A higher level of performance

Data Sheet

GLADIATOR

Vibration Smart Switch Series

- A level switch for liquids and solids -

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

Principle of Operations

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

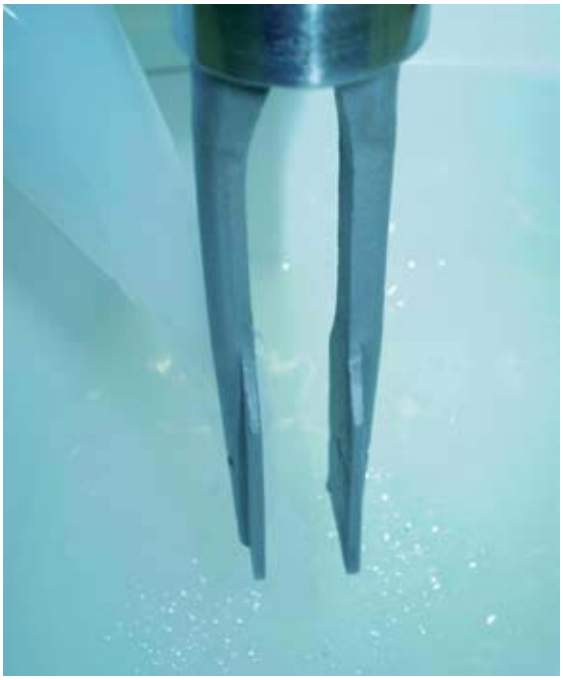
- Brewing
- Cement
- Chemical
- Dairy
- Edible oil
- Fertilizer
- Food & Beverage
- Glass
- Mining & Metals
- Oil & Gas
- Packaging
- Paint
- Paper
- Pharmaceutical
- Plastics
- Power Generation
- Refining
- Semiconductor
- Sugar
- Textile
- Water & Wastewater

Features:

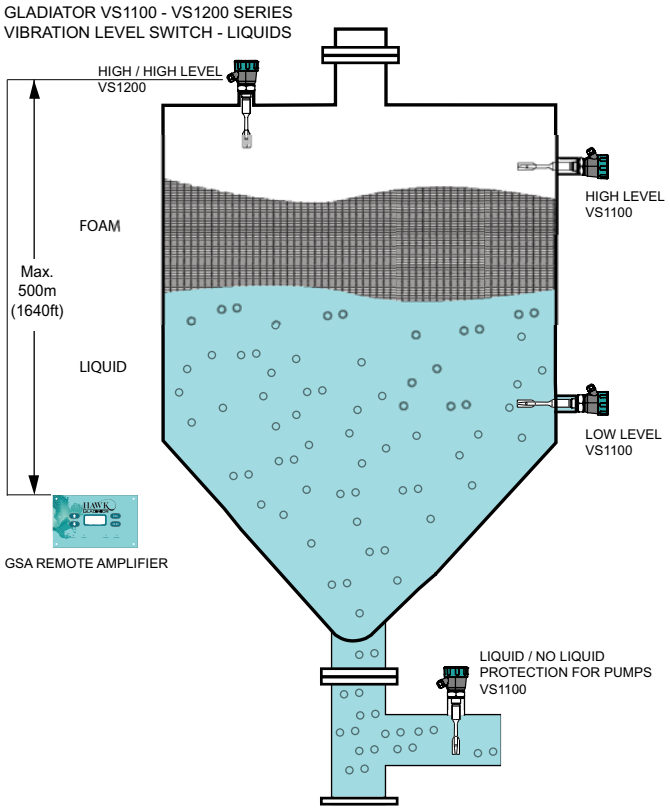
- Suitable for a wide range of solids and liquids
- Heavy duty construction
- Simple ‘1-minute’ setup
- Remote sensor or Smart ‘all in one’ types
- Relay outputs: Smart probe (1) Remote (2)
- Remote test function
- Adjustable ON and OFF delays (0-20 sec)
- Smart communication options: GosHawk, Modbus,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

