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# 1500 Series Level Switches

The SOR® family of **1500 series** mechanical level switches answer industry's call for less expensive alternatives to the traditional chambered level switch. The 1500s are suitable for most any point level application.

## Common Applications

- Separators
- Suction Scrubbers
- Dehydrators
- Refrigeration
- Re-injection
- Small Diameter Vessels
- High-Low Level Alarm
- Cooling Water Applications
- Wet Scrubbers
- Seal Pots
- Make-Up Water
- Vapor Recovery
- Overflow Protection
- Lube Oil Reservoirs
- Pump On - Pump Off
- Contaminated Water Applications




1510



1530



1540



1550

## Features and Benefits

- **All Stainless Steel construction**
- **Standard product rating of 1500 psi @ -40 to 400°F (103 BAR @ -40 to 204°C)**
- **Minimum working temperature rating of -40°F**
- **5000 psi rating available with polypropylene float**
- **Complete isolation of the process from the switch – no o-rings or seals**
- **Horizontal switches may be oriented for high- or low-level action**
- **SOR products are certified to IEC 61508 for non-redundant use in SIL1 and SIL2 Safety Instrumented Systems for most models. For more details or values applicable to a specific product, see the Safety Integrity Level Quick Guide (Form 1528).**
- **5-year warranty**

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## Application: Separators

Multiple separators are a common occurance in the natural gas industry. Even with raw gas wells, there is always condensate, water, or some other NGL that needs to be separated prior to transporting for processing.

There are a number of separation technologies and all of them require collection of these liquids after separation. Some are simple gravity separators, while some can be quite elaborate. **Regardless of the separation method, SOR 1500 Series Level Switches fit the application.**

## Inlet separator

As raw gas enters large vessels in the plant called “inlet separators”, condensate (natural gasoline) and water is removed from the main gas stream. An SOR 1510 level switch is mounted in a separator at, or about, the same elevation as the inlet pipe that brings in the raw oil and gas mixture. A shut-off valve is installed in the inlet piping that is usually kept open by air pressure and allows the fluid mixture to enter the inlet separator. When liquid level reaches the float on the 1510 the switch actuates.

Upon actuation, a signal is sent to (for example) a solenoid valve, sometimes via a PLC, which shuts off the air normally routed to the valve. With the air supply cut off, the valve closes and fluid flow to the separator comes to a halt.

When an SOR 1540 is used, the air supply reaches the shut-off valve via the pneumatic level switch. When actuated, the air is blocked and the shut-off valve closes because of a lack of air supply.

In both cases, a separate level controller works in conjunction with a dump valve that drains the liquid from the inlet separator.

## Blow case separator

Another specific separator application where 1500 series level switches excel is controlling a blowcase separator upstream from a compressor.

A blowcase separator is essentially two vessels connected vertically. Gas flows into the upper vessel (compressor) and gravity pulls liquids down into the lower vessel (blowcase). When the blowcase is full, a 1500 series switch actuates and closes a valve between the two tanks. A second valve opens and allows the compressed gas to move from the compressor back down into the blowcase. This forces the accumulated liquids out into the pipeline, downstream from the compressor.

A second 1500 series switch is often used as a low level to reset the system when the blowcase empties. Both the 1510 and 1540 may be used with equal effectiveness; the one you choose depends only on the application and your preference.

## Glycol dehydrator

Often, a glycol dehydrator is necessary for removal of tiny water droplets from natural gas if the water was not completely extracted with the initial separator. The process works by “dehydrating” the natural gas; glycol dehydration involves putting glycol in contact with a stream of natural gas that contains water. The glycol absorbs the water from the wet gas stream, becomes heavier and sinks to the bottom of the contactor where it is expelled. The natural gas is then easily routed out of the dehydrator and the glycol/water solution is sent to a special boiler that evaporates the water, allowing the glycol to be recycled and dehydrate the natural gas once again.

An SOR 1500 series mechanical level switch is installed on the contactor to monitor glycol/water levels. When mounted below the wet gas inlet, it prevents the glycol/water level from rising above it. If the level reaches the switch, a signal is sent to a solenoid valve that works in conjunction with a dump valve and drains the liquid from the dehydrator.

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The first step to creating your model string is to determine whether an electronic or pneumatic switch is needed, and whether a side or top mount switch is needed. Refer to the pages mentioned below for the different options for selecting the right technology for a specific application.



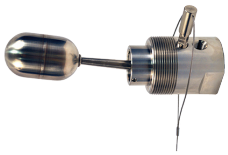
## 1510 Side Mounted Level Switch ---- 4

is a horizontally mounted, float-operated level switch suitable for plant and OEM applications where open or closed contacts are required to signal presence or absence of liquid at a discrete level. The float extension arm moves a magnet which actuates (deactuates) a hermetically sealed reed switch. Actuation (deactuation) can be reversed by rotating the unit 180 degrees.



## 1530 Side Mounted Pneumatic Level Switch ---- 7

is a horizontally mounted, float-operated level switch suitable for plant and OEM applications where pneumatic valve operation is required to signal presence or absence of liquid at a discrete level. The float extension arm moves a magnet which actuates (deactuates) a pilot valve to operate a pneumatic amplifier. Actuation (deactuation) can be reversed by rotating the unit 180 degrees.



## 1540 Side Mounted Pneumatic Level Switch ---- 9

is a horizontally mounted, float-operated level switch suitable for plant and OEM applications where pneumatic valve operation is required to signal presence or absence of liquid at a discrete level. The float arm moves a magnet which in turn moves a shuttle that either blocks or allows pilot pressure to pass and operate ancillary equipment. Actuation (deactuation) can be reversed by rotating the unit 180 degrees or switching inlet connections. The supply media must be filtered and oil free. Air is the usual media; however, any dry, filtered gas can be used.



