# TABLE OF CONTENTS

1. GENERAL INSTRUCTIONS
   1.1 Presentation
   1.2 Installation
   1.3 Maintenance
   1.4 Specific notice
   1.5 Cathodic Protection
   1.6 Model number and Features
   1.7 Cable technical data LiYCY-OB
   1.8 Cable technical data LiYY-OB

2. 5Vdc TRANSMITTERS
   2.1 Electrical Parameters
   2.2 Notes
   2.3 Schematic diagram
   2.4 Example of compatible Safety Barrier
   2.5 Hall Effect TWINSITE (JR, SR or TAYLOR)
   2.6 Hall Effect 4" PV for Senior Gauges (6290/6293)
   2.7 Hall Effect 4" and 8" for Magnetel Gauges

3. 2.5Vdc TRANSMITTERS
   3.1 Electrical Parameters
   3.2 Notes
   3.3 Schematic diagram
   3.4 Example of compatible Safety Barrier
   3.5 Hall Effect TWINSITE (JR 2.5Vdc)

4. 3.3Vdc TRANSMITTERS
   4.1 Electrical Parameters
   4.2 Notes
   4.3 Schematic diagram
   4.4 Example of compatible Safety Barrier
   4.5 Hall Effect TWINSITE (JR, SR or TAYLOR)
   4.6 Hall Effect 4" PV for Senior Gauges (6290/6293)
   4.7 Hall Effect 4" and 8" for Magnetel Gauges

5. EC Declaration of conformity

Notice subject to change without notification.
CHAPTER 1
INTRODUCTION

1.1 Presentation

WORK PRINCIPLE
The Rochester Hall Effect Transmitter is based on the transformation of the magnetic field of the dial pointer magnet into an electrical signal proportional to the volume of the liquid inside the tank. Those transmitters are available in different dial sizes (Junior, Senior, Senior 4", Magnetel 4" or 8").

Most of those transmitters are working as voltage dividers (Vout = % Vin). Refer to specific documentation of each model in the following pages.

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, li = 200mA. The transmitter is supplied with a sticker indicating the details of the type of ATEX approval and intrinsically safe parameters.

1.2 Installation

WARNING:
Only qualified people are authorised 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 through an intrinsically safe barrier compatible with the sensor parameter (see specific notice).
The transmitters 6320S*107** are mainly dedicated for remote system with intermittent power supply or for wireless level transmission with cable no longer than 50 meters.

ELECTRICAL WIRING
The specific documentation of each model (see following pages) specify the colour code of the wires.
In case of shielded cable, the shield has to be connected to the protection terminal (Sh) or to the receiver Electrical Ground. If a junction box is used, the junction box has to be waterproof and in conformity with the Ex protection degree required by its installation’s location.
RECEIVER CALIBRATION
If the receiver has to be calibrated with the sensor this can be done by setting the needle of the dial at the calibration value. To set the needle at the required value, use a magnet or a metal rod underneath the dial to rotate the needle.

DIAL/TRANSMITTER MOUNTING
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 a magnet or a metal rod, locate the pointer of the new transmitter on the recorded value. Locate and fix the transmitter dial on the gauge head.

1.3 Maintenance
- These sensors and the dedicated dial do not need specific maintenance.
- If required clean them with a sweet and wet tissue.
- The use of solvent and abrasive are prohibited.
- Shut down the power supply before any electrical works.

Any defective sensors have to be returned to the manufacturer with a report explaining the missfunction.

1.4 Specific Notice
Specific information on each model (Junior, Senior, Squibb Taylor, Senior 4", Magnetel 4" or 8") are given in following pages.

1.5 Catodic Protection
No specific instruction, except: the shield (if present) is wired to the ground of the receiver but never wired to the cathodic protection.

1.6 Model Number & Features

RECEIVER CALIBRATION
If the receiver has to be calibrated with the sensor this can be done by setting the needle of the dial at the calibration value. To set the needle at the required value, use a magnet or a metal rod underneath the dial to rotate the needle.

DIAL/TRANSMITTER MOUNTING
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 a magnet or a metal rod, locate the pointer of the new transmitter on the recorded value. Locate and fix the transmitter dial on the gauge head.

1.3 Maintenance
- These sensors and the dedicated dial do not need specific maintenance.
- If required clean them with a sweet and wet tissue.
- The use of solvent and abrasive are prohibited.
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Any defective sensors have to be returned to the manufacturer with a report explaining the missfunction.

1.4 Specific Notice
Specific information on each model (Junior, Senior, Squibb Taylor, Senior 4", Magnetel 4" or 8") are given in following pages.

1.5 Catodic Protection
No specific instruction, except: the shield (if present) is wired to the ground of the receiver but never wired to the cathodic protection.

