

### Remote Systems

In machines and equipment, there is a need for flexible I/O interfaces for applications involving rotating tables, moving pallets, punches, and forming dies. Interfaces of this type require that the sensors follow the movements of the machine. The operation cannot be obstructed by the wiring of the cables. Applications such as this are not possible with fixed or hardwired connections.

The use of the Balluff Remote Systems is a proven technology to solve the problems and demands of flexible automation.

Remote systems allow the transfer of signals to a controller through an air gap without the need for physical contact or hardwiring.

A remote system consists of three components: the output sensor, transmitter, and the detector sensors. The output sensor connects to the power source and inputs of a controller. When power is applied to the output sensor, the coil is energized. When the transmitter is placed within the sensing range, the transmitter is inductively coupled and powered, allowing the transfer of power to the detector sensors. When the detector sensor sees a target, the output produced is transmitted through the transmitter across the air gap to the controller.

- 5.2 Selection Guide
- 5.4 Applications

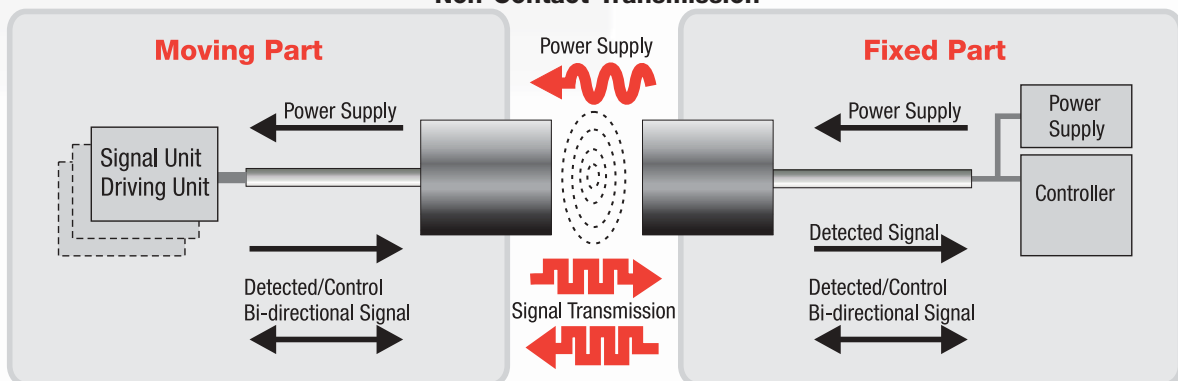
#### Remote Sensor Systems

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- 5.10 G-Power Remotes
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#### Remote Coupler Systems

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### Non-Contact Transmission



## Power Remotes

Transmits 12 Vdc power and signals to/from any input device.

- Can interface to any 12 Vdc input sensor
- Connects to inductive, capacitive, optical, magnetic or mechanical sensors
- Up to 15 signal transmission
- M18, M30, 80x40x22, and 90x90 housings



## G-Power Remotes

Transmits power and signals to/from input and output sensors. 12 Vdc & 24 Vdc models are available.

- Interfaces to any 12 Vdc or 24 Vdc input or output sensor
- Provides up to 300mA of drive current
- Transmits 8 signals
- M30, 40x40 and 90x90 housings



## Analog Remotes

Transmits operating power and 0-10 Vdc analog signal from a single BAW analog sensor.

- Common 18mm tubula housing
- Transmission of 0-10 Vdc analog signal between remote units
- Compatible with most Balluff BAW series sensors in M8 to M30 housings



## Thermal Remotes

Interfaces to standard PT100 resistance sensors and K thermocouples. All signals are transmitted through the air gap and converted to a 4-20mA output signal.

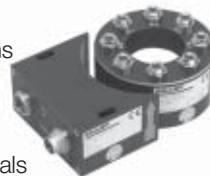
- Connects to standard PT100 resistance sensors or K thermocouples
- Outputs 4-20mA signal to external controller
- M18 housings



## Radial Remotes

Designed specifically for rotating shafts or indexing tables. Contains stationary base unit and rotating sensor unit, transmitting up to 8 signals between the two devices. Ideal for turntables or indexing tables.

- Eliminates slip rings or "cable twist" problems
- Can turn in same direction continuously or in back and forth motion
- Ideal for rotating shafts or indexing tables
- Transmits up to 8 independent discrete signals



## High Power Remote

Transmits power and signals to/from 24 Vdc input and output sensors. Load capacity is up to 1A.

- Utilizes any 24 Vdc input or output sensor
- Provides up to 1A of drive current
- 4 in/4 out & 8 in/8 out models available
- 8 in/8 out model provides up to 1 amp of drive current



# Selection Guide

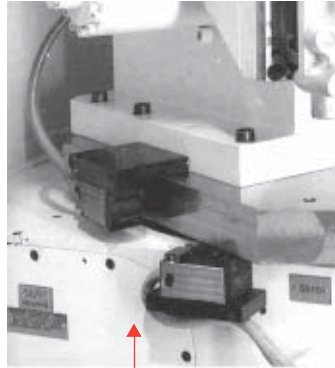
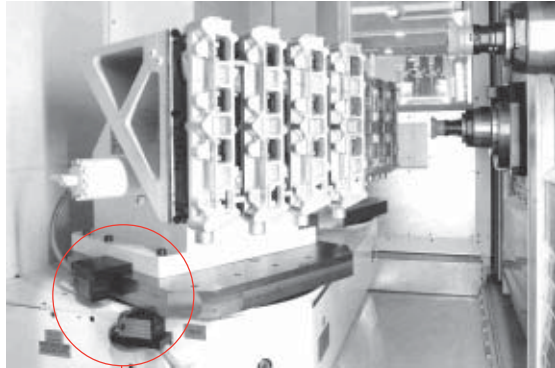
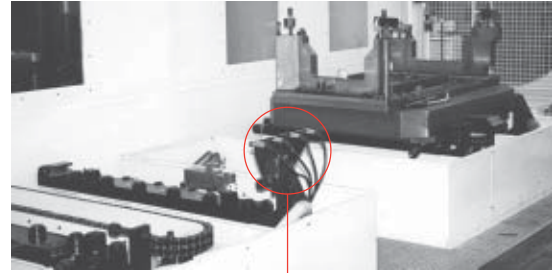
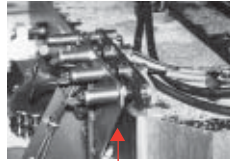
Signals		Series & Drive Current
<b>Remote Sensor System</b>		
X1		<b>Power Remote</b> 30 mA
X4		<b>Power Remote</b> 40 mA
X8		<b>Power Remote</b> 50 mA
X8		<b>Power Remote</b> 100 mA
X15		<b>Power Remote</b> 6.5 mA/Signal
X8		<b>G-Power Remote</b> 150 mA
		200 mA
		300 mA 24 Vdc
X1		<b>Analog Remote</b>
X1		<b>Thermal Remote</b>
X8		<b>Radial Remote</b> 160 mA 24 Vdc
<b>Remote Coupler System</b>		
4x4		<b>High Power Remote</b> 300 mA 24 Vdc
8x8		1A 24 Vdc

Transmission Distance	Compatible Sensors	Transmitter	Output Sensor	Page Number
4 mm	Any DC 3-wire sensor	RPT-1804P/N-PU-01	RPE-1804P/N-PU-02	5.6
4 mm	Any DC 2-wire sensor	RPT-1804D-PU-01	RPE-1804P/N-PU-02	5.6
8 mm	Any DC 3-wire sensor	RPT-3008P/N-PU-01	RPE-3008P/N-PU-02	5.6
8 mm	Any DC 2-wire sensor	RPT-3008D-PU-01	RPE-3008P/N-PU-02	5.6
3 mm	Any DC 3-wire sensor	RPTA-1803-PU-01	RPEA-1803P/N-PU-02	5.7
5 mm	Any DC 3-wire sensor	RPTA-3005-PU-01	RPEA-3005P/N-PU-02	5.7
10 mm	Any DC 3-wire sensor	RPTA-FX406-PU-01	RPEA-FX406P/N-PU-02	5.8
15 mm	Any DC 3-wire sensor	RPTA-8010-PU-01	RPEA-8010P/N-PU-02	5.8
5 mm	Any DC 2-wire sensor	RPT15-3005D-PU-01	RPE15-3000P/N-PU-02	5.9
5 mm	Any DC 3-wire sensor	RGPT-3005-V1215-PU-01	RGPE-3005-V1215N/P-PU-02	5.10
8 mm	Any DC 3-wire sensor	RGPT-4008-V1220A/B-PU-01	RGPE-4008-V1220P/NA/B-PU-02	5.10
12 mm	Any DC 3-wire sensor	RGPT-9012-V2430-PU-01	RGPE-9012-V2430P/N-PU-02	5.11
2.5 mm	BAW sensors	RNT-1803-VS10-PU-01	RNE-1803A-PU-02	5.12
4 mm	PT-100	RTT-1804-PT1B__PU-01	RTE-1804E-PU-02	5.13
2 mm	Any DC 3-wire sensor	RPTM-4502P/N-S49	RPEM-4502P/N-ST	5.15
10 mm	Any DC 3-wire sensor and actuators	RHPT8-8010P/N-C3-PU01	RHPE8-8010N/P-C3-PU-02	5.16
6 mm	Any DC 2- and 3-wire sensor and actuators	RHPT-8010-V2410-PU-01 RHP16TN-RS01	RHPE-8010-V2410-PU-02 RHP16EN-RS01	5.17

### Workpiece position sensing in a machining center

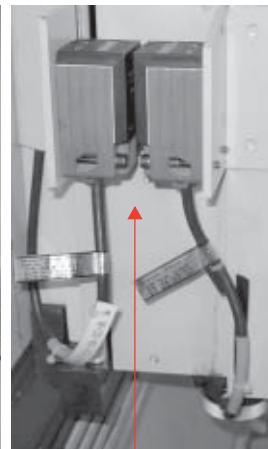
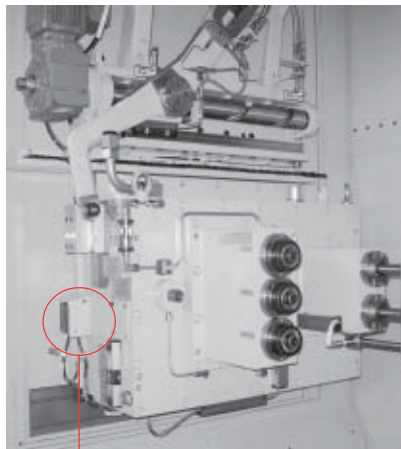
To manage the variety of parts, autonomous sensing of the workpieces on the existing pallet was implemented using a remote system.

Up to 16 sensors detect the positions and recognize the part to be machined based on certain features. After loading, the pallet is brought into the machining area. The information gathered is used to define the machining program in the machining center.



### Monitoring clamping jaws in the work area of a 2-spindle machining center

Monitoring of the clamping jaws is possible even during machining with the G-Power-Remote systems. Eight sensors transmit information without contact on the swinging table with two rotary indexing tables. Power for the sensor functionality is also inductively coupled. The separable inductive coupling of power and signals allows a high degree of flexibility in machining centers.



### Monitoring slide settings on an interchangeable drill head

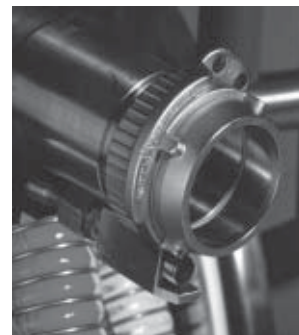
The G-Power-Remote System supplies the inductive sensors with power and handles sending back of the sensor information.

When the drill head is automatically changed, no connection points need to be disconnected. The inductive "G-Power Remote" provides for quick separation.



### Secure connection – application at Böhringer Ingelheim Pharma KG

The distribution of liquid products in chemical plants is often associated with risk, since different materials have to be filled into tanks using hose terminals and coupling stations.



A valveless circuit without the proper connection of the hose can lead to disastrous results. By using a remote system for automatic process monitoring, assurance can be provided that the hose is in fact connected.



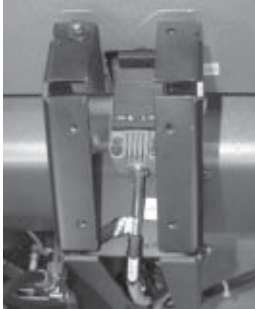
Signal transmission is made without contact between the moving drum and the associated stand in two latchable positions. The connection is verified by an inductive sensor.



### Monitoring clamping jaw function

The function of the clamping jaws is monitored from the first moment the sheet is clamped.

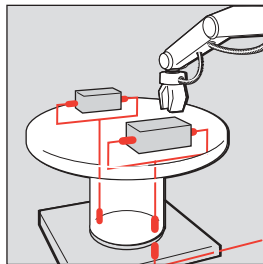
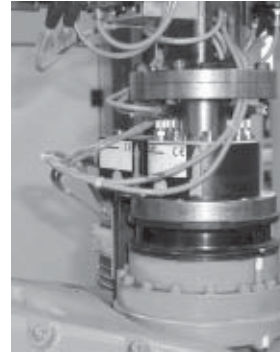
If the position is correct, the handling system moves the complete table into the working area of the machine. The sensors mounted on the table are powered by the G-Power-Remote system. The information is inductively coupled to the output sensor, which passes the signals to the controller.



