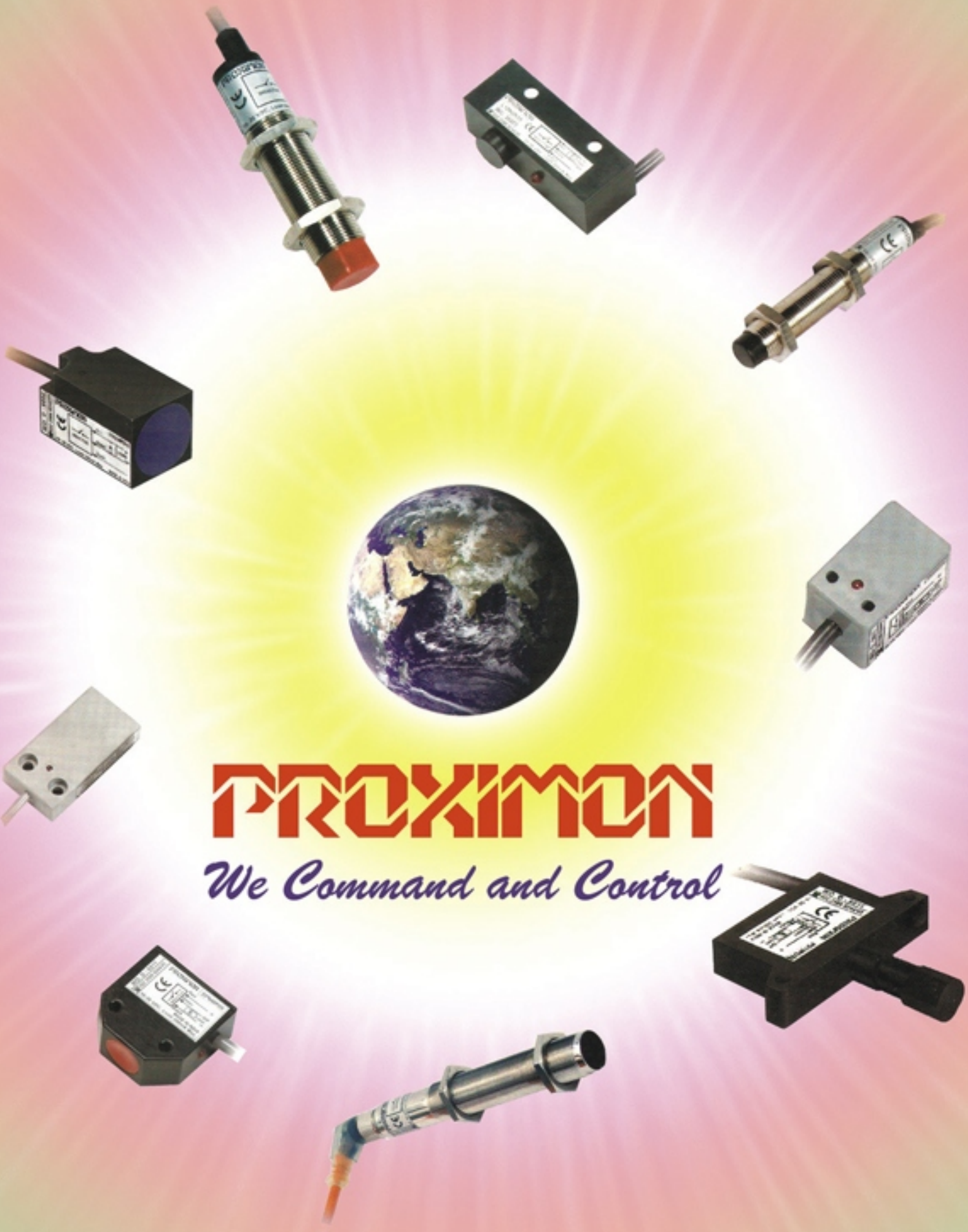
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INDUCTIVE PROXIMITY SENSORS

DC TYPE (3 WIRE VERSION)

Inductive proximity sensors can be used for position sensing, speed measurement, counting & in conditions such as oily, dusty, corrosive enviroment. Their applications are in Automobile, Steel Industries, CNC/NC machines, Conveyor systems, Packaging machines etc.

These 3 wire DC sensors are with NPN or PNP transistorised output and the load is connected in parallel.

