

# Rosemount™ 228

## Toroidal Conductivity Sensor



### A Versatile Conductivity Sensor for Solving Diverse Application Challenges

Rosemount 228 toroidal conductivity sensors reliably measure conductivity in highly conductive electrolyte solutions up to 2 S/cm (2,000,000  $\mu$ S/cm). These sensors work in dirty and corrosive applications where metal electrode sensors would otherwise fail. A robust sensor design makes the Rosemount 228 ideal for measuring concentrations of acid, base, and salt solutions.

ROSEMOUNT™





### High Performance and Reliability

- Meet challenging application requirements with a selection of chemical resistant body options including PEEK and Tefzel
- High vibration tolerance with reinforced internal metal frame design
- High temperature option for process temperatures up to 392 °F (200 °C) and suitable for use under high pressure up to 295 psig (2135 kPa [abs])



### Meet Your Process Mounting Needs

- Suitable for insertion and submersion type applications
- Versatile mounting options featuring either a 3/4 in. MNPT or 5/8 in. 11 UNC process connection
- Eliminate the need to shut down your process when removing sensors from piping and tanks by using an optional retraction assembly kit

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## Contents

Ordering Information.....	3
Specifications.....	4
Dimensional Drawings.....	6
Accessories.....	9

## Ordering Information



Rosemount 228  
Toroidal Conductivity Sensor

Rosemount 228 Toroidal Conductivity Sensors are molded of chemically resistant glass-filled PEEK or Tefzel and are ideal for measuring concentrations of acid, base, and salt solutions. The sensors include an integral PT-100 RTD for temperature compensation and an integral cable length of 20 ft. The Rosemount 228 can be used with a variety of insertion mounting adapters to meet your installation requirements (see Accessories).

**Table 1 -Rosemount 228 Toroidal Conductivity Sensor Ordering Information**

Model	Sensor type
228	Toroidal Conductivity Sensor
<b>Materials of construction</b>	
02	Glass-filled PEEK (standard temperature)
03	Glass-filled PEEK (high temperature)
04	Glass filled Tefzel <sup>1</sup>
09	Unfilled Tefzel <sup>2</sup>
<b>Process connection</b>	
20	5/8 in. 11 UNC <sup>3</sup>
21	3/4 in. MNPT <sup>4</sup>
<b>Cable type<sup>5</sup></b>	
54	Unshielded cable <sup>6</sup>
56	EMI/RFI shielded cable <sup>7</sup>
<b>Cable length</b>	
61	20 ft (6.1 m)
62	18 in. (457 mm) <sup>8</sup>
<b>Typical model number: 228-03-21-51-61</b>	

(1) Not available with options -50-62 and -54-62

(2) Not available with option -54-62

(3) This option requires a mounting adapter. This option comes standard with an EPDM gasket (Viton and Kalrez gaskets are also available; see Accessories).

(4) Not available with option -62.

(5) Cables may be extended using the remote junction box PN 23550-00 (sold separately) and extension cables (see Accessories).

(6) Recommended for use with transmitter models 1054 and 2054. May be used with transmitter models 1055, 1056, 1066, 54C, 54eC, 81T, 2081T, 3081T, 4081T, 5081T, and XMT, but not recommended.

(7) Recommended for use with transmitter models 1055, 1056, 1066, 56, 54C, 54eC, 5081, and XMT.

(8) For use with option -54 only. Connects sensor used in valve insertion assembly to junction box. Requires interconnecting cable to connect junction box to transmitter. Use either cable 23294-00 (unshielded) or 23294-05 (shielded).

## Specifications

### Sensor Specifications

**Wetted materials:** Body materials either glass-filled PEEK, glass-filled Tefzel, or unfilled Tefzel. Option-20 has EPDM gasket.

**Process connection:** -20: 5/8 in. 11 UNC  
-21 : 3/4 in. MNPT

**Cable length:** 20 ft (6.1 m)

**Maximum cable length:** 200 ft (61 m)

**Weight/shipping weight:** 2 lb/3 lb (1.0 kg/1.5 kg)

**Table 2 - Maximum Operating Temperature and Pressure**

Body material option	Maximum temperature	Maximum pressure	Maximum pressure (for CRN registration only)
-02	248 °F (120 °C)	295 psig (2135 kPa)	220 psig (1618 kPa [abs])
-03	392 °F (200 °C)	295 psig (2135 kPa)	220 psig (1618 kPa [abs])
-04	248 °F (120 °C)	200 psig (1480 kPa)	150 psig (1135 kPa [abs])
-05	248 °F (120 °C)	200 psig (1480 kPa)	150 psig (1135 kPa [abs])

