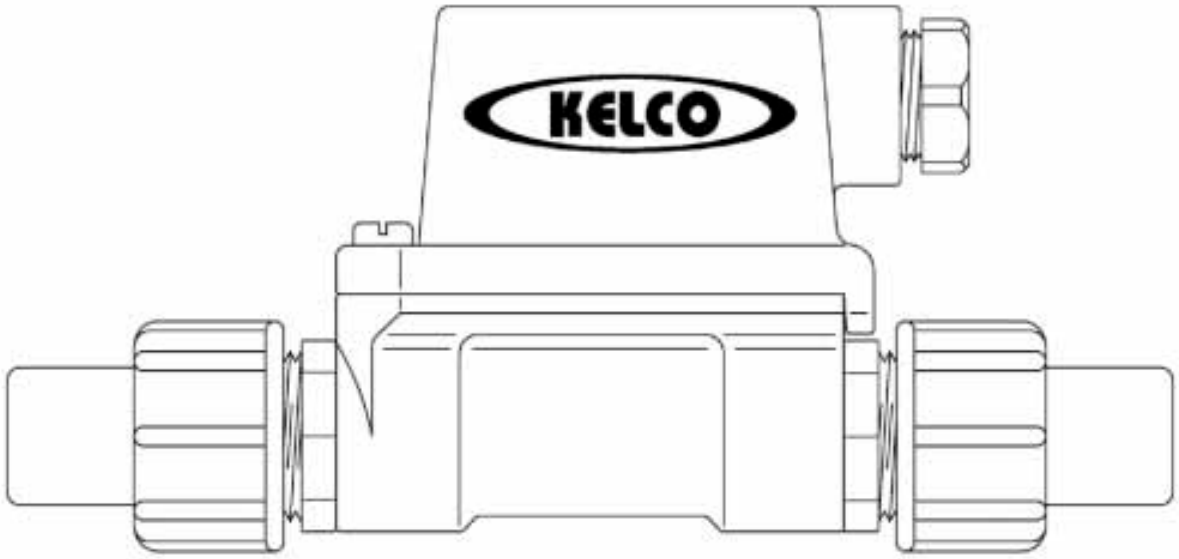
KELCO

CATALOGUE 2009



QUALITY FLUID CONTROLS

KELCO ENGINEERING PTY LTD
9/9 POWELLS ROAD BROOKVALE NSW 2100 AUSTRALIA
PO BOX 496 BROOKVALE NSW 2100
PH: +61 2 99056425 FAX: +61 2 99056420
ABN 20 002 834 844

TABLE OF CONTENTS

Click on product name to be taken to the appropriate page



PADDLE FLOW SWITCHES

- **F25 SERIES** Paddle Flow switches
- **F26 SERIES** Heavy duty flow switches
- **F27 SERIES** Flow switch with built in timer
- **F30 SERIES** Pump controller



FLOAT SWITCHES

- **Q SERIES** Heavy duty float switches
- **K SERIES** Precision level regulator



INLINE FLOW SWITCHES

- **CR20 SERIES** Super sensitive chemical resistant inline flow switch **(NEW)**
- **P20 SERIES** Non metal inline flow switches
- **MF20 SERIES** Non metal micro flow switches
- **P25 SERIES** Non metal, heavy duty inline flow switches
- **C15/C20 SERIES** Compact brass or stainless inline flow switches
- **C25 SERIES** Compact brass or stainless inline flow switches
- **UB SERIES** Brass inline flow switch



TRAILING WIRE FLOW SWITCHES

- **TW25** Trailing wire flow switch
- **TW26** Heavy duty trailing wire flow switch



SIDE ENTRY LEVEL SWITCHES

- **L25 SERIES** Non metal level switches
- **L26 SERIES** Heavy duty non metal level switches



TOP ENTRY LEVEL SWITCHES

- **D30 SERIES** Non metal two position level switch



MODULAR LEVEL SWITCH SYSTEM

- **LC20** Modular level sensor

KELCO

F25 CORROSION RESISTANT FLOW SWITCHES

FEATURES

- RELIABLE ROBUST CONSTRUCTION
- WEATHERPROOF ENCLOSURE IP56
- ALL WETTED PARTS IN THERMO PLASTIC
- NO METAL PARTS IN CONTACT WITH FLUIDS
- FULLY ADJUSTABLE FLOW SENSITIVITY
- SUITS PIPE SIZES 25MM TO 150MM +
- REED SWITCH OR SOLID STATE RELAY OUTPUT
- TOTALLY SERVICEABLE DESIGN
- FULL 18 BAR (260 PSI) PRESSURE RATING
- ENERGY AUTHORITY APPROVED

APPLICATIONS

- Loss of flow protection for pumps
- Control of flow in ultra pure water systems
- Flow status signalling in water treatment plants
- Control of effluent and fluid neutralising systems
- Corrosive and saline ground water applications
- Applications involving sea water or brine solutions
- Safety and control signalling for chemical handling
- Control and protection of chemical pumps
- Irrigation and turf watering systems control
- Horticultural and hydroponics system control



The F25 series flow switch has been specifically developed to fill the need for a flow sensor, capable of working reliably in applications in which metal flow switches fail. Typical areas include chemical, process, pharmaceutical, scientific and agricultural uses in which the metal components of traditional flow switches either interfere with, or are attacked by, the liquids being handled.

Modern thermo plastic pipe systems are used extensively in agriculture, industry, and in commercial and domestic fluid handling. The F25 flow switch has been specifically designed to integrate into plastic piping systems, and to enhance the advantages of such systems. Total avoidance of metal components, in the fluid stream, has been achieved. In addition, an advanced frictionless sensitivity adjusting system gives total external control over the switching threshold.

AUSTRALIAN MADE

TECHNICAL DATA

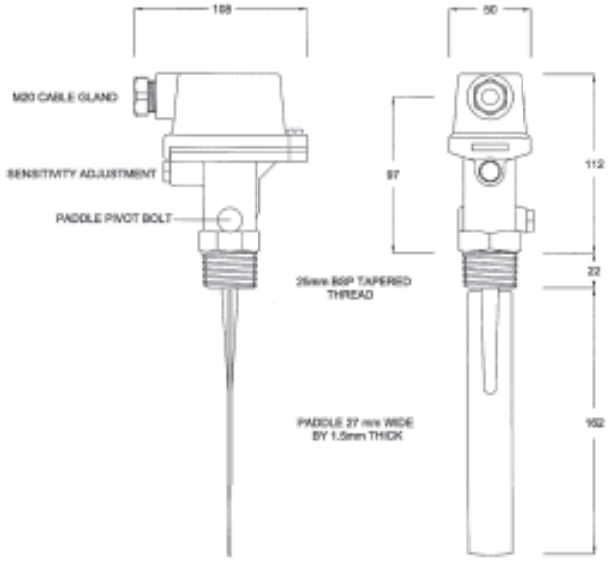
CONSTRUCTION

The F25 series flow switch is made from glass reinforced polypropylene.

Polypropylene is non-ageing and is unaffected by ground conditions. It will not support algae or bacterial growth, and has exceptional resistance to most acids, alkalis and solvents.

The F25 series flow switch should not be used with organic solvents.

DIMENSIONS



ELECTRICAL DATA

Switches can be supplied with a variety of circuit boards to suit specific applications. The electrical specifications of these boards are listed below.

Switch Model	Module Type	Contact Configuration	Switched Power	Switched Voltage Maximum	Switched Current Resistive AC (rms) Maximum	Inductive Loads (Power Factor 0.4)	Typical Application
F25-B	Dry Reed Switch	S.P.S.T. N.O/N.C.	40W	240V AC 200V DC	1A	Not Suitable	PLC & control circuits
F25-C	Dry Reed Switch	S.P.D.T.	40W	240V AC 200V DC	1A	Not Suitable	PLC & control circuits
F25-R	Solid State Relay (Triac)	S.P.S.T. N.O/N.C.	750W	240V AC	4A	4A at 240V AC	AC control circuits & motor control
F25-A-240	Standard Relay 240V AC Coil	S.P.D.T.	2500VA at 250V AC 300VA at 30V DC	240V AC	10A	7.5A at 250V AC 5A at 30V DC	General AC or DC control
F25-A-24	Standard Relay 24V AC Coil	S.P.D.T.	2500VA at 250V AC 300VA at 30V DC	240V AC	10A	7.5A at 250V AC 5A at 30V DC	General AC or DC control

The circuit boards fitted to the F25-B and the F25-R switches are supplied as normally off switches that turn on when flow starts. Turning the circuit board end for end will reverse this standard switch function. Circuit boards with S.P.D.T. contacts, such as the F25-C and the boards that include built in relays, should not be reversed. Normally on and normally off functions are available directly from the terminal blocks of these switches.

Data on maximum and minimum flow rates needed to actuate F25 flow switches is not included. Pipe size, paddle arm trimming and sensitivity settings all interact to determine the switching thresholds. The unique magnetic system employed in the Ultraswitch F25 series provides a range of settings unequalled - covering extreme sensitivity to very low flows through to relative insensitivity to quite high flow rates.

OPERATING ENVIRONMENT

Maximum Operating Pressure (Static or Dynamic) at Ambient Temperature	1800 Kpa 260 P.S.I.
Minimum Burst Pressure at Ambient Temperature	7000 Kpa 1000-P.S.I.
Maximum Operating Temperature	80 Degrees C at a pressure 1 bar absolute, see note below
Minimum Operating Temperature	-20°C
Ph Range Standard Switch	1 to 14

Note: Switching point flow rate date given in the table above refers to water at 15°C as the process fluid. In the interest of safety, maximum operating pressure given in the operating parameters table must be de-rated linearity in direct proportion to temperature increase, to a maximum pressure of 1 bar absolute at 80 degrees Centigrade. In other words only use this switch at elevated temperatures in non pressurised systems that are totally open to atmosphere in all circumstances and under all conditions.

NEW SOUTH WALES DEPARTMENT OF MINERALS AND ENERGY APPROVAL No. CS4937N

MADE IN AUSTRALIA BY

KELCO Engineering Pty Ltd
ABN 20 002 834 844
Head office and factory
9/9 Powells Road Brookvale 2100 NSW Australia
Phone: +61 2 9905 6425 Fax: +61 2 9905 6420
Email: sales@kelco.com.au Web: www.kelco.com.au

©2008 Kelco Engineering Pty Ltd

PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008.

F26 SERIES CORROSION RESISTANT HEAVY DUTY FLOW SWITCHES

FEATURES

- POLYPROPYLENE OR STAINLESS CONSTRUCTION
- 15 OR 20 AMP 500V S.P.D.T. SWITCH
- SUITS PIPE SIZES 25mm AND ABOVE
- 18 OR 100 BAR PRESSURE RATING
- WEATHERPROOF IP67 HOUSING
- SEAL LESS MAGNETIC DRIVE
- MANUAL OVERRIDE BUILT IN
- FULLY ADJUSTABLE



The F26 heavy-duty flow switch is a highly sensitive paddle style switch suitable for a wide range of process control applications in cold to warm liquids. The switch is designed to integrate into modern thermoplastic piping systems, and to compliment the inherent advantages of such systems.

The F26 flow switch is available in two basic forms, a general purpose polypropylene model designated F26-S, which is suitable for most control circuit applications and for the direct control of low wattage pump motors. The second version, model F26-H is supplied with a 20Amp 500Volt switch suitable for directly controlling heaters, fans or pump motors up to 1.5kW 2HP. Both versions of the switch are available in either Polypropylene thermoplastic or Polypropylene and 316 stainless steel construction. All F26 flow switches are supplied with an extra long paddle designed to be custom cut and shaped to suit the specific installation.

A unique feature of all the F26 flow switches is a built-in manual override switch that allows the flow switch to be turned on, regardless of lack of flow. This feature means pumps can be manually started or primed directly from the flow switch, it also facilitates the testing and commissioning of systems.

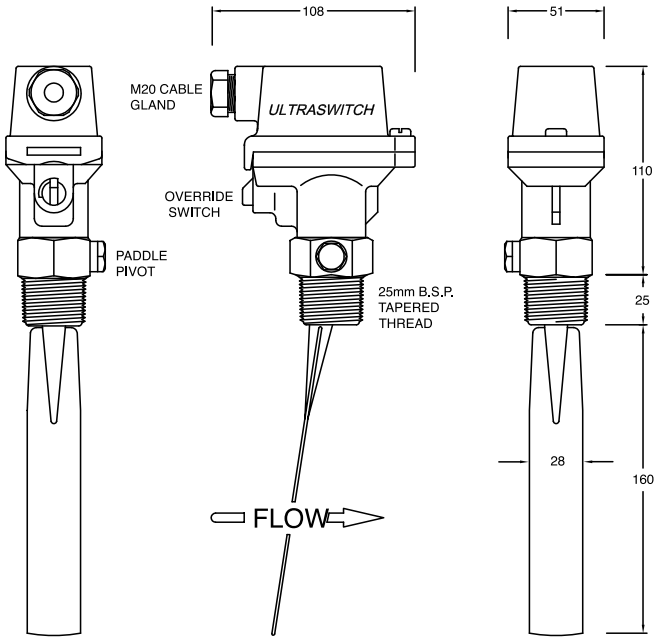
Our unique magnetic repulsion system is built into each F26 flow switch and couples the paddle's movement to the high compliance switch through a wall of solid polypropylene or stainless steel. The result is a flow switch with no seals or bellows or other points of potential failure. Where required, the F26 flow switch can be supplied with no metal parts in contact with the process liquid. The F26 flow switch can be used reliably in a huge variety of liquids including sea water, bore water, acids, alkalis and in many chemical solutions.



AUSTRALIAN MADE

TECHNICAL DATA

DIMENSIONS



MODELS AVAILABLE

F26-S	Standard polypropylene flow switch with 15Amp 500Volt SPDT switch 18 Bar pressure rated.
F26-SS	316 Stainless & polypropylene model with 15Amp 500Volt SPDT switch 100 Bar pressure rated.
F26-H	Polypropylene heavy-duty model with 20Amp 500Volt SPDT switch 18 Bar pressure rated.
F26-HS	316 Stainless & polypropylene model with 20Amp 500Volt SPDT switch 100 Bar pressure rated.

OPERATING ENVIRONMENT

MODEL	**F26-S, & F26-H** (all Polypropylene construction)	**F26-SS & F26-HS** (316 Stainless & Polypropylene construction)
Maximum operating pressure (static or dynamic) at ambient temperature.	18 Bars (260 PSI)	100 Bars (1450 PSI)
Minimum burst pressure at ambient temperature.	80 Bars (1160 PSI)	400 Bars (5800 PSI)
Maximum operating temperature (Liquid)	80 Degrees C at a pressure 1 bar absolute, see note below	80˚ C
Minimum operating temperature (Liquid)	-30˚ C	-30˚ C
Process liquid Ph range	1 to 14	1 to 14
Ingress protection rating (Weatherproof rating)	IP67 Watertight to 300mm submergence	IP67 Watertight to 300mm submergence

FLOW SENSITIVITY

The accompanying table gives the flow in litres per minute required to actuate the F26 flow switch when installed in Schedule 40 Steel Pipe of various diameters. The flow rates given refer to water as the process liquid. In the case of 25NB and 32NB pipe, the paddles are trimmed to clear the inside wall of the pipe by 3mm. For all other pipe diameters the switch is fitted with a standard width paddle that has been trimmed to the centre line of the pipe. The data is accurate to +/-15% in a non-turbulent flow installation; with 5 diameters of straight pipe either side of the switch.

The accompanying table should be used as a general guide only. Increasing the paddle length will proportionally increase the sensitivity of the switch. That is, it will decrease the flow rate required to actuate the flow switch. Inversely, decreasing the paddle length will reduce the sensitivity of the switch and increase the flow rate required to actuate the switch. Maximum recommended flow rates are determined by setting a safe limit to the flow induced forces acting on the paddle.

Under the conditions described above the maximum flow rates should not exceed 5 times the switching point flow rates given in the table. Proportionally reducing the paddle length can substantially increase the safe maximum flow rate, but at a low flow will also increase the flow rate required to actuate the flow switch.

ELECTRICAL DATA

The F26-S and the F26-SS models are suitable for general control circuit applications

MODELS F26-S AND F26-SS								
Rated Voltage	NON INDUCTIVE LOADS				INDUCTIVE LOADS			
	Resistive load		Lamp Load		Inductive Load		Motor Load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	15A		3 A	1.5 A	15A		5A	2.5A
250 VAC	15A		2.5A	1.25A	15A		3A	1.5A
500 VAC	10A		1.5A	0.75A	6A		1.5A	0.75A
8 VDC	15A		3 A	1.5 A	15A		5A	2.5A
14 VDC	15A		3 A	1.5 A	10A		5A	2.5A
30 VDC	6A		3 A	1.5 A	5A		5A	2.5A
125 VDC	0.5A		0.5 A	0.5 A	0.05A		0.05A	0.05A
250 VDC	0.25A		0.25 A	0.25 A	0.03A		0.03A	0.03A

The F26-H and the F26-HS models are suitable for the direct control of pump motors up to 1.5kW 2HP.

MODELS F26-H AND F26-HS								
Rated Voltage	NON INDUCTIVE LOADS				INDUCTIVE LOADS			
	Resistive load		Lamp Load		Inductive Load		Motor Load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	20A		7.5A		20A		12.5A	
250 VAC	20A		7.5A		20A		8.3A	
500 VAC	15 A		4A		10A		2A	
8 VDC	20A		3 A	1.5 A	20A		12.5A	
14 VDC	20A		3 A	1.5 A	15 A		12.5A	
30 VDC	6 A		3 A	1.5 A	5 A		5 A	
125 VDC	0.5 A		0.5 A		0.05 A		0.05 A	
250 VDC	0.25 A		0.25 A		0.03 A		0.03 A	

Note: temperature for the maximum operating pressure shown in the above operating environment table is 15°C, In the interest of safety, when using the polypropylene version of the F26 series, maximum operating pressure must be de-rated linearly in direct proportion to temperature increase, to a maximum pressure of 1 bar absolute at 80 degrees Centigrade. In other words only use this switch at elevated temperatures in non pressurised systems that are totally open to atmosphere in all circumstances and under all conditions.

MADE IN AUSTRALIA BY

KELCO Engineering Pty Ltd
ABN 20 002 834 844
Head office and factory
9/9 Powells Road Brookvale 2100 NSW Australia
Phone: +61 2 9905 6425 Fax: +61 2 9905 6420
Email: sales@kelco.com.au Web: www.kelco.com.au

©2008 Kelco Engineering Pty Ltd

PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008.

F27 TIME DELAY FLOW SWITCH

FEATURES

- DRY RUN PROTECTION FOR PRESSURE SYSTEMS
- DRY RUN PROTECTION FOR BORE PUMPS
- DIRECTLY CONTROL PUMPS TO 3.75kW 5HP
- INBUILT START-UP TIMER
- AUTOMATIC RUN-ON TIMER
- NO METAL PARTS IN CONTACT WITH LIQUIDS
- 240V, 24VAC AND DC MODELS AVAILABLE
- INDICATOR LED's FOR ALL FUNCTIONS
- RELIABLE PROVEN CONSTRUCTION
- WEATHERPROOF ENCLOSURE
- SUITS PIPES 25mm AND ABOVE
- 18 BAR (260 PSI) PRESSURE RATING
- STAINLESS MODELS AVAILABLE

GENERAL DESCRIPTION

The F27 time delay flow switches are paddle flow switches with built-in digital timers that override the off state of the flow switch and allow a pump to start in spite of an initial lack of flow. They also have adjustable run-on timers that let the pump ignore minor flow interruptions while still being fully protected against running dry.

DRY RUN PROTECTION FOR STANDARD PRESSURE SYSTEMS

If a normal pressure system operated by a pressure switch is run dry, severe damage to the pump and its seal may result. An F27 flow switch connected between the pressure switch and the pump will protect the pump from dry run damage by shutting it down, in spite of the pressure switch trying to keep it running.

CONSTRUCTION

The F27 flow switches have no metal parts in contact with liquids. They operate through a seal-less magnetic coupling system, and are therefore ideally suited to use in aggressive or saline ground water, seawater or chlorinated water.

The F27 is made from a high tech blend of ABS, and Polypropylene thermoplastics, specifically tailored to give the highest possible performance in terms of mechanical strength, ultraviolet stability, and chemical inertness. All the F27 flow switches use our well proven magnetic suspension system, to give a frictionless spring return action to the paddle, and total isolation of the electronic module. The electronics built into the F27 are both brown-out and voltage surge protected.

