

A Higher Level of Performance



Data Sheet

Centurion Guided Radar

CGR Series



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

Overview / Dimensions

Centurion Guided Radar



Principle of Operation

Guided-wave technology sends the radar pulse down a probe to measure either liquids or solids.

The pulse hits the surface and is reflected back up the probe to the sensor, where the transit time is translated into a distance using time of flight and time expansion.

The amplitude of the reflection depends on the dielectric constant of the product.



Function

The HAWK range of Guided Radar products are ideal for level measurement of liquids, solids, bulk materials, sludge, powders and granules to a distance of 18.5m.

This technology is not affected by pressure, temperature, viscosity, vacuum, foam, dust, changes in dielectric constant or coating of the probe.

Features

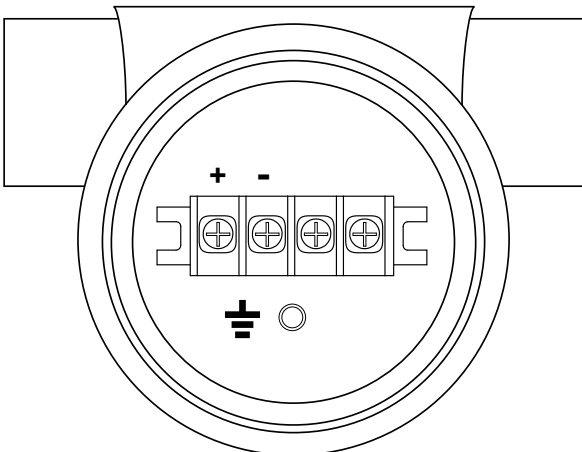
- IECEx Ex d [ia] ia IIC T6 Gb Ga
- Up to 18.5m (60ft 8in) range
- Very short minimum range (150mm, 6")
- Simple setup
- Auto-Calibration to any dielectric ≥ 1.5
- Adjustable Sensitivity

Primary Areas of Application

- Chemicals
- Petrochemicals
- Cement
- Building Aggregates
- Mining / Minerals
- Food & Beverages
- Oil & Gas
- Pharmaceutical
- Pulp & Paper
- Wastewater

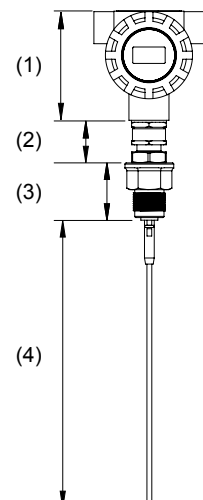
- Precise & continuous measurement
- 2 wire loop
- 4-20mA, HART Universal / Common practice commands
- Protection class IP66
- Measures extremely low dielectric (1.5)
- Programmable fail safe mode

Wiring Terminal Compartment



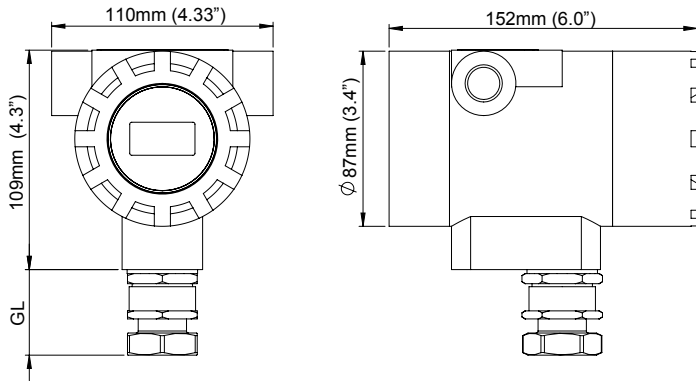
Dimensions - Reference

1	Housing
2	Gland
3	Threaded Connection / Flange
4	Probe Length





Dimensions Housing + Gland



Cable Gland Length (GL)			
Process Temperature Option	Approval Option	Length	
		mm	in
1	XX	50	2.0
1	1D	57	2.2
2	XX, 1D	100	3.9

