SIEMENS

Speed sensors Milltronics RBSS

Operating Instructions

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A5E45419003-AA

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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1.1 Operating instructions scope

This instruction manual covers the installation, operation and maintenance of the RBSS Speed Sensor Integrator.

1.2 Industrial use note

Note

- The RBSS is to be used only in the manner outlined in this instruction manual.
- This product is intended for use in industrial areas. Operation of this equipment in a residential area may cause interference to several frequency based communications.

Description

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2.1 Milltronics RBSS overview

The Milltronics RBSS is a high-resolution, wheel-driven return belt speed sensor that provides speed input to an integrator when used on a belt scale system.

The RBSS has a toothed gear, wheel, and trailing arm assembly, that rides along the return belt. The gear and wheel rotate on a shaft fixed to the trailing arm. The internal magnetic sensor detects the gear rotation and generates a signal proportional to the belt speed. The output signal is transmitted via cable connection to the integrator to determine the rate of the conveyed material.

The RBSS IS speed sensor contains a Pepperl + Fuchs, NAMUR rated, inductive proximity switch, model number: NJ0.8-5GM-N. The proximity switch detects the gear rotation, and transmits a signal to the integrator via the associated Switch Isolator.

Installing/mounting

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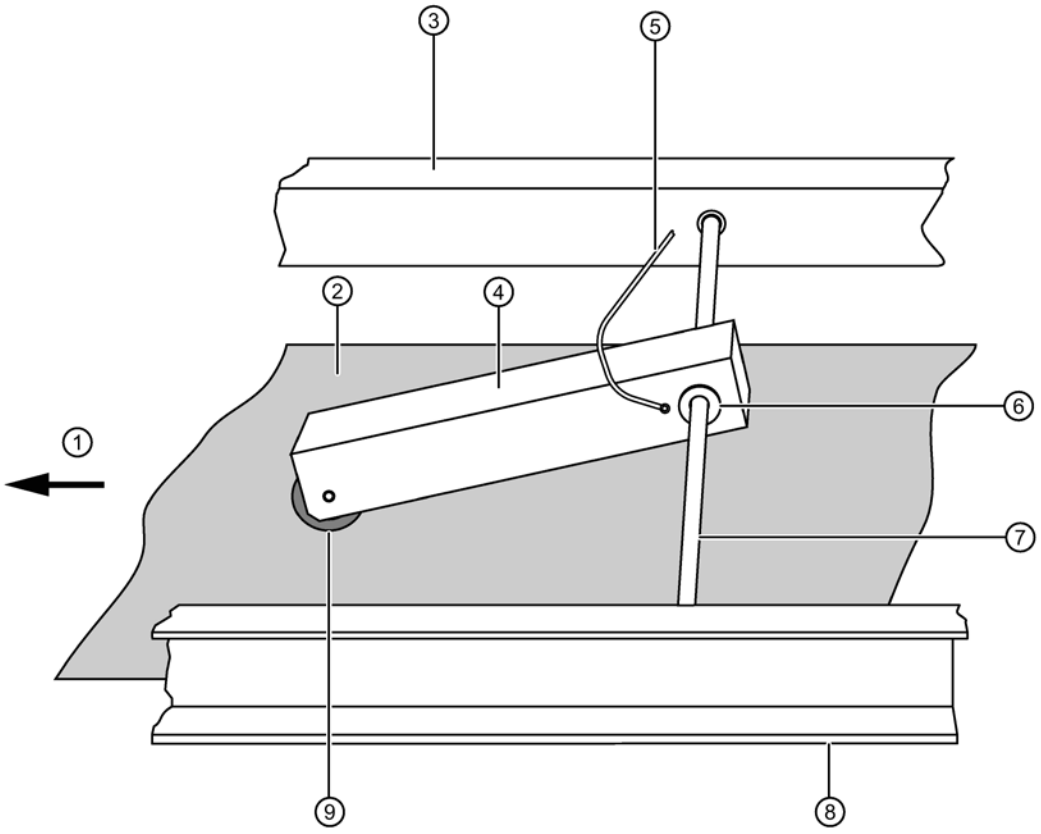
3.1 Location

The RBSS should be located near the scale assembly to simplify wiring. The wheel should ride on the return belt, either just before or just after a return belt idler.

