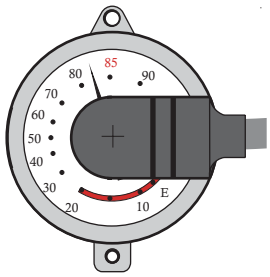
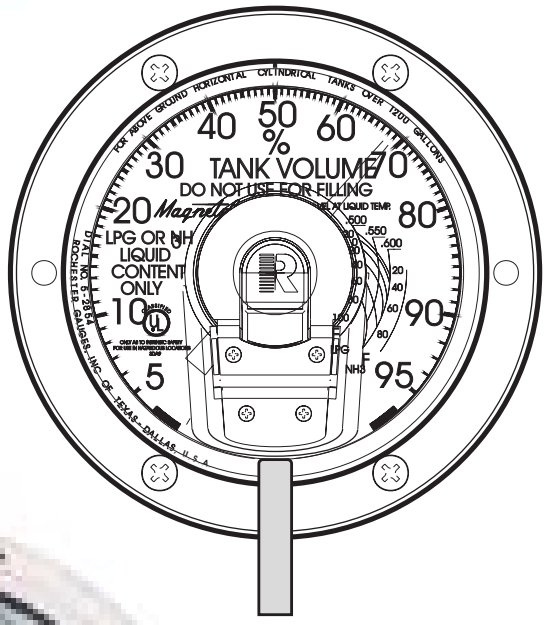
HALL EFFECT TWINSITE SENSOR (6320S**07**)





INSTRUCTION MANUAL

June 06

ROCHESTER GAUGES INTERNATIONAL S.A.
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HALL EFFECT TRANSMITTER MODEL NUMBER & FEATURES

MODEL NUMBER	DESCRIPTION	DIAL SIZE	CABLE WIRES COLOUR CODES				CABLE		BASED ON TWINSITE NUMBER	APPLICATION
6320S…			SUPPLY	SIGNAL	GROUND	SHIELD	SIZE	LENGTH		
01078C	H.E. Tr 8" 5V 3-97% C	8"	Brown	Black	Blue	no	0.5²	8M	5AANS02086	On Centerline Mount Magnetel, only for level information
01078X	H.E. Tr 8" 5V 3-97% X	8"	Brown	Black	Blue	no	0.5²	8M	5AANS02086	On Straddleline Mount Magnetel, only for level information
31078C	H.E. Tr 4" Magn 5V C	4"	Brown	Black	Blue	no	0.5²	8M	5AANS02086	On Centerline Mount Magnetel, only for level information
31078X	H.E. Tr 4" Magn 5V X	4"	Brown	Black	Blue	no	0.5²	8M	5AANS02086	On Straddleline Mount Magnetel, only for level information
41074E	H.E. Tr 4" SR 5V 4M	SR 4"	Brown	Black	Blue	no	0.5²	4M	5AANS02086	On 6290 SR 4" gauges, only for level information
71072E	H.E. Module for R³D 2M	no	White	Green	Brown	no	0.25²	2M	5909S02772	On R³D JR dial, only for level information
81072E	Tr H.E. JR 5V 2M	JR	Brown	Black	Blue	no	0.5²	2M	5883S02714	On JR gauges, only for level information
82072E	Tr H.E. JR 5V 2M Sh	JR	White	Green	Brown	yes	0.75²	2M	5ABYS02714	On JR gauges, for level information and tank control
91072E	Tr H.E. SR 5V 2M	SR	Brown	Black	Blue	no	0.5²	2M	5952S02714	On JR gauges, only for level information
92072E	Tr H.E. SR 5V 2M Sh	SR	White	Green	Brown	yes	0.75²	2M	5ACAS02714	On SR gauges, for level information and tank control
none	RGInc Dallas wiring	all	Red	Green	Black	no	18 AWG		All type	Just for concordance with US documentation

NOTES:

- On request, other cable length is available (last model number numeral).
- Customer has to check the transmitter compatibility with his application and receiver.
- When located in Hazardous Area, the transmitter has to be powered by an Intrinsically Safe Power Supply (see WD-566.BE).
- Voltage power supply is 5VDC (3.5 to 6VDC). Others voltage (4V or 3V) on request (see page 11).
- The basis TwinSite Hall Effect have been certified by UL for use in Hazardous Area under the certification number OERX.E225210, which refer to Rochester Gauges Inc. Control Drawing WD-566 or WD-570(R³D)
- The listed Hall Effect Transmitter have certified by ISSeP for use in Hazardous Area under the certification

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Hall Effect Transmitter
General Instructions

I) PRÉSENTATION

a) Work principle

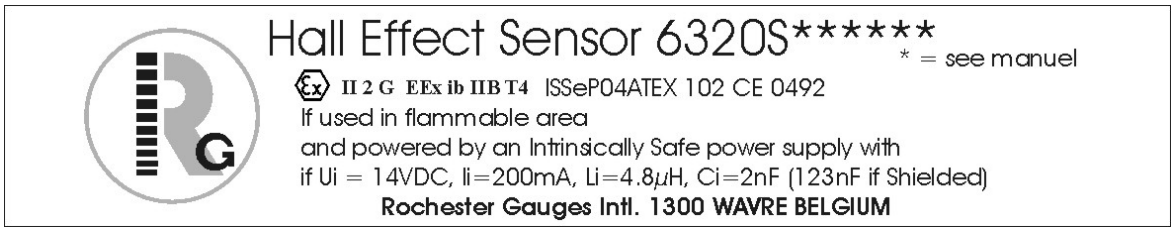
The Hall Effect Transmitter are based on the transformation of magnetic field from the specific pointer to an electrical signal proportional with the volume (in %) of the liquid inside the tank and this which is the dial size (Junior, Senior, R3D, Senior 4", Magnetel 4" or 8".
The transmitters work as Voltage divider (Vout = %Vin).

b) Certification

These sensors are compatible for use in Hazardous Area if they are powered by an intrinsically safe voltage supply with the values : Ui = 14VDC, Ii = 200mA.

!!! Ui and Ii are not the power supply and the consumption current of the sensors but the maximum admitted values for the explosion proof protection.
On the other hand Li and Ci are the inductance and the capacitance of the sensor. It is important to add them the wiring values.
They are identified by means of a sticker which recall the certification data.

Except other mentions, the power supply voltage is 5VDC +/- 1V with a nominal current of 5mA under 5VDC..



Ex	Certification following European Directive 94/9/CE ATEX.
II 2 G	Sensor for aboveground Hazardous Area with probability of gas or vapour category 2.
EEx ib	Intrinsically Safe sensor, protection made by the supply characteristics (Ui, Ii, ...).
II B	Gas group for which the sensor is safe (see list in the Norms EN 50014 et next).
T4	Maximum Sensor contact temperature (135°C)
ISSeP	Notified Body who certify the product
04	Certification year
ATEX102	Certification number
CE 0492	Notified body who certify the Product Quality Management

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II) INSTALLATION

WARNING :

- *Only authorised people are capable to work on this device.*
- *All electrical works have to be done out of power.*
- *When located in hazardous area the sensor has to be powered trough an intrinsically safe barrier compatible with the sensor parameter (see specific notice).*
- *The transmitters 6320S*1*7** are mainly dedicated for remote system with intermittently power supply or for wireless level transmission with cable no longer than 8 meters.*
- *A bad use or the use or a wrong transmitter dial could send false level reading.*

a) Electrical wiring.

Connections have to be made following the wires colour code mentioned in the model specific documentation .
In case of shielded cord it has to be connected to the protection terminal (Sh) or to the receiver Electrical Earth.
If necessary the junction box has to be waterproof and conform with the required Ex protection degree regarding its location.

b) Receiver calibration.

The check of the receiver calibration with the sensor is made by means of a metallic barrel (screw driver) located under the dial.
Par rotating of the barrel place the pointer on a low position (10%) and adjust the receiver (see receiver user's manual)
Repeat the procedure for a high position (85%).
Check the conformity of the low position and eventually repeat the procedure in order to obtain correct and stable readings

c) Dial mount.

WARNING : Never unscrew the gauge head screws or bolts

By means of a "Philips" screw driver remove the existing dial after recording of the displayed level.
By means of the metallic barrel, located the pointer on the recorded value
Located and fix the transmitter dial (see specific documentation)

III) MAINTENANCE

- These sensors and the dedicated dial don't need special maintenance.
- If necessary clean them with a sweet and wet tissue.
- The use of solvent and abrasive are prohibited.
- In case of electrical works before shut down the power supply.