SPECIFICATIONS:

Supply voltage	: 10-30 V DC
Ripple on supply	: 10% max
No load current	: Less than 10 mA
Maximum load current	: 100 mA / 300 mA (For M12 & above)
Hysterisis	: 15% max
Operating temperature	: -25° C to +70° C
Output transistor	: PNP or NPN
Output logic	: NO or NC or NO +NC
Environmental protection	: IP67
Repeat accuracy	: Less than 0.02 mm
Temperature drift	: 5% typical
Switch - ON effect suppression	: Incorporated
Reverse polarity protection	: Provided
Short circuit protection	: Provided (For M12 & above)
Status indication	: Provided through LED

SWITCHING FREQUENCY

Ø (mm)	8	12	18	30	36	50
Hz	2000	1000	800	300	200	100

FLUSH MOUNTING

Ø1	L1	L2	L	Sn
8	45	-	45	1
12	55	20	75	2
16	55	20	75	5
18	55	20	75	5
20	50	20	70	5
25	50	20	70	8

Ø1	L1	L2	L	Sn
30	50	20	70	10
36	60	20	80	15
50	40	20	60	20

NON FLUSH MOUNTING

Ø1	Ø2	L1	L2	L3	L	Sn
8	7	40	-	5	45	2
12	10	45	20	5	70	4
18	16	45	20	10	75	8
20	16	50	20	10	80	8
22	16	50	20	10	80	8

Ø1	Ø2	L1	L2	L3	L	Sn
25	23	50	20	10	80	10
30	28	35	20	15	70	15
36	33	35	20	25	80	20
50	46	40	20	20	80	25

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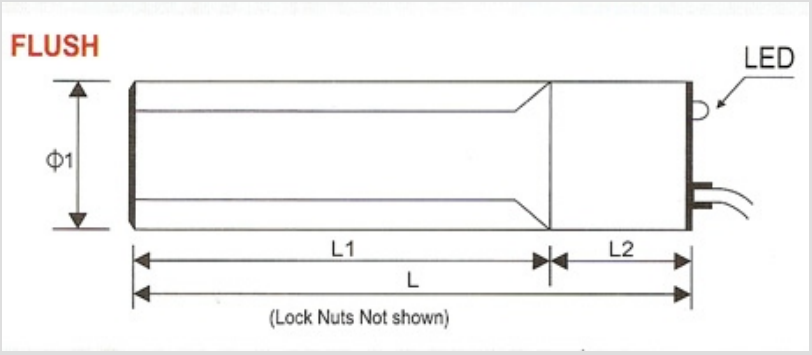
INDUCTIVE PROXIMITY SENSORS

DC TYPE (2 WIRE VERSION)

These Sensors are designed to work as solid state DC limit switches. The Sensors are connected directly in series with a load and have a bridge rectifier so they are not polarity conscious. The circuit is such that, when in off state, it allows very low current to flow through the load. However, a output load (such as relay) should be chosen, considering the voltage drop across the switch in the ON state. These sensors find wide application in electric control circuits and PLC's.

SPECIFICATIONS:

Supply voltage	: 10-60 V DC
Voltage drop across the switch	: Less than 6.8 V
Maximum load current	: 100 mA
OFF state current	: Less than 1mA
Operating temperature	: -25° C to +70° C
Hysterisis	: 15% max
Switching frequency	: 5Hz typical
Output logic	: NO or NC
Environmental protection	: IP 67
Status indication	: Through LED



FLUSH					NON FLUSH						
Ø1	L1	L2	L	Sn	Ø1	Ø2	L1	L2	L3	L	Sn
18	55	20	75	5	18	16	45	20	10	75	8
25	50	20	70	8	25	23	50	20	10	80	10
30	50	20	70	10	30	28	35	20	15	70	15
36	60	20	80	15	36	33	35	20	25	80	20
50	40	20	60	20	50	46	40	20	20	80	25

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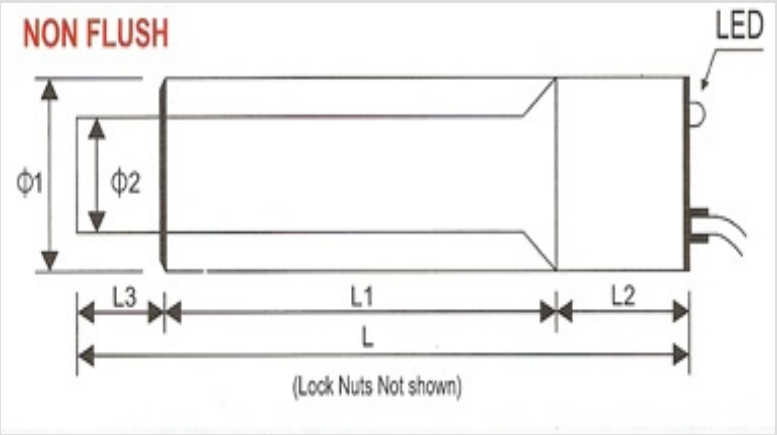
INDUCTIVE PROXIMITY SENSORS

