A Higher Level of Performance

Data Sheet

Gladiator

Vibration Smart Switch Series

A Level Switch for Liquids and Solids

For more information, please visit >
www.hawkmeasurement.com

Overview

Gladiator Vibration Smart Switch Series

The **Gladiator Smart Vibration Switch** is a third generation, state-of-the-art level probe, designed to operate in tough industrial environments.

Principle of Operation

A stainless steel tuning fork is driven by piezo ceramic elements, causing it to vibrate at its resonant frequency. When the material to be detected covers the fork, vibrations are damped. The changed vibration is sensed electronically, and the processed signal is used to switch a relay for indication or control purposes.

Typical Uses

- Failsafe high-level / low-level alarm
- High-level alarm
- Low-level alarm
- Interface Detection
- Pump control.

Function

Point level switch for liquids, solids and slurries.

Primary Areas of Application

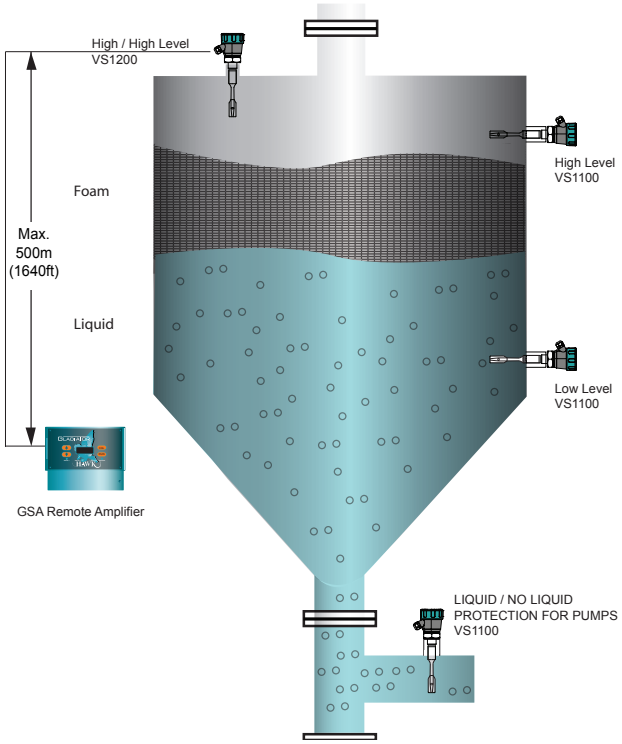
- Brewing
- Cement
- Chemical
- Dairy
- Edible oil
- Fertilizer
- Food & Beverage
- Glass
- Mining & Metals
- Oil & Gas
- Packaging
- Paint
- Paper
- Pharmaceutical
- Plastics
- Power Generation
- Refining
- Semiconductor
- Sugar
- Textile
- Water & Wastewater

Features

- Suitable for a wide range of solids and liquids
- Heavy duty construction
- Simple ‘1-minute’ setup
- Remote sensor or Integral ‘all in one’ types
- Relay outputs: Integral probe (1) Remote (2)
- Remote test function
- Adjustable ON and OFF delays (0-20 sec)
- Modbus, GosHawk
- Remote 3G Connection option
- Remote amplifier to probe separation up to 500m (1640ft)
- Bright visual status indication on probe
- Independent housing alignment after mounting thread locked

