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PRODUCT DATASHEET

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Product Data Sheet
February 2015
IP210, Rev EA

Mobrey Mini-SQUING

Compact Vibrating Fork Liquid Level Switch

- Function virtually unaffected by flow, turbulence, bubbles, foam, vibration, solids content, coating, properties of the liquid, and product variations
- No need for calibration and requires minimum installation procedures
- Polarity insensitive and short circuit protection
- Industry standard plug/socket connection
- No moving parts or crevices means virtually no maintenance
- Electronic, self-checking, and condition monitoring - Heartbeat LED gives status and health information
- Magnetic test point makes functional test easy
- Compact design, small in size and weight
- “Fast Drip” Fork Design gives quicker response time especially with viscous liquids
- Hygienic connections

mobrey

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Process Management

Overview of the Mobrey Mini-SQUING

Threaded process connection

Tri-Clamp process connection

Measurement principle

The Mobrey Mini-SQUING is designed using the principle of a tuning fork. A piezo-electric crystal oscillates the forks at their natural frequency. Changes to this frequency are continuously monitored. The frequency of the vibrating fork sensor changes depending on the medium in which it is immersed. The denser the liquid, the lower the frequency.

When used as a low level alarm, the liquid in the tank or pipe drains down past the fork, causing a change of natural frequency that is detected by the electronics and switches the output state.

When the Mini-SQUING is used as a high level alarm, the liquid rises in the tank or pipe, making contact with the fork which then causes the output state to switch.

Compact and lightweight

'Fast Drip' forks

Key features and benefits

- Virtually unaffected by turbulence, foam, vibration, solids content, coating, or liquid properties
- Stainless steel housing and plug/socket connection for the fast fit, high volume user
- Compact and lightweight design for side or top mounting
- The industry standard DIN 43650 plug/socket is used for a fast connection. The polarity insensitivity and short circuit protection make electrical hook-up safe and easy
- The Mini-SQUING is designed for operation in temperatures from –40 to 302 °F (–40 to 150 °C)
- The 'heartbeat' LED gives status and health information on the Mini-SQUING
- 'Fast Drip' fork design gives quicker response time, especially with viscous liquids
- Rapid wet-to-dry time for highly responsive switching
- Fork shape is optimized for hand polishing to meet hygienic requirements
- No moving parts or crevices for virtually no maintenance

Contents

Fit and forget

- Once installed, the Mini-SQUING is ready to go.
  It needs no calibration and requires minimum installation
- The 'heartbeat' LED is visible through the end cap and gives an instant visual indication that the unit is operational
- Functional testing of the instrument and system is easy with a magnetic test point
- You can install, and forget it

Superior performance

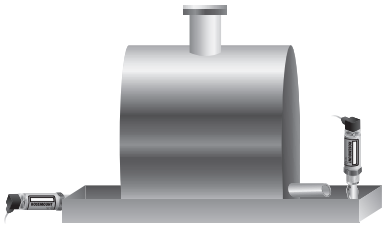
- Functionality is virtually unaffected by flow, turbulence, bubbles, foam, or vibration
- The 'Fast Drip' design allows the liquid to be quickly drawn away from the fork tip, making the Mini-SQUING quicker and more responsive in high density or viscous liquid applications

Applications

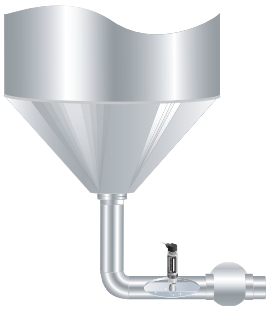
- Overfill protection
- High and low level alarms
- Leak detection
- Run dry or pump protection
- Pump control or limit detection
- Hygienic applications

