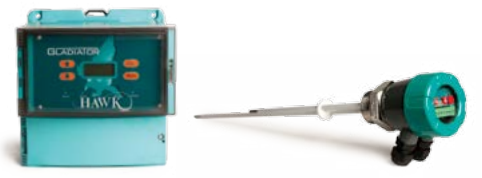
A Higher Level of Performance

Data Sheet

Gladiator

Conductivity Switch Series

A Level Switch for Liquids and Slurrys



For more information, please visit >
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Overview

Gladiator Conductivity Switch Series

Principle of Operation

A low voltage AC signal is applied between the probe electrode and the tank wall or reference electrode in the case of a non-metallic tank. When the liquid comes into contact with the electrode tip, a conductive path is established between the sense electrode and the metallic tank wall/reference electrode.

Current flow due to the conductive path is sensed, amplified and used to switch a relay for indication or control purposes.

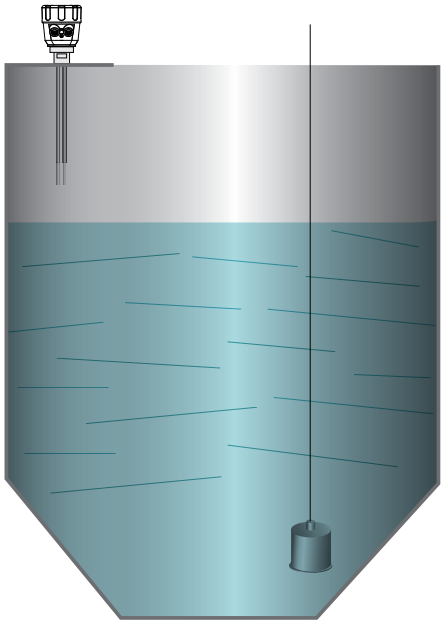
Primary Areas of Application

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

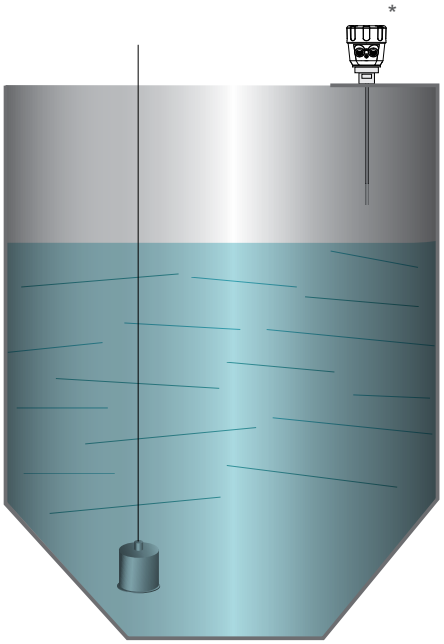
Features

- No moving parts - low maintenance
- Low voltage on probe for operational safety
- Simple ‘1-minute’ setup
- Remote sensor or Smart ‘all in one’ types
- Relays outputs:
  Smart 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 500 m (1640 ft)
- Bright visual status indication on probe
- Independent housing alignment after mounting thread locked.