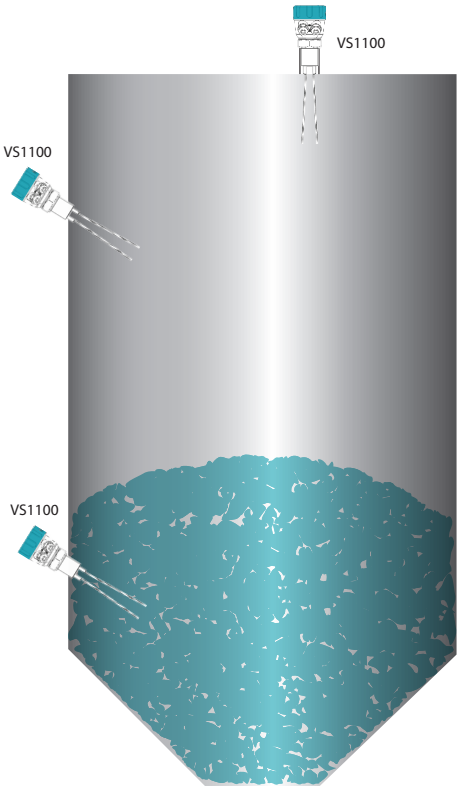
Level switch in liquid tank

High and low liquid level switch in tanks



Level switch in a plastic pellet silo

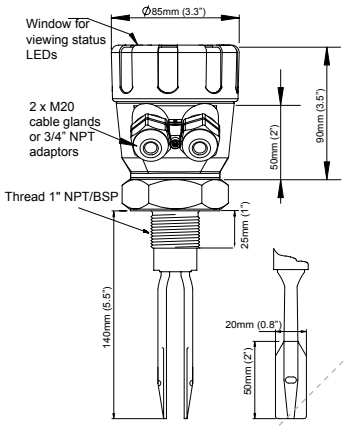
High and low level switch in hopper



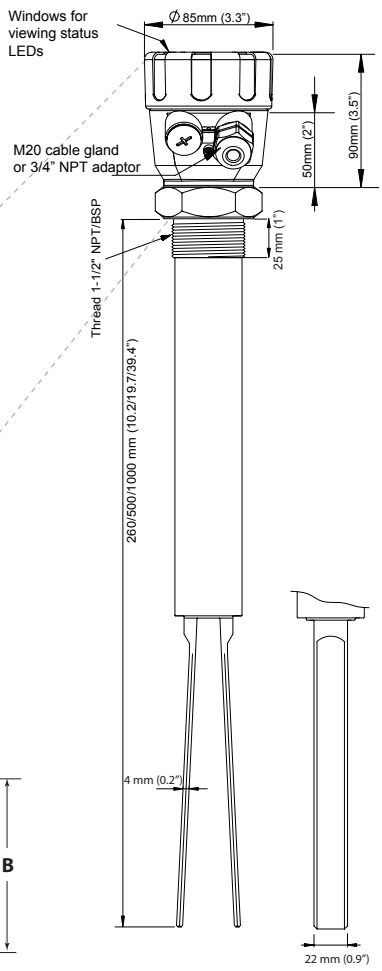
Dimensions

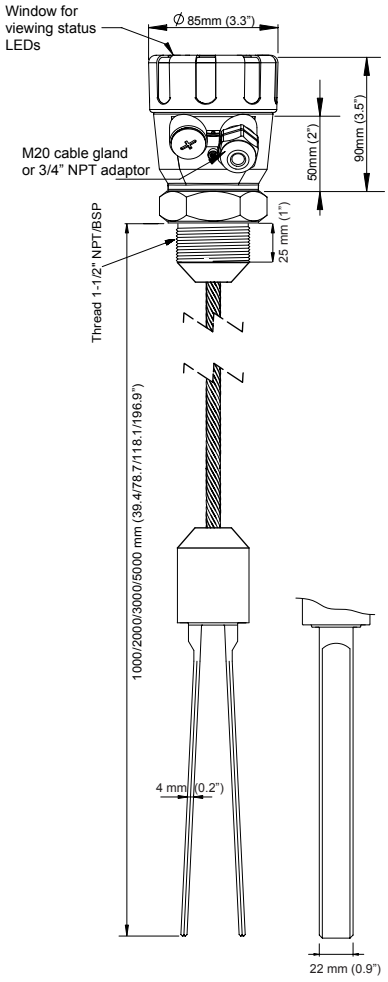
Gladiator Vibration Smart Switch Series

Liquid Probe

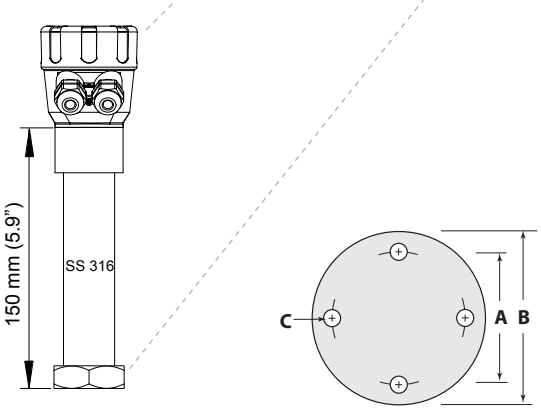


