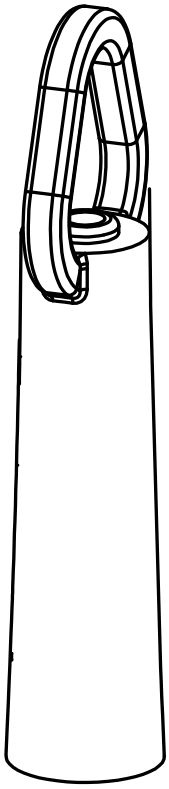
MN-TS001102

Tilt Switch and Control Units

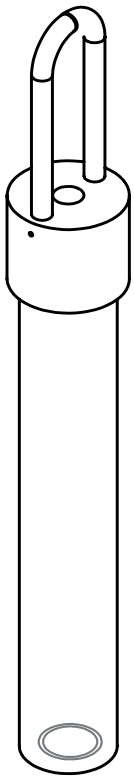


Read this booklet carefully before installing Bulk Pro Systems Tilt Switches. Keep this manual safe for future reference.

Tilt Switches are used to detect the presence or absence of bulk material. Common usages are:

- Plugged chute: Tilt switches can be installed in a chute to detect when its blocked.
- High and low level: Tilt switches can be used to detect the high level or low flow level for bulk media in a storage space.
- Flow: Tilt switches can be installed above conveyors to detect material flow.

Any improper installation or any tampering of the device may cause personnel injury or property damage. The installation and maintenance must be performed by specialized and authorized personnel.



Bulk Pro Systems Tilt Switches are designed and manufactured according to IEC international standard and EN European regulations.

Bulk Pro Systems reserves the right to change the features and data shown in this document at any time without notice.

Bulk Pro Systems, LLC
13653 Johnson Street NE
Ham Lake, MN 55304

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Specifications

Technical data	
Enclosure	SL23-8C, SL23-16C, SL23-8C-HT, SL20-8C: Ductile Iron SL24-8C: Stainless Steel
Protection class	IP68
Cable length	SL23-8C, SL23-8C-HT, SL24-8, SL20-8C: 8 meters SL23-16C: 16 meters

Specifications	Mercury	Non-Mercury
Contact Form / Style	Normally Closed	Normally Closed
Switching Voltage	120 VAC	60 VAC
Switching Current	1.5 A	0.25 A
Switching Capacity	180 VA	3 VA
Contact Resistance	5 Ohms	30 Ohms at 5 VDC
Operating Angle	20˚ ± 5	25˚ ±10

SL29-115C FRP, SL28-115C Metal		SL29-DIN DIN Rail Mount	
Alarm Contact	1 SPDT - 110/220 VAC 10 A 30 VDC 7 A	Alarm Contact	1 NO - 110/220 VAC 2 A 24 VDC 3 A
Fault Contact	1 SPDT - 110/220 VAC 2 A 24 VDC 2 A	Fault Contact	1 NO - 110/220 VAC 2 A 24 VDC 3 A
Delay (seconds)	1, 2, 4 or 6	Delay (seconds)	1, 2, 4 or 6
Temperature Rating	-40°C, +80°C	Temperature Rating	-40°C, +80°C
Protection Class	IP66	Protection Class	IP20
Mounting Style	Field Mount via brackets	Mounting Style	DIN Mount

Certifications

Bulk Pro Systems Tilt Switches are in conformity with the following standards:

EN 60947-1	2007/A1 : 2011/A2 : 2014
EN 60947-3	2009/A1 : 2012/A2 : 2015
EN 60204-1	2006/A1 : 2009
EN 60529	1991/A1 : 2000/A2 : 2013

CE EAC

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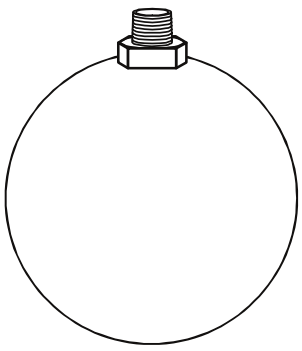
Specifications

Model	Tilting Angle	Contact Type	Temperature Rating	Description
SL23-8C	20°	Mercury	-40°C to +80°C	Standard SL23-8C with heavy duty casting body.
SL23-8C-HT	20°	Mercury	-40°C to +190°C	High Temp with heavy duty casting body.
SL20-8C	20°	Non-mercury	-40°C to +80°C	Non-mercury version.
SL20-8C	20°	Non-mercury	-40°C to +80°C	ATEX version for hazardous locations (coming soon).

Model	Tilting Angle	Contact Type	Temperature Rating	Description
SL24-8C	20°	Mercury	-40°C to +80°C	Standard SL24-8C with corrosion resistant stainless-steel body.
SL24-8C-NM	20°	Non-mercury	-40°C to +80°C	Non-mercury version.
SL24-8C-NM-X	20°	Non-mercury	-40°C to +80°C	ATEX version for hazardous locations. (coming soon).

