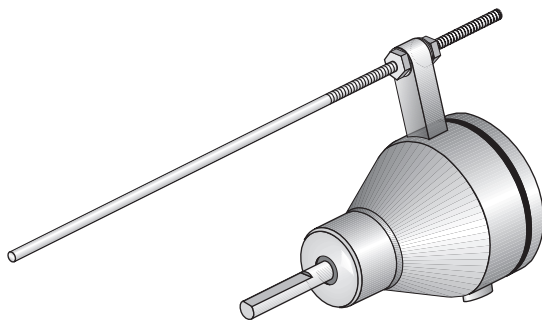


Instruction Manual • August 2003



**milltronics**

MD-256 SPEED SENSOR

**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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While we have verified the contents of this manual for agreement with the instrumentation described, variations remain possible. Thus we cannot guarantee full agreement. The contents of this manual are regularly reviewed and corrections are included in subsequent editions. We welcome all suggestions for improvement.

Technical data subject to change.

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# Milltronics MD-256 Speed Sensor

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Milltronics MD-256 speed sensor is a high-resolution shaft driven speed sensor. It measures the shaft's rotation by sending pulses to the integrator.

This small, light-weight speed sensor features:

- High resolution for accurate measurement, suitable for low or varying shaft speeds
- Long bearing life

256 pulses are generated for each rotation of the MD-256 shaft. These pulses are typically fed into a Milltronics belt scale integrator. The integrator interprets the pulses and uses them in the calculation of belt speed, flow rate, and material totalization.

Integrators with which the MD-256 works are:

- CompuScale III
- Milltronics BW100
- Milltronics BW500
- Competitive integrators – consult your local Siemens Milltronics representative

The MD-256 sensors can also be used with older model Siemens Milltronics integrators:

- Compuscale
- Compuscale IIA
- Compuscale II
- Compu-M

## The Manual

This instruction manual covers the installation, operation and maintenance of the MD-256 speed sensor. Because the MD-256 speed sensor is used in conjunction with a belt scale integrator, the instruction manual covering this component must be read as well.

This manual must be referred to for proper installation and operation of any component of the weighing system including the MD-256. Adhering to the installation and operating procedures will ensure a quick, trouble-free installation and allow for the maximum accuracy and reliability of your weighing system.

If you have any questions, comments, or suggestions about the manual contents, please email us at [techpubs@siemens-milltronics.com](mailto:techpubs@siemens-milltronics.com).

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# Specifications

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## Power

- +10 to +15 V DC, 30 mA (from integrator)

## Ambient Temperature

- -40 to 55 °C (-40 °F to 131 °F)

## Input

- shaft rotation 0.5 to 470 rpm, bi-directional

## Output

- uni-directional open collector sinking output
- +5 V DC, 25 mA max (to integrator)
- 256 pulses per revolution
- 2 to 2000 Hz

## Enclosure

- general purpose
- aluminum

## Cable (optional)

- 3-wire shielded, 0.75mm<sup>2</sup> (18 AWG)
- maximum cable run 305 m (1000 ft.)

## Weight

- 1.22 kg (2.68 lbs.)