## 1550 Top Mounted Level Switch ---- 11

is a vertically mounted, float-operated level switch suitable for plant and OEM applications where open or closed contacts are required to signal presence or absence of liquid at a discrete level. The float stem moves a magnet that actuates (deactuates) a hermetically sealed reed switch.

## Popular Add-Ons ---- 14

- Manual Check
- Extended Float
- Interface Detection
- Chambers

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# 1510 Side Mounted Level Switch

**1510** is a horizontally mounted, float-operated level switch suitable for plant and OEM applications where open or closed contacts are required to signal presence or absence of liquid at a discrete level. The float extension arm moves a magnet which actuates (deactuates) a hermetically sealed reed switch. Actuation (deactuation) can be reversed by rotating the unit 180 degrees.



## Product Specifications

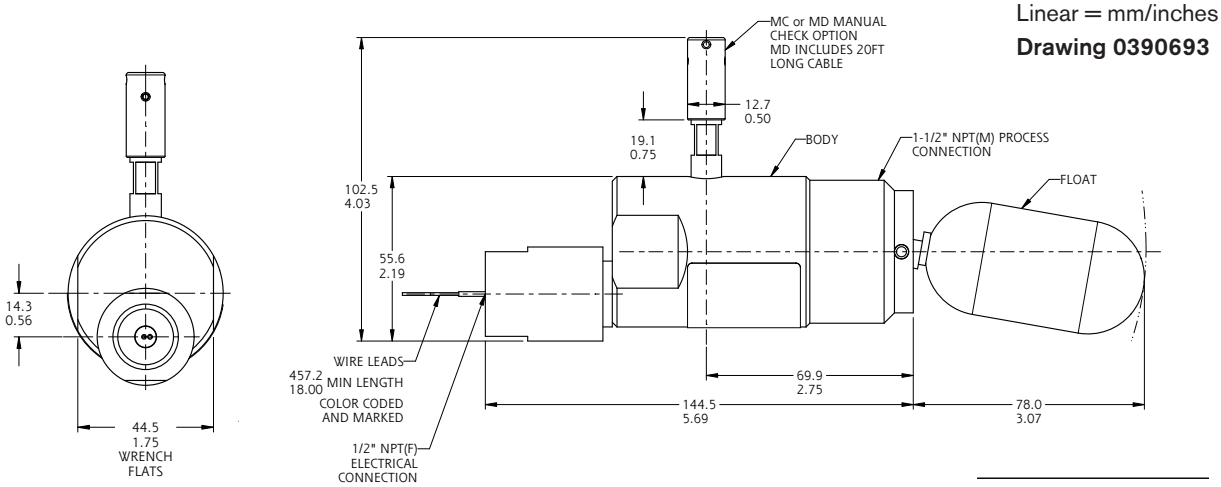
| | |
|---|---|
| **Mounting** | |
| Orientation | Horizontal mount only |
| Connection Size | 1-1/2" through 6" |
| Connection Type | NPT(M) or Flanged |
| Maximum Process Pressure* | up to 5000 psi (345 bar) |
| Process Temperature Range* | -40 to 400°F (-40 to 204°C) |
| **Electrical** | |
| Switch Type | Hermetically sealed reed switch with 18" 20 AWG wire leads |
| Housing | Class I, Groups A, B, C & D; Divisions 1 & 2 with CS option |
| Relay Housing | Class I, Groups C & D; Divisions 1 & 2 with CS option |
| Connection Size | 1/2" NPT(F) |
| Minimum Specific Gravity | 0.45 |
| Design Code | ANSI B31.3 |
| Weight | Approximately 6 lbs. (3 kg) |
| Agency Listing* | CSA Certified (US & Canada) and ANSI/ISA 12.27.01, ATEX and IEC or INMETRO approved (optional). See page 2. GOST R and Rostechnadzor (RTN) Certified (Standard). Certifications available upon request. |
| **Safety Certified to IEC 61508 (SIL)** | SOR products are certified to IEC 61508 for non-redundant use in SIL1 and SIL2 Safety Instrumented Systems for most models. For more details or values applicable to a specific product, see the Safety Integrity Level Quick Guide (Form 1528). |

*Agency certifications may affect ratings. See Accessories for details.

## Dimensions

*Design and specifications are subject to change without notice.*
*For latest revision, see sorinc.com.*

Linear = mm/inches
**Drawing 0390693**




*1 1/2" body shown. For all others, please consult factory.*

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# Level Switches

## 1510 Side Mounted Level Switch

Below is the SOR quick select model number tree that provides you with all the options to configure and order a product for your application. You must select a designator for each component.

### 1 Body Material

| | |
|---|---|
| 303SS (Standard) | B |
| 316 Stainless Steel | C |

### 2 Process Connections

| | | |
|---|---|---|
| Threaded: | 1 1/2" NPT(M) | G5A |
| | 2" NPT(M) | G2A |
| Flanged: (Available with 316SS body only) | | |
| May affect process pressure rating. | 2 1/2" 150# | G7C |
| | 300# | G7D |
| | 600# | G7E |
| | 3" 150# | G3C |
| | 300# | G3D |
| | 600# | G3E |
| | 4" 150# | G4C |
| | 300# | G4D |
| | 6" 150# | G6C |
| | 300# | G6D |

### 3 Float Material

| | | |
|---|---|---|
| 316SS (Standard) | 1500 psig (103 bar) –40 to 400°F (–40 to 204°C) | C |
| Monel | 900 psig (62 bar) –40 to 400°F (–40 to 204°C) | M |
| Polypropylene | 5000 psig (345 bar) –40 to 190°F (–40 to 88°C) | S |

