

6320 SureSense™ Capacitance Propane Level Sensor

BLE output sensor and capacitance probe for use with high pressure propane tanks



The 6320 SureSense™ Capacitance level sensor measures liquid level in a propane tank without relying on a mechanical system. The capacitive technology used in the 6320 removes any moving parts inside the tank eliminating interference between the sensor, tank wall, and other components. The replaceable electronics module is battery powered and provides a periodic BLE broadcast output and a visual digital readout. These options not only allow users to read the tank level in person but enable telemetry units to connect and monitor the level as well. The device conforms to typical IECEX/ATEX/UKEX/CSA safety requirements for use in Class 1 Division 1 (Zone 0) hazardous locations.

The electronics module is designed to support a 10-year battery life and can be replaced at the end of its service interval. The probe inside the tank is permanently mounted and left in place when the electronics module is replaced. The electronics module is not user serviceable.

Users may wish to check the level in person. The 6320 includes a digital readout of the level on an LCD. The LCD never shuts off and is automatically updated anytime the sensor reads a new level. Some sensor status information is displayed on the LCD as well to assist the user in maintaining their propane level.

Wireless operation simplifies installation and eliminates common issues with cable connection and cable damage. A broadcast occurs every 2.2 seconds so telemetry units can scan at any time and get the latest level and sensor status. The status will indicate things such as errors and low or high warnings. Estimated battery life is included in the broadcast and can be used to create an estimated battery percentage.

The Rochester 6320 supports OTA (Over the air) firmware updates via the Bluetooth interface.

Application

The Rochester 6320 Suresense™ Capacitance Propane Level Sensor is a versatile sensing unit with no moving parts. A new level reading is acquired every 90 seconds and will update the LCD and BLE broadcast on the fly. The LCD is available on demand, while the BLE broadcast operates on a 2.2 second cadence. The capacitive sensing element is permanently installed into the tank and the calibration data for the unit is stored inside it. Replacing the electronics is simple and can be performed when the battery is consumed without the user needing to perform any set up or calibration to use the system.

- Wide Temperature Range: -40°C to +80°C
- Probe Assembly
 - No moving parts
 - Excellent accuracy especially at low tank levels
 - Mechanically robust, designed for the rigors of transporting and setting tanks & cylinders
 - Sensor mounting options include 4-bolt and various NPTF adapter sizes
 - Patented probe seal – designed to prevent content leakage under extreme conditions

E. & O.E. ©Rochester Sensors.

Since the suitability of these products depends upon a wide range of factors not in our control, Rochester Sensors expects and understands that you conduct the testing and evaluation necessary to determine that these products are suitable for your application. While every effort is made to ensure the above details are correct at the time of printing, Rochester Sensors reserves the right to make material changes, and or technical changes without notification.

General Information and Features

- Polycarbonate housing offers excellent mechanical properties, UV and chemical resistance
- No exposed sensing elements, all components are located on the PCB inside the housing
- Housing: IK9 impact rating
- Ingress Protection: IP69K9 rated

Key Benefits

- BLE broadcast for simple and robust communications
- Fast installation time
- Easy to read digital display shows tank volume in 1% increments
- Rugged plastic housing
- 1" NPTF threaded connection to tank standard. Contact your local Rochester Sensors sales team for additional mounting options.

LCD OUTPUT

LCD Status Indicators

The 6320 sensor is equipped with a 2-digit 7-segment LCD display. The LCD will show the level in 1% increments and status codes to indicate different sensor conditions. Some status codes are considered errors while some are considered warnings. Refer to each code for an expected system behavior. Refer to Appendix A for all system errors and warnings.

LCD OUTPUT	DESCRIPTION
	nC: Electronics are not connected to probe. The level will be set to 0% and alternate with this code. Typically, will be seen when a replacement unit is shipped without a probe attached, but may indicate a physical issue has developed on a previously working system.
	bL: Battery Low. Battery is estimated to be within 1-2 years of expected end of life. The measured level will alternate on the LCD with this code.
	bC: Battery Critical. Battery is estimated to be < 1 year of expected end of life. The measured level will alternate on the LCD with this code.
	Er: Device Error. Device is not functioning correctly, and electronics should be replaced. The level will be set to 0% and alternate with this code.
	Lo: Low Low Warning. Tank level is below sensor operating range. This is the typical value for a newly installed probe in a tank that has not been filled.