3.2 Device without mounting bracket

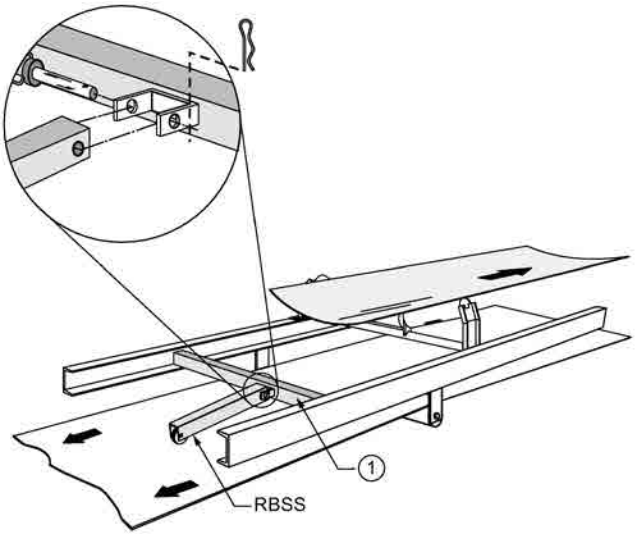
The standard RBSS mounting attaches to the conveyor stringers via a customer-supplied 1 inch cross bar, cut and fastened to the stringers.



① Return belt travel	② Belt	③ Stringer
④ RBSS	⑤ Cable	⑥ Washers, 2 places (by customer)
⑦ 24 mm (1 inch) dia. cross bar (by customer)	⑧ Stringer	⑨ Wheel

3.3 Device with mounting bracket

The RBSS speed sensor attaches to a customer-supplied structural cross member via a pivot and bracket assembly.

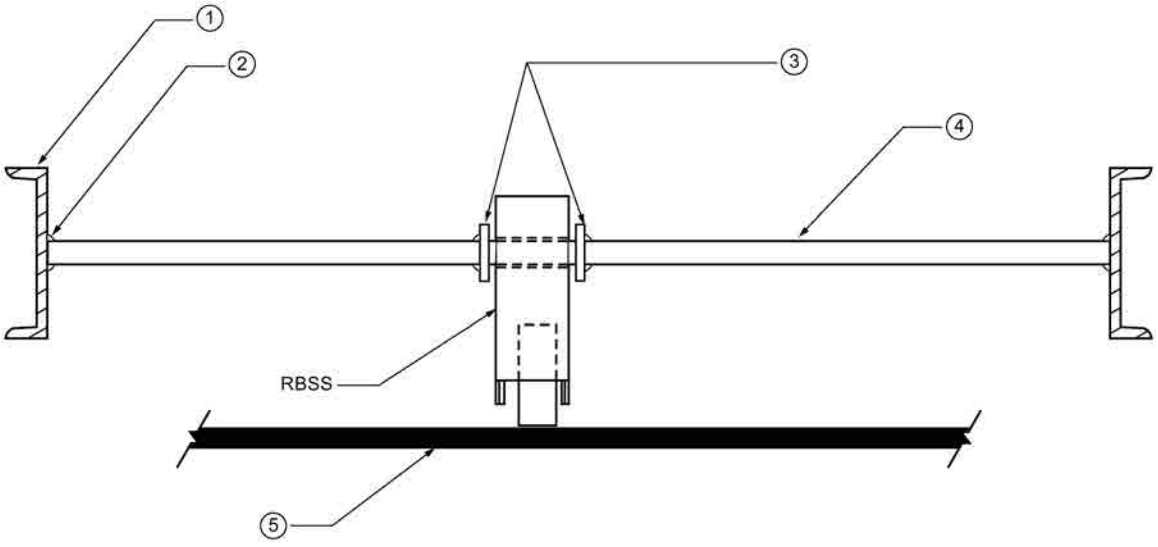


① Cross member (customer-supplied)

3.4 Installation steps

3.4.1 Device without mounting bracket

1. Measure the distance between the inside of the conveyor stringers, and then cut the 24 mm (1 inch) cross bar to the measured length.
2. Orient the return belt speed sensor. See RBSS without mounting bracket (Page 9).
3. Slide the cross bar through the hole on the end of the return belt speed sensor, and then slide one 24 mm (1 inch) washer onto either end of the cross bar.
4. Position the assembly so the sensor wheel rides in the middle of the return belt.
5. Make sure there is 3 mm (1/8 inch) clearance between the sides of the sensor and the washers, and then tack-weld the washers to the cross bar.
6. Tack-weld one end of the cross bar to one stringer.
7. Square the entire assembly with the return belt so the wheel will ride straight.
8. Tack-weld the other end of the cross bar to the opposite stringer, making sure the assembly remains square with the belt.
9. Run the belt to check that the wheel is riding straight on the belt and is not pulling to either side. If necessary, break one weld and pivot the entire assembly until the wheel runs true.