Typical Applications

Level switch in liquid tank

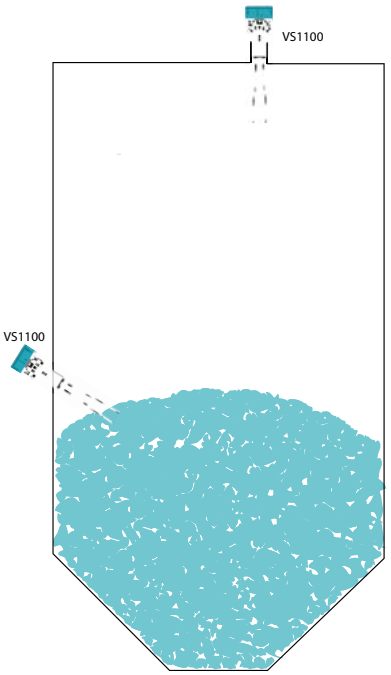


High and low liquid level switch in tanks

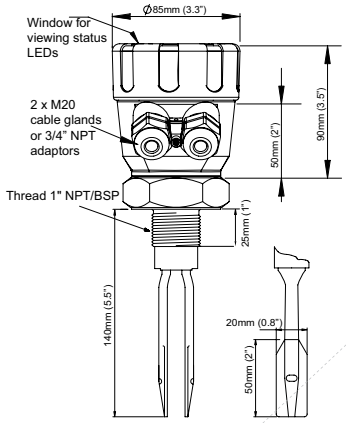


Level switch in a plastic pellet silo

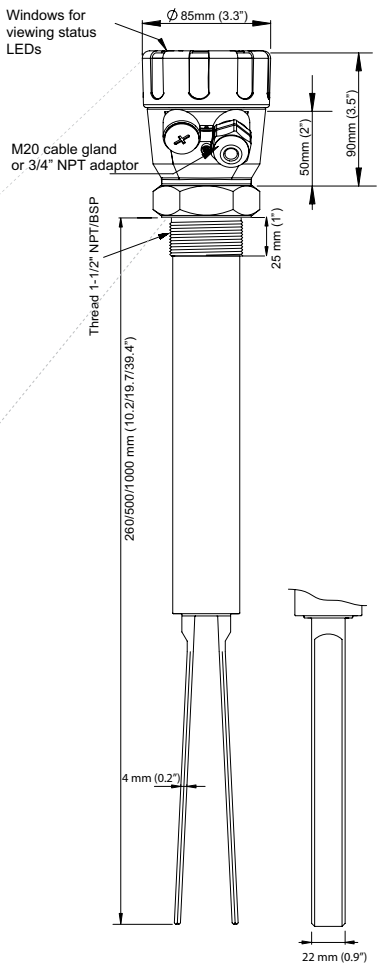
High and low level switch in hopper

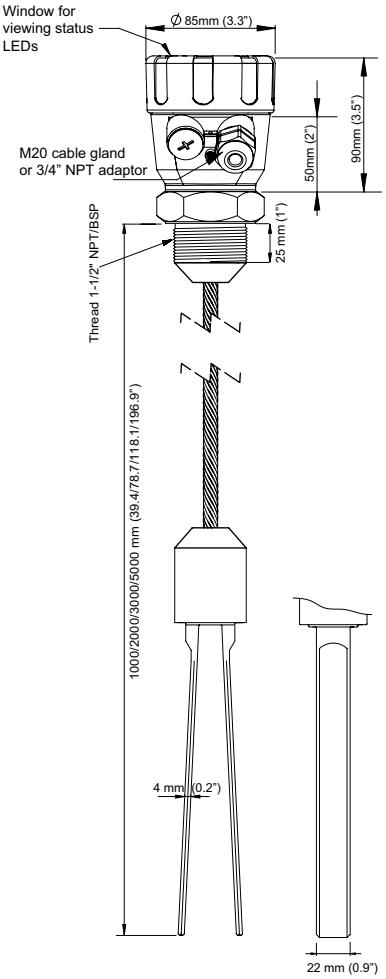


Liquid Probe

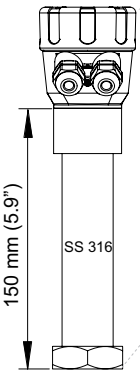


Solid Probes

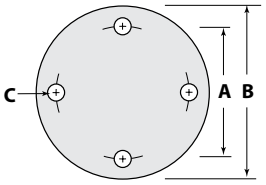




Temperature Extension Option

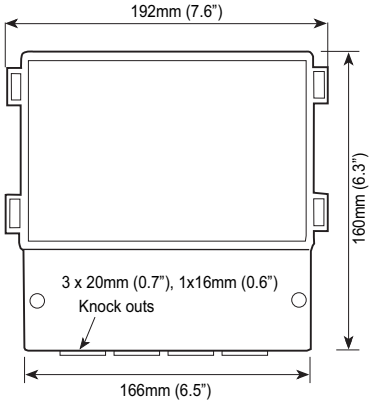


Optional Flange Dimensions 50mm (2")			
	A	B	C
ANSI (Class 150)	120.7 4.75"	152.4 6"	19.1 0.75"
DIN (PN40)	125 4.9"	165 6.5"	18 0.7"
JIS (10K)	120 4.7"	155 6.1"	19 0.75"

