INSTALLATION & OPERATING INSTRUCTIONS

INSTALLING THE KELCO TWM SERIES FLOW SWITCH

FOR TWM-L MODELS · LOW VOLTAGE GOLD CONTACT MICROSWITCH

WARNING

Read these instructions fully before installing or servicing this flow switch. The TWM Series is a **mains voltage device** – incorrect installation can cause death or serious injury. All electrical work must be carried out by a licensed electrician.

1. CHECK THE MODEL NUMBER

Check the part number on the label inside the lid against the codes below – for example **TWM-L-25B-100**.

TWM	–	L	–	25B	–	100

SERIES
TWM Series

SWITCH
L Low voltage gold switch

PROCESS CONNECTION
25B 1" BSP thread
25N 1" NPT thread

TRAILING WIRE LENGTH
Length in mm

2. MECHANICAL INSTALLATION

1. Check the part number (label inside the lid) against the tables in this sheet for pressure, temperature and electrical load.
2. Check there will be enough flow to operate the switch. Enter the flow rate, pipe diameter and wire length into the Paddle Trimming Calculator – it shows the force on the wire and whether the switch will actuate.

   Paddle Trimming Calculator ›

   Not sure which wire length to use? Go to **www.kelco.com.au/en/tools/paddle-calculator** and use the calculator – enter your pipe inside diameter, flow rate and liquid to check the switch will operate reliably at your flow.
3. The switch can go in suction or delivery pipework, horizontal or vertical. In vertical pipe, flow must be upward. Do not mount on the underside of horizontal pipe.

   Where possible, mount the switch away from pumps, valves and bends. A fitting directly upstream makes the flow uneven and turbulent at the wire sensor, which can shift the switching point slightly or make the wire flutter near the switching point. Downstream fittings have little effect. If the switch has to go close to a fitting, enter the upstream straight length in the Paddle Trimming Calculator and check operation on commissioning.
4. Mount in a pipe tee, tapping saddle or weld-on socket. For effluent or liquids carrying solids, use a stand-off tee so the switch body sits out of the line of flow (see Fig. 1). The arrow on the switch must point in the direction of flow.
5. Seal the thread with PTFE tape or thread sealant, leaving at least 4 mm of thread above the socket. Tighten with a spanner on the spanner flats only – never twist the switch body.
6. Switches are supplied at maximum sensitivity (adjuster wound fully in). To decrease sensitivity, remove the red dust cap and wind the adjusting screw out (anti-clockwise) with a wide flat screwdriver. The further out, the more flow is needed to operate the switch. Refit the dust cap.