Dimensions - Probe Variants

A04 / A06 / A08

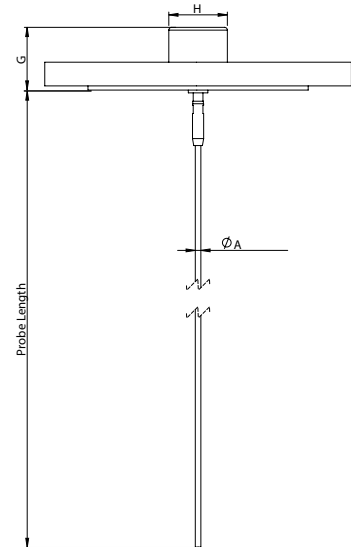
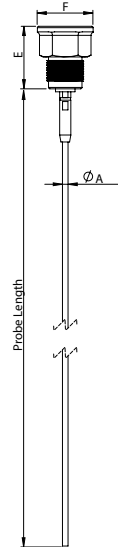
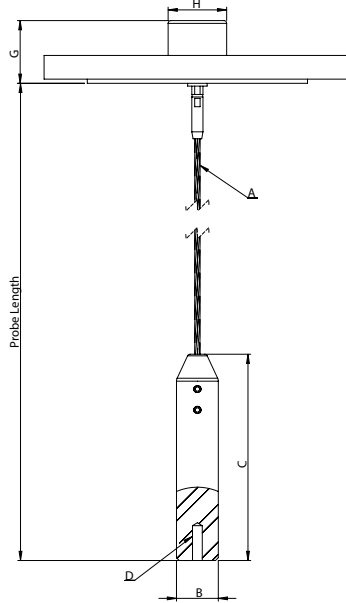
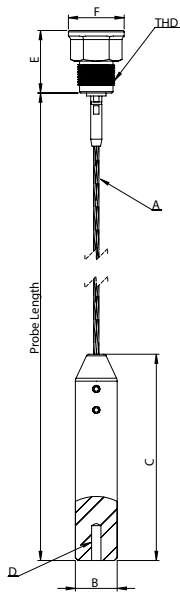
B04 / B06 / B08

Threaded

Welded Flange

Threaded

Welded Flange



Probe / Cable Dimensions

Probe Type	THD BSP or NPT	A		B		C		E		F		D Internal Threads (A04, A06, A08 only)
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	
A04, B04	3/4	4	0.16	22	0.9	120	4.7	45	1.8	40	1.6	M8x1.25, 20mm deep
A06, B06	1	6	0.24	28	1.1	150	5.9	45	1.8	44	1.7	M12x1.75, 20mm deep
A08, B08	1-1/2	8	0.31	36	1.4	200	7.8	72	2.8	64	2.5	M16x2.0, 20mm deep
	Welded Flange	G		H								
		mm	in.	mm	in.							
A04, B04		45	1.8	42	1.6							
A08, B08		72	2.8	70	2.7							



Centurion Guided Radar System

Model

CGR2 2 wire Centurion Guided Radar

Communication

H 4-20mA with HART

Housing

- 1 Aluminium, Epoxy Painted
- 2 316L Stainless Steel

Gland Entry

- 1 1/2" NPT Cable gland entry
- 2 3/4" NPT Cable gland entry
- 3 M20 x 1.5 Cable gland entry
- 4 M25 x 1.5 Cable gland entry

Probe Type³

- A04 4mm flexible cable
 A06 6mm flexible cable
 A08 8mm flexible cable
 B04 4mm rigid probe
 B06 6mm rigid probe
 B08 8mm rigid probe

Probe variant / materials³

S 316L

Mounting³

- TN07 3/4" NPT Thread (316L) or threaded flange mount²
 TB07 3/4" BSP Thread (316L)
 TN10 1" NPT Thread (316L)
 TB10 1" BSP Thread (316L)
 TN15 1.5" NPT Thread (316L) or threaded flange mount²
 TB15 1.5" BSP Thread (316L)
 FXXX¹ Pre-Welded Flange (replace XXX with 3 character Welded Flange Code)

Process O-ring seal

- V FKM (Viton) (-20°C to +204°C)
 B NBR (-35°C to +110°C)
 S Silicone (-60°C to +230°C)

Process Temperature

- 1 -40°C to +80°C (-40 to +176°F)
- 2 -40°C to +150°C (-40 to +302°F)

Process Pressure

- 1 5 bar
- 3 20 bar
- 4 40 bar

Approval Standard

- XX Not Required
 1D IECEx Ex d [ia] ia IIC T6 Gb Ga

Probe Length³

Specify in cm to the nearest 10cm using⁴

CGR2 H 1 3 B04 S TN07 S 1 1 1D 200

Probe / Mounting Combination Table (subject to change)

