

Thermo Scientific
**Pro-Line Tilt
Switch Probes**
Installation, Operation and
Maintenance Manual
Manual Part No. 01136 Revision 1



Thermo Scientific
Pro-Line Tilt
Switch Probes
Installation, Operation and
Maintenance Manual
Manual Part No. 01136 Revision 1

This product and associated documentation are products of Thermo Fisher Scientific Inc. and shall in no way be reproduced or copied without prior written consent of Thermo Fisher.

Thermo Fisher reserves the right to make changes to the product and this document without notice.

© 2013 Thermo Fisher Scientific. All rights reserved.

Thermo Fisher Scientific
18 Butler Boulevard
Burbridge Business Park
Adelaide Airport SA 5950
AUSTRALIA

Postal: PO Box 97, Export Park, Adelaide Airport 5950.
Telephone: +61 8 8208 8200
Fax: +61 8 8234 3772
E-mail: sales.auadl@thermofisher.com
Website: <http://www.thermoscientific.com>

European Contact Details

Thermo Fisher Scientific – Spain (Bulk)
Valportillo 1, No. 22
28108 Alcobendas, Madrid, Spain
Ph: 011-34-91-484-5965
Fax: 011-34-91-484-3597

Document Information

| | | |
|---|--|-------------------|
| Document Number | 01136 | |
| Author | Sash Janarthan | |
| Product Technical Leads, Technical Approvers | Technical Lead, electrical/electronic | Allan Stabile |
| | Technical Lead, mechanical | Sash Janarthan |
| | Technical Lead, service | Scott Chamberlain |

Version History

| Rev | Description | Revised by | Checked by | Date |
|-----|--------------------------|------------|----------------|----------|
| 0 | First issue | - | Sash Janarthan | Dec 2013 |
| 1 | Drawing 15431 revised | E. Chicco | Sash Janarthan | Sep 2014 |
| | | | | |
| | | | | |
| | | | | |

Where to find more information

For more information, service or spare parts for this product, contact:

AUSTRALIA

Thermo Fisher Scientific
18 Butler Boulevard, Burbridge Business Park
Adelaide Airport, SA 5950,
AUSTRALIA

Or

PO Box 97,
Export Park
Adelaide Airport, SA 5950
AUSTRALIA.

Telephone: +61 8 8208 8200

Fax: +61 8 8234 3772

Catalog : [Internet](#)

E-mail (parts): spares.auadl@thermofisher.com

E-mail (service): service.auadl@thermofisher.com

UNITED STATES

Thermo Fisher Scientific
501 90th Ave NW
Minneapolis, MN 55433 USA
Service Email: service.bulk.us@thermofisher.com
Parts Email: parts.bulk.us@thermofisher.com
Phone: 800-445-3503
International Calls: 763-783-2500

Tilt Switch Models

| <u>Part Number</u> | <u>Description</u> |
|--------------------|---|
| 15407 | Tilt, Switch 20-39 4.5m cable |
| 15408 | Tilt, Switch 20-39 7.6m cable |
| 15410 | Tilt, Switch 20-30-SS |
| 15431 | Tilt, Switch 20-44 25 f cable |
| 15432 | Tilt, Switch 20-44 SS f cable 110/240 V |
| 15414 | Tilt, Switch 20-31-25 with fins |
| 15409 | Tilt, Switch 20-39-C-25 |

Contents

| | | |
|-------------------|--|------------|
| | Where to find more information..... | i |
| | Tilt Switch Models | ii |
| Chapter 1 | Tilt Switch Probe | 1-1 |
| | Introduction..... | 1-1 |
| | Specifications | 1-1 |
| | Normal Installation..... | 1-1 |
| | Shielded Installation..... | 1-2 |
| | General Applications..... | 1-3 |
| Appendix A | Drawings | A-1 |

List of Figures

| | |
|--|-----|
| Figure 1–1. Tilt Switch Probe Installation Method - Normal | 1-1 |
| Figure 1–2. Tilt Switch Probe Installation Method - Shielded..... | 1-2 |
| Figure 1–3. General Applications (1) | 1-3 |
| Figure 1–4. General Applications (2) | 1-4 |

List of Tables

| | |
|--|-----|
| Table 1–1. Model Description..... | 1-1 |
| Table A–1. Drawing List..... | A-1 |

Chapter 1 Tilt Switch Probe

Introduction

The Tilt Switch Probe actuates when it is tilted 15 degrees or more from its vertical position. The Mercury Switch is precisely positioned so that regardless of direction of tilt the normally closed contact will open.

Specifications

1. Contact – Normally closed. Mercury Switch.
2. Contact Rating – See outline and mounting drawings.
3. Model Description:

Table 1–1. Model Description

| Model | Power Requirement | Description |
|---------|-------------------|--|
| 20-39 | 24V DC | Standard heavy duty ductile iron |
| 20-30 | 24V DC | Standard Stainless steel |
| 20-44 | 110V/240V | Tilt Switch with 110V/240V Input |
| 20-31 | 24V DC | Light weight plastic tilt switch with fins |
| 20-39-C | 24V DC | High temperature model |