Non-metallic Tank

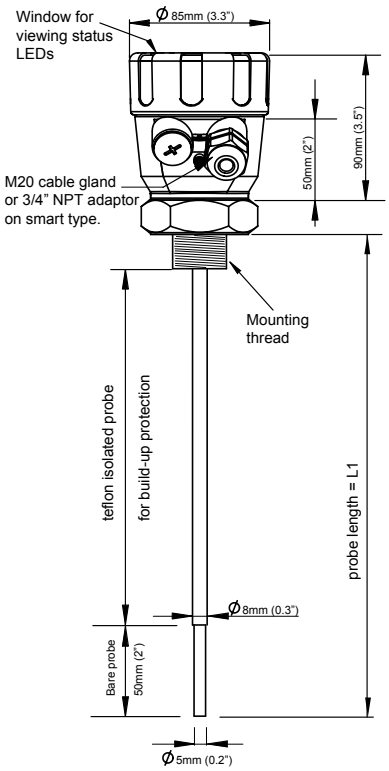


Metallic Tank

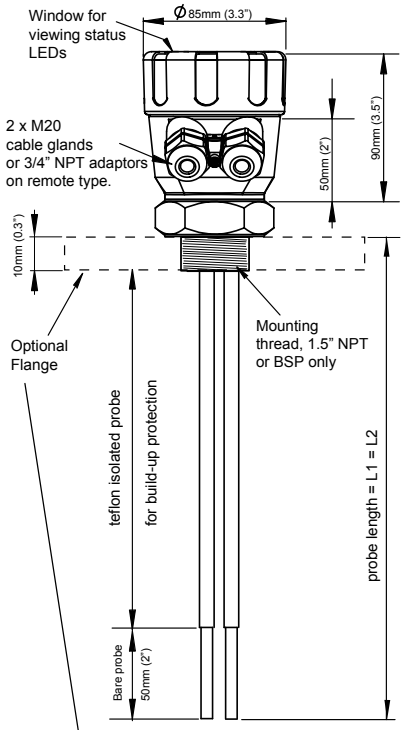


*Mounting must be electrically connected to tank wall for a single rod probe to work. Dual probe will work without electrical connection.

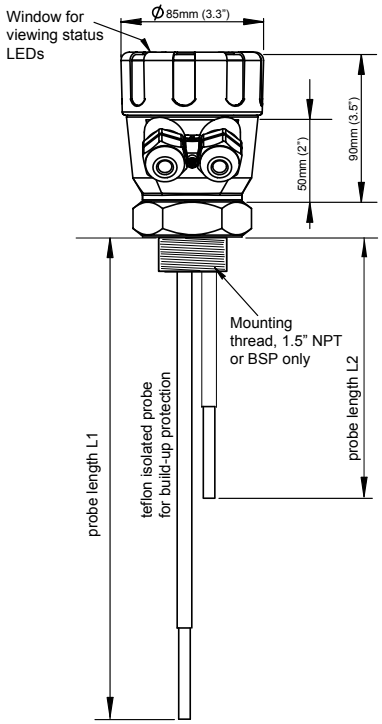
Single Probe



Two Probes - single switch point

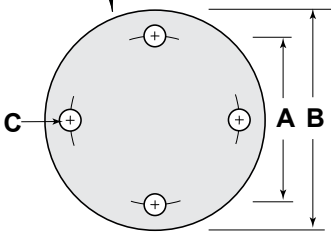


Two Probes - dual switch points



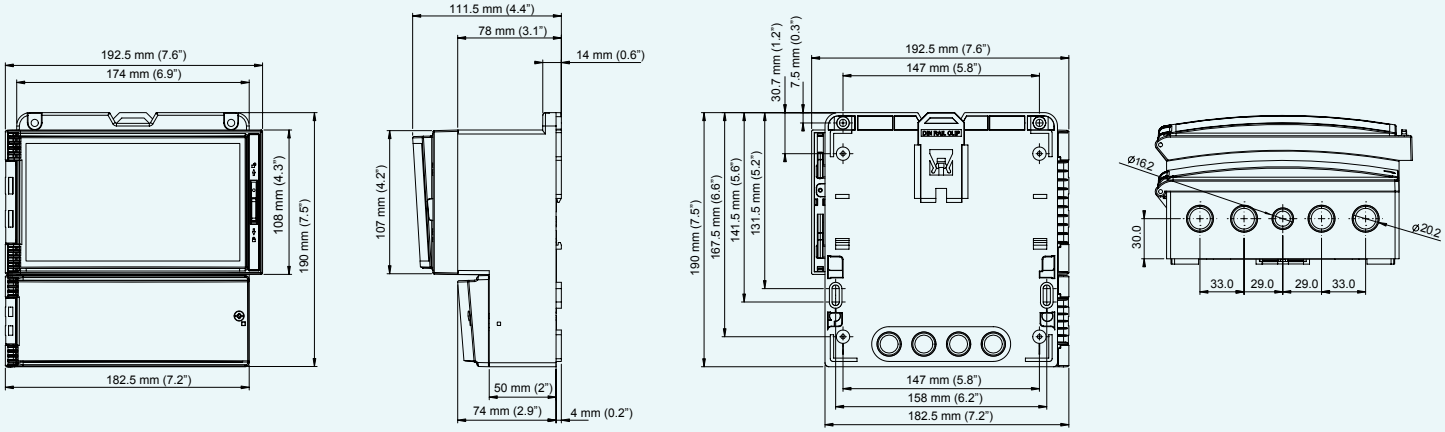
Standard probe lengths (L1 or L2):

