Industrial Controls

liquid level & flow sensors

Made in the U.S.A

THOMAS PRODUCTS LTD.

designers & manufacturers of quality level & flow sensors

www.ThomasProd.com

860.621.9101

800.666.9101

How does Thomas Products meet your needs?

Over three decades ago, Thomas Products pioneered the development of advanced procedures for hot forming titanium sheets into tubes to produce quality heat shields for jet engine components. Employing high technology machining and welding techniques, coupled with our design department has kept Thomas Products an innovator of cutting edge electrical level and flow sensors, as well as non-electric indicators. This innovative spirit and dedication to craftsmanship has kept Thomas Products ahead of our competition.

QUALITY

When you buy our products, you receive total quality assurance. Thomas Products is a full-service solutions provider, from raw material purchase to design, to product completion. Limited subcontracting means more control over the manufacturing process. You benefit from our advanced design and manufacturing techniques and stringent control processes. Thousands of parts are processed through our quality control department which guarantees nearly zero defects.

OMA Program

Thomas Products LTD., offers this Obsolescence Management Alternative Program to ensure the required actions to prepare for EOL interruption in manufacturing. Even product health update reports can be implemented. Contact Thomas Products LTD., for details.

INTEGRATED product development

Thomas Products offers hundreds of standard level and flow switches, as well as customized sensors. Our production team has the ability to create tailored tools and dies for your individual product development and application.

Thomas Products operates as a complete in-house team with Sales Engineering, Technical Production, and highly skilled employees to deliver quality products and service.

Certified welders handle each part in our low-hydrogen environment. Each welder is re-qualified annually

What does our one-stop design to manufacturing solution mean for you?

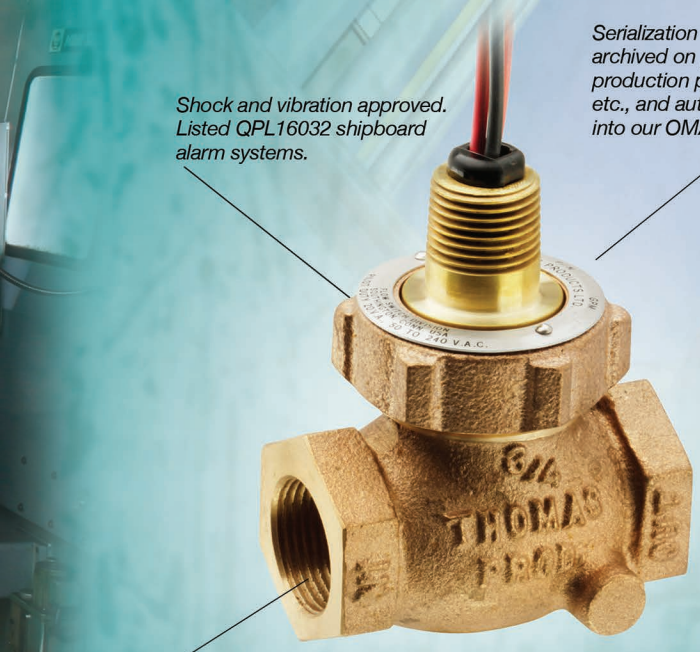
- Top Notch Design
- Quality Production
- Certified Materials
- Quick Time to Market
- Significant Cost Savings

Work cell: SCARA robots automate assembly for high volume orders.

Our in-house injection molding capabilities means Thomas Products LTD., can certify that only virgin materials are used. No reprocessing or non-FDA approved additives etc., are ever introduced during the injection mold process.

Shock and vibration approved. Listed QPL16032 shipboard alarm systems.

Serialization and documentation is archived on purchased materials, production processes, inspection, etc., and automatically integrated into our OMA program.

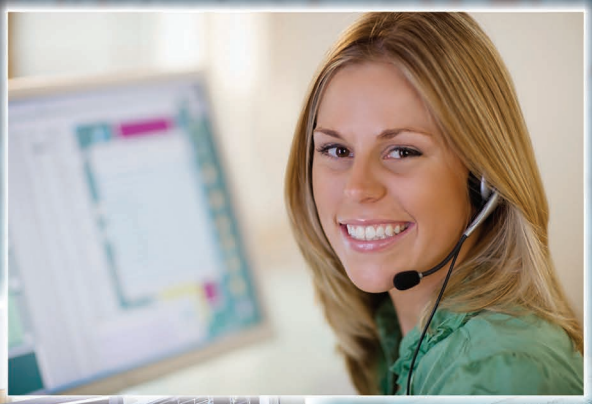


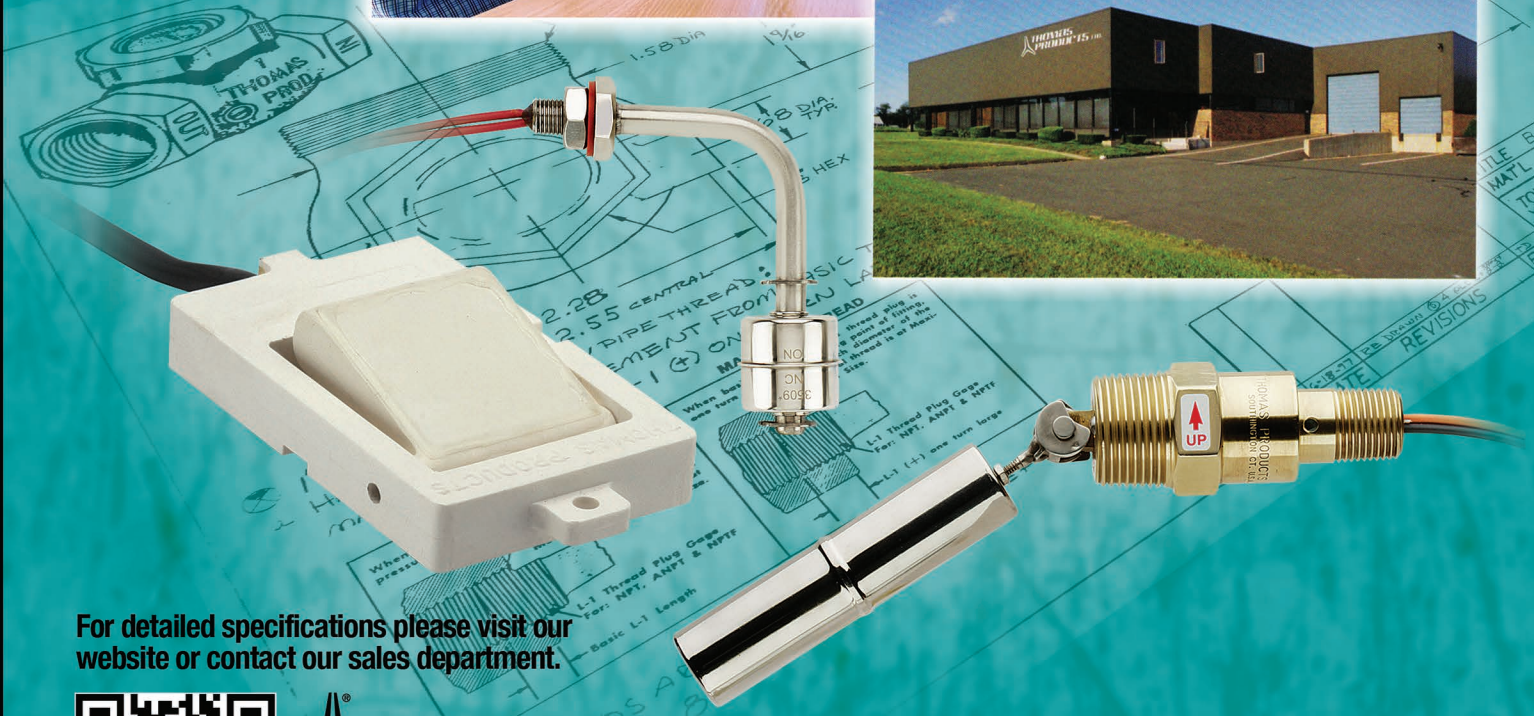
In-House machining available for special modifications (i.e., NPT, BSPT, SAE, Silver, Braze, Socket Weld, etc.).

State-of-the-art "artificial intelligence" molding machines.

Our Mission

From day one, Thomas Products LTD., set out to provide the best quality level and flow sensors in the industry. We have achieved just that by constantly innovating and implementing cutting-edge production techniques that ultimately save our customers time and money. What sets Thomas Products apart from our competitors is our ability to customize our products to fit your needs, and also provide ongoing support.





For detailed specifications please visit our website or contact our sales department.

THOMAS PRODUCTS LTD.

987 West Street, Southington, Ct 06489-1023

860.621.9101 • Fax 860.621.1470

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Level and Flow Switch selection guide

- Ideas
- Solutions
- Technical Support

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Level Switch
selection guide

Customizing available on all models.
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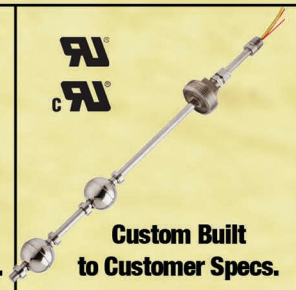
5000 Styles A-D	4000 Adjustable	4000 Styles 5-9	4000 Style 11	4000 Style 10	4000 Styles 1- 4	
 **Custom Built to Customer Specs.**	 **Custom Built to Customer Specs.**	 **Custom Built to Customer Specs.**	 **Custom Built to Customer Specs.**	 **Custom Built to Customer Specs.**	 **Custom Built to Customer Specs.**	
Materials per customer specs. Polysulfone, Ryton, Nylon, etc.	Materials per customer specs. Brass, Bronze,Stainless Steel, PVC , etc.	Materials per customer specs. Brass, Bronze,Stainless Steel, PVC , etc.	Materials per customer specs. Brass, Bronze,Stainless Steel, PVC , etc.	Materials per customer specs. Brass, Bronze,Stainless Steel, PVC , etc.	Materials per customer specs. Brass, Bronze,Stainless Steel, PVC , etc.	Stem & Mounting Material
Same as above, plus Polypropylene, and BUNA.	Same as above, plus Polysulfone, BUNA and Polypropylene.	Same as above, plus Polysulfone, BUNA and Polypropylene.	Same as above, plus BUNA and PVC.	Same as above, plus Polysulfone, BUNA and Polypropylene.	Same as above, plus Polysulfone, BUNA and Polypropylene.	Float Material
FDA approved material installs top or bottom, variety of mountings.	Adjustable stem. Customer can raise entire stem to position.	Installs from inside or outside of tanks. Top or bottom, variety of mountings.	Side of tank mounting.	External tank mounting to side of tank.	Installs from inside or outside of tanks. Top or bottom, variety of mountings.	Advantages
1/8 “, 1” NPT, 3/8” - 16 Bulkhead 2” diameter flange.	Any Model 4000 metal construction.	1/8 “, 3/4”,1” NPT, 3 -5/8” diameter flange. Any length available.	2”, 3” or 4” 150# ANSI flange.	Port Size 1” NPT	1/2”, 1-1/4”, 2” NPT and 3” 150# ANSI flange. Any length available.	Mounting Sizes
5/16” Diameter, fluted.	5/16” and 1/2” Diameter.	5/16” Diameter.	1/2” Diameter.	1/2” Diameter.	1/2” Diameter.	Stem Diameter
20 VA SPST	20 VA SPST , 20 -100 VA SPST or 20 VA SPDT	20 VA SPST , 20 -100 VA SPST or 20 VA SPDT	20 VA SPST , 20 -100 VA SPST or 20 VA SPDT	20 VA SPST , 20 -100 VA SPST or 20 VA SPDT	20 VA SPST , 20 -100 VA SPST or 20 VA SPDT	Reed Switch
1 to 4	1 to 6	1 to 5	1 to 6	1 to 6	1 to 6	Switch Points
- 40 °F to +225 °F	-40 °F to +300 °F (Depending on style specified.)	-40 °F to +300 °F (Depending on style specified.)	-40 °F to +300 °F (Depending on style specified.)	-40 °F to +300 °F (Depending on style specified.)	-40 °F to +300 °F (Depending on style specified.)	Operating Temperatures
750 PSIG (Depending on style specified.)	750 PSIG (Depending on style specified.)	750 PSIG (Depending on style specified.)	750 PSIG (Depending on style specified.)	750 PSIG (Depending on style specified.)	750 PSIG (Depending on style specified.)	Operating Pressure

Level Switch
selection guide

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5100	3800	4900	4400	4100	3900	3700	
 Pat. No. 5,425,271	 Patent Pending	CAN BE CUSTOMIZED TO YOUR SPECS. 			CAN BE CUSTOMIZED TO YOUR SPECS.  Patent Pending		
Brass or Stainless Steel	PVC	Brass or SST	Polysulfone, Polypropylene	Brass, Bronze, Stainless Steel	Brass, Bronze, Stainless Steel	Brass, Bronze, Stainless Steel	Stem & Housing Material
Stainless Steel	PVC	BUNA, Stainless Steel, Polysulfone, Polypro-pylene	Polysulfone, Polypropylene Optional Ryton	Stainless Steel	Stainless Steel	Stainless Steel	Float Materials
Side tank indicator, use in hazardous loca-tions, non-electrical, 2 color flag (Red & Green).	Lays at bottom of tank or double wall containment system.	Side tank mounting, high pressure, variable length stems.	Side tank mounting, economical, FDA approved material, opt. conduit connector.	Side tank mounting, high pressure. Replacement parts available.	Side tank mounting for use in contaminated and viscous fluids. Food processing equip.	External tank mounting to side of tank.	Advantages
3/4" NPT	N/A	1/8" NPT or 3/8" - 24 Bulkhead & Nut	1/2" NPT, 1/2" - 13 or 5/8"-11 Bulkhead & Nut	1" NPT	1/8" NPT	Port size 1" NPT	Mounting Sizes
N/A	10 VA SPST	20 VA SPST	20 VA SPST	20 VA SPDT	20 VA SPST	20 VA SPST	Reed Switch
-40 °F to + 225 °F	-30 °F to + 140 °F	Depending on float specified.-40 °F to + 300 °F Max.	-40 °F to + 225 °F	-40 °F to + 300 °F	-40 °F to + 300 °F	-40 °F to + 300 °F	Operating Temperatures
400 PSI Max.	50 PSI Max.	Depending on float specified. 400 PSI Max.	Depending on float specified. 150 PSI Max.	Depending on float specified. 900 PSI Max.	50 PSI Max.	900 PSI Max.	Operating Pressure

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4800	4700 / H	4600	4500	4200 H	4200	4200	
							
PVC	Brass or SST	Brass or SST	Brass or SST	Brass or SST	Brass or SST	Polysulfone or Polypropylene	Stem Materials
PVC	SST	BUNA	BUNA	SST	4200 BUNA or SST	Polysulfone or Polypropylene	Float Material
Increased float strength, economical,chemical resistant.	**4700** High pressure, hazardous locations, Silicone potted, shock & vibration resistant.	Compatible with fuel, oil, etc. Silicone potted. Shock & vibration resistant. Float inter-facing available.	Compatible with fuel, oil, etc. Silicone potted. Shock & vibration resistant. Float inter-facing available.	**4200H** High pressure, hazardous locations, Silicone potted, shock & vibration resistant.	Fuel oil and chemical applications. Silicone potted, shock & vibration resistant.	OEM large volume use, fluted stem	Advantages
1/4" NPT	1/4" NPT	1/4" NPT	1/8" NPT	1/8" NPT	1/8" NPT	1/8" NPT or 3/8" Bulkhead	Mounting Sizes
20 VA SPST, 100 VA SPST, 20 VA SPDT, 20 VA SPST	20 VA SPST, 100 VA SPST, 20 VA SPDT, 20 VA SPST	20 VA SPST, 100 VA SPST, 20 VA SPDT, 20 VA SPST	20 VA SPST, 100 VA SPST, 20 VA SPDT, 20 VA SPST	20 VA SPST, 100 VA SPST, 20 VA SPST	20 VA SPST, 100 VA SPST, 20 VA SPST	20 VA SPST, 100 VA SPST, 20 VA SPST	Reed Switch
N/A	**4700H** Class I Div. 1 Groups C&D Class I Div. 2 Groups A,B,C, & D	N/A	N/A	**4200H** Class I Div. 1 Groups C&D Class I Div. 2 Groups A,B,C, & D	N/A	N/A	Hazardous Locations
-40 °F to + 140 °F	-40 °F to + 300 °F	-40 °F to + 230 °F (Depending on media.)	-40 °F to + 230 °F (Depending on media.)	Depending on float specified -40 °F to + 300 °F	Depending on float specified -40 °F to + 300 °F	-40 °F to + 225 °F	Operating Temperatures
100 PSI Max.	750 PSI Max.	150 PSI Max.	150 PSI Max.	Depending on float specified. 400 PSI Max.	Depending on float specified. 400 PSI Max.	Depending on float specified. 100 PSI Max.	Operating Pressure

Flow Switch
selection guide

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2600	1800	1400	1300	1200	1100	
 Pat. No. 5,162,624	 Pat. No. 5,162,624				 NAV SEA	
PVC		Bronze		Bronze or SST	Bronze or SST	Housing Material
SST, PVC & Ceramic		Brass, SST, Teflon® & Ceramic		Brass, SST & Ceramic or SST & Ceramic & Monel		Trim Materials
Bypass design, low Δ P economical.	True flow switch operation, removable bonnet assembly, economical.	Field adjustable, eliminates turbulence & reduces Δ P, 25% . Approved for shock, vibration.	Eliminates turbulence & reduces Δ P, 25% . Approved for shock, vibration, salt spray.	Field adjustable, eliminates turbulence & reduces Δ P, 25% . Approved for shock, vibration.	Eliminates turbulence & reduces Δ P, 25% . Approved for shock, vibration, salt spray. 1100 MSB listed QPL 16032.	Advantages
2" Slip, accepts standard adapters	1" Slip, accepts standard adapters	3/4" NPT		1" NPT	3/4" - 3" NPT	Process Connections
20 VA SPST, 20 VA SPDT		20 VA SPDT			1100 MSB SPST 10 Watt Lampload	Reed Switch
.5 & 1.0 & 2.0 GPM	.5 & 1.0 GPM 6.0 GPM Max.	.75 - 14 GPM Field Adjustable	.75 - 10 GPM	.75 - 14 GPM Field Adjustable	.5 - 100 GPM	Set Points
0 °F to +140 °F		-20 °F to +300 °F				Operating Temperature
150 PSIG Max.		400 PSI @ 100 °F operating 800 PSI @ 100 °F proof load				Operating Pressure

Flow Switch
selection guide

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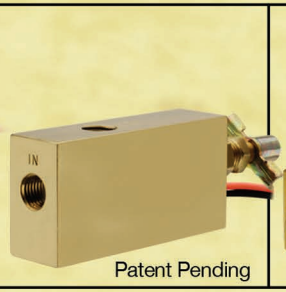
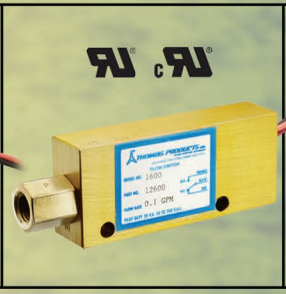
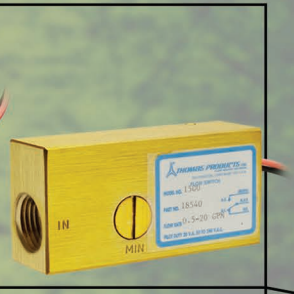
	2000	2300	1900	1700	1600	1500
		 Patent Pending				
Housing Material	Brass or 316 Stainless Steel					
Trim Materials	Brass or Stainless Steel		Brass, 316 Stainless Steel or Polysulfone			
Advantages	Self - Cleaning, true 1/2" IPS, Silicone potted shock & vibration resistant.	Self - Cleaning, 3 ports, serviceable while in line.	Long - lasting pistons with wide lands. Hardened and lapped bore. Mounting Holes Replacement parts available.			Field adjustable or factory set from either side, available graduated scale and mounting holes.
Process Connections	1/2" NPT	1/4" NPT				1/2" NPT
Reed Switch	20 VA SPST	20 VA SPDT	20 VA SPST 20 VA SPDT	20 VA SPDT	20 VA SPST	
Set Points	.5 - 3.0 GPM	.1 - 1.5 GPM		Liquid: 2.0 - 300 cc/min Gas: 2.0 to 50 SCFH	Liquid: 1 - 1.5 GPM Gas: .5 - 40.0 SCFM	Liquid: 1 - 20.0 GPM Gas: 1.0 - 250 SCFM
Operating Temperature	Brass unit: -20 ºF to + 250 ºF SST unit: -20 ºF to +300 ºF	-20 ºF to +300 ºF	Brass unit: -20 ºF to + 250 ºF SST unit: -20 ºF to +300 ºF	-20 ºF to +300 ºF		
Operating Pressure	1500 PSGI Max.	1000 PSGI Max.				

Flow Switch
selection guide

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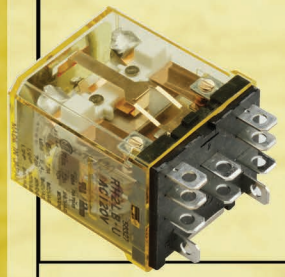
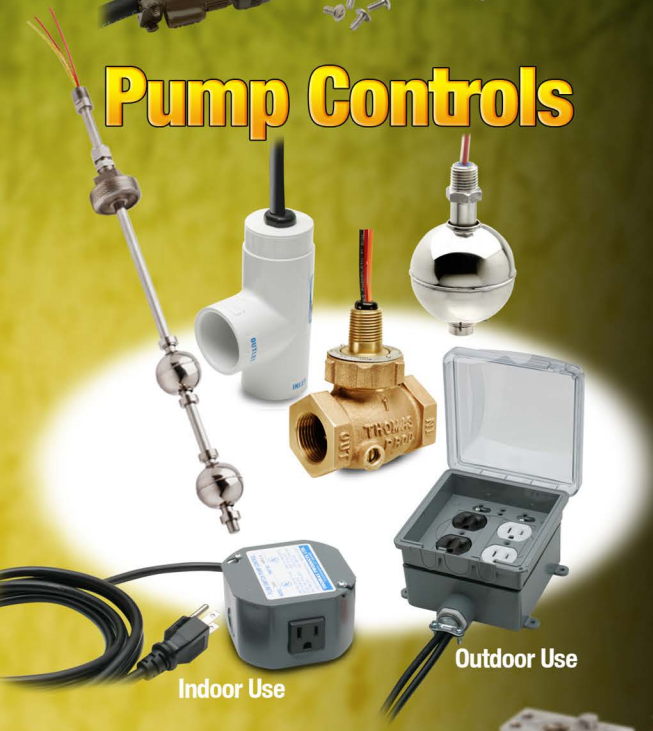
Accessories	5200	2500	2400	2200	2100	
	 Pat. No. 5,245,271					
Explosion - proof junction boxes. Relays DPDT general purpose. Relays DPDT latching pump controls. Crimp on terminals. Terminal Strips. TFE tape & TFE paste. Cable glands	Brass or 316 Stainless Steel	Ploysulfone	Brass or 316 Stainless Steel	Polysulfone		Housing Material
	316 Stainless Steel	Ploysulfone 316 SST	316 Stainless Steel	Polysulfone	Polysulfone 316 SST	Trim Materials
	Indicator use in hazardous locations 2 color flag.	SPDT reed switch assembly	SPDT reed switch assembly, all metal wetted parts, rugged investment cast components.	Stronger one - piece housing silicone potted, shock & vibration resistant, reverse taper bore, self cleaning. All wetted material PSF.		Advantages
	3/4 NPT	1" NPT		9/16" - 18 UNF 2 B threads. Accepts variety of adapters. See website.		Process Connections
	NA	20 VA SPDT		20 VA SPDT	15 VA SPST or 20 VA SPDT	Reed Switch
	1.5 - 5.0 GPM	Custom cut paddle to appropriate pipe sizes. Field adjustable set points.		.1 - .75 GPM	.1 - 1.5 GPM Optional 1 cc/min to 300 cc/min	Set Points
	-40 °F to +225 °F		-30 °F to +300 °F	-40 °F to +225 °F		Operating Temperature
	400 PSI @ 70° F	150 PSGI Max.	850 PSGI Max.	700 PSI @ 70° F		Operating Pressure

Value Added
Products and Services

Accessories

Pump Controls



Model 5100
liquid level indicator

A Case History of Value Added Services

As a quality driven manufacturing company, we at Thomas Products LTD., believe that a manufacturer should at least manufacture most of what they sell and NOT resell a foreign made product. And for us, manufacturing quality sensors is only the beginning. Thomas Products LTD., is an innovative solutions provider helping customers solve complex design problems. With quick time to market production strategies and cost savings, our products and services are second to none. The case history below is just one example of how we helped a customer who wanted to think outside the box.

Our Customer's Dilemma:

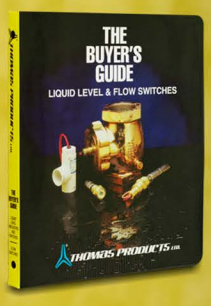
A customer previously bought flow switches via a blanket order that they hoped to add into the plumbing of their manifold as depicted in the **photo below.** As the project unfolded, it became clear that most of their time was being spent coordinating vendors, negotiating pricing and delivery, not to mention machine time and training their staff to complete the project. The final cost to produce a finished product was approximately $ 480.00 per unit and headaches off the charts.

The TPL Solution:

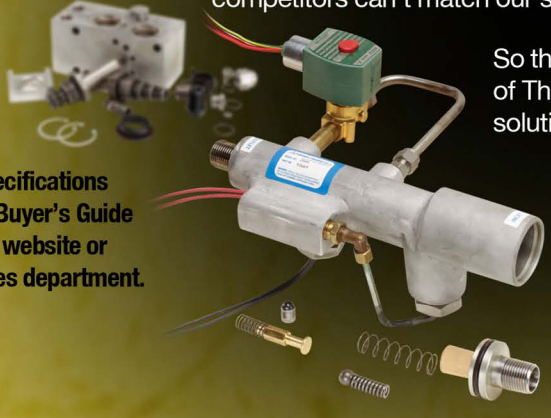
When Thomas Products LTD., was approached to develop a high-quality cost effective solution, our design team and production staff convened and made recommendations to our customer.

With our production team handling almost all of the manufacturing process to incorporate a flow switch and temperature switch into a manifold, we were able to create a product that could be delivered for $ 266.00 per unit, far below the customer's original cost of $ 480.00 per unit.

This is what we love to do, and we've been doing it for over 35 years. We have the knowledge, machining capabilities and a great design and production team. We are a quiet company with a lot to offer and we're convinced our competitors can't match our service and dedication to our customers.



For detailed specifications or to order our Buyer's Guide please visit our website or contact our sales department.



So the next time you're thinking outside the box, think of Thomas Products LTD., as your innovative solutions provider.

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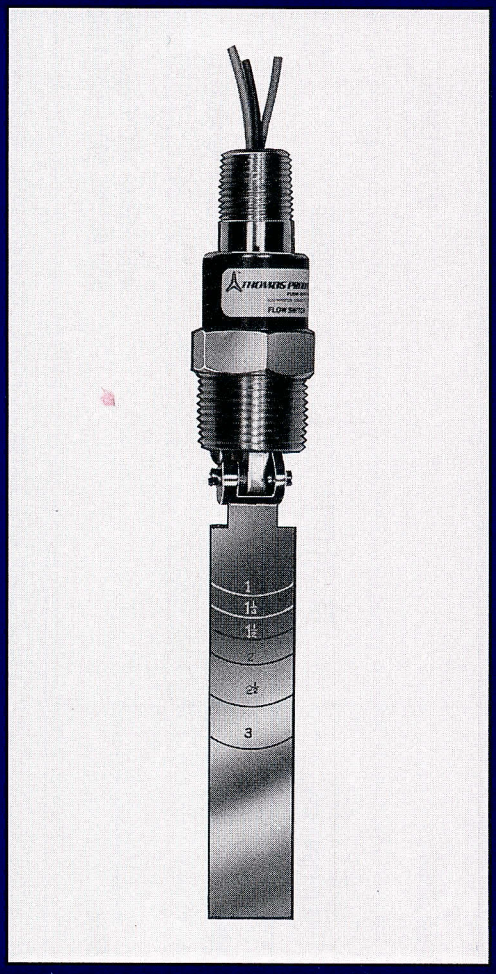
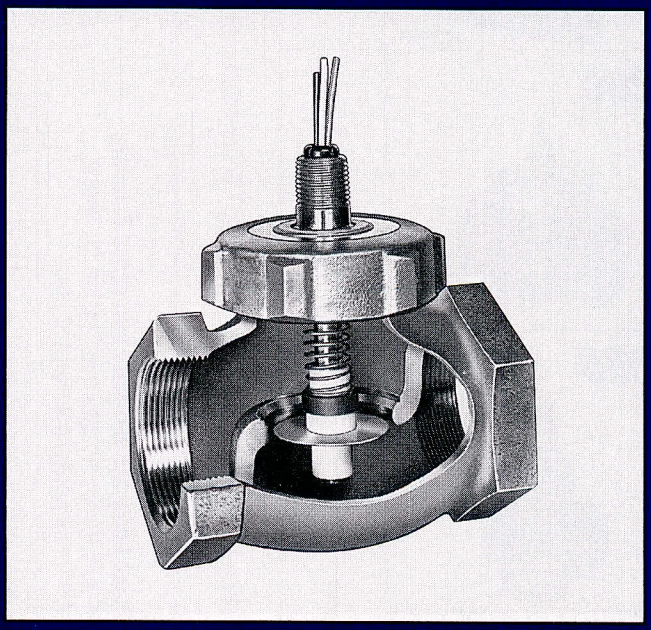
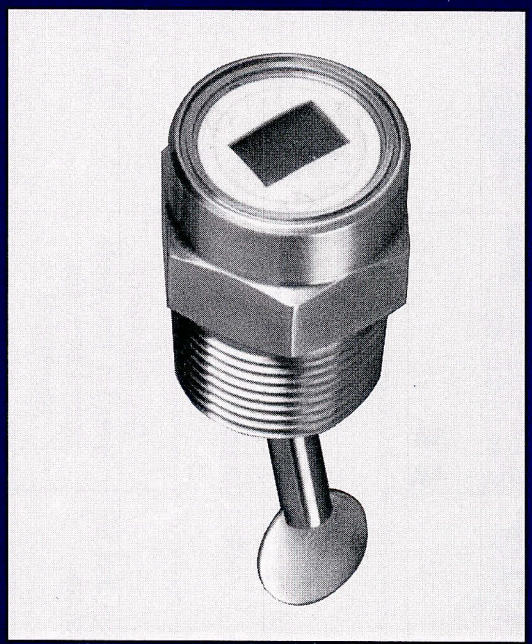
FLOW SWITCH SELECTION GUIDE







THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

Standard Product Selection Guide

	Housing Material	Trim Materials	Advantages	Process Connections	Reed Switch	Set Points	Operating Temperature	Operating Pressure	Notes
1100 **1100M-SB** NAV SEA	Bronze or SST	Brass, SST & Ceramic or SST & Ceramic & Monel	True globe body shape housings eliminate turbulence & reduce ΔP, 25% heavier wall thickness approved tested for shock, vibration, salt spray, accelerated life.	1100 MSB Listed QPL 16032	3/4″ - 3″ NPT	1100 MSB SPST, 10 Watt Lamploa	.5 - 100 GPM	-20°F to +300°F	400 PSI @ 100°F operating 800 PSI @ 100°F proof load	Complement of outlined switches is to show product line breadth. Our in-house manufacturing capabilities can customize any unit to suit.
1200 	Bronze or SST				1″ NPT		.75 - 15 GPM			
1300 	Bronze			20 VA SPDT	3/4″ NPT		.75 - 10 GPM			
1400 							.75 - 14 GPM			
1800 Pat. No. 5,162,624	PVC	PVC & Ceramic	True flow switch operation, removable bonnet assembly, economical.	1″ slip, accepts standard adapters			.5 & 1.0 GPM 6.0 GPM Max.	0°F to +140°F	150 PSIG Max.	
2600 Pat. No. 5,162,624			Bypass design, low ΔP, economical.	2″ slip, accepts standard adapters			.5, 1.0 & 2.0 GPM			

20 VA SPST, 20 VA SPDT

THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

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Standard Product Selection Guide

	Housing Material	Trim Materials	Advantages	Process Connections	Reed Switch	Set Points	Operating Temperature	Operating Pressure	Notes
1500	Brass or 316 Stainless Steel	Brass, 316 Stainless Steel or Polysulfone	Field adjustable or factory set from either side, available graduated scale.	1/2″ NPT	20 VA SPDT 20 VA SPST	Liquid: .1 - 20.0 GPM Gas: 1.0 - 250 SCFM	-20°F to +300°F	1000 PSIG Max.	Complement of outlined switches is to show product line breadth. Our in-house manufacturing capabilities can customize any unit to suit.
1600			Long-lasting pistons with wide lands. Hardened and lapped bore. Replacement parts.	1/4″ NPT		Liquid: .1 - 1.5 GPM Gas: .5 - 40.0 SCFM			
1700						Liquid: 2.0 - 300 cc/min Gas: 2.0 to 50 SCFH			
1900					20 VA SPST 20 VA SPDT	.1 - 1.5 GPM	Brass unit: -20°F to +250°F; SST unit: -20°F to +300°F		
2300 *Patent Pending*		Brass or 316 Stainless Steel	Self-cleaning, 3 ports, serviceable while in line.		20 VA SPDT		-20°F to +300°F		
2000			Self-cleaning, true 1/2″ IPS, silicone potted, shock & vibration resistant.	1/2″ NPT	20 VA SPST	.5 - 3.0 GPM	Brass unit: -20°F to +250°F; SST unit: -20°F to +300°F	1500 PSIG Max.	