Normal Installation

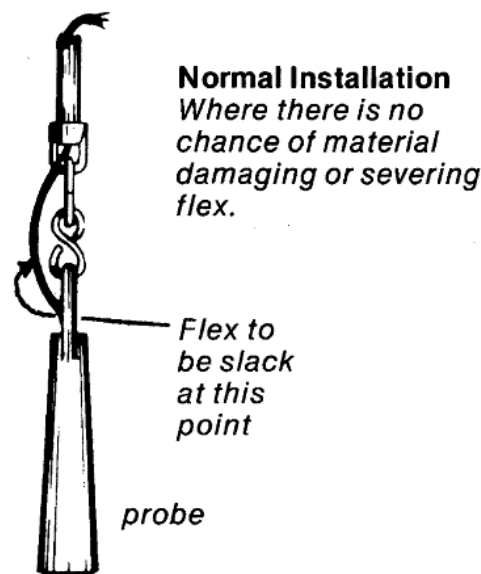


Figure 1–1. Tilt Switch Probe Installation Method - Normal

Shielded Installation

**Shielded
Installation**
*Pipe shield to be
such that probe
can traverse to
alarm position
freely.*

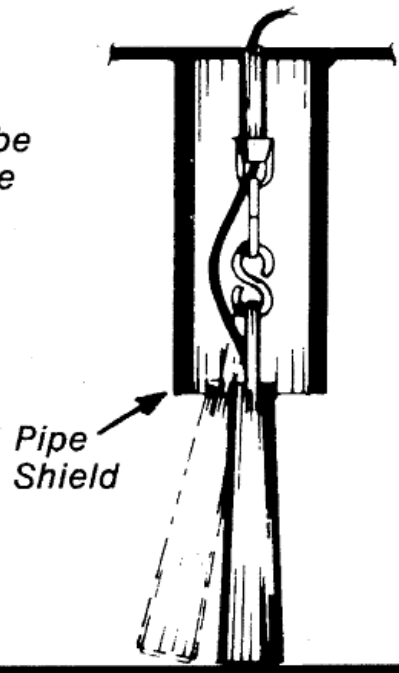


Figure 1-2. Tilt Switch Probe Installation Method - Shielded

General Applications

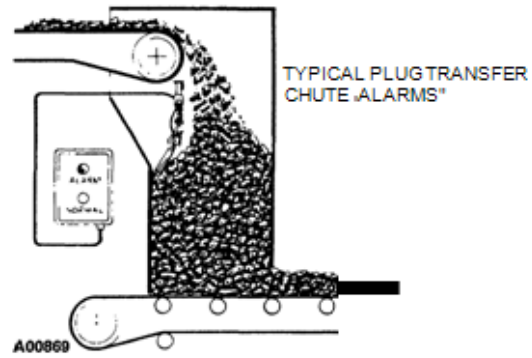
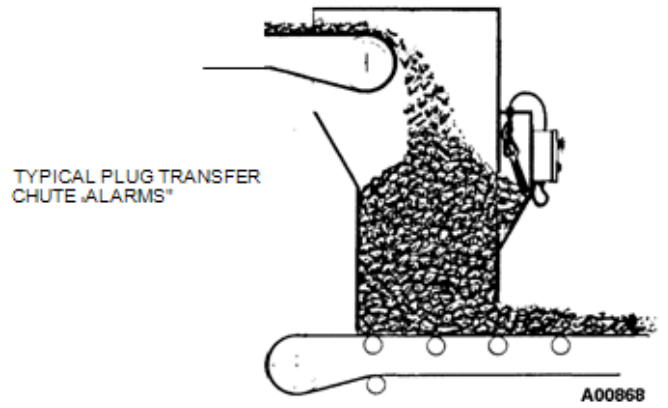
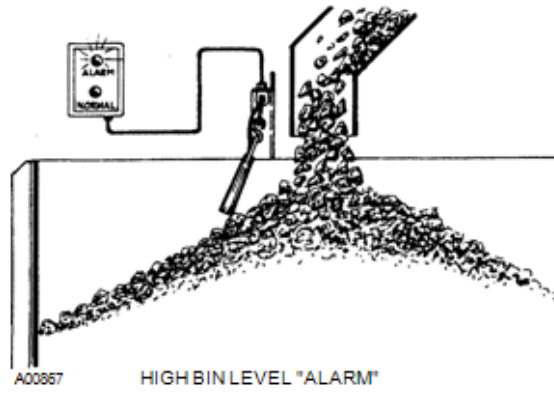
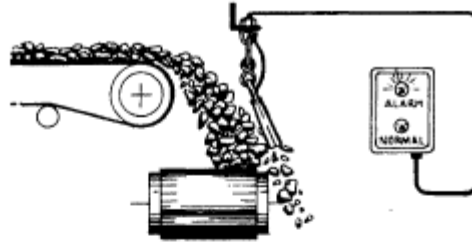
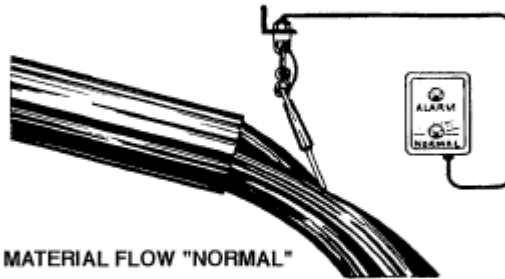


Figure 1–3. General Applications (1)



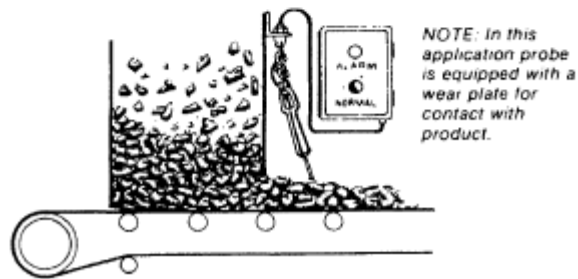
**MATERIAL OVERSHOOTING
TRANSFER CONVEYOR "ALARM"**

A00870



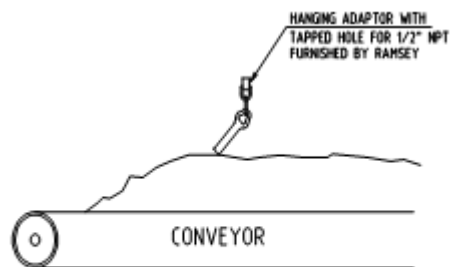
MATERIAL FLOW "NORMAL"

A00871



MATERIAL-FLOW "NORMAL"

A00872



FEED - NO FEED ALARM

MATERIAL NO FLOW "ALARM"