E. & O.E. ©Rochester Sensors.

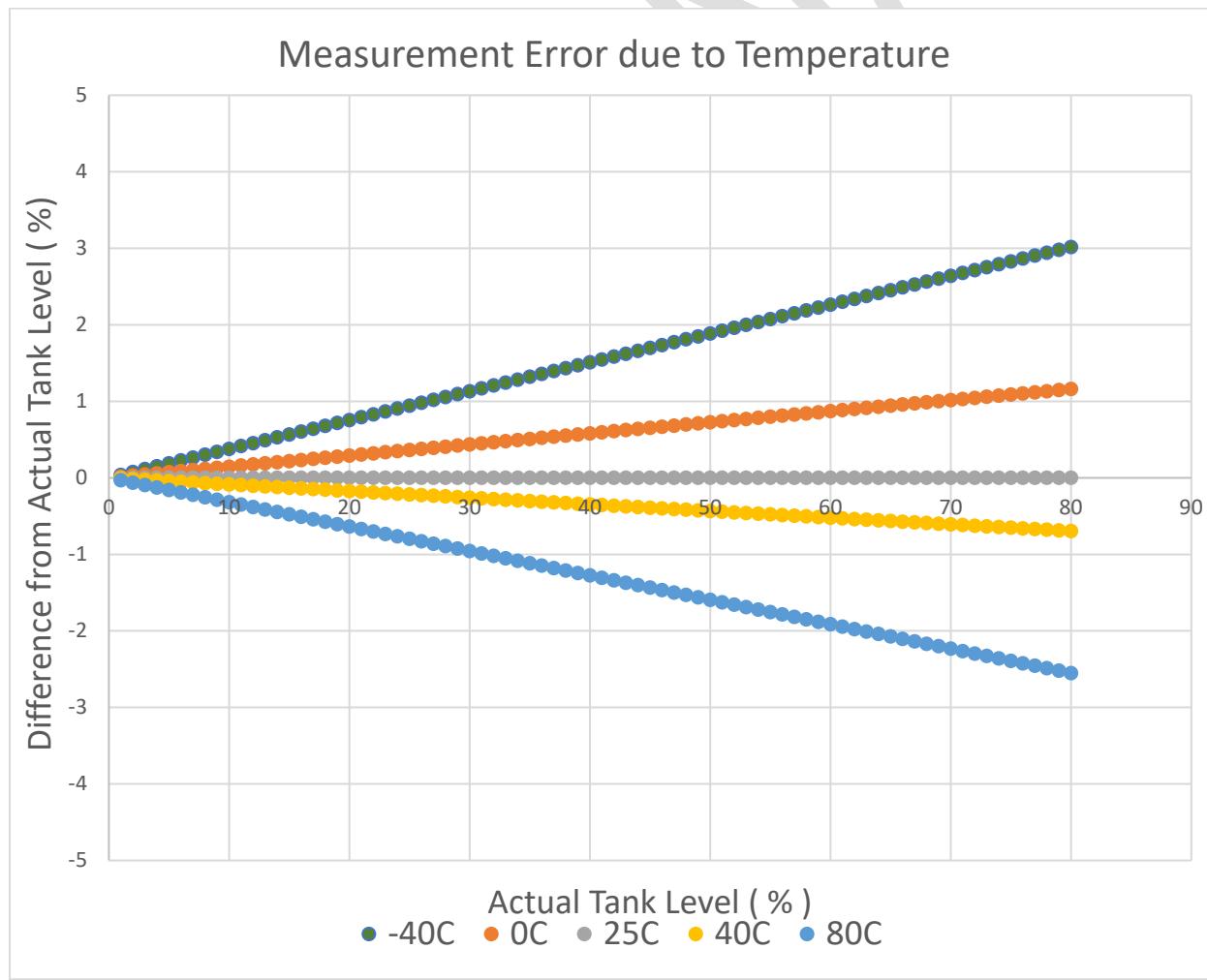
Since the suitability of these products depends upon a wide range of factors not in our control, Rochester Sensors expects and understands that you conduct the testing and evaluation necessary to determine that these products are suitable for your application. While every effort is made to ensure the above details are correct at the time of printing, Rochester Sensors reserves the right to make material changes, and or technical changes without notification.



Hi: High High Warning. Tank level is above sensor operating range.

Effect of Temperature on Measurements

Changes in ambient temperature cause a corresponding change in density of propane. This change will manifest as an error in reported tank value. The relative change in density and the change in dielectric constant act in opposite directions causing much of the temperature change to be automatically compensated out when compared to a traditional float gauge. Figure 3 shows a chart showing the difference in reported level from actual level. The horizontal axis is the actual level in the tank from 0 to 80% and the vertical axis shows the error in the reported value as a percentage of tank level. The reference temperature for the plot is 25°C and varying temperatures from -40°C to 80°C are plotted.