Options	Description
HT	High temperature version. -40°C to +190°C

Extensions	Description
FL6-304	Ball float extension, 6” diameter, 304 Stainless Steel



FL6-304 Ball Float Extension

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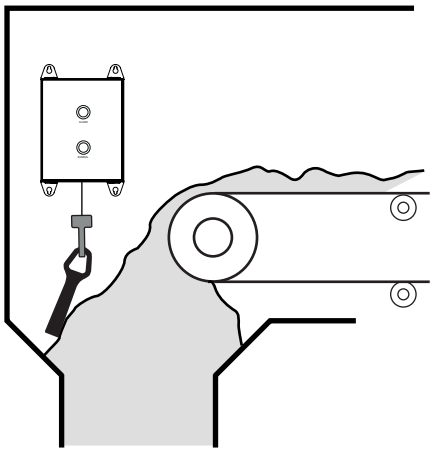
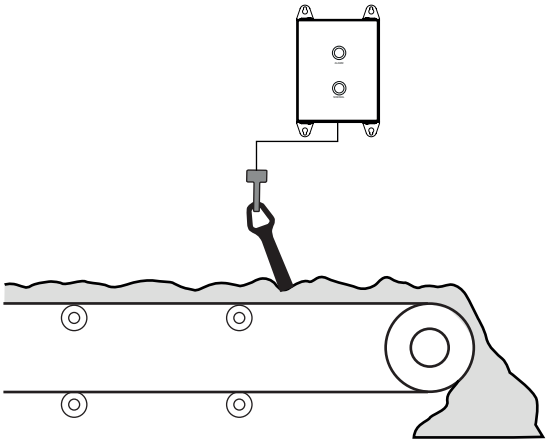
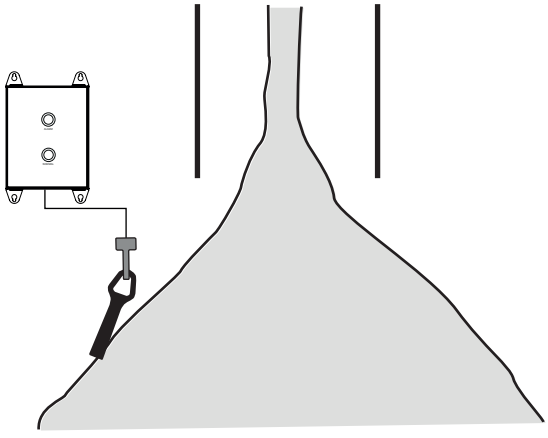


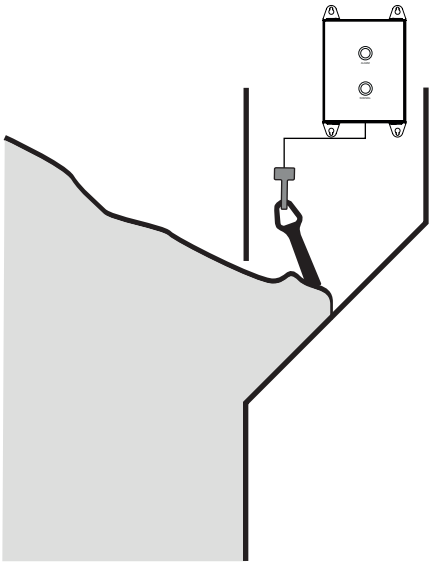
Plugged Chute



Flow/No-Flow



High Level



Low Level

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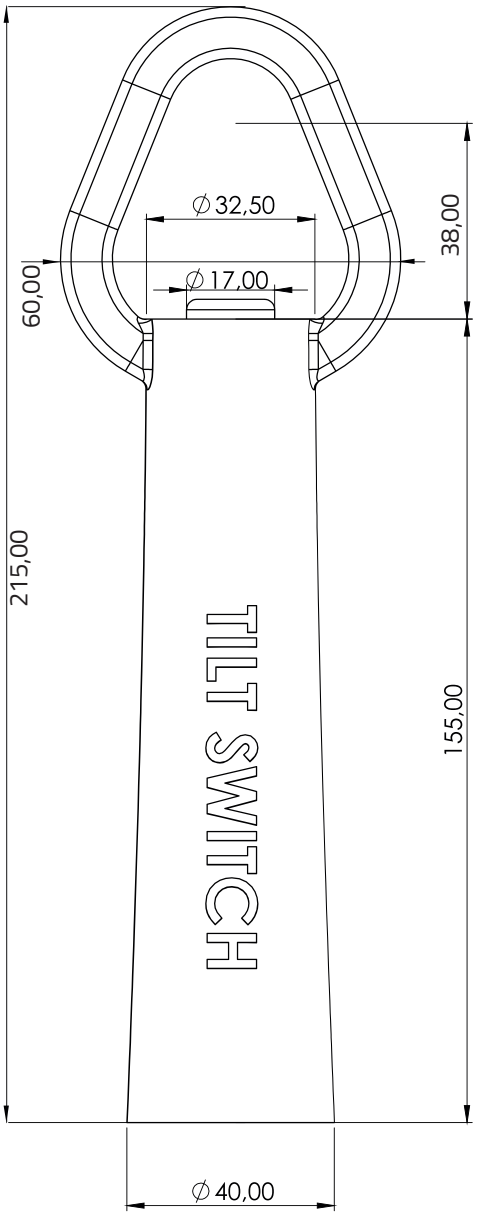
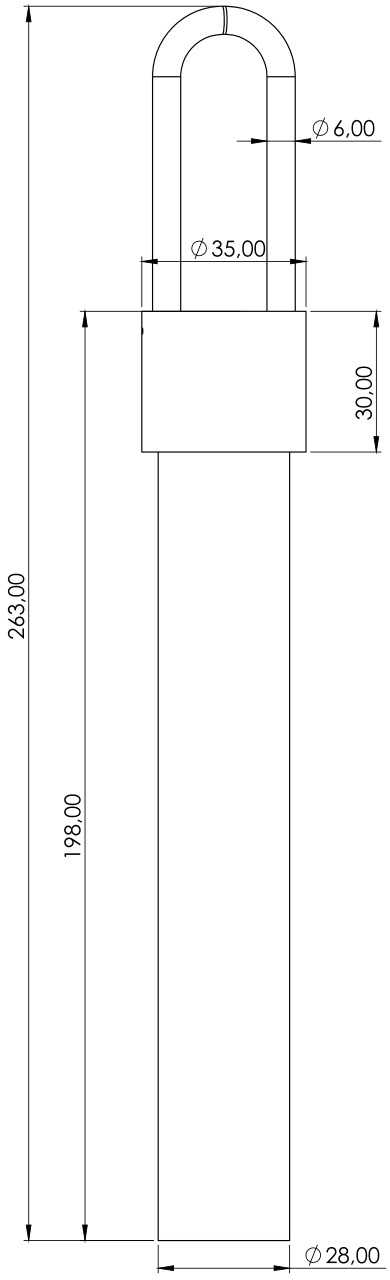
Product Dimensions