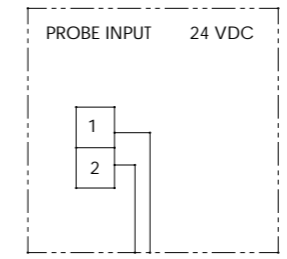
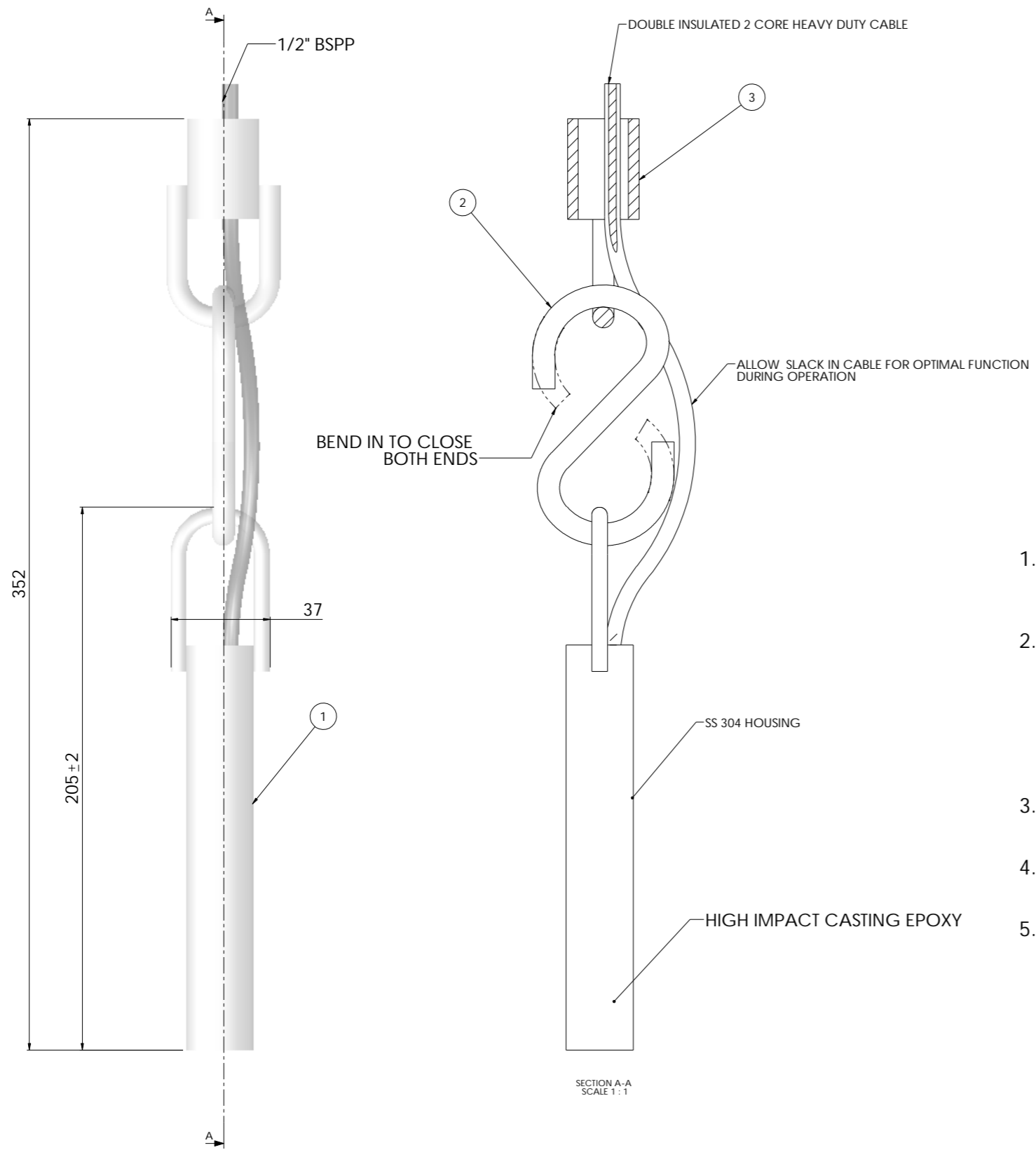
Figure 1-4. General Applications (2)

Appendix A Drawings

Table A-1. Drawing List

| Description | Drawing Number |
|--|----------------|
| Tilt Switch 20-30-SS-25 Model | 15410 |
| Tilt Switch Model 20-39-25 7.6m cable | 15408 |
| Tilt Switch Model 20-39-15 4.5m cable | 15407 |
| Tilt Switch High Temperature Model 20-39-C-25 7.6m cable | 15409 |
| Tilt Switch 120-240VAC Model 20-44-SS-25f or 7.6m | 15432 |
| Tilt Switch Model 20-44-25f or 7.6m cable | 15431-r1 |

| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|-------------|-------------------------|------|
| 1 | 15422 | HOUSING - 304SS | 1 |
| 2 | 15419 | "S" HOOK MS ZINC PLATED | 1 |
| 3 | 15418 | HANGER MS ZINC PLATED | 1 |



NOTES:

- DO NOT HANG TILT SWITCH BY THE CABLE, USE THE SUPPLIED HANGER OR "S" HOOK TO HANG THE TILT SWITCH. REFER TO TILT SWITCH INSTRUCTION MANUAL. P/N. 01136 FOR TYPICAL INSTALLATIONS.
- CONTACT SPECIFICATION:
 TYPE: MERCURY SWITCH - NORMALLY CLOSED
 (CONTACT CLOSED AT VERTICAL POSITION, OPENED AT 15 ° TILT NOMINAL)
 RATING: 1A @24 VDC NON-INDUCTIVE
 (USE RAMSEY MODEL 20-44-SS TILT SWITCH FOR 100-240VAC)
- OPERATING TEMPERATURE: -31 ° TO +75 ° C
 (USE RAMSEY MODEL 20 °-39-C-25 FOR TEMPERATURE UP TO +204 ° C)
- WHERE EXCESSIVE VIBRATION CAUSES FALSE OPERATION, USE RAMSEY MODEL 20-35A TIME DELAY CONTROL UNIT.
- NET WEIGHT: 0.9 KG

