

Переключатели потока Shuttle FS

Технические характеристики

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FS-400 Series – General Purpose, 90° Flow Path

- ▶ **Flow Rate Settings:** Fixed: 0.75 GPM to 10.0 GPM
Adjustable Version: 0.75 GPM to 14.0 GPM
- ▶ **Port Size:** 3/4-14 NPT
- ▶ **Primary Construction Material:** Bronze
- ▶ **Setting Type:** Fixed or Adjustable

Provides accurate flow detection in water and oil with 1% repeatability. Flow settings on the adjustable version can be easily changed without disassembly. A shuttle by-pass vane inside the housing is controlled externally using an ordinary flat-blade screwdriver. These switches are ruggedly constructed of non-corrosive materials and resist shock and vibration. Suitable for triggering alarms on interlocking shutdown circuitry when flow rate is improper to protect bearings, gears and cooling systems.

Specification

Wetted Materials	
Housing	Bronze
Shuttle	Delrin®
Spring	316 Stainless Steel
O-Ring	Viton®
Other Wetted Parts	Ceramic
Pressure Rating, Maximum	
Operating	400 psi (27.6 bar) @ 100°F (+37.8°C)
Proof	800 psi (55.2 bar) @ 100°F (+37.8°C)
Operating Temperature	-20°F to +180°F (-29°C to +82.2°C)
Repeatability	1% Maximum Deviation
Set Point Accuracy	±10%
Set Point Differential	15% Maximum
Switch*	SPDT, 20 VA
Inlet/Outlet Ports	3/4-14 NPT
Electrical Termination	No. 18 AWG, 24" L., Polymeric Lead Wires

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

How To Order – Standard Models

Specify Part Number based on flow settings for the FS-400 Series, based on flow setting range for the FS-400 Adjustable version.

FS-400 Series

NPT	Flow Setting GPM	Part Numbers
3/4-14	0.75	26440 ⚡
	1.5	26441
	2.0	26442
	2.5	26443
	5.0	26444
	7.5	26445
	10.0	26446

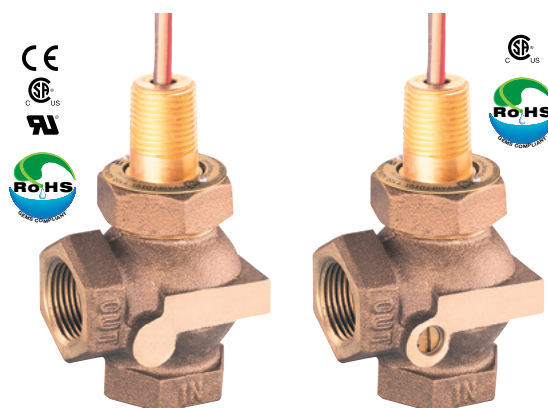
FS-400 Adjustable

NPT	Flow Setting GPM	Part Numbers
3/4-14	0.75-4.0	26600 ⚡
	2.0-8.0	26601 ⚡
	7.0-14.0	26602

Notes:

1. Flow settings for Fixed Version are calibrated using water at +70°F on increasing flow, with units in a vertical position (lead wires up). Temperature changes will slightly affect the flow settings listed.
2. Adjustable units that are set to customer specifications are subject to GEMS test stand accuracy.
3. Use of 150 micron filtration is recommended.
4. Minimum 5 PSI line pressure required.

⚡ Stock Items



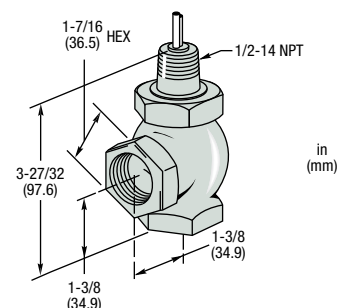
FS-400 Series

U.L. Recognized:
File No. E31926
CSA Listed:
LR30200 and LR22666

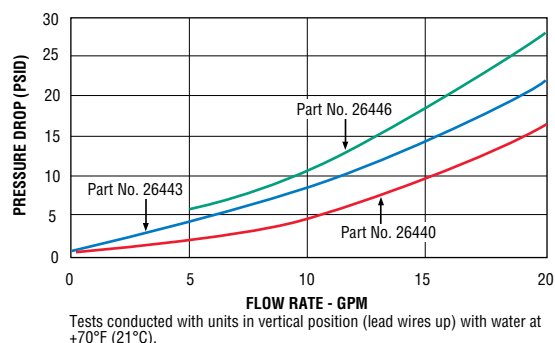
FS-400 Adjustable

CSA Listed:
File No. LR22666

Dimensions



Pressure Drop - Typical



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

FS-400 switches are U.L. Approved for Class I, Division 2, Groups A, B, C, D hazardous areas.