SL23 & SL20



SL24

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Tilt Switch Probe **Installation and Wiring**

Tilt Switches must be installed by qualified personnel only, in compliance with safety norms. Before wiring, the power supply to the switch must be interrupted. After wiring, test the installation according to safety norms.

- Tilt Switch must be suspended from a vibration-free rigid support.
- Tilt Switch must be installed in a vertical position and must be allowed free movement.
- Tilt Switch must be out of falling material's path.
- Select the location of the Tilt Switch according to your application. Choosing right position is important to avoid burying the Tilt Switch under bulk material.
- Prefer a shielded installation for tough working conditions to protect the cable and probe from impacts.
- For coarse material, prefer probe extensions to prevent the Tilt Switch being buried.
- After fixing the Tilt Switch to its position, connect the wires to Bulk Pro Systems Control Panel or your existing control panel. The Switch is normally closed in vertical position, will open when tripped.
- Control unit can be powered with 110 or 220 VAC. Connect the live wire to 110 VAC or 220 VAC labeled terminal ensuring that it is correct. Connect the neutral wire to "0 VAC" terminal. Connect the grounding wire to "Ground" terminal.
- If you are using NC probe, connect the probe cables to "Probe" terminal. Select the SW2-6 DIP Switch to up position (ON).
- If you are using an electronic probe connect the probe cables to E. Probe terminals. Select the SW2-6 DIP Switch to down position (OFF).
- Connect to output and fault terminals. Behaviour of outputs change with SW2-5 DIP Switch. Follow this manual to select it according to your application. Fault terminals are only used with electronic tilt switches.

