* system does not require regular maintenance, but it is advisable to perform a periodic functional check, according to the indications below.

It is the exclusive responsibility of the user to determine the frequency of functional checks based on their particular application and installation.

It is very important to verify that the cable of the Probe is not damaged.

The *Ramsey Mercury Free Tilt Sensor* system has been designed to operate under normal industrial environments.

The operation of the control unit may be checked by following procedure:

CAUTION

If the *Ramsey Mercury Free Tilt Sensor* is being used to control other equipment or processes, be sure that appropriate measures are taken so that troubleshooting procedures do not cause any unintended or undesired reactions.

4.2 Control Unit Model 20-35-NM-F *Check Procedure*

1. Check the power supply voltage. Make sure the AC voltage selector SW4 is set to the proper voltage. The proper voltage must be present between the HOT and NEUT terminals.
2. Check the state of the "Probe Fault" relay K2 and (red) indicator LED 2. If the probe is open-circuited, or the probe cable is shorted, the LED 2 is ON and relay K2 energized.
3. With the probe cable connected, measure the DC voltage across sensor terminals 1 and 2. The measurement should be between 18 and 23 volts.
4. Remove the probe wires from terminals 1 and 2. The "Probe Fault" relay K2 must be energized and LED 2 is ON should indicate a probe fault has occured (open-circuited or the cable is shorted).
5. With the probe cable still disconnected, measure the voltage at probe terminals 1 and 2. The measurement should be greater than 20 volts DC.

4.3 Control Unit Model 20-35-NM-DIN *Check Procedure*

1. Check the power supply connection. Make sure the input power wires are connected to the correct inputs on terminal block M1 and that they match the actual AC power supplied to the unit.
2. Check the state of the "FAULT LED" (red). If the probe is open-circuited or the probe cable is shorted, this led is ON.
3. With the probe cable connected, measure the DC voltage across sensor terminal block M4 (terminals 1 and 2). The measurement should be between 18 and 23 volts.
4. Remove the probe wires from terminal block M4 (terminals 1 and 2). The "FAULT LED" must be ON.
5. With the probe cable still disconnected, measure the voltage at probe terminal block M4 (terminals 1 and 2). The measurement should be greater than 20 volts DC.

Chapter 5
Service Repair and Replacement Parts

This chapter provides information about service, repair, and replacement parts for your *Thermo Fisher Scientific* product. It includes the telephone numbers for various departments at *Thermo*, the procedure for ordering replacement parts, a Return Material Authorization Form, and the parts list for the product are also included in this chapter.

The maintenance information in this manual is designed to meet your service needs. If you should encounter a problem that requires technical assistance, you may call *Thermo Fisher Scientific Product Service* at (800) 445-3503 .

Thermo Fisher Scientific also provides on-site service technicians to assist customers with installation, setup, initial calibration, customer training, maintenance, and repair. Contact the *Thermo Fisher Scientific Field Service* department at the number given below for current rates and scheduling.

Thermo Fisher Scientific has repair centers located at the plant in Minneapolis, Minnesota. Products that need system checkout or repair can be returned to the plant with the Return Material Authorization (RMA) Form or the Foreign Customer Repair Authorization form. Contact our Repair and Return department (800) 445-3503 to get an RMA number to use on the form.

Note: Have your machine model number and serial number available when you call. ▲

Main Switchboard	(800) 445-3503
FAX	(763) 783-2525
Service	(800) 445-3503
Return Material Authorization & Repair	(800) 445-3503

24 x 7 phone support

Or any local *Thermo Fisher Scientific* office.

5.1 Parts Ordering Information

For the fastest service when ordering parts, telephone or FAX the *Thermo Fisher Scientific Parts Department* at the numbers given below. Your regional field service representative can also assist you with parts orders.

The recommended procedure for ordering parts is:

1. Determine the broken or faulty part.
2. Locate the part in the Parts List.
3. Find the part number(s) for the item(s) you need.
4. Before you contact *Thermo Fisher Scientific* for your parts, make sure you have the following information:
   - Machine model and serial number
   - Purchase Order number
   - Date Required
   - Preferred shipping method
   - Part number(s), descripto9in, and quantity needed.
   - Telephone or FAX:

   Thermo Fisher Scientific
   Customer Service Department
   501 90th Ave. NW
   Minneapolis, MN 55433

   FAX: (763) 780-2525
   Phone: (800) 445-3503
   Return Material Authorization and Repair: (800) 445-3503

Chapter 6
Decommissioning and Dismantling

6.1 Decommissioning of the System

If the System has to be stopped for a fairly long period of time, then you are advised to take the following precautions:

- Disconnect the product from the circuit
- Move the product “out of production”, clean all parts of it with compressed air in order to remove all dust and other foreign bodies
- Cover the unit and protect it from dust during storage
- Make sure the ambient temperature in the place where the unit is to be stored conforms to the specifications in the technical data table

6.2 Dismantling the Unit

To dismantle the System, follow the steps outlined below:

- Disconnect the unit from the circuit
- The resulting waste materials must be disposed of in accordance with the binding legislation in the unit’s country of installation
- Proceed with the disposal in accordance with the binding legislation in the unit’s county of installation

