

C25 SERIES INLINE FLOW SWITCHES

High performance 25mm inline flow switches with advanced features make the C25 an ideal choice for many system designers.

FEATURES

- BRASS OR STAINLESS STEEL BODY
- ALL POSITION MOUNTING
- DIESEL AND OIL MODELS AVAILABLE
- CHOICE OF 2 ELECTRICAL MODULES
- CHOICE OF 3 SWITCHING RANGES
- 1" BSP or 1" NPT THREADS
- VERY LOW HEAD LOSS
- FULLY SERVICEABLE
- WEATHERPROOF

The C25 inline flow switches are versatile magnetically actuated normally off flow switches that switch on in response to a selectable flow. They are ideal for a multitude of clean liquid applications including pressure boosting and for the direct control of pumps or fans. They are available with bodies made from lead free brass or 316 stainless steel.

The C25 flow switches can be supplied with reed switch contacts for relay or PLC control or with a built in 40 Amp solid state switch for the direct control of single phase motors up to 3kW 4HP.

CONSTRUCTION

The C25 flow switch consists of a sealed electrical switching module that saddles a one-piece metal body. The self contained electrical modules fitted to the flow switches is easily removed without disturbing pipework, and can be reversed or rotated independently of the switch body. Within the metal body of the flow switch a free fitting magnetically suspended piston actuates the switch as soon as flow starts.

SWITCHING POINT

Switching point and sensitivity to flow depends on liquid velocity, viscosity and piston clearance. To give users as wide a choice as possible, three pistons are available to suit the C25 flow switches. The three pistons allow the choice of a high, low or intermediate range of switching thresholds.

Piston Markings 1=A 2=B 3=C	Switching Point on a Slowly Rising Flow in Litres per Minute	Switching Point on a Slowly Reducing Flow in Litres per Minute	Electrical Response Time in Seconds
A	1.0	0.6	0.1
B	4.0	3.2	0.1
C	8.0	5.5	0.1

Note: The data shown in the table above refers to water at ambient temperature as the test medium. Increasing fluid viscosity will decrease the flow rate required to actuate the switch. Decreasing the fluid viscosity will proportionally increase the switch on flow rate.



APPLICATIONS

The C25 flow switches can be used in many clean liquids, including fresh water, sea water, and diesel fuel. The stainless steel models can tolerate many chemical solutions including acids and alkalis. The switches can also be used in compressed air or gas systems.

INSTALLATION

The C25 flow switches can be positioned in any orientation in pipework. In vertical piping, flow can be either upward or downward through the switch with very little difference in flow sensitivity. The C25 flow switch is suitable for use with hot or cold liquids up to 90°C. Systems can be steam sterilized at 100°C for short periods without damaging the switch.

HAZARDOUS APPLICATIONS

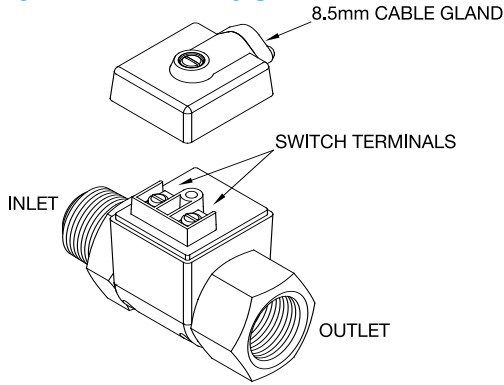
The C25-B flow switch with an inbuilt dry contact reed switch can be used in hazardous areas. The switches are classed as simple devices as they do not contain components capable of storing or producing an electric charge. As simple devices the switches can be used in hazardous applications provided they are isolated by an intrinsically safe barrier, a Zener barrier. The model C25-R flow switch is not suited to such applications, and will only operate in AC circuits.



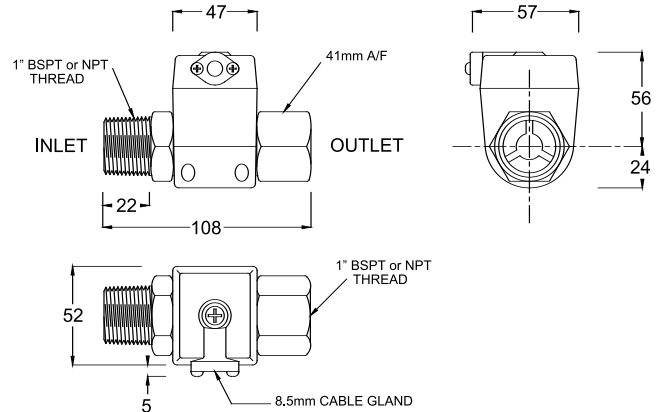
AUSTRALIAN MADE

TECHNICAL DATA

GENERAL LAYOUT



DIMENSIONS



ELECTRICAL APPLICATIONS

All C25 flow switches are single pole single throw normally open switches that switch on in response to flow.