① Stringer ② Tack-weld ③ Washers (2 places)
④ Cross bar ⑤ Return belt

3.4.2 Device with mounting bracket

1. Position the RBSS mounting bracket against a structural cross member so the sensor wheel rides in the middle of the return belt. See RBSS with mounting bracket (Page 11).
2. Drill and fasten or tack-weld the RBSS mounting bracket in place.
3. Position the RBSS between the bracket arms, and insert pin. Insert pin clip into pin.
4. Run the belt to check that the wheel is riding straight on the belt and is not pulling to either side. If necessary, reposition the bracket until the wheel runs true.

Connection

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Note

All wiring must be done in conjunction with approved conduit, boxes, and fittings and to procedures in accordance with all governing regulations.

Ensure that there is sufficient slack in the cabling to allow the RBSS arm to pivot freely so the wheel rides on the belt. Restriction of the arm can cause slippage or excessive contact between the belt and the wheel.

RBSS CE

RBSS	Integrator
Red	Excitation
White	Signal
Black	Common

RBSS IS

RBSS IS	IS Switch Isolator Terminal	Integrator
Brown	1	
Blue	3	
	7	Speed signal input
	8	- excitation of load cells

Service and maintenance 5

5.1 Inspection

- Inspect the RBSS periodically to ensure that it can rotate freely about the pivot pin or cross bar.
- Inspect the proximity switch area periodically and remove any material build-up.

5.2 Unit repair and excluded liability

All changes and repairs must be done by qualified personnel and applicable safety regulations must be followed. Please note the following:

- The user is responsible for all changes and repairs made to the device.
- All new components must be provided by Siemens Milltronics Process Instruments Inc.
- Restrict repair to faulty components only.
- Do not re-use faulty components.

5.3 Wheel and bearing repair

Case 1

For tube housings with through holes for bolt and bushings of 22 mm (7/8 inch).

Parts required:

- 1 - wheel assembly, complete with sealed bearings and 60 tooth gear
- 2 - bushings
- 1 - M12 washer (optional - see ⑪ on diagram below)
- 2 - stepped washers
- 1 - hex head bolt M12 x 1.75, 120 mm long
- 1 - locking hex nut M12 x 1.75

Case 2

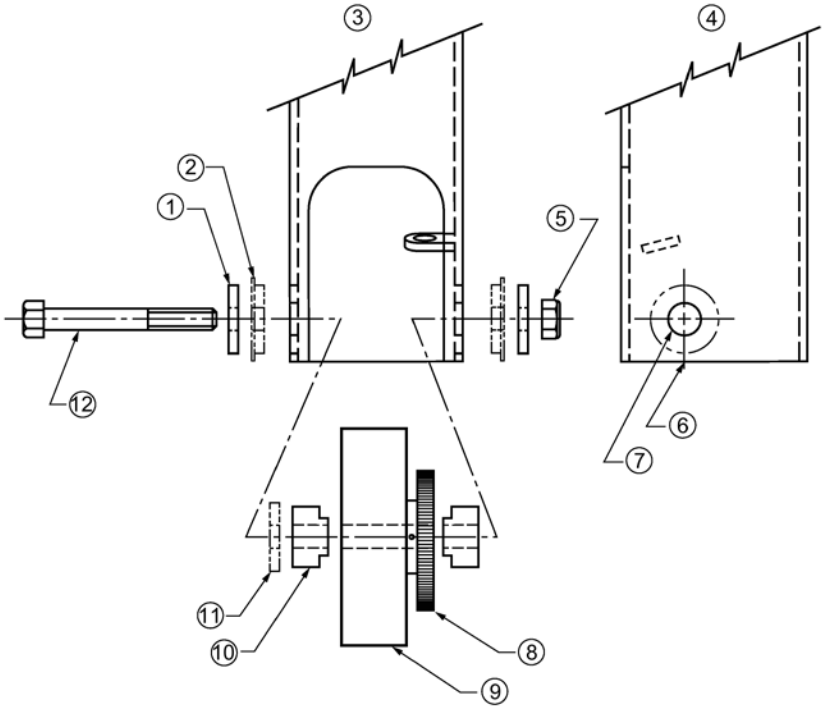
For tube housings with through holes for bolt of 13 mm (1/2 inch).

