

# Rosemount™ 2230 Graphical Field Display

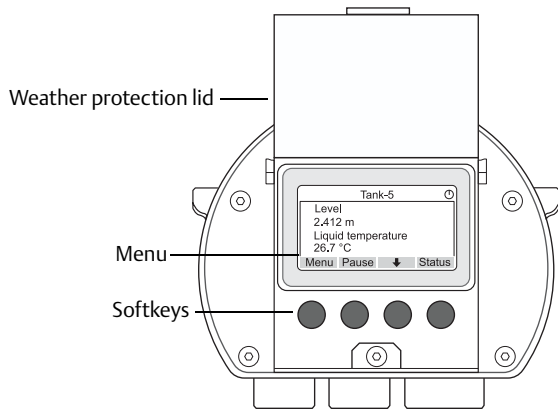
for tank gauging systems



**Monitor real time tank gauging data, such as level, temperature, pressure, and total observed volume**

- Choose among seven languages and several view options
- Install in hazardous areas
- Obtain excellent readability with back-lit display
- Get legal custody transfer read-out
- Benefit from a 2-wire, low voltage Tankbus for easy and safe installation

# Tank data where you need it



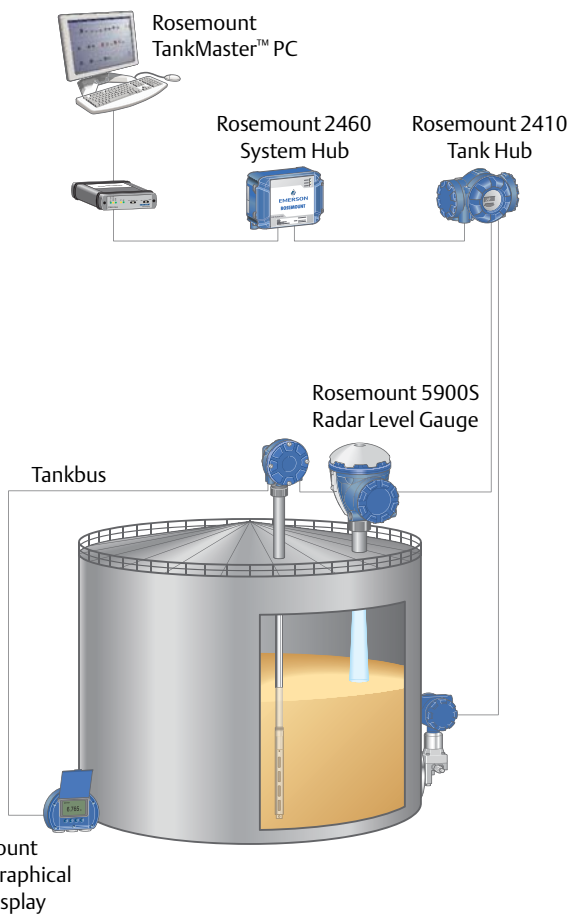
Rosemount 2230 Graphical Field Display presents inventory tank gauging data such as level, temperature, and pressure. It is approved for legal custody transfer. This intrinsically safe field display is designed for tough environments and can be installed in hazardous (Ex) locations.

- Rosemount 2230 displays data from devices connected to a Rosemount 2410 Tank Hub for maximum 10 tanks.
- Up to three Rosemount 2230 can be connected to a Rosemount 2410 Tank Hub
- The four softkeys allow you to navigate through the different menus to provide all tank data, directly in the field.
- The device is powered by the FISCO Tankbus.

## Flexible installation

The back-lit user friendly display can be installed either on the tank roof, or at the foot of the tank, for a flexible and convenient read-out of tank data.

- Wiring can be daisy-chained via the Rosemount 2230 terminals to other devices on the Tankbus. The field display has a built-in Tankbus terminator, which can be connected if required.
- The field display is designed to be mounted on a wall or a pipe, using the same mounting arrangement as for all Rosemount Tank Gauging System units.
- A hinged lid protects the LCD display from sunlight exposure.