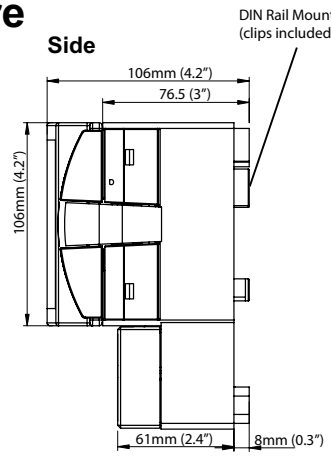


Remote Amplifier Enclosure

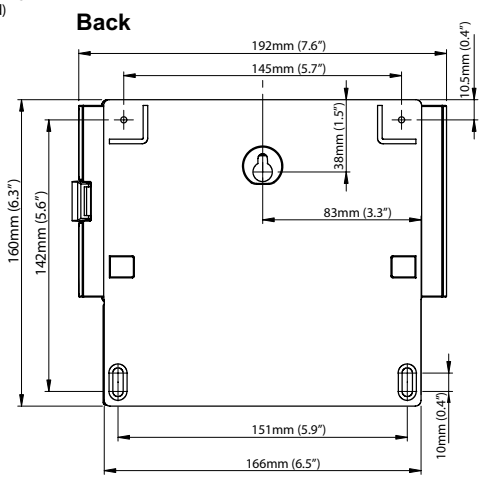
Front



Side

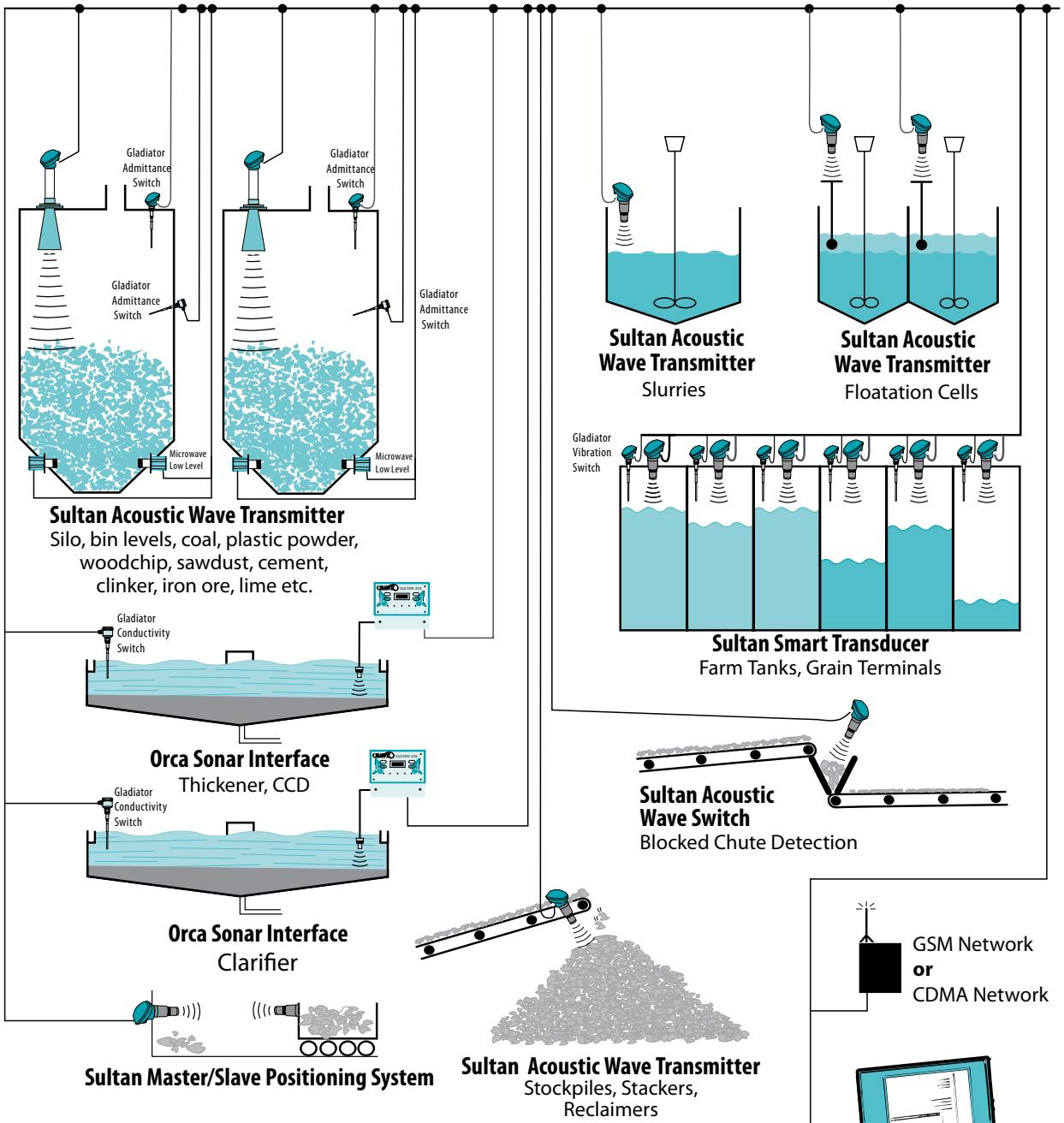


Back



Communication Network Overview

Multidrop Connections

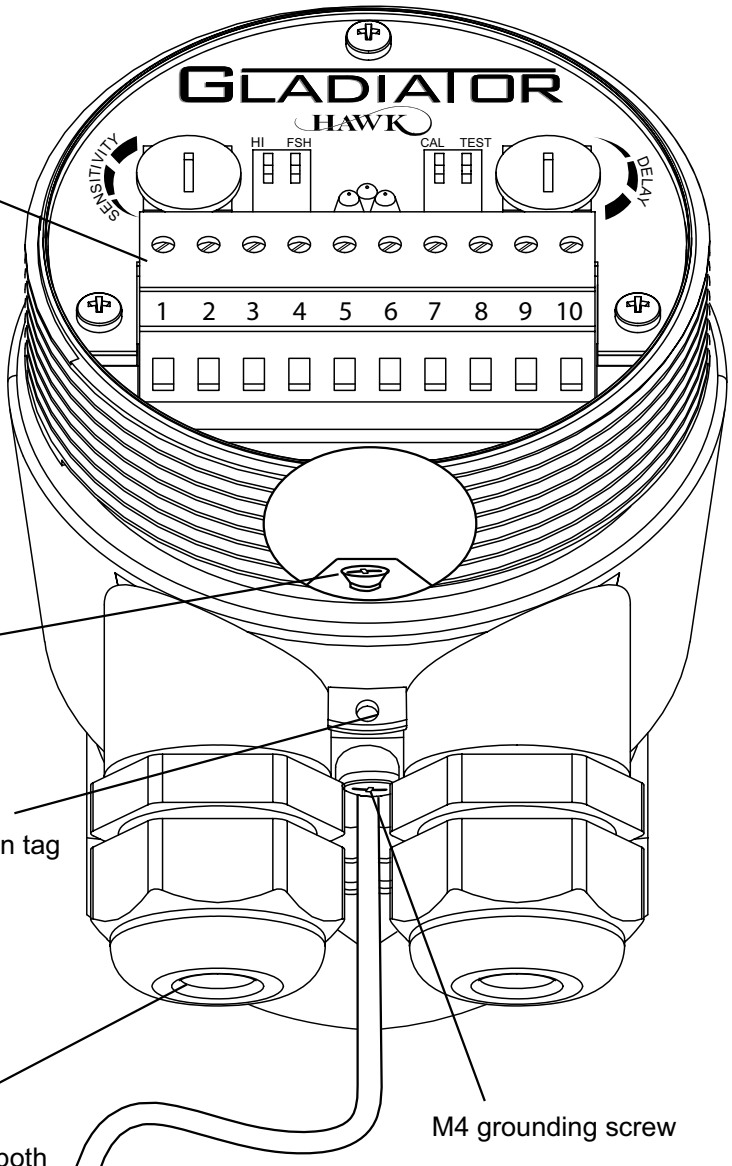


GSM or CDMA Network

- Typically up to 31 transmitters or switches per string.
- Maximum 250 transmitters or switches.
- Using GSM/CDMA network, transmitters and switches can be monitored, calibrated remotely.
- Alarm status, diagnostics can be monitored.
- Support from factory engineering for customer application problems.

(Limited Modbus query rate for Switches only)

