

ANALOG SENSORS

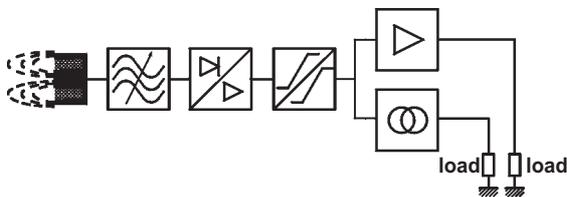
■ Features

- Analog sensors give a signal output which is proportional to sensing distance.
- Analog sensors give both a voltage signal 0-10V, and current signal 0-20mA.
- Analog sensors may be used for distance, thickness control of conveyor belts, detection of unevenness, positioning, continuous level-control, max-control with variable hysteresis as well as for counting and control, to name but a few, they are particularly suited for use in measuring techniques and control systems and are PLC-compatible.

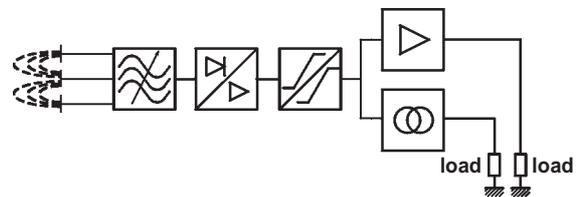
■ General

In common with capacitive and inductive sensors the analog sensor also consists of a transistor oscillator. The oscillator current will be influenced by the approach of metals and electric conductive media to the inductive analog sensors or by metals and all non-metals.

● Inductive analog sensor



● Capacitive analog sensor



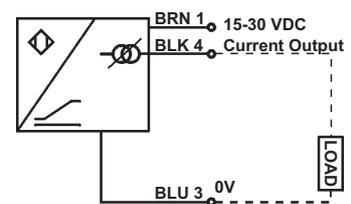
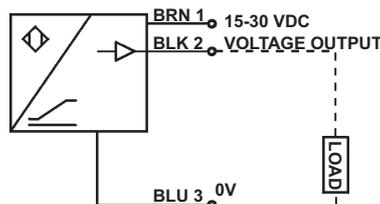
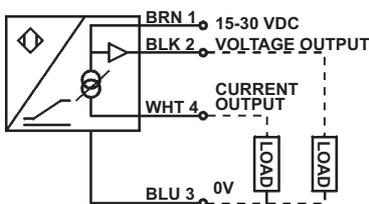
■ Control Output

The measured signal will give a voltage output of 0-10V to a load of $>4.7\text{K}$ or a current output of 0-20mA to a load of 0-200 Ω . The control outputs of the analog sensor are short circuit proof.

*: Current and Voltage Output

*: Voltage Output

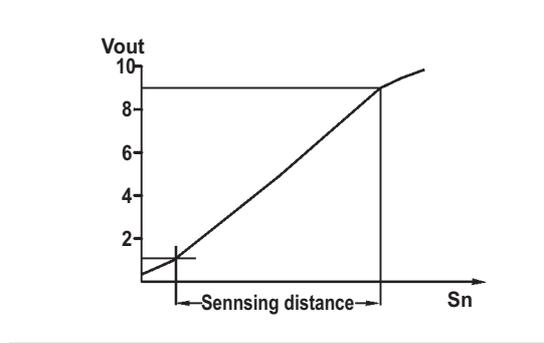
*: Current Output



ANALOG SENSORS

■ 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.



■ Linearity

The linearity error of the output characteristic shows the deviation from an ideal straight line between starting and ending values. The linearity is expressed as a percentage error of the measured range final value.

