million
in one

milltronics
RBSS

SIEMENS

Safety Guidelines

Warning notices must be observed to ensure personal safety as well as that of others, and to protect the product and the connected equipment. These warning notices are accompanied by a clarification of the level of caution to be observed.

Qualified Personnel

This device/system may only be set up and operated in conjunction with this manual. Qualified personnel are only authorized to install and operate this equipment in accordance with established safety practices and standards.

Warning: This product can only function properly and safely if it is correctly transported, stored, installed, set up, operated, and maintained.

Note: Always use product in accordance with specifications.

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Siemens Milltronics Process Instruments Inc.
1954 Technology Drive, P.O. Box 4225
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Introduction

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 rotates on a shaft fixed to the trailing arm. The internal magnetic sensor detects rotation of the gear, generating a signal proportional to 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 sensor, model #: NJ0.8-5GM-N. Rotation of the gear is detected by the proximity sensor, which transmits the signal to the integrator via the associated Switch Isolator.

The Manual

This instruction manual covers the installation, operation and maintenance of the RBSS Speed Sensor. Integrator and belt scale instruction manuals can be downloaded from www.siemens.com/milltronics.

We always welcome questions, comments, or suggestions about manual content, design, and accessibility.

Please direct your questions or comments to techpubs.smpi@siemens.com.

RBSS Specifications

Power
- RBSS: 5 to 18 V DC, 10 mA
- RBSS IS: 5 to 25 V DC from IS Switch Isolator

Temperature
- RBSS: -40 to 105 °C (-40 to 220 °F)
- RBSS IS: -25 to 100 °C (-14 to 212 °F)

Input
- shaft rotation 2 to 450 rpm, bi-directional

Output
- 60 pulses per revolution, 2 to 450 Hz, 45.8 pulses/foot (150.4 pulses/meter)
- RBSS: open collector sinking output, max. 17 mA
- RBSS IS: load current, 0 to 15 mA

Cable
- RBSS: 3 m, 3 conductor 22 AWG, shielded cable
  300 m (1000 ft) maximum cable run
- RBSS IS: 2 m, 2 conductor, 26 AWG PVC covered cable
  300 m (1000 ft) maximum cable run to IS switch isolator
  300 m (1000 ft) maximum cable run from IS switch isolator and integrator

Construction
- trailing arm: painted mild steel
- sensor wheel: 127 mm (5") diameter, polyurethane tread

Approvals
- RBSS: CE
- RBSS IS:
- ATEX: II 2 G EEx ia IIC T6 (with suitable IS Switch Isolator)
- CSA/FM (with suitable IS Switch Isolator or Swich Amplifier): Class I, Div. 1, Groups A,B,C, and D. Also Class II, Div. 1, Groups E, F, and G system approval
- CE

Switch and Isolator Approvals

> **Note:** The Approval Ratings for the Proximity Switch and the IS Switch Isolator are the property of Pepperl+Fuchs. Copies of theses Approval Certificates may be obtained at www.siemens.com/milltronics.

Proximity Switch Approval Ratings (Pepperl+Fuchs #NJ0.8-5GM-N)
- ATEX: II 2G, EEx ia IIC T6 (with suitable IS Switch Isolator)[1]
- CSA/FM (with suitable IS Switch Isolator or Switch Amplifier): Class I, Div. 1, Groups A,B,C, and D. Also Class II, Div. 1, Groups E, F, and G system approval
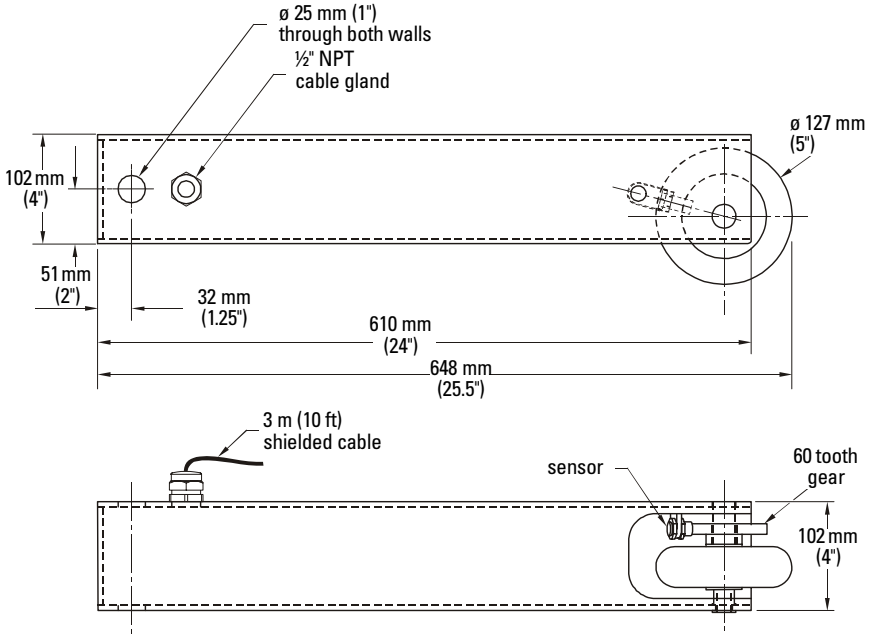
IS Switch Isolator (Pepperl+Fuchs #KFA5-SOT2-Ex2 and #KFA6-SOT2-Ex2)
- ATEX: II (1) G, [EEx ia] IIC
- CSA/FM: Class I, Div. 1, Groups A,B,C, and D. Also Class II, Div. 1, Groups E,F, and G.