### 4 Switch Mechanisms

Amperages based on resistive loads

| | | | |
|---|---|---|---|
| General Purpose | SPST | 0.9A @ 110 VAC Max<br>3A @ 28 VDC Max<br>3 Watt Minimum | W9 |
| General Purpose | SPDT | 0.9A @ 110 VAC Max<br>3A @ 28 VDC Max<br>3 Watt Minimum | W1 |
| Low Power | SPST | 25 Watts Max | L9 |
| Low Power | SPDT | 25 Watts Max | L1 |

### 5 Housing

ES — Electronic Switch Housing: Class I, Groups A, B, C, D; Divisions 1 & 2 with CS option

### 6 Optional Accessories

Insert accessory designator(s) as needed

| | |
|---|---|
| CK* | ATEX and IECEx dual approved (not available with L9 or W9 switch mechanism). Ex d IIC Ga/Gb T4 (-40°C < Ta < +90°C), T5 (-40°C < Ta < +75°C) and Ex ia IIC T3 (-40°C < Ta < +125°C) |
| CL* | ATEX and IECEx approved. Ex ia IIC T3 (-40°C < Ta < +125°C) |
| CR | 3/4" NPT(F) conduit connection |
| CS* | CSA Certified, US and Canada. Class 1, Group A, B, C, D; Divisions 1 & 2. For relay option; Class 1, Group C & D, Divisions 1 & 2. Single seal ambient & process temperatures -40°C to +125°C. Additional seal not required. |
| CV | Canadian Registration Number (CRN). Consult the factory for applicable pressure and additional information |
| HB | Universal terminal box, 1/2" NPT(F), 316SS explosion proof. ATEX/IECEx certified Ex db IIC T4, T5, T6 Gb |
| HBME | Universal terminal box, M20 x 1.5(F), 316SS explosion proof. ATEX/IECEx certified Ex db IIC T4, T5, T6 Gb |
| HT | Universal terminal box, 1/2" NPT(F), 316SS explosion proof. FM approved; CSA certified |
| MC** | Manual check accessory (uses Viton GLT o-rings - not available with polypropylene floats) |
| MD** | Manual check accessory (uses Viton GLT o-rings - not available with polypropylene floats) with 20' remote cable |
| MR | Mill Test Report |
| NC | NACE construction - MR0175 / ISO 15156. Available only with 316SS materials of construction |
| NM* | INMETRO approved. Ex ia IIC T3 (-40°C < Ta < +125°C) |
| RB*** | 24 VDC powered DPDT relay in explosion proof terminal box. Contact rating: 10 amps @ 115 VAC. Class I, Group C, D; Divisions 1 & 2. |
| RC*** | 120 VAC powered DPDT relay in explosion proof terminal box. Contact rating: 10 amps @ 115 VAC. Class I, Group C, D; Divisions 1 & 2 |
| RR | Tag, stainless steel. (Attached with stainless steel wire to housing. Stamped with customer specified tagging information. 2 lines, 18 characters and spaces per line.) |
| TS**** | Taiwan Safety Mark |
| TT | Stainless steel nameplate permanently attached to housing. Stamped with customer specified tagging information. |

* CK, CL, CS or NM option is required on all flange mounted units.
** Manufacturer limits on Viton GLT are -40 to 400°F.
*** Not available with L9 or L1 switch options.
**** Requires use of CK or CL option.

| 1510 | [ ] | - | [ ] | - | [ ] | - | [ ] | - | ES | - | [ ] |
|---|---|---|---|---|---|---|---|---|---|---|---|

**1510 B-G5A-C-W9-ES-MC** Example Model No.

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## Test Certificates

| | Certificates | C1 | C3 | C4 | C5 | C6 | C7 | B5 | B6 | B7 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1510 Level Switch | Calibration | ◆ | | | | | | ◆ | ◆ | ◆ |
| | Inspection Report | | ◆ | | | | | ◆ | ◆ | ◆ |
| | Compliance / Conformance | | | ◆ | | | | | | ◆ |
| | Dielectric Test | | | | ◆ | | | ◆ | | |
| | Insulation Resistance | | | | | ◆ | | ◆ | ◆ | |
| | QA Test Report | | | | | | ◆ | | | |

## Replacement Parts

| Description | Part Number |
|---|---|
| W9 - SPST Hermetically Sealed Switch Capsule | 3130 - 106 |
| W1 - SPDT Hermetically Sealed Switch Capsule | 3130 - 245 |
| W1 - SPDT Switch/Conduit Connection Assembly (CK option only) | 3130 - 259 |
| L9 - SPST Hermetically Sealed Switch Capsule | 3130 - 107 |
| L1 - SPDT Hermetically Sealed Switch Capsule | 3130 - 244 |
| L1 - SPDT Switch/Conduit Connection Assembly (CK option only) | 3130 - 260 |
| 316SS Float Assembly | 3130 - 052 |
| 20’ Remote Cable with two cable crimps* | 3130 - 040 |
| Manual Check Accessory (MC) (2” NPT only)* | 9227 - 024 |
| Manual Check Accessory with 20’ remote cable (MD) (2” NPT only)* | 9227 - 025 |
| Manual Check Accessory (MC) (1 1/2” NPT only)* | 9227 - 028 |
| Manual Check Accessory with 20’ remote cable (MD) (1 1/2” NPT only)* | 9227 - 029 |

*Unit must have originally been supplied with MC or MD option.

## Limited Warranty

SOR agrees to repair or replace any switch found to be defective in material or workmanship within five years from date of shipment. The limited warranty is valid only if the switch was installed in accordance with published factory installation instructions, operated within the design limitations stated on the nameplate, and returned to the factory for inspection, freight prepaid, within the warranty period. Contact the factory for return authorization. No claim for labor or consequential damages will be allowed.

