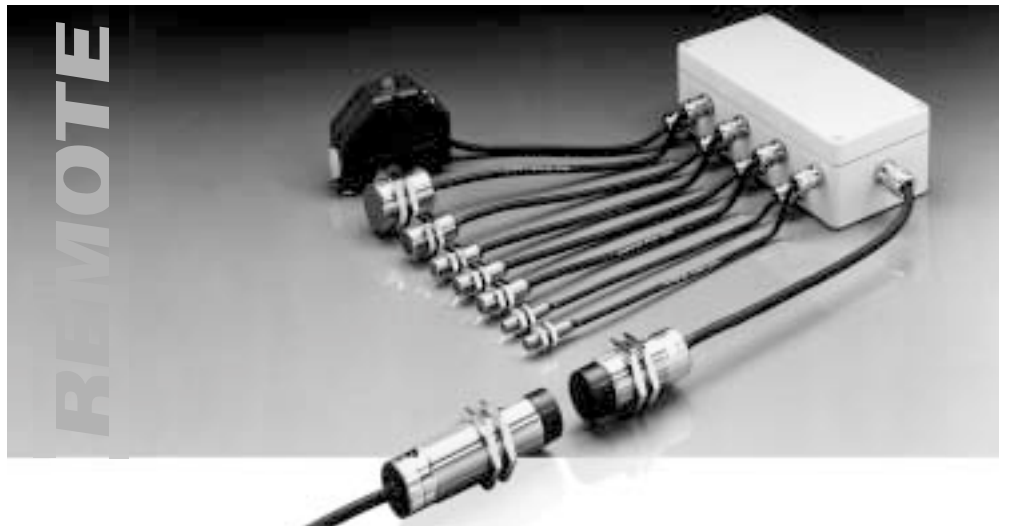
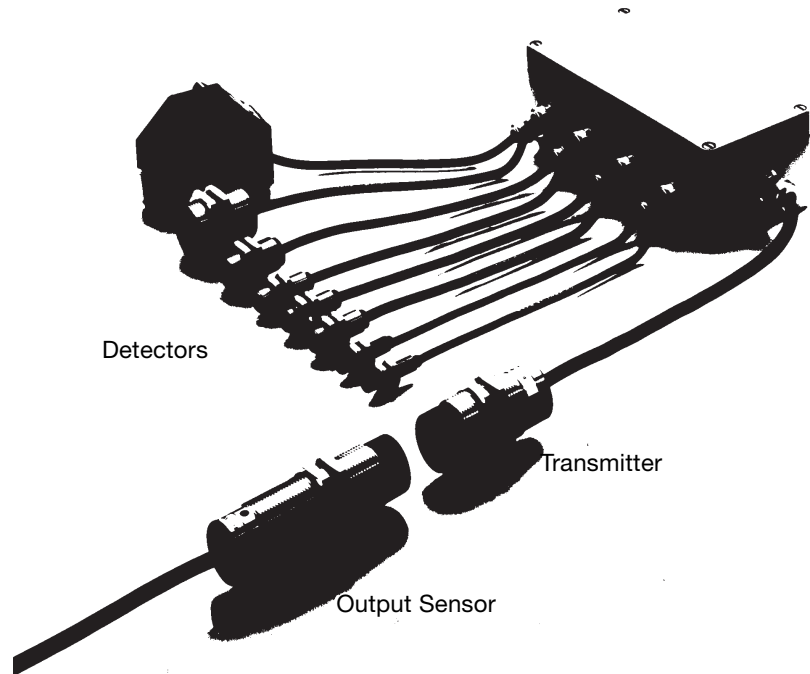


Manual Remote Sensor



Product Description	
The System	3
Features	4
Components	5
Specification and data	
Detectors	6
Transmitters Single Remote	8
Output Sensors Single Remote	9
Transmitters Multiple Remote	10
Output Sensors Multiple Remote	12
Terminal Box	14
Installation	
Wiring Diagram	15
Characteristic Diagram	16
Transmitting area Single Remote	17
Transmitting area Multiple Remote	18
Mounting in Metal	19
Mutual Interference	20
Tightening Torques	20
Wiring	20
Power Supply	21
Mechanical switches	21

The System



The Task

In factory automation there is often a need for sensors that are able to locate, move, or be attached/disattached. For this type of application the cable to and from the detecting sensor may restrict the design of the machine.

The System

REMOTE SENSORS from Balluff can solve this problem. Remote sensors consist of three parts called the Detector, Transmitter, and Output Sensor. The Detector can detect metallic objects just like an inductive proximity switch. It is connected to the Transmitter and any housing size of Detector can be used with any Transmitter size. Up to eight different Detectors can be connected to the Transmitter.

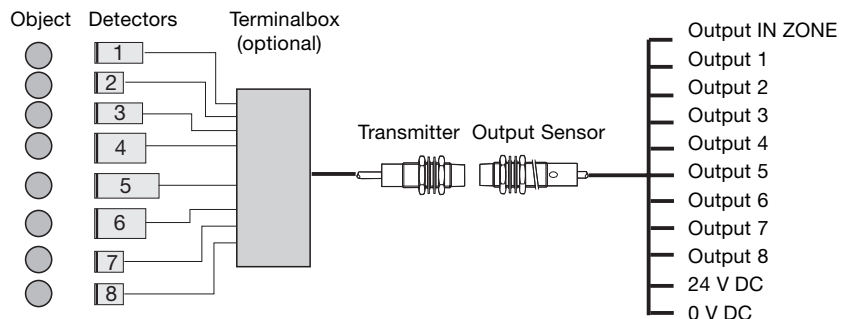
The system is not limited to Series RXD Detectors; even mechanical switches such as Balluff type BNS 519-....-10 can be used. The cable length between the Detector and the Transmitter may be up to 30 m. The Transmitter transmits the status of the Detector or switch to the Output Sensor via inductive coupling. The transmission distance depends on the size and type of Transmitter and Output Sensor used.

The Transmitter and Output Sensor must have the same diameter. The Output Sensor has eight separate outputs which can be connected to the controller input module. There is also an "In Zone" signal which indicates when the Transmitter and Output Sensor are in the proper relative transmission range.