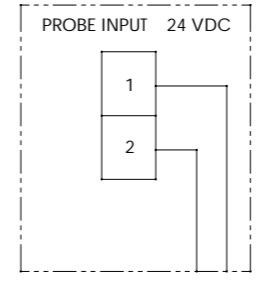
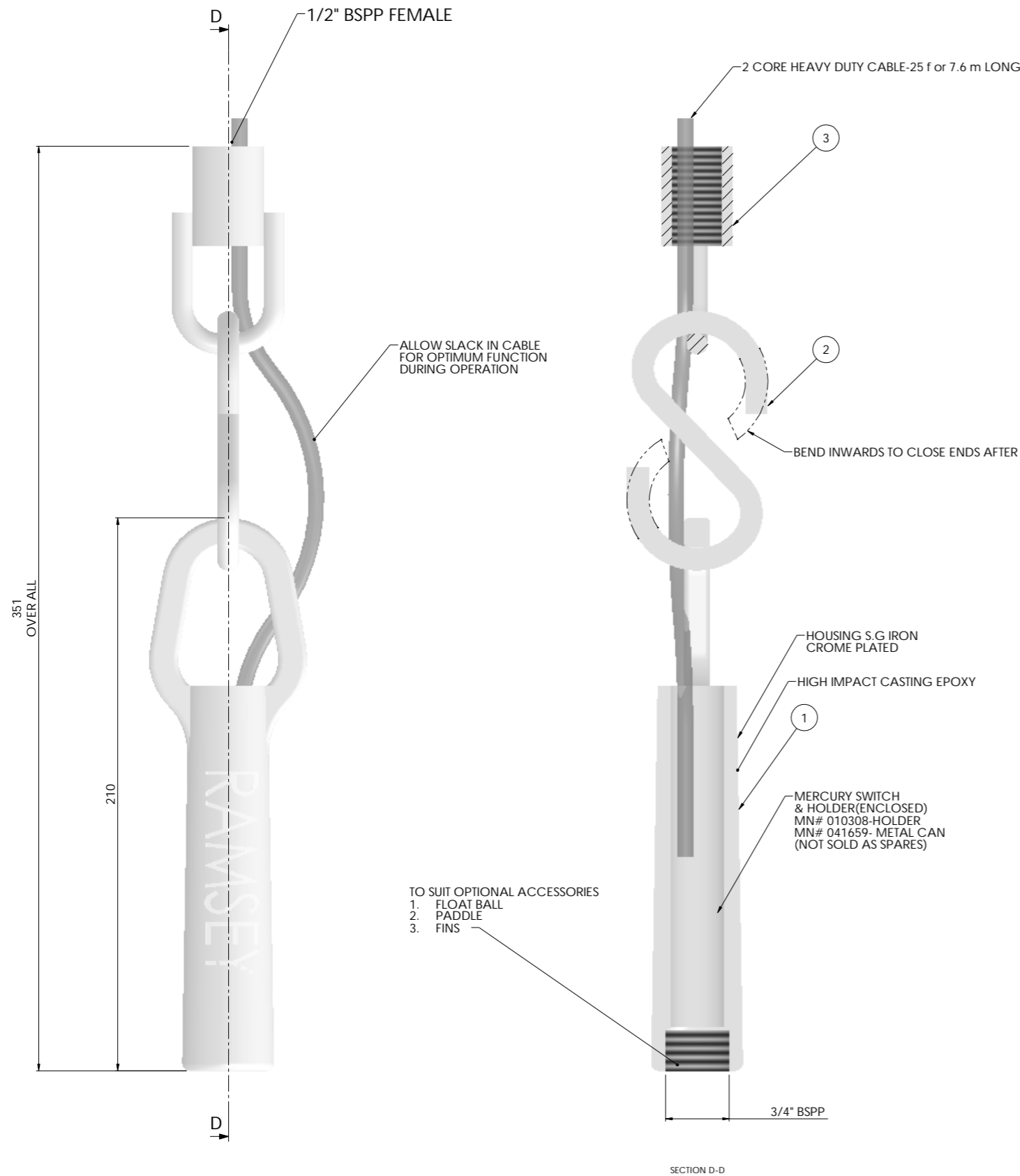
| | | | | | |
|---|---------|-----------|--------|-------|---------|
| ALL DIMENSIONS IN mm UNLESS OTHERWISE SPECIFIED | | MATERIAL | | TITLE | |
| 1 - 200 | LINEAR | ±0.5 | FINISH | DRN | NL |
| >200 - 2000 | | ±1 | | DATE | 27SEP12 |
| >2000 | | ±2 | | CKD | SJ |
| DECIMAL X.X | | ±0.5 | | DATE | 27SEP12 |
| 1 - 10 | ANGULAR | ±1.0° | | APP | |
| > 10 - 200 | | ±0.5° | | DATE | |
| >200 - 400 | | ±0.1° | | | |
| > 400 | | ±0.1° | | | |
| SHEET NO. 1 OF 1 | | SCALE 1:2 | | | |

TILT SWITCH
20-30-SS-25 MODEL

ThermoFisher
SCIENTIFIC

PART NO./CODE NO. 15410 REV. 0

| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|-------------|---------------------------------|------|
| 1 | 15421 | HOUSING - S.G IRON CHROM PLATED | 1 |
| 2 | 15419 | "S" HOOK MS ZINC PLATED | 1 |
| 3 | 15418 | HANGER MS ZINC PLATED | 1 |



NOTES:

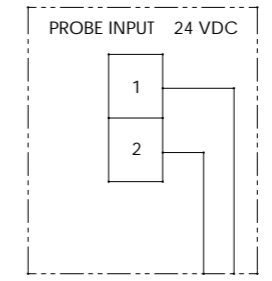
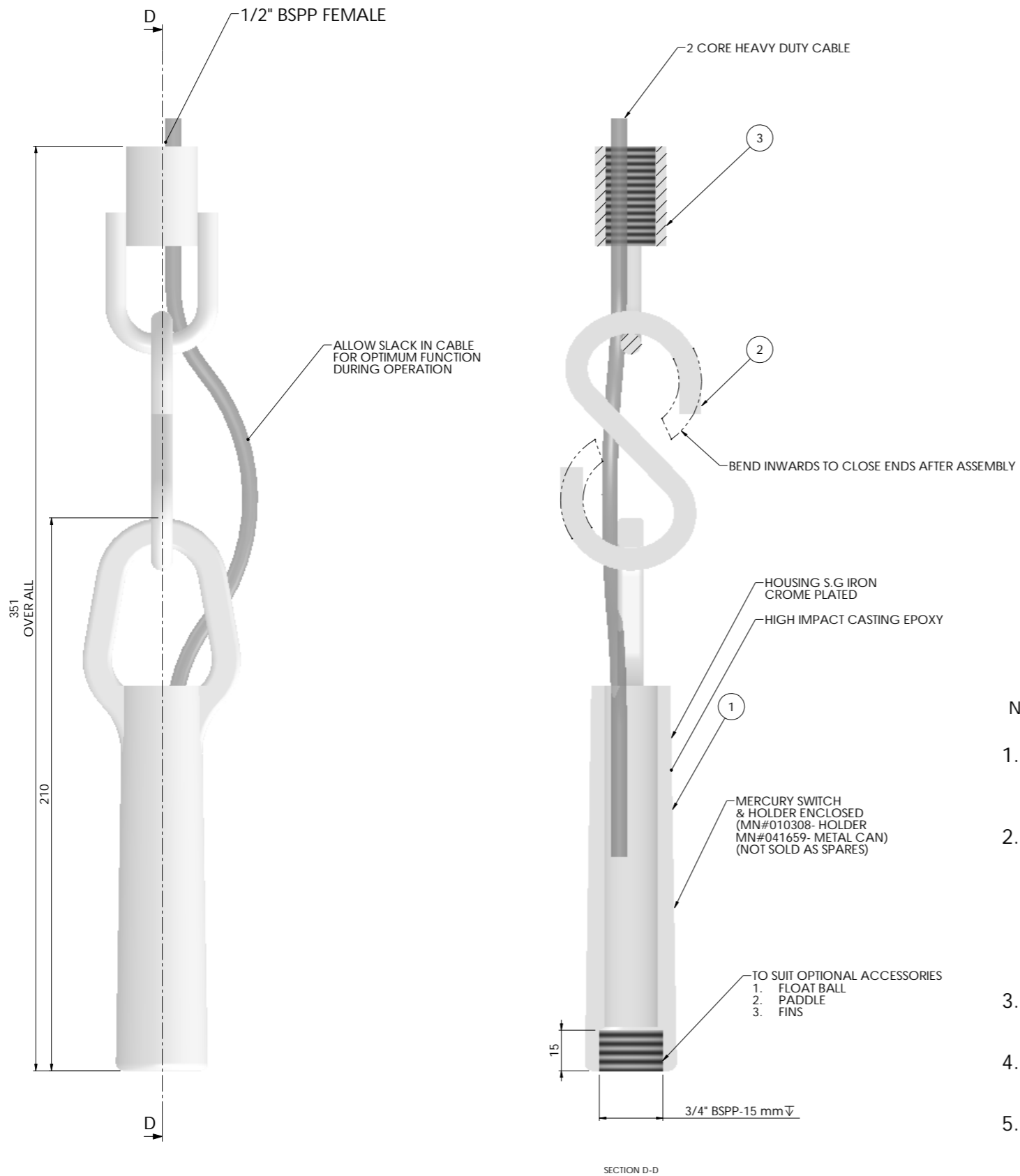
- DO NOT HANG TILT SWITCH BY THE CABLE, USE THE SUPPLIED HANGER OR "S" HOOK TO HANG THE TILT SWITCH. REFER TO TILT SWITCH INSTRUCTION MANUAL. P/N. 01136 FOR TYPICAL INSTALLATIONS.
- CONTACT SPECIFICATION:
 TYPE: MERCURY SWITCH - NORMALLY CLOSED
 (CONTACT CLOSED AT VERTICAL POSITION, OPENED AT 15 ° TILT NOMINAL)