TYPICAL MOUNTING

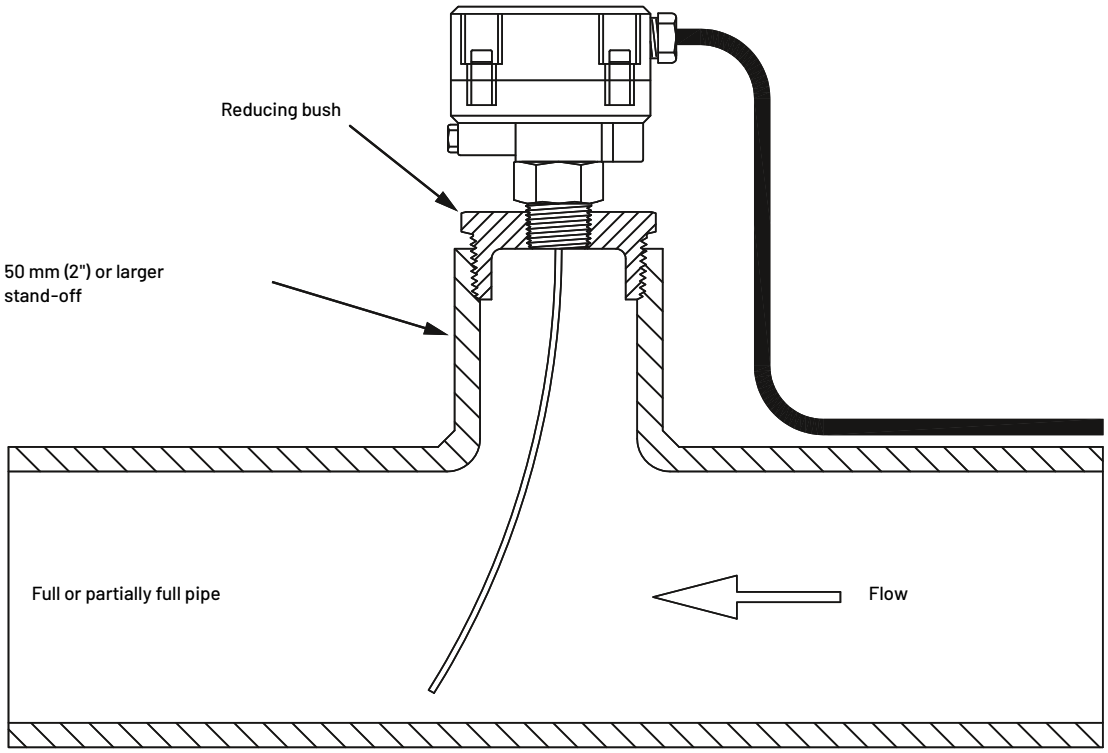


FIG. 1 Typical dead leg stand-off prevents solids reaching the switch body

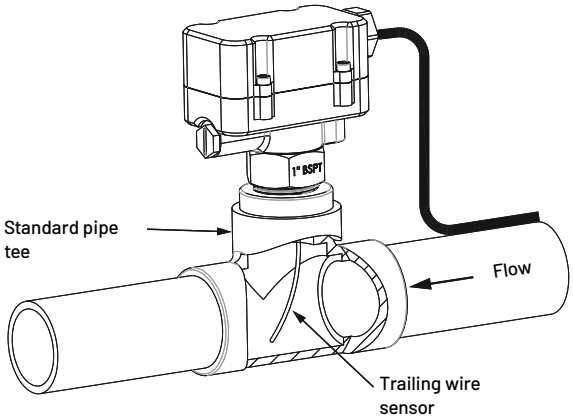


FIG. 2 Typical small pipe installation

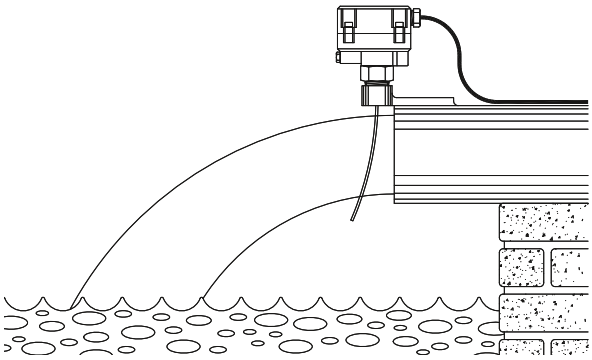


FIG. 3 Trailing wire switch mounting on an effluent discharge pipe

3. ELECTRICAL INSTALLATION

1. This sheet covers the **TWM-L** models: an S.P.D.T. gold contact microswitch for low voltage, low current signalling (PLC inputs, telemetry, hazardous areas via a certified IS barrier or isolator). Check the part number on the lid label before wiring – TWM-H models have their own installation sheet.
2. Confirm the load is within the electrical ratings on page 4. The 'L' switch is easily damaged by overload.
3. The switch has terminals marked C (common), NO (normally open) and NC (normally closed). For a two-wire connection use C plus either NO or NC to suit the application.
4. The TWM has an aluminium housing. For all mains voltage applications it must be earthed using the dedicated earth terminal inside the housing.
5. Fully tighten the cable gland nut, check the lid gasket is in place and tighten the lid down.
6. Test: press the red manual override button under the cable gland. The switch changes state as if liquid were pushing the trailing wire.

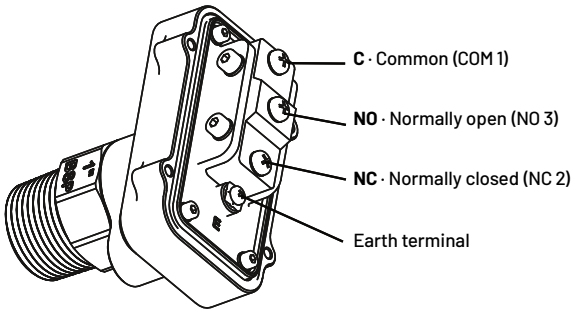


FIG. 4 Switch terminals

WARNING

Always refit the lid and fully tighten the lid screw and cable gland after installing or servicing. Without its lid the switch is not water, weather or insect proof and presents a **shock hazard that may cause death or serious injury**. Never splash water into the open housing or leave the lid off for extended periods.