- 30 cm (11.8")
- 50 cm (19.7")
- 100 cm (39.4")



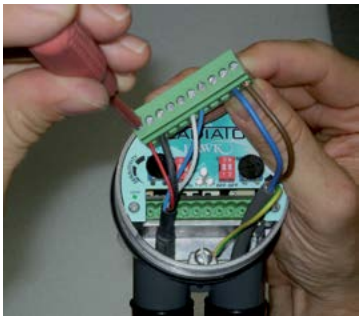
Flange Dimensions - 50mm (2")						
	A		B		C	
ANSI (Class 150)	120.7	4.75"	152.4	6"	19.1	0.75"
DIN (PN40)	125	4.9"	165	6.5"	18	0.7"
JIS (10K)	120	4.7"	155	6.1"	19	0.75"

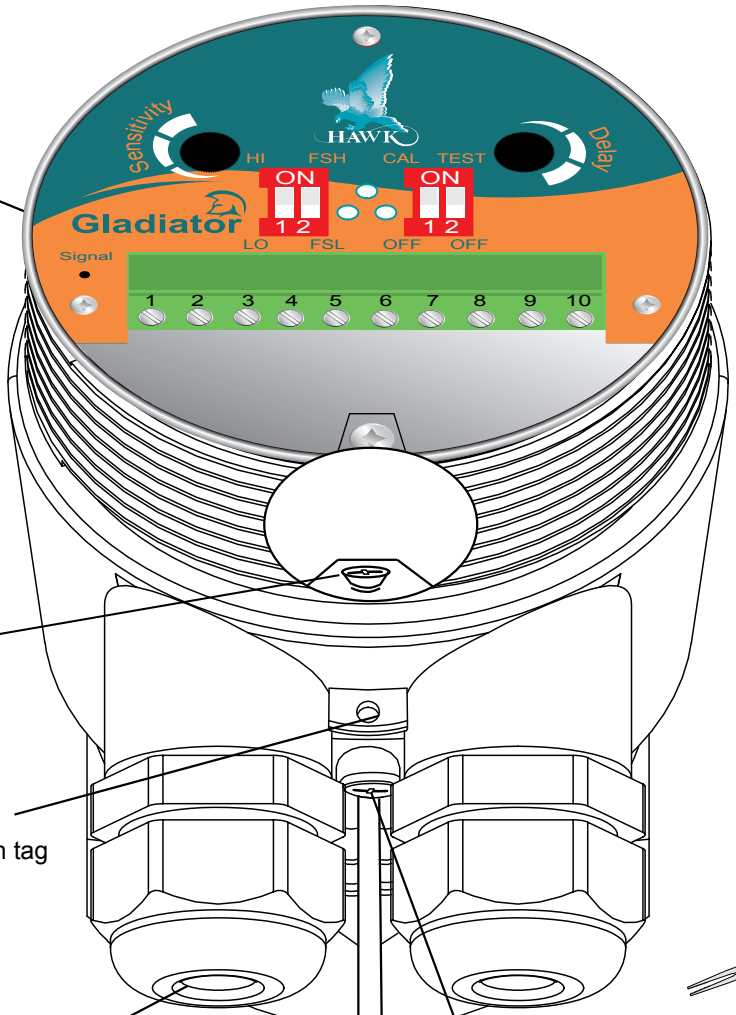
Remote Amplifier



Integral Probe Wiring

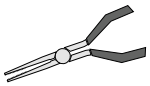
Remove Plug-In terminal block for easier wiring.