INSTALLATION

The F27 pump controller should be mounted in a straight section of the pump's discharge pipe, either before or after the air cell. A 1"BSP female thread must be provided to fit the controller. The F27 is supplied with an extra long paddle to allow it to be installed in large pipes for industrial or irrigation use. The paddle is normally cut down to suit the specific pipe into which the controller is to be installed.

BASIC MODE

With both its start-up and run-on timers set to zero, the F27 mimics the action of a basic flow switch. It simply turns on and off in direct response to flow. The start-up override and run-on functions are ignored.

OVERRIDE ON START

When powered up, the F27 turns on the pump and lets it run for a settable time in spite of a lack of initial flow. It expects to see its paddle pushed into the on position by flow during the start-up time. If flow is not established by the end of the set time period the F27 shuts down the pump and prevents it from running dry. The override on start time is adjustable in 16 steps from 1 second to 3 minutes. Normally a time setting of a few seconds is all that is required to start a pump. The extra long start-up time settings can be used to start submersible bore pumps with self-draining risers and in any situation where a long delay in flow stabilisation may be encountered.

IGNORE PADDLE BOUNCE

The F27 has an adjustable run-on function so that minor fluctuations in flow don't cause the pump to instantly stop. The run-on function is adjustable in 16 steps from 1 second to 5 minutes. A setting of a few seconds run-on is all that is normally needed to ignore minor flow interruptions, such as air bubbles in the pipework. The extra long run-on feature can be used to allow the pump to pressurise high volume piping systems, to charge large air cells or to pump down low yield bores at very low flow rates.





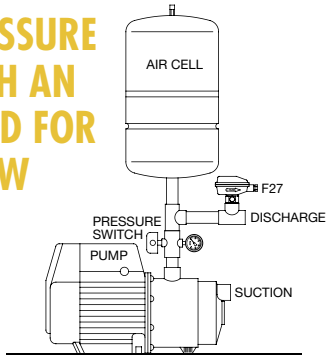
Run-on Timer Control
Start-up Timer Control
Paddle LED
Timer LED



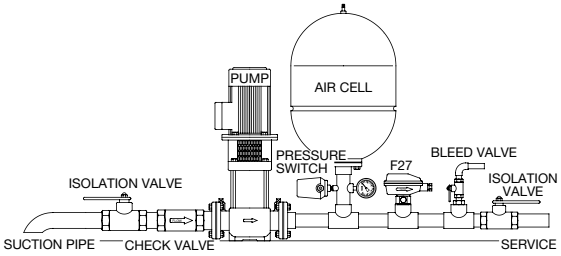
AUSTRALIAN MADE

TECHNICAL DATA

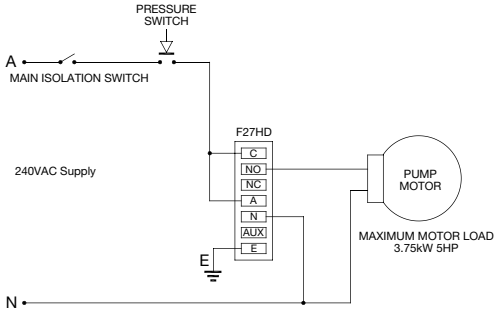
TYPICAL PRESSURE SYSTEM WITH AN F27 INCLUDED FOR LOSS OF FLOW PROTECTION



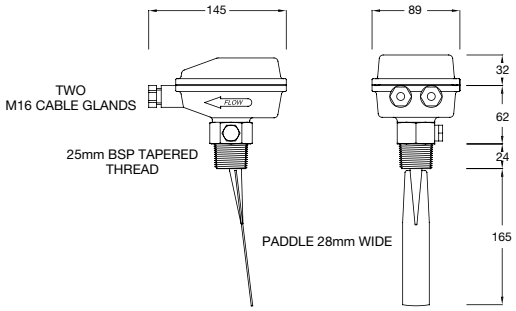
TYPICAL RURAL OR INDUSTRIAL PUMP INSTALLATION



CIRCUIT FOR A STANDARD PRESSURE SYSTEM CONTROLLED BY AN F27



DIMENSIONS



MODELS

Part Number	Maximum 240VAC Motor Load	Supply Required	Contact Type	Typical Application	Output Type	Output can drive timers or small relays
F27-240HD	3.75kW 5HP	140mA at 240VAC	S.P.D.T.	Control of pump motors to 5HP	Hybrid Solid State Drive	NO
F27-24HD	3.75kW 5HP	140mA at 240VAC	S.P.D.T.	Control of pump motors to 5HP	Hybrid Solid State Drive	NO
F27-240	0.75kW 1HP	140mA at 240VAC	S.P.D.T.	Control of pump motors to 1HP	Mechanical Relay	YES
F27-24	0.75kW 1HP	140mA at 24VAC	S.P.D.T.	Control of pump motors to 1HP	Mechanical Relay	YES
F27-DC	0.75kW 1HP (AC Motors Only)	140mA at 12 to 24VDC	S.P.D.T.	Control of pump motors to 1HP	Mechanical Relay	YES

OPTIONS

316 Stainless steel body with 100 Bar pressure rating
1" NPT Male Polypropylene process connection
Trailing Wire Flow Sensor for effluent applications

SPECIFICATIONS

Microprocessor digital control.
Fully independent control over both the start-up and run-on timers.
Start-up timer adjustable from 0 to 180 seconds in 16 steps.
Run-on timer adjustable from 0 to 300 seconds in 16 steps.
True paddle status LED, turns green in direct response to flow.
Power indication LED slowly blinks red to indicate when the F27 is powered up and in standby mode.
Timer LED turns green to indicate when the start-up timer is running.
Timer LED turns red to indicate when the run-on timer is running.
Output to drive the pump, Hybrid Drive or Relay.
One set of normally closed 16 Amp contacts are also provided to operate an external alarm or warning light, to indicate the pump has stopped.
The F27 flow switch has both brown-out and voltage surge protection built in.
Magnetic paddle adjustment for flow sensitivity.
Two M16 cable glands in the controller's housing accept 8mm flex or two M16 conduit connections, to bring power to the F27 and to run a cable to the pump.
Maximum operating pressure, static or dynamic, standard models, 18Bars (260 PSI), or 100Bars (1400PSI) for the optional stainless steel models.
Maximum liquid temperature 70ºC All models.
Minimum liquid temperature –20ºC All models.
Liquid Ph 1 to 14.
Weatherproof rating IP56 (Hose proof).

MADE IN AUSTRALIA BY

KELCO

KELCO ENGINEERING Pty Ltd ABN 20 002 834 844
Head Office and Factory: 9/9 Powells Road BROOKVALE 2100 AUSTRALIA
Postal Address PO Box 496 BROOKVALE NSW 2100
Phone: (61) 2 99056425 Fax: (61) 2 99056420
Email: sales@kelco.com.au URLwww.kelco.com.au

PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008

F30 PUMP CONTROLLER

CAPABLE OF DIRECTLY CONTROLLING PUMPS UP TO 3.75Kw 5HP, THE F30 IS A VERSATILE CONTROLLER THAT INTEGRATES FLOW AND PRESSURE. IT BRINGS THE ADVANTAGES OF CONSTANT FLOW AND DRY RUN PROTECTION TO TRADITIONAL PRESSURE SYSTEMS.

INTRODUCTION

The F30 Pump Controller is a microprocessor based electronic flow switch that monitors both flow and pressure. When included in a pressure system it vastly improves overall performance and gives the benefit of both constant flow and dry run protection.

Pressure systems cycle between low and high pressure, not because this gives the user any advantage but simply because a pressure differential is required to operate the pressure switch that normally controls such pumps. The user sees the effect as fluctuations in pressure at the tap. If loss of prime occurs, a pump controlled by a pressure switch will run the pump dry and can cause major damage.

THE F30 CONTROLLER

The F30 Pump Controller offers a far better approach. The pump starts on either flow or pressure drop, as soon as there is a modest demand. When demand ceases the controller continues to run the pump for a length of time, sufficient to recharge the system's air cell. Such a system allows the selection of a pump that has a flat curve and delivers a steady constant pressure over widely varying flows. An air cell with a very small draw-off can be used; as there only has to be sufficient stored pressure to re-actuate the F30 controller the next time there is a demand. With the F30 system the external pressure switch is set to start the pump at a pressure only marginally higher than the system's static pressure. If the demand is too low to actuate the F30's paddle, or if for any reason the pressure falls, eventually the pressure switch will close and signal the F30 to start the pump. The F30 then runs the pump for a preset time, recharges the air cell, switches to standby mode and waits for a further demand.

DRY RUN PROTECTION

A pump running under the control of an F30 will start if the pressure drops, or if a tap is turned on. If the system runs out of water the F30 senses the loss of flow and the lack of pressure and stops the pump. A red warning light on the controller then flashes rapidly to indicate there is a problem. The pump will not restart until the power to the pump is reset.

CONSTRUCTION

The F30 controllers have no metal parts in contact with liquids. They operate magnetically through a seal-less magnetic coupling system. They are therefore ideally suited to use in aggressive or saline ground water, in seawater or chlorinated water and in a huge variety of chemical solutions, including most acids and alkalis. The F30 is made from a high tech blend of Polypropylene and ABS thermoplastic, specifically tailored to give the highest possible performance, in terms of mechanical strength, ultraviolet stability, and chemical inertness.

INSTALLATION

The F30 pump controller should be mounted in a straight section of the pump's discharge pipe, either before or after the air cell. A 1"BSP female thread must be provided to fit the controller. The F30 is supplied with an extra long paddle to allow it to be installed in large pipes for industrial or irrigation use. The paddle is normally cut down to suit the specific pipe into which the controller is to be installed.



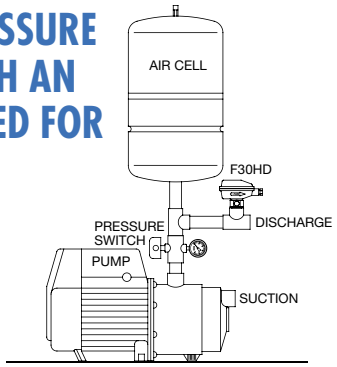


Run-on Timer Control
Start-up Timer Control
Pressure switch LED
Paddle and Alarm LED
Timer LED

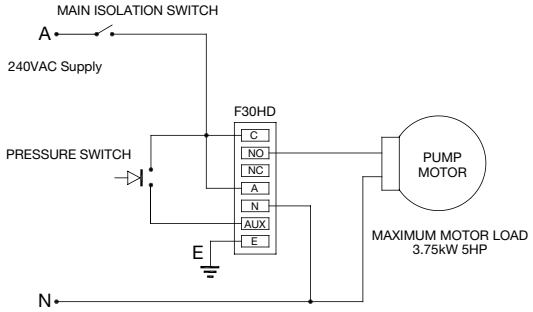
AUSTRALIAN MADE

TECHNICAL DATA

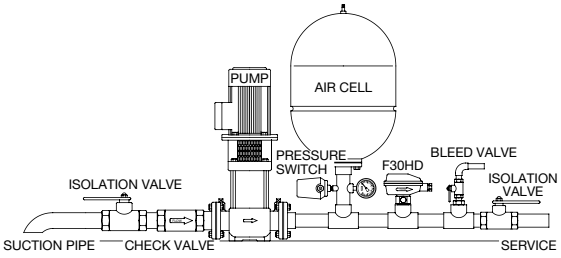
TYPICAL PRESSURE SYSTEM WITH AN F30 INSTALLED FOR PROTECTION



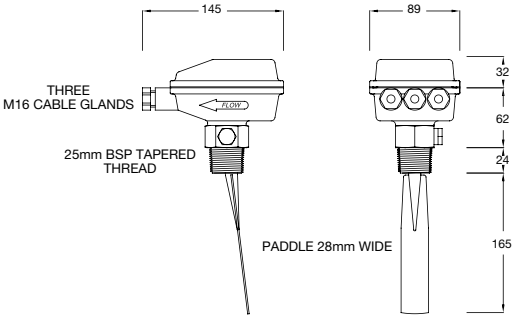
BASIC PRESSURE SYSTEM WIRING DIAGRAM



LAYOUT OF A LARGE RURAL OR INDUSTRIAL PUMPING SYSTEM



DIMENSIONS



MODELS

Part Number	Maximum 240VAC Motor Load	Supply Required	Contact Type	Typical Application	Output Type	Suitable for general control circuit applications
F30-240HD	3.75kW 5HP	150mA at 240VAC	S.P.D.T.	Control of pump motors to 5HP	Hybrid Solid State Drive	NO
F30-24HD	3.75kW 5HP	150mA at 240VAC	S.P.D.T.	Control of pump motors to 5HP	Hybrid Solid State Drive	NO
F30-240	0.75kW 1HP	150mA at 240VAC	S.P.D.T.	Control of pump motors to 1HP	Mechanical Relay	YES
F30-24	0.75kW 1HP	150mA at 24VAC	S.P.D.T.	Control of pump motors to 1HP	Mechanical Relay	YES
F30-DC	0.75kW 1HP (AC Motors Only)	150mA at 12 to 24VDC	S.P.D.T.	Control of pump motors to 1HP	Mechanical Relay	YES

OPTIONS

316 Stainless steel high pressure body
1"NPT Male process connection
Trailing Wire Sensor for effluent applications

SPECIFICATIONS

Microprocessor digital control.
Pressure switch input. Allows connection of external pressure switch.
Indicator LED shows when the pressure is high or low.
Fully independent control over both the start-up and run-on timers.
Start-up timer adjustable from 0 to 180 seconds.
Run-on timer adjustable from 0 to 300 seconds.
True paddle status LED, turns on and off in response to flow.
Power indication LED blinks to indicate the F30HD is powered up.
Timer LED indicates the start-up timer is running.
Dry run LED flashes to indicate the pump has run dry and shut down.
Timer LED indicates the run-on timer is running.
Output to drive pump is via a Solid State Hybrid Drive or Relay.
Brown-out and voltage surge protection built-in.
Magnetic paddle adjustment for flow sensitivity.
Three M16 cable glands in the controller's housing accept 8mm flex or three M16 conduit connections.
Maximum operating pressure, static or dynamic, standard models 18 Bars (260 PSI). 316 Stainless steel model 100Bars (1400 PSI).
Maximum liquid temperature 70ºC.
Minimum liquid temperature –20ºC.
Liquid Ph 1 to 14, Standard Polypropylene models.
Maximum ambient temperature 45ºC.
Weatherproof rating, housing IP56 Hose-proof.

MADE IN AUSTRALIA BY

KELCO

KELCO ENGINEERING Pty Ltd ABN 20 002 834 844
Head Office and Factory: 9/9 Powells Road BROOKVALE 2100 AUSTRALIA
Postal Address PO Box 496 BROOKVALE NSW 2100
Phone: (61) 2 99056425 Fax: (61) 2 99056420
Email: sales@kelco.com.au URLwww.kelco.com.au

PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008

KELCO

Q SERIES HEAVY DUTY FLOAT SWITCH

FEATURES

- Extra strong polypropylene float
- S.P.D.T three wire switch
- No mercury or lead components
- High quality rubber cable
- No corrodible metal parts
- Sealed tamperproof design
- Highly chemical resistant
- Wide range of cable lengths available

CABLE DATA

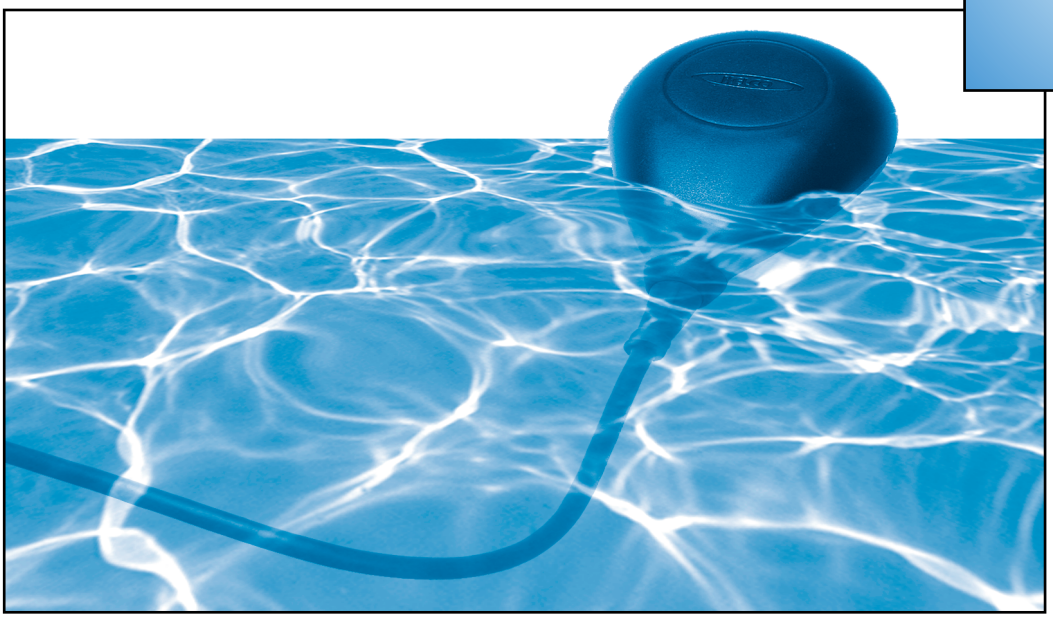
The switch is made of high grade polypropylene. Our high tech manufacturing process produces a sealed, seamless and glandless float that is totally tamperproof and extremely tough.

The heavy duty cable fitted to the Q series switch is constructed from Hypalon Rubber, which is specifically designed for permanent immersion in water. The switch and cable are also resistant to oil, grease, fat, sewerage and a variety of chemicals.

APPLICATIONS

- High and low level control in tanks, pits and dams
- Loss of prime protection for pumps
- Automatic control of sump pumps
- Control of tank filling and draining valves
- Control of levels in effluent and separation pits
- Level control in bulk liquid tanks
- Control of level warning equipment





The Q Series Float Switch consists of a heavy duty polypropylene float double moulded onto a high quality three core cable. The float contains a single pole double throw switch, which can be used to give adjustable control over the level of liquid in tanks, pits and dams. By careful tethering of the cable the switch can be set to give an ON or Off action at any desired position. The heavy duty switch can directly control small pump motors, and is also ideal for instrument or PLC signalling.

AUSTRALIAN MADE

TECHNICAL DATA

OPERATING ENVIRONMENT

Maximum submergence	30metres,300kPa static pressure
Maximum liquid temperature	60ºC
Minimum liquid temperature	-20ºC
Liquid specific gravity	>0.82
Liquid Ph	1 to 14
Smallest diameter well that the switch can operate in	600mm
Liquid level change for the switch to operate	300mm (approx)
Smallest opening through which the switch will fit	108mm
Minimum distance between float and closest tethering point/cable weight	100mm
Suitability for use in diesel fuel	Can be used, but some softening and swelling of the cable and boot may occur
Suitability for use in sodium hypochlorite	Fully Compatible
Suitability for use in sea water	Fully compatible
Suitability for use in octane (petrol)	Not suitable
Suitability for use in potable water	Fully compatible

SWITCH DATA

Switch type	Single Pole Double Throw
Contact gap	1mm
Contact material	Silver Alloy
Contact resistance	15mΩ max
Rated voltage AC	0 - 240V AC
Rated voltage DC	0 - 250V DC
Currant rating resistive AC	21 A at 250V
Motor load current rating AC	4 A at 250V
Current rating resistive DC	0.3 A at 250V
Motor load current rating DC	0.05 A at 250V
Maximum lamp load AC	3 A at 250V
Maximum lamp load DC	0.05 A at 250V
Maximum operating frequency, electrical	60 operations per/min
Insulation resistive	100MΩ min (at 500VDC)
Dielectric strength between contacts	2000 VAC, 50/60Hz for 1 minute
Life expectancy mechanical	50,000,000 operations min
Life expectancy electrical	100,000 operations min
Approved standards	UL508 E41515 CSA C22.2 No.55 (File No LR21642)

IMPORTANT SAFETY NOTE

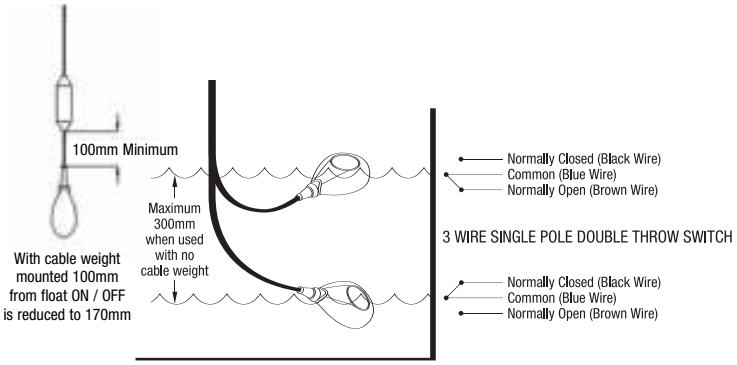
The Q Series Switches have been designed and built to be as tough as possible, and can withstand harsh environments. Great care should be taken to ensure the switch is only installed in positions where it will not be subjected to entanglement, severe agitation and abrasion against tank walls or moving equipment. If the application requires control of mains voltage, local electrical codes may require the switch to be isolated to a low voltage supply. This may be required, regardless of the high voltage rating of the float switch. Please check with your local electrical authority before connecting a Q Series Float Switch to a mains voltage supply.

