

HTM photoelectrics

RP 74 Series



	Through Beam	Diffused	Retroreflective	Clear Object Detection
Model				
Range	152 m / 498.7 ft	3.04 m / 9.97 ft	9.14 m / 29.99 ft	1.2 m / 3.93 ft

RP 76 Series



	Through Beam	Diffused	Retroreflective	Background Suppression
Model				
Range	28 m / 91.86 ft	800 mm / 2.625 ft	10 m / 32.81 ft	300 mm / 11.81 in

RP 43 Series



	Through Beam	Diffused	Retroreflective	Background Suppression
Model				
Range	22 m / 72.18 ft	300 mm / 11.81 in	13 m / 42.65 ft	300 mm / 11.81 in

RP 32 Series



	Through Beam	Diffused	Retroreflective	Clear Object Detection
Model				
Range	8.5 m / 27.89 ft	400 mm / 15.75 in	4 m / 13.12 ft	0.5 m / 1.64 ft

EP Series



	Through Beam	Diffused	Retroreflective	Convergent
Model				
Range	1.8 m / 5.906 ft	200 mm / 7.87 in	5 m / 16.4 ft	16 mm / 0.629 in

MP Series



	Through Beam	Diffused	Retroreflective	Convergent
Model				
Range	30 m / 98.43 ft	380 mm / 14.96 in	5 m / 16.4 ft	43 mm / 1.693 in

M18 B Series



	Through Beam	Diffused	Retroreflective	Polarized Retroreflective
Model				
Range	15 m / 49.21 ft	500 mm / 1.64 ft	3 m / 9.843 ft	1 m / 3.28 in

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Distribution Boxes - Connector Type



- * Save time and cable
- * Very economical
- * Oil resistant
- * All port caps included
- * Hard shell connectors available

Description

4-6-8 port Cable Version

3 pole, 3 wire, AC Dual Key, with two dust covers and ten attachable molds (for ASTU & DSTU Models)

5 pole, 4 wire, earth connection, with two dust covers and ten attachable molds (ASTR & DSTR Models)

Technical Data

Application Class: -15°C to +90°C

Mechanical Data:

Insertion Force: $\leq 2.0N, 0.45LBS$
 Withdrawal Force: >math>\geq 0.5N, 0.11LBS</math>
 Protection: IP 65
 (only in fully locked position)
 Shock: IEC-68-2-27
 Vibration: IEC-68-2-6

Materials:

Housing(ZV 3U): PUR (Polyurethane), yellow
 Contact: Brass, gold over nickel plating
 Receptacle Shell: Brass, Nickel-plated
 Insert: PUR (Polyurethane), black
 O-Ring: Viton

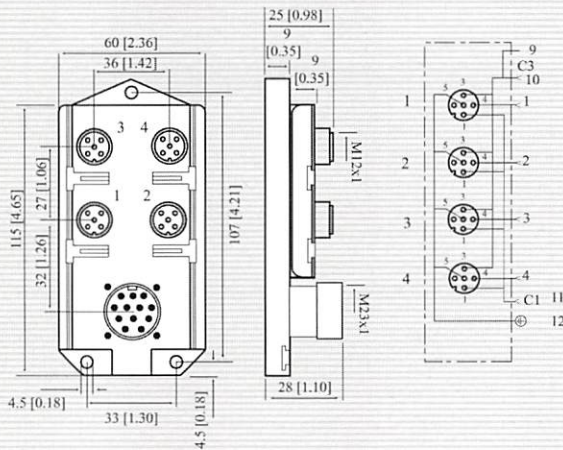
CE Conformity with Standards:

EN50082-1, EN50082-2 and IEC947-5-2

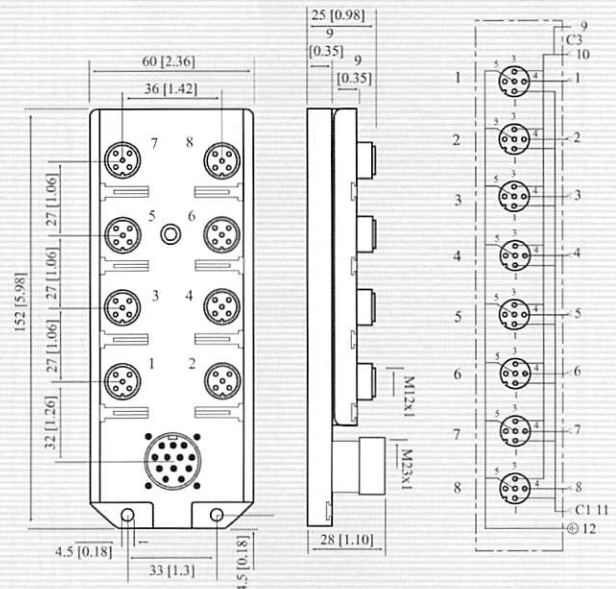
Electrical Data:

Contact Resistance: $\leq 5m\Omega$
 Current Rating: 4 Amps per outlet
 12 Amp max. per box
 Working Voltage: 60 VAC/75VDC
 Insulation Resistance: >math>10^9\Omega</math>

ALTR4-5/4XA-TZ12



DLTR8-5/4XA-TZ12

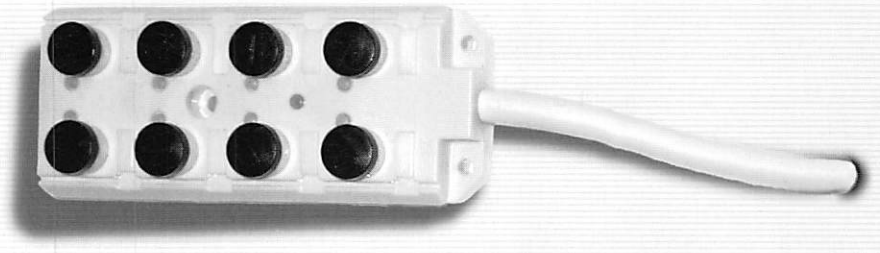


Connector Diagram



Outlet	On Board Connector
1 = 11	(C1)
2 = No Wire	
3 = 9 bridged 10	(C2)
4 = 1	(1)
5 = 2	(2)
6 = 3	(3)
7 = 4	(4)
8 = 5	(5)
9 = 6	(6)
10 = 7	(7)
11 = 8	(8)
12 = 12	(GND)

Distribution Boxes - Cable Type



Description

4-6-8 port Cable Version

3 pole, 3 wire, AC Dual Key, with two dust covers and ten attachable molds (for ASTU & DSTU Models)

5 pole, 4 wire, earth connection, with two dust covers and ten attachable molds (ASTR & DSTR Models)

Technical Data

Application Class: -15°C to +90°C

Materials:

Housing(ZV 3U): PUR (Polyurethane), yellow
 Contact: Brass, gold over nickel plating
 Receptacle Shell: Brass, Nickel-plated
 Insert: PUR (Polyurethane), black
 O-Ring: Viton

Mechanical Data:

Insertion Force: <2.0N, 0.45LBS
 Withdrawal Force: >0.5N, 0.11LBS
 Protection: IP 68, NEMA 6P
 (only in fully locked position)
 Shock: IEC-68-2-27
 Vibration: IEC-68-2-6

Electrical Data:

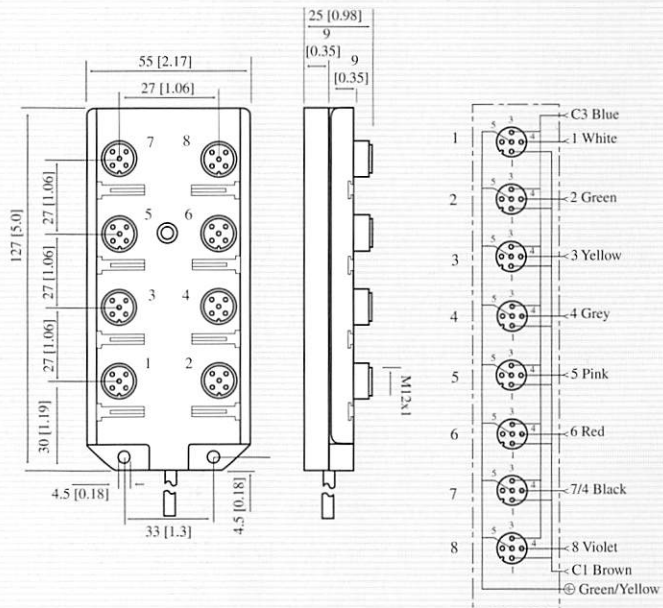
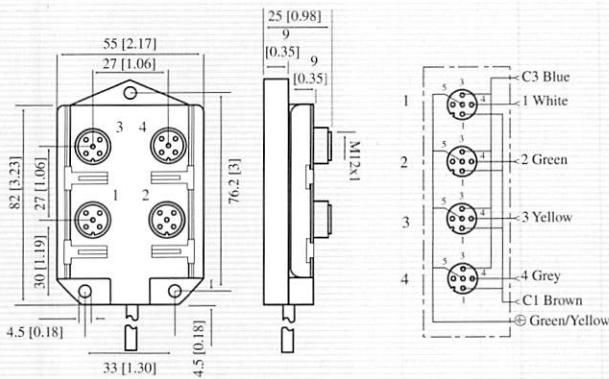
Contact Resistance: <5m
 Current Rating: 4 Amps per outlet
 12 Amp max. per box
 Working Voltage: 250 VAC
 Insulation Resistance: >10⁹

CE Conformity with Standards:

EN50082-1, EN50082-2 and IEC947-5-2

ASTR4-5/4XA-3005

DSTR8-5/4XA-3205



Cable Box Selection Guide



1. DISTRIBUTION BOXES SHAPE:

AST = Short A Shape and input ports on top
ALT = Long A Shape and input ports on top
DST = Short rectangle shape and input ports on top
DLT = Long rectangle shape and input ports on top

2. INPUT PORTS TYPE

R = Euro-style (R-series) C = Pico-style
B = Euro-style (B-series) Z = Mini-style
U = Micro-style

3. INPUT PORTS NUMBER

4 = 4 port distribution box
6 = 6 port distribution box
8 = 8 port distribution box

4. NUMBER OF POLES PER PORT

3/3 = 3 pole 3 wire AC dual key
4/3 = 4 pole 3 wire
5/3 = 5 pole 3 wire
5/4 = 5 pole 4 wire

5. OUTPUT FUNCTION:

P = PNP A = AC
N = NPN U = AC/DC
D = NPN/PNP (one NPN and one PNP is bipolar)