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	Housing Materials	Trim Materials	Advantages	Process Connections	Reed Switch	Set Points	Operating Temperature	Operating Pressure	Notes
2100 UL	Polysulfone	Polysulfone 316 SST	Stronger one-piece housing silicone potted, shock & vibration resistant, reverse taper bore, self-cleaning. All wetted material PSF.	9/16″ - 18 UNF 2 B Accepts variety of adapters	15 VA SPST or 20 VA SPDT	.1 - 1.5 GPM Optional 1 cc/min to 300 cc/min	-40°F to +225°F	700 PSI @ 70°F	Complement of outlined switches is to show standard product line breadth. Our in-house manufacturing capabilities can customize any unit to suit.
2200		Polysulfone			20 VA SPDT	.1 - .75 GPM			
2400	Brass or 316 Stainless Steel	316 Stainless Steel	SPDT reed switch assembly, all metal wetted parts, rugged investment cast components.	1″ NPT	20 VA SPDT	4.0 GPM Min.	-30°F to +300°F	850 PSIG Max.	
2500	Polysulfone	Polysulfone 316 SST	SPDT reed switch assembly.				-40°F to +225°F	150 PSIG Max.	
5200 Pat. No. 5,245,271	Brass or 316 Stainless Steel	316 Stainless Steel	Indicator use in hazardous locations, 2 color flag.	3/4″ NPT	N/A	1.5 - 5.0 GPM		400 PSI @ 70°F	
Accessories	Explosion-proof junction boxes.	Relays DPDT general purpose.	Relays DPDT latching pump controls.	Crimp on terminals.	Terminal strips.	TFE tape & TFE paste.		Cable glands.	

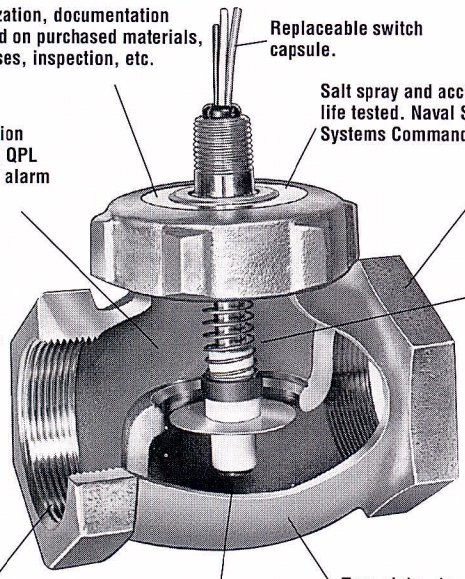
EASY ORDERING
1-800-666-9101
TELEPHONE 860-621-9101 ☐ FAX 860-621-1470 ☐ 1-800-666-9101
www.thomasprod.com

FLOW SWITCH SELECTION GUIDE

- ☐ Ideas
- ☐ Solutions
- ☐ Technical Support
- ☐ On-Time Delivery
- ☐ Quality

Calibration: flow stands are calibrated to the National Bureau of Standards and Thomas Products Ltd. recalibration schedule.

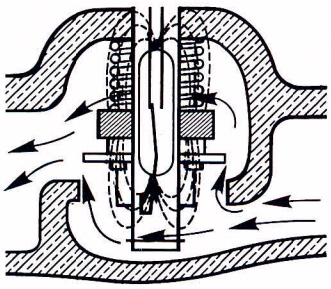
Model 1100



Operational Q.C. system and manual, MIL I 45208 MIL STD 45662.

Raw materials inventoried in a controlled and segregated department under Thomas Products, Ltd. stock rotation program.

Call-outs presented are typical to their respective models.



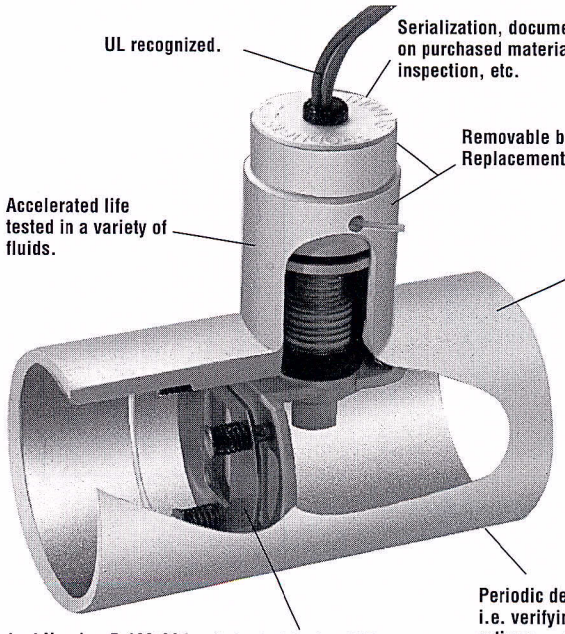
Typical Shuttle Type:

A magnet equipped shuttle is displaced at the proper calibrated flow of either liquid or gas to actuate the hermetically sealed reed switch.

At flow rates under the set point, clearance is provided for the liquid or gas to continue to flow.

When flow rates exceed the set point the shuttle or piston is displaced even further to reveal a smooth, clear opening for a low pressure drop.

Model 2600

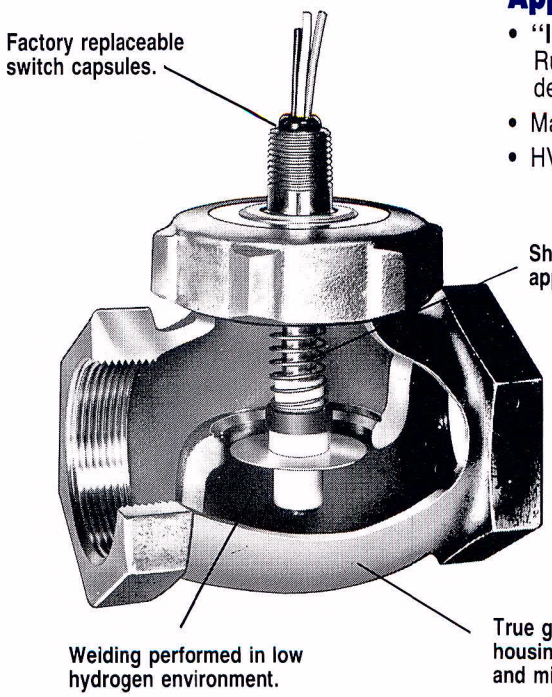


THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

1100

Please turn to our ***Company Profile*** and ***Level Switch Selection Guide*** to learn more of the advantages in specifying ***Thomas Products Ltd.®*** sensors.

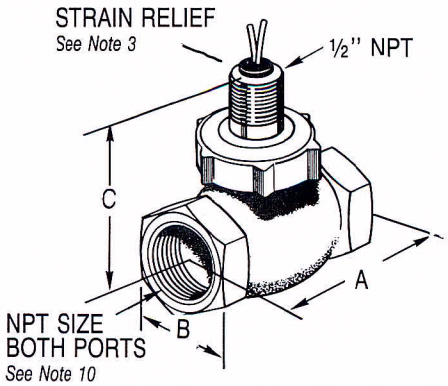
FIXED SET POINTS, 3/4'' - 3'' NPT, BRONZE & SST



Applications:

- **"INDUSTRIAL STANDARD"** Rugged and accurate flow detection for most applications.
- Machine Tool Industry
- HVAC Equipment

Dimensional Data:



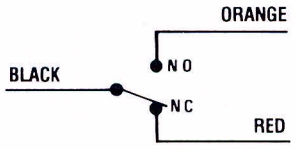
SIZE NPT	A	B HEX	C
¾''	2⅞	1⅜	2¾
1''	3¼	1 25/32	3
1¼''	4	2 3/16	3 3/16
1½''	4½	2½	3½
2''	5⅜	3 3/32	4
2½''	6 5/16	3⅝	4½
3''	7⅜	4⅜	5 5/32

Specifications:

Housing	Shuttle	Spring	"O" Ring	Reed Switch	Wire	Oper. Temp.	Oper. Pres.	Proof Load	Burst Strength	Set Pt. Accur.	Set Pt. Diff.	Repeat-ability
Bronze or 316 SST	Teflon See Note 7	316 SST	Viton "A"	20 Watt SPDT See Notes 4,5	18 AWG 24'' Lg. Poly-meric See Note 6	-20°F to +300°F See Note 11	400 PSI @ 100°F	800 PSI @ 100°F	1200 PSI @ 100°F	±10% MAX. See Note 14	±10%	1% Max. Deviation

Electrical:

Reed switch shown in NO FLOW condition.



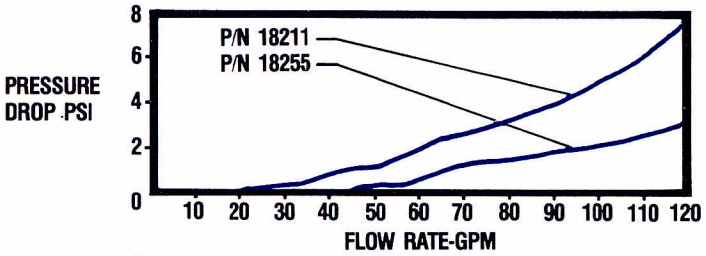
SPDT, SHOWN AT NO FLOW

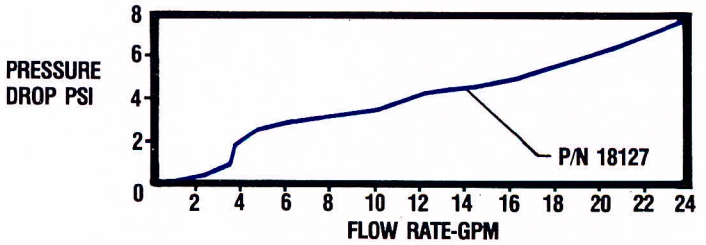
Switch Ratings... Max Resistive Load

V.A.	VOLTS	AMPS DC	AMPS AC	AMPS AC MAX
20	0-50	.4	.4	1.0
	120	.15	.16	
	240	.06	.08	

Switch Rating 20 VA: 120-240 VAC Pilot Duty
UL File E86797

Pressure Drop △p:





THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

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1100

Please turn to our ***Company Profile*** and ***Level Switch Selection Guide*** to learn more of the advantages in specifying ***Thomas Products Ltd.®*** sensors.

FIXED SET POINTS, 3/4'' - 3'' NPT, BRONZE & SST

Part No.

SIZE NPT	FLOW SETTING GPM *See Note 1, 12*	P/N BRONZE	P/N 316 SST
3/4'' *See Note 13*	.5	18100	
	1.0	18101	
	2.0	18102	
	3.0	18103	
	4.0	18104	
	5.0	18105	
	6.0	18106	
	8.0	18107	
1''	.5	18127	18140
	1.0	18128	18141
	2.0	18129	18142
	3.0	18130	18143
	4.0	18131	18144
	5.0	18132	18145
	6.0	18133	18146
	8.0	18134	18147
1¼''	1.0	18153	
	2.0	18154	
	4.0	18155	
	6.0	18156	
	8.0	18157	
	10	18158	
	12	18159	
	16	18160	
	20	18161	
1½''	1.5	18183	18197
	3	18184	18198
	5	18185	18199
	7.5	18186	18200
	10	18187	18201

SIZE NPT	FLOW SETTING GPM *See Note 1, 12*	P/N BRONZE	P/N 316 SST
1½''	15	18188	18202
	20	18189	18203
	30	18190	18204
2''	2	18211	18225
	4	18212	18226
	5	18213	18227
	10	18214	18228
	15	18215	18229
	26	18216	18230
	35	18217	18231
	50	18218	18232
2½''	5	18239	
	10	18240	
	15	18241	
	20	18242	
	25	18243	N/A
	30	18244	
	40	18245	
	50	18246	
	60	18247	
	75	18248	
3''	5	18255	
	15	18256	
	20	18257	
	25	18258	
	30	18259	
	40	18260	N/A
	50	18261	
	60	18262	
	75	18263	
	100	18264	

Notes: Model 1100

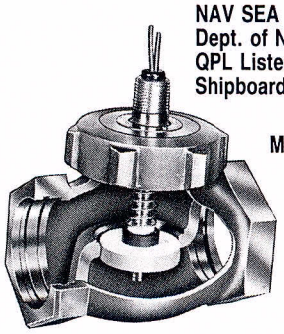
1. Standard flow calibration is in water @ 70°F. Calibrated on increasing flow.
2. Temperature effect on flow settings: water calibration, slight change; oil varies with viscosity.
3. Strain reliefs are standard. Optional silicone potting avail. Consult factory.
4. Optional 100W SPST reed switches are stocked. Consult factory.
5. Relays for higher loads, junction boxes, terminal strips, etc. are available. See accessories section for details *(See Page 28)*
6. Optional cables available. Consult factory.
7. Other wetted materials: ceramic ring magnet.
8. Optional SST identification tags attached to unit. Consult factory.
9. Optional M/S connector. MS3102E10S-3P
10. Optional port sizes: BSP, SAE, silver braze, socket weld, etc. Consult factory.
11. High temperature units available to 400°F. Consult factory.
12. Standard flow settings are calibrated in water. Other set points in water or oil are available. Consult factory.
13. For pipe sizes smaller than 3/4'', install appropriate size bushings.
14. Calibration: Flow stands are calibrated to the National Bureau of Standards and Thomas Products Ltd. recalibration schedule.

Specialty Options:

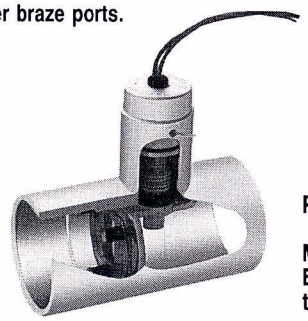
NAV SEA
Dept. of Navy
QPL Listed MIL-S-16032
Shipboard Alarm Systems.

Monel trim.

Silver braze ports.



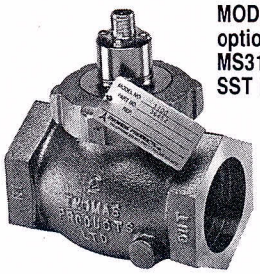
MODEL 1100M-SB
Marine Flow Switch
for sea water
applications.



Pat. No. 5,162,624

MODEL 2600
Economical PVC. Straight
through flow path.

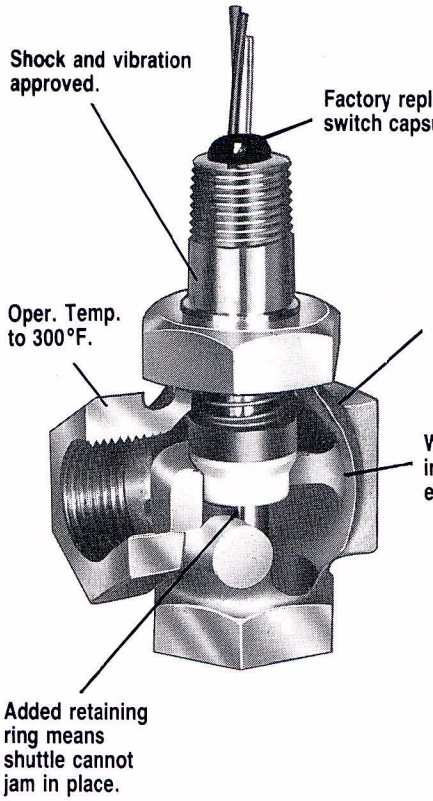
MODEL 1100 with
optional M/S connector.
MS3102E10S-3P and
SST Ident. tag.



MODEL 1800
Economical PVC.
90° flow path.

Please turn to our **Company Profile** and **Level Switch Selection Guide** to learn more of the advantages in specifying **Thomas Products Ltd.®** sensors.

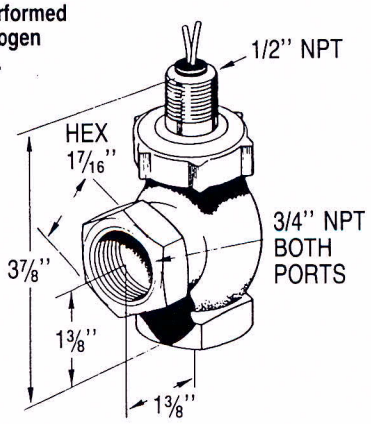
FIXED SET POINTS, 3/4'' NPT, BRONZE



Applications:

- Coolant Systems
- HVAC Equipment
- Machine Tool Industry

Dimensional Data:



Notes: Model 1300

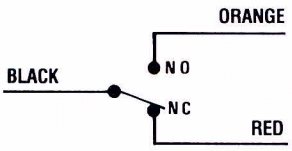
1. Standard flow calibration is in water @ 70°F. Calibrated on increasing flow.
2. Temperature effect on flow settings: water calibration, slight change; oil varies with viscosity.
3. Optional 100W SPST reed switches are stocked. Consult factory.
4. Relays for higher loads, junction boxes, terminal strips, etc. are available. See accessories section for details *(See Page 28)*
5. Optional cables available. Consult factory.
6. Other wetted materials: ceramic ring magnet.
7. Optional SST identification tags attached to unit. Consult factory.
8. Optional port sizes: BSPT, SAE, silver braze, socket weld, etc. Consult factory.
9. High temperature units available to 400°F. Consult factory.
10. Standard flow settings are calibrated in water. Other set points in water or oil are available. Consult factory.
11. Calibration: Flow stands are calibrated to the National Bureau of Standards and Thomas Products Ltd. recalibration schedule.

Specifications:

Housing	Shuttle	Spring	"O" Ring	Reed Switch	Wire	Oper. Temp.	Oper. Pres.	Proof Load	Burst Strength	Set Pt. Accur.	Set Pt. Diff.	Repeat-ability
Bronze	Teflon *See Note 6*	316 SST	Viton "A"	20 Watt SPDT *See Note 3, 4*	18 AWG 24" Lg. Polymeric *See Note 5*	-20°F to +300°F *See Note 9*	400 PSI @ 100°F	800 PSI @ 100°F	1200 PSI @ 100°F	±10% MAX. *See Note 11*	±10%	1% Max. Deviation

Electrical:

Reed switch shown in NO FLOW condition.



SPDT, SHOWN AT NO FLOW

Switch Ratings... Max Resistive Load

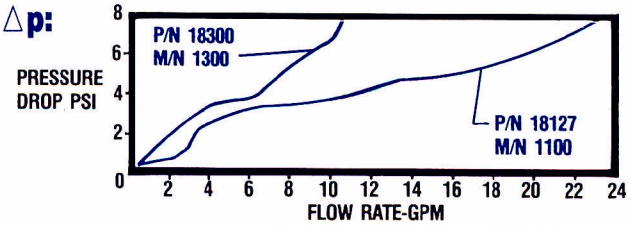
V.A.	VOLTS	AMPS DC	AMPS AC	AMPS AC MAX
20	0-50	.4	.4	1.0
	120	.15	.15	
	240	.06	.08	

Switch Rating 20 VA: 120-240 VAC Pilot Duty
UL File E86797

Part No.

SIZE NPT	FLOW SETTING GPM *See Note 1, 2, 10*	P/N
3/4'' *See Note 8*	.75	18300
	1.5	18301
	2	18302
	2.5	18303
	5	18304
	7.5	18305
	10	18306

Pressure Drop △p:



THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

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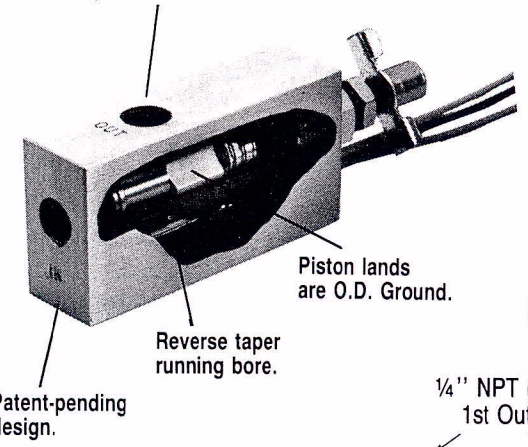
2300

Patent Pending

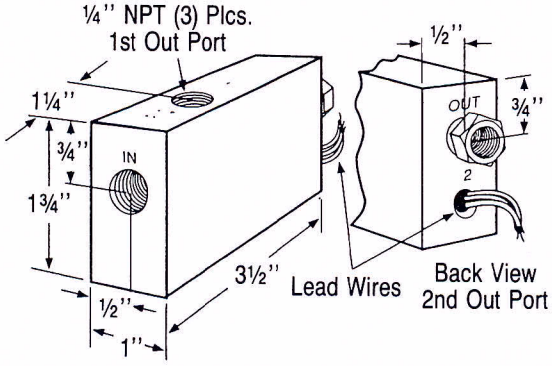
FIXED SET POINTS, 1/4" NPT, BRASS & SST



Applications:

- Designed to help pass 100 micron particulates.
- Serviceable in line.
- Optional petcock to continually bleed out particles.
- High pressure applications.

Dimensional Data:



Notes: Model 2300

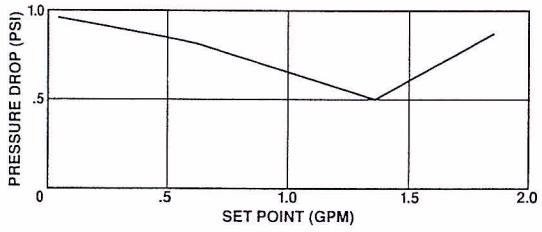
1. Standard flow calibration is in water @ 70°F with lead wires up. Calibrated on increasing flow.
2. Temperature effect on flow settings: water calibration, slight change; oil varies with viscosity.
3. Optional 100W SPST reed switches are stocked. Consult factory.
4. Relays for higher loads are available. See accessories section for details *(See Page 28)*
5. Optional cables available. Consult factory.
6. Other wetted materials: Hysol epoxy.
7. High temperature units available to 400°F. Consult factory.
8. Standard flow settings are calibrated in water. Other set points in water or oil are available. Consult factory.
9. Pistons: Brass for oil, polysulfone for water in either housing; SST in SST housing.
10. Calibration: Flow stands are calibrated to the National Bureau of Standards and Thomas Products Ltd. recalibration schedule.

Specifications:

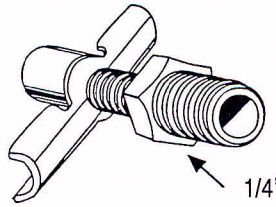
Housing	Piston	Spring	Reed Switch	Wire	Oper. Temp. *Select Piston*	Oper. Pres.	Proof Load	Burst Strength	Set Pt. Accur.	Set Pt. Diff.
Brass or 316 SST	Polysulfone Brass, or 316 SST *See Note 6, 9*	316 SST	20 Watt SPDT *See Note 3, 4*	18 AWG 24" Lg. Polymeric *See Note 5*	*w/ Brass or SST Piston See Note 7* -20°F to +300°F *w/Polysulfone Piston* -20°F to +225°F	1000 PSIG*	2500 PSIG*	5000 PSIG*	±10% MAX. *See Note 10*	±20% MAX.
						*Without use of optional Petcock				

Pressure Drop △p:

VERTICAL ATTITUDE,
LEAD WIRES UP AND 1st OUT PORT OPEN



OPTIONS: BRASS PETCOCK



P/N 3697

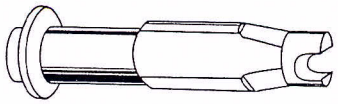
Electrical & Switch Ratings:

See Model 1300. Page 8

Part No.

SIZE NPT	FLOW SET GPM	BRASS Housing PISTON P/N Specify	316 SS Construction
1/4"	.1	43253 - _____	43259
	.25	43254 - _____	43260
	.5	43255 - _____	43261
	.75	43256 - _____	43262
	1.0	43257 - _____	43263
	1.5	43258 - _____	43264

PISTONS FOR BRASS OR 316 SST HOUSINGS:



See Note 9

BRASS	P/N 3699
316 SST	P/N 3700
POLYSULFONE	P/N 3701

THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

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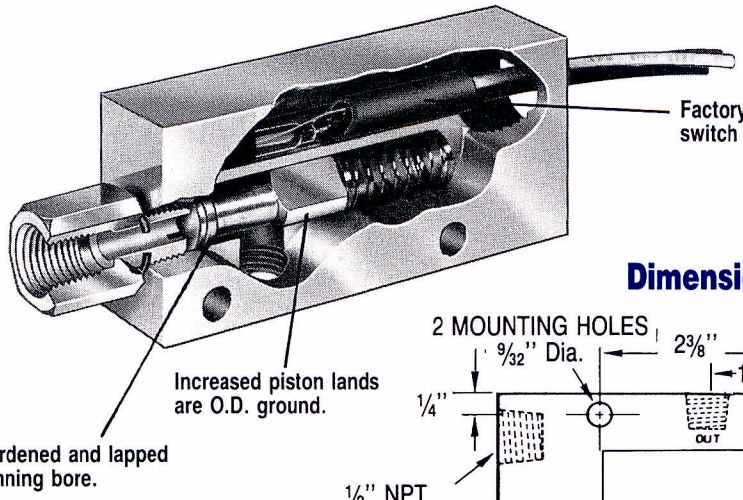
1600 & 1700

Please turn to our ***Company Profile*** and ***Level Switch Selection Guide*** to learn more of the advantages in specifying ***Thomas Products Ltd.®*** sensors.

FIXED SET POINTS, 1/4" NPT, BRASS & SST

Model 1600

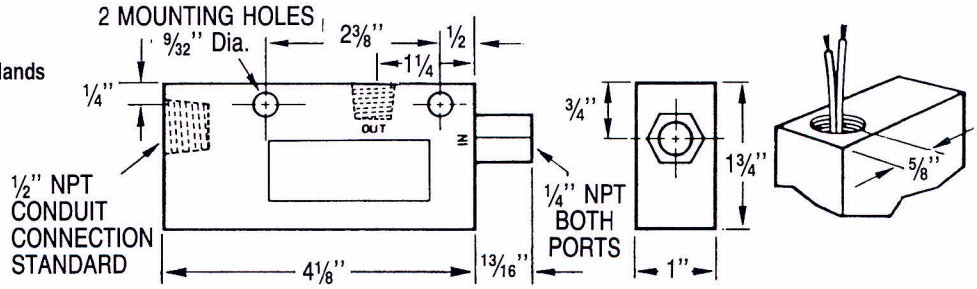
- **Set points in water from .1 GPM to 1.5 GPM.**
- **Set points in air from .06 SCFM to 8 SCFM.**



Applications:

- UL Recognized *(Note 4)*
- Machine Tool Industry
- Lubrication Systems
- Lasers

Dimensional Data: Model 1600 & 1700



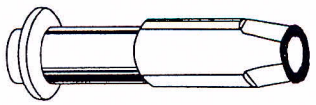
Specifications:

Housing	Piston	Spring	"O" Ring	Reed Switch	Wire	Oper. Temp.	Oper. Pres.	Proof Load	Burst Strength	Set Pt. Accur.	Set Pt. Diff.	Repeat-ability
Brass or 316 SST	Polysulfone *See Note 15*	316 SST	Viton "A"	20 Watt SPDT *See Notes 4, 5*	18 AWG 24" Lg. Poly-meric *See Notes 6, 7*	w/ Brass or SST Piston -20°F to +300°F *See Note 8*	1000 PSIG	2500 PSIG	5000 PSIG	±10% MAX. *See Note 18*	**1600** 15% MAX.	1% Max. Deviation
	Brass *See Notes 12, 14, 16*					w/ Polysulfone Piston -20°F to +225°F					**1700** 20% MAX.	
	316 SST *See Notes 12, 14, 17*											

Part No.

SIZE NPT	FLOW SET GPM *Notes 1-3, 9, 10*	BRASS Housing PISTON P/N Specify	316 SST Construction
1/4"	.1	12600 - _____	12609
	.25	12601 - _____	12610
	.5	12602 - _____	12611
	.75	12603 - _____	12612
	1.0	12604 - _____	12613
	1.5	12605 - _____	12614

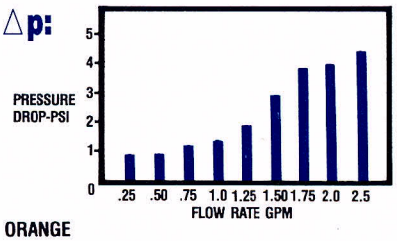
PISTONS FOR BRASS OR 316 SST HOUSINGS:



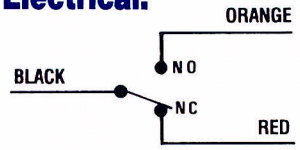
See Note 12, 14-17

POLYSULFONE	P/N 4054
BRASS	P/N 4055
316 SST	P/N 4056

Pressure Drop △p: Model 1600



Electrical:



SPDT, SHOWN AT NO FLOW

Reed switch shown in NO FLOW condition.

Switch Ratings... Max Resistive Load

V.A.	VOLTS	AMPS DC	AMPS AC	AMPS AC MAX
20	0-50	.4	.4	1.0
	120	.15	.16	
	240	.06	.08	

Switch Rating of UL Recognized Unit 20 VA: 120-240 VAC Pilot Duty

THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

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1600 & 1700

Please turn to our ***Company Profile*** and ***Level Switch Selection Guide*** to learn more of the advantages in specifying ***Thomas Products Ltd.®*** sensors.

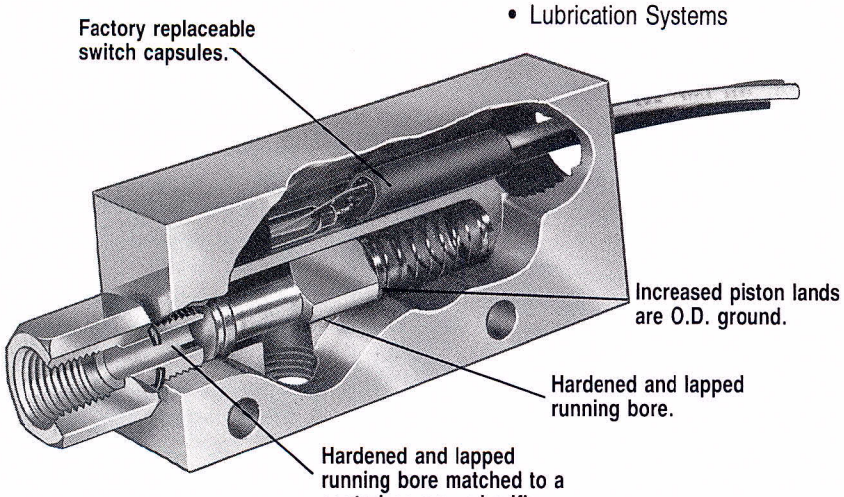
FIXED SET POINTS, 1/4'' NPT, BRASS & SST

Model 1700:

- Water from 2 cc/min to 300 cc/min.
- Air from 2SCFH to 50SCFH.

Applications:

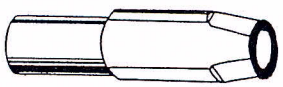
- U.L. File E86797
- Accurate low flow applications.
- Lubrication Systems



Part No.

