Missouri Filter & Process Equipment Co
MOFILCO-Quality, Value, Service
12025 Manchester Road, Suite 30G
St Louis MO 63131
314-821-4321 www.mofilco.com
mofilco@mofilco.com

MONITOR

Practical solutions...at every level!

SiloPatrol® SMU



FEATURES & ADVANTAGES

- **Weight and cable-based "Smart" level sensor** provides continuous or on-demand level measurement and is unaffected by material characteristics such as dielectric constant, conductivity, dust and humidity.
- **Innovative Hall-effect sensor array** helps to eliminate the plumb bob from getting stuck in material by providing data to the microprocessor which in turn controls the amount of power to the robust direct-drive gear motor so it can pull the plumb bob harder if needed.
- NEW! **Wireless Bluetooth® set-up** allows operator to utilize a free configuration app on an Android-based device with Bluetooth® capability to easily access and configure the SMU set-up instead of having to open the unit to configure it. (App available from Monitor's Web site.)
- NEW! **Modbus™ connectivity** lets the RS-485 version of SMU communicate with existing control systems.
- NEW! **Widened array of programmable features** including cable cycle limit and relay output for high or low distance threshold setting, error indication or cycle operate.
- **Split-compartment enclosure** isolates all electrical and electronic components from the process environment to ensure long-term reliable operation.
- **Uniquely designed wiper seal compartment** for fast, easy servicing or replacement if necessary.
- **Easy to install** means that the user-friendly design and technology does not require the services of an instrumentation technician.
- **Measuring range up to 150 feet (46m)** in storage vessels.

Now with Wireless Bluetooth® Set-Up

Easily download free Android™-based app from Monitor Web site at www.monitortech.com/apps or scan QR-Code

Practical Tip

SiloPatrol provides reliable long-range measurement of materials with low dielectric constants such as plastics.

PRINCIPLE OF OPERATION

The heart of the **SiloPatrol®** Inventory Management System is an industry-leading cable-based "Smart" sensor called the Silo Monitoring Unit (SMU) that is designed to perform in some of the harshest and most dynamic level measurement conditions. The SMU with its state-of-the-art sensors including Hall-effect technology can be combined with a variety of operator interface and auxiliary output options to provide a practical vendor / remote managed inventory system designed for your specific requirements.

When a measurement cycle is initiated, either manually or automatically, the **SiloPatrol®** sensor (SMU) motor control system deploys a plumb bob, that is attached to a heavy-duty stainless steel cable, for descent into the vessel. The motor control circuitry regulates an optimal speed of descent that helps to eliminate cable slack, maximizes motor life and ensures that the plumb bob will stop when it contacts the material surface. The SMU measures the amount of cable deployed during descent via its unique optical sensing system. Once the optical encoder determines that the plumb bob has reached the material surface, the microcontroller reverses the direction of the motor and transmits the distance value. During the ascent of the plumb bob, the SMU measures the amount of cable retrieved in order to reconfirm the distance measurement.

PRACTICAL APPLICATIONS

- Use when target material characteristics may change thereby eliminating need for re-calibration.
- Great economical choice when accuracy is important and periodic measurements are sufficient.
- Measuring technique provides peace-of-mind without concern of spurious reflections associated with other technologies.
- Typical applications include, but are not limited to: Grains, Feeds, Powders, Coal, Bulk Chemicals, Cement, Rocks, Sand, Limestone, Plastic Pellets, Plastic Regrind, Slurries, Liquids and Oils.
- Measure many liquids or slurries with optional ball float plumb bob or detect some settled solids covered in water with optional solid/water interface plumb bob.

For more detailed information, please contact a Monitor representative or visit Monitor's website at http://www.monitortech.com/product_c_c_sp.shtml

follow us on facebook LinkedIn Google+

OPTIONS

- Three models to choose from:
  - Smart RS-485 version with Bluetooth® set-up for use with **HMI²** local operator interface or **SiloTrack™** inventory management software. Also includes Modbus connectivity to communicate with other operator interfaces or control systems being used at facilities that utilize Modbus. (Units are backwards compatible.)
  - Analog output version with Bluetooth® set-up for use as a standalone transmitter that provides an updated analog signal each time a new measurement is made. (Units are backwards compatible.)
  - Pulse output version generates AC or DC pulses in response to a request for a measurement from a contact input. This output can be used to provide direct input into a PLC.
- Choice of 0°, 5° or 10° freeze-resistant mounting flange.
- Selection of plumb bobs to fit specific application needs.
- Available in ordinary location, $CSA_{US/C}$ hazardous location or ATEX Ex hazardous location.
- **WirelessEZ** communication interface is available.
- Optional independent analog & relay outputs are offered for RS-485 systems using an Auxiliary Output Enclosure (AOE).

SPECIFICATIONS

More product specifications can be found on Monitor's Web site.

Power Requirements:	115VAC or 230VAC(±15%), 50/60 Hz
Power Consumption:	6VA continuous, 50VA intermittent
Process Temperature:	-40°F to 300°F (-40° C to 150°C)
Ambient Operating Temp.:	-40°F to 150°F (-40° C to 65°C)
Max. Internal Bin Temp.:	Up to 300°F (149°C) with use of bare stainless steel cable; Up to 200°F (93°C) with use of nylon or polyethylene jacketed cables
Max. Vessel Pressure:	15 PSI
Measurement Range:	150 feet maximum (45.7 m)
Measurement Rate:	1.0ft/sec (typical) (0.3 m/s)
Accuracy:	± 0.25% of distance reading
Repeatability:	0.1ft (30 mm)
Resolution:	0.01ft (0.12in/3mm)
Conduit Entry:	(2) 3/4" NPT
Shipping Dimensions: (L x W x H)	34 x 15 x 16" (864 x 381 x 406mm)
Shipping Weight-Approx.:	45lbs (20.4kg) -SMU, plumb bob, cable
Air Purge Connection:	1/4" NPT
Wiring Distance ("smart"):	3,280ft (1000m) max @ 9600 baud, 26 AWG
Enclosure Rating:	NEMA 4X / ENCLOSURE TYPE 4X; IP66