Robots are indispensable for precise loading and unloading of parts on a machining center.

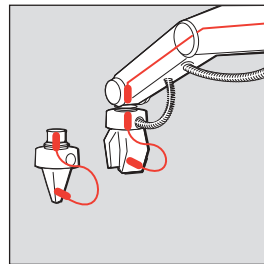
The high rate of motion of the gripper often leads to problems with the sensor cabling. Federal Mogul Friedberg GmbH has taken on the problem and installed a Radial Power Remote System at the gripper-robot arm interface. The energy for powering the sensors as well as the position information is inductively coupled.

This concept ensures reliable transmission whether stopped or in motion.



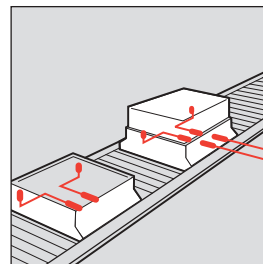
### Indexing table

The sensor determines whether the workpiece is in the correct position and sends the signals without contact.



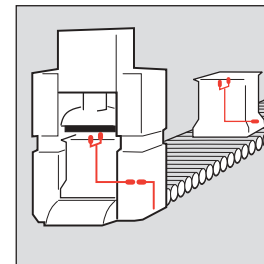
### Robot gripper

The sensor determines whether the workpiece was captured by the gripper. The switching state of the sensors is transmitted without contact.



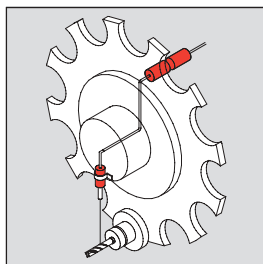
### Material flow

The sensor detects the presence of parts on moving objects.



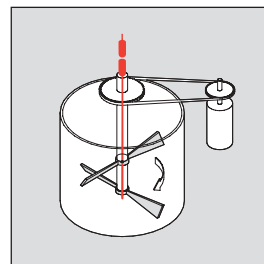
### Presses

The sensor detects the presence of the material, sends the signals back without contact and together with the controller positions the sheet in the proper location.



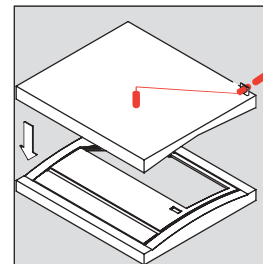
### Tool changers

Verifying presence of a tool in a tool changer. If the tool is not present, mechanical damage may be the result.



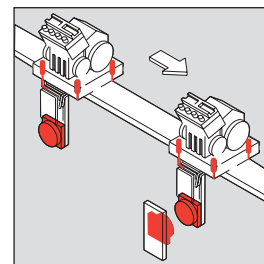
### Temperature sensing

Temperature sensing in a stirring tank.



### Material detection

Material detection and monitoring of the ejected part in a mold.



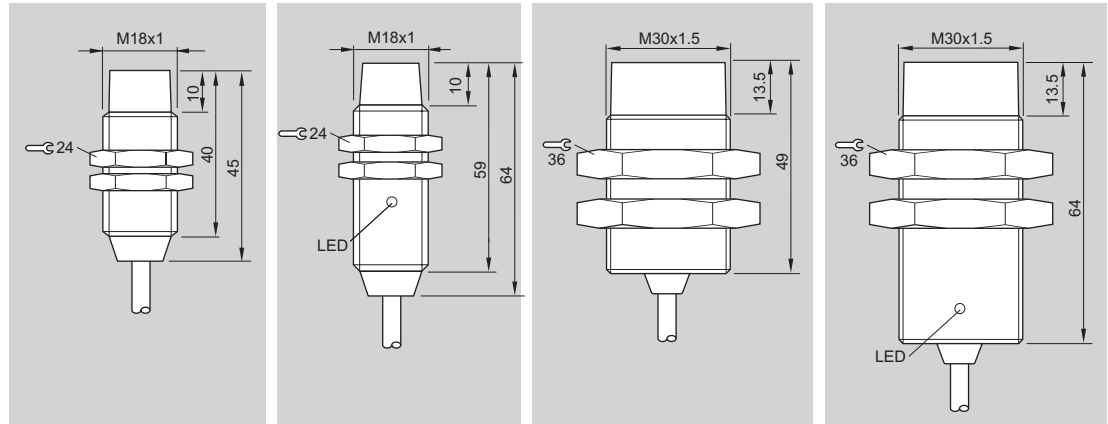
### Inductive coupling

Inductive sensors can be used to identify the workpiece and determine its position by its shape and size. The Remote System transmits this information to the stationary size by means of inductive coupling. The separable mechanical interface is thus bridged.

**Transmitter ←····· Output Sensor**

**Transmitter ←····· Output Sensor**

Number of Signals	1 Signal	1 Signal	1 Signal	1 Signal
Housing Size	<b>M18 X 1</b>	<b>M18 X 1</b>	<b>M30 X 1.5</b>	<b>M30 X 1.5</b>
Mounting	non-flush	non-flush	non-flush	non-flush
Transmission Distance	<b>0...4.0 mm</b>		<b>1.0...8.0 mm</b>	



Transmitter				
For 3 wire PNP sensors	RPT-1804-P-PU-01		RPT-3008-P-PU-01	
For 3 wire NPN sensors	RPT-1804-N-PU-01		RPT-3008-N-PU-01	
For 2 wire sensors	RPT-1804-D-PU-01		RPT-3008-D-PU-01	
Output Sensor				
PNP Output		RPE-1804-P-PU-02		RPE-3008-P-PU-02
NPN Output		RPE-1804-N-PU-02		RPE-3008-N-PU-02

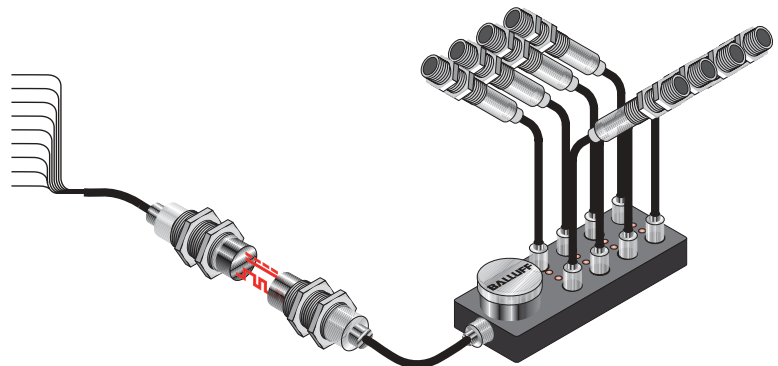
Rated operational voltage		24 Vdc ± 5%		24 Vdc ± 5%
Drive current	≤ 30mA		≤ 30mA	
Drive voltage	12 Vdc ± 5%		12 Vdc ± 5%	
Center off-set	≤ ± 2 mm		≤ ± 3 mm	
Short circuit protection		yes		yes
Current consumption		≤ 150mA		≤ 150mA
Load capacity		max. 50mA		max. 50mA
Operation frequency		25 Hz		25 Hz
Ambient temp. range		0..+50° C		0..+50° C
Function indication		yes		yes
CE approval (max 10M)	yes	yes	yes	yes
Environmental protection (per IEC529)	IP 67	IP 67	IP 67	IP 67
Housing material	nickel plated brass	nickel plated brass	nickel plated brass	nickel plated brass
Sensing face material	ABS + PBT	ABS + PBT	ABS + PBT	ABS + PBT
Cable material	PU	PU	PU	PU
Cable length/diameter/AWG	1M, 5 mm, 3X22 AWG	2M, 5 mm, 3X22 AWG	1M, 5 mm, 3X22 AWG	2M, 5 mm, 3X22 AWG

**Notes:**

Detector should have the following rating:  
 (1) Operating voltage: 12 Vdc ± 1.5 V  
 (2) Current consumption: less than the available drive current.

The type of transmitter depends on the detector type.

Drive current varies depending on the transmission distance and center off-set. (see page 5.21 for transmitting diagram)



This diagram shows the Power Remote System with eight detector sensors. The detector sensors can be any type of standard DC sensor. Available for 1, 4, 8 and 15 detector systems. Optional junction box for quick and easy wiring is available.

# Remote Sensor Systems

## Remote Systems

4 Signal Power Remotes M18 - M30

Transmitter ←..... Output Sensor

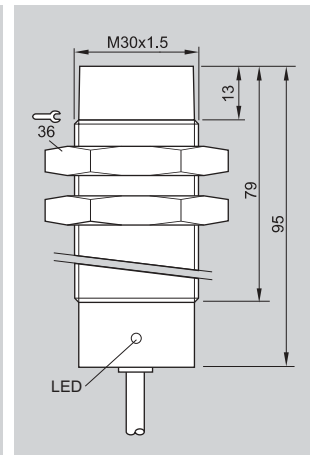
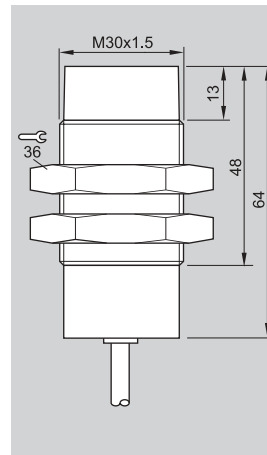
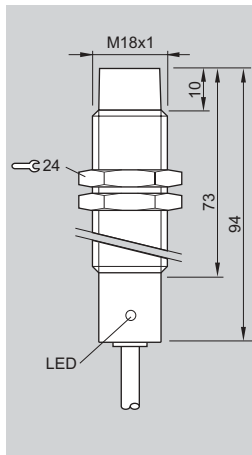
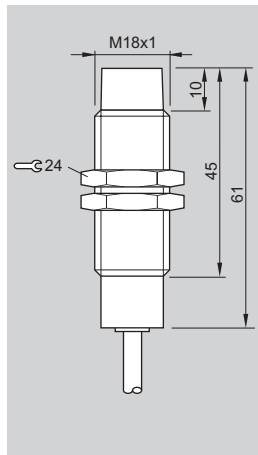
Transmitter ←..... Output Sensor

Number of Signals	4 Signals
Housing Size	<b>M18 X 1</b>
Mounting	non-flush
Transmission Distance	<b>0.5...3.0 mm</b>

Number of Signals	4 Signals
Housing Size	<b>M18 X 1</b>
Mounting	non-flush
Transmission Distance	<b>1.0...5.0 mm</b>

Number of Signals	4 Signals
Housing Size	<b>M30 x 1.5</b>
Mounting	non-flush
Transmission Distance	<b>1.0...5.0 mm</b>

Number of Signals	4 Signals
Housing Size	<b>M30 X 1.5</b>
Mounting	non-flush
Transmission Distance	<b>1.0...5.0 mm</b>



Transmitter				
For any standard sensor	RPTA-1803-PU-01		RPTA-3005-PU-01	
Output Sensor				
PNP Output		RPEA-1803-P-PU-02		RPEA-3005-P-PU-02
NPN Output		RPEA-1803-N-PU-02		RPEA-3005-N-PU-02

Rated operational voltage		24 Vdc ± 5%		24 Vdc ± 5%
Drive current	≤ 30mA		≤ 40mA	
Drive voltage	12 Vdc ± 1.5V		12 Vdc ± 1.5V	
Center off-set	± 2 mm		± 3 mm	
Short circuit protection		yes		yes
Current consumption		≤ 170mA		≤ 150mA
Load capacity		max. 50mA (per output)		max. 50mA (per output)
Operation frequency		30 Hz		30 Hz
Ambient temp.range		0..+50° C		0..+50° C
Funtion indication		yes		yes
CE approval	yes	yes	yes	yes
Environmental protection	IP 67	IP 67	IP 67	IP 67
Housing material	nickel plated brass	nickel plated brass	nickel plated brass	nickel plated brass
Sensing face material	ABS + PBT	ABS + PBT	ABS + PBT	ABS + PBT
Cable material	PU	PU	PU	PU
Cable length/diameter/AWG	1M, 7 mm, 7X22 AWG	2M, 7 mm, 7X22 AWG	1M, 7 mm, 7X22 AWG	2M, 7 mm, 7X22 AWG

A DC 2 wire transmitter is available upon request if using a DC 2 wire sensor.

### Notes:

Detector should have the following rating:

- (1) Operating voltage: 12 Vdc ± 1.5 V
- (2) Current consumption: less than the available drive current.