SIZE NPT	FLOW SETTING cc/min *See Notes 1,2,3,9,11*	EQUIV. GPM APPX.	BRASS Housing	PISTON P/N Specify	316 SST Construction
1/4''	50	.013	12618 -		12628
	100	.026	12619 -		12629
	150	.040	12620 -		12630
	200	.053	12621 -		12631
	250	.066	12622 -		12632
	300	.079	12623 -		12633

PISTONS FOR BRASS OR 316 SST HOUSINGS:

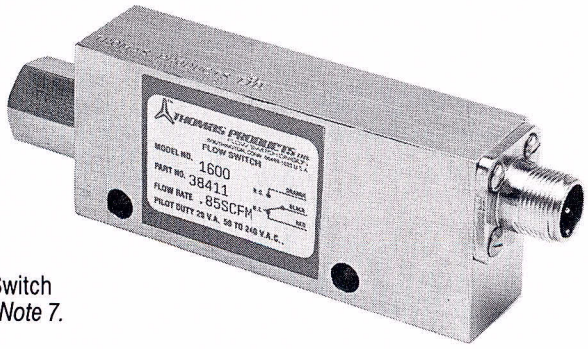


See Notes 12, 14

POLYSULFONE	P/N 4058
BRASS	P/N 4059
316 SST	P/N 4060

Electrical & Switch Ratings: *Page 10.*

Specialty Options:

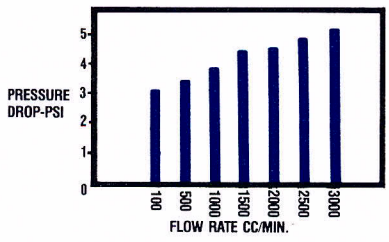


Model 1600 Air Flow Switch with MS connector *See Note 7.*

Notes: Model 1600 & 1700

1. Standard flow calibration is in water @ 70°F with lead wires up. Calibrated on increasing flow.
2. Temperature effect on flow settings: water calibration, slight change; oil varies with viscosity; gas, slight change.
3. Set point accuracy will change slightly in other than calibrated position.
4. Model 1600 is UL recognized with a SPST reed switch rated pilot duty 20 VA 120-240 VAC, 174°F.
5. Relays for higher loads, junction boxes, terminal strips, etc. are available. See accessories section for details *(See Page 28)*
6. Also available: leads in different lengths, cable, terminated ends, etc. Consult factory.
7. Optional 3 Pin M/S connector — MS3102E10S-3P. Consult factory.
8. High temperature units available to 400°F. Consult factory.
9. Standard flow settings are calibrated in water. Other set points in water or oil are available. Consult factory.
10. Optional air set points for Model 1600 are available. Consult factory with CFM and line pressure.
11. Optional air set points for Model 1700 are available. Consult factory with CFH and line pressure.
12. Other wetted materials: Hysol epoxy.
13. Model 1700 orifice dia. is 5/16''; inlet fitting supplied by customer must be 3/8'' I.D. minimum.
14. All SST piston eliminating epoxy is available. Consult factory.
15. Polysulfone for water in brass housing.
16. Brass for oil in brass housing.
17. SST for SST housing.
18. Calibration: Flow stands are calibrated to the National Bureau of Standards and Thomas Products Ltd. recalibration schedule.

Pressure Drop △p: Model 1700



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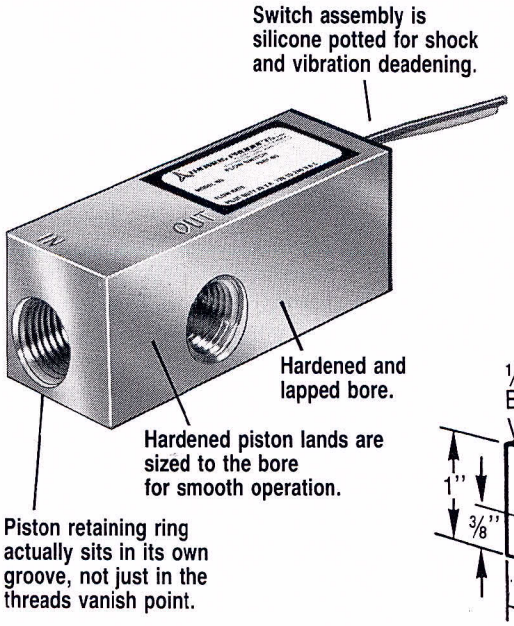
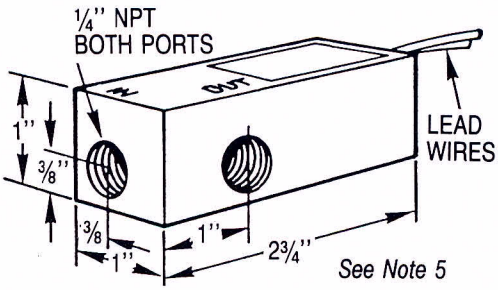
FIXED SET POINTS, 1/4" NPT, BRASS & SST



Applications

- The "mini" small and accurate in line flow switch detects low or high flow rates.
- Fixed actuations from .1 GPM to 1.5 GPM
- UL File No. E86797

Dimensional Data:



Notes: Model 1900

1. Standard flow calibration is in water @ 70°F with lead wires up. Calibrated on increasing flow.
2. Temperature effect on flow settings: water calibration, slight change; oil varies with viscosity.
3. Set point accuracy will change slightly in other than calibrated position.
4. Optional aluminum housings with SST trim are stocked. Consult factory.
5. Optional mounting holes available. Consult factory.
6. Also available: leads in different lengths, cable, terminated ends, etc. Consult factory.
7. Relays for higher loads are available. See accessories section for details *(See Page 28)*
8. High temperature units available to 400°F. Consult factory.
9. Standard flow settings are calibrated in water. Other set points in water or oil are available. Consult factory.
10. Other wetted materials: Hysol Epoxy
11. All SST piston for either brass or SST housing, eliminating hysol epoxy. Consult factory.
12. Calibration: Flow stands are calibrated to the National Bureau of Standards and Thomas Products Ltd. recalibration schedule.

Part No.

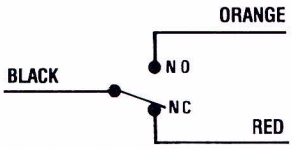
SIZE NPT	FLOW SETTING GPM *See Notes 1,2,3,9*	P/N BRASS N.O. SPST SWITCH	P/N BRASS N.C. SPST SWITCH	P/N BRASS SPDT SWITCH	P/N 316 SST SPDT SWITCH
1/4"	.1	18321	18327	18350	18360
	.25	18322	18328	18351	18361
	.5	18323	18329	18352	18362
	.75	18324	18330	18353	18363
	1	18325	18331	18354	18364
	1.5	18326	18332	18355	18365

Specifications:

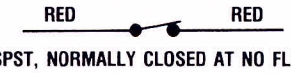
Housing	Piston	Spring	Reed Switch	Wire	Oper. Temp. *See Note 8*	Oper. Pres.	Proof Load	Burst Strength	Set Pt. Accur.	Set Pt. Diff.	Repeat-ability
Brass *See Note 10*		316 SST	20 Watt SPST or SPDT *See Note 7*	18 AWG 24" Lg. Polymeric *See Note 6*	-20°F to +250°F	1000 PSIG	2000 PSIG	4000 PSIG	±10% MAX. *See Note 12*	±15% MAX.	1% Max. Deviation
316 SST *See Notes 10, 11*					-20°F to +300°F						

Electrical:

Reed switch shown in NO FLOW condition.



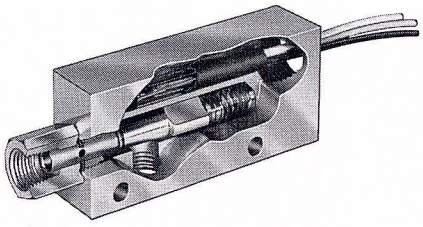
SPDT, SHOWN AT NO FLOW



SPST, NORMALLY CLOSED AT NO FLOW

SPST, NORMALLY OPEN AT NO FLOW

Specialty Options:



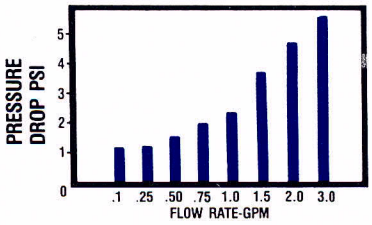
See Model 1700 for set points from 2 cc/min. to 300 cc/min.

Switch Ratings... Max Resistive Load

V.A.	VOLTS	AMPS DC	AMPS AC	AMPS AC MAX
20	0-50	.4	.4	1.0
	120	.15	.16	
	240	.06	.08	

Switch Rating 20 VA: 120-240 VAC Pilot Duty

Pressure Drop △p:



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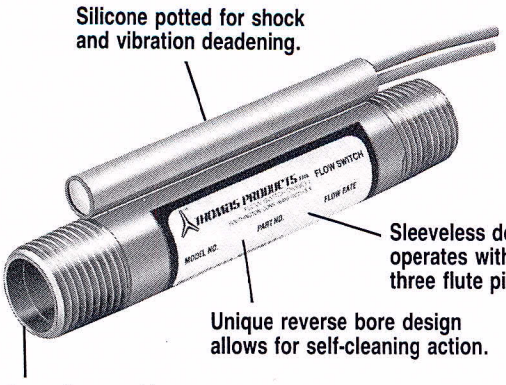
FIXED SET POINTS, 1/2" NPT, BRASS & SST



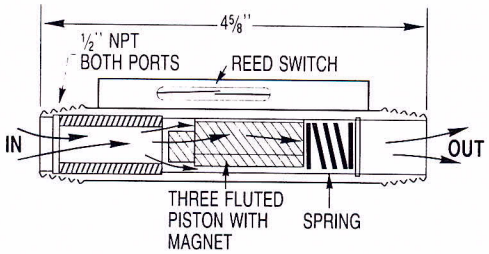
Applications:

- "Thomas Tube" designed for straight in line flow detection.
- Industry Standard Since 1986.
- .5 GPM to 3.0 GPM in brass or stainless steel
- U.L. No. E86797

Notes: Model 2000

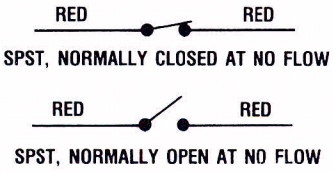
1. Standard flow calibration is in water @ 70°F with lead wires in horizontal position. Calibrated on decreasing flow.
2. Set point accuracy will change slightly in other than calibrated position.
3. Also available: Leads in different lengths, cable, terminated ends, etc. Consult factory.
4. High temperature units available to 400°F. Consult factory.
5. Standard flow settings are calibrated in water. Other set points in water or oil are available. Consult factory.
6. Other wetted materials: Hysol epoxy.
7. All SST piston for either brass or SST housings, eliminate hysol epoxy is available. Consult factory.
8. Relays for higher loads are available. See accessories section for details *(Page 28)*
9. Calibration: Flow stands are calibrated to the National Bureau of Standards and Thomas Products Ltd. recalibration schedule.

Dimensional Data:



Electrical:

Reed switch shown in NO FLOW condition.



Specifications:

Housing	Piston	Spring	Reed Switch	Wire	Oper. Temp. *See Note 4*	Oper. Pres.	Set Pt. Accur.	Set Pt. Diff.
Brass *See Note 6*		316 SST	50 Watt SPST *See Note 8*	18 AWG 24" Lg. Polymeric *See Note 3*	-20°F to +250°F	1500 PSIG MAX.	±20% MAX. *See Note 9*	20% MAX.
316 SST *See Notes 6,7*					-20°F to +300°F			

Switch Ratings... Max Resistive Load

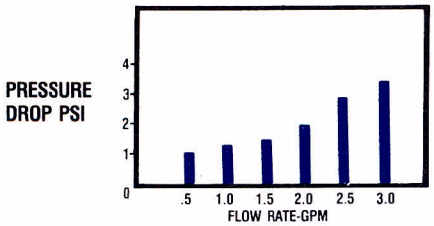
V.A.	VOLTS	AMPS DC	AMPS AC	AMPS AC MAX
50	0-50	1.0	1.0	0.5
	120	.4	.4	
	240	.2	.2	

Switch Rating 50 VA: 120-240 VAC Pilot Duty

Part No.

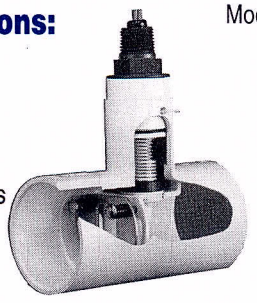
SIZE NPT	FLOW SETTING GPM *See Notes 1,2,5*	APPX. △P AT 10 GPM-PSIG	P/N BRASS N.O. SPST SWITCH	P/N BRASS N.C. SPST SWITCH	P/N 316 SST N.O. SPST SWITCH	P/N 316 SST N.C. SPST SWITCH
½"	.50	25	12666	12676	12723	12733
	1.0	25	12667	12677	12724	12734
	1.5	20	12668	12678	12725	12735
	2.0	20	12669	12679	12726	12736
	2.5	15	12670	12680	12727	12737
	3.0	15	12671	12681	12728	12738

Pressure Drop △p:

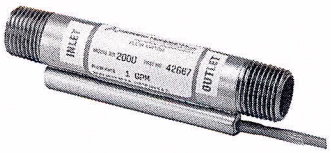


Specialty Options:

Model 2600 for units with straight thru flow and pipe sizes to 3" NPT.



Model 2000 Brass Flow Switch with cable.



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2100 & 2200

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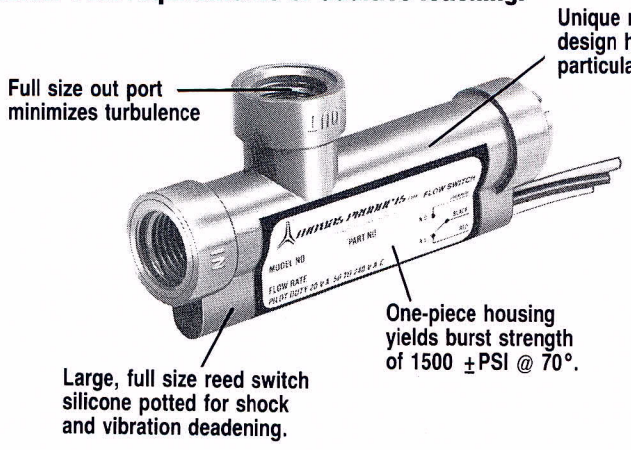
FIXED SET POINTS, 9/16'' - 18'' UNF-2B, PLASTIC

Model 2100 *UL*

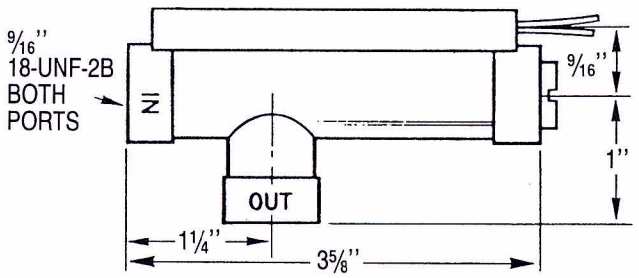
Because we mold in-house, we can certify that our polysulfone flow switches use only virgin material and runners are not introduced nor have color concentrates been added during processing that can hinder FDA requirements or additive leaching.

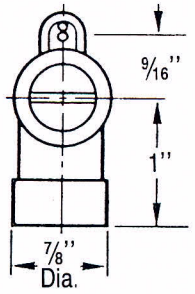


Applications:

- Plastic configuration throughout.
- Rugged yet economical flow switch for monitoring liquid flow or no flow conditions.
- FDA Approved Polysulfone
- UL File No. E86797

Dimensional Data: Model 2100 & 2200





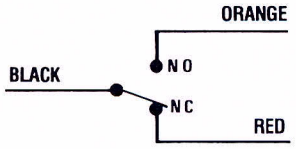
Specifications:

Housing	Piston	Spring	"O" Ring	Reed Switch	Wire	Oper. Temp.	Oper. Pres.	Set Pt. Accur.	Set Pt. Diff.
Polysulfone		316 SST	Viton "A"	20 Watt SPDT 15 Watt SPST *See Note 6*	18 AWG 24" Lg. Polymeric *See Note 5*	-20°F to +225°F	250 PSIG @ 70°F Max. *See Note 7*	15% MAX.	20% MAX.

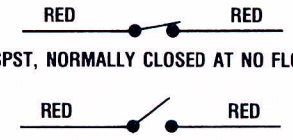
Part No.

SIZE PORT	FLOW SETTING GPM *See Notes 1, 2, 8, 9*	P/N N.O. SPST SWITCH	P/N N.C. SPST SWITCH	P/N SPDT SWITCH
9/16''- 18	.1	12686	12695	12704
	.25	12687	12696	12705
	.5	12688	12697	12706
	.75	12689	12698	12707
	1	12690	12699	12708
	1.5	12691	12700	12709

Electrical: Reed switch shown in NO FLOW condition.



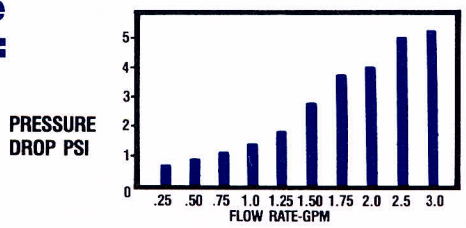
SPDT, SHOWN AT NO FLOW



SPST, NORMALLY CLOSED AT NO FLOW

SPST, NORMALLY OPEN AT NO FLOW

Pressure Drop △p:



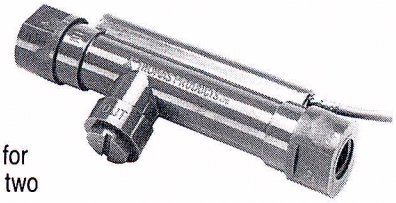
Switch Ratings... Max Resistive Load

V.A.	VOLTS	AMPS DC	AMPS AC	AMPS AC MAX
20	0-50	.4	.4	1.0
	120	.15	.16	
	240	.06	.08	

Switch Rating 20 VA: 50-240 VAC Pilot Duty

Specialty Options:

Model 2100 Ryton R4 with SST low flow orifice assembly, 1 cc/min water set point and cable.



Model 2100 Modified for straight-thru flow and two ¼'' NPT adapters.

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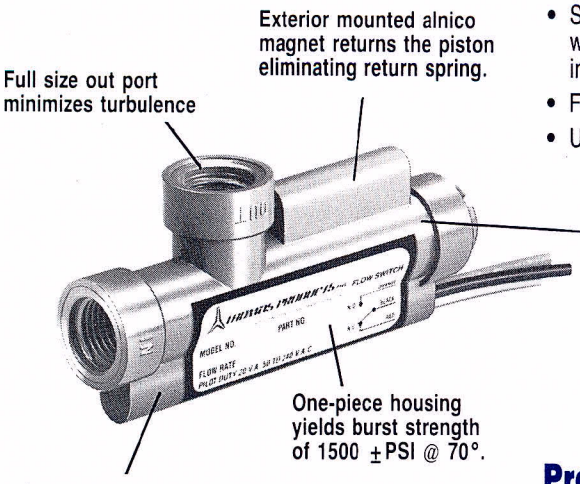
FIXED SET POINTS, 9/16'' - 18'' UNF-2B, PLASTIC

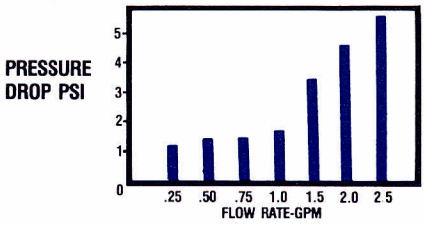
Model 2200



Applications:

- Similar to 2100. Ideally suited where no metal parts can come in contact with the liquid.
- FDA Approved Polysulfone.
- UL File No. E 86797

Pressure Drop △p:



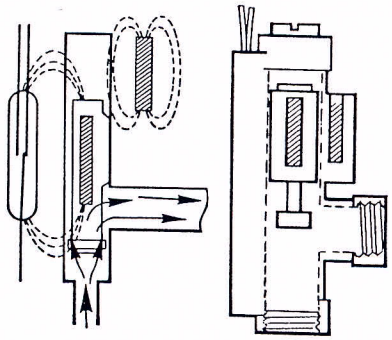
Notes: Model 2100/2200

1. Standard flow calibration is in water @ 70°F with lead wires up. Calibrated on increasing flow.
2. Model 2100 set point accuracy will change slightly in other than calibrated position.
3. Model 2200 must be installed with lead wires up.
4. Polysulfone is a FDA approved material.
5. Lead wires are available in different lengths, terminated ends, cables, etc. Consult factory.
6. Relays are available for handling higher loads. See accessories section for details. *(See Page 28)*
7. Actual housing burst strength of 1500 PSI ± @ 70°F.
8. Standard flow settings are calibrated in water as low as 2 cc/min. Other set points in water are available. Consult factory.
9. Calibration: Flow stands are calibrated to the National Bureau of Standards and Thomas Products Ltd. recalibration schedule.

Specifications:

Housing	Piston	Spring	"O" Ring	Reed Switch	Wire	Oper. Temp.	Oper. Pres.	Set Pt. Accur.	Set Pt. Diff.
Polysulfone	Polysulfone	None	Viton "A"	20 Watt SPDT *See Note 6*	18 AWG 24" Lg. Polymeric *See Note 5*	-20°F to +225°F	250 PSIG @ 70°F Max. *See Note 7*	±20%	25% MAX.

SPRINGLESS DESIGN:
Using a second magnet Model 2200 eliminates the need for a return spring. Model 2200 must be installed with lead wires up.

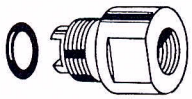
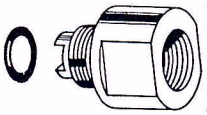
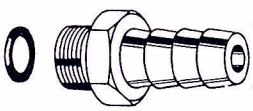


Part No.

SIZE PORT	FLOW SETTING GPM *See Notes 1, 3, 9*	P/N SPDT SWITCH
9/16" - 18"	.1 .25 .5 .75	12713 12714 12715 12716

Adapter fittings to convert the 9/16-18 UNF -2B threaded port to 1/8" NPT, 1/4" NPT or 1/2" barbed to accept 1/2" I.D. flexible hose. All fittings are made of polysulfone and are supplied with viton "A" "O" ring seals assembled in place.

ACCESSORY FITTINGS FOR MODEL 2100 and 2200

ADAPTER SIZE	P/N	'O' RING & FITTING DIMENSIONAL DATA
1/8" NPT	12720	9/16"-18 UNF - 2A TYP.  5/8" Dia.
1/4" NPT	12721	 1" Dia
1/2"BARB ACCEPTS 1/2" I.D. FLEXIBLE HOSE	12722	 1/2" Dia.

Electrical & Switch Ratings:

See previous page

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FIXED SET POINTS, 1/2" - 1" PVC

Plastic components are molded in-house using only 100% virgin material. Runners are not reintroduced to the performance parts.

Solid one-piece removable bonnet assembly means safer use to 150 PSIG.

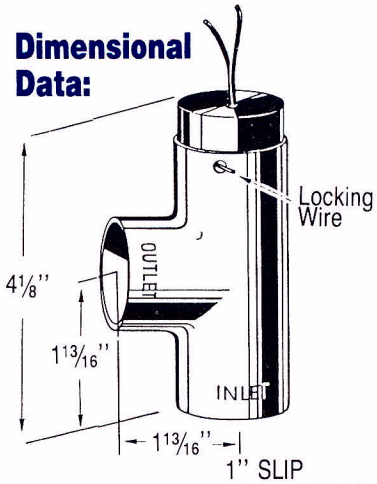
True-flow switch design utilizes a SST return spring for any mounting attitude.

Anti-menscous projections on shuttle prevents shuttle from drying in place after long machine shutdowns.

Applications:

- PVC construction
- Removable bonnet assembly
- Return spring for any mounting attitude.

Dimensional Data:



1" SLIP BOTH PORTS

Specifications:

Housing	Shuttle	Spring	"O" Ring	Reed Switch	Wire	Oper. Temp.	Oper. Pres.	Set Pt. Accur.	Set Pt. Diff.
PVC *See Note 8*	PVC *See Note 8, 6*	316 SST	Viton "A"	20 Watt SPST *See Notes 2, 5*	18 AWG 24" Lg. PVC *See Note 4*	-20°F to +140°F	150 PSIG	±20% *See Note 9*	20% MAX.

Part No.

STANDARD FLOW SETTING *See Notes 1, 9*	P/N
.5 GPM	42549
1.0 GPM	42545

Electrical:

Reed switch shown in NO FLOW condition.

SPST, NORMALLY OPEN AT NO FLOW

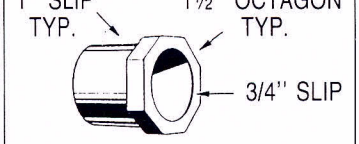
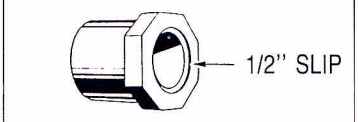
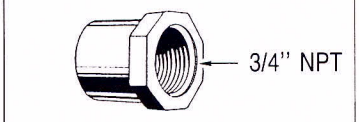
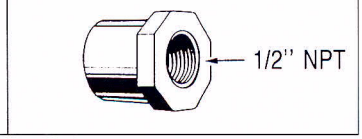
Switch Ratings... Max Resistive Load

V.A.	VOLTS	AMPS DC	AMPS AC	AMPS AC MAX
20	0-50	.4	.4	1.0
	120	.15	.16	
	240	.06	.08	

Switch Rating 20 VA: 50-240 VAC Pilot Duty

ACCESSORY ADAPTERS FOR MODEL 1800

Model 1800 may be used as is with 1" slip ports or with any combination of adapters shown.

P/N	DIMENSIONAL DATA
42751	
42752	
42753	
42754	

Notes: Model 1800

1. Standard flow calibration is in water @ 70°F with lead wires up. Calibrated on increasing flow.
2. Optional SPDT reed switches are available. Consult factory.
3. Standard flow set points available to 6.0 GPM in water. Consult factory.
4. Lead wires are available in different lengths, terminated ends, cables, etc. Consult factory.
5. Relays are available for handling higher loads. See accessories section for details. *(See page 28.)*
6. Other wetted material: ceramic ring magnet.
7. When specifying Model 1800 with 1/2" NPT, conduit connector, only plastic junction box and flexible conduit should be used.
8. Model 1800 is available molded in CPVC. Consult factory.
9. Calibration: Flow stands are calibrated to the National Bureau of Standards and Thomas Products Ltd. recalibration schedule.

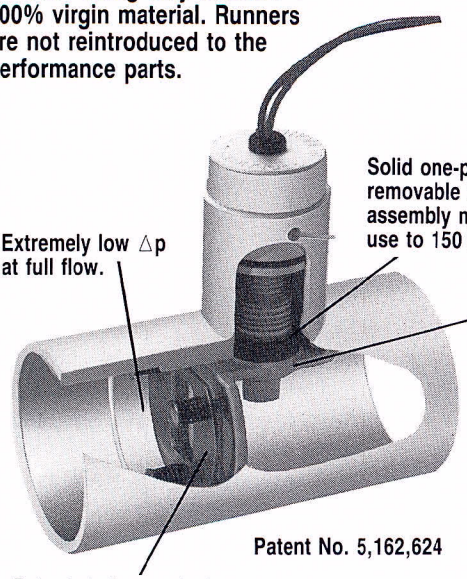
Specialty Option:

Model 1800 with 1/2" NPT conduit connector. *See Note 7.*

Please turn to our **Company Profile** and **Level Switch Selection Guide** to learn more of the advantages in specifying **Thomas Products Ltd.®** sensors.

FIXED SET POINTS, 1/2" - 2" PVC

Plastic components are molded in-house using only certified 100% virgin material. Runners are not reintroduced to the performance parts. **UL**



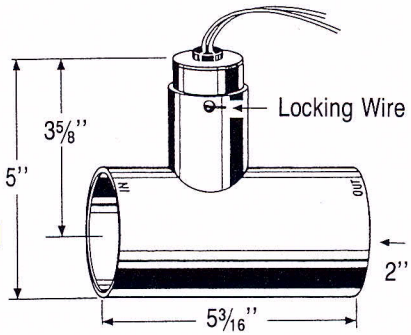
Applications:

- Straight thru flow design.
- PVC Construction.
- Removeable bonnet assembly.
- Return spring for any mounting attitude.
- Very low pressure drop.

Notes: Model 2600

1. Standard flow calibration is in water @ 70°F with lead wires up. Calibrated on decreasing flow.
2. Temperature effect on flow settings: water calibration, slight change; oil varies with viscosity.
3. Optional SPDT reed switches are available. Consult factory.
4. Lead wires are available in different lengths, terminated ends, cables, etc. Consult factory.
5. Relays are availalbe for handling higher loads. See accessories section for details. *(See Page 28)*
6. Other wetted materials: ceramic ring magnet.
7. When specifying Model 2600 with 1/2" NPT conduit connector, only plastic junction box and flexible conduit should be used.
8. Calibration: Flow stands are calibrated to the National Bureau of Standards and Thomas Products Ltd. recalibration schedule.

Dimensional Data:



2" SLIP, BOTH PORTS

Specifications:

Housing	Shuttle	Spring	"O" Ring	Reed Switch	Wire	Oper. Temp.	Oper. Pres.	Set Pt. Accur.	Set Pt. Diff.
PVC	PVC *See Note 6*	316 SST	Viton "A"	20 Watt SPST *See Notes 3, 5*	18 AWG 24" Lg. PVC *See Note 4*	-20°F to +140°F	150 PSIG	±20% *See Note 8*	20% MAX.

Part No.

STD. FLOW SETTING *See Notes 1, 2, 8*	.5 GPM	1.0 GPM	2.0 GPM
P/N	42951	42952	42953

Electrical: Reed switch shown in NO FLOW condition.

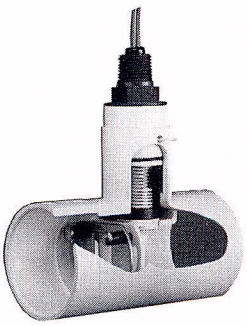
SPST, NORMALLY OPEN AT NO FLOW

Switch Ratings...Max Resistive Load

V.A.	VOLTS	AMPS DC	AMPS AC	AMPS AC MAX
20	0-50	.4	.4	1.0
	120	.15	.16	
	240	.06	.08	

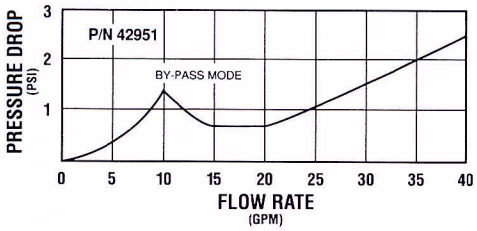
Switch Rating 20 VA: 50-240 VAC Pilot Duty

Specialty Options:



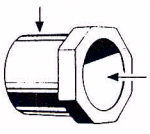
Model 2600 with 1/2" conduit connector. *See Note 7.*

Pressure Drop △p:

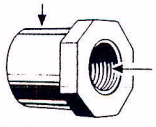


ACCESSORY ADAPTERS:
Model 2600 may be used as is with 2" slip ports or with any combination of adapters shown.

P/N	"A"	DIMENSIONAL DATA
42954	1½"	2" SLIP TYP.
42955	1¼"	
42956	1"	
42957	¾"	
42958	½"	



P/N	"B"	DIMENSIONAL DATA
42959	1½"	2" SLIP TYP.
42960	1¼"	
42961	1"	
42962	¾"	
42963	½"	



THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

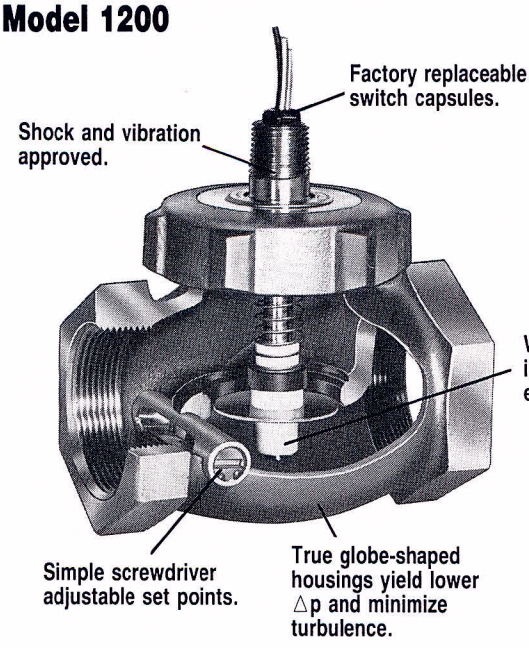
EASY ORDERING
1-800-666-9101

1200 & 1400

Please turn to our ***Company Profile*** and ***Level Switch Selection Guide*** to learn more of the advantages in specifying ***Thomas Products Ltd.®*** sensors.

