



#### ring sensors 2200

design 35 x 20 x 60mm

to

200 x 71 x 200mm

static / dynamic 6.1mm ring-Ø

10.1mm

15.1mm

20.1mm

25.1mm

101.0mm

wire break (static) ring-Ø





- √ high resolution
- ✓ insensitive to soiling
- ✓ adjustable pulse width
- ✓ adjustable sensitivity
- ✓ high object speed possible
- ✓ short response time

functions "static" and "dynamic" as well as "wire break sensors"









#### description

In the case of inductive ring sensors, the active detection range is located within a ring-shaped opening. When passing this ring, all metal objects trigger a defined output signal. Pulse stretching is integrated so that it can be reliably used for control, registration, checking and other processing tasks.

*ipf* ring sensors are especially suited for use in machine and system engineering and are increasingly used in the fields of installation technology and feed automation.

Static ring sensors offer optimum functions for all conceivable applications, e.g. detection and jam control of small metal parts in feed hoses.

Dynamic ring sensors guarantee the secure detection of parts which are quickly moved at a minimum speed of 15cm/sec.

They have a resolution which is still higher and guarantees the detection of the smallest of parts / parts which have a low mass (e.g. springs). The high resolution also remains preserved for a long time when environmental conditions are changed, e.g. soiling which contains metal.

*ipf* wire fracture sensors are especially adjusted for fracture control of thin wires. They are characterized by their very short reaction time. Versions which have interior diameters of the ring measuring 4mm and 8mm are fitted with a ceramic element for improving resistance.

#### application examples

- ▶ in processing situations, secure detection of metallic foreign bodies in bulk material or foodstuffs
- in manufacturing processes, controlling the ejection of small parts partially containing metal
- the reliable selection of different part sizes in transportation or assembly lines
- secure controlling of wire breakage where wires are wound and pulled
- controlling the supply of metal parts





# inductive sensors

### 2200 ring sensors



| article-no. version resolution (steel ball) article-no. version  | IY060121<br>static<br>1.0mm<br>IY060125<br>dynamic          | IY100121<br>static<br>1.5mm<br>IY100125<br>dynamic           | IY150121<br>static<br>2.0mm<br>IY150125<br>dynamic           |
|--|---|--|--|
| resolution (steel ball)  | 0.5mm   | 0.8mm  | 1.0mm  |
| TECHNICAL DATA   |   |  |  |
| inner ring diameter<br>sensitivity adjustment<br>time adjustment<br>output signal  | 6.1mm potentiometer 1 10 150msec (potentiometer 2)* pnp, no | 10.1mm potentiometer 1 10 150msec (potentiometer 2)* pnp, no | 15.1mm potentiometer 1 10 150msec (potentiometer 2)* pnp, no |
| operating voltage<br>current consumption (w/o load)<br>output current (max. load)<br>voltage drop (max. load)<br>response time | 10 35V DC<br>< 10mA<br>200mA<br>2.5V DC<br>≤ 2msec          | 10 35V DC<br>< 10mA<br>200mA<br>2.5V DC<br>≤ 2msec           | 10 35V DC<br>< 10mA<br>200mA<br>2.5V DC<br>≤ 2msec           |
| display (signal) display (operation) parts speed (max.) short-circuit protection   | LED 1 yellow<br>-<br>35m/sec<br>+                           | LED 1 yellow<br>-<br>35m/sec<br>+                            | LED 1 yellow<br>-<br>35m/sec<br>+                            |
| reverse polarity protection  | +   | +  | +  |
| design housing material ring material operating temperature system of protection (EN 60529)                                    | 35x20x60mm<br>PA<br>PETP<br>-25 +70°C<br>IP65               | 35x20x60mm<br>PA<br>PETP<br>-25 +70°C<br>IP65                | 35x20x60mm<br>PA<br>PETP<br>-25 +70°C<br>IP65                |
| connection   | M12-connector, 3-pin  | M12-connector, 3-pin   | M12-connector, 3-pin   |
| connection accessories   | e.g. <b>VK200021</b> , 2m<br>PUR, angular                   | e.g. <b>VK200021</b> , 2m<br>PUR, angular                    | e.g. <b>VK200021</b> , 2m<br>PUR, angular                    |
| * potentiometer setting for pulse stretching:  |   |  |  |
| left stop position approx. 10msec  |   |  |  |
| middle position<br>approx. 100msec   |   |  |  |
| right stop position<br>approx. 150msec   |   |  |  |
|  |   | -  |  |



