

INSTALLING AND OPERATING THE KELCO P25 SERIES FLOW SWITCH



WARNING

Please read these installation and operating instructions fully and carefully before installing or servicing this Inline Flow Switch. The P25 Series flow switch is mains voltage device. Death or serious injury may result if this switch is not correctly installed and operated. All electrical work must be performed by a fully qualified and licenced electrician.

INSTALLATION

The P25 flow switch is a 25mm (1") magnetically operated inline flow sensor that will provide an electrical signal in response to liquid flow through the switch body. The switch is available with a choice of 3 electrical configurations and 3 different size pipe terminations. The following model designation describes the various options.

P25 - B - 25

ELECTRICAL MODULE

B = SPST NORMALLY OPEN REED SWITCH
C = SPDT DOUBLE THROW REED SWITCH
S = 500VAC 15A 2HP RATED STDT SWITCH

PROCESS CONNECTION

PVC SOCKETS TO SUIT
PVC PRESSURE PIPE

15 = 15 NB PIPE
20 = 20 NB PIPE
25 = 25 NB PIPE

The P25 flow switch has no metal parts in contact with the process liquid. Inert thermoplastics are all that come in contact with liquid passing through the switch. This means the P25 can be used in aggressive chemical solutions, seawater and bore water and in many fluids that would attack metal parts, including most acids and alkalis. The P25 contains a close fitting piston and should only be used in applications where the process fluid is clean and free from entrained or suspended materials. Solutions that contain large particulates, ferrous materials or fibrous matter should not be used in this switch. If the degree of contamination of the process liquid can't be guaranteed then a suitable line strainer should be installed prior to the flow switch. The P25 flow switch is made from glass reinforced polypropylene with nitrile o-rings. The switch is weatherproof and it is suitable for all outdoor exposed applications. The switch should be protected from freezing and from exposure to hot liquids >60°C. The P25 flow switch must not be used in applications where the static or dynamic pressure exceeds 18 Bars. Care should be taken to ensure the switch is not exposed to water hammer. The following table sets out the environmental limitations of the P25 flow switch.

OPERATING LIMITATIONS

Maximum Recommended Continuous Flow Rate	100 Litres per Minute (Head loss across the switch <50kPa at 100L/min.)
Maximum Recommended Operating Pressure (Static or Dynamic) at Ambient Temperature	18 Bars (260 P.S.I.)
Minimum Burst Pressure at Ambient Temperature	60 Bars (865 P.S.I.)
Maximum Liquid Temperature	60°C
Minimum Liquid Temperature	-20°C
Liquid Ph Range	1 to 14
Ingress Protection Rating	IP67

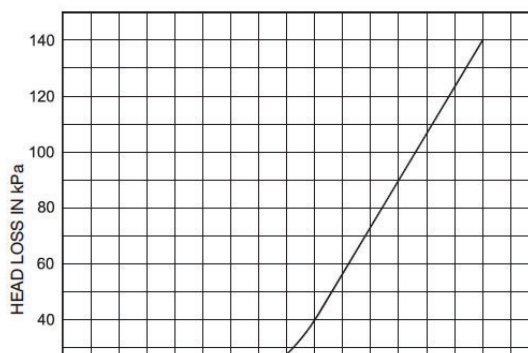
IMPORTANT NOTE: Maximum operating pressure given in the table above must be de-rated in proportion to temperature increase and in consideration of any chemical solutions being processed. At top operating temperature (60°C) the maximum operating pressure is 1 Bar absolute. (Fully open atmospheric discharge).

SWITCHING POINTS

The flow required to actuate the P25 is different for each model. The table below sets out the flow required to actuate and de-actuate each of the 3 models.

MODEL	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
P25-B	9	7	0.1
P25-C	3	2.5	0.1
P25-S	9	7	0.1

The maximum recommended flow rate through the P25 flow switch is 100 Litres per minute. The graph below shows the head loss across the P25 at flows up to 100 Litres per minute.



INSTALLATION

The P25 flow switch can be mounted in any orientation including upside down. There is a direction of flow arrow on the switch body. This directionality must be adhered to, as the switch will not operate against a reverse flow. Pipework can be used to support the switch, or the switch can be connected directly to valve manifolds or pump ports. Do not use this flow switch as a non-return valve.