ADJUSTABLE SET POINTS, 1'' NPT, BRONZE

Model 1200



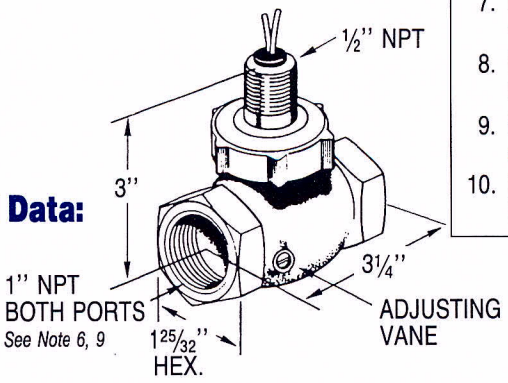
Applications:

- Protects pumps and bearings.
- Coolant Systems.
- HVAC Equipment.

Notes: Model 1200/1400

1. Strain reliefs are standard. Optional silicone potting avail. Consult factory.
2. Optional 100W SPST reed switches are stocked. Consult factory.
3. Relays for higher loads, junction boxes, terminal strips, etc. are available. See accessories section for details *(See Page 28)*
4. Also available: Leads in different lengths, cables, terminated ends, etc. Consult factory.
5. Other wetted materials: ceramic ring magnet.
6. Optional port sizes: BSP, SAE, silver-braze, socket weld, etc. Consult factory.
7. High temperature units available to 400°F. Consult factory.
8. Factory calibrated set points available. Consult factory.
9. For smaller pipe sizes, install appropriate size bushings.
10. Model 1200 is available in 316 SST. Consult factory.

Dimensional Data:

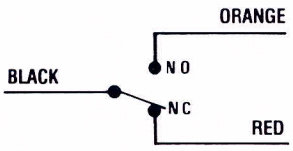


Specifications:

Housing	Shuttle	Spring	"O" Ring	Reed Switch	Wire	Oper. Temp.	Oper. Pres.	Proof Load	Burst Strength	Set Pt. Diff.	Repeat-ability
Bronze *See Note 10*	Teflon *See Note 5*	316 SST	Viton "A"	20 Watt SPDT *See Note 2, 3*	18 AWG 24'' Lg. Polymeric *See Note 4*	-20°F to +300°F *See Note 7*	400 PSI @ 100°F	800 PSI @ 100°F	1200 PSI @ 100°F	±10%	1% Max. Deviation

Electrical:

Reed switch shown in NO FLOW condition.



SPDT, SHOWN AT NO FLOW

Part No.

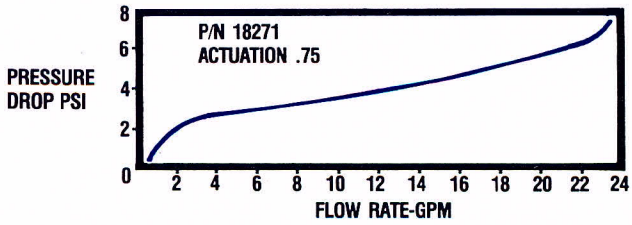
SIZE NPT	FLOW SETTING RANGE GPM *See Note 8*	P/N
1'' See Note 6, 9	.75 - 6.0	18271
	2.0 - 8.0	18272
	5.0 - 15.0	18273

Switch Ratings... Max Resistive Load

V.A.	VOLTS	AMPS DC	AMPS AC	AMPS AC MAX
20	0-50	.4	.4	1.0
	120	.15	.16	
	240	.06	.08	

Switch Rating 20 VA: 120-240 VAC Pilot Duty
U.L. File E86797

Pressure Drop △p:



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LEVEL & FLOW SWITCHES

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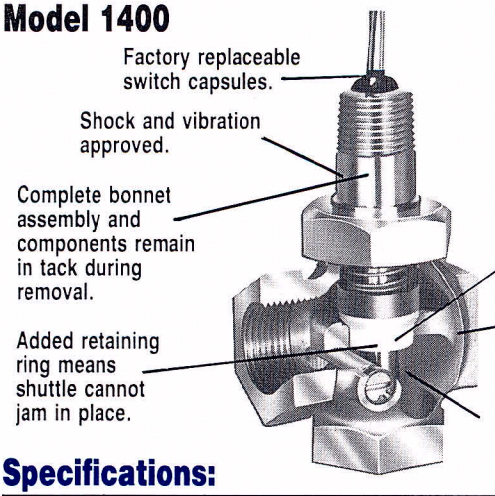
1200 & 1400

Please turn to our ***Company Profile*** and ***Level Switch Selection Guide*** to learn more of the advantages in specifying ***Thomas Products Ltd.®*** sensors.

ADJUSTABLE SET POINTS, 3/4'' NPT, BRONZE

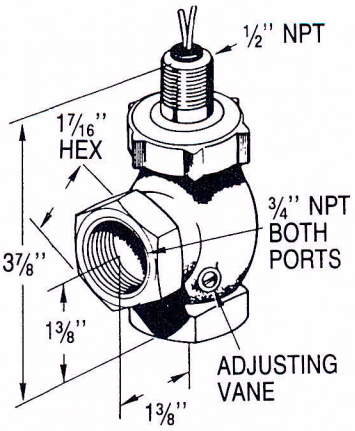
Model 1400



Applications:

- Machine Tool Industry
- Waste Water Monitoring
- HVAC

Dimensional Data:



Specifications:

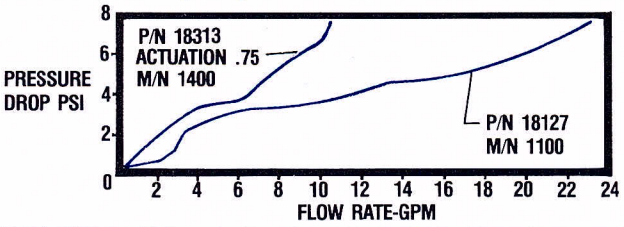
Housing	Shuttle	Spring	"O" Ring	Reed Switch	Wire	Oper. Temp.	Oper. Pres.	Proof Load	Burst Strength	Set Pt. Diff.	Repeat-ability
Bronze	Teflon *See Note 5*	316 SST	Viton "A"	20 Watt SPDT *See Note 2,3*	18 AWG 24" Lg. Polymeric *See Note 4*	-20°F to +300°F *See Note 7*	400 PSI @ 100°F	800 PSI @ 100°F	1200 PSI @ 100°F	± 10%	1% Max. Deviation

Electrical: *See Model 1200*

Part No.

SIZE NPT	FLOW SETTING RANGE GPM *See Note 8*	P/N
3/4''	.75 - 4.0	18313
	2.0 - 8.0	18314
	7.0 - 14.0	18315

Pressure Drop △p:

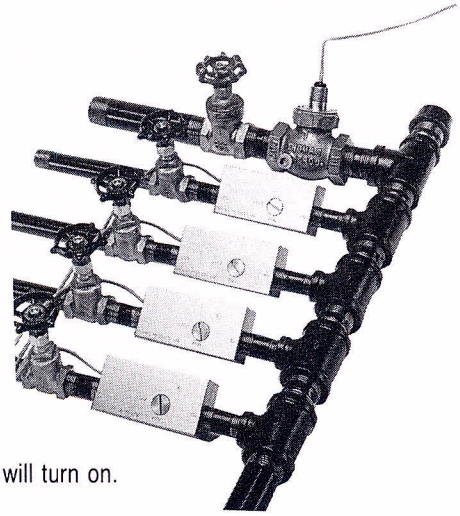


Applications:

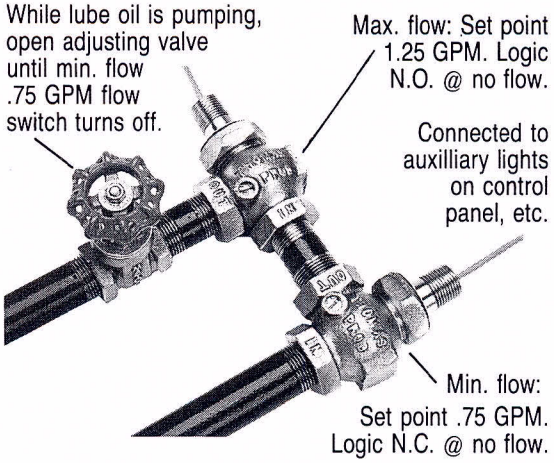
COOLANT MANIFOLD ON AN INJECTION MOLDING MACHINE: Eliminate constant visual inspection of minimum coolant flow by using flow switches. You can be sure sufficient flow is automatically monitored. Flow switches activate audible alarms, lights, etc., warning you of insufficient flow. Operation is simple:

1. Close all flow control valves.
2. Open all flow switch set point adjusting vanes (alarms will turn on).
3. Turn on coolant.
4. Open each flow control valve to correct flow rate (starting at highest flow).
5. Close each flow switch set point adjusting vane until alarms just turn off.

Whenever the flow rates drop under that set point, your alarms will turn on.



LUBE OIL MONITORING SYSTEM ON A ROLLING MACHINE: 1 GPM is needed in the oil bath to lubricate and cool large bronze bearings.



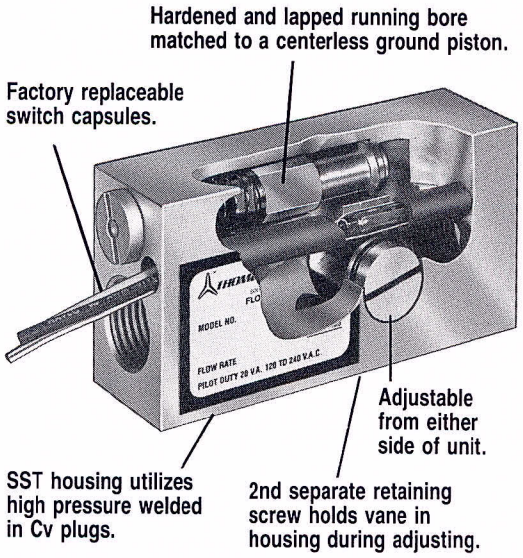
Whenever the flow rate rises or drops out of the set point range, your alarm will turn on.

THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

EASY ORDERING
1-800-666-9101

Please turn to our ***Company Profile*** and ***Level Switch Selection Guide*** to learn more of the advantages in specifying ***Thomas Products Ltd.***® sensors.

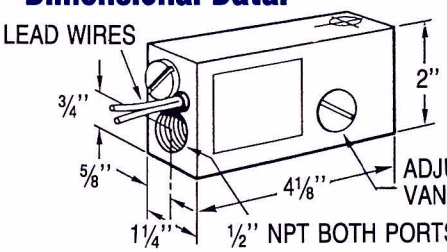
ADJUSTABLE SET POINTS, 1/2" NPT, BRASS/SST



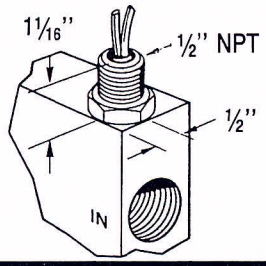
Notes: Model 1500

1. Approximate SCFM depending on line pressure.
2. Optional lower air set point range. Consult factory.
3. Optional lower water set point range .2-10 GPM. Consult factory.
4. Factory calibrated set points available. Consult factory.
5. Other wetted materials: epoxy.
6. Polysulfone for water in brass housing.
7. Brass for oil in brass housing.
8. SST for SST housing.
9. Relays for higher loads, junction boxes, terminal strips, etc. are available. See accessories section for details. *Page 28.*
10. High temperature units are available to 400°F. Consult factory.
11. Also available: leads in different lengths, cable, terminated ends, etc. Consult factory.

Dimensional Data:



1/2" NPT CONDUIT CONNECTOR

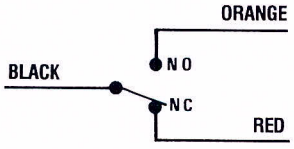


Specifications:

Housing	Piston	Spring	"O" Ring Seal	Reed Switch	Wire	Oper. Temp.	Oper. Pres.	Proof Load	Burst Strength	Set Pt. Diff.	Repeat-ability
Brass or 316 SST	Polysulfone *See Note 6*	316 SST	Viton "A"	20 Watt SPDT *See Note 9*	18 AWG 24" Lg. Polymeric *See Note 11*	Polysulfone Piston -20°F to +225°F	1000 PSIG	2500 PSIG	5000 PSIG	±15% MAX.	1% Max. Deviation
	Brass *See Notes 5, 7*					Brass or SST Piston -20°F to +300°F *See Note 10*					
	316 SST *See Notes 5, 8*										

Electrical:

Reed switch shown in NO FLOW condition.



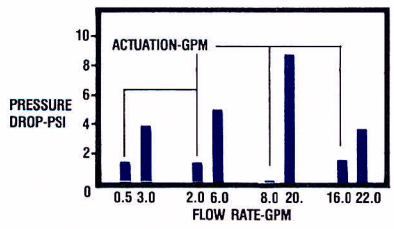
SPDT, SHOWN AT NO FLOW

Switch Ratings... Max Resistive Load

V.A.	VOLTS	AMPS DC	AMPS AC	AMPS AC MAX
20	0-50	.4	.4	1.0
	120	.15	.16	
	240	.06	.08	

Switch Rating 20 VA: 120-240 VAC Pilot Duty

Pressure Drop △p:

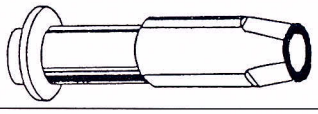


Part No.

SIZE NPT	FLOW SET RANGE		BRASS Housing PISTON P/N Specify	316 SST Construction
1/2"	.5 to 20 Water GPM *See Notes 3, 4*	Lead Wires	18540 - _____	18541
		Conduit Conn.	18542 - _____	18543
1/2"	2 to 200 Air SCFM *See Notes 1, 2, 4*	Lead Wires	18545	18546
		Conduit Conn.	18547	18548

PISTONS FOR LIQUIDS IN BRASS OR SST HOUSINGS:

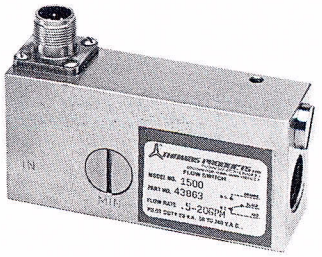
See Notes 6, 7, 8



POLYSULFONE	P/N 4054
BRASS	P/N 4055
316 SST	P/N 4056

Specialty Options:

See Model 1200 & 1400 for more helpful application information



Model 1500 with M/S connector MS3102E10S-3P

THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

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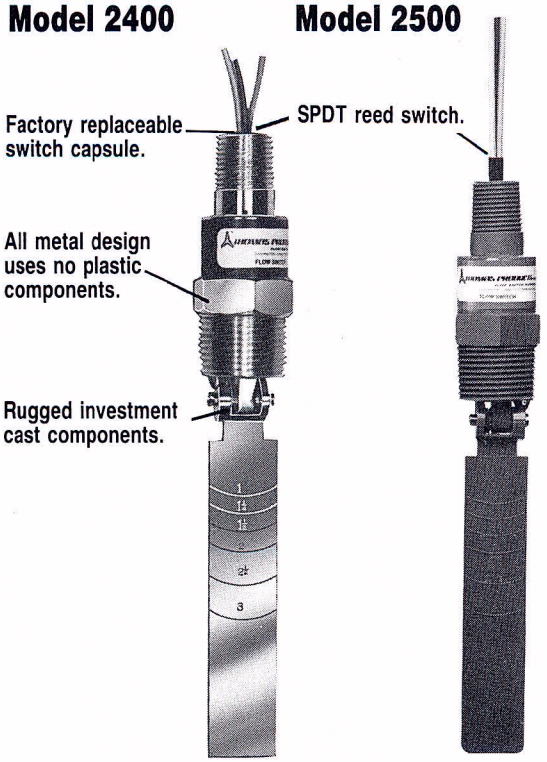
2400/2500

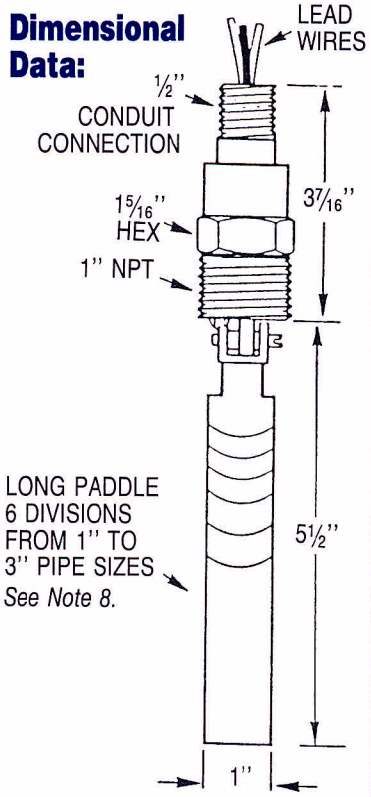
Please turn to our ***Company Profile*** and ***Level Switch Selection Guide*** to learn more of the advantages in specifying ***Thomas Products Ltd.®*** sensors.

ADJUSTABLE PADDLE TYPE, BRASS, SST, PLASTIC

Model 2400 Model 2500



Dimensional Data:



Notes: Model 2400/2500

1. Flow tests were performed in water with unit installed into standard reducing tee.
2. Set point accuracy depends on paddle cut-off length.
3. Unit installs into a 1" reducing tee or weld-o-let etc. for 1" pipe sizes and up.
4. Install vertically as shown, lead wires up.
5. Higher temperature units available up to 450° F. Consult factory.
6. Relays for higher loads, junction boxes, terminal strips, etc. are available. See accessories section for details *(See Page 28)*
7. To adjust flow set point, simply cut paddle for the appropriate set point listed. See also installlation/maintenance sheet.
8. For pipe sizes larger than 3", actuation of the 5" paddle is a velocity of approximately .5 ft./sec.
9. Also available: leads in different lengths, cable, terminated ends, etc. Consult factory.
10. Optional 100W SPST reed switches are stocked. Consult factory.

Specifications:

Model	Housing	Paddle	Shuttle	Spring	Reed Switch	Wire	Oper. Temp.	Oper. Pres. Max.	Set Pt. Accur.	Repeatability	Pressure Drop
2400	Brass or 316 SST	316 SST	316 SST	316 SST	20 Watt SPDT	18 AWG 24" Lg. Polymeric	-30°F to +300°F *See Note 5*	850 PSIG	±25% MAX. *See Note 2*	±5%	3 PSIG MAX.
2500	Polysulfone	Polysulfone	Polysulfone		*See Notes 6, 10*	*See Note 9*	-20° to +225°F	150 PSIG			

Part No.

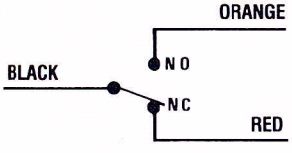
MODEL NO.	P/N BRASS	P/N 316 SST	P/N POLYSULFONE
2400	19650	19651	
2500			19652

Actuation-Deactuation in GPM/Water *See Notes 1-4, 7, 8*

Paddle Cut-Off	PIPE LINE SIZES											
	1"		1¼"		1½"		2"		2½"		3"	
	ACT	DA	ACT	DA	ACT	DA	ACT	DA	ACT	DA	ACT	DA
1"	6	4	9	7	13	9						
1¼"			7	5	9	7	16	13				
1½"					13	9	23	16	34	30		
2"							17	12	24	20	26	22
2½"									18	15	22	19
3"											17	14

Electrical:

Reed switch shown in NO FLOW condition.



SPDT, SHOWN AT NO FLOW

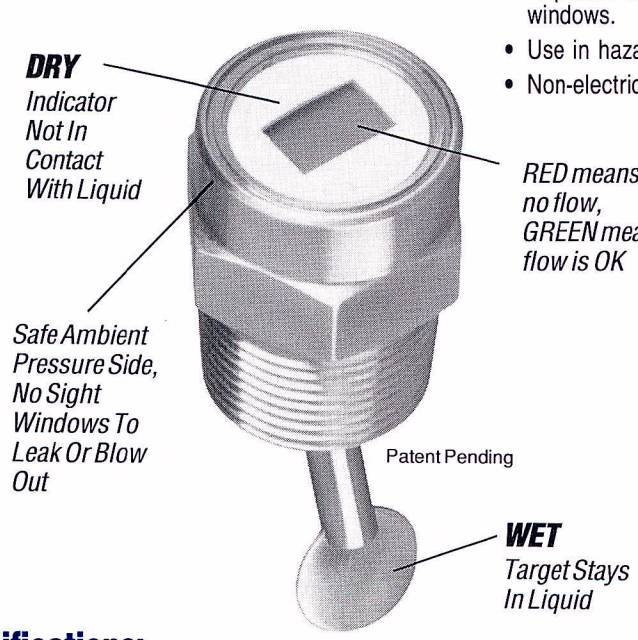
Switch Ratings... Max Resistive Load

V.A.	VOLTS	AMPS DC	AMPS AC	AMPS AC MAX
20	0-50	.4	.4	1.0
	120	.15	.16	
	240	.06	.08	

Switch Rating 20 VA: 120-240 VAC Pilot Duty

Please turn to our ***Company Profile*** and ***Level Switch Selection Guide*** to learn more of the advantages in specifying ***Thomas Products Ltd.®*** sensors.

FLOW INDICATOR, BRASS/SST, NON-ELECTRIC



Applications:

- Replaces unreadable sight windows.
- Use in hazardous locations.
- Non-electrical.

Notes: Model 5200

1. Flow rates are for water, these valves will decrease as the viscosity increases.
2. All wetted parts in brass housing are brass and 316 SST or 316 SST housing is all 316 SST.
3. For pipe sizes larger than 1", indication can be seen at water velocity of 3 ft./sec.
4. High temperature modifications available.
5. Pressure drop <1 PSIG.
6. 5.0 GPM indicators can be installed in any mounting attitude.
7. 1.5 GPM indicators must be installed horizontally in a vertical pipe run with the flow direction up.
8. If you need to know what direction the liquid is flowing either a 43702 or 43704 may be used. Unit must be installed in a horizontal pipe run, indicator housing up at 12:00. Depending on installation, the red and green side will indicate the direction of flow.

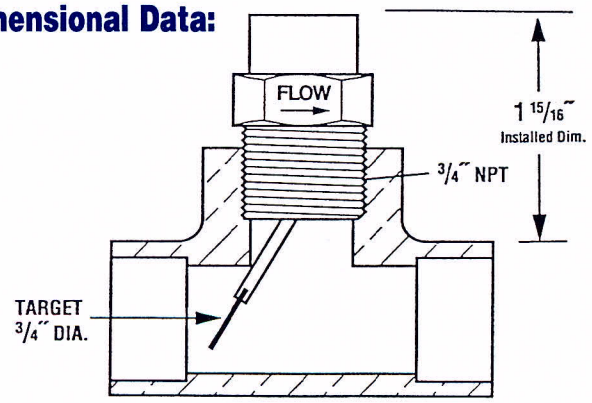
Specifications:

P/N	Indication GPM *(Note 1, 3, 5)*	Housing *(Note 2)*	Target Assembly	Operating Temperature	Operating Pressure
43701	5.0 *(See Note 6)*	Brass	316 SST	-40°F to +225°F *(See Note 4)*	400 PSI 70°F
43702	1.5 *(See Note 7 & 8)*				
43703	5.0 *(See Note 6)*	SST			
43704	1.5 *(See Note 7 & 8)*				

Operation:

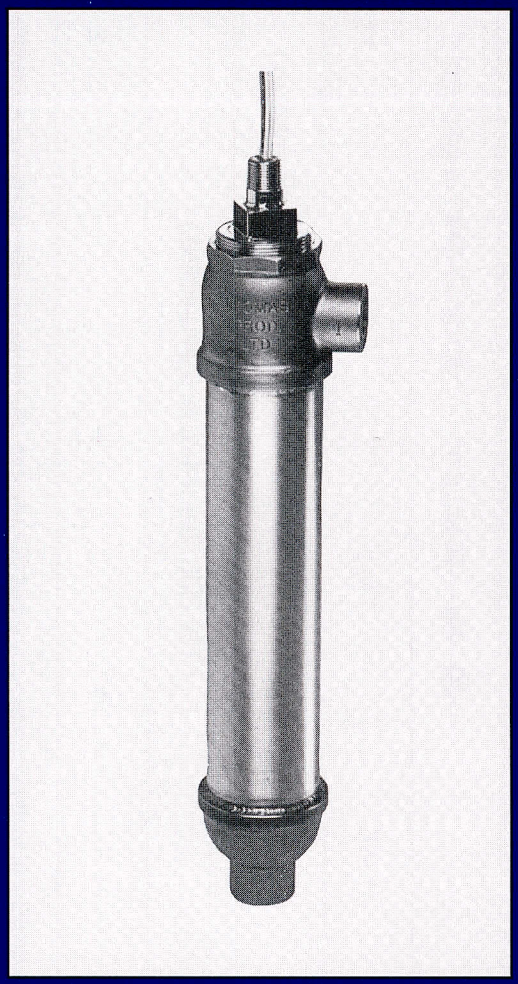
The housing has 2 separate chambers. In the front chamber behind a transparent lens is a 2 color roller, half red, half green and it is equipped with a magnet. In the rear chamber is a magnet equipped target free to swing with the action of the liquid's flow. The poles of the 2 magnets are opposite creating a permanent interlock. As the liquid flow falls, the target and magnet swing to rotate the roller exposing the red side indicating low liquid flow. Accordingly, as the flow rises, the green side indicating a satisfactory liquid flow condition appears.

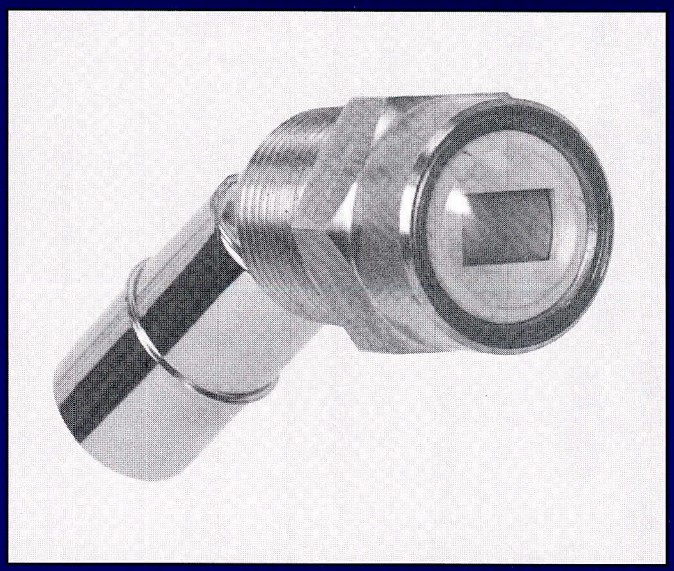
Dimensional Data:

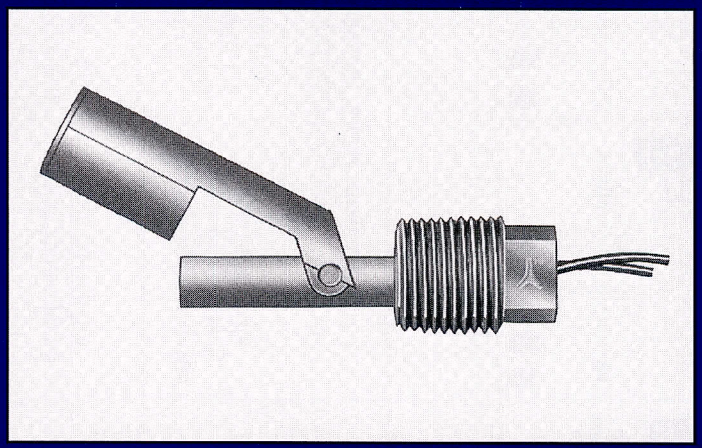


Model 5200 illustrated at no flow condition, red side visible. Unit is installed into a standard PVC 1x1x3/4" SCH 40 reducing tee or a similar method may be used.

LEVEL SWITCH SELECTION GUIDE







THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

Standard Product Selection Guide

	Stem & Mounting Material	Float Material	Advantages	Mounting Sizes	Stem Diameter	Reed Switch	Switch Points	Operating Temperatures	Operating Pressure	Page	Notes
4000 Style 1-4	Brass, Bronze, Stainless Steel, or PVC	Polysulfone, BUNA, Stainless Steel, Polypropylene, or PVC	Installs from inside or outside of tanks. Top or bottom, variety of mountings.	1/2″, 1-1/4″, 2″ NPT and 3″ 150# ANSI flange.	1/2″ Diameter.	20-100 VA SPST or 20 VA SPDT	1 to 6	-40°F to +300°F (Depending on style specified.)	750 PSIG (Depending on float specified.)	6 - 9	Complement of outlined switches is to show standard product line breadth. Our in-house manufacturing capabilities can customize any unit to suit.
4000 Style 10			External tank mounting to side of tank.	Port size 1" NPT.							
4000 Style 11			Side of tank mounting.	2″, 3″ or 4″ 150# ANSI flange.							
4000 Style 5-9		Polysulfone, BUNA, Stainless Steel and Polypropylene	Installs from inside or outside of tanks. Top or bottom, variety of mountings.	1/8″, 3/4″, 1″ NPT and 3-5/8″ diameter flange.	5/16" Diameter.	20 VA SPST	1 to 5			6 - 13	
4000 ADJ.			Adjustable stem. Customer can raise entire stem to position.	Any Model 4000 metal construction.	5/16″ and 1/2″ Diameter.		1 to 6				
5000 Styles A-D	Polysulfone	Polysulfone, Polypropylene, BUNA	FDA approved material installs top or bottom, variety of mountings.	1/8″. 1″ NPT. 3/8″ - 16 Bulkhead 2″ diameter flange.	5/16″ Diameter. Fluted.	20 VA SPST	1 to 4	-40°F to +225°F		14, 15	

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Standard Product Selection Guide

	Stem & Housing Materials	Float Materials	Advantages	Mounting Sizes	Reed Switch	Operating Temperatures	Operating Pressure	Page	Notes
3700	Brass, Bronze, Stainless Steel	Stainless Steel	External tank mounting to side of tank.	Port size 1″ NPT	20 VA SPST	-40°F to +300°F	900 PSI Max.	16	Complement of outlined switches is to show standard product line breadth. Our in-house manufacturing capabilities can customize any unit to suit.
3900 Pat. No. 5,117,693			Side tank mounting for use in contaminated and viscous fluids.	1/8″ NPT			50 PSI Max.	17	
4100			Side tank mounting, high pressure. Replacement parts available.	1" NPT	20 VA SPDT		Depending on float specified. To 900 PSI Max.	20	
4400	Polysulfone Polypropylene		Side tank mounting, economical, FDA approved material, conduit connector.	1/2″ NPT, 1/2″-13 or 5/8″-11 Bulkhead & Nut.	20 VA SPST	-40°F to +225°F	Depending on float specified. 150 PSI Max.	18, 19	
4900	Brass or SST	BUNA, Stainless Steel, Polysulfone Polypropylene	Side tank mounting, high pressure, variable length stems.	1/8″ NPT or 3/8″-24 Bulkhead & Nut.		Depending on float specified. -40°F to +300°F Max.	Depending on float specified. 400 PSI Max.	21	
3800	PVC		Lays at bottom of tank or double wall containment system.	N/A	10 VA SPST	-30°F to 140°F	50 PSI Max.	26	
5100 *Style 3* Pat. No. 5,425,271	Brass or Stainless Steel	Stainless Steel	Side of tank indicator, use in hazardous locations, non-electrical, 2 color flag, (red & green).	3/4″ NPT	N/A	-40°F to +225°F	400 PSI Max.	27	

Standard Product Selection Guide

	Stem Materials	Float Material	Advantages	Mounting Sizes	Reed Switch	Hazardous Locations	Operating Temperatures	Operating Pressure	Page	Notes
4200	Polysulfone or Polypropylene		OEM large volume use, fluted stem	1/8″ NPT or 3/8″ Bulkhead	20 VA SPST, 100 VA SPST, UL 20 VA SPST	N/A	-40°F to +225°F	Depending on float specified. 100 PSI Max.	22	Complement of outlined switches is to show standard product line breadth. Our in-house manufacturing capabilities can customize any unit to suit.
4200, 4200H	Brass or SST	4200 BUNA or SST 4200H SST	Compact, hazardous locations	1/8″ NPT	20 VA SPST, 100 VA SPST, UL 20 VA SPST	4200H Class I Div. I Groups C & D Class I Div. 2 Groups A, B, C & D	Depending on float specified. -40°F to +300°F		24	
4500		BUNA	Compatible with fuel, oil, etc. Silicone potted. Shock & vibration resistant. Float interfacing		20 VA SPST, 100 VA SPDT, UL 20 VA SPST	N/A	-40° to +230°F (Depending on media.)	150 PSI Max.	25	
4600				1/4″ NPT					25	
4700, 4700H	Brass or SST	SST	High press., hazardous locations, silicone potted, shock & vibration resistant			4700H Class I Div. 1 Groups C & D Class I Div. 2 Groups A, B, C & D	-40° to +300°F	750 PSI Max.	24	
4800	PVC		Increased float strength, economical			N/A	-40° to +140°F	100 PSI Max.	23	
Accessories	Junction boxes explosion proof.	Relays DPDT general purpose.	Relays DPDT latching pump controls.	Crimp on terminals.	Terminal strips.	TFE Tape & TFE Paste	Cable Glands		28	

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LEVEL SWITCH SELECTION GUIDE

Model 4000 Custom Level Switch

Serialization, documentation retained on purchased materials, processes, inspection, etc.