■ Reproduceability/Resolution

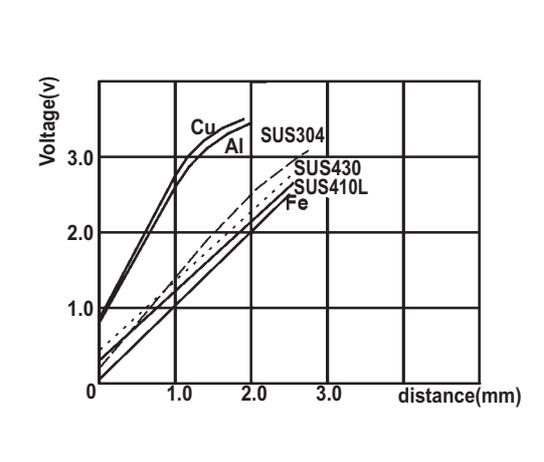
The reproduceability is the deviation between consecutive measurements when the same measurement point is utilized repeatedly. The reproduceability is referenced to constant temperature and supply voltage conditions.

■ Temperature Error

The temperature error gives the deviation of the output signal with a constant sensing distance but with varying ambient temperatures. The temperature error is expressed as a percentage of the final value.

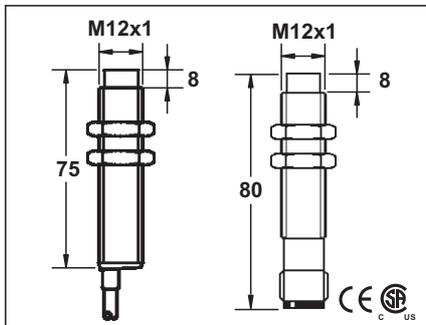
■ Output Characteristic Graph for Non-ferrous Metals

The standard sensing object is iron. Note the use of non-ferrous metals may alter the characteristic. Special sensors for non-ferrous metals are also available. For more information please contact factory.

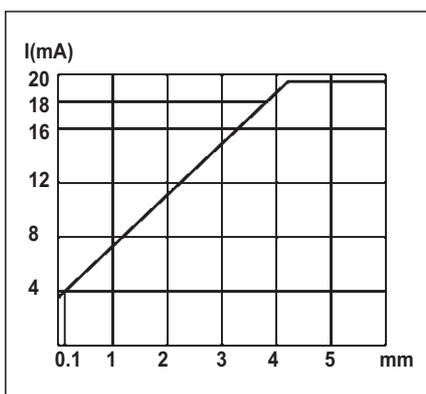


INDUCTIVE CURRENT OUTPUT ANALOG SENSOR

M 12
○
0.1-4 mm
Nickel plated brass
○



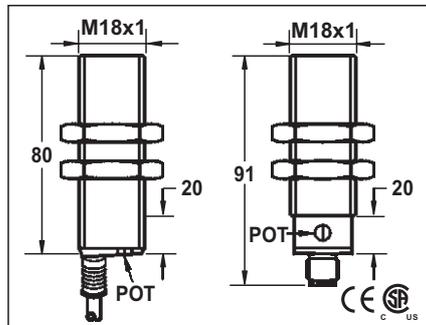
18-30VDC
<10%
<35mA
-
4-20mA/400 Ω Max.
<5%
0.02mm
0°C ~ +50°C
<5%(Sr)
NO
YES
IP67
PNP-ANALOG
100Hz
-
RFI>3V/m / EFT>1KV / ESD>4KV (contact)
IEC 60947-5-2,Part 7.4.1 / IEC 60947-5-2,Part 7.4.2
PBT