1.6 Model Number & Features

6320 S ** 07 **

Particularity Order

For a 4" or 8"

C Centerline mounting
CX Reverse Straddle mounting
X Straddle mounting
E 4" Senior for 6290/6293 gauges

For a Taylor, Junior or Senior

E Horizontal cable entry
V Vertical cable entry (with 3x0.25mm² cable)
H Horizontal cable entry with a specific dial plate
IND Horizontal cable entry with an industrial dial plate

Length of cable 0.5m to 20m by step of 0.5m (1 or 2 digits with or without decimal point) Standard length specified in data sheet

Type of Cable and Power Supply

1 Transmitter (5Vdc) with cable LiYY-0B
2 Transmitter (5Vdc) with shielded cable LiYCY-0B
3 Transmitter (3.3Vdc) with Shielded cable LiYCY-0B
4 Transmitter (2.5Vdc) with Shielded cable LiYCY-0B

Dial Type

0 8" Magnetel with 3-97% dial
1 8" Magnetel with 5-95% dial
2 Taylor dial
3 4" Magnetel with 5-95% dial
4 4" 6290/6293 gauges with 5-95% dial
8 Junior dial
9 Senior dial

NOTE
- 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.
- The listed Hall Effect Transmitters are certified for use in Hazardous Area.
1.7 Cable Technical Data LiYCY-OB

Controls and signalisation multiconductors screened cable with:
- Stranded conductors of bare copper
- PVC insulation
- Twisted
- Polyester foil taped
- Conductors colour code in accordance with DIN 47100.
- Total screening with tinned copper braid, 85% minimum coverage.

TEMPERATURE RANGE
Mounting and servicing: -15°C to +70°C

USE
Measuring, control regulation applications.
Electronics control.

STANDARDS LiYCY-OB
In accordance with IEC 60228, DIN 47100, NF C 32-070, IEC 60332-1.

CABLE DESCRIPTION
- wire: Red copper, 8 (0.25²) or 16 (0.5²) wires of 0.19 mm diameter
- insulation: PVC Coloured following DIN 47100, PVC 105°C,
  - diameter 1.3mm for 0.25mm²
  - diameter 1.7mm for 0.5mm²
- twisted: by layers
- assembly: Mylar sheet
- screening: tinned copper braid
- outer sheath:
  - for 0.25mm² RAL 7001 grey PVC, flame retardant category C2 by NF C 32-070, IEC 60332-1
  - for 0.5mm² RAL 5012 blue PVC, flame retardant category C2 by NF C 32-070, IEC 60332-1

CABLE SPECIFICATIONS
- operating voltage: 300/500V
- insulation at 20°C: conform to IEC 60228
- testing voltage: 2KV
- Bending radius: 10 x Ø of cable

ELECTRICAL DATA AT 20°C
- conductor resistance: 79Ω/Km (0.25²) and 39Ω/Km (0.5²)
- capacity (between 2 conductors): 100nF/m (0.25²) and 120nF/m (0.5²)
- capacity (between cond. & Shield): 200nF/m (0.25²) and 210nF/m (0.5²)
- Inductance: 0.460mH/Km
- load: maximum 3A (0.25²) and 6A (0.5²)

MECHANICAL DATA

<table>
<thead>
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<th>number of conductors</th>
<th>outer diameter [mm]</th>
<th>total weight [Kg/Km]</th>
</tr>
</thead>
<tbody>
<tr>
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<td>4.3 (±0.3)</td>
<td>31.0</td>
</tr>
<tr>
<td>3 x 0.5</td>
<td>5.3 (±0.3)</td>
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COLOUR MARKING DIN 47100

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<thead>
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<tbody>
<tr>
<td>1</td>
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</tr>
<tr>
<td>2</td>
<td>brown</td>
</tr>
<tr>
<td>3</td>
<td>green</td>
</tr>
</tbody>
</table>
Controls and signalisation multiconductors screened cable with:
- Stranded conductors of bare copper
- PVC insulation
- Twisted
- Conductors colour code in accordance with DIN 47100.

**TEMPERATURE RANGE**
Mounting and servicing -15°C to +70°C

**USE**
Measuring, control regulation applications.
Electronics control.

**STANDARDS LiYY-OB**
In accordance with IEC 60228, DIN 47100, NF C 32-070, IEC 60332-1.

**CABLE DESCRIPTION**
wire: Red copper, 8 (0.25²) or 16 (0.5²) wires of 0.19 mm diameter
insulation: PVC Coloured following DIN 47100, PVC 105°C,
  - diameter 1.3mm for 0.25mm²
  - diameter 1.7mm for 0.5mm²
twisted: by layers
assembly: Mylar sheet
outer sheath: for 0.25mm² RAL 7001 grey PVC, flame retardant category C2 by NF C 32-070, IEC 60332-1
  for 0.5mm² RAL 5012 blue PVC, flame retardant category C2 by NF C 32-070, IEC 60332-1

**CABLE SPECIFICATIONS**
operating voltage: 300/500V
insulation at 20°C: conform to IEC 60228
testing voltage: 2KV
Bending radius: 5 x Ø of cable

**ELECTRICAL DATA AT 20°C**
conductor resistance: 79Ω/Km (0.25²) and 39Ω/Km (0.5²)
Servicing capacity: 150nF/m
capacity (between 2 conductors): 100nF/m (0.25²) and 120nF/m (0.5²)
Inductance: 0.70mH/Km
load: maximum 3A (0.25²) and 6A (0.5²)

**MECHANICAL DATA**

<table>
<thead>
<tr>
<th>Number of conductors [mm²]</th>
<th>Outer diameter [mm]</th>
<th>Total weight [Kg/Km]</th>
</tr>
</thead>
<tbody>
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<td>4.1 (±0.3)</td>
<td>26.0</td>
</tr>
<tr>
<td>3 x 0.5</td>
<td>5.1 (±0.3)</td>
<td>42.0</td>
</tr>
</tbody>
</table>

**COLOUR MARKING DIN 47100**

<table>
<thead>
<tr>
<th>Number</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
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<tr>
<td>2</td>
<td>brown</td>
</tr>
<tr>
<td>3</td>
<td>green</td>
</tr>
</tbody>
</table>
2.1 Electrical Parameters