The defective sensors have to be returned to the manufacturer trough the distributor accompanied by a trouble report

IV) SPECIFIC NOTICE

Into the next sheets you could find in detail the dedicated technical information regarding each sensors model (Junior, Senior, R3D, Senior 4'', Magnetel 4'' or 8'').

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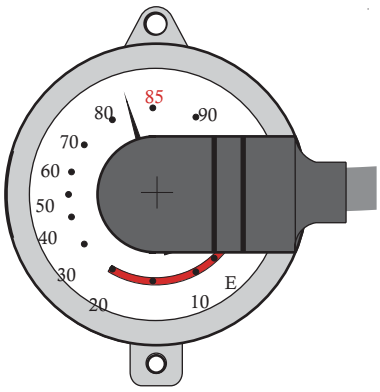
Hall Effect Transmitter
6320S**072E

General Description:

The Hall Effect Twinsite ™ transmitter is a magnetically-driven, Hall Effect, voltage output sender with potted wires and cable. Senders are utilized where direct reading plus an electrical signal to a remote level indication are required. Hall Effect is a solid state technology with no contacts. It counts on the fact that a magnet bends the path of electrons moving through a semiconductor.This bending is detected and converted into ratiometric voltage output. Many existing domestic storage tanks are equipped with weak drive magnets suited for low friction direct-indicating dial assemblies. As the Hall Effect Twinsite ™ is a contactless sensor it can be utilized for a retrofit on these vessels to provide an electrical output which can be used for remote indication of tank levels. The Hall Effect Twinsite ™ provide the easiest to read local indication by using a dial face divided into percentage units.
The case, in UV stabilized material, is hermetically sealed by ultrasonic welding and the electrical connections are sealed with epoxy chambers.



General Specifications

Accuracy: +/- 4% for all types
Hysteresys : less than 1% typical
Repetability :+/- 2%
Resolution : Infinite
Operating Temperature : -40°C à 70°C (-40°F à 176°F)
Operating Voltage range : 5VDC±0.5
With an accuracy decrease of 1 to 2%, power range can be extended at 3.5 to 6VDC
Consumption :typical 5 milliamps under 5VDC
Output Voltage : Ratiometric 8-90% of input voltage @ 8-90% volume
Ratiometric means that the output signal voltage is proportional with the input voltage (Vin)
Under 5VDC, “Empty”is 0.4V (or 8% of input voltage) 90% is 4.5V (or 90% of input voltage)

Material of Construction

Crystal and case : polycarbonate, ultrasonic sealed
Dial : painted aluminium

Warning!

If this equipment is used in a flammable area, it has to be powered by an intrinsically safe power supply.

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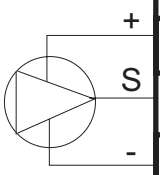
MODEL NUMBER

Supplied with a 2 meters grey cord and 3*0.5² blue (-), brown (+) & black (S) conductors, the Hall Effect Twinsite ™ Transmitters are available in two size to fit all Junior and Senior Rochester Gauges
For use with battery powered receiver wired with no more than 3 meter 3*0.5² cable, part number is
6320S*1072E with * = 8 Junior size, * = 9 Senior Size
Impedance : Ci = 2nF ; Li = 4.8µF

Supplied with a shielded grey cable and 3*0.75² brown (-), white (+) & green (S) conductors, the Hall Effect Twinsite ™ Transmitters are available in two size to fit all Junior and Senior Rochester Gauges
For use with ROCHESTER receiver CSU/M 4370S****** and Intrinsically Safe Barrier 0146-00075E wired with up to 300 meters of 3*0.75² shielded cable (Li YCY) part number is
6320S*2072E with * = 8 Junior Size, * = 9 Senior Size
Impedance : Ci = 100nF ; Li = 4.8µF

- For power supply less than 5VDC, other models available. Please contact us.

WIRING



Model	6320S *1072E	6320S *2072E
Power: 4 à 6VDC	Brown	White
SIGNAL: 0 to "Power"	Black	Green
OV (ground)	Blue	Brown

The shield has to be wired to the receiver electrical earth

APPROVAL

II 2 G EEx ib IIB T4 ISSeP04ATEX 102 CE 0492
If used in flammable area
and powered by an Intrinsically Safe power supply with
if Ui = 14VDC, Ii=200mA, Li=4.8µH, Ci=2nF (123nF if Shielded)

R3D HALL EFFECT MODULE
6320S71072E

Description

The Rochester Remote Ready Dial, R3D, is a magnetically-driven, Hall Effect compatible dial. Dials are utilized on stationary tanks equipped with gauges Serie 628* JR or SR where direct reading plus an electrical level indication are required

Rochester's Hall Effect module is designed to snap-fit in the R3D which provide a second magnetic coupling to Hall Effect Module (read also "Hall Effect Transmitter" leaflet).

General Specifications

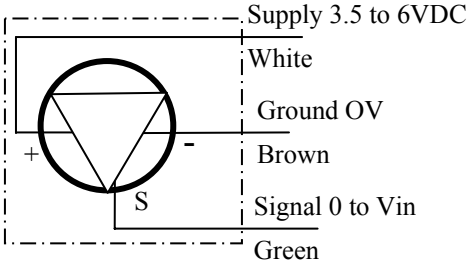
Accuracy :	±4% for all types
Hysteresis:	less de 1% typical
Repeatability:	±2%
Operating Temp:	-40°C to 80°C (-40°F to 176°F)
Voltage Supply:	5VDC nom (3.5 to 6VDC)
Consumption:	4.5mA under 5VDC typical
Impedance (typical):	Ci = 2.0nF, Li = 4.8µH
Tension de sortie:	Ratiometric: 8-80% of supply Voltage @ 8-80% volume

(Ratiometric means that the output voltage is proportional to the volume).
See « DS-1349.BE » for installation note

Output current:	±1mA	
Resolution:	Infinite	
Electrical cord:	Cable Li-YY 3x0.5²	Std Length: 2 metres, (Max 8 metres) wires white (+), brown (-), green (S)

Associated dials

Size	Application	Reference
JR	Above ground tank	5909S02733
JR	Under ground tank	5909S02799
JR	Vertical tank	5909S02772
SR	Above ground tank	5986S02733



Reference

R3D Hall Effect Module
6320S71072E

Warning

If this equipment is used in a flammable area, it has to be powered by an intrinsically safe power supply (read WD-566.be for features)

The customer has the responsibility to verify the compatibility of the transmitter with his application. This transmitter is ideal for tank level wireless remote systems but is not convenient for warning signals or valves and pumps control

Approval

Ex II 2G EEx ib IIB T4 ISSeP04ATEX102 CE 0492

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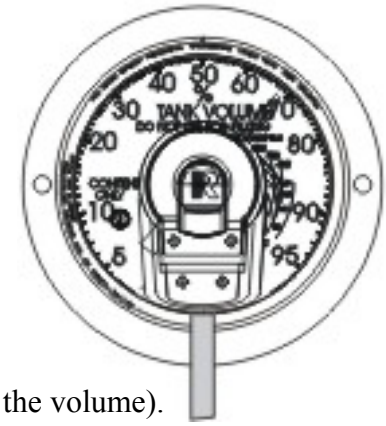
DIAL Serie 6290 SR 4"
With HALL EFFECT TRANSMITTER

Description

The dial serie 6290 SR 4 ´´ Hall Effect is a magnetically-driven, Hall Effect, voltage output sender with potted wires and cable. These dials are utilized on stationary tanks equipped with Serie 6290 4" gauges where direct reading plus an electrical level indication are required (read also "Hall Effect Transmitter leaflet")

General Specifications



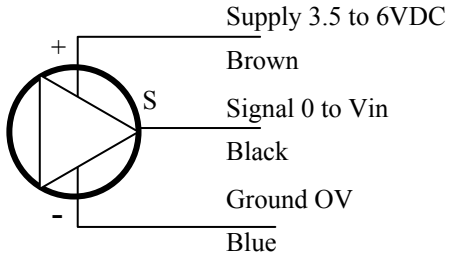
Accuracy :	±4% for all types
Hysteresis:	less de 1% typical
Repeatability:	±2%
Operating Temp:	-40°C to 80°C (-40°F to 176°F)
Voltage Supply:	5VDC nom (3.5 to 6VDC)
Consumption:	4.5mA under 5VDC typical
Impedance (typical):	Ci = 2.0nF, Li = 4.8µH
Tension de sortie:	Ratiometric: 8-80% of supply Voltage @ 8-80% volume

(Ratiometric means that the output voltage is proportional to the volume).
See « Install SR 4´´/HE » for application note

Output current:	±1mA
Resolution:	Infinite
Electrical cord:	Cable Li-YY 3x0.5² Std Length: 4 metres, (Max 8 metres) wires brown (+), blue (-), black (S)

Materials of construction

Lens:	Acrylic Plastic
Case:	Aluminium
Bezel:	Aluminium
Cable cover:	Anodized Aluminium
Sensor:	Polycarbonate



Reference

Dial 6290 SR 4´´ with Hall Effect Transmitter: **6320S41074E**

Warning

If this equipment is used in a flammable area, it has to be powered by an intrinsically safe power supply (read WD-566.be for features)

The customer has the responsibility to verify the compatibility of the transmitter with his application. This transmitter is ideal for tank level wireless remote systems but is not convenient for warning signals or valves and pumps control.