[1.] Based on the ATEX rating of the NAMUR slotted sensor and CSA/FM system approvals.
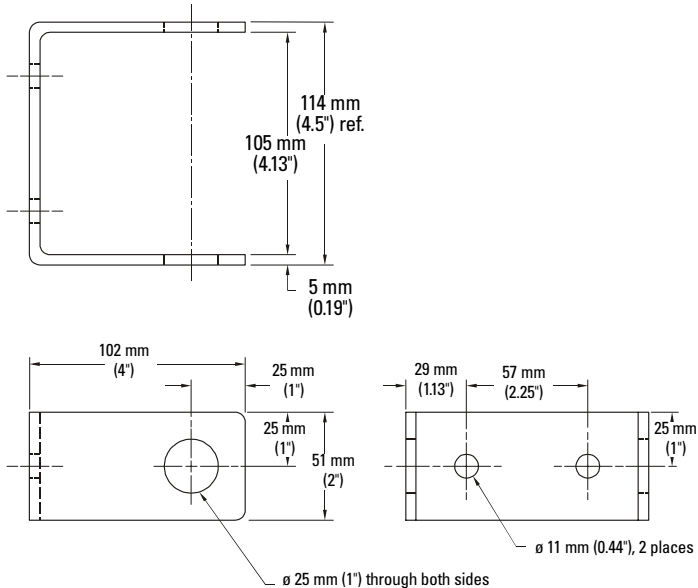
Dimensions

RBSS

ø 25 mm (1")
through both walls
½" NPT
cable gland

ø 127 mm (5")

102 mm (4")

51 mm (2")

32 mm (1.25")

610 mm (24")

648 mm (25.5")

3 m (10 ft) shielded cable

sensor

60 tooth gear

102 mm (4")

Note: Cable for RBSS IS is 2 m, 2 conductor 26 AWG, PVC covered.

Optional Mounting Bracket

114 mm (4.5") ref.

105 mm (4.13")

5 mm (0.19")

102 mm (4")

25 mm (1")

25 mm (1")

51 mm (2")

29 mm (1.13")

57 mm (2.25")

25 mm (1")