Valid for 5VDC models, see pages (8 to 12)
For Hall Effect transmitters manufactured with twinsite 5AANS02086, 5883S02714, 5883S02877, 5952S02714, 5952S02877 or 5948S02757 Sensor. (note: twinsite model number is printed on the back side of transmitter)

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>Signal</th>
<th>Safety barrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vin max = 6Vdc</td>
<td>Vout = 0 to Vin</td>
<td>Vmax (Ui) = 14Vdc</td>
</tr>
<tr>
<td>Iin max = 8mA</td>
<td>Iout max = 1mA</td>
<td>Imax (Li) = 200mA</td>
</tr>
<tr>
<td>Ci = 123nF</td>
<td>Li = 4.8μH</td>
<td>Ca &gt; Ci + Cc</td>
</tr>
<tr>
<td>Li = 4.8μH</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ci, Li: internal capacitance and inductance of transmitter, Lc, Cc: cable inductance and capacitance

2.2 Note

a) Selected associated apparatus or barriers must be third party approved as Intrinsically Safe for the application and have V open circuit and I short circuit 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) (Ca and La: barrier's capacitance and inductance)
c) Barriers must be installed in accordance with barriers manufacturer's control drawing and applicable rules and standards.
d) The maximum nonhazardous location voltage must not exceed than 250Vrms.
e) 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.
f) Operating temperature: -20°C to +65°C

2.3 Schematic Diagram

2.4 Example of Compatible Safety Barrier

a) Consumer: MTL
   Model Number: MTL7761ac
   b) Consumer: Stahl
   Model Number: 9001/01-086-150-01 for power supply line
                9001/01-086-020-01 for signal line
   c) Consumer: Pepperl+Fuchs
   Model Number: Z961

(*) for 6320S*107** or 6320S*207**
Hall Effect Transmitter
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 or industrial storage tanks are equipped with gauge having a weak drive magnet 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 those gauges to provide an electrical output which can be used for remote indication of tank levels.

The Hall Effect Twinsite™ provide the easiest way to read local indication by using a dial face divided into percentage units or fractional units.

This Hall Effect Twinsite require a 5Vdc Power Supply.

The housing, in UV stabilized plastic material, is hermetically sealed by ultrasonic welding and the electrical connections are sealed with potting material.

GENERAL SPECIFICATIONS
Accuracy: ±4% with nominal value indicated in the calibration chart « DS-1318 » (see next page) for all types
Hysteresys: less than ±1% typical
Repetability: ±2%
Resolution: Infinite
Operating Temperature: -20 to 65°C
Operating Voltage range: 5Vdc ± 0.5Vdc With a accuracy decrease of 1 to 2%, power range can be extended to: 3.5 to 6Vdc
Consumption: typical 5 mA under 5Vdc
Output Voltage: Ratiometric (Ratiometric means that the output signal voltage is proportional with the input voltage (Vin) Under 5Vdc, 10% is 0.5V (or 10% of input voltage) 90% is 4.5V (or 90% of input voltage)).
Output Current: Max 1mA

MATERIAL OF CONSTRUCTION
Crystal and case: polycarbonate, ultrasonic sealed
Dial: painted aluminium
Cap: polycarbonate or polyamide
**SPECIFICITY**
The Hall Effect Twinsite™ Transmitters are available in three sizes to fit all Junior and Senior Rochester Gauges and also for mounting on Taylor Gauges or some of competitive gauge (refer to specific mounting and instruction).

**Transmitter with not shielded cable**
Supplied in standard with 2 meters shielded blue cable LiYCY-OB 3x0.5mm² DIN47100 (with white, green and brown conductors) for each models except for vertical entry supplied with a grey cable 3x0.25mm². This transmitter is used with battery operated receiver with intermittent power supply to the transmitter.
- Impedance : 4.8\(\mu\)H
- Capacitance : 123nF
- Color of cable cover : Black
- Cable Length : 50m maximum

**Transmitter with shielded cable**
Supplied in standard with 2 meters shielded blue cable LiYCY-OB 3x0.5mm² DIN47100 (with white, green and brown conductors) for each models except for vertical entry supplied with a grey cable 3x0.25mm². For use with ROCHESTER receiver CSU or permanent power supply and Intrinsically Safe Barrier (if necessary) wired with no more than 300m 3x0.5mm² cable.
- Impedance : 4.8\(\mu\)H
- Capacitance : 123nF
- Color of cable cover : Green
- Cable Length : 300m maximum

**CALIBRATION CHART « DS-1318 »**
Best accuracy will be obtained using the calibration data in the table below, when powered in 5Vdc.

<table>
<thead>
<tr>
<th>Graduation</th>
<th>Nominal Ref. (Volts)</th>
</tr>
</thead>
<tbody>
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<td>E</td>
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<td>1.53</td>
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<td>40</td>
<td>1.98</td>
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<td>60</td>
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<td>70</td>
<td>3.5</td>
</tr>
<tr>
<td>80</td>
<td>3.9</td>
</tr>
</tbody>
</table>

Customer has to check the suitability of the sensor with his application.
GENERAL DESCRIPTION
The Hall Effect Twinsite™ transmitter consists of a 4” dial for Senior Gauge (model 6290/6293) incorporating a Hall Effect Twinsite™ which provides an electrical output for remote indication. The Hall Effect Twinsite™ provide the easiest way to read local indication by using a dial face divided into percentage units. This Hall Effect Twinsite require a 5Vdc Power Supply.