The gauge to be fitted with this dial has to be manufactured with a strong magnet. (6290 or 6293 gauges).

Approval

Ex II 2G EEx ib IIB T4 ISSeP04ATEX102 CE 0492

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MAGNETEL 4" or 8" DIAL
With HALL EFFECT TRANSMITTER

Description

The Hall Effect Magnetel dial is a magnetically-driven, voltage output sender with potted wires and cable. The dials are utilized on stationary tanks equipped with Magnetel gauges where direct reading plus an electrical level indication are required (read also "Hall Effect Transmitter" leaflet).

General Specifications

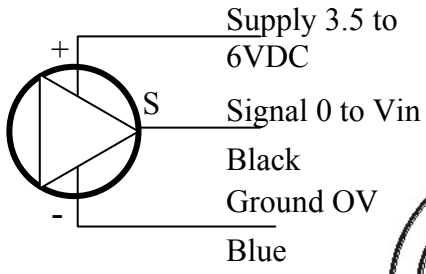
Accuracy :	±4% for all types
Hysteresis:	less de 1% typical
Repeatability:	±2%
Operating Temp:	-40°C to 80°C (-40°F to 176°F)
Voltage Supply:	5VDC nom (3.5 to 6VDC)
Consumption:	4.5mA under 5VDC typical
Impedance (typical):	Ci = 2.0nF, Li = 4.8µH
Tension de sortie:	Ratiometric: 8-80% of supply Voltage @ 8-80% volume

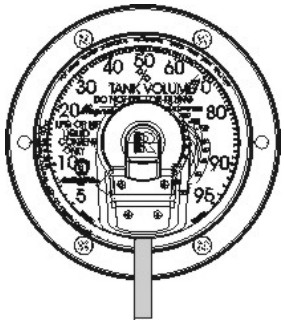
(Ratiometric means that the output voltage is proportional to the volume).
See « Install Magnetel HE » for application note

Output current:	±1mA
Resolution:	Infinite
Electrical cord:	Cable Li-YY 3x0.5² Maximum Length: 8 metres
	wires brown (+), blue (-), black (S)

Materials of construction

Lens:	Acrylic Plastic
Case:	Aluminium
Bezel:	Aluminium
Cable cover:	Anodized Aluminium
Sensor:	Polycarbonate





Reference

MAGNETEl dial with Hall Effect transmitter,

6320S a 1078 b with a = 0 for Magnetel 8'' dial
a = 3 for Magnetel 4'' dial
b = C for Center line mount
b = X for Straddle line mount

Warning

If this equipment is used in a flammable area, it has to be powered by an intrinsically safe power supply (read WD-566.be for features)

The customer has the responsibility to verify the compatibility of the transmitter with his application. This transmitter is ideal for tank level wireless remote systems but is not convenient for warning signals or valves and pumps control.

Approval

Ex II 2G EEx ib IIB T4 ISSeP04ATEX102 CE 0492

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HALL EFFECT TRANSMITTER 6320S*
Intrinsically Safe Parameters

1) **Electrical parameters**

Valid for standard models, see also next sheet

	Supply	Signal	Safety barrier
Vmax	Vin max 6VDC	Vout = 0 to Vin	Vmax 14V
Imax	Iin max 8mA	Iout max 1mA	Imax 200mA
C	Ci = 2.0 nF 123nF (6320S*2072E)	Ci = 2.0 nF 123nF (6320S*2072E)	Ca > Ci + Cc
L	Li = 4.8µH	Li = 4.8µH	La > Li + Lc

2) **Notes**

a- Selected associated apparatus or barriers must be third party approved as Intrinsically Safe for the application and have Voc and Isc not exceeding Vmax and Imax.

b- Cable capacitance (Cc) added to transmitter capacitance (Ci) must be less than the marked capacitance (Ca) and the cable inductance (Lc) added to the transmitter inductance (Li) must be less than the marked inductance (La)

c- If the cable electrical parameters are unknown, the following values may be used: Capacitance: 150pF/M Inductance : 0.7mH/Km

d- Multiple circuits extend from the same piece of intrinsically safe equipment to associated apparatus they must be installed in separated cables or in one cable which has suitable insulation (in accordance with applicable practices, rules and standards).

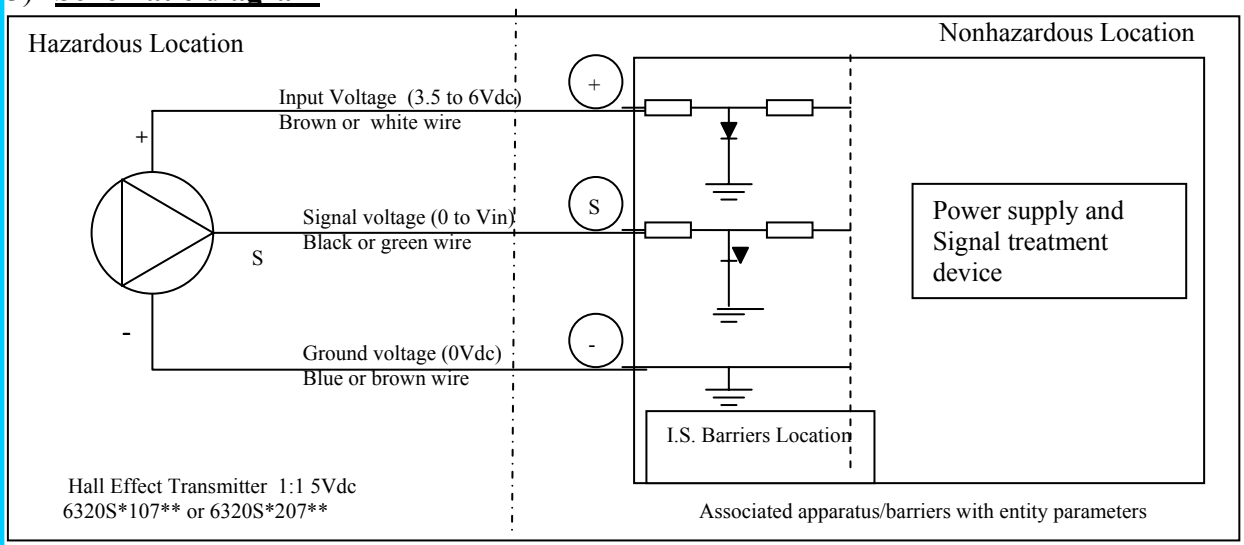
e- Barriers must ne installed in accordance with barriers manufacturer's control drawing and applicable rules and standards.

f- The maximum nonhazardous location voltage must be no greater than 250Vrms.

g- Output current must be limited by a resistor such that the output voltage-current plot is a straight line drawn between open circuit voltage and short circuit current..

h- Operating temperature : -40°C to +80°C

3) **Schematic diagram**



Ex II 2G EEx ib IIB T4 ISSeP04ATEX102 CE 0492

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Hall Effect Sensor: Electrical and Intrinsically Safety Characteristics

