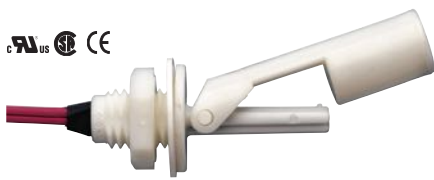


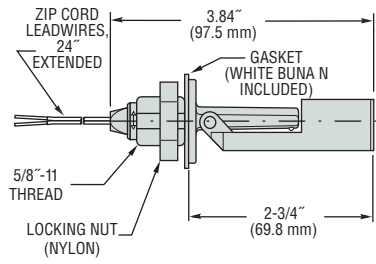
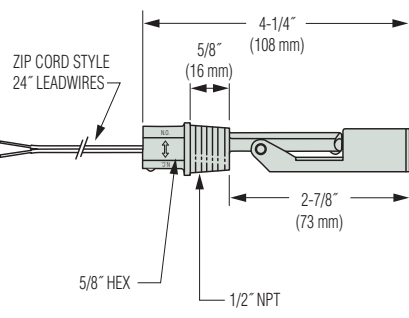
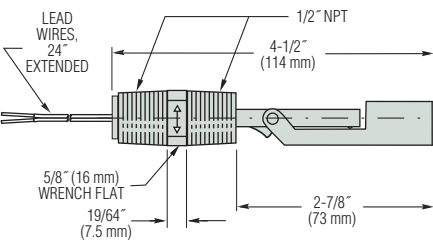


Small Size – Engineered Plastics

LS-7 Series–Compact Side Mounts are the Solution to Many Small Tanks

These low-cost units are ideal for high volume use in small tanks and vessels. Engineered plastics construction offers broad compatibility in water, oils and chemicals.

Type 3 Internal Mounting	Type 5 External Mounting	Type 7 External Mounting
 <p>Polypropylene or Nylon.</p>	 <p>Polypropylene or Nylon.</p>	 <p>Polypropylene or Nylon; conduit connection.</p>
 <p>ZIP CORD LEADWIRES, 24" EXTENDED 3.84" (97.5 mm) GASKET (WHITE BUNA N INCLUDED) 5/8"-11 THREAD LOCKING NUT (NYLON) 2-3/4" (69.8 mm)</p>	 <p>ZIP CORD STYLE 24" LEADWIRES 4-1/4" (108 mm) 5/8" (16 mm) 2-7/8" (73 mm) 5/8" HEX 1/2" NPT</p>	 <p>LEAD WIRES, 24" EXTENDED 1/2" NPT 4-1/2" (114 mm) 5/8" (16 mm) WRENCH FLAT 19/64" (7.5 mm) 2-7/8" (73 mm)</p>

Common Specifications

Switch Rating*: SPST, 20VA

Lead Wire Gauge: No. 22 AWG

Approvals: All LS-7 Series switches on this page are U.L. Recognized – File No. E45168, and are CSA Listed-File No. 30200. For NSF approved level switches contact Gems.

Mounting Attitude: Horizontal.

*See "Electrical Data" on Page X-5 for more information.

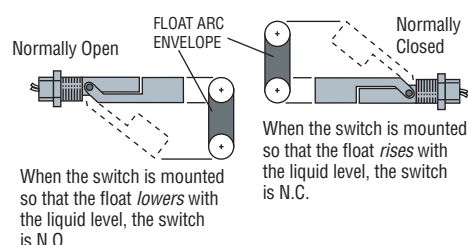
Media Compatibility

Media	LS-7 Compatible Types
Oil, Fuel, Hydrocarbons	Nylon
Broad Range of Chemicals and Water	Polypropylene
Limited Chemicals and Water	Noryl®

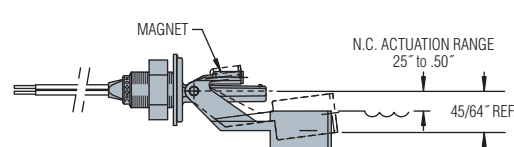
Switch Operation

Depending on the mounting position, the float on these switches can rise or lower with the liquid level. By rotating the switch 180°, the switch operation can be Normally Open or Normally Closed (except Type 12).