Factory replaceable switch bundles.

Investment cast components machined in-house.

Welding: Thomas Products Ltd. certified welders under requalification system, performed in low hydrogen environment. Process schedules revision controlled. Inspection 100% bubble tight, hydrostatic, fluorescent penetrant.

UL recognized.

Approved packaging.

Switches shock and vibration tested.

Automated assembly procedures.

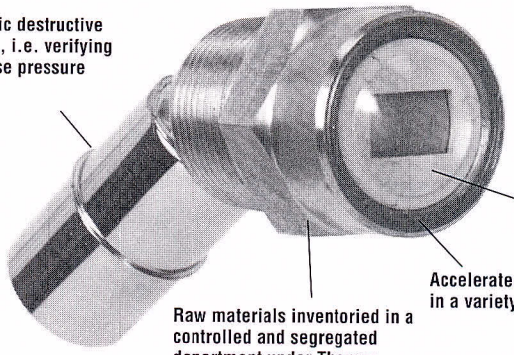
Operational Q.C. systems and manual, MIL I 45208 and MIL STD 45662.

Model 5100 Liquid Level Indicator

Inspection using calibrated tools and gages traceable to National Bureau of Standards under Thomas Products, Ltd. recalibration system.

Injection molding in-house, Thomas Products Ltd. can certify that only virgin materials are used and no reprocessing is done nor has color concentrate been added during molding.

Periodic destructive testing, i.e. verifying collapse pressure rating.



DRY
Indicator Not In Contact With Liquid

New technology patent pending design.

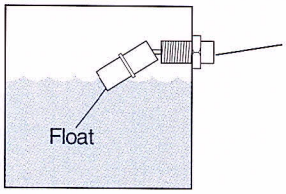
Accelerated life tested in a variety of fluids.

Raw materials inventoried in a controlled and segregated department under Thomas Products, Ltd. stock rotation program.

Call-outs provided are typical to their respective models.

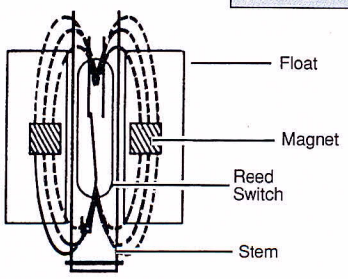
Operation:

The housing has 2 separate chambers. In the front chamber behind a transparent lens is a 2 color roller, half red, half green and it is equipped with a magnet. In the rear chamber is a magnet equipped float free to swing with the action of the liquid's level. The poles of the 2 magnets are opposite creating a permanent interlock. As the liquid level falls, the float and magnet swing to rotate the roller exposing the red side indication low liquid level. Accordingly, as the level rises, the green side indicating a satisfactory liquid level condition appears.



Indicator Turns Red When Liquid Is Low;

Green Means Liquid Is OK.



Typical Operation:

A magnet equipped float moves directly with the liquids level to actuate the hermetically sealed reed switch within the stem.

- ☐ **Ideas**
- ☐ **Solutions**
- ☐ **Technical Support**
- ☐ **On-Time Delivery**
- ☐ **Quality**

THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

4000 CUSTOM LEVEL SWITCH

Please turn to our ***Company Profile*** and ***Level Switch Selection Guide*** to learn more of the advantages in specifying ***Thomas Products Ltd.®*** sensors.

METAL (1/2″ Diameter Stem)

1/2″ NPT Plug Mounting

STYLE **1**

See Notes 7 & 15

Mounts From Inside of Tank

1 1/4″ NPT Plug Mounting

STYLE **2**

See Notes 8 & 15

Plug-Mounted From Outside of Tank

2″ NPT Plug Mounting

STYLE **3**

See Notes 9 & 15

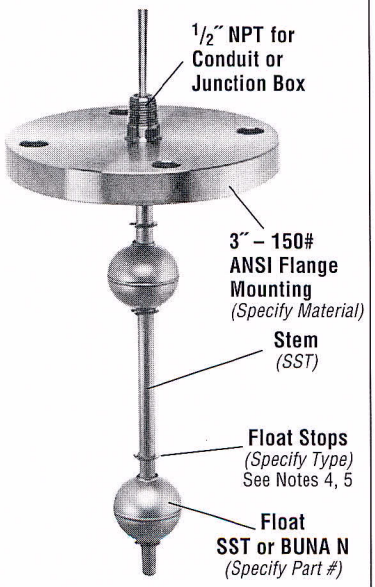
Plug-Mounted From Outside of Tank

METAL (1/2″ Diameter Stem)

3″ 150# ANSI Flange Mounting

STYLE **4**

See Notes 10, 14, 15

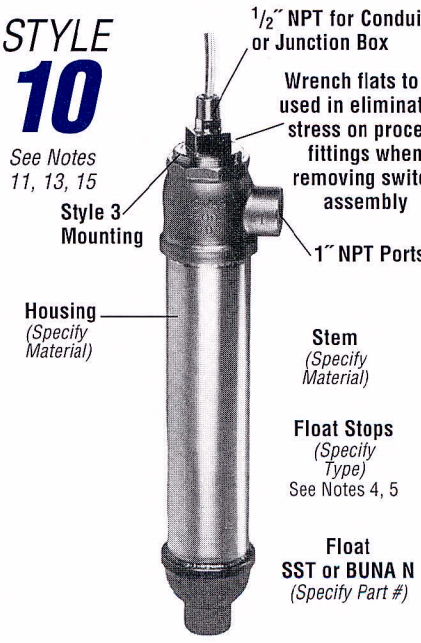


Flange Mounting From Outside of Tank

1″ NPT External Tank Mounting

STYLE **10**

See Notes 11, 13, 15

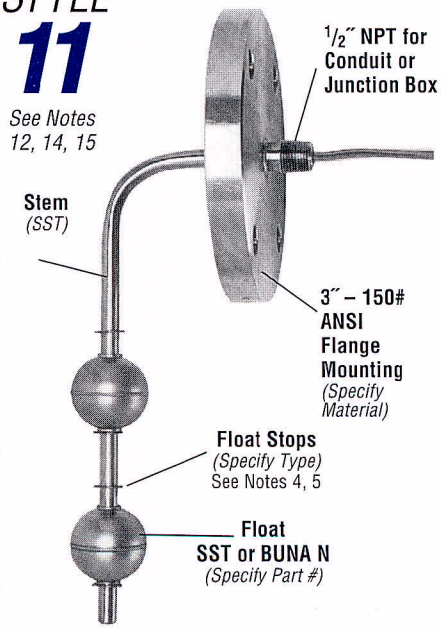


Mounts to Outside of Tank

3″ 150# ANSI Flange Mounting

STYLE **11**

See Notes 12, 14, 15



Flange Mounting from Outside of Tank

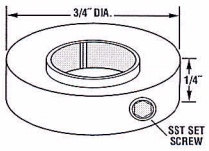
4000 CUSTOM LEVEL SWITCH

SPECIFICATIONS

4000 (Styles 1, 2, 3, 4, 10 and 11)

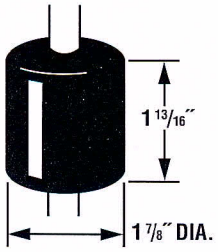
METAL				
Style	1, 2, 3	4	10	11
Mounting *See Note 18*	Brass or Stainless Steel	Carbon Steel or SST	Mounting & Housing Bronze or SST	Carbon Steel or SST
Stem	Brass or Stainless Steel	Stainless Steel	Brass or SST	Stainless Steel
Float	Customer to Specify Part Number			
Float Stops: Grip Rings *See Note 4*	Brass units - Beryllium Copper; SST units Ph 15-7 Mo SST	Ph 15-7 Mo SST	Brass units - Beryllium Copper; SST units Ph 15-7 Mo SST	Ph 15-7 Mo SST
Float Stops: Collars *See Note 5 Drawing 1.0*	Brass units - Brass collars; SST units - 316 SST collars	316 SST Collars	Brass units - Brass collars; SST units - 316 SST collars	316 SST Collars
Stem Length	Per Customer Requirements			
Reed Switches and Wire *See Notes 2 & 3*	UL Recognized units: SPST Pilot Duty 20 VA 120-240 VAC. Polymeric leads: See Multi-Level Specification Form.			
Reed Switches and Wire *See Notes 2 & 3*	SPST Pilot Duty 20 VA 120-240 VAC; SPST Pilot Duty 100 VA 120-240 VAC; SPDT Pilot Duty 20 VA 120-240 VAC. Teflon leads: See Multi-Level Specification Form.			
Hysteresis	1/16″ Total Envelope *Note 6*			

Collars: Brass or 316 SST

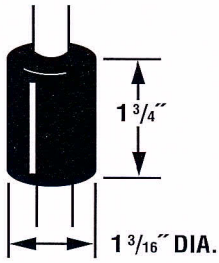


Drawing 1.0

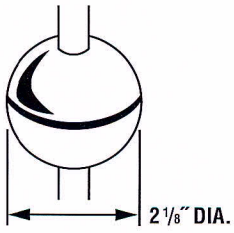
P/N 3506 BUNA N



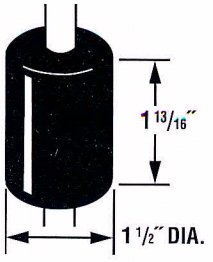
P/N 3507 BUNA N



P/N 3508 SST



PVC Units Only: P/N 3555



FLOAT SPECIFICATIONS:

(Styles 1, 2, 3, 4, 10 and 11)

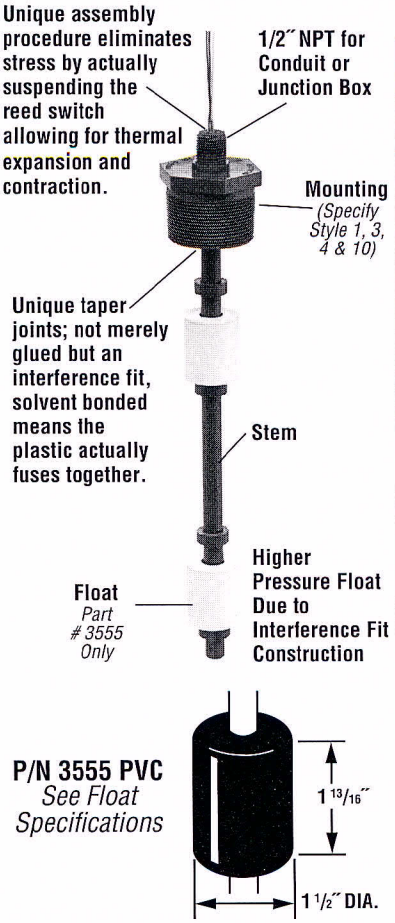
Float Part Number	Temperature Range	Pressure Max.	Specific Gravity
3506 BUNA	-40° to 180°F in water -40° to 230°F in oil	150 PSI	.55 *See Note 17*
3507 BUNA	-40° to 180°F in water -40° to 230°F in oil	150 PSI	.65 *See Note 17*
3508 S.S.T.	-40° to 300°F	750 PSI	.65 *See Note 17*
3555 PVC *Note 1*	-30°F to +140°F	100 PSI	.85 *See Note 17*

4000 CUSTOM LEVEL SWITCH

Notes:

1. Part Number 3555 PVC float is used for PVC Model 4000. See specifications
2. Also available: leads in different lengths, cable, terminated ends, etc. consult factory.
3. Relays are available for handling higher electrical loads than allowed. See accessory section for details.
4. Grip rings come standard at no extra charge.
5. Optional collars are available from stock. See drawing 1.0.
6. Special reed switches are stocked to yield a hysteresis of 1/4". Consult factory.
7. Style 1 mounting installs from the inside of the tank into a 1/2" NPT boss. Specify float part number: 3506,3507, 3508, or 3555.
8. Style 2 mounting installs from the outside of the tank into a 1 1/4" NPT boss. Specify float part number 3507.
9. Style 3 mounting installs from the outside of the tank into a 2" NPT boss. Specify float part number: 3506, 3507, 3508, or 3555.
10. Style 4 flange mounting installs from the outside of the tank onto a 3˝ ANSI flange mating surface. Specify float part number 3506, 3507, 3508, or 3555.
11. Style 10 external tank mounting installs to the tank exterior. Bottom "run" port can be fabricated at branch position typical to top port. Thomas Products LTD. can machine ports on both bronze and stainless steel housings for silver braze or socket weld end connections. Consult factory. Specify float part number: 3506 or 3508.
12. Style 11 mountings install from the outside of the tank onto a 3" ANSI flange mating surface. Note: The bolt patterns angular position must be followed per drawing. See Multi-Level Specification Form 4000. Specify float part number: 3506, 3507 or 3508.
13. Style 10 external tank unit is available in all PVC construction. Consult factory.
14. Styles 4 & 11 flange mounting types are also available with a 1˝, 2˝ or 4˝ 150# ANSI flanges.
15. Multi-level Specification Form 4000 must be used to ensure correct dimensional data.
16. All wetted parts PVC.
17. Custom interface floats are available. Consult factory.
18. Materials of copper-nickel, titanium, hastelloy and aluminum are stocked. Consult factory.

PVC

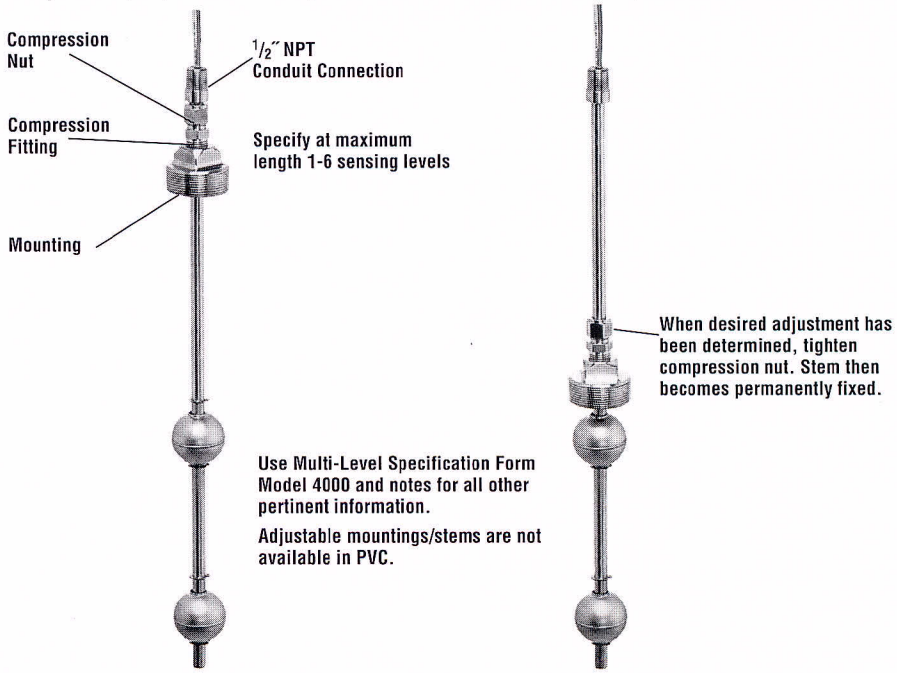


SPECIFICATIONS:

Style	Styles 1, 3, 4 & 10 *See Notes 1, 13, 15 & 16*
Mounting	PVC
Stem	PVC. 1/4˝ Schedule 80 Pipe
Float	PVC. Part # 3555
Float Stops	PVC. Solvent Bonded to Stem
Stem Length	Per Customer Requirements
Reed Switches ®	UL Recognized Units SPST Pilot Duty 20 VA 50 – 240 VAC
Reed Switches	Non UL Recognized Units SPST Pilot Duty 100 VA 50 – 240 VAC SPDT Pilot Duty 20 VA 50 – 240 VAC *See Note 6*
Wire	PVC 24˝ Long Extended *See Notes 2 & 3*
Hysteresis	1/16˝ Total Envelope *See Note 6*

ADJUSTABLE STEM

For Styles 2, 3, 4 & 10. Option for Model 4000 – 1/2˝ Diameter Stem



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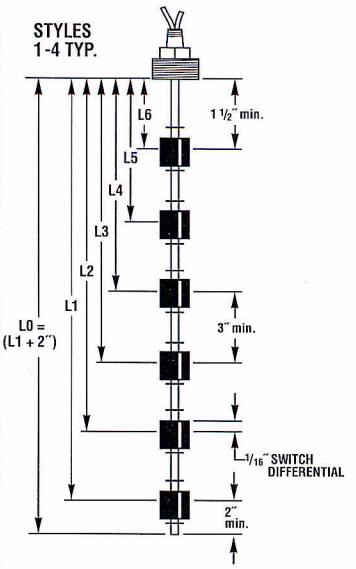
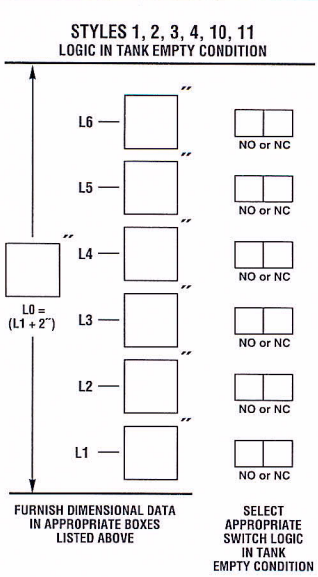
4000 CUSTOM LEVEL SWITCH

All Model 4000 Custom Level Switches are fabricated in-house. Quick shipments of 2 weeks are standard, but if you need a unit sooner, our Short Order Department can satisfy almost any delivery requirement.

MULTI-LEVEL SPECIFICATION FORM 4000





Style: 1 ☐ 2 ☐ 3 ☐ 4 ☐ 10 ☐ 11 ☐

Style 1, 2, 3:
Mounting & Stem Material: Brass ☐ SST ☐

Style 4: Stem SST
Mounting: Carbon Steel ☐ SST ☐

PVC Styles 1, 3, & 4 Only: PVC ☐

Style 10:
Mounting & Stem Material: Brass ☐ SST ☐
Housing Material: SST ☐
Port Size: 1" ☐
Port Dim.: _____"

Style 11:
Mounting Material: Carbon Steel ☐ SST ☐
Stem Material: SST ☐
Bend Dim.: _____"

Mounting Attitude:
VTL to 30° Inclination
Tank Top ☐ Tank Bottom ☐

Adjustable Mounting:
Yes ☐ No ☐

Float Part Number: _____

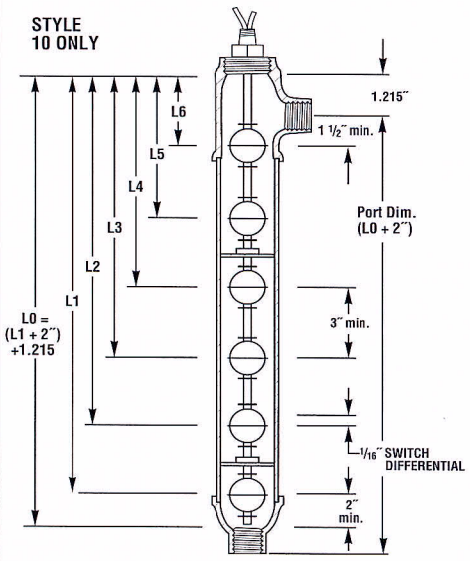
Float Stops:
Brass Units: *(See Notes 4 & 5)*
Beryllium Copper Grip Rings ☐
Brass Collars ☐
SST Units: *(See Notes 4 & 5)*
Ph 15-7 Mo SST Grip Rings ☐
316 SST Collars ☐

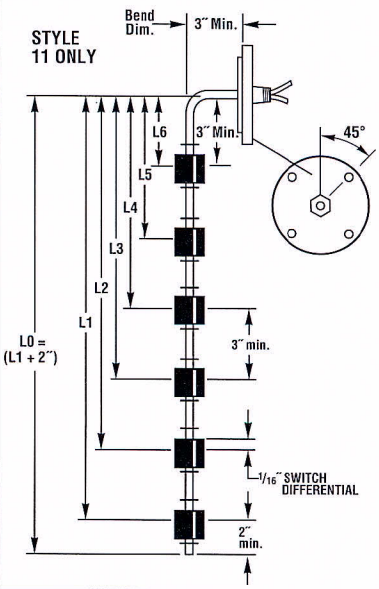
PVC Units:
PVC Collars Only ☐

Wiring Configurations:
W-A ☐ W-B ☐
W-C ☐ W-D ☐

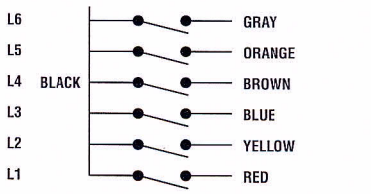
Electrical Connection:
24" LG. Lead Wire ☐
Junction Box ☐

Switch Type:
SPST 20 VA ☐
SPDT 20 VA ☐
SPST 100 VA ☐



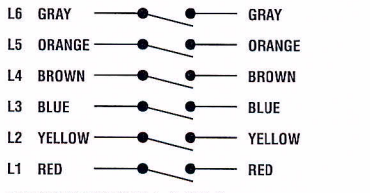


W-A SPST 20 WATT OR 100 WATT



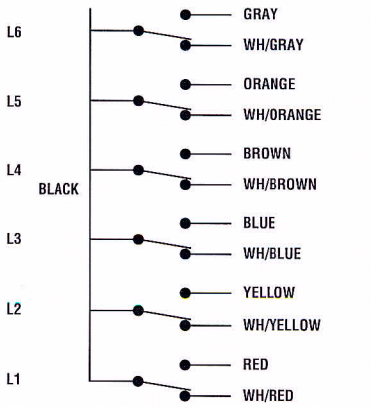
WIRE SIZES FOR STYLES 1–4, 10 & 11
1 to 5 sensing levels 18 AWG 24" Lg. Polymeric or Teflon-UL 1213
6 sensing levels 22 AWG 24" Lg. Teflon-UL 1213

W-B SPST 20 WATT OR 100 WATT



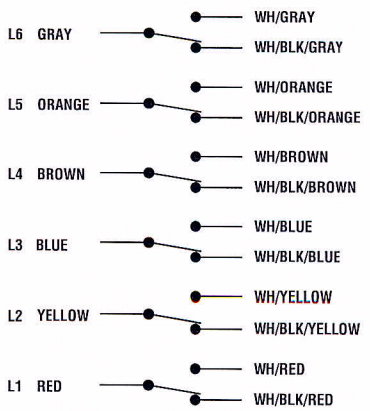
WIRE SIZES FOR STYLES 1–4, 10 & 11
1 – 3 sensing levels 18 AWG 24" Lg. Polymeric or Teflon-UL 1213
4 – 6 sensing levels 22 AWG 24" Lg. Teflon-UL 1213

W-C SPDT 20 WATT



WIRE SIZES FOR STYLES 1–4, 10 & 11
1 – 2 Stations 18 AWG 24" Lg. Polymeric or Teflon-UL 1213
3 – 6 Stations 22 AWG 24" Lg. Teflon-UL 1213

W-D SPDT 20 WATT



WIRE SIZES FOR STYLES 1–4, 10 & 11
1 – 2 Stations 18 AWG 24" Lg. Polymeric or Teflon-UL 1213
3 – 6 Stations 22 AWG 24" Lg. Teflon-UL 1213

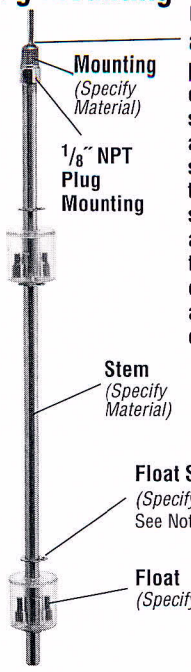
4000 CUSTOM LEVEL SWITCH

METAL (5/16″ Diameter Stem)

1/8″ NPT Plug Mounting

STYLE **5**

See Note 5

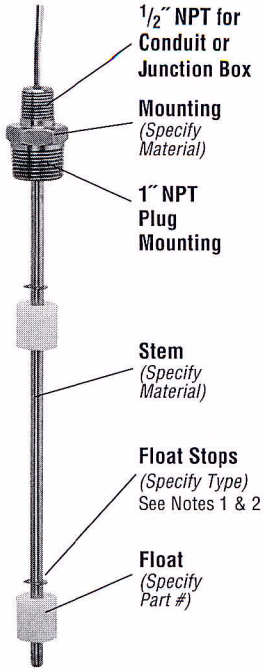


Mounts From Inside of Tank

1″ NPT Plug Mounting

STYLE **6**

See Note 6

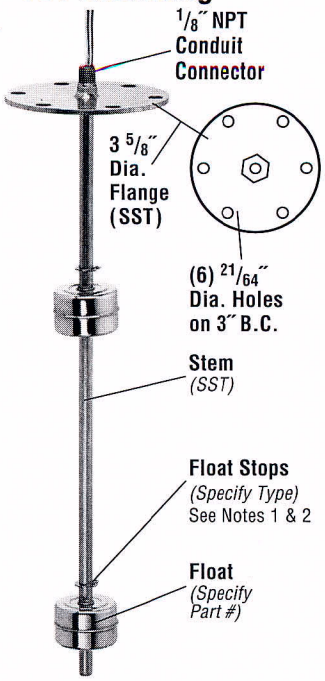


Mounts From Outside of Tank

3 5/8″ Dia. Flange SST Mounting

STYLE **7**

See Note 7



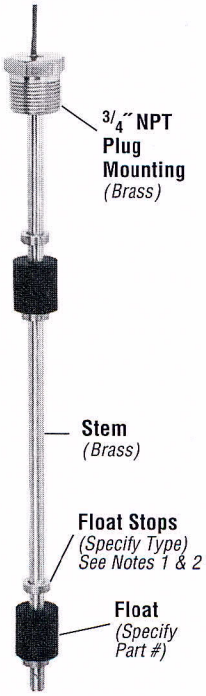
Mounts From Outside of Tank

METAL (5/16″ Diameter Stem)

3/4″ NPT Plug Mounting

STYLE **8**

See Notes 8 & 10

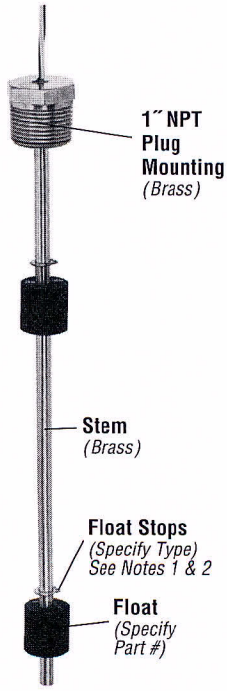


Mounts From Outside of Tank

1″ NPT Plug Mounting

STYLE **9**

See Note 9 & 10

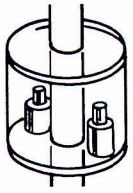


Mounts From Outside of Tank

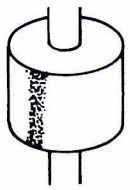
Part Numbers 3458 and 3510 plastic floats are molded in-house. We can certify that our polysulfone and polypropylene floats use only virgin material, and runners are not reintroduced, nor have blow agents or color concentrates been added during processing.

Part Number 3510: the magnets are heat-sealed in place using pure polypropylene welding rods.

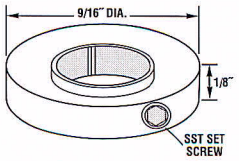
P/N 3458 POLYSULFONE



P/N 3510 POLYPROPYLENE



Collars: Brass or 316 SST Optional



Drawing 1.1

THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

EASY ORDERING
1-800-666-9101

4000 CUSTOM LEVEL SWITCH

5/16″ Diameter Stem

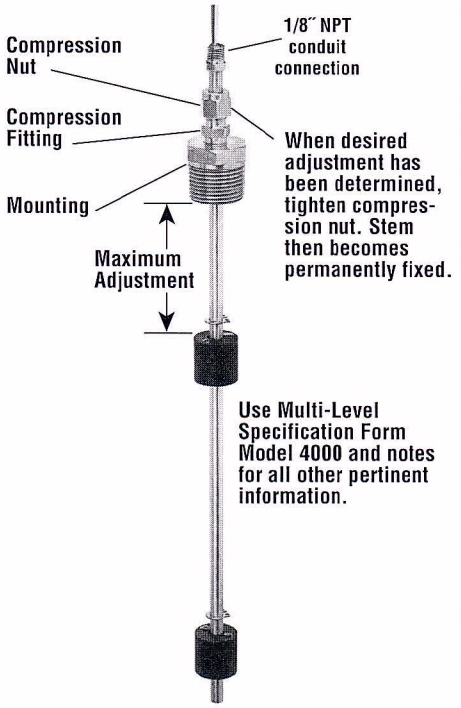
ADJUSTABLE STEM

4000 (Styles 5, 6, 7, 8 and 9)

SPECIFICATIONS:

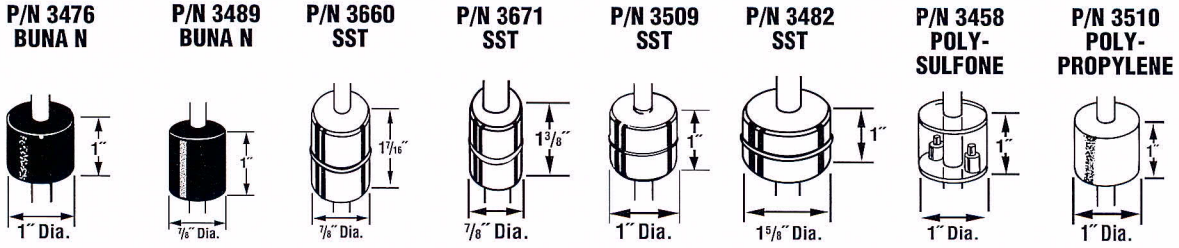
Style	5 & 6	7	8 & 9
Mounting	Brass or Stainless Steel	Stainless Steel	Brass *See Note 10*
Stem	Brass or Stainless Steel	Stainless Steel	Brass *See Note 10*
Float	Customer To Specify Part Number		
Float Stops Grip Rings *See Note 1*	Brass units: Beryllium Copper Grip Rings SST Units: Ph 15-7 Mo SST Grip Rings	Ph 15-7 Mo Stainless Steel	Beryllium Copper *See Note 10*
Float Stops Collars *See Note 2 Drawing 1.1*	Brass units: Brass collars SST Units: Stainless Steel Collars	Stainless Steel	Brass *See Note 10*
Stem Length	Per Customer Requirements		
Reed Switches and Wire *See Notes 3 & 4*	UL Recognized units: SPST Pilot duty 20 VA 120-240 VAC Polymeric Leads: See multi-level specification form		
Reed Switches and Wire *See Notes 3 & 4*	Non UL Recognized units: SPST Pilot duty 20 VA 120-240 VAC SPST Pilot duty 100 VA 120-240 VAC Teflon Leads: See multi-level specification form		
Hysteresis	1/16″ Total Envelope		

For Styles 6, 7 & 8. Option for Model 4000 – 5/16″ Diameter Stem



FLOAT SPECIFICATIONS:

(Styles 5, 6, 7, 8 and 9)



Float P/N	3476 *BUNA*	3489 *BUNA*	3660 *SST*	3671 *SST*	3509 *SST*	3482 *SST*	3458 *Polysulfone*	3510 *Polypropylene*
Temperature Range	-40° to 180°F in water -40° to 230°F in oil		-40°F to +300°F				-40°F to +225°F	
Pressure Max.	150 PSI		500 PSI	750 PSI	400 PSI	150 PSI	75 PSI	100 PSI
Specific Gravity	.55	.51	.7	.88	.77	.57	.65	.81

4000 CUSTOM LEVEL SWITCH

INSTALLATIONS/OPTIONS

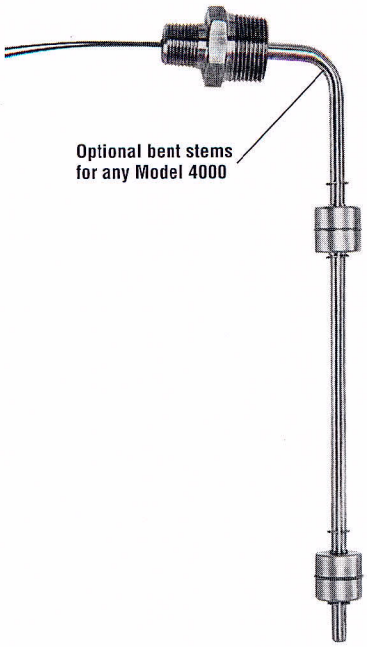
Notes:

1. Grip rings come standard at no extra charge.
2. Optional collars are available from stock. See drawing 1.1.
3. Also available, leads in different lengths, cable, terminated ends, etc. Consult factory.
4. Relays are available for handling higher electrical loads than allowed. See accessary section for details.
5. Style 5 mounting installs from the inside of the tank into a 1/8˝ NPT boss. Specify float part number: 3476, 3489, 3660, 3671, 3509, 3482, 3458, or 3510.
6. Style 6 mounting installs from the outside of the tank into a 1˝ NPT boss. Specify float part number 3476, 3489, 3660, 3671, 3509, 3458, or 3510.
7. Style 7 mounting installs from the outside of the tank onto a mating surface as dimensions. Bore float clearance hole to suit specified float. Specify float part number 3476, 3489, 3660, 3671, 3509, 3482, 3458 or 3510.
8. Style 8 mounting installs from the outside of the tank into a 3/4˝ NPT boss. Specify float part number 3489, 3660 or 3671.
9. Style 9 mounting installs from the outside of the tank into a 1˝ NPT boss. Specify float part number 3476, 3489, 3660, 3671, 3509, 3458 or 3510.
10. Styles 8 and 9 are available constructed of 316 stainless steel and may be ordered with grip rings of Ph 15-7 Mo stainless steel or 316 SST collars. Consult factory.
11. Custom interface floats are available. Consult factory.
12. Multi-level Specification Form 4000 must be used to ensure correct dimensional data.
13. Material of copper-nickel, titanium, hastelloy and aluminum are stocked. Consult factory.