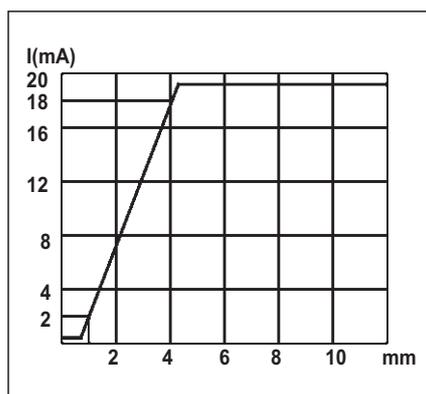
FCM2-1204G-I3U2	19	FCM2-1204G-IRU4

4 φ3x0.15	—
approx.67g	approx.30g

M 18
●
1-4 mm
Nickel plated brass
○



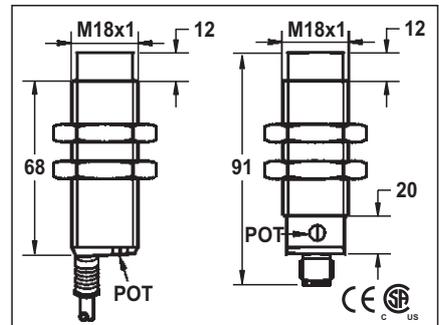
18-30VDC
<10%
15mA
-
0-20mA/200 Ω Max.
<10%(Sr)
0.02mm
0°C-70°C
5%(Sr)
NO
YES
IP67
PNP-ANALOG
100Hz
-
RFI>3V/m / EFT>1KV / ESD>4KV (contact)
IEC 60947-5-2,Part 7.4.1 / IEC 60947-5-2,Part 7.4.2
PBT



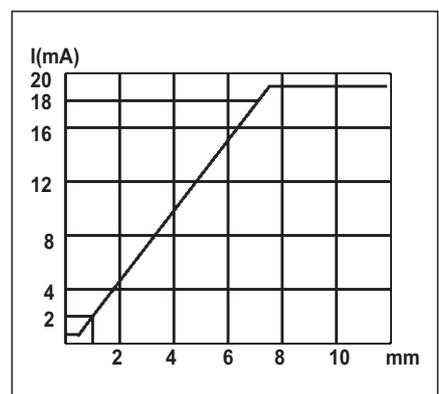
FCM1-1804G-I3U2	19	FCM1-1804G-IRU4

5.0 φ44x0.1	—
approx.142g	approx.69g

M 18
○
1-7 mm
Nickel plated brass
○



18-30VDC
<10%
15mA
-
0-20mA/200 Ω Max.
<10%(Sr)
0.02mm
0°C-70°C
5%(Sr)
NO
YES
IP67
PNP-ANALOG
100Hz
-
RFI>3V/m / EFT>1KV / ESD>4KV (contact)
IEC 60947-5-2,Part 7.4.1 / IEC 60947-5-2,Part 7.4.2
PBT

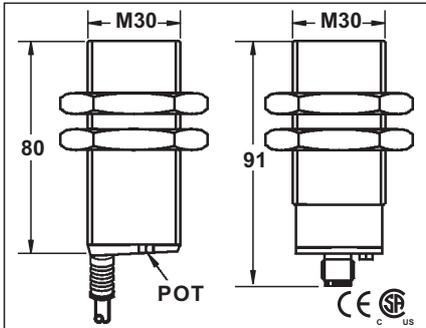


FCM2-1807G-I3U2	19	FCM2-1807G-IRU4

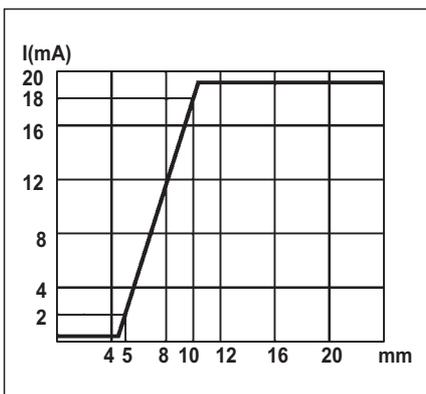
5.0 φ44x0.1	—
approx.142g	approx.69g

INDUCTIVE CURRENT OUTPUT ANALOG SENSOR

M 30
●
5-10 mm
Nickel plated brass
○



18-30VDC
<10%
15mA
-
0-20mA/200 Ω Max.
<10%(Sr)
0.02mm
0°C-70°C
5%(Sr)
NO
YES
IP67
PNP-ANALOG
100Hz
-
RFI>3V/m / EFT>1KV / ESD>4KV (contact)
IEC 60947-5-2,Part 7.4.1 / IEC 60947-5-2,Part 7.4.2
PBT