Ref RGi Belgium Based on Ref RGInc Dallas	Réf RGInc USA (basic sensor)	Dial Size	Cable type, Lmax	Voltage Power supply	V et I nom	Sensor Impedance	Intrinsically Power parameters	Doc ref Dallas	Cable Impedance
6320S01078C-X 5AACS02783	5AANS02086	Magn 8"	Li YY 0.5² 8M	3.5 -6V	5V, 4.5mA	Ci = 2nF Li = 4.8µH	14V 200mA	DS 1318 WD 566	Cc = 120nF/Km Lc = 0.7mH/KM
6320S31078C-X 5ABPS02854	5AANS02086	Magn 4"	Li YY 0.5² 8M	3.5 -6V	5V, 4.5mA	Ci = 2nF Li = 4.8µH	14V 200mA	DS 1318 WD 566	Cc = 120nF/Km Lc = 0.7mH/KM
6320S41074E 5978S00453	5AANS02086	SR 4"	Li YY 0.5² 8M	3.5 -6V	5V, 4.5mA	Ci = 2nF Li = 4.8µH	14V 200mA	DS 1318 WD 566	Cc = 120nF/Km Lc = 0.7mH/KM
6320S71072E 0102S00001	0102S00001	R3D	Li YY 0.25² 8M	3.5 -6V	5V, 4.5mA	Ci = 2nF Li = 4.8µH	14V 200mA	DS 1318 WD 570	Cc = 120nF/Km Lc = 0.7mH/KM
6320S81072E-H 5883S0****	5883S02714 - 2877	JR	Li YY 0.5² 50M	3.5 -6V	5V, 4.5mA	Ci = 2nF Li = 4.8µH	14V 200mA	DS 1318 WD 566	Cc = 120nF/Km Lc = 0.7mH/KM
6320S82072E 5ABYS02714	5ABYS02714	JR	Li YCY 0.75² 300M	3.5 -6V	5V, 4.5mA	Ci = 123nF Li = 4.8µH	14V 200mA	Dedicated Europe	Cc = 210nF/Km Lc = 0.7mH/KM
6320S91072E- H 5952S0****	5952S02714 - 2877	SR	Li YY 0.5² 50M	3.5 -6V	5V, 4.5mA	Ci = 2nF Li = 4.8µH	14V 200mA	DS 1318 WD 566	Cc = 120nF/Km Lc = 0.7mH/KM
6320S92072E 5ACAS02714	5ACAS02714	SR	Li YCY 0.75² 300M	3.5 -6V	5V, 4.5mA	Ci = 123nF Li = 4.8µH	14V 200mA	Dedicated Europe	Cc = 210nF/Km Lc = 0.7mH/KM
Sensor for special utilisation, on request									
6320S83072E 5992S02713	5992S02713	JR	Li YCY 0.75² 100M	3 – 4V	3.3V, 9mA	Ci = 0.45µF Li = 4.8µH	14V 200mA	DS 1369 WD 569	Cc = 210nF/Km Lc = 0.7mH/KM
6320S93072E 5ACNS02714	5ACNS02714	SR	Li YCY 0.75² 100M	3 – 4V	3.3V, 9mA	Ci = 0.45µF Li = 4.8µH	14V 200mA	DS 1369 WD 569	Cc = 210nF/Km Lc = 0.7mH/KM
6320S84072E 5961S02714	5961S02714	JR	Li YCY 0.75² 8M	2-3V	2.5V, 11mA	Ci = 2.3µF Li = 4.8µH	10V 200mA	DS 1368 WD 568	Cc = 210nF/Km Lc = 0.7mH/KM
6320S85072E 5896S02714	5896S02714	JR	Li YCY 0.75² 50M	7 – 24V	7-24V, 8mA	Ci = 0.13µF Li = 4.8µH	24V 200mA	DS 1370 WD 570	Cc = 210nF/Km Lc = 0.7mH/KM

ROCHESTER GAUGES, INC.

ISO 9001 AND QS-9000 REGISTERED

Replacing Dials

115-794

Replacing Dials

READ COMPLETELY BEFORE ATTEMPTING INSTALLATION

THESE INSTRUCTIONS ARE PREPARED TO ASSIST TRADESMEN AND OTHERS GENERALLY FAMILIAR WITH LIQUID STORAGE TANK EQUIPMENT. **CONSUMERS ARE NOT QUALIFIED TO PERFORM THE INSTALLATION DESCRIBED BELOW.**

IF YOU HAVE ANY QUESTIONS CONCERNING INSTALLATION OR OPERATION OF THE DIAL OR GAUGE, CONTACT ROCHESTER GAUGES, INC. OR ONE OF OUR AUTHORIZED DISTRIBUTORS FOR ASSISTANCE. CHECK SIDE OF GAUGE HEAD FOR MODEL NUMBER AND ASK FOR TECHNICAL DATA SHEET FOR YOUR MODEL.

CAUTION: **Determine and install the appropriate magnetic dial based on gauge and system requirements. The dial type supplied may not be suitable for all applications and for those applications other dials may be available. The information contained herein is intended for guideline use only and the suitability of any dial or TwinSite™ sender for a particular application must be determined by the user prior to installation.**

1. Look for dial number on face of existing dial or TwinSite™ sender.
2. Determine if identical dial chamber or TwinSite™ sender may be suitable for your gauge and application.
3. Order appropriate dial chamber or TwinSite™ sender. Gauge for TwinSite™ sender must be equipped with large drive magnet. Confirm gauge model number and ask authorized distributor or factory to confirm drive magnet size.
4. Assure that replacement dial is the appropriate dial chamber or TwinSite sender for your gauge and application.
5. Record reading on old dial, disconnect electrical connection to TwinSite. Using a #1 phillips screwdriver, remove two #6 screws retaining old dial chamber and remove old dial. Pry off snap-on dial by inserting flat blade screwdriver into slot between back of dial and top of gauge head.

WARNING: **Do not remove gauge mounting screws or bolts. Do not unscrew gauge heads that are screwed in to tank. Tank may contain high pressure and flammable gas. A hazard of fire or explosion may exist if gauge mounting screws, bolts or gauge heads are loosened or removed.**

6. Install replacement dial or TwinSite™ sender assuring that dial chamber fits gauge head and torque dial mounting screws at 4 to 5 IN. LB. [0,5 Nm]. Note: Align key on snap-on dial with notch on snap-on gauge head and snap replacement dial on to gauge head. If standard junior, senior or snap-on dial does not fit gauge, ask about "Dial Kits" for obsolete gauges.
7. Compare new dial reading to recorded reading or estimated tank contents. If the new dial reading is not correct, remove dial and using a magnet near the back of the dial, rotate the pointer to approximate the expected dial reading and re-install dial. If reading still seems incorrect, the dial chamber may be the wrong type.
8. If replacement dial chamber is a TwinSite™ sender, compare reading on sender with reading on receiver. If readings are different, the sender may not match the ohms requirements of the receiver. Look on TwinSite dial for sender ohms range and compare with ohm range required for receiver. Ask for DS-923 with information about other TwinSite™ senders and indicators. Contact authorized distributor or factory for assistance.

CAUTION: **Improper dial selection or application may result in inaccurate gauge readings. Release of tank contents as well as damage to equipment and safety hazard may result if tank is overfilled. Fuel exhaustion may occur if tank contents are less than indicated. This dial is not a substitute for a fixed liquid level gauge or weight measurement device that may be required for filling.**

WARNING: **IMPROPER INSTALLATION OR USE OF THIS DIAL MAY CAUSE SERIOUS INJURY OR PROPERTY DAMAGE.**

[METRIC]

R3D

Junior
Advanced Matrix
TwinSite™

Snap-on TwinSite™

Snap-on
Direct Reading

Junior™ Direct Reading

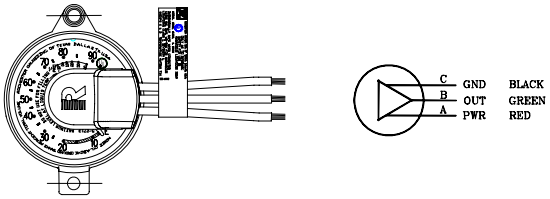
ROCHESTER GAUGES, INC.