E. & O.E. ©Rochester Sensors.

Since the suitability of these products depends upon a wide range of factors not in our control, Rochester Sensors expects and understands that you conduct the testing and evaluation necessary to determine that these products are suitable for your application. While every effort is made to ensure the above details are correct at the time of printing, Rochester Sensors reserves the right to make material changes, and or technical changes without notification.

Figure 3. Temperature effect on measurement

PRELIMINARY

E. & O.E. ©Rochester Sensors.

Since the suitability of these products depends upon a wide range of factors not in our control, Rochester Sensors expects and understands that you conduct the testing and evaluation necessary to determine that these products are suitable for your application. While every effort is made to ensure the above details are correct at the time of printing, Rochester Sensors reserves the right to make material changes, and or technical changes without notification.

Effect of Propane Blend on Measurements

Changes in the blend of propane and butane cause a corresponding change in the density and dielectric constant of the resulting fluid. This change will manifest as an error in reported tank value. Figure 4 shows the resulting error with 3 different propane/butane blends: 0% butane, 5% butane and 10% butane. The actual tank level is shown on the horizontal axis and the error from actual level is shown on the vertical axis.

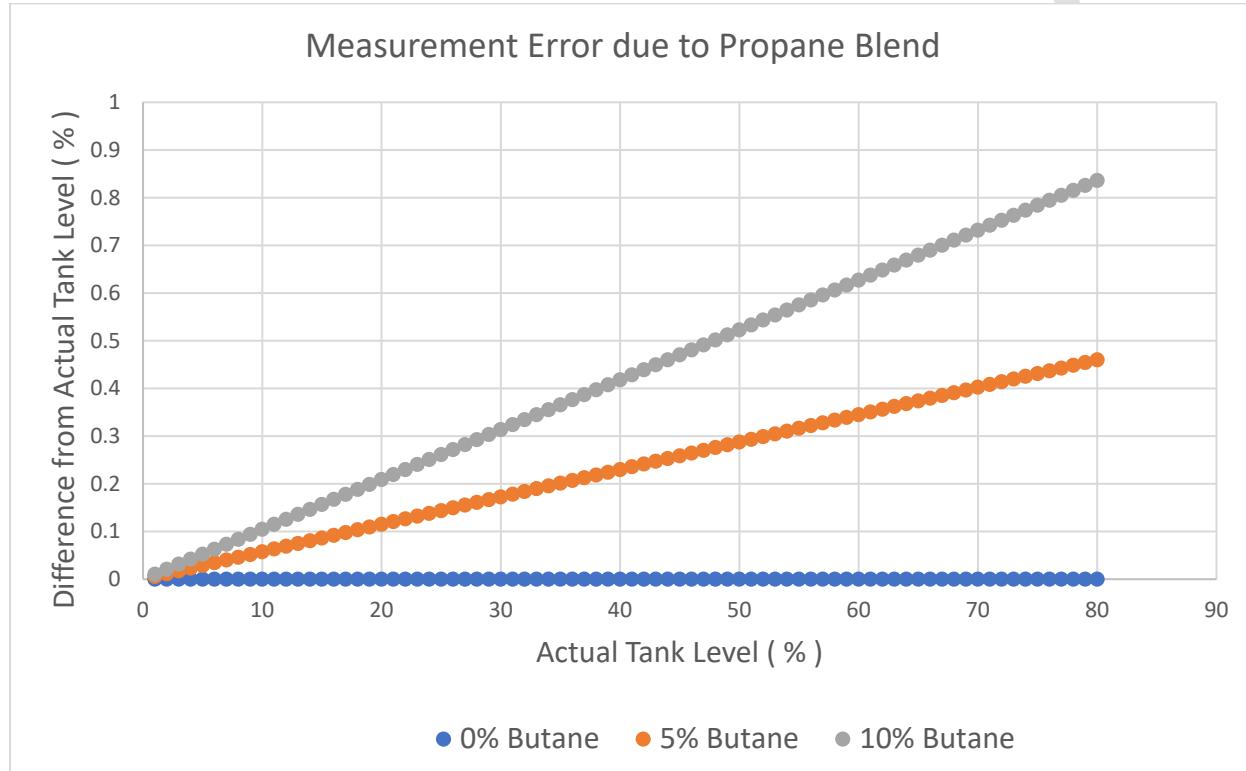


Figure 4. Propane Blend effect on measurement

BLE Output

Broadcast protocol

PACKET TYPE 0x0101 TELEMETRIC PACKET 2.2sec INTERVAL		
Bytes	Payload Contents	Description
0	Flag 0	BLE Protocol Specified
1	Flag 1	BLE Protocol Specified
2	Flag 2	BLE Protocol Specified
3	Length	0x14
4	Type Flag (0xFF)	Manufacturer Specific Data
5	MM – Byte 0	0x0C – RS ID from bluetooth.com
6	MM – Byte 1	0x7F – RS ID from bluetooth.com
7	Byte 1 RS device name	R
8	Byte 2 RS device name	O
9	Byte 3 RS device name	S
10	Byte 4 RS device name	0x63
11	Byte 5 RS device name	0x20
12	0x01 (identification of content type)	LSB
13	0x01 (identification of content type)	MSB
14	Status ¹	See status table
15	RAW DATA TYPE	0x00 = %
16	RAW DATA LSB ²	
17	RAW DATA MSB ²	
18	Reserved	
19	Battery LSB	(MSB LSB)/(0xFFFF) = % Battery remaining
20	Battery MSB	
21	Reserved	
22	Reserved	
23	Version	0x0A – 0x0F

Note 1: See Appendix for status values

Note 2: Possible values 0x01E – 0x3CA (3%-97%) in 0.1% per bit increments

Product Certification

E. & O.E. ©Rochester Sensors.

