Uni-Switch™
Universal flow switch

626600A

01052/23 NA
Replaces 01052/22 NA

Function

The Uni-Switch™ flow switch detects whether there is any flow in the piping and opens or closes an electrical contact. It is normally used in heating, air-conditioning, refrigeration, water treatment, additive pumping and process systems in general. The flow switch can control devices such as pumps, burners, compressors, refrigerators, motorized valves; to turn on indicator and alarm devices and regulate equipment for dosing water additives.

In heating systems, the flow switch will switch the burner off in case of a lack of fluid circulation in heating circuit. A lack of fluid circulation would otherwise impair the operation of the temperature-sensitive safety and protection devices.

c UL us LISTED 30V9

CE

Product range

Code 626600A	Flow switch	Size 1” NPT male
Code 626009	Replacement paddles (blades) assembly	for pipe diameters 1" to 8"

Technical specifications

Materials

Body:	brass
Cover:	self-extinguishing polycarbonate
Microswitch protection casing:	self-extinguishing polycarbonate
Bellows rod and bellows:	stainless steel
Paddle (Blades) for pipes:	stainless steel
Microswitch spring:	stainless steel
O-Ring seals:	peroxide-cured EPDM

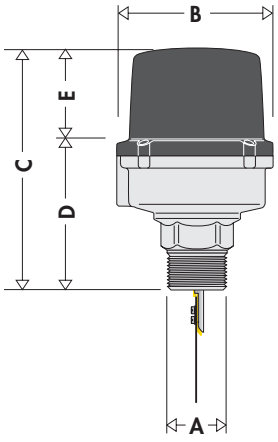
Performance

Suitable fluids:	water and glycol solutions
Max. percentage of glycol:	50%
Max. working pressure:	150 psi (10 bar)
Fluid temperature range:	-20–250°F (-30–120°C)
Max. ambient temperature:	130°F (55°C)
Pipe connection:	1” NPT male
Pipe adjustability:	from 1” to 8”

Electric specifications

Voltage:	250 V
Electrical connection:	1/2" NPT female
Current:	15 (5) A
Protection class:	NEMA Type 5
	IP 54
Certification:	CE, C-UL

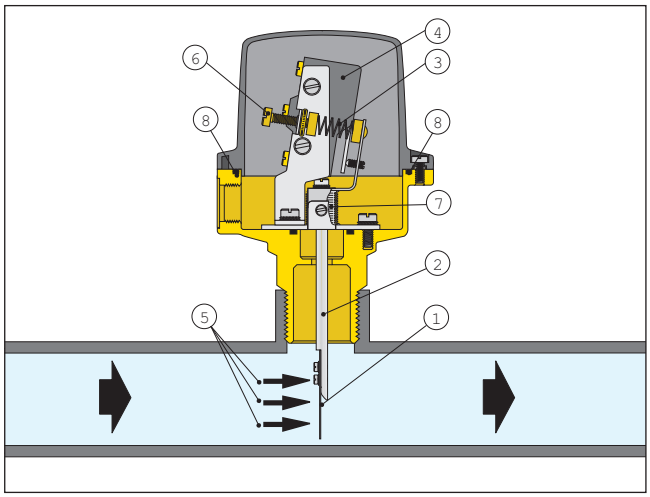
Dimensions



Code	A	B	C	D	E	Weight (lb)
626600A	1"	3 7/16”	5 5/16”	2 15/16”	2 3/8”	2.30

Operating principle

The flow switch is composed of a paddle (blade) (1) integral with a control rod (2) connected, at the top, to an adjustable counter spring (3). The assembly, by turning around a pin under the action of the water flow, operates a microswitch contained in a protective casing (4). At rest, the counter spring keeps the microswitch contact open. When the increasing flow rate of the medium within the piping becomes equal or greater than the trip flow rate, the thrust (5) on the blade applied (1) by the flow overcomes the opposing force applied by the adjustable spring (3) thus making the microswitch contact close. With a decreasing flow rate, on reaching the trip flow rate values, the flow thrust on the blade is not enough to overcome the opposing force applied by the adjustable spring, so the blade returns to the rest position and the microswitch contact opens.
The trip values for closing (increasing flow) and opening (decreasing flow) the microswitch contact can be modified with the adjusting screw (6).