Features

- **Up to eight Detectors can be transmitted.**
1 to 8 Detectors can be connected to a Transmitter. The signals from the Detectors are simultaneously sent to the Output Sensor.
- **No power supply wiring is necessary between the Detector and Transmitter.**
The power for the Detectors and Transmitter is supplied from the Output Sensor by means of inductive coupling. Therefore no power supply is needed for the Transmitters or Detectors, giving you flexibility you need.
- **Both non-contact Detectors and mechanical switches can be used.**
Both non-contact sensors (like proximity switches) and mechanical switches can be used interchangeably as Detectors.
- **4 sizes of non-contact Detectors are available.**
Our new Detectors come in a 4 standard sizes, M8, M12, M18, M30. These are specially designed Balluff sensors that operate like proximity switches. However, normal proximity switches are not compatible with the Remote Sensor system but, our standard mechanical switches can be used.
- **30 m cable lengths between the Transmitter and each Detector.**
- **Assured signal transmission even under the harshest conditions.**
With the non-contact inductive coupling, our system is not affected by oil, dirt, or dust. This allows the Remote Sensor system to be used for many different applications.
- **Specially designed inductive Detectors avoid all irregular signals from metal chips.**
The emitter will output the correct signal even if a piece of metal is located between the Transmitter and Output Sensor.
- **IN-ZONE LED and IN-ZONE output.**
The red LED on the Output Sensor turns on when a Transmitter is in the operating area (IN-ZONE) and also the IN-ZONE signal turns on.
- **Signal monitoring LED.**
It is possible to monitor the switching of the Detectors with the yellow LED. When the number of Detectors operating is odd the yellow light is active and when it is even, it is inactive.
- **Direct connection to the PLC's.**
An output amplifier is built into the Output Sensor, where it can be connected directly to the I/O module of a PLC.
- **Terminal box is available.**
An optional terminal box (protection class IP-65) is available for easy installation when connecting the multiple Detectors to the Transmitter.

Components



Function of the Components

Sensor

Detects the target and sends a signal to the Transmitter. Both inductive or mechanical switches can be connected.

Transmitter

Transmits the Detector signal to the Output Sensor.
Generates the power for the Detectors and Transmitter which is supplied inductively from the Output Sensor. Up to 8 Detectors can be connected to one Transmitter.

Output Sensor

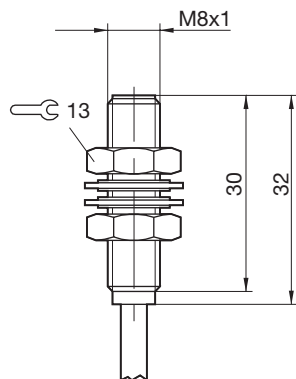
Receives the signal from the Transmitter and outputs that as a signal to an external control unit.
Supplies the power to the Transmitter inductively.
Red LED activates when the inductive link is active, and also the IN-ZONE signal activates.

Terminal Box

Is used for the connection between the Detectors and the Transmitter.

Detectors

Detectors RXD-0801-..

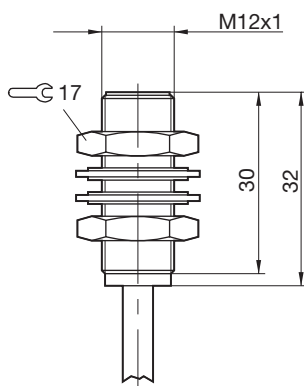


Nominal sensing distance	1.5 mm
Operating distance	0...1.2 mm
Operating temperature	0...+50 °C
Operating humidity	35...95 % RH
Storage temperature	-25...+75 °C
Storage humidity	35...95 % RH
Rated isolation voltage U_i	75 V DC
Vibration proof	55 Hz, Amplitude 1 mm, 3 x 30 min
Shock proof	Half-sinus, 30 g, 11 ms
Protection class	IP 67
Cable	2 x 0.14 mm ² . Outside diameter 4 mm
Housing material	Stainless steel. Sensing surface: PP
Cable length	Standard 1 m



* optional for PU jacket

Detectors RXD-1202-..



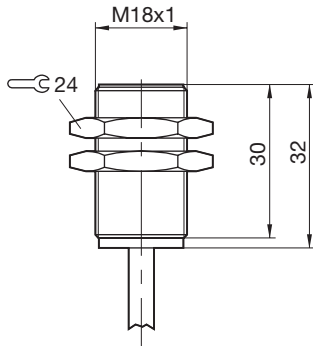
Nominal sensing distance	2 mm
Operating distance	0...1.6 mm
Operating temperature	0...+50 °C
Operating humidity	35...95 % RH
Storage temperature	-25...+75 °C
Storage humidity	35...95 % RH
Rated isolation voltage U_i	75 V DC
Vibration proof	55 Hz, Amplitude 1 mm, 3 x 30 min
Shock proof	Half-sinus, 30 g, 11 ms
Protection class	IP 67
Cable	2 x 0.5 mm ² . Outside diameter 5 mm
Housing material	Nickel plated brass. Sensing surface: PP
Cable length	Standard 1 m



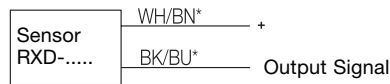
* optional for PU jacket

Remote Sensor Specifications and Data

Detectors RXD-1805-..

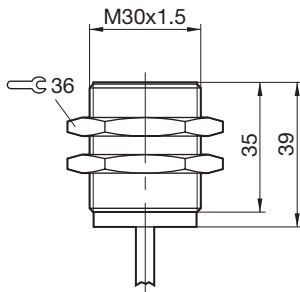


Nominal sensing distance	5 mm
Operating distance	0...4 mm
Operating temperature	0...+50 °C
Operating humidity	35...95 % RH
Storage temperature	-25...+75 °C
Storage humidity	35...95 % RH
Rated isolation voltage U_i	75 V DC
Vibration proof	55 Hz, Amplitude 1 mm, 3 x 30 min
Shock proof	Half-sinus, 30 g, 11 ms
Protection class	IP 67
Cable	2 x 0.5 mm ² . Outside diameter 5 mm
Housing material	Nickel plated brass. Sensing surface: PP
Cable length	No indication = Standard 1 m. 3 = 3 m.



* optional for PU jacket

Detectors RXD-3010M-..



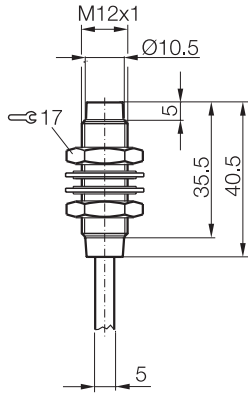
Nominal sensing distance	10 mm
Operating distance	0...8 mm
Operating temperature	0...+50 °C
Operating humidity	35...95 % RH
Storage temperature	-25...+75 °C
Storage humidity	35...95 % RH
Rated isolation voltage U_i	75 V DC
Vibration proof	55 Hz, Amplitude 1 mm, 3 x 30 min
Shock proof	Half-sinus, 30 g, 11 ms
Protection class	IP 67
Cable	2 x 0.5 mm ² . Outside diameter 5 mm
Housing material	Nickel plated brass. Sensing surface: Niron
Cable length	No indication = Standard 1 m. 3 = 3 m.



