

A Higher Level of Performance



Data Sheet

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## Gladiator

### Admittance Smart Switch Series

An All-round Point Level Switch



For more information, please visit >

# Overview

## Gladiator Admittance Smart Switch Series



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

### Principle of Operation

The probe of the Admittance Switch forms one plate of a capacitance circuit, with the vessel wall making the second plate. The dielectric constant of the product between the probe and the vessel wall will cause a change of capacitance as the level approaches the probe. The change is detected, amplified and used to switch a relay for indication or control purposes. A special circuit is used to ignore product build-up between the sensing probe (active element) and guard, and also between the guard and vessel wall.

### Typical Uses

- Failsafe high-level / low-level alarm
- High-level alarm
- Low-level alarm
- Blocked chute / Plugged chute
- Interface detection
- Pump control.

### Function

The Gladiator Admittance Smart Switch is point level switch for liquids, solids and powders. The unit is suitable for a broad range of products and dielectric constants up to high temperature of 450°C (842°F).

### Primary Areas of Application

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

### Features

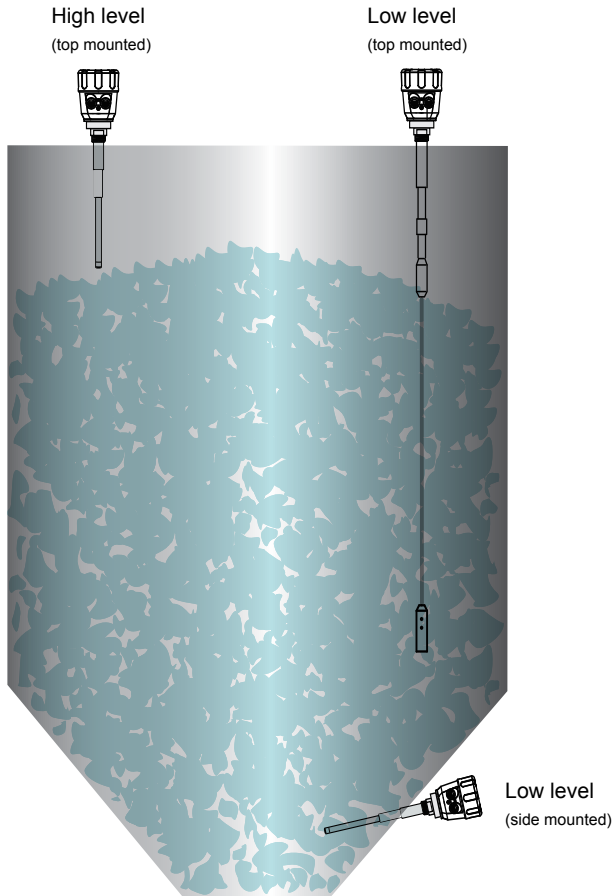
- Excellent immunity to product build-up
- Excellent temperature stability - no false trips
- Non contact switching possible with many products
- Simple '1-minute' setup
- Remote sensor or Integral 'all in one' types
- Relay outputs: Integral probe (1) Remote (2)
- Remote test function
- Adjustable ON and OFF delays (0-20 sec)
- Remote 3G Connection option
- Remote amplifier to probe separation up to 500 meters (1640 ft)
- Bright visual status indication on Probe
- Independent housing alignment after mounting thread locked.

# Typical Applications

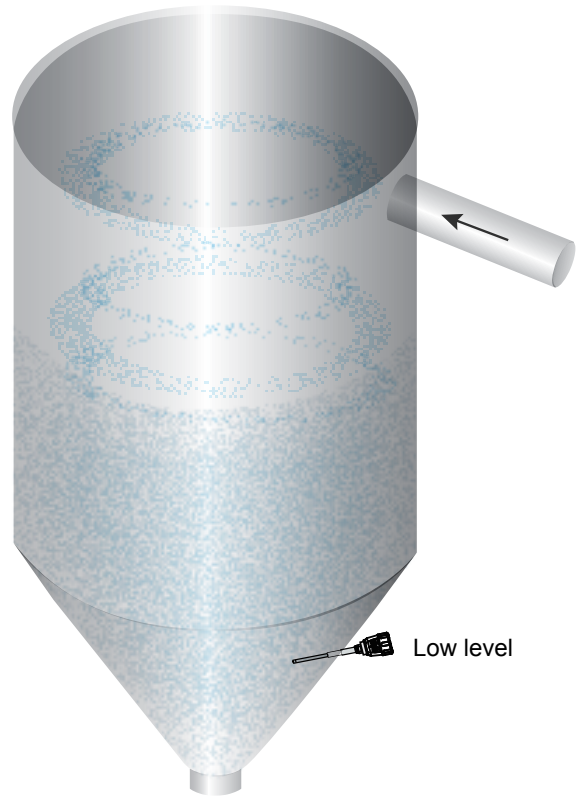
Gladiator Admittance Smart Switch Series