Solid Probes



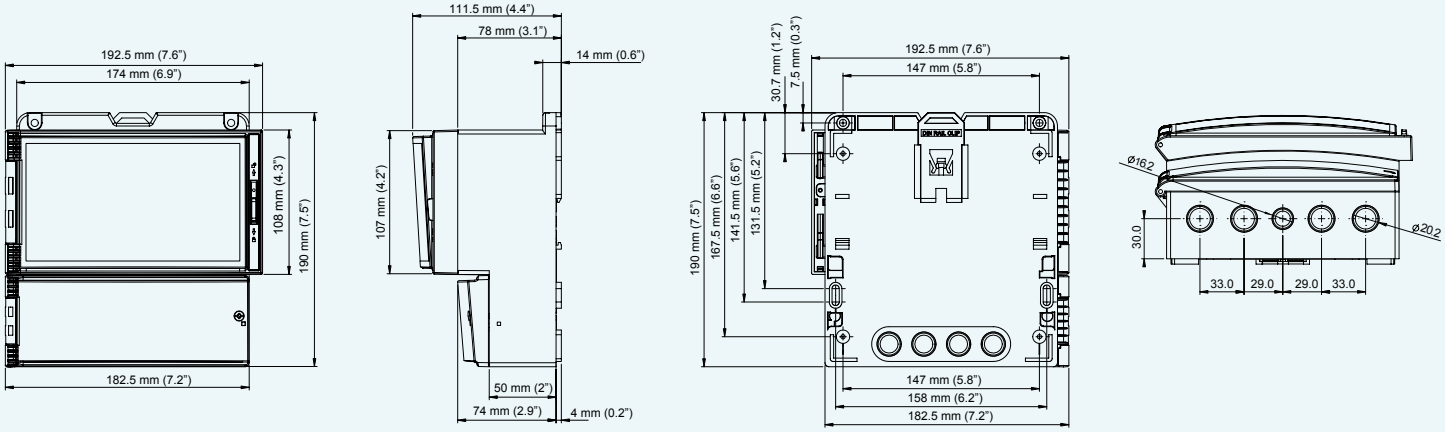


Temperature Extension Option



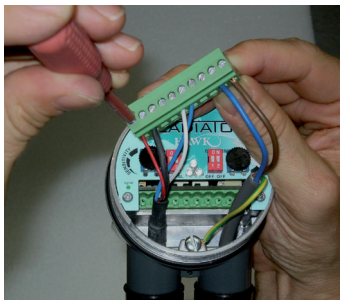
Flange Dimensions - 50mm (2")						
	A		B		C	
ANSI (Class 150)	120.7	4.75"	152.4	6"	19.1	0.75"
DIN (PN40)	125	4.9"	165	6.5"	18	0.7"
JIS (10K)	120	4.7"	155	6.1"	19	0.75"

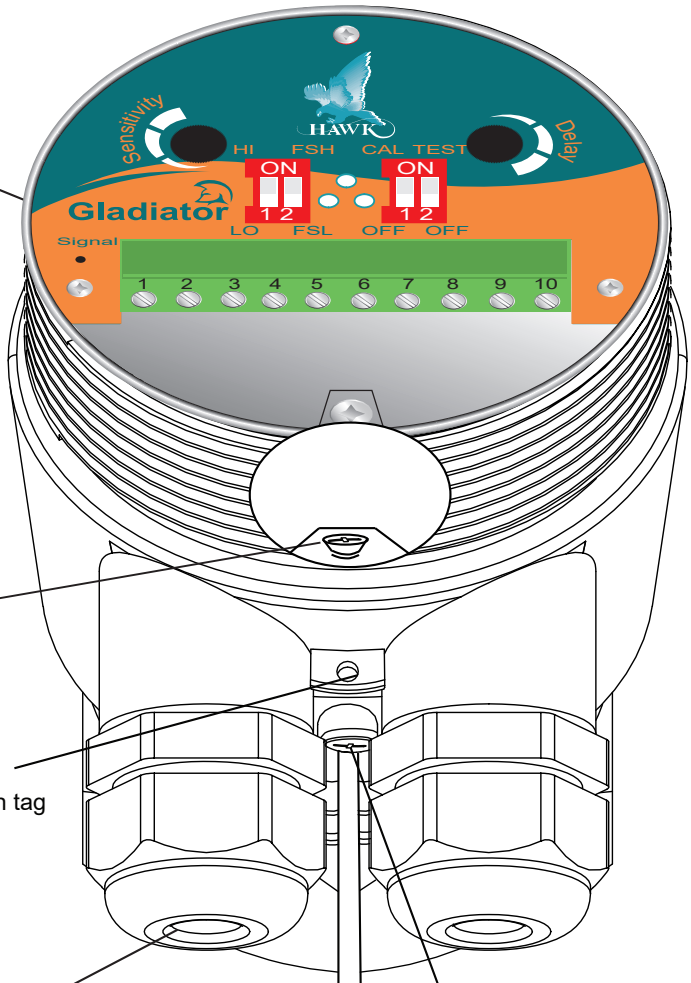
Remote Amplifier



Integral Probe Wiring

Remove Plug-In terminal block for easier wiring.