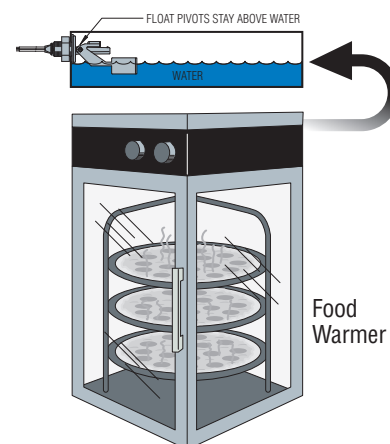
Types 3, 5, 7, 10 and 13



Type 12 – N.C. "Drop Float" Design




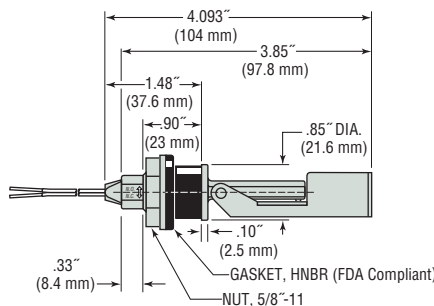
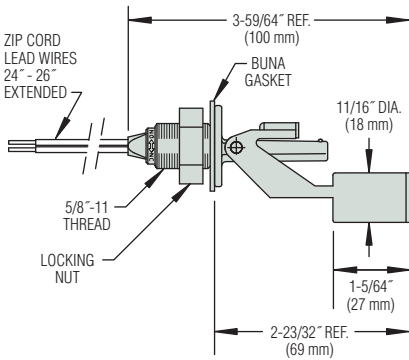
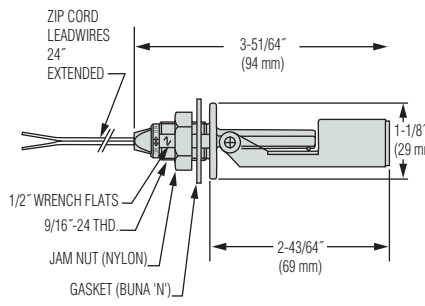


The LS-7 Type 12 is ideal for use on food warmers, hot water heaters, steam cookers, small boilers or wherever water evaporation occurs. The switch is used effectively for either high fluid level alarms or water make up systems. The units are made of Noryl®, which carries both NSF and WRC approval for use in potable water, and are supplied with FDA-approved Buna gaskets.





- ▶ Nylon is ideal for oils and fuels.
- ▶ NSF Standard 61 polypropylene is ideal for potable water and broad chemicals.

Type 10 External Mounting	Type 12 Internal Mounting	Type 13 Internal Mounting
 <p>Externally mounts through and seals non-threaded holes using a HNBR compression gasket.</p>	 <p>Side mount "Drop Down" design for calcifying hot water applications. NSF and WRC compliant Noryl®.</p>	 <p>Polypropylene or Nylon.</p>
 <p>Note: Recommended hole size = 7/8" dia. x 1/32" - 5/32" thick panel.</p>		

How To Order – Select Part Number based on specifications required.

Mounting Type	Materials*			Min. Liquid Sp. Gr.	Operating Temperature	Operating Pressure, Max.	Float Arc Envelope	Part Number
	Stem and Mounting	Float	Lead Wire Jacket					
3	Nylon	TPE†		.65	-40°F to +250°F (-40°F to +121.1°C)	100 psi @ 70°F	2.20	165570 ⚡
	Polypropylene			.55	-40°F to +225°F (-40°C to +107.2°C)			164520 ⚡
5	Polypropylene	TPE†		.55	-40°F to +225°F (-40°C to +107.2°C)	100 psi @ 70°F	1.25	131100 ⚡
	Nylon			.65	-40°F to +250°F (-40°F to +121.1°C)			140620 ⚡
7	Polypropylene	TPE†		.55	-40°F to +225°F (-40°C to +107.2°C)	100 psi @ 70°F	1.50	160450 ⚡
	Nylon			.65	-40°F to +250°F (-40°F to +121.1°C)			160460 ⚡
10	Polypropylene	TPE†		.55	-40°F to +225°F (-40°C to +107.2°C)	50 psi @ 70°F	2.08	165800 ⚡
	Nylon			.65	-40°F to +250°F (-40°F to +121.1°C)			165900 ⚡
12	Noryl®	TPE†		.80	-40°F to +225°F (-40°C to +107.2°C)	100 psi @ 70°F	.70	191080 ⚡
13	Polypropylene	TPE†		.55	-40°F to +225°F (-40°C to +107.2°C)	100 psi @ 70°F	2.20	197050 ⚡

* Polysulfone and Rytan® R-4 are available upon request.

† Thermoplastic Elastomer Zip Cord, 22 AWG.

Note: NSF C2 Versions available. Contact factory.

⚡ – Stock Items.

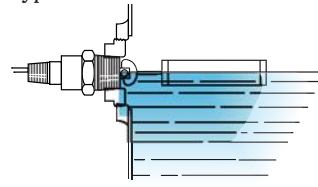
See alloy versions on next page.

Large Size – Alloys

Side Mounting Switches Solve the Problem of Inaccessible Tank Tops & Bottoms

These units solve the problem of point level sensing in tanks with inaccessible tops or bottoms, or at intermediate locations in larger tanks. Operation is positive and dependable. The float pivots with changing liquid level, displacing a shuttle which magnetically actuates a hermetically sealed switch within the unit. Installation is through the tank side at the detection point.