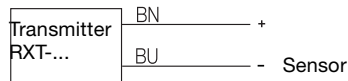
* optional for PU jacket

Transmitter

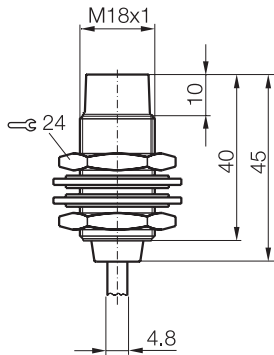
Transmitter RXT-1202-PU-05



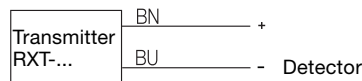
Compatible output sensor	RXE-1202P-...
Transmission distance	shielded/unshielded: 2 mm
Assured transmission distance	shielded: 0...1.6 mm unshielded: 0...2 mm
Rated isolation voltage U_i	75 DC
Ambient temperature T_a	0...+50 °C
Vibration	55 Hz, Amplitude 1 mm, 3 x 30 min
Shock load	Half-sinus, 30 g, 11 ms
Enclosure rating per IEC 529	IP 67
Connection type	Cable LiY-Y-11Y-O, 2 x 0.5 mm ² .
Housing material	Nickel plated brass
Active surface	ABS + PBT
Contamination class	3
Cable length	Standard 5 m



Transmitter RXT-1805-PU-05



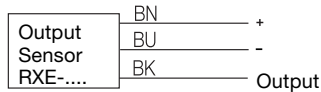
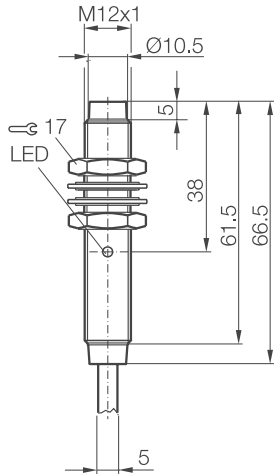
Compatible output sensor	RXE-1805P-... or RXE-1805N-...
Transmission distance	shielded/unshielded: 5 mm
Assured transmission distance	shielded: 0...3 mm unshielded: 0...4 mm
Rated isolation voltage U_i	75 DC
Ambient temperature T_a	0...+50 °C
Vibration	55 Hz, Amplitude 1 mm, 3 x 30 min
Shock load	Half-sinus, 30 g, 11 ms
Enclosure rating per IEC 529	IP 67
Connection type	Cable LiY-D-11Y, 2 x 0.5 mm ² .
Housing material	Nickel plated brass
Active surface	PA 12
Contamination class	3
Cable length	Standard 5 m



Single Remote Sensor Specifications and Data

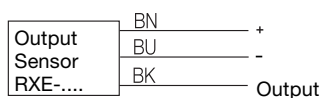
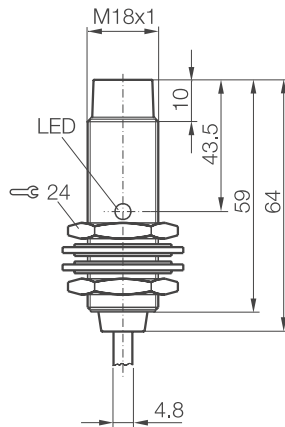
Output Sensor

Output Sensor RXE-1202P-PU-05



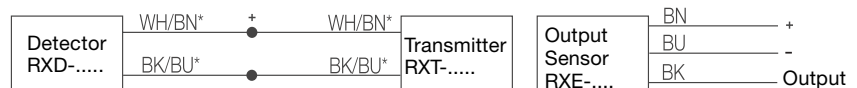
Compatible Transmitter	RXT-1202-...
Installation	shielded/unshielded
Output	N.O.
Output logic	PNP
Supply voltage U_B	24 V DC \pm 5 % (incl. ripple)
Voltage drop	\leq 1.5 V
Rated operating current	\leq 100 mA
Current draw	\leq 25 mA
Leakage current	0.08 mA
Switching frequency f	25 Hz
Short circuit protected	yes
Function indicator	yes
Ambient temperature	0...+50 °C
Vibration	55 Hz, Amplitude 1 mm, 3 x 30 min
Shock load	Half-sinus, 30 g, 11 ms
Enclosure rating per IEC 529	IP 67
Connection type	Cable LiFY-Y-11Y-O, 3 x 0.3 mm ² .
Housing material	Nickel plated brass
Active surface	ABS + PBT
Contamination class	3
Cable length	Standard 5 m

Output Sensor RXE-1805P-PU-05



Compatible Transmitter	RXT-1805-...
Installation	shielded/unshielded
Output	N.O.
Output logic	PNP
Supply voltage U_B	24 V DC \pm 10 % (incl. ripple)
Voltage drop	\leq 1.5 V
Rated operating current	\leq 100 mA
Current draw	\leq 25 mA
Leakage current	0.08 mA
Switching frequency f	25 Hz
Short circuit protected	yes
Function indicator	yes
Ambient temperature	0...+50 °C
Vibration	55 Hz, Amplitude 1 mm, 3 x 30 min
Shock load	Half-sinus, 30 g, 11 ms
Enclosure rating per IEC 529	IP 67
Connection type	Cable LiYY-O, 3 x 0.3 mm ² .
Housing material	Nickel plated brass
Active surface	PA 12
Contamination class	3
Cable length	Standard 5 m

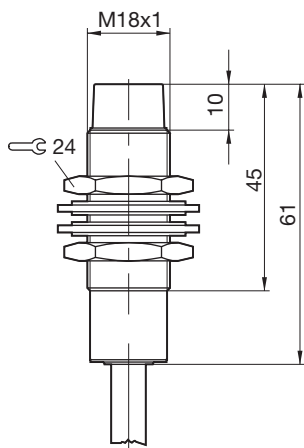
Wiring Single Remote Detectors - Transmitters



* optional for PU jacket

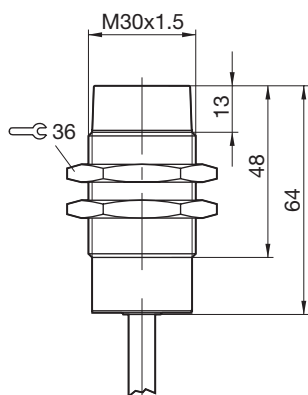
Transmitter

Transmitter RFTA-1805-..