Overfill protection

High and low level alarm



Leak detection



Pump protection

Mobrey Mini-SQUING Ordering Information

Table 1. Mobrey Mini-SQUING ordering information

Model	Product Description
VT	Compact Vibrating Fork Liquid Level Switch
Electronic Type	
Standard	
0	Direct load switching with plug connection (2 wire) 21 to 264 Vac 50/60Hz, 21 to 264 Vdc
1	PNP/PLC low voltage switching with plug connection 18 to 60 Vdc
Process Connection Size / Type	
Standard	
0	3/4-in. BSPT (R) thread
3	1-in. BSPT (R) thread
5	3/4-in. NPT thread
7	2-in. (51 mm) Tri-clamp
F	1-in. BSPP (G) thread
L	1-in. BSPP (G) Semi-extended 4.6 in. (116 mm)
Typical Model Number: VT 0 7	

Table 2. Spare parts and accessories ordering information

Spares and Accessories	
Standard	
SK331	Seal for 1-in. BSPP (G1A). Material: Non-asbestos BS7531 grade X carbon fiber with rubber binder
SK267	Hygienic adaptor boss for 1-in. BSPP model. Material: 316 SST fitting. Fluorocarbon (FPM/FKM) O-ring
SK266	Hygienic mounting kit for 2-in. (51 mm) Tri-clamp model. Includes vessel fitting, clamp ring, and seal. Material: 316 SST and NBR Nitrile
MSP-MMS	Telescopic test magnet

Specifications

Material selection

Emerson provides a variety of Mobrey products with various product options and configurations including materials of construction that can be expected to perform well in a wide range of applications. The Mobrey product information presented is intended as a guide for the purchaser to make an appropriate selection for the application. It is the purchaser's sole responsibility to make a careful analysis of all process parameters (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.), when specifying product, materials, options and components for the particular application. Emerson Process Management is not in a position to evaluate or guarantee the compatibility of the process fluid or other process parameters with the product, options, configuration or materials of construction selected.

Physical

Product

- Mobrey Mini-SQUING Compact Liquid Level Switch

Measuring principle

- Vibrating Fork

Applications

- Most liquids including coating liquids, aerated liquids, and slurries

Mechanical

Process material

- 316L Stainless Steel (1.4404)
- For Tri-Clamp connection, hand polished to better than 0.8 µm. Gasket material for 1 in. BSPP (G1) is Non-asbestos BS7531 Grade X carbon fiber with rubber binder.

Housing materials

- Body: 304 SST with polyester label
- LED window: Flame retardant Polyamide (Pa12) UL94 V2
- Plug: Polyamide glass reinforced
- Plug seals: Nitrile butadiene rubber

Mounting

- 3/4-in. BSPT (R) or NPT
- 1-in. BSPT (R) or BSPP (G) thread, or
- Hygienic 2-in. (51 mm) Tri-clamp fitting

Dimensional drawings

- See "Dimensional Drawing" on page 7

Ingress Protection (IP) rating

IP66/67 to EN60529

Performance

Hysteresis (water)

- ±0.039-in. (± 1 mm) nominal.

Switching point (water)

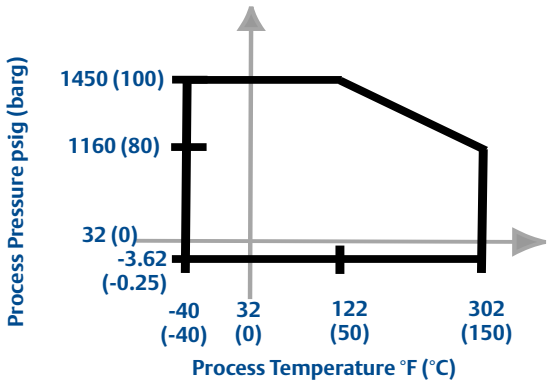
- 0.5 in. (13 mm) from fork tip if mounted vertically.
- 0.5 in. (13 mm) from the fork edge if mounted horizontally.
- The switch point varies with different liquid densities.