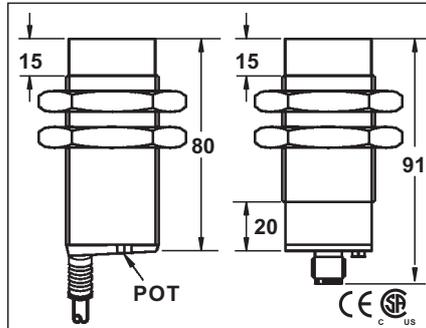


FCM1-3010G-I3U2	19	FCM1-3010G-IRU4

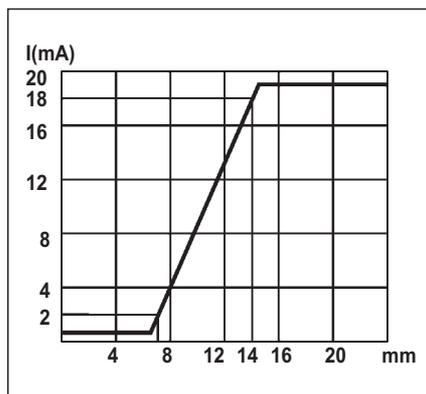
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5.8φ3x0.5	—
approx.252g	approx.187g

M 30
○
7-14 mm
Nickel plated brass
○



18-30VDC
<10%
15mA
-
0-20mA/200 Ω Max.
<10%(Sr)
0.02mm
0°C-70°C
5%(Sr)
NO
YES
IP67
PNP-ANALOG
100Hz
-
RFI>3V/m / EFT>1KV / ESD>4KV (contact)
IEC 60947-5-2,Part 7.4.1 / IEC 60947-5-2,Part 7.4.2
PBT



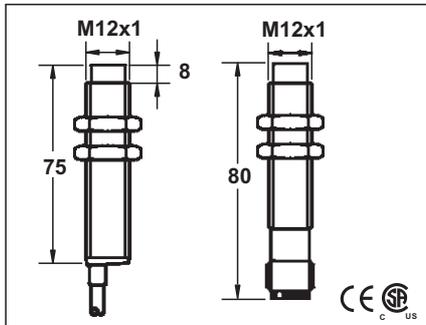
FCM2-3014G-I3U2	19	FCM2-3014G-IRU4

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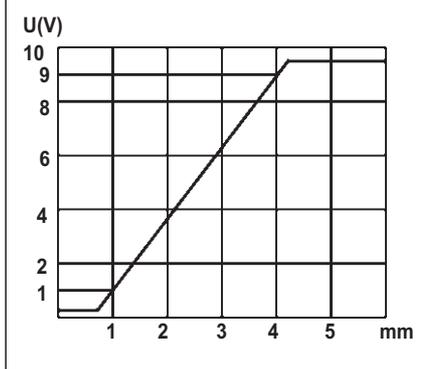
5.8φ3x0.5	—
approx.252g	approx.187g

INDUCTIVE VOLTAGE OUTPUT ANALOG SENSOR

M 12
○
1-4 mm
Nickel plated brass
○



18-30VDC
<10%
<35mA
0-10VDC / $\geq 2K\Omega$
-
<5%(Sr)
0.02mm
0 °C-70 °C
5%(Sr)
NO
YES
IP67
PNP-ANALOG
100Hz
-
RFI>3V/m / EFT>1KV / ESD>4KV (contact)
IEC 60947-5-2,Part 7.4.1 / IEC 60947-5-2,Part 7.4.2
PBT