Output Signal:	
Standard "Smart":	RS-485 half-duplex, isolated, proprietary protocol Address Selection - 1-16 (SiloPatrol); 1-247 (Modbus) Relay Output - 5A @ 250VAC max, isolated, dry contact
Pulse:	1 pulse per 1/10ft or dm, isolated, dry contact, selectable: 0.1ft - 12Hz, time-on 40mS, time-off 45mS dm - 4Hz, time-on 40mS, time-off 210mS AC Pulse - 70mA max @ 24-250VAC DC Pulse - 70mA max @ 24VDC Relay Output – 5A @ 250VAC max, isolated, dry contact
Analog:	4-20mA, reversible to 20-4mA, isolated; Self powered 500 Ohms maximum loop resistance Relay Output – 5A @ 250VAC max, isolated, dry contact
Enclosure:	Cast aluminum w/ powder coat finish
Mounting:	Freeze-Resistant "K" flange, 8"dia w/ 7" bolt circle
Approvals:	
Ordinary Location:	$CSA_{US/C}$; CE Mark
Hazardous Location:	$CSA_{US/C}$: Class II, Groups E, F & G; Class III ATEX: ⟨Ex⟩ II 1/2 Dc T 75°C Ex tD A21 IP6X T75°C (Ta -40°C to +65°C)

ORDERING INFORMATION

SiloPatrol SE Silo Monitoring Unit (SMU SE)

Select	Output
1	Standard "Smart" RS-485 communications
2	Pulse (retro) output
3	4-20mA analog output

Select	Environment
1	Ordinary locations
2	Hazardous locations - CSA us/c (North America)
3	Hazardous locations - ATEX

Select	Mounting Flange
1	Standard K-flange
2	5° K-flange
3	10° K-flange

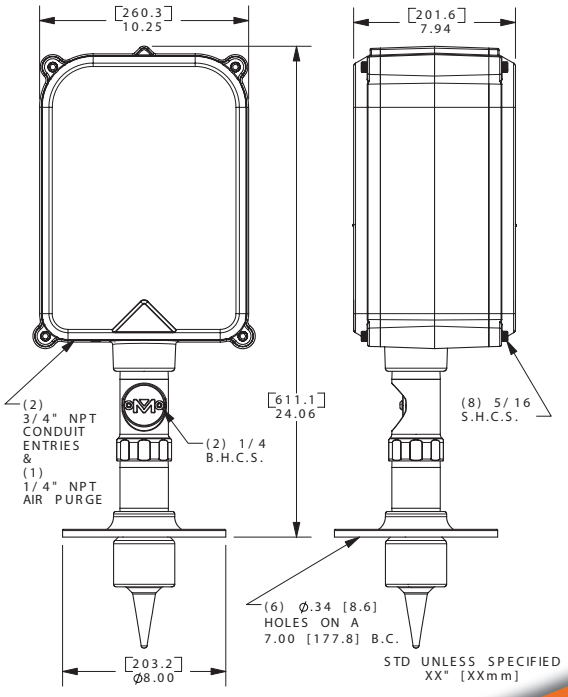
Select	Cable Type (Customer Specified Length up to 150ft [46m])
1	Nylon jacket
2	Stainless steel
3	Polyethylene jacket

Select	Operating Voltage
1	115 VAC
2	230 VAC

6	-	8	5	X	X	–	X	X	X	2	Order Number

MECHANICALS

DIMENSIONS ARE SHOWN IN INCHES WITH MILLIMETER EQUIVALENT IN BRACKETS



ACCESSORIES [1]:

Part #	Description
6-2190	Digestible Plumb Bob
6-2021	Cast Epoxy Plumb Bob
6-3103 [1]	Standard Cast Aluminum Plumb Bob
6-3123	Cast Aluminum with Teflon® Coating Plumb Bob
6-3136	316 Stainless Steel Plumb Bob
6-4106	316 Stainless Steel Inverted Cone Plumb Bob
6-4126	Teflon®-Coated 316 Stainless Steel Inverted Cone
6-4108	316 Stainless Steel Ball Float
6-4128	Teflon®-Coated 316 Stainless Steel Ball Float
6-4112	Solid / Water Interface-Style SS Plumb Bob
6-3125	5° Mounting Flange
6-3128	10° Mounting Flange
6-8010	Tablet, WiFi / Bluetooth®
R0514-22001 [2]	Belden® 9322 RS-485 communication cable (Overall Beldfoil® Shield - 100% Coverage, PVC Insulation, Chrome PVC Jacket, Nominal OD is .201" [5.10mm])

NOTES:
1 6-3103 cast aluminum plumb bob is included with each SMU SE.
2 R0514-22001 cable is not for plenum installations. Consult local electrical codes.

ISO 9001:2008 Certified

2-Year Limited Warranty

Teflon® is a registered trademark of Dupont Chemical Co.
Bluetooth® is a registered trademark of Bluetooth SIG, Inc.
Android™ is a trademark of Google Inc.
Modbus™ is a trademark of Schneider Electric / Modicon

MONITOR TECHNOLOGIES, LLC
44W320 Keslinger Road ▼ Elburn, IL 60119 USA
Tel: 1-630-365-9403 ▼ In US/CAN 1-800-766-6486
Fax: 1-630-365-5646 ▼ monitor@monitortech.com
www.monitortech.com ▼ www.flexar.info
Blog: www.monitortech.typepad.com