The AC earth/ground cable must be connected to the ground screw inside the housing when using AC power.

Hole for securing of optional identification tag

M4 grounding screw

If only one cable is used for both power and output signal, then the second entry port must be plugged or blinded. Every Smart unit is supplied with two M20 glands (or 3/4"NPT adaptors) mounted on the unit and one blind plug loose.

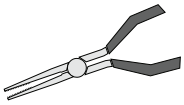
Ground the housing to vessel, if vessel is metallic. Ground the housing to plant ground, if vessel is non-metallic.

Terminal Layout - Output Option S (SPDT)

RELAY				COMMS		DC-IN		AC-IN	
NC	COM	NO	Test	A	B	+	-	N	L1
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
				RS 485		12-30Vdc		80-265Vac	

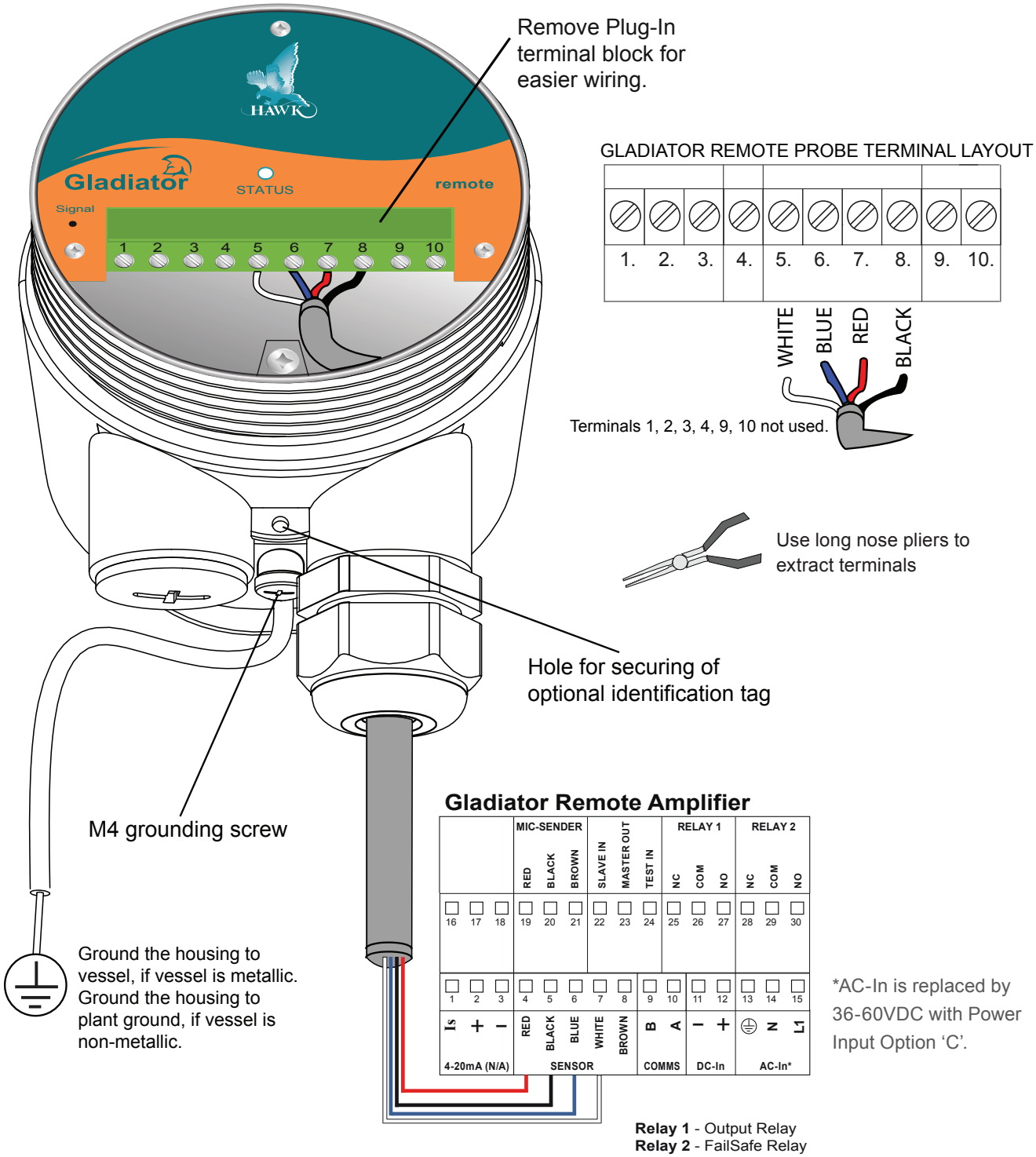
Terminal Layout - Output Option D (DPDT)