Since the suitability of these products depends upon a wide range of factors not in our control, Rochester Sensors expects and understands that you conduct the testing and evaluation necessary to determine that these products are suitable for your application. While every effort is made to ensure the above details are correct at the time of printing, Rochester Sensors reserves the right to make material changes, and or technical changes without notification.

Rochester Sensors 6320 units are certified as intrinsically safe for Class 1, Division 1, Groups C & D (Zone 0) hazardous locations. Products are marked and approved by ETL, ATEX, UKCA, and CE. Certification and testing have been performed to the following standards:

Ordinary Locations Safety Standards	
Conforms to UL STD 61010-1 Ed.3	Electrical Equipment for Measurement, Control, and Laboratory Use; Part1: General Requirements *Note: for USA ordinary locations listing certification
Certified to CSA STD C22.2 #61010-1-12 Ed.3	Electrical Equipment for Measurement, Control, and Laboratory Use; Part1: General Requirements *Note: for Canada ordinary locations listing certification
UL 565 Revision 6	Pending
EN 13799:2022	Pending
Hazardous Locations Safety Standards	
IEC 60079-0: 2017	Explosive atmospheres – Part 0: Equipment – General requirements *Note: For IECEx Certification
EN 60079-0: 2011 + C1: 2012	Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i” *Note: For IECEx Certification
EN 60079-0: 2018	Explosive atmospheres – Part 0: Equipment – General requirements *Note: For ATEX Certification
EN 60079-0: 2012	Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i” *Note: For ATEX Certification
UL 60079-11, 6th Ed., Issued 03/26/2019	Explosive atmospheres – Part 0: Equipment – General requirements *Note: For USA listing Certification
UL 60079-11, 6th Ed., Revised 03/28/2014	Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i” *Note: For USA listing Certification
CSA C22.2 No. 60079-0: 2011	Explosive atmospheres – Part 0: Equipment – General requirements *Note: For Canada listing Certification
CSA C22.2 No. 6009-11: 2011	Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i” *Note: For Canada listing Certification

E. & O.E. ©Rochester Sensors.

Since the suitability of these products depends upon a wide range of factors not in our control, Rochester Sensors expects and understands that you conduct the testing and evaluation necessary to determine that these products are suitable for your application. While every effort is made to ensure the above details are correct at the time of printing, Rochester Sensors reserves the right to make material changes, and or technical changes without notification.

