# MODEL 622 DIRECT INSERTED HIGH RELIABILITY FLOW SWITCH
# PRECALIBRATED SWITCH POINT – MECHANICAL DEPENDABILITY

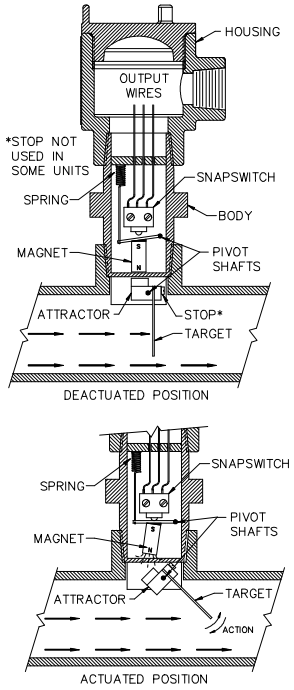
## APPLICATION

The Type 622 produces on/off switching action in response to liquid or gas flow rates in horizontal or vertical pipelines and ducts. A target extends into the flowing stream and operates an output switch at the setpoint flow rate. These switches protect pumps, blowers, heat exchangers, etc. They are factory calibrated to switch at the specified flowrate. An internal adjustment allows small switchpoint changes to be made in the field. Large changes require changing the size of the target.

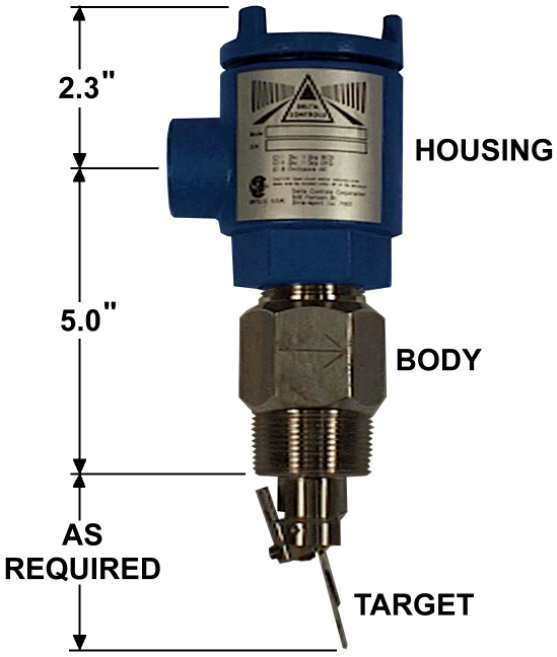
Connection of the target to the output switch is done magnetically. A heavy duty solid sealing tube separates the process fluid from the switch mechanism. Leaks and seal failures are eliminated because "O" rings, diaphragms, etc., are not used.

## OPERATING PRINCIPLE

A pivoted target extends down into the flowing stream. The flowing fluid creates a force as it strikes the target. At a predetermined velocity, the force becomes great enough to cause the target and the attractor to rotate about the pivot point. The magnet reacts to the new attractor position and the output switch operates. The target rotates back to its original position as the flow decreases; and the output switch then returns to its original position.




Note: (1) Normal swing targets provide the best accuracy for switching on decreasing flowrate.
(2) Switching accuracy decreases on viscosities above 20 cp and is inaccurate above 100 cp.




622 WITH 1½" NPT FOR
BRANCH CONN. MOUNTING

## HARDWARE MODEL NUMBER*

* Application and Service Number must also be provided.