### Insertion Adapter Specifications

Adapter part number	Sensor compatibility	Process connection	Wetted materials	Maximum temperature	Maximum pressure	Maximum pressure (for CRN registration only)	Weight/shipping weight
23242-02	For use with option -21	1-1/2 in. MNPT	316 SS, glass-filled PEEK, Viton	392 °F (200 °C)	295 psig (2135 kPa)	220 psig (1618 kPa)	3 lb/4 lb (1.5 kg/2.0 kg)
23242-03	For use with option -20	1-1/2 in. MNPT	316 SS, glass-filled PEEK, Viton	392 °F (200 °C)	295 psig (2135 kPa)	220 psig (1618 kPa)	3 lb/4 lb (1.5 kg/2.0 kg)
2001990	For use with option -21	2 in. MNPT	CPVC, Viton	100 °F (38 °C)	100 psig (791 kPa [abs])	N/A	1 lb/2 lb (0.5 kg/1.0 kg)
				185 °F (85 °C)	45 psig (412 kPa [abs])		

### Retraction Assembly Specifications

**Sensor compatibility:** The retraction assemblies are used with 228 - [ ]-20-54-62 only

**Wetted materials:** 316 stainless steel, ethylene polypropylene (EP), unfilled Teflon, carbon-filled Teflon

**Process connection:** 1-1/2 in. MNPT

**Maximum temperature:** 392 °F (200 °C)

**Maximum pressure:** 295 psig (2135 kPa [abs])

**Table 3 - Maximum Retraction/Insertion Conditions**

Description	Temperature	Pressure	Maximum insertion travel	Weight/shipping weight
23311-00, mechanical retraction assembly	392 °F (200 °C)	295 psig (2135 kPa [abs])	10.5 in. (267 mm)	12 lb/15 lb (5.5 kg/7.0 kg)
23311-01, manual retraction assembly	266 °F (130 °C)	35 psig (343 kPa [abs])	12.0 in. (305 mm)	9 lb/12 lb (4.5 kg/5.5 kg)