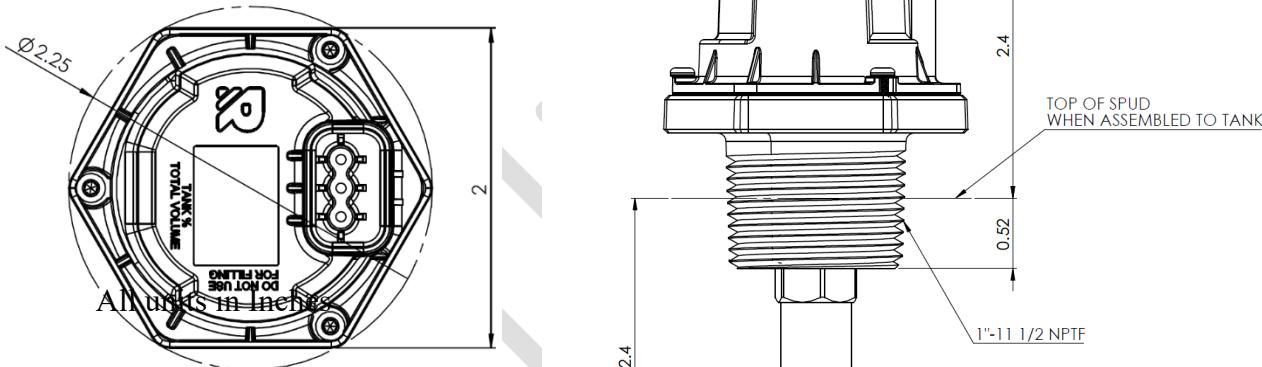
Environmental Ratings

Parameter	Condition	Min	Typical	Max	Unit
Operating & Storage Temperature Range	Temperature Range	-40	-	80	°C
Module Accuracy		-	<1%	-	Level

Environmental Testing

Test	Condition
UV withstand	600 hrs, UVA-340 @.76W/m ² , 70°C
VIBRATION	Mil STD-810: 5 Hz, 12.7mm amplitude, 1G, 45 minutes

Dimensions



Ordering Information

Contact your local sales representative for samples, availability, and pricing information

Part Numbers

- 6320-01001 420 lb Vertical Tank
- 6320-01002 Horizontal tanks
- 6320-01001-EU 420 lb Vertical Tank with European Union level indications
- 6320-01002-EU Horizontal tanks with European Union level indications

Installation

See Document DS-02043

E. & O.E. ©Rochester Sensors.

Since the suitability of these products depends upon a wide range of factors not in our control, Rochester Sensors expects and understands that you conduct the testing and evaluation necessary to determine that these products are suitable for your application. While every effort is made to ensure the above details are correct at the time of printing, Rochester Sensors reserves the right to make material changes, and or technical changes without notification.

FCC Interference statement (Part 15.19)(a)(3)

This device complies with part 15 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.

FCC Interference Statement — PART 15.105 (B)

Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

ISED Canada compliance statement

This device complies with ISED Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'ISDE Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

E. & O.E. ©Rochester Sensors.

Since the suitability of these products depends upon a wide range of factors not in our control, Rochester Sensors expects and understands that you conduct the testing and evaluation necessary to determine that these products are suitable for your application. While every effort is made to ensure the above details are correct at the time of printing, Rochester Sensors reserves the right to make material changes, and or technical changes without notification.

Appendix A

<i>System Conditions</i>	<i>BLE STATUS BYTE</i>	<i>BLE BROADCAST LEVEL</i>	<i>LCD OUTPUT</i>	<i>Description</i>
Normal	0x0	Level	Level	Normal Operation
Tank Level < 5%	0x2	Level		Measurement Low Low Warning <ul style="list-style-type: none"> • LCD displays static "Lo" • Typical value for new tanks before initial propane fill
Tank Level < 10%**	0x6	Level		Measurement Low Warning <ul style="list-style-type: none"> • LCD displays alternating "Lo" and level
Tank Level > 85%	0x7	Level		Measurement High Warning <ul style="list-style-type: none"> • LCD displays alternating "HI" and level
Tank Level > 95%	0x3	Level		Measurement High High Warning <ul style="list-style-type: none"> • LCD displays static "HI"
NOT CONNECTED	0x4	0		nC: Electronics are not connected to probe. The level will be set to 0% and alternate with this code.
Device Error	0x1	0		Er: Device error. Device is not functioning correctly and electronics should be replaced. The level will be set to 0% and alternate with this code.
Battery Low	0x0	Level		bL: Battery low. Battery is estimated to be within 1-2 years of expected end of life. The measured level will alternate on the LCD with this code plus any level warning codes (if any).
Battery Critical	0x0	Level		bC: Battery critical. Battery is estimated to be < 1 year of expected end of life. The measured level will alternate on the LCD with this code plus any level warning codes (if any)

E. & O.E. ©Rochester Sensors.

Since the suitability of these products depends upon a wide range of factors not in our control, Rochester Sensors expects and understands that you conduct the testing and evaluation necessary to determine that these products are suitable for your application. While every effort is made to ensure the above details are correct at the time of printing, Rochester Sensors reserves the right to make material changes, and or technical changes without notification.

** For EU products the LO warning level is 20%

PRELIMINARY

E. & O.E. ©Rochester Sensors.

Since the suitability of these products depends upon a wide range of factors not in our control, Rochester Sensors expects and understands that you conduct the testing and evaluation necessary to determine that these products are suitable for your application. While every effort is made to ensure the above details are correct at the time of printing, Rochester Sensors reserves the right to make material changes, and or technical changes without notification.