SPECIALTY OPTIONS:

Sanitary Flanges

J-boxes in stock with relays, terminal strips, etc. See *Accessory* Section.



Hirshman Connectors, MS Connectors, etc.

Special mountings to your specifications.

Interface floats: i.e., to detect water in oil.

Adjustable Stem. Options are available from stock.

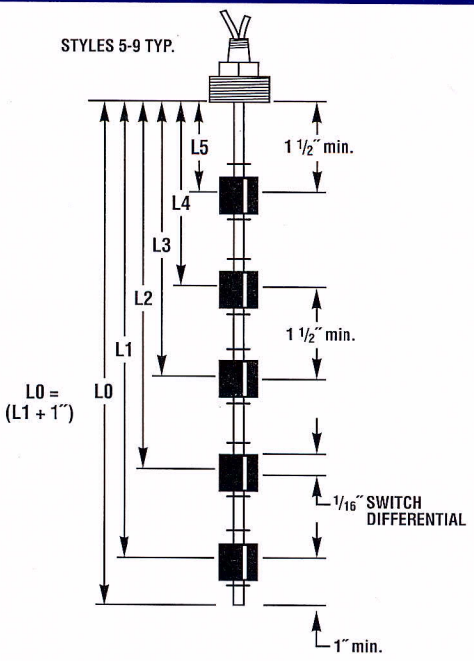
All PVC wetted parts. See Model 4000. 1/2˝ Dia. Stem.

ANSI flange mountings. See Model 4000.

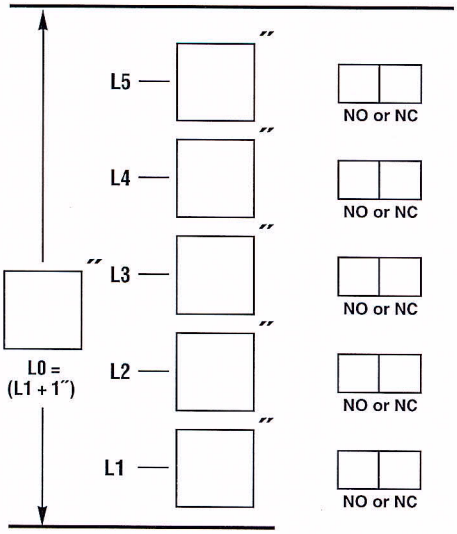
4000 CUSTOM LEVEL SWITCH

All Model 4000 Custom Level Switches are fabricated in-house. Quick shipments of 2 weeks are standard, but if you need a unit sooner, our Short Order Department can satisfy almost any delivery requirement.

Model 4000 Styles 5, 6, 7, 8 & 9 Multi-level Specification Form



STYLES 5, 6, 7, 8 & 9
LOGIC IN TANK EMPTY CONDITION



FURNISH DIMENSIONAL DATA IN APPROPRIATE BOXES LISTED ABOVE

SELECT APPROPRIATE SWITCH LOGIC IN TANK EMPTY CONDITION

Style: 5☐ 6☐ 7☐ 8☐ 9☐

Style 5 & 6 :
Mounting & Stem Material: Brass☐ SST☐

Style 7 :
Mounting & Stem Material: SST☐

Style 8 & 9:
Mounting & Stem Material: Brass☐

Adjustable Mounting: Yes☐ No☐

Float P/N ☐

Mounting Attitude:
VTL to 30° Inclination
Tank Top ☐
Tank Bottom ☐

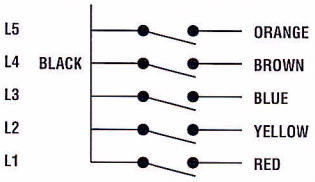
Float Stops:
Brass Units: *(See Notes 1 & 2)*
Beryllium Copper Grip Rings ☐
Brass Collars ☐
SST Units: *(See Notes 1 & 2)*
Ph 15-7 Mo SST Grip Rings ☐
316 SST Collars ☐

Wiring Configurations:
W-A☐ W-B☐

Electrical Connection:
24″ LG. Lead Wire ☐
Junction Box ☐

Switch Type:
SPST 20 VA ☐
SPST 100 VA ☐
☐

W-A SPST 20 WATT OR 100 WATT



WIRE SIZES FOR STYLES 5–9
1 to 5 sensing levels 22 AWG 24″ Lg. Polymeric or Teflon-UL 1213

W-B SPST 20 WATT OR 100 WATT

WIRE SIZES FOR STYLES 5–9
1 to 3 sensing levels 22 AWG 24″ Lg. Polymeric or Teflon-UL 1213

ELECTRICAL REED SWITCHES ARE SHOWN IN N.O. (DRY TANK) POSITION.

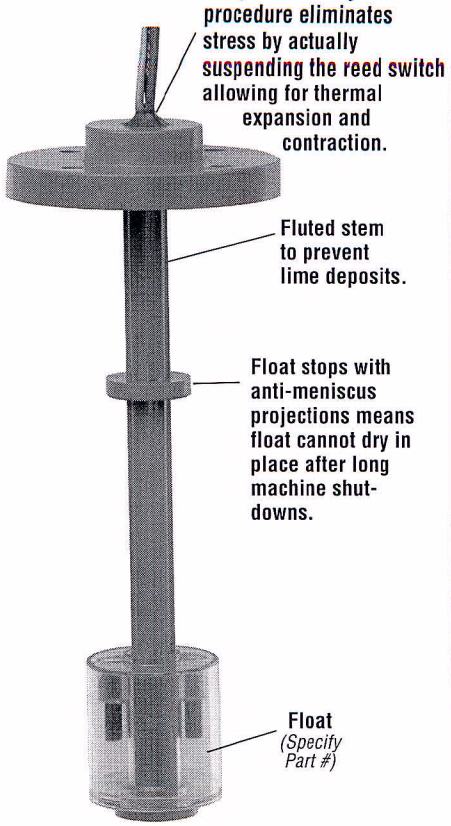
Switch Ratings... Max Resistive Load

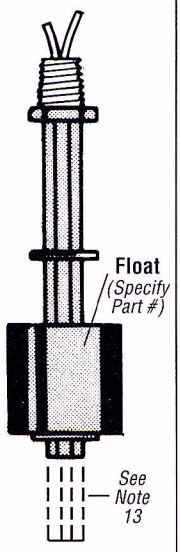
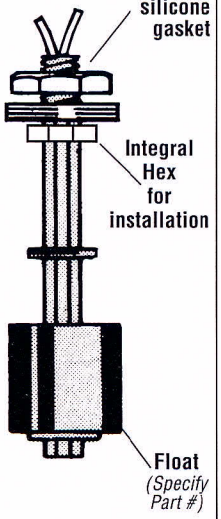
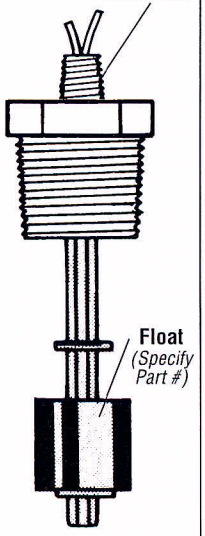
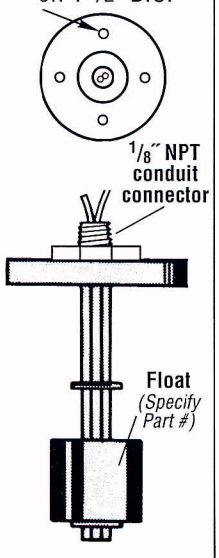
V.A.	VOLTS	AMPS DC	AMPS AC	AMPS AC MAX
20	0-50	.4	.4	1.0
	120	.15	.16	
	240	.06	.08	
100	0-50	1.0	1.5	3.0
	120	.4	.8	
	240	.2	.4	

Switch Rating of UL Recognized Units, 20VA: UL File E86797
Metal Stem Units: 120-240VAC Pilot Duty

5000 CUSTOM LEVEL SWITCHES

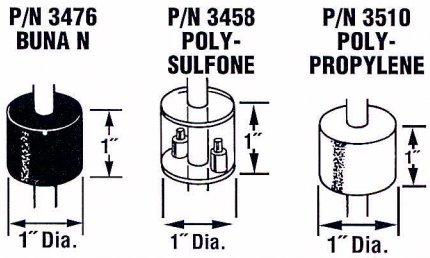
PLASTIC STEM (Polysulfone)



STYLE A	STYLE B	STYLE C	STYLE D
1/8″ NPT Plug Mounting	3/8″ Bulkhead Mounting	1″ NPT Plug Mounting	2″ O.D. Flange Mounting
			
Note 8	Note 9	Note 10	Note 11

Applications:

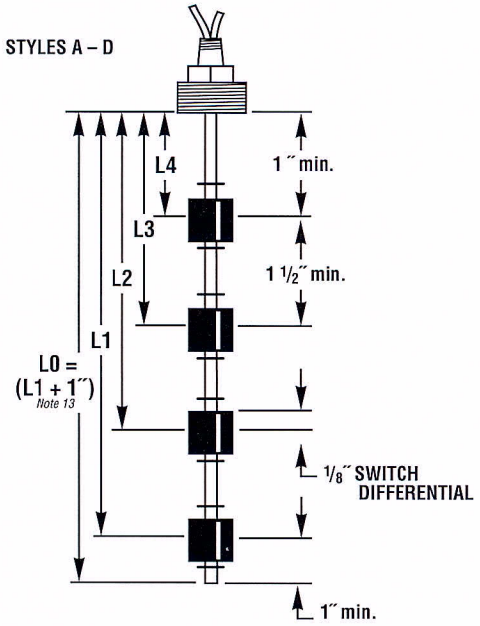
- FDA approved polysulfone for use in food and beverage control.

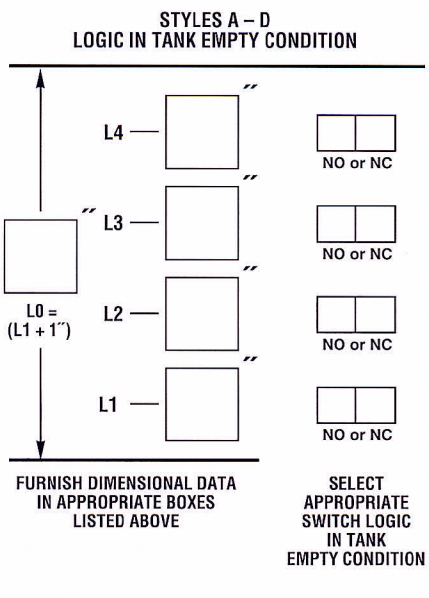


Float P/N	3476 *BUNA*	3458 *Polysulfone*	3510 *Polypropylene*
Temperature Range	-40° to +180°F in Water -40° to +230°F in Oil	-40°F to +225°F	
Pressure Max.	150 PSI	75 PSI	100 PSI
Specific Gravity	.55	.65	.81

5/16″ DIAMETER STEMS	
Style	A, B, C, D
Materials	Polysulfone
Mounting	
Stem Float Stops *See Note 12*	
Floats	Customer to specify. See Notes 1 - 5 & 12.
Stem Length	Per customer requirements.
Reed Switches and Wires	UL Recognized: SPST Pilot duty 20 VA 50-240 VAC PVC Leads 24″ Long. See Multi-level Specification Form. See Notes 6 & 7.
Temperature	Polysulfone max. temp. range -40° to +225°F
Hysteresis	1/8″ total envelope

MULTI-LEVEL SPECIFICATION FORM 4000





Style: A☐ B☐ C☐ D☐

Float P/N _____

Mounting Attitude:

VTL to 30° Inclination

Tank Top ☐

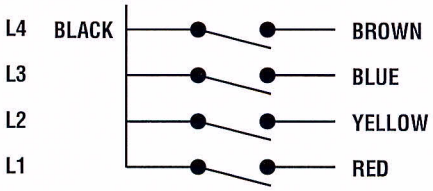
Tank Bottom ☐

Wiring Configurations:

W-A ☐ W-B ☐

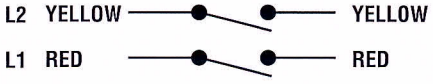
ELECTRICAL REED SWITCHES ARE SHOWN IN N.O. (DRY TANK) POSITION.

W-A SPST 20 VA



WIRE SIZES FOR STYLES A – D
1 to 4 sensing levels 22 AWG 24″ Lg. PVC

W-B SPST 20 VA



WIRE SIZES FOR STYLES A – D
1 or 2 sensing levels 22 AWG 24″ Lg. PVC

Switch Ratings... Max Resistive Load

V.A.	VOLTS	AMPS DC	AMPS AC	AMPS AC MAX
20	0-50	.4	.4	1.0
	120	.15	.16	
	240	.06	.08	

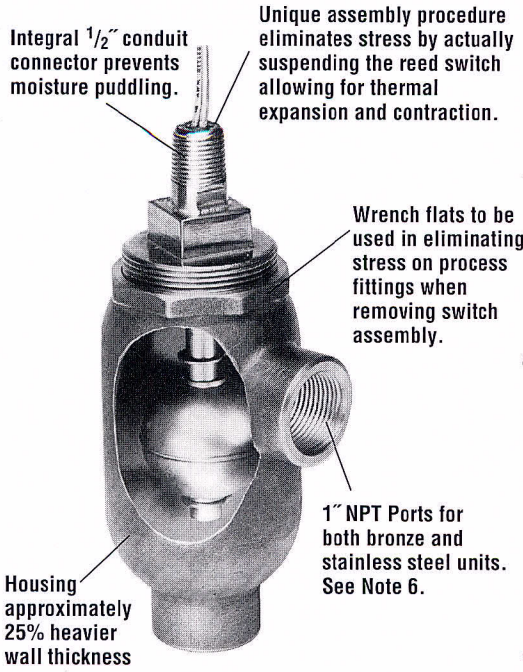
Switch Rating of UL Recognized Units
20VA 50 - 240 VAC Pilot Duty
UL File E86797

NOTES:

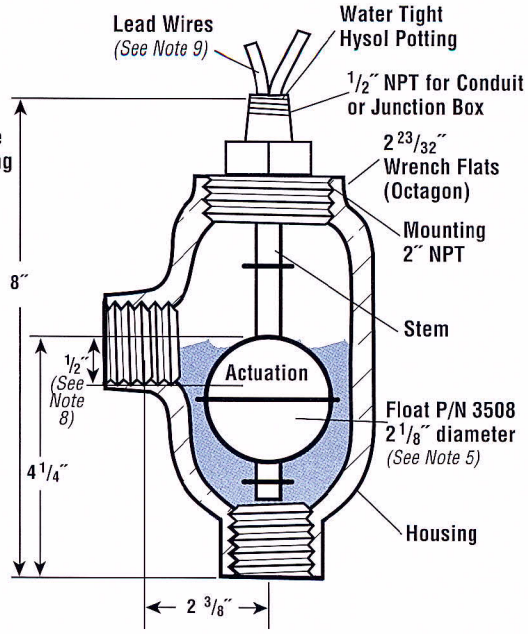
1. Unit's maximum pressure rating is the lowest pressure rated component either mounting and stem pressure rating or float pressure rating.
2. Unit's maximum temperature rating is the lowest temperature rated component either polysulfone temperature range or float temperature range.
3. Pressure rating of styles A & B mounting and stem are 100 PSI @ 72°F. Also see float pressure rating. See Note 1.
4. Pressure rating of style C mounting and stem is 50 PSI @ 72°F. Also see float pressure rating. See Note 1.
5. Pressure rating of style D mounting and stem is 10 PSI @ 72°F. Also see float pressure rating. See Note 1.
6. Also available: leads in different lengths, cable, and/or terminated ends, etc. Consult factory.
7. Relays are available for electrical loads higher than allowed. See *Accessories* section for details.
8. Style A mounting installs from the inside of the tank into a 1/8″ NPT boss.
9. Style B mounting installs from the inside of the tank through a 3/8″ dia. hole.
10. Style C mounting installs from the outside of the tank into a 1″ NPT boss.
11. Style D mounting installs from the outside of the tank onto a mating surface as dimensioned. Bore float clearance hole to suit specified float. Maximum float diameter 1″.
12. Other floats than shown are available. See Model 4000, metal 5/16″ diameter stem, styles 5 - 9 for details.
13. Request extra 1″ stem length to attach guy wires (customer supplied) for exceptionally long stems or if unit will be subjected to turbulence.
14. Custom interface floats are available. Consult factory.
15. Multi-level Specification Form 4000 must be used to ensure correct dimensional data.

3700 BOTTLE SWITCH

METAL



DIMENSIONAL DATA:



DIMENSIONS ARE FOR BOTH BRONZE & STAINLESS STEEL UNITS.

Specifications:

Part Number	Housing Material	Ports NPT	Mounting	Stem	Float	Switch	Lead Wires	Operating Temperature	Operating Pressure
43402	Bronze C836	1″	Bronze C836	Brass *See Note 1*	316 Stainless Steel *See Note 5*	20 VA SPST *See Notes 2, 11 & 12*	18 AWG Polymeric 24″ Long *See Note 9*	-40°F to +300°F *See Note 10*	750 PSI Max. (Float) *See Note 4*
43404	316 Stainless Steel	1″	316 Stainless Steel	316 Stainless Steel *See Note 1*					

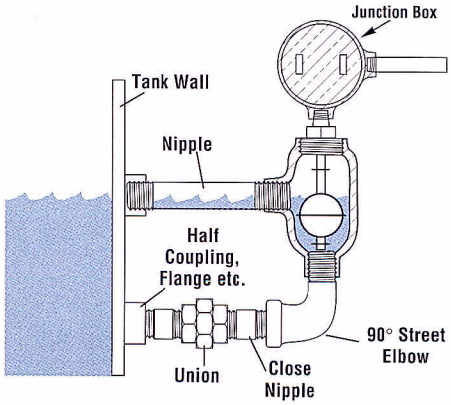
Notes:

1. Brass stems use beryllium copper grip rings, 316 stainless stems use Ph 15-7 Mo grip rings, optional 316 stainless steel collars available, consult factory.
2. Optional high wattage SPST and SPDT reed switches are stocked. Consult factory.
3. Install unit vertical as shown; lead wires up.
4. Actual bronze housing burst pressure, 2500 psi ±@ 70°F; SST housing higher.
5. Float specific gravity .65
6. Optional silver braze ports to MIL-F-1183 and socket weld ports available. Consult factory.
7. Weight 5.5 ± lbs.
8. Approximate actuation in water. Specific gravity 1.0.
9. Optional cable available. Consult factory.
10. Higher temperature units available up to 450°F. Consult factory.
11. Relays for higher loads, junction boxes, terminal strips, etc. are available. See accessories section for details.
12. Unit is supplied in N.O Tank Dry condition. Logic is reversed by inverting float.

Applications:

- External of tank mount.
- Use this model when the tank's internal area is inaccessible.

TYPICAL THREADED PIPE AND FITTING INSTALLATION



If more than one switch point is needed, see Model 4000 Style 10, for custom length housings and switch points, to your requirements.

Model 4000 Style 10

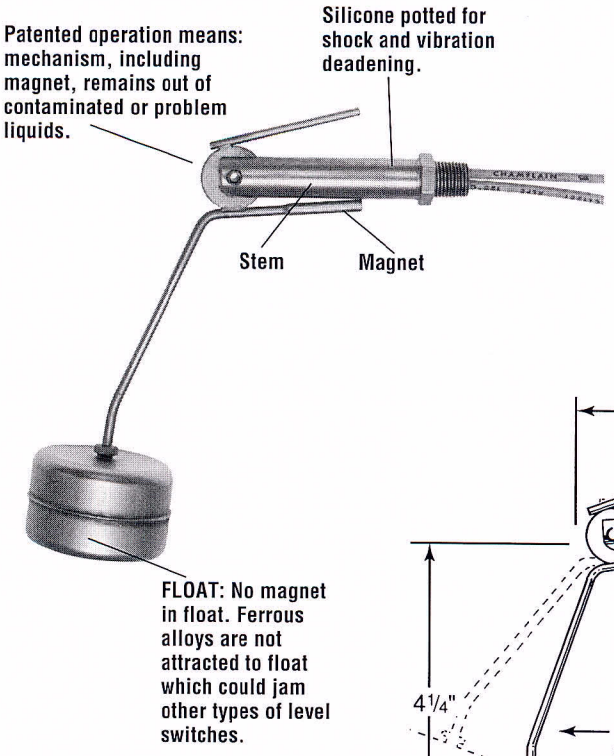
THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

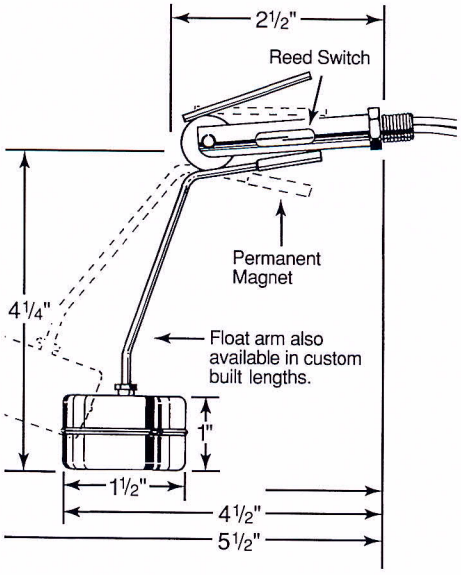
EASY ORDERING
1-800-666-9101

3900 SIDE MOUNTED

METAL

Patent Number 5117693





Drawing 1.0

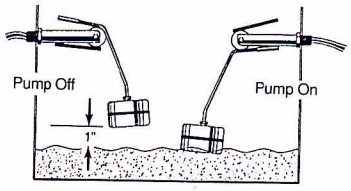
Applications:

- Ideal for dirty or contaminated liquids.
- Viscous fluids.
- Only the float is in contact with the liquid.
- All metal design.
- Choice of N.O. or N.C. switch logic.

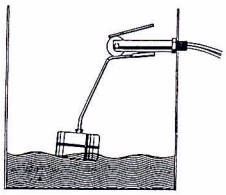
Notes:

1. Other mounting styles available. Consult factory.
2. Float Sp. Gr. .5.
3. Consult factory for operating temperatures to 450°F.
4. Switch logic in tank dry condition per drawing 1.0.
5. Optional 100W SPST reed switches are stocked. Consult factory.
6. Relays are available for handling higher loads than allowed. See *Accessories* section for details.

The unique design permits only the float to come in contact with the liquid, thereby eliminating the possibility of jamming caused by the metallic chips collecting on the magnet.

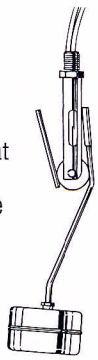


Grinding fluid contaminated with metallic chips and lube oil.



Viscous epoxy.

One level switch maintains the proper level of a viscous epoxy used in automatic coating machines.



By simply bending the float arm, tank top mounting may be used in lieu of side of tank installation.

Specifications:

P/N N.O. *See Note 4*	P/N N.C. *See Note 4*	Mount-ing	Stem	Float	Switch	Lead Wires	Oper. Temp.	Oper. Pressure
43031	43033	1/8˝ NPT *See Note 1*	Brass	SST *See Note 2*	20VA SPST *See Notes 5 & 6*	18 AWG Poly-meric	-40°F to +300°F *See Note 3*	50 PSIG
43032	43034		SST					

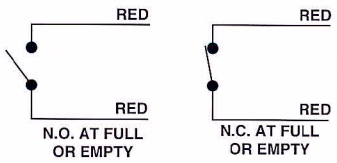
Electrical

Switch Ratings... Max Resistive Loads

V.A.	VOLTS	AMPS DC	AMPS AC MAX	AMPS AC MAX
20	0 - 50	.4	.4	1.0
	120	.15	.16	
	240	.06	.08	

Switch Rating 20VA: 120-240VAC Pilot Duty

WIRING DIAGRAM FOR STANDARD SPST SWITCHES



THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

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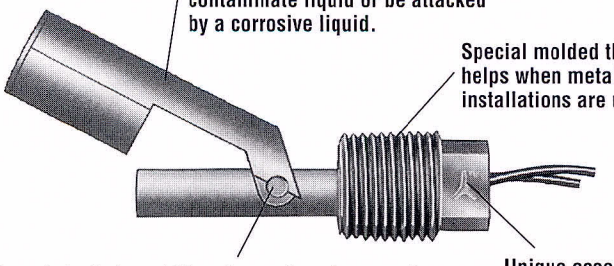
4400 SIDE MOUNTED

PLASTIC

1/2″ NPT



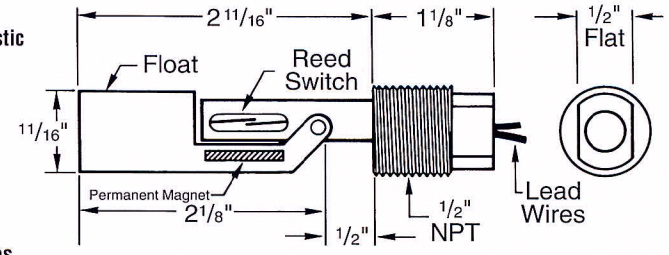
Strong Alnico bar magnet hermetically sealed inside means no other wetted material to contaminate liquid or be attacked by a corrosive liquid.

Special molded thread helps when metal to plastic installations are used.

Round pivot pins add bearing surface for smooth operation and due to design clearances, squeeze out the liquid from either side during operation to help eliminate build-up.

Unique assembly procedure eliminates stress by actually suspending the reed switch allowing for thermal expansion and contraction.

DIMENSIONAL DATA

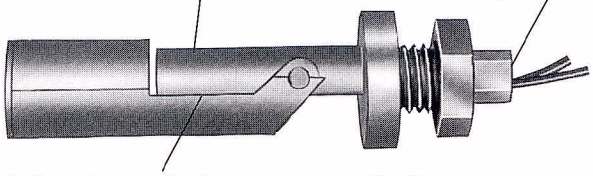


Specifications:

P/N	Mounting	Stem	Float *See Note 7*	Switch	Lead Wires	Operating Temp.	Operating Pressure
24237	1/2″ NPT	Poly-sulfone	Poly-sulfone	20VA SPST *See Notes 2 & 3*	22 AWG PVC 24″ Long *See Note 1*	-40°F to +225°F	150 PSIG Max.
24250		Poly-propylene	Poly-propylene				100 PSIG Max.

1/2″ -13 or 5/8″ -11 Bulkhead

High wattage reed switch de-rated and matched to the strong Alnico bar magnet makes a superior match.

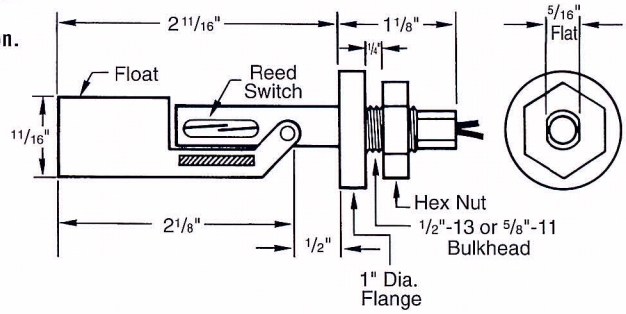


Unique assembly procedure eliminates stress by actually suspending the reed switch allowing for thermal expansion and contraction.

Anti-meniscus projection means float cannot dry in place after long machine shut-downs.

Plastic components are molded, in-house, using only certified 100% virgin material. Runners are not reintroduced to the performance parts.

DIMENSIONAL DATA



Specifications:

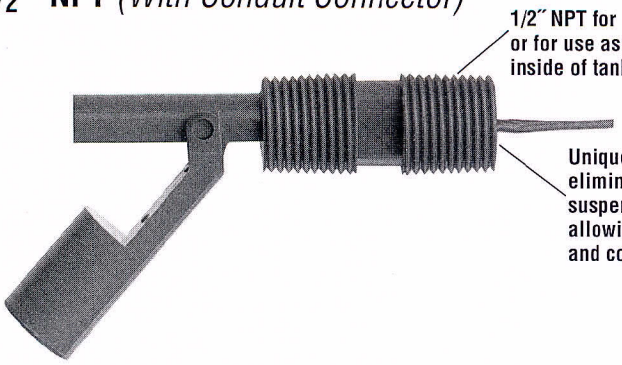
P/N	Mounting	Stem	Float *See Note 7*	Switch	Lead Wires	Operating Temp.	Operating Pressure
24238	1/2″ - 13 Bulkhead With Nut *See Note 4*	Poly-sulfone	Poly-sulfone	20VA SPST *See Notes 2 & 3*	22 AWG PVC 24″ Long *See Note 1*	-40°F to +225°F	150 PSIG Max.
42605		Poly-propylene	Poly-propylene				100 PSIG Max.
42603	5/8″ - 11 Bulkhead With Nut *See Note 5*	Poly-sulfone	Poly-sulfone				150 PSIG Max.
42606		Poly-propylene	Poly-propylene				100 PSIG Max.

Because Thomas Products Ltd. molds in-house, we can certify that during the molding process color concentrates have not been added that hinder FDA requirements of additive leaching.