### Ball Valve Specifications (Sold Separately)

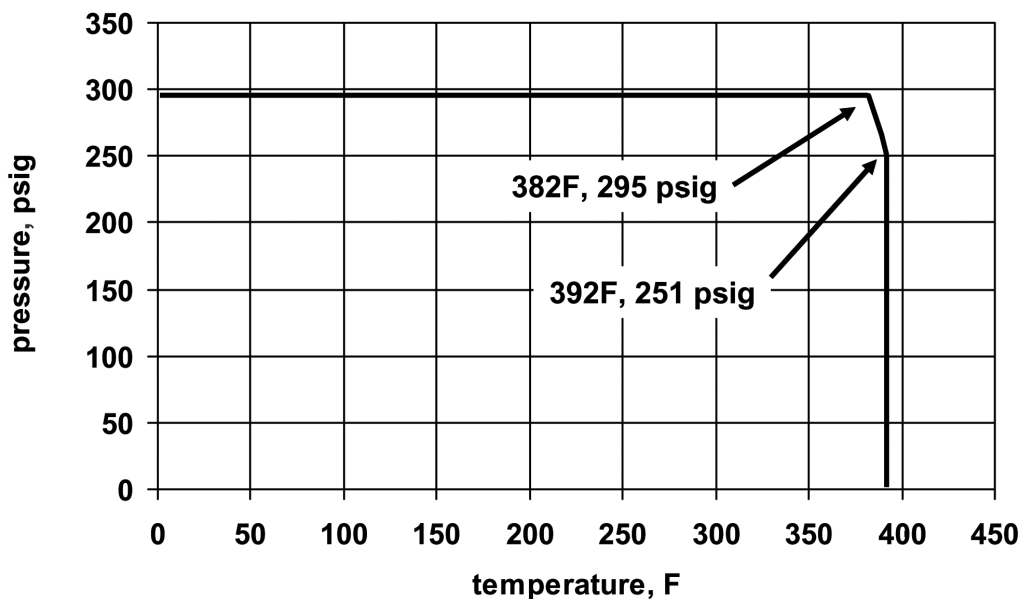
**Part number:** 9340065

**Wetted materials:** 316 stainless steel, Teflon TFE

**Process connection:** 1-1/2 in. FNPT

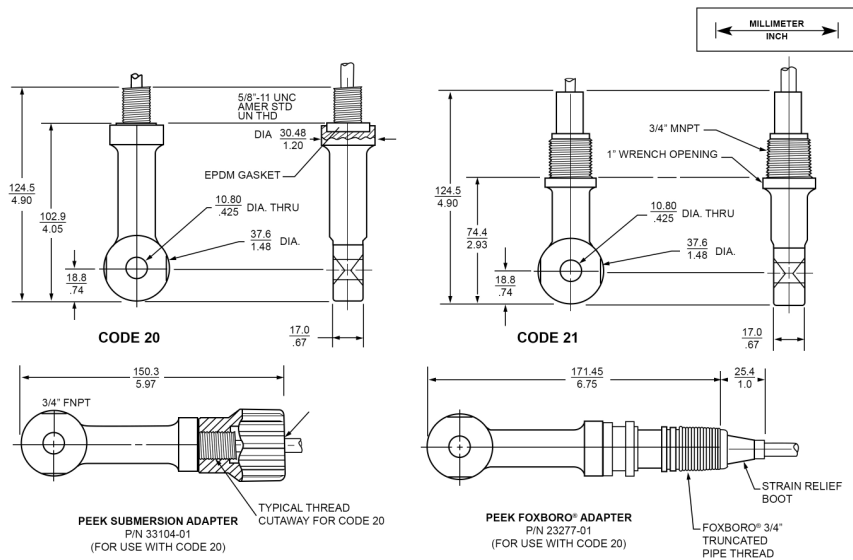
**Weight/shipping weight:** 4 lb/5 lb (2.0 kg/2.5 kg)