GENERAL SPECIFICATIONS
Accuracy: ± 4% with nominal value indicated in the calibration chart (see below) for all types
Hysteresys: less than ±3% typical
Repetability: ±2%
Resolution: Infinite
Operating Temperature: -20 to 65°C
Operating Voltage range: 5Vdc ± 0.5Vdc With a decrease in accuracy of 1 to 2%, power range can be extended to: 3.5 to 6Vdc
Consumption: typical 5 mA under 5Vdc
Output Voltage: Ratiometric (Ratiometric means that the output signal voltage is proportional with the input voltage (Vin) Under 5Vdc, 10% is 0.5V (or 10% of input voltage) 90% is 4.5V (or 90% of input voltage)).
Output Current: Max 1mA

MATERIAL OF CONSTRUCTION
Crystal and case of twinsite: polycarbonate, ultrasonic sealed
Crystal of dial: polycarbonate
Case of dial: aluminium anodised
Bezel Ring: aluminium
Dial: painted aluminium

SPECIFICITY
This 4” Hall Effect Twinsite™ Transmitters is designed for mounting on Rochester Gauges models 6290/6293.

Transmitter with not shielded cable
Supplied in standard with 4 meters blue cable LiYY-OB 3x0.5mm² DIN47100 (with blue, brown and black conductors).
This transmitter is used with battery operated receiver with intermittent power supply to the transmitter.
Impedance: 4.8µH
Capacitance: 123nF
Cable Length: 50m maximum

Transmitter with shielded cable
Supplied in standard with 4 meters shielded blue cable 3x0.5mm² DIN47100 (with white, green and brown conductors).
For use with ROCHESTER receiver CSU or permanent power supply and Intrinsically Safe Barrier (if necessary) wired with no more than 300m 3x0.5mm² cable.
Impedance: 4.8µH
Capacitance: 123nF
Cable Length: 300m maximum

CALIBRATION CHART
Best accuracy will be obtained using the calibration data in the table below, when powered in 5Vdc.

<table>
<thead>
<tr>
<th>Graduation</th>
<th>Nominal Ref. (Volts)</th>
</tr>
</thead>
<tbody>
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<tr>
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<td>80</td>
<td>3.97</td>
</tr>
<tr>
<td>90</td>
<td>4.42</td>
</tr>
<tr>
<td>95</td>
<td>4.82</td>
</tr>
</tbody>
</table>

Customer has to check the suitability of the sensor with his application.
2.7 Hall Effect 4" and 8" for Magnetel Gauges

GENERAL DESCRIPTION
The Hall Effect Twinsite™ transmitter consists of a 4" or 8" dial for Magnetel Gauge incorporating a Hall Effect Twinsite™ which provides an electrical output for remote indication.
The Hall Effect Twinsite™ provide the easiest way to read local indication by using a dial face divided into percentage units.
This Hall Effect Twinsite require a 5Vdc Power Supply.

GENERAL SPECIFICATIONS
Accuracy: ±4% with nominal value indicated in calibration chart (see next page) for all types
Hysteresys: less than ±3% typical
Repetability: ±2%
Resolution: Infinite
Operating Temperature: -20 to 65°C
Operating Voltage range: 5Vdc ± 0.5Vdc With a decrease in accuracy of 1 to 2%, power range can be extended to: 3.5 to 6Vdc
Consumption: typical 5 mA under 5Vdc
Output Voltage: Ratiometric (Ratiometric means that the output signal voltage is proportional with the input voltage (Vin) Under 5Vdc, 10% is 0.5V (or 10% of input voltage) 90% is 4.5V (or 90% of input voltage)).
Output Current: Max 1mA

MATERIAL OF CONSTRUCTION
Crystal and case of twinsite: polycarbonate, ultrasonic sealed
Crystal of dial: polycarbonate
Case of dial: aluminium anodised
Bezel Ring: Stainless Steel
Dial: painted aluminium
SPECIFICITY
This Hall Effect Twinsite™ Transmitters are available for three different mounting (C, X or CX) to fit all respective Magnetel Rochester Gauge.

Transmitter with not shielded cable
Supplied in standard with 8 meters blue cable LiYY-OB 3x0.5mm² DIN47100 (with blue, brown and black conductors).
This transmitter is used with battery operated receiver with intermittent power supply to the transmitter.
Impedance : 4.8µH
Capacitance : 123nF
Cable Length : 50m maximum

Transmitter with shielded cable
Supplied in standard with 8 meters shielded blue cable 3x0.5mm² DIN47100 (with white, green and brown conductors).
For use with ROCHESTER receiver CSU or permanent power supply and Intrinsically Safe Barrier (if necessary) wired with no more than 300m 3x0.5mm² cable.
Impedance : 4.8µH
Capacitance : 123nF
Cable Length : 300m maximum

CALIBRATION CHART « for 4" Transmitters »
Best accuracy will be obtained using the calibration data in the table below, when powered in 5Vdc.

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<td>4.504</td>
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<td>95</td>
<td>4.789</td>
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</table>

Customer has to check the suitability of the sensor with his application.

CALIBRATION CHART « for 8" Transmitters »
Best accuracy will be obtained using the calibration data in the table below, when powered in 5Vdc.