ENVIRONMENTAL LIMITATIONS

MODEL	TWM SERIES
Maximum operating pressure *	**400 bar** 5800 psi
Minimum burst pressure *	**800 bar** 11600 psi
Maximum operating temperature	**80 °C** 176 °F
Minimum operating temperature	**–60 °C** –76 °F
Ingress protection	**IP67**

*** PLEASE NOTE** Pressures are at ambient temperature, static or dynamic.

Check that the switch materials suit the liquid being monitored:

Chemical Compatibility Checker ›

'L' SWITCH ELECTRICAL DATA

The 'TWM-L' models use an S.P.D.T. gold contact microswitch rated down to 1 mA at 5 VDC, so they switch reliably at the low wetting currents of PLC inputs, telemetry and relay logic.

> **PLEASE NOTE**
> Not suitable for inductive or capacitive loads (contactors, relays). Loads above the rating will damage the switch.

Switch type	**Gold contact microswitch**
Contact configuration	**S.P.D.T.**
Contact material	**Gold alloy**
Rated current (resistive)	**0.1 A at 125 VAC** **0.1 A at 8, 14 and 30 VDC**
Inrush current	**0.1 A maximum (NC and NO)**
Minimum applicable load	**1 mA at 5 VDC**
Operating range (micro load)	**5 to 30 V, 5 to 800 mW** **(26 mA maximum at 30 V)**
Contact resistance	**50 mΩ maximum (initial)**
Typical applications	**PLC, telemetry and low voltage control**

HAZARDOUS AREAS

The TWM-L is a passive switch that meets the definition of simple apparatus under AS/NZS 60079.11. It is not Ex certified in its own right. It may be used in a hazardous area only as part of an intrinsically safe circuit, connected through suitably certified associated apparatus such as a Zener barrier or galvanic isolator. The design of the intrinsically safe system and its installation are the responsibility of the system designer and installer, in accordance with AS/NZS 60079.14 and AS/NZS 60079.25. The TWM-L uses gold alloy contacts, which switch reliably at intrinsically safe signal levels. Contact rating: minimum load 1 mA at 5 VDC; maximum 0.1 A resistive at up to 30 VDC. The associated apparatus must not exceed these limits (Uo ≤ 30 V, Io ≤ 100 mA). Where the associated apparatus monitors for line faults, end-of-line resistors must be fitted as specified by its manufacturer. The housing and stainless steel process connection must be bonded to the plant earth. The TWM-L is not suitable for use in a hazardous area outside an intrinsically safe circuit.

MAINTENANCE

The TWM Series is low maintenance and should give years of service when correctly installed. Its life is shortened by pressures, temperatures or electrical loads beyond its ratings.

Spare parts, including replacement trailing wire sensors and arm assemblies, are available from your supplier (see below).

REPLACING THE TWM TRAILING WIRE & ARM

The trailing wire sensor and its associated arm and pivot bearing (Fig. 5, page 6) are replaceable items. Spare parts can be obtained from your supplier. Please quote the part number of the trailing wire switch when ordering spare parts.

REMOVING AND REPLACING THE TRAILING WIRE

1. The trailing wire is terminated at its top end with a special screw that has small spanner flats provided.
2. Using the spanner flats, unscrew the wire from the main switch arm (right-hand thread).
3. Fit the replacement wire sensor and fully tighten the screw. For additional security a drop of Loctite Stud Lock can be placed on the thread. In most applications the small O-ring on the screw will act as a lock washer and provide adequate security, given the screw is fully tightened.

FITTING A REPLACEMENT ARM ASSEMBLY

1. Replacement arms are supplied complete with a new bronze bearing. To fit a replacement arm, first ensure a trailing wire sensor is screwed into the end of the replacement arm.
2. To remove an arm, first undo the pivot bolt located on the side of the process adaptor (it has a right-hand thread). Completely remove the pivot bolt and then withdraw the main arm from the process connector by pulling on the trailing wire.
3. Do not under any circumstances undo or remove the hexagonal cap at the top end of the main arm. It is sealed and is not intended to be opened. It houses a magnet that is oriented for proper operation of the switch.
4. Place the new bronze bearing through the bearing hole in the replacement main arm. Prepare the pivot bolt by ensuring its O-ring is in good order and apply a small amount of silicone oil or Vaseline to the thread on the pivot bolt.
5. Insert the main arm with its bronze bearing into the process adaptor. Use the trailing wire to rotate the arm into a position where the hole in the bronze bearing lines up with the pivot bolt hole in the process adaptor.
6. Fit the pivot bolt and screw it into the process adaptor, ensuring the pin on the nose of the pivot bolt engages in the bore of the bronze bearing bush.
7. Fully tighten the pivot bolt.
8. Test the replacement arm by pushing the trailing wire back and forward to ensure it swings freely. When pushed into the forward position, the trailing wire should return to the off position under its own volition when released.