6. WITH OR WITHOUT LED

A = Each input port with 1 LED (N.O.)
B = Each input port with 1 LED (N.C.)
C = Each input port with 2 LEDs (Changeover)
Z = Without LED

7. OUTPUT CONNECTION

Number = PVC and irr-PVC cable specification
P = Pigtail
T = Quick Disconnect top
F = Quick disconnect beside

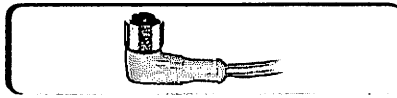
8. OUTPUT CABLE LENGTH OR CONNECTOR PIN NUMBER:

5 = 5M 10 = 10M
7 = 7 pole connector 12 = 12 pole connector
9 = 9 pole connector 19 = 19 pole connector

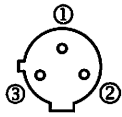
AC Micro Style Cables - U Series

1/2"-20 UN Thread Connection

3 - 5 Pin Models

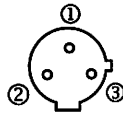


3 Pin Connection



Female

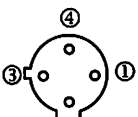
- ① = green
- ② = red/black
- ③ = red/white



Male

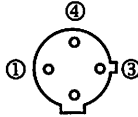
- ① = green
- ② = red/black
- ③ = red/white

4 Pin Connection



Female

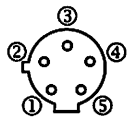
- ① = red/black
- ② = red/white
- ③ = red
- ④ = green



Male

- ① = red/black
- ② = red/white
- ③ = red
- ④ = green

5 Pin Connection



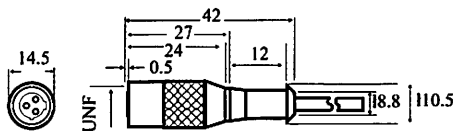
Female

- ① = red/white
- ② = red
- ③ = green
- ④ = red/yellow
- ⑤ = red/black

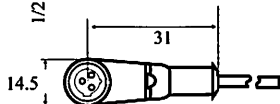


Male

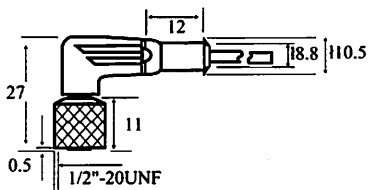
- ① = red/white
- ② = red
- ③ = green
- ④ = red/yellow
- ⑤ = red/black



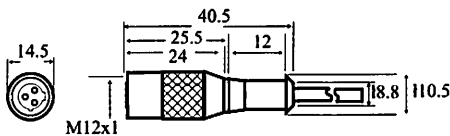
U-FS3TAV312
U-FS4TAV102



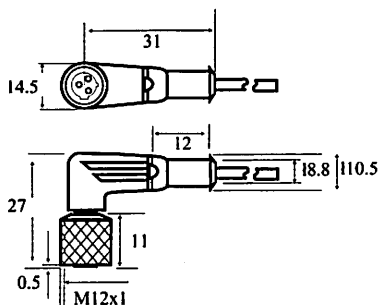
U-FA3TAV312
U-FA4TAV102



U-FS3TAV022/12



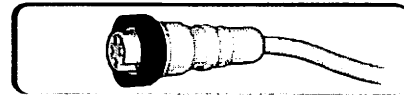
U-FA3TAV022/12



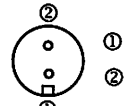
Mini Style Cables - Z Series

7/8"-16 UN Thread Connection

2 - 5 Pin Models



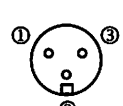
2 Pin Connection



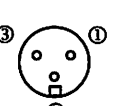
Female/Male

- ① = brown
- ② = blue

3 Pin Connection



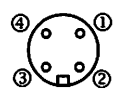
Female



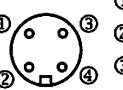
Male

- ① = brown
- ② = yellow/green
(black for /B models)
- ③ = blue

4 Pin Connection



Female



Male

- ① = brown
- ② = white
- ③ = blue
- ④ = black

5 Pin Connection

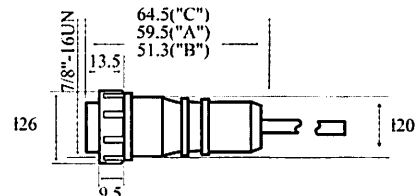


Female

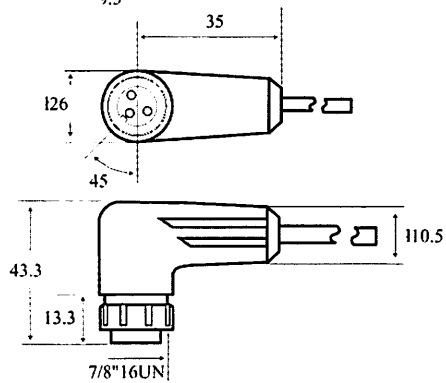


Male

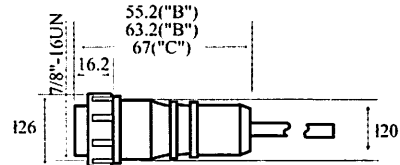
- ① = black
- ② = blue
- ③ = yellow/g
- ④ = brown
- ⑤ = white



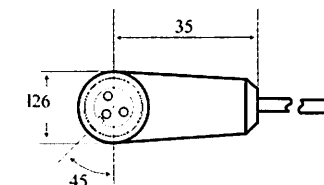
Z-FS2PAV032
Z-FS3PAV032
Z-FS3PAV032/B
Z-FS4PAV022



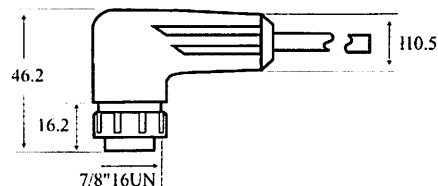
Z-FA2PAV032
Z-FA3PAV032
Z-FA3PAV032/B
Z-FA4PAV022



Z-MS2PAV032
Z-MS3PAV032
Z-MS3PAV032/B
Z-MS4PAV022



Z-MA2PAV032
Z-MA3PAV032
Z-MA3PAV032/B
Z-MA3PAV022

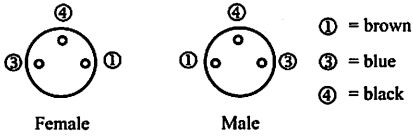


Pico Style Cables - C Series

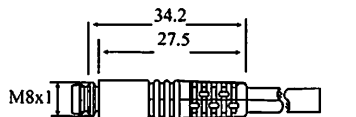
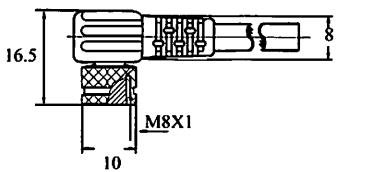
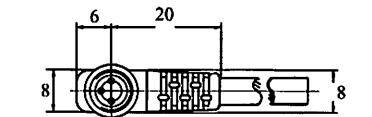
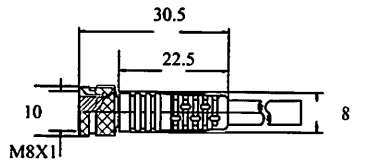
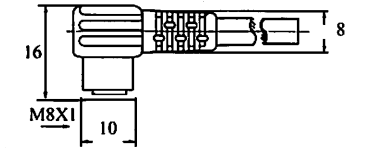
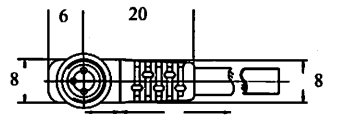
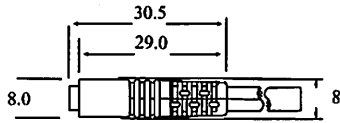
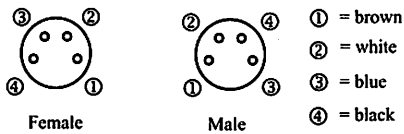
M8 x 1 Thread Connection
3 & 4 Pin Models



3 Pin Connection

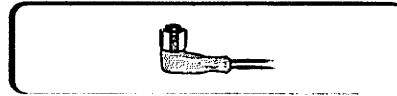


4 Pin Connection

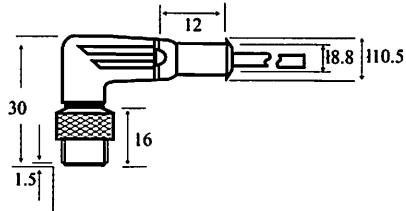
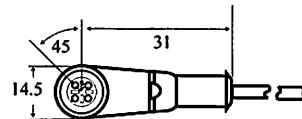
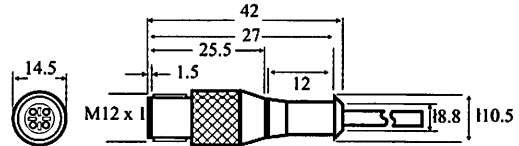
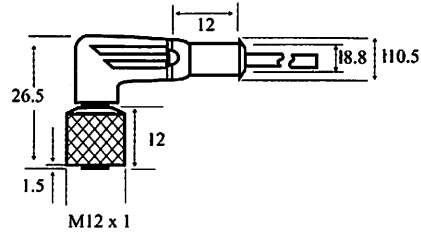
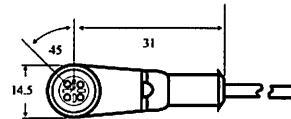
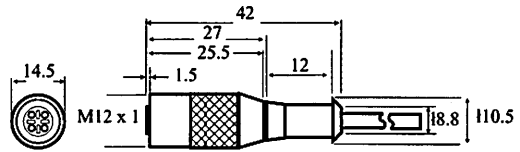
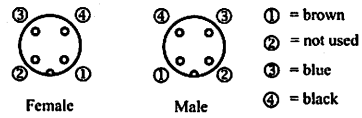


Euro Style Cables - R Series

M12 x 1 Thread Connection
3 - 5 Pin Models



4 Pin Connection



Cable Selection Guide



1. CONNECTOR STYLE:

C = Pico Style R = DC Micro Style U = AC Micro Style Z = Mini Style

2. MALE / FEMALE TYPE

MS = Straight Male FS = Straight Female
 MA = Right Angle Male FA = Right Angle Female

3. POLES OR CABLE EXIT TYPE

2 = 2 Poles 3 = 3 Poles 4 = 4 Poles 5 = 5 Poles
 Z = Cable Exit 0° E = Cable Exit 180°

4. CONSTRUCTION TYPE

T = with (Auto) Securing Safety Nut

5. OUTPUT FUNCTION OR CIRCUIT PROTECTION:

N = NPN with LED
 P = PNP with LED
 Z = without LED
 A = AC
 N/P = NPN or PNP with LED

6. MATERIAL

V = PVC U = PUR Y = PUR/PVCJ = SJTO

7. DIAMETER OF CABLE:

06 = (42x0.1mm)0.34 21 = (128x0.05mm)0.25 31 = (19x0.15mm)0.34
 03 = (22x0.2mm)0.75 58 = (180x0.05mm)0.34 02 = (16x0.2mm)0.50
 07 = (32x0.1mm)0.25 10 = (26x0.13mm)0.34 09 = (14x0.15mm)0.34
 11 = (24x0.2mm)0.75 12 = (64x0.1mm)0.50

8. CABLE LENGTH:

2 = 2m 3 = 3m 5 = 5m 10 = 10m
 Other lengths available upon request.