## High and low-level switch in a hopper

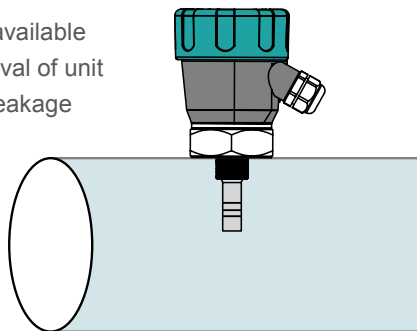


## Cyclone bin level switch



## Presence / Absence of liquid in pipe detection

Sealing plug available allowing removal of unit without pipe leakage



## High level switch in grain application



## Continuous filling with build-up on probe

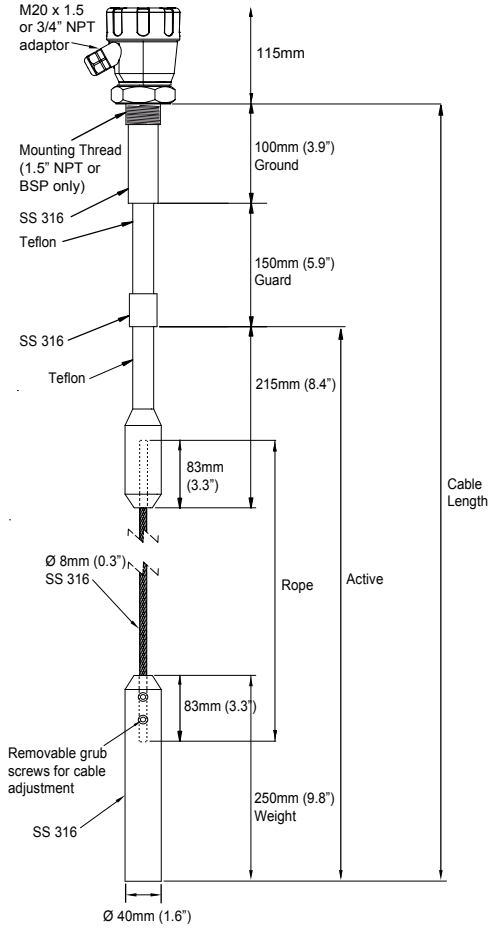


# Dimensions

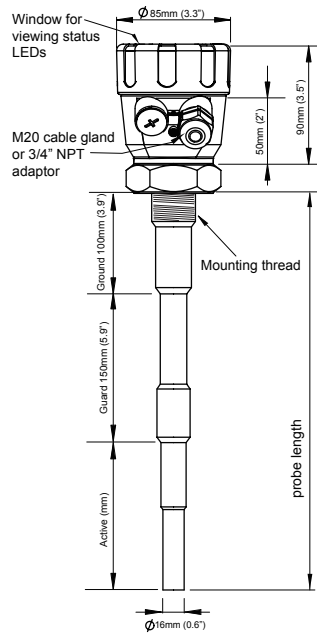
## Gladiator Admittance Smart Switch Series