OVERRIDE SWITCH (P25-S MODEL ONLY)

The P25-S flow switch is fitted with a manual override. This allows the switch to be actuated even if there is no flow. The override is located on the side of the switch body, under a locking cap. The locking cap can be removed by placing a small screwdriver in the notch provided on the underside of the cap. The cap simply pops off when lifted gently. The override dial turns through 90 degrees between AUTO and ON. In the ON position the state of flow is ignored and the flow switch will be on. The override can be used to override the off state of the flow switch and allow pumps to be started. It can also be used when installing or commissioning systems to simulate switch operation.

ELECTRICAL



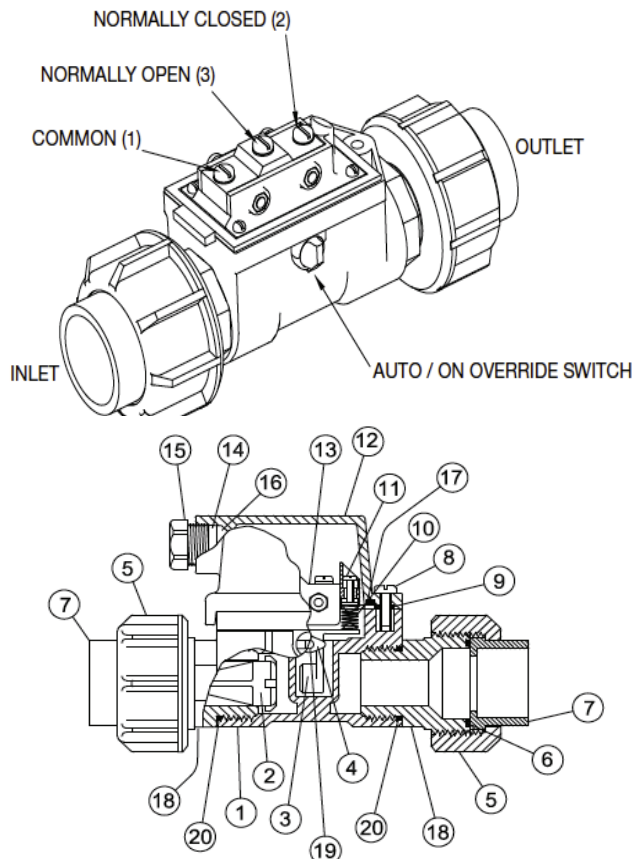
WARNING

All electrical work associated with the P25 Series flow switch **must** be carried out by qualified electrical personnel and all electrical work must conform to AS/NZ (or equivalent) standards and to local wiring rules.

Switch Model	Module Type	Contact Configuration	Switched Power Maximum	Switched Voltage Maximum	Switched Current Resistive AC (rms)	Inductive Loads	Typical Application
P25-B	Dry contact reed switch	S.P.S.T Normally Open	40 Watts	240V AC 200V DC	1 Amp Maximum	Not Suitable	PLC Telemetry & Relay Logic Circuits
P25-C	Dry contact reed switch	S.P.D.T	20 Watts	140V AC 150V DC	1 Amp Maximum	Not Suitable	PLC Telemetry & Relay Logic Circuits
P25-S	Heavy Duty Mechanical Switch	S.P.D.T	1.5 kW	500V AC 250V DC	20 Amps @ 240V AC	Direct Control of Motors to 1.5 kW / 2HP	AC Control Circuits & AC Motor Control

The P25 flow switch is available in three electrical configurations, outlined above. The standard version (P25-S) of the flow switch is supplied with an SPDT microswitch fitted. Two reed switch versions (S.P.D.T and S.P.S.T) of the flow switch are available for low power applications. The model number of the switch is located on a label inside the switch lid. The standard flow switch houses a magnetically coupled high current high voltage single pole double throw microswitch that is suitable for most general-purpose control circuit applications at any voltage up to 500VAC. The reed switch versions of the P25 house a gas filled reed switch that provide either an S.P.D.T (make before break) or S.P.S.T switching action. The cable gland on the P25 flow switch is threaded M20 and will accept standard M20 conduit bushes in addition to flexible cable. When wiring an P25 flow switch, ensure the lid and cable gland are securely tightened and in fully exposed locations use secondary precautions such as cable drip loops to make sure no water can enter the switch housing.