Construction details

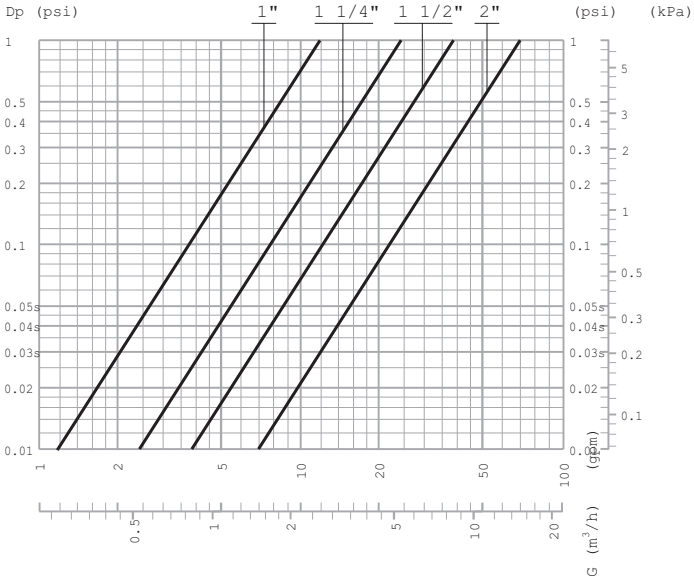
Electric component protection
A metal bellows (7) separates the electric and the hydraulic parts. Since this is the most stressed part that must prevent any contact between the medium and the electric components, it is made of stainless steel. Stainless steel is also used in the construction of other mechanical components corrosion resistance.

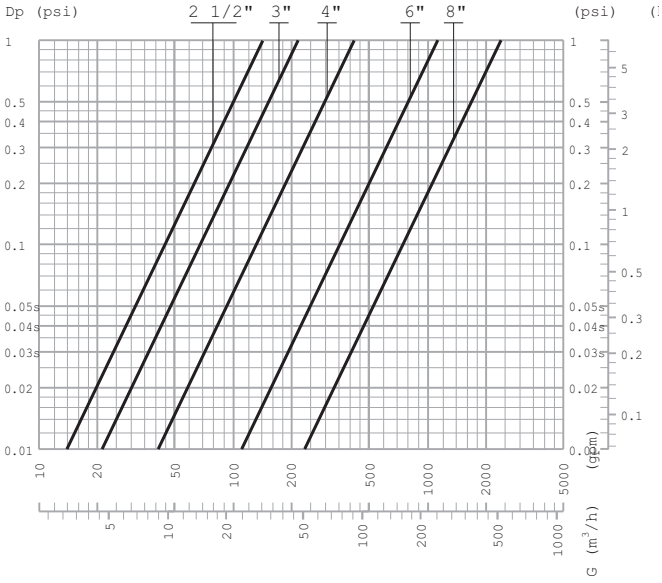
Insulating protective cover
The O-Ring seal (8) between the body and the cover, with a protection class of NEMA type 5 (IP 54), ensures operation in particularly damp and dusty places. The insulating protective casing (4) on the microswitch avoids the risk of accidental contact when calibrating. Both the microswitch protection and the cover are made of self-extinguishing V-0 class plastic.

Electric switchover contact
The electric switchover contact indistinctly permits turning on or off any electric device at the trip flow rate.

Setting screw
The setting screw (6) allows easy adjustment of the trip flow rate as desired.

Hydraulic characteristics





Size	1″	1 1/4″	1 1/2″	2″
Cv	11.5	24.3	37.6	67
Kv (m^3/h)	10	21	32.5	58

Size	2 1/2″	3″	4″	6″	8″
Cv	139	208	405	1098	2255
Kv (m^3/h)	120	180	350	950	1950

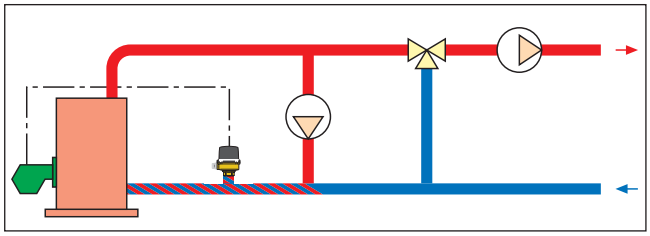
Cv = flow in gal/min for a pressure loss of 1 psi

The stated Cv (Kv) values refer to the head loss within the pipes with diameters from 1” to 8” and standard length of 39 in (1 m), in which flow switches, equipped with a paddle (blade) of adequate size, are installed.