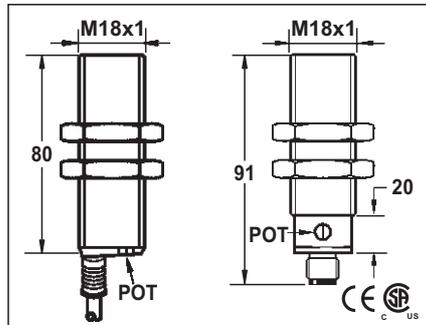


FCM2-1204G-V3U2	20	FCM2-1204G-VRU4

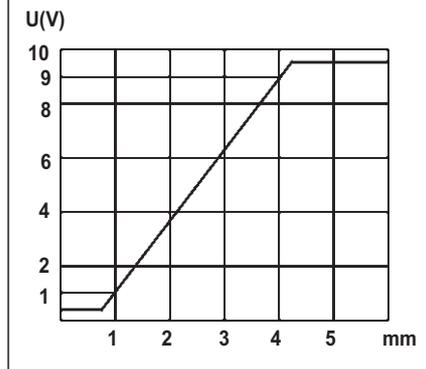
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4 ϕ 3x0.15	—
approx.67g	approx.30g

M 18
●
1-4 mm
Nickel plated brass
○



18-30VDC
<10%
15mA
0-10VDC / $\geq 4.7K\Omega$
-
<10%(Sr)
0.02mm
0 °C-70 °C
5%(Sr)
NO
YES
IP67
PNP-ANALOG
100Hz
-
RFI>3V/m / EFT>1KV / ESD>4KV (contact)
IEC 60947-5-2,Part 7.4.1 / IEC 60947-5-2,Part 7.4.2
PBT

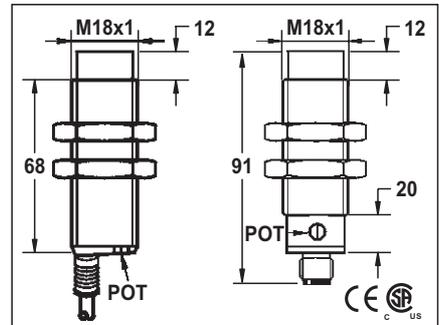


FCM1-1804G-V3U2	20	FCM1-1804G-VRU4

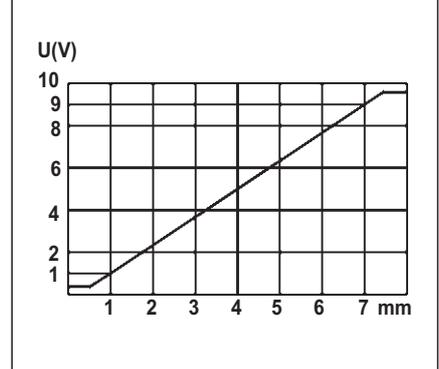
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5.0 ϕ 44x0.1	—
approx.142g	approx.60g

M 18
○
1-7 mm
Nickel plated brass
○



18-30VDC
<10%
15mA
0-10VDC / $\geq 4.7K\Omega$
-
<10%(Sr)
0.02mm
0 °C-70 °C
5%(Sr)
NO
YES
IP67
PNP-ANALOG
100Hz
-
RFI>3V/m / EFT>1KV / ESD>4KV (contact)
IEC 60947-5-2,Part 7.4.1 / IEC 60947-5-2,Part 7.4.2
PBT



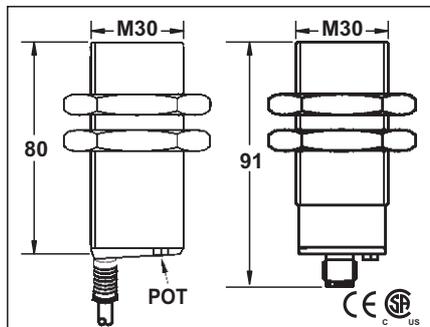
FCM2-1807G-V3U2	20	FCM2-1807G-VRU4

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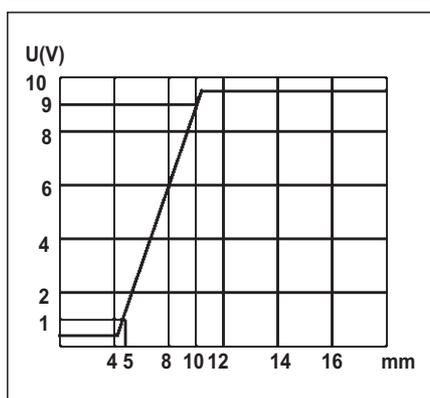
5.0 ϕ 44x0.1	—
approx.142g	approx.60g