4400 SIDE MOUNTED

PLASTIC

1/2″ NPT *(With Conduit Connector)*



Notes:

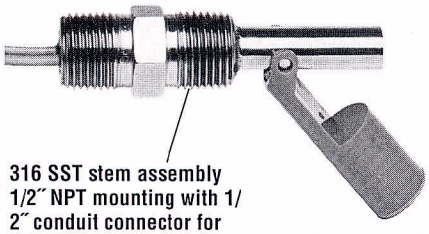
1. Lead wires are available in different lengths, terminated ends or cable. Consult factory.
2. 100 VA SPST non-UL reed switches are stocked. Consult factory.
3. Relays are available for handling higher loads than allowed. See *Accessories* section for details.
4. Optional silicone gasket P/N 3474 1/16″ thick x 1″ O.D. x 1/2″ I.D. 40 durometer. (Other materials are available – consult factory.
5. Optional silicone gasket P/N 3500 1/16″ thick x 1″ O.D. x 5/8″ I.D. 40 durometer. (Other materials are available – consult factory.
6. All Model 4400 level switches depicted are available with cable. All specifications are the same except for operating temperature of -40°F to +176°F. Determine the length of cable required and contact factory sales department for pricing. UL recognized Model No. 4400L.
7. Float specific gravity .7

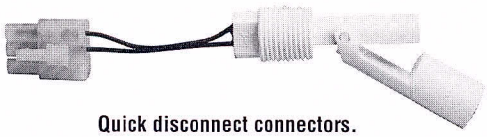
Specifications:

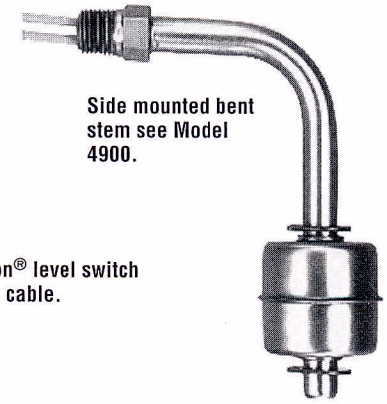
P/N	Mounting	Stem	Float *See Note 7*	Switch	Lead Wires	Operating Temp.	Operating Pressure
42681	1/2″ NPT	Poly-sulfone	Poly-sulfone	20VA SPST *See Notes 2 & 3*	22 AWG PVC 24″ Long *See Note 1*	-40°F to +225°F	150 PSIG Max.
42682		Poly-propylene	Poly-propylene				100 PSIG Max.

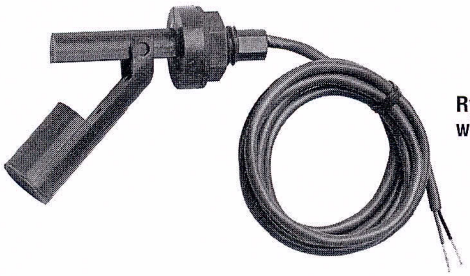
- Variations of standard unit can be easily done in our tool room to provide you with samples before production starts.

SPECIALTY OPTIONS:


316 SST stem assembly 1/2″ NPT mounting with 1/2″ conduit connector for J-box, polysulfone float.


Quick disconnect connectors.


Side mounted bent stem see Model 4900.


Ryton® level switch with cable.

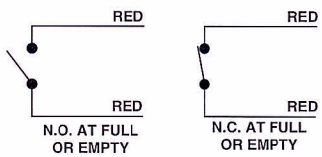
Electrical

Switch Ratings... Max Resistive Loads

V.A.	VOLTS	AMPS DC	AMPS AC MAX	AMPS AC MAX
20	0 - 50	.4	.4	1.0
	120	.15	.16	
	240	.06	.08	

Switch Rating of UL Recognized Units, 50-240VAC Pilot Duty.

WIRING DIAGRAM FOR STANDARD SPST SWITCHES



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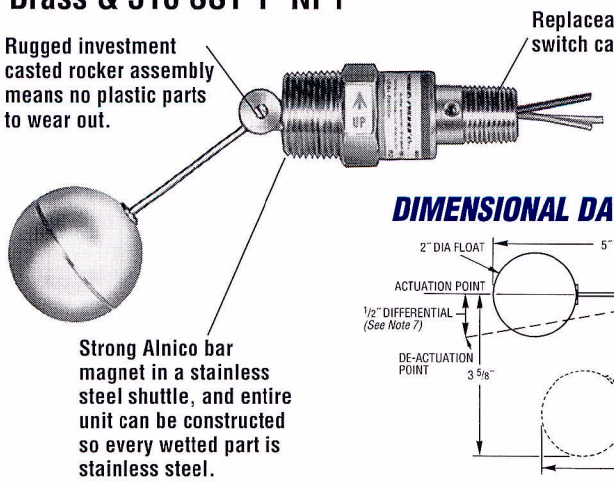
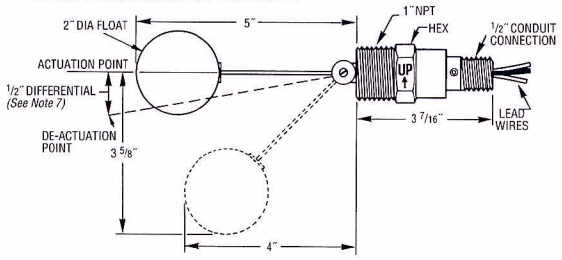
METAL

Brass & 316 SST 1″ NPT



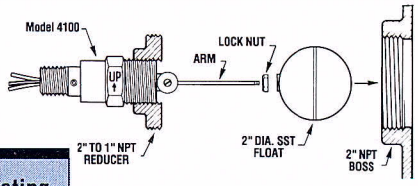
DIMENSIONAL DATA:



Drawing 1.0

Notes:

1. Float S.G. .8
2. Float S.G. .75
3. Lead wires are available in different lengths, terminated ends or cable. Consult factory.
4. Relays are available for handling higher loads than allowed. See *Accessories* section for details.
5. SST units can be made with all wetted parts being SST.
6. 100 VA SPST non-UL reed switches are stocked. Consult factory.
7. 1″ differential units are available. Consult factory.

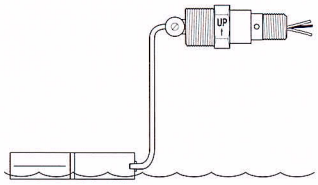


Drawing 1.1

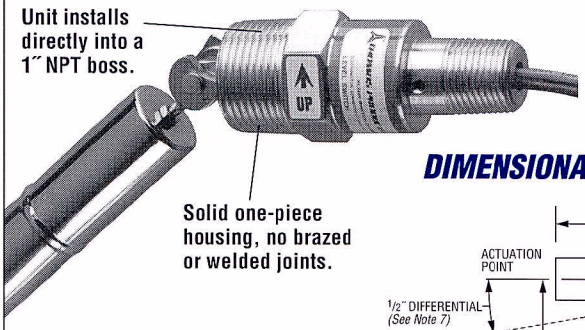
Specifications:

P/N	Mounting	Stem	Float	Switch	Lead Wires	Operating Temp.	Operating Pressure
24221	1″NPT. *See Dwg. 1.0*	Brass	316 SST 2″ Spherical *See Note 1*	20VA SPDT *See Note 6*	18 AWG Polymeric 24″Long *See Notes 3, 4*	-30°F to +300°F	900 PSIG Max.
24222		316 SST *See Note 5*					
24227	1″NPT. *See Dwg. 2.0*	Brass	316 SST 1″ Cylindrical *See Note 2*	20VA SPDT *See Note 6*	18 AWG Polymeric 24″Long *See Notes 3, 4*	-30°F to +300°F	1000 PSIG Max.
24228		316 SST *See Note 5*					

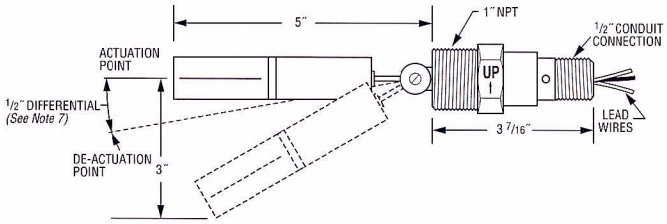
Custom made arms are available to help keep the contaminated liquid out of the mechanism.



Brass & 316 SST 1″ NPT

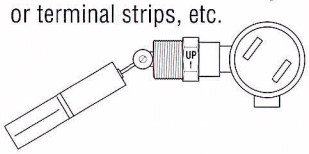


DIMENSIONAL DATA:

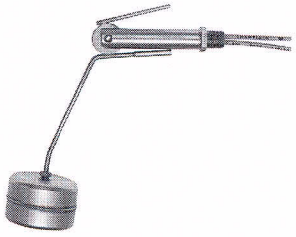


Drawing 2.0

Optional junction boxes shown in the *Accessories* section mount directly onto the 1/2″ conduit connection for relays or terminal strips, etc.



See Model 3900 for use in contaminated liquids where only the float gets wet.

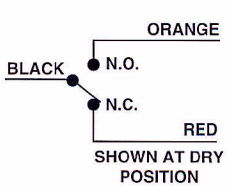


Electrical

Switch Ratings... Max Resistive Loads

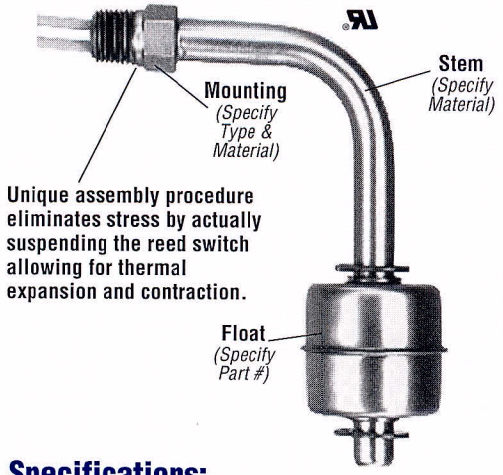
V.A.	VOLTS	AMPS DC	AMPS AC	AMPS AC MAX
20	0 - 50	.4	.4	1.0
	120	.15	.16	
	240	.06	.08	

20VA - 120-240 VAC Pilot Duty



4900 SIDE MOUNTED

METAL STEM

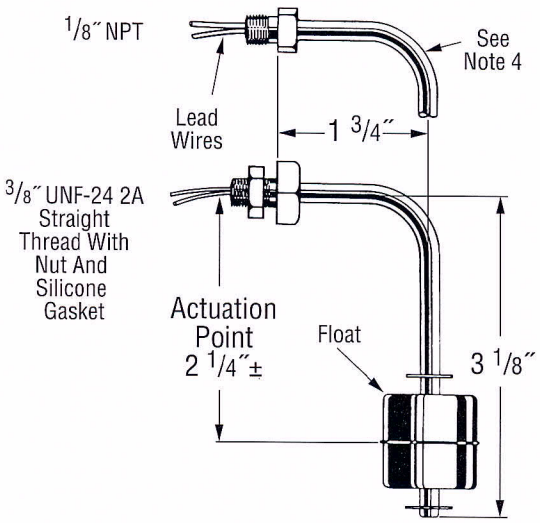


Notes:

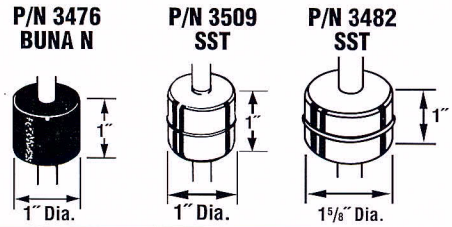
1. Teflon® coated stems and floats are available. Consult factory.
2. Lead wires are available in different lengths, terminated ends or cable. Consult factory.
3. Relays are available for handling higher loads than allowed. See *Accessories* section for details.
4. Custom bend locations are available per your specification. Consult factory.
5. High temperature units are available up to 450°F. Consult factory.
6. 100 VA SPST non-UL reed switches are stocked. Consult factory.
7. Brass units use beryllium copper grip rings. SST units use 15-7 Mo SST grip rings.
8. Optional collars are available from stock. See drawing 1.1. Consult factory.
9. Silicone gasket 1″ O.D. x 3/8″ I.D. x 1/16″ thick 40 durometer.
10. 1/8″ NPT mounting installs from inside the tank into a 1/8″ NPT boss.
11. 3/8″-24 UNF 2A mounting installs from the inside of the tank into a 13/32″ dia. hole.
12. Interface floats are available. Consult factory.

Specifications:

P/N	Mounting	Stem	Float	Switch	Lead Wires
42867	1/8″ NPT *See Note 10*	Brass	BUNA *P/N 3476*	20VA SPST *See Notes 3, 6*	22 AWG 24″ Long Polymeric *See Note 2*
42868		SST			
42869		Brass	SST *P/N 3509*		
42870		SST			
42875		Brass	SST *P/N 3482*		
42876		SST			
42882	3/8″ - 24 UNF 2A Bulkhead With Nut And Silicone Gasket *See Notes 9, 11*	Brass	BUNA *P/N 3476*		
42883		SST			
42884		Brass	SST *P/N 3509*		
42885		SST			
42886		Brass	SST *P/N 3482*		
42887		SST			

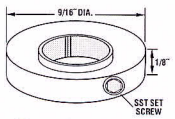


Float Specifications:

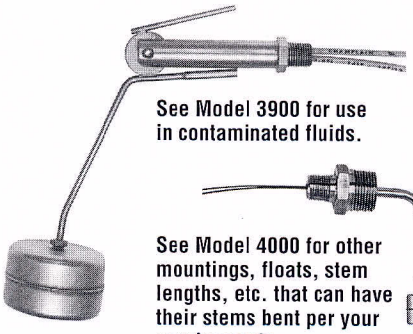


Float P/N *See Note 12*	3476 *BUNA*	3509 *SST*	3482 *SST*
Temperature Range *See Note 5*	-40° to 180°F in Water -40° to 230°F in oil	-40°F to +300°F	
Pressure Max.	150 PSI	400 PSI	150 PSI
Specific Gravity	.55	.77	.57

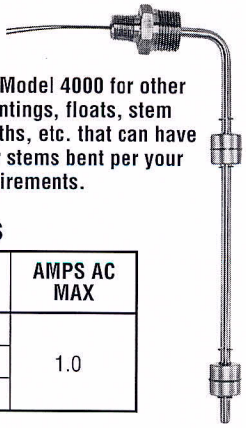
Collars: Brass or 316 SST Optional



Drawing 1.1



See Model 3900 for use in contaminated fluids.



See Model 4000 for other mountings, floats, stem lengths, etc. that can have their stems bent per your requirements.

Electrical

Switch Ratings... Max Resistive Loads

V.A.	VOLTS	AMPS DC	AMPS AC	AMPS AC MAX
20	0 - 50	.4	.4	1.0
	120	.15	.16	
	240	.06	.08	

20VA - 120-240 VAC Pilot Duty

4200 SINGLE LEVEL

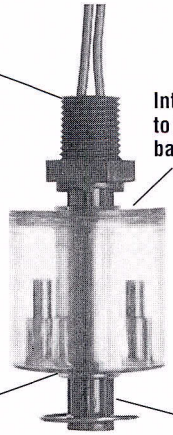
PLASTIC STEM

Plastic 1/8″ NPT

Unique assembly procedure eliminates stress by actually suspending the reed switch allowing for thermal expansion and contraction.

Beverage control food contact. Made of FDA approved material.

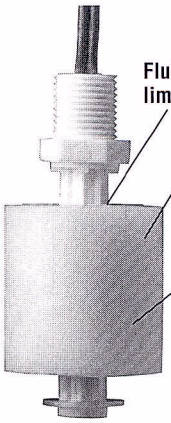
Anti-meniscus projections mean float cannot dry in place after lengthy machine shut downs.



Internal lettering to help prevent bacterial growth.

Fluted stem to prevent lime deposits.

P/N 24251



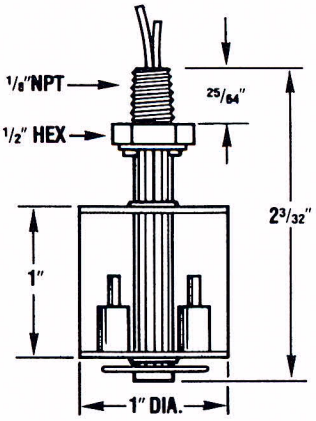
Fluted stem to prevent lime deposits.

Magnets are heat-sealed in place using pure polypropylene welding rods, not epoxy.

Molded in-house. We can certify that our polypropylene floats use only virgin material, runners are not reintroduced, nor have blow agents or color concentrates been added during processing.

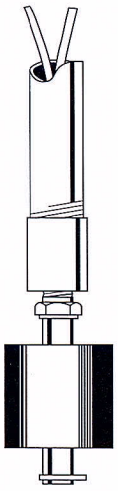
P/N 42654

DIMENSIONAL DATA:



All Model 4200 level switches depicted are available with cable. All specifications are the same except for operating temperatures of -40°F to +176°F. Determine length of cable required and contact factory sales department for pricing. *See Note 7.*

When extending a level switch deep into a tank, configuration shown can mount, confine and protect the lead wires.



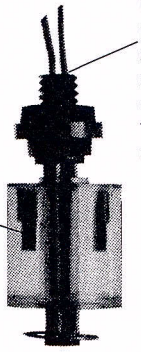
Specifications:

P/N	Mounting	Stem	Float	Switch	Lead Wires	Operating Temp.	Operating Pressure
24251	1/8″ NPT	Poly-sulfone	Poly-sulfone *See Note 3*	20VA SPST *Note 2*	22 AWG PVC 24″ Long *See Note 1*	-40°F to +225°F	75 PSIG Max.
42654		Poly-propylene	Poly-propylene *See Note 4*				100 PSIG Max.

Plastic 3/8″ -16 Bulkhead

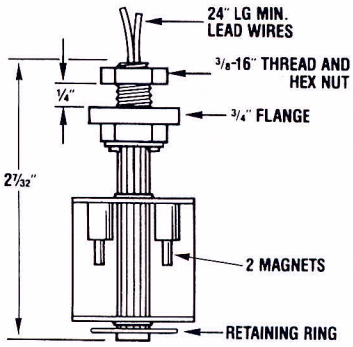
Unique assembly procedure eliminates stress by actually suspending the reed switch allowing for thermal expansion and contraction.

Magnets hermetically sealed from the inside of the float means no potting is exposed to the media.



P/N 24252

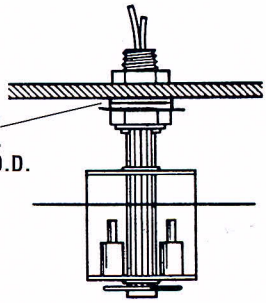
DIMENSIONAL DATA:



Specifications:

P/N	Mounting	Stem	Float	Switch	Lead Wires	Operating Temp.	Operating Pressure
24252	3/8″- 16 Bulkhead With Nut * Gasket P/N 3488 *See Dwg. 1.0*	Poly-sulfone	Poly-sulfone *See Note 3*	20VA SPST *See Note 2*	22 AWG PVC 24″ Long *See Note 1*	-40°F to +225°F	75 PSIG Max.

Optional silicone gasket P/N 3488. 1/16″ thick 3/4″ O.D. 40 durometer.



Drawing 1.0

THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

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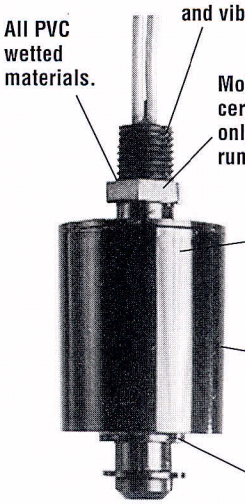
4800 SINGLE LEVEL

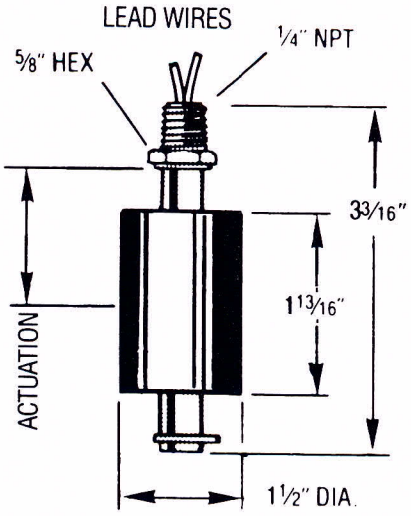
PLASTIC STEM

1/4" NPT



NOTE: Photo shown in black for clarity.

DIMENSIONAL DATA:



Notes:

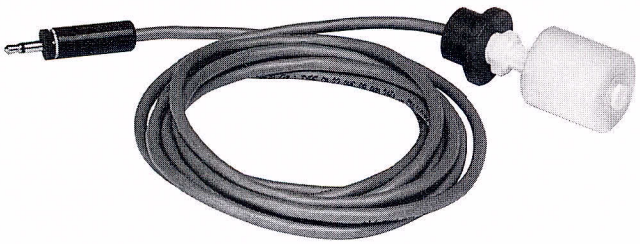
1. Lead wires are available in different lengths, terminated ends or cable. Contact factory.
2. 100 VA SPST reed switch is available non UL. Consult factory.
3. Float specific gravity... .65
4. Float specific gravity... .81
5. Float specific gravity... .85
6. Custom interface floats are available. Consult factory.
7. PVC cable UL 2464 AWG #22 300V 80°C. Customer to specify length. Consult factory for pricing. UL recognized Model No. 4200L.
8. 100 VA SPST and 20 VA SPDT reed switches are available. Consult factory.
9. Relays are available for handling higher loads than allowed. See *Accessories* section for details.

Specifications:

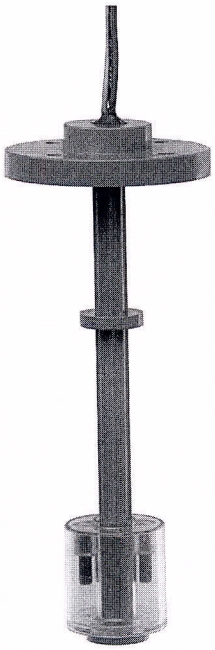
P/N	Mounting	Stem	Float	Switch	Lead Wires	Operating Temp.	Operating Pressure
41401	1/4" NPT	PVC	PVC *See Note 5*	20VA SPST *See Note 2*	18 AWG PVC 24" Long *See Note 1*	-30°F to +140°F	100 PSIG Max.

When a plastic unit with a long stem or more than one switch point is needed, see Model 4000 PVC or Model 5000 Polysulfone.

Specialty Option:



Model 4000 PVC



Model 5000 Polysulfone

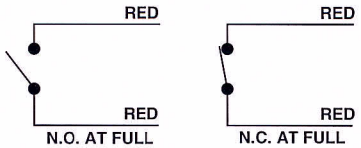
Electrical

Switch Ratings... Max Resistive Loads

V.A.	VOLTS	AMPS DC	AMPS AC	AMPS AC MAX
20	0 - 50	.4	.4	1.0
	120	.15	.16	
	240	.06	.08	

Switch Rating of UL recognized units 20VA - 50-240 VAC Pilot Duty

WIRING DIAGRAM FOR STANDARD SPST SWITCHES



Switch logic is changed by removing retaining ring and inverting float.

THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

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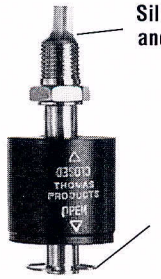
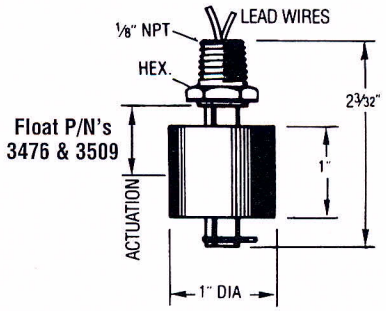
4200 SINGLE LEVEL

METAL STEM

Brass, 316 SST and BUNA N 1/8" NPT



DIMENSIONAL DATA:



Specifications:

P/N	Mounting	Stem	Float	Switch	Lead Wires	Operating Temp.	Operating Pressure
41001	1/8" NPT *See Note 6*	Brass	P/N 3476 BUNA *See Notes 3 & 11*	20VA SPST	22 AWG Polymeric 24" Long *See Notes 1 & 2*	-40° to +180°F in Water -40° to +230°F in Oils	150 PSIG Max.
41002		316 SST *See Note 8*	P/N 3476 BUNA *See Notes 3 & 11*				
41003			P/N 3509 316 SST *See Notes 5, 9, 11*			-40°F to +300°F *See Note 10*	400 PSIG Max.
41008			P/N 3482 316 SST *See Notes 9, 11, 14*				150 PSIG Max.

4200H

HAZARDOUS LOCATIONS

Models 4200H and 4700H have been tested and approved by Underwriters Laboratories for use in hazardous locations for:

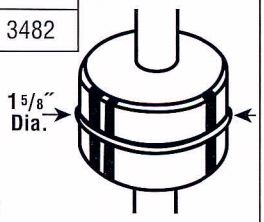
Class I Div. I Groups C & D. Unit must be installed in accordance with article 501-4 (A) N.E.C. 1993.

Class I Div. 2 Groups A, B, C & D. Unit to be mounted in a suitable enclosure and wiring to be installed in accordance with article 501-4 (B) N.E.C. 1993.

Class I Div. 1 Groups C & D.
Class I Div. 2 Groups A, B, C & D.

P/N	Stem	Float P/N
43529	316 SST	3509
43531		3482

P/N 3482
See Note 14



See Notes 15 & 16

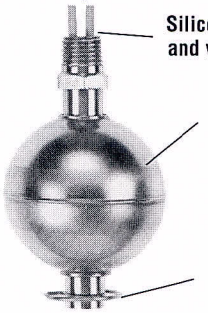
Class I Div. 2 Groups A, B, C & D.

P/N	Stem	Float P/N
43533	Brass	3509
43534		3482

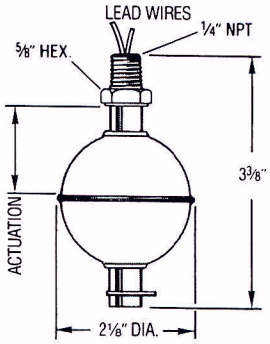
4700 SINGLE LEVEL

METAL STEM

316 SST 1/4" NPT



DIMENSIONAL DATA:



Specifications:

P/N	Mounting	Stem	Float	Switch SPST *See Note 13*	Lead Wires	Operating Temp.	Operating Pressure
41301	1/4" NPT *See Note 6*	316 SST *See Note 8*	P/N 3508 316 SST *See Notes 4, 9, 11*	20 VA	18 AWG Polymeric 24" Long *See Notes 1 & 2*	-40°F to +300°F *See Note 10*	750 PSIG Max.
41302				100 VA			
41321		Brass		20 VA			

4700H

HAZARDOUS LOCATIONS

Class I Div. 1 Groups C & D.
Class I Div. 2 Groups A, B, C & D.

P/N	Stem	Float P/N
43651	316 SST	3508

Class I Div. 2 Groups A, B, C & D.

P/N	Stem	Float P/N
43653	Brass	3508

See Note 17

THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

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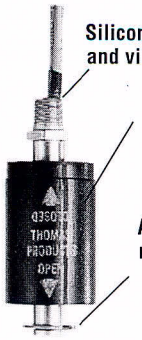
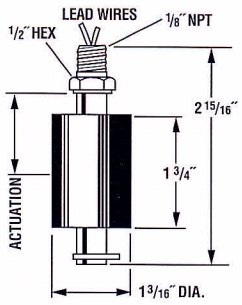
4500 SINGLE LEVEL

METAL STEM

Brass, 316 SST and BUNA N 1/8″ NPT



DIMENSIONAL DATA:



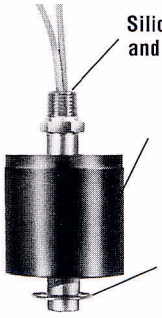
Specifications:

P/N	Mounting	Stem	Float	Switch SPST *See Note 13*	Lead Wires	Operating Temp.	Operating Pressure
41101	1/8″ NPT *See Note 6*	Brass	BUNA N *See Notes* 5[1] *& 18*	20VA	18 AWG Polymeric 24″Long *See Notes 1 & 2*	-40° to +180°F in Water	150 PSIG Max.
41102		Brass		100VA			
41103		316 SST *See Note 8*		20VA		-40° to +230°F in Oils	
41104		316 SST *See Note 8*		100VA			

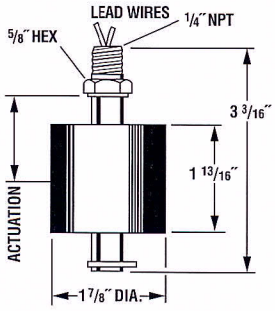
4600 SINGLE LEVEL

METAL STEM

Brass, 316 SST and BUNA N 1/4″ NPT



DIMENSIONAL DATA:



Specifications:

P/N	Mounting	Stem	Float	Switch SPST *See Note 13*	Lead Wires	Operating Temp.	Operating Pressure
41201	1/4″ NPT *See Note 6*	Brass	BUNA N *See Notes 3 & 11*	20VA	18 AWG Polymeric 24″Long *See Notes 1 & 2*	-40° to +180°F in Water	150 PSIG Max.
41202		Brass		100VA			
41203		316 SST *See Note 8*		20VA		-40° to +230°F in Oils	
41204		316 SST *See Note 8*		100VA			

Notes:

1. Lead wires are available in different lengths, terminated ends or cable. Consult factory. *See Note 12.*
2. Relays are available for handling higher loads than allowed. See *Accessories* section for details.
3. Float specific gravity... .55
4. Float specific gravity... .65
5. Float specific gravity... .7

5[1]. Float specific gravity... .80

6. Other standard mountings are available, i.e. 1/4″ and 1/2″ NPT, bulkhead, etc. Consult factory.
7. SPDT switches are available. Consult factory.
8. Teflon coated stems are available. Consult factory.
9. Teflon factory coated floats are available. Consult factory.
10. High temperature units up to 450°F are available. Consult factory.
11. Custom interface floats are available. Consult factory.
12. Optional PVC cable UL 2464 AWG #22 300V 80°C Underwriters Laboratories recognized. Consult factory.
13. SPDT reed switches are available. Consult factory.
14. Float specific gravity... .57
15. All dimensions and specifications are typical to Model 4200 P/N 41003 except lead length of 36″ max.
16. All dimensions and specifications are typical to Model 4200 P/N 41003 except lead length of 36″ max and float P/N 3482. See drawing.
17. All dimensions and specifications are typical to Model 4700 P/N 41301 except lead length of 36″ max.
18. Optional float available for S.G. of .65 specify switch logic for top mounting N.O. or N.C. tank dry condition.

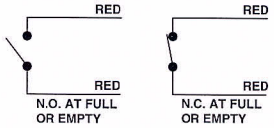
Electrical

Switch Ratings... Max Resistive Loads

V.A.	VOLTS	AMPS DC	AMPS AC	AMPS AC MAX
20	0 - 50	.4	.4	1.0
	120	.15	.16	
	240	.06	.08	
100	0 - 50	1.0	1.5	3.0
	120	.4	.8	
	240	.2	.4	

Switch Rating of UL Recognized Units, 20VA:
Metal Stem: 120-240 VAC Pilot Duty

WIRING DIAGRAM FOR STANDARD SPST SWITCHES



Switch logic is changed by removing retaining ring and inverting float.

THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

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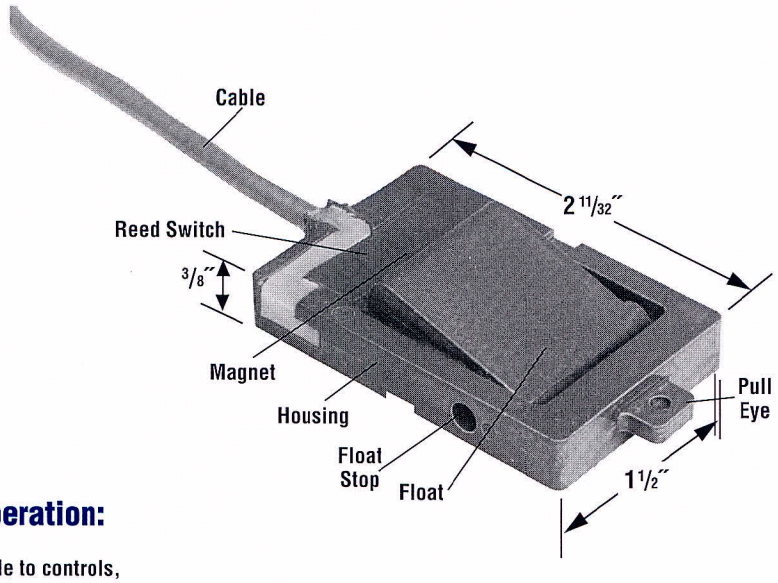
3800 PANCAKE

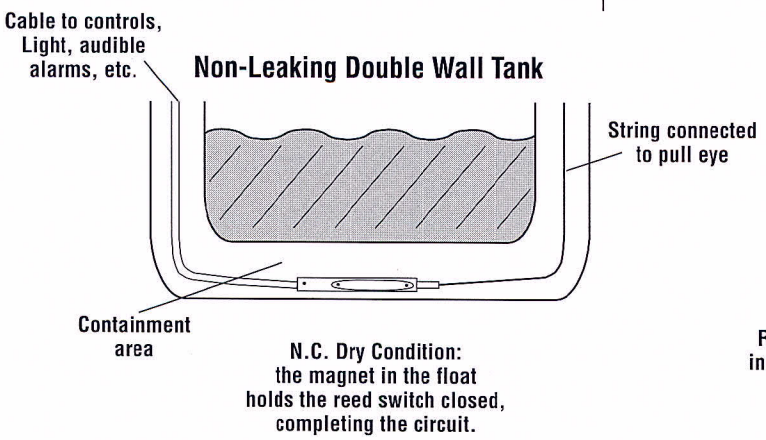
PLASTIC

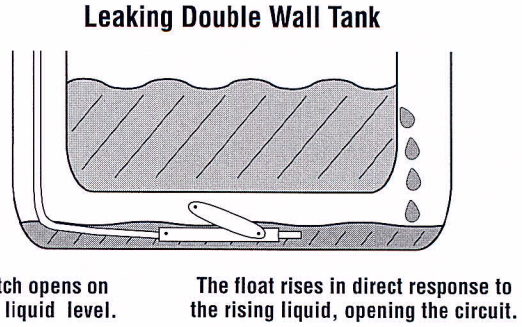


Notes:

1. Specific gravity .7 minimum.
2. Operates in 5/8″ envelope. Actuates in approximately 1/4" of water level.
3. Wetted parts: stainless steel, PVC, hysol epoxy, and cunife magnet.
4. Use in flammable environments. Should only be used with an intrinsically safe barrier to make the sensor safe not posing a hazard.
5. Model 3800 switch logic is the same N.C. (normally closed) tank dry condition in either side unit is installed.
6. Switch logic N.C. (normally closed) tank dry. Switch opens on increasing level.