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## Ordering Information

**Table 1. Rosemount 2230 Graphical Field Display Ordering Information**

Model	Product description
2230	Graphical Field Display
<b>Default language</b>	
E	English
S	Spanish
G	German
F	French
P	Portuguese
I	Italian
C	Chinese
<b>Tankbus: Power and communication</b>	
F	Bus powered 2-wire FOUNDATION™ Fieldbus (IEC 61158)
<b>Firmware</b>	
S	Standard
<b>Hazardous location certification</b>	
I1	ATEX Intrinsic Safety
I2	INMETRO Intrinsic Safety (Brazil)
I4 <sup>(1)</sup>	TIIS Intrinsic Safety (Japan)
I5	FM-US Intrinsic Safety
I6	FM-Canada Intrinsic Safety
I7	IECEx Intrinsic Safety
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety
IP <sup>(2)</sup>	KC Intrinsic Safety (South Korea)
IW	CCOE/PESO Intrinsic Safety (India)
NA	None
<b>Custody transfer type approval<sup>(3)</sup></b>	
R	OIML R 85 edition 2008
C	PTB Eich (Germany)
K <sup>(4)</sup>	GOST (Kazakhstan)
L	LNE (France)
N	NMi (The Netherlands)
S <sup>(4)</sup>	GOST (Russia)

**Table 1. Rosemount 2230 Graphical Field Display Ordering Information**

0	None	
<b>Housing</b>		
A	Standard enclosure (IP 66/67). Polyurethane-covered aluminium	
<b>Cable/Conduit connections</b>		
1	1/2–14 NPT	Female thread, 1 plug included
2	M20 x 1.5 adapters	Female thread, 2 adapters, 1 plug included
G	Metal cable glands (1/2–14 NPT)	Minimum temperature -20 °C (-4 °F). ATEX/IECEX Exe approved. 2 glands, 1 plug included.
E	eurofast® male connector	1 connector and 1 plug included
M	minifast® male connector	1 connector and 1 plug included
<b>Mechanical installation</b>		
W	Wall installation kit included	
P	Mounting kit for both wall and pipe installation	1-2 in. vertical and horizontal pipes

**Options (include with selected model number)**

<b>Tag plate</b>		
ST	Engraved SST tag plate (provide tag information in order)	
<b>Extended warranty</b>		
WR3	Extended product warranty: 3-year limited warranty	Standard warranty: 18 months from delivery
WR5	Extended product warranty: 5-year limited warranty	
<b>Typical model number: 2230 E F S I5 R A 1 P ST</b>		

1. Requires Default language code E and Mechanical installation code W.
2. Requires Custody transfer type approval code R or 0.
3. Requires Rosemount 5900S Radar Level Gauge and Rosemount 2410 Tank Hub with corresponding Custody transfer type approval.
4. Requires Hazardous location certification code I1.

# Specifications

## Toggle time

The time each value or set of values are displayed: 2-30 s.

## Language selection possibilities

English, French, German, Spanish, Italian, Chinese and Portuguese.

## Variables to display

Level, ullage, level rate, signal strength, free water level (FWL), vapor pressure, liquid pressure, air pressure, ambient temperature, vapor average temperature, liquid average temperature, tank temperature, 1-16 spot temperature, observed density, reference density, flow rate, volume (TOV), middle pressure, tank height, delta level, bargraph level, and bargraph ullage.

## Units to display

- Level, free water level, and ullage: meter, millimeter, feet, or imperial 1/16
- Level rate: meter/second, meter/hour, feet/second, or feet/hour
- Flow rate: meter<sup>3</sup>/hour, liter/minute, barrel/hour, UK gallon/hour, or US gallon/hour
- Total Observed Volume (TOV): meter<sup>3</sup>, liter, barrel, UK gallon, or US gallon
- Temperature: °F, °C, or °K.
- Pressure: psi, psiA, psiG, bar, barA, barG, atm, Pa, or kPa
- Density: kg/m<sup>3</sup>, kg/liter, or °API
- Signal strength: mV

## View Options

- **Select View:** “Single Value”, “Two Values” or “Four Values”. The single value view presents large 25-mm (1-in.) digits
- **Options:** Units, tanks (all/default/custom), variables to display, toggle time, and display language
- **Service:** To adjust LCD contrast, show custody transfer view, make a factory reset, or activate an LCD test feature

## Electric

### Power supply

Input voltage U<sub>i</sub> for FOUNDATION Fieldbus:

- 9.0 to 17.5 VDC in FISCO applications
- 9.0 to 30 VDC in Entity applications

### Tankbus current draw

30 mA

### Display type

Back-lit LCD monochrome display, 128x64 pixels.