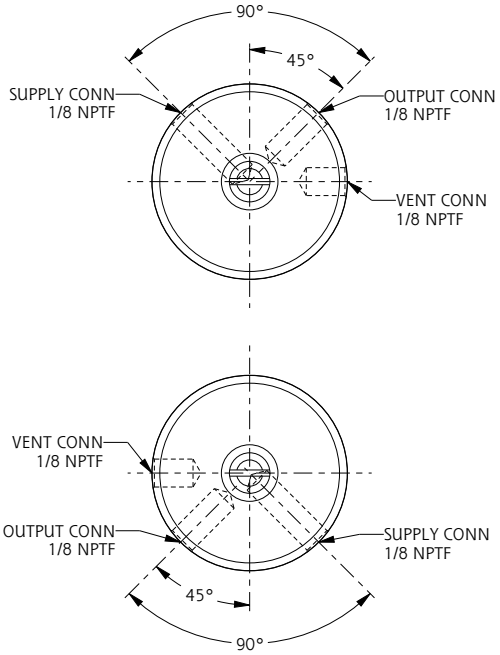
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# 1530 Side Mounted Pneumatic Level Switch

**The 1530** is a horizontally mounted, float-operated level switch suitable for plant and OEM applications where pneumatic valve operation is required to signal presence or absence of liquid at a discrete level. The float extension arm moves a magnet which actuates (deactuates) a pilot valve to operate a pneumatic amplifier. Actuation (deactuation) can be reversed by rotating the unit 180 degrees.





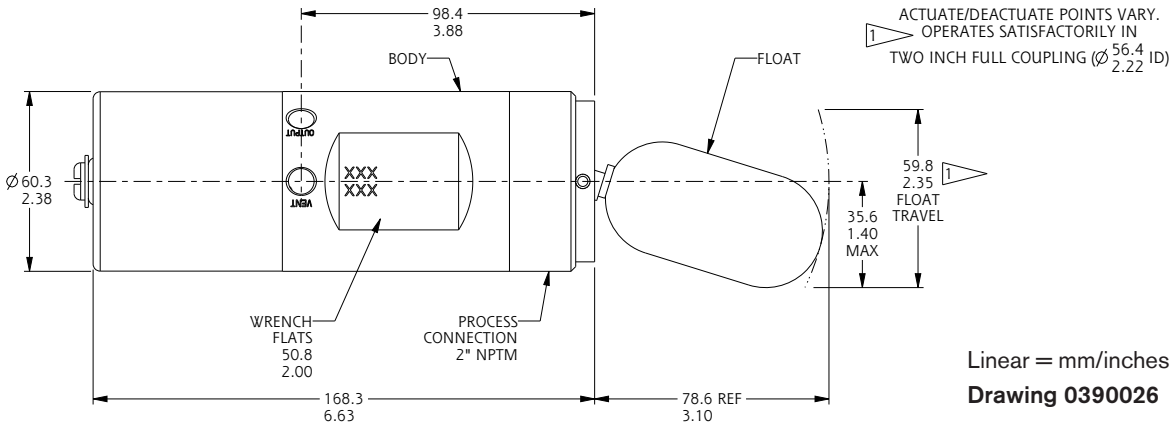

## Product Specifications

| | |
|---|---|
| **Mounting** | |
| Orientation | Horizontal mount only |
| Connection Size | 2" NPT(M) Standard |
| Flange Options Available | |
| **Maximum Process Pressure** | |
| Float Material | |
| 316SS | 1500 psi (103 bar) |
| Monel | 900 psi (62 bar) |
| Polypropylene | 5000 psi (345 bar) |
| **Process Temperature Range** | |
| Float Material | |
| 316SS | –40 to 400°F (–40 to 204°C) |
| Monel | –40 to 400°F (–40 to 204°C) |
| Polypropylene | –40 to 190°F (–40 to 88°C) |
| **Supply Pressure Range** | 20 to 60 psi (1.4 to 4.1 bar) |
| **Supply Pressure Connection Size** | 1/8" NPT(F) |
| **Minimum Specific Gravity** | 0.60 |
| **Design Code** | ANSI B31.3 |
| **Weight** | Approximately 6 lbs. (3 kg) |

If supply pressure medium is natural gas, a filter/regulator is suggested on the supply line, and the valve vent port should be piped to a safe area.

## Dimensions

*Design and specifications are subject to change without notice.*
*For latest revision, see sorinc.com.*




Linear = mm/inches
**Drawing 0390026**

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Below is the SOR quick select model number tree that provides you with all the options to configure and order a product for your application. You must select a designator for each component.

## 4 Switch Mechanism

| | |
|---|---|
| J0 | Pneumatic Switch |

## 5 Housing

| | |
|---|---|
| PS | Pneumatic Switch Housing |

## 3 Float Material

| | | |
|---|---|---|
| 316SS (Standard) | 1500 psig (103 bar) −40 to 400°F (−40 to 204°C) | C |
| Monel | 900 psig (62 bar) −40 to 400°F (−40 to 204°C) | M |
| Polypropylene | 5000 psig (345 bar) −40 to 190°F (−40 to 88°C) | S |

## 2 Process Connections

| | | |
|---|---|---|
| Flanged: (Available with 316SS body only) May affect process pressure rating. | 2” NPT(M) | G2A |
| | 2 1/2” 150# | G7C |
| | 300# | G7D |
| | 600# | G7E |
| | 3” 150# | G3C |
| | 300# | G3D |
| | 600# | G3E |
| | 4” 150# | G4C |
| | 300# | G4D |
| | 6” 150# | G6C |
| | 300# | G6D |

## 1 Body Material

| | |
|---|---|
| 303SS (Standard) | B |
| 316 Stainless Steel | C |

## 6 Optional Accessories

Insert accessory designator(s) as needed

| | |
|---|---|
| BB | Wetted parts are cleaned for industrial oxygen service |
| CV | Canadian Registration Number (CRN). Consult the factory for applicable pressure and additional information. |
| MR | Mill Test Report |
| NC | NACE construction - MR0175 / ISO 15156. Available only with 316SS materials of construction |
| PP | Tag, fiber. Attached with plastic wire to housing. Stamped with customer specified tagging information. |
| RR | Tag, stainless steel. (Attached with stainless steel wire to housing. Stamped with customer specified tagging information. 2 lines, 18 characters and spaces per line.) |
| TT | Stainless steel nameplate permanently attached to housing. Stamped with customer specified tagging information. |
| VV | Fungicidal varnish. Covers exterior except working parts. |