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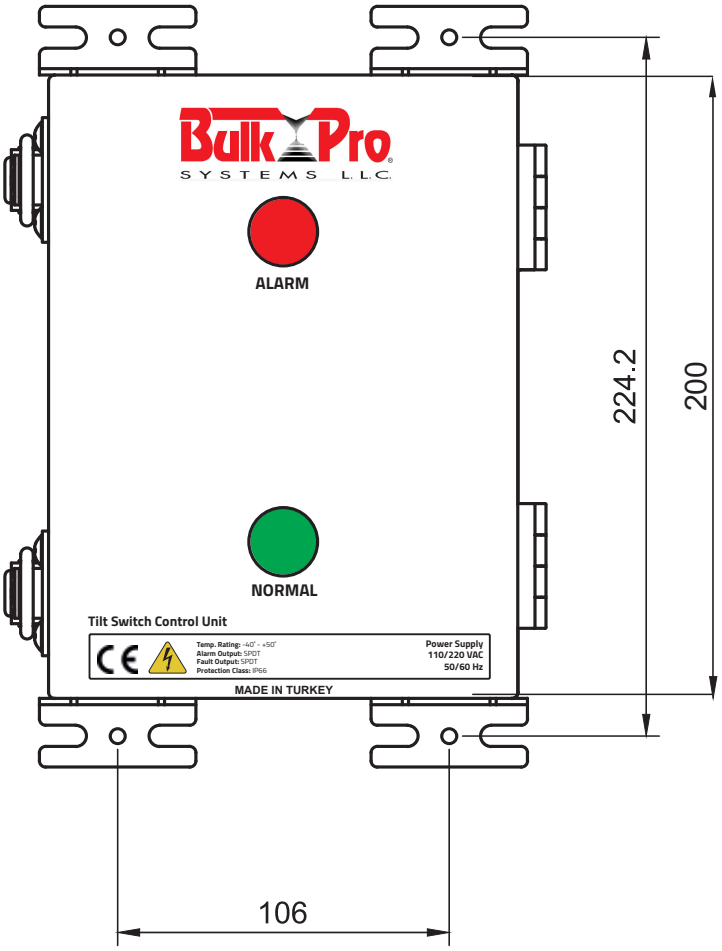
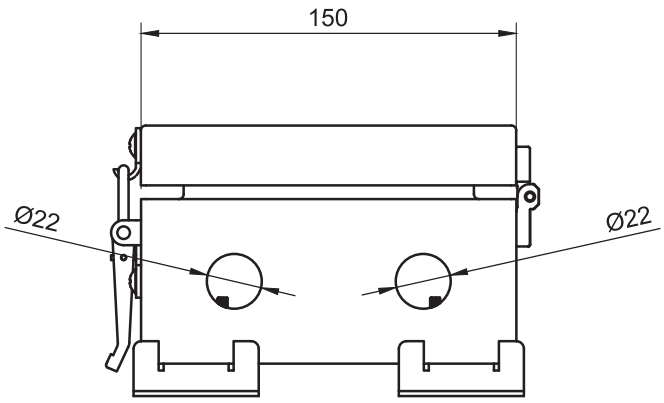
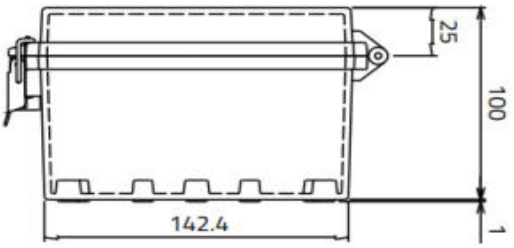
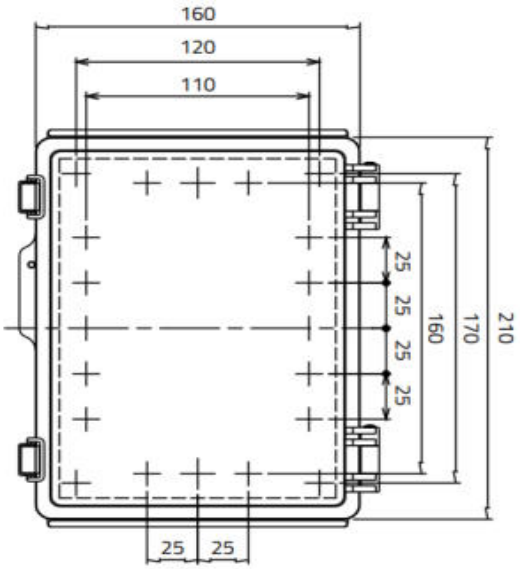
Tilt Switch Control Dimensions SL28-115C