The Measure of Excellence

11616 Harry Hines Blvd. • P.O. Box 29242 • Dallas, TX 75229 • (972) 241-2161 • *FAX* (972) 620-1403
Website http://www.rochestergauges.com • *E-mail* info@rochestergauges.com

Hall Effect TwinSites and R3D Remote Ready Hall Effect Module

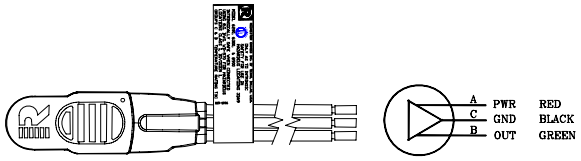
HALL TWINSITE PIN OUTPUT DIAGRAM



Best accuracy will be obtained using the calibration data in the table below:

Graduation	Design Output Volts	Lower Tolerance	Upper Tolerance
E-Stop	0.291	0.216	0.336
E	0.490	0.415	0.565
10	0.642	0.567	0.717
20	1.155	1.055	1.255
30	1.528	1.378	1.678
40	1.976	1.826	2.126
50	2.497	2.347	2.647
60	3.023	2.873	3.173
70	3.499	3.349	3.649
80	3.892	3.742	4.042

R3D HALL MODULE PIN OUTPUT DIAGRAM

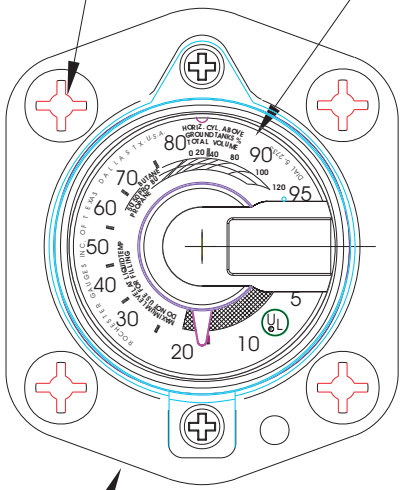


Best accuracy will be obtained using the calibration data in the table below:

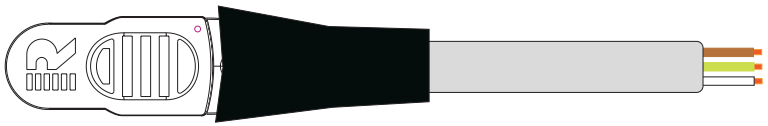
Graduation	Design Output Volts	Lower Tolerance	Upper Tolerance
E-Stop	0.266	0.091	0.441
5	0.327	0.152	0.552
10	0.589	0.414	0.764
20	1.095	0.920	1.270
30	1.491	1.316	1.666
40	1.951	1.776	2.126
50	2.462	2.287	2.637
60	3.003	2.828	3.178
70	3.484	3.309	3.659
80	3.917	3.742	4.092

Notes for TwinSite & Module :

- The Device is intended for supply voltage of 5 VDC, 4.5 to 5.5 VDC. With decrease in accuracy of only 1 to 2%, the supply voltage range can be extended to 3.5 to 6.0 VDC. The typical current draw is 4.5mA.
- The output is ratiometric, percent of supply voltage, 1:1 Ratio
- Settling time is1.5 Microseconds and does not include any circuitry outside TwinSite or Module.
- Due to temperature compensation for magnet, voltage output will drift up to 40mV if power is applied for more than a few seconds .
- While maximum rated load is one mA, for best accuracy, the actual load should be 100 uA or less.
- Like many amplifiers, the output amplifier of the sender will become unstable when driving capacitive loads. While these senders are usually stable while driving up to 0.1 uF capacitance, the addition of stray inductance and/or the addition of resistance in the input power line can greatly reduce margins and cause instability with much smaller capacitive loads. Careful design is required to minimize these factors. If they can not be eliminated , testing must be done to insure that the system operates correctly under all conditions.



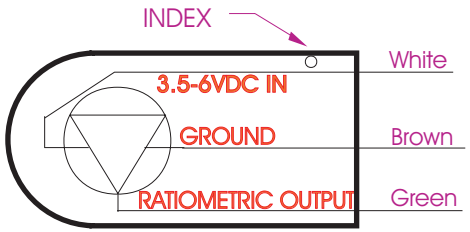
1 REMOVE PLUG



2 FIT MODULE

FUNCTIONAL SPECIFICATIONS/VOLTAGE OUTPUT MODULE

CONFORMITY: 3-1/2% @ 5 VDC WHEN ATTACHED TO REMOTE READY DIAL
OPERATING TEMPERATURE: -40 C TO 80 C °
RESOLUTION INFINITE
OPERATING VOLTAGE: 3.5 TO 6.0 VDC
OPERATING CURRENT: 4.5MA TYPICAL
OUTPUT: RATIOMETRIC, 5-80% OF INPUT VOLTAGE @ 5-80% VOLUME
OUTPUT CURRENT: 1MA



HALL MODULE INSTALLATION PROCEDURE

The following procedure details how to install a Hall Effect transmitter module onto a Rochester Gauges Remote Ready dial.

1. Remove shipping plug from dial.
2. Remove all dirt and debris from cavity under shipping plug.

NOTE: Failure to clean cavity properly may result in failure of transmitter module to seat properly and cause reduced accuracy.

3. slide module into slot on dial from edge of dial. Do not attempt to install module vertically.
4. Apply thumb pressure in area provided and push module toward center of dial until it snaps into place.

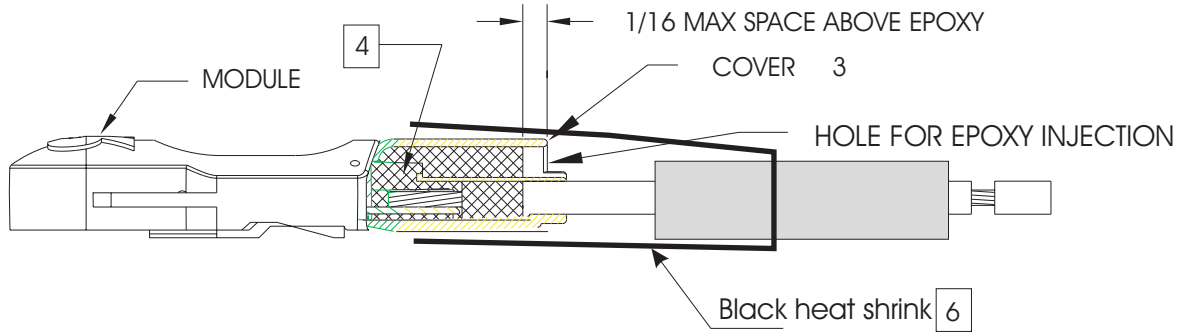
CAUTION: Attempts to remove transmitter from dial may result in damage to transmitter, dial, or both.
Do not pull the module by the cable.

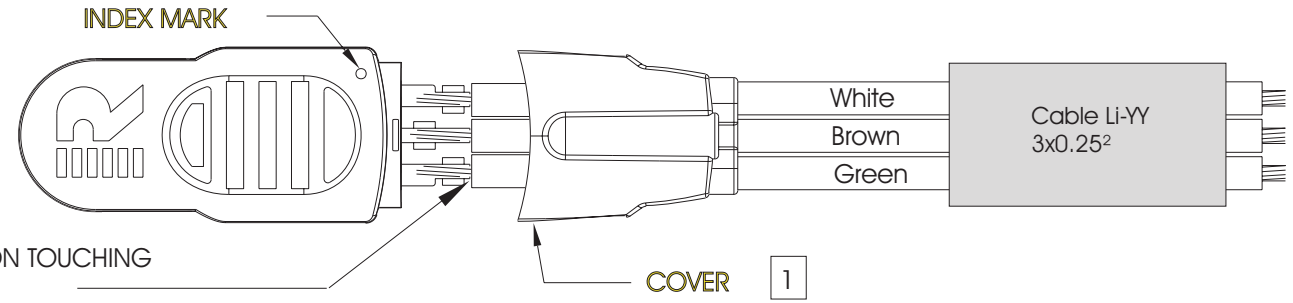
5. Installation is now complete.

WARNING: Do not remove gauge mounting screws or bolts. Do not unscrew gauge heads that are screwed into tank. Tank may contain high pressure and flammable gas. A hazard of fire or explosion may exist if gauge mounting screws, bolts or gauge heads are loosened or removed.