RELAY						DC-IN		AC-IN	
NC1	COM1	NO1	NC2	COM2	NO2	+	-	N	L1
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
						7-30Vdc		80-265Vac	



Use long nose pliers to extract terminals

Remote Probe to Amplifier Wiring



Cable type between Amplifier and Probe

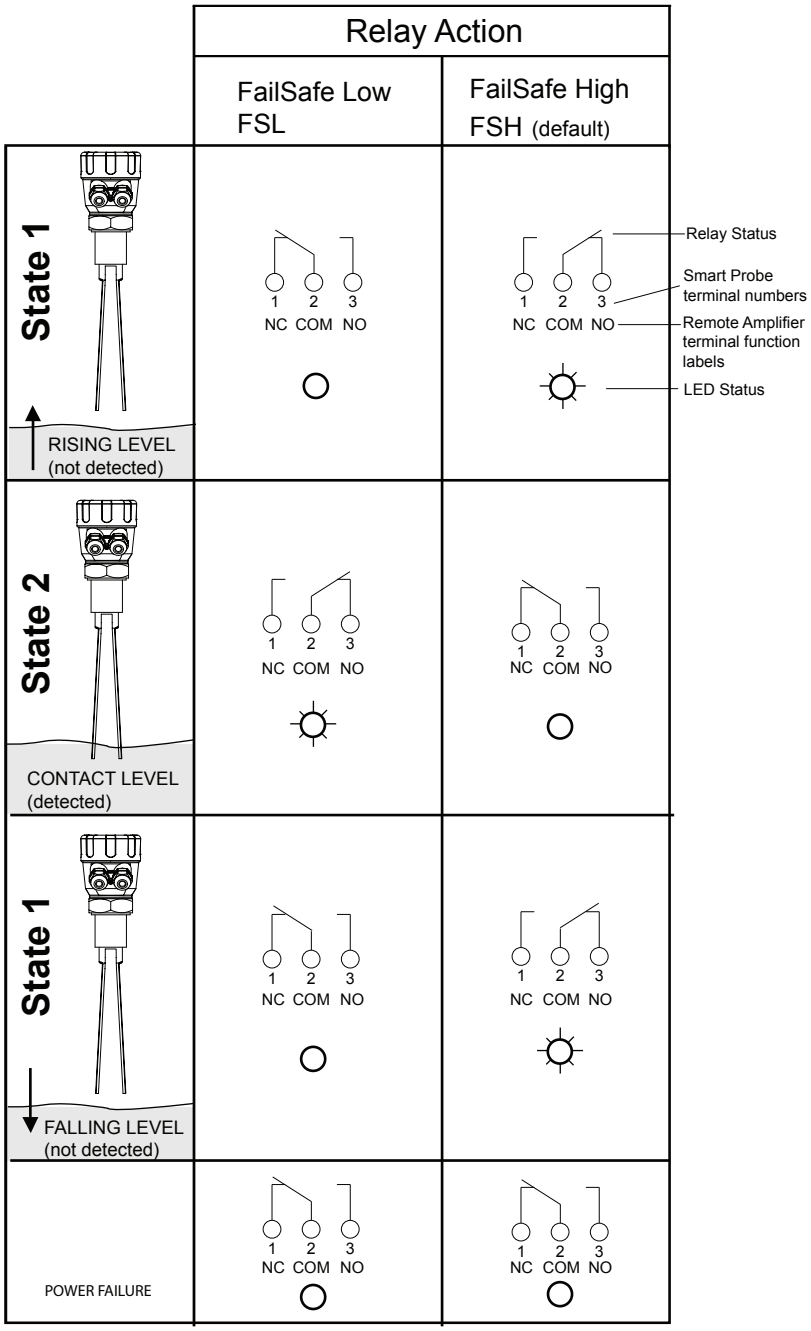
- Cable type between Amplifier and Probe
- 4 conductor shielded twisted pair instrument cable
- Conductor size dependent on cable length
- BELDEN 3084A, DEKORON or equivalent
- Max: BELDEN 3084A = 500m (1640ft)
- Max: DEKORON IED183AA002 = 350m (1150ft).