U.L. Approved: File No. E183854

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

- ▶ **Flow Rate Settings:** Fixed: 0.5 GPM to 100.0 GPM
Adjustable: 1.0 GPM to 15.0 GPM
- ▶ **Port Size:** 1-11.5 NPT to 2-11.5 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 (27.6 bar) @ 100°F (37.8°C)

Proof 800 psig (55.2 bar) @ 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%

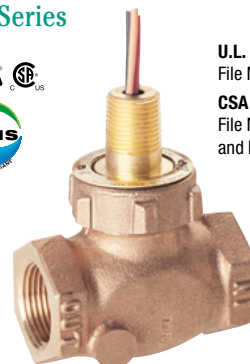
Set Point Differential 15% Maximum

Switch* SPDT, 20 VA

Electrical Termination No. 18 AWG, 24" L., Polymeric Lead Wires
Red NC, Black Common, Orange NO

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

FS-200 Series



U.L. Recognized:
File No. E31926

CSA Listed:
File No. LR30200
and LR22666

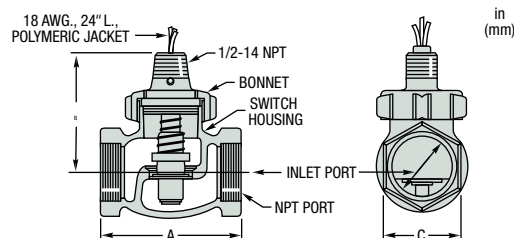
FS-200 Adjustable



U.L. Recognized:
File No. E31926

CSA Listed:
File No. LR22666

Dimensions



Model	Port Size NPT	A	B	C Hex
FS-200 and FS-200 Adjustable	1-11.5	3-1/4" (82.6 mm)	3" (76.2 mm)	1-25/32" (45.2 mm)
	1¼-11.5	4" (101.6 mm)	3-3/16" (80.9 mm)	2-3/16" (55.5 mm)
	1½-11.5 ss	4-1/2" (114.3 mm)	3-3/16" (80.9 mm)	2-3/16" (55.5 mm)
	1½-11.5	4-1/2" (114.3 mm)	3-1/2" (88.9 mm)	2-1/2" (63.5 mm)
	2-11.5	5-3/8" (136.5 mm)	4" (101.6 mm)	3-3/32" (78.5 mm)

Notes:

- Adjustable versions available in 1 inch port sizes only.
- Standard calibration is in water with units in a horizontal position.
- Viscosity changes will affect setpoints. Typically, as viscosity increases setpoints will decrease.
- Consult Gems for special applications.

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
1-11.5	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
1¼-11.5	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
1½-11.5	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
2-11.5	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

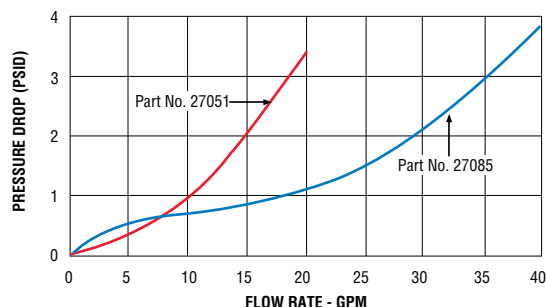
Port Size NPT	Flow Setting Adjustment Range GPM	Part Numbers
1"	1.0-6.0	26615 ⚡
	5.0-15.0	26616 ⚡
	2.0-8.0	26838 ⚡

Notes:

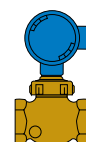
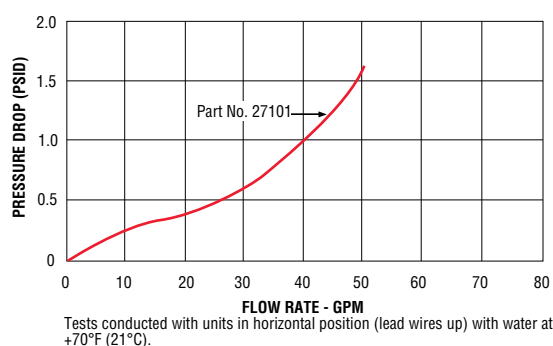
- Flow settings for fixed versions are calibrated using water at +70°F on increasing flow, with units in a horizontal position (lead wires up). Consult factory regarding special flow setting calibration, or liquids other than water. Temperature changes will slightly affect the flow settings listed. Oil 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