AC TYPE (2 WIRE VERSION)

These Sensors are designed to provide better alternative to conventional limit Switches / micro switches. These are epoxy potted similar to other types of sensors to render IP67 protection and hence are suitable even in underwater applications. The load (AC Contactor / AC Relay / Solenoid Coil) is to be connected in series with the switch.

SPECIFICATIONS:

Supply voltage	: 90-250 V AC or 20-250 V AC
Supply frequency	: 45 - 65 Hz
Load current	: 300 mA / 500 mA*
Leakage current	: 2.3 mA typical
Voltage drop across the switch	: 6.8 V eff
Maximum inrush current	: 6A; t < 10ms; f < 5
Minimum load current	: 5 mA
Operating temperature	: -25° C to +70° C
Hysterisis	: 10% typical
Switching frequency	: 5Hz typical
Repeatability	: 1% typical
Temperature drift	: 5% typical
Switch - ON effect suppression	: Provided
Output logic	: NO or NC or NO+NC*
Status indication	: Through LED



** In sizes M30 & above.*

FLUSH					NON FLUSH						
Ø1	L1	L2	L	Sn	Ø1	Ø2	L1	L2	L3	L	Sn
12	55	20	75	2	12	10	55	20	5	80	4
18	55	20	75	5	18	16	45	20	10	75	8
25	50	20	70	8	25	23	50	20	10	80	10
30	50	20	70	10	30	28	35	20	15	70	15
36	60	20	80	15	36	33	35	20	25	80	20
50	40	20	60	20	50	46	40	20	20	80	25

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TECHNICAL NOTES

An inductive proximity switch is designed to detect, and react to any metal object which moves into the operating zone situated immediately in front of its sensing face.

Sensing Distance : The distance between the target and the active face at which the sensor switches.

Nominal Sensing Distance (Sn) : The operating distance for which the switch is designed. This value should only be taken as a guide, since no manufacturing tolerances, or changes in voltage or temperature, etc., during operation are taken into account.

Usable Sensing Distance (S) : The true sensing distance, derived by testing with a standard metal target during extremes of supply and temperature variations. Usually found as 0.80 Sn < S < 1.20 Sn..

Operating Sensing Distance : Is the distance at which a proximity sensor senses the target reliably. It is between 0 % and 80 % of the nominal sensing range.

Operating Voltage : Voltage range in which the proximity sensor can function reliably.

Maximum Load Current : Is the maximum current which may be drawn continuously through the sensor in active state. Usually it is less than or equal to 60 % for reliable working of the sensor.

Normally Open Output (N/O) : This type of output will switch on the load whenever a target comes within the operating zone. (Normal condition is when no target is present).

Normally Closed Output (N/C) : This type of output will switch off the load whenever a target comes within the operating zone. (Normal Condition is when no target is present).

NPN Output : Proximity sensor with NPN output switch the negative potential to the load. It is also described as negative-switching or current-sinking.

PNP Output : Proximity sensor with PNP output switch the positive potential to the load. It is also described as positive-switching or current-sourcing.

Switching Frequency : The maximum number of times per second the sensor can change its state (on and off) usually expressed in hertz (Hz).

Hysterisis : The difference between the operate (Switch-on) and the release (Switch-off) is called hysterisis. This helps the sensor to avoid chattering i.e. accidental switch cycling, when subject to vibration, electrical noise, or temperature drift.