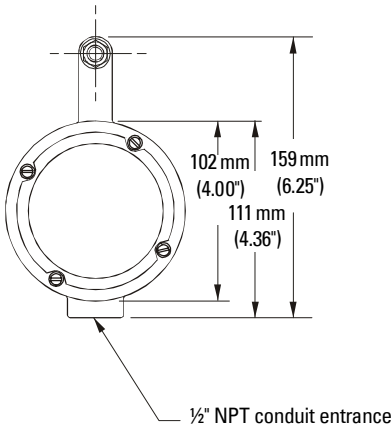
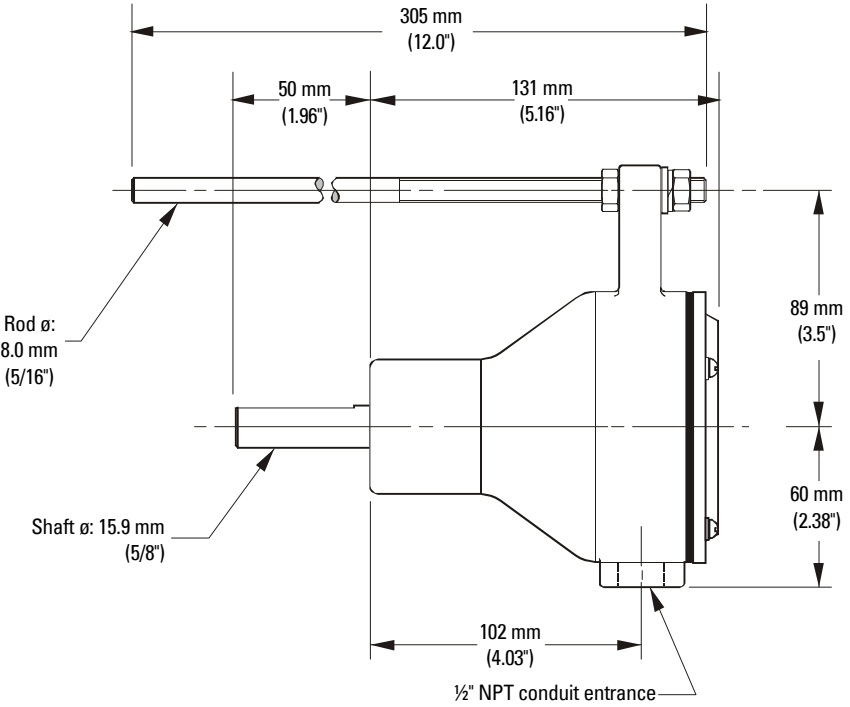
## Approvals

- NEMA 4x
- IP65
- CE

# Installation

**Note:** Installation must only be performed by qualified personnel.

## Dimensions



# Mounting

The input shaft on the MD-256 is coupled to the rotating shaft on a belt driven pulley and is not externally supported. The unit's arresting rod stops it from rotating with the shaft and can be fitted with a spring to soften sudden speed changes.

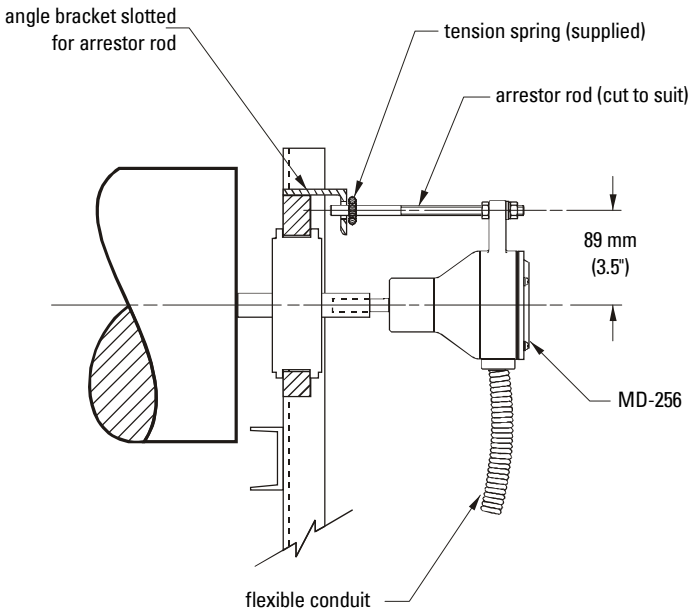
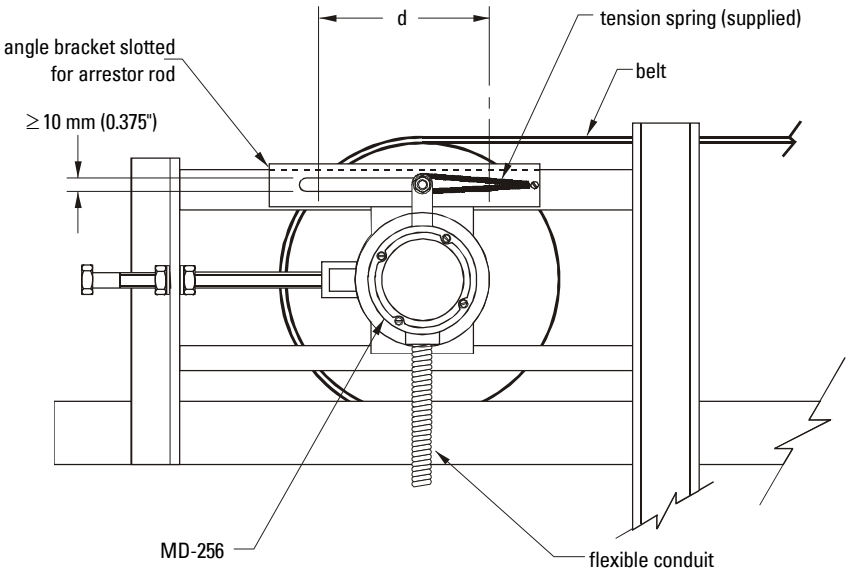
**CAUTION: The arresting rod should only be solidly attached to the MD-256. Fixing the rod at both ends will apply binding forces and cause the unit's bearings to wear prematurely.**