1-11.5 NPT and 1½-11.5 NPT Ports



2-11.5 NPT Ports



FS-200 Series Flow Switches are U.L. Approved for Class I, Division 2, Groups A, B, C, D hazardous areas.
U.L. Approved : File No. E183854

For Remote Alarms – See Page E-31

- Adjustable Volume
- Indoor Outdoor
- Solid-State



FS-500 Series – Low Cost Units for Threaded Plastic Piping

Flow Rate Settings: 0.25 GPM to 5.0 GPM

Port Size: 3/4" NPT

Primary Construction Material: Polypropylene

Setting Type: Fixed

The FS-500 offers low cost flow monitoring with a variety of switch actuation points and low pressure drop. All wetted parts are polypropylene or stainless steel, making this switch ideal for a wide range of chemical and temperature requirements. These Flow Switches can be used in water treatment applications including chlorinators, purifiers and heaters. The FS-500 is ideal for equipment cooling including welders, lasers, etc. A J-box version with a 5 amp relay is also available for direct control of higher electrical loads, such as chlorinator pumps.

Specifications

Wetted Materials*	
Housing, Bonnet, Shuttle, Shuttle Cap	Polypropylene, Hydrolytically Stable
O-Ring	Viton® or Buna N
Spring	316 Stainless Steel
Retaining Clip	PH 15-7 Mo Stainless Steel
Operating Pressure, Maximum	100 PSIG (6.9 bar) @ +70°F (21°C)
	50 PSIG (3.4 bar) @ +180°F (82°C)
	40 PSIG (2.8 bar) @ +212°F (100°C)
Operating Temperature, Maximum	0° to 212°F (100°C)
Set Point Accuracy	± 20%
Set Point Differential	± 20% Maximum
Switch**	SPST, N.O. Pilot Duty 20 VA, 120-240 VAC or VDC
J-Box with 5A Relay	
Coil	120 VAC 50/60 Hz
Contacts SPDT	5A – 240 VAC Res
	1/3 HP – 120 VAC
	5A – 28 VDC Res.
Inlet/Outlet Ports	3/4" Female NPT
Electric Termination	
Pilot	No. 22 AWG, 24" Zip Cord Lead Wires
J-Box	6" PVC Cable

* Materials of Construction are available for FDA Compliance.

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

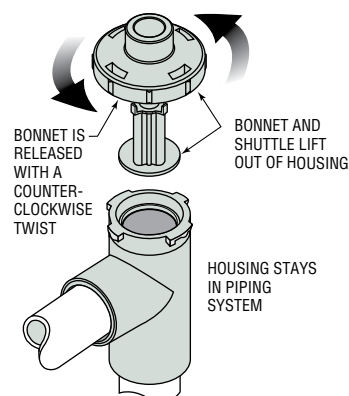
How To Order – Standard Models

Specify Part Number based on switch actuation set point. Set points other than those listed are available as special order; contact GEMS with your requirements. Normally closed switch logic units available as special orders.

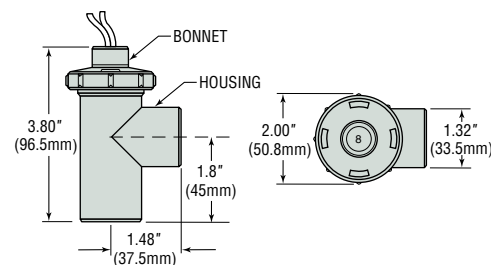
Switch Actuation Set Point GPM	Part Numbers	
	Pilot Duty	J-Box w/5A Relay
0.25	170231 ⚡	175901
0.50	170232 ⚡	175902
1.00	170233 ⚡	—
2.00	175117	—
2.50	170234 ⚡	—
5.00	170235 ⚡	—

Note: Use of 100 micron filtration is recommended.

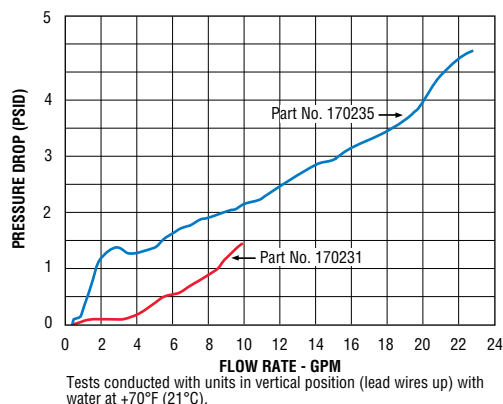
⚡ – Stock Items.



Dimensions



Pressure Drop - Typical



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