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



Use long nose pliers to extract terminals

M4 grounding screw

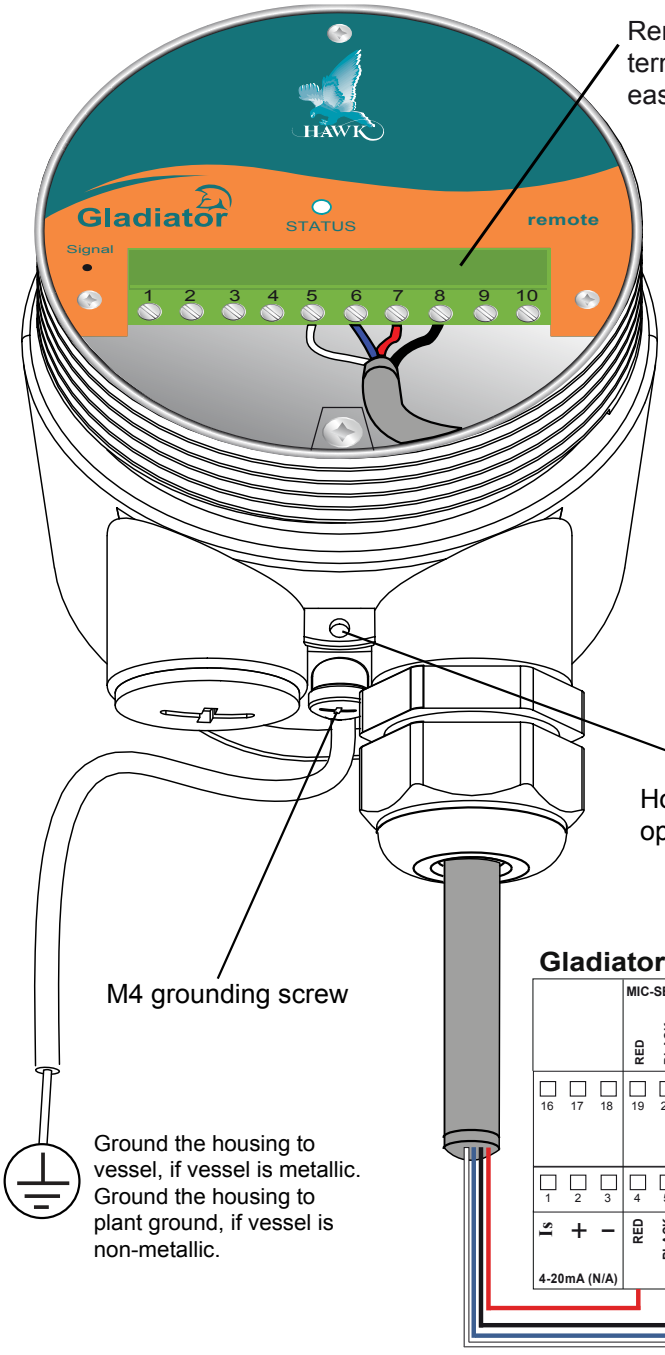
If only one cable is used for both power and output signal, then the second entry port must be plugged or blinded. Every Smart unit is supplied with two M20 glands (or 3/4"NPT adaptors) mounted on the unit and one blind plug loose.