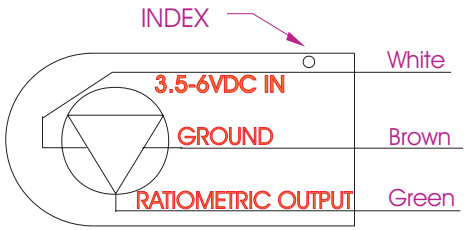
LET	REVISIONS	E.R.#	DATE	LET	REVISIONS	E.R.#	DATE	LET	REVISIONS	E.R.#	DATE
D	CONFORMITY 3-1/2% WAS CONFORMITY 4%	15437	8/14 03	C	Modify for European Market	JN/RGI	28 Jan 04				

TOLERANCES NOT SHOWN	.DD .010	.DDD .005	ANGLES 1	MAT'L:COMMERCIAL TOLERANCES	DO NOT SCALE DRAWING	SUPERSEDES NEW	DRAWN JN	CHK.	E.R.# 15437	USED ON "REMOTE READY" GAUGES
ROCHESTER GAUGES, INC., DALLAS,TEXAS,U.S.A. OF TEXAS					SCALE N/A	DATE 28 Jan 04	PART NAME HALL MODULE INSTALLATION INSTRUCTIONS DATA SHEET			DRAWING NUMBER DS-1349. BE





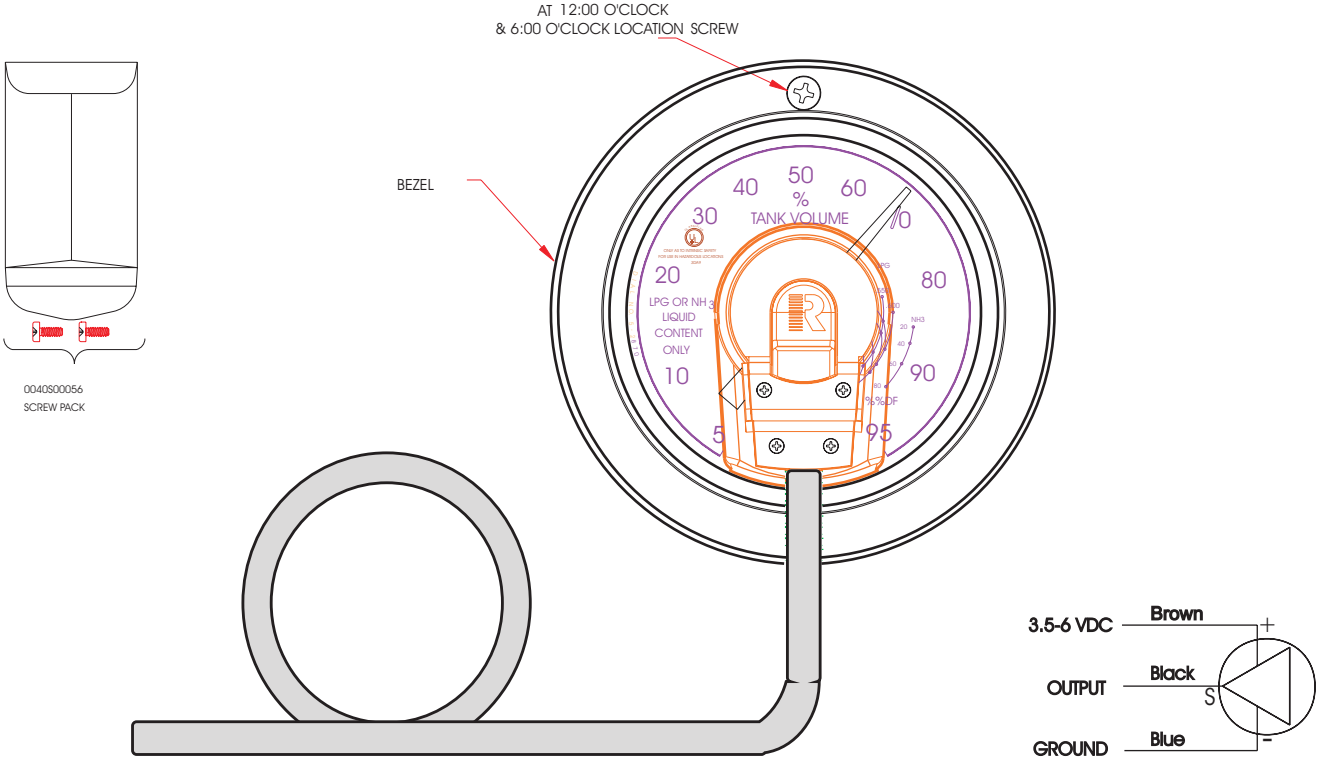
2 SOLDER WITH INSULATION TOUCHING TERMINAL, TYP. 3 PL.



NOTES:
1. SLIDE 0023-00519 COVER OVER WIRES .
2. SOLDER WIRES TO APPROPRIATE TERMINALS .
3. FIT COVER OVER TERMINALS.
4. FIXTURE & POT WITH EPOXY. FILL POTTING COVER WITH EPOXY COVERING ALL BARE METAL, AND ONTO WIRE INSULATION. USE .070 O.D. NEEDLE & FILL FROM BOTTOM OF HOLE.
5. ALLOW EPOXY TO CURE.
6 Locate and heat shrink tube.

A	ADDED HOLE FOR EPOXY INJECTION NOTE, REVISED NOTE 4 TO ADD NEEDLE SIZE & FILL--	13462	4/26 /02	B	SHOW LABEL	14435	1/29 03	C	Modify for European Market	JN/RGI	28 Jan 04
LET	REVISIONS	E.R.#	DATE	LET	REVISIONS	E.R.#	DATE	LET	REVISIONS	E.R.#	DATE

ROCHESTER GAUGES, INC., DALLAS,TEXAS,U.S.A. OF TEXAS	SCALE N/A	DATE 28 Jan 04	PART NAME HALL MODULE INSTALLATION INSTRUCTIONS DATA SHEET	DRAWING NUMBER DS-1349.BE	



INSTRUCTIONS FOR ATTACHING THE 4" HALL EFFECT DIAL ON 4" SENIOR GAUGES

The Senior 4" gauge head has one sheet metal dial mounting bracket. The gauge dial is attached to bracket using two #10 screws that extend through the bezel and into the bracket.

There will be #10 bezel-screws at 12:00 & 6:00 O'clock.

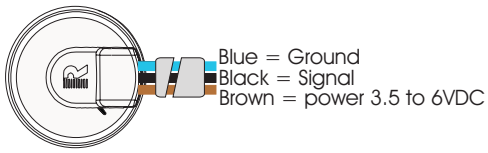
1. Note and record the pointer reading on gauge dial. Remove dial from gauge by removing two #10-32 bezel-screws, one at 12:00 O'clock, one at 6:00 O'clock.
2. Rotate a magnet or steel tool near center rear of new dial to rotate pointer to approximate the pointer reading you recorded from the old dial. Place dial into the dial-mounting bracket. Use two new #10-32 x 3/8" screws from the envelope to secure bezel and dial to bracket.
3. Observe dial pointer reading and assure that it is within a few percentage points of the recorded reading from old dial.
4. NOTE: The drive magnet in an ordinary senior gauge is not powerful enough for correct function of 4" Hall Effect dial.

WARNING: DO NOT REMOVE GAUGE MOUNTING BOLTS. TANK MAY CONTAIN HIGH PRESSURE AND FLAMMABLE GAS. A HAZARD OF FIRE OR EXPLOSION MAY EXIST IF GAUGE MOUNTING BOLTS ARE LOOSENED OR REMOVED. IMPROPER INSTALLATION OR USE OF THIS DIAL MAY CAUSE SERIOUS INJURY OR PROPERTY DAMAGE.

CAUTION: IMPROPER DIAL SELECTION OR APPLICATION MAY RESULT IN INACCURATE GAUGE READINGS. RELEASE OF TANK CONTENTS MAY OCCUR IF TANK IS OVERFILLED. FUEL EXHAUSTION MAY OCCUR IF TANK CONTENTS ARE LESS THAN INDICATED. THIS DIAL IS NOT A SUBSTITUTE FOR A FIXED LIQUID LEVEL GAUGE OR WEIGHT MEASURING DEVICE THAT MAY BE REQUIRED FOR FILLING.

Hall Effect Sensor Data's

HALL TWINSITE PIN OUTPUT DIAGRAM



This TwinSite is intended for supply voltage of 5VDC, 3.5 to 6 Vdc with an accuracy of ± 4%.
The typical current is 4.5mA at 5VDC
Settling time is 1.5 μsec, not included any circuitry outside TwinSite
Typical impedance is Ci=2.0nF, Li=4.8μH
Due to temperature compensation for magnet, voltage output will drift up to 40mV if power is applied more than a few seconds
The output is ratiometric, percent of supply voltage, similar to a potentiometer.
With 5.0 volt intput, typical output is 0.1 (2%) to 0.5 (10%) volts at Empty stop, 2.5volts at 50%, 4 volts at 80%
and 4.5(90%) to 5 (100%) volts at FULL stop.