Probe Code	Variant / Materials	Mounting	Flange Sizes		Max. Length
			Min. Size	Max size	
A04	S	TN07, TB07, FXXX	1", DN25, 25mm	1-1/2", DN40, 40mm	1850cm
A06	S	TN10, TB10	N/A	N/A	1850cm
A08	S	TN15, TB15, FXXX	2", DN50, 50mm	4", DN100, 100mm	1850cm
B04	S	TN07, TB07, FXXX	1", DN25, 25mm	1-1/2", DN40, 40mm	400cm
B06	S	TN10, TB10	N/A	N/A	400cm
B08	S	TN15, TB15, FXXX	2", DN50, 50mm	4", DN100, 100mm	400cm

¹See Weld Code selection in Flange Table.

²Order flange as separate line item. See Probe / Mounting combination table matching size and variants options. See Flange Table Accessory Code for ordering.

³See Probe Table for valid Probe, Variant / Materials, Mounting and Length combinations prior to selection

⁴For example a 110cm probe length is specified as 0110. A 15m probe length is specified as 1500. You must use 4 digits.



Flange Table (subject to change)

Accessory Code	Welded Code	Type (all options Blind Flanges)	Material	Bore Hole (threaded type only)	Matching Mounting Thread (threaded type only)
FLA-1A1-SS-TN07	F1A1	1" ANSI B16.5 150LB	316L	3/4" NPT	TN07
FLA-1A3-SS-TN07	F1A3	1" ANSI B16.5 300LB	316L	3/4" NPT	TN07
FLA-1A6-SS-TN07	F1A6	1" ANSI B16.5 600LB	316L	3/4" NPT	TN07
FLA-1A9-SS-TN07	F1A9	1" ANSI B16.5 900LB	316L	3/4" NPT	TN07
FLA-1AA-SS-TN07	F1AA	1" ANSI B16.5 1200LB	316L	3/4" NPT	TN07
FLA-1AB-SS-TN07	F1AB	1" ANSI B16.5 2500LB	316L	3/4" NPT	TN07
FLA-HA1-SS-TN07	FHA1	1-1/2" ANSI B16.5 300LB	316L	3/4" NPT	TN07
FLA-HA3-SS-TN07	FHA3	1-1/2" ANSI B16.5 600LB	316L	3/4" NPT	TN07
FLA-HA6-SS-TN07	FHA6	1-1/2" ANSI B16.5 900LB	316L	3/4" NPT	TN07
FLA-HA9-SS-TN07	FHA9	1-1/2" ANSI B16.5 900LB	316L	3/4" NPT	TN07
FLA-HAA-SS-TN07	FHAA	1-1/2" ANSI B16.5 1200LB	316L	3/4" NPT	TN07
FLA-HAB-SS-TN07	FHAB	1-1/2" ANSI B16.5 2500LB	316L	3/4" NPT	TN07
FLA-2A1-SS-TN15	F2A1	2" ANSI B16.5 150LB	316L	1.5" NPT	TN15
FLA-2A3-SS-TN15	F2A3	2" ANSI B16.5 300LB	316L	1.5" NPT	TN15
FLA-2A6-SS-TN15	F2A6	2" ANSI B16.5 600LB	316L	1.5" NPT	TN15
FLA-2A9-SS-TN15	F2A9	2" ANSI B16.5 900LB	316L	1.5" NPT	TN15
FLA-2AA-SS-TN15	F2AA	2" ANSI B16.5 1200LB	316L	1.5" NPT	TN15
FLA-2AB-SS-TN15	F2AB	2" ANSI B16.5 2500LB	316L	1.5" NPT	TN15
FLA-3A1-SS-TN15	F3A1	3" ANSI B16.5 150LB	316L	1.5" NPT	TN15
FLA-3A3-SS-TN15	F3A3	3" ANSI B16.5 300LB	316L	1.5" NPT	TN15
FLA-3A6-SS-TN15	F3A6	3" ANSI B16.5 600LB	316L	1.5" NPT	TN15
FLA-3A9-SS-TN15	F3A9	3" ANSI B16.5 900LB	316L	1.5" NPT	TN15
FLA-3AA-SS-TN15	F3AA	3" ANSI B16.5 1200LB	316L	1.5" NPT	TN15
FLA-3AB-SS-TN15	F3AB	3" ANSI B16.5 2500LB	316L	1.5" NPT	TN15
FLA-4A1-SS-TN15	F4A1	4" ANSI B16.5 150LB	316L	1.5" NPT	TN15
FLA-4A3-SS-TN15	F4A3	4" ANSI B16.5 300LB	316L	1.5" NPT	TN15
FLA-4A6-SS-TN15	F4A6	4" ANSI B16.5 600LB	316L	1.5" NPT	TN15
