

INSTALLATION AND OPERATING INSTRUCTIONS FOR KELCO D40 DISPLACEMENT LEVEL SWITCH

INTRODUCTION

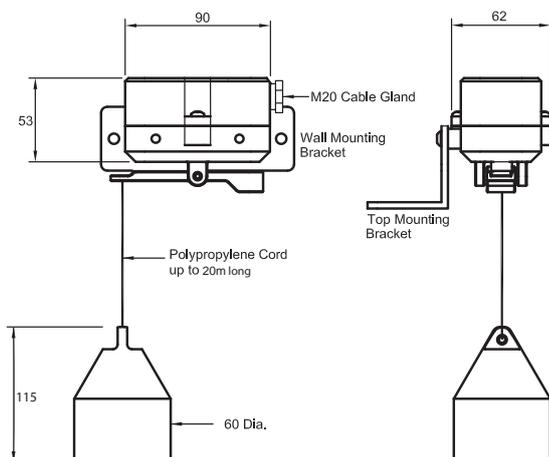
The D40 top entry level switch operates by Archimedes principle. When an object is immersed in a liquid its weight is reduced by an amount equal to the weight of the liquid it displaces. In the D40 level switch a magnetically actuated switch detects the weight reduction that occurs when liquid submerges a solid Polypropylene displacer suspended from a cord below the switch. Since it is the change of weight sensed by the displacer as it is submerged that actuates the switch, the specific gravity of the liquid will directly effect the operation of the switch. The D40 level switch will only operate in liquids that have a specific gravity that is 0.95 or greater (water). They will not operate if used in liquids with an S.G. of less than 0.95.

OPERATING ENVIRONMENT

The D40 level switch is an extremely versatile device. It can be used to detect a liquid level in wells, tanks, pits, sumps, bores and bund areas. The inert materials of construction mean the switch can be used in water, sea water, mild acids and in many common chemical solutions. The D40 is highly tolerant of liquids containing solids, slurries or pulp. It will also work reliably in froth or foam and in applications where there is floating scum or debris of various kinds.

The electrical enclosure on the D40 level switch is sealed and separated from the switch's actuating arm by a solid metal wall. The switch is actuated magnetically through the solid wall. This means the electrical housing is totally sealed and weatherproof provided the lid is fully tightened and the cable gland is properly utilised. The Polypropylene suspension cord and the displacer are the only components in contact with the process liquid. Polypropylene is a very inert material and is well known for its resistance to many commonly encountered chemicals.

The D40 is ideal for warm liquid applications provided the electrical head is mounted well above the liquid and is protected from hot vapour. The wetted components, the cord and displacer are highly tolerant of liquids at elevated temperatures.



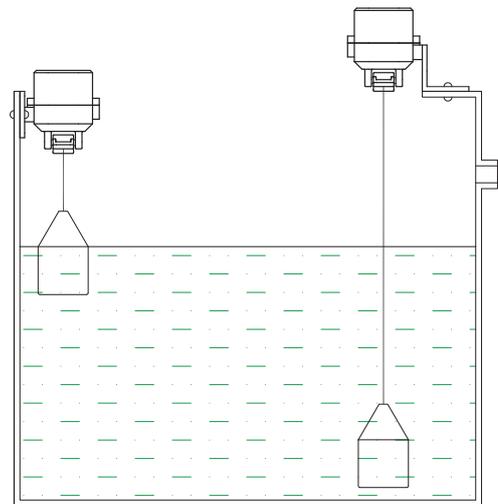
INSTALLATION

The D40 level switch is supplied with a flat mounting plate for installing the switch against the walls of pits or tanks. In addition to the flat plate, an angle bracket is also supplied. The angle bracket can be used to mount the switch on any flat horizontal surface such as tank lids or horizontal bracing. M5 threaded mounting holes are provided in the sides of the switch body so the switch can be oriented with its cable entry pointing to the right or left.

Whichever mounting bracket is used, ensure that once installed, the top face of the D40's lid is perfectly horizontal. This ensures the cord and displacer hang vertically beneath the switch and apply force to the switch arm directly downwards.

Thread the supplied cord through the hole at the end of the switch actuating arm and tie a double knot in it so the cord can't pull back through the hole. Thread the free end of the cord through the hole in the top of the displacer and tie it off securely. D40 level switch is supplied with 3 metres of cord. Cords up to 20 metres in length can be used with the D40 switch and are available from Kelco or your supplier if required.