 RATING: 1 AMPERE @24 VDC NON-INDUCTIVE
 (USE RAMSEY MODEL 20-44 TILT SWITCH FOR 120VAC-240VAC)
- OPERATING TEMPERATURE: -31 ° TO +75 ° C
 (USE RAMSEY MODEL 20 ° -39-C-25 FOR TEMPERATURE UP TO +204 ° C)
- WHERE EXCESSIVE VIBRATION CAUSES FALSE OPERATION, USE RAMSEY MODEL 20-35A TIME DELAY CONTROL UNIT.
- NET WEIGHT: 1.3KG

- TO SUIT OPTIONAL ACCESSORIES
- FLOAT BALL
 - PADDLE
 - FINS

| | | | |
|--|--|---|--|
| ALL DIMENSIONS IN mm UNLESS OTHERWISE SPECIFIED FINISH: 1-200 LINEAR ±0.5, >200-2000 ±1, >2000 ±2 DECIMAL X X ±0.5 | | DATE: 28 SEP 12 DATE: 28 SEP 12 | |
| DRN: NL CKD: SJ | | DATE: 28 SEP 12 DATE: 28 SEP 12 | |
| SHEET NO: 1 OF 1 SCALE: 1:1 | | TITLE: TILT SWITCH MODEL 20-39-25 7.6 m CABLE | |
| ThermoFisher SCIENTIFIC | | PART NO./CODE NO: 15408 REV: - | |

| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|-------------|---------------------------------|------|
| 1 | 15421 | HOUSING - S.G IRON CHROM PLATED | 1 |
| 2 | 15419 | "S" HOOK MS ZINC PLATED | 1 |
| 3 | 15418 | HANGER MS ZINC PLATED | 1 |



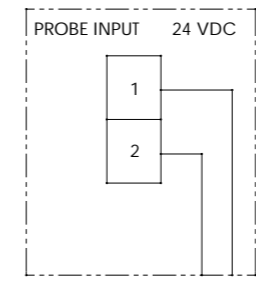
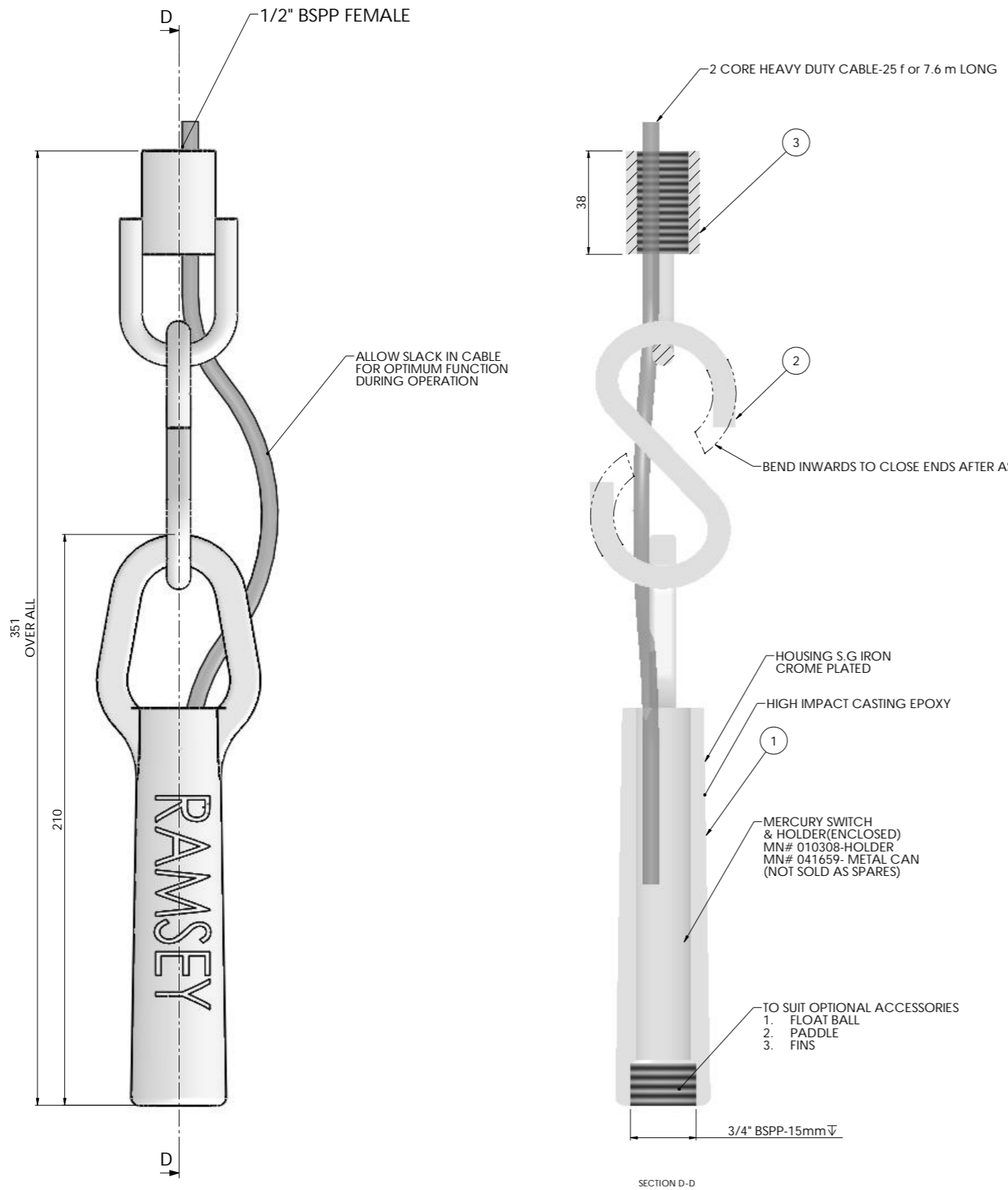
- NOTE:
- DO NOT HANG TILT SWITCH BY THE CABLE, USE THE SUPPLIED HANGER OR "S" HOOK TO HANG THE TILT SWITCH. REFER TO TILT SWITCH INSTRUCTION MANUAL. P/N. 01136 FOR TYPICAL INSTALLATIONS.
 - CONTACT SPECIFICATION:
 TYPE: MERCURY SWITCH - NORMALLY CLOSED
 (CONTACT CLOSED AT VERTICAL POSITION, OPENED AT 15 ° TILT NOMINAL)
 RATING: 1 AMPERE @24 VDC NON-INDUCTIVE
 (USE RAMSEY MODEL 20-44 TILT SWITCH FOR 100-240VAC)
 - OPERATING TEMPERATURE: -31 ° TO +75 ° C
 (USE RAMSEY HIGH TEMPREATURE MODEL 20-39-C-25 FOR TEMPERATURE UP TO +204 ° C)
 - WHERE EXCESSIVE VIBRATION CAUSES FALSE OPERATION, USE RAMSEY MODEL 20-35A TIME DELAY CONTROL UNIT.
 - NET WEIGHT: 1.3KG