CAUTION

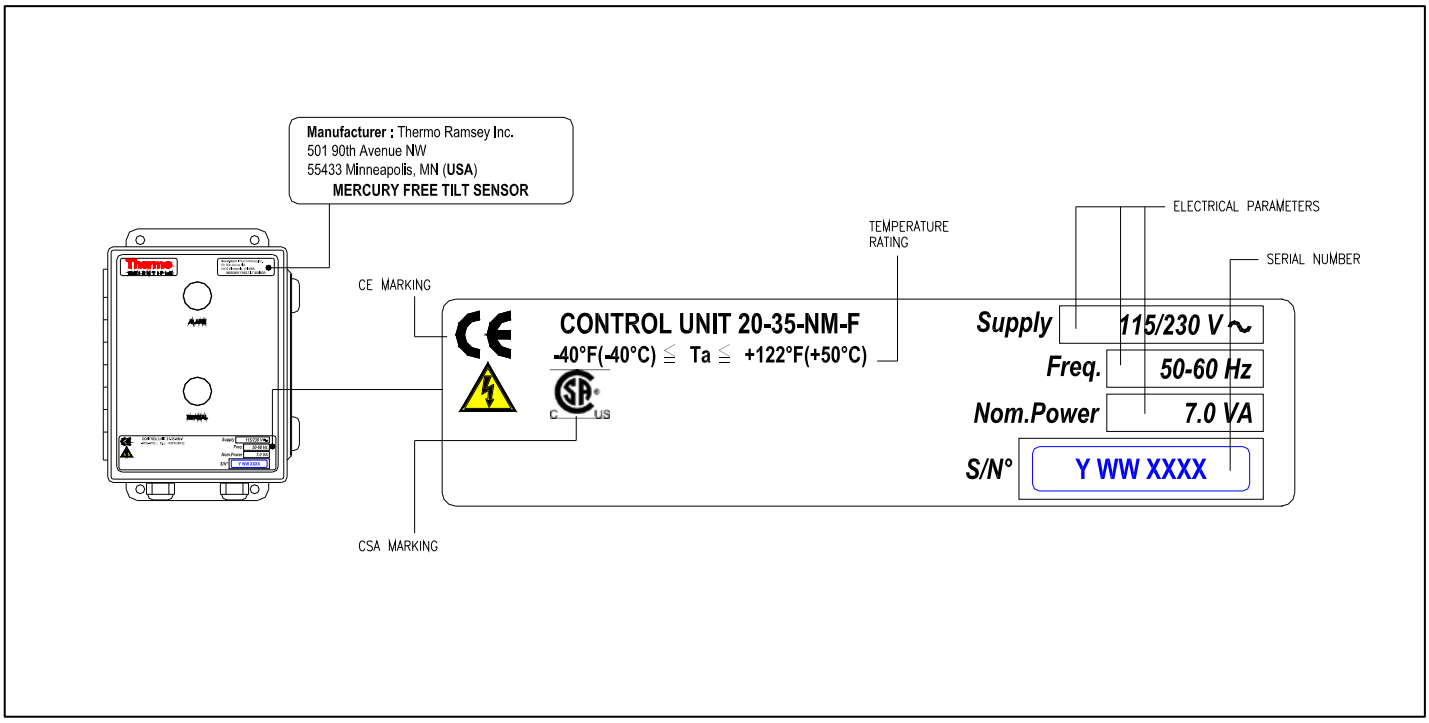
Strictly observe all worker safety precautions in all stages of the disassembly.

Chapter 7
Labels

This chapter describes the labels reporting the approvals of all *Mercury Free Tilt Sensor* systems. The following figures show where the labels are positioned on the instruments.

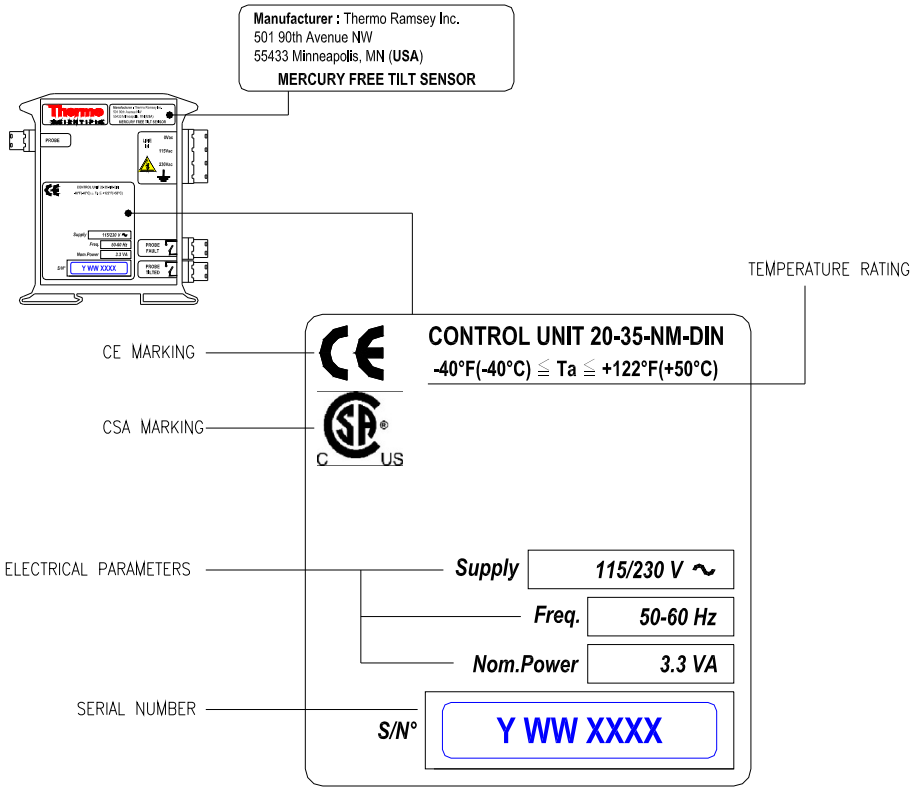
7.1 Control Unit Model 20-35-NM-F Labels

The following figure shows where the labels are positioned on the instrument.



7.2 Control Unit Model 20-35-NM-DIN Labels

The following figure shows where the labels are positioned on the instrument.



7.3 Probe Label

The following figure shows where the labels are positioned on the Tilt Sensor Probes.