Operation:





- Double wall tanks.
- Containment piping.
- Ideal for leak detection systems.
- Operates down to -40°F.
- Positive signals.
- Very economical.
- Not affected by translucent films.
- Can be immersed continuously in any media compatible with wetted parts.
- No special controls necessary.
- No excitation voltage necessary.
- No false indications.

Electrical:

Switch Ratings... Max Resistive Loads

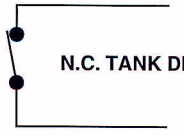
V.A.	VOLTS	AMPS DC	AMPS AC	AMPS AC MAX
10	0 - 50	.15	.2	.5
	120	.06	.08	
	240	.03	.04	

Switch Rating – Pilot Duty 50 - 240 VAC

Specifications:

P/N	Housing	Float	Reed Switch	Cable	Temperature	Pressure	Mounting Attitude
43426	PVC	PVC *See Notes 1, 2*	10 VA SPST	22 AWG UL 2464 25′ Lg.	-40°F to 140°F Max.	50 PSI @ 72°F Max.	Horizontal

SPST TYPICAL WIRING DIAGRAM



THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

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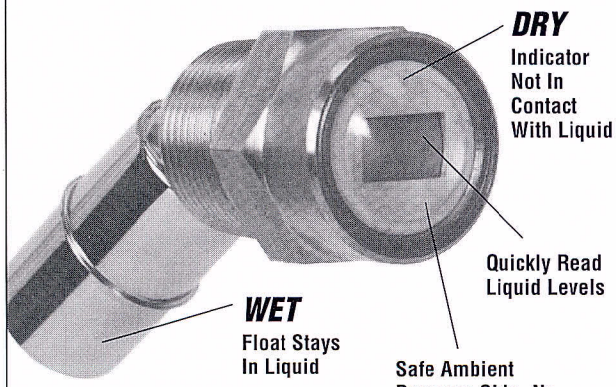
1-800-666-9101

5100 LIQUID LEVEL INDICATORS

Patent Number 5,425,271

METAL

- *Replaces Unreadable Sight Windows*
- *Non-Electrical*
- *Use in Hazardous Locations*



Patent Number 5,425,271

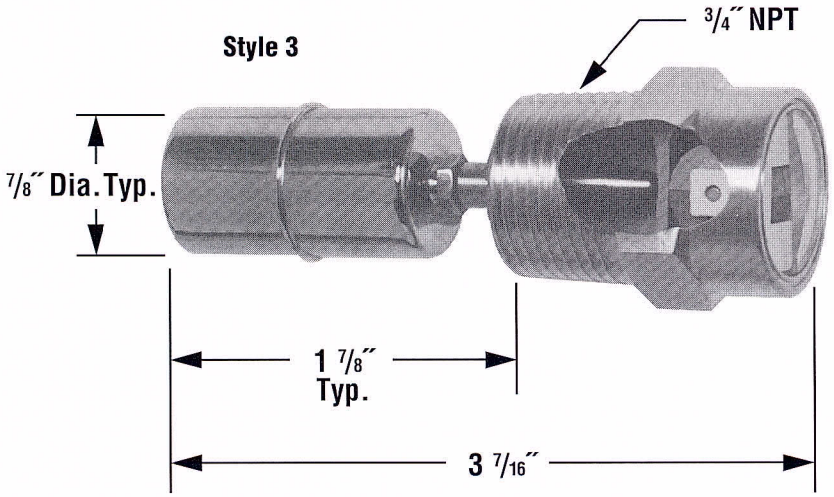
Operation:

The housing has 2 separate chambers. In the front chamber behind a transparent lens is a 2 color roller, half red, half green and it is equipped with a magnet. In the rear chamber is a magnet equipped float free to swing with the action of the liquid's level. The poles of the 2 magnets are opposite creating a permanent interlock. As the liquid level falls, the float and magnet swing to rotate the roller exposing the red side indication low liquid level. Accordingly, as the level rises, the green side indicating a satisfactory liquid level condition appears.

Notes:

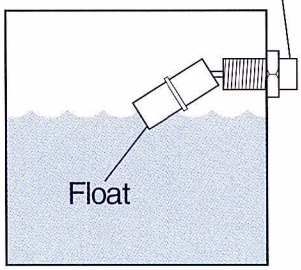
1. High temperature modifications available. Consult factory.
2. High pressure floats available. Consult factory.
3. All other wetted parts stainless steel.
4. Mounting attitude horizontal.
5. Specific gravity .4 min.
6. Both styles 1 and 2 install through a 1 9/32″ dia hole.

DIMENSIONAL DATA:



Indicator Turns Red When Liquid Is Low;

Green Means Liquid Is OK.



Specifications:

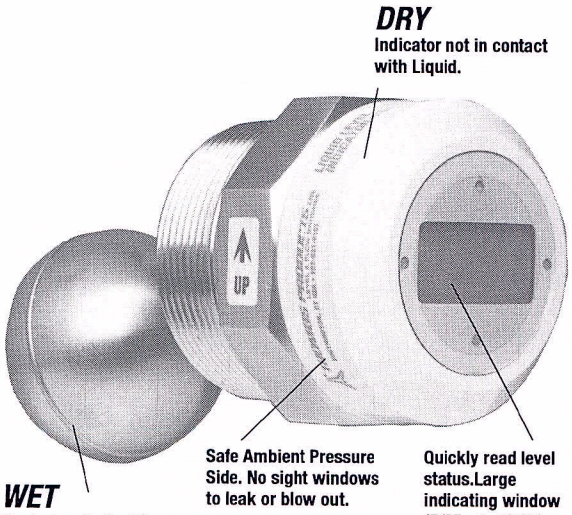
Part Number	Housing Material *See Note 5*	Size	Float	Operating Temperature	Operating Pressure
43676	Brass	3/4″ NPT Style 3	316 SST *See Note 5*	-40°F to +225°F *See Note 1*	400 PSI @ 72°F *See Note 2*
43677	316 SST				

5101 LIQUID LEVEL INDICATOR

Patent Number 5,661,238

METAL

- *Replaces Unreadable Sight Windows*
- *Non-Electrical*
- *Use in Hazardous Locations*



Pat. No. 5,661,238

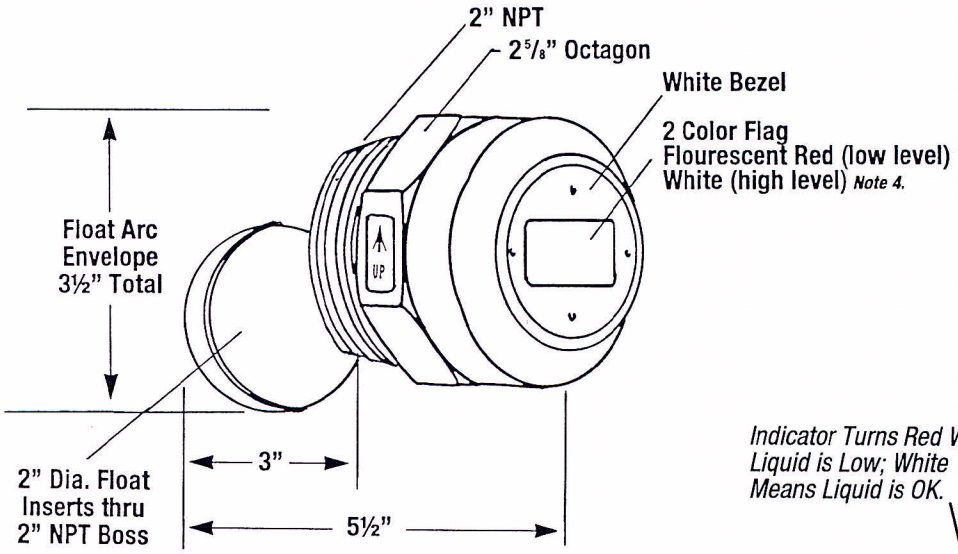
Operation:

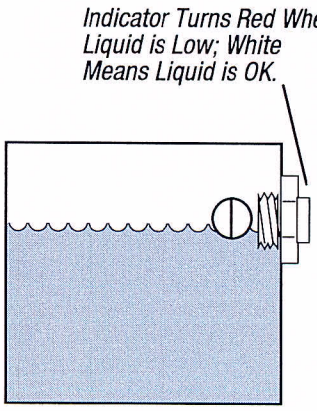
The housing has 2 separate chambers. In the front chamber, behind a transparent lens, is a 2-color flag (half red, half white) equipped with a magnet. In the rear chamber is a magnet equipped float, free to swing with the action of the liquid's level. The poles of the two (2) magnets are opposite creating a bi-stable interlocking condition. As the liquid level falls, the float and magnet swing down opening the magnetic coupling. This causes the flag to drop, exposing the red side and indicating a low liquid level. Accordingly, as the level rises, the magnet's proximity is shortened causing a magnetic attraction to snap up the flag exposing the white side and indicating a satisfactory liquid level condition.

Notes:

1. All other wetted materials 316 stainless steel
2. Specific gravity .5 min.
3. Mounting attitude horizontal
4. Other flag colors or lettering available. Consult factory.

DIMENSIONAL DATA:





Specifications:

Part Number	Housing Material *See Note 1*	Size	Float	Operating Temperature	Operating Pressure
45127	Brass	2" NPT	316 SST *See Note 2*	-40°F to +225°F	900 PSI @ 72°F
45128	316 SST				

THOMAS PRODUCTS LTD.
LEVEL & FLOW SWITCHES

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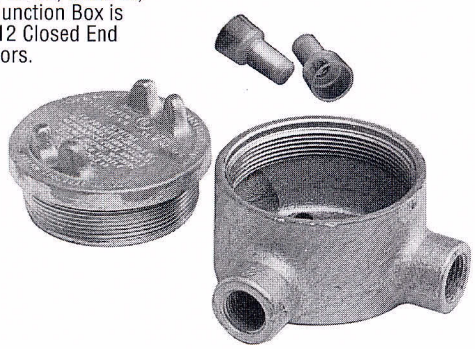
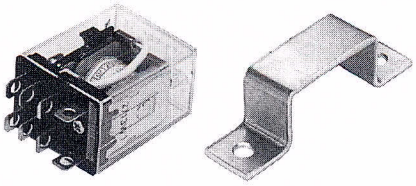
ACCESSORIES

P/N 42755
Junction Box
Explosion Proof for Hazardous Areas, Wet Locations, Class I, Group C.D., Class II, Group E.F.G., Class III, and Nema 4. Junction Box is Supplied with 12 Closed End Crimp Connectors.



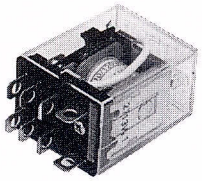
P/N 42761
Junction box (P/N 42755) with general purpose relay (P/N 42756) and clamp



P/N 42762
Junction box (P/N 42755) with 6 position terminal strip

P/N 42756
General purpose relay only

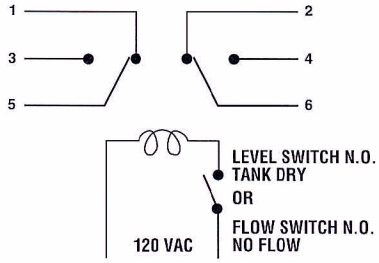
12A DPDT and 8 Fully Insulted Push-On Crimp Terminals



Relay Specifications:

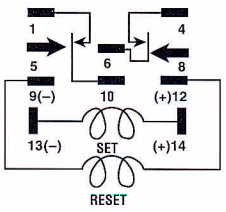
Contact Configuration	DPDT
Coil Voltage	120 VAC 50/60 Hz
Contact Ratings	12A 240 VAC 1/2 HP 120 VAC 10A 24 VDC

RELAY WIRING DIAGRAM SHOWN DE-ENERGIZED



Magnetic Latching Relays
2 Form C Contacts
Use to turn on and off pumps or other equipment and to maintain high and low levels or flows.

	Junction Box (P/N 42755) with latching relay and clamp	Voltage	Latching Relay Only
AC Voltage 50/60 Hz	42764	12 VAC	42770
	42765	24 VAC	42771
	42766	120 VAC	42772
DC Voltage	42767	6 VDC	42773
	42768	12 VDC	42774
	42769	24 VDC	42775

Contact Ratings			Internal Circuit
CSA RU	7.5 A	240 VAC	
RES	10 A	30 VDC	
General Use	7.5 A	120 VAC	
	5 A	240 VAC	
	7.5 A	30 VDC	
	1/6 HP	120 VAC	
	1/3 HP	240 VAC	

APPENDIX

These conversion factors are provided for reference only. Care has been taken in compilation; however, no guarantee for accuracy is implied. Caution should be exercised during use.

CONVERSION FACTORS

Multiply...	By...	To Obtain...
Centimeters	0.3937	Inches
Cms/Second	1.969	Ft./Min.
	0.03281	Ft./Sec.
Cubic Cms.	3.531×10^{-5}	Cu. Ft.
	6.102×10^{-2}	Cu. In.
	2.642×10^{-4}	Gals.
	10^{-3}	Liters
	2.113×10^{-3}	Pints (Liq.)
	1.057×10^{-3}	Quarts (Liq.)
CC/Hr.	.0167	CC/Min.
	.0000005	Cu. Ft./Min.
	.00003	Cu. Ft./Hr.
	.000017	LPM
	.001	LPH
	.000004	Gal./Min.
	.00026	Gal./Hr.
CC/Min.	60	CC/Hr.
	.000035	Cu. Ft./Min.
	.0021	Cu. Ft./Hr.
	.001	LPM
	.06	LPH
	.00026	Gal./Min.
	.0159	Gal./Hr.
Cubic Feet	2.832×10^{4}	Cubic Cms.
	1728	Cu. Inches
	59.84	Pints (Liq.)
	29.92	Quarts (Liq.)
Cu. Ft./Min.	60	Cu. Ft./Hr.
	28.316	LPM
	1699	LPH
	28317	CC/Min.
	1,699,011	CC/Hr.
	7.481	Gal./Min.
	448.831	Gal./Hr.
Cubic Ft./Min.	62.43	Lbs. Water/Min.
Cubic Inches	16.39	CC
	5.787×10^{-4}	Cu. Ft.
	4.329×10^{-3}	Gals.
	1.639×10^{-2}	Liters
	0.03463	Pints (Liq.)
	0.01732	Quarts (Liq.)
Cu. Ft./Hr.	.0166	Cu. Ft./Min.
	.4719	LPM
	28.316	LPH
	471.947	CC/Min.
	28317	CC/Hr.
	.1247	Gal/Min.
	7.481	Gal./Hr.
Cubic Meters	10^{4}	CC
Feet	30.48	Cms.
	12	Inches
	0.3048	Meters
	1/3	Yards
Ft. of Water	0.02950	Atms.
	0.8826	Ins. Mercury
	0.03048	Kgs./Sq. Cm.
	62.43	Lbs./Sq. Ft.
	0.4335	Lbs./Sq. In.
Feet/Min.	0.5080	Cms./Sec.
	0.01667	Ft./Sec.
	0.01829	Kms./Hr.
	0.3048	Ms./Min.
	0.01136	Miles/Hr.
Gallons	3785	Ccs.
	231	Cu. Inches
	3.785×10^{-3}	Cu. Meters
	8	Pints (Liq.)
	4	Quarts (Liq.)

Multiply...	By...	To Obtain...
Gallons, Imp.	1.20095	U.S. Gals.
Gallons, U.S.	0.83267	Imp. Gals.
Gallons Water	8.3453	Lbs. Water
Gallons/Min.	2.228×10^{-3}	Cu. Ft./Sec.
	0.06308	Liters/Sec.
	8.0208	Cu. Ft./Hr.
Gal./Min.	60	Gal./Hr.
	.1337	Cu. Ft./Min.
	8.021	Cu. Ft./Hr.
	3.785	LPM
	227.118	LPH
	3785.412	CC/Min.
	227,125	CC/Hr.
Gallons Water/Min.	6.0086	Tons Water/24 Hrs.
Grams	980.7	Dynes
	15.43	Grains
	10^{3}	Milligrams
	0.03527	Oz.
	0.03215	Oz. (Troy)
	2.205×10^{-3}	Lbs.
Grams/Cm.	5.600×10^{-3}	Lbs./In.
Grams/Cu. Cm.	62.43	Lbs./Cu. Ft.
	0.03613	Lbs./Cu. In.
Gal./Hr.	.0167	Gal./Min.
	.002	Cu. Ft./Min.
	.1337	Cu. Ft./Hr.
	.063	LPM
	3.785	LPH
	63.069	CC/Min.
	3785	CC/Hr.
Grams/Liter	58.417	Grains/Gal.
	8.345	Lbs./1000 Gals.
	0.062427	Lbs./Cu. Ft.
Kiloliters	10^{3}	Liters
Lbs. of Water	0.01602	Cu. Ft.
	27.68	Cu. In.
	0.1198	Gals.
Lbs. of Water/Min.	2.679×10^{-4}	Cu. Ft./Sec.
Liters	61.02	Cu. Ins.
	10^{-2}	Cu. Meters
	1.057	Quarts (Liq.)
Liters/Min.	4.403×10^{-3}	Gals./Sec.
LPM	60	LPH
	.035	Cu. Ft./Min.
	2.1189	Cu. Ft./Hr.
	1000	CC/Min.
	60,001	CC/Hr.
	.264	Gal./Min.
	15.851	Gal./Hr.
LPH	.0166	LPM
	.00059	Cu. Ft./Min.
	.035	Cu. Ft./Hr.
	16.667	CC/Min.
	1000	CC/Hr.
	.004	Gal./Min.
	.264	Gal./Hr.
Meters/Sec.	196.8	Ft./Min.
	3.281	Ft./Sec.
Millimeters	0.1	Cms.
	0.03937	Ins.
Ozs. (Fluid)	1.805	Cu. In.
	0.02957	Liters
PSI	.0690	BAR
PSI	68.95	M BAR
PSI	6895	Pa
PSI	6.895	KPA

Formulas:

$E =$ (Volts)	IR
	$\frac{P}{I}$
	$\sqrt{PR}$
$I =$ (Amps)	$\frac{E}{R}$
	$\frac{P}{E}$
	$\sqrt{\frac{P}{R}}$
$P =$ (Watts)	$\frac{E^2}{R}$
	$I^2 R$
	EI
$R =$ (Ohms)	$\frac{E}{I}$
	$\frac{E^2}{P}$
	$\frac{P}{I^2}$

APPENDIX

These definitions are not to be construed as the only definitions available, but as a guide to understanding the terminology as it pertains to our products.

GLOSSARY

A *[Elec.]*: Amp. See *"Ampere"*.

AC *[Elec.]*: (alternating current) Electrical current that reverses direction periodically.

AC Field *[Elec.]*: The space around a magnet or magnetic circuit which is under the influence of magnetic forces.

Actuation *[Elec.]*: To turn on.

Adjustable Set Point: Actuation point that can be field adjusted, usually within a given range.

Alnico Magnet: Aluminum, nickel, and copper alloy magnet.

Ampere *[Elec.]*: (amp) Unit of electrical current.

Arcing *[Elec.]*: An electric current through air or across the surface of an insulator associated with high voltage and usually occurs when a contact is opened, de-energizing an inductive load. Arcing of a contact will limit its life.

Beryllium Copper *[Met.]*: (BeCu) An alloy of copper and beryllium and not more than 3% beryllium.

Bonnet Assembly: The working mechanism in a shuttle type flow switch that contains the magnet and reed switch assembly.

Bulkhead Fitting: Straight thread with nut mounted through an unthreaded hole. Can be used with an 0-ring or gasket.

BUNA: A brand of synthetic rubber made by polymerizing or copolymerizing butadiene with another material. Typical use carburetor floats.

Burst Strength *[Mech.]*: A measure of the ability of a material to withstand a given pressure without rupture.

Cable *[Elec.]: A* group of individually insulated conductors in twisted or parallel configuration under common sheath.

Cable Gland: Strain relief with integral waterproof seal.

Calibration: The act of determining by measuring with a standard; i.e., Thomas Products Limited's flow stands are calibrated to the National Bureau of Standards.

Calibration Position: The position of the flow switch at the time of setting the actuation point.

Capacitive Load *[Electromag.]*: The load in which the capacitive reactance exceeds the inductive reactance; the load draws a leading current.

CCM: Cubic centimeter per minute.

Celsius Conversion: See *"Conversion Factors"*.

CFM: Cubic foot per minute

Chemical Compatibility: A harmonious effect between a chemical and the materials with which it comes in contact.

Collars: Tubular float stops equipped with set screws used to limit float travel.

Condensation *[Chem.]*: Transformation of a gas to a liquid.

Conduit Connector: Threaded portion of unit specifically designed for the connection of a flexible conduit or junction boxes, etc.

Crazing *[Eng.]*: Network of fine cracks on or under the surface of a material; i.e., the crazing of certain plastics can be caused by chemical incompatibility.

Crimp on Connectors or Terminals: Male or female electrical components that can be affixed to lead wired by pinching.

Cunife Magnet: Copper, nickel, and iron alloy magnet.

DC *[Elec.]*: (direct current) Electric current which flows in one direction only, as opposed to alternating current.

Deactuation: To turn off.

Dead Band: The range between make and break.

Decreasing Set Point *[Fl. Mech.]*: Actuation set as the flow decreases.

Differential *[Cont. Sys.]*: The difference between make and break operation in a control system.

Displacer: Flow detection device that relies on gravity to return the working mechanism to the inactive position.

DPDT *[Elec.]*: (double-pole, double-throw) Six-terminal switch or relay contact arrangement that simultaneously connects one pair of terminals to either of two other pairs of terminals.

Electrical Conversion Formula: See *"Conversion Factors"*.

Electrical Current Shock: Excessive electrical load; esp. to a reed switch.

Envelope: The total amount of movement including its mean dimension and tolerance.

Explosion Proof: Apparatus enclosed in a case that is capable of both withstanding an explosion of a specified gas or vapor that may occur within it, and preventing the ignition of a specified gas or vapor surrounding the enclosure by sparks, flashes, or explosion of the gas of vapor within, and that operates at such an external temperature that a surrounding flammable atmosphere will not be ignited thereby.

Fahrenheit Conversion: See *"Conversion Factors"*.

Fixed Set Point: Factory set non-field-adjustable actuation point.

Flow Indicator: Nonelectrical device that indicates a predetermined amount of flow or the lack thereof.

Flow Switch *[Fl. Mech.]*: Electromechanical device that will make or break an electrical circuit at a given flow rate.

Fluted Stem: The tubing housing the reed switch that the float rides on, having specially shaped grooves along its axis to allow particulates to collect in them. Designed to help eliminate float jamming due to lime deposits.

APPENDIX

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GLOSSARY

GPM: (gallons per minute) Units of measuring liquid flow.

Grip Rings: Float stops used to limit float travel. Circular split metal rings whose fixation to the stem relies on its own tensile strength alone.

Hermetically Sealed *[Eng.]*: Air tight seal; i.e. reed switches are hermetically sealed within a glass enclosure to isolate the contacts from the surrounding elements.

Hertz *[Phys.]*: Unit of frequency cycle per second.

Hirshman Connector: Brand name of quick disconnect electrical interface.

Housing *[Eng.]*: The body.

Hysteresis *[Phys.]*: See *"Differential"*.

Increasing Set Point *[Fl. Mech.]*: Actuation set as the flow increases.

Inductive Load *[Elec.]*: Alternating load current lags behind the alternating voltage of the load, i.e. coils, transformers, etc.

Interface Float: A float whose specific gravity (s.g.) is adjusted to be buoyant in a higher s.g. liquid, as water 1.0, but will sink in a lower s.g. liquid, as oil.

Intrinsically Safe Barrier: A device which limits the power (energy) which can be delivered from a safe area into a hazardous area.

IPS: Inner pipe size.

J-box: (junction box) Electrical enclosure.

Lamp Load: A load that is of an incandescent lamp; any device which consumes power that is connected to another device or circuit that supplies the power.

Level Indicator: Non-electrical float device that shows liquid level at point of installation.

Level Switch: Electromechanical level detection device that will make or break an electrical connection by the float's rise or fall.

LO: (length overall) Used for stem length on Model 4000/4900/5000 custom level switches, etc.

Locking Wire: Wire or plastic filament used to lock bonnet assembly in place.

Magnetic Field *[Electromag.]*: Natural and artificial elementary fields or forces found in the vicinity of magnetic bodies or current-carrying medium.

Mating MS Connector: Female connector that interfaces with male pin connector.

Max. Flow Rate: Maximum flow through the flow switch.

Max. PSI: (maximum pounds per square inch) Maximum pressure recommended.

Max. Temp: Maximum temperature recommended.

Mechanical Shock *[Mech.]*: (impact shock) Forceful collision between two bodies sufficient enough to cause change.

Micron: Unit of measure used in filtration. One micron = millionth meter = .00003937 inches.

Micron Filter: Filter used to help maintain a predetermined amount of purity. Micron denotes minimum size of particulates filtered.

Mounting Attitude: The position in which a unit is mounted or installed; i.e., tank top, tank bottom or side mounted.

M-SB: (monel trim with silver brazed process connections) Available on our marine flow switch.

MS Connector: A male pin electrical connector.

N.C. *[Elec.]*: Normally closed. Electrical contact in closed condition whose system is inactive.

NEMA: National Electrical Manufacturers Association.

NEMA Rated: Rating or type given by NEMA which denotes a device will meet requirements for a given location or application; i.e., NEMA 4-watertight and dusttight indoor and outdoor, etc.

90° Angle Flow: When in and out ports are at right angles to one another.

N.O. *[Elec.]*: Normally open. Electrical contact in open condition whose system is inactive.

NPT: National pipe thread (tapered thread) usually designated by nominal pipe size and number of threads per inch.

Ohm *[Elec.]*: Unit of measurement for resistance and impedance. See *"Conversion Factors"*.

Operating Pressure *[Eng.]*: The maximum working pressure allowed at that device.

Operating Temperature *[Eng.]*: The maximum working temperature allowed at that device.

Orifice: A device used to regulate flow through it to accurately achieve a specific set point.

Petcock: A small valve used to drain off excessive waste material; i.e., bleed systems, trapped air.

Ph 15-7 Mo: Basic 300 series stainless steel; 15% chromium, 7% nickel, and 2.5% molybdenum.

Pilot Duty: The rating assigned to a relay or switch that controls the coil of another relay or switch.

Piston: A cylindrically-shaped member housing a magnet which rides in a bore that is displaced by the dynamic force in a flow switch. The displacement will cause either actuation or deactuation, depending on the proximity of the reed switch assembly.

P/N: Part number.

APPENDIX

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GLOSSARY

Polypropylene: A light weight plastic generally known for its high chemical resistance.

Polysulfone: A high performance thermoplastic known for its high tensile strength, temperature resistance and wide chemical compatibility.

Pressure Drop *[Fl. Mech.]*: The difference in pressure between two points in a flow system.

Proof Load *[Eng.]*: A predetermined test load, greater than the service load.

PSI: (pounds per square inch) Unit of measuring pressure.

PSIG: (pounds per square inch gauge) Unit of measuring pressure above "0" gauge. "0" gauge is equal to 14.7 PSI on the absolute scale.

PVC *[Or. Chem.]*: (polyvinyl chloride) Polymer of vinyl chloride; insoluble in most organic solvents.

Reed Switch *[Electromag.]*: A dry switch that has contacts mounted on ferromagnetic reeds hermetically sealed in a glass tube designed for actuation by an external magnetic field.

Repeatability: The percentage measurement derived from accuracy on a control, returning back to its original setting.

Reset Point: See *"Reset Point Differential"*.

Reset Point Differential *[Fl. Mech.]*: The difference between the set point and reset point.

Resistive Load *[Elec.]*: A load whose total reactance is zero, so that the alternating current is in a phase with the terminal voltage.

SCFH *[Fl. Mech.]*: Standard cubic feet per hour of gas flow at specified standard conditions of temperature and pressure.

SCFM *[Fl. Mech.]*: Standard cubic feet per minute of gas flow at a specified standard conditions of temperature and pressure.

Set Point *[Cont. Sys.]*: The actuation or deactuation point at a predetermined flow rate at which the contacts will make or break.

Set Point Accuracy *[Eng.]*: A permissible deviation from a specified value, given in a percent.

Set Point Differential: See *"Differential"*.

Shuttle: Same as piston, except the shuttle housing the magnet rides on a stem instead of in a bore.

Silver Brazed Ports: Process connections with a grooved ring for insertion of a silver brazing alloy.

Slip Ports: Smooth non-threaded process connections allowing for its mating part to be glued in place; i.e., PVC fittings.

Socket Weld Ports: Smooth non-threaded process connections. Bored to accept pipe fittings, etc., and made of material suitable for welding.

Solid State *[Eng.]*: Pertaining to a circuit, device, or system that depends on some combination of electrical, magnetic and optical phenomena within a solid that is usually a crystalline.

Specific Gravity *[Mech.]*: (s.g.) The ratio of the density of a material to the density of some standard material, usually water at a specified temperature.

SST: (stainless steel) Corrosion-resistant alloy.

SSU *[Fl. Mech.]*: (second, saybolt universal) Unit of measuring viscosity; the time in seconds for 60 milliliters of fluid to flow through a capillary tube in a saybolt universal viscosimeter at a given temperature.

SPDT *[Elec.]*: (single-pole, double-throw) A three-terminal switch for relay contact arrangement that connects one terminal to either of two other terminals. Allows for achievement of N.O. or N.C. condition.

SPST *[Elec.]*: (single-pole, single-throw) A two-terminal switch or relay contact arrangement that opens or closes a circuit.

Straight Thread: Uniform screw threads in which its pitch diameter is parallel.

Straight Through Flow: The flow path of a liquid or gas from the in port to the out port is in line to each other.

Stress Crack *[Mech.]*: (metal or plastic) An external or internal crack in a solid body.

Turbulence *[Fl. Mech]*: (turbulence flow) Motion of fluids in which local velocities and dynamic pressures fluctuate irregularly.

V *[Elec.]*: (volt) The practical unit of electric pressure (voltage). The symbol for voltage is E or V. See *"Conversion Factors"*.

VA *[Elec.]*: (volt amp. or volt- ampere) An electric measurement unit, equal to the product of one volt times one ampere, equivalent to one watt for direct current and a unit of apparent power for alternating current.

VAC *[Elec.]*: Volts alternating current.

VDC *[Elec.]*: Volts direct current.

Viscosity *[Fl. Mech.]*: Internal resistance of a fluid whose impedance against flow rises as its viscosity rises. Can be measured in: 1.) poise (P); 2.) stokes (S); 3.) centipoise (cP); 4.) centistokes (cS); 5.) second saybolt universals (SSU), among others.

Viton: A fluorocarbon elastomer widely used in the making of O-rings. Recognized for its chemical compatibility and higher temperature use for a variety of applications.

Voids: Open passages through which liquid or gas can flow.

W *[Phys.]*: (watts) The unit of power in the meter-kilogram-second system of units, equal to 1 joule per second and equal to the power in a circuit in which a current of one ampere flows across a potential difference of one volt.

Watertight: Sufficiently sealed to prevent water from seeping through.

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