1530 [ ] - [ ] - [ ] - J0 - PS - [ ]

**1530 B - G2A - C - J0 - PS - TT** Example Model No.

## Certificates

| | Certificates | C1 | C3 | C4 | C7 | B7 |
|---|---|---|---|---|---|---|
| 1530 Pneumatic Level Switch | Calibration | ◆ | | | | ◆ |
| | Inspection Report | | ◆ | | | ◆ |
| | Compliance / Conformance | | | ◆ | | ◆ |
| | QA Test Report | | | | ◆ | |

## Replacement Parts

| Description | Part Number |
|---|---|
| Pneumatic Relay Assembly | 3130 - 114 |
| 316SS Float Assembly | 3130 - 052 |

## Limited Warranty

SOR agrees to repair or replace any switch found to be defective in material or workmanship within five years from date of shipment. The limited warranty is valid only if the switch was installed in accordance with published factory installation instructions, operated within the design limitations stated on the nameplate, and returned to the factory for inspection, freight prepaid, within the warranty period. Contact the factory for return authorization. No claim for labor or consequential damages will be allowed.

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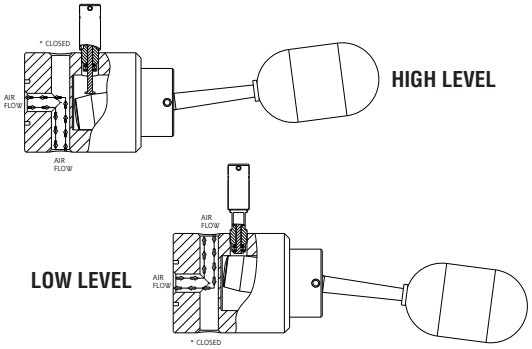
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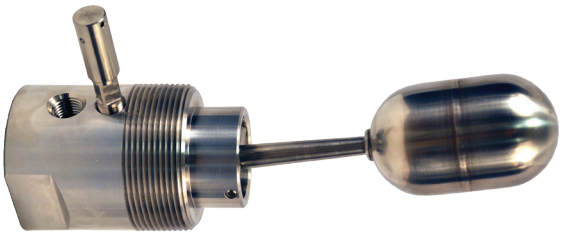


# 1540 Side Mounted Pneumatic Level Switch

**1540** is a horizontally mounted, float-operated level switch suitable for plant and OEM applications where pneumatic valve operation is required to signal presence or absence of liquid at a discrete level. The float arm moves a magnet which in turn moves a shuttle that either blocks or allows pilot pressure to pass and operate ancillary equipment. Actuation (deactuation) can be reversed by rotating the unit 180 degrees or switching inlet connections (see below).

The supply media must be filtered and oil free. Air is the usual media; however, any dry, filtered gas can be used.



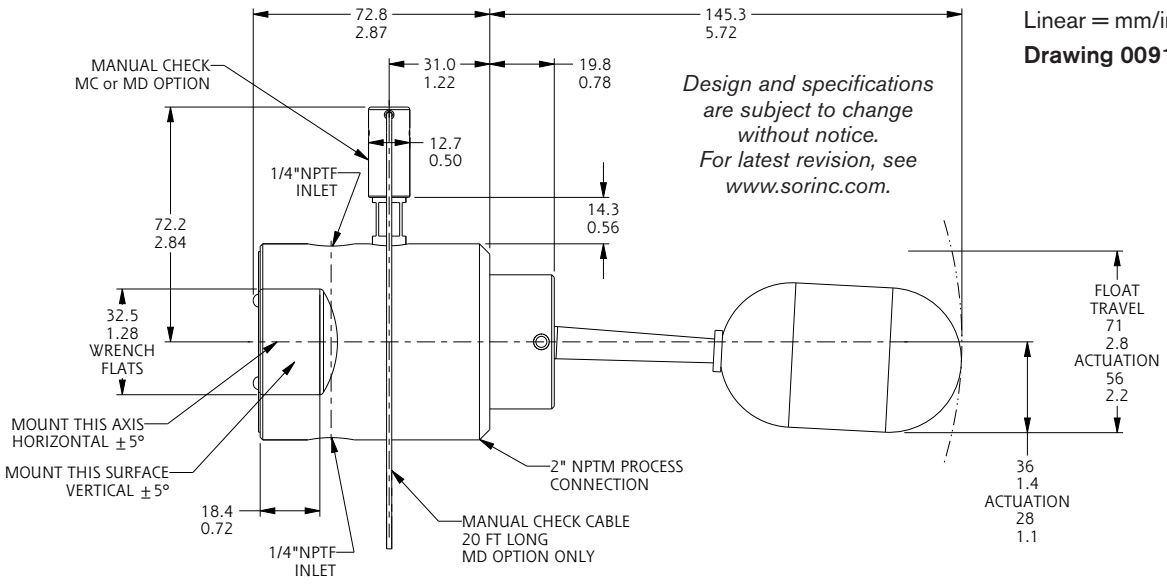
## Product Specifications

| | |
|---|---|
| Orientation | Horizontal mount only |
| Body Material | 316 Stainless Steel |
| Connection Size | 2" NPT(M) |
| I/O Connection | 1/4" NPT(F) |
| Pilot (Supply) Pressure | 0-30 psi (0-2 BAR) or 0-80 psi (0-5.5 BAR) |
| Flow Rate @ Max Pilot Pressure | 60 SCFH (1.7 CMH) |
| Maximum Process Pressure | 1500 psi (103 BAR) |
| Process Temperature Range | –40 to 400°F (–40 to 204°C) |
| Minimum Specific Gravity | 0.65 |
| Weight | 3.5 lbs. (2 kg) |
| Rostechnadzor (RTN) Standard | Certificate available upon request |

SCFH - Standard cubic feet per hour
CMH - Cubic meter per hour

## Dimensions

The drawings & illustrations below show the manual check (MC or MD) option.