FLA-4A9-SS-TN15	F4A9	4" ANSI B16.5 900LB	316L	1.5" NPT	TN15
FLA-4AA-SS-TN15	F4AA	4" ANSI B16.5 1200LB	316L	1.5" NPT	TN15
FLA-4AB-SS-TN15	F4AB	4" ANSI B16.5 2500LB	316L	1.5" NPT	TN15
FLA-1D1-SS-TN07	F1D1	DN25 DIN2527 PN16	316L	3/4" NPT	TN07
FLA-1D4-SS-TN07	F1D4	DN25 DIN2527 PN40	316L	3/4" NPT	TN07
FLA-HD1-SS-TN07	FHA1	DN40 DIN2527 PN16	316L	3/4" NPT	TN07
FLA-HD4-SS-TN07	FHD4	DN40 DIN2527 PN40	316L	3/4" NPT	TN07
FLA-2D1-SS-TN15	F2D1	DN50 PN16	316L	1.5" NPT	TN15
FLA-2D4-SS-TN15	F2D4	DN50 PN40	316L	1.5" NPT	TN15
FLA-3D1-SS-TN15	F3A1	DN80 PN16	316L	1.5" NPT	TN15
FLA-3D4-SS-TN15	F3D4	DN80 PN40	316L	1.5" NPT	TN15
FLA-4D1-SS-TN15	F4A1	DN100 PN16	316L	1.5" NPT	TN15
FLA-4D4-SS-TN15	F4D4	DN100 PN40	316L	1.5" NPT	TN15
FLA-1J1-SS-TN07	F1J1	JIS 25mm 16k	316L	3/4" NPT	TN07
FLA-1J4-SS-TN07	F1J4	JIS 25mm 40k	316L	3/4" NPT	TN07
FLA-HJ1-SS-TN07	FHJ1	JIS 40mm 16k	316L	3/4" NPT	TN07
FLA-HJ4-SS-TN07	FHJ4	JIS 40mm 40k	316L	3/4" NPT	TN07
FLA-2J1-SS-TN15	F2J1	JIS 50mm 16k	316L	1.5" NPT	TN15
FLA-2J4-SS-TN15	F2J4	JIS 50mm 40k	316L	1.5" NPT	TN15
FLA-3J1-SS-TN15	F3J1	JIS 80mm 16k	316L	1.5" NPT	TN15
FLA-3J4-SS-TN15	F3J4	JIS 80mm 40k	316L	1.5" NPT	TN15
FLA-4J1-SS-TN15	F4J1	JIS 100mm 16k	316L	1.5" NPT	TN15
FLA-4J4-SS-TN15	F4J4	JIS 100mm 40k	316L	1.5" NPT	TN15

Specifications

Centurion Guided Radar



Electronics

Power

- 2 wire loop powered
- 24VDC (14 to 28VDC)

Power Consumption

- <4mA @ 24VDC
- <500mW @ 24VDC

Analog Output

- 14V @ 0 Ohm
- 19V @ 250 Ohms
- 24V @ 500 Ohms
- Current park at 4mA, 8mA, 12mA

Communications*

- HART (Revision 5, Universal & Common Practice commands)
- GoshawkII via HART. Full parameter list

Maximum Range

- Flexible cable probe: 18.5m (60ft 8in)
- Rigid probe: 4m (13ft 1in)

Minimum Range (Blanking)

- 150mm

Dielectric Range

- ≥ 1.5

Frequency

- 2.2 GHz

Resolution

- Analog: 1uA
- Display: 1.0mm

Accuracy¹

- +/- 3mm

Measurements per second

- 3

Response Time

- <1 second (application dependant)

Sum of non linearity, non repeatability, hysteresis

- Analog +/- 0.02%

Repeatability

- +/- 3mm

Memory

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

Operating Temperature (Electronics)

- -40°C to +80°C (-40 to +176°F)

Display

- 4 line graphic display (128 x 64 pixels)

Language

- English

Configuration

- 4 button (up down, Cal, Run), GoshawkII via HART

Approvals*

- IECEx Ex d [ia] ia IIC T6 Gb Ga

Cable Entries

- 1/2" NPT
- M20 x 1.5

Electromagnetic Compatibility



CAN ICES-3(A)/NMB-3(A)

This device complies with Part 15, Subpart B Class # of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

*Specifications model dependent. Consult part number listing.