**Pressure and temperature:**



## Dimensional Drawings

Figure 1. Rosemount 228 dimensional drawing



Model 228 Dimensional Drawing

Figure 2. Insertion Adapter 23242-02

Figure 3. Insertion Adapter 23242-03

Figure 4. Insertion Adapter 2001990

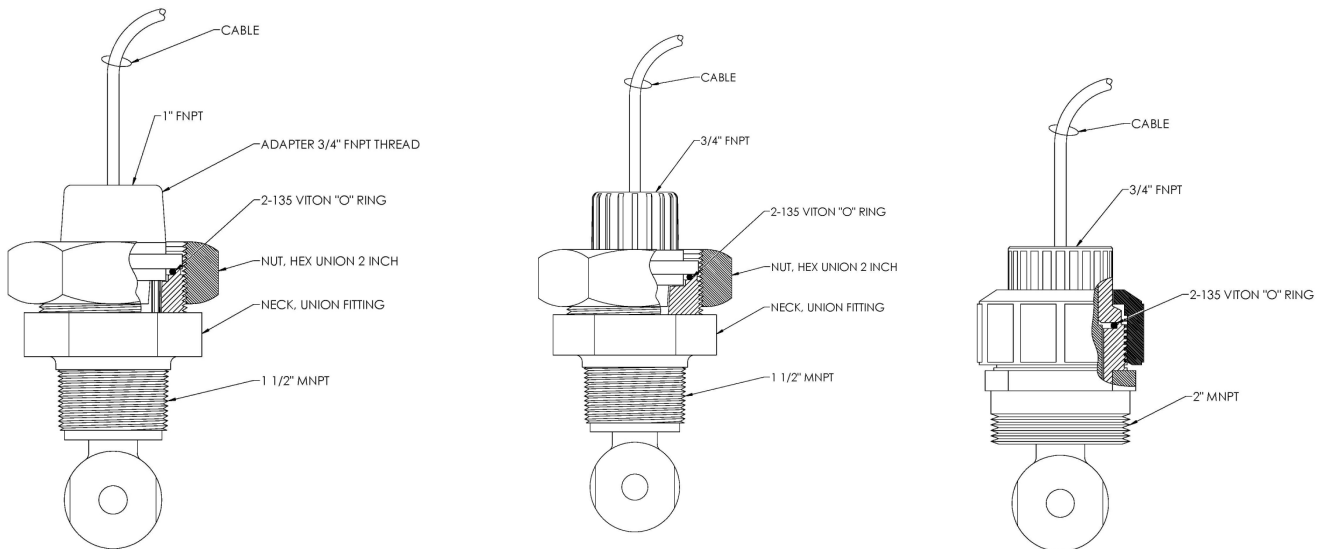


Figure 5. Manual Retraction Assembly PN 23311-01 dimensional drawing

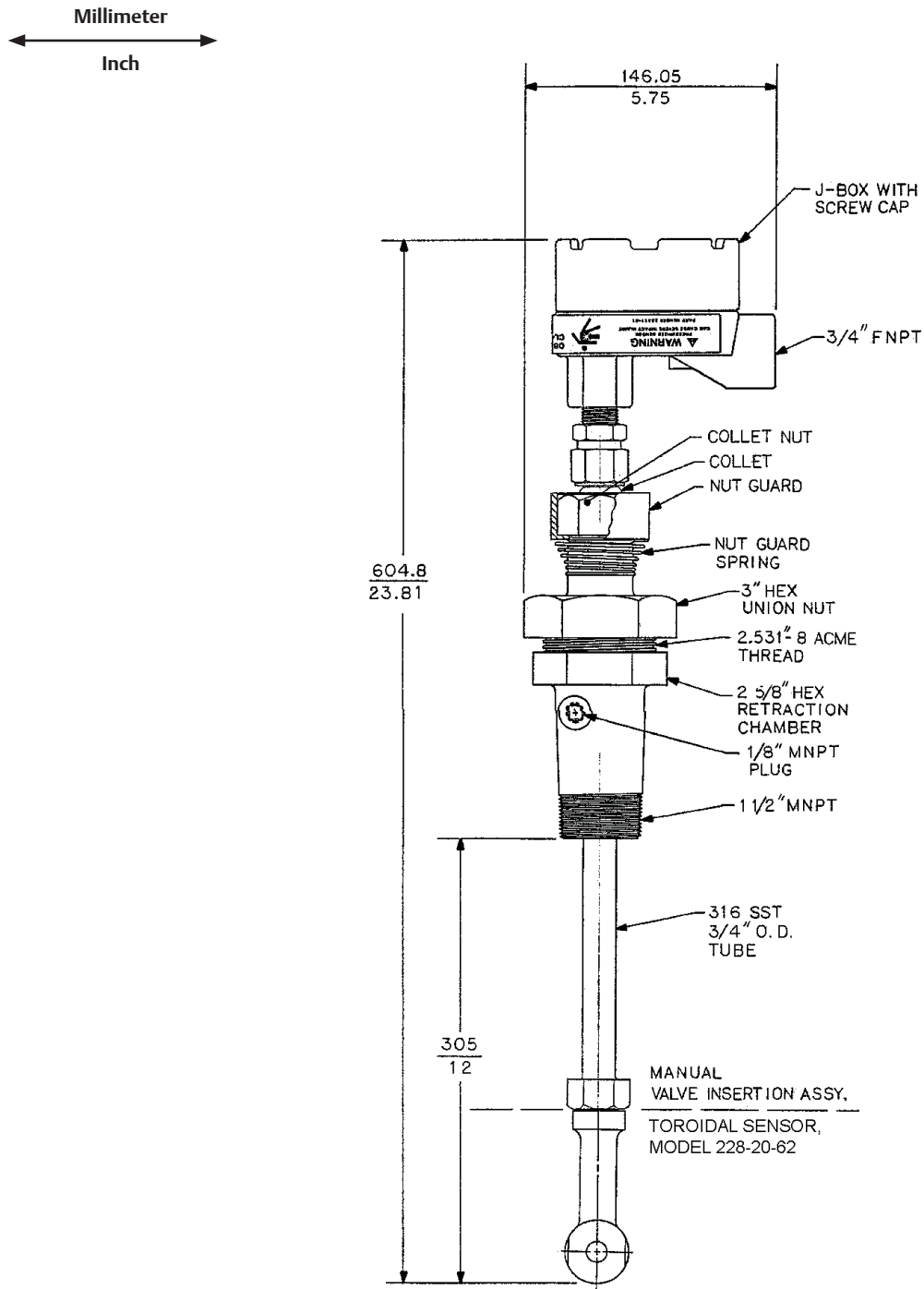
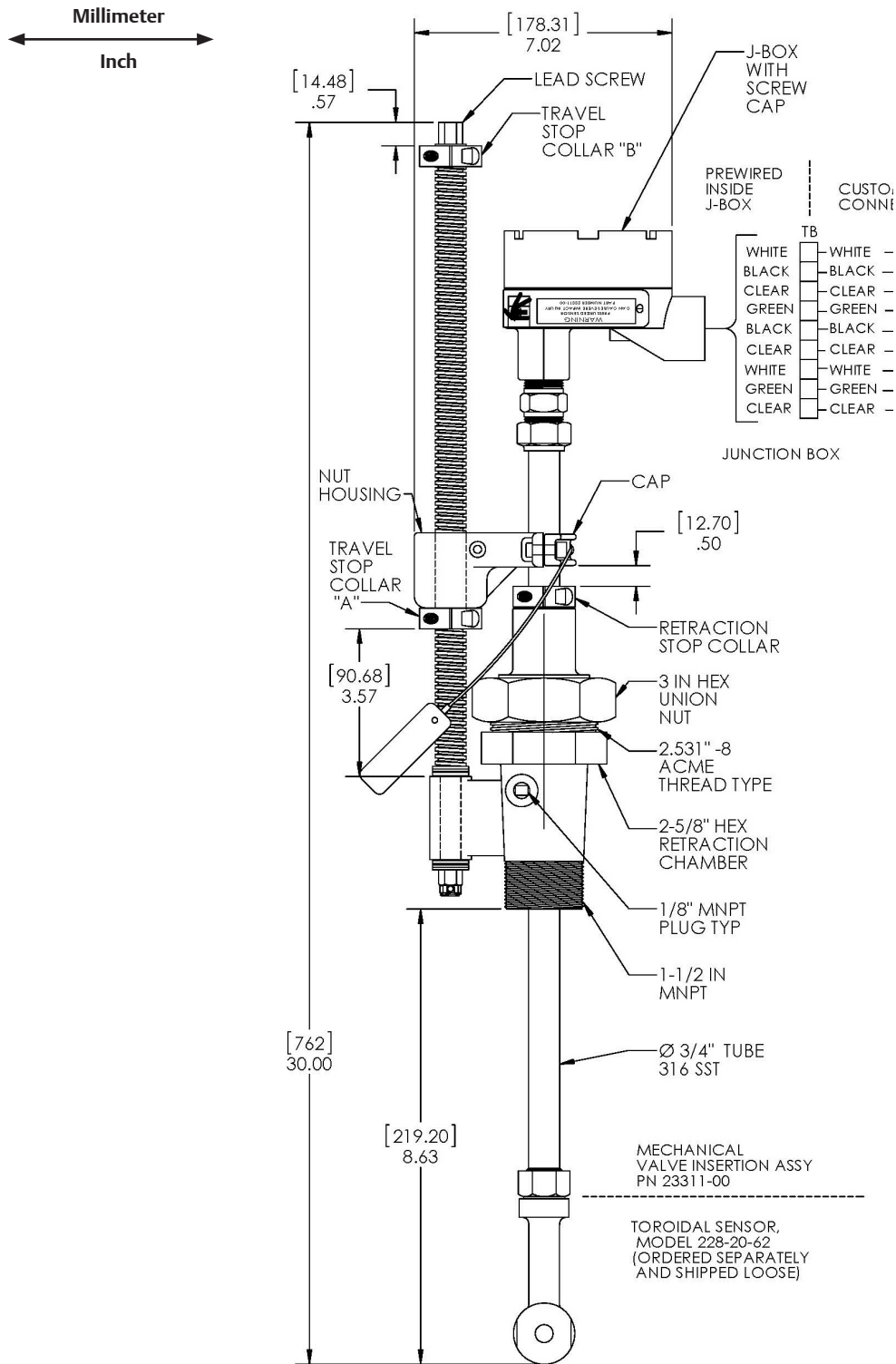