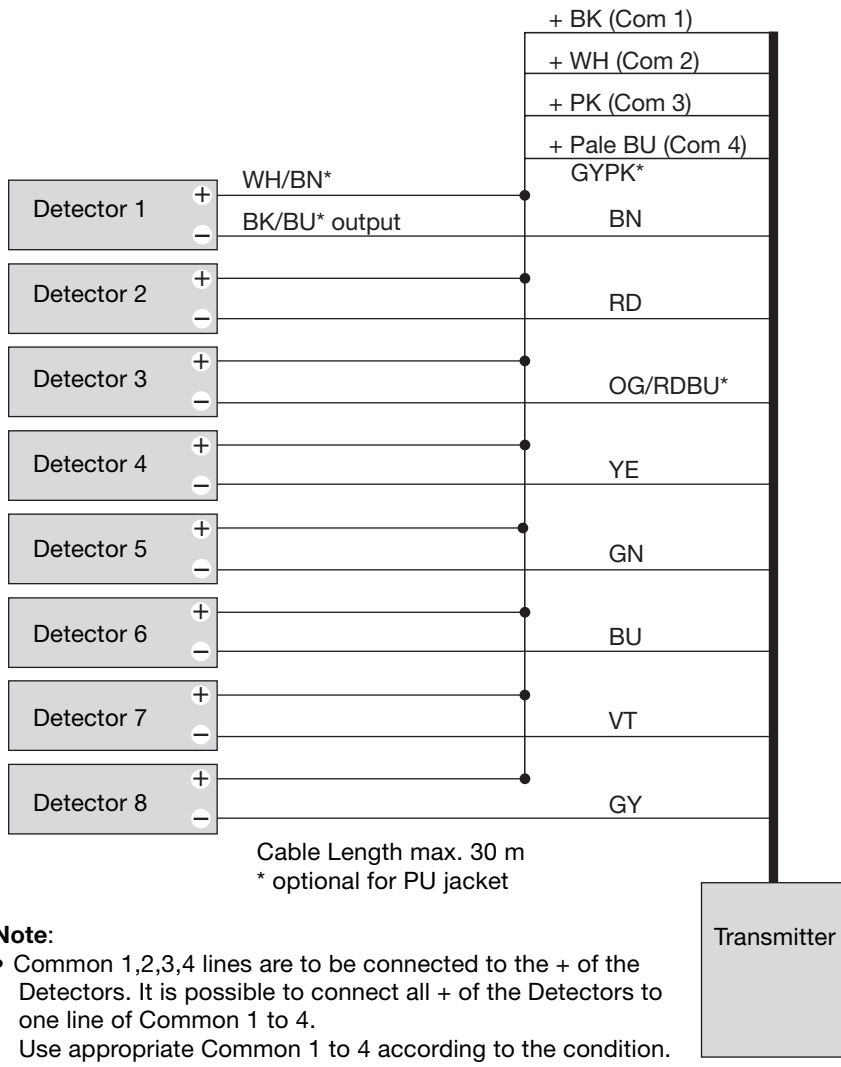
Matching Output Sensors	RFEA-1805N-..	RFEA-1805P-..
	(must be used with RFTA-1805-..)	
Nominal distance	Shielded: 1...4 mm	Non-Shielded: 1...5 mm
Current output	For Detectors: less than 0.5 mA	
Operating temperature	0...+50 °C	
Operating humidity	35...95 % RH	
Storage temperature	-25...+75 °C	
Storage humidity	35...95 % RH	
Rated isolation voltage U_i	75 V DC	
Vibration proof	55 Hz, Amplitude 1 mm, 3 x 30 min	
Shock proof	Half-sinus, 30 g, 11 ms	
Protection class	IP 67	
Cable	12 x 0.18 mm ² . Outside diameter 7 mm	
Housing material	Nickel plated brass. Sensing surface: Niron	
Cable length	Standard 2 m	

Transmitter RFTA-3010-..



Matching Output Sensors	RFEA-3010N-..	RFEA-3010P-..
	(must be used with RFTA-3010-..)	
Nominal distance	Shielded: 2...8 mm	Non-Shielded: 2...10 mm
Current output	For Detectors: less than 0.5 mA	
Operating temperature	0...+50 °C	
Operating humidity	35...95 % RH	
Storage temperature	-25...+75 °C	
Storage humidity	35...95 % RH	
Rated isolation voltage U_i	75 V DC	
Vibration proof	55 Hz, Amplitude 1 mm, 3 x 30 min	
Shock proof	Half-sinus, 30 g, 11 ms	
Protection class	IP 67	
Cable	12 x 0.18 mm ² . Outside diameter 7 mm	
Housing material	Nickel plated brass. Sensing surface: Niron	
Cable length	Standard 2 m	

Connections Detectors - Transmitter

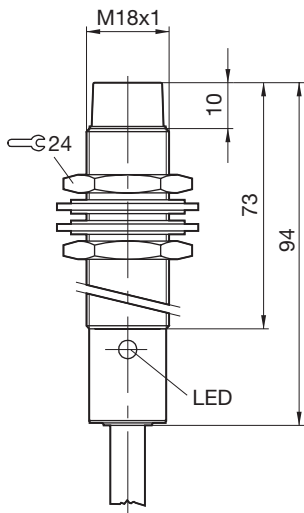


Note:

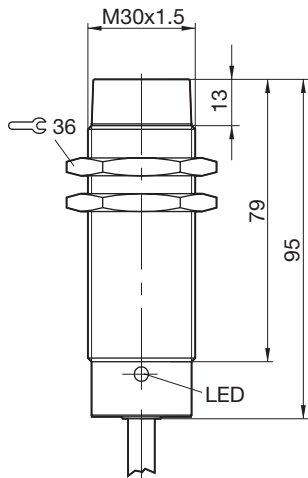
- Common 1,2,3,4 lines are to be connected to the + of the Detectors. It is possible to connect all + of the Detectors to one line of Common 1 to 4. Use appropriate Common 1 to 4 according to the condition.
- The cable between the Transmitter and the Detector can be extended up to 30 m.

Output Sensors

Type RFEA-1805-..

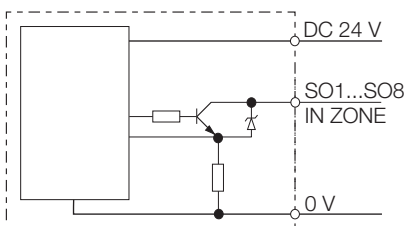


Type RFEA-3010-.. and RFTA-3018-..