Reference standards

In heating systems with a closed expansion tank, where circulation is ensured by motor pumps, the flow switch is used to stop the heat supply to the generator when the pumps stop and there is no circulation.

Water circulation is indeed essential for safety and temperature-sensitive protection devices such as thermostats, thermal discharge valves and fuel shut-off valves to work properly.



Operating flow rates: gpm (l/s)

Pipe diameter	**1"**	**1 ¼"**	**1 ½"**	**2"**	**2 ½"**	**3"**	**4"**	**5"**	**6"**	**8"**
Minimum calibration operating trip flow rate **with increasing flow***	5.7 (0.36)	7.5 (0.47)	11.4 (0.72)	13.2 (0.83)	22.0 (1.38)	29.9 (1.89)	44.0 (2.78)	61.1 (3.85)	72.6 (4.58)	162 (10.2)
Minimum calibration operating trip flow rate **with decreasing flow***	4.0 (0.25)	5.5 (0.35)	8.4 (0.53)	9.7 (0.61)	16.3 (1.03)	22.9 (1.44)	37.4 (2.36)	51.5 (3.25)	63.8 (4.03)	145 (9.15)
Maximum calibration operating trip flow rate **with increasing flow**	12.3 (0.78)	16.7 (1.05)	26.0 (1.64)	29.5 (1.86)	51.5 (3.25)	69.5 (4.38)	94.6 (5.97)	136 (8.6)	189 (11.9)	334 (21.1)
Maximum calibration operating trip flow rate **with decreasing flow**	11.9 (0.75)	16.3 (1.03)	25.5 (1.61)	29.0 (1.83)	50.6 (3.19)	68.6 (4.33)	92.4 (5.83)	127 (8.01)	158 (9.97)	308 (19.4)

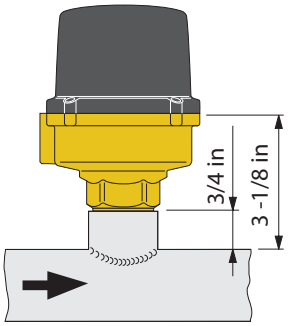
*factory setting.

Installation

To install the flow switch correctly follow these instructions:
When selecting the blade, identify the diameter of the pipe to which the Uni-Switch will be installed.
The Uni-Switch comes complete with the 1" blade.
For diameters of 1 1/4" (DN 32) and above, the pre-installed blade should be removed and the long blade installed, cutting it to the correct corresponding size for the desired diameter.
Install the flow switch to the pipe, carefully observing the direction of flow indicated by the arrows stamped on the cover and on the switch mounting plate. When installed, the distance between the upper surface of the pipe and upper surface of the switch mounting plate should be 3 1/8" (80 mm).
The tee connection in the pipe can be formed by the direct welding of a threaded socket.
This also applies to a 1" (DN 25) diameter pipe, as the blades are designed to be contained in these smaller dimensions.
It is, however, advisable to check that the weld is free from burrs on the inside so that the blade can move freely in the connection.
Whenever possible the flow switch should be installed with the control stem in the vertical position to avoid deposits of impurities which may cause it to function incorrectly.

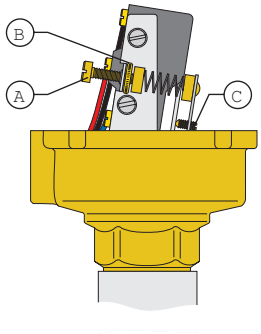
The flow switch should be installed on the pipe with the control rod upright, following the flow direction indicated by the arrow on the cover and on the body exterior.

For blade proper operation install the flow switch by following the distance shown on the drawing, using a sleeve welded for total passage. It will not install into a copper pipe tee.