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	

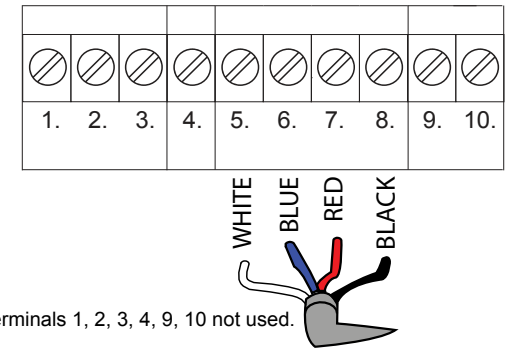
Ground the housing to vessel, if vessel is metallic. Ground the housing to plant ground, if vessel is non-metallic.

Remote Probe Wiring



Remove Plug-In terminal block for easier wiring.

GLADIATOR REMOTE PROBE TERMINAL LAYOUT



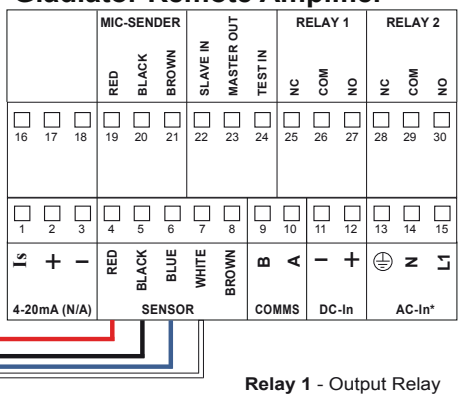
Terminals 1, 2, 3, 4, 9, 10 not used.

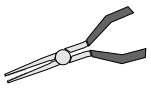
Hole for securing of optional identification tag

M4 grounding screw