When mounting, make sure the unit and the pulley shaft are concentric to avoid stresses on the unit's bearings.

For preferred mounting locations, refer to the associated belt scale or weigh feeder instruction manual.



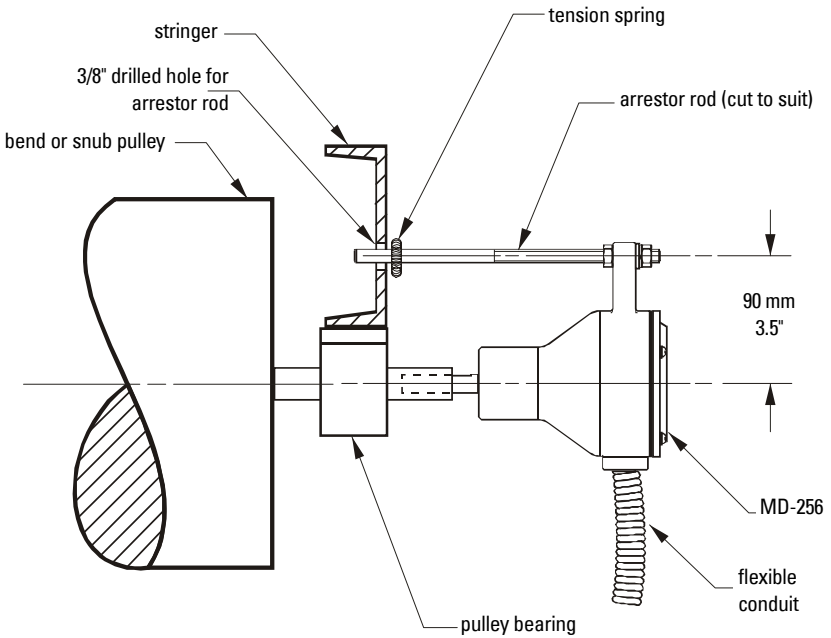
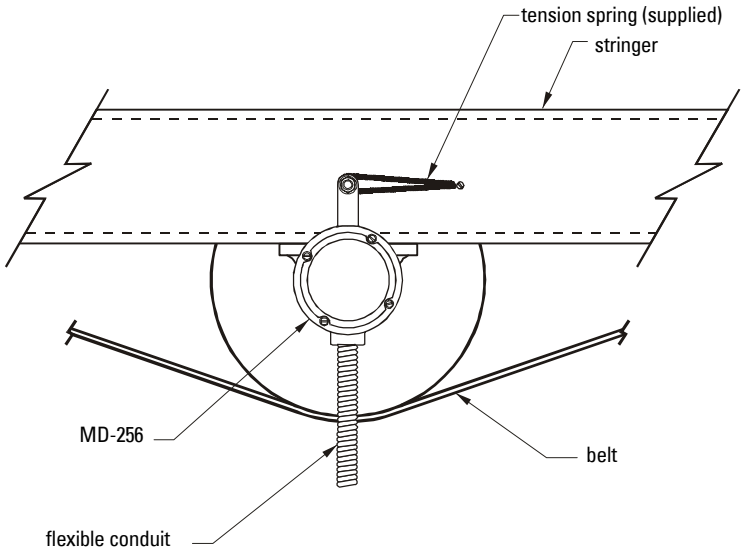
# Mounting to a Tail Pulley



## Notes:

- Distance (d) is the take up travel on the tail pulley
- When adjusting the belt take up, ensure there is play on the arrestor rod. If the arrestor rod is pushed against the end of its travel slot, premature bearing wear may result.

# Mounting to a Bend or Snub Pulley



## Notes:

When mounting to a bend or snub pulley only a 3/8" (10 mm) drilled hole is required for the arrestor rod.