Drive current varies depending on the transmission distance axis tolerance. (see page 5.21 for transmitting diagram)

Terminal blocks for detectors/transmitters are available as options. (see pages 5.18-5.20 for terminal blocks)



Remote Systems

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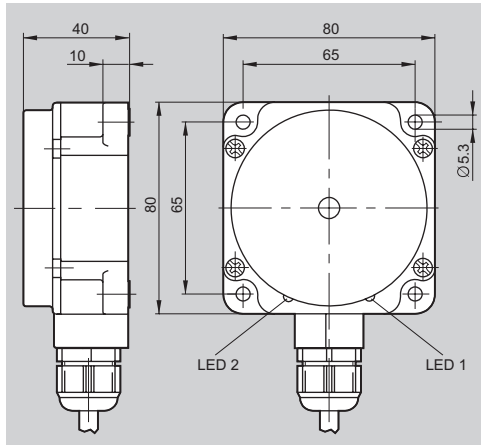
6 Connectors

7 Accessories

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	Transmitter ←.....	Output Sensor
Number of Signals	8 Signals	
Housing Size	<b>L80 X W80 X H40</b>	<b>L80 X W80 X H40</b>
Mounting	non-flush	
Transmission Distance	<b>2.0...15.0 mm</b>	



Transmitter		
For any DC 3-wire sensor	RPTA-8010-PU-01	
Output Sensor		
PNP Output		RPEA-8010-P-PU-02
NPN Output		RPEA-8010-N-PU-02
Rated operational voltage		24 Vdc ± 5%
Drive current	≤ 100mA	
Drive voltage	12 Vdc ± 1.5V	
Center off-set	± 6 mm	
Short circuit protection		yes
Current consumption		≤ 300mA
Load capacity		max. 50mA (per output)
Operation frequency		30 Hz
Ambient temperature range		0..+50° C
Funtion indication		yes
CE approval (max 10M)	yes	yes
Environmental protection	IP 67	IP 67
Housing material	Nylon	Nylon
Sensing face material	Nylon	Nylon
Cable material	PU	PU
Cable length/diameter/AWG	1M, 7mm, 12X26 AWG	2M, 12mm, 12x22 AWG

A DC 2 wire transmitter is available upon request if using a DC 2 wire sensor.

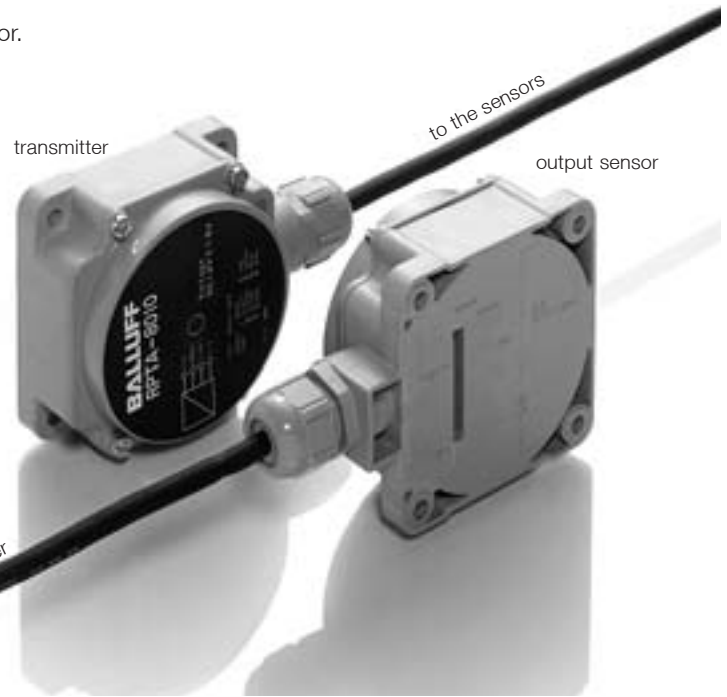
**Notes:**

Detector should have the following rating:

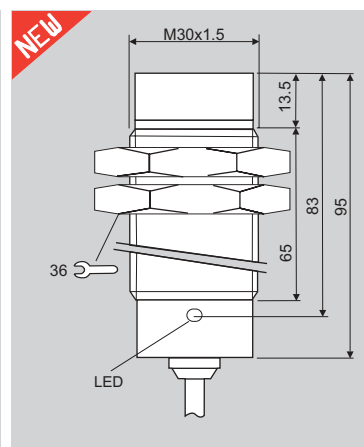
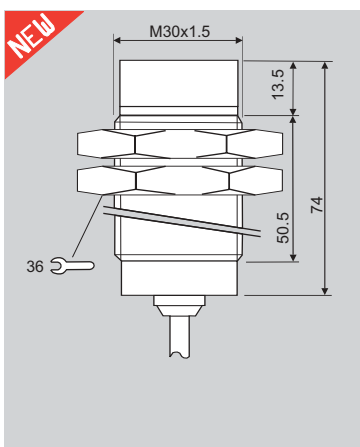
- (1) Operating voltage: 12 Vdc ± 1.5 V
- (2) Current consumption: less than the available drive current.

Drive current varies depending on the transmission distance axis tolerance. (see page 5.21 for transmitting diagram)

Terminal blocks for detectors/transmitters are available as options. (see pages 5.18-5.20 for terminal blocks)



	Transmitter ←.....	Output Sensor
Number of Signals	15 Signals	
Housing Size	<b>M30 X 1.5</b>	<b>M30 x 1.5</b>
Mounting	non-flush	non-flush
Transmission Distance	<b>1.0...5.0 mm</b>	



Transmitter		
For 2-wire detector sensors	RPT15-3005D-PU-01	
Output Sensor		
PNP Output		RPE15-3000P-PU-02
NPN Output		RPE15-3000N-PU-02
Rated operational voltage		24 Vdc ± 10%
Drive current	5.0...6.5mA (per switch)	
Drive voltage	12 Vdc ± 1.5V	
Center off-set	≤ ± 2.5 mm	
Short circuit protection		yes
Current consumption		≤ 500mA
Load capacity		max. 50mA (per output)
Operation frequency		20 Hz
Ambient temperature range	0..+50° C	0..+50° C
CE approval (max 10M)	yes	yes
Environmental protection	IP 67	IP 67
Housing material	nickel plated brass	nickel plated brass
Sensing face material	ABS + PBT	ABS + PBT
Cable material	PU	PU
Cable length/diameter/AWG	1m, 8.6mm, 2x0.5, 16x0.18/PUR	2m, 8.6mm, 2x0.5, 16x0.18/PUR

#### Notes:

Detectors should have the following rating for DC 2-wire sensors:

(1) Operating voltage: 12 Vdc ± 1.5 V

(2) Load capacity (current): 5.0mA

Mechanical limit switches with LED are connectable.

(Provided the switches are designed such that LED lights with operating voltage 12 Vdc/5mA and leakage current is less than 0.5mA).

Both DC 2-wire proximity switch and mechanical limit switch can be connected with the same transmitter.

Drive current varies depending on the transmission distance and center off-set. (see page 5.21 for transmitting diagram)

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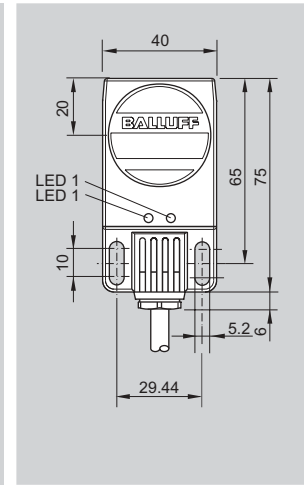
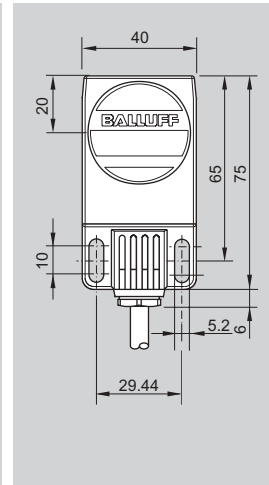
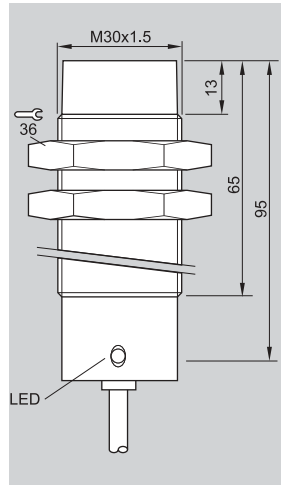
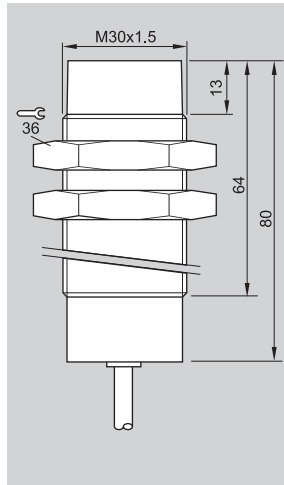
Connectors

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	Transmitter ←..... Output Sensor	Transmitter ←..... Output Sensor
Number of Signals	8 Signals	8 Signals
Housing Size	<b>M30x1.5</b>	<b>40x40x75</b>
Mounting	non-flush	non-flush
Transmission distance	<b>2...5 mm</b>	<b>3...8 mm</b>



Transmitter				
For any DC 3-wire sensor	RGPT-3005-V1215-PU-05		RGPT-4008-V1220-A*-PU-05	
OutputSensor				
PNP Output		RGPE-3005-V1215P-PU-05		RGPE-4008-V1220P-A*-PU-05
NPN Output		RGPE-3005-V1215N-PU-05		RGPE-4008-V1220N-A*-PU-05
Rated operational voltage		24 Vdc ±10%		24 Vdc ± 10%
Drive current	150 mA		200 mA	
Drive voltage	12 V ± 1.5 Vdc		12 V ± 1.5 Vdc	
Center off-set	± 3mm		± 3 mm	
Short circuit protection		yes		yes
Current consumption		≤400 mA		≤500 mA
Load capacity		max. 50 mA (Per output)		max. 50 mA (Per output)
Operation frequency		60Hz		60Hz
Ambient temp. range		0...+50° C		0...+50° C
Function indication		yes		yes
CE approval		yes		yes
Environmental protection		IP 67		IP 67
Housing material		Nickel plated brass		Nickel plated brass
Sensing face material		ABS + PBT		ABS + PBT
Cable material		PU		PU
Cable length/diameter/AWG		8.3 mm, 2x0.5 9x0.18/PUR		8.3 mm, 2x0.5 9x0.18/PUR

### Notes:

Standard cable length 5m.

Detector should have the following rating:

- Operating voltage: 12 Vdc ± 1.5 V (RGPT-3005, RGPT-4008)  
24 Vdc ± 1.5 V (RGPT-9012)
- Current consumption: the total current consumption of switches are less than the available drive current.

Drive current varies depending on the transmission distance and center off-set. (see page 5.21 for transmitting diagram)

Terminal blocks for detectors/transmitters are available as options. (see pages 5.18-5.20 for terminal blocks)

\*For model RGPT4008/RGPE 4008

select from **A** or **B**

Version A: active surface front

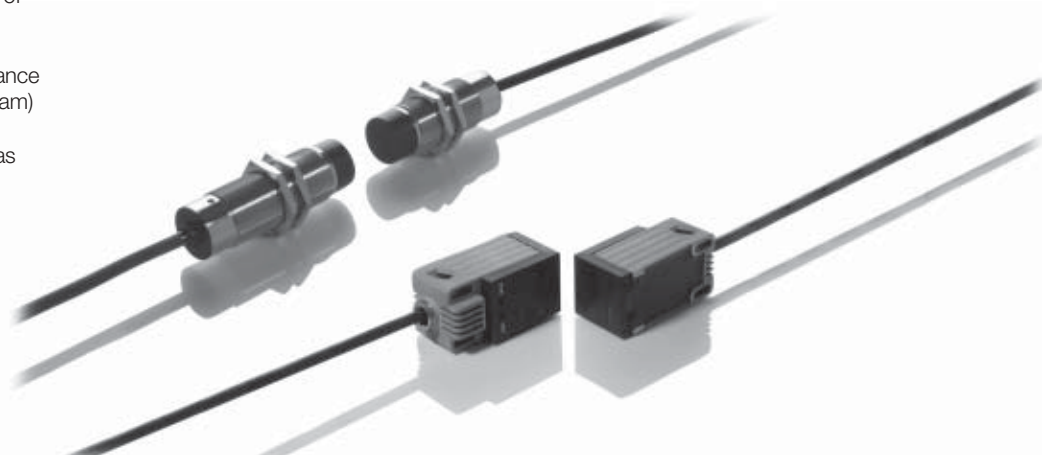
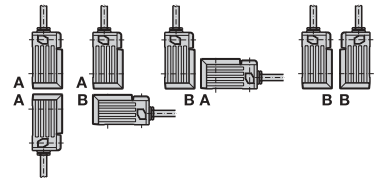
Version B: active surface side