Relay Functions

Level Switch Contact Action

Relay - for Integral Probe version
(Set Relay Action selection switch)

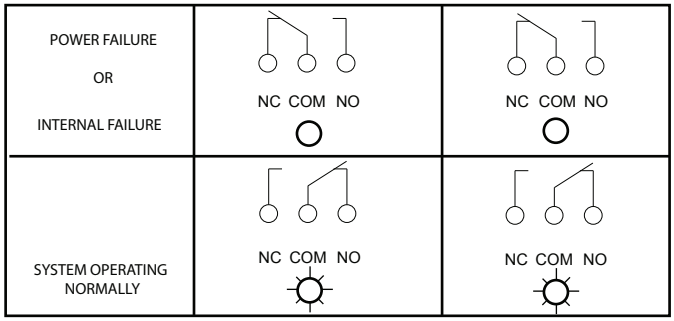
Relay 1 - for Remote version
(Set Relay Action parameter)



Fail-Safe Switch Contact Action

Relay 2 - Remote version only.

For Integral Probes the 'Test' terminal can act as a solid state output with a similar function.

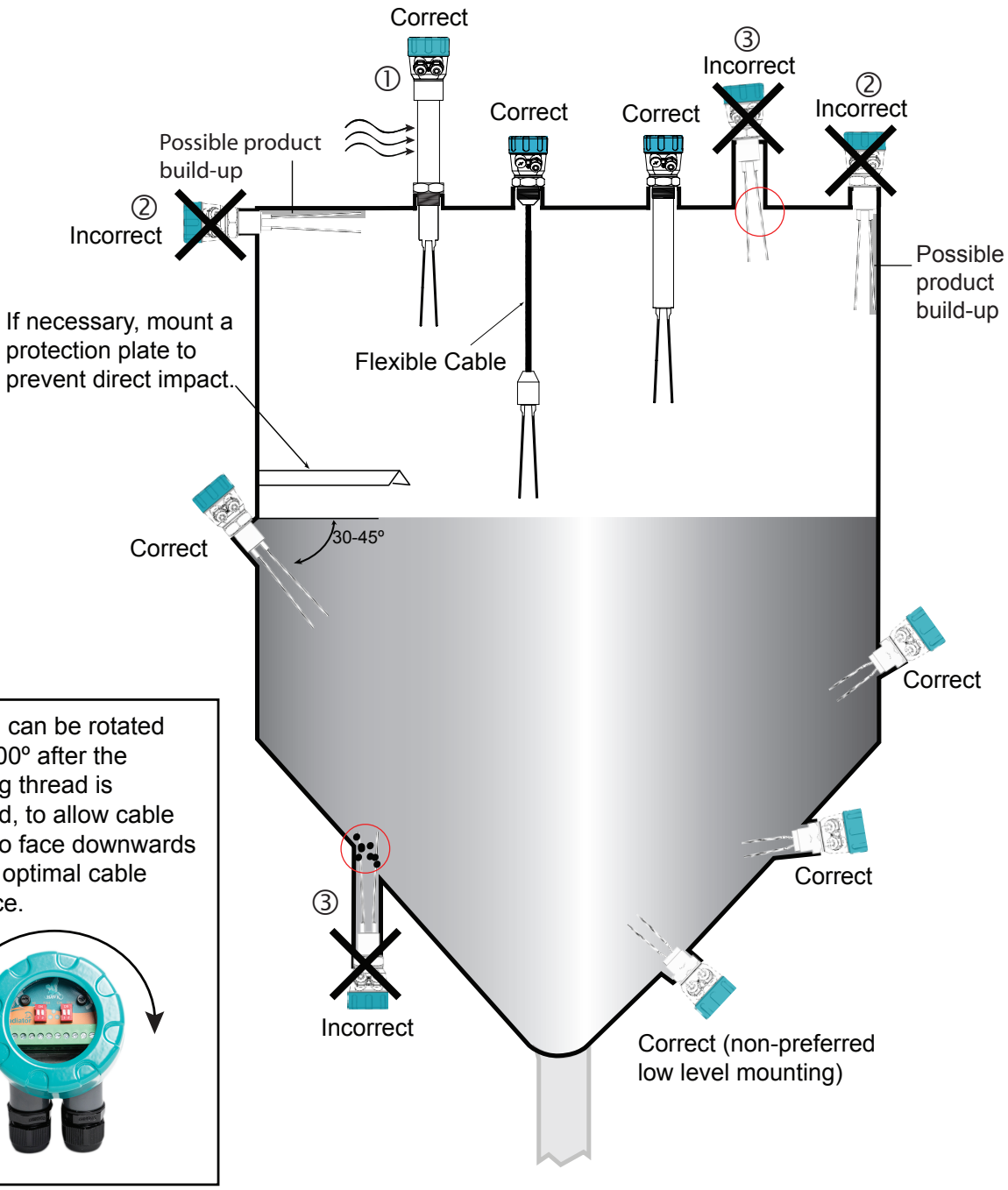


Mounting

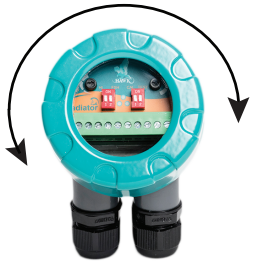
Probes can be mounted from above or from the side.