Part Number Legend

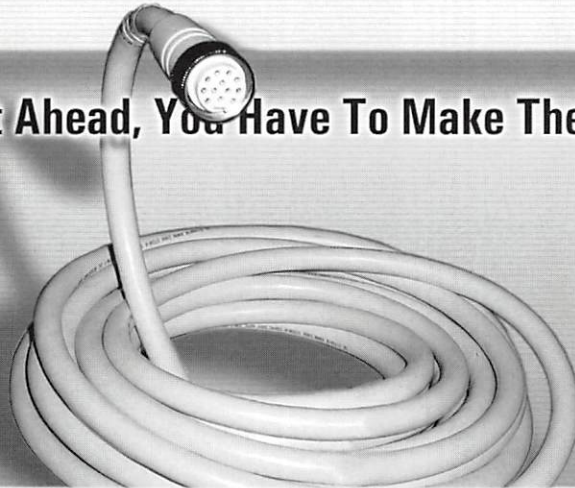
@=Z, without LED, @=P, PNP with LED, @=N, NPN with LED

#=V062, PVC, (42x0.1mm)0.34, 2m cable length #=Y062, PUR/PVC, (42x0.1mm)0.34, 2m cable length
 #=V312, PVC(19x0.15mm)0.34, 2m cable length #=Y312, PUR/PVC(19x0.15mm)0.34, 2m cable length
 #=V072, PVC, (32x0.1mm)0.25, 2m cable length

Double Ended Cables are also available.

Cables & Distribution Boxes

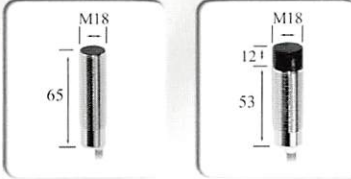
If You Want To Get Ahead, You Have To Make The Right Contacts.



Cable Specifications

Application class:	HNE acc. to DIN 40040 (-25°C /+90°C/ 75%rF)	Contact:	
Moulded body:	TPU, self-extinguishing PA6.6, self-extinguishing for locking plug or snap-in types (nickel-plated brass for C-MS3(or 4) KZ models)	Pico Style:	CuZn, pre-nickled and 0.8 microns gold-plated
Nominal power:	4A	Micro DC Style:	CuSn (CuZn for PG models, right-angle males CuZn, 2-4UM CuSnZn for screw-lock models), brass, pre-nickled and 0.3 microns gold-plated
Locking Nut:	Nickel-plated brass (where applicable)		8 poles=CuZn, pre-nickled and 0.8 microns gold-plated (0.3 microns for right-angle models)
O-Ring:	Viton (where applicable)	Micro AC Style:	CuZn, brass, pre-nickeled and 0.3 microns gold-plated (0.8 microns gold-plated for 5 pole models)
Protection:	IP67 (IP65 for snap-in models)		PG7 & PG9 models: CuZn, 2-4 m CuSnZn (OPTALLOY)
Insulation Group:	C acc. to VDE 0110		U-FS(A)3TAV022/12 models: CuZn, brass, pre-nickeled, tin-plated and 0.3 microns gold-plated
Insulation resistance:	>10 ⁹		Mini Style: CuZn,3 microns silver-plated and 0.25 microns gold-plated
Nominal voltage:			
	Pico Style: 60VAC/75VDC 10 - 30 VDC for LED models		
	Micro DC Style: 3+4 poles, 250VAC/300VDC 5+8 poles, 30VAC/36VDC (10-30VDC for LED models)		
	Micro AC Style: 300VAC (250VAC for PG7 & PG9 models)		
	Mini Style: CuZn,3 microns silver-plated and 0.25 microns gold-plated		

Capacitive Proximity Sensors - AC



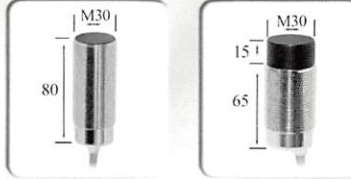
CCM1-1808A-#3L2 **CCM2-1815A-#3L2**

Sensing Distance: 8 mm 15 mm
 Switching Frequency: 25 Hz 25 Hz

Housing:	Nickel Plated Brass
Voltage:	20 - 250 VAC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP65

Capacitive Proximity Sensors are available in connector types.

AC, DC, or AC/DC models are also available.



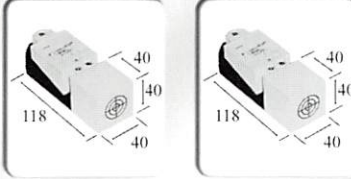
CCM1-3020A-#3L2 **CCM2-3030A-#3L2**

Sensing Distance: 20 mm 30 mm
 Switching Frequency: 25 Hz 25 Hz

Housing:	Nickel Plated Brass
Voltage:	20 - 250 VAC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP65

Plastic housings (POM resin) are also available.

Capacitive Square Plastic Body Proximity Sensors - AC



CQP1-4030A-A2L2 **CQP2-4040A-A2L2**

Sensing Distance: 8 mm 20 mm
 Switching Frequency: 25 Hz 25 Hz

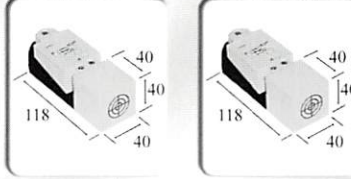
Housing:	POM Resin
Voltage:	20 - 250 VAC
Ambient Operating Temperature:	-25 to +70°C
Connection:	1/2"-14NPT or PG 13.5
Protection Rating:	IP65



CQP2-8050U-#UL3T

Sensing Distance: 5-50mm (adjustable)
 Switching Frequency: 25 Hz AC, 40 Hz DC

Housing:	PBT Resin
Voltage:	20-250VAC/VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	3 pin <i>pico</i> (8mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof

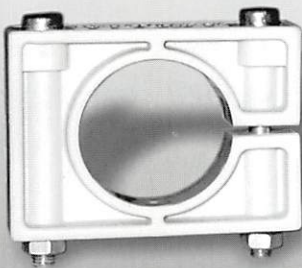


CQP1-4030A-B2L2 **CQP2-4040A-B2L2**

Sensing Distance: 15 mm 30 mm
 Switching Frequency: 25 Hz 25 Hz

Housing:	POM Resin
Voltage:	20 - 250 VAC
Ambient Operating Temperature:	-25 to +70°C
Connection:	1/2"-14NPT or PG 13.5
Protection Rating:	IP65

Mounting Brackets & Accessories



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Shielded Configuration:



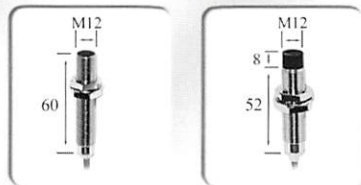
Shielded sensors have a straight-line electrical field. They scan for the presence of solids (e.g. wafers, components, PCB's, hybrids, cartons, bottles, plastic blocks and stacks of paper) at a distance. Shielded capacitive sensors can also detect liquids through a separating wall (glass or plastic up to a maximum of 4 mm thick).

Non-shielded Configuration:



Non-shielded sensors have a spherical electrical field. They are designed to touch the product with their active surface. They are used to detect mainly bulk goods or liquids (e.g. granulate, sugar, flour, corn, sand, oil, water or pastes).

Capacitive Proximity Sensors - DC



CCM1-1204X-#3U2



CCM2-1208X-#3U2

Sensing Distance:
4 mm 8 mm
Switching Frequency:
100 Hz 100 Hz

Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP65



CCM1-1808X-#3U2



CCM2-1815X-#3U2

Sensing Distance:
8 mm 15 mm
Switching Frequency:
100 Hz 100 Hz

Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP65



CCM1-3020X-#3U2



CCM2-3030X-#3U2

Sensing Distance:
20 mm 30 mm
Switching Frequency:
100 Hz 100 Hz

Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP65

Plastic housings (POM resin) are also available for 12, 18 and 30mm.

Capacitive Square Plastic Body Proximity Sensors



CQP2-8050X-#RU4

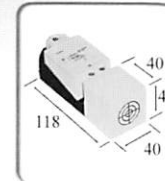
Sensing Distance:
5-50mm (adjustable)
Switching Frequency:
100 Hz

Housing:	PBT Resin
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin <i>micro</i> (12mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof

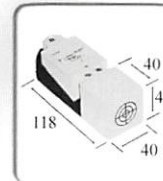
CQP1 & CQP2 Models

are available in

**4 pin *Micro*, AC *Micro*,
Terminal or Cable Connections.**



CQP1-4030X-#3U



CQP2-4040X-#3U

Sensing Distance:
30 mm 40 mm
Switching Frequency:
100 Hz 100 Hz

Housing:	PBT Resin
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	1/2"-14 NPT or PG 13.5
Protection Rating:	IP65, Short circuit & reverse polarity proof

Capacitive Proximity Sensors

Capacitive Proximity Sensors detect all materials, including liquids, powders and metallic and non-metallic solids. These sensors are often used to control the levels of pellets, liquids and powders in production control.