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<td>4.82</td>
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<table>
<thead>
<tr>
<th>Graduation</th>
<th>Nominal Ref. (Volts)</th>
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</thead>
<tbody>
<tr>
<td>5</td>
<td>0.18</td>
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</tr>
<tr>
<td>30</td>
<td>1.40</td>
</tr>
<tr>
<td>40</td>
<td>1.87</td>
</tr>
<tr>
<td>50</td>
<td>2.44</td>
</tr>
<tr>
<td>60</td>
<td>3.04</td>
</tr>
<tr>
<td>70</td>
<td>3.56</td>
</tr>
<tr>
<td>80</td>
<td>3.98</td>
</tr>
<tr>
<td>90</td>
<td>4.45</td>
</tr>
<tr>
<td>95</td>
<td>4.82</td>
</tr>
</tbody>
</table>

Customer has to check the suitability of the sensor with his application.
### 3.1 Electrical Parameters

**Valid for 2.5VDC models, see page (14)**

For Hall Effect transmitters manufactured with twinsite 5961S02714 Sensor. (note: twinsite model number is printed on the back side of transmitter)

<table>
<thead>
<tr>
<th>Description</th>
<th>Model</th>
<th>Sensor associated (**)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot; Magnetel</td>
<td>6320S0307</td>
<td>SAFYS20086 (2)</td>
</tr>
<tr>
<td>4&quot; Magnetel</td>
<td>6320S4307</td>
<td>SAFYS20086 (2)</td>
</tr>
<tr>
<td>Junior</td>
<td>6320S8307</td>
<td>5992S02713 (2)</td>
</tr>
<tr>
<td>Senior</td>
<td>6320S9307</td>
<td>5ACN02714 (2)</td>
</tr>
</tbody>
</table>

If used in flammable area, sensor must be powered by an Intrinsically Safe power supply with:

- $U_i = 10\text{V}(1)$ & $14\text{V}(2)$, $I_i = 200\text{mA}$, $L_i = 4.8\mu\text{H}$, $C_i = 2.3\mu\text{F}(1)$ & $0.44\mu\text{F}(2)$

#### Hall Effect Sensor 6320S**07**

- ** = see manual
- $T^\circ$ ambient : $-20^\circ\text{C}$ to $+65^\circ\text{C}$

#### Power Supply

- $V_{\text{in max}} = 3\text{Vdc}$
- $I_{\text{in max}} = 11\text{mA}$

#### Signal

- $V_{\text{out}} = 0$ to $V_{\text{in}}$
- $I_{\text{out max}} = 1\text{mA}$

#### Safety barrier

- $V_{\text{max}}(U_i) = 10\text{Vdc}$
- $I_{\text{max}}(L_i) = 200\text{mA}$

- $C_i > C_t + C_c$
- $L_i > L_t + L_c$

#### Ci, Li internal capacitance and inductance of transmitter, $L_c, C_c$: cable inductance and capacitance

### 3.2 Note

a) Selected associated apparatus or barriers must be third party approved as Intrinsically Safe for the application and have $V$ open circuit and $I$ short circuit not exceeding $V_{\text{max}}$ and $I_{\text{max}}$.

b) Cable capacitance ($C_c$) added to transmitter capacitance ($C_t$) must be less than the marked capacitance ($C_a$) and the cable inductance ($L_c$) added to the transmitter inductance ($L_t$) must be less than the marked inductance ($L_a$) ($C_a$ and $L_a$: barrier's capacitance and inductance).

c) Barriers must be installed in accordance with barriers manufacturer's control drawing and applicable rules and standards.

d) The maximum nonhazardous location voltage must not exceed than 250Vrms.

e) 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.

f) Operating temperature : $-20^\circ\text{C}$ to $+65^\circ\text{C}$

### 3.3 Schematic Diagram

#### Hazardous Location

- Hall Effect Transmitter
- 0Vdc to Vin (*)
- 1.8 to 3.0Vdc (*)
- White
- Green
- Brown

#### Nonhazardous Location

- Safety Barrier
- Power Supply and Signal treatment device

### 3.4 Example of Compatible Safety Barrier

- **a)** Consumer : MTL  
  Model Number : MTL7761ac
- **b)** Consumer : Stahl 
  Model Number : 9001/01-086-150-01 for power supply line  
  9001/01-086-020-01 for signal line
- **c)** Consumer : Pepperl+Fuchs  
  Model Number : Z961
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 or industrial storage tanks are equipped with gauges having a weak drive magnet 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 those gauges to provide an electrical output which can be used for remote indication of tank levels.

The Hall Effect Twinsite™ provide the easiest way to read local indication by using a dial face divided into percentage units.

This Hall Effect Twinsite requires a 2.5Vdc Power Supply. The housing, in UV stabilized plastic material, is hermetically sealed by ultrasonic welding and the electrical connections are sealed with potting material.

GENERAL SPECIFICATIONS
Accuracy: ± 4% with nominal value indicated in the calibration chart « DS-1318 » (see below) for all types
Hysteresis: less than ±1% typical
Repeatability: ±2%
Resolution: Infinite
Operating Temperature: -20 to 65°C
Operating Voltage range: 2.5Vdc ± 0.25Vdc with a accuracy decrease of 1 to 2%, power range can be extended to: 1.8 to 3Vdc
Consumption: typical 10 to 11 mA under 2.5Vdc
Output Voltage: Ratiometric (Ratiometric means that the output signal voltage is proportional with the input voltage (Vin) Under 2.5Vdc, 10% is 0.25V (or 10% of input voltage) 90% is 2.25V (or 90% of input voltage)).
Output Current: Max 1mA

MATERIAL OF CONSTRUCTION
Crystal and case: polycarbonate, ultrasonic sealed
Dial: painted aluminium
Cap: polycarbonate or polyamide

SPECIFICITY
The Hall Effect Twinsite™ Transmitters are available in one size to fit all Junior Rochester Gauges.