TRAILING WIRE & ARM ASSEMBLY

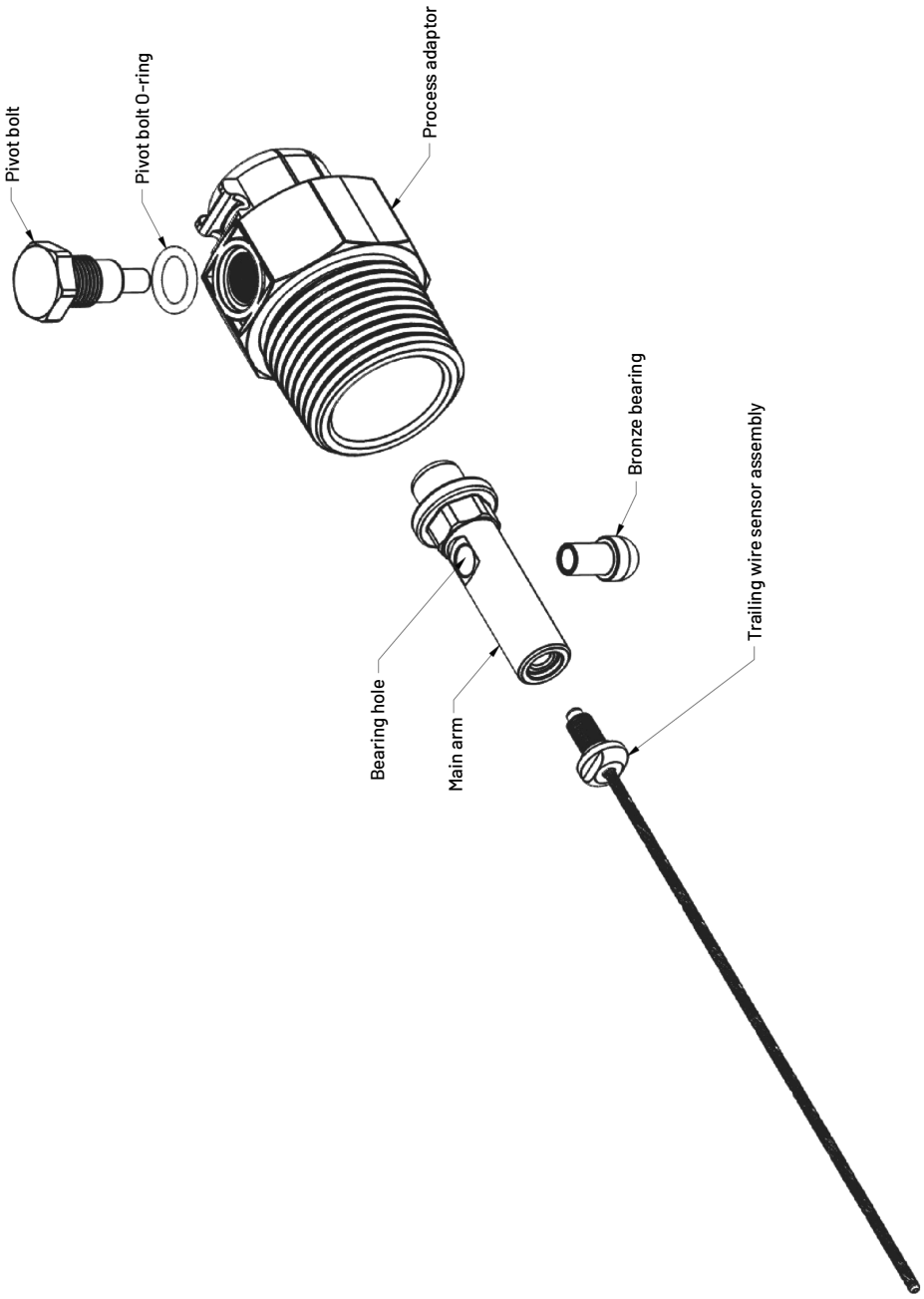


FIG. 5 Exploded view of the trailing wire and arm assembly

Kelco Engineering Pty Ltd

ABN 20 002 834 844

HEAD OFFICE & FACTORY
9/9 Powells Road
Brookvale NSW 2100, Australia

POSTAL ADDRESS
PO Box 7485, Warringah Mall
Brookvale NSW 2100, Australia

SALES ENQUIRIES
sales@kelco.com.au
www.kelco.com.au

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