Typical Installation



**UL Approved
Explosion-Proof**

LS-2050 Series – Brass and Buna N



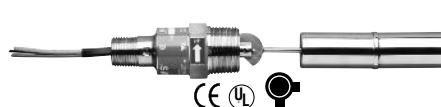
General purpose materials designed to provide reliable service in oils and water.

LS-2050 Series – All-Stainless Steel



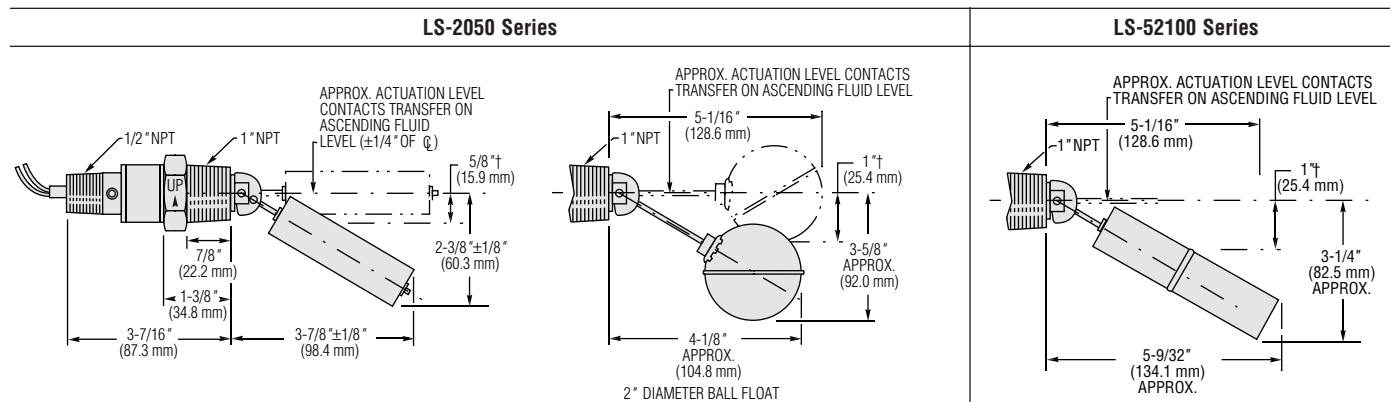
Ultimate strength: for pressures to 900 PSIG and temperatures to 300°F. Explosion-proof models available.

LS-52100 Series – All Stainless Steel



Rugged, all-stainless steel unit offers broad chemical compatibility at temperatures to 300°F. Explosion-proof models available.

Dimensions



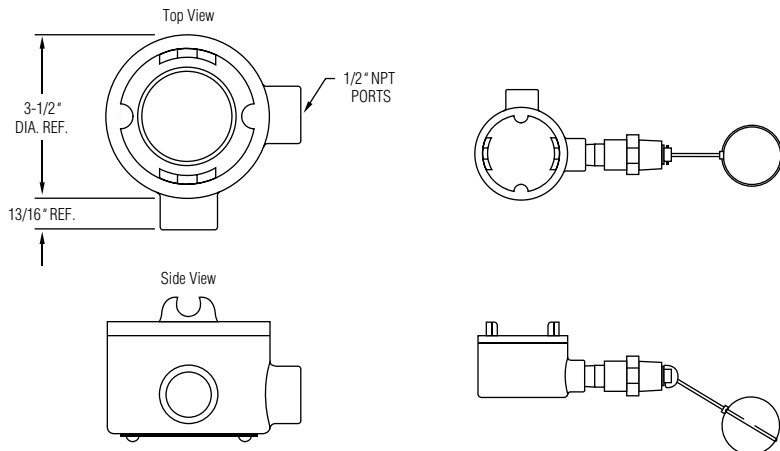
†Approximate de-actuation level, nominal (based on a liquid specific gravity of 1.0).

* Switch Mounting dimensions are the same as shown on the LS-2050 Series drawing (far left).

Explosion-Proof Versions

CSA or FM Approved versions are available in all-stainless steel configurations only.

Typical Example (P/N 55690 Shown):



For Remote Alarms – See Page D-33

- Adjustable Volume
- Indoor Outdoor
- Solid-State





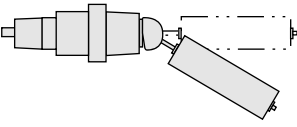
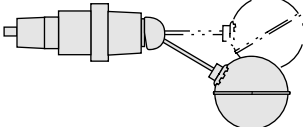
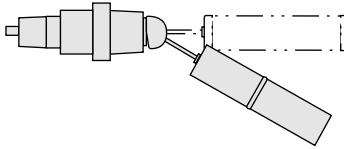
Common Specifications

Electrical Termination: No.18 AWG, 24" L., Polymeric Lead Wires.

Approvals: LS-2050 Series Switches are U.L. Recognized – File No. E45168 and are CSA Listed. Explosion-proof units are approved for Class I, Division 1, Group D hazardous areas.