ø 11 mm (0.44"), 2 places

ø 25 mm (1") through both sides

Installation

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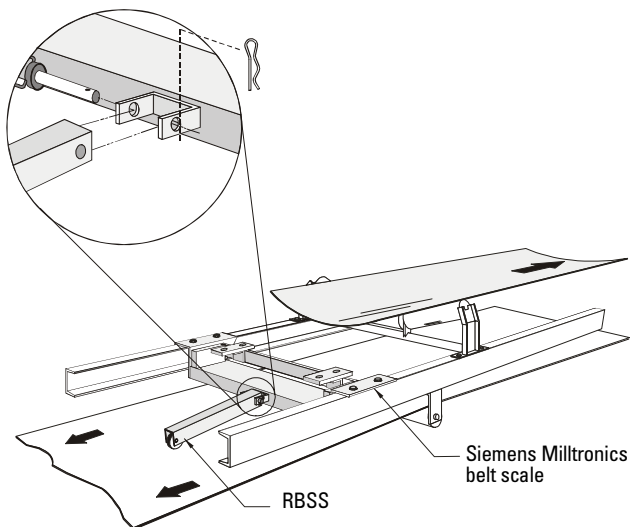
RBSS standard mounting
The standard RBSS mounting attaches to the conveyor stringers via a customer supplied 1" cross bar cut and fastened to the stringers
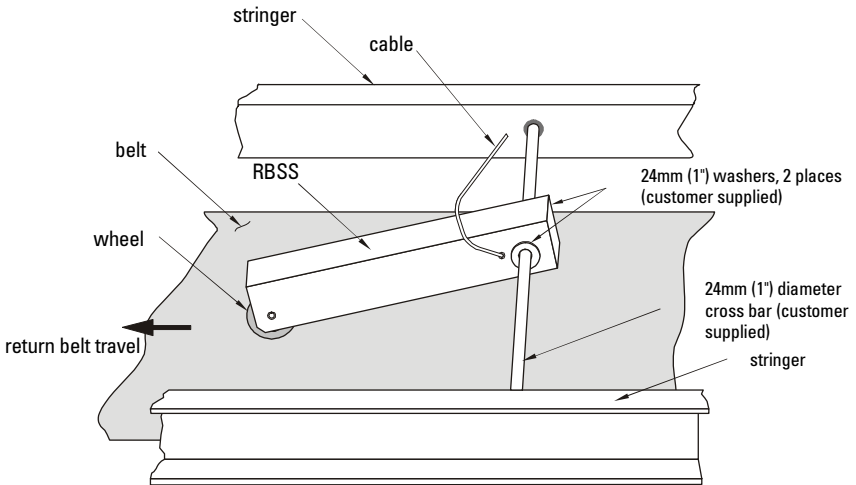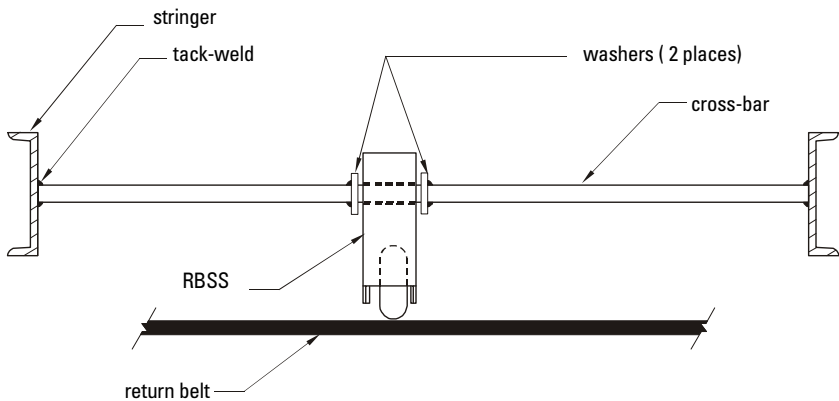

RBSS with optional mounting bracket
The RBSS speed sensor attaches to the static beam of the associated belt scale, or to a structural cross member via a pivot and bracket assembly.

Installation Steps

RBSS Standard Mounting

1. Measure the distance between the inside of the conveyor stringers, and then cut the 24 mm (1") cross bar to the measured length.
2. Orient the Return Belt Speed Sensor as shown in the RBSS standard mounting diagram on page 4.
3. Slide the cross bar through the hole on the end of the Return Belt Speed Sensor, and then slide one 24 mm (1") 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") 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.

RBSS with Optional Mounting Bracket

1. Drill and fasten or tackweld the RBSS mounting bracket to a structural cross-member. Position the bracket so the sensor wheel rides in the middle of the return belt.
2. Position the RBSS between the bracket arms, and insert pin. Insert pin clip into pin.
3. 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.

Interconnection

> **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.

Connection

RBSS

RBSS	Integrator
red	excitation (+15 VDC)
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

Maintenance

Inspection

- Inspect the RBSS periodically to ensure that it can rotate freely about the pivot pin or crossbar.
- Inspect the proximity switch area periodically and remove any material build-up.
- Inspect the wheel for premature wear on the wheel assembly. If left uncorrected, the wear may cause the wheel assembly to slide, allowing the bearings to contact the riv-nut. See Wheel and Bearing repair on next page for more information.