INDUCTIVE VOLTAGE OUTPUT ANALOG SENSOR

M 30
●
5-10mm
Nickel plated brass
○



18-30VDC
<10%
15mA
0-10VDC / $\geq 4.7K\Omega$
-
<10%(Sr)
0.02mm
0 °C-70 °C
5%(Sr)
NO
YES
IP67
PNP-ANALOG
100Hz
-
RFI>3V/m / EFT>1KV / ESD>4KV (contact)
IEC 60947-5-2,Part 7.4.1 / IEC 60947-5-2,Part 7.4.2
PBT

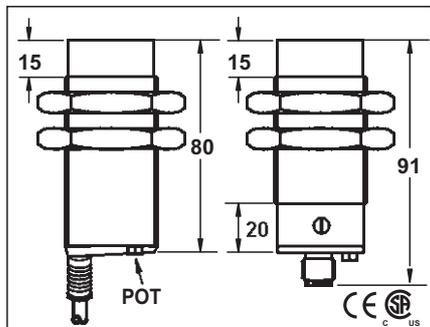


FCM1-3010G-V3U2	20	FCM1-3010G-VRU4

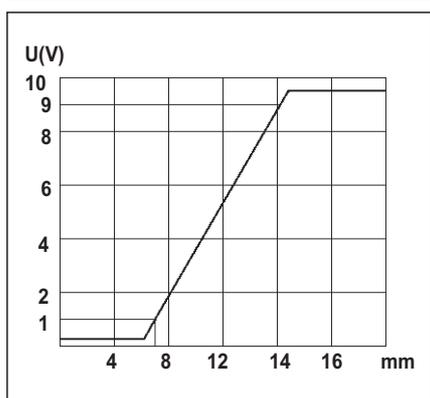
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5.8 ϕ 3x0.5	-
approx.252g	approx.110g

M 30
○
7-14mm
Nickel plated brass
○



18-30VDC
<10%
15mA
0-10VDC / $\geq 4.7K\Omega$
-
<10%(Sr)
0.02mm
0 °C-70 °C
5%(Sr)
NO
YES
IP67
PNP-ANALOG
100Hz
-
RFI>3V/m / EFT>1KV / ESD>4KV (contact)
IEC 60947-5-2,Part 7.4.1 / IEC 60947-5-2,Part 7.4.2
PBT



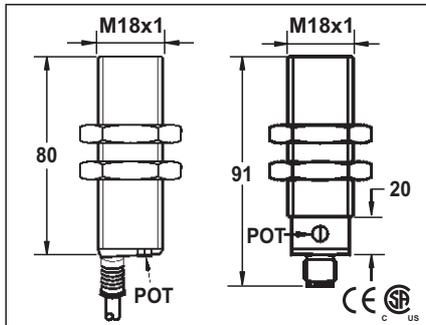
FCM2-3014G-V3U2	20	FCM2-3014G-VRU4

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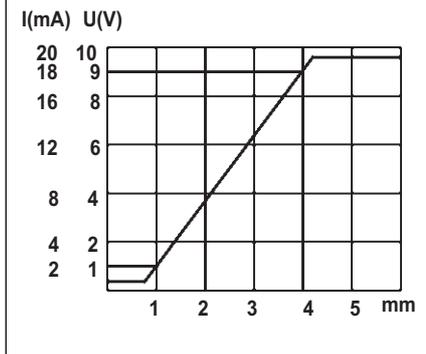
5.8 ϕ 3x0.5	-
approx.246g	approx.110g