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

Gladiator Remote Amplifier





Use long nose pliers to extract terminals

Relay 1 - Output Relay
Relay 2 - FailSafe Relay

*AC-In is replaced by 36-60VDC with Power Input Option 'C'.

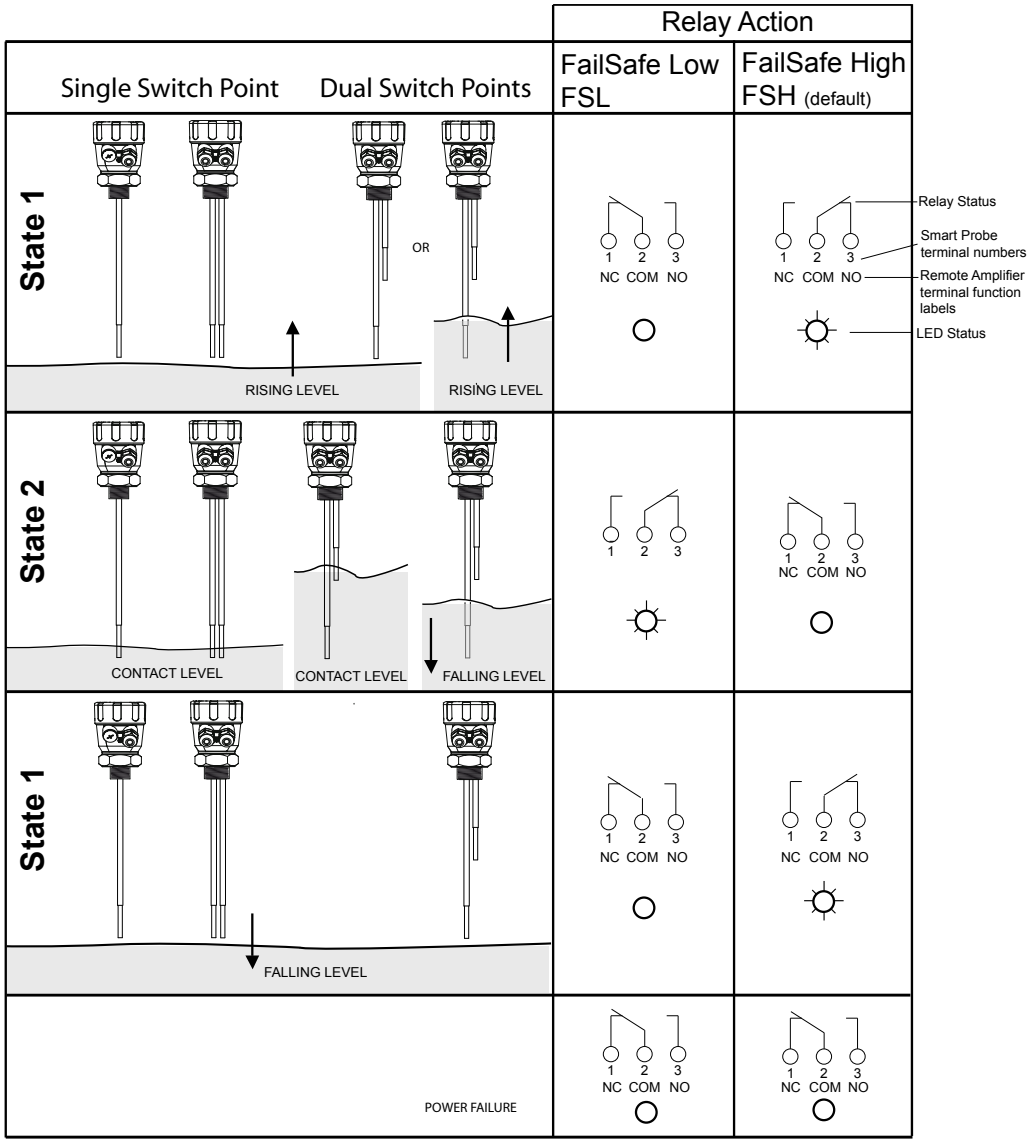
Cable type between Amplifier and Probe
4 conductor shielded twisted pair instrument cable.
Conductor size dependent on cable length.
BELDEN 3084A, DEKORON or equivalent.
Max: BELDEN 3084A = 500m (1640ft)
Max: DEKORON IED183AA002 = 350m (1150ft)