Smart 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

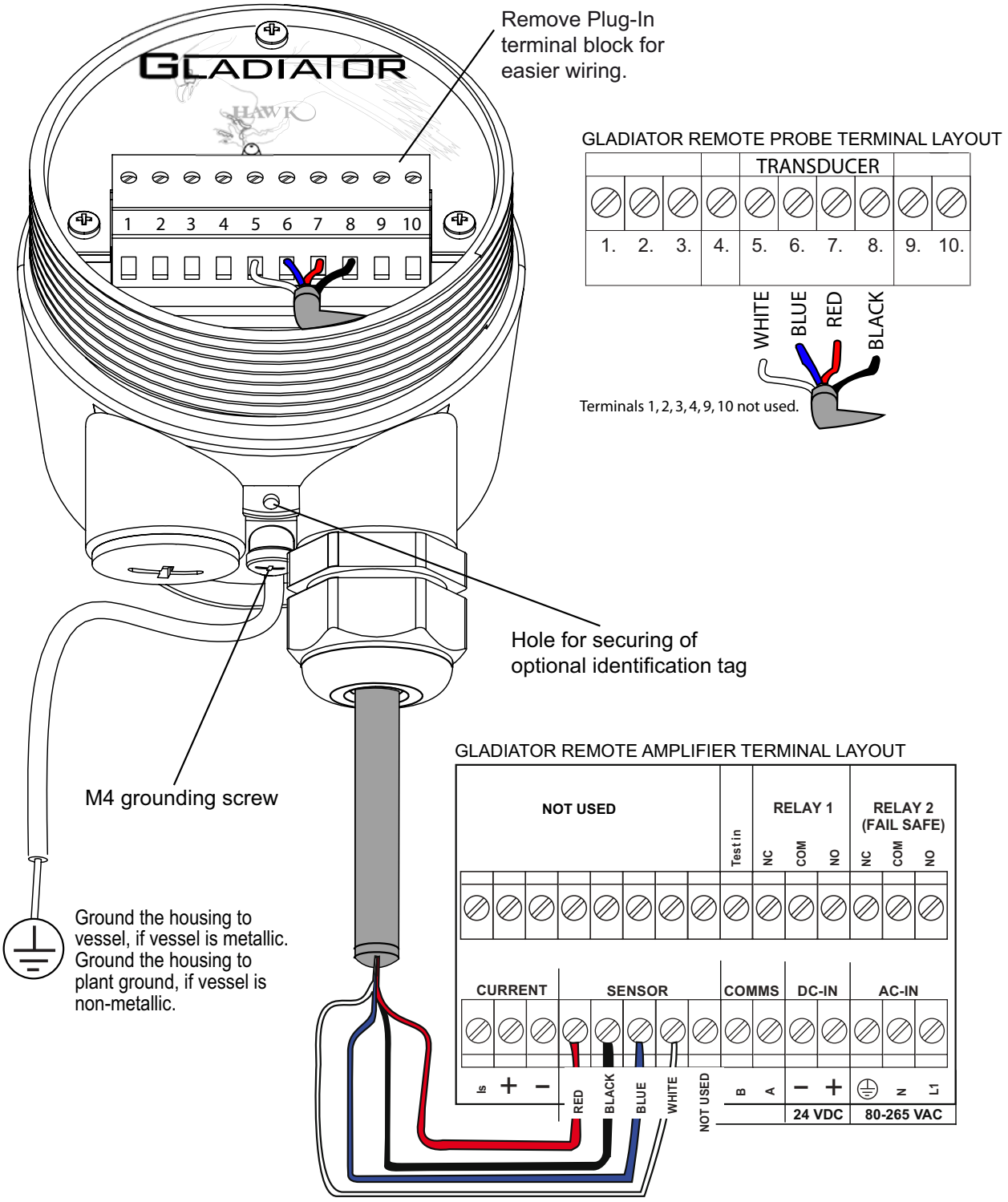
If only one cable is used for both power and output signal, then the second entry port must be plugged or blinded. Every Smart unit is supplied with two M20 glands (or 3/4"NPT adaptors) mounted on the unit and one blind plug loose.

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

GLADIATOR SMART PROBE TERMINAL LAYOUT

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		80-265 VAC	

Remote Probe to Amplifier Wiring



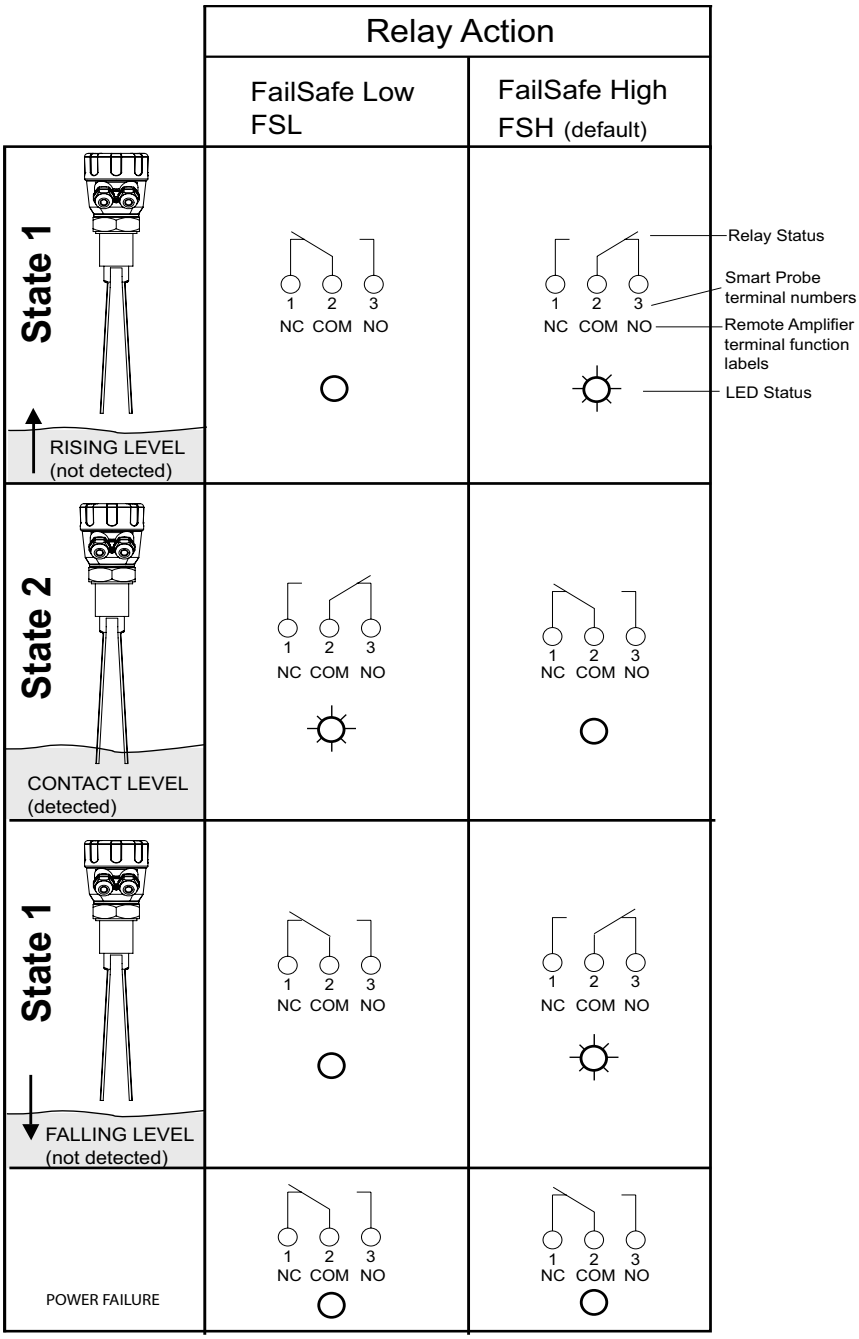
Cable type between Amplifier and Probe
4 conductor shielded twisted pair instrument cable.
Conductor size dependent on cable length.
BELDEN 3084A, DEKORON or equivalent.
Max: BELDEN 3084A = 500m (1640 ft)
Max: DEKORON IED183AA002 = 350m (1150 ft)