INDUCTIVE VOLTAGE AND CURRENT OUTPUT ANALOG SENSOR

M 18
●
1-4 mm
Nickel plated brass
○



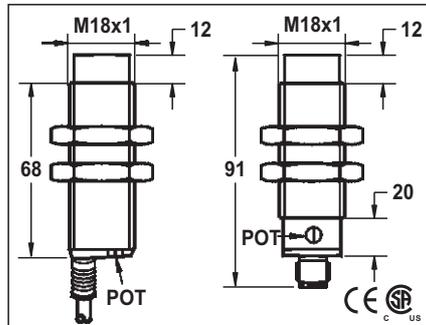
18-30VDC
<10%
15mA
0-10VDC/ $\geq 4.7K\Omega$
0-20mA/0-200
<10%(Sr)
0.02mm
0 °C-70 °C
<5%(Sr)
NO
YES
IP67
PNP-ANALOG
100Hz
-
RFI>3V/m / EFT>1KV / ESD>4KV (contact)
IEC 60947-5-2,Part 7.4.1 / IEC 60947-5-2,Part 7.4.2
PBT



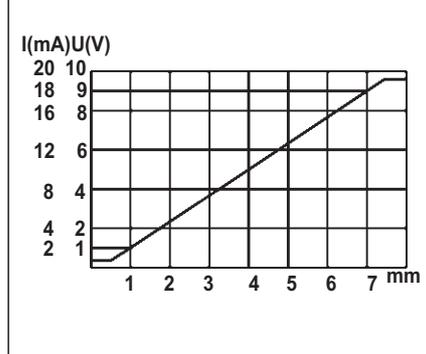
FCM1-1804G-M4U2	17	FCM1-1804G-MRU4
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5.0 ϕ 44x0.1	—
approx.142g	approx.60g

M 18
○
1-7 mm
Nickel plated brass
○



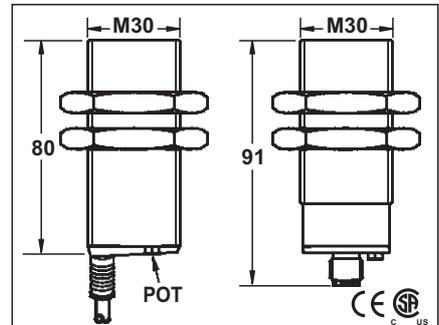
18-30VDC
<10%
15mA
0-10VDC/ $\geq 4.7K\Omega$
0-20mA/0-200
<10%(Sr)
0.02mm
0 °C-70 °C
<5%(Sr)
NO
YES
IP67
PNP-ANALOG
30Hz
-
RFI>3V/m / EFT>1KV / ESD>4KV (contact)
IEC 60947-5-2,Part 7.4.1 / IEC 60947-5-2,Part 7.4.2
PBT



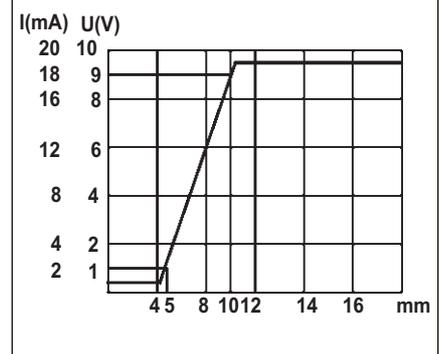
FCM2-1807G-M4U2	17	FCM2-1807G-MRU4
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5.0 ϕ 44x0.1	—
approx.138g	approx.58g

M 30
●
5-10mm
Nickel plated brass
○



18-30VDC
<10%
15mA
0-10VDC/ $\geq 4.7K\Omega$
0-20mA/0-200
<10%(Sr)
0.02mm
0 °C-70 °C
<5%(Sr)
NO
YES
IP67
PNP-ANALOG
100Hz
-
RFI>3V/m / EFT>1KV / ESD>4KV (contact)
IEC 60947-5-2,Part 7.4.1 / IEC 60947-5-2,Part 7.4.2
PBT



FCM1-3010G-M4U2	17	FCM1-3010G-MRU4
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5.8 ϕ 4x0.5	—
approx.252g	approx.110g