*Design and specifications are subject to change without notice. For latest revision, see www.sorinc.com.*

Linear = mm/inches
**Drawing 0091448**

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Here is the SOR quick select model number tree that provides you with all the options to configure and order a product for your application. You must select a designator for each component.

**1 Body Material**
316 Stainless Steel — C

**2 Process Connections**
2" NPT(M) — G2A

**3 Float Material**
316SS 1500 psig (103 bar)
-40 to 400°F (-40 to 204°C) — C

**4 Switches**
Pilot (Supply) Pressure: 0-30 psi (0-2 BAR)
Flow Rate @ 30 psi Supply: 60 SCFH (1.7 CMH) — J0

Pilot (Supply) Pressure: 0-80 psi (0-5.5 BAR)
Flow Rate @ 80 psi Supply: 60 SCFH (1.7 CMH) — J1

**5 Housing**
PS — Pneumatic Switch Housing

**6 Optional Accessories**
Insert accessory designator(s) as needed

| | |
|---|---|
| BB | Wetted parts are cleaned for industrial oxygen service |
| CV | Canadian Registration Number (CRN). Consult the factory for applicable pressure and additional information. |
| MC* | Manual check accessory (uses Viton GLT o-rings) |
| MD* | Manual check accessory (uses Viton GLT o-rings) with 20' remote cable |
| MR | Mill Test Report |
| NC | NACE construction - MR0175 / ISO 15156 |
| PP | Tag, fiber. Attached with plastic wire to housing. Stamped with customer specified tagging information. |
| RR | Tag, stainless steel. (Attached with stainless steel wire to housing. Stamped with customer specified tagging information. 2 lines, 18 characters and spaces per line.) |
| TT | Stainless steel nameplate permanently attached to housing. Stamped with customer specified tagging information. |
| VV | Fungicidal varnish. Covers exterior except working parts. |

*Manufacturer limits on Viton GLT are -40 to 400°F.

| 1540 | C | - | 2A | - | C | - | | | PS | |
|---|---|---|---|---|---|---|---|---|---|---|

**1540 C - G2A - C - J0 - PS - MC** — Example Model No.

## Test Certificates

| | Certificates | C1 | C3 | C4 | C7 | B7 |
|---|---|---|---|---|---|---|
| 1540 Pneumatic Level Switch | Calibration | ◆ | | | | ◆ |
| | Inspection Report | | ◆ | | | ◆ |
| | Compliance / Conformance | | | ◆ | | ◆ |
| | QA Test Report | | | | ◆ | |

## Replacement Parts

| Description | Part Number |
|---|---|
| 20' Remote Cable with two cable crimps** | 3130 - 040 |
| Float | 3100 - 152 |
| Float & Arm Assembly | 9227 - 012 |
| Manual Check Accessory (MC)** | 9227 - 024 |
| Manual Check Accessory with remote 20' cable (MD)** | 9227 - 025 |

**Unit must have originally been supplied with MC or MD option.

## Limited Warranty

SOR agrees to repair or replace any switch found to be defective in material or workmanship within five years from date of shipment. The limited warranty is valid only if the switch was installed in accordance with published factory installation instructions, operated within the design limitations stated on the nameplate, and returned to the factory for inspection, freight prepaid, within the warranty period. Contact the factory for return authorization. No claim for labor or consequential damages will be allowed.

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**1550** is a vertically mounted, float-operated level switch suitable for plant and OEM applications where open or closed contacts are required to signal presence or absence of liquid at a discrete level. The float stem moves a magnet that actuates (deactuates) a hermetically sealed reed switch.



## Dimensions




Linear = mm/inches

**Drawing 0390789**

*Design and specifications are subject to change without notice. For latest revision, see sorinc.com.*

## Product Specifications

| | |
|---|---|
| **Mounting** | |
| Orientation | Vertical mount only |
| Body Material | 316 Stainless Steel |
| Connection Size | 1-1/2" through 6" |
| Connection Type | NPT(M) or Flanged |
| **Maximum Process Pressure** | up to 473 psi (32.6 bar) @ 400°F (204°C) |
| **Process Temperature Range** | -40 to 400°F (-40 to 204°C) |
| **Electrical** | |
| Switch Type | Hermetically sealed reed switch with 18" 20 AWG wire leads |
| Housing | Class I, Groups A, B, C & D; Divisions 1 & 2 with CS option |
| Relay Housing | Class I, Groups C & D; Divisions 1 & 2 with CS option |
| Connection Size | 1/2" NPT(F) |
| **Minimum Specific Gravity** (based on 14" insertion depth L in the figure at left) | 0.60 |
| **Minimum Insertion Depth L** | 5" (13 cm) |
| Full Coupling | 7" (17.8 cm) |
| Half Coupling | 5.25" (13.3 cm) |
| **Maximum Insertion Depth L** | 48" (122 cm) |
| **Minimum Specific Gravity @ 48" (122 cm)** | 0.71 |
| **Design Code** | ANSI B31.3 |
| **Weight** | Approximately 5 lbs. (2.2 kg) |
| **Agency Listing*** | CSA Certified (US & Canada) and ANSI/ISA 12.27.01, ATEX and IEC or INMETRO approved (optional). See page 2. GOST R and Rostechnadzor (RTN) Certified (Standard). Certifications available upon request. |
| **Safety Certified to IEC 61508 (SIL)** | SOR products are certified to IEC 61508 for non-redundant use in SIL1 and SIL2 Safety Instrumented Systems for most models. For more details or values applicable to a specific product, see the Safety Integrity Level Quick Guide (Form 1528). |

*Agency certifications may affect ratings. See Accessories for details.