Lubrication

The RBSS wheel bearing will require lubrication. The frequency of lubrication varies, and may be adjusted, according to operating conditions. Use suitable industrial grade multi-purpose bearing grease.

Operating Condition	Lubrication Frequency
Conveying highly abrasive material	Bi-weekly
Outdoor operating conditions	Bi-weekly
Conveying low abrasive material	Monthly
Indoor operating conditions	Monthly

## 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.

Wheel and Bearing Repair
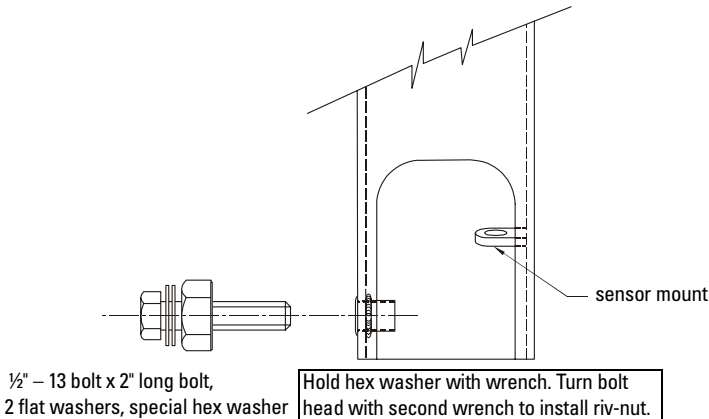
The RBSS wheel assembly consists of:

- 1 – ½" ID x 1" OD x 1/16" thick bronze thrust washer
- 2 – 5/8" ID x 1" OD x 1/16" thick bronze thrust washer
- 1 – 5/8" ID x ¾" OD x 7/16" thick bronze thrust bushing
- 1 – riv-nut
- 1 – wheel complete with bearing assembly
- 1 – 2 3/4" shoulder bolt

½" ID x 1" OD x 1/16"
thick bronze thrust washer

shoulder bolt

5/8" ID x ¾" OD x 7/16" thick bronze thrust bushing

5/8" ID x 1" OD x 1/16"
thick bronze thrust washer

5/8" ID x 1" OD x 1/16" thick bronze thrust washer

wheel assembly
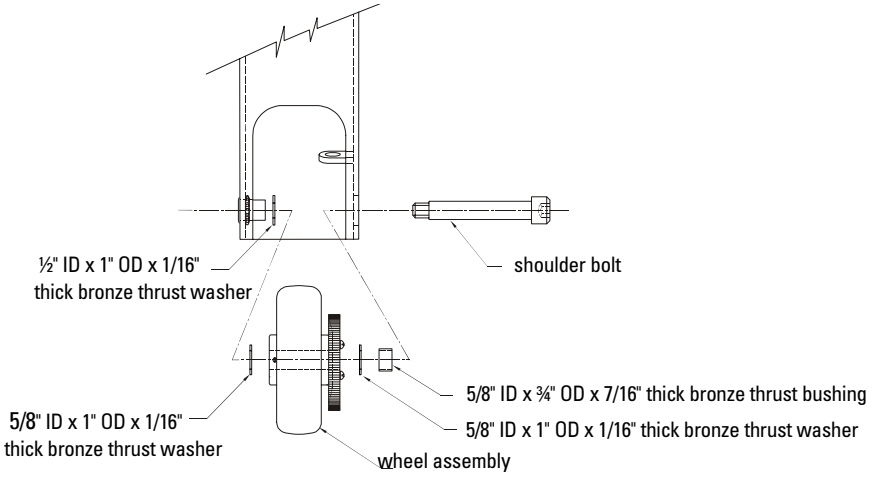
Riv-nut Replacement

To replace the riv-nut, order the replacement kit from Siemens Milltronics (Part Number: 7MH7723-1AT), and follow instructions below:

1. Drill out and discard the old riv-nut, being careful not to damage the hole in the housing.

2. Place the new riv-nut through the hole, using a ½" -13 bolt, hex washer and flat washers. Tighten the riv-nut so it fully compresses and secures to the housing.

sensor mount

½" – 13 bolt x 2" long bolt,
2 flat washers, special hex washer

Hold hex washer with wrench. Turn bolt head with second wrench to install riv-nut.

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