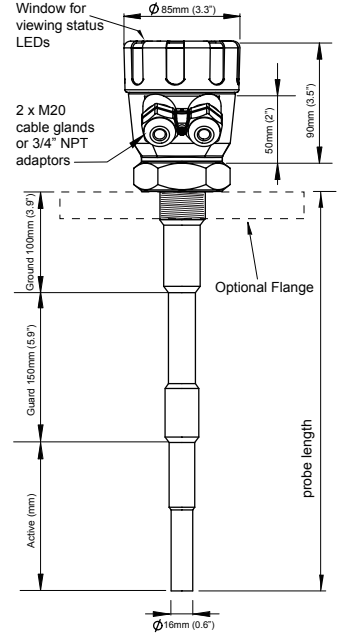
### Flexible Cable Probe



### Remote Probe



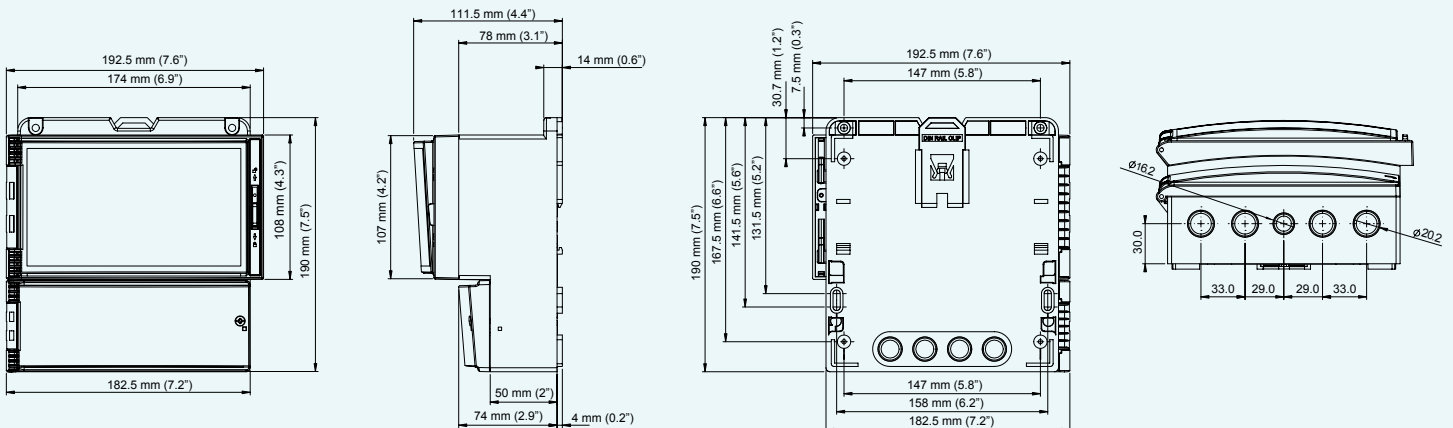
### Integral Probe



Probe Length (mm, inch)	Active	+ Guard + Ground
P05 (50mm, 2")	= 15mm, 0.6"	+ 35mm, 1.4"
P30 (300mm, 11.8")	= 50mm, 2"	+ 250mm, 9.8"
P50 (500mm, 19.7")	= 250mm, 9.8"	+ 250mm, 9.8"
P100 (1000mm, 39.4")	= 750mm, 29.5"	+ 250mm, 9.8"

Probe Length (mm, inch)	Active	+ Guard + Ground	(Rope Length)
<b>C100</b> (1000mm, 39.3")	= 750mm, 29.5"	+ 250mm, 9.8"	451mm, 17.8"
<b>C200</b> (2000mm, 78.7")	= 1750mm, 68.9"	+ 250mm, 9.8"	1451mm, 57.1"
<b>C300</b> (3000mm, 118.1")	= 2750mm, 108.3"	+ 250mm, 9.8"	2451mm, 96.5"

### Remote Amplifier



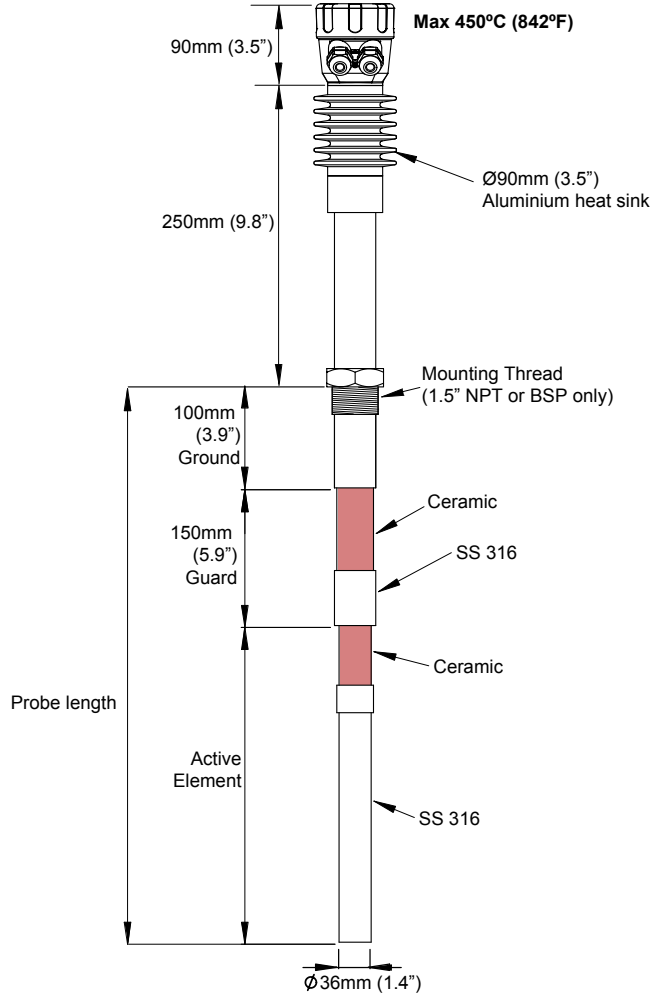
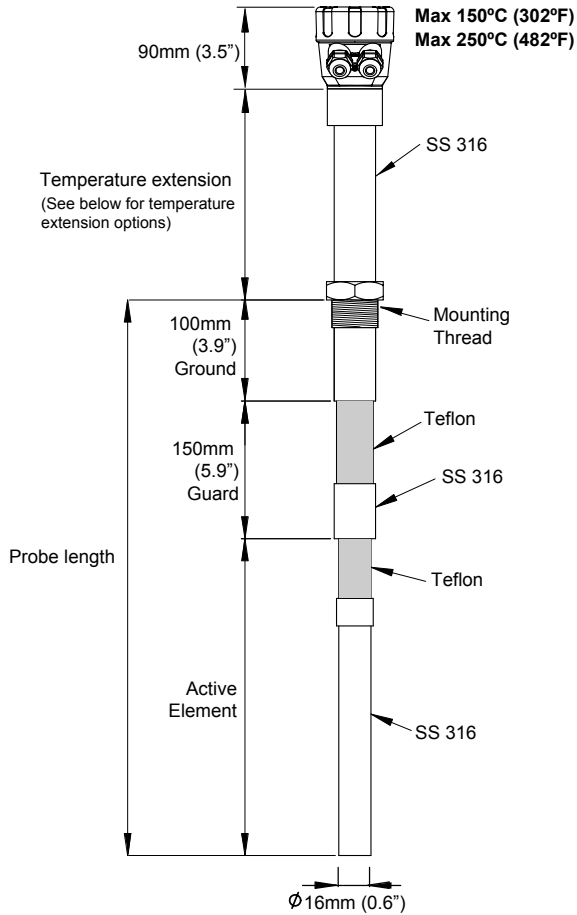
# Dimensions