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### ring sensors 2200

| TECHNICAL DATA  inner ring diameter sensitivity adjustment time adjustment output signal  operating voltage current consumption (w/o load) output current (max. load) voltage drop (max. load) response time  display (signal) display (operation) parts speed (max.) short-circuit protection reverse polarity protection  design housing material ring material operating temperature system of protection (EN 60529)  connection connection accessories  * potentiometer setting  * potentiometer setting  accessories  * potentiometer setting  20.1mm popenatiometer 20.1mm pnp, no 10 150msec (potention accessories  10 150msec (potentioneter accessories  10 150msec (potentioneter) accessories accessories accessories accessories accessories access   | IY250121 static 3.0mm IY250125 dynamic 1.5mm  | IY350121 static 4.5mm IY350125 dynamic 2.0mm                                |
|--|---|---|
| version resolution (steel ball)  article-no. IY200125 version dynamic resolution (steel ball)  TECHNICAL DATA  inner ring diameter sensitivity adjustment time adjustment output signal operating voltage current consumption (w/o load) output current (max. load) voltage drop (max. load) 2.5v DC response time display (signal) lED 1 yellow display (operation) parts speed (max.) short-circuit protection treverse polarity protection the design assertion (EN 60529) connection accessories  * potentiometer setting   | static 3.0mm IY250125 dynamic 1.5mm   | static 4.5mm  IY350125  dynamic 2.0mm                                       |
| resolution (steel ball)  article-no. version resolution (steel ball)  TECHNICAL DATA  inner ring diameter sensitivity adjustment time adjustment output signal operating voltage current consumption (w/o load) output current (max. load) voltage drop (max. load) voltage drop (max. load) display (signal) display (operation) parts speed (max.) short-circuit protection reverse polarity protection design housing material ring material operating temperature system of protection (EN 60529) connection connection accessories  * potentiometer setting   | 3.0mm<br>IY250125<br>dynamic<br>1.5mm   | 4.5mm IY350125 dynamic 2.0mm  |
| article-no.  | IY250125<br>dynamic<br>1.5mm  | IY350125 dynamic 2.0mm  |
| resolution (steel ball)  TECHNICAL DATA  inner ring diameter sensitivity adjustment time adjustment output signal operating voltage current consumption (w/o load) output current (max. load) voltage drop (max. load) voltage drop (max. load) response time display (signal) display (operation) parts speed (max.) short-circuit protection design housing material ring material operating temperature system of protection (EN 60529) connection connection accessories  * potentiometer setting  * potentiometer setting  * potentiometer setting  * potentiometer setting   | dynamic<br>1.5mm  | dynamic 2.0mm   |
| TECHNICAL DATA  inner ring diameter sensitivity adjustment time adjustment output signal  operating voltage current consumption (w/o load) output current (max. load) voltage drop (max. load) response time  display (signal) display (operation) parts speed (max.) short-circuit protection reverse polarity protection design housing material ring material operating temperature system of protection (EN 60529) connection connection accessories  * potentiometer setting  * potentiometer setting  10 150msec (potention) pnp, no  < 10 35V DC < 10mA 2.5V DC  ≤ 2msec LED 1 yellow display (operation) - parts speed (max.) 35m/sec short-circuit protection + teverse polarity protection + design housing material PETP operating temperature system of protection (EN 60529) connection connection accessories  * potentiometer setting  * potentiometer setting  | 1.5mm   | 2.0mm  pot.1 pot.2  |