| | | | |
|---|--|--|--|
| ALL DIMENSIONS IN mm UNLESS INDICATED OTHERWISE FINISH: 1-200 LINEAR ±0.5, >200-2000 ±1, >2000 ±3000 DECIMAL X.X 1-10 ANGLE ±1.0°, >10-200 ±0.5°, >200-400 ±0.1°, >400 ±0.1° | | DRN: NL, DATE: 28 SEP 12 CKD: SJ, DATE: 28 SEP 12 APP: DATE: | |
| DWG. SIZE: A1 THRD ANGLE PROJECTION: [Symbol] SHEET NO. 1 OF 1 | | SCALE: 1:1 | |

| | | | |
|--|----------|--|--|
| TILT SWITCH MODEL 20-39-15 4.5 m CABLE | | ThermoFisher SCIENTIFIC | |
| PART NO./CODE NO. | DWG. NO. | REV. | |
| | 15407 | 0 | |

This drawing is CONFIDENTIAL property of Thermo Fisher Scientific and may not be used, reproduced, published or disclosed to third parties without expressed written authorization from Thermo Fisher. If shared, this drawing is subject to return upon demand, and with the understanding that it is not to be used in any way detrimental to Thermo Fisher.

| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|-------------|---------------------------------|------|
| 1 | 15421 | HOUSING - S.G IRON CHROM PLATED | 1 |
| 2 | 15419 | "S" HOOK MS ZINC PLATED | 1 |
| 3 | 15418 | HANGER MS ZINC PLATED | 1 |



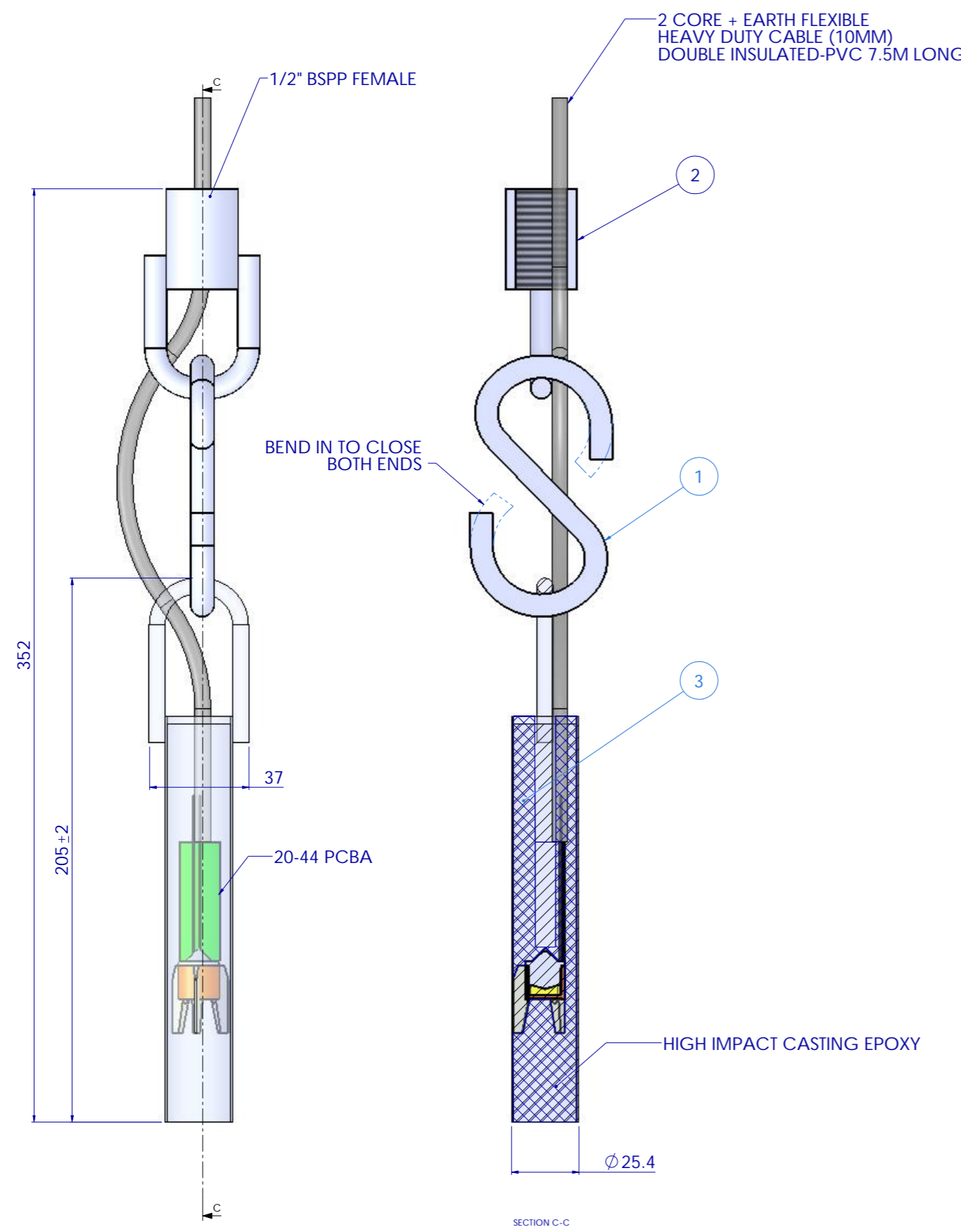
NOTES:

- DO NOT HANG TILT SWITCH BY THE CABLE, USE THE SUPPLIED HANGER OR "S" HOOK TO HANG THE TILT SWITCH. REFER TO TILT SWITCH INSTRUCTION MANUAL P/N. 01136 FOR TYPICAL INSTALLATIONS.
- CONTACT SPECIFICATION:
 TYPE: MERCURY SWITCH - NORMALLY CLOSED
 (CONTACT CLOSED AT VERTICAL POSITION, OPENED AT 15 ° TILT NOMINAL)
 RATING: 1 AMPERE @24 VDC NON-INDUCTIVE
- OPERATING TEMPERATURE: 20-39-C-25 FOR TEMPERATURE UP TO +204 °C
- WHERE EXCESSIVE VIBRATION CAUSES FALSE OPERATION, USE RAMSEY MODEL 20-35A TIME DELAY CONTROL UNIT.
- NET WEIGHT: 1.3KG

| | | | | |
|---|----------------------------|----------------------------|------------------------------------|--|
| ALL DIMENSIONS IN mm UNLESS OTHERWISE SPECIFIED 1 - 200 LINEAR ±0.5 >200 - 2000 ±1 >2000 ±3 DECIMAL X.X ±0.5 1 - 10 ANGULAR ±1.0° >10 - 200 ±0.5° >200 - 400 ±0.1° >400 ±0.1° | | FINISH ±0.5 ±1 ±3 | DATE: 28 SEP 12 DATE: 28 SEP 12 | ThermoFisher SCIENTIFIC |
| TILT SWITCH HIGH TEMPERATURE MODEL 20-39-C-25 7.6 m CABLE | PART NO./CODE NO. 15409 | DWG. NO. 15409 | REV. 0 | SHEET NO. 1 OF 1 SCALE 1:1 |

This drawing is CONFIDENTIAL property of Thermo Fisher Scientific and may not be used, reproduced, published or disclosed to third parties without expressed written authorization from Thermo Fisher. If located, this drawing is subject to return upon demand, and with the understanding that it is not to be used in any way detrimental to Thermo Fisher.

| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|-------------|-------------------------|------|
| 1 | 15419 | "S" HOOK MS ZINC PLATED | 1 |
| 2 | 15418 | HANGER MS ZINC PLATED | 1 |
| 3 | 15421 | HOUSING - 304SS | 1 |



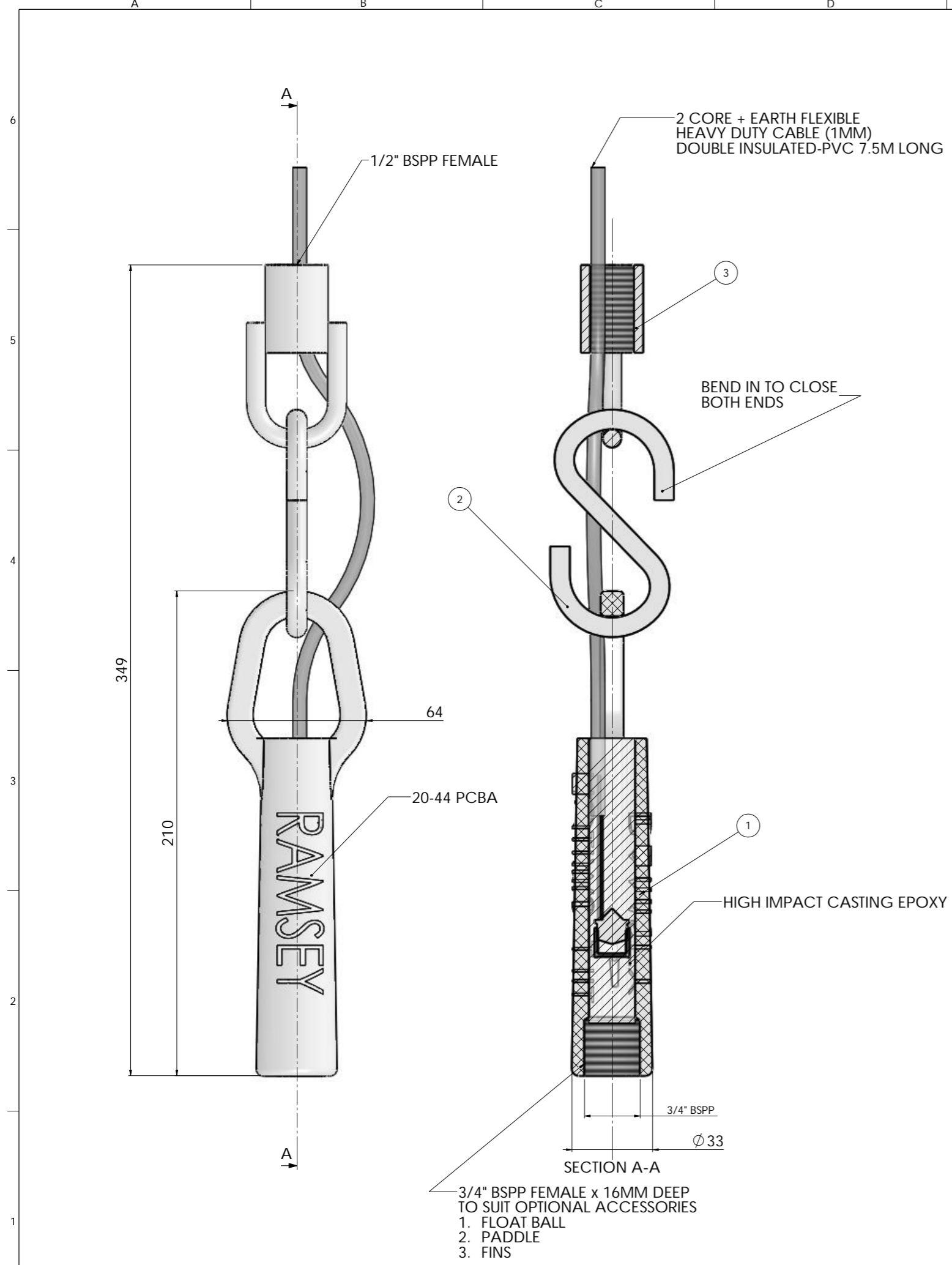
- NOTES:**
- DO NOT HANG TILT SWITCH BY THE CABLE, USE THE SUPPLIED HANGER OR "S" HOOK TO HANG THE TILT SWITCH. REFER TO TILT SWITCH INSTRUCTION MANUAL. P/N. 01136 FOR TYPICAL INSTALLATIONS.
 - CONTACT SPECIFICATION:
 TYPE: SOLID STATE SWITCH
 OPERATED BY NORMALLY CLOSE MERCURY SWITCH
 (CONTACT CLOSED AT VERTICAL POSITION, OPENED AT 15 ° TILT NOMINAL)