DETAILS OF THE P25-S



Item	Description	Qty	Material
1	Body	1	Glass reinforced Polypropylene
2	Piston	1	Glass reinforced Polypropylene
3	Switch arm and magnet	1	ASA
4	Toggle assembly	1	ASA
5	Union nut	2	Glass reinforced Polypropylene
6	O-Ring	2	Nitrile
7	Pipe socket	2	PVC
8	Lid Screw	1	M5 X 15 Stainless pan head
9	Retainer ring	1	Nitrile
10	Spring	1	Stainless steel
11	Sensitivity Adjustment	1	M3.5 X 14 Stainless pan head
12	Lid	1	Glass reinforced Polypropylene
13	Microswitch Assembly	1	Microswitch and carrier (carrier ASA)
14	Gland backing ring	1	Glass reinforced Polypropylene
15	Gland nut	1	Glass reinforced Polypropylene
16	cable grommet	1	Santoprene
17	lid gasket	1	Santoprene
18	adaptor	2	Glass reinforced Polypropylene
19	toggle O-Ring	1	Nitrile
20	Body O-Ring	2	Nitrile

Please Note: Spare part kits are available for the P25 Inline Flow Switch

KELCO Engineering Pty Ltd

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PLEASE NOTE: Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Users will use their own judgment to determine the appropriateness of using of Kelco Products in an application, any safety measures required and that the product is properly installed for that application. To the extent permitted by law Kelco Engineering Pty Ltd disclaims and excludes all and any liability for the use of this product in any particular application or for defective installation. This Kelco product is warranted against malfunction by a 12 month return to base manufacturer's warranty. Full details of our warranty and limitation of liability can be found in this document or downloaded from: <http://www.kelco.com.au/warranty>.

Warranty and Limitation of Liability

Thank you for purchasing Kelco Engineering Pty Ltd, (ABN 200 002 834 844) ("Kelco") products (*Kelco Products*). This document sets out the terms and conditions of the product warranty and Limitation of Liability for *Kelco Products*. It is an important document. Please keep it with your proof of purchase documents in a safe place for future reference should you need to lodge a claim.

This Warranty and Limitation of Liability (or any more recent version in effect when you purchase a *Kelco Product*) ("**Warranty**") applies to all *Kelco Products* regardless of where you purchased the *Kelco Products*.

When you place an order, you are deemed to agree to the *Warranty*, unless otherwise agreed in writing with *Kelco*.

Kelco is located at 9/9 Powells Road, Brookvale, NSW 2100, AUSTRALIA and may be contacted by calling 61 2 99056425 or emailing: sales@kelco.com.au

1. Definition

The following terms used herein are defined as follows:

- (1) *Australian Consumer Law* or *ACL*: Schedule 2 to the Competition and Consumer Act 2010 (Cth).
- (2) *Brochures and Technical data sheets*: *Kelco* brochures, including, without limitation, sales brochures and technical data sheets, whether or not provided electronically.
- (3) *Customer Application*: Any application of *Kelco Products* or component parts by a you including, but not limited to, embedding and/or using *Kelco Products* in your parts/components, electronic substrates, devices, equipment and /or systems manufactured by customers.
- (4) *Non- Excludable Guarantee*: a Consumer Guarantee applicable to these *Warranty Terms* under the *Australian Consumer Law* or *New Zealand Consumer Guarantee Act 1993*.
- (5) *Fitness*: (a) fitness for a particular purpose, (b) performance, (c) compliance with laws and regulations and (d) conformity to standards of a *Kelco Product*.
- (6) *Kelco Products*: flow switches, level switches and float switches, related products and electronic/mechanical components under the *Kelco* brand.
- (7) 'you' or "customer" means the purchaser of the *Kelco Products* not having purchased the *Kelco Products* for re-sale, and 'your' has a corresponding meaning.
- (8) *Usage Conditions*: Usage conditions, rating, performance, operating environment, handling instructions, warnings, restrictions on use, etc. of *Kelco Products* described in the *Brochures and technical data sheets*.

2. Descriptions

You are deemed to accept the following terms and conditions regarding the descriptions provided of *Kelco Products* in the *Brochures* and technical data sheets when you adopt or use a *Kelco Product* or component thereof.

- (1) Rated values and performance values are based on average performance established from batch production runs and *Kelco* does NOT warrant any rated values and performance values for multiple composite conditions.
- (2) Reference data is provided for your reference only. *Kelco* does NOT warrant that *Kelco Products* work properly at all times or continuously as provided in the reference data.
- (3) Application examples (if any) are provided for your reference only. *Kelco* does NOT warrant the *Fitness* of *Kelco Products* under such applications.
- (4) *Kelco* may discontinue the production of *Kelco Products* or change their specifications for the purpose of improving such products or for other reasons entirely at its own discretion and is under no obligation to notify you of any such change.