Transmitter with shielded cable
Supplied in standard with 2 meters shielded blue cable LiYCY-OB 3x0.5mm² DIN47100 (with white, green and brown conductors) for each models except for vertical entry supplied with a grey cable 3x0.25mm².
Impedance: 4.8µH
Capacitance: 2.3µF
Color of cable cover: White for each models except black for vertical entry
Cable Length: 50m maximum

CALIBRATION CHART « DS-1318 »
Best accuracy will be obtained using the calibration data in the table below, when powered in 2.5Vdc.

<table>
<thead>
<tr>
<th>Graduation</th>
<th>Nominal Ref. (Volts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-Stop</td>
<td>0.145</td>
</tr>
<tr>
<td>E</td>
<td>0.245</td>
</tr>
<tr>
<td>10</td>
<td>0.320</td>
</tr>
<tr>
<td>20</td>
<td>0.575</td>
</tr>
<tr>
<td>30</td>
<td>0.765</td>
</tr>
<tr>
<td>40</td>
<td>0.990</td>
</tr>
<tr>
<td>50</td>
<td>1.250</td>
</tr>
<tr>
<td>60</td>
<td>1.510</td>
</tr>
<tr>
<td>70</td>
<td>1.750</td>
</tr>
<tr>
<td>80</td>
<td>1.950</td>
</tr>
</tbody>
</table>

Customer has to check the suitability of the sensor with his application.
CHAPITRE 4
3.3VDC TRANSmitters

4.1 Electrical Parameters

Valid for 3.3VDC models, see pages (16 to 19)
For Hall Effect transmitters manufactured with twinsite 55992S02713, 5AFYS02086 or 5ACNS02714 Sensor. (note: twinsite model number is printed on the back side of transmitter)

### Hall Effect Sensor 6320S**07**

<table>
<thead>
<tr>
<th>Description</th>
<th>Model</th>
<th>Sensor associated (***)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8” Magnetel</td>
<td>6320S0307bc</td>
<td>5AFYS02086 (2)</td>
</tr>
<tr>
<td>4” Magnetel</td>
<td>6320S3307bc</td>
<td>5AFYS02086 (2)</td>
</tr>
<tr>
<td>4” PV</td>
<td>6320P4307bc</td>
<td>5AFYS02086 (2)</td>
</tr>
<tr>
<td>Junior</td>
<td>6320S8307bc</td>
<td>5992S02713 (2)</td>
</tr>
<tr>
<td>Senior</td>
<td>6320S9307bc</td>
<td>5ACN02714 (2)</td>
</tr>
<tr>
<td>Junior</td>
<td>6320S8407bc</td>
<td>5961S02714 (1)</td>
</tr>
</tbody>
</table>

If used in flammable area, sensor must be powered by an Intrinsically Safe power supply with:

- \( U_i = 10V(1) \& 14V(2), I_i=200mA, L_i=4.8\mu H, C_i=2,3\mu F(1) \& 0,44\mu F(2) \)

**Hall Effect Sensor 6320S**07**

* = see manual

T° ambient : -20°C to +65°C

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>Signal</th>
<th>Safety barrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>Current</td>
<td>Capacitance</td>
</tr>
<tr>
<td>Vin max = 4Vdc</td>
<td>lin max = 9mA</td>
<td>Ci = 450nF</td>
</tr>
<tr>
<td>Vout = 0 to Vin</td>
<td>lout max = 1mA</td>
<td>Ci = 0.44\mu F</td>
</tr>
<tr>
<td>Vmax (Ui) = 14Vdc</td>
<td>Imax (Li) = 200mA</td>
<td>Ca &gt; Ci + Cc</td>
</tr>
</tbody>
</table>

C\(_i\), L\(_i\) : internal capacitance and inductance of transmitter, L\(_c\), C\(_c\) : cable inductance and capacitance

4.2 Note

a) Selected associated apparatus or barriers must be third party approved as Intrinsically Safe for the application and have V open circuit and I short circuit not exceeding Vmax and Imax.

b) Cable capacitance (C\(_c\)) added to transmitter capacitance (C\(_i\)) must be less than the marked capacitance (C\(_a\)) and the cable inductance (L\(_c\)) added to the transmitter inductance (L\(_i\)) must be less than the marked inductance (L\(_a\)) (C\(_a\) and L\(_a\) : barrier's capacitance and inductance)

c) Barriers must be installed in accordance with barriers manufacturer's control drawing and applicable rules and standards.

d) The maximum nonhazardous location voltage must not exceed than 250Vrms.

e) 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.

f) Operating temperature : -20°C to +65°C

4.3 Schematic Diagram

4.4 Example of Compatible Safety Barrier

a) Consumer : MTL Model Number : MTL7761ac
b) Consumer : Stahl Model Number : 9001/01-086-150-01 for power supply line
                9001/01-086-020-01 for signal line

c) Consumer : Pepperl+Fuchs Model Number : Z961
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 or industrial storage tanks are equipped with gauge having a weak drive magnet 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 those gauges to provide an electrical output which can be used for remote indication of tank levels.

The Hall Effect Twinsite™ provide the easiest way to read local indication by using a dial face divided into percentage units.