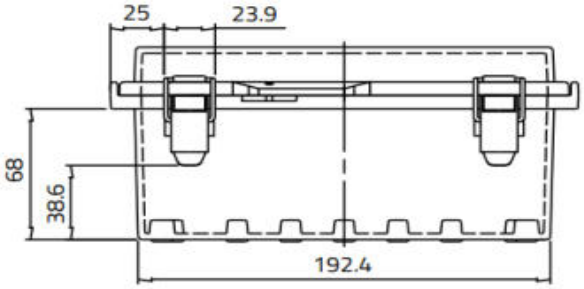




Tilt Switch Control Dimensions SL29-115C





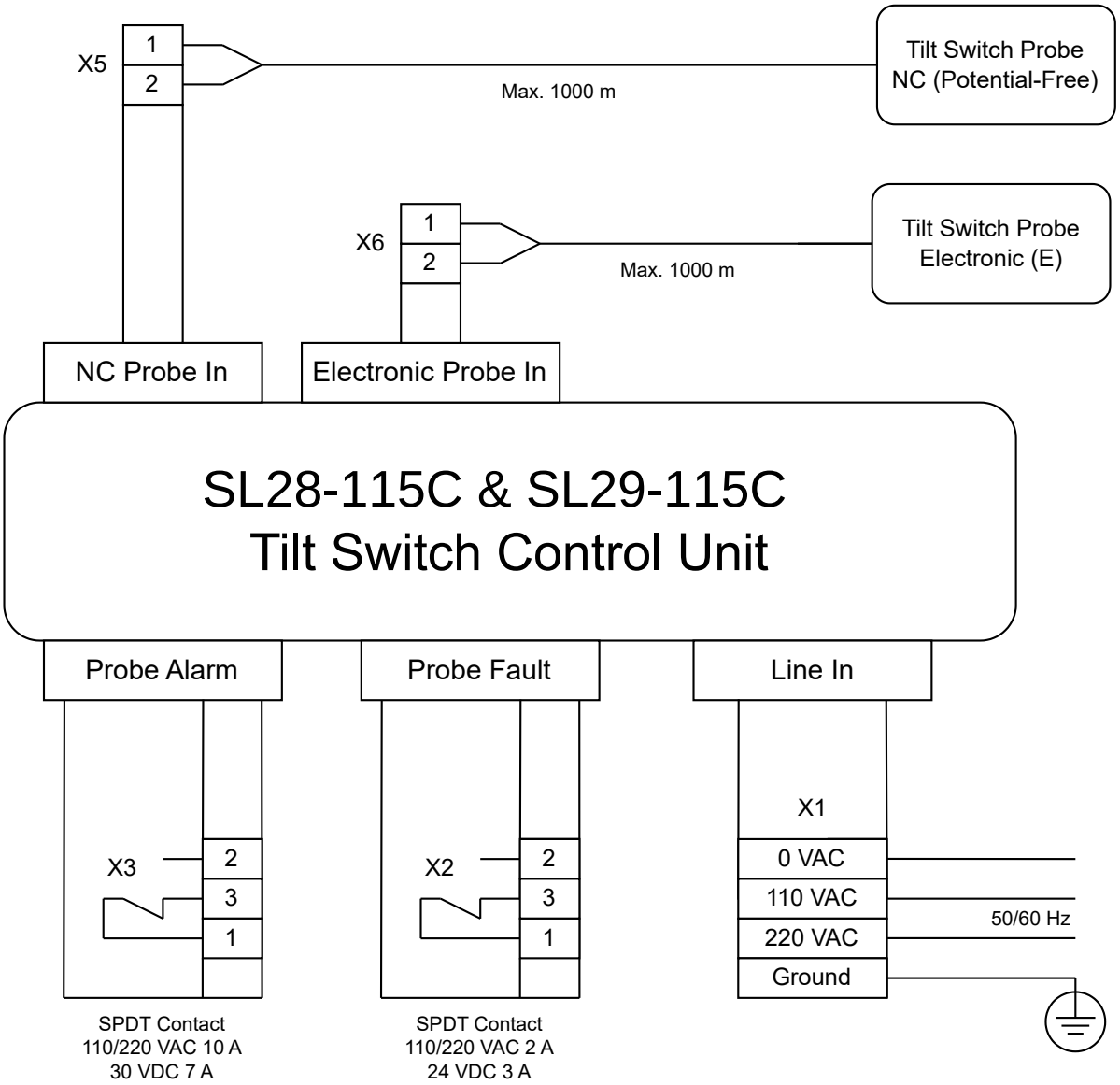


Installation

Control Panels must be installed by qualified personnel only, in compliance with safety norms. Before wiring the power supply to the switch must be interrupted. Control Panel must not be used in explosive atmosphere After wiring, test the installation according to safety norms.

- Control Panel should be mounted in a vibration free area free of heat and humidity.
- The unit has two holes on the bottom for cable glands.
- Use separate cable glands for probe and power supply.
- Maximum 12 AWG stranded cable is suitable for terminals.

Wiring Diagram



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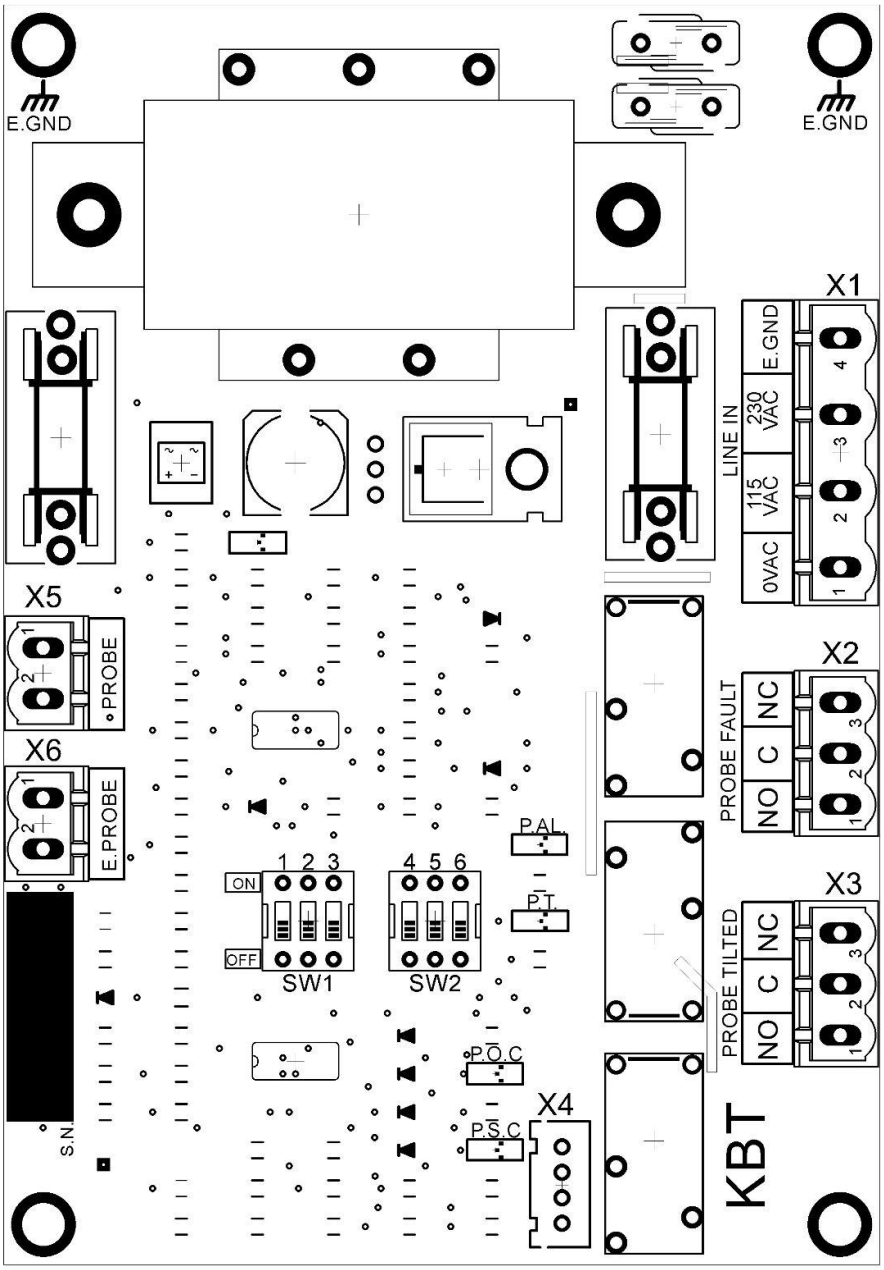
SL28-115C & SL29-115C Board Settings