**Actuation Point**: Within 10% basic, closer optional
**Housing**: Class 1, Division 1, Groups BCD, X-Proof, also 4X, IP67.
Third Party Listed by CSA NRTL/C (USA & Canada)

| Basic Type | - | Wetted Material | - | Switch Contact | - | Process Conn. | - | Options |
|---|---|---|---|---|---|---|---|---|

Example 622 - SCY - B - 1½'MPT - AA

WETTED MATERIAL COMBINATIONS [a]

| M/N | BODY | TRIM | TARGET |
|---|---|---|---|
| LCY | Brass | 416 SS | 316 SS |
| SCY | Steel * | 416 SS | 316 SS |
| YCY | 316 SS | 416 SS | 316 SS |
| YYY | 316 SS | 316 SS | 316 SS |
| MMM | Monel | Monel | Monel |
| GGG | Hastelloy C | Hastelloy C | Hastelloy C |
| VGG | PVC | Hastelloy C | Hastelloy C |

[a] Available with flanged process connection only.
* Titanium, Alloy 20, and other materials are available.

| M/N | DESCRIPTION |
|---|---|
| AA | None |
| SH | SS Housing |

| M/N | CONTACT | AMPS * | MAX EF |
|---|---|---|---|
| A | SPDT | 10 | 220 |
| B | SPDT | 5 | 450 |
| C | DPDT | 10 | 220 |
| H | DPDT | 5 | 450 |

* Ratings up to 250 VAC;
all rated 4 amps at 24 VDC

| THREADED M/N |
|---|
| 1½" MPT |
| 2" MPT |
| 2½" MPT |

2000 PSIG MAX WKG PRESSURE UP TO 5000 PSIG OPTIONAL

FLANGED M/N

| SIZE | " RATING | FACE |
|---|---|---|

2"/150# R.F. IS MINIMUM
2000 PSI W.P. UP TO
5000 PSI OPTIONAL

## APPLICATION AND SERVICE NUMBER

The Model 622 flow switch is designed for direct insertion into the pipeline. Proper operation and a successful installation are dependent on the 622 fitting into the place prepared for it by the installer. Correct mounting and application of the 622 requires careful attention to dimensional detail. Complete information is required for construction and calibration of the switch. Describe the switch needed and the service details by building up an application number as shown below.

| | Basic Type | - | Switch Point | - | Switch Action | - | Flow Direction | - | Max Pressure | - | Pipeline ID | - | Dim "A" | - | Fluid SPG | - | Fluid Visc | - | Name of Fluid | - | Max. Flow |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Application Example | 622 | - | 5.5G | - | D | - | U | - | 70 | - | 2.067" | - | 6.56" | - | 1.03 | - | 2CP | - | Brine Solution | - | 12G |

SPECIFY IN FLOW RATE UNITS AS:
"G" GALLONS PER MINUTE
"L" LITERS PER MINUTE
"S" STD CUBIC FEET PER MIN
"M" $M^3$ PER MINUTE

SPECIFY THE PSIG

PIPELINE INSIDE DIAMETER IN INCHES

SPECIFIC GRAVITY OF FLUID AT OPERATING TEMPERATURE

SPECIFY NAME OF FLUID

MAXIMUM EXPECTED FLOW RATE:
G=GALLONS PER MINUTE
S=STANDARD CUBIC FEET
M=$M^3$/MINUTE

| A/N | SWITCH ACTION OCCURS |
|---|---|
| D | DEACTUATE ON DECREASING FLOW |
| N | ACTUATE ON INCREASING FLOW |

| A/N | * DIRECTION THAT FLUID IS MOVING |
|---|---|
| H | HORIZONTAL FLOW (STANDARD) |
| U | VERTICAL UPFLOW (SEE OPTION "VU") |

* NOT AVAILABLE FOR VERTICAL DOWNFLOW

DISTANCE FROM THE TOP MOUNTING FACE OF THE THREAD-O-LET OR FLANGE TO THE INSIDE BOTTOM OF THE PIPELINE

SPECIFY VISCOSITY, OF FLUID IN CENTIPOISE, "CP" AT OPERATING TEMPERATURE C/F IF OVER 8 CP

Select the Switch Point Flow Rate between the maximum and minimum valves shown in the Range Table below:

**PIPELINE SIZE (BASED ON ANSI SCHEDULE 40 PIPE)**

| | Flow Rate | Switch Action | Body Size | 1 ½ | 2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Water at 77 ° F | Min GPM | Actuate | 1 ½ | 7 | 15 | 45 | 95 | 210 | 375 | 600 | 900 | 1200 | 1400 | 2000 | 10000 |
| | Min GPM | Deactuate | 1 ½ | 3 | 8 | 22 | 40 | 120 | 175 | 300 | 450 | 600 | 800 | 1000 | 5500 |
| | Min GPM | Actuate | 2 | - | 6 | 18 | 27 | 47 | 62 | 100 | 142 | 600 | 220 | 350 | 405 |
| | Min GPM | Deactuate | 2 | - | 3.2 | 10 | 15 | 26 | 34 | 54 | 79 | | 120 | 190 | 220 |
| | Min GPM | Actuate | 2 ½ | - | - | 13 | 21 | 35 | 55 | 75 | 100 | | 140 | 200 | 280 |
| | Min GPM | Deactuate | 2 ½ | - | - | 7 | 12 | 19 | 30 | 41 | 55 | | 77 | 110 | 155 |
| | Max GPM | Actuate (Std) | Any | 12 | 60 | 130 | 220 | 500 | 870 | 1370 | 1950 | | 3070 | 4830 | 5555 |
| | Max GPM | Actuate (Sp) | Any | 20 | 100 | 215 | 365 | 835 | 1450 | 2285 | 3250 | | 5115 | 8050 | 9260 |
| Air at STP 77 ° F and 1 Atmosphere | Min SCFM | Actuate | 1 ½ | 30 | 40 | 50 | 58 | 118 | 210 | 330 | 470 | | 840 | 1310 | 1885 |
| | Min SCFM | Deactuate | 1 ½ | 17 | 22 | 28 | 32 | 65 | 115 | 180 | 260 | | 460 | 720 | 1035 |
| | Min SCFM | Actuate | 2 | - | 33 | 42 | 48 | 98 | 175 | 275 | 390 | | 700 | 1090 | 1570 |
| | Min SCFM | Deactuate | 2 | - | 18 | 23 | 27 | 54 | 96 | 150 | 215 | | 385 | 600 | 860 |
| | Min SCFM | Actuate | 2 ½ | - | - | 33 | 40 | 80 | 140 | 220 | 315 | | 560 | 875 | 1255 |
| | Min SCFM | Deactuate | 2 ½ | - | - | 25 | 30 | 60 | 105 | 165 | 235 | | 420 | 655 | 940 |
| | Max SCFM | Actuate (Std) | Any | 175 | 235 | 290 | 340 | 690 | 1220 | 1915 | 2750 | | 4890 | 7635 | 11000 |
| | Max SCFM | Actuate (Sp) | Any | 290 | 390 | 485 | 565 | 1150 | 2050 | 3200 | 4600 | | 8150 | 12700 | 18300 |

* These units are equipped with an assist spring; not available with full swing feature.

NOTES:

1. Standard deactuation is 50% of actuation flowrate; this may be increased to 70% by the addition of an assist spring; not available with full swing feature.
2. For rectangular air ducts; calculate the minimum available actuation point based on velocity:
   1 ½" body = 600 FPM; 2" body = 500 FPM; 2 ½" body = 400 FPM; 3" body = 330 FPM
3. Normal swing targets are limited to 10 FPS flow velocity. Full swing targets are available that permit high velocity flow rates (up to 100 FPS), while retaining the ability to operate and switch at low flow rates; Pipeline size must be 2 ½" ANSI (80MM) or larger.

### FACTORS FOR LIQUIDS OR GASES WITH DENSITIES DIFFERENT FROM WATER OR AIR AT STP

| Density | 0.50 | 0.55 | 0.60 | 0.65 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 1.05 | 1.10 | 1.15 | 1.20 | 1.25 | 1.30 | 1.35 | 1.40 | 1.45 | 1.50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Multiply by | 1.41 | 1.35 | 1.29 | 1.24 | 1.19 | 1.15 | 1.12 | 1.08 | 1.05 | 1.02 | 0.97 | 0.95 | 0.93 | 0.91 | 0.90 | 0.88 | 0.86 | 0.84 | 0.82 | 0.80 |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