This Hall Effect Twinsite require a 3.3Vdc Power Supply.

The housing, in UV stabilized plastic material, is hermetically sealed by ultrasonic welding and the electrical connections are sealed with potting material.

GENERAL SPECIFICATIONS
Accuracy: ± 4% with nominal value indicated in the calibration chart « DS-1318 » (see below) for all types
Hysteresys : less than ±1% typical
Repetability : ±2%
Resolution : Infinite
Operating Temperature : -20 to 65°C
Operating Voltage range : 3.3Vdc ± 0.33Vdc with a accuracy decrease of 1 to 2%, power range can be extended to: 2.33 to 4Vdc
Consumption : typical 8 to 9 mA under 3.3Vdc
Output Voltage : Ratiometric (Ratiometric means that the output signal voltage is proportional with the input voltage (Vin) Under 3.3Vdc, 10% is 0.33V (or 10% of input voltage) 90% is 2.97V (or 90% of input voltage)).
Output Current : Max 1mA

MATERIAL OF CONSTRUCTION
Crystal and case : polycarbonate, ultrasonic sealed
Dial : painted aluminium
Cap : polycarbonate or polyamide

SPECIFICITY
The Hall Effect Twinsite™ Transmitters are available in two sizes to fit all Junior or Senior Rochester Gauges.

Transmitter with not shielded cable
Supplied in standard with 2 meters shielded blue cable LiYCY-OB 3x0.5mm² DIN47100 (with white, green and brown conductors) for each models except for vertical entry supplied with a grey cable 3x0.25mm².
Impedance : 4.8µH
Capacitance : 440nF
Color of cable cover : White for each models except black for vertical entry
Cable Length : 100m maximum

CALIBRATION CHART « DS-1318 »
Best accuracy will be obtained using the calibration data in the table below, when powered in 3.3Vdc.

<table>
<thead>
<tr>
<th>Graduation</th>
<th>Nominal Ref. (Volts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-Stop</td>
<td>0.191</td>
</tr>
<tr>
<td>E</td>
<td>0.323</td>
</tr>
<tr>
<td>10</td>
<td>0.422</td>
</tr>
<tr>
<td>20</td>
<td>0.759</td>
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<tr>
<td>30</td>
<td>1.010</td>
</tr>
<tr>
<td>40</td>
<td>1.307</td>
</tr>
<tr>
<td>50</td>
<td>1.650</td>
</tr>
<tr>
<td>60</td>
<td>1.993</td>
</tr>
<tr>
<td>70</td>
<td>2.310</td>
</tr>
<tr>
<td>80</td>
<td>2.574</td>
</tr>
</tbody>
</table>

Customer has to check the suitability of the sensor with his application.
GENERAL DESCRIPTION
The Hall Effect Twinsite™ transmitter consists of a 4" dial for Senior Gauge (model 6290/6293) incorporating a Hall Effect Twinsite™ which provides an electrical output for remote indication. The Hall Effect Twinsite™ provide the easiest way to read local indication by using a dial face divided into percentage units. This Hall Effect Twinsite require a 3.3Vdc Power Supply.

GENERAL SPECIFICATIONS
Accuracy: ± 4% with nominal value indicated in the calibration chart (see below) for all types
Hysteresys: less than ±3% typical
Repetability: ±2%
Resolution: Infinite
Operating Temperature: -20 to 65°C
Operating Voltage range: 3.3Vdc ± 0.33Vdc With a decrease in accuracy of 1 to 2%, power range can be extended to: 2.33 to 4Vdc
Consumption: typical 8 to 9 mA under 3.3Vdc
Output Voltage: Ratiometric (Ratiometric means that the output signal voltage is proportional with the input voltage (Vin) Under 3.3Vdc, 10% is 0.33V (or 10% of input voltage) 90% is 2.97V (or 90% of input voltage)).
Output Current: Max 1mA

MATERIAL OF CONSTRUCTION
Crystal and case of twinsite: polycarbonate, ultrasonic sealed
Crystal of dial: polycarbonate
Case of dial: aluminium anodised
Bezel Ring: aluminium
Dial: painted aluminium

SPECIFICITY
This 4" Hall Effect Twinsite™ Transmitters is designed for mounting on Rochester Gauges models 6290/6293.

Transmitter with shielded cable
Supplied in standard with 4 meters shielded blue cable LiYCY-OB 3x0.5mm² DIN47100 (with white, green and brown conductors).
Impedance: 4.8µH
Capacitance: 440nF
Cable Length: 100m maximum

CALIBRATION CHART
Best accuracy will be obtained using the calibration data in the table below, when powered in 3,3Vdc.

<table>
<thead>
<tr>
<th>Graduation</th>
<th>Nominal Ref. (Volts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>0.119</td>
</tr>
<tr>
<td>10</td>
<td>0.356</td>
</tr>
<tr>
<td>20</td>
<td>0.680</td>
</tr>
<tr>
<td>30</td>
<td>0.917</td>
</tr>
<tr>
<td>40</td>
<td>1.241</td>
</tr>
<tr>
<td>50</td>
<td>1.610</td>
</tr>
<tr>
<td>60</td>
<td>2.000</td>
</tr>
<tr>
<td>70</td>
<td>2.356</td>
</tr>
<tr>
<td>80</td>
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<tr>
<td>90</td>
<td>2.917</td>
</tr>
<tr>
<td>95</td>
<td>3.181</td>
</tr>
</tbody>
</table>

Customer has to check the suitability of the sensor with his application.
4.7 Hall Effect 4" and 8" for Magnetel Gauges

GENERAL DESCRIPTION
The Hall Effect Twinsite™ transmitter consists of a 4" or 8" dial for Magnetel Gauge incorporating a Hall Effect Twinsite™ which provides an electrical output for remote indication. The Hall Effect Twinsite™ provide the easiest way to read local indication by using a dial face divided into percentage units. This Hall Effect Twinsite require a 3.3Vdc Power Supply.