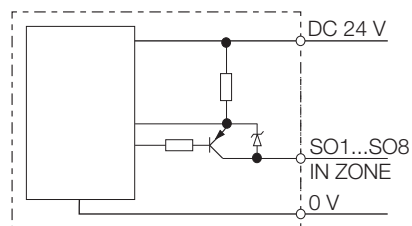


Output Sensors	RFEA-1805N-.. RFEA-3010N-..	RFEA-1805P-.. RFEA-3010P-..	Transmitter
Usable Combinations	Output Sensor RFEA-1805N-.. / RFEA-1805P-.. → RFEA-3010N-.. / RFEA-3010P-.. →		RFTA-1805-.. RFTA-3010-..
Output type	Normally open		
Output logic	NPN (RFEA-....N-..)	PNP (RFEA-....P-..)	
Number of outputs	1: In-Zone output SO0 8: Signal outputs SO1 - SO8		
Supply Voltage	24 V DC ± 5 % (including ripple)		
Load current	50 mA per output		
Current consumption	≤ 40 mA (not including load current of PNP)		
Leakage current	≤ 0.08 mA		
Residual voltage	≤ 1.5 V		
Switching frequency	3.2 Hz		
Operating temperature	0...+50 °C		
Operating humidity	35...95 % RH		
Storage temperature	-25...+75 °C		
Storage humidity	35...95 % RH		
Rated isolation voltage U_i	75 V DC		
Vibration proof	55 Hz, Amplitude 1 mm, 3 x 30 min		
Shock proof	Half-sinus, 30 g, 11 ms		
Protection class	IP 67		
Cable	12 x 0.18 mm ² . Outside diameter 7 mm		
Housing material	Nickel plated brass. Sensing surface: Niron		
Cable length	Standard 2 m		

NPN



PNP



Multiple Remote Sensor Specifications and Data

Function of Signals (NPN Current Sinking: Type RFEA-....N-..)

Signal name	Abr	Wire Color	Function
Power supply 24 V	+	WH	Connect this to the power supply +24V
Power supply 24 V	+	PK	Use one or both of the two
Ground 0 V	-	light BU GYPK*	Connect this to ground
IN-Zone signal	SO0	BK	This signal turns on when the Transmitter is in the active (IN-ZONE) of the Output Sensor
Signal output 1	SO1	BN	ON/OFF from Detector 1
Signal output 2	SO2	RD	ON/OFF from Detector 2
Signal output 3	SO3	OG/RDBU*	ON/OFF from Detector 3
Signal output 4	SO4	YE	ON/OFF from Detector 4
Signal output 5	SO5	G	ON/OFF from Detector 5
Signal output 6	SO6	BU	ON/OFF from Detector 6
Signal output 7	SO7	VT	ON/OFF from Detector 7
Signal output 8	SO8	GY	ON/OFF from Detector 8

* optional for PU jacket

Function of Signals (PNP Current Sinking: Type RFEA-....P-..)

Signal name	Abr	Wire Color	Function
Power supply 24 V	+	WH	Connect this to the power supply +24V
Power supply 24 V	-	PK	Use one or both of the two
Ground 0 V	-	Pale BU GYPK*	Connect this to ground
IN-Zone signal	SO0	BK	This signal turns on when the Transmitter is in the active (IN-ZONE) of the Output Sensor
Signal output 1	SO1	BN	ON/OFF from Detector 1
Signal output 2	SO2	RD	ON/OFF from Detector 2
Signal output 3	SO3	OG/RDBU*	ON/OFF from Detector 3
Signal output 4	SO4	YE	ON/OFF from Detector 4
Signal output 5	SO5	G	ON/OFF from Detector 5
Signal output 6	SO6	BU	ON/OFF from Detector 6
Signal output 7	SO7	VT	ON/OFF from Detector 7
Signal output 8	SO8	GY	ON/OFF from Detector 8

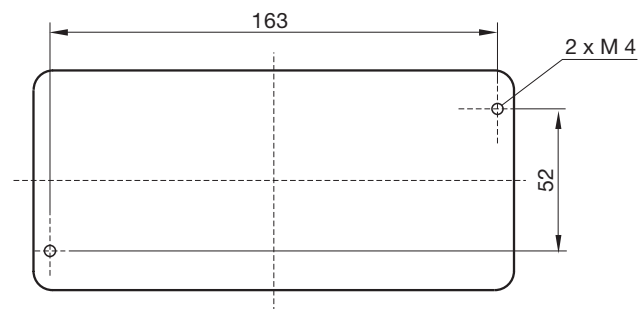
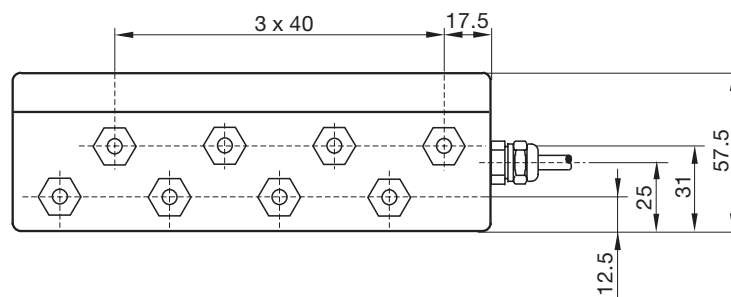
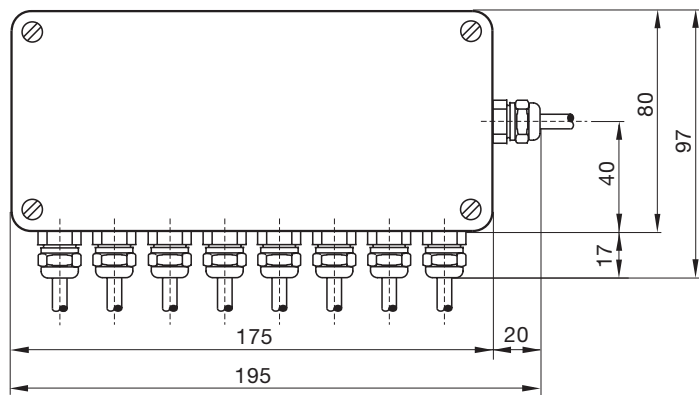
* optional for PU jacket