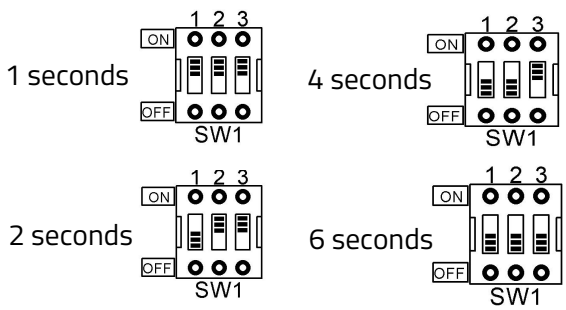
Terminals

X1: Line In
X2: Probe Fault
X3: Probe Tilted
X4: Lights (installed in factory)
X5: Probe In (NC, potential-free)
X6: Probe In (Electronic)

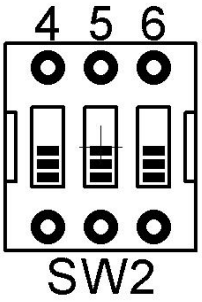
Lights

Power: Control unit is powered.
P.AL: Fault, check probe connection.
P.T: Probe tilted, reversed if SW2-5 switched.
P.O.C: Damaged/broken cable.
P.S.C: Probe short circuit.
*Fault, damaged cable and short circuit indicators only work with electronic tilt switch probes.

SW1 - Delay Switches



SW2 - Function Switches



SW2-4 - Sensitivity Setting
ON: Sensitive (Flow applications)
OFF: Normal (Level applications)

SW2-5 - Alarm Reversal
ON: Tilted is normal (Low level)
OFF: Vertical is normal (High level)