Gladiator Admittance Smart Switch Series



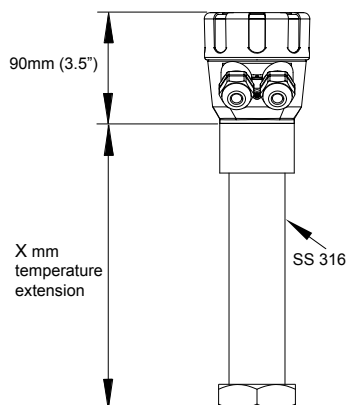
## High Temperature Probe (<250°C, <482°F)

## High Temperature Probe (450°C, 842°F)



## High Temperature Extensions (<250°C, 482°F)

### Remote Probe or Integral Probe



#### X mm:

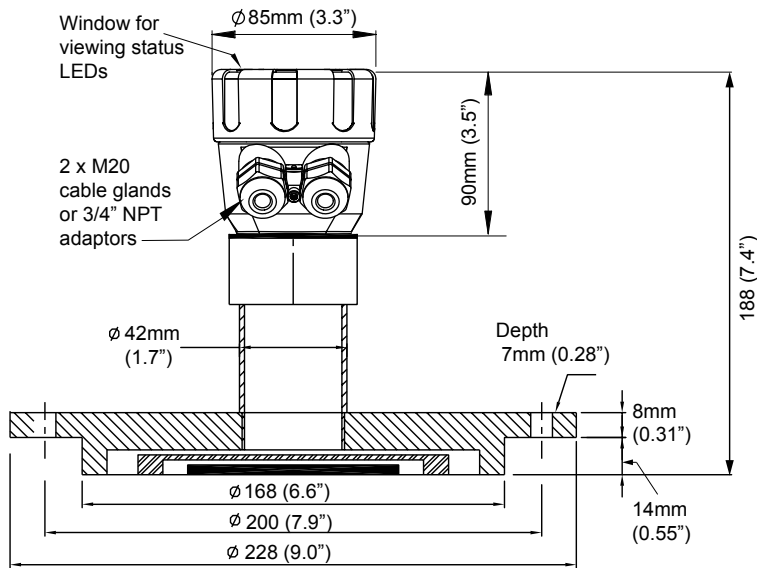
- Max. 80°C (176°F) ~ no temperature extension required.
- Max. 150°C (302°F) ~ 150mm (5.9")
- Max. 250°C (482°F) ~ 250mm (9.8")
- For the 450°C (842°F) Probe, a different extension applies.