Mounting Attitude: Horizontal, $\pm 15^\circ$.

Performance

	LS-2050 Series		LS-52100 Series
	Brass Mounting/Buna-N Float	All-Stainless Steel	
			
Operating Temperature	Water: to $+180^\circ\text{F}$ (82.2°C) Oil: -40°F to $+250^\circ\text{F}$ (-40°C to $+121^\circ\text{C}$)		-40°F to $+300^\circ\text{F}$ (-40°C to $+148.9^\circ\text{C}$)
Pressure, PSIG Max. @ 70°F	150	900	500
Min. Liquid Sp. Gr.	.8	.9	.85
Switch Differential in Liquid	1/2" Minimum	Approximately 3/4"	

How To Order – Select Part Number based on specifications required.

Series Number	Materials			Switch ¹	Part Numbers		
	Stem and Mounting	Float	Other Wetted		Standard Versions	With Bellows (Details Below)	Explosion-Proof FM SR
LS-2050	Brass	Buna N	316 Stainless Steel, Beryllium Copper, Teflon®, Ceramic	SPDT, 20 VA	30288 ⚡	—	—
	316 Stainless Steel	316 Stainless Steel	Stainless Steel, Teflon®, Ceramic	SPDT, 20 VA	30290 ⚡	175650	55690
				SPST, 100 VA, N.O. ^{2,4}	48068	—	—
				SPST, 100 VA, N.C. ^{2,4}	48069	—	—
LS-52100	316 Stainless Steel	304 Stainless Steel	430 Stainless Steel, Teflon®, Ceramic	SPDT, 20 VA	52100 ⚡	—	121753
				SPST, 100 VA, N.O. ³	116971 ⚡	—	—
				SPST, 100 VA, N.C. ³	116972	—	—

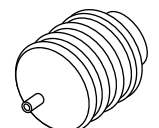
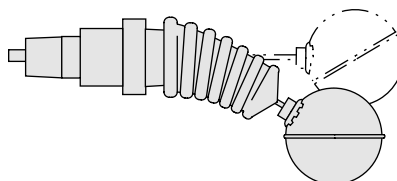
Notes

- See "Electrical Data" on Page X-5 for more information.
- Not CSA Approved.
- Not U.L. Recognized or CSA Approved.
- UL Resistive Rated

⚡ – Stock Items.

Switch with Bellows - P/N 175650

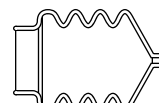
Seals moving parts from debris and particulates that might impede shuttle movement. **Note:** Bellows are installed only on Part Number 175650 – LS-2050 Series, 316 Stainless Steel with SPDT, 20VA switch. Bellows are not sold separately or with any other switch version.



Rated for:
• 250°F , Max.
• Atmospheric pressure.



P/N: 175650 (switch with bellows)
Bellows to be used only with spherical floats.



Large Size – Alloys

All Stainless Steel Switches Deliver Highest Pressure/Temperature Performance

For high performance applications, these models provide high temperature and pressure capabilities. Materials of construction comply with FDA food contact regulations.

LS-1850 Series –
Ultra-Light



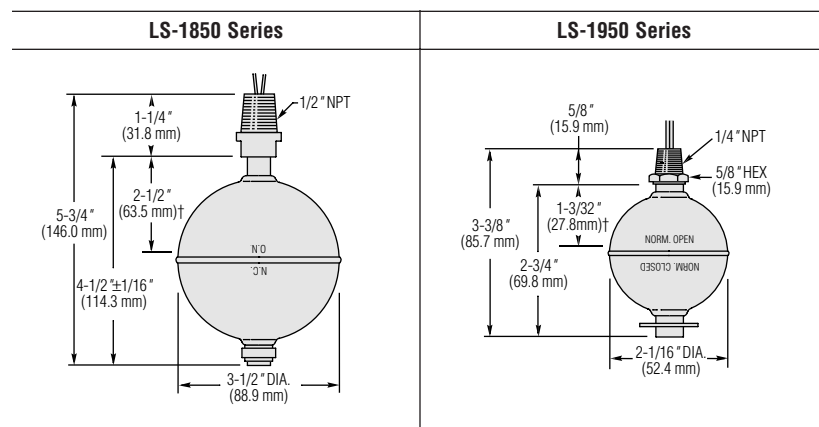
For use in liquids with specific gravities as low as 0.40 to 0.70. Excellent in a wide range of chemical applications. Also available with brass stems.

LS-1950 Series



Exceptionally accurate and rugged for higher temperatures and in pressurized or corrosive liquids. For oils, water and chemicals.

Dimensions



†L_F = Switch actuation level, nominal (based on a liquid specific gravity of 1.0 and N.O. dry circuit – dimension will vary for N.C. circuit).

Common Specifications

Electrical Termination: No. 18 AWG, 24" L., Polymeric Lead Wires (except Part No. 79999 which has Teflon® lead wires).