### Start-up time

5 s

### Update rate

New values to display once every two seconds.

### Response time

< 0.5 s from released button to new image.

### Cable entry (connection/glands)

Two ½ - 14 NPT entries for cable glands or conduits. A metal plug to seal unused port is included in the delivery. Optional:

- M20×1.5 conduit/cable adapters
- Cable glands in metal (½ - 14 NPT)
- 4-pin male eurofast connector or A size Mini 4-pin male minifast connector

### Tankbus cabling

AWG 0.5-1.5 mm<sup>2</sup> (22-16), shielded twisted pairs.

### Built-in Tankbus terminator

Yes (to be connected if required).

## FOUNDATION Fieldbus characteristics

### Polarity sensitive

No

### Quiescent current draw

30 mA

### Lift-off minimum voltage

9.0 VDC

### Device capacitance / inductance

See “Product Certifications” on page 7

### Class (Basic or Link Master)

Link Master (LAS)

**Number of available VCRs**

Maximum 38. Client and server=20, Publisher=20, Subscribers=20, Source=2, Sink=0.

**Links**

Maximum 32

**Minimum slot time / maximum response delay/  
minimum intermessage delay**

8 / 5 / 8

**Blocks and Execution time**

1 **Resource** block, 3 **Transducer** blocks (Main, Register, Display), 4 **Multiple Analog Output** (MAO) blocks: 15 ms.

For more information, see the FOUNDATION Fieldbus Blocks [Manual](#).

**Instantiation**

No

**Conforming FOUNDATION Fieldbus**

ITK 6

**Field Diagnostics support (NAMUR 107)**

Yes

**Action support wizards**

Write protect device, factory reset - device configuration, reset statistics, start/stop alerts simulation, restart communication

**Advanced diagnostics**

Software, memory/database, electronics, internal communication, configuration, model code, internal temperature, MAO fault state

**Mechanical****Housing material**

Polyurethane-covered die-cast aluminum.

**Dimensions (width x height x depth)**

150 x 120 x 78 mm (5.9 x 4.7 x 3.1 in.)

**Weight**

1.3 kg (2.9 lbs)

**Environment****Ambient temperature**

-20 to 70 °C (-4 to 158 °F)

**Storage temperature**

-30 to 85 °C (-22 to 185 °F)

**Humidity**

0-100% relative humidity, non-condensing.

**Ingress protection**

IP 66 and 67 (NEMA® 4)

**Metrology sealing possibility**

Yes

**Write protect switch**

Yes

**Transient / built-in lightning protection**

According to IEC 61000-4-5, level 1 kV line to ground. Complies with IEEE 587. Category B transient protection and IEEE 472 surge protection.

**Installation and Configuration**

The Rosemount 2230 Graphical Field Display can be installed either on the tank roof or at the foot of the tank for a flexible and convenient read-out of tank data.

Cabling can be daisy-chained via the Rosemount 2230 terminals to other devices on the Tankbus. A terminator is required at each end of the Tankbus to ensure the fieldbus network will have proper signal levels. Generally, one terminator is at the fieldbus power supply and the other is in the last device in the network.

Rosemount 2230 has a built-in terminator which can be connected if required.

The Rosemount 2230 display can be installed on a wall or a 33.4-60.3 mm (1-2 in.) diameter pipe. It is important to provide space for opening the lid. The hinged lid protects the LCD display from sunlight exposure.

Configuration is done locally via the device's graphical menu and built-in buttons or remotely by using the TankMaster WinSetup software.

For more information, see the Rosemount 2230 [Reference Manual](#) or the Rosemount TankMaster [System Configuration Manual](#).

# Product Certifications

Rev 4.3

## European Directive Information

The most recent revision of the EU Declaration of Conformity can be found at [Emerson.com/Rosemount](http://Emerson.com/Rosemount)

## Ordinary Location Certification

As standard, the transmitter has been examined and tested to determine that the design meets the basic electrical, mechanical, and fire protection requirements by a nationally recognized test laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

## Installing Equipment in North America

The US National Electrical Code® (NEC) and the Canadian Electrical Code (CEC) permit the use of Division marked equipment in Zones and Zone marked equipment in Divisions. The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