Ordering example: RGPE 4008-V1220P-A-PU-05

RGPE-4008-V1220P-B-

RGPT-4008-V1220-B-

-V1220-A-



# Remote Sensor Systems

## Remote Systems

G-Power Remote Sensors  
Pancake Style  
for max. 8 sensors

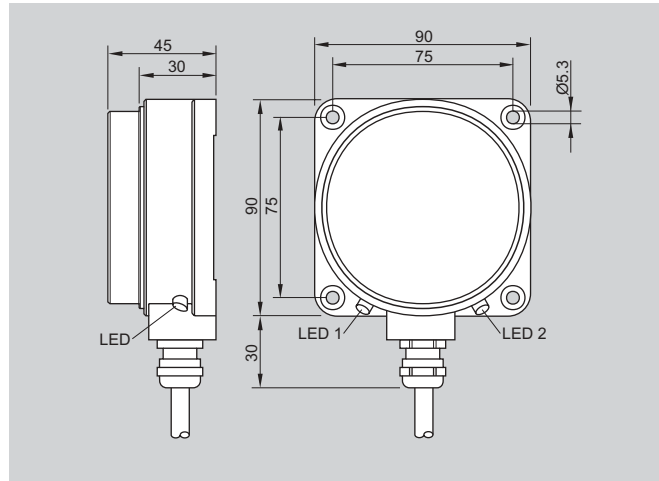
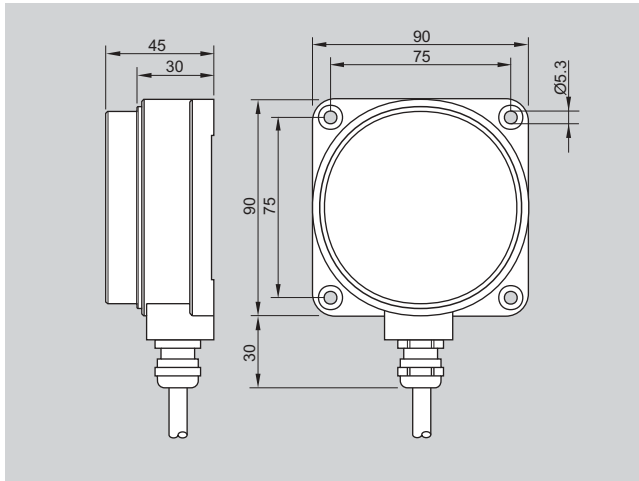
### Transmitter



### Output Sensor

8 Signals  
**90x90x45**  
non-flush  
**4...12 mm**

**90x90x45**  
non-flush



RGPT-9012-V2430-PU-05

RGPE-9012-V2430P-PU-05  
RGPE-9012-V2430N-PU-05

300 mA  
24 V ± 1.5 Vdc  
± 7mm

24 Vdc ± 10%

yes  
≤ 1.5 mA  
max. 50 mA (Per output)  
60Hz

0...+50° C

yes

yes

IP 67

Aluminum

ABS + PBT

PU

8.3 mm, 2x0.5 16x0.18/PUR

# Remote Systems

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	Transmitter ←.....	Output Sensor
Housing size	<b>M18x1</b>	<b>M18x1</b>
Mounting	non-flush	non-flush
Transmission distance	<b>0...2.5 mm</b>	

### Single Analog-Remote Sensor

Not only digital switchpoints can be detected with a Remote System. Now you can also process analog signals.

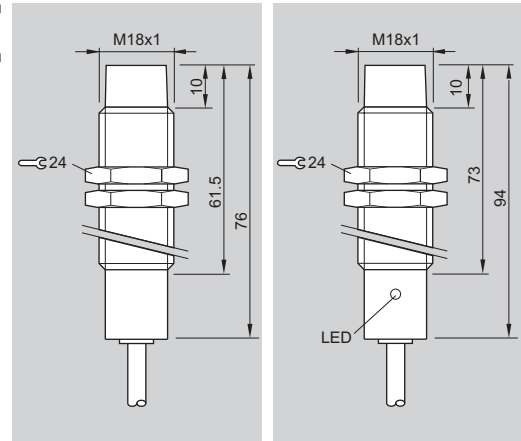
The necessary energy for the analog sensor Series BAW with a voltage output of 0...10 V is provided inductively and the sensor's analog signal is sent back over the same air gap.

The use of BAW sensors for moving components is now possible, for example in monitoring the clamping distance during processing. The transmitter and output sensor built into the axis transmit the energy and information regardless of the rotational speed.

**Note:**

Use the analog sensors which fulfill the specifications below:

- (1) Output voltage: 0...10V
- (2) Operating voltage: 16...24 Vdc
- (3) Current consumption: ≤ 10mA

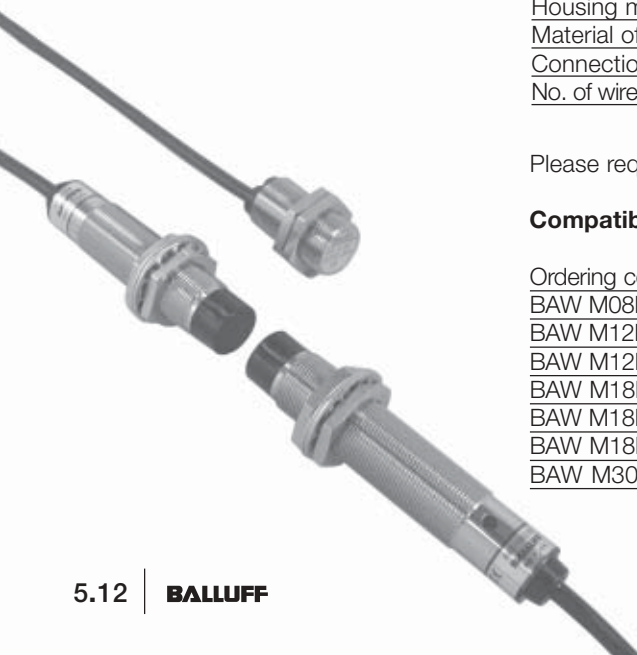


Transmitter		RNE 1803A-PU-05
Output sensor	RNT 1803-VS10-PU-05	
Supply voltage $U_B$ incl. ripple		24 Vdc $\pm 5\%$
Output signal		voltage 0...10 Vdc
No-load supply current $I_0$ max.		≤ 150 mA
Short circuit protected		yes
Contamination class	3	3
Tightening torque	40 Nm	40 Nm
Radial offset	$\pm 2$ mm	
Operating current (for sensor)	≤ 10 mA	
Output voltage (for sensor)	18 $\pm 1.5$ Vdc	
Rated insulation voltage $U_i$	75 Vdc	
Voltage input	0...10 Vdc	
Load resistance $R_L$		≥ 10 k $\Omega$
Max. non-linearity		≤ $\pm 0.8\%$ of $U_a$ max.
Resolution	≤ $\pm 0.05$ Vdc	≤ 0.1 %
Temperature drift		≤ $\pm 0.05\%$ /°C
Response time		≤ 0.2 s
Ambient temperature range $T_a$	0...+60 °C	0...+60 °C
Function indication		yes
Degree of protection per IEC 60529	IP 67	IP 67
Housing material	CuZn nickel plated	CuZn nickel plated
Material of sensing face	ABS/PBT	ABS/PBT
Connection	5 m, PUR	5 m, PUR
No. of wires x gauge	3 x 0.34 mm <sup>2</sup>	3 x 0.34 mm <sup>2</sup>

Please request the user's manual for your electronic design and layout.

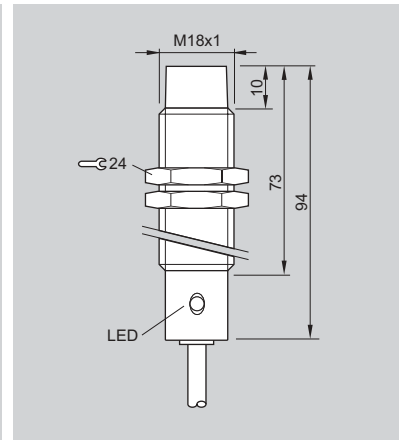
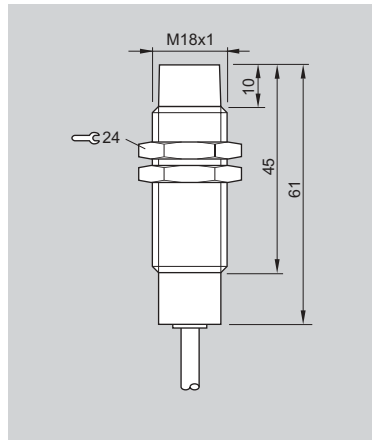
### Compatible analog sensors

Ordering code	Housing size	Output signal	Linear range s
BAW M08EI-UAD15B-	M8x1	0...10 V	0.5 ... 1.5 mm
BAW M12MG2-UAC20B-	M12x1	0...10 V	0.5 ... 2.0 mm
BAW M12MF2-UAC40F-	M12x1	0...10 V	1.0 ... 4.0 mm
BAW M18MI-UAC50B-S04G	M18x1	0...10 V	1.0 ... 5.0 mm
BAW M18ME-UAC50B-	M18x1	0...10 V	1.0 ... 5.0 mm
BAW M18MG-UAC80F-S04G	M18x1	0...10 V	2.0 ... 8.0 mm
BAW M30ME-UAC10B-S04G	M30x1.5	0...10 V	2.0 ... 10.0 mm



	Transmitter ←	Output Sensor
Number of Signals	1	
Housing Size	<b>M18 x 1</b>	<b>M18 x 1</b>
Mounting	flush/non-flush	flush/non-flush
Transmission Distance	<b>1.0...4.0 mm</b>	

These sensors are for use with Pt 100 resistance thermometer sensors.



Temperature measurement range		RTE-1804E-PU02
0... 100° C	RTT-1804-PT1B10-PU01	
0... 200° C	RTT-1804-PT1B20-PU01	
0... 300° C	RTT-1804-PT1B30-PU01	
Rated operational voltage incl. ripple		24 Vdc ± 5%
Output Signal		4...20mA
Current consumption		≤ 150mA
Short circuit protected		yes
Contamination class	3	3
Tightening torque	40 Nm	40 Nm
Radial offset	≤ ± 2.5 mm	
Resolution	≤ 0.5 C	
Response delay	0.5 sec.	
Load resistance		≤ 400 Ω
Standard accuracy		≤ ± 0.8%
Temperature drift		≤ ± 0.04% /°C
CE approval (max.10m)	Yes	Yes
Operating temperature range	0... +60° C	
Operating humidity range	35...95%RH	
Storage temperature range	-25...+70° C	
Protection class	IP 67	IP 67
Function indication		Inzone indication
Housing material	nickel plated brass	nickel plated brass
Sensing face material	ABS+PBT	ABS+PBT
Connection	PUR 5 m	PUR 5 m
No. of wires x gauge	3 x 0.3 mm <sup>2</sup>	3 x 0.3 mm <sup>2</sup>

#### Notes:

As a detector, use the resistance thermometer sensors Pt 100 (3 wire type) according to JIS standard.

The temperature range of measurement is allowed;

RTT-1804-PT1B10-PU: 0...100°C

RTT-1804-PT1B20-PU: 0...200°C

RTT-1804-PT1B30-PU: 0...300°C

Current output is current source, therefore connect the load between output and negative.

A K thermocouple transmitter is available upon request.

## Non-contact energy and data transmission

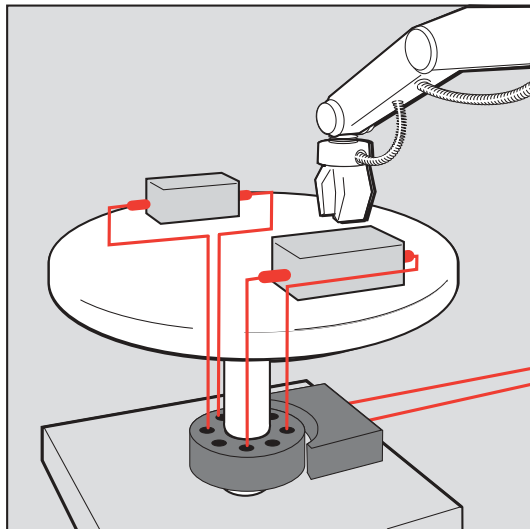
This system features modular construction for non-contact transmission of energy for supplying up to 8 PNP sensors on rotating shafts, axles, or tables.

The switching states of the sensors are transmitted over the air gap to the stationary component. The system works independent of rotation speed, and transmission is assured even under the harshest ambient conditions.

Since no mechanically contacting components are used, this technology significantly reduces service and maintenance work.