Relay Functions

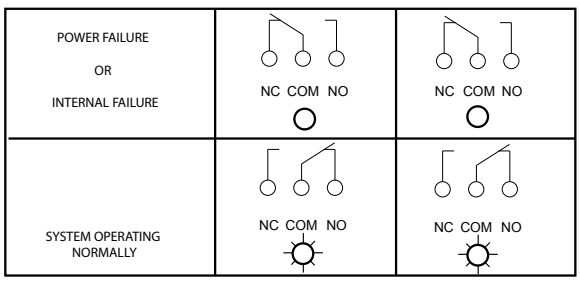
Level Switch Contact Action

Relay - for Smart 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.

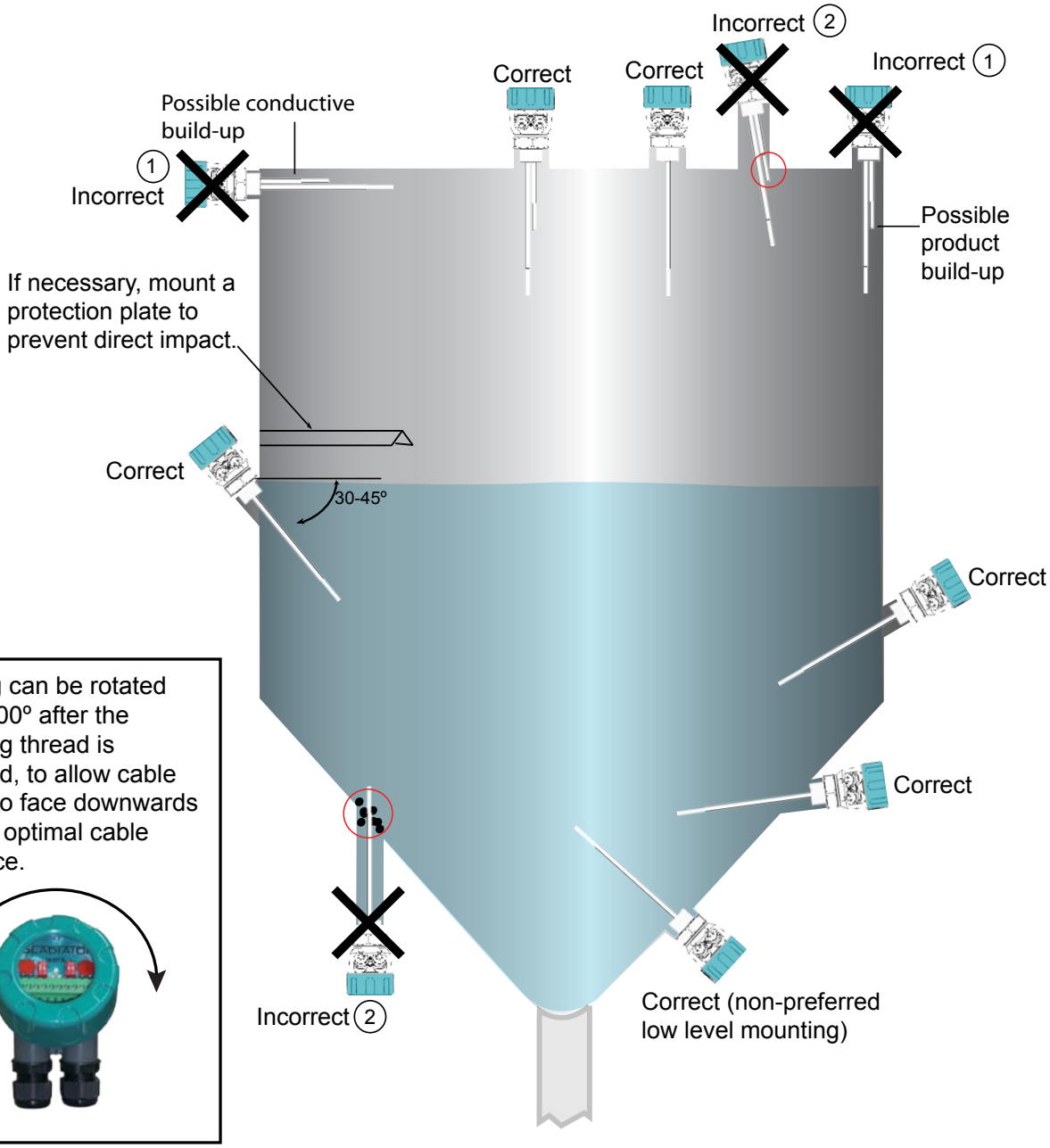
For Integral Probes the Test terminal can act as a solid state output with a similar function.

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 probe from coming into contact with the wall, and prevent conductive build-up from bridging the probe to 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.

Integral Probe Version

CS3100 Gladiator Conductivity Integral Switch

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

Output Options
S Switch. 1 level relay, with Modbus

Housing
S Powder Coated Mild Steel with glass lid
C 316L Stainless Steel with glass lid

Type of Electrodes
S Single Point 1 Electrode Type for Metallic tanks
D Dual Point 2 Electrode Type for Metallic tanks
N Single Point 2 Electrode Type for Non-Metallic tanks (L1 must = L2)

Mounting
TN10 1" NPT Thread (Electrodes option S only)
TB10 1" BSP Thread (Electrodes option S only)
TN15 1.5" NPT Thread
TB15 1.5" BSP Thread
FA2 2" ANSI 316L (Class 150)
FD2 2" DIN 316L 50 (PN 40)

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

L1. Probe Length (Active Probe)
P30 30 cm (11.8") rigid probe
P50 50 cm (18.7") rigid probe
P100 100 cm (39.4") rigid probe

L2. Probe Length
(Reference Probe - equal to or longer than L1)
X Not required for 1 electrode type
P30 30 cm (11.8") rigid probe
P50 50 cm (19.7") rig id probe
P100 100 cm (39.3") rigid probe