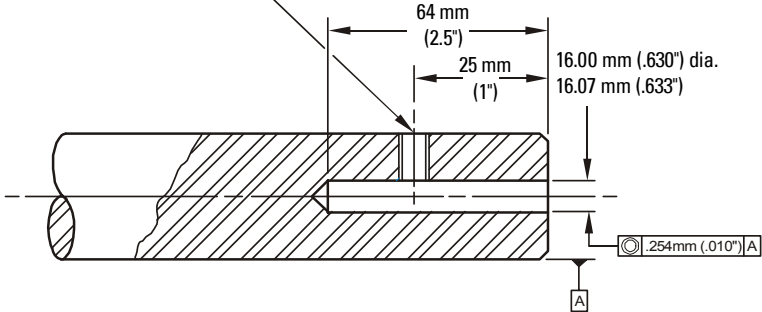
# General Installation Steps

1. Drill out pulley shaft to a depth of 64mm (2.5") concentric to its centerline.

**!** **WARNING: Exercise caution and remain within specified tolerances.**

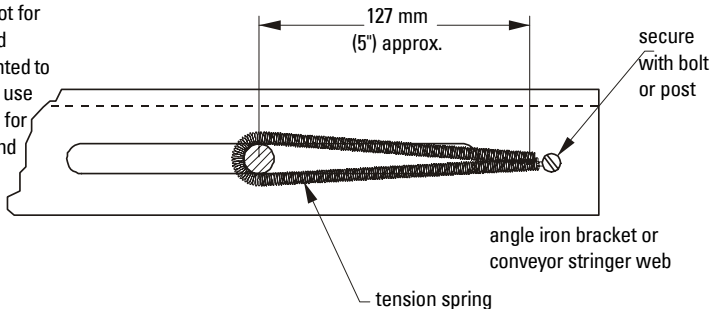
2. Drill out and thread the set screw hole.

M8x1.25 (5/16-18 UNC)  
set screw (by customer)



3. Attach angle iron bracket to work with the arrestor rod (if mounting on a tail pulley).
4. Cut the arrestor rod to a suitable length.
5. Insert the MD-256 shaft into the pulley shaft and lock with set screw on flat of shaft.

Example slot for  
arrestor rod  
when mounted to  
tail pulley - use  
drilled hole for  
snub or bend  
pulley



6. Attach spring to arresting rod and frame.
7. Encase wiring in flexible conduit to allow unit to float.
8. Wire the MD-256 to the Milltronics' integrator. See Terminal Connections to Milltronics Integrators on page 9 for terminal post connections.

**!** **WARNING: The arresting rod should only be solidly attached to the MD-256. Fixing the rod at both ends will apply binding forces and wear the unit's bearings prematurely.**

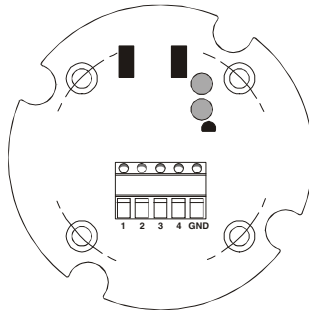
# Interconnection

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

Interconnection between the unit and the integrator should be made with three-wire shielded, 0.75 mm<sup>2</sup> (18 AWG) cable.

Ground the shield at the integrator end **ONLY**.

**Note:** Flexible conduit is recommended so that excess stress is not applied to the shaft bearings.



## Terminals

### 1 – +15 V DC

The positive power supply from the integrator connection.

### 2 – Clockwise Speed Out

The positive output connection of the measurement loop. This output is only used when the sensor is rotating clockwise.

### 3 – Counter-Clockwise Speed Out

The positive output connection of the measurement loop. This output is only used when the sensor is rotating counter-clockwise.

### 4 – Common

The common connection used as a reference point with the integrator.

### GND – Ground

A ground connection. Do not use this ground for the cable shield.

**Note:** Ground the cable shield at the integrator end only!

# Terminal Connections to Milltronics Integrators

MD-256	1 +15V	2 CW	3 CCW	4 Cmn	GND
CompuScale III	30	31	31	32	N/C
Milltronics BW100	8	7	7	6	N/C
Milltronics BW500	19	16	16	17	N/C

Determine the pulley shaft rotation on the end of the pulley shaft to which the MD-256 is attached.

If the pulley shaft **rotates clockwise**, connect the appropriate wire to terminal 2.