Use a protection plate for side mounting where the probe may be subject to impact damage.

Install the Probe far enough away from the vessel wall to prevent the forks from coming into contact with the wall, and prevent build-up of product between the forks and the wall over time.



Housing can be rotated within 200º after the mounting thread is tightened, to allow cable entries to face downwards or allow optimal cable clearance.



Integral Probe Version

VS1100 Gladiator Vibration Switch - Integral Probe

Power Supply
B 12-30 VDC
U 12-30VDC and 90-260VAC

Output Options
S 1 x SPDT relay
D 1 x DPDT relay

Housing
S Powder Coated Aluminium, Glass viewing window
C 316 Stainless Steel, Glass viewing window

Max **Process Temperature**
1 80ºC (176 ºF)
2 150ºC (302 ºF)

Version
1 Rigid probe
2 Flexible Cable with Probe (solid/powder version only)

Application Type
L Liquid
S Solid/Powder - 1.5” mounting only

Mounting
TN10 1” NPT Thread - Liquid type only
TB10 1” BSP Thread - Liquid type only
TN15 1.5” NPT Thread
TB15 1.5” BSP Thread
FA2 2” Flange ANSI (Class 150)
FD2 2” Flange DIN 50 (PN 40)
TC2 2” Tri-Clamp

Approval Standard
X Not Required
A20 ATEX Grp II Cat 1/2 D Ex tD A20 IP65 T100°C for Ta -20°C to 80°C
i20 IECEx Zone 20 (Ex iaD A20 IP65 T100°C Ta -20°C to 80°C
A22 ATEX Grp II Cat 3 GD T75°C IP67 Tamb -40°C to 65°C

(P) Rigid Probe Length (C) Cable Length
(custom lengths min: P30 / C100 max P100 / C500)
P14 140 mm (5.5”) rigid probe - ‘Liquid’ type only
P26 260 mm (10.2”) rigid probe
P50 500 mm (19.7”) rigid probe
P100 1000 mm (39.4”) rigid probe
C100 1000 mm (39.4”) flexible cable - ‘Solid/Powder’ type only
C200 2000 mm (78.7”) flexible cable - ‘Solid/Powder’ type only
C300 3000 mm (118.1”) flexible cable - ‘Solid/Powder’ type only
C500 5000 mm (196.9”) flexible cable - ‘Solid/Powder’ type only

VS1100	B	S	S	1	1	S	TN15	X	P14

Remote Version

Remote Amplifier

GSA Remote Gladiator System Amplifier

Housing

S Standard polycarbonate electronics housing

Power Supply

B 12-30VDC
C 36-60VDC
U 12-30VDC and 90-260VAC

Output Options (inc. Modbus)

S Switch only, 1 level relay, 1 failsafe relay

Approvals

X Not Required
A22 ATEX Grp II Cat 3 GD T75°C IP67 Tamb -40°C to 65°C

GSA	S	U	S

Remote Probe

VS1200 Remote Gladiator Vibration Probe

Housing

S Powder Coated Aluminium, Glass viewing window
C 316 Stainless Steel, Glass viewing window

Process Temperature

1 80°C (176 °F)
2 150°C (302 °F)

Version

1 Rigid Probe
2 Flexible Cable with Probe (solid/powder version only)

Application Type

L Liquid
S Solid/Powder - 1.5" mounting only

Mounting

TN10 1" NPT Thread - Liquid type only
TB10 1" BSP Thread - Liquid type only
TN15 1.5" NPT Thread
TB15 1.5" BSP Thread
FA2 2" Flange ANSI (Class 150)
FD2 2" Flange DIN 50 (PN 40)
TC2 2" Tri-Clamp

Approval Standard

X Not Required
A20 ATEX Grp II Cat 1/2 D Ex iaD A20 IP65 T100C Ta -20°C to 80°C
i20 IECEx Zone 20 (Ex iaD A20 IP65 T100°C Ta -20°C to 80°C
A22 ATEX Grp II Cat 3 GD T75°C IP67 Tamb -40°C to 65°C