## North America

### 15 USA Intrinsic Safety

Certificate: FM17US0035X

Standards: FM Class 3600 – 2011,  
 FM Class 3610 – 2010,  
 FM Class 3810 – 2005,  
 ANSI/NEMA 250 – 2008,  
 ANSI/IEC 60529 – 2004,  
 ANSI/ISA 61010-1:2004  
 ANSI/ISA 60079-0 – 2013,  
 ANSI/ISA 60079-11 – 2013,

Markings: IS/I,II,III/1/ABCDEF/G/T4 Ta = -50°C to +70°C  
 Control Dwg D9240040-949  
 I/0/AEx ia IIC Ga T4 Ta = -50°C to +70°C  
 Control Dwg D9240040-949  
 Type 4X; IP66, IP67

	Ui	Ii	Pi	Ci	Li
<b>Entity parameters</b>	30 V	300 mA	1.3 W	2.1 nF	1.1 μH
<b>FISCO parameters</b>	17.5V	380 mA	5.32 W	N/A	N/A

### Specific Conditions for Safe Use (X):

1. The non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore particularly when it is used for applications that specifically require Division 1 and Group II, Zone 0 located equipment, the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. Additionally, the equipment shall only be cleaned with a damp cloth.
2. The enclosure contains aluminum and is considered to present a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact or friction.
3. The Rosemount 2230 Graphical Field Display will not pass the 500Vrms dielectric strength test and this must be taken into account during installation.
4. To maintain ingress protection ratings IP66 and IP67, PTFE tape or pipe dope is required for cable entries and blanking plugs.

### 16 Canada Intrinsic Safety

Certificate: FM17CA0019X

Standards: CAN/CSA C22.2 No.157-1992 (R2012);  
 CAN/CSA C22.2 No. 1010.1:2004;  
 CAN/CSA C22.2 No. 25-1966 (R2014);  
 CAN/CSA C22.2 No. 94-M91:1991 (R2011);  
 CAN/CSA-C22.2 No. 60529-2005 (R2015);  
 CAN/CSA C22.2 No. E60079-0:2011;  
 CAN/CSA C22.2 No. E60079-11:2011

Markings: IS/I,II,III/1/ABCDEF/G/T4 Ta = -50°C to +70°C  
 Control Drawing D9240040-949  
 I/0/Ex ia IIC Ga T4 Ta = -50°C to +70°C  
 Control Drawing D9240040-949  
 Type 4X; IP66, IP67

	Ui	Ii	Pi	Ci	Li
<b>Entity parameters</b>	30 V	300 mA	1.3 W	2.1 nF	1.1 μH
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- To maintain ingress protection ratings IP66 and IP67, PTFE tape or pipe dope is required for cable entries and blanking plugs.

## Europe

### I1 ATEX Intrinsic Safety

Certificate: FM10ATEX0046X

Standards: EN 60079-0:2012 + A11:2013,  
EN 60079-11:2012,  
EN 60529:2013

Markings:  II 1 G Ex ia IIC Ga T4 Ta = -50°C to +70°C;  
IP66, IP67

	Ui	Ii	Pi	Ci	Li
<b>Entity parameters</b>	30 V	300 mA	1.3 W	2.1 nF	1.1 μH
<b>FISCO parameters</b>	17.5V	380 mA	5.32 W	N/A	N/A

#### Specific Conditions for Safe Use (X):

- The non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore particularly when it is used for applications that specifically require Division 1 and Group II, Zone 0 located equipment, the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. Additionally, the equipment shall only be cleaned with a damp cloth.
- The enclosure contains aluminum and is considered to present a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact or friction.
- The Rosemount 2230 Graphical Field Display will not pass the 500Vrms dielectric strength test and this must be taken into account during installation.
- To maintain ingress protection ratings IP66 and IP67, PTFE tape or pipe dope is required for cable entries and blanking plugs.

## International

### I7 IECEx Intrinsic Safety

Certificate: IECEx FMG 10.0021X

Standards: IEC 60079-0:2011, IEC 60079-11:2011

Markings: Ex ia IIC Ga T4 (-50°C ≤ Ta ≤ +70°C);  
IP66/IP67

	Ui	Ii	Pi	Ci	Li
<b>Entity parameters</b>	30 V	300 mA	1.3 W	2.1 nF	1.1 μH
<b>FISCO parameters</b>	17.5V	380 mA	5.32 W	N/A	N/A

#### Specific Conditions for Safe Use (X):

- The non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore particularly when it is used for applications that specifically require Division 1 and Group II, Zone 0 located equipment, the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. Additionally, the equipment shall only be cleaned with a damp cloth.
- The enclosure contains aluminum and is considered to present a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact or friction.
- The Rosemount 2230 Graphical Field Display will not pass the 500Vrms dielectric strength test and this must be taken into account during installation.
- To maintain ingress protection ratings IP66 and IP67, PTFE tape or pipe dope is required for cable entries and blanking plugs.