The model C25-B is suitable for PLC use, data logging, telemetry systems, relay logic circuits, or any light duty control application in either AC or DC circuits. It is rated at 0 to 240V AC at 40Watts maximum switched power.

The model C25-R is suitable for AC use only, and can directly control any AC motor load up to 3kW 4HP. The C25-R will not operate in DC circuits or in circuits that draw less than 10mA.

ENVIRONMENT

Maximum Liquid Temperature	90°C, 100°C for short periods
Minimum Liquid Temperature	-20°C
Max. Liquid Pressure, Brass Body	100 Bars (1450 PSI)
Max. Liquid Pressure, Stainless Body	100 Bars (1450 PSI)
Ingress Protection Rating	IP56

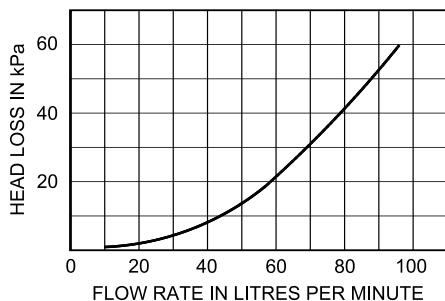
ELECTRICAL DATA

Electrical Module	Module Type	Contact Configuration	Switched Power Maximum	Switched Voltage Maximum	Switched Current Resistive AC (rms)	Inductive Loads (Power Factor 0.4)	Typical Application
B	Dry contact reed switch	S.P.S.T Normally Open	40Watts	240V AC 200V DC	1 Amp Maximum	Not Suitable	PLC telemetry and relay logic circuits
R	Solid state switch	S.P.S.T Normally Open	3kW 4HP	5 to 240V AC	10mA Minimum 40 Amps Maximum	40 Amps at 240V	AC control circuits and motor control

Note: The switched power of the C25-R module given above refers to a switch operating in a water pipe system at ambient temperature. The solid state switch built into the C25-R can tolerate locked rotor motor currents to 40 Amps continuous.

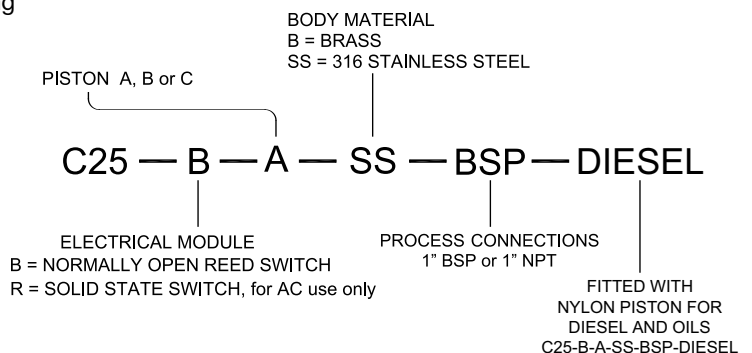
HEAD LOSS

Table based on test results from water only, see switching point data for other fluids.



Head loss, or pressure drop measured between the inlet and outlet of a C25 flow switch and expressed as a function of an increasing flow.

ORDERING



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KELCO C25 FLOW SWITCH INSTALLATION AND OPERATION

The C25 inline flow switch is a 25mm or 1 inch magnetically actuated piston flow switch that is normally off and switches on in response to flow. It is suitable for many types of pressure boosting and control applications in both hot and cold liquids.

INSTALLATION

The C25 flow switch can be installed in any location in vertical or horizontal pipes. In vertical pipes flow can be either upward or downward through the switch. Where possible install a union on the inlet and outlet of the flow switch to allow easy removal for cleaning or servicing. Ensure the flow switch is oriented correctly to the direction of flow. Note that this flow switch may be supplied with either 1" BSP or 1" NPT threads. The male threaded end of the switch is the inlet. When installing make sure no thread tape or other material from the installation becomes entrained in the switch. Also ensure no foreign matter can enter the flow switch from tanks or pipework. Where scale or entrained material may be present always install a Y-strainer in the inlet pipe directly before the switch.

Note that this flow switch operates magnetically and is therefore not suited to any application where iron or iron scale may be present in the process liquid.

The electrical module that saddles the flow switch body can be removed or loosened if required to allow the body of the switch to be screwed into tight locations, for example into the discharge port of a pump. To completely remove the electrical module undo the 4 self-tapping screws that secure the two halves of the module together, the sealed electrical module then simply lifts off.

Under no circumstances should the C25-R module be operated electrically under a high amperage load unless suitably attached to the flow switch body.

REFITTING ELECTRICAL MODULES

The electrical module of the C25 flow switch can be oriented to suit the application. It can be mounted in either direction on the switch body and can be rotated around the switch body to any required position. All modules are normally off switches that turn on in response to flow. Reversing the orientation of the electrical module does not reverse the action of the switch. To refit a module to the switch body, fit and tighten the 4 stainless self-tapping screws.