Approvals: LS-1950 Series switches are U.L. Recognized – File No. E45168 and are CSA Listed - File No. 30200 (Part No. 79999 is U.L. Recognized only).

Switch Operation: Selectable, N.O. or N.C., by inverting float on unit stem. Units are shipped N.O. unless otherwise specified.

How to Order – Select Part Number based on specifications required.

Series Number	Materials		Min. Liquid Sp. Gr.	Operating Temperature	Pressure, PSI, Max.	Switch ¹	Part Number
	Stem and Mounting	Float					
LS-1850	316 Stainless Steel	.40	-40°F to +300°F (-40°C to +148.9°C)	300	SPST, 20 VA		113820 ⚡
					SPST, 100 VA ²		113822
					SPDT, 20 VA		113821⁴
LS-1950	316 Stainless Steel	.80	-40°F to +300°F (-40°C to +148.9°C)	750	SPST, 20 VA		01950 ⚡
					SPST, 100 VA ³		26717 ⚡
			-40°F to +480°F (-40°C to +248.9°C)		SPST, 20 VA		79999 ⚡

Notes

- See "Electrical Data" on Page X-5 for more information.
- Not U.L. Recognized or CSA Listed.
- UL Resistive Rated
- Float inversion is not required to select switch operation (N.O./N.C.) on SPDT units.

⚡ – Stock Items.

FS-200 Series – General Purpose, Straight-Through Flow Path

UL Approved
Explosion-Proof

Flow Rate Settings: Fixed: 0.5 GPM to 100.0 GPM
Adjustable: 1.0 GPM to 15.0 GPM

Port Size: 1" NPT to 2" NPT

Primary Construction Material: Bronze or Stainless Steel

Setting Type: Fixed or Adjustable

The FS-200 Series offers accurate flow detection, with 1% repeatability, over a broad range of flow settings and port sizes. Its durable construction delivers long-life reliability in either water or oil. Generous flow paths keep pressure drop low. These switches are ideal for detection of improper flow rates in high volume lubrication, cooling or process systems.

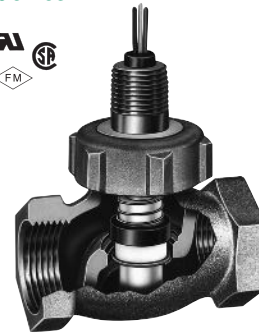
FS-200 Adjustable Series switches offer the same accuracy and are as rugged as those with fixed settings, but provide one additional feature: external adjustability. With these versatile switches your choice of flow settings is diverse within a given range. An ordinary, flat-blade screwdriver is all that's required for the actuation adjustment.

Specifications

Wetted Materials	
Housing	
FS-200	Bronze or 316 Stainless Steel
FS-200 Adjustable	Bronze
Shuttle	Teflon®
Bonnet	Bronze or Stainless Steel
Spring	316 Stainless Steel
Other Wetted Parts	Viton®, Ceramic
Pressure Rating	
Operating	400 PSIG @ 100°F (37.8°C)
Proof	800 PSIG @ 100°F (37.8°C)
Operating Temperature	
FS-200	-20°F to +300°F (-29°C to +148.9°C)
FS-200 Adjustable	-20°F to +200°F (-29°C to +93.3°C)
Repeatability	1% Maximum Deviation
Set Point Accuracy	±10%
Set Point Differential	15% Maximum
Switch*	SPDT, 20 VA
Electrical Termination	No. 18 AWG, 24" L., Polymeric Lead Wires

*See "Electrical Data" on Page X-5 for more information.

FS-200 Series

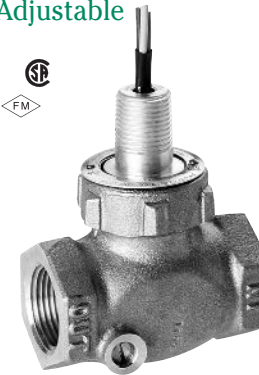


MASTER DISTRIBUTOR



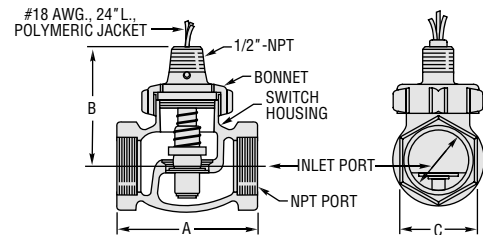
U.L. Recognized
File No. E31926
CSA Listed —
File No. LR30200
and LR22666
FM Approved —
File No. 0A8A3.AE
and 1H3A2.AX
U.L. Approved —
File No. 183854

FS-200 Adjustable



CSA Listed —
File No. LR22666
FM Approved —
File No. 0Q2A8.AE

Dimensions



Model	Port Size NPT	A inch (mm)	B inch (mm)	C Hex inch (mm)
FS-200 and FS-200 Adjustable	1"	3-1/4 (82.6)	3 (76.2)	1-25/32 (45.2)
	1-1/4"	4 (101.6)	3-3/16 (80.9)	2-3/16 (55.5)
	1-1/4" ss	4-1/2 (114.3)	3-3/16 (80.9)	2-3/16 (55.5)
	1-1/2"	4-1/2 (114.3)	3-1/2 (88.9)	2-1/2 (63.5)
	2"	5-3/8 (136.5)	4 (101.6)	3-3/32 (78.5)

Adjustable versions available in 1 inch port sizes only.