3. Precautions

You are deemed to accept the following terms and conditions when you purchase *Kelco Products*:

- (1) You will use *Kelco Products* in compliance with *Usage Conditions* including rating and performance.
- (2) You will confirm *Fitness* and use your own judgment to determine the appropriateness of using *Kelco Products* in a *Customer Application*. *Kelco products* are unlike conventional flow and level switches and pump controllers in that they can be applied to virtually any fluid or pumping system in any manner defined by an original equipment manufacturer, a wholesaler or end user or their agents. The knowledge and experience of such parties is outside the control of *Kelco*, and their having relevant knowledge and experience is critical to the successful application and operation of the *Kelco Products*. ***Kelco does NOT warrant the Fitness of Kelco Products in a Customer Application.***
- (3) You will confirm that *Kelco Products* are properly wired and installed for their intended use in your overall system. In the case of *Kelco* pump controllers, the flexibility of their operating system means it requires an extensive knowledge of pumps and their characteristics and the intended overall goal of the system in order to select the correct functions and settings. Failure to understand the ramifications of incorrect settings may result in a system that fails to perform to your expectations and or may even damage the pump or system itself. It is therefore critical that correct settings are used to achieve a stable and reliable overall system and to provide any such system with appropriate pressure and or flow protection the pump controller is intended to provide. ***Kelco does NOT warrant Kelco Products against defective installation, incorrect programming, incorrect wiring or electrical overload in any form.***
- (4) When using *Kelco Products*, you will make sure to (i) maintain a margin of safety in relation to the published rated and performance values, (ii) design to minimize risks to any *Customer Application* in case of failure of any *Kelco Products*, such as introducing redundancy i.e. critical systems should include double redundancy of all controls, (iii) adopt system-wide safety measures to notify risks to users such as independent backup protection. Such backup may consist of a simple or complex independent alarm system to alert an operator to any issue with the system, and (iv) conduct regular maintenance on *Kelco Products* and the *Customer Application*.
- (5) It will be your sole responsibility as user to determine and use adequate measures and checkpoints to satisfy your particular requirements for (i) data input and output, (ii) maintaining a means for reconstruction of lost data, (iv) preventing *Kelco Products* installed thereon from being infected with computer viruses and (v) protecting *Kelco Products* from unauthorized access. ***Kelco shall not be responsible and/or liable for any loss, damage, or expenses directly or indirectly resulting from any third-party software or hardware not contained in the product as originally configured by the manufacturer, the infection of Kelco products, or any computer equipment, computer programs, networks, databases or other proprietary material connected thereto, by service attack, computer viruses, other technologically harmful material and/or unauthorized access.***
- (6) *Kelco Products* are designed and manufactured as general-purpose products for use in general industrial products. They are not intended to be used in the applications described in subsection 3...(5)(a), (b), and (c). If you are using *Kelco Products* in the applications described below, ***Kelco does not provide any warranty for such Kelco Products, except for specific applications where Kelco has specified that it intends to provide a warranty or by separate written agreement between the customer and Kelco.***

- a. Applications with stringent safety requirements and applications that could cause physical injury to a person or result in loss of life.
- b. Applications under severe conditions or in severe environment, including but not limited to outdoor equipment, equipment exposed to chemical contamination, equipment exposed to electromagnetic interference and equipment exposed to vibration and shocks.

- c. Applications under conditions or environments not described in any of the Brochures and Technical data sheets.
- d. *Kelco Products* are not intended for use in Hydrocarbons other than Dieseline.

4. Warranty

Kelco warrants that *Kelco Products* will perform in accordance with the specifications set out in the Technical data sheets, subject to and in accordance with the following:

- (1) Warranty period: The *Warranty* shall apply for 12 months from the date of original purchase of *Kelco Products* by the customer. .
- (2) Sole Remedy: Unless required to do otherwise as a result of statutory guarantees applicable under *ACL*, *Kelco* will provide, at its own discretion, either of the following two services as the sole remedy for a malfunctioning *Kelco Product*:
Repair of the malfunctioning *Kelco Product(s)* or components by *Kelco* or *Kelco* authorised dealer at no charge to the customer, or

- a. Replacement of the malfunctioning *Kelco Product(s)* or components by *Kelco* or *Kelco* authorised dealer with the same number of replacement/alternative products or components at no charge to the customer.