CHECK VALVES

Many applications will benefit from a non-return valve in the pipework directly before the flow switch. This flow switch is not designed to operate as a one-way valve and rapid or high-pressure flow reversal may damage the piston in the switch. A simple non-return valve directly before the flow switch will reduce the possibility of damage due to flow reversal.

HOT LIQUIDS

This flow switch is suitable for use with hot or cold liquids up to 90°C continuous. Systems can be steam sterilized at 100°C for short periods without damaging the switch.

ELECTRICAL

The C25 flow switches are available in one of two basic electrical configurations. There is a model number and an electrical rating on the inside of every switch. The electrical rating of the two types of modules is set out in the following table.

ELECTRICAL DATA

Electrical Module	Module Type	Contact Configuration	Switched Power Maximum	Switched Voltage Maximum	Switched Current Resistive AC (rms)	Inductive Loads (Power Factor 0.4)	Typical Application
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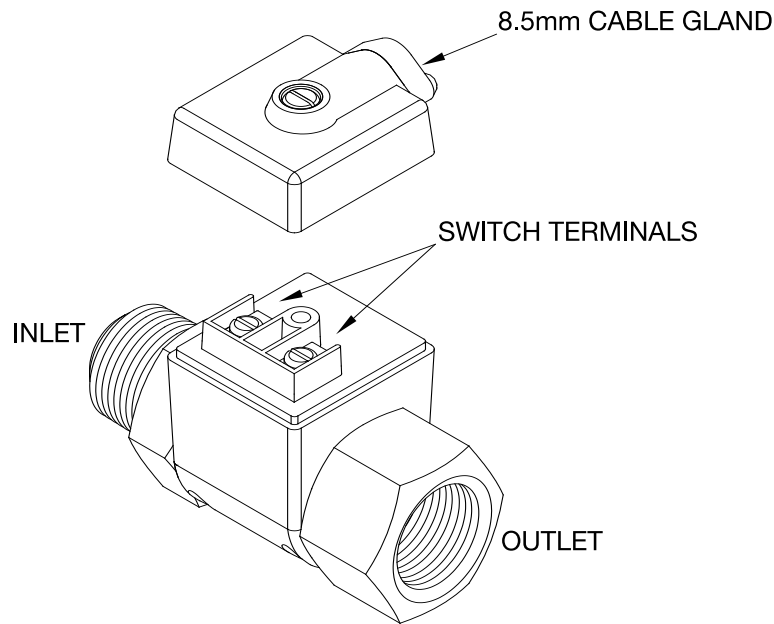
FLOW SENSITIVITY

Sensitivity to flow depends on liquid viscosity and piston clearance. There are three pistons available to suit the C25 flow switch. These are designated and marked A, B and C. Switches are normally supplied with one of the three pistons pre-fitted. The table below shows the switch on and switch off flow rates for the three pistons. Pistons can be identified by a simple code of small pimples or bumps on the nose of each piston. The pimples are visible looking into the inlet end of the switch. One bump is the "A" piston, two is the "B" piston and three pimples is the "C" piston.

Piston Markings	Switching Point on a Slowly Rising Flow in Litres per Minute	Switching Point on a Slowly Reducing Flow in Litres per Minute	Electrical Response Time in Seconds
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2 = B	4.0	3.2	0.1
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Note: The data shown in the table above refers to water at ambient temperature as the test medium. Increasing fluid viscosity will decrease the switch on points. Decreasing the fluid viscosity will proportionally increase the switch on points.

GENERAL LAYOUT



SERVICING

The C25 flow switch operates magnetically. The piston within the switch body should be a free fit and spring back to its off position as soon as flow stops. To test the flow switch push your finger into the inlet of the switch and press the piston back as far as it can go. When released, the piston should spring back freely. If the piston becomes jammed, it may require removal and cleaning.

Using a pair of long nosed pliers remove the spring circlip located in the outlet port of the switch. Press the piston back with your finger, it should pop out along with its three finned magnetic spider. Ensure there are no pieces of iron scale adhered to the piston or spider and that both parts are free of damage. Reassemble the switch and test it to ensure the piston is a free and smooth fit. The C25-B flow switch can be tested electrically using a continuity tester. The switch should be initially off and switch on when the piston is pushed back. The model C25-R should only be tested with a lamp load on an AC supply. The test lamp should light each time the piston is pushed back. If the C25-R is tested for continuity using an Ohms meter, a high resistance reading will be present across the switch terminals regardless of the ON or OFF state of the switch. This resistance is due to the solid state switch, and equates to a very small current leak present at all times across the contacts of the switch. The C25-R flow switch should not be used in AC applications that draw very small currents (<10mA), for example to drive electronic timers, as the load may remain in an on state regardless of the state of the flow switch, this effect is due to the small leakage current through the flow switch.

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