LED Display Function

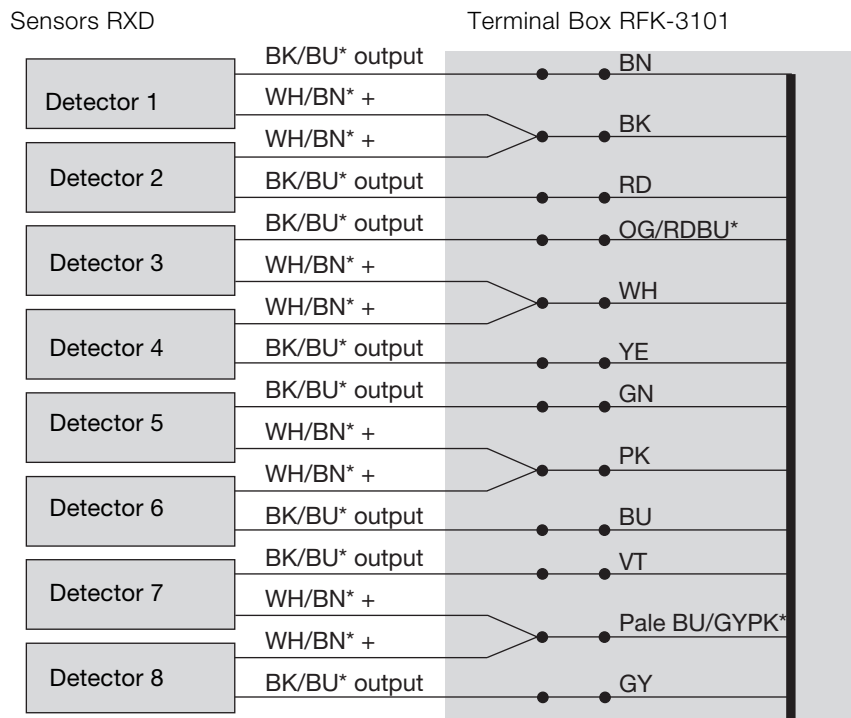
LED	Color	Function
IN-ZONE LED	red	Turns on when the Transmitter is in the active zone (IN-ZONE) of the Output Sensor.
MONITOR LED	yellow	Turns on when the total number of the signals with ON is odd, and turns off if the total number is even. If one Detectors signal changes, this LED also changes to ON or OFF. This function can be used for testing the function of the Detectors and Transmitter.

Terminal Box RFK-3010

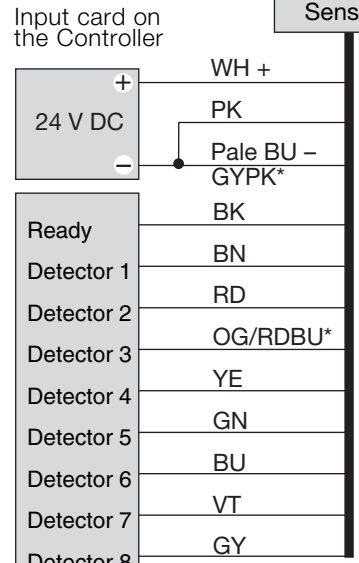
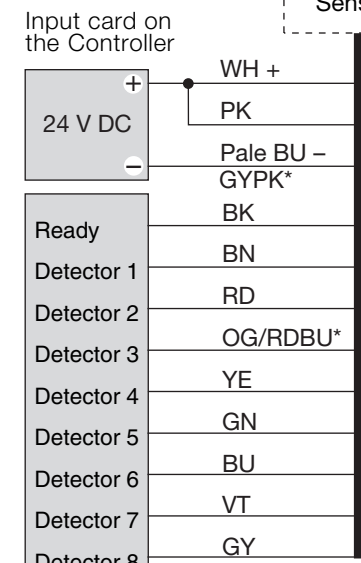
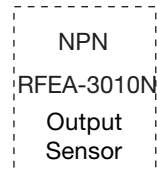
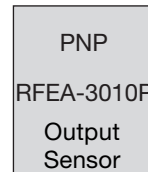
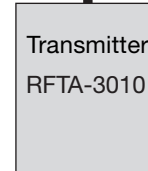
Protection class	IP 65
Housing Material	Diecast aluminium
Gasket Material	Polyuretane
Terminals	12 pole, screw size M3 x 12 L
Cable ground	PG 7 x 8 pcs. for the Detectors PG 9 x 1 pcs. for the Transmitter
Mounting	Fastened with 2 M4 screws



Wiring Diagram

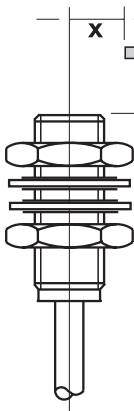


* optional for PU jacket (Cable)



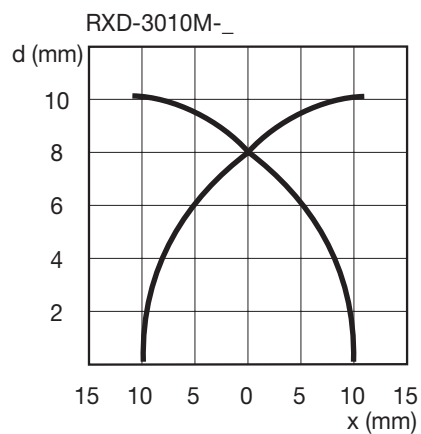
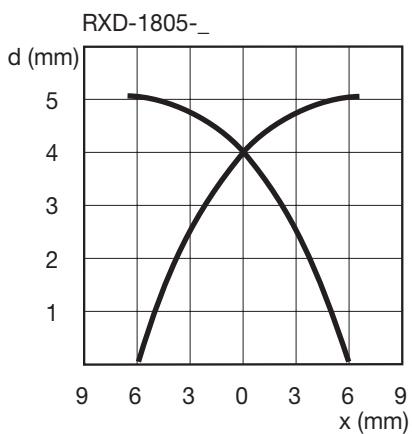
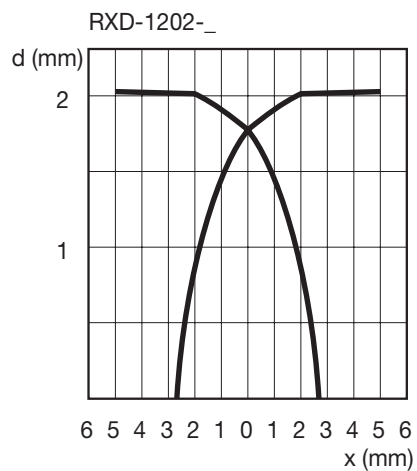
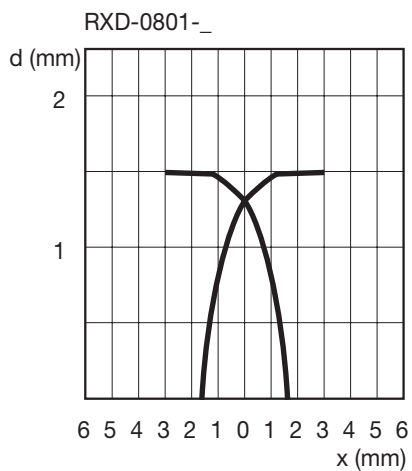
* optional for PU jacket (Cable)

Characteristic Diagram: Sensing Range of the Detectors RXD-.... (typical value)



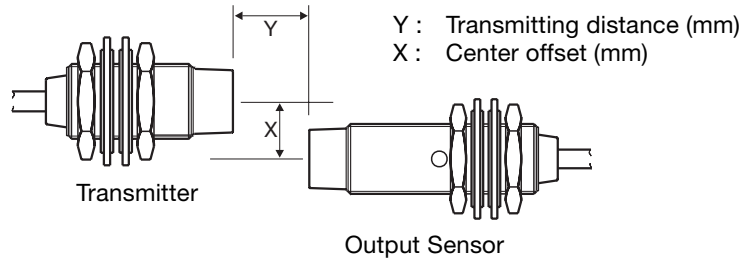
d = Sensing distance
 x = Distance from center