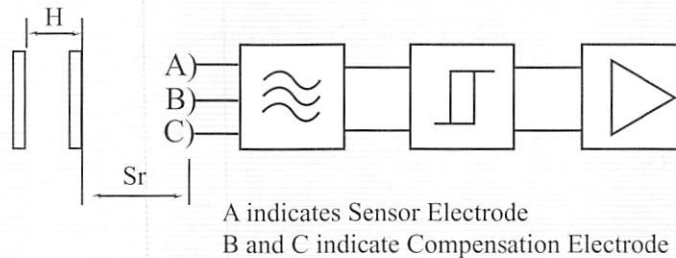
Like their inductive counterparts, they are manufactured in shielded and non-shielded configurations and are available in both AC and DC power formats. The shielded models are used to detect solid products such as cartons, stacks of paper, wood or liquids through the wall of a non-metallic container. The non-shielded models are used to detect liquids or powders where the product flows around the sensor. Shielded models have a shorter detection range since part of the field is lost in the shielding process.

All detection ranges given here are for a steel target which is equal to, or larger than the diameter of the sensor. Non-conductive products, such as wood or plastic, will be detected at a reduced detection range. The range at which a product is detected is directly related to the dielectric constant of the material; the greater the dielectric constant, the greater the detection range.

All capacitive models have an adjustable sensitivity that allows the calibration to be made in the field. This allows the sensitivity to be set for the target desired; for example, the sensitivity can be reduced to ignore a glass container but still detect the liquid inside the container. Similarly, the sensitivity can be reduced to ignore a build-up of a viscous product such as honey while still detecting the level when a large amount of the product reaches the sensor.

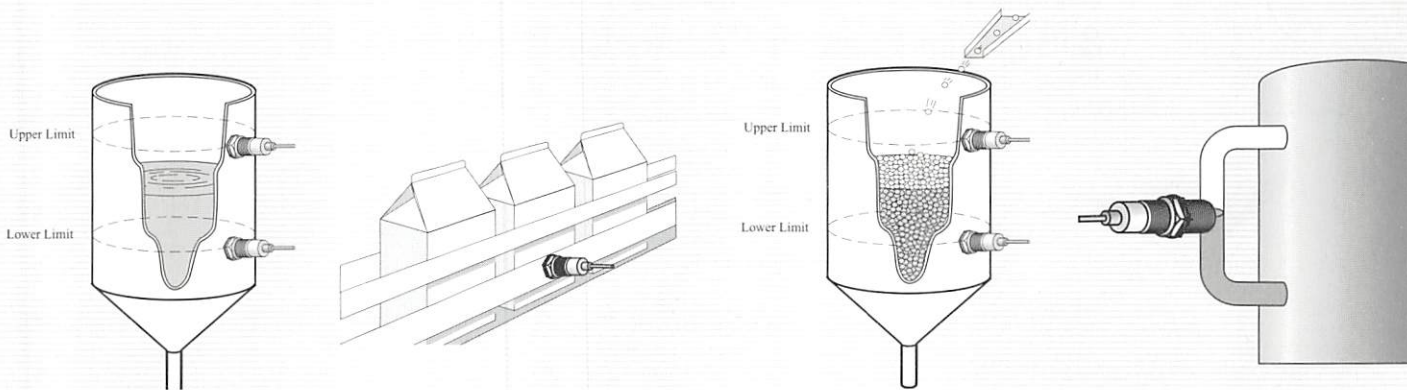
Sensitivity Adjustment

To adjust the sensitivity on a Capacitive Proximity Sensor, mount the sensor in the working position. Allow the target material to reach the position where detection should take place. If the material has not been detected, rotate the sensitivity potentiometer clockwise, with the screwdriver provided, until detection first occurs (LED will illuminate). Continue to rotate the potentiometer for another 1/4 turn. Remove the target material and ensure that the sensor turns OFF (LED will turn off). If the sensor turns OFF, leave the sensitivity at that position. If the sensor remains ON, decrease the sensitivity (counterclockwise rotation) until the sensor turns OFF. For best results, position the sensitivity potentiometer half way between these two points.



Inductive Switch Block Diagram

Applications for Capacitive Proximity Sensors



Liquid Level Control

Capacitive Proximity Sensors reliably detect liquid levels.

Carton Detection

The packaging industry relies on Capacitive sensors to detect paper and cardboard cartons.

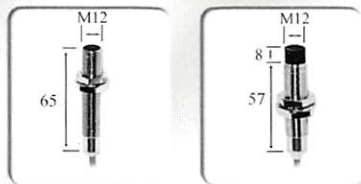
Bin Level Control

Capacitive Sensors can detect liquids, powders, plastic pellets and pastes for level control.

Resist Liquid Level

Use Capacitive Sensors to monitor resist liquid levels in pipes.

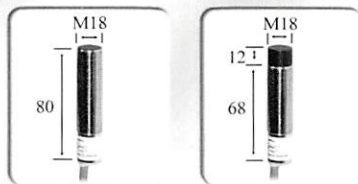
Inductive Proximity Sensors - AC



FCM1-1202A-#3L2 **FCM2-1204A-#3L2**

Sensing Distance: 2 mm 4 mm
 Switching Frequency: 25 Hz 25 Hz

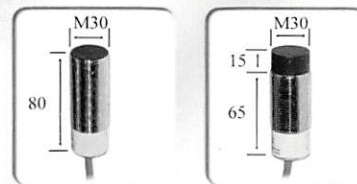
Housing:	Nickel Plated Brass
Voltage:	20-250 VAC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67



FCM1-1805A-#3L2 **FCM2-1808A-#3L2**

Sensing Distance: 5 mm 8 mm
 Switching Frequency: 25 Hz 25 Hz

Housing:	Nickel Plated Brass
Voltage:	20-250 VAC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67



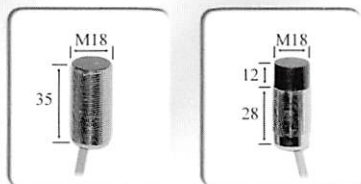
FCM1-3010A-#3L2 **FCM2-3015A-#3L2**

Sensing Distance: 10 mm 15 mm
 Switching Frequency: 25 Hz 25 Hz

Housing:	Nickel Plated Brass
Voltage:	20-250 VAC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67

Plastic housings (POM resin) and connector models (3 pin, 1/2"-20 UNF or 4 pin M12) are also available.

Short Body Types - AC



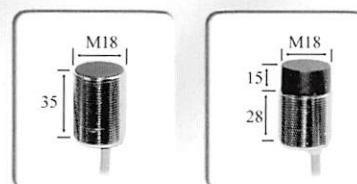
FCM1-1805A-#3S2 **FCM2-1808A-#3S2**

Sensing Distance: 5 mm 8 mm
 Switching Frequency: 25 Hz 25 Hz

Housing:	Nickel Plated Brass
Voltage:	20-250 VAC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67

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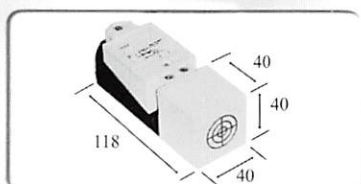


FCM1-3010A-#3S2 **FCM2-3015A-#3S2**

Sensing Distance: 10 mm 15 mm
 Switching Frequency: 25 Hz 25 Hz

Housing:	Nickel Plated Brass
Voltage:	20-250 VAC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67

5 Way Rotatable Head Limit Switch Style & Square Plastic Proximity Sensors - AC



Part Number: Sensing Distance: Switching Frequency:

FQP1-4015A-C4L	15 mm	25 Hz
FQP1-4020A-C4L	20 mm	25 Hz
FQP1-4030A-C4L	30 mm	25 Hz

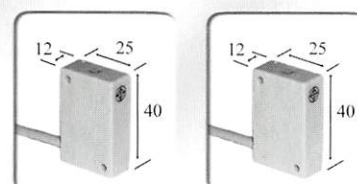
Housing:	PBT Resin
Voltage:	20 - 250 VAC
Ambient Operating Temperature:	-25 to +70°C
Connection:	1/2"-14 NPT or PG 13.5
Protection Rating:	IP67, Short circuit & reverse polarity proof



FQP1-2510A-#2L2

Sensing Distance: 10 mm
 Switching Frequency: 25 Hz

Housing:	ABS Resin
Voltage:	20 - 250 VAC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67



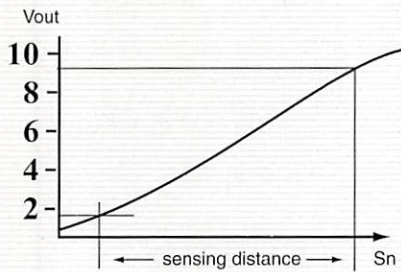
FQP1-4002A-#2L2

FQP2-4004A-#2L2

Sensing Distance: 2 mm 4 mm
 Switching Frequency: 2000 Hz 1000 Hz

Housing:	ABS Resin
Voltage:	20 - 250 VAC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67

Inductive Analog Output Sensors - DC



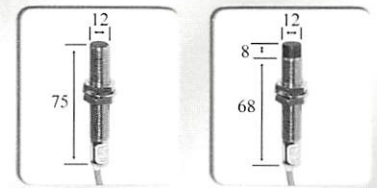
Measurement Range

The measurement range determines over which sensing range a proportional output signal can be given. The measurement range is shown for operation of the analog sensor with a mild steel (ST 37) actuator. The sides of this actuator

are equal in length to the diameter of the sensor being utilized. Actuation of an analog sensor with metals other than mild steel will result in a reduced measurement range.

Features:

Analog sensors give a signal output which is proportional to sensing distance. Analog sensors give both a voltage signal (0-10V) and a current signal (0-20mA). Analog sensors may be used for distance, thickness control of conveyor belts, detection of unevenness, positioning and continuous level control.