NSW DEPARTMENT OF MINERALS AND ENERGY APPROVAL NUMBER CS4937N

CABLE DATA

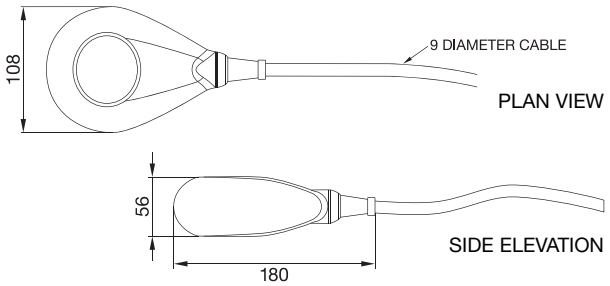
Cable type	Heavy Duty EPR/CSP Flexible Hypalon Rubber
Outer sheathing	CSP Hypalon, Oil Resistant & Flame Retarded to VDO 0472
Inner sheathing	R-EP-90 Special Elastomer Insulation
Cores	3 Cores, Each 1mm Diameter
Cable diameter	9mm Nominal
Core colours	Blue (Common) Black (Normally Closed) Brown (Normally Open)
Cable voltage rating Uo/U	600V / 1kV
AC test voltage	2.5kV
Cable current carrying capacity	18 Amps Continuous at a temperature of 30.5ºC
Cable maximum tensile strength	15N/mm^2
Minimum bending radii	50mm
Maximum ambient operating temperature	80ºC
Minimum permissible ambient temperature	-40ºC
Minimum permissible ambient temperature for fully flexible operation	-25ºC
Cable maximum permissible short circuit temperature	250ºC
Standards of cable construction	Meets or exceeds AS1125, AS3191, AS3116 and DIN/VDE0282
Cable lengths available	1, 3, 4, 6, 10, 15, 20, 30, 50 Metres standard. Against special order switches to 1000 Metres can be supplied

TYPICAL APPLICATION



Switching range adjustable up to a maximum of 300mm depending on tethering point.

DIMENSIONS



MADE IN AUSTRALIA BY

KELCO Engineering Pty Ltd
ABN 20 002 834 844
Head office and factory
9/9 Powells Road Brookvale 2100 NSW Australia
Phone: +61 2 9905 6425 Fax: +61 2 9905 6420
Email: sales@kelco.com.au Web: www.kelco.com.au

©2008 Kelco Engineering Pty Ltd

PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008.

KELCO

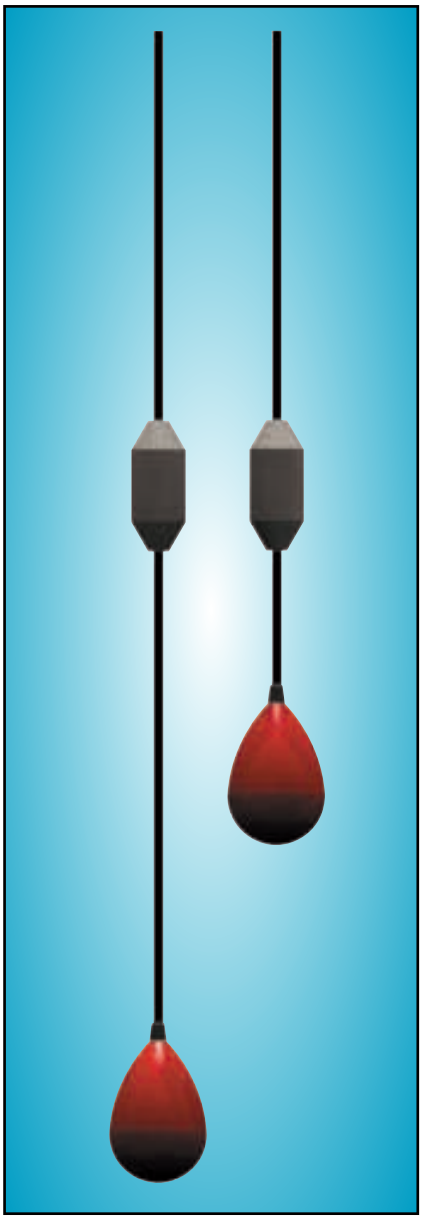
K SERIES HEAVY DUTY LEVEL REGULATOR

FEATURES

- LOW DIFFERENTIAL SWITCHING
- ALL DIRECTION TILT ACTION
- S.P.D.T 3 WIRE SINGLE POINT SWITCH
- POLYPROPYLENE & HYPALON CONSTRUCTION
- WIDE RANGE OF CABLE LENGTHS AVAILABLE
- STABLE REPEATABLE SWITCHING ACTION
- NO MERCURY OR LEAD COMPONENTS
- COMPACT SIZE, 75mm DIAMETER
- OPTIONAL CABLE WEIGHT AVAILABLE



AUSTRALIAN MADE



APPLICATIONS

- BASIC LIQUID LEVEL CONTROL
- MULTI POINT LEVEL CONTROL
- SEWERAGE LEVEL CONTROL
- CHEMICAL LEVEL CONTROL
- HIGH & LOW LEVEL ALARMS
- SELF POWERED SIGNALLING
- PUMP PROTECTION

The K series heavy duty level regulator is a compact three-wire float switch for highly accurate and repeatable single point level sensing and control applications. It is ideal for use in water, sea water and most acids and alkali solutions. It will provide a stable switching action with a very high degree of reliability. The teardrop shape of the float makes it ideal for effluent and sewerage usage, as the float cell has no shoulders or edges for solids to build on. These float switches can be reliably and safely used in potable water systems, as they do not contain hazardous materials such as mercury or lead.

OPERATING PRINCIPLE

The K series level regulator houses a heavy ball that is balanced on the actuating arm of a high precision switch. When rising liquid level causes the float to lift and tilt, the centre of gravity of the ball moves away from the actuating axis of the switch and allows it to de-actuate. A falling liquid level allows the float to straighten up and the centre of gravity of the ball shifts back onto the switch causing it to again actuate. This simple reliable action only requires the float to tilt by 45 degrees in any direction for the switch to operate.

CONSTRUCTION

The K series heavy duty level regulator is constructed from polypropylene and high compliance three core Hypalon cable. The float chamber is a double moulded hermetically sealed cell with a double moulded barrier of solid polypropylene sealing the cable entry. The switch housed within the float cell is a precision single pole double throw device rated at 0 to 240V AC at up to 15 Amps resistive load.

HAZARDOUS APPLICATIONS

This level regulator is classed as a simple device and does not require separate certification to be used in hazardous applications. In any such installation the level regulator should be isolated by an intrinsically safe barrier, a zener barrier.

IMPORTANT SAFETY NOTE

The K series level regulators are rated for mains voltage operation. However, in the interest of safety we recommend that they are only ever operated at low voltage, preferably at 24 to 48V AC. Where mains voltage operation is unavoidable an earth leakage circuit breaker should always be installed in the control circuit. The application and wiring of this float switch should always be carried out by qualified electrical personnel and must always conform to local wiring rules.

TECHNICAL DATA

CABLE SPECIFICATIONS

Cable type	Heavy Duty EPR/CSP Flexible Hypalon Rubber
Outer sheathing	CSP Hypalon, Oil Resistant & Flame Retarded to VDE 0472
Inner sheathing	R-EP-90 Special Elastomer Insulation
Cores	3 Cores, each 0.75mm Sq. tinned copper
Cable diameter	7.5mm Nominal
Core colours	Blue (Common) Black (Normally Closed) Brown (Normally Open)
Cable voltage rating Uo/U	600 V / 1kV
AC test voltage	2.5kV
Cable current carrying capacity	18 Amps Continuous at a temperature of 30.5ºC
Cable maximum tensile strength	30 N
Minimum bending radii	40mm
Maximum ambient operating temperature	80ºC
Minimum permissible ambient temperature	-40ºC
Minimum permissible ambient temperature for fully flexible operation	-25ºC
Cable maximum permissible short circuit temperature	250ºC
Standards of cable construction	Meets or exceeds AS1125, AS3191, AS3116 and DIN/VDE0282
Cable lengths available	1, 3, 4, 6, 10, 15, 20, 30, 50 Metres standard. Against special order switches to 1000 Metres can be supplied

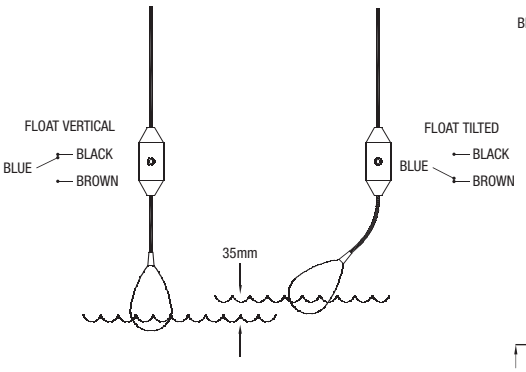
ENVIRONMENTAL LIMITATIONS

Maximum submergence	30meters,300kPa Static pressure
Maximum liquid temperature	60ºC
Minimum liquid temperature	-20ºC
Liquid specific gravity	>0.82
Liquid Ph	1 to 14
Smallest diameter well that the switch can operate in	Within a 160mm inside diameter vertically mounted pipe
Liquid level change for switch to operate	35mm
Closest switching point to tank floor	50mm
Smallest opening through which the switch will fit	75mm diameter
Minimum distance between float and closest tethering point or cable weight	150mm
Suitability for use in Diesel Fuel	Can be used, but some swelling and softening of the cable & boot may occur
Suitability for use in Sodium Hypochlorite	Fully Compatible
Suitability for sea water use	Fully Compatible
Suitability for use in Octane (Petrol)	Not suitable
Suitability for use in potable water	Fully Compatible

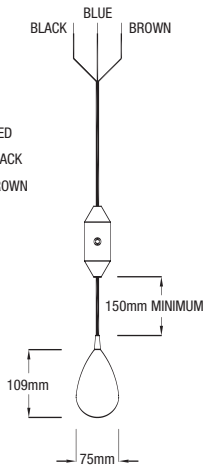
SWITCH SPECIFICATIONS

Switch type	Single Pole Double Throw
Contact gap	0.5mm
Contact material	Silver Alloy
Contact resistance	15m Ohms (initial value)
Rated voltage AC	0 to 240V AC
Rated voltage DC	0 to 250V DC
Currant rating AC resistive	15 A at 250V AC, 15A at 125V DC
Motor load currant rating AC	1.5 A at 250V AC, 2.5A at 125V AC (1/4HP)
Currant rating DC Resistive	15 Amps at 14V DC, 6 Amps at 30V DC
Maximum lamp load AC	1.25 Amps at 250V AC
Maximum lamp load DC	1.5 Amps at 30V DC
Minimum operating load	100mA at 12V, or 60mA at 24V
Maximum operating frequency, electrical	24 operations per minute
Insulation resistance	100M Ohms minimum at 500 V DC
Dielectric strength between contacts	1000 V AC at 50 to 60Hz for 1 minute
Life expectancy Mechanical	20,000,000 operations minimum
Life expectancy Electrical	500,000 operations minimum
Approved standards	UL508 E41515, CSA C22.2 No55 (File No LR21642)

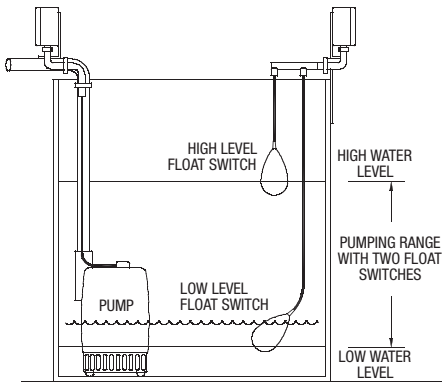
OPERATION



DIMENSIONS



TYPICAL INSTALLATION



MADE IN AUSTRALIA BY

KELCO Engineering Pty Ltd
ABN 20 002 834 844
Head office and factory
9/9 Powells Road Brookvale 2100 NSW Australia
Phone: +61 2 9905 6425 Fax: +61 2 9905 6420
Email: sales@kelco.com.au Web: www.kelco.com.au

©2008 Kelco Engineering Pty Ltd

PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008.

CR20 MICROFLOW SWITCH

LOW FLOW CHEMICAL RESISTANT FLOW SWITCH



FEATURES

- DETECTS FLOWS OF LESS THAN 5mL PER MINUTE
- HANDLES CONTINUOUS FLOWS TO 4L PER MINUTE
- SUITABLE FOR PULSED OR CONTINUOUS FLOWS
- SUITS TUBE & PIPES 6mm TO 20mm
- ALL WETTED PARTS UPVC & VITON®
- PVDF MODEL ALSO AVAILABLE
- COMPACT ALL POSITION MOUNTING
- 18 Bar (260PSI) PRESSURE RATING
- FAST RESPONSE TO FLOW LOSS
- EASY TO INSTALL & SERVICE
- SIMPLE AND RELIABLE
- WEATHERPROOF

The CR20 Microflow switch is a compact in line flow sensor designed to detect extremely low flows. Its main application is in detecting loss of flow in chemical metering and injection systems. The CR20 is made from PVC, or PVDF with VITON, seals, making it ideal for use in such applications.

DESCRIPTION

The CR20 Microflow switch operates on the displaced piston principle. Process liquid passing through the switch moves a precision piston. Every time the piston is moved a magnet sealed inside it actuates an external reed switch. The reed switch provides a signal indicating flow. The CR20 can be setup as a normally on or a normally off switch that responds either to flow, or to loss of flow.

APPLICATIONS

Flow, or loss of flow detection is a critical part of many scientific and industrial applications. Due to their robust construction and high sensitivity the CR20 Microflow switches are suitable for detection of loss of flow in a variety of liquid and gas applications.

The wetted parts of the CR20 are made from UPVC with Viton, O-ring seals. Optional PVDF versions are also available. There are no metal parts within the wet area of the switch. The CR20 can be used with a variety of chemical solutions, including most mineral salt solutions, acids and alkalis. The switch can only be used with clean liquids or gases that are free from suspended solids larger than 20 microns, and free from particulates or sludge residue that is attracted to magnets. Materials such as Ferric solutions, organic solvents, esters and keytones in general should not be used with the CR20.

ADDITIONAL CONSIDERATIONS

The sensitivity to flow of the CR20 flow switch is not adjustable. It is partially fixed and partially a function of a number of variables. The actual flow rate that the CR20 can detect is affected by the fixed geometry of the switch and by the viscosity of the process liquid. In general, liquids of an SG> 1.0 or kinematic viscosity of >1.0 will proportionally increase the sensitivity of the switch, and slow down its response time. Low viscosity liquids will have the reverse effect. The CR20 is not suitable for use with highly viscous liquids.

HAZARDOUS APPLICATIONS

The CR20-B Microflow switch can be used in hazardous areas. The flow switch is classed as a simple device and does not contain components capable of storing or producing an electric charge. As a simple device the CR20-B flow sensor can be used in hazardous applications provided it is isolated by an intrinsically safe barrier, a zener barrier.

NORMALLY ON OR NORMALLY OFF OPERATION

The CR20 Microflow switch can be configured to give a normally on or normally off signal. As supplied the switch is normally off, switching on in response to flow. To reverse this function, simply reverse the inlet and outlet fittings. Unscrew the inlet and outlet adaptors from the switch body and reassemble with the inlet adaptor fitted to the outlet end of the switch and the outlet adaptor fitted to the inlet end of the switch. Note that the electrical module on the switch can be removed and reversed so the electrical cable enters the switch from either the right or left side. Reversing the electrical module does not reverse its electrical function.

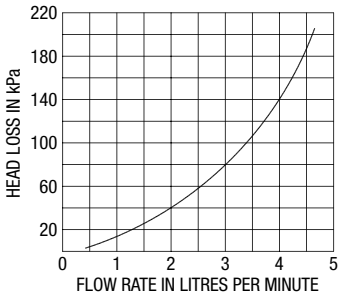


AUSTRALIAN MADE

TECHNICAL DATA

HEAD LOSS

The graph below shows the head loss, or pressure drop, measured between the inlet and outlet of a CR20 Microflow switch and expressed as a function of a continuous flow through the switch. The graph shown is for water at ambient temperature. As an example, from the graph, at 3L/min flow the pressure drop across the CR20 will be 80kPa.



SWITCH OUTPUT

On a rising flow, the CR20 will switch on or off at 250mL +/- 10% per hour. When applied to a pulsing flow such as from a dosing pump, the nature of the flow needs to be considered. Liquid passing through the flow switch causes its reed switch to change state, either turning it on or turning it off depending on how the switch has been set up. If the liquid stops flowing, the switch will change state, after a delay. The delayed response time depends on the process liquids viscosity. Water for example will give a delay of approximately 7 seconds.

When connected directly to a dosing pump, the flow switch will normally receive a train of pulses of liquid. If the frequency of the pulses is greater than one every 7 seconds, the flow switch will provide a steady output state, while ever the pulses are maintained by the pump. If however the pulse frequency from the pump is less than one pulse every 7 seconds, the flow switch will respond with a series of on and off signals that are directly proportional to the dosing pumps pulse frequency.

ELECTRICAL

Sensor Model	Module Type	Contact Configuration Maximum	Switched Power Maximum	Switched Voltage Resistive AC (rms)	Switched Current	Inductive Loads	Typical Application
B	Dry Contact Reed Switch	S.P.S.T NO or NC	40Watts	240V AC 200V DC	1 Amp Maximum	Not Suitable	PLC Telemetry and Relay Logic circuits
R	Solid State Relay	S.P.S.T. NO or NC	750W	240V AC	4 Amps	4A at 240V AC	AC control circuits & AC motor control

Note: The CR20 Microflow switch uses a dry contact reed switch as the primary switching element. Reed switches are one of the most reliable mechanical devices ever devised. They offer an operating life in excess of 100 million cycles; however care needs to be taken to ensure they are not electrically overloaded. If applied in questionable applications suitable protection should be added to the control circuit. Details of reed switch protection circuits can be downloaded from www.kelco.com.au

Note: The CR20-R Microflow switch contains a Triac. It can only be used in AC applications. To operate correctly a minimum load of 10mA must be imposed on the switch, at any voltage from 5 to 240 V AC.

OPTIONS

Various options are available to suit specific OEM applications; these include custom-made process connections, special threads, tube adaptors and pipe spigots in a variety of sizes.

The CR20 Microflow switch can be supplied in PVDF with Viton or EPDM seals, against special order.

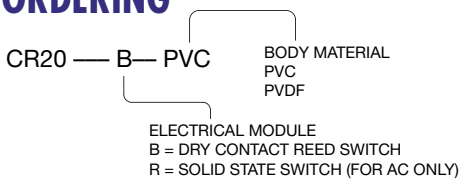
SPARE PARTS

The body assembly and sensor head for the CR20 flow switch are available as spare parts.

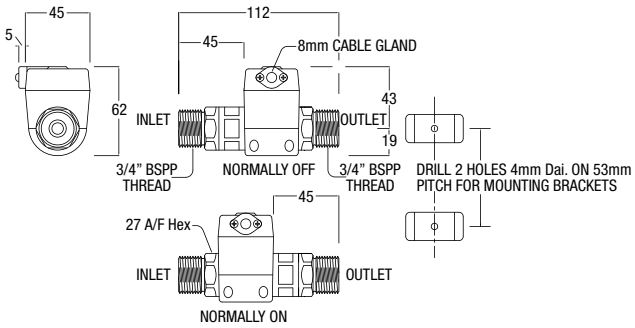
OPERATING PARAMETERS

Switching point on a rising flow (water at ambient temperature)	250mL per Hour +/- 10%
Response to loss of flow (water at ambient temperature)	7 seconds +/- 10%
Maximum recommended operating pressure, (static or dynamic) at ambient temperature	1800 kPa (260 PSI)
Minimum burst pressure at ambient temperature	9700kPa (1400 PSI)
Maximum process liquid temperature	60ºC
Minimum liquid temperature	0ºC
Maximum recommended continuous flow through switch	4 Litres per minute
Liquid Ph range	1 to 14
Maximum process liquid S.G.	1.5
Minimum process liquid S.G.	0.8
Weatherproof rating of electrical module	IP56

ORDERING



DIMENSIONS



MADE IN AUSTRALIA BY

KELCO Engineering Pty Ltd

ABN 20 002 834 844
Head office and factory
9/9 Powells Road Brookvale 2100 NSW Australia
Phone: +61 2 9905 6425 Fax: +61 2 9905 6420
Email: sales@kelco.com.au Web: www.kelco.com.au

©2009 Kelco Engineering Pty Ltd

PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2009.