Type	Standard Target
RXD-0801-..	Steel 8 x 8 x 1 mm
RXD-1202-..	Steel 12 x 12 x 1 mm
RXD-1805-..	Steel 18 x 18 x 1 mm
RXD-3010M-..	Steel 30 x 30 x 1 mm

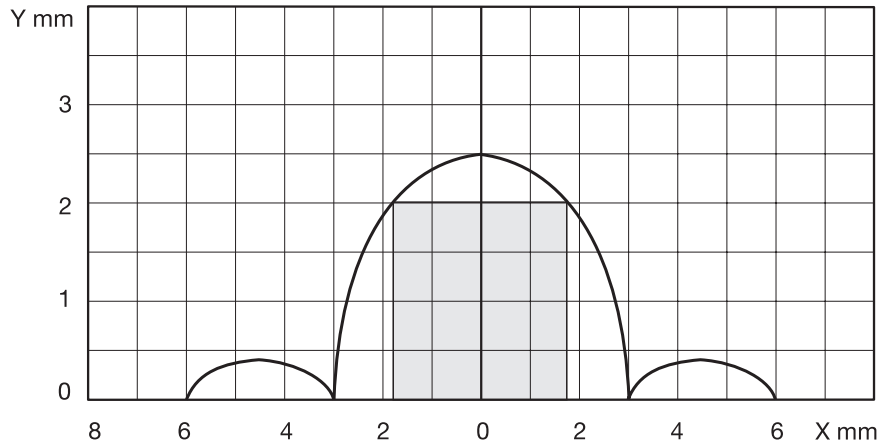


Single Remote Sensor Installation

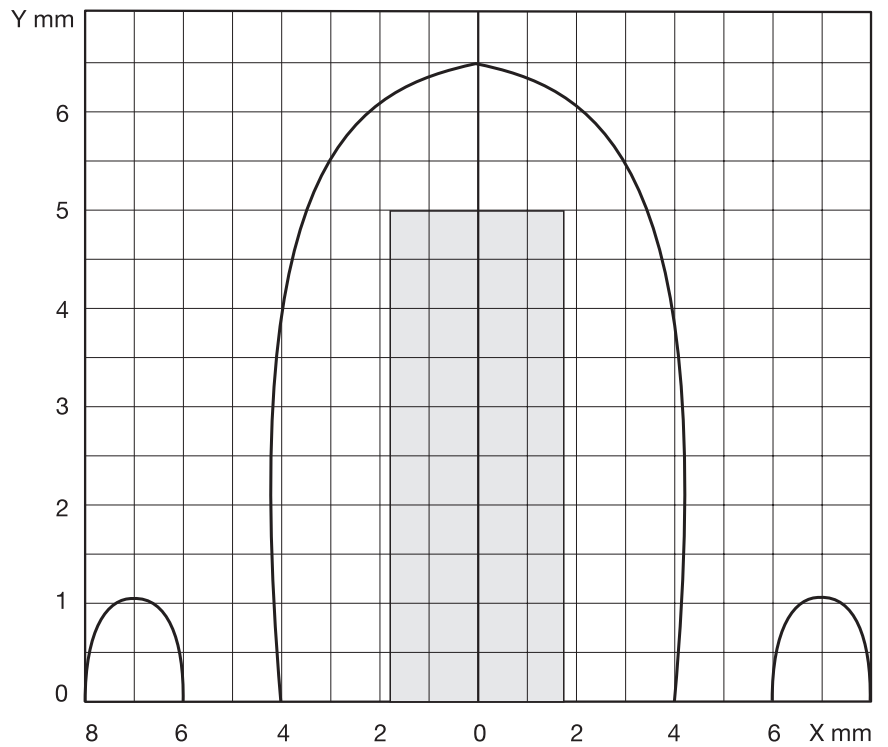
Transmitting area between the Transmitter and the Output Sensor single remote (typical value)



RXT-1202-PU
RXE-1202P-PU



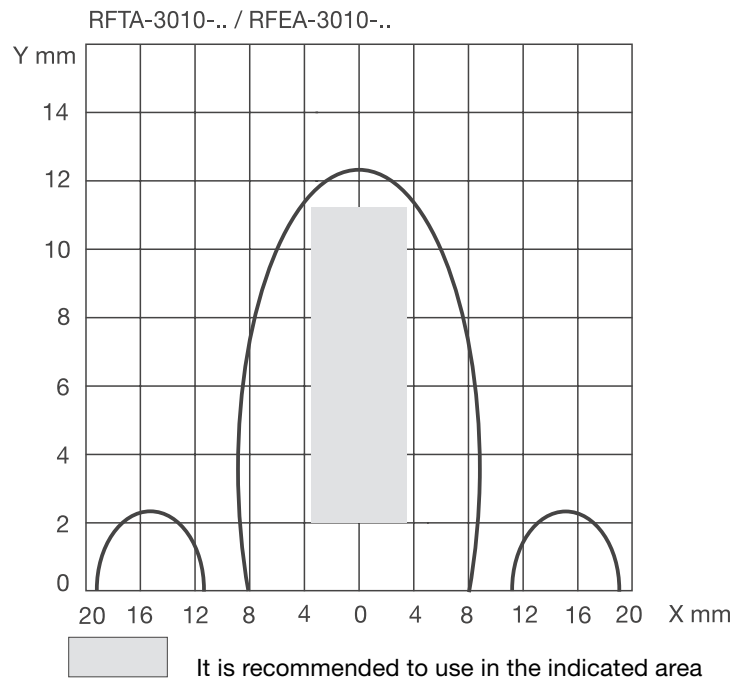
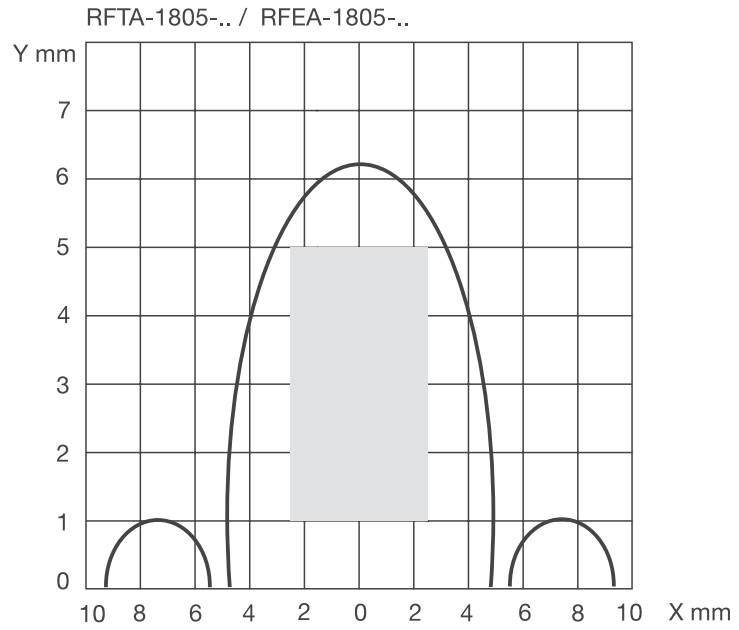
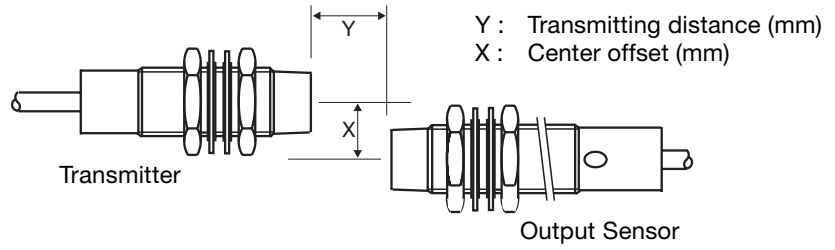
RXT-1805-PU
RXE-1805P-PU