Functional

Operating pressures

- The final rating depends on the process connection
- Threaded Connection: See Figure 1
- Hygienic Connection: Up to 435 psig (30 barg)

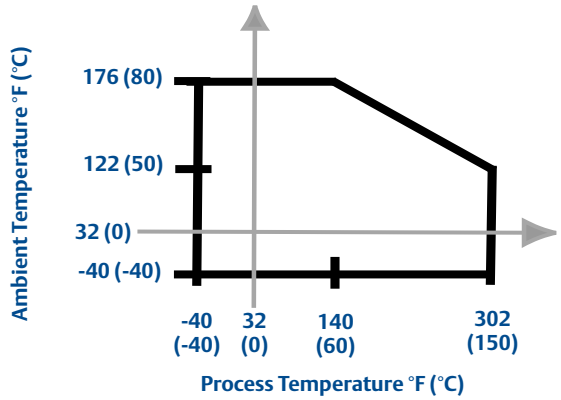
Figure 1. Process pressures graph



Operating temperatures

- See Figure 2 for the maximum and minimum temperatures

Figure 2. Process temperatures graph



Liquid density

- Minimum 37.5 lb/ft^3 (600 kg/m^3)

Liquid viscosity range

- 0.2 to 10000 cP (centiPoise)

Solids content and coating

- Maximum recommended diameter of solid particles in the liquid is 0.2 in. (5 mm)
- For coating products, avoid 'bridging' of forks

Switching delay

- 1 second dry-to-wet or wet-to-dry

CIP (Clean In Place) cleaning

- Withstands steam cleaning routines up to 302 °F (150 °C)

Electrical

Switching mode

- User selectable (Dry=on or Wet=on) by selecting plug wiring

Cable connection

- Via 4-way plug provided (DIN43650)
- Max. conductor size is 15AWG
- 4-position orientation (90°/180°/270°/360°)

Conductor size

- Maximum 0.06 in.^{2} (1,5 mm^2)

Cable gland

- PG9 provided. Cable diameter 0.16 to 0.35 in. (4 to 9 mm)

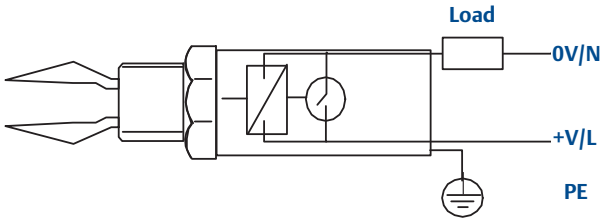
Protection

- Polarity insensitive
- Over-current, short circuit, and load-missing protection
- Surge protection to IEC61326

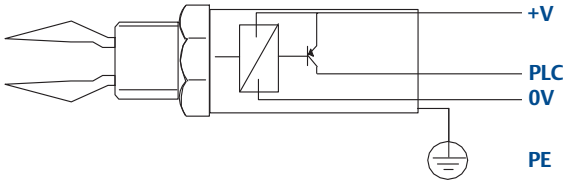
Grounding

- The Mini-SQUING should always be grounded either through the terminals or using the external ground connection provided

Direct Load Switching (Electronics Type Code 0)	
Operating Voltage	21 to 264 Vac (50 to 60 Hz)/dc
Maximum switched load	500 mA
Maximum peak load	5 A for 40 ms max.
Minimum switched load	20 mA continuous
Voltage drop	6.5 V @ 24 Vdc / 5 V @ 240 Vac
Current draw (load off)	<3.0 mA continuous



PNP Switching (Electronics Type Code 1)	
Operating Voltage	18 to 60 Vdc
Maximum switched load	500 mA
Maximum peak load	5 A for 40 ms max.
Voltage drop	<3 V
Supply Current	3 mA nominal
Output current (load off)	<0.5 mA



Product Certifications

L.V. Directive

EN61010-1
Pollution degree 2, Category II (264V max),
Pollution degree 2, Category III (150 V maximum)