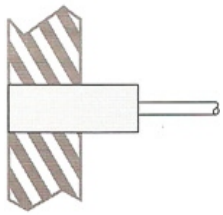
Standard Target : The active face of the proximity switch is the surface where a high-frequency Electro-Magnetic field emerges (However, no direct magnetic field occurs). The target consists of mild steel, 1 mm thick, square form with side lengths equal to the diameter of the sensing surface circle

Correction Factors:

Mild Steel	Approx. 1.0 x Nominal Sensing Distance	**Aluminium**	Approx. 0.45 x Nominal Sensing Distance
Stainless Steel	Approx. 0.9 x Nominal Sensing Distance	**Copper**	Approx. 0.4 x Nominal Sensing Distance
Brass	Approx. 0.5 x Nominal Sensing Distance		

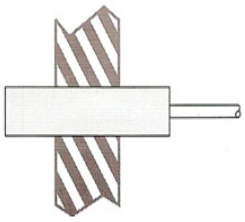
The size and shape of the target may also affect the sensing distance.

Flush Installation:



Proximity sensor can be mounted in metal upto the active surface. No side sensing occures in these sensors. However, the sensing distance is less in these sensors compared to non-flush sensors.

Non-Flush Installation:



Proximity sensor must be installed in such a way that metal free-zone is maintained (To avoid side sensing). Sensors for non-flush mounting have an extended sensing distance compared to sensors for flush mounting.

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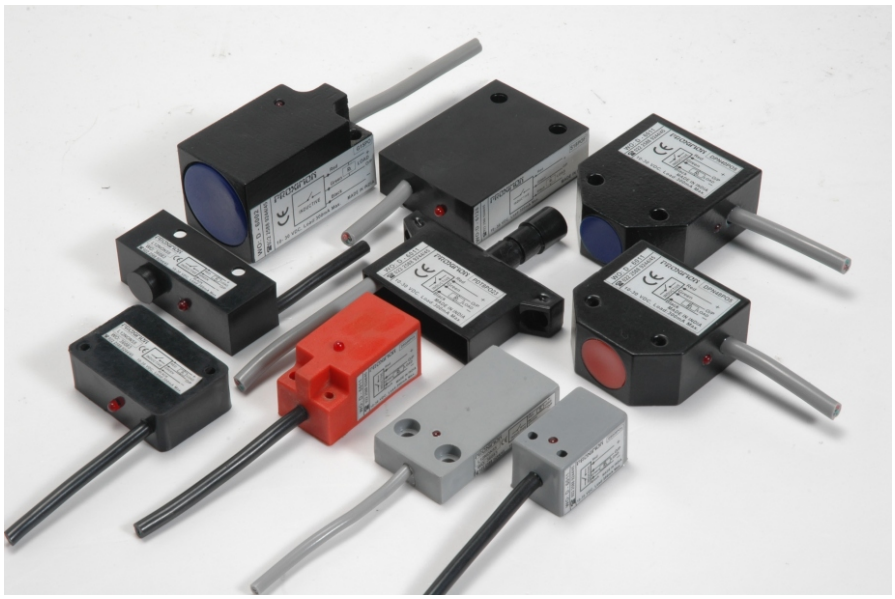
INDUCTIVE SENSORS (BLOCK TYPE)



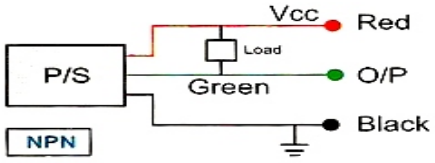
These are constructed in Rectangular, T type, Slot type, Pentagonal and Block types sensors. The technical specifications are similar to standard cylindrical sensors and are available in 3 wire DC & 2 wire AC types.

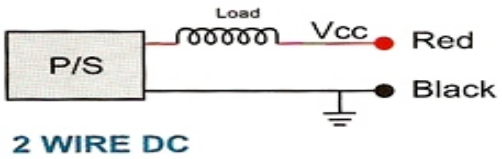
RECTANGULAR SENSORS	
H x W x D (mm)	Sn (mm)
16 x 19 x 35	4
16 x 19 x 49	4
50 x 25 x 10	5
14 x 40 x 26	2

T TYPE SENSOR	Sn = 2mm
Slot Sensor	
H x W x D(mm)	
60 x 45 x 30	
Sensing gap	Sn = 15mm
Pentagonal Sensor	Sn = 5mm

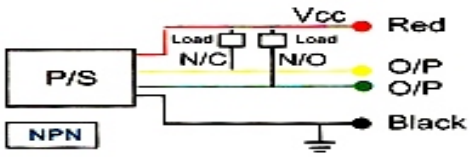
BLOCK SENSORS	
Sq x D (mm)	Sn (mm)
17 X 17 X 28	5
20 X 20 X 38	4
30 X 30 X 53	10
40 X 40 X 112.5	20