How To Order – Standard Models

Specify Part Number for the FS-200 Series based on desired housing material, port size and flow setting, or based on flow setting range for FS-200 Adjustable versions.

FS-200 Series

Port Size NPT	Flow Setting GPM	Part Numbers	
		Bronze	Stainless Steel
1"	0.5	27051 ⚡	27059 ⚡
	1	27052 ⚡	27060
	2	27053 ⚡	27061
	3	27054 ⚡	27062
	4	27055 ⚡	27063
	5	27056 ⚡	27064
	6	27057 ⚡	27065
	8	27058 ⚡	27066
1-1/4"	1	27067 ⚡	27076
	2	27068	27077
	4	27069	27078
	6	27070	27079
	8	27071	27080
	10	27072	27081
	12	27073	27082
	16	27074	27083
	20	27075	27084

Port Size NPT	Flow Setting GPM	Part Numbers	
		Bronze	Stainless Steel
1-1/2"	1.5	27085 ⚡	27093
	3	27086	27094
	5	27087	27095
	7.5	27088	27096
	10	27089	27097
	15	27090	27098
	20	27091	27099
	30	27092	27100
2"	2	27101 ⚡	27109
	4	27102	27110
	5	27103	27111
	10	27104	27112
	15	27105	27113
	25	27106	27114
	35	27107	27115
	50	27108	27116

FS-200 Adjustable

Port Size NPT	Flow Setting Adjustment Range GPM	Part Numbers
1"	1.0-6.0	26615 ⚡
	5.0-15.0	26616 ⚡
	2.0-8.0	26838 ⚡

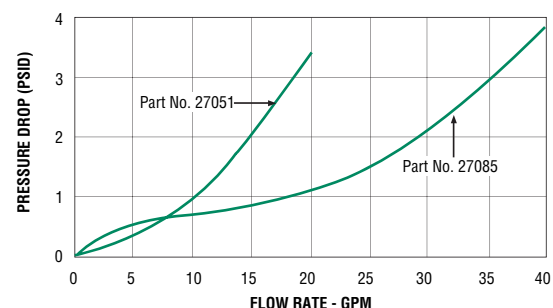
Notes:

- Flow settings for fixed versions are calibrated using water at +70°F on increasing flow, with units in a horizontal position (lead wires up). Consult factory regarding special flow setting calibration, or liquids other than water. Temperature changes will slightly affect the flow settings listed. Oil flow settings will vary with viscosity.
- Adjustable units that are set to customer specification are subject to GEMS test stand accuracy.
- Use of 150 micron filtration is recommended.
- Minimum 5 PSI line pressure required.

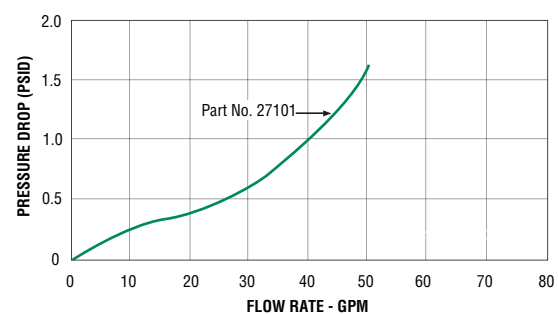
⚡ – Stock Items.

Pressure Drop - Typical

1" NPT and 1-1/2" NPT Ports

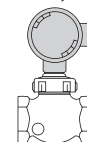


2" NPT Ports



Tests conducted with units in horizontal position (lead wires up) with water at +70°F (21°C).

FS-200 Series Flow Switches are U.L. Approved for Class I, Division 2, Groups A, B, C, D hazardous areas.



They are also available with FM-approved, explosion-proof junction box for Class I, Division 1, Group D hazardous locations. Units must be completely assembled at GEMS.

For Remote Alarms – See Page D-33

- Adjustable Volume
- Indoor Outdoor
- Solid-State



FS-4 Series – Low Cost, Molded Plastic Construction

Flow Rate Settings: 0.1 GPM to 1.5 GPM

Port Size: 9/16"-18 UNF

Primary Construction Material: Ryton®

Setting Type: Fixed

The FS-4 Series makes flow protection economical for a broad range of industrial applications such as welders, lubrication systems, medical sterilizers and laundry chemicals dispensing.