 RATING: 4A @120VAC OR 2A @240VAC NON-INDUCTIVE
 (USE RAMSEY MODEL 20-30 TILT SWITCH FOR 240VDC)
 - OPERATING TEMPERATURE: -31 ° TO +75 ° C
 (USE RAMSEY MODEL 20 °-30 ° C FOR TEMPERATURE UP TO +204 ° C)
 - WHERE EXCESSIVE VIBRATION CAUSES FALSE OPERATION, USE RAMSEY MODEL 20-35A TIME DELAY CONTROL UNIT.
 - NET WEIGHT: 0.9KG

This drawing is CONFIDENTIAL property of Thermo Fisher Scientific and may not be used, reproduced, published or disclosed to third parties without expressed written authorization from Thermo Fisher. If issued, this drawing is subject to return upon demand, and with the understanding that it is not to be used in any way detrimental to Thermo Fisher.

| | | | | |
|---|------------------|------------------------|---------|---------------|
| ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED | MATL | FINISH | TITLE | |
| LINEAR: X ±0.5, XX ±0.2, XXX ±0.1 | DRG. SIZE: A1 | THIRD ANGLE PROJECTION | DRN: NL | DATE: 27SEP12 |
| ANG.: X ±1.0°, XX ±0.5° | SHEET NO. 1 OF 1 | SCALE: 1:1 | CKD: SJ | DATE: 27SEP12 |

| | | | |
|--|-------|-----------------------------------|---|
| TILT SWITCH, 120-240VAC MODEL 20-44-SS-25f or 7.6 m | | ThermoFisher SCIENTIFIC | |
| PART NO./CODE NO. | 15432 | DWG. NO. | 0 |



| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|-------------|---------------------------------|------|
| 1 | 15421 | HOUSING - S.G IRON CHROM PLATED | 1 |
| 2 | 15419 | "S" HOOK MS ZINC PLATED | 1 |
| 3 | 15418 | HANGER MS ZINC PLATED | 1 |

NOTES:

- DO NOT HANG TILT SWITCH BY THE CABLE, USE THE SUPPLIED HANGER OR "S" HOOK TO HANG THE TILT SWITCH. REFER TO TILT SWITCH INSTRUCTION MANUAL. P/N. 201036 FOR TYPICAL INSTALLATIONS.
- CONTACT SPECIFICATION:
 TYPE: SOLID STATE SWITCH
 OPERATED BY NORMALLY CLOSE MERCURY SWITCH
 (CONTACT CLOSED AT VERTICAL POSITION, OPENED AT 15 ° TILT NOMINAL)
 RATING: 4A @120VAC OR 2A @240VAC NON-INDUCTIVE
 (USE RAMSEY MODEL 20-30 TILT SWITCH FOR 24VDC)
- OPERATING TEMPERATURE: -31 ° TO +75 ° C
- WHERE EXCESSIVE VIBRATION CAUSES FALSE OPERATION, USE RAMSEY MODEL 20-35A TIME DELAY CONTROL UNIT.
- NET WEIGHT: 1.5 KG

| REV | DESCRIPTION | DATE | PCR No | DRN | APP |
|-----|-------------------------------------|-----------|--------|-----|-----|
| 1 | TYPD CORRECTED FROM 240VDC TO 24VDC | 2/09/2014 | SASH | AS | |

This drawing is CONFIDENTIAL property of Thermo Fisher Scientific and may not be used, reproduced, published or disclosed to third parties without expressed written authorization from Thermo Fisher. If licensed, this drawing is subject to return upon demand, and with the understanding that it is not to be used in any way detrimental to Thermo Fisher.

| ALL DIMENSIONS IN mm UNLESS OTHERWISE SPECIFIED | | FINISH | | DATE | |
|---|-------------|--------|--|-----------|--|
| 1 - 200 | LINEAR | ±0.5 | | 28 SEP 12 | |
| >200 - 2000 | | ±1 | | 28 SEP 12 | |
| >2000 | | ±2 | | | |
| | DECIMAL X.X | ±0.5 | | | |
| 1 - 10 | ANGULAR | ±1.0° | | | |
| >10 - 200 | | ±0.5° | | | |
| >200 - 400 | | ±0.1° | | | |
| >400 | | ±0.1° | | | |

| | | | |
|---|----------|---------------------------------|--|
| TILT SWITCH MODEL 20-44-25 f or 7.6 m cable | | Thermo Fisher SCIENTIFIC | |
| PART NO./CODE NO. | DWG. NO. | REV. | |
| | 15431 | 1 | |

Thermo Fisher Scientific
18 Butler Boulevard
Burbridge Business Park
PO Box 97, Export Park
Adelaide Airport, SA 5950
Australia