CS3100	**B**	**S**	**S**	**S**	**TN10**	**X**	**P30**	**X**	**Single Point Switch - Metallic Tank**
CS3100	**B**	**S**	**S**	**D**	**TN15**	**X**	**P30**	**P50**	**Dual Point Switch - Metallic Tank**
CS3100	**B**	**S**	**S**	**N**	**TN15**	**X**	**P30**	**P30**	**Single Point Switch - Non-Metallic Tank**

Remote Version

Remote Amplifier

GSA Gladiator Amplifier (compatible with all Gladiator products), Modbus

Housing

S Standard polycarbonate electronics housing

Power Supply

B 12-30 VDC

C 30-48VDC and 48-90VAC

U 12-30VDC and 90-260VAC

Output Options

S Switch. 1 level relay, 1 failsafe relay

Approval

A22 Grp II Cat 3 GD T85°C IP67 Tamb -40°C to 70°C

GSA	**S**	**U**	**S**

Remote Probe

CS3200 Gladiator Conductivity Remote Probe

Housing

S Powder Coated Mild Steel with glass lid

C 316L Stainless Steel with glass lid

Electrodes

S Single Point 1 Electrode Type for Metallic tanks

D Dual Point 2 Electrode Type for Metallic tanks

N Single Point 2 Electrode Type for Non-Metallic tanks (L1 must = L2)

Mounting

TN10 1" NPT Thread - (Electrodes option S only)

TB10 1" BSP Thread - (Electrodes option S only)

TN15 1.5" NPT Thread

TB15 1.5" BSP Thread

FA2 2" ANSI 316L (Class 150)

FD2 2" DIN 316L 50 (PN 40)

Approval Standard

X Standard CE Approved

A20 (Open Vessel) ATEX Grp II Cat 1/2 D Ex iaD A20 IP65 T100°C for Tamb -20°C to 80°C
(Closed Vessel - Internal) ATEX Grp II Cat 1/2 D Ex iaD A20 IP65 T100°C
(Closed Vessel - External) ATEX Grp II Cat 1/2 D Ex iaD A20 IP65 T100°C for Tamb -20°C to 80°C

i20 (Open Vessel) IECEx Zone 20 (Ex iaD tD A20 IP65 T100°C Ta -20°C to 80°C
(Closed Vessel - Internal) IECEx Zone 20 (Ex iaD 20 IP65 T100°C Ta -20°C to 80°C
(Closed Vessel - External) IECEx Zone 21 (Ex iaD A21 IP65 T100°C Ta -20°C to 80°C

A22 ATEX Grp II Cat 3 GD T85°C IP67 Tamb -40°C to 70°C

L1. Probe Length (Active Probe)

P30 300 mm (11.8")

P50 500 mm (19.7")

P100 1000 mm (39.4")

L2. Probe Length (Reference Probe - equal to or longer than L1)

X Not required for 1 electrode type

P30 300 mm (11.8")

P50 500 mm (19.7")

P100 1000 mm (39.4")

CS3200	**S**	**S**	**TN10**	**X**	**P30**	**X**	**Single Point Switch - Metallic Tank**
CS3200	**S**	**D**	**TN15**	**X**	**P30**	**P50**	**Dual Point Switch - Metallic Tank**
CS3200	**S**	**N**	**TN15**	**X**	**P30**	**P30**	**Single Point Switch - Non-Metallic Tank**

Operating Voltage

- 7 - 30VDC (residual ripple no greater than 100mV)
- 80 - 260VAC 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.

Measurement Range

- 100 Ohms - 10 M-Ohms
- 10000 Micro-Siemens - 1 Micro-Siemen

Stability

- 0.01% Conductivity / °C

Operating Temperature

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

- 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
- 1.5" NPT or BSP Thread
- 50mm (2") Flange (ANSI, DIN patterns available)

Remote Test Input

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

Conductivity Table

Please see www.hawkmeasure.com or consult the Gladiator Conductivity manual.

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

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