## Brazil

### I2 INMETRO Intrinsic Safety

Certificate: IEx 11.0076X

Standards: ABNT NBR IEC 60079-0:2013,  
ABNT NBR IEC 60079-11:2013

Markings: Ex ia IIC T4 Ga (-50 °C ≤ Tamb ≤ + 70 °C);  
Entity/FISCO; IP66/IP67

	Ui	Ii	Pi	Ci	Li
<b>Entity parameters</b>	30 V	300 mA	1.3 W	2.1 nF	1.1 μH
<b>FISCO parameters</b>	17.5V	380 mA	5.32 W	2.1 nF	1.1 μH

#### Special Conditions for Safe Use (X):

- See certificate for special condition.

## China

### I3 China Intrinsic Safety

Certificate: GYJ13.1135X

Standards: GB 3836.1 – 2010, GB 3836.4 – 2010,  
GB 3836.20 – 2010

Markings: Ex ia IIC T4 Ga



	Ui	Ii	Pi	Ci	Li
<b>Entity parameters</b>	30 V	300 mA	1.3 W	2.1 nF	1.1 μH
<b>FISCO parameters</b>	17.5V	380 mA	5.32 W	2.1 nF	1.1 μH

**Special Conditions for Safe Use (X):**

1. See certificate for special condition.

## Technical Regulations Customs Union (EAC)

**IM** EAC Intrinsic Safety

Certificate: RU C-SE.AA87.B.00348

Markings: 0Ex ia IIC T4 Ga X  
Ta = -50°C to +70°C  
IP66, IP67

	Ui	Ii	Pi	Ci	Li
<b>Entity parameters</b>	30 V	300 mA	1.3 W	2.1 nF	1.1 μH
<b>FISCO parameters</b>	17.5V	380 mA	5.32 W	2.1 nF	1.1 μH

## Japan

**I4** Japan Intrinsic Safety

Certificate: TC20391

Markings: Ex ib IIB T4 (-20°C ≤ Ta ≤ +60°C)

	Ui	Ii	Pi	Ci	Li
<b>Entity parameters</b>	30 V	300 mA	1.3 W	2.1 nF	1.1 μH
<b>FISCO parameters</b>	17.5V	380 mA	5.32 W	2.1 nF	1.1 μH

## Republic of Korea

**IP** Korea Intrinsic Safety

Certificate: 11-KB4BO-0073X

Markings: Ex ia IIC T4 (-50°C ≤ Ta ≤ +70°C)

	Ui	Ii	Pi	Ci	Li
<b>Entity parameters</b>	30 V	300 mA	1.3 W	2.1 nF	1.1 μH
<b>FISCO parameters</b>	17.5V	380 mA	5.32 W	2.1 nF	1.1 μH