Specifications

Wetted Materials	
Housing and Piston	Ryton® R4
Spring	316 Stainless Steel
O-Ring	Viton®
Other Wetted Parts	
	Epoxy
Operating Pressure, Maximum	250 PSIG (17.2 bar) @ 70°F (21°C)
Operating Temperature	0°F to 225°F (-17°C to +107°C)
Set Point Accuracy	±15% Maximum
Set Point Differential	20% Maximum
Switch*	SPST or SPDT, 20 VA (SPDT: 240 VAC Max.)
Inlet/Outlet Ports	9/16"-18 UNF-2B Thread
Recommended Filtration	50 Microns or Better
Electrical Termination	SPST
	18 AWG, Zipcord, 24" Long
SPDT	18 AWG, PVC 24" Long Leads

* See "Electrical Data" on Page X-5 for more information.

How To Order – Standard Models

Housing and Piston Material	Flow Setting GPM	Part Numbers		
		SPST Switch		With SPDT Switch
		N.O., No Flow	N.C., No Flow	
Ryton®	0.1	122340	122346	122352
	0.25	122341	122347	122353
	0.5	122342	122348	122354
	0.75	122343	122349	122355
	1.0	122344	122350	122356
	1.5	122345	122351	122357

Note:
Flow settings are calibrated using water @ +70°F on increasing flow, with units in a vertical position (lead wires up).

Port Adapters for FS-4

Converts 9/16" threaded ports to NPT or barbed connection. Made of Ryton®-R4 or polypropylene with O-Rings in place.

CAUTION: Do not exceed 15 in./lbs. maximum torque when installing adapter fittings.

Material	Adapter Size	Part Numbers
Ryton®	1/8" NPT*	123028
	1/4" NPT*	123029
Polypropylene	1/4" NPT*	158602
	1/2" Barb**	158603

*Wrench flats provide for proper assembly.

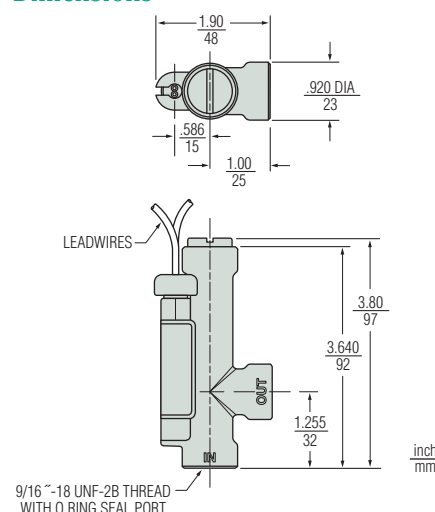
**Accepts 1/2" I.D. flexible hose

– Stock Items.

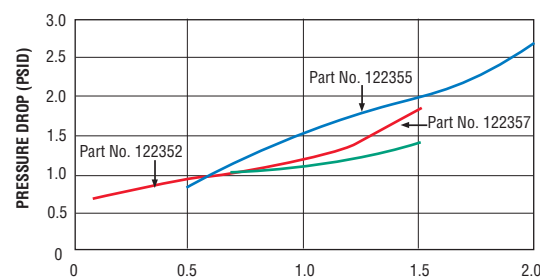


U.L. Recognized —
File No. E31926
CSA Listed —
File No. LR30200

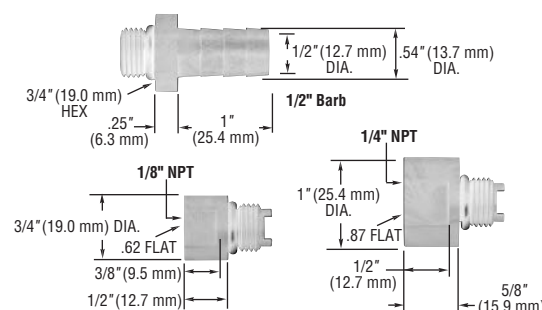
Dimensions



Pressure Drop – Typical



Tests conducted with units in vertical position (lead wires up) with water at +70 F (21 C).



Large Size – Alloys

FABRI-LEVEL™ Components and Kits Build Into Custom Switches in Minutes

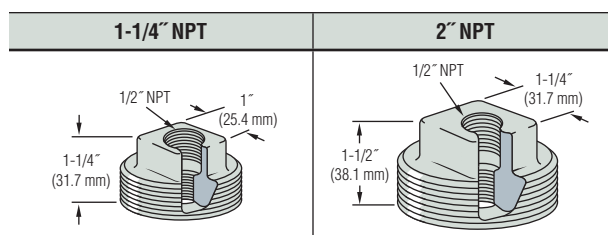
GEMS FABRI-LEVEL™ units can be custom-assembled in minutes from standard components, right in your plant. Simple instructions are furnished with kits.