# Dimensions

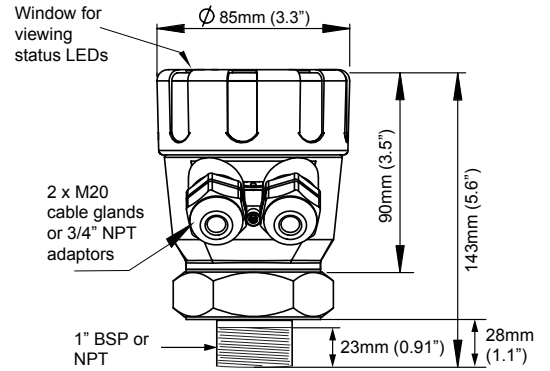
Gladiator Admittance Smart Switch Series



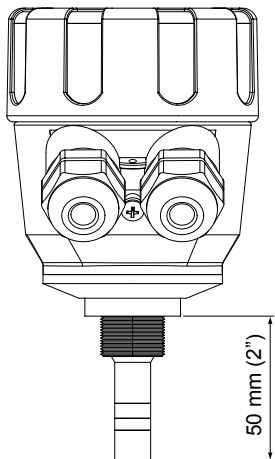
## D168 Probe version (Flanged Mount)



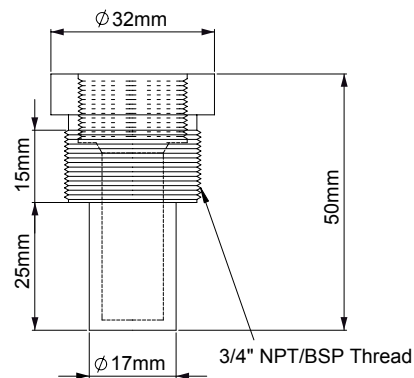
## D33 Probe version (1" Mount)



## Pump Protection Version



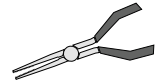
## Sealing Cover





### Integral Probe Wiring

Remove Plug-In terminal block for easier wiring.



Use long nose pliers to extract terminal



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)

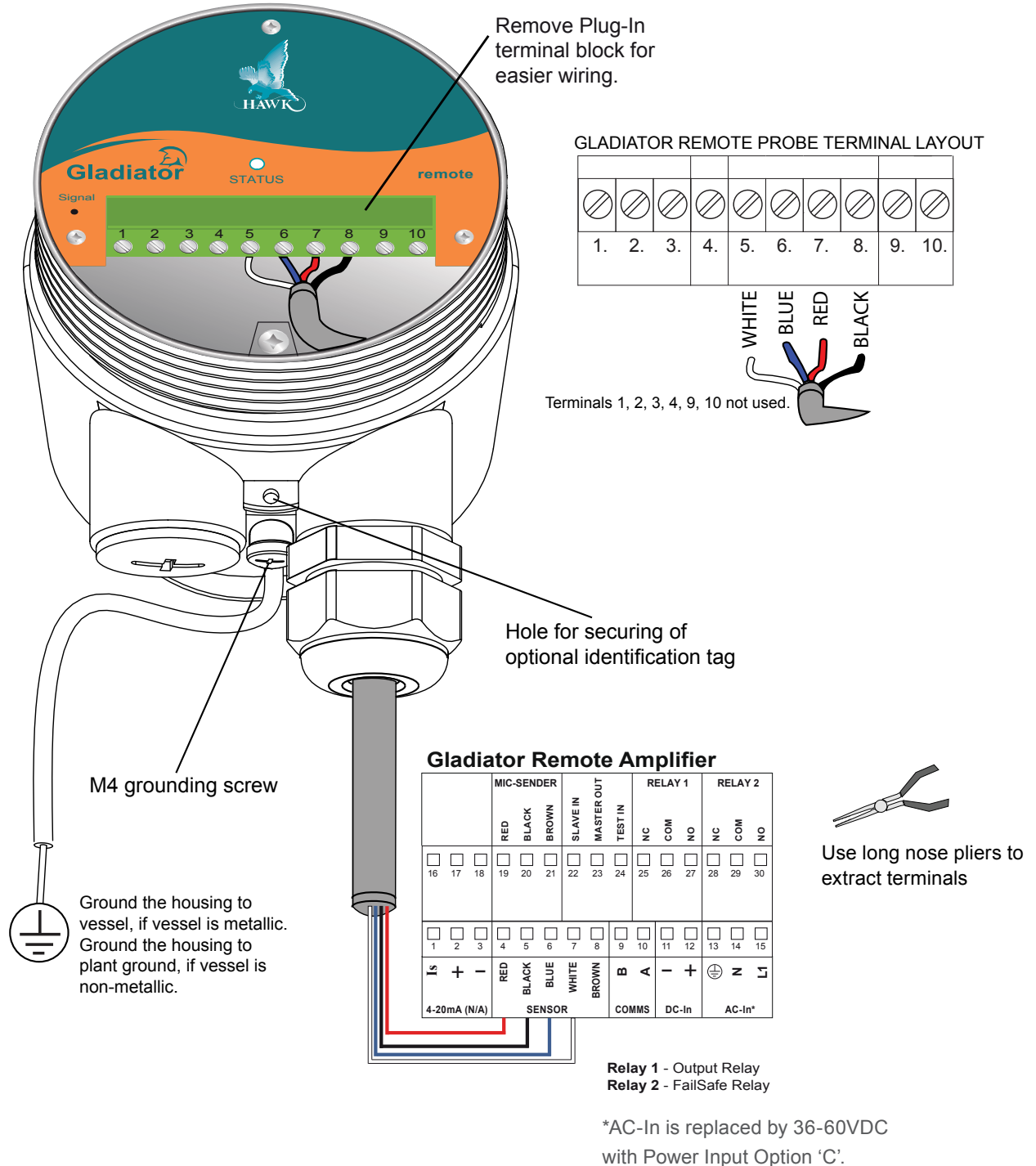
RELAY				COMMS		DC-IN		AC-IN	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
NC	COM	NO	Test	A	B	+	-	N	L1
				RS 485		12-30Vdc		80-265Vac	