TYPICAL INSTALLATIONS



LIMITATIONS

Fixed switching differential	40mm +/- 5mm
Maximum distance between D40 & displacer.	20 metres (3m of cord is supplied with the switch)
Minimum distance from displacer to the floor of a tank or sump.	20mm
Minimum inside diameter of pipe housing or shroud.	70mm
Maximum liquid temperature.	90°C
Specific gravity of process liquid.	0.95 or greater

ELECTRICAL



WARNING

Please read these installation and operating instructions fully and carefully before installing or servicing this level switch. The D40 level switch is a mains voltage device. Death or serious injury may result if this switch is not correctly installed and operated. All electrical work associated with this switch must be performed by a fully qualified and licenced electrician.

The D40 level switch houses a S.P.D.T (Single Pole Double Throw) switch. The standard switch is suitable for all general control circuit applications up to 500V AC. It is ideal for the control of pump starters, relay logic circuits, and for the direct control of contactors and timers. The standard switch can operate at ANY voltage from 5 to 500VAC. It is rated to directly control motors up to 1.5kW (2HP).

RATED VOLTAGE	NON INDUCTIVE LOADS				INDUCTIVE LOADS			
	RESISTIVE LOAD		LAMP LOAD		INDUCTIVE LOAD		MOTOR LOAD	
	NO	NC	NO	NC	NO	NC	NO	NC
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		0.05 A	

Note:

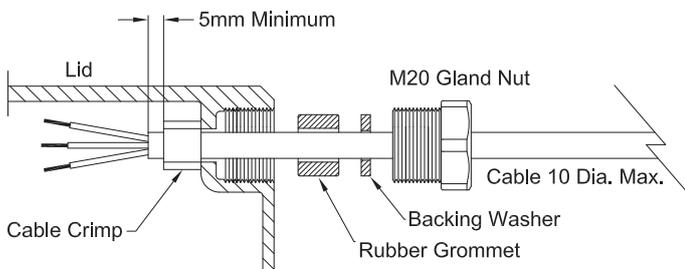
To switch ON when a rising water level covers the displacer use terminals 1 (COM) and 3 (NO)

To switch ON when a falling water level uncovers the displacer use terminals 1 (COM) and 2 (NC)

EXPOSED APPLICATIONS

If this switch is to be mounted in an outside location, for example on top of an open water tank, we recommend the cord and displacers as well as the electrical lead be protected from direct exposure to the sun. A simple shroud can be constructed from a length of 50mm or larger PVC pipe. Stand the pipe on end in the tank and mount the D50 so its displacers and cord sit inside the open pipe and are thus protected from the sun. The electrical lead to the switch can be protected from the sun using a suitable length of conduit.

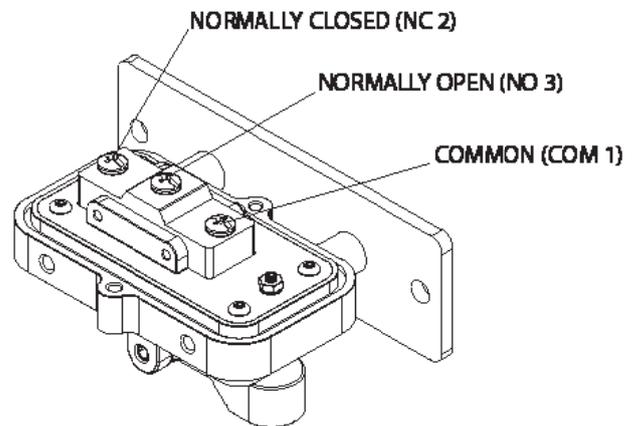
CABLE GLAND ASSEMBLY



Crimp the ears using pliers so the ring is as tight as possible on the cable outer sheathing.

Maximum Switched Voltage	500VAC
Maximum Switched Current	15A
Minimum Switched Voltage	5VDC
Minimum Switched Current	160mA

Note: Do not apply maximum voltage at maximum current across the switch contacts. See main data table for current limits at specific voltages and for specific loads.



TERMINAL IDENTIFICATION

EARTHING THE D40

An M4 earth screw is provided inside the lid of the D40 level switch. In the interests of safety, all applications should be properly earthed using the earth screw.

CABLE ANCHOR

Each D40 level switch is shipped with two cable crimps to suit various cable sizes. A cable crimp should be crimped onto the outer sheathing of the cable at least 5mm back from the end of the outer sheathing. The cable should then be pulled back through the cable gland until the cable crimp rests hard up against the inner wall of the cable gland. After bedding the cable crimp into position, fully tighten the cable gland.

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