FABRI-LEVEL™ Components

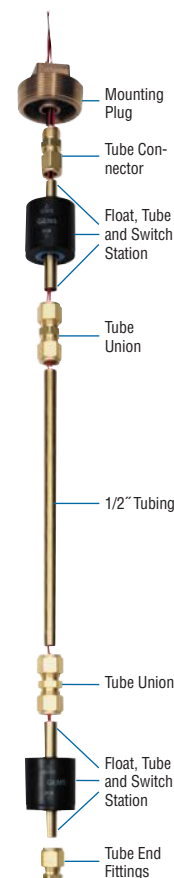
How to Order: Specify Part Number and quantity of each component required.

Mounting Types

Provides clearance for inserting unit in tank. 2" NPT Mounting must be used with stainless steel floats.



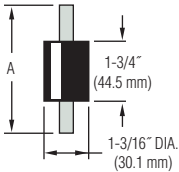
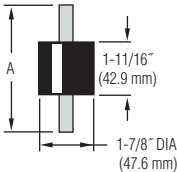
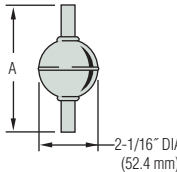
Material	Part Numbers	
Brass	26034 ⚡	24408 ⚡
316 Stainless Steel	26033	24407 ⚡



Level Station Assemblies

Each Station is comprised of a float, tube section and switch.

Lead Wires: SPST: #18 AWG, 60" L., Teflon®; **SPDT:** #22 AWG, 60" L., Teflon®

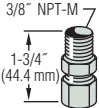
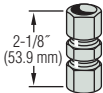

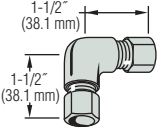

Float Material			Buna N				316 Stainless Steel					
Compatible Mounting Type			1-1/4" NPT		2" NPT							
Float Dimensions												
Operating Temperature			Water: to +180°F (+82°C); Oil: -40°F to +230°F (-40°C to +110°C)				-40°F to +275°F (-40°C to +135°C)					
Pressure, PSI, Max.			150				750					
Min. Media Specific Gravity			.75		.55		.75					
Mounting Size	Switch Type	Tubing Material	Part Number	A Dim.	Part Number	A Dim.	Part Number	A Dim.				
1-1/4" NPT	SPST 20 VA	Brass	26609 ⚡	4" (101.6 mm)	—	—	—	—				
		Stainless Steel	26608 ⚡									
	SPDT 20 VA	Brass	26737 ⚡	4-29/64" (113.0 mm)								
		Stainless Steel	26738									
2" NPT	SPST 20 VA	Brass	—	—	24410 ⚡	4" (101.6 mm)	—	4-1/4" (107.9 mm)				
		Stainless Steel			25328 ⚡		24411 ⚡					
	SPDT 20 VA	Brass			24578	4-29/64" (113.0 mm)	—	4-29/64" (113.0 mm)				
		Stainless Steel			25329		24579 ⚡					

* See "Electrical Data" on Page X-5 for more information.

⚡ – Stock Items.



Fittings and Tubing

Description (1/2" Fittings)	Tube Connector	Tube Union	Tube End Fitting	90° Elbow	1/2" O.D. Tubing	
					10" Length	36" Length
Function	Connects tube to mounting plug, mounts unit from inside of tank.	Connects level stations or extension tubes.	Seals end of unit.	For side entry into tank	For extending units or level station spacing.	
						
Material	Part Numbers					
Brass (Nylon Ferrule)	24633 ⚡	24412 ⚡	24553 ⚡	24631	25199 ⚡	24637 ⚡
All-316 Stainless Steel	24634 ⚡	24413 ⚡	24554 ⚡	24632	25204	24638 ⚡

FABRI-LEVEL™ Kits

FABRI-LEVEL Switch Kits contain all components for complete assembly of a 1- or 2- station level switch unit for pipe-plug mounting in your tank. Kits are available in several material and size combinations. N.O. or N.C. operation of the SPST switch is selectable by inverting the float(s) on the unit stem. Two 10" (254 mm) lengths of tube are furnished to space level stations as desired. Components available for custom-building other configurations are listed on the facing page and above.

Specifications

Kits use the components listed individually on the facing page and above. Please review for performance and dimensional data.

How To Order

Specify Kit Number and quantity.

Materials		Mounting NPT	Kit Number
Fittings	Floats		
Brass	Buna N	1-1/4"	26128 ⚡
		2"	24576 ⚡
316 Stainless Steel	Buna N	1-1/4"	26130
		2"	26675
316 Stainless Steel		2"	24577 ⚡

Warning: Improper application, assembly or installation of FABRI-LEVEL™ Kits or components may result in injuries to personnel or damages.

⚡ – Stock Items.



Each Kit Contains:

- 1 Tube Connector
- 1 Mounting Plug
- 2 Level Stations (Switch, Tube, Float)
- 2 Extension Tubes
- 1 Tube End Fitting
- 3 Tube Unions