Parts required:

- 1 - wheel assembly, complete with sealed bearings and 60 tooth gear
- 2 - bushings
- 3 - M12 washers (1 of 3 washers is optional - see ⑪ on diagram below)
- 1 - hex head bolt M12 x 1.75, 120 mm long
- 1 - locking nut M12 x 1.75

Note

Spare parts kit 7MH7723-1FX contains parts for both Case 1 and Case 2. Extra M12 washers and stepped washers are provided.



① M12 flat washer (2)[2)]	② Stepped washer (2)[1)]	③ Front view
④ Side view	⑤ M12 x 1.75 locking hex nut[3)]	⑥ 22 mm (7/8 inch) hole[1)]
⑦ 13 mm (½ inch) hole[2)]	⑧ 60 tooth gear	⑨ Wheel assembly
⑩ Bushing (2)	⑪ Optional M12 washer: - Required of housing is imperial 4 x 3/16 inch square tubing - Not required if housing is metric 100 x 100 x 5 mm square tubing	

[1)] Case 1

[2)] Case 2

[3)] Torque to 34 Nm (25 ft/lb)

Technical data

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6.1 Power

RBSS CE	4.5 ... 28 V DC, 16 mA max.
RBSS IS	5 ... 25 V DC from IS Switch Isolator

6.2 Temperature

RBSS CE	-40 ... +110 °C (-40 ... +230 °F)
RBSS IS	-25 ... +100 °C (-14 ... +212 °F)

6.3 Input

	Shaft rotation 2 ... 450 rpm, bi-directional

6.4 Output

	60 pulses per revolution, 2 ... 450 Hz, 45.8 pulses/foot (150.4 pulses/meter)
RBSS CE	Open collector sinking output, 25 mA
RBSS IS	Load current, 0 ... 15 mA

6.5 Cable

RBSS CE	3 m (10 ft), 3 conductor 22 AWG (0.324 mm^2), PVC shielded cable 300 m (1 000 ft) maximum cable run
RBSS IS	2 m (6.5 ft), 2 conductor 26 AWG (0.129 mm^2), PVC covered cable 300 m (1 000 ft) maximum cable run to IS switch isolator 300 m (1 000 ft) maximum cable run from IS switch isolator and integrator

6.6 Construction

Trailing arm	Painted mild steel
Sensor wheel	127 mm (5 inch) diameter, polyurethane tread

6.7 Approvals

RBSS CE	CE
RBSS IS	Uses CE, ATEX and CSA approved Pepperl + Fuchs Proximity Switch and IS Switch Isolator (See Switch and Isolator Approvals below.)

Switch and Isolator Approvals

Note

The Approval Ratings for the Proximity Switch and the IS Switch Isolator are the property of Pepperl + Fuchs. For current approvals go to: http://www.am.pepperl-fuchs.com (http://www.am.pepperl-fuchs.com).

Proximity Switch Approval Ratings (Pepperl + Fuchs #NJ0.8-5GM-N)	• ATEX II 1D Ex iaD 20 T 108 °C (with suitable IS Switch Isolator)[1)] • CSA (with suitable IS Switch Isolator or Switch Amplifier): – General Purpose • CE
IS Switch Isolator Approval Ratings (Pepperl + Fuchs #KFA5-SOT2-Ex2 and #KFA6-SOT2-Ex2)	• ATEX II 1G D [EEx ia] II C • CSA: – Class I, Div. 1, Groups A, B, C, and D – Class II, Div. 1, Groups E, F, and G – Class III • CE

[1)] Based on the ATEX rating of the NAMUR slotted sensor and CSA approvals.