Capacitive Propane Sensor: 6320 family

DS-02043-scheduled_drawing

The 6320 Capacitive Propane Sensor is designed to read liquid levels in propane cylinders without any moving parts unlike many traditional sensors. The capacitive sensing element inside the tank is coupled to a out-of-tank electronics to read the level and transmit either wirelessly over Bluetooth or through a voltage output cable connection. The electronics module includes an integrated LCD display showing tank volume in % full.

The electronics module is battery operated and fully sealed. It is mounted on top of the mechanical sensor and sealed from the environment with an o-ring and plastic housing. Electrical connections to the mechanical sensor are connected at the joint between the module and the mechanical sensor.

The electronics module has a optional cable connection allowing a voltage to be read from the module to represent tank level.

The electronics module is fully sealed and not serviceable. The module can be replaced when the battery life is reached. The battery is non-replaceable.

The Sensor is suitable for field applications including high pressure washing systems.

General Information & Features

- Temp Range Static: -40°C to +80°C
- Ingress Protection: IP66, IP69K Rated
- System Accuracy: +/- 1%
- LCD display wakes on command
- Optional bluetooth data broadcast every 2.2 seconds
- Operational Life Span: Up to 10 Years
- Operational Range: Over 50FT
- See SD-588 for entity parameters.

Electronics Module Installation Instructions

These instructions are made to assist tradesmen and others generally familiar with liquid storage tank equipment. Most consumers are not qualified to perform the installation described herein. If you have any question concerning installation or operation of this product, contact Rochester Gauges LLC or one of our authorized distributors for assistance. The sensing element inside the tank is not intended to be replaced or serviced and should only be replaced by qualified personnel trained in safe handling of propane.

1. Disconnect the existing cable if installed.
2. Unscrew the mounting screws from the module.
3. Gently pull the module up to remove it from the mechanical sensor.
4. Clean any debris or liquid on the mechanical sensor with a dry cloth.
5. If the dielectric grease shows sign of dirt, remove with a dry cloth.
6. Remove the new module from the shipping container.
7. Optionally lubricate the o-ring with jet-lube or similar o-ring lubricant.
8. Optionally apply the enclosed dielectric grease to the permanent PCBA cavity
9. Place the new module in the keyed orientation and gently press down to install and seat the o-ring.
10. Install the screws and tighten to 2 in-lb with hand tools only
11. Dispose of the old electronics according to location standards for metal and electronic disposal.
12. Confirm the LCD level reads the correct value (if known).
13. The installer may optionally verify the BLE dial is broadcasting over Bluetooth. Refer to the Manufacturer's instructions on parsing BLE broadcast packets.
14. Equipment is intended for fixed and grounded installation only.

Tank grounding

For applications where the 6320 Capacitance Sensor is connected to a line-powered telemetry unit, the tank must be connected to earth ground to avoid any floating voltage potentials or circulating earth currents..

If the 6320 Capacitance Sensor is connected to a battery-powered telemetry unit, best practice would be to connect the tank to earth ground to minimize any possible effects of mis-wiring or unforeseen cable damage.

For applications where the 6320 Capacitance Sensor is not connected to a telemetry system and only the wireless connection is used, no additional earth grounding is required since the 6320 Capacitance Sensor is battery powered internally.

DS-02043
SCHEDULED DRAWING
Revision A, 12 July 2023

Customer Service, Toll Free (888) 723-5549
Rochester Gauges LLC
1025 S Beltline Road, Coppell, TX

WARNINGS:

Tank may contain high pressure and flammable gas.

These units are not meant to be repaired or serviced. Doing so will void the intrinsically safe rating of the device.

The product is a sealed unit and is never meant to be opened or modified in any way. Doing so will invalidate all certifications and safety listings.

Safety Specifications

▪ WARNING - POTENTIAL ELECTROSTATIC CHARGING HAZARD

Caution must be used when handling or cleaning products so there is no static charge buildup. Do not wipe off the 6320 Capacitance Sensor with dry cloth. Use only water damp cloth and allow to air dry for cleaning device. Do not use or install in high charge areas. See IEC60079-32-1 for further information.

▪ AVERTISSEMENT - RISQUE DE CHARGE ÉLECTROSTATIQUE POTENTIEL

Il faut être prudent lors de la manipulation ou du nettoyage des produits afin qu'il n'y ait pas d'accumulation de charge statique. N'essuyez pas le capteur avec un chiffon sec. Utilisez uniquement un chiffon humide et laissez sécher à l'air pour nettoyer l'appareil. Ne pas utiliser ou installer dans des zones de charge élevée. Voir IEC 60079-32-1 pour plus d'informations.