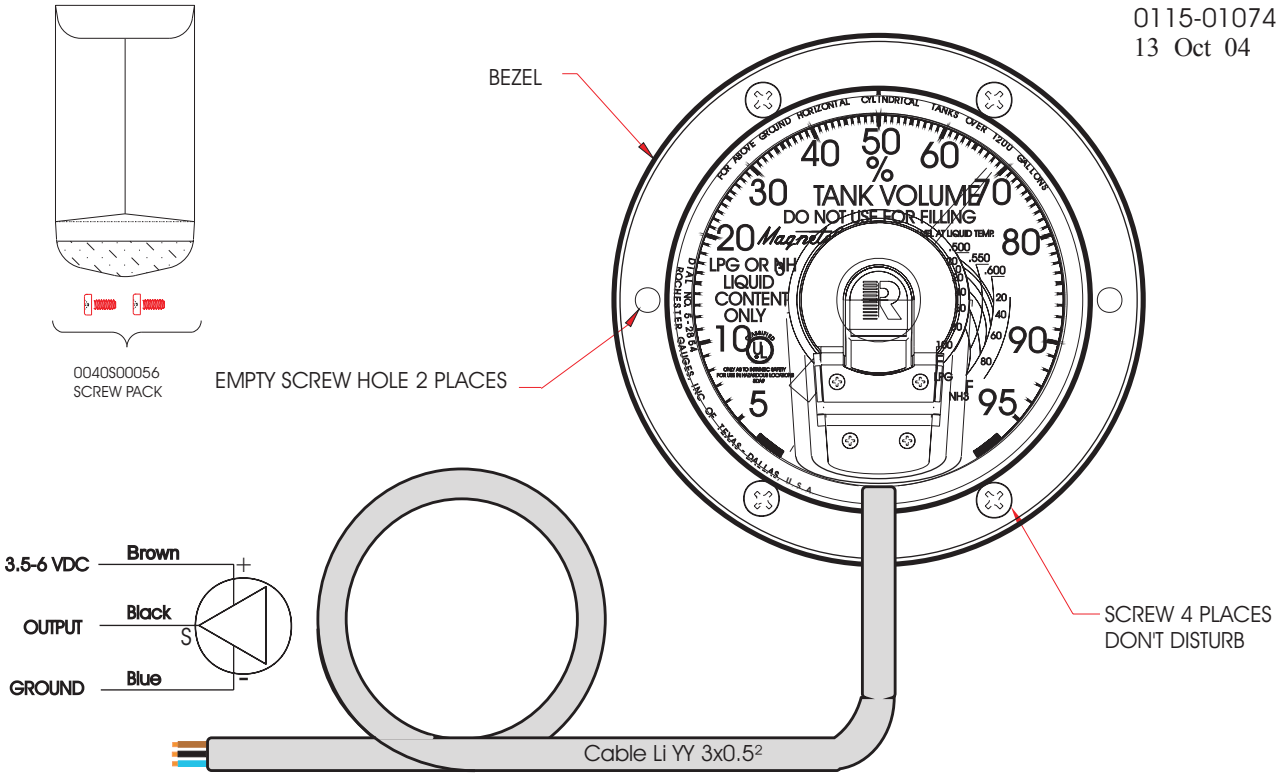
APPLICATION NOTES FOR 629* Senior 4" Dial :

1. SEE WD-566BE FOR CONTROL DRAWING.
2. WITH 5 VOLT INPUT, BEST ACCURACY WILL BE OBTAINED USING THE CALIBRATION DATA IN THE TABLE BELOW.

USE THIS CHART FOR TWINSITE WITH BLANK DIAL
5AANS02086 USED on 6320S41074E with 5-453 dial plate

GRADUATION	DESIGN OUTPUT VOLTS (±4%)
5	0.18
10	0.54
20	1.03
30	1.39
40	1.88
50	2.44
60	3.03
70	3.57
80	3.97
90	4.42
95	4.82

0115-01074 BE
13 Oct 04



INSTRUCTIONS FOR ATTACHING THE 4" HALL EFFECT MAGNETEL DIAL ON CENTERLINE MOUNT GAUGES

The Magnetel gauge head has two sheet metal dial mounting brackets. The Magnetel gauge dial is attached to these brackets using two #10 screws that extend through the bezel and into the brackets.

If this is a centerline mount gauge then there will be #10 bezel-screws at 9:00 & 3:00 O'clock. If there are no #10 bezel-screws at 9:00 & 3:00 O'clock, then this may be a straddle mount gauge.
This Hall effect dial will not fit a straddle mount Magnetel gauge.

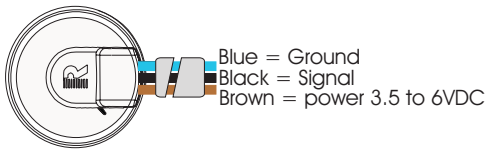
1. Note and record the pointer reading on Magnetel gauge dial. Remove dial from Magnetel gauge by removing two #10-32 bezel-screws, one at 9:00 O'clock, one at 3:00 O'clock.
2. Rotate a magnet or steel tool near center rear of new dial to rotate pointer to approximate the pointer reading you recorded from the old dial. Place dial bezel lip over the dial-mounting brackets. Use two new #10-32 x 3/8" screws from the envelope to secure dial to brackets.
3. Observe dial pointer reading and assure that it is within a few percentage points of the recorded reading from old dial.

WARNING: DO NOT REMOVE GAUGE MOUNTING NUTS OR BOLTS. TANK MAY CONTAIN HIGH PRESSURE AND FLAMMABLE GAS. A HAZARD OF FIRE OR EXPLOSION MAY EXIST IF GAUGE MOUNTING NUTS OR BOLTS ARE LOOSENED OR REMOVED. IMPROPER INSTALLATION OR USE OF THIS DIAL MAY CAUSE SERIOUS INJURY OR PROPERTY DAMAGE.

CAUTION: IMPROPER DIAL SELECTION OR APPLICATION MAY RESULT IN INACCURATE GAUGE READINGS. RELEASE OF TANK CONTENTS MAY OCCUR IF TANK IS OVERFILLED. FUEL EXHAUSTION MAY OCCUR IF TANK CONTENTS ARE LESS THAN INDICATED. THIS DIAL IS NOT A SUBSTITUTE FOR A FIXED LIQUID LEVEL GAUGE OR WEIGHT MEASURING DEVICE THAT MAY BE REQUIRED FOR FILLING.

Hall Effect Sensor Data's

HALL TWINSITE PIN OUTPUT DIAGRAM



This TwinSite is intended for supply voltage of 5VDC, 3.5 to 6 Vdc with an accuracy of ± 4%.
The typical current is 4.5mA at 5VDC
Settling time is 1.5 μsec, not included any circuitry outside TwinSite
Typical impedance is Ci=2.0nF, Li=4.8μH
Due to temperature compensation for magnet, voltage output will drift up to 40mV if power is applied more than a few seconds
The output is ratiometric, percent of supply voltage, similar to a potentiometer.
With 5.0 volt intput, typical output is 0.1 (2%) to 0.5 (10%) volts at Empty stop, 2.5volts at 50%, 4 volts at 80%
and 4.5(90%) to 5 (100%) volts at FULL stop.

APPLICATION NOTES FOR Magnetel Dial 4" & 8":

1. SEE WD-566 FOR CONTROL DRAWING.
2. WITH 5 VOLT INPUT, BEST ACCURACY WILL BE OBTAINED USING THE CALIBRATION DATA IN THE TABLE BELOW.