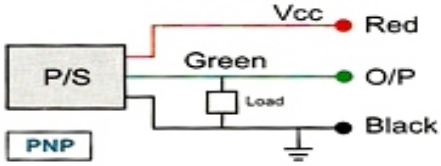
CONNECTION DIAGRAMS

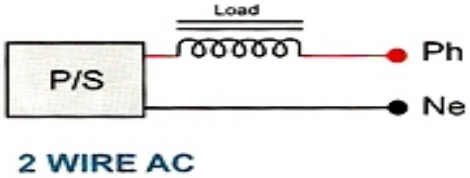




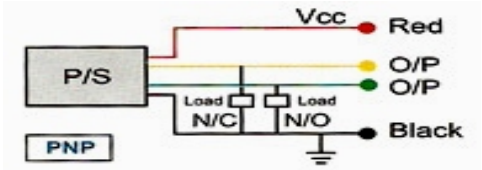
2 WIRE DC







2 WIRE AC



Proximity Sensor can be used:

- To drive DC relay
- To drive DC contactor (ask for load current 500 mA)
- To drive AC relay / AC contactor
- Can be coupled directly to any PLC / DCS / Logic Circuits
- Can be used as an input for a Digital Counter / RPM Indicator etc.

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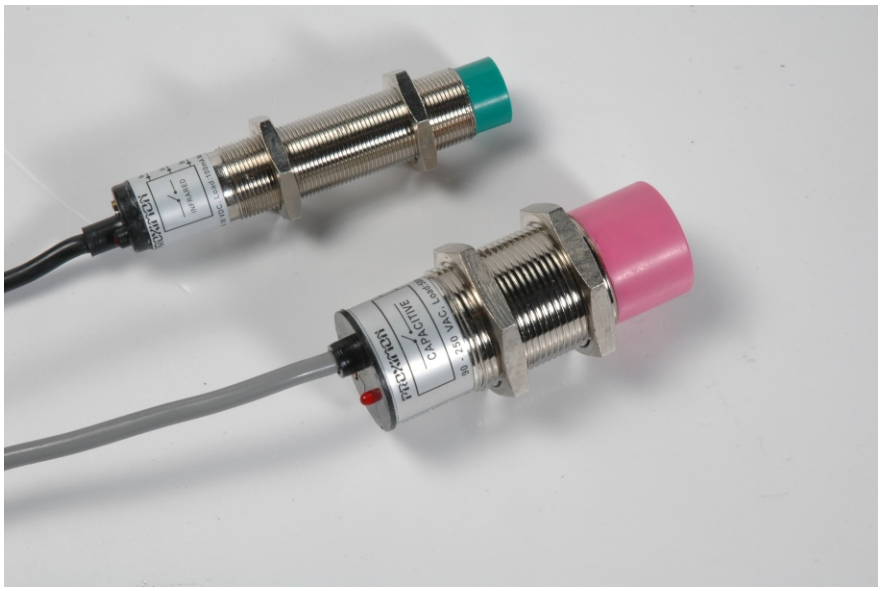
CAPACITIVE SENSORS



Capacitive Proximity Sensor is designed to detect and react to any object which moves into the operating zone. The sensor contains an oscillator. The capacitance of this oscillator is linked with the sensing face and when any object moves into the operating zone, its capacitance activates the oscillator. The sensor can detect conductive as well as non conductive material. It is advisable to have an object with permitivity more than one. The conductive objects are generally to be earthed for better results.

SPECIFICATIONS (3 WIRE DC):

Dimension	: M30 X1.5 X 75 mm or M18 X 1 X 90mm
Supply voltage	: 10-30 V DC
Maximum load current	: 100 mA
Hysterisis	: 15% max.
Operating temperature	: -25°C + 55°C
Output transistor	: PNP or NPN
Output logic	: NO or NC
Environmental protection	: IP65
Temperature drift	: 5% typical
Switch - ON effect suppression	: Incorporated
Reverse polarity protection	: Provided
Short circuit protection	: Provided
Status indication	: Provided through LED
Sensing range	: 15 mm adjustable through Potentiometer

SPECIFICATION (2 WIRE AC):

Dimension	: M30 X 1.5 X 75 mm
Supply voltage	: 90-250 VAC
Supply frequency	: 45 - 65 Hz
Load current	: 500 mA max.
Hysterisis	: 15% max.
Output logic	: NO or NC
Status indication	: Through LED
Sensing range	: 15 mm adjustable through Potentiometer

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