(P) Rigid Probe Length (C) Cable Length (custom lengths min: P30 / C100 max P100 / C500)

P14 140 mm (5.5") rigid probe - 'Liquid' type only
P26 260 mm (10.2") rigid probe
P50 500 mm (19.7") rigid probe
P100 1000 mm (39.4") rigid probe
C100 1000 mm (39.4") flexible cable - 'Solid/Powder' type only
C200 2000 mm (78.7") flexible cable - 'Solid/Powder' type only
C300 3000 mm (118.1") flexible cable - 'Solid/Powder' type only
C500 5000 mm (196.9") flexible cable - 'Solid/Powder' type only

VS1200	S	1	1	S	TN15	X	P14

Operating Voltage

- 7 - 30VDC (residual ripple no greater than 100mV)
- 80 - 265VAC 50/60Hz
- 36-60VDC

Power Consumption

- <0.8W @ 24VDC
- <6W @ 48VDC
- <5VA @ 240VAC
- <3VA @ 115VAC

Communications

- GosHawk, Modbus
- Remote version also with HART, Profibus DP and DeviceNet (options)
- Multidrop mode can address 1-250 units over 4 wires

Relay Output: (1) Integral (2) Remote

- Form 'C' (SPDT) contacts, rated 5A at 240VAC resistive
- Remote failsafe test facility for one relay

Vibration Frequency

- Liquids 425Hz
- Solids 80Hz

Measurement Capability

- Liquids - All liquids and many solids
- Solids - Solids, powder and some liquids

Sensitivity

- Liquids - 50 g/l
- Solids - 5 g/l

Stability

- 0.01% of reading / °C

Operating Temperature

- Remote electronics -40°C (-40°F) to 80°C (176°F)
- Integral Probe -40°C (-40°F) to 150°C (302°F)*
- Remote Probe -40°C (-40°F) to 150°C (302°F)*

Probe/Amplifier Separation

- Up to 500m (1640ft) using specified extension cable

Cable type between Amplifier and Probe

- 4 conductor shielded twisted pair instrument cable
- Conductor size dependent on cable length
- BELDEN 3084A, DEKORON or equivalent
- Max: BELDEN 3084A = 500m (1640ft)
- Max: DEKORON IED183AA002 = 350m (1150ft)

Maximum Operating Pressure

- 2 BAR

Display (Remote version only)

- 2 line x 12 character alphanumeric LCD
- Backlight standard

Memory - Remote

- Non-Volatile (No backup battery required)
- >10 years data retention

Enclosure Sealing

- Integral Probe IP67
- Remote Electronics IP65 (NEMA 4x)
- Remote Probe IP67

Cable Entries

- BSP process mounting: 2 x M20 Glands
- NPT process mounting: 2 x 3/4" NPT threaded adaptors
- Remote: 3 x 20mm (0.8"), 1 x 16mm (0.6") knock outs

Mounting

- 1" NPT or BSP Thread - Liquid type only
- 1.5" NPT or BSP Thread - Solid/Powder type only
- 50mm (2") Flange (ANSI, DIN or JIS patterns available)
- 2" Tri-Clamp

Remote Test Input

- Press to test
  (used to check for malfunction of unit from remote position, PLC, SCADA etc)

**Model dependent*

HAWK, Since 1988

Hawk Measurement Systems Pty Ltd (HAWK) was established in 1988. It's founding members saw the universal requirement of various industries requiring improved process control and efficiency in their operations.

We Can Help

HAWK understands the difficulties customers face when seeking accurate level measurement. Every application is different, involving a multitude of environmental factors. This is where HAWK excels. Our aim is to ensure that customers feel comfortable with our technology, and are provided with long term and reliable solutions. We believe that a combination of application and product expertise, as well as forward thinking and proactive support policies are the foundation of successful customer-supplier relationships.

Progressive Technical Support

HAWK believes that the future of the Level Measurement Industry revolves around the quality of pre and post sales - support. Our aim is for all sales & support staff to be product experts, and more importantly application experts making our customers applications as efficient and consistent as possible.

Knowledge Sharing

HAWK believes that knowledge sharing is key to creating long term relationships. Empowering our customers and our worldwide distribution network, whilst being available at all times to lend a helping hand, is the perfect recipe for long term solutions and relationships. HAWK openly extends an invitation to share our 25 years of level measurement experience, and ensure that your day to day processes are efficient, understood, and always working.

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Represented by:

For more information and global representatives: **www.hawkmeasurement.com**

Additional product warranty and application guarantees upon request.
Technical data subject to change without notice.

DOC-VIBRATION-DAT v1.13 2020