It is recommended to use in the indicated area

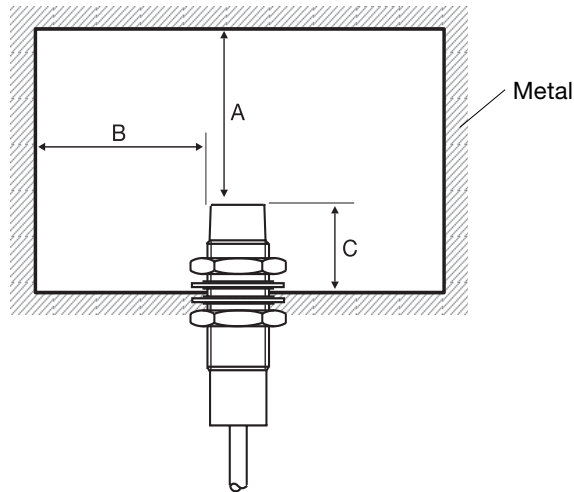
Multiple Remote Sensor Installation

Transmitting area between the Transmitter and the Output Sensor multiple remote (typical value)



Mounting in Metal

When installing in metal, please keep the specified distances from all metal objects to get the rated transmission distances. The transmitting distances may vary due to the surrounding metal, therefore, please pay attention when installing the Transmitter and Output Sensor in metal.



Single Remote

Transmitter	Output Sensor	A mm	B mm	C mm
RXT-1202-...	RXE-1202P-...	-	12 (6)*	12 (0)* Shielded*
RXT-1805-...	RXE-1805P-...	-	18 (9)*	18 (0)* Shielded*

Multiple Remote

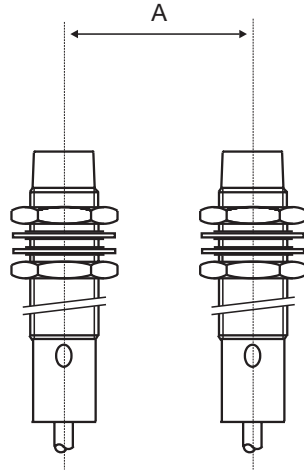
Transmitter	Output Sensor	A mm	B mm	C mm
RFTA-1805	RFEA-1805-..	19 (1)*	18 (9)*	18 (0)* Shielded*
RFTA-3010	RFEA-3010-..	32 (2)*	30 (15)*	30 (0)* Shielded*

* When Shielded mount is indicated in parentheses (), the transmitting distances become the value at Shielded mounted.

Detector	A mm	B mm	C mm
RXD-0801-..	5	4	0
RXD-1202-..	8	6	0
RXD-1805-..	20	9	0
RXD-3010M-..	40	15	0

Mutual Interference

Please keep the below specified spaces to avoid mutual interference when mounting the Detectors, Transmitters, or Output Sensors. The required space for the Transmitter or Output Sensor varies with mounting method.



Transmitter	Output Sensor	A(mm)
RXT-1202-...	RXE-1202-...	100 (20)*
RXT-1805-...	RXE-1805-...	110 (35)*
RFTA-1805-...	RFEA-1805-...	110 (35)*
RFTA-3010-...	RFEA-3010-...	200 (70)*

* The value in () is for shielded

Detector	A(mm)
RXD-0801-..	15
RXD-1202-..	20
RXD-1805-..	35
RXD-3010M-..	70

Tightening Torques

To prevent mechanical damage when installing, the following tightening torques of the mounting nuts should not be exceeded.

Transmitter / Output Sensor	Maximum Tightening Torque
RFTA-1805-.. RFEA-1805-..	200 Nm
RFTA-3010-.. RFEA-3010-..	250 Nm 100 Nm at 10 mm from sensing face
RXT-1... RXE-1...	40 Nm 40 Nm

Detector	Maximum Tightening Torque
RXD-0801-..	40 Nm
RXD-1202-..	100 Nm
RXD-1805-..	200 Nm
RXD-3010M-..	250 Nm 100 Nm at 10 mm from sensing face

Wiring

When wiring please pay attention to the information below:

- Please make the correct wiring with reference to section **Wiring** on page 13.
- Keep the wires away, as far as possible, from high voltage or large current wires to avoid irregular functioning caused by noise.
- Do not bend the cable smaller than the specified radius below:

Transmitter and Output Sensors:	50mm
Detector (RXD-0801)	25mm
Detector (1202/1805/3010M)	30mm

Power Supply

Use a stable voltage power supply, such as, a switch regulator. If an excessive ripple exists it may cause irregular functions so we recommend to use well regulated power.

Mechanical switches

When using the standard mechanical switches as Detectors, please note the following .

- Use a switch designed for a small current
- Use a switch where the leakage current is less than 0.1 mA at an open stage.
- The total circuit resistance for one output of the Transmitter should be less than 1 KOhm, including the cable resistance. (Under these conditions you can connect as many switches as you need to make the AND/OR logic).

Balluff GmbH
Schurwaldstrasse 9
73765 Neuhausen a.d.F.
Germany
Phone +49 (0) 71 58/1 73-0
Fax +49 (0) 71 58/50 10
E-Mail: balluff@balluff.de

BALLUFF

No. 640 813 E • Edition 0408 ; Replaces edition 0107 ; Subject to modification.