DS-02043

SCHEDULED DRAWING

Revision A, 12 July 2023

Customer Service, Toll Free (888) 723-5549

Rochester Gauges LLC

1025 S Beltline Road, Coppell, TX

Ordinary Locations Safety Standards	
Conforms to UL STD 61010-1 Ed. 3	Electrical Equipment for Measurement, Control, and Laboratory Use; Part 1: General Requirements *Note: For USA ordinary locations listing certification
Certified to CSA STD C22.2 #61010-1-12 Ed.3	Electrical Equipment for Measurement, Control, and Laboratory Use; Part 1: General Requirements *Note: For Canada ordinary locations listing certification
Hazardous Locations Safety Standards	
IEC 60079-0: 2017	Explosive atmospheres - Part 0 Equipment - General requirements *Note: For IECEx Certification
IEC 60079-11: 2011 + C1: 2012	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i" *Note: For IECEx Certification
IEC 60079-25: 2010 Ed 2.	Explosive atmospheres – Part 25: Intrinsically safe electrical systems *Note: For IECEx Certification
EN 60079-0: 2018	Explosive atmospheres - Part 0: Equipment - General requirements *Note: For ATEX Certification
EN 60079-11:2012	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i" *Note: For ATEX Certification
IEC 60079-25: 2010 Ed 2.	Explosive atmospheres – Part 25: Intrinsically safe electrical systems *Note: For ATEX Certification
Conforms to UL 60079-0, 7 th Ed.	Explosive atmospheres - Part 0: Equipment - General requirements *Note: For USA listing certification
Conforms to UL 60079-11, 6 th Ed.	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i" *Note: For USA listing certification
Certified to CSA C22.2 No. 60079-0: Ed. 4	Explosive atmospheres - Part 0: Equipment - General requirements *Note: For Canada listing certification
Certified to CSA C22.2 No. 60079-11: Ed. 2	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i" *Note: For Canada listing certification

DS-02043

SCHEDULED DRAWING

Revision A, 12 July 2023

Customer Service, Toll Free (888) 723-5549

Rochester Gauges LLC

1025 S Beltline Road, Coppell, TX

MATERIAL:	SCHEDULED DRAWING	N/A	WEIGHT: LBS.															
HAZARDOUS (CLASSIFIED) LOCATION		NON-HAZARDOUS LOCATION																
CLASS I, DIVISION 1, GROUPS C & D, T4																		
CLASS I, ZONE 0, AEx ia IIB T4 Ga																		
Ex ia IIB Ga																		
Ex II 1 G Ex ia IIB T4 Ga																		
-40°C ≤ Tamb ≤ +80°C																		
CAPSENSE TRANSMITTERS * SEE NOTE 5 FOR NOMENCLATURE																		
NOTES:																		
1. INTRINSICALLY SAFE DEVICES ENTITY PARAMETERS:																		
<table border="1"> <thead> <tr> <th colspan="3">Entity Parameter Set #1</th> </tr> <tr> <th>Total</th> <th>Input</th> <th>Output</th> </tr> </thead> <tbody> <tr> <td>Ui=7.8V</td> <td>7.8</td> <td>7.8</td> </tr> <tr> <td>Il = 510 mA</td> <td>425</td> <td>85</td> </tr> <tr> <td>Pi = 452mW</td> <td>370</td> <td>172</td> </tr> </tbody> </table>			Entity Parameter Set #1			Total	Input	Output	Ui=7.8V	7.8	7.8	Il = 510 mA	425	85	Pi = 452mW	370	172	
Entity Parameter Set #1																		
Total	Input	Output																
Ui=7.8V	7.8	7.8																
Il = 510 mA	425	85																
Pi = 452mW	370	172																
2. CABLE CAPACITANCE (Cc) PLUS INTRINSICALLY SAFE EQUIPMENT CAPACITANCE (Ci) MUST BE LESS THAN THE MARKED CAPACITANCE (Ca) AND CABLE INDUCTANCE (Lc) PLUS INTRINSICALLY SAFE EQUIPMENT INDUCTANCE (Li) MUST BE LESS THAN THE MARKED INDUCTANCE (La) SHOWN ON ANY SAFETY BARRIER. SEE NOTE 4.																		
3. IF THE ELECTRICAL PARAMETERS OF THE CABLE ARE UNKNOWN, THE FOLLOWING VALUES MAY BE USED:																		
(Cc) CAPACITANCE: 60 pF/ft																		
(Lc) INDUCTANCE: 0.20 µH/ft																		
4. MAX CABLE LENGTH 20 FEET																		
5. I.S. EQUIPMENT BARRIER																		
$Um \leq Um$ $Im \leq Im$ $Pmax \leq Po$ $Ci + Cc \leq Ca$ $Li + Lc \leq La$																		
REV A	CHANGE DESCRIPTION NEW RELEASE	ECO #	DATE 12/14/22	REV	CHANGE DESCRIPTION	ECO #	DATE	REV	CHANGE DESCRIPTION	ECO #	DATE							
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF ROCHESTER SENSORS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT WRITTEN PERMISSION OF ROCHESTER SENSORS IS PROHIBITED.			TOLERANCES NOT SHOWN 2 PLC 3 PLC FRAC. ANGLES ±.010" ±.005" ±1/64" ±1"		SUPERSEDES	ECO #	DRAWN BY HL	DATE 12/14/22	USED ON									
		SCALE 1:5	DESCRIPTION INTRINSIC SAFETY CONTROL DRAWING FOR CAP SENSE TRANSMITTER				DRAWING NUMBER SD-588		REV A	SIZE A	SHEET 1 OF 1							