Relay Functions

Level Switch Contact Action

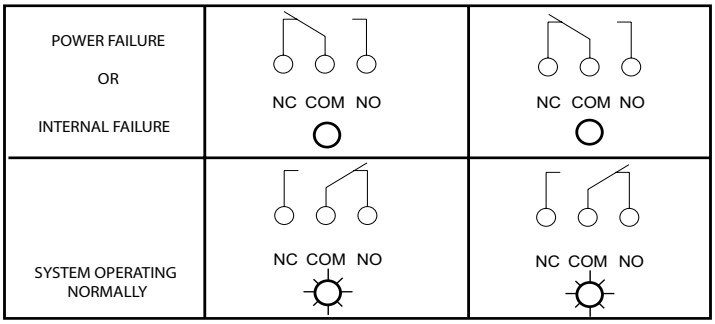
Relay - for Smart Probe version
(Set Relay Action selection switch)

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



FailSafe Switch Contact Action

Relay 2 - Remote version only.
For Smart Probes the 'Test' terminal can act as a solid state output with a similar function.



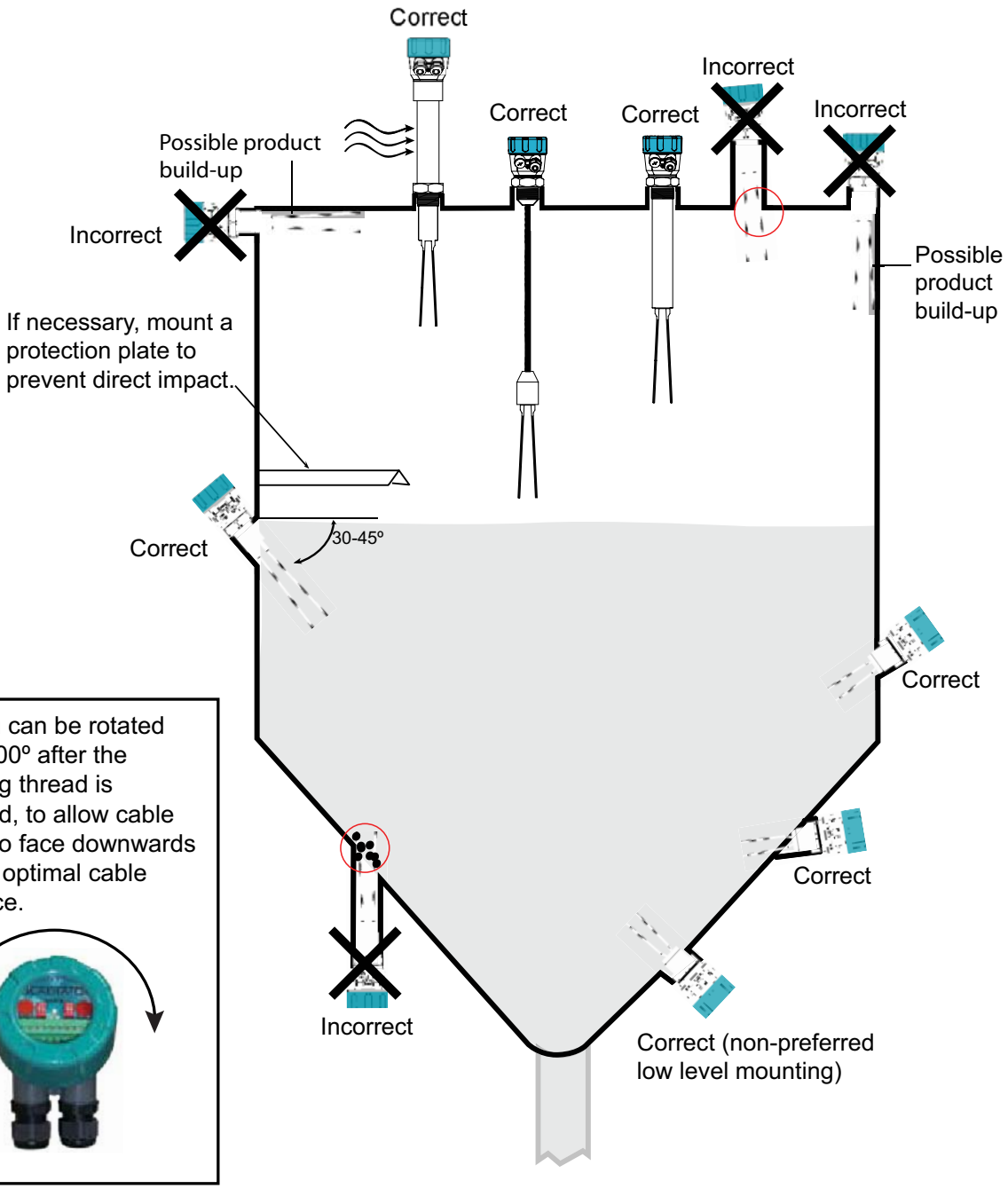
Mounting Examples

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.

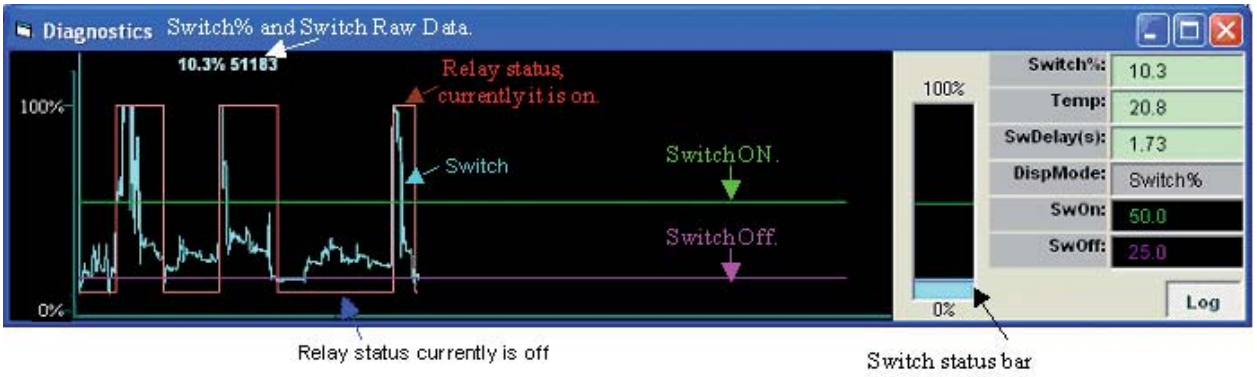


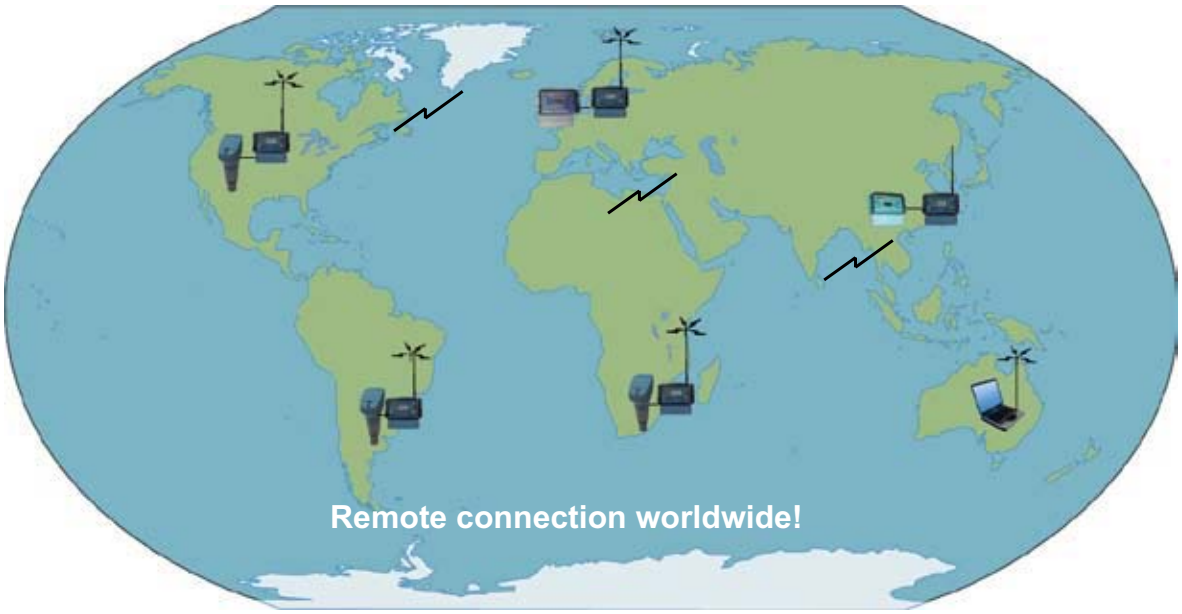
Housing can be rotated within 200° after the mounting thread is tightened, to allow cable entries to face downwards or allow optimal cable clearance.