KELCO

P20 CORROSION RESISTANT IN LINE FLOW SWITCHES



Magnetically sprung piston provides exceptional reliability

FEATURES

- SUITS TUBES & PIPES 6 TO 20 MM (¼" TO ¾") DIA.
- NO METAL PARTS IN CONTACT WITH LIQUIDS
- ALL POSITION MOUNTING
- CHOICE OF 3 SWITCHING FLOW RATES
- DETECTS VERY LOW FLOWS
- ROBUST RELIABLE SWITCH
- EASY TO INSTALL
- HIGH FLOW THROUGH
- 18 BAR (260 PSI) PRESSURE RATING
- VERY LOW HEAD LOSS
- MANY OPTIONS AVAILABLE



HORIZONTAL MOUNTING



VERTICAL MOUNTING

APPLICATIONS

- Liquid or gas flow detection
- Constant pressure pump control
- Loss of prime pump protection
- Water treatment contol
- Industrial process control
- Irrigation control
- Chemical dosing systems
- Chilled water control
- Vapour flow detection



AUSTRALIAN MADE

DESCRIPTION

The P20 In line Flow Switch is a simple and reliable flow switch that can detect the flow of liquids or gases in tubes and small diameter pipes. The P20 can detect either continuous or pulsed flows. Typical applications include monitoring flow in water treatment and irrigation systems, domestic constant pressure system control, gland cooling systems and a myriad of uses in industrial process control. The P20 flow switch gives a simple on or off response to liquid flow. There are no metal parts in contact with liquids within the switch, so the P20 is ideal for use in aggressive liquids such as seawater, groundwater, acids and many chemical solutions. The standard switch is supplied complete with pipe spigots and unions, for direct fitting into PVC or ABS pipe work. In addition 5 electrical modules are available that give a wide choice of control options. These include electrical modules with single and multiple reed switches, relays with various coil voltages, and solid-state switches. Each P20 flow switch is supplied complete with 3 pistons, to provide the user with a wide choice of flow switching points.

OPERATING PRINCIPLE

The body of the P20 flow switch houses a fluted piston. Any flow, either pulsed or continuous, causes the piston to be pushed back within the switch body to a point where the liquid can pass over the piston and out of the switch. The piston contains a magnet that actuates a reed switch and this provides the switching output. When flow stops, the piston is pushed back to the off position by a second magnet built into the switch body. No metal parts are in contact with the process liquid, and the magnetically sprung piston provides an exceptionally reliable corrosion proof mechanism. The sensitivity of the flow switch and its switching point are determined by the viscosity of the fluid and by the clearance between the piston and the switch body. The P20 flow switch can be mounted in any orientation in pipe-work, including upside down, with no adverse effects.

CONSTRUCTION

The standard P20 flow switch is made entirely from glass reinforced polypropylene, with neoprene O-ring seals. The piston return mechanism and the electrical switching action within the switch are achieved using high power magnets operating through the solid body of the switch. The electrical housing is hose-proof & weatherproof, and is supplied with a built in 20mm cable gland, for conduit or flexible cable entry. The electrical circuit boards used in the switch are interchangeable, and all of the parts of the P20 flow switch are available as spare parts.

OPTIONS

In addition to a choice of 5 standard circuit boards to suit the P20 flow switch; the user also has the following options.

Each P20 flow switch is supplied complete with 3 pistons. By simply changing pistons the user has the choice of 3 switching points, 140 millilitres per minute, 570 millilitres per minute or 1.70 Litres per minute. In addition, for OEM applications, switches can be ordered pre-set to any required switching point from one Litre per hour to 4 Litres per minute. Contact your supplier for details.

The standard P20 flow switch is supplied complete with inlet and outlet pipe connections with 20mm (3/4 BSP) male threads and unions. Pipe spigots in 15 nominal size are also included. In addition, the P20 flow switch can also be ordered with optional 25mm (1" BSP) unions and 20mm (3/4") nominal size spigots, in PVC.

MADE IN AUSTRALIA BY

KELCO Engineering Pty Ltd
ABN 20 002 834 844
Head office and factory
9/9 Powells Road Brookvale 2100 NSW Australia
Phone: +61 2 9905 6425 Fax: +61 2 9905 6420
Email: sales@kelco.com.au Web: www.kelco.com.au
©2008 Kelco Engineering Pty Ltd

PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008.

KELCO

MF20 MICRO FLOW SWITCHES



FEATURES

- DETECTS FLOWS OF LESS THAN 350mL /Hour
- SUITS TUBES & PIPES 6 to 20mm (1/4" to 3/4") DIA.
- NO METAL PARTS IN CONTACT WITH LIQUIDS
- SUITS PULSED OR CONTINUOUS FLOWS
- 18 BAR (260 PSI) PRESSURE RATING
- STABLE ELECTRICAL RESPONSE
- VERY HIGH FLOW THROUGH
- MANY OPTIONS AVAILABLE
- VERY LOW HEAD LOSS
- VERTICAL MOUNTING
- EASY TO INSTALL

APPLICATIONS

- CONTROL FOR BACKUP DOSING PUMPS
- CHEMICAL METERING PUMP CONTROL
- CHEMICAL INJECTION POINT STATUS
- VAPOUR & GAS FLOW DETECTION
- LABORATORY APPLICATIONS
- LOSS OF PRIME DETECTION
- BATCH CONTROL

DESCRIPTION

The MF20 micro flow switch is a super sensitive version of our popular P20 in line flow switch. The MF20 is a very simple and reliable mechanical flow switch that can detect extremely low flows; the switch can detect either continuous or pulsed flows. Typical applications include monitoring chemical metering pumps to ensure they are delivering flow, in water treatment, cooling towers and in a multitude of industrial processes. The MF20 flow switch gives a simple on or off response to liquid flow. There are no metal parts in contact with liquids within the switch, so the MF20 is ideal for use in aggressive media such as acids and alkalis and many chemical solutions. The standard switch is supplied complete with tube flare fittings, for 3 popular tube sizes, and a set of pipe spigots and unions, for direct fitting into 15NB PVC or ABS pipe work. In addition, a number of electrical options are available. These include electrical modules with single and multiple reed switches, relays with various coil voltages, and solid-state switches.

OPERATING PRINCIPLE

The body of the MF20 flow switch houses a fluted piston. Any flow, either pulsed or continuous, causes the piston to be lifted up within the switch body to a point where the liquid can pass over the piston and out of the top of the switch. The piston contains a magnet that actuates a reed switch and this provides the switching output. When flow stops, the piston sinks due to gravity, thus moving the magnet within away from the reed switch. No metal parts are in contact with the process liquid, and the simple gravity return system provides an exceptionally reliable corrosion proof mechanism. The sensitivity of the flow switch is determined by the viscosity of the fluid and by the clearance between the piston and the switch body. Three pistons are supplied with each MF20 flow switch, with accurate and predictable switch points ranging from 0.32 litres per hour to 12.8 litres per hour. The MF20 flow switch must be mounted vertically with flow upward through the switch body. The switch can be mounted directly on the suction or discharge valve of a metering pump.

CONSTRUCTION

The Micro flow MF20 flow switch is made from glass-reinforced polypropylene with EPDM O-ring seals and PVC spigots. These are the only materials that come in contact with liquids passing through the switch. A high power rare earth magnet operating through the solid body of the switch actuates the MF20 electrically. The electrical housing is weatherproof to IP67, and is supplied with an integral 20mm cable gland, for conduit or cable entry. The electrical circuit boards used in the switch are interchangeable, and all of the parts of the MF20 flow switch are available as spare parts.

AUSTRALIAN MADE

TECHNICAL DATA

FLOW SENSITIVITY AND RESPONSE TIME

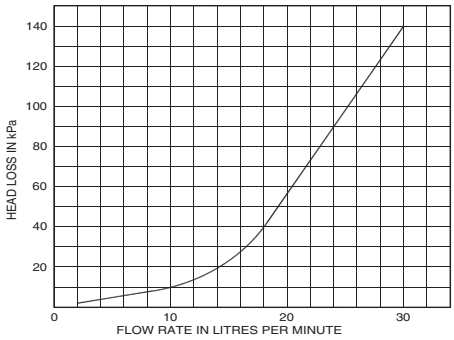
Sensitivity to fluid flow is a function of liquid viscosity and piston clearance. There are 3 pistons available to suit the MF20 flow switch. Each piston has a distinct switching point. The pistons are designated and marked A, B and C. The "A" piston is fitted to the MF20 flow switch as standard. The optional "B" and "C" pistons are also supplied packed in with each switch. The following table sets out the performance parameters of the 3 pistons. The data is based on testing with water at 15˚C as the test medium, and is accurate to +/-10%. Changes in liquid viscosity or temperature will affect the switching point. Increases in viscosity will proportionally decrease the flow rate required to actuate the switch, and will proportionally increase the response time. Decreasing viscosity will proportionally increase the flow required to actuate the switch, and will proportionally decrease the response time.

Note: In pulsed flow applications where no pulse dampener is installed, and the pulse frequency is less than the electrical response time, the MF20 flow switch may respond with a train of on / off pulses rather than with a continuous on signal.

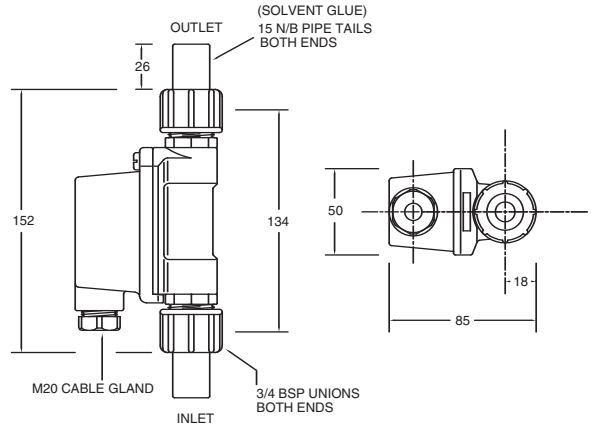
Piston Markings and Designation	Switching Point . on a Rising Flow in Litres per Hour	Switching Point . on a Reducing Flow in Litres Per Hour	Electrical Response Time in Seconds on Cessation of Flow
A	**0.32**	**0.30**	**4**
B	**3.10**	**3.05**	**3**
C	**12.80**	**12.6**	**2**

Please Note: The type "A "piston is supplied as standard fitted to each switch, unless otherwise specified. The B & C pistons are included packed in with each switch.

The graph shows the dynamic head loss across the MF20 flow switches. The data refers to water at 15˚C as the test medium.



DIMENSIONS



OPERATING ENVIRONMENT

Maximum Recommended Operating Pressure (Static or Dynamic) at Ambient Temperature	1800 kPa (260 P.S.I.)
Minimum Burst Pressure at Ambient Temperature	9700 kPa (1400 P.S.I.)
Maximum Liquid Temperature (Standard MF20 Switch)	80 Degrees C at a pressure 1 bar absolute, see note below
Minimum Liquid Temperature (Standard MF20 Switch)	-30˚C
Maximum Recommended Continuous Flow Rate (Water)	25 Litres per Minute (Head loss across the switch <100kPa at 25L/min)
Liquid Ph range	1 to14
Ingress Protection Rating (Weatherproof Rating)	IP67

Note: Temperature for the maximum operating pressure shown in the above operating environment table is 15°C, In the interest of safety, maximum operating pressure must be de-rated linearly in direct proportion to temperature increase, to a maximum pressure of 1 bar absolute at 80 degrees Centigrade. In other words only use this switch at elevated temperatures in non pressurised systems that are totally open to atmosphere in all circumstances and under all conditions.

ELECTRICAL DATA

The MF20 in line flow switch is available in a variety of electrical configurations, to suit specific applications. The model numbers and details of these options are outlined in the table below.

Switch Model	Module Type	Contact Configuration	Switched Power Maximum	Switched Voltage Maximum	Switched Current Resistive AC (rms) Maximum	Inductive Loads (Power Factor 0.4)	Typical Application
MF20-B	Dry Reed Switch	S.P.S.T. N.O	40W	240V AC 200V DC	1A	Not Suitable	PLC and General Control Circuits
MF20-C	Dry Reed Switch	S.P.D.T.	40W	240V AC 200V DC	1A	Not Suitable	PLC and General Control Circuits
MF20-R	Solid State Relay (Triac)	S.P.S.T. N.O	750W	2 to 240V AC	4A Continuous (Spike to 16A)	4A at 240V AC	AC Control Circuits and AC Motor Control to1 HP
MF20-A240	Standard Relay 240V AC Coil	S.P.D.T.	2500VA at 250VAC 300VA at 30VDC	0 to 240 V AC	10A	7.5A at 240V AC 5A at 30V DC	General AC or DC Control
MF20-A24	Standard Relay 24V AC Coil	S.P.D.T.	2500VA at 250VAC 300VA at 30VDC	0 to 240V AC	10A	7.5A at 240V AC 5A at 30V DC	General AC or DC Control

Note: The MF20 flow switch uses reed switches as the primary switching element. Reed switches are one of the most reliable mechanical switching devices ever devised. They offer an operating life in excess of 100 million cycles, however, care needs to be taken to ensure they are not electrically overloaded or if applied in questionable applications, suitable protection should be added to the control circuit.

MADE IN AUSTRALIA BY

KELCO Engineering Pty Ltd

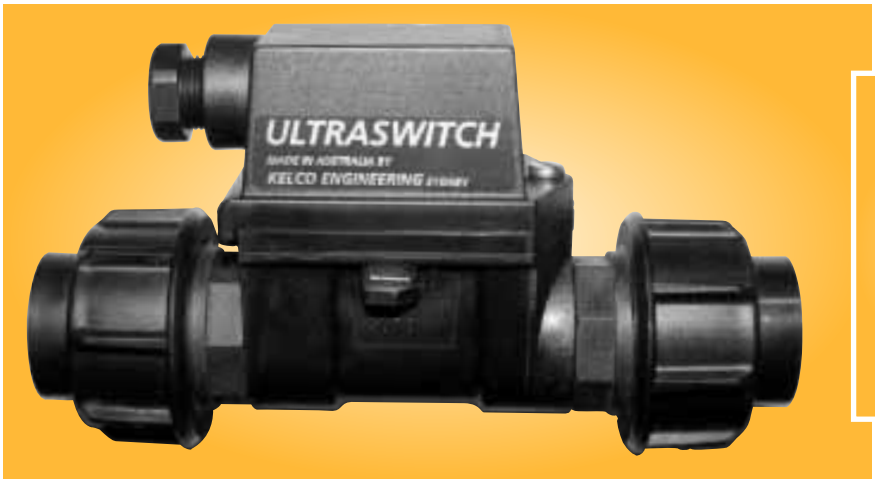
ABN 20 002 834 844
Head office and factory
9/9 Powells Road Brookvale 2100 NSW Australia
Phone: +61 2 9905 6425 Fax: +61 2 9905 6420
Email: sales@kelco.com.au Web: www.kelco.com.au

©2008 Kelco Engineering Pty Ltd

PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008.

KELCO

P25 SERIES CORROSION RESISTANT HEAVY DUTY INLINE FLOW SWITCHES





FEATURES

- DIRECTLY SWITCH PUMP MOTORS TO 1.5kW 2HP
- NO METAL PARTS IN CONTACT WITH LIQUIDS
- SUITS PIPE FROM 15mm to 25mm (1/2” to 1”) DIA.
- 100 LITRES PER MINUTE FLOW RATING
- VERSATILE ALL POSITION MOUNTING
- 18 BAR (260 PSI) PRESSURE RATING
- IP67 WEATHERPROOF HOUSING
- DETECTS VERY LOW FLOWS
- MANUAL OVERRIDE BUILT IN
- ADJUSTABLE SWITCH POINT

APPLICATIONS

- LOSS OF PRIME PROTECTION FOR PUMPS
- CONSTANT PRESSURE PUMP CONTROL
- CONTROL OF TANK FILLING SYSTEMS
- LOW YIELD BORE PUMP PROTECTION
- WATER TREATMENT MONITORING
- INDUSTRIAL PROCESS CONTROL
- METERING PUMP CONTROL
- MECHANICAL SERVICES
- IRRIGATION CONTROL



AUSTRALIAN MADE

DESCRIPTION

The P25 Inline flow switch is a rugged flow actuated sensor that can detect the flow of liquids in 15mm (1/2”) to 25mm (1”) diameter pipes. The switch can detect very low flows yet has a low head loss high flow through rating. It can be used to sense either continuous or pulsed flows. The P25 finds a myriad of applications in industrial, rural and domestic piping systems. It is particularly well suited to pressure boosting applications and in the control of constant pressure pumps, due to its ability to detect and switch at extremely low flows. In addition the P25 finds application in the protection of low yield bore pumps, and in remote tank filling systems. There are no metal parts in contact with liquids within the switch, so it is ideal for use in aggressive liquids such as groundwater, seawater, acids and in many chemical solutions.

The standard switch is supplied complete with pipe sockets and unions, for direct fitting into PVC, ABS or Poly pipework. The heart of the P25 flow switch is a 500Volt 20Amp single pole double throw switch with Tungsten contacts capable of directly controlling single-phase pump motors up to 2 Horse Power 1.5kW. A manual override switch is built into the body of every P25 flow switch. This feature allows pumping systems to be manually activated at any time for normal starting or for priming testing or commissioning.

OPERATING PRINCIPLE

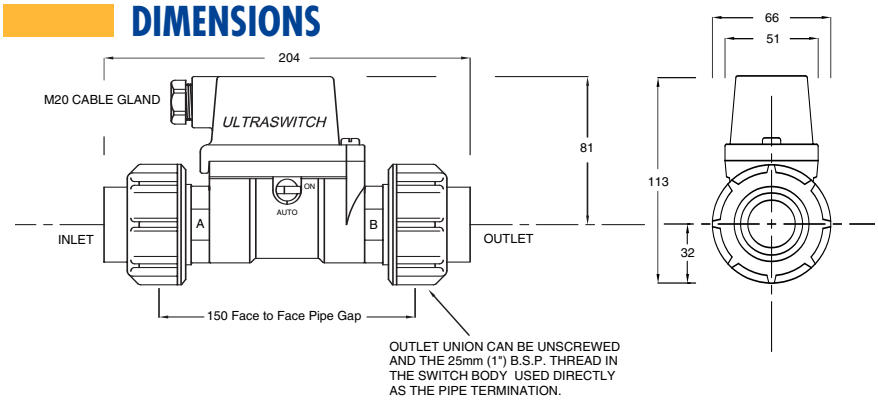
The body of the P25 flow switch houses a free fitting piston. Any flow, either pulsed or continuous, causes the piston to be pushed back within the switch body to a point where liquid can pass around it and out of the switch. When pushed back by flow, the piston actuates a magnetically linked switch. When flow stops, the piston is pushed back to the off position by magnetic repulsion. There are no springs or metal parts in contact with the process liquid, and the magnetically isolated piston provides an exceptionally reliable corrosion proof mechanism. The sensitivity and set point of the P25 flow switch is adjustable over two overlapping flow ranges, by interchanging the inlet and outlet fittings on the switch. For fine tuning the switching point, a set screw located in the switch housing is provided.

TECHNICAL DATA

CONSTRUCTION

The standard P25 flow switch is made from glass reinforced polypropylene, with neoprene o-ring seals. The piston return mechanism and the electrical switching action within the sensor are achieved using high power magnets operating through the solid body of the switch. The electrical housing is hoseproof & weatherproof to IP67, and is supplied with a 20mm cable gland, for conduit or cable entry. All of the parts of the P25 flow switch are available as spare parts.

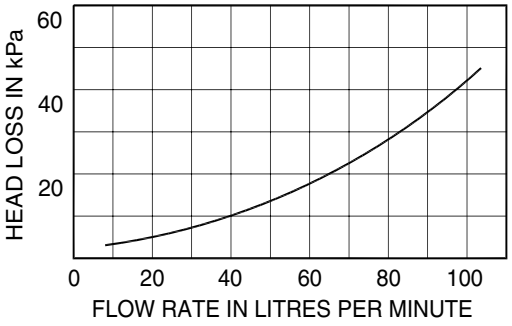
DIMENSIONS



MODELS AVAILABLE

Model	Description
P25-15	Switch supplied with 25mm Unions and 15NB PVC pipe sockets
P25-20	Switch supplied with 32mm Unions and 20NB PVC pipe sockets
P25-25	Switch supplied with 40mm Unions and 25NB PVC pipe sockets

Flow rate verses differential head loss for the P25 flow switch.