Rochester Sensors, LLC 6320 Capacitance Sensor does not require any external connections or sources of power. The Sensor device is certified as complete intrinsic safety system (Reference Intrinsic Safety Control Drawings SD-588). Device is intended for use in Class I, Division 1, Groups C and D, T4 or Zone 1, Group IIB, T4 Hazardous Locations under the certification schemes and ratings noted below:

DS-02043

SCHEDULED DRAWING

Revision A, 12 July 2023

Customer Service, Toll Free (888) 723-5549

Rochester Gauges LLC

1025 S Beltline Road, Coppell, TX

<i>IECEx (Global Certification):</i> Ex ia IIB T4 Ga -40°C ≤ T _{AMB} ≤ +80°C	<i>ATEX (EU Certification):</i> CE ₂₉₀₃ II 1G Ex ia IIB T4 Ga -40°C ≤ T _{AMB} ≤ +80°C	<i>North America (USA & Canada):</i> Class I Zone 0 AEx ia IIB T4 Ga Class I, Division 1, Groups C & D, T4 Ex ia IIB T4 Ga -40°C ≤ T _{AMB} ≤ +80°C	<i>United Kingdom (UK):</i> UKCA ₀₃₅₉ II 1G Ex ia IIB T4 Ga -40°C ≤ T _{AMB} ≤ +80°C
IECEx Cert # IECEx ETL 23.0024X	ATEX Cert # ETL23ATEX0298X	CSA Cert # ETL23CA105370757X	UKEX Cert# ITS23UKEX0720X

CE Compliance section:

A. Electromagnetic Compatibility

1. EN 61000-6-2:2005 - Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments IEC 61000-6-2:2005
2. EN 61000-6-4:2007 - Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments IEC 61000-6-4:2006

B. Restriction of hazardous substances in electrical and electron equipment

1. EN 50581:2012 - Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

IEC 60079-0 Compliance section:

1. This device does not comply with IEC 60079-0 Clause 8.3 for compliance with the amount in total of < 10% aluminum, magnesium, titanium and zirconium. The user of this equipment is required to take steps to avoid ignition hazards due to impact or friction.

Special Conditions of Use:

1. Equipment is intended for fixed and grounded installation only.
2. Potential Electrostatic Charging Hazard - See Instructions.
3. The device contains an internal battery that cannot be changed by the user.
4. Equipment contains metallic parts with material Brass and Aluminum. For EPL Ga, the material composition is greater than 10 % in total of aluminum, magnesium, titanium and zirconium, with more than 7,5 % in total of magnesium, titanium and zirconium. The end user shall conduct an ignition hazard

DS-02043

SCHEDULED DRAWING

Revision A, 12 July 2023

Customer Service, Toll Free (888) 723-5549

Rochester Gauges LLC

1025 S Beltline Road, Coppell, TX

assessment to ensure that the equipment does not pose an impact or friction ignition hazard prior to installation in the explosive atmosphere.

5. The product has a capacitance average 121nF on Outer Electrode tube, 113nF on Propane Head, 103.66nF on Compression nut and 85.66nF on screws which are in excess of 3pF and may pose electrostatic charging hazard. All metal parts of product must be connected to ground through $< 1G\Omega$ impedance or the user must determine the suitability for the specific application.
6. Equipment does not provide a dielectric isolation of 500 Vrms between the circuit inputs and the metallic frame. Care shall be taken to avoid circulating earth currents and potential floating voltages. Refer to the user installation manual for guidance on safe installation.