GSM/CDMA Communication

HawkLink GSM/CDMA communication device allows any authorized computer with a standard modem and GosHawk software to dial in and calibrate, test or check on the performance of the connected Hawk product. The HawkLink device can be wired to the standard communication terminals of the Hawk products.

Remote technical support and complete commissioning of equipment in applications via our GSM/CDMA module allows monitoring and adjustments of settings no matter what corner of the world.





Part Numbering

Smart Probe Version

VS1100 Gladiator Vibration Switch - Smart Probe

Power Supply
- **B** 24 Vdc standard (7-30Vdc)
- U Universal AC power supply (80-260 VAC input) and 7-30Vdc

Output Options
- **S** Switch only, 1 level relay, Modbus
- Z Special request

Housing
- **S** Standard powder coated, diecast with glass lid
- C Corrosion resistant, stainless steel housing

Process Temperature
- **1** 80ºC (176 F)
- 2 Maximum 150ºC (302 F), temperature extension length 150 mm (5.9”)

Version
- **1** Standard rigid probe
- 2 Flexible cable

Application Type
- **L** Liquid - 1” mounting only
- 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 - Solid/Powder type only
- TB15 1.5” BSP Thread - Solid/Powder type only
- TZ Special thread request
- FA2 2” Flange ANSI (Class 150)
- FD2 2” Flange DIN 50 (PN 40)
- FJ2 2” Flange JIS (10K)
- FZ Special flange request

Approval Standard
- **X** Standard CE Approved
- A22 ATEX 22 (Pending)

(P) Probe Length (C) Cable Length
- **P14** 140 mm (5.5”) rigid probe - Liquid type only
- P26 260 mm (10.2”) rigid probe - Solid/Powder type only
- P50 500 mm (19.7”) rigid probe - Solid/Powder type only
- P100 1000 mm (39.4”) rigid probe - Solid/Powder type only
- 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	L	TN10	X	P14

Remote Version

Remote Amplifier

GSA Remote Gladiator System Amplifier

Housing

S Standard polycarbonate electronics housing

Power Supply

B 24 Vdc standard (7-30Vdc)

C 48 VDC

U Universal AC power supply (80-260 VAC input) and 7-30Vdc

Output Options

S Switch only, 1 level relay, 1 failsafe relay, Modbus

I HART Isolated, 1 level relay, 1 failsafe relay

D Profibus DP, 1 level relay, 1 failsafe relay

P DeviceNet, 1 level relay, 1 failsafe relay

Z Special Request

GSA	S	B	S

Remote Probe

VS1200 Remote Gladiator Vibration Probe

Housing

S Standard powder coated, diecast with glass lid

C Corrosion Resistant, Stainless Steel Housing

Process Temperature

1 80ºC (176 F)

2 Maximum 150ºC (302 F), temperature extension length 150 mm (5.9”)

Version

1 Standard rigid probe

2 Flexible cable

Application Type

L Liquid - 1” mounting only

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 - Solid/Powder type only

TB15 1.5” BSP Thread - Solid/Powder type only

TZ Special thread request

FA2 2” Flange ANSI (Class 150)

FD2 2” Flange DIN 50 (PN 40)

FJ2 2” Flange JIS (10K)

FZ Special flange request

Approval Standard

X Standard CE Approved

A22 ATEX 22 (Pending)

(P) Probe Length (C) Cable Length

P14 140 mm (5.5”) rigid probe - Liquid type only

P26 260 mm (10.2”) rigid probe - Solid/Powder type only

P50 500 mm (19.7”) rigid probe - Solid/Powder type only

P100 1000 mm (39.4”) rigid probe - Solid/Powder type only

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	L	TN10	X	P14

Specifications

Operating Voltage
- 7 - 30Vdc (residual ripple no greater than 100mV)
- 80 - 260Vac 50/60Hz

Power Consumption
- <0.8W @ 24Vdc
- <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) Smart (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)
- Smart 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 (1640 ft)
Max: DEKORON IED183AA002 = 350m (1150 ft)

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
- Smart 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)

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

* using optional temperature extension

Additional product warranty and application guarantees upon request.

Technical data subject to change without notice.

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