Dimension drawings

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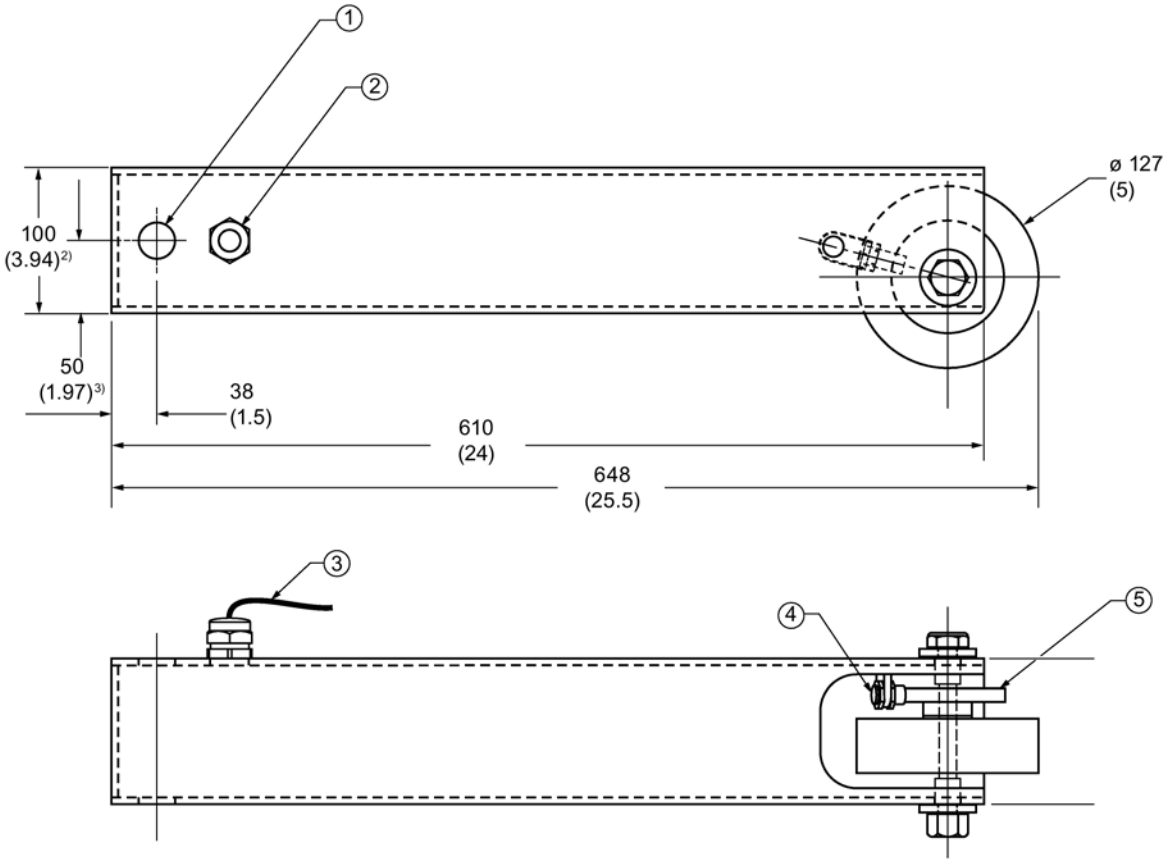
7.1 RBSS



Dimensions in mm (inch)