¹Accuracy dielectric & material dependent

Specifications

Centurion Guided Radar



Enclosure

Type

- Dual Compartment with Glass window

Material

- Die-cast Copper-Free Aluminium, Epoxy Painted
- 316L Stainless

Cable Entries

- 1/2" NPT
- 3/4" NPT
- M20 x 1.5
- M25 x 1.5

Material

- Die-cast Copper-Free Aluminium, Epoxy Painted
- 316L Stainless

IP Rating

- NEMA 4X
- IP66

Probe

Probe Size / Materials

- 4mm SS316L rod
- 4mm DIN3055 (7x7 strand) SS316L flexible cable
- 6mm SS316L rod
- 6mm DIN3055 (7x7 strand) SS316L flexible cable
- 8mm SS316L rod
- 8mm DIN3055 (7x7 strand) SS316L flexible cable

Probe Entry Materials

- TN07 / TB07 / TN10 / TB10 / Welded Flange¹ - PEEK
- TN15 / TB15 / Welded Flange¹ - PTFE + GF25

¹ See Probe / Mounting Combination Table for flange types

Probe O-Ring Seals

- Silicone / VMQ (-60°C to +230°C)
- Nitrile / NBR (-35°C to +110°C)
- Viton (-20°C to +204°C)

Process Connections

- 3/4" NPT or BSP
- 3/4" NPT with Flange
- 1" NPT or BSP
- 1.5" NPT or BSP
- 1.5" NPT with Flange
- Welded Flange

Process Pressure*

- -1 to 40 BAR

Process Temperature*

- -40°C to +80°C (-40 to +176°F)
- -40°C to +150°C (-40 to +302°F)

Tensile Load (flexible cable probes)

- Probe Type: A04 0.5 ton
- Probe Type: A06 1.0 ton
- Probe Type: A08 4.0 ton

Tensile Load (cable weight)

- Probe Type: A04 0.5 ton
- Probe Type: A06 1.0 ton
- Probe Type: A08 1.5 ton

Lateral Load (rigid probes)

- Probe Type: B04 1 Nm
- Probe Type: B06 3 Nm
- Probe Type: B08 8 Nm

Maximum Probe Length

- Probe Type: A04 1850cm
- Probe Type: A06 1850cm
- Probe Type: A08 1850cm
- Probe Type: B04 400cm
- Probe Type: B06 400cm
- Probe Type: B08 400cm

Minimum Probe Length

- Probe Type: A04 100cm
- Probe Type: A06 100cm
- Probe Type: A08 100cm
- Probe Type: B04 20cm
- Probe Type: B06 20cm
- Probe Type: B08 20cm

*Specifications model dependent. Consult part number listing.

Specification & Ordering Information

Centurion Guided Radar



Ordering Instructions

Threaded unit type

Assemble part number taking note of the valid combinations and exclusions for the full system. The unit is ordered as a single line item. For example:

CGR2H13B08STB15B11XX0200

Flanged type - Threaded flange

Assemble part number taking note of the valid combinations and exclusions for the full system (noting smaller flanges require TN07 threaded unit and larger flanges require TN15 threaded unit). The unit and the threaded flange are ordered as separate line items. For example:

CGR2H13B08S**TN15**B11XX200

FLA-FA4-SS-**TN15**

or

CGR2H13B08S**TN07**B11XX200

FLA-FA1-SS-**TN07**

Flanged type - Welded flange

Assemble part number taking note of the valid combinations and exclusions for the full system. In the Mounting part code enter 4 character Welded flange code from the table. All Welded flanges have F as the first character. For example.

CGR2H13B08S**F4A1**B11XX200

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Technical data subject to change without notice.

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