### Benefits

- Eliminates slip rings
- Intelligent, compact, and noise-immune system; inductive, non-contact, no wear
- For connecting up to 8 sensors
- Integrated energy supply for the detectors
- Just plug in, turn on, and process data



Size
Type
Transmission distance
Installation



Transmitter
Output sensor PNP (without connectors)
Output sensor PNP in Package* (with connectors)

Supply voltage $U_B$ incl. ripple
Voltage drop
Load current per output
Current consumption
Leakage current
Radial offset
Operating current
Output voltage
Nominal isolation voltage $U_i$
Switching frequency $f$
Ambient temperature $T_a$
Function/power indicator
Enclosure rating
Protection class
Contamination class
CE approval
Housing material
Active surface material
Connection type

\*Included: Output sensor with 3-pole connector BKS-S 96-PU-05 and 12-pole connector BKS-S 97-PU-05

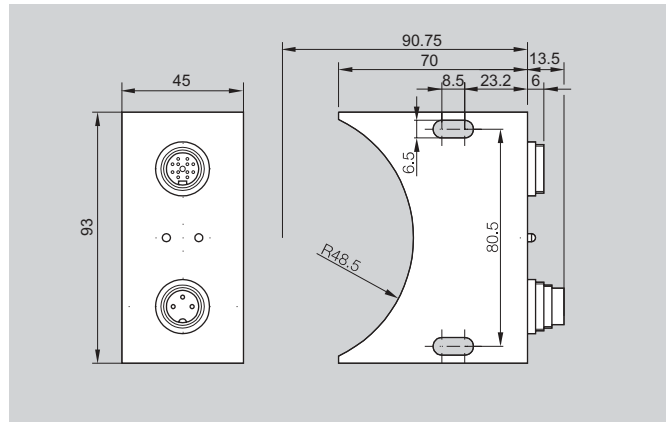
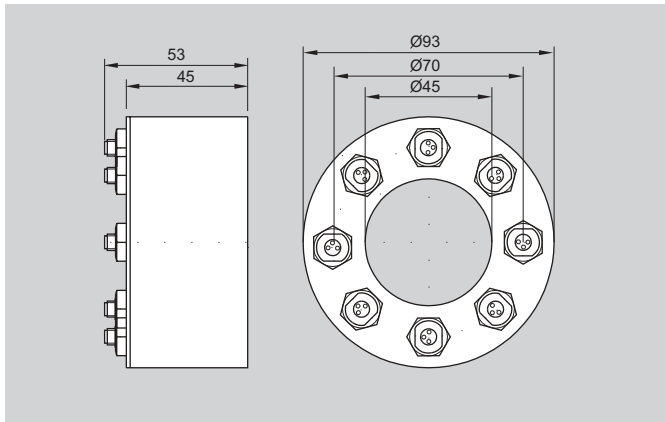
# Remote Sensor Systems

## Remote Systems

Power Remote Sensor  
Type Radial System  
for max. 8 sensors PNP

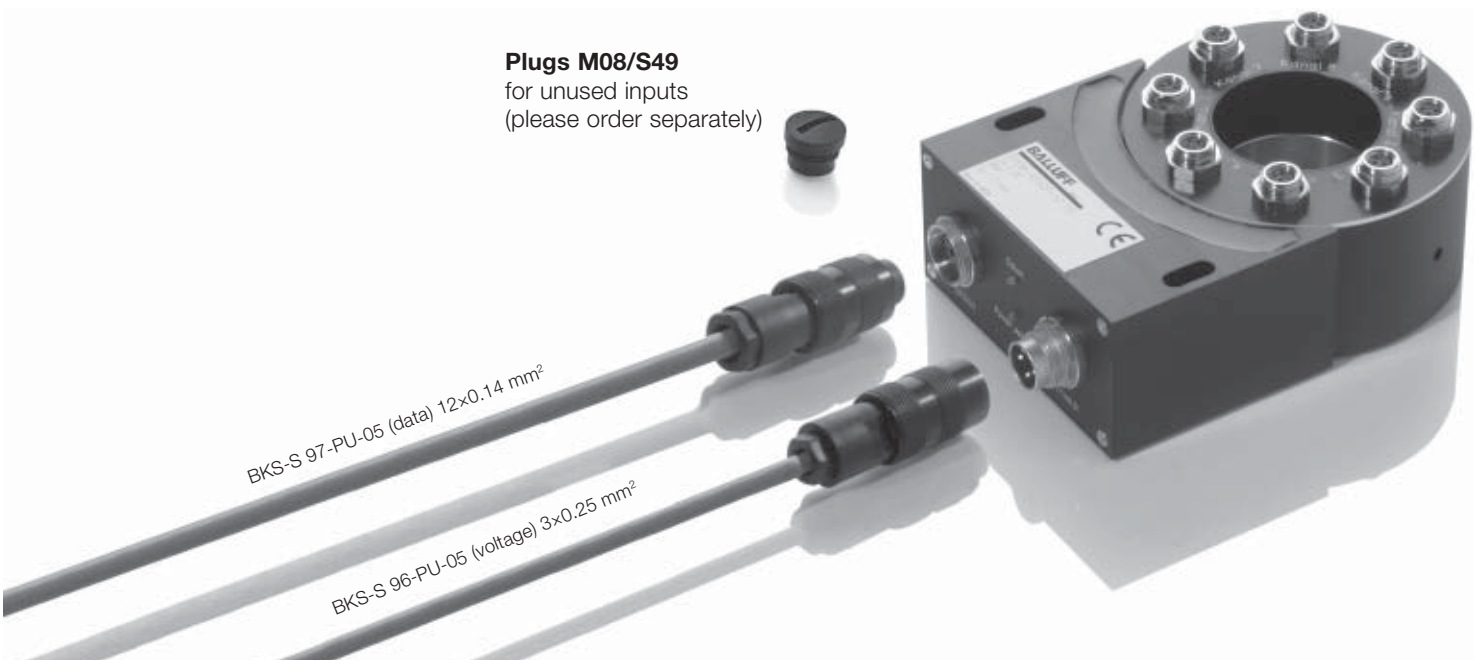
Remote Systems

<b>Ø 93</b>	<b>93 x 83 x 45</b>
Transmitter	Output sensor
<b>0...2 mm</b>	
on shaft Ø = 45 mm	stationary



RPTM-4502P-S 49	RPEM-4502P-ST RPEM-4502P-ST05
	24 Vdc ± 5 %
	≤ 1.5 V
	30 mA
	0.7 mA
	0.05 mA
	±1 mm
±1 mm	
≤ 160 mA	
24 Vdc	
75 Vdc	
1 kHz	1 kHz
0...+70 °C	0...+70 °C
	yes/yes
IP 67	IP 67
II	II
3	3
yes	yes
POM	POM
POM	POM
8 connectors type M8-C49 ANC	2 connectors (1 × 3-pole, 1 × 12-pole)

**Plugs M08/S49**  
for unused inputs  
(please order separately)



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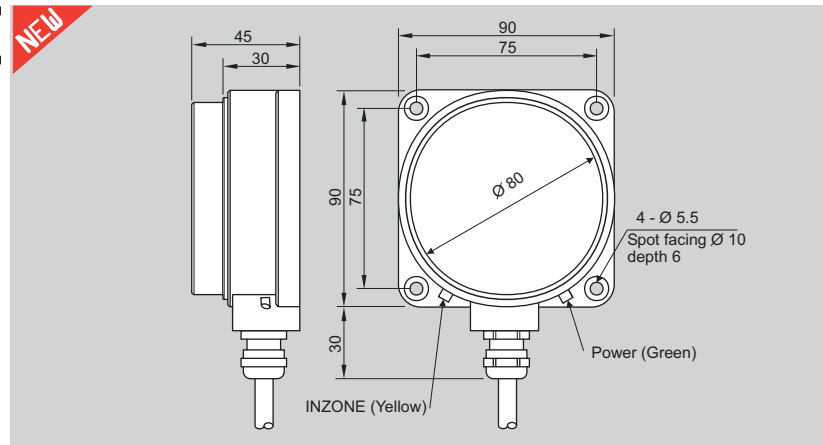
5.15

	Transmitter ←.....→	Output Sensor
Number of Signals	Bi-directional	
Housing Size	<b>L90 x W90 x H45</b>	<b>L90 x W90 x H45</b>
Mounting	non-flush	non-flush
Transmission Distance	<b>3.0...10.0 mm</b>	

**H-Power Remote 4 + 4**



This system is the bi-directional coupling system for 4 sensor signals and 4 actuator control signals. This system inductively transmits signals in both directions. Previously only the sensors could be supplied. The Remote Unit RHPT8 can now also be used with clamping units. From the stationary side up to four signals can be transmitted, and four channels can be independently controlled.



Transmitter		
PNP	RHPT8-8010P-C3-PU-05	
NPN	RHPT8-8010N-C3-PU-05	
Output Sensor		
PNP		RHPE8-8010P-C3-PU-05
NPN		RHPE8-8010N-C3-PU-05
Rated operational voltage		24 Vdc ± 10%
Drive current	≤ 300 mA	
Drive voltage	24 Vdc ± 1.5V	
Center off-set	≤ ± 7 mm	
Short circuit protection		yes
Current consumption		≤ 1.5 A
Load capacity		max. 50 mA
Operation frequency		40 Hz
Ambient temperature range	0..+50° C	0..+50° C
CE approval	yes	yes
Environmental protection	IP 67	IP 67
Housing material	aluminum	aluminum
Sensing face material	ABS + PBT	ABS + PBT
Cable material	PU	PU
Cable length/diameter/AWG	5 m, 7.7 mm, 2x0.5, 9x0.18/PUR	5 m, 7.7 mm, 2x0.5, 9x0.18/PUR

**Notes:**

Maximum 4 detectors and 4 drive signals for small motors, solenoid valves or magnets can be connected to the Remote. (4 in/4 out)

Detectors and drive unit should have 24 Vdc ± 1.5V rating.

Total current consumption of detectors and drive unit should not exceed the rated drive current.

Drive current varies depending on the transmission distance and center off-set. (see page 5.22 for transmitting diagram)

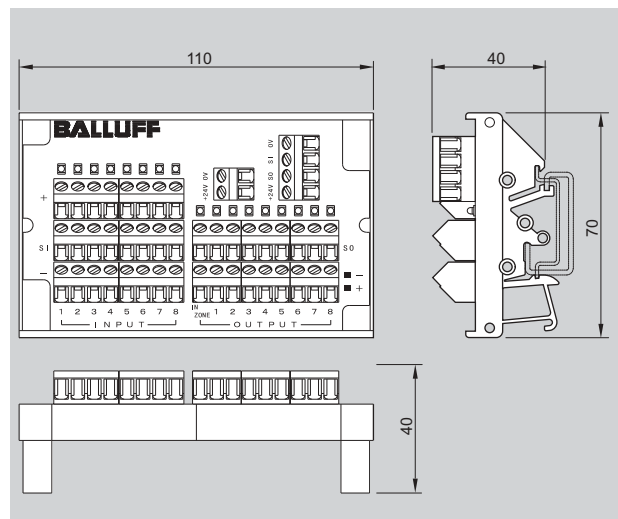
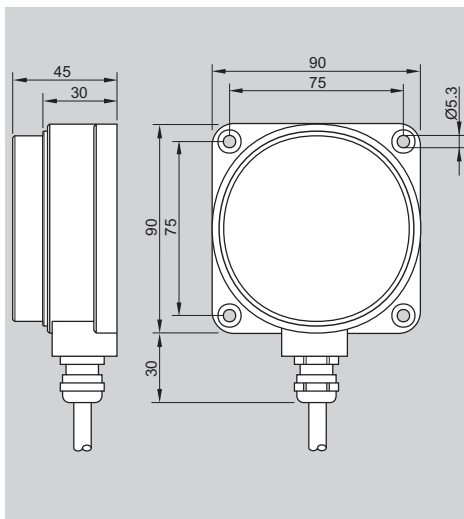


# Remote Coupler Systems

## Remote Systems

8 Sensor Signals, 8 Control Signals and Power Supply, & Amplifier

	Transmitter Head	Output Sensor Head	Transmitter & Output Amplifier
Number of Signals	Bi-directional 8 I/O's		
Housing Size	<b>L90 X W90 X H45</b>	<b>L90 X W90 X H45</b>	<b>L110 X W70 X H40</b>
Mounting	non-flush	non-flush	DIN Rail Mountable
Transmission Distance	<b>3.0...10.0 mm</b>		



Remote Sensors	RHPT-8010-V2410	RHPE-8010-V2410	
Amplifier input / Output type			
PNP			RHP16P-RS01 (Works on both Transmitter & Output Sensor)
NPN			RHP16TN-RS01 (Transmitter Amplifier)
			RHP16EN-RS01 (Output Sensor Amplifier)
Rated operational voltage		24Vdc ± 10%	24 Vdc ± 10%
Drive current	≤ 1A		
Drive voltage	24Vdc ± 1.5V		
Center off-set	± 5 mm		
Short circuit protection		yes	
Current consumption		≤ 3A	≤ 150 mA
Load capacity		max. 200mA (per output)	max. 200 mA (per output)
Operation frequency		20 Hz	20 Hz
Ambient temperature range		0..+50° C	0..+50° C
Function indication		yes	yes
CE approval	yes	yes	yes
Environmental protection	IP 67	IP 67	IP 0
Housing material	Aluminum	Aluminum	
Sensing face material	ABS + PBT	ABS + PBT	
Cable material	PU	PU	
Cable length/diameter/AWG	1M, 7mm, 4X18 AWG	1M, 7mm, 4X18 AWG	

### Notes:

Drive current is dependent on gap distance.

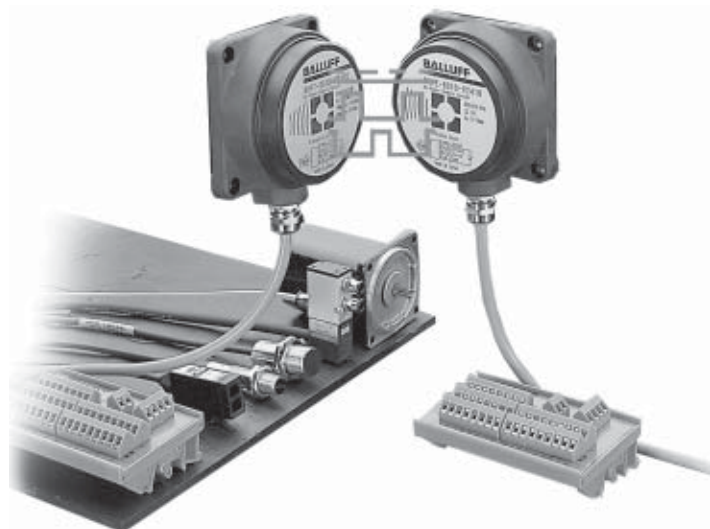
Maximum 8 detectors and 8 drive signals for small motors, solenoid valves or magnets can be connected to the Remote Amplifier. (8 in/8 out)

Detector and drive unit should have 24 Vdc ± 1.5V rating.