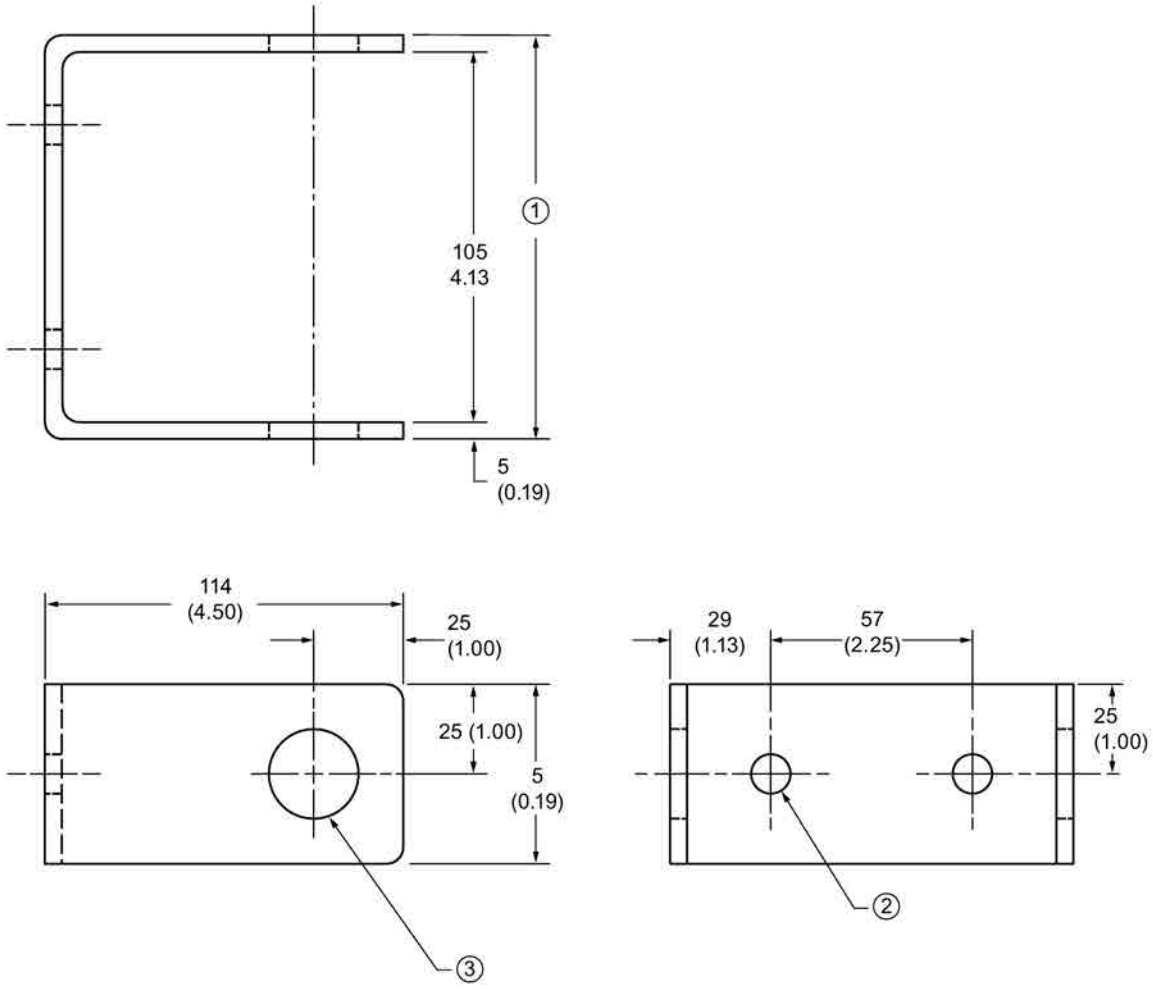
① ø 25 mm (1 inch) through both walls	② Through hole for cable gland 22 mm(0.88 inch)	③ 3 m (10 ft)[1] shielded cable
④ Sensor	⑤ 60 tooth gear	

[1] Cable for RBSS IS is 2 m (6.5 ft).

[2] Dimension equals 102 mm (4 inch) if manufactured in Canada.

[3] Dimension equals 51 mm (2 inch) if manufactured in Canada.

7.2 Mounting bracket



Dimensions in mm (inch)

① 114 (4.5 inch) ref.

② ø 11 mm (0.44 inch), 2 places

③ ø 25 mm (1 inch) through both sides

Certificates and support

A

A.1 Certificates

You can find certificates on the Internet at certificates (http://www.siemens.com/processinstrumentation/certificates) or on an included DVD.

A.2 Technical support

Technical Support

If this documentation does not provide complete answers to any technical questions you may have, contact Technical Support at:

- Support request (http://www.siemens.com/automation/support-request)
- More information about our Technical Support is available at Technical support (http://www.siemens.com/automation/csi/service)

Internet Service & Support

In addition to our documentation, Siemens provides a comprehensive support solution at:

- Service and support (http://www.siemens.com/automation/service&support)

Personal contact

If you have additional questions about the device, please contact your Siemens personal contact at:

- Partner (http://www.automation.siemens.com/partner)

To find the personal contact for your product, go to "All Products and Branches" and select "Products & Services > Industrial Automation > Process Instrumentation".

Documentation

You can find documentation on various products and systems at:

- Instructions and manuals (http://www.siemens.com/processinstrumentation/documentation)