OPERATING PARAMETERS

Switching Point on a Slowly Rising Flow +/- 15%.	**A** Range Adjustable from 0.8 Litres per Minute to 5.3 L/min. **B** Range Adjustable from 2.2L/min. to 10L/min.
Switching Point on a Slowly Falling Flow +/-15%.	Approximately 20% less than the rising flow switching rate in both the **A** and **B** ranges..
Minimum Gravity Head Required to Actuate the P25 Switch	**A** or **B** Range at Maximum Sensitivity, 1.4 Metres,
Maximum Recommended Continuous Flow Rate	100 Litres per Minute (Head loss across the switch<50kPa at 100 L/min.)
Maximum Recommended Operating Pressure (Static or Dynamic) at Ambient Temperature	1800 kPa (260 P.S.I.)
Minimum Burst Pressure at Ambient Temperature	6000 kPa (865 P.S.I.)
Maximum Liquid Temperature (Standard P25 Switch)	80 Degrees C at a pressure 1 bar absolute, see note below
Minimum Liquid Temperature (Standard P25 Switch)	-30˚C
Liquid Ph range	1 to14
Ingress Protection Rating (Weatherproof Rating)	IP67

Note: Switching point flow rate date given in the table above refers to water at 15°C as the process fluid. In the interest of safety, maximum operating pressure given in the operating parameters table must be de-rated linearity in direct proportion to temperature increase, to a maximum pressure of 1 bar absolute at 80 degrees Centigrade. In other words only use this switch at elevated temperatures in non pressurised systems that are totally open to atmosphere in all circumstances and under all conditions.

ELECTRICAL DATA

The P25 flow switch houses a high capacity single pole double throw microswitch suitable for most general control applications and for the direct control of pump motors up to 1.5kW 2HP.

Rated Voltage	NON INDUCTIVE LOADS				INDUCTIVE LOADS			
	Resistive Load		Lamp Load		Inductive Load		Motor Load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	20A		7.5A		20A		12.5A	
250 VAC	20A		7.5A		20A		8.3A	
500 VAC	15 A		4A		10A		2A	
8 VDC	20A		3 A	1.5 A	20A		12.5A	
14 VDC	20A		3 A	1.5 A	15 A		12.5A	
30 VDC	6 A		3 A	1.5 A	5 A		5 A	
125 VDC	0.5 A		0.5 A		0.05 A		0.05 A	
250 VDC	0.25 A		0.25 A		0.03 A		0.03 A	

MADE IN AUSTRALIA BY

KELCO Engineering Pty Ltd
ABN 20 002 834 844
Head office and factory
9/9 Powells Road Brookvale 2100 NSW Australia
Phone: +61 2 9905 6425 Fax: +61 2 9905 6420
Email: sales@kelco.com.au Web: www.kelco.com.au

©2008 Kelco Engineering Pty Ltd

PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008.

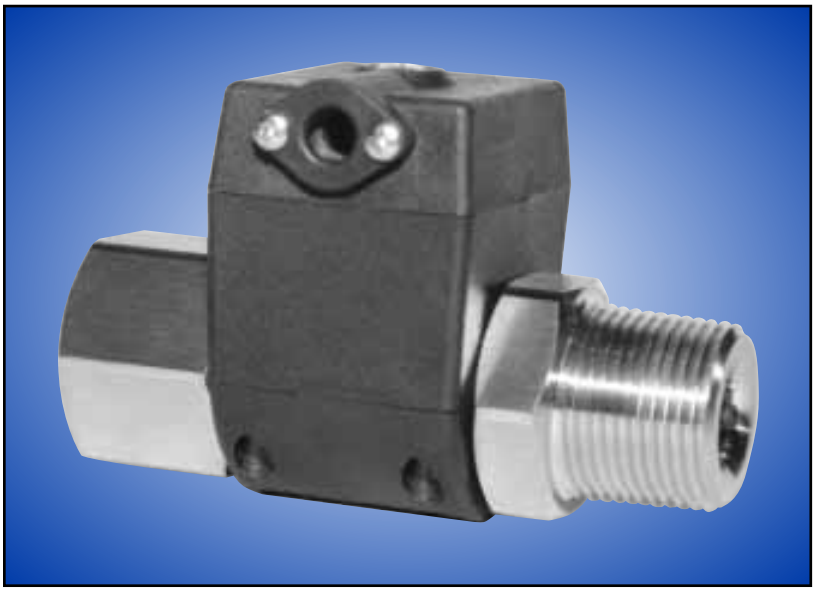
KELCO

C15 & C20 SERIES INLINE FLOW SWITCH

FEATURES

- STAINLESS STEEL OR BRASS BODY
- CHOICE OF 3 SWITCHING POINTS
- DIESEL AND OIL MODELS AVAILABLE
- CHOICE OF 2 ELECTRICAL MODULES
- VERY HIGH PRESSURE RATING
- LOW HEAD LOSS DESIGN
- FULLY SERVICEABLE
- SPARE PARTS AVAILABLE
- WEATHERPROOF

The C15 & C20 in line flow switches are compact magnetically actuated piston flow switches that switch in response to low fluid flows. They are ideal for many types of pressure boosting and control applications in both hot and cold liquids. They are available with bodies made from brass or 316 stainless steel.



CONSTRUCTION

The C15 / C20 flow switch consists of an electrical switching module that saddles a one-piece metal body. The switches are available in either BSP or NPT threads. The electrical modules fitted to the C15 / C20 flow switches are easily removed without disturbing pipe work, and can be reversed or rotated and positioned to suit tight locations. The switches can handle flows up to 30 Litres per minute (water), and can tolerate static or dynamic pressures to 100 Bars (1470PSI) with a 4 to 1 safety factor.

INSTALLATION

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

FLOW SENSITIVITY

Sensitivity to flow depends on liquid viscosity and piston clearance. There are three pistons available to suit the C15 & C20 flow switches. 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.

HAZARDOUS APPLICATIONS

The -B version of the C15 / C20 flow switches can be used in hazardous areas. They 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.

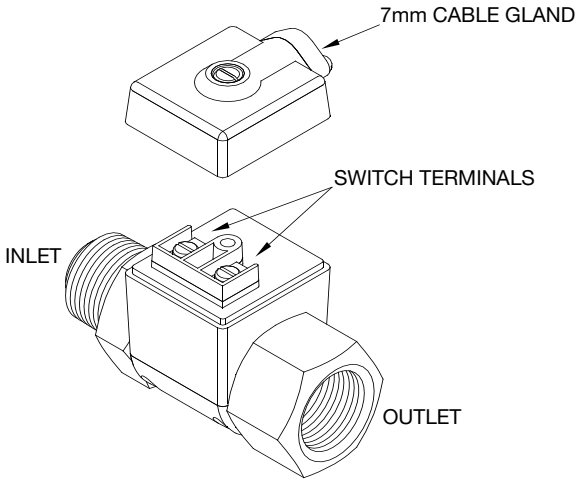
Piston Markings	Switching Point on a Slowly Rising Flow in Litres per Minute	Switching Point on a Slowly Reducing Flow in Litres per Minute	Electrical Response Time in Seconds
A	0.140	0.065	0.4
B	0.570	0.370	0.3
C	1.70	1.33	0.2

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.

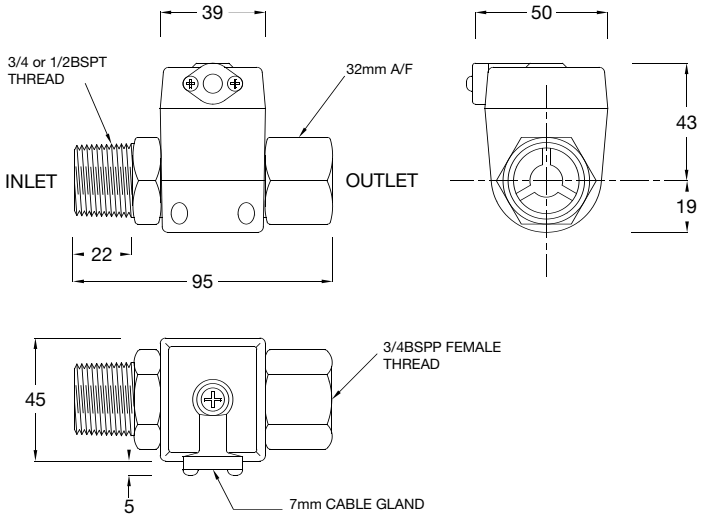
AUSTRALIAN MADE

TECHNICAL DATA

GENERAL LAYOUT



DIMENSIONS



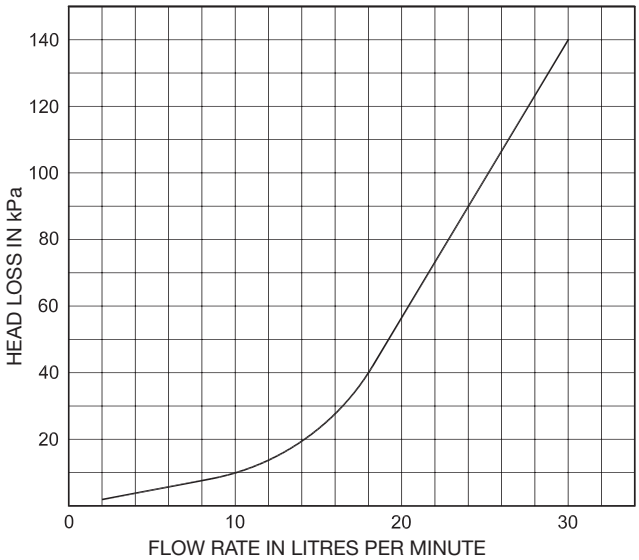
ELECTRICAL DATA

Sensor Model	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 Reed Switch	S.P.S.T Normally Open	40Watts	240VAC 200VDC	1 Amp Maximum	Not Suitable	PLC Telemetry and Relay Logic circuits
R	Solid State Relay (Triac)	S.P.S.T Normally Open	1.1kW	5 to 240V AC	10mA Minimum 5 Amps Maximum	5 Amps at 240V	AC control circuits and direct motor control

Note: The switched power of the C20-R module given above refers to a switch operating in a water pipe system at ambient temperature. In hot water applications the switched power must be proportionally reduced to avoid overheating the Triac. At the top operating temperature of 90°C the switched power must not exceed 375 Watts. The C20-B modules do not require de-rating at elevated temperatures.

HEAD LOSS VERSUS FLOW RATE

Table based on test results from water only, See Flow sensitivity for other fluids.



ORDERING

PISTON
A= 0.14L/min
B= 0.57L/min
C= 1.7L/min

BODY MATERIAL
B=BRASS
SS=STAINLESS STEEL

C20 — B — A — SS — DIESEL

INLET THREAD SIZE
15=1/2"BSP
20=3/4"BSP

ELECTRICAL MODULE
B= DRY CONTACT REED SWITCH
R= SOLID STATE RELAY (TRIAC)

FOR DIESEL AND OIL MODEL ONLY:
C20-B-A-SS-BSP-DIESEL

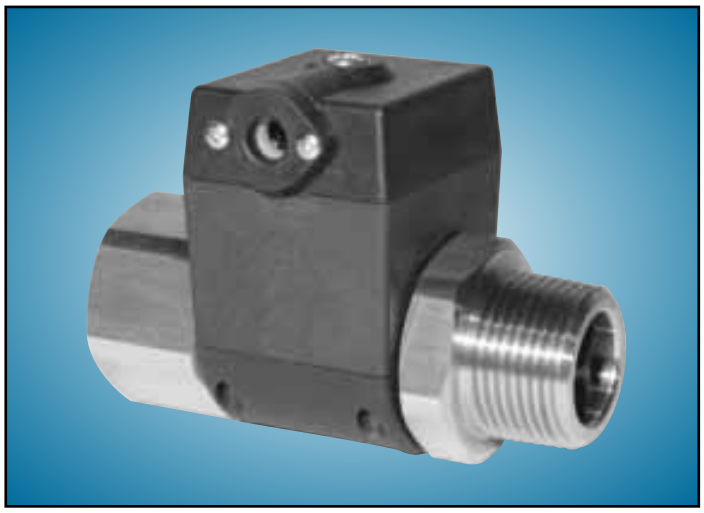
MADE IN AUSTRALIA BY

KELCO Engineering Pty Ltd
ABN 20 002 834 844
Head office and factory
9/9 Powells Road Brookvale 2100 NSW Australia
Phone: +61 2 9905 6425 Fax: +61 2 9905 6420
Email: sales@kelco.com.au Web: www.kelco.com.au
©2008 Kelco Engineering Pty Ltd

PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008.

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.

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.

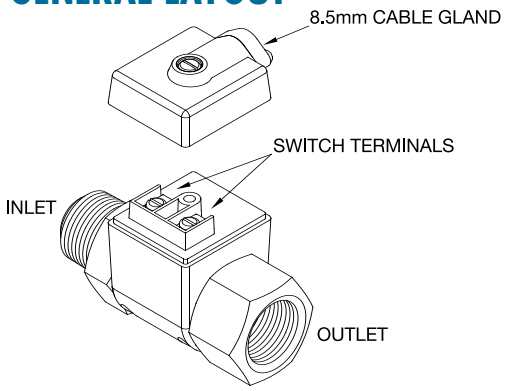
Piston Markings 1=A 2=B 3=C	Switching Point on a Slowly Rising Flow in Litres per Minute	Switching Point on a Slowly Reducing Flow in Litres per Minute	Electrical Response Time in Seconds
A	1.0	0.6	0.1
B	4.0	3.2	0.1
C	8.0	5.5	0.1

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.

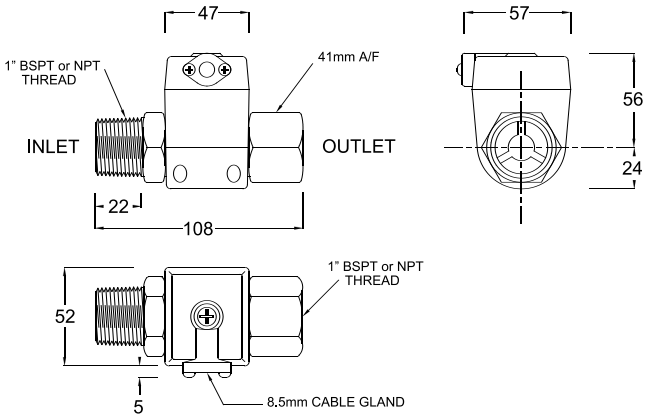
AUSTRALIAN MADE

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

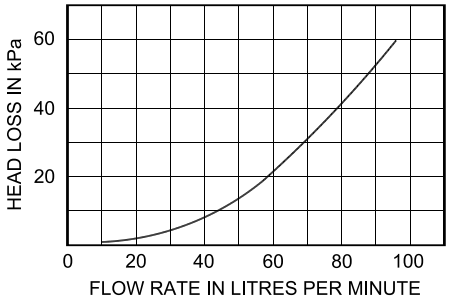
ELECTRICAL DATA

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.

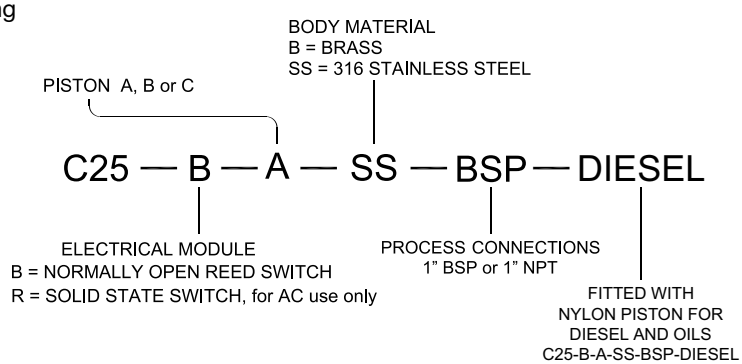
HEAD LOSS

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



MADE IN AUSTRALIA BY

KELCO Engineering Pty Ltd
ABN 20 002 834 844
Head office and factory
9/9 Powells Road Brookvale 2100 NSW Australia
Phone: +61 2 9905 6425 Fax: +61 2 9905 6420
Email: sales@kelco.com.au Web: www.kelco.com.au

©2008 Kelco Engineering Pty Ltd

PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008.

KELCO

UB SERIES SUPER SENSITIVE INLINE FLOW SWITCHES





FEATURES

- SUITS 20NB (3/4") OR 25NB (1") PIPEWORK
- VERSATILE ALL POSITION MOUNTING
- 200 BAR 2900 PSI PRESSURE RATING
- SWITCHES AT VERY LOW FLOWS
- IP67 WEATHERPROOF HOUSING
- SOLID MACHINED BRASS BODY
- HIGH FLOW THROUGH RATING
- HANDLES LIQUIDS TO 90°C

APPLICATIONS

- HOT & COLD WATER PRESSURE BOOSTING
- GRAVITY HOT WATER SYSTEM CONTROL
- HOT WATER CIRCULATOR ACTUATION
- SAFETY SHOWER ALARM SENTINEL
- WASH DOWN PUMP CONTROL
- SOLAR HOT WATER CONTROL
- MAINS PRESSURE BOOSTING

DESCRIPTION

The UB series inline flow switches are magnetically actuated piston style sensors that switch in response to very low fluid flows. They are ideal for all types of pressure boosting pump control and for the control of commercial or domestic hot and cold water systems. They find application in monitoring industrial safety showers and in many applications where extreme reliability is paramount. The UB series flow switches are also ideal for constant pressure pump control.

OPERATING PRINCIPLE

The solid brass body of the UB flow switch houses a free sliding piston. Any flow, either pulsed or continuous, causes the piston to be pushed back within the switch body to a point where liquid can pass around it and out of the switch. When pushed back by flow, the piston actuates a magnetically linked switch. When flow stops, the piston is pushed back to the off position by magnetic repulsion. There are no springs in the wet area of the switch, and the magnetically isolated piston provides an exceptionally reliable mechanism. The UB flow switches can be mounted in any orientation including upside down, in either horizontal or vertical pipework.

CONSTRUCTION

The body of the UB flow switch is machined from solid brass. The piston is glass reinforced polypropylene. The piston return mechanism and the electrical switching action within the switch are achieved using high power magnets operating through the solid body of the switch. The electrical housing is hoseproof & weatherproof, and is supplied with a 20mm cable gland, for conduit or cable entry. All of the parts of the UB flow switch are available as spare parts. The switch is supplied as standard in either 20mm 3/4" B.S.P. (model UB20) or 25mm 1" B.S.P. (model UB25). All models have a male inlet thread and a female outlet thread. Four electrical modules are available to suit the UB flow switches. Details of the various options are set out in the accompanying table.

AUSTRALIAN MADE

TECHNICAL DATA

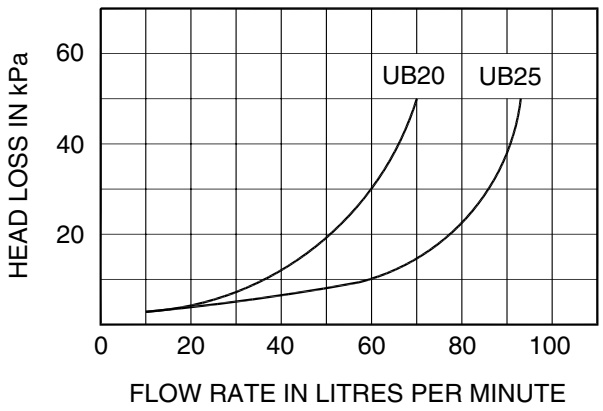
ELECTRICAL DATA

MODEL	Module Type	Contact Configuration	Switched Power Maximum	Switched Voltage Maximum	Switched Current Resistive AC (rms) Maximum	Inductive Loads (Power Factor 0.4)	Typical Application
UB20-B UB25-B	Dry Reed Switch	S.P.S.T. N.O	40W	240V AC 200V DC	1A	Not Suitable	PLC and General Control Circuits
UB20-R UB25-R	Solid State Relay	S.P.S.T. N.O	1500W	12 to 240V AC	Spike to 40A	8A at 240V AC	AC Control Circuits and AC Motor Control to a Maximum of 2 HP1.5kW in Cold Water <40˚C. 1HP 0.75kW in Hot Water>40˚C.
UB20-A240 UB25-A240	Standard Relay 240V AC Coil	S.P.D.T.	2500VA at 250VAC 300VA at 30VDC	0 to 240 V AC	10A	7.5A at 240V AC 5A at 30V DC	General AC or DC Control (Motors to 0.75kW 1HP Maximum)
UB20-A24 UB25-A24	Standard Relay 24V AC Coil	S.P.D.T.	2500VA at 250VAC 300VA at 30VDC	0 to 240V AC	10A	7.5A at 240V AC 5A at 30V DC	General AC or DC Control (Motors to 0.75kW 1HP Maximum)

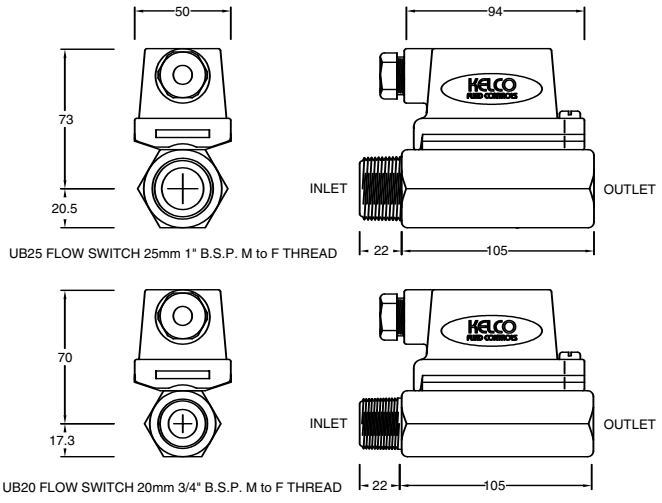
OPERATING PARAMETERS

The environmental limitations and the main performance parameters of both the UB20 and the UB25 flow switches are set out in the table below.