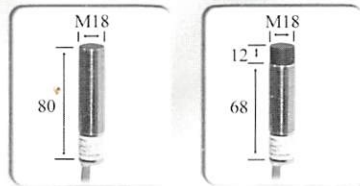


FCM1-1202G-V3U2

FCM2-1204G-V3U2

Sensing Distance: 2.5 mm
4 mm
Switching Frequency: 100 Hz
100 Hz

Housing:	Nickel Plated Brass
Voltage:	18 - 30 VDC
Ambient Operating Temperature:	0 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

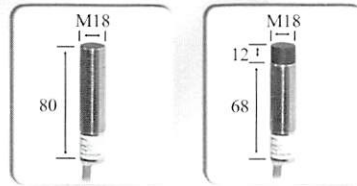


FCM1-1804G-I3U2

FCM2-1807G-I3U2

Sensing Distance: 4 mm
7 mm
Switching Frequency: 100 Hz
30 Hz

Housing:	Nickel Plated Brass
Voltage:	18 - 30 VDC
Ambient Operating Temperature:	0 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

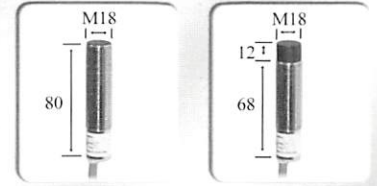


FCM1-1804G-M4U2

FCM2-1807G-M4U2

Sensing Distance: 4 mm
7 mm
Switching Frequency: 100 Hz
30 Hz

Housing:	Nickel Plated Brass
Voltage:	18 - 30 VDC
Ambient Operating Temperature:	0 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

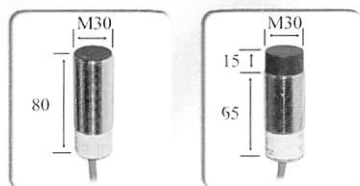


FCM1-1804G-V3U2

FCM2-1807G-V3U2

Sensing Distance: 4 mm
7 mm
Switching Frequency: 100 Hz
30 Hz

Housing:	Nickel Plated Brass
Voltage:	18 - 30 VDC
Ambient Operating Temperature:	0 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

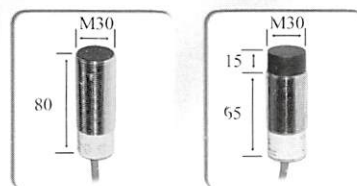


FCM1-3010G-I3U2

FCM2-3014G-I3U2

Sensing Distance: 10 mm
14 mm
Switching Frequency: 100 Hz
30 Hz

Housing:	Nickel Plated Brass
Voltage:	18 - 30 VDC
Ambient Operating Temperature:	0 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

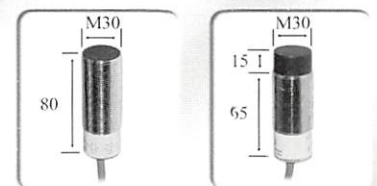


FCM1-3010G-M4U2

FCM2-3014G-M4U2

Sensing Distance: 10 mm
14 mm
Switching Frequency: 100 Hz
30 Hz

Housing:	Nickel Plated Brass
Voltage:	18 - 30 VDC
Ambient Operating Temperature:	0 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof



FCM1-3010G-V3U2

FCM2-3014G-V3U2

Sensing Distance: 10 mm
14 mm
Switching Frequency: 30 Hz
30 Hz

Housing:	Nickel Plated Brass
Voltage:	18 - 30 VDC
Ambient Operating Temperature:	0 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

Weld Field Immune Inductive Proximity Sensors

Weld Field Immunity

These proximity sensors have been designed specifically for use in weld field applications. The high currents used in resistance welders produce an inductive field strong enough to prevent standard proximity sensors from functioning. Weld field immunity is achieved through the use of a special core material and a specifically designed circuit that will not be saturated by the inductive field. The sensors have been designed to operate on machines utilizing either AC or DC resistance systems.

STAINLESS STEEL HOUSINGS WITH PTFE SENSING FACES

* Designed for applications in welding facilities with strong DC and AC magnetic fields.

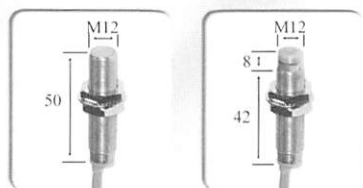
* Manufactured according to Annex E of IEC 947-5 electric weld fields



* Immune to high welding currents.

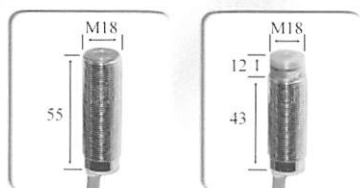
* High switching frequency and conforms with nominal sensing ranges

* Rugged construction stands up to tough industrial environments



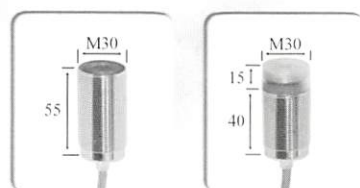
WCU1-1202X-A3U2 **WCU1-1204X-A3U2**
Sensing Distance: 2 mm 4 mm
Switching Frequency: 2000 Hz 1000 Hz

Housing:	Stainless Steel
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67. Short circuit & reverse polarity proof



WCU1-1805X-A3U2 **WCU1-1808X-A3U2**
Sensing Distance: 5 mm 8 mm
Switching Frequency: 1000 Hz 500 Hz

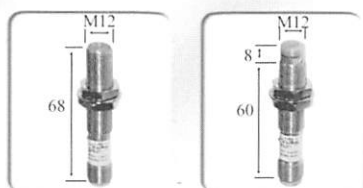
Housing:	Stainless Steel
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67. Short circuit & reverse polarity proof



WCU1-3010X-A3U2 **WCU2-3015X-A3U2**
Sensing Distance: 10 mm 15 mm
Switching Frequency: 300 Hz 150 Hz

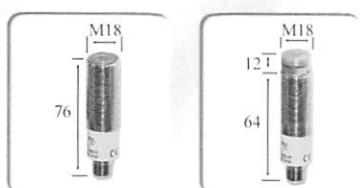
Housing:	Stainless Steel
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67. Short circuit & reverse polarity proof

Weld Field Immune Connector Types



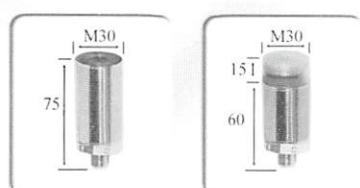
WCU1-1202X-ARU4 **WCU2-1204X-ARU4**
Sensing Distance: 2 mm 4 mm
Switching Frequency: 2000 Hz 1000 Hz

Housing:	Stainless Steel
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin <i>micro</i> (12mm)
Protection Rating:	IP67. Short circuit & reverse polarity proof



WCU1-1805X-A3U2 **WCU2-1808X-A3U2**
Sensing Distance: 5 mm 8 mm
Switching Frequency: 1000 Hz 500 Hz

Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin <i>micro</i> (12mm)
Protection Rating:	IP67. Short circuit & reverse polarity proof



WCU1-3010X-ARU4 **WCU2-3015X-ARU4**
Sensing Distance: 10 mm 15 mm
Switching Frequency: 300 Hz 150 Hz

Housing:	Stainless Steel
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin <i>micro</i> (12mm)
Protection Rating:	IP67. Short circuit & reverse polarity proof

Metal Face

Inductive Proximity Sensors

Our 0.5 mm thick metal face inductive proximity sensors are made of total stainless steel housings from stainless steel stock..no two piece welds, no ultra thin foils... no short cuts. This provides a higher level of protection for more reliable operation and longer life in harsh environments.

Robust Electrical Design

- * AC/DC, 2 wire or DC 2, 3, 4 - wire
- * Short circuit protection
- * Overload protection
- * Reverse polarity protection
- * Radio frequency protection
- * Transient noise protection
- * False pulse protection
- * Epoxy potted for protection against mechanical shock and vibration

Stainless Steel Barrel

- * Impact and abrasion resistant
- * Chemical and cutting fluid resistance
- * IP67
- * 12mm, 18mm, and 30mm diameters

LED Output Indicators

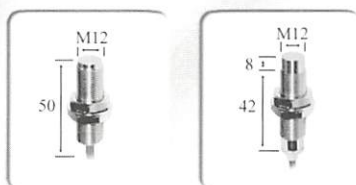


Output Connect Mode

- * PVC cable, 2 meter length
- * Euro QD for DC Types
- * Micro QD models available

Stainless Steel Face

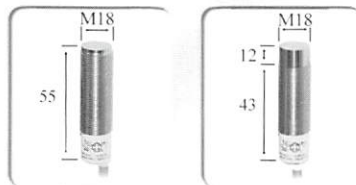
- * Superior strength against impact from abrasion resistant stainless steel
- * Superior chemical and cutting fluid resistance
- * Leakproof
- * Sensing face is 20 mil thick



FCS1-1202X-#3U2 **FCS2-1204X-#3U2**

Sensing Distance: 2 mm 4 mm
Switching Frequency: 2000 Hz 1000 Hz

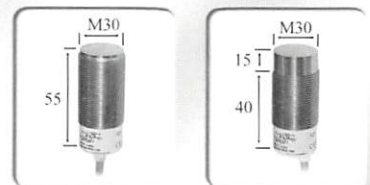
Housing:	Stainless Steel
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof



FCS1-1805X-#3U2 **FCS2-1808X-#3U2**

Sensing Distance: 5 mm 8 mm
Switching Frequency: 1000 Hz 500 Hz

Housing:	Stainless Steel
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

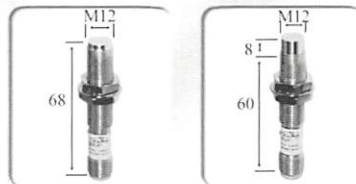


FCS1-3010X-#3U2 **FCS2-3015X-#3U2**

Sensing Distance: 10 mm 15 mm
Switching Frequency: 300 Hz 150 Hz

Housing:	Stainless Steel
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

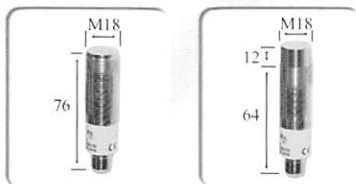
Metal Face Connector Types



FCS1-1202X-#RU4 **FCS2-1204X-#RU4**

Sensing Distance: 2 mm 4 mm
Switching Frequency: 2000 Hz 1000 Hz

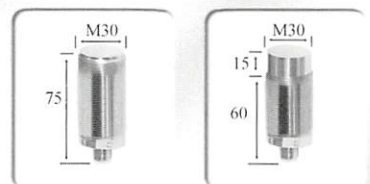
Housing:	Stainless Steel
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin micro (12mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof



FCS1-1805X-#RU4 **FCS2-1808X-#RU4**

Sensing Distance: 5 mm 8 mm
Switching Frequency: 1000 Hz 500 Hz

Housing:	Stainless Steel
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin micro (12mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof



FCS1-3010X-#RU4 **FCS2-3015X-#RU4**

Sensing Distance: 10 mm 15 mm
Switching Frequency: 300 Hz 150 Hz

Housing:	Stainless Steel
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin micro (12mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof

Speed Detectors

Feature:



The speed detector is a self contained device incorporating an impulse generator for the detection of rotational speed.

The speed detector is noncontact and works on the principle of an inductive proximity switch. Speed is monitored to check that it does not fall below a minimum preset value. This minimum value is adjustable. The unit contains a fixed time duration override circuit for the start up period, as well as an indicator to show the output state.