Figure 6. Mechanical Retraction Assembly PN 23311-00 dimensional drawing





## Accessories

Part number	Description
23550-00	Remote junction box
23294-00	Unshielded interconnecting cable
23294-05	Shielded interconnecting cable
23311-00	Mechanical valve insertion assembly
23311-01	Manual valve insertion assembly
2001990	Mounting adapter, 2 in. MNPT, CPVC
9550179	O-ring, EP rubber, for 2001990
23242-02	Mounting adapter, 1-1/2 in. MNPT insertion, 1 in. FNPT conduit connection, PEEK
33081-00-99SQ7091A	Adapter insert, Tefzel, for 23242-02
33081-00	Adapter insert, PEEK, for 23242-02
23242-03	Mounting adapter, 1-1/2 in. MNPT insertion, 3/4 in. FNPT conduit connection, PEEK
33080-01-99SQ7182	Adapter insert, Tefzel, for 23242-03
23277-01	Mounting adapter, Foxboro, PEEK, 5/8 11 UNC
23277-01-99SQ7182	Mounting adapter, Foxboro, Tefzel, 5/8 11 UNC
33075-00	Viton gasket for option 20
33075-03	Kalrez gasket for option 20
9200276	Extension cable, unprepped
9340065	1-1/2 in. FNPT full port ball valve for use with retraction assemblies