USE THIS CHART FOR TWINSITE WITH BLANK DIAL
5AANS02086 USED on 6320S31078* with 5-2854 dial plate

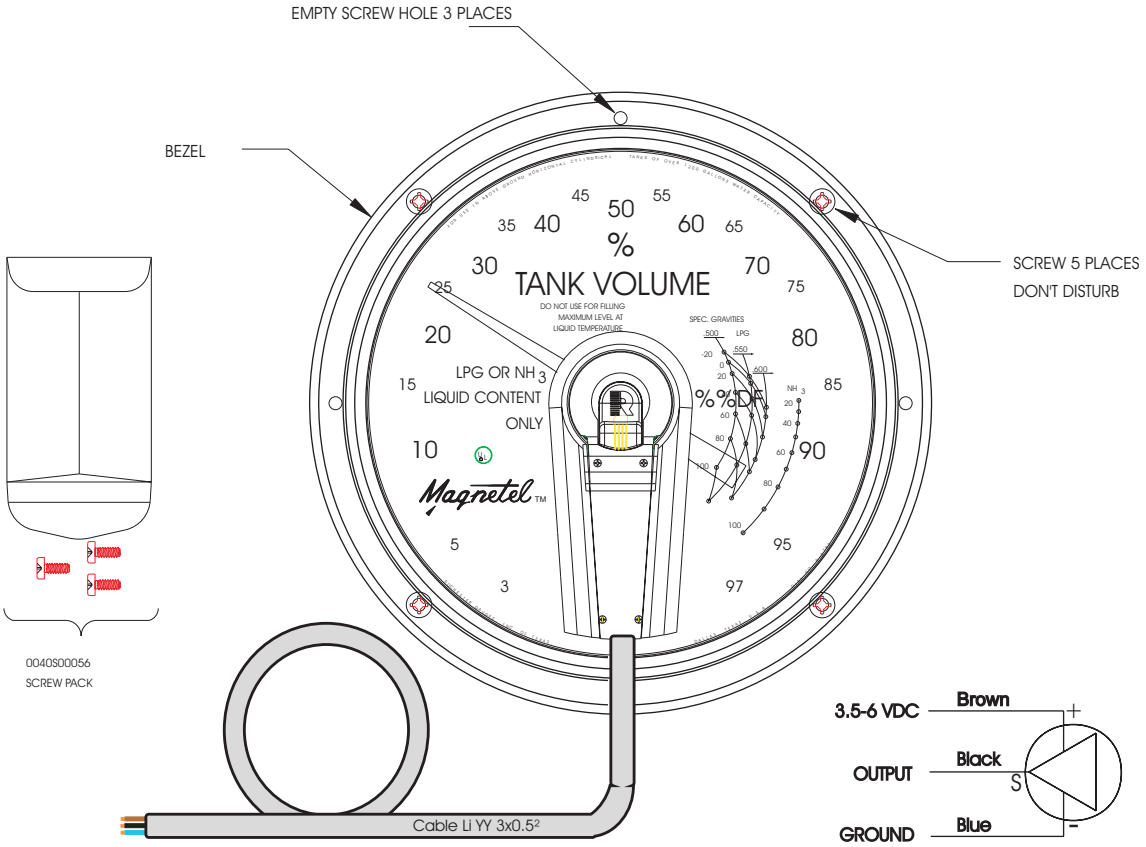
GRADUATION	DESIGN OUTPUT VOLTS (±4%)
5	0.18
10	0.52
20	1.03
30	1.39
40	1.88
50	2.44
60	3.03
70	3.57
80	4.02
90	4.47
95	4.82

CAUTION:

When used in hazardous area, The Hall effect TwinSide has to be powered by an intrinsically save power supply or thru an intrisiccaly safe barrier.

See WD-566 for TwinSite control Drawing and Intrinsically Save power supply

Install Magnetel 8" Hall Effect Dial



INSTRUCTIONS FOR ATTACHING THE 8" HALL EFFECT DIAL ON CENTERLINE MOUNT GAUGES

The Magnetel gauge head has three sheet metal dial mounting brackets. The Magnetel gauge dial is attached to these brackets using three #10 screws that extend through the bezel and into the brackets.

If this is a centerline mount gauge then there will be a #10 bezel-screw at 12:00 O'clock. If there is no #10 bezel-screw at 12:00 O'clock then this may be a straddle mount gauge. In this case there will be bezel-screws at 11:00 O'clock and 1:00 O'clock. This Hall effect dial will not fit a straddle mount Magnetel gauge.

1. Note and record the pointer reading on Magnetel gauge dial. Remove dial from Magnetel gauge by removing three #10-32 bezel-screws, one at 9:00 O'clock, one at 3:00 O'clock and one at 12:00 O'clock.

2. Rotate a magnet or steel tool near center rear of new dial to rotate pointer to approximate the pointer reading you recorded from the old dial. Place dial bezel lip over the dial-mounting brackets. Use three new #10-32 x 3/8" screws from the envelope to secure dial to brackets.

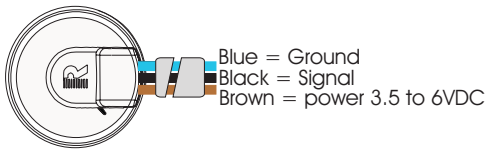
3. Observe dial pointer reading and assure that it is within a few percentage points of the recorded reading from old dial.

WARNING: DO NOT REMOVE GAUGE MOUNTING NUTS OR BOLTS. TANK MAY CONTAIN HIGH PRESSURE AND FLAMMABLE GAS. A HAZARD OF FIRE OR EXPLOSION MAY EXIST IF GAUGE MOUNTING NUTS OR BOLTS ARE LOOSENED OR REMOVED. IMPROPER INSTALLATION OR USE OF THIS DIAL MAY CAUSE SERIOUS INJURY OR PROPERTY DAMAGE.

CAUTION: IMPROPER DIAL SELECTION OR APPLICATION MAY RESULT IN INACCURATE GAUGE READINGS. RELEASE OF TANK CONTENTS MAY OCCUR IF TANK IS OVERFILLED. FUEL EXHAUSTION MAY OCCUR IF TANK CONTENTS ARE LESS THAN INDICATED. THIS DIAL IS NOT A SUBSTITUTE FOR A FIXED LIQUID LEVEL GAUGE OR WEIGHT MEASURING DEVICE THAT MAY BE REQUIRED FOR FILLING.

Hall Effect Sensor Data's

HALL TWINSITE PIN OUTPUT DIAGRAM



This TwinSite is intended for supply voltage of 5VDC, 3.5 to 6 Vdc with an accuracy of ± 4%.
The typical current is 4.5mA at 5VDC
Settling time is 1.5 μsec, not included any circuitry outside TwinSite
Typical impedance is Ci=2.0nF, Li=4.8μH
Due to temperature compensation for magnet, voltage output will drift up to 40mV if power is applied more than a few seconds
The output is ratiometric, percent of supply voltage, similar to a potentiometer.
With 5.0 volt intput, typical output is 0.1 (2%) to 0.5 (10%) volts at Empty stop, 2.5volts at 50%, 4 volts at 80%
and 4.5(90%) to 5 (100%) volts at FULL stop.

APPLICATION NOTES FOR Magnetel Dial 8" :

1. SEE WD-566 FOR CONTROL DRAWING.
2. WITH 5 VOLT INPUT, BEST ACCURACY WILL BE OBTAINED USING THE CALIBRATION DATA IN THE TABLE BELOW.

USE THIS CHART FOR TWINSITE WITH BLANK DIAL
5AANS02086 USED on 6320S01078* with 5-2783 dial plate

GRADUATION	DESIGN OUTPUT VOLTS (±4%)
3	0.18
10	0.69
20	1.10
30	1.45
40	1.91
50	2.44
60	3.00
70	3.07
80	3.89
90	4.30
95	4.82

ROCHESTER GAUGES INTERNATIONAL S.A.

Z.I. WAVRE NORD AV. LAVOISIER, 6 1300 WAVRE BELGIUM
Tél: 32 (0) 10 24 10 10 Fax: 32 (0) 10 22 81 39 http://www.rochester-gauges.be
R.C. NIVELLES 65.461 TVA : BE 440.371.387

Wavre, 13th October 2004

DECLARATION OF CONFORMITY

I, the undersigned NOKERMAN Jacques, Technical Supervisor

ROCHESTER GAUGES INTERNATIONAL S.A.

6, Avenue LAVOISIER Zone Industrielle Nord 1300 WAVRE,

Certify that the sensor for tank level gauge

HALL EFFECT TWINSITE or Module R3D

With generic reference 6320S**07**

Conforms with European Directives and Standards applicable today :

Directive ATEX 94/9/CE, annex III, EC type examination, and annex IV, production quality management.

It was certified by

- ISSeP, rue de la Platinerie, B 7340 COLFONTAINE, Belgique
- EURO QUALITY SYSTEMS, bvd de la république 50, F-92250 La Garenne Colombe, France

The Sensor has been labelled

⟨Ex⟩ II 2G EEx ib IIB T4 ISSeP04ATEX102 CE 0492

It conforms with the following Standards EN 50014, EN 50020, EN 13980

Jacques NOKERMAN
Technical Supervisor