If the pulley shaft **rotates counter clockwise**, connect the appropriate wire to terminal 3.

**!** **WARNING: Do not connect terminals two and three at the same time.**

**Note:** N/C indicates the terminal is not normally connected.

# Maintenance

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## Inspection

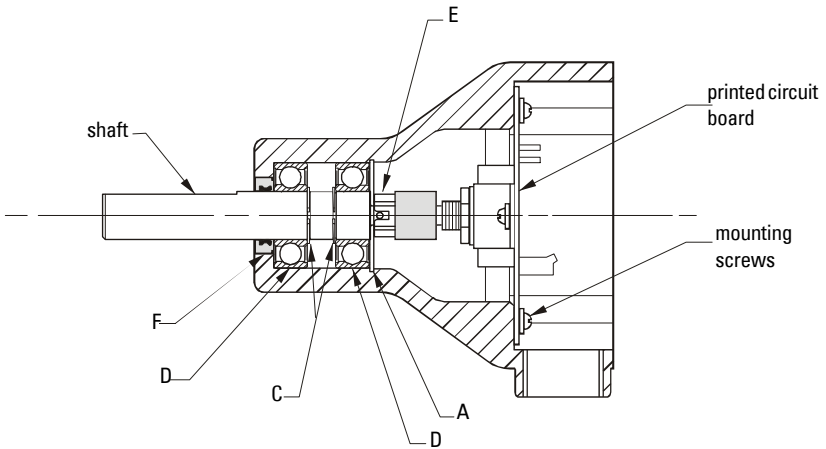
Periodically the cover should be removed and the enclosure and circuit board should be cleaned for dust and grime buildup. If cleaning is required, disconnect the power and use a vacuum cleaner and a clean, dry paintbrush. While the cover is off, check all electrical contacts for corrosion and evidence of arcing.

Bearing wear is detected by excess play or sound. If the bearings exhibit excess play or produce an unreasonably loud sound, they should be replaced.

## Bearing Replacement

The unit's bearings should be periodically checked for corrosion, wear, and seizing. The bearings' life depends on the mounting, the severity of the application, and the surrounding environment. Sealed bearings are used so that lubrication is not required.

The bearing will wear prematurely if there is any force applied to the MD-256 body. Ensure that only flexible conduit is used on the unit and that it is not exerting force on the unit.



# Bearing Replacement Procedure

To replace the bearings when they are worn follow these steps.

## Removing the Bearings

1. Remove the MD-256 cover.
2. Remove the wiring from the terminal block.
3. Remove the unit from its installation.
4. Unscrew the circuit board fixing screws.
5. Remove the circuit board and store in a static-free bag or equivalent “safe” area.
6. Remove the first bearing’s **C clip (part A)** using retaining ring pliers.
7. Gently drift the unit’s shaft out of the housing. One bearing should come with the shaft and one should remain in the housing.
8. Pull the bearing off the shaft.
9. Drift out the bearing and rawhide seal (**part F**) from the housing.
10. Clean the housing with a rag.

## Replacing the Bearings

1. Warm the housing in hot water to expand the metal.
2. Remove from the water and completely dry with a clean rag.
3. Insert the rawhide seal (**part F**) into the housing.
4. Slide one of the new bearings (**part D**) into the housing. Make sure it fits snugly against the end of the housing.
5. Slide the second bearing onto the unit’s shaft.
6. Gently drift the shaft back into place. It is in place when you can see the groove for the **C clip (part A)**. Do not damage the pin on the end of the shaft because it is required to turn the encoder.
7. Replace the **C clip (part A)**
8. Replace the circuit board and ensure correct alignment of the rubber coupling and the shaft pins.
9. Replace the mounting screws for the circuit board.
10. Reconnect to the installation.
11. Rewire the terminal block.
12. Replace the MD-256 cover.

## Replacement Parts

Part numbers and suppliers for the user-serviceable parts in the MD-256 are:

Part	Supplier	Part Number
Bearings ( <b>parts D</b> )	Boston Bearings,	1623DC
	Nice Bearings	16232RS
C Clip ( <b>part A</b> )	TRUARC	R3000-137
C Clip ( <b>parts C</b> )	TRUARC	R3100-62
Rubber Connector ( <b>part E</b> )	Milltronics	PBD-21420010
Dust Seal ( <b>part F</b> )	Chicago Rawhide	6141





# Notes

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# Notes

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