Total current consumption of detectors and drive unit should not exceed the rated drive current.

Drive current varies depending on the transmission distance and axis tolerance. (see page 5.22 for transmitting diagram)

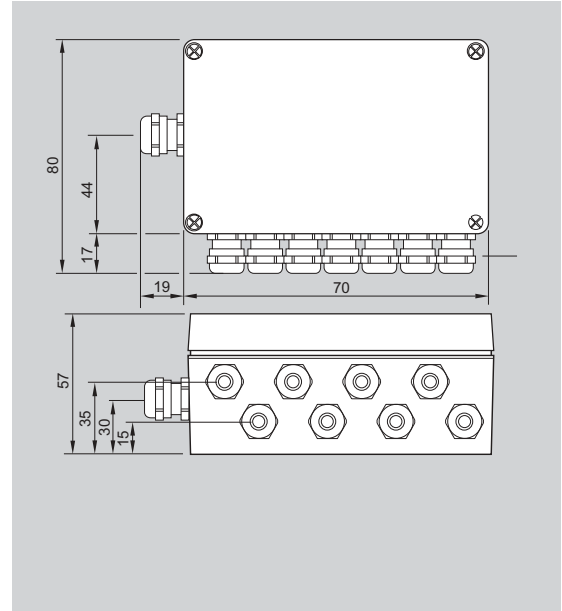
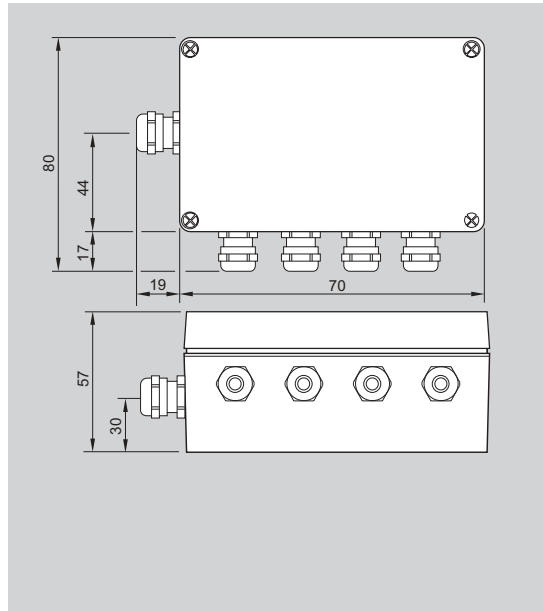
Double transmission system is also possible. (Consult factory for details)



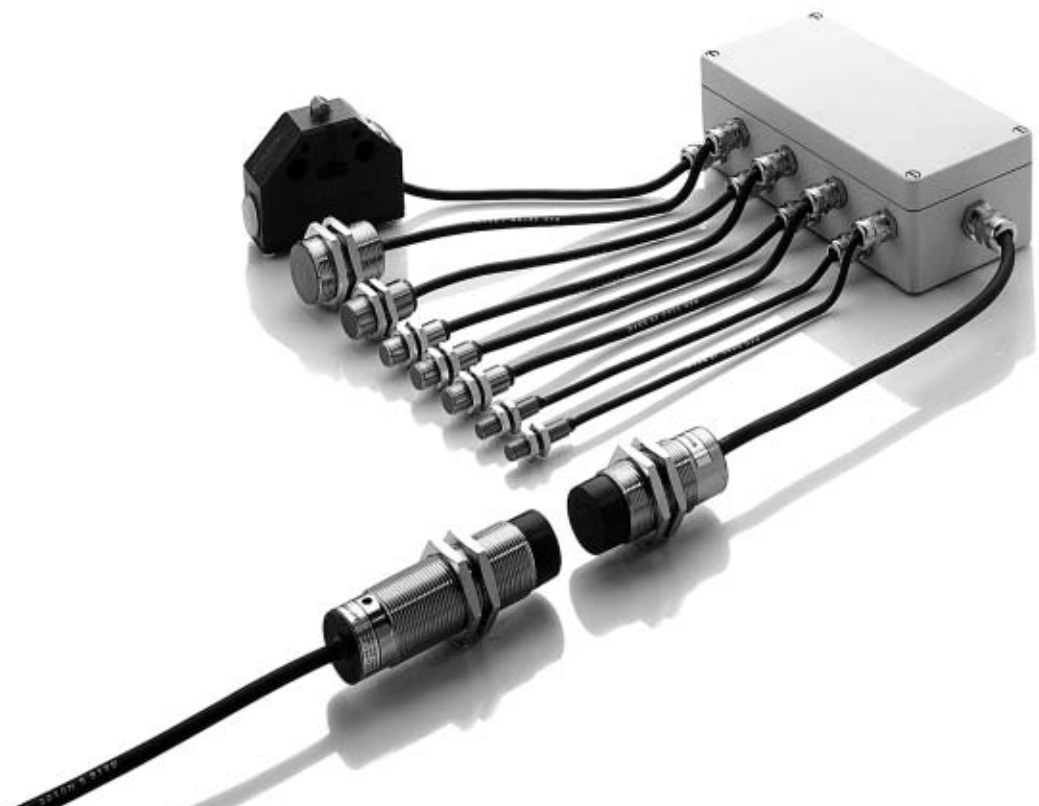
Number of Signals  
Housing Size

**4 Port**  
L125 x W80 x H57

**8 Port**  
L125 x W80 x H57



PNP/NPN (Change over switch)	RPK-2102	RPK-2101
PNP		
NPN		
Housing material	Aluminum	Aluminum
Gasket	Neoprene	Neoprene
Terminals for transmitter	6 poles x 2	6 poles x 2
Terminals for detectors	8 poles x 3	8 poles x 3
Cable gland	PG 9x1, PG 7x4	PG 9x1, M8x8
Changeover switch	PNP/NPN	PNP/NPN
Environmental protection	IP65	IP65
Mounting	2-M4 Allen Screws	2-M4 Allen Screws
LED indicators	no	no



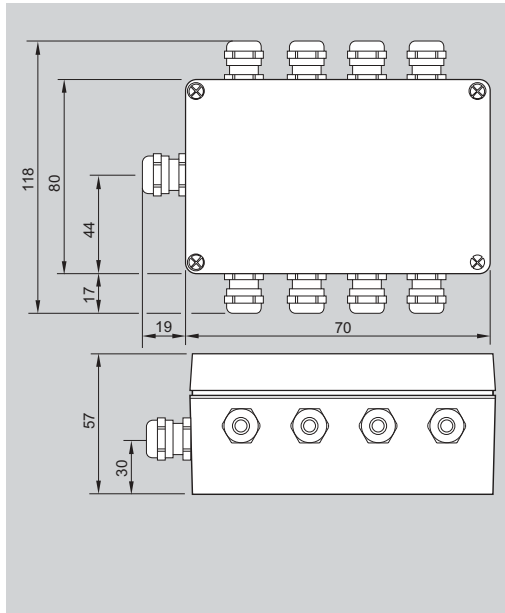
# Remote Terminal Blocks

**Remote Systems**

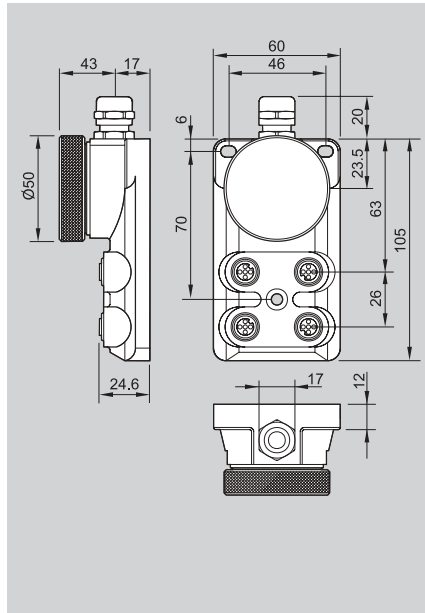
4 & 8 Port M12-MIBs with Wiring Chamber

Remote Systems

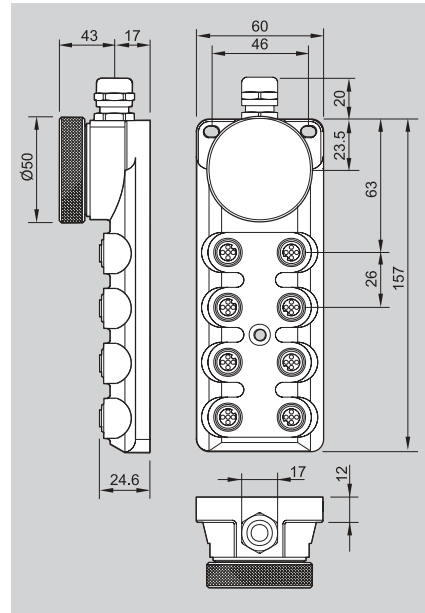
**8 Port**  
L125 x W80 x H57



**4 Port**  
L105 x W60 x H43



**8 Port**  
L157 x W60 x H43



RPK-2103

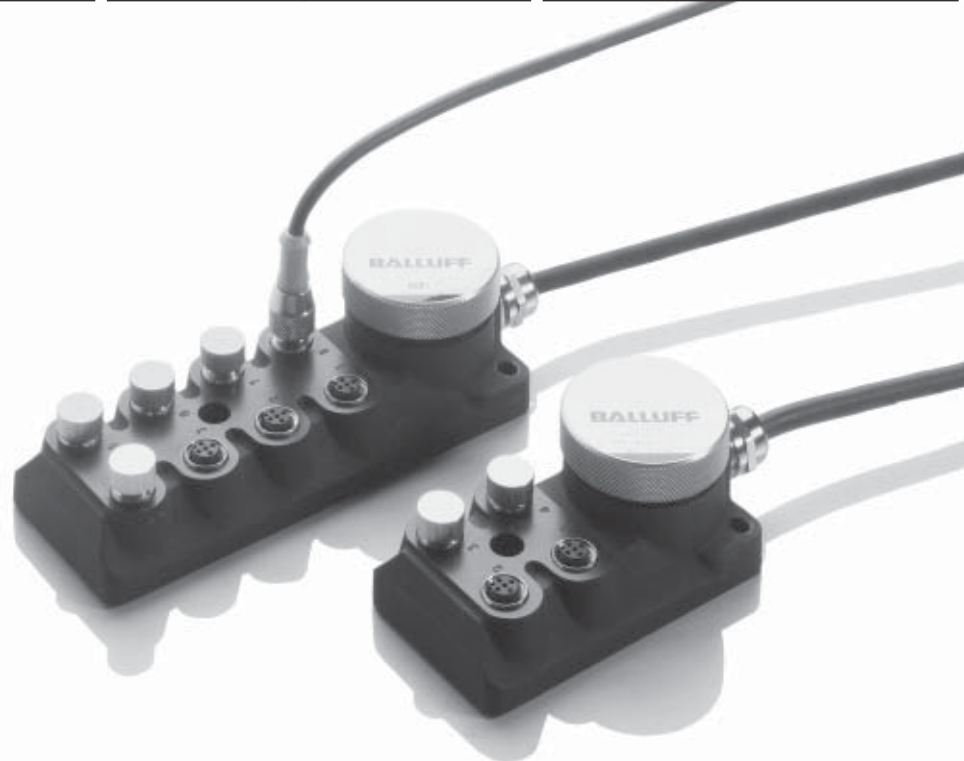
RPK-8C01-L-P  
RPK-8C01-L-N

RPK-4C01-P  
RPK-4C01-N

Aluminum  
Neoprene  
6 poles x 2  
8 poles x 3  
PG 9x1, PG 9x8  
PNP/NPN  
IP65  
2-M4 Allen Screws  
no

Machined Aluminum  
Viton 11  
12 Pole Terminal  
8 M12x1  
PG 9  
IP 67  
3 M5 Allen Screws  
yes

Machined Aluminum  
Viton  
7 Pole Terminal  
4 M12x2  
PG 9  
IP 67  
3 M5 Allen Screws  
no



**5**

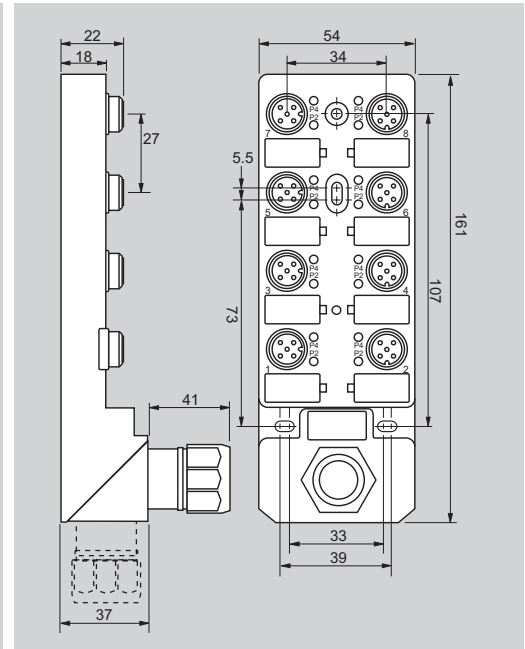
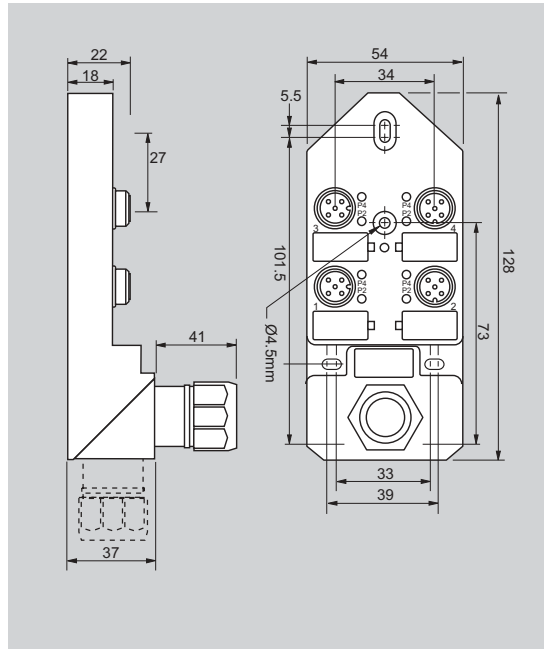
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Number of Signals  
Housing Size