(3) Exceptions: This *Warranty* of *Kelco Products* does not apply if the cause of the malfunction falls under any of the following:

- a. Usage in a manner other than the original intended use for the *Kelco Products* or component thereof.
- b. Usage other than as described in the *Usage Conditions*.
- c. Usage that is not in accordance with Section 2 (Descriptions) and Section 3 (Precautions) above.
- d. Modification or repair made to the *Kelco Products* by persons other than *Kelco*.
- e. Causes which could not have been foreseen with the level of science and technology at the time of shipping from *Kelco*.
- f. Replacement or repair of any (1) consumables (including cables, paddles and circuit boards), or (2) lost parts or accessories.
- g. Service of any product whilst it is outside Australia.
- h. Causes originating from other than *Kelco* or *Kelco Products* (including force majeure such as but not limited to natural disasters)
- i. Causes from any environmental factors. Such factors may include but are not limited to water or chemical ingress, fire damage, lightning damage, mechanical damage, sun damage or degradation, failure due to over-heating, freezing or vibration. Failure due to customers over tightening threads or fittings. Failure due to power supply fluctuations, surges, spikes, brown outs. or AC supplies that do not provide a pure sine wave output.

(4) If you intend to make a claim under this *Warranty* you must contact *Kelco* to register your claim by telephone on (02)99056425 and provide the following details to enable *Kelco* to assess the claim: (i) proof of purchase; (ii) evidence of the particulars of the claim that gives rise to the application of the *Warranty*; (iii) confirmation that the cause of the malfunction was not an Exception set out above; and (iv) your phone number, email and address details.

You must provide or make the *Kelco product* available to *Kelco* for evaluation. If you are required to return the product to *Kelco* for repair replacement or evaluation, *Kelco* will provide delivery details and a return goods authorisation number to you. The *Kelco Products* will be at the owner's risk whilst in transit to and from *Kelco*, unless transported by *Kelco* or its authorised representatives.

The *Kelco Product* presented for repair may be replaced by refurbished products of the same type rather than being repaired. Refurbished parts may be used to repair the product.

To the extent permitted by law replacement of the product or a part does not extend or restart the *Warranty Term*.

Kelco may seek reimbursement of any costs incurred by them when the *Kelco* product is found to be in good working order.

5. Non-excludable Statutory Guarantees

(1) The *Warranty* is given by *Kelco* in addition to other rights and remedies which you may be entitled to under by law, nothing contained in this agreement excludes, restricts or modifies any condition, guarantee, warranty or other obligation which is applicable to or is conferred on *Kelco* pursuant to law where to exclude, restrict or modify any such condition, warranty or other obligation is unlawful. (2) **Australia:** To the extent that you are a consumer for the purposes of the *ACL*, *Kelco Products* come with guarantees that cannot be excluded under the *ACL*. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. "Acceptable Quality" and "major failure" have the meaning they have in the *ACL*. (3) **New Zealand:** For *Kelco Products* provided by *Kelco* in New Zealand, the *Kelco Products* come with a guarantee by *Kelco* pursuant to the provisions of the Consumer Guarantees Act, section 345(1)(i) of the Contract and Commercial Law Act 2017 and the Fair Trading Act. Where the *Kelco Product* was purchased in New Zealand for commercial purposes the Consumer Guarantee Act does not apply.

6. Disclaimer and Limitation of Liability

TO THE EXTENT PERMITTED BY APPLICABLE LAW:

(1) SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, OTHER THAN AS STATED IN SECTION 4 ABOVE AND SELLER DISCLAIMS AND EXCLUDES ANY WARRANTY OF ANY OTHER KIND. (2) THE SOLE AND EXCLUSIVE REMEDY FOR MALFUNCTIONING KELCO PRODUCTS SHALL BE AS SET FORTH IN SECTION 4. ABOVE. (3) *KELCO* AND THE DISTRIBUTORS OF *KELCO PRODUCTS* ARE NOT LIABLE FOR ANY DAMAGES WHICH MAY ARISE FROM OR BE RELATED TO *KELCO PRODUCTS*.

7. Confidentiality: You accept that if you make a *Warranty* claim, *Kelco* and its agents may exchange information in relation to you to enable *Kelco* to meet its obligations under this *Warranty*.

8. Export/ Import Controls

Customers of *Kelco Products* shall comply with all applicable laws and regulations of Australia and/or other relevant countries with regard to security export/import control, when exporting/importing *Kelco Products* and/or technical documents or providing such products and/or documents to a non-resident of Australia. At its discretion *Kelco* may not provide customers with *Kelco Products* and/or technical documents should they fail to comply with such laws and regulations.