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Below is the SOR quick select model number tree that provides you with all the options to configure and order a product for your application. You must select a designator for each component.

## 1 Body Material

316 Stainless Steel — C

## 2 Process Connections

| | | |
|---|---|---|
| Threaded: | 1 1/2" NPT(M) | F5A |
| | 2" NPT(M) | F2A |
| Flanged: (Available with 316SS body only) | 2 1/2" 150# | F7C |
| | 300# | F7D |
| | 600# | F7E |
| May affect process pressure rating. | 3" 150# | F3C |
| | 300# | F3D |
| | 600# | F3E |
| | 4" 150# | F4C |
| | 300# | F4D |
| | 6" 150# | F6C |
| | 300# | F6D |

## 3 Float Material

| | | |
|---|---|---|
| 316SS (Standard) | 473 psig (32.6 bar) | C |
| Monel | 284 psig (19.6 bar) | M |

## 4 Switch Mechanisms

Amperages based on resistive loads

| | | | |
|---|---|---|---|
| General Purpose | SPST | 0.9A @ 110 VAC Max<br>3A @ 28 VDC Max<br>3 Watt Minimum | W9 |
| General Purpose | SPDT | 0.9A @ 110 VAC Max<br>3A @ 28 VDC Max<br>3 Watt Minimum | W1 |
| Low Power | SPST | 25 Watts Max | L9 |
| Low Power | SPDT | 25 Watts Max | L1 |

## 5 Housing

Electronic Switch Housing: Class I, Groups A, B, C, D; Divisions 1 & 2 with CS option — ES

## 6 Optional Accessories

Insert accessory designator(s) as needed

| | |
|---|---|
| CK* | ATEX and IECEx dual approved (not available with L9 or W9 switch mechanism). Ex d IIC Ga/Gb T4 (-40°C < Ta < +90°C), T5 (-40°C < Ta < +75°C) and Ex ia IIC T3 (-40°C < Ta < +125°C) |
| CL* | ATEX and IECEx approved. Ex ia IIC T3 (-40°C < Ta < +125 °C) |
| CR | 3/4" NPT(F) conduit connection |
| CS* | CSA Certified, US and Canada. Class 1, Group A, B, C, D; Divisions 1 & 2. For relay option; Class 1, Group C & D, Divisions 1 & 2. Single seal ambient & process temperatures -40°C to +125°C |
| CV | Canadian Registration Number (CRN). Consult the factory for applicable pressure and additional information. |
| HB | Universal terminal box, 1/2" NPT(F), 316SS explosion proof. ATEX/IECEx certified Ex db IIC T4, T5, T6 Gb |
| HBME | Universal terminal box, M20 x 1.5(F), 316SS explosion proof. ATEX/IECEx certified Ex db IIC T4, T5, T6 Gb |
| HT | Explosion proof 316SS terminal box CSA Certified Class I, Groups A, B, C & D; Class II, Groups E, F & G; Class III, Division I (NEMA 4X) |
| MR | Mill Test Report |
| NC | NACE construction - MR0175 / ISO 15156. Available only with 316SS materials of construction |
| NM* | INMETRO approved. Ex ia IIC T3 (-40°C < Ta < +125°C) |
| RB** | 24 VDC powered DPDT relay in explosion proof terminal box. Contact rating: 10 amps @ 115 VAC. Class I, Group C, D; Divisions 1 & 2. |
| RC** | 120 VAC powered DPDT relay in explosion proof terminal box. Contact rating: 10 amps @ 115 VAC. Class I, Group C, D; Divisions 1 & 2 |
| RR | Tag, stainless steel. (Attached with stainless steel wire to housing. Stamped with customer specified tagging information. 2 lines, 18 characters and spaces per line.) |
| TS*** | Taiwan Safety Mark |
| TT | Stainless steel nameplate permanently attached to housing. Stamped with customer specified tagging information. |

* CK, CL, CS or NM option is required on all flange mounted units.
** Not available with L9 or L1 switch options.
*** Requires use of CK or CL option.

| 1550 | C | - | | - | | - | | - | ES | - | |
|---|---|---|---|---|---|---|---|---|---|---|---|

**1550 C - F5A - C - W9 - ES - TT** Example Model No.

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Customer to specify insertion depth L for each switch. See drawing on page 1. Stem guides are not installed on units with insertion depth L less than 7" (177.8 mm). The 1550 Series level switch has a 3.5" (90 mm) diameter float. It will not fit through many process connections. Be sure there is access to attach the float from inside the vessel after instrument installation if necessary.

## Test Certificates

| | Certificate Designator | C1 | C3 | C4 | C5 | C6 | C7 | B5 | B6 | B7 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1550 Level Switch | Calibration | ◆ | | | | | | ◆ | ◆ | ◆ |
| | Inspection Report | | ◆ | | | | | ◆ | ◆ | ◆ |
| | Compliance / Conformance | | | ◆ | | | | | | ◆ |
| | Dielectric Test | | | | ◆ | | | ◆ | | |
| | Insulation Resistance | | | | | ◆ | | ◆ | ◆ | |
| | QA Test Report | | | | | | ◆ | | | |

## Replacement Parts

| Designator | Part Number |
|---|---|
| W9 - SPST Hermetically Sealed Switch Capsule | 3130 - 106 |
| W1 - SPDT Hermetically Sealed Switch Capsule | 3130 - 245 |
| W1 - SPDT Switch/Conduit Connection Assembly (CK option only) | 3130 - 259 |
| L9 - SPST Hermetically Sealed Switch Capsule | 3130 - 107 |
| L1 - SPDT Hermetically Sealed Switch Capsule | 3130 - 244 |
| L1 - SPDT Switch/Conduit Connection Assembly (CK option only) | 3130 - 260 |
| 316SS Float. (Consult the factory for other materials.) | 3101 - 122 |
| Actuator Replacement Kit | 3130 - 396 |

## Limited Warranty

SOR agrees to repair or replace any switch found to be defective in material or workmanship within five years from date of shipment. The limited warranty is valid only if the switch was installed in accordance with published factory installation instructions, operated within the design limitations stated on the nameplate, and returned to the factory for inspection, freight prepaid, within the warranty period. Contact the factory for return authorization. No claim for labor or consequential damages will be allowed.