Terminal Layout - Output Option D (DPDT)

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



### 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 (1640 ft)
- Max: DEKORON IED183AA002 = 350m (1150 ft).



# Part Numbering

Gladiator Admittance Smart Switch Series



## Integral Probe Version

**AS2100** Gladiator Admittance Switch - Integral Probe

### Power Supply

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

### Output Options

- S 1 x SPDT Relay, Modbus
- D 1 x DPDT Relay, Modbus

### Housing

- S Powder Coated Aluminium
- C 316L Stainless Steel

### Guard Length

- 1 Standard

### Temperature<sup>1</sup>

- 1 Max. 80°C (176°F)
- 2 Max. 150°C (302°F)
- 3 Max. 250°C (482°F)
- 4 Max. 450°C (842°F) (Mounting Option TB15/TN15, Flanged only)

### Probe Type<sup>1</sup>

- 1 316L rod
- 2 Teflon Insulated 316L rod
- 3 Cable

### Mounting<sup>1</sup> (Flanges available)

- TN07 3/4" NPT Thread
- TB07 3/4" BSP Thread
- TN10 1" NPT Thread
- TB10 1" BSP Thread
- TN15 1.5" NPT Thread
- TB15 1.5" BSP Thread

### Approvals<sup>2</sup>

- X Not Required
- A20A ATEX Grp II Cat 1/2 D
- A20 ATEX Grp II Cat 1/2 D
- i20A IECEx Zone 20
- i20 IECEx Zone 20 or 21
- A22 ATEX Grp II Cat 3 GD

### (P)Probe<sup>3</sup> (C)Cable Length<sup>3</sup>

- P10 100mm (4")
- P30 300mm (11.8")
- P50 500mm (19.6")
- P100 1000mm (39.3")
- C100 1000mm (39.3")
- C200 2000mm (78.7")
- C300 3000mm (118.1")
- C500 5000mm (196.9")

**AS2100 B S S 1 1 1 TB15 X P30**

<sup>1</sup>See Probe Configuration for combination options

<sup>2</sup>See Approvals Section for critical details

<sup>3</sup>Custom lengths available. Consult Factory

# Part Numbering

Gladiator Admittance Smart Switch Series



## Remote Version

### Remote Amplifier

**GSA** Remote Gladiator System Amplifier

#### Housing

S Polycarbonate

#### Power Supply

B 12-30 VDC

C 36-60VDC

U 12-30VDC and 90-260VAC

#### Output Options (inc. Modbus)

S 2 x SPDT, 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**

### Connection Cable

**CA-GMR** Pre-cut cable for remote system

10 10m cable

20 20m cable

30 30m cable

50 50m cable

100 100m cable

**CA-GMR 10**

Lengths above 100m available via special order

## Mounting Flanges

### Model

FLA - **Flange Size**

1 1" or DN25 or 25mm

H 1 1/2" or DN40 or 40mm

2 2" or DN50 or 50mm

K 2 1/2" or DN65 or 65mm

3 3" or DN80 or 80mm

L 3 1/2" (ANSI ONLY)