## Additional Certifications

India Intrinsic Safety

Certificate: P38880/1

Markings: Ex ia IIC Ga T4

## Conduit plugs and adapters

IECEx Flameproof and Increased Safety

Certificate: IECEx FMG 13.0032X

Standards: IEC60079-0:2011,  
IEC60079-1:2007-04,  
IEC60079-7:2006-07

Markings: Ex de IIC Gb

ATEX Flameproof and Increased Safety

Certificate: FM13ATEX0076X

Standards: EN60079-0:2012,  
EN60079-1:2007,  
IEC60079-7:2007

Markings:  II 2 G Ex de IIC Gb

### Conduit Plug Thread Sizes

Thread	Identification Mark
M20 x 1.5	M20
½ - 14 NPT	½ NPT

### Thread Adapter Thread Sizes

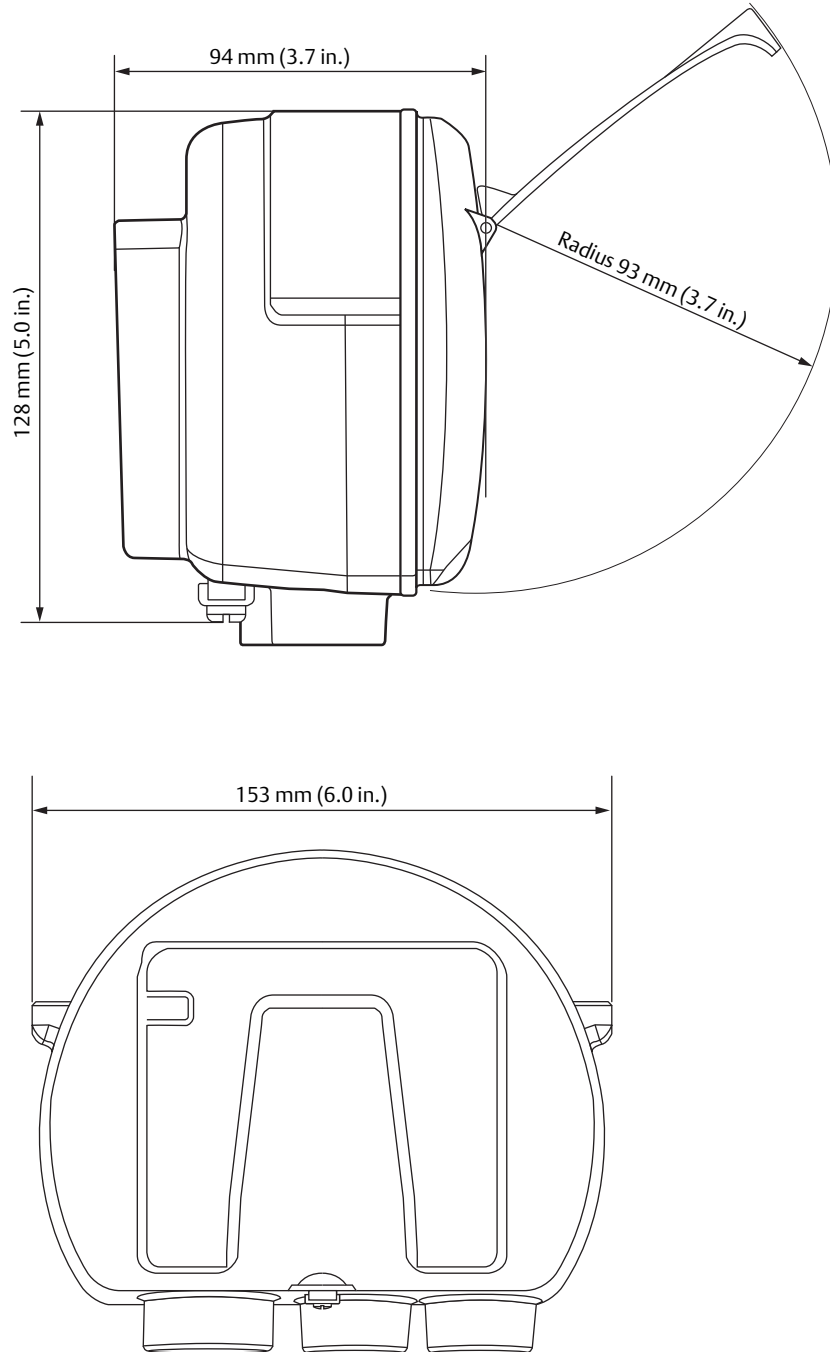
Male Thread	Identification Mark
M20 x 1.5 – 6g	M20
½ - 14 NPT	½ - 14 NPT
¾ - 14 NPT	¾ - 14 NPT
Female Thread	Identification Mark
M20 x 1.5 – 6H	M20
½ - 14 NPT	½ - 14 NPT
G1/2	G1/2

### Special Conditions for Safe Use (X):

1. When the thread adapter or blanking plug is used with an enclosure in type of protection increased safety “e” the entry thread shall be suitably sealed in order to maintain the ingress protection rating (IP) of the enclosure. See certificate for special conditions.
2. The blanking plug shall not be used with an adapter.
3. Blanking Plug and Threaded Adapter shall be either NPT or Metric thread forms. G½ thread forms are only acceptable for existing (legacy) equipment installations.

# Dimensional Drawings

Figure 1. Rosemount 2230 Graphical Field Display



Dimensions are in millimeters (inches).



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