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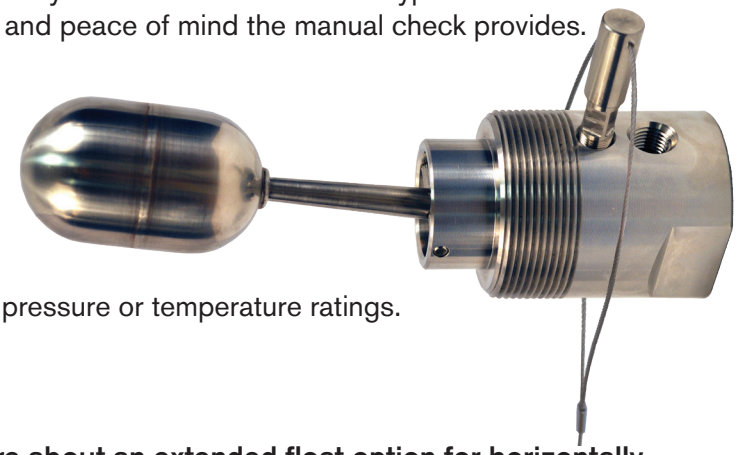


## Manual Check

**The original model 1500 was born from customer input and SOR continues the tradition by offering a manual check option for the 1500 series level switches**. The optional manual check allows the user to verify switch integrity without removing it from the vessel or increasing or decreasing liquid levels. This is particularly useful for systems testing in safety applications, such as a manual override, where the switch is not called upon very often. It may also be used as a method to manually trigger a valve or activate the normal function of the switch.

Many customers are mandated by regulatory authorities to include this type of self-test function. Others just prefer the added functionality and peace of mind the manual check provides.

The manual check option is activated by simply pushing the self returning plunger. The manual check can also be activated by purchasing the MD option that provides a 20' remote cable.



Whatever your application, the manual check option provides added functionality to the 1500 series without compromising pressure or temperature ratings.

## Extended Float

**On occasion, we have customers inquire about an extended float option for horizontally mounted 1500 series. These float extensions are available in a variety of lengths and materials based on the conditions and specifications that the application and customer demand.**

This option extends the pivot arm, placing the float further into the process vessel. It is particularly helpful in applications where the nozzle diameter is too small, or where process build-up can limit the full travel of the float. In either case, the unit does not have suitable clearance to fully actuate/deactuate; positioning the float past the obstruction allows it to travel the full range of motion.

There are times when extending the float can have adverse effects on the unit's ability to handle lower specific gravities. That's why SOR has several options available and is prepared to design a solution specifically for you if necessary.

* Adding a float extension will increase the unit's minimum specific gravity. Please consult factory to determine if a float extension is possible (Extension Length, SG, Pressure & Temperature required).

** Extended float option only available for the 1510 & 1530.

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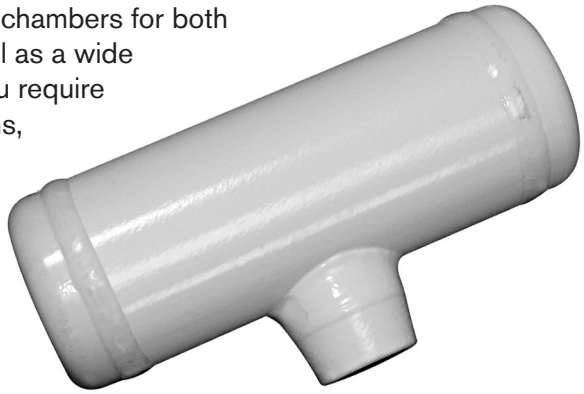


## Chambers

**Customers often ask SOR to use its machining and welding expertise to make small chambers that go with the 1500 series they purchase. Thanks to a major expansion of the SOR manufacturing facilities, we now offer competitively priced, ANSI quality chambers for use with the 1500 series products.**

Flexible processes make it possible for us to offer chambers for both 1-1/2 and 2-inch body 1500 series products, as well as a wide range of available process connections. Whether you require the standard 1-inch NPT or even flanged connections, SOR can make it happen. Just give us your requirements and we're off and running.

With chambers from SOR, you can consolidate vendors and buy from a name you have trusted for many years.



## Interface Detection

**Liquid interface application can be commonly found across a wide range of industries.**

The interface detection option changes the float's minimum specific gravity, allowing it to measure the lower liquid level while ignoring the upper (less dense) liquid. A specific gravity differential of approximately 0.25 between the upper & lower liquid is required for interface detection*.

* Please consult factory to determine if interface detection is possible (minimum and maximum interface specific gravities required).

** Interface detection option only available for the 1510 and 1530 with either 316SS(C) or Monel(M) float material.

## All 1500 series mechanical level switches come with a 5-year warranty

SOR agrees to repair or replace any switch found to be defective in material or workmanship within five years from date of shipment. The limited warranty is valid only if the switch was installed in accordance with published factory installation instructions, operated within the design limitations stated on the nameplate and returned to the factory for inspection, freight prepaid, within the warranty period. Contact the factory for return authorization. No claim for labor or consequential damages will be allowed.

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