**4 Port**  
L128 x W54 x H37

**8 Port**  
L161 x W54 x H37



PNP/NPN (change over switch)  
PNP  
NPN

C04-T4R-PG16

C04-T8R-PG16

Housing material

PBT

PBT

Gasket

Neoprene

Neoprene

Terminals for transmitter

11 Pole Screw Terminal

19 Pole Screw Terminal

Terminals for detectors

4 M12x1

8 M12x1

Cable gland

PG16

PG16

Changeover switch

Environmental protection

IP68

IP68

Mounting

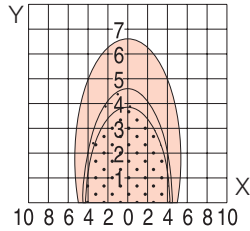
LED indicators

yes

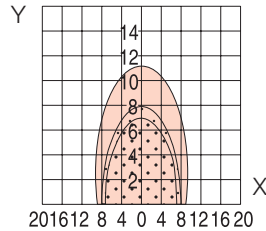
yes

### Transmitting Diagrams

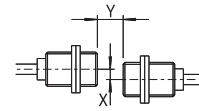
**RPT-1804/RPE-1804**



**RPT-3008/RPE-3008**

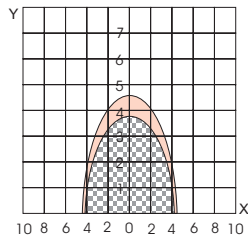


- Driving current  $\leq 5\text{mA}$
- Driving current  $\leq 20\text{mA}$
- Driving current  $\leq 30\text{mA}$

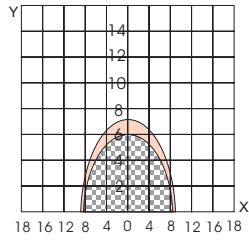


X: Center off-set  
Y: Transmitting distance

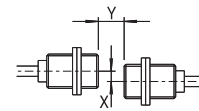
**RPTA-1803/RPEA-1803**



**RPTA-3005/RPEA-3005**

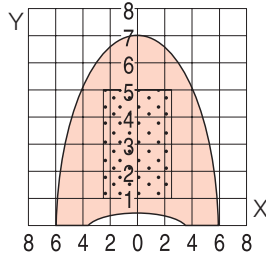


- Driving current  $\leq 30\text{mA}$
- Driving current  $\leq 20\text{mA}$

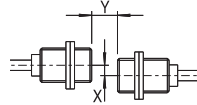


X: Center off-set  
Y: Transmitting distance

**RPT15-3005D/RPE15-3000**

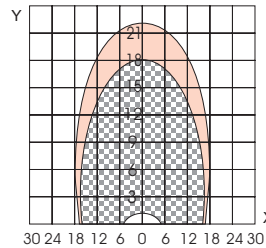


- Rated operating distance

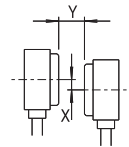


X: Center off-set  
Y: Transmitting distance

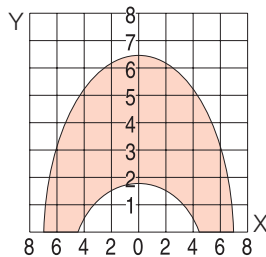
**RPTA-8010/RPEA-8010**



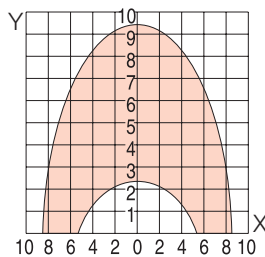
- Driving current  $\leq 50\text{mA}$
- Driving current  $\leq 100\text{mA}$



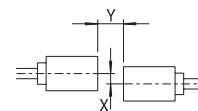
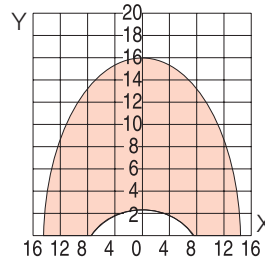
**RGPT-3005-V1215/  
RGPE-3005-V1215**



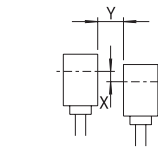
**RGPT-4008-V1220/  
RGPE-4008-V1220**



**RGPT-9012-V2430/  
RGPE-9012-V2430**



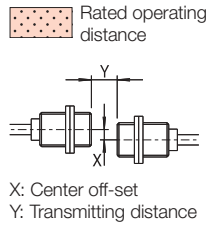
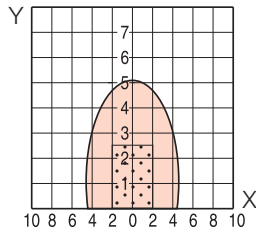
X: Center off-set  
Y: Transmitting distance



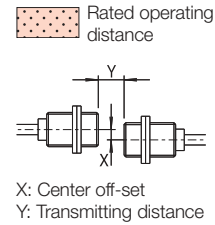
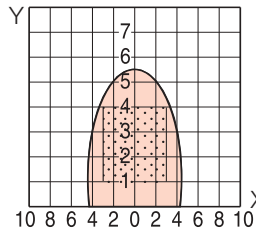
X: Center off-set  
Y: Transmitting distance

Transmitting Diagrams

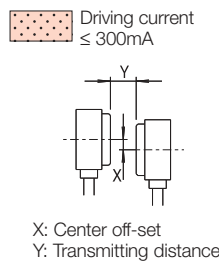
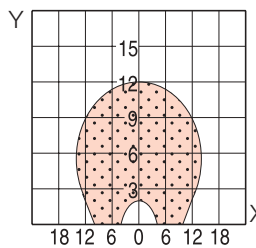
RNT-1803-VS10  
RTE-1803A



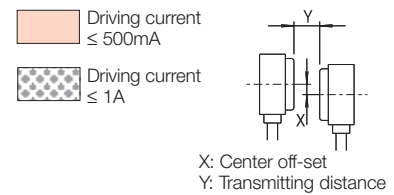
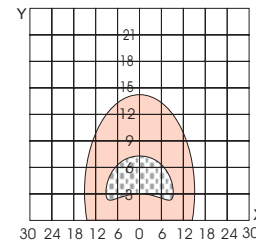
RTT-1804-PT1B  
RTE-1804E



RHPT8-8010N/P-C3  
RHPE8-8010N/P-C3

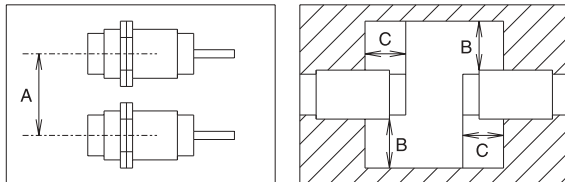


RHPT8-8010-V2410  
RHPE-8010-V2410



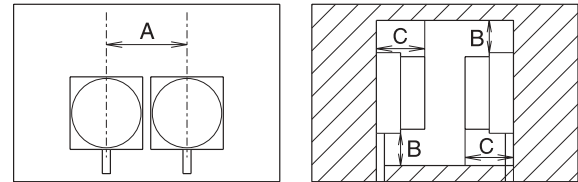
Mutual Interference & Influence of Surrounding Metal

In order to avoid mutual interference between parallel-mounted sensors, or to avoid influence of surrounding metal, when sensor is mounted in metal, keep the minimum space as described below.



Type Number	A (mm)	B (mm)	C (mm)
RPT-1804N, RPT-1804P, RPT-1804D	110	20	15
RPE-1804N, RPE-1804P			
RPT-3008N, RPT-3008P, RPT-3008D	300	30	20
RPE-3008N, RPE-3008P			
RPTA-1803	110	18	18
RPEA-1803N, RPEA-1803P			
RPTA-3005	300	40	32
RPEA-3005N, RPEA-3005P			
RPT15-3005D	200	30	20
RPE15-3000N, RPE15-3000P			
RNT-1803-VS10	110	20	20
RNE-1803A			
RTT-1804-PT1B	110	20	20
RTE-1804E			

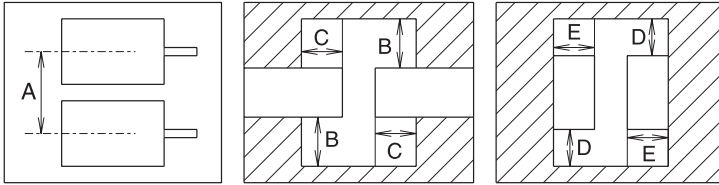
In order to avoid mutual interference between parallel-mounted sensors, or to avoid influence of surrounding metal, when sensor is mounted in metal, keep the minimum space as described below.



Type Number	A (mm)	B (mm)	C (mm)
RPTA-8010	200	20	40
RPEA-8010N, RPEA-8010P			
RHPT8-8010N-C3/RHPT8-8010P-C3	300	50	45
RHPE8-8010N-C3/RHPE8-8010P-C3			
RHPT-8010-V2410	300	50	45
RHPE-8010-V2410			

#### Mutual Interference & Influence of Surrounding Metal

In order to avoid mutual interference between parallel-mounted sensors, or to avoid influence of surrounding metal, when sensor is mounted in metal, keep the minimum space as described below.



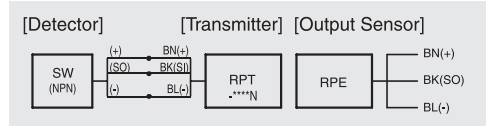
Type Number	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
RGPT-3005-V1215	200	30	20	--	--
RGPE-3005-V1215N/RGPE-3005-V1215P					
RGPT-4008-V1220*	300	40	40	40	40
RGPE-4008-V1220N/RGPE-4008-V1220P*					
RGPT-9012-V2430	300	--	--	50	45
RGPE-9012-V2430N/RGPE-9012-V2430P					

\*Active surface A (front): BC  
Active surface B (top): DE

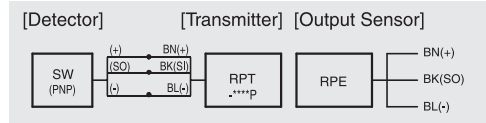
#### Connections for Remote Sensor Systems

##### Power Remote Sensor System RP series, 1 signal transmission type

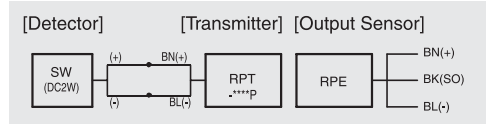
Connecting NPN type switch



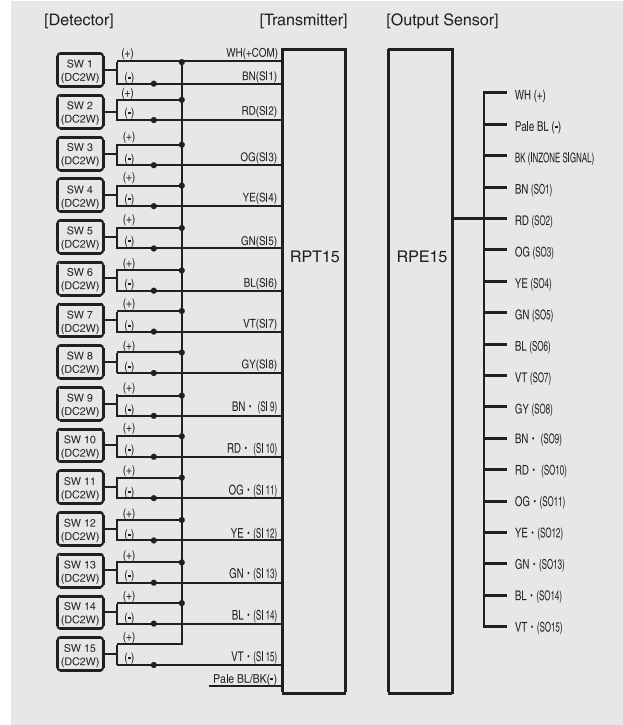
Connecting PNP type switch



Connecting DC2W type switch



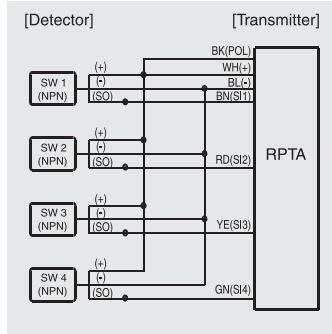
##### Power Remote Sensor System RP series, 15 signal transmission type