SW2-6 - Probe Type Selector
ON: NC Probe (potential-free)
OFF: Electronic Probe

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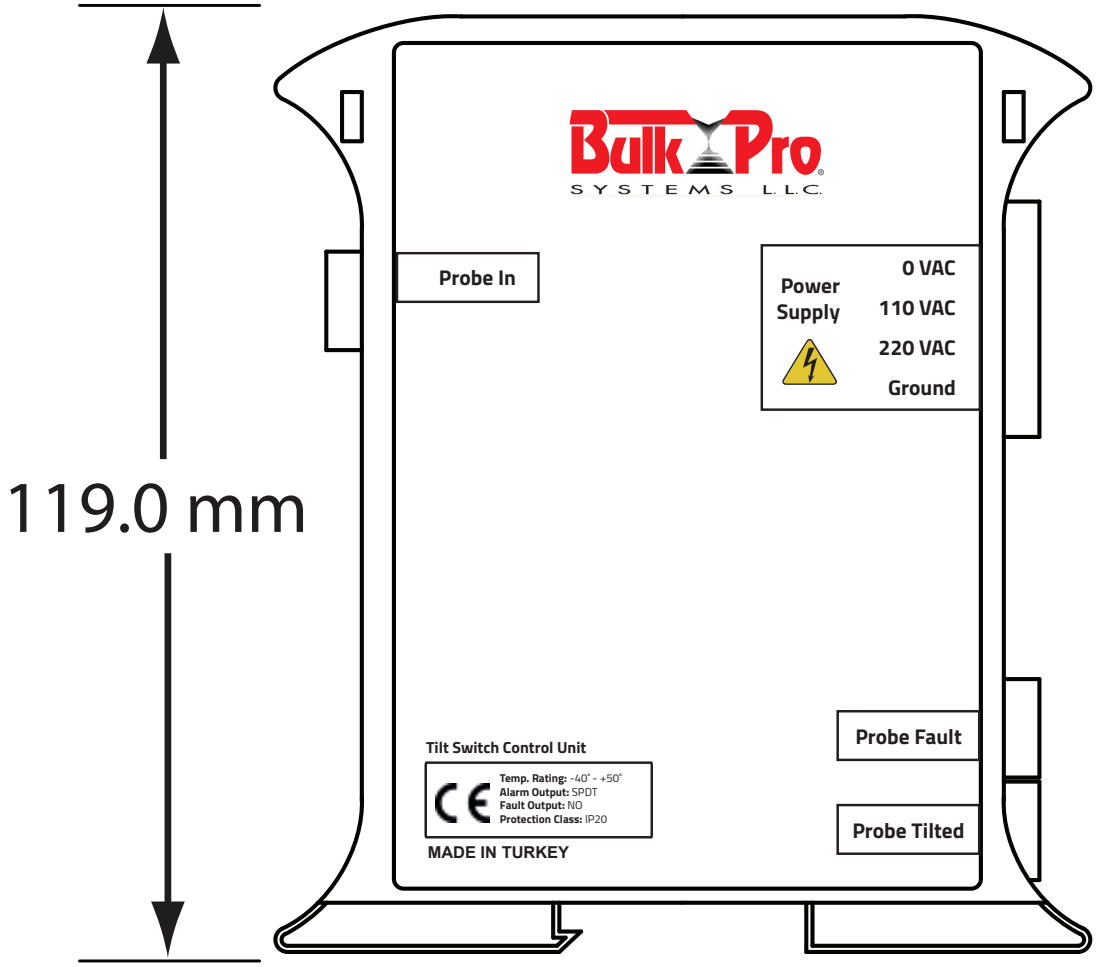
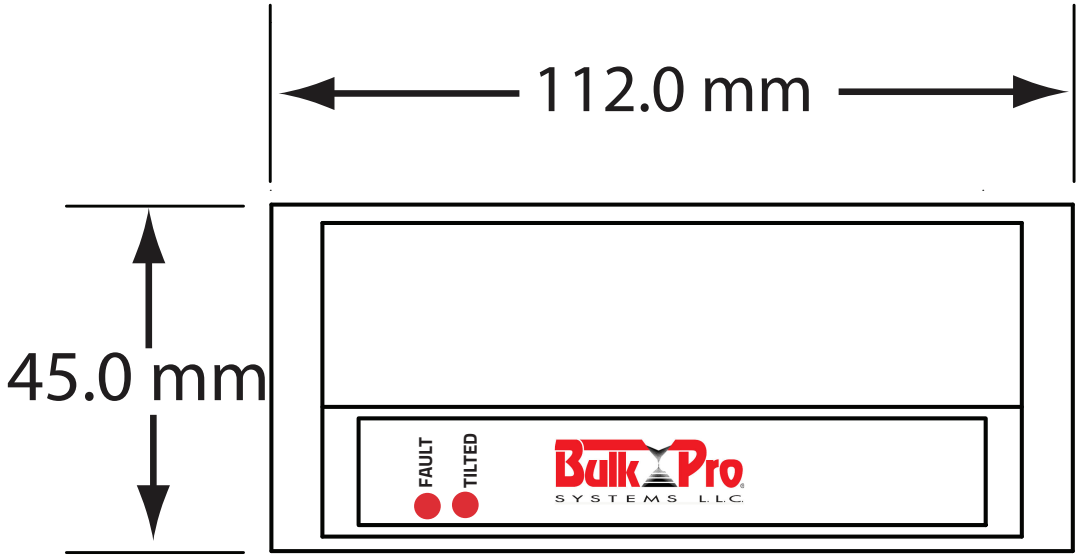
Tilt Switch Control Dimensions SL29-DIN