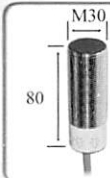
When the supply voltage is switched on, the output circuit is on for the start up override period. If the desired set speed is reached by the end of the start up period then the circuit remains on. If the set minimum speed is not reached by the end of the start up override period, or if the speed subsequently falls below the set minimum value, then the output is switched off.

Cancellation of this state is achieved by disconnecting the supply voltage.

Functional Instruction and Adjustment


Front Diagram	Condition	Functional Instruction and Adjustment
	The green LED on the front turns on.	Turn the potentiometer to the point required. The speed range is 120 rpm to 3000 rpm.
		The time delay is 0.5 seconds to 10 seconds. Turn the potentiometer to the point required.

Inductive Speed Detectors - DC



FCM1-3010X-#3U2/S

Sensing Distance: 10 mm
Switching Frequency: 150 Hz

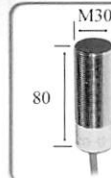


FCM2-3015X-#3U2/S

Sensing Distance: 15 mm
Switching Frequency: 150 Hz

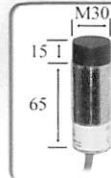
Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67. Short circuit & reverse polarity proof

Slower Speed (6 - 150 targets/min.)



FCM1-3010X-#3U2/F

Sensing Distance: 10 mm
Switching Frequency: 3000 Hz



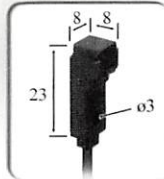
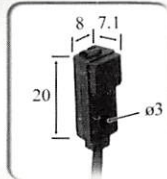
FCM2-3015X-#3U2/F

Sensing Distance: 15 mm
Switching Frequency: 3000 Hz

Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67. Short circuit & reverse polarity proof

Faster Speed (120 - 3000 targets/min.)

Square Plastic Body Proximity Sensors

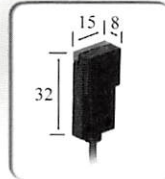
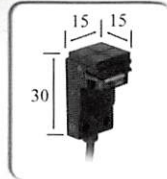


MQP2-881.5X-#3U2F

MQP2-881.5X-#3U2T

Sensing Distance: 1.5 mm
Switching Frequency: 500 Hz

Housing:	Polycarbonate
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

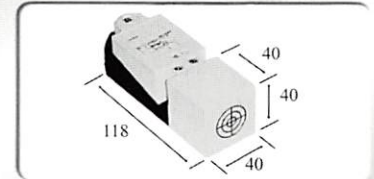


MQP2-1504X-#3U2T

MQP2-1504X-#3U2F

Sensing Distance: 4 mm
Switching Frequency: 250 Hz

Housing:	Polycarbonate
Voltage:	5 - 36 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof



Part Number: **Sensing Distance:** **Switching Frequency:**

FQP1-4015X-#3U 15 mm 100 Hz
FQP1-4030X-SRU4 30 mm 100 Hz
FQP2-4030X-#3U 30 mm 100 Hz

Housing:	PBT Resin
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	1/2"-14 NPT or PG 13.5
Protection Rating:	IP67, Short circuit & reverse polarity proof

Rectangular Plastic Body Proximity Sensors - DC

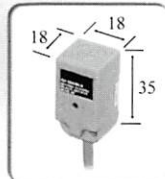
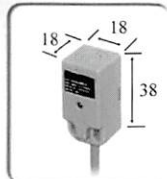


FQP2-1604X-A3U2

FQP2-2510X-X3L2

Sensing Distance: 4 mm
Switching Frequency: 500 Hz

Housing:	ABS Resin
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67

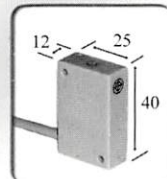
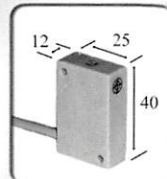


FQP2-18A04X-#3U2

FQP2-1804X-#3U2

Sensing Distance: 4 mm
Switching Frequency: 500 Hz

Housing:	ABS Resin
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof



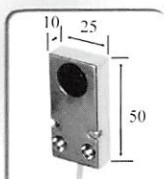
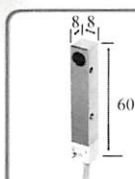
FQP1-4002X-#3U2

FQP2-4004X-A3U2

Sensing Distance: 2 mm
Switching Frequency: 300 Hz

Housing:	ABS Resin
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

Rectangular Metal Body Proximity Sensors - DC

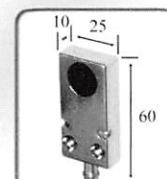


FQM1-8801X-#3U2

FQM1-2505X-#3U2

Sensing Distance: 1.5 mm
Switching Frequency: 2000 Hz

Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof



FQM1-8801X-#CU3

FQM1-2505X-#CU3

Sensing Distance: 1.5 mm
Switching Frequency: 2000 Hz

Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	3 pin <i>pico</i> (8mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof

Inductive Stainless Steel Connector Types - DC



ICU1-0501X-#CU3

ICU1-D0601X-#CU3

Sensing Distance: 1.5 mm
Switching Frequency: 2000 Hz

Housing:	303 Stainless Steel
Voltage:	5 - 36 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	3 pin <i>pico</i> (8mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof



ICU1-0801X-#RS4

ICU2-0802X-#RS4

Sensing Distance: 1.5 mm
Switching Frequency: 2000 Hz

Housing:	303 Stainless Steel
Voltage:	5 - 36 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin <i>micro</i> (12mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof



FCU1-D0801X-#CU3

FCU2-D0802X-#CU3

Sensing Distance: 2.5 mm
Switching Frequency: 2000 Hz

Housing:	303 Stainless Steel
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	3 pin <i>pico</i> (8mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof



FCU1-0801X-#RU4

FCU2-0802X-#RU4

Sensing Distance: 1.5 mm
Switching Frequency: 2000 Hz

Housing:	303 Stainless Steel
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin <i>micro</i> (12mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof



FCU1-1202X-#RU4

FCU2-1204X-#RU4

Sensing Distance: 2 mm
Switching Frequency: 1000 Hz

Housing:	303 Stainless Steel
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin <i>micro</i> (12mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof

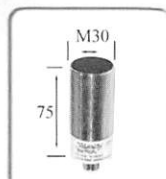


FCU1-1805X-#RU4

FCU2-1808X-#RU4

Sensing Distance: 5 mm
Switching Frequency: 1000 Hz

Housing:	303 Stainless Steel
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin <i>micro</i> (12mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof



FCU1-3010X-#RU4

FCU2-3015X-#RU4

Sensing Distance: 10 mm
Switching Frequency: 300 Hz

Housing:	303 Stainless Steel
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin <i>micro</i> (12mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof

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Weld Field Immune
Inductive Proximity Sensors

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Page 14

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Protection Rating:	IP67
Connection:	4 pin micro (1.2mm)
Ambient Operating Temperature:	-25 to +70°C
Voltage:	10 - 30 VDC
Housing:	Nickel Plated Brass
Switching Frequency:	300 Hz
Sensing Distance:	15 mm

FCM1-3010X-#RS4 FCM2-3015X-#RS4

Protection Rating:	IP67
Connection:	4 pin micro (1.2mm)
Ambient Operating Temperature:	-25 to +70°C
Voltage:	10 - 30 VDC
Housing:	Nickel Plated Brass
Switching Frequency:	500 Hz
Sensing Distance:	8 mm

FCM1-1805X-#RS4 FCM2-1808X-#RS4

Protection Rating:	IP67
Connection:	4 pin micro (1.2mm)
Ambient Operating Temperature:	-25 to +70°C
Voltage:	10 - 30 VDC
Housing:	Nickel Plated Brass
Switching Frequency:	1000 Hz
Sensing Distance:	4 mm

FCM1-1202X-#RS4 FCM2-1204X-#RS4

Short Body Connector Types - DC

Protection Rating:	IP67
Connection:	2 meter cable
Ambient Operating Temperature:	-25 to +70°C
Voltage:	10 - 30 VDC
Housing:	Nickel Plated Brass
Switching Frequency:	300 Hz
Sensing Distance:	15 mm

FCM1-3010X-#3S2 FCM2-3015X-#3S2

Protection Rating:	IP67
Connection:	2 meter cable
Ambient Operating Temperature:	-25 to +70°C
Voltage:	10 - 30 VDC
Housing:	Nickel Plated Brass
Switching Frequency:	500 Hz
Sensing Distance:	8 mm

FCM1-1805X-#3S2 FCM2-1808X-#3S2

Protection Rating:	IP67
Connection:	2 meter cable
Ambient Operating Temperature:	-25 to +70°C
Voltage:	10 - 30 VDC
Housing:	Nickel Plated Brass
Switching Frequency:	1000 Hz
Sensing Distance:	4 mm

FCM1-1202X-#3S2 FCM2-1204X-#3S2

Inductive Short Body Proximity Sensors - DC

LCM1-1812X-#RU4

Sensing Distance: 12 mm

Switching Frequency: 300 Hz

LCM2-1820X-#RU4

Sensing Distance: 20 mm

Switching Frequency: 100 Hz

Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin <i>micro</i> (12mm)
Protection Rating:	IP67. Short circuit & reverse polarity proof

LCM1-3022X-#RU4

Sensing Distance: 22 mm

Switching Frequency: 300 Hz

LCM2-3040X-#RU4

Sensing Distance: 40 mm

Switching Frequency: 100 Hz

Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin <i>micro</i> (12mm)
Protection Rating:	IP67. Short circuit & reverse polarity proof

Cushioned Sensor Mounts

When accidental collisions can't be avoided, cushioned sensor mounts can protect your sensors from harm.