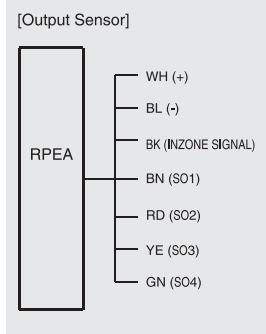
**Connections for Remote Sensor Systems**

**Power Remote Sensor System  
RP/A series, 4 signal transmission type**

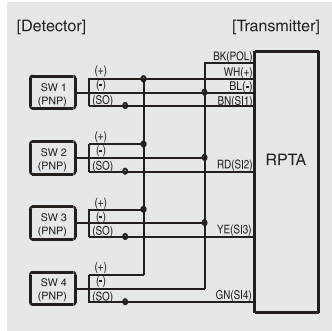
Connecting NPN type switch



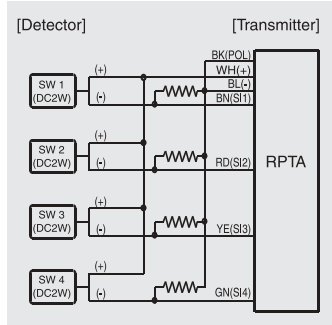
Connecting output sensor



Connecting PNP type switch



Connecting DC2W type switch

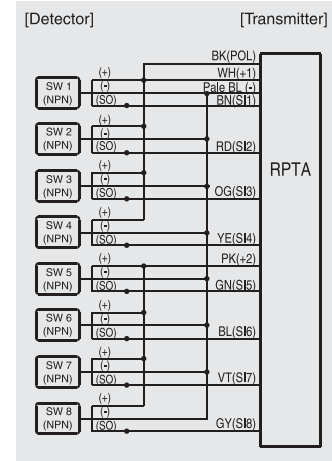


Note:  
(-) line of transmitter and (-) line of detectors should be connected together with a resistor of 1-2k ohm.

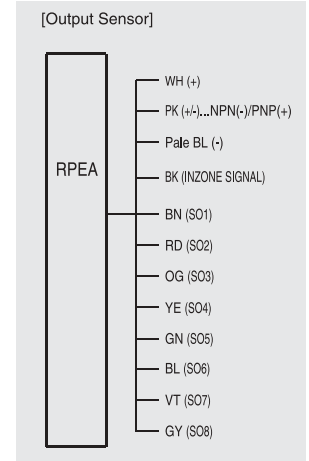
Terminal blocks for connecting detectors and transmitter are available as an option.  
(refer to pages 5.18-5.20)

**Power Remote Sensor System  
RP/A series, 8 signal transmission type**

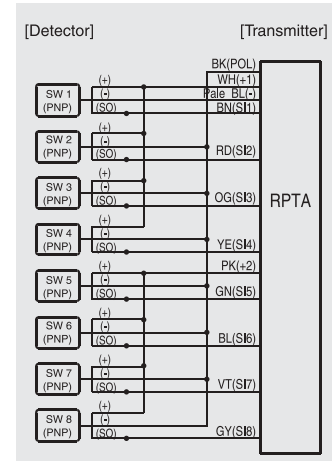
Connecting NPN type switch



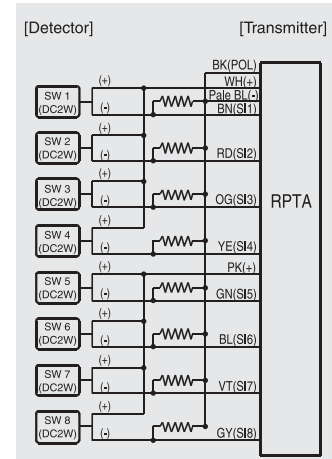
Connecting output sensor



Connecting PNP type switch



Connecting DC2W type switch

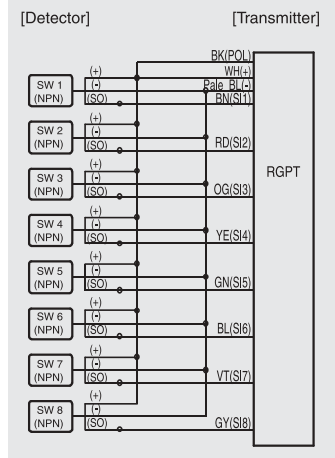


Note:  
(-) line of transmitter and (-) line of detectors should be connected together with a resistor of 1-2k ohm.

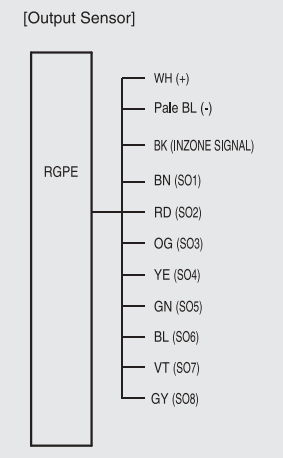
### Connections for Remote Sensor Systems & Remote Coupler Systems

#### Power Remote Sensor System RGP series, 8 signal transmission type

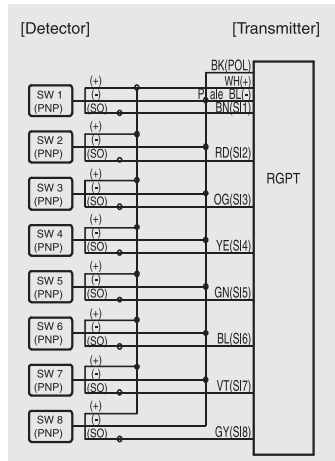
Connecting NPN type switch



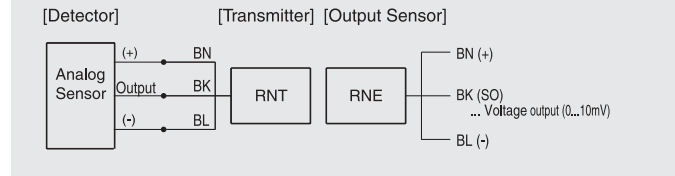
Connecting output sensor



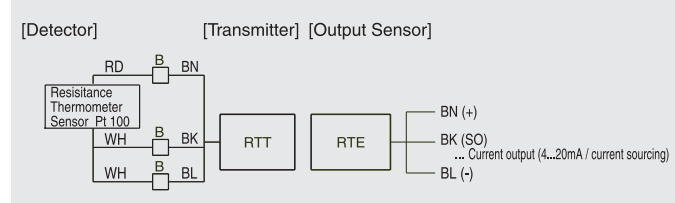
Connecting PNP type switch



#### Analog Remote Sensor System RN/VS series, 1 signal transmission type



#### Thermal Remote Sensor System RT/PT series, 1 signal transmission type



- Contents
- Selection Guide
- Applications
- Remote Sensor Systems
- Remote Coupler Systems
- Remote Terminal Blocks

**Technical Data**

6 Connectors

7 Accessories

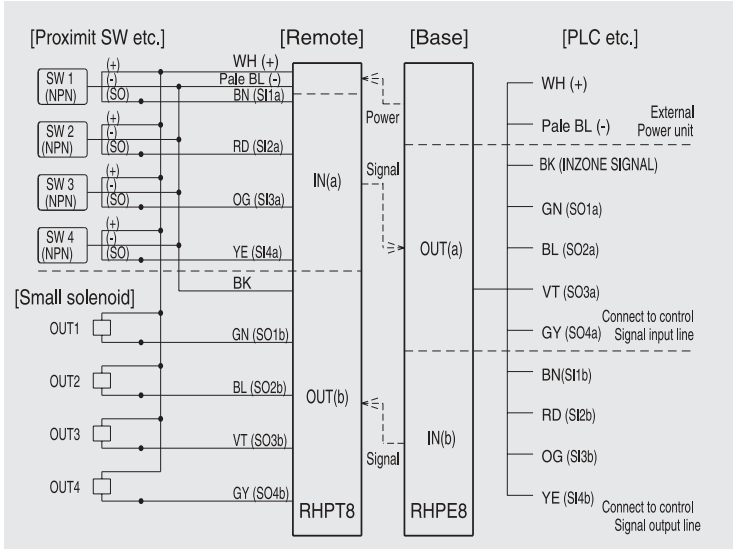
t Technical Reference

p Part Number Index

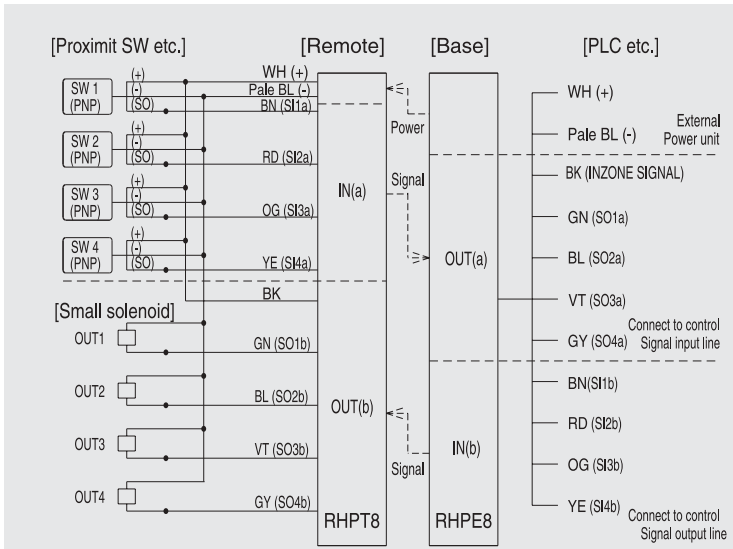
Connections for Remote Coupler Systems

Power Supply and Signal Transmission  
Remote Coupler System  
RHP series, Bi-directional (4+4) transmission type

NPN type

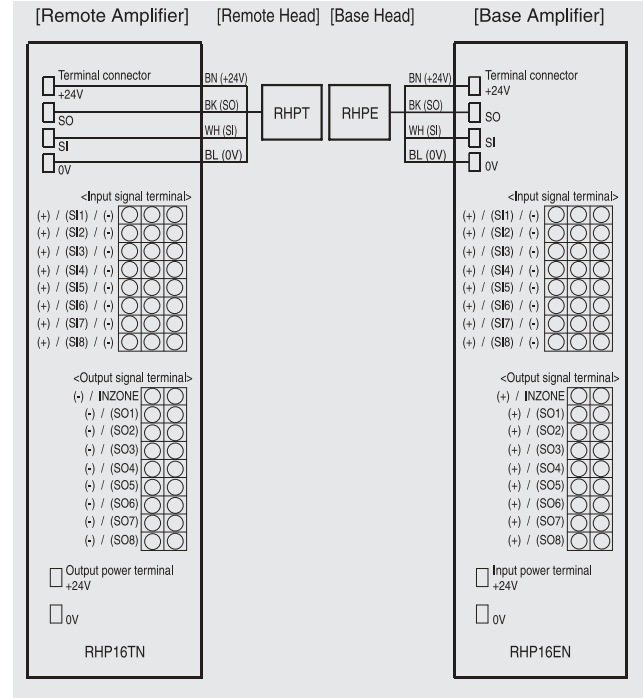


PNP type



Power Supply and Signal Transmission  
Remote Coupler System  
RHP series, Bi-directional (8+8) transmission type

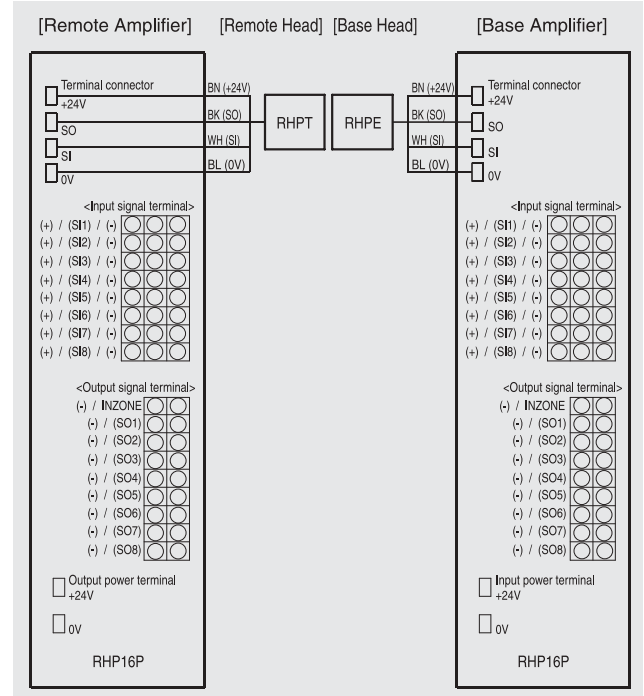
NPN type



Note 1: When connecting a DC 2-wire switch to the remote amplifier, connect + side to (SI\_) and - side to (-).

Note 2: When control outputs are connected to the base amplifier, connect + side to (SI\_) and - side to (-).

PNP type



Note 1: The same unit is designed to be used for remote amplifier.

Note 2: When connecting a DC 2-wire switch to the remote amplifier, connect + side to (+) and - side to (SI\_).

Note 3: When control outputs are connected to the base amplifier, connect + side to (+) and - side to (SI\_).