GENERAL SPECIFICATIONS
Accuracy: ±4% with nominal value indicated in calibration chart (see next page) for all types
Hysteresys: less than ±3% typical
Repeatability: ±2%
Resolution: Infinite
Operating Temperature: -20 to 65°C
Operating Voltage range: 3.3Vdc ± 0.33Vdc With a decrease in accuracy of 1 to 2%, power range can be extended to: 2.33 to 4Vdc
Consumption: typical 8 to 9 mA under 3.3Vdc
Output Voltage: Ratiometric (Ratiometric means that the output signal voltage is proportional with the input voltage (Vin) Under 3.3Vdc, 10% is 0.33V (or 10% of input voltage) 90% is 2.97V (or 90% of input voltage)).
Output Current: Max 1mA

MATERIAL OF CONSTRUCTION
Crystal and case of twinsite: polycarbonate, ultrasonic sealed
Crystal of dial: polycarbonate
Case of dial: aluminium anodised
Bezel Ring: Stainless Steel
Dial: painted aluminium
SPECIFICITY
This Hall Effect Twinsite™ Transmitters are available for three different mounting (C, X or CX) to fit all respective Magnetel Rochester Gauge.

Transmitter with shielded cable
Supplied in standard with 8 meters shielded blue cable LiYCY-OB 3x0.5mm² DIN47100 (with white, green and brown conductors).
Impedance : 4.8µH
Capacitance : 440nF
Cable Length : 100m maximum

CALIBRATION CHART « for 4" Transmitters »
Best accuracy will be obtained using the calibration data in the table below, when powered in 3.3Vdc.

<table>
<thead>
<tr>
<th>Graduation</th>
<th>Nominal Ref. (Volts)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0.971</td>
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<td>1.292</td>
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<td>50</td>
<td>1.639</td>
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<td>2.010</td>
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<td>2.973</td>
</tr>
<tr>
<td>95</td>
<td>3.161</td>
</tr>
</tbody>
</table>

Customer has to check the suitability of the sensor with his application.

CALIBRATION CHART « for 8" Transmitters »
Best accuracy will be obtained using the calibration data in the table below, when powered in 3.3Vdc.

For dial plate 3 to 97%

<table>
<thead>
<tr>
<th>Graduation</th>
<th>Nominal Ref. (Volts)</th>
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</thead>
<tbody>
<tr>
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<tr>
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<td>20</td>
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<tr>
<td>30</td>
<td>0.957</td>
</tr>
<tr>
<td>40</td>
<td>1.281</td>
</tr>
<tr>
<td>50</td>
<td>1.610</td>
</tr>
<tr>
<td>60</td>
<td>1.980</td>
</tr>
<tr>
<td>70</td>
<td>2.310</td>
</tr>
<tr>
<td>80</td>
<td>2.567</td>
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<tr>
<td>90</td>
<td>2.838</td>
</tr>
<tr>
<td>97</td>
<td>3.181</td>
</tr>
</tbody>
</table>

For dial plate 5 to 95%

<table>
<thead>
<tr>
<th>Graduation</th>
<th>Nominal Ref. (Volts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>0.119</td>
</tr>
<tr>
<td>10</td>
<td>0.356</td>
</tr>
<tr>
<td>20</td>
<td>0.666</td>
</tr>
<tr>
<td>30</td>
<td>0.924</td>
</tr>
<tr>
<td>40</td>
<td>1.234</td>
</tr>
<tr>
<td>50</td>
<td>1.610</td>
</tr>
<tr>
<td>60</td>
<td>2.006</td>
</tr>
<tr>
<td>70</td>
<td>2.350</td>
</tr>
<tr>
<td>80</td>
<td>2.627</td>
</tr>
<tr>
<td>90</td>
<td>2.937</td>
</tr>
<tr>
<td>95</td>
<td>3.181</td>
</tr>
</tbody>
</table>

Customer has to check the suitability of the sensor with his application.
CONFORMITY DECLARATION

Wavre, 6th May 2015

I, PIERRE Lionel, Managing Director of

ROCHESTER Gauges International S.A.
Zone Industriel Nord
Avenue Lavoisier, 6
B-1300 Wavre BELGIUM

hereby certify that the
HALL EFFECT TWINSITE
with generic reference 6320S**07** are in conformity with the European Directives and Standards applicable:

Directive ATEX 94/9/EC with limits required by:
EN 60079-0 ed. 6 (2011-06)
EN 60079-11 ed. 6 (2011-06)

type certified by

APPRAGAZ - Chaussée de Vilvorde, 156 - B-1120 Brussels (Belgium)

Marked

Ex II 2 G Ex ib IIB T4 EPL Gb APRAGAZ 10ATEX0124X

T° ambiant : -20°C to +65°C

European Directives Low Voltage 2006/95/EC and EMC 2004/108/EC do not apply as the power supply is less than 75Vdc or 50Vac.


Certificates can be downloaded from our web site www.rochester-gauges.be

PIERRE Lionel
Managing Director