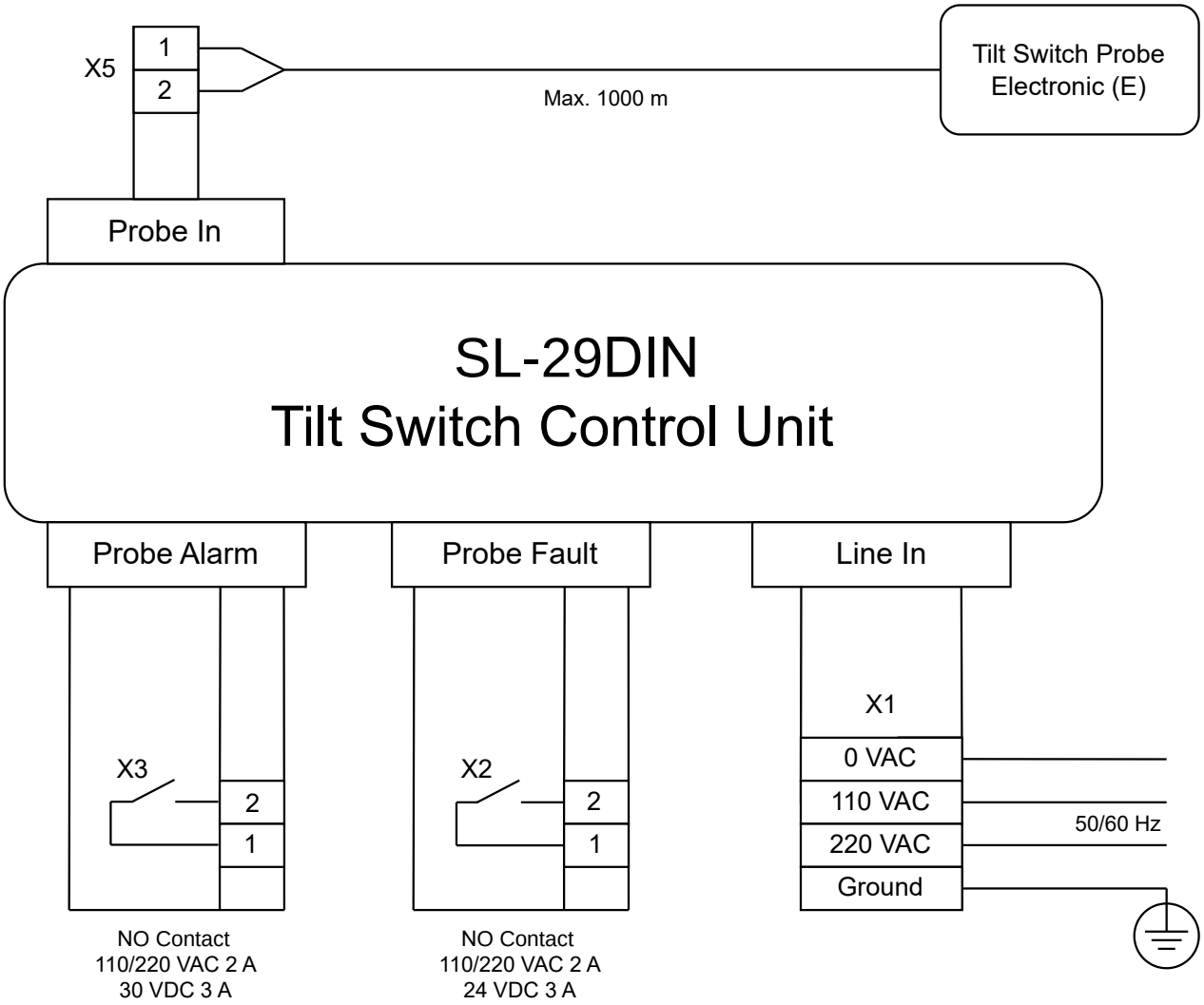
MN-TS001102

SL-29DIN **Installation**

SL-29DIN Control Panel must be installed by qualified personnel only, in compliance with safety norms. Before wiring, the power supply to the switch must be interrupted. Control Panel must not be used in explosive atmosphere. After wiring, test the installation according to safety norms.

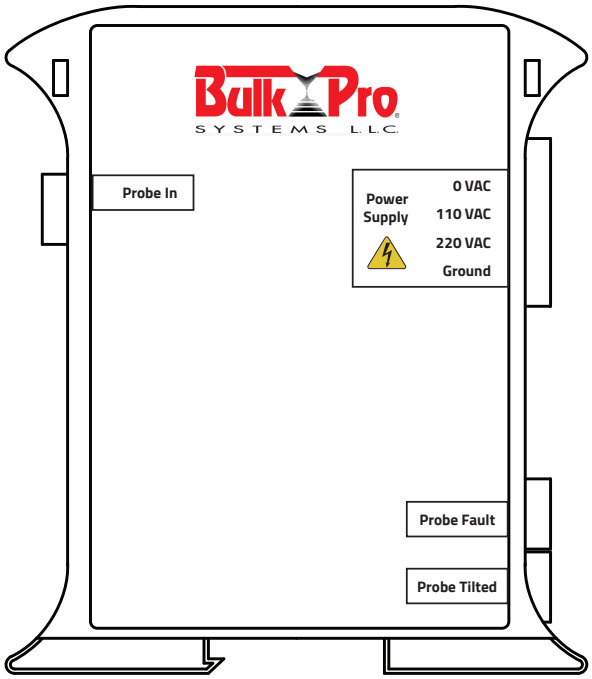
- Control Panel should be mounted in a vibration free area free of heat and humidity.
- The unit has labeled terminals on it for connections.
- Use separate cable glands for probe and power supply.
- Maximum 12 AWG stranded cable is suitable for terminals.

Wiring Diagram



MN-TS001102

SL29-DIN Settings



Terminals

Probe In: Electronic Probe connection

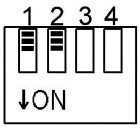
Power Supply: 110 or 220 VAC power supply is connected. Make sure to connect the live wire to the correct terminal. Neutral wire is connected to 0 VAC terminal. Ground wire is connected to Ground terminal.

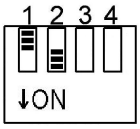
Probe Fault: 1 SPDT fault contact

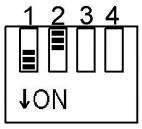
Probe Alarm: 1 SPDT alarm contact

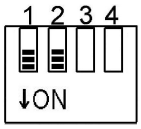
Delay Switches

Switch 1 and Switch 2 are used to control delay times. Settings are as seen as below:

1 seconds 

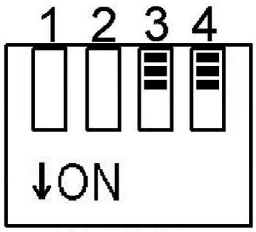
4 seconds 

2 seconds 

6 seconds 

Function Switches

Switch 3 and Switch 4 are used to select between high/low level and flow/no flow applications.



Switch 3 - Sensitivity Setting
ON: Sensitive (Flow applications)
OFF: Normal (Level applications)
Switch 4 - Alarm Reversal
ON: Tilted is normal (Low level)
OFF: Vertical is normal (High level)