MODEL	UB 20	UB25
Switching Point on a Slowly Rising Flow +/-15%	0.25 Litres per Minute	1.5 Litres per Minute
Switching Point on a Slowly Falling Flow +/-15%	0.2 Litres per Minute	1.2 Litres per Minute
Minimum Gravity Head Required to Actuate the Switch	1.2 Metres	1.2 Metres
Maximum Recommended Continuous Flow (Water)	65 Litres per Minute	90 Litres per Minute
Maximum Recommended Operating Pressure, Static or Dynamic.	200 Bars (2940 PSI)	200 Bars (2940 PSI)
Minimum Burst Pressure	400 Bars (5800 PSI)	400 Bars (5800 PSI)
Maximum Liquid Temperature	90˚C	90˚C
Minimum Liquid Temperature	-30˚C	-30˚C
Liquid Ph range	6.8 to 8	6.8 to 8
Ingress Protection Rating (Weatherproof Rating)	IP67	IP67



DIMENSIONS



MADE IN AUSTRALIA BY

KELCO Engineering Pty Ltd
ABN 20 002 834 844
Head office and factory
9/9 Powells Road Brookvale 2100 NSW Australia
Phone: +61 2 9905 6425 Fax: +61 2 9905 6420
Email: sales@kelco.com.au Web: www.kelco.com.au
©2008 Kelco Engineering Pty Ltd

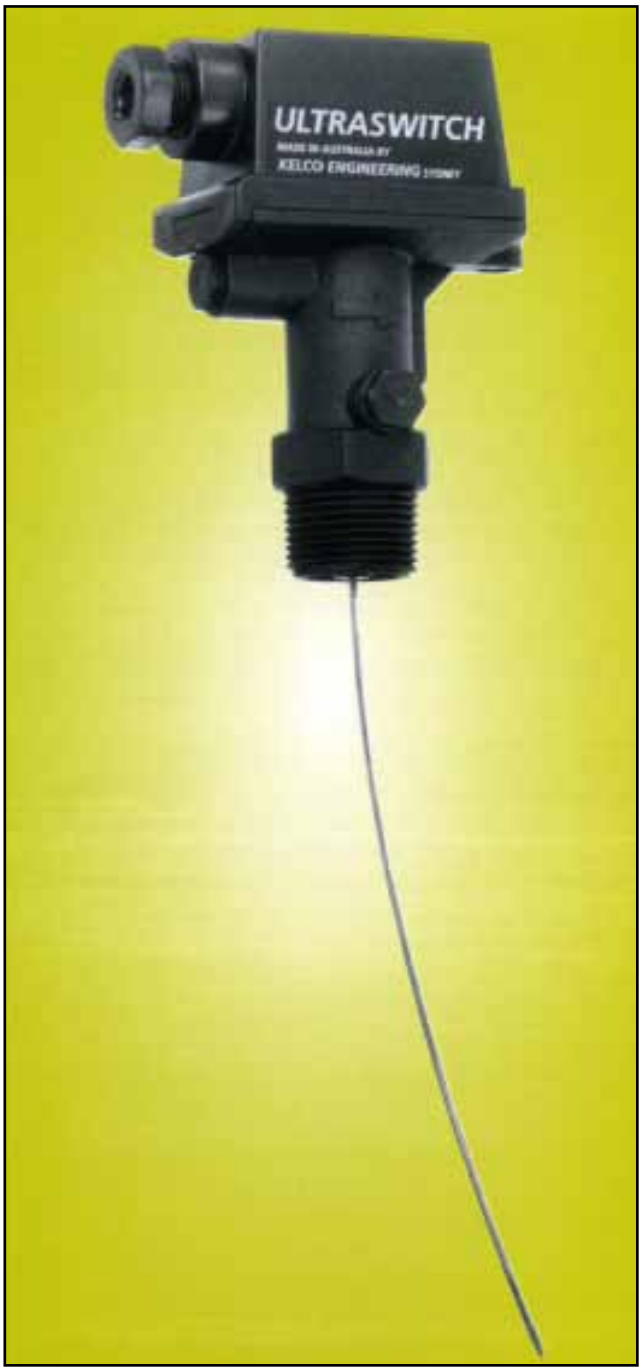
PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008.

KELCO

TRAILING WIRE FLOW SWITCHES

FEATURES

- CORROSION RESISTANT BODY
- WEATHERPROOF IP56 HOUSING
- UNIQUE TRAILING STAINLESS CABLE SENSOR
- WIDELY ADJUSTABLE FLOW SENSITIVITY
- SUITS OPEN CHANNEL OR PRESSURE APPLICATIONS
- 18 BAR PRESSURE RATING
- VARIETY OF ELECTRICAL OPTIONS AVAILABLE



APPLICATIONS

- DATA LOGGING OF EFFLUENT FLOWS
- RIVER MANAGEMENT & FARM RUN OFF SYSTEMS
- CONVEYOR BELT SOLIDS DETECTION
- CONTROL & LOGGING OF INDUSTRIAL WASTE
- OPEN CHANNEL DATA ACQUISITION
- SLURRY PIPE FLOW MONITORING
- CHEMICAL PROCESS CONTROL

The Ultraswitch trailing wire flow switches are unique sensors that can be used in applications where conventional flow switches would fail. Principally intended for control of data acquisition equipment monitoring influx and effluent systems, these switches are equally useful in high velocity flows, or in any situation where liquids may contain solids or materials that would damage normal flow switches. These trailing wire switches have evolved to meet the need for flow sensors that are capable of maintenance free performance in the most arduous of environments.

Conventional flow switches use flat paddles to detect liquid movement. Such paddles are prone to damage if liquid velocity is high, or if the liquid contains solids of any appreciable size. The unique trailing stainless wire used in the switch is simply deflected by high flow rates or by impact with entrained materials. Material will not build on, or tangle around the trailing wire. With virtually no exceptions, the material being monitored will simply deflect the wire.



AUSTRALIAN MADE

TECHNICAL DATA

CONSTRUCTION

Constructed from glass-reinforced polypropylene and 316 stainless steel, the trailing wire switches use flexible stainless wire to move a magnetically sprung arm that in turn actuates a dry reed switch. The reed switch and its associated components are housed in a weathertight housing above the magnetic arm. The switch body has a 25mm BSP male thread, to facilitate either bracket or pipe mounting. An M20 cable gland is provided for installing either conduit fittings or electrical flex.

Trailing wire switches can be supplied with a variety of electrical modules to suit specific requirements. In all cases, high compliance high wattage dry reed switches are used as the primary switching element. Reed switches offer major advantages over other switch types. The reed contacts are sealed in an inert atmosphere in a glass envelope where the contact resistance is virtually unaffected by external environmental factors. The reed arms move magnetically, within their elastic limits, and as such are capable of an extraordinarily long and reliable service life. The cable spring return system in the trailing wire switches uses rare earth magnets in opposition, to effect a frictionless and infinitely adjustable action.

APPLICATIONS

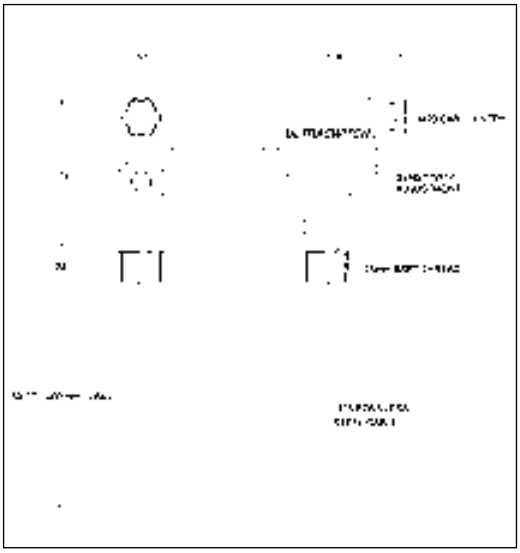
It is not possible to give definitive data on the actual flow rates required to actuate the switch. Every installation is unique, and many factors interact to determine exactly how the sensor will perform. Depending very much on wire length and submergence, a minimum liquid velocity of around 0.2 metres per second is required to reliably actuate the switch. In very low flow applications, the cross section of the open channel or pipe should be reduced, to increase the local velocity, sufficiently to actuate the switch. The degree of submergence of the trailing wire, and the distance from the liquid surface to the switch, the viscosity, amount and nature of entrained matter in the monitored liquid will also effect the switch's action.

The trailing wire switches are principally intended to be mounted above and clear of the surface of the liquid to be monitored. The only part of the switch in contact with the liquid should be the trailing wire. There are a number of variations of this principal that can be used to advantage. For example, the switch can be bracketed in front of an open discharge pipe, with the trailing wire displaced only when liquid flows. Equally, the switch can be screwed through an inspection cover, with the wire trailing into a partially filled pipe.

SPECIFYING SWITCHES

Our factory can supply switches configured to meet specific requirements. The trailing wire is normally supplied cut to length, and terminated, (silver soldered) to prevent fraying. Wire lengths range from 50mm to 1 metre.

Note: both the wire length and the required electrical circuit board should be specified, when ordering. As an example, the following number would define a switch, with a cable length of 200mm, and a circuit board with a single reed switch contact. TW25-B-200.



HAZARDOUS LOCATIONS

The trailing wire switches are classed as simple devices, as such, they do not require separate certification to be used in hazardous locations. Specifically, the switches do not contain any mechanism for the storage or production of electrical energy. These sensors can be used in explosion prone environments, provided they are isolated via an intrinsically safe barrier, (a zenner barrier).

ELECTRICAL DATA

Switches can be supplied with a variety of circuit boards to suit specific applications. The electrical specifications of these boards are listed below.

Circuit Board Type	Module Type	Contact Configuration	Switched Power	Switched Voltage Maximum	Switched Current Resistive AC (rms) Maximum	Inductive Loads (Power Factor 0.4)	Typical Application
FL25B	Dry Reed Switch	S.P.S.T. N.O/N.C.	40W	240V AC 200V DC	1A	Not Suitable	PLC & control circuits
FL25C	Dry Reed Switch	S.P.D.T.	40W	240V AC 200V DC	1A	Not Suitable	PLC & control circuits
FL25R	Solid State Relay (Triac)	S.P.S.T. N.O/N.C.	750W	240V AC	4A	4A at 240V AC	AC control circuits & motor control
FL25A240	Standard Relay 240V AC Coil	S.P.D.T.	2500VA at 250V AC 300VA at 30V DC	240V AC	10A	7.5A at 250V AC 5A at 30V DC	General AC or DC control
FL25A24	Standard Relay 24V AC Coil	S.P.D.T.	2500VA at 250V AC 300VA at 30V DC	240V AC	10A	7.5A at 250V AC 5A at 30V DC	General AC or DC control

MADE IN AUSTRALIA BY

KELCO Engineering Pty Ltd
ABN 20 002 834 844
Head office and factory
9/9 Powells Road Brookvale 2100 NSW Australia
Phone: +61 2 9905 6425 Fax: +61 2 9905 6420
Email: sales@kelco.com.au Web: www.kelco.com.au
©2008 Kelco Engineering Pty Ltd

PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008.

TW26 SERIES TRAILING WIRE FLOW SWITCHES

FEATURES

- UNIQUE TRAILING WIRE SENSOR
- 18 OR 100 BAR PRESSURE RATING
- POWERFUL 15A 500V SPDT SWITCH
- SUITS OPEN CHANNELS OR PIPEWORK
- CORROSION RESISTANT BODY
- WEATHERPROOF IP67 HOUSING

APPLICATIONS

- HIGH VELOCITY FLOW SENSING
- SEWERAGE PUMP CONTROL
- SLURRY PUMP FLOW MONITORING
- PUMP DRY RUN PROTECTION
- DATA LOGGING EFFLUENT FLOWS
- OPEN CHANNEL DATA ACQUISITION
- CONVEYOR BELT SOLIDS DETECTION



AUSTRALIAN MADE

INTRODUCTION

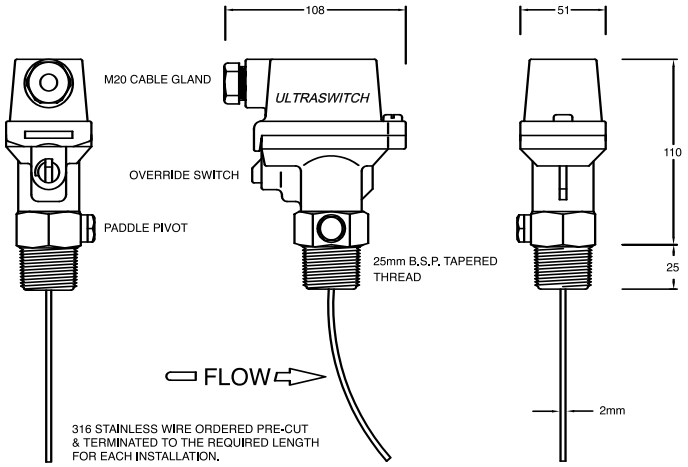
The TW26-S and TW26-SS trailing wire flow switches are heavy duty flow sensors that use a flexible stainless wire rather than a conventional paddle to sense fluid flow. They are suitable for sensing flow in open discharge applications or in pipes of any diameter from 25mm upwards. The flexible stainless wire sensor offers major advantages over conventional paddles when used in situations where solids or semi-solids are present, such as in sewerage pumping applications. They are also suitable for use in slurry and mining applications and in many normal pumping situations where the flow velocity is high and conventional paddles are unsuitable.

The TW26 trailing wire flow switch is available in two models, an all Polypropylene version, designated TW26-S and an Poypropylene / 316 stainless steel model TW26-SS. Both models are identical with the exception of the stainless body. The standard all Polypropylene switch is suitable for most applications where static or dynamic pressures are less than 18 Bars. The stainless version can safely tolerate pressures to 100 Bars. The TW26-SS has the advantage of higher mechanical strength and finds application in fire prone or vandal prone areas.

CONSTRUCTION

The TW26 series flow switches are made from premium grade polypropylene thermoplastic, and 316 stainless steel. The electrical action within the switch is achieved by the use of powerful rare earth magnets coupling the movement of the trailing wire to the high compliance switch. This mechanism avoids the use of bellows, seals or springs and ensures the switch operates with a very high degree of reliability.

DIMENSIONS



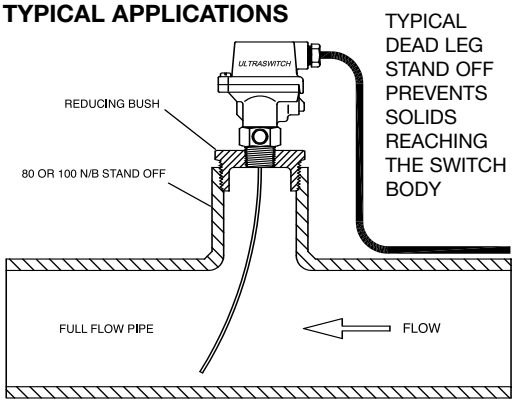
TECHNICAL DATA

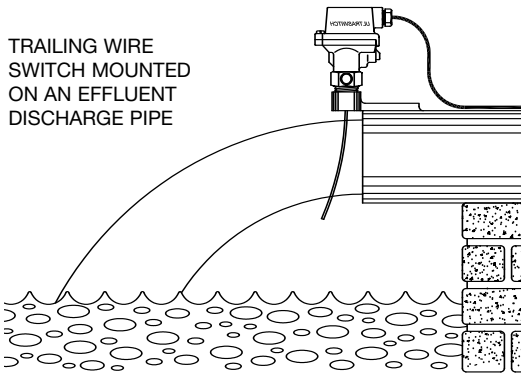
APPLICATIONS

It is not possible to give definitive data on the actual flow rates required to actuate the TW26 flow switch. Every installation is unique and many factors interact to influence exactly how the sensor will respond. A minimum force acting on the flexible wire of 0.4N (40 grams) is required to actuate the switch. Depending very much on wire length and submergence, a minimum fluid velocity of around 0.2 to 0.4 Metres per second is generally required to reliably actuate the switch. In low flow situations the cross section of the channel or pipe can be reduced to increase the local velocity sufficient to actuate the TW26 switch. The degree of submergence of the trailing wire and the distance from the liquid surface to the switch, the viscosity and amount and nature of any entrained matter in the fluid stream will also affect the switch's action.

The TW26 flow switches are principally intended to be mounted above and clear of the surface of the liquid to be monitored. The only part of the switch in contact with the liquid should be the trailing wire. There are a number of variations of this principle that can be used to advantage. For example the switch can be bracketed in front of an open discharge pipe with the trailing wire displaced only when fluid flows. Equally the switch can be screwed through an inspection cover, with the flexible wire trailing into a partly filled pipe.

TYPICAL APPLICATIONS





OPERATING ENVIRONMENT

Maximum operating pressure (static or dynamic) at ambient temperature.	20 Bars (290 PSI) polypropylene model 100 Bars (1450 PSI) 316 Stainless model
Minimum burst pressure at ambient temperature.	80 Bars (1160 PSI) polypropylene model 400 Bars (5800 PSI) 316 Stainless model
Maximum operating temperature (Liquid)	80 Degrees C at a pressure 1 bar absolute, see note below
Minimum operating temperature (Liquid)	-30˚C
Process liquid Ph range	6.8 to 14
Ingress protection rating (Housing)	IP67

Note: Temperature for the maximum operating pressure shown in the above operating environment table is 15°C, In the interest of safety, when using the polypropylene version of the TW26 series, maximum operating pressure must be de-rated linearly in direct proportion to temperature increase, to a maximum pressure of 1 bar absolute at 80 degrees Centigrade. In other words only use this switch at elevated temperatures in non pressurised systems that are totally open to atmosphere in all circumstances and under all conditions.

SPECIFYING SWITCHES

Our factory can supply switches configured to specific requirements. The trailing wire is normally supplied cut to the required length. The free end of the flexible wire is TIG welded to prevent fraying. Wire lengths range from 25mm to 500mm.

When ordering TW26 flow switches, please nominate the required wire length or the size of the pipe in which the switch is to be installed. For example the following part number would define the basic all Polypropylene switch with a flexible wire length of 100mm. TW26-S-100. A 100 Bar pressure rated switch with an Polypropylene / 316 stainless body suitable for mounting in a 200mm diameter pipe would be defined as TW26-SS-200.

MANUAL OVERRIDE

The TW26 trailing wire flow switch has a built in manual override, located under the cable gland on the end face of the switch. The rotary toggle switch is marked AUTO and ON. In the AUTO position the flow switch responds solely to flow, and the toggle switch has no effect. In the ON position the flow switch is actuated regardless of the state of the actual flow, that is, the switch is turned on. The override feature is handy for testing new installations, commissioning systems and for manually priming pumps or starting diesel pump sets etc.

ELECTRICAL DATA

All electrical work associated with this flow switch must be carried out by qualified persons only and must be in accordance with the relevant local codes.

The TW26 flow switch houses a magnetically coupled high current high voltage single pole double throw microswitch. The standard TW26 flow switch is fitted with a 15Amp 500Volt switch suitable for most general control circuit applications. The accompanying table gives the electrical rating of the switch.