| TECHNICAL DATA  inner ring diameter sensitivity adjustment time adjustment output signal  operating voltage current consumption (w/o load) output current (max. load) voltage drop (max. load) response time  display (signal) display (operation) parts speed (max.) short-circuit protection reverse polarity protection design housing material ring material operating temperature system of protection (EN 60529) connection connection accessories  * potentiometer setting  * potentiometer setting  10 150msec (potention) pnp, no  < 10 35V DC < 10mA 2.5V DC  ≤ 2msec LED 1 yellow display (operation) - parts speed (max.) 35m/sec short-circuit protection + teverse polarity protection + design housing material PETP operating temperature system of protection (EN 60529) connection connection accessories  * potentiometer setting  * potentiometer setting  | 9   | pot 1 pot 2   |
| TECHNICAL DATA  inner ring diameter sensitivity adjustment time adjustment output signal operating voltage current consumption (w/o load) output current (max. load) voltage drop (max. load) voltage drop (max. load) cisplay (signal) display (operation) parts speed (max.) short-circuit protection reverse polarity protection design housing material ring material operating temperature system of protection (EN 60529) connection connection accessories  * potentiometer setting  * potentiometer setting  * potentiometer setting  * potentiometer setting  | 82 0  |   |
| inner ring diameter sensitivity adjustment time adjustment output signal operating voltage current consumption (w/o load) output current (max. load) voltage drop (max. load) response time display (signal) display (operation) parts speed (max.) short-circuit protection reverse polarity protection design housing material ring material operating temperature system of protection (EN 60529)  connection connection accessories  * potentiometer setting  * potentiometer setting  20.1mm potentiometer 10 150msec (potention 20 150msec (   | 5 5 7 7 7 8 7 7 8 7 8 7 8 7 8 7 8 7 8 7   | 5 48 59 60 M12x1 60 M12x1   |
| sensitivity adjustment time adjustment output signal  operating voltage current consumption (w/o load) output current (max. load) voltage drop (max. load) voltage drop (max. load)  response time  display (signal) display (operation) parts speed (max.) short-circuit protection  design housing material ring material operating temperature system of protection (EN 60529)  connection connection accessories  * potentiometer setting  poperating temperature system of protection  * puR, angular  * potentiometer setting  * potentiometer setting   |   |   |
| time adjustment output signal  operating voltage current consumption (w/o load) output current (max. load) voltage drop (max. load) voltage drop (max. load) response time  display (signal) display (operation) parts speed (max.) short-circuit protection reverse polarity protection  design housing material ring material operating temperature system of protection (EN 60529)  connection connection accessories  * potentiometer setting  * potentiometer setting  10 150msec (potention) class pnp, no connect sequence 10 35V DC comparation comparation connection squence current consumption (w/o load) comparation connection connecti          | 25.1mm  | 35.2mm  |
| output signal pnp, no operating voltage current consumption (w/o load) output current (max. load) 200mA voltage drop (max. load) 2.5V DC response time ≤ 2msec display (signal) LED 1 yellow display (operation) - parts speed (max.) 35m/sec short-circuit protection + reverse polarity protection + design 35x20x60mn housing material PA ring material PA ring material PETP operating temperature -25 +70°C system of protection (EN 60529) IP65  connection M12-connector, 3 connection accessories e.g. VK200021, PUR, angular mounting accessories   |   | potentiometer 1   |
| operating voltage current consumption (w/o load) output current (max. load) voltage drop (max. load) response time display (signal) display (operation) parts speed (max.) short-circuit protection reverse polarity protection design housing material ring material operating temperature system of protection (EN 60529) connection connection accessories  * potentiometer setting  10 35V DC c 20mA 200mA 2.5V DC c 2msec LED 1 yellow display (signal)   | ·   |   |