Ask us how by calling our Toll Free Number:

800-644-1756

Extended Range Proximity Sensors - DC

ECU1-0802X-#3S2

Sensing Distance: 2 mm

Switching Frequency: 2000 Hz

ECU1-0802X-#3U2

Sensing Distance: 2 mm

Switching Frequency: 2000 Hz

Housing:	Stainless Steel
Voltage:	5 - 36 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67

ECM1-1204X-#3S2

Sensing Distance: 4 mm

Switching Frequency: 1000 Hz

ECM1-1204X-#3U2

Sensing Distance: 4 mm

Switching Frequency: 2000 Hz

Housing:	Nickel plated brass
Voltage:	5 - 36 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67

ECM1-1204X-#3L2

Sensing Distance: 4 mm

Switching Frequency: <25 Hz

ECM2-1208X-#3L2

Sensing Distance: 8 mm

Switching Frequency: <25 Hz

Housing:	Nickel plated brass
Voltage:	5 - 36 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67

Inductive Two Wire Sensors - DC

FCM1-1202C-A2U2

Sensing Distance: 2 mm

Switching Frequency: 2000 Hz

FCM2-1204C-A2U2

Sensing Distance: 4 mm

Switching Frequency: 1000 Hz

Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67. Short circuit & reverse polarity proof

FCM1-1805C-A2U2

Sensing Distance: 5 mm

Switching Frequency: 1000 Hz

FCM2-1808C-A2U2

Sensing Distance: 8 mm

Switching Frequency: 500 Hz

Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67. Short circuit & reverse polarity proof

FCM1-3010C-A2U2

Sensing Distance: 10 mm

Switching Frequency: 300 Hz

FCM2-3015C-A2U2

Sensing Distance: 15 mm

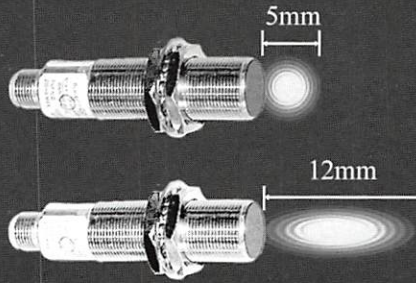
Switching Frequency: 150 Hz

Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67. Short circuit & reverse polarity proof

Long Range Proximity Sensors

Standard
18mm diameter
proximity sensor.

Long Range
18mm diameter
proximity sensor



Available Shielded
and Unshielded.
Maximum Sensing
Range up to 40 mm.

Almost 3 X Normal Sensing Range

Inductive Long Range Proximity Sensors - DC

LCM1-0803X-#3U2	LCM2-0806X-#3U2
Sensing Distance: 3 mm 6 mm	
Switching Frequency: 2000 Hz 1000 Hz	
Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

LCM1-1206X-#3U2	LCM2-1210X-#3U2
Sensing Distance: 6 mm 10 mm	
Switching Frequency: 2000 Hz 1000 Hz	
Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

LCM1-1812X-#3U2	LCM2-1820X-#3U2
Sensing Distance: 12 mm 20 mm	
Switching Frequency: 1000 Hz 500 Hz	
Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

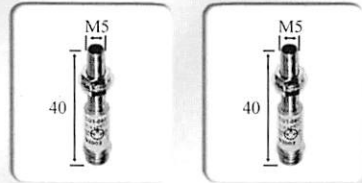
Long Range Connector Types - DC

LCM1-3022X-#3U2	LCM2-3040X-#3U2
Sensing Distance: 22 mm 40 mm	
Switching Frequency: 300 Hz 150 Hz	
Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

LCM1-0803X-#RU4	LCM2-0806X-#RU4
Sensing Distance: 3 mm 6 mm	
Switching Frequency: 1000 Hz 500 Hz	
Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin micro (12mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof

LCM1-1206X-#RU4	LCM2-1210X-#RU4
Sensing Distance: 6 mm 10 mm	
Switching Frequency: 800 Hz 400 Hz	
Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin micro (12mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof

Inductive Connector Types - DC*

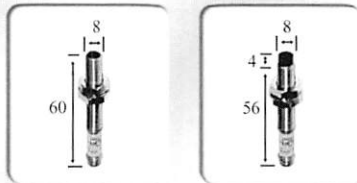


ICU1-0501X-ACU3

ICU1-0501X-BCU3

Sensing Distance: 1 mm
Switching Frequency: 2000 Hz

Housing:	Stainless Steel
Voltage:	5 - 36 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	3 pin <i>pico</i> (8mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof

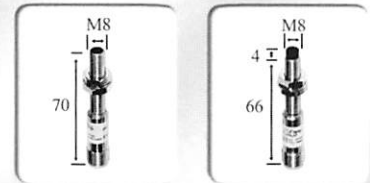


FCM1-0801X-#CU3

FCM2-0802X-#CU3

Sensing Distance: 2 mm
Switching Frequency: 2000 Hz

Housing:	Nickel Plated Brass
Voltage:	10- 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	3 pin <i>pico</i> (8mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof

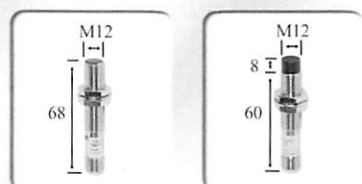


FCM1-0801X-#RU4

FCM2-0802X-#RU4

Sensing Distance: 2 mm
Switching Frequency: 2000 Hz

Housing:	Nickel Plated Brass
Voltage:	10- 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin <i>micro</i> (12mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof

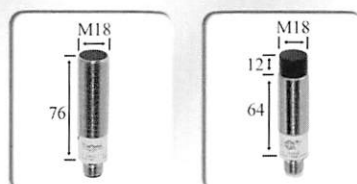


FCM1-1202X-#RU4

FCM2-1204X-#RU4

Sensing Distance: 4 mm
Switching Frequency: 1000 Hz

Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin <i>micro</i> (12mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof

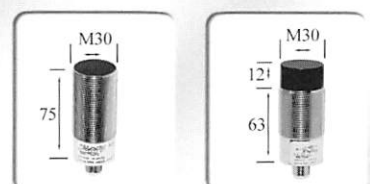


FCM1-1805X-#RU4

FCM2-1808X-#RU4

Sensing Distance: 8 mm
Switching Frequency: 500 Hz

Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin <i>micro</i> (12mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof



FCM1-3010X-#RU4

FCM2-3015X-#RU4

Sensing Distance: 15 mm
Switching Frequency: 150 Hz

Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	4 pin <i>micro</i> (12mm)
Protection Rating:	IP67, Short circuit & reverse polarity proof

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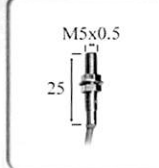
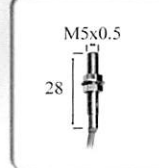
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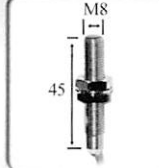

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www.htm-sensors.com



Inductive Proximity Sensors - DC*



	
ICU1-D080.8X-#3U2	ICU1-040.8X-#3U2
Sensing Distance: 0.8 mm	
Switching Frequency: 2000 Hz	
Housing:	Stainless Steel
Voltage:	5 - 36 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

	
ICU1-0501X-#3U2	ICU1-0501X-#3S2
Sensing Distance: 1 mm	
Switching Frequency: 2000 Hz	
Housing:	Stainless Steel
Voltage:	5 - 36 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

	
FCM1-0801X-#3U2	FCM2-0801X-#3U2
Sensing Distance: 2 mm	
Switching Frequency: 2000 Hz	
Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

	
FCM1-1202X-#3U2	FCM2-1202X-#3U2
Sensing Distance: 4 mm	
Switching Frequency: 1000 Hz	
Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

	
FCM1-1805X-#3U2	FCM2-1808X-#3U2
Sensing Distance: 8 mm	
Switching Frequency: 500 Hz	
Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

	
FCM1-3010X-#3U2	FCM2-3015X-#3U2
Sensing Distance: 15 mm	
Switching Frequency: 150 Hz	
Housing:	Nickel Plated Brass
Voltage:	10 - 30 VDC
Ambient Operating Temperature:	-25 to +70°C
Connection:	2 meter cable
Protection Rating:	IP67, Short circuit & reverse polarity proof

When It Comes To Performance, Don't Just Guess.

- * The perfect tool for field diagnostics.
- * Convenient pocket size tester can go anywhere.
- * Two color LED Red (PNP) & Green (NPN)



- * Works with proximity & photoelectric sensors.
- * Very affordable price
- * 18 Volt (DC) power supply.
- * Two 9 Volt batteries included!

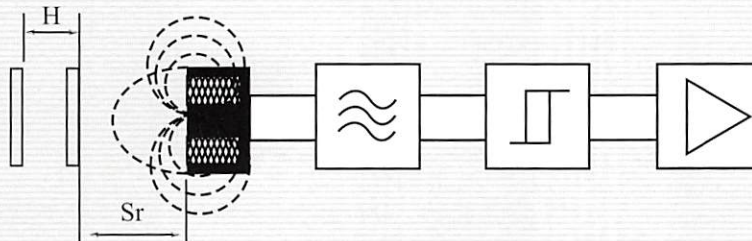
Put Your Sensors To the Test!

* Our DC Inductive Proximity Sensors are available in plastic (POM resin) housings.

Inductive Proximity Sensors

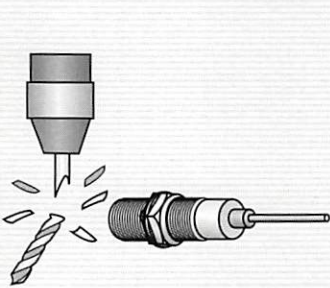
The inductive sensor's circuit consists of a coil of copper wire wrapped on a ferrite core and a transistorized circuit. A small amount of energy is supplied to the coil and the transistorized circuit uses this coil to produce an oscillation. The inductive sensors operate on a "kill oscillator" principle. When the conductive material (metals) are brought into the Radio Frequency field, eddy current losses draw energy from the coil to run along the surface of the metal (skin effect). Since there is little energy in the coil, the amplitude of the oscillation decreases as more of the target metal enters the field. When enough metal enters the field, the losses become so great that the circuit is unable to keep the oscillator running. When the oscillation is killed, a detector produces an output signal that is used to operate a relay or to switch another electronic circuit.

Since the signal is Radio Frequency, ferrous metal is not attracted to the sensor head. These new generation proximity sensors resemble their ancestors mostly in the operating principle only. With the development of stable integrated circuits, the oscillator driver and amplifier can now be located in the detector head itself. This removes the troublesome shielded cable from the circuit and drastically improves the detector's noise immunity. The only wire used with the detector is now the power supply and a low impedance output signal that does not have to be shielded since it is not in the detector's circuit.



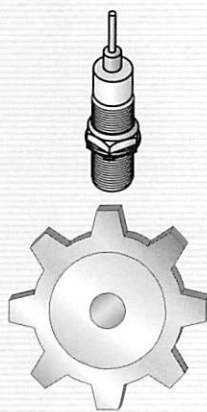
Inductive Switch Block Diagram

Applications for Inductive Proximity Sensors



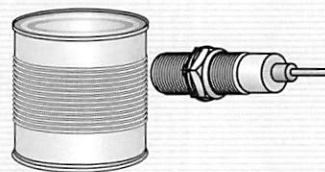
Broken Tool Detection

Inductive Proximity Sensors are ideal for detecting broken drill bits, tooling or other moving parts that can otherwise go unnoticed and slow down production.