4 4" or DN100 or 100mm

### Flange Type

A1 ANSI B16.5 150LB FLANGE

A3 ANSI B16.5 300LB FLANGE

A6 ANSI B16.5 600LB FLANGE

A9 ANSI B16.5 900LB FLANGE

AA ANSI B16.5 1500LB FLANGE

AB ANSI B16.5 2500LB FLANGE

D6 DIN2527 PN6 FLANGE

D0 DIN2527 PN10 FLANGE

D1 DIN2527 PN16 FLANGE

D2 DIN2527 PN25 FLANGE

D4 DIN2527 PN40 FLANGE

J5 JIS 5K FLANGE

J0 JIS 10K FLANGE

J1 JIS 16K FLANGE

J2 JIS 20K FLANGE

J4 JIS 40K FLANGE

S1 AS 2129 Table D

S2 AS 2129 Table E

S3 AS 2129 Table F

S4 AS 2129 Table H

### Material

SS SS316L

### Thread Type (internal)

TB07 3/4" BSP THDs

TB10 1" BSP THDs

TB15 1 1/2" BSP THDs

TN07 3/4" NPT THDs

TN10 1" NPT THDs

TN15 1 1/2" NPT THDs

**FLA - 2 A1 - SS - TB15**

# Part Numbering

Gladiator Admittance Smart Switch Series



## Remote Probe

**AS2200** Remote Gladiator Admittance Probe

### Housing

- S Powder Coated Aluminium
- C 316L Stainless Steel

### Guard Length

- 1 Standard

### Temperature<sup>1</sup>

- 1 Max. 80°C (176°F)
- 2 Max. 150°C (302°F)
- 3 Max. 250°C (482°F)
- 4 Max. 450°C (842°F) (Mounting Option TB15/TN15, Flanged only)

### Probe Type<sup>1</sup>

- 1 316L rod
- 2 Teflon Insulated 316L rod
- 3 Cable

### Mounting<sup>1</sup> (Flanges available)

- TN07 3/4" NPT Thread
- TB07 3/4" BSP Thread
- TN10 1" NPT Thread
- TB10 1" BSP Thread
- TN15 1.5" NPT Thread
- TB15 1.5" BSP Thread

### Approvals<sup>2</sup>

- X Not Required
- A20A ATEX Grp II Cat 1/2 D
- A20 ATEX Grp II Cat 1/2 D
- i20A IECEx Zone 20
- i20 IECEx Zone 20 or 21
- A22 ATEX Grp II Cat 3 GD

### (P)Probe<sup>3</sup> (C)Cable Length<sup>3</sup>

- P10 100mm (4")
- P30 300mm (11.8")
- P50 500mm (19.6")
- P100 1000mm (39.3")
- C100 1000mm (39.3")
- C200 2000mm (78.7")
- C300 3000mm (118.1")
- C500 5000mm (196.9")

**AS2200 S 1 1 1 TB15 X P30**

<sup>1</sup>See Probe Configuration for combination options

<sup>2</sup>See Approvals Section for critical details

<sup>3</sup>Custom lengths available. Consult Factory

# Part Numbering

Gladiator Admittance Smart Switch Series



## Pump Protection Version

**AS2100** Gladiator Admittance Pump Protection Probe

### Power Supply

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

### Output Options

- S 1 x SPDT Relay, Modbus
- D 1 x DPDT Relay, Modbus

### Housing

- S Powder Coated Aluminium
- C 316L Stainless Steel

### Guard Length

- 2 Short guard

### Temperature

- 1 Max. 80°C (176°F)
- 2 Max. 150°C (302°F)
- 3 Max. 250°C (482°F)

### Probe Type

- 1 316L rod

### Mounting

- TB05 1/2" BSP thread
- TN05 1/2" NPT thread

### Approvals (see Approvals Section for critical details)

- X Not Required
- A20A ATEX Grp II Cat 1/2 D
- A20 ATEX Grp II Cat 1/2 D
- i20A IECEx Zone 20
- i20 IECEx Zone 20 or 21
- A22 ATEX Grp II Cat 3 GD

### (P)Probe Length

- P05 50mm

**AS2100 B S S 1 1 1 TN05 X P05**

## Flush Mount Version

**AS2100** Gladiator Admittance Flushed Mount Integral Probe

### Power Supply

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

### Output Options

- S 1 x SPDT Relay, Modbus
- D 1 x DPDT Relay, Modbus

### Housing

- S Powder Coated Aluminium
- C 316L Stainless Steel

### Guard Length

- 3 Not Required (In-Built)

### Temperature

- 1 Max. 80°C (176°F)

### Probe Type

- 1 316L rod

### Mounting

- F200 Flanged Mount (P.C.D 200mm)
- TN10 1" NPT thread
- TB10 1" BSP thread

### Approvals

- X Not Required

### (D)Probe Diameter<sup>1</sup>

- D168 168mm (F200 Flanged Mount type only)
- D33 33mm (TN10 / TB10 mounting type only)