The TW26-S and the TW26-SS models are suitable for general control circuit applications.

Rated Voltage	NON INDUCTIVE LOADS				INDUCTIVE LOADS			
	Resistive load		Lamp Load		Inductive Load		Motor Load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	15A		3 A	1.5 A	15A		5A	2.5A
250 VAC	15A		2.5A	1.25A	15A		3A	1.5A
500 VAC	10A		1.5A	0.75A	6A		1.5A	0.75A
8 VDC	15A		3 A	1.5 A	15A		5A	2.5A
14 VDC	15A		3 A	1.5 A	10A		5A	2.5A
30 VDC	6A		3 A	1.5 A	5A		5A	2.5A
125 VDC	0.5A		0.5 A	0.5 A	0.05A		0.05A	0.05A
250 VDC	0.25A		0.25 A	0.25 A	0.03A		0.03A	0.03A

Please Note: All of the component parts of the TW26 series trailing wire flow switch are available as spare parts. Spare flexible wire sensor arms should be specified by quoting the required wire length.

MADE IN AUSTRALIA BY

KELCO Engineering Pty Ltd
ABN 20 002 834 844
Head office and factory
9/9 Powells Road Brookvale 2100 NSW Australia
Phone: +61 2 9905 6425 Fax: +61 2 9905 6420
Email: sales@kelco.com.au Web: www.kelco.com.au
©2008 Kelco Engineering Pty Ltd

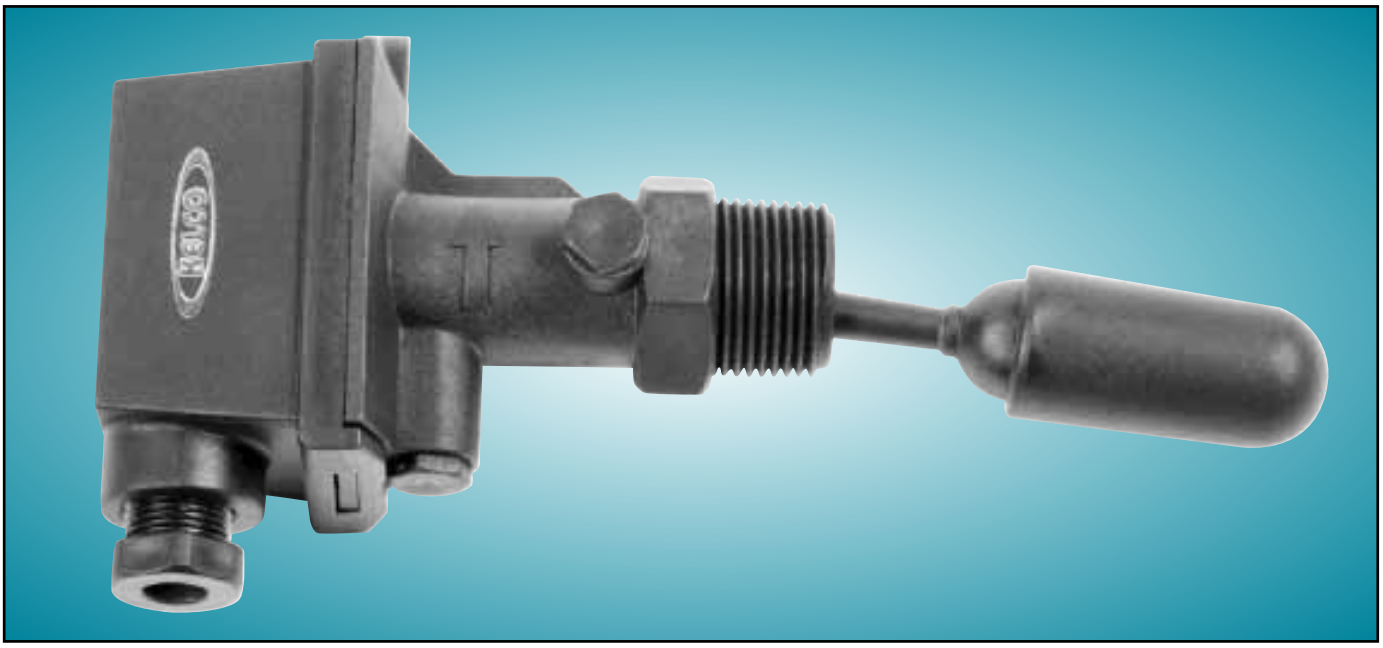
PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008.

KELCO

L25 CORROSION RESISTANT LEVEL SWITCHES

FEATURES

- RELIABLE ROBUST CONSTRUCTION
- WEATHERPROOF ENCLOSURE IP56
- ALL WETTED PARTS IN POLYPROPYLENE
- NO METAL PARTS IN CONTACT WITH FLUIDS
- FULLY ADJUSTABLE LEVEL SENSITIVITY
- SIMPLE TO INSTALL AND ADJUST
- REED SWITCH OR SOLID STATE RELAY OUTPUT
- TOTALLY SERVICEABLE DESIGN
- ENERGY AUTHORITY APPROVED



APPLICATIONS

- Low level protection for pumps
- Control and signalling in ultra pure water systems
- Tank level status signalling in water treatment plants
- Control of levels in effluent and fluid neutralising systems
- Applications involving sea water or brine solutions
- Safety and control signalling for chemical handling
- Control and protection of chemical pumps

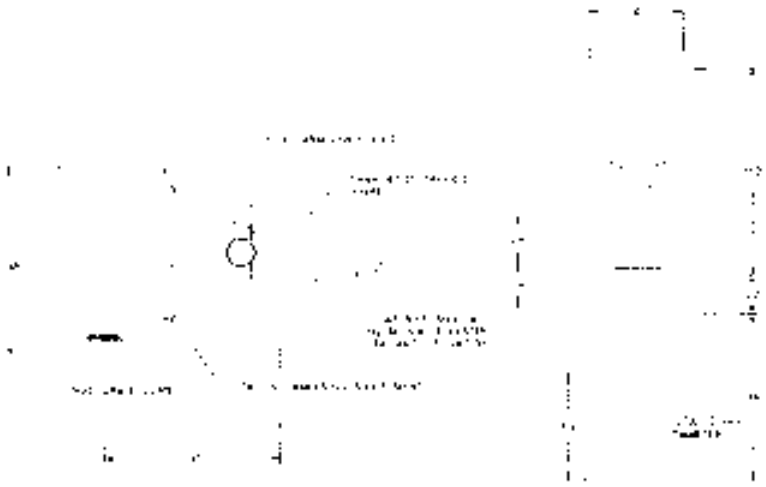
AUSTRALIAN MADE

TECHNICAL DATA

The L25 series level switch has been specifically developed to fill the need for a level sensor, capable of working reliably in applications in which metal level switches fail. Typical areas include chemical, process, pharmaceutical, scientific and agricultural uses, in which the metal components of traditional level switches either interfere with, or are attacked by, the liquids being handled.

Modern plastic and fibreglass tank systems are used extensively in agriculture, industry, and in commercial and domestic fluid handling. The L25 level switch has been specifically designed to integrate into plastic and fibreglass tank systems, and to enhance the advantages of such systems. Total avoidance of metal components, in contact with the liquid, has been achieved. In addition, an advanced frictionless sensitivity adjusting system gives total external control over the switching threshold.

DIMENSION SKETCH



ELECTRICAL DATA

Switch Model	Electrical Module	Switched Power in Watts Maximum	Switched Voltage AC(r.m.s.) Maximum	Switched Current Resistive AC(r.m.s.) Maximum	Maximum Starting Current Inductive Loads	Motors or Other Inductive Loads
L25-B	Dry Contact Reed switch S.P.S.T.	40W	250V	1A	-	-
L25-C	Dry Contact Reed Switch S.P.D.T.	40W	250 V	1A	-	-
L25-R	Solid State Relay output S.P.S.T.	750W	250V	5.2A	100A	1HP 0.75 Kw Maximum

CONSTRUCTION

The L25 series level switches are made from glass reinforced polypropylene.

Polypropylene is non-ageing and is unaffected by ground conditions. It will not support algae or bacterial growth, and has exceptional resistance to most acids, alkalis and solvents. The L25 series level switch should not be used with oxidizing acids or chlorinated organic solvents.

L25 series level switches are intended to be mounted horizontally, in a 25mm B.S.P. socket in the side of tanks. As supplied by the factory, the L25 level switch will give an off condition when the float arm is down, or not being lifted by liquid. The on state will occur when the float is raised by liquid level. This electrical function may be reversed by turning the switch electrical module end for end. Thus an on state will occur when the liquid level drops and the float is lowered.

OPERATING ENVIRONMENT

Maximum Operating Pressure (Static or Dynamic) at Ambient Temperature	1800 Kpa 260 P.S.I.
Minimum Burst Pressure at Ambient Temperature	7000 Kpa 1000-P.S.I.
Maximum Operating Temperature	80 Degrees C at a pressure 1 bar absolute, see note below
Minimum Operating Temperature	-20°C
Ph Range Standard Switch	1 to 10
Ph Range with ABS Arm	1 to 14

NOTE: Temperature for the maximum operating pressure shown in the above operating environment table is 15°C, In the interest of safety, when using the L25 series, maximum operating pressure must be de-rated linearly in direct proportion to temperature increase, to a maximum pressure of 1 bar absolute at 80 degrees Centigrade. In other words only use this switch at elevated temperatures in non pressurised systems that are totally open to atmosphere in all circumstances and under all conditions.

NEW SOUTH WALES DEPARTMENT OF MINERALS AND ENERGY APPROVAL No. CS4937N

MADE IN AUSTRALIA BY

KELCO Engineering Pty Ltd
ABN 20 002 834 844
Head office and factory
9/9 Powells Road Brookvale 2100 NSW Australia
Phone: +61 2 9905 6425 Fax: +61 2 9905 6420
Email: sales@kelco.com.au Web: www.kelco.com.au
©2008 Kelco Engineering Pty Ltd

PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008.

KELCO

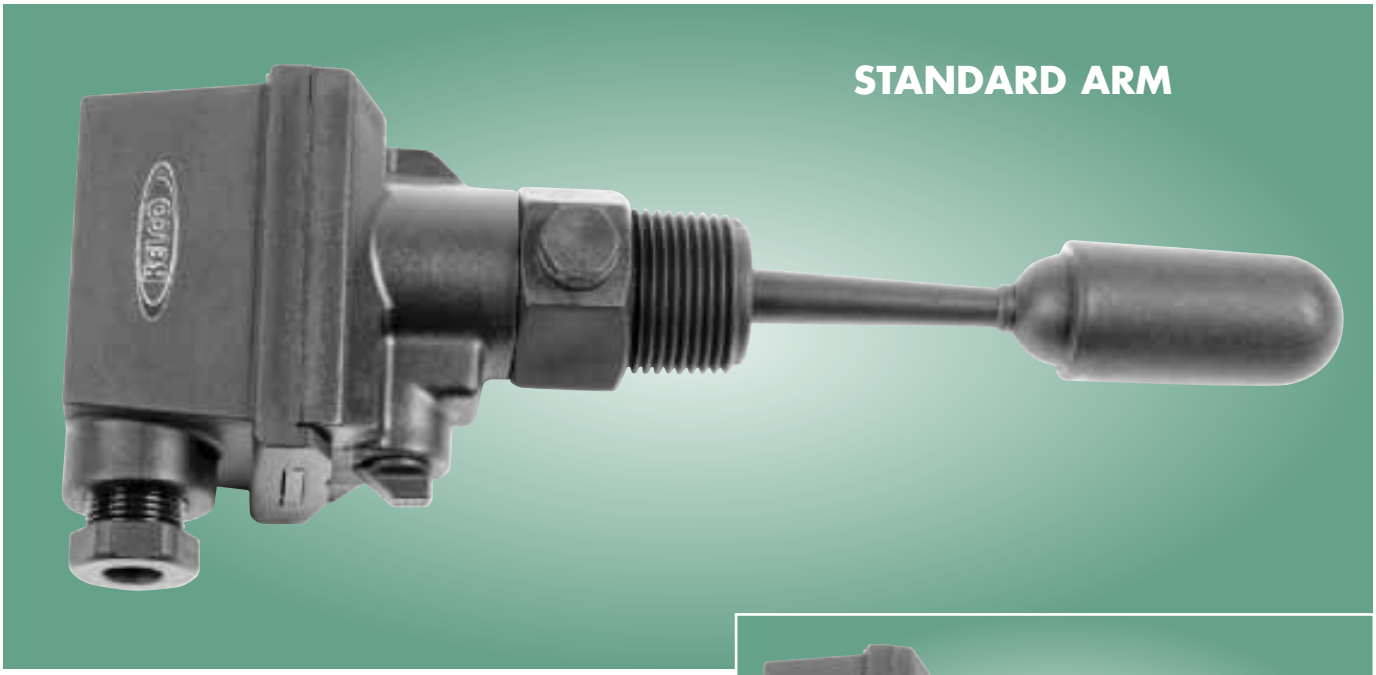
L26 SERIES HEAVY DUTY LEVEL SWITCHES

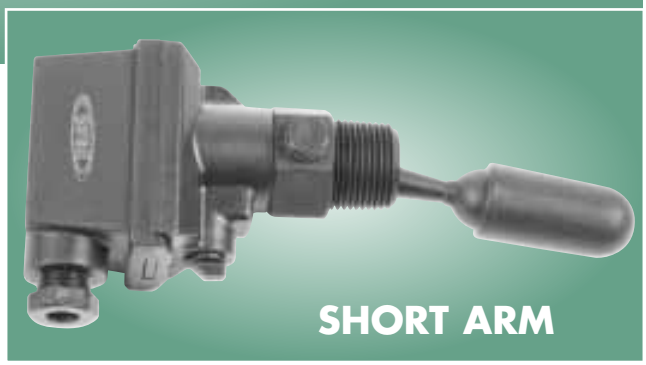
FEATURES

- STAINLESS STEEL OR POLYPROPYLENE BODY
- BUILT IN MANUAL OVERRIDE SWITCH
- RELIABLE PROVEN DESIGN
- 15 AMP 500VOLT SPDT SWITCH
- UNIQUE SEAL-LESS COUPLING
- WEATHERPROOF IP67 HOUSING
- SIMPLE TO INSTALL
- FULLY SERVICEABLE

APPLICATIONS

- TANK LIQUID LEVEL CONTROL
- LOW LEVEL PROTECTION FOR PUMPS
- LEVEL CONTROL IN WATER TREATMENT
- CHEMICAL TANK LEVEL MONITORING
- SAFETY MONITORING IN CHEMICAL TANKS





INTRODUCTION

The L26 series heavy duty level switches provide a highly reliable accurate and low cost solution to tank level control. Offering polypropylene or stainless steel and polypropylene construction, the L26 level switches are built tough, from their high impact weatherproof casing to their high compliance micro switches. These level switches are intended to give long reliable duty under the most arduous conditions. The L26 level switch incorporates our unique seal less magnetic dampening system that both couples the internal switch mechanism to the float arm and ensures a reliable switching action even where surface agitation is present.

The L26 level switch integrates well into modern thermoplastic and fiberglass tank systems. The switches are fitted and removed through the external 25mm B.S.P. socket in which they are installed. There is no need to access the tank from the inside. The standard L26-S has a float arm of sufficient length to clear the inner wall of even the thickest concrete tanks. A short arm L26-SA model is available specifically for small diameter tanks and risers and integrates into vessels down to 100mm inside diameter.

AUSTRALIAN MADE

TECHNICAL DATA

OVERRIDE SWITCH

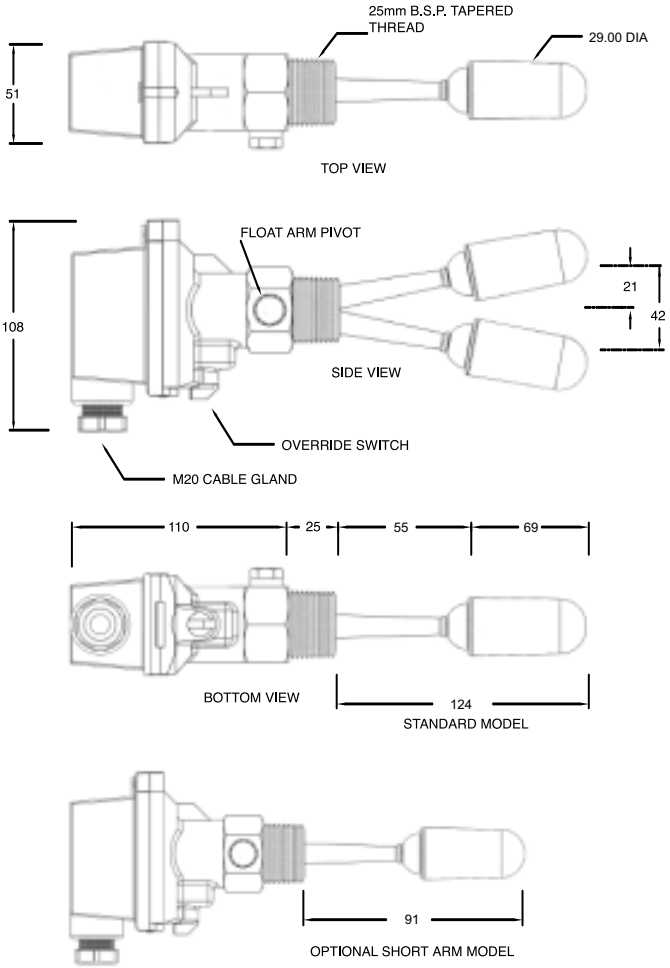
All L26 level switches have a built in two position manual switch that allows the level switch to be overridden regardless of the position of the float. This unique feature means the switch can be tested and operated at any time. The override switch can be used for commissioning systems or for pump priming. In addition it allows the filling of tanks that have been drained to below their normal low level cut out level.

OPERATING ENVIRONMENT

Maximum operating pressure, at ambient temperature.	10 Bars (145 PSI) All models
Minimum burst pressure (Body) at ambient temperature.	80 Bars (1160 PSI) L26-S & L26-SA models only.
Minimum burst pressure (Body) at ambient temperature	100 Bars (1450 PSI) Stainless L26-SS model only
Maximum operating temperature (Liquid)	80 Degrees C at a pressure 1 bar absolute, see note below
Minimum operating temperature (Liquid)	-20˚C
Ingress protection rating (Housing)	IP67

Note: Temperature for the maximum operating pressure shown in the above operating environment table is 15°C, In the interest of safety, when using the polypropylene version of the L26 series, maximum operating pressure must be de-rated linearly in direct proportion to temperature increase, to a maximum pressure of 1 bar absolute at 80 degrees Centigrade. In other words only use this switch at elevated temperatures in non pressurised systems that are totally open to atmosphere in all circumstances and under all conditions.

DIMENSIONS



ELECTRICAL DATA

The L26-S, L26-SS and L26-SA level switches house a 15Amp 500Volt single pole double throw microswitch suitable for most general control applications.

125 VAC	15A	3A	1.5A	15A	5A	2.5A
250 VAC	15A	2.5A	1.25A	15A	3A	1.5A
500 VAC	10A	1.5A	0.75A	6A	1.5A	0.75A
8 VDC	15A	3A	1.5A	15A	5A	2.5A
14 VDC	15A	3A	1.5A	10A	5A	2.5A
30 VDC	6A	3A	1.5A	5A	5A	2.5A
125 VDC	0.5A	0.5A	0.5A	0.05A	0.05A	0.05A
250 VDC	0.25A	0.25A	0.25A	0.03A	0.03A	0.03A

MODELS AVAILABLE

L26-S	Standard all polypropylene switch with long float arm 15Amp 500Volt rating
L26-SA	All polypropylene switch with short float arm 15Amp 500Volt Rating
L26-SS	Long arm polypropylene & 316 stainless switch with 15AMP 500Volt rating

MADE IN AUSTRALIA BY

KELCO Engineering Pty Ltd
ABN 20 002 834 844
Head office and factory
9/9 Powells Road Brookvale 2100 NSW Australia
Phone: +61 2 9905 6425 Fax: +61 2 9905 6420
Email: sales@kelco.com.au Web: www.kelco.com.au

©2008 Kelco Engineering Pty Ltd

PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008.