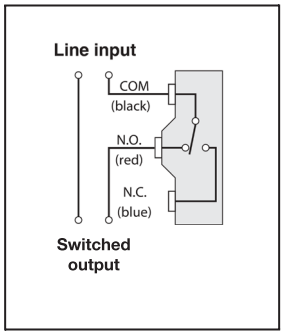
Flow rate adjustment

The minimum and maximum operating flow rates are given in the table below. Adjustments should be carried out as follows: turn the adjusting screw (A) in a clockwise direction for the contacts to close at higher flow rates or in a counterclockwise direction for lower flow rates. When the adjustment has been made lock the screw (A) with the locking ring nut (B). **Avoid all contact with the presetting screw (C).** An incorrect setting would seriously impair the operation of the switch.

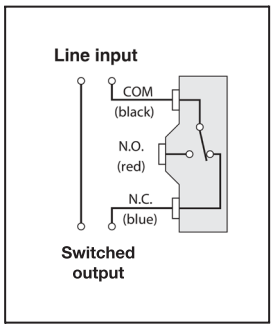


Diagrams showing the internal connections of the micro-switch with:

Flow switch is used to activate a device when flow starts.
When flow starts and the increasing operating flow is reached or exceeded, the common (black wire) and normally open (red wire) contacts are closed, while the common (black wire) and the normally closed (blue wire) are open.



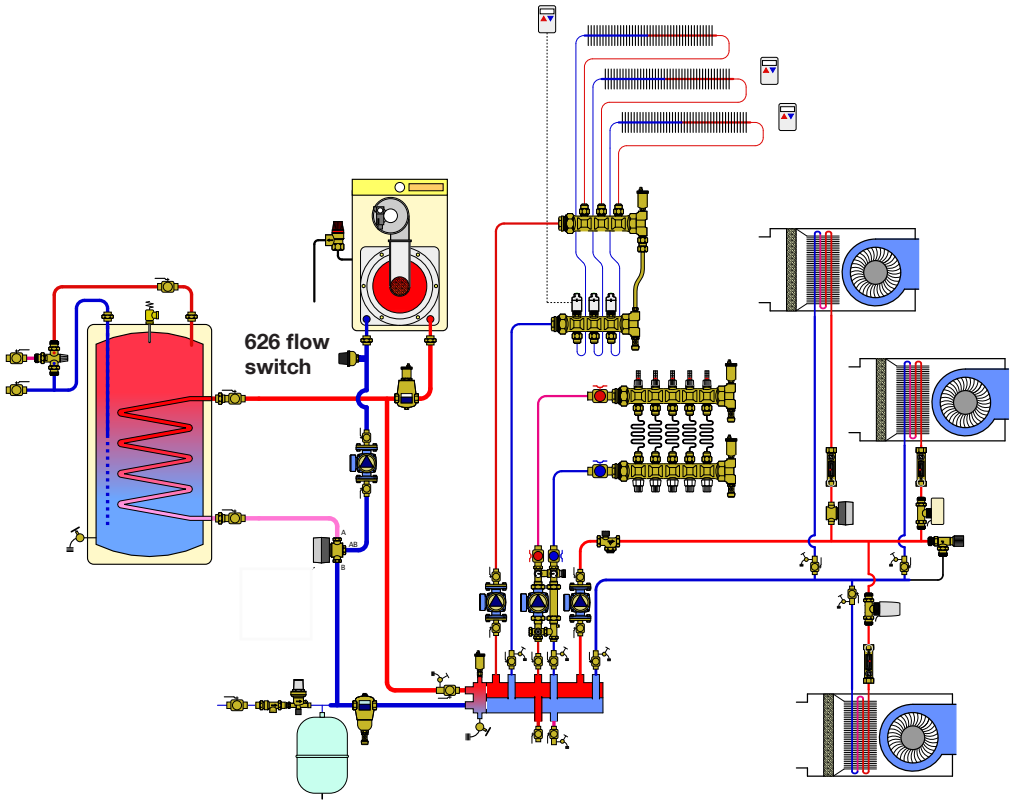
Flow switch used to activate a device when flow stops.
When the decreasing operating flow is reached or stops the common (black wire) and the normally open (red wire) contacts open, while the common (black wire) and the normally closed (blue wire) contacts close.