Electro Magnetic Compatibility (EMC) Directive

EN61326

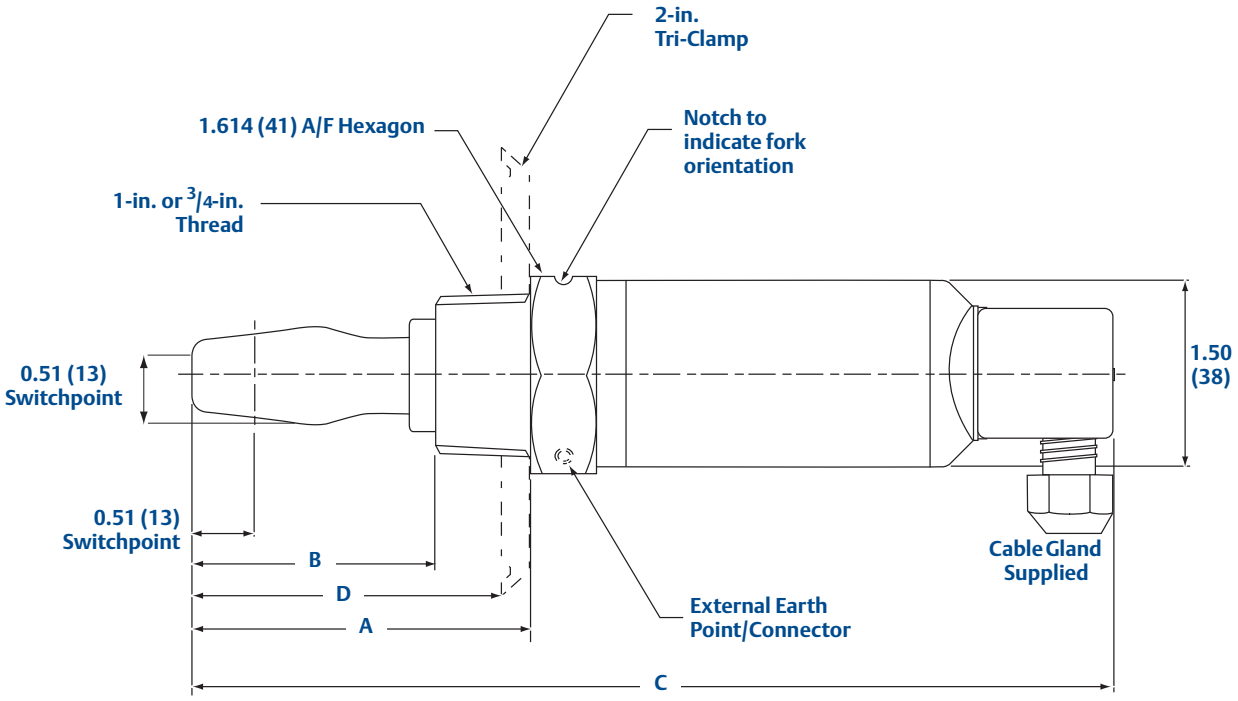
Overfill Protection

If required, select Product Certificates code U1 for DIBt/WHG overfill protection.
The approval number is Z-65.11-236.

Canadian Registration Number (CRN)

The CRN is 0F04227.2C for model numbers with a NPT threaded process connection selected.

Dimensional Drawing



Process Connections	A	B	C	D
3/4-in. BSPT (R)	2.72 (69)	1.97 (50)	7.40 (188)	N/A
3/4-in. NPT	2.72 (69)	1.97 (50)	7.40 (188)	N/A
1-in. BSPT (R)	2.72 (69)	1.97 (50)	7.40 (188)	N/A
1-in. BSPP (G)	3.07 (78)	2.36 (60)	7.91 (201)	N/A
2-in. (51 mm) Tri-Clamp	2.72 (69)	1.97 (50)	7.40 (188)	2.52 (64)
1-in. Semi-extended	4.57 (116)	3.86 (98)	9.41 (239)	N/A

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