<sup>1</sup>See Probe Configuration for combination options

<sup>2</sup>See Approvals Section for critical details

**AS2100 B S S 1 1 1 TN10 X D168**

# Approvals / Probe Options

Gladiator Admittance Smart Switch Series



## Approvals

Part Code	Condition	Rating	I.S Barriers Req
<b>A20A</b>	Open Vessel	ATEX Grp II Cat 1/2 D Ex iaD A20 IP65 T100°C for Tamb -20°C to 80°C	Yes (2)
<b>A20</b>	Closed Vessel (Internal)	ATEX Grp II Cat 1/2 D Ex iaD A20 IP65 T100°C	Yes (2)
<b>A20</b>	Closed Vessel (External)	ATEX Grp II Cat 1/2 D Ex iaD A20 IP65 T100°C for Tamb -20°C to 80°C	Yes (2)
<b>i20A</b>	Open Vessel	IECEX Zone 20 (Ex iaD tD A20 IP65 T100°C Ta -20°C to 80°C)	Yes (2)
<b>i20</b>	Closed Vessel (Internal)	IECEX Zone 20 (Ex iaD 20 IP65 T100°C Ta -20°C to 80°C)	Yes (2)
<b>i20</b>	Closed Vessel (External)	IECEX Zone 21 (Ex iaD A21 IP65 T100°C Ta -20°C to 80°C)	Yes (2)
<b>A22</b>	None	ATEX Grp II Cat 3 GD T75°C IP67 Tamb -40°C to 65°C	No

Consult appropriate Safety Instructions for critical information

## Probe Configurations

Probe Option	Wetted Probe Materials	Mounting Option	Temperature Option	Max. Pressure
P <sup>x</sup> , C <sup>x</sup>	316L / PTFE	TB05, TB07, TB10, TB15 TN05, TN07, TN10, TN15 Flanged	1, 2, 3	10 bar (145 Psi)
P <sup>x</sup> , C <sup>x</sup>	316L / Ceramic	TB15 TN15 Flanged	4	1 bar (14.5 Psi)
D33	316L / PTFE / PEEK	TB10 TN10	1, 2, 3	60 bar (870 Psi)
D168	316L / PTFE	F200	1, 2, 3	1 bar (14.5 Psi)

<sup>x</sup> = (P)robe / (C)able Length

# Specifications

## Gladiator Admittance Smart Switch Series



### Operating Voltage

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- 12 - 30Vdc (residual ripple no greater than 100mV)
- 90 - 260Vac 50 / 60Hz.
- 36-60VDC.

### Power Consumption

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

### Communications

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- GosHawk, Modbus
- Multidrop mode can address 1-250 units over 4 wires.

### Relay Output: (1) Integral (2) Remote

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- Remote: 2 x Form 'C' (SPDT) contacts, rated 5A at 240Vac resistive
- Integral: 1 x DPDT or 1 x SPDT rated 5A at 240Vac resistive
- Remote failsafe test facility for one relay (SPDT only)

### Measurement Range

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- 0.2pF - 100nF.

### Resolution

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- 0.01 pF.

### Electronic Accuracy

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- 0.05 pF.

### Stability

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- 0.01% / °C.

### Operating Temperature

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- Remote Electronics -40°C (-40°F) to 80°C (176°F)
- Integral Probe -40°C (-40°F) to 450°C (842°F)\*
- Remote Probe -40°C (-40°F) to 450°C (842°F)\*.

\*See Probe Configurations

### Probe / Amplifier Separation

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

### Cable type between Amplifier and Probe

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- 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

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- 1-60 Bar (14.5-870 Psi) see Probe Configurations

### Display (Remote version only)

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- 2 line x 12 character alphanumeric LCD
- Backlight standard.

### Memory - Remote

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

### Enclosure Sealing

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- Integral Probe IP67
- Remote Electronics IP65 (Nema 4x)
- Remote Probe IP67.

### Cable Entries

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BSP process mounting

- 2 x M20 Glands.

NPT process mounting

- 2 x 3/4" NPTF threaded adaptors.

Remote

- 3 x 20mm (0.8"), 1 x 16mm (0.6") knock outs.

### Mounting

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- 1/2" NPT or BSP Thread
- 3/4" NPT or BSP Thread
- 1" NPT or BSP Thread
- 1.5" NPT or BSP Thread
- Flanged

### Remote Test Input

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

### Dielectric Constants Table

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Please see [www.hawkmeasure.com](http://www.hawkmeasure.com) or consult the Gladiator Manual.

## Notes

Gladiator Admittance Smart Switch Series





## HAWK, Since 1988

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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

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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

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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

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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.