Application diagrams

Example of using the flow switch in a hydronic system

The flow switch is used to protect flow sensitive equipment in hydronic systems, such as the boiler in the below system. An insufficient flow rate causes the switch to turn off the boiler before any equipment could be damaged.

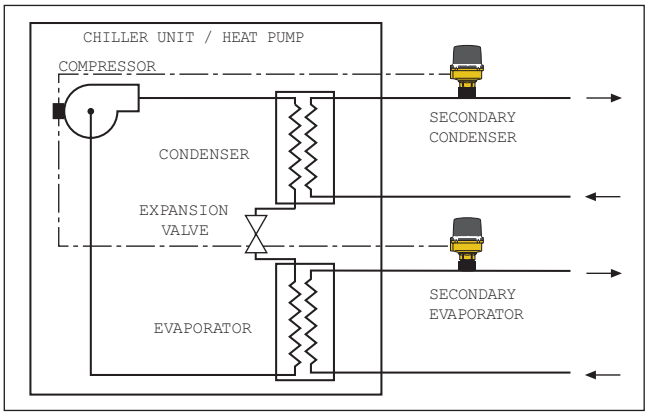


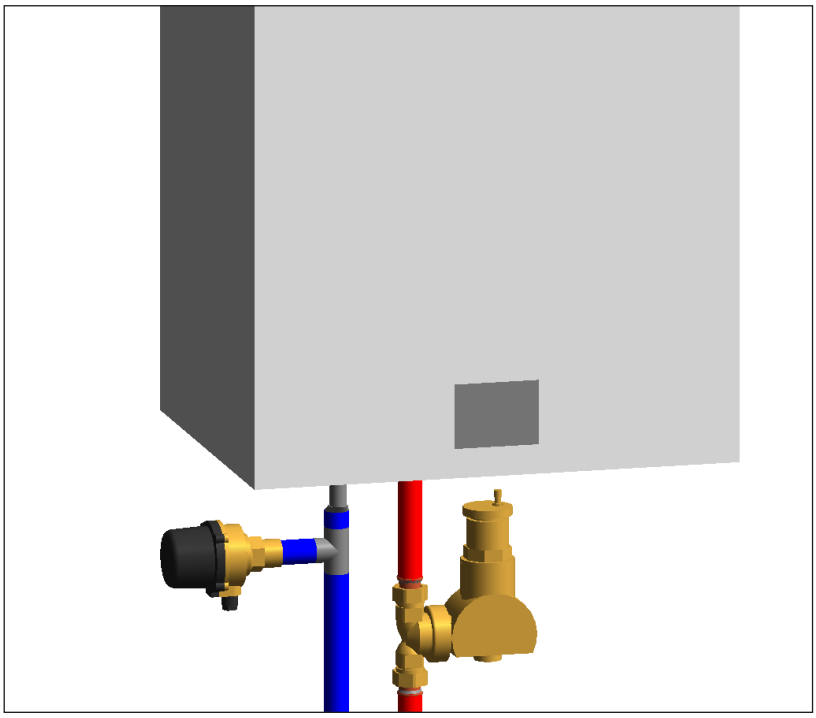
Example of flow switch use in a refrigerating system or heat pump

The flow switch is useful on machinery in general where water circulation is considered essential for the equipment to work properly. A typical example is the chiller unit shown in the figure.

If one of the following conditions occurs, the respective flow switch will trip to stop the compressor from working:

- insufficient or no flow of cooling water in the condenser (danger of overheating)
- insufficient or no flow of refrigerated water (danger of ice forming on the evaporator and liquid returning to the compressor suction side).





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SPECIFICATION SUMMARIES

626 series

Universal flow switch suitable for 1” to 8” pipe with 1” NPT male pipe connection and 1/2" NPT female conduit connection. UL certificate number E307420. Brass body. Self-extinguishing polycarbonate cover and microswitch protection casing. Stainless steel bellows and bellows rod, paddles for pipes and microswitch spring. EPDM O-Ring seals. Maximum working pressure 150 psi (10 bar). Medium temperature range -20–250°F (-30–120°C). Maximum ambient temperature 130°F (55°C). Suitable fluids: water and glycol solutions; Maximum percentage of glycol 50%. Voltage 250 V. Current 15 (5) A. Protection class NEMA type 5 (IP 54).

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