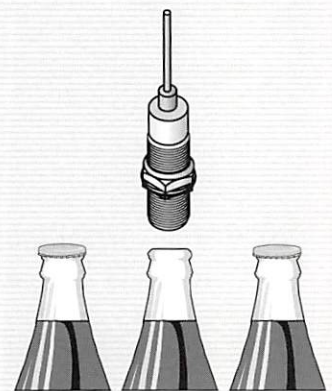
Cam Follower

The high switching speed of our inductive sensors allows you to monitor any variation in cam or gear rotation speed.



Part & Product Detection

Inductive Sensors can be used for detecting any metal part or product to allow for perfect positioning in filling, labelling or batch counting applications

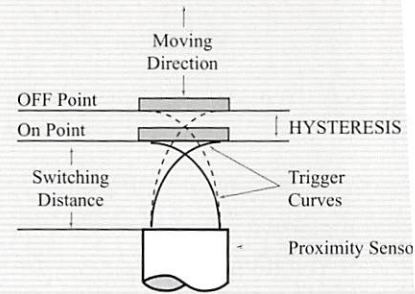


Bottle Cap Detection

Use Inductive Sensors to ensure quality control in packaged or bottled food and drink production.

Hysteresis

Hysteresis is the travel of the target between the “switch-on” point and the “switch-off” point. This distance is required to allow the switch to properly detect the target, and reduces the possibility of false trips.



Current Source and Current Sink

DC Proximity Sensors are made to interface with solid state controllers such as Programmable Controllers (PLCs). The inputs described in the instruction manuals of these devices often ask for a Current Source or Current Sink input.

NPN type sensors are designed to be a Current Sink device. Current from the controller is supplied to the sensor and it will “sink” the current to ground when the sensor is activated.

PNP type sensors are designed to be a Current Source device. Current is supplied from the sensor as a “source” to the controller when the sensor is activated.

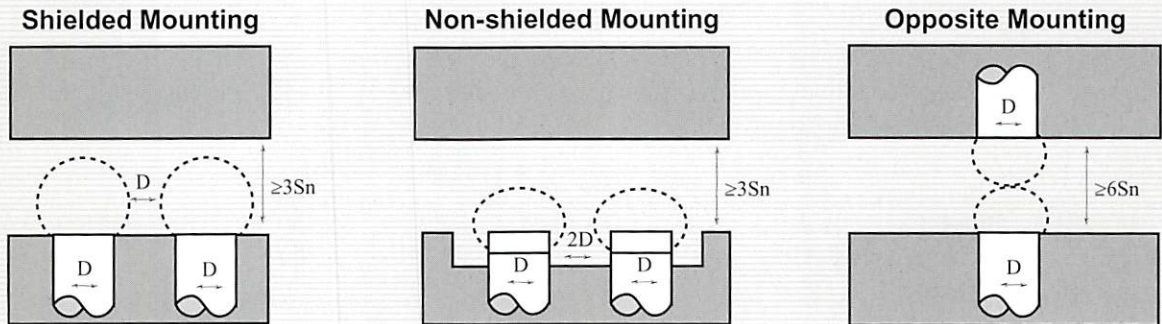
Mounting

Because of possible interference of the electromagnetic fields generated by the oscillators, minimum spacing is required between adjacent or opposing “active surfaces” of proximity switches.

Shielded Mounting: The “active surface” may be flush with the metal in which the switch is mounted.

Non-shielded Mounting: The “active surface” must have a free zone in which no metal is present.

Opposite Mounting: When mounting proximity switches in this manner where the “active surfaces” are opposite each other, there must be a minimum distance between them.



Proximity Sensor Specifications

AC Models	Brass or Plastic Housing
Supply voltage	20 to 250 VAC
Voltage drop	< 8 VAC at 400 mA
Max. load	400 mA
Max. leakage	1.8 mA
No load current	5 mA
Surge current (inrush protection)	5A (20 ms)
Response time ON/OFF	10ms/10ms
Switching frequency	25 Hz
Short circuit protection	No
Hysteresis	< 15%
Repeat accuracy	< 1% full range
Temperature range	-25° to +70°C
Temperature drift	< 10% full range
Protection rating	IP67

DC Models	Brass or Plastic Housing	Stainless Steel Housing
Supply voltage	10 to 30 VDC	5 to 36 VDC
Voltage drop	< 3 V	< 1 V
Max. load	100 mA	200 mA
Max. leakage	< 0.01 mA	
No load current	< 10 mA	
Response time ON/OFF	0.1 ms/0.1 ms	
Frequency response	as rated on each sensor	
Short circuit protection	Yes	
Hysteresis	< 15%	
Repeat accuracy	< 1% full range	
Temperature range	-25° to +70°C	
Temperature drift	< 10% full range	
Protection rating	IP67	

PROXIMITY CONTROL TECHNOLOGY

Inductive and Capacitive Proximity Sensors are devices that will make an electrical change in a circuit as a result of a material approaching the sensor head. Inductive sensors are metal sensing devices, whereas capacitive types detect all material including liquids, powders and pastes.

Advances in integrated circuits and solid-state technology have allowed design engineers to overcome previous problems and develop both inductive and capacitive proximity sensors that can perform in industrial environments for many years with few problems.

Normal Operating Distance

The Normal Operating Distance, or Sensing Range, is defined as the distance between the detector and the target when the change (switching) in the logic state of the proximity switch occurs. This distance and the tests associated in obtaining this distance are outlined in CENELEC EN 50010 Standards. From this standard, the target for establishing the Normal Operating Distance is an iron (FE 37) square, 1mm thick. For cylindrical switches the size is as shown in the table to the right.

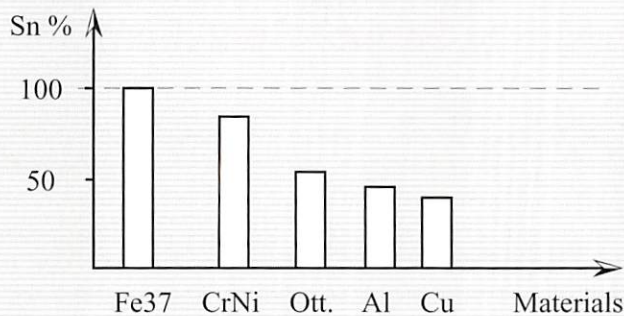
Diameter (mm)	Nominal Distance SN (mm)	Fe 37 Actuator (mm)
8	1	□ 8x1
8	2	□ 8x1
12	2	□ 12x1
12	4	□ 12x1
18	5	□ 18x1
18	8	□ 24x1
30	10	□ 30x1
30	15	□ 45x1

Correction Factor

Inductive Sensors: When using inductive proximity sensors with non-ferrous metals it is necessary to apply a correction factor to the operating distance (sensing range) as follows:

Aluminum	Distance	x. 0.45
Brass	Distance	x. 0.50
Chrome Nickel Alloy	Distance	x. 0.85
Copper	Distance	x. 0.40

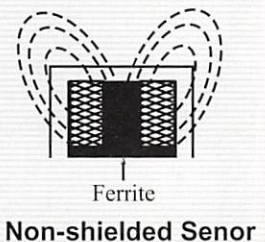
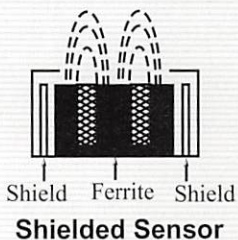
Capacitive Sensors: Capacitive sensors have an adjustable detection range, and are dependant upon the type of material to be sensed (shown below).



Shielded & Non-shielded

Shielded construction includes a metal band which surrounds the ferrite core and coil arrangement. This helps to direct the electro-magnetic field to the front of the sensor.

Non-shielded sensors do not have this metal band, therefore they can be side sensitive.



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MODEL SELECTION GUIDE

FEATURE #

1 2 3 4 5 6 7 8 9 10 11

MODEL #

F C M 1 12 02 N A 3 U 2

1. TYPE:

F: Inductive C: Capacitive L: Long Range E: Extended Range
I: 5-36 VDC W: Weld Field Immune T: High Temperature (-25°C - +100°C)

2. HOUSINGS:

C: Cylindrical Q: Square

3. HOUSING MATERIAL:

M: Chrome plated brass U: Stainless Steel P: Plastic S: Stainless Steel Face

4. MOUNTING:

1: Shielded 2: Non-shielded

5. HOUSING STYLE:

Numeral only: threaded body diameter
D + Numeral: smooth body diameter

6. SENSING DISTANCE:

Range in millimeters (eg. 02: 2mm)

7. OUTPUT FUNCTION:

N: NPN P: PNP A: AC C: 2 wire DC G: Analog U: AC/DC

8. OUTPUT:

A: Normally Open B: Normally Closed C: AC or AC/DC (NO or NC selectable)
S: Changeover (NO and NC) I: Current Output (0-20 mA) V: Voltage Output (0-10 VDC)
M: Both Current & Voltage Output (0-20mA/0-10 VDC)

9. CONNECTION:

2: 2 wire 3: 3 wire 4: 4 wire 5: 5 wire
C: Connector (8mm Pico Series) R: Connector (12mm Micro Series)
B: Connector (4 pin Micro AC) U: Connector (3 pin Micro AC)
Z: Mini

10. PROTECTION:

S: Short body short circuit protected L: No short circuit protection
U: Short circuit protected

11. CABLE LENGTH OR NUMBER OF CONNECTOR PINS:

Cable Type: 2 = 2 meters, 5 = 5 meters
Connector Type: 2 = 2 pin, 3 = 3 pin, 4 = 4 pin, 5 = 5 pin

Part Number Legend:

In place of: "X" use N to signify NPN
P to signify PNP
"#" use A to signify Normally Open (NO)
B to signify Normally Closed (NC)
S to signify Changeover
"&" use C to signify 3 pin Pico connector
R to signify 4 pin Micro connector
"*" use T to signify Top sensing
M to signify Middle sensing

HTM electronics

Proximity Sensors, Cables & Boxes



Standard Prox



Quick Disconnect



Short Body



Extra Long Range
(3 x Standard Range)



Stainless
Steel Body



Stainless
Steel Face



Weld Field
Immune



Analog
Output



Rectangular
Plastic Body



Plastic Body



Rectangular
Metal Body



Rotatable Head



Distribution
Boxes



Pico Cables



Micro Cables



Mini Cables