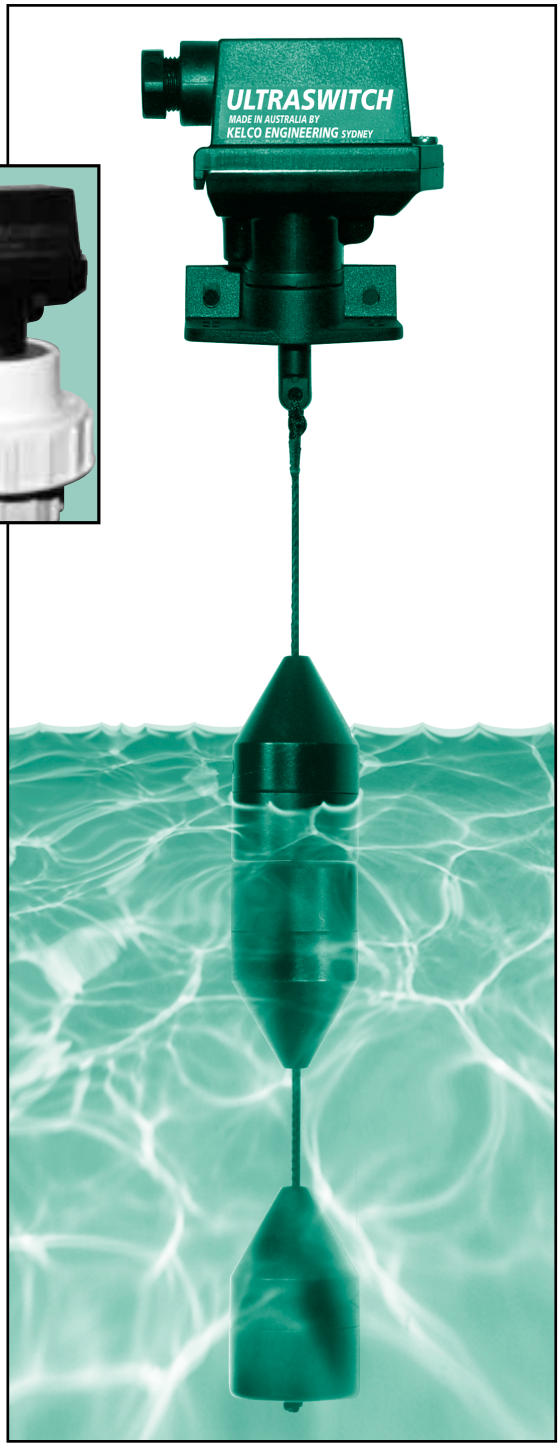
KELCO

D30 SERIES LIQUID LEVEL SWITCH

FEATURES

- FULLY ADJUSTABLE TWO POSITION SWITCHING
- 2 HP RATED 20 AMP S.P.D.T. SWITCH
- NO METAL PARTS IN CONTACT WITH LIQUIDS
- -1 TO 18 BAR PRESSURE RATING
- ALL THERMOPLASTIC CONSTRUCTION
- WEATHERPROOF HOUSING
- SUPER RELIABLE MAGNETIC ACTION
- UNIVERSAL MOUNTING BRACKET SUPPLIED





APPLICATIONS

- SUMP PUMP CONTROL
- FOR EITHER PUMP IN OR PUMP OUT
- WATER TANK LEVEL CONTROL
- EFFLUENT AND LIQUID WASTE LEVEL CONTROL
- SUITS SLURRYS AND HIGH SOLIDS APPLICATIONS
- SEPTIC AND SEWER PUMPOUT CONTROL
- COOLING TOWER CONTROL SYSTEMS
- SUITS FROTHING FOAMING OR AGITATED LIQUIDS
- SUITABLE FOR SEA WATER, ACIDS & MANY CHEMICALS
- WORKS IN SUMPS, PITS, BORES, TANKS, WELLS OR BUNDS
- CAN BE USED IN PRESSURE OR VACUUM VESSELS

Modern thermoplastic piping and tank systems demand modern controls. The D30 level switch is a rugged versatile liquid level switch that integrates states of the art magnet technology with one of the most fundamental principles of physics to achieve a sensible and reliable solution to the problem of controlling the level of liquids in tanks and sumps.

OPERATING PRINCIPLE

The D30 two position top entry level switch operates on the principle of displacement. When non floating solid polypropylene displacers, suspended from the switch, are immersed in liquid their weight is reduced by an amount equal to the weight of the liquid they displace, This weight change is detected and used to actuate a magnetically isolated switch. Surface agitation, froth, floating or submerged solids do not effect the action of the D30 switch. The displacement principle depends on the specific gravity of the liquid in which the displacers are suspended. The switch is set to operate in water, at a specific gravity of 1+/- 5%. Various displacers are also available to allow the switch to operate in liquids of other specific gravities.

CONSTRUCTION

The electrical housing and body of the D30 level switch are constructed from impact resistant ultraviolet stabilized ABS thermoplastic. The solid displacers are made from glass-reinforced polypropylene, and the suspension cord is made from virgin polypropylene. On the underside of the switch body is a standard 20 NB (pipe size) male spigot. The spigot can be either fitted into, or glued into any standard PVC or ABS pipefitting such as flanges, unions or reducing bushes. In addition each switch is supplied with a universal mounting bracket suitable for direct fixing to walls, tank lids or horizontal pipework. The displacers suspended from the switch fit easily inside 50mm nominal size PVC pipe. This feature allows the switch to be simply and quickly mounted in stilling wells, by-pass housings or in stand off risers. Such mounting can be constructed from standard off the shelf PVC or ABS pipe and fittings. The D30 level switch has no metal



AUSTRALIAN MADE

parts that come into contact with liquids, regardless of the mounting method used. The actuation arm operates the switch by magnetic force, through a solid barrier of ABS. This means the switch can be used in pressure vessels or in applications where the entire displacer and cord assembly are under pressure or vacuum.

HAZARDOUS AREA USES

The D30 liquid level switch is a mechanically self-actuating device in which there is no mechanism for the production or storage of electrical energy. As such the D30 is classed as a simple device. No separate certification is required to use the switch in an explosion prone environment. In hazardous applications, the switch should be isolated via an intrinsically safe relay, a zenner barrier.

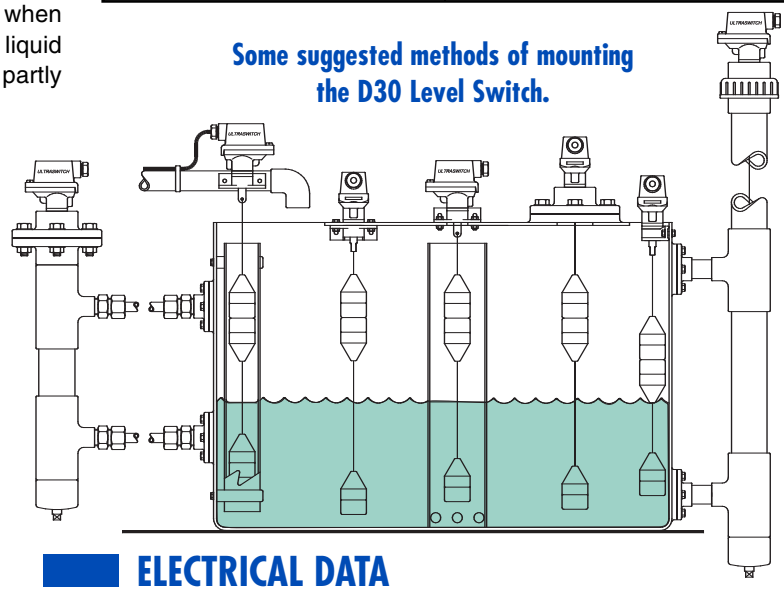
APPLICATIONS

The D30 level switch is designed to detect a level change in liquids that have a specific gravity of one, that is, water or water that contains dissolved or suspended solids. The switch can be mounted in any location above the liquid being sensed. The twist lock displacers are positioned on the cord at points where the switch is required to change state, for example close to the bottom of a tank for the low level switching point and close to the top of a tank for the high level switching point. A falling liquid level will trip the switch when the bottom displacers are partly uncovered, and a rising liquid will reset the switch when the top displacers are partly submerged. A 20 Amp single pole double throw switch is provided so circuits can be switched on or off when liquid is either rising or falling, making the switch ideal for both pump in and pump out applications. The switch mechanism built into the D30 is a special high current high capacity device, capable of directly controlling pump motors up to 2 HP at 240 VAC. For less demanding applications, the switch is equally capable of actuating relays, contactors or PLC's.

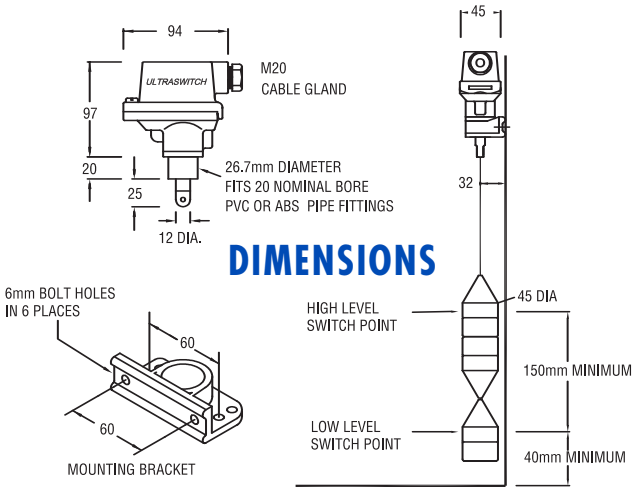
OPERATING PARAMETERS

Minimum level differential	150mm, (with 3 displacers stacked tightly together)
Maximum level differential	20 Metres, (3 Metres of cord supplied with switch)
Minimum distance from switch point to floor of a tank or sump.	40mm (Sumps can be pumped out to within 40mm of floor)
Maximum pressure, at ambient temperature	18 Bars (Where the displacers are in a pressure vessel)
Minimum burst pressure, at ambient temperature	80 Bars
Minimum pressure	-1 Bar (Where the displacers are under vacuum)
Maximum liquid temperature, (in open tank non pressure applications)	100˚C (Displacers & cord only can withstand this temperature.
Maximum liquid temperature, (where switch housing is exposed to hot liquid), at Ph 7	60˚C (This temperature must be de-rated in pressure vessel applications.)
Ph Range	1 to 14 (At ambient temperature)
Specific Gravity of process liquid	1.0 +/- 5%
Ingress Protection rating (Housing)	IP 67

Some suggested methods of mounting the D30 Level Switch.



DIMENSIONS



ELECTRICAL DATA

The D30 level switch contains a high capacity single pole double throw microswitch with Tungsten contacts, specifically designed to control motor loads up to 2 Horse Power.

Rated Voltage	NON INDUCTIVE LOADS				INDUCTIVE LOADS			
	Resistive load		Lamp Load		Inductive Load		Motor Load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	20 A		7.5 A		20 A		12.5 A	
250 VAC	20 A		7.5 A		20 A		8.3 A	
500 VAC	15 A		4 A		10 A		2 A	
8 VDC	20 A		3 A	1.5 A	20 A		12.5 A	
14 VDC	20 A		3 A	1.5 A	15 A		12.5 A	
30 VDC	6 A		3 A	1.5 A	5 A		5 A	
125 VDC	0.5 A		0.5 A		0.05 A		0.05 A	
250 VDC	0.25 A		0.25 A		0.03 A		0.03 A	

MADE IN AUSTRALIA BY

KELCO Engineering Pty Ltd
ABN 20 002 834 844
Head office and factory
9/9 Powells Road Brookvale 2100 NSW Australia
Phone: +61 2 9905 6425 Fax: +61 2 9905 6420
Email: sales@kelco.com.au Web: www.kelco.com.au
©2008 Kelco Engineering Pty Ltd

PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008.

KELCO

LC20 MODULAR LEVEL SWITCH SYSTEM



FEATURES

- VERSATILE MULTIPOINT LEVEL SENSORS
- FOR TANK GAUGING & LEVEL CONTROL
- SUITS PVC OR STAINLESS SYSTEMS
- SERVICEABLE AND EXPANDABLE
- SIMPLE AND RELIABLE
- IP67 WEATHERPROOF
- EASILY ADJUSTED

The LC20 modular level switches enable users to easily build sophisticated systems to monitor liquid levels and to control alarms and pumps. The system is very flexible and can be used with PVC, stainless steel or copper tubes and can be easily adjusted, added to or serviced.

DESCRIPTION

A number of compact highly weatherproof sensing heads are positioned along a vertical riser pipe that is attached to the side of a tank. The riser pipe is made from a length of standard 20mm PVC or 1 inch stainless steel or copper tube. Liquid level rising and falling in the tank and in the riser pipe, carries a small magnetic float through the sensor heads and provides a series of switching points that can be used for a multitude of level control and sensing applications. Typical uses include water treatment equipment, beverage, cosmetics and pharmaceutical manufacture, chemical metering systems, water features and a vast variety of mechanical services and process control applications.

A typical system comprises a tank with an externally mounted balance pipe, or riser pipe alongside. The riser pipe is connected to the base of the tank and is constructed from standard pipe and fittings. Liquid level in the tank maintains an equal level in the riser pipe. As the level of liquid in the tank changes so does the level in the adjacent riser. A small float containing a magnet rides up and down within the riser pipe, and is carried through the sensor heads, causing them to sequentially switch.

LC20 SENSOR HEADS

The LC20 sensor heads are available as normally open or normally closed switches. Both types can be supplied with dry reed switch contacts or with built-in Triacs for control of moderate AC loads. The sensor heads clamp around standard tube or pipe, and can be easily removed or repositioned if required. They are sized to fit standard 20mm PVC or ABS pipe and a spacer is supplied with each sensor to adapt it to fit 25.4mm (1") diameter metal or glass tubing.

Each sensor head provides a single switching point, either on or off as the system's float passes through it. Once actuated, a level change of 5mm, either up or down will cause the sensor to change state. LC20 heads are ideal for relay control, for making and breaking latched relay logic circuits and for PLC control. Any number of sensors can be stacked along a riser pipe, but typical systems normally consist of 2, 4 or 6 heads. For accurate tank level-gauging sensors can be stacked close together along the riser pipe. The minimum distance between sensors is 40mm. The maximum distance is unlimited.

ELECTRICAL OPTIONS

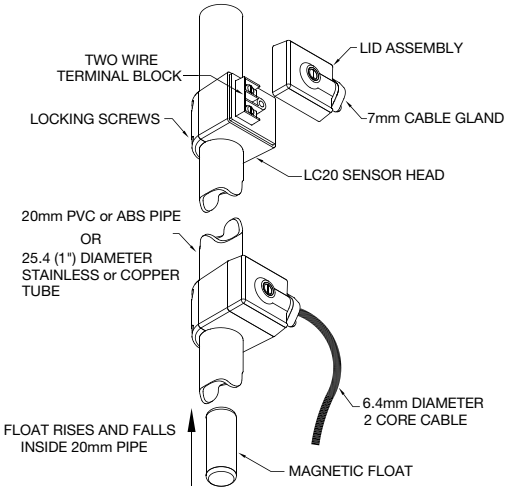
For PLC, relay logic and telemetry circuits the model LC20-B-NO provides a single set of normally open voltage free contacts in the form of a dry contact reed switch. For moderate current AC applications, a high power model designated LC20-R-NO; containing a Triac solid-state relay is also available. For reverse acting applications, the LC20-B-NC and LC20-R-NC models provide a single set of normally closed contacts.



AUSTRALIAN MADE

TECHNICAL DATA

SENSOR DETAILS



ELECTRICAL DATA

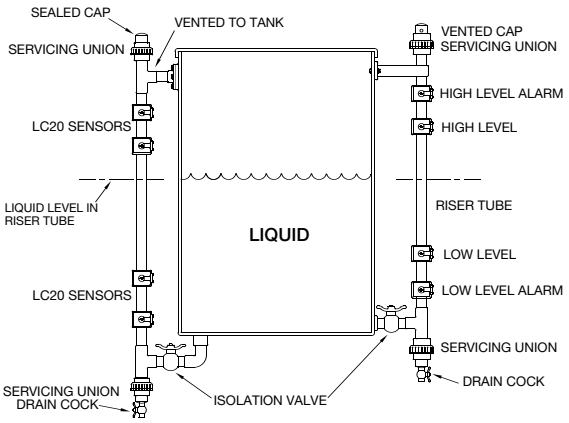
Sensor Model	Module Type	Contact Configuration	Switched Power Maximum	Switched Voltage Maximum	Switched Current Resistive AC (rms) Maximum	Inductive Loads (Power Factor 0.4)	Typical Application
LC20-B	Dry Reed Switch	S.P.S.T NO or NC	40Watts	240VAC 200VDC	1 Amp	Not Suitable	PLC Telemetry and Relay Logic circuits
LC20-R	Solid State Relay (Triac)	S.P.S.T NO or NC	750Watts	5 to 240V AC only	4 Amps	4 Amps at 240V	AC control circuits and direct pump control

Note: The switched power of the LC20-R module given above refers to a sensor operating on a metal riser pipe at ambient temperature. In hot liquid applications the switched power must be proportionally reduced to avoid overheating the Triac. At the top operating temperature of 90°C the switched power must not exceed 375 Watts. The LC20-B sensor heads do not require de-rating at elevated temperatures.

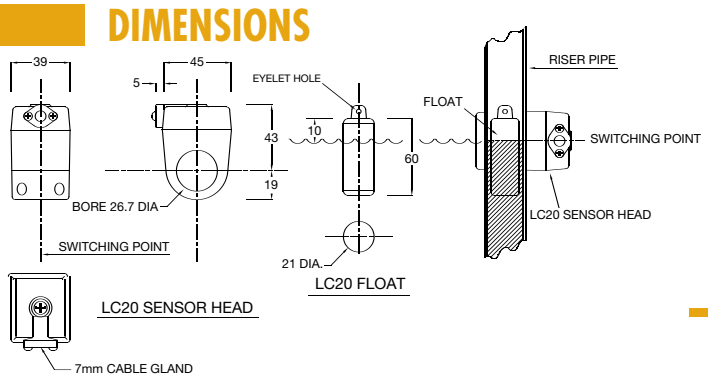
FLOAT

A magnetic float is supplied with each LC20 sensor head. The float is made from polypropylene and is sized to easily fit inside 20mm Class 18 PVC pipe. The float is buoyant enough to operate in liquids with a specific gravity of >0.80, and in pressure vessel applications can tolerate pressures to10 Bars (150 PSI). The Float has an eyelet in it's top face so a cord can be attached for testing systems and for commissioning.

TYPICAL APPLICATIONS



DIMENSIONS



STAINLESS STEEL TUBE SYSTEMS

The LC20 system operates magnetically and will only work in tube and pipe systems that are magnetically transparent. A riser tube can be constructed from essentially any material that is of the correct diameter and bore and is non magnetic. For example 1" diameter brass or copper tube will work perfectly, as will 1" diameter glass tube. Some grades of stainless and some special corrosion resistant alloys will attract a magnet and are therefore unsuitable. Generally, grade 304 and grade 316 stainless steel is non magnetic and will work perfectly with the LC20 system.

OPERATING ENVIRONMENT

The LC20 level sensing system is suitable for use with most liquids of the correct specific gravity that can be contained within the system's riser pipe. This includes acids, alkalis, sea water, brine solutions, chlorinated solutions and oils. When used with PVC or ABS riser pipe, liquid temperature should never exceed 60°C. In stainless and copper tube systems, the LC20 sensor heads can be operated at temperatures of up to 90°C continuously. For short periods, such as for system sterilization the sensors and float will tolerate temperatures to100°C. The system is suitable for use in pressurized vessels up to 10 Bars (150PSI). Do not use the LC20 level sensing system with isomorphic solutions or with liquids containing material that coats out, cakes up, or with liquids that contain solids of any appreciable size. Any material in the liquid that impedes the free movement of the float may cause malfunctions. Where solids may be present, such as in waste and effluent applications, it is generally possible to install a strainer at the base of the riser pipe to prevent ingression of solids.

HAZARDOUS LOCATIONS

The LC20 level sensing system can be used in hazardous areas. The sensor heads are classed as simple devices as they do not contain components capable of storing or producing an electric charge. As simple devices the LC20 sensors can be used in hazardous applications provided the heads are isolated by an intrinsically safe barrier, a zener barrier.

ORDERING

Each kit consists of one sensor head and one float. In addition to the kits, individual components are also available at all times to allow for expansion of systems or for spare parts.

LC20 - B - NO

SWITCH TYPE
B = DRY CONTACT REED SWITCH
R = SOLID STATE RELAY (TRIAC)

SWITCH FUNCTION
NO = NORMALLY OPEN
NC = NORMALLY CLOSED

MADE IN AUSTRALIA BY
KELCO Engineering Pty Ltd
ABN 20 002 834 844
Head office and factory
9/9 Powells Road Brookvale 2100 NSW Australia
Phone: +61 2 9905 6425 Fax: +61 2 9905 6420
Email: sales@kelco.com.au Web: www.kelco.com.au

©2008 Kelco Engineering Pty Ltd

PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008.