| current consumption (w/o load) output current (max. load) voltage drop (max. load) response time display (signal) display (operation) parts speed (max.) short-circuit protection reverse polarity protection design housing material ring material operating temperature system of protection (EN 60529)  connection connection accessories  * potentiometer setting  * potentiometer setting  current consumption (w/o load) 200mA PED 1 200mA 200mA 200mA 200mA PED 1 200mA | pnp, no   | pnp, no   |
| output current (max. load) voltage drop (max. load) response time  display (signal) display (operation) parts speed (max.) short-circuit protection reverse polarity protection  design housing material ring material operating temperature system of protection (EN 60529)  connection connection accessories  * potentiometer setting  2.5V DC 2.5V DC 2.5V DC 2.5V DC 2.5V DC 2.5V DC 3.5V DC 3.5V DC 3.5V DC 3.5V DC 3.5V DC 4.5V PETP 4.5V AC 4  |   | 10 35V DC   |
| voltage drop (max. load)  response time  display (signal)  display (operation)  parts speed (max.)  short-circuit protection  reverse polarity protection  design  housing material  ring material  operating temperature  system of protection (EN 60529)  connection  connection accessories  * potentiometer setting  * potentiometer setting  2.5V DC  125V DC  126V 22msec  126V 21msec  135m/sec  4  4  75m/sec  14  75m/sec  15m/sec  15m/s  | < 10mA  | < 10mA  |
| response time ≤ 2msec  display (signal)  display (operation)  parts speed (max.)  short-circuit protection  reverse polarity protection  design  housing material  ring material  operating temperature  system of protection (EN 60529)  connection  connection accessories  * potentiometer setting  * potentiometer setting  LED 1 yellow  LED 1 yellow  LED 1 yellow  LED 1 yellow  185m/sec   | 200mA   | 200mA   |
| display (signal) display (operation) parts speed (max.) short-circuit protection reverse polarity protection + design housing material ring material operating temperature system of protection (EN 60529)  connection connection accessories  * potentiometer setting  LED 1 yellow 1 FD 1 FO 1 FO 2 FO 35m/sec  # Pa  # PETP  -25 +70°C  IP65  M12-connector, 3 e.g. VK200021, PUR, angular  # potentiometer setting   | 2.5V DC   | 2.5V DC   |
| display (operation) parts speed (max.) short-circuit protection reverse polarity protection  design housing material ring material operating temperature system of protection (EN 60529)  connection connection accessories  * potentiometer setting  - 25 +70°C  M12-connector, 3 e.g. VK200021, PUR, angular   | ≤ 2msec   | ≤ 2msec   |
| parts speed (max.) short-circuit protection reverse polarity protection  design housing material ring material operating temperature system of protection (EN 60529)  connection connection accessories  * potentiometer setting  35x20x60mm PA PETP PETP -25 +70°C system of protection (EN 60529)  IP65  Connection M12-connector, 3 e.g. VK200021, PUR, angular   | LED 1 yellow  | LED 1 yellow  |
| short-circuit protection reverse polarity protection  design housing material ring material operating temperature system of protection (EN 60529)  connection connection accessories  * potentiometer setting  # particular petro PETP -25 +70°C IP65  M12-connector, 3 e.g. VK200021, PUR, angular  |   | -   |
| reverse polarity protection +  design 35x20x60mm housing material PA ring material PETP operating temperature -25 +70°C system of protection (EN 60529) IP65  connection M12-connector, 3 connection accessories e.g. VK200021, PUR, angular mounting accessories -  | 35m/sec   | 35m/sec   |
| design housing material ring material operating temperature system of protection (EN 60529)  connection connection accessories  * potentiometer setting  35x20x60mn PA  PETP  -25 +70°C  IP65  M12-connector, 3  e.g. VK200021, PUR, angular   | +   |   |
| housing material PA ring material PETP operating temperature -25 +70°C system of protection (EN 60529) IP65  connection M12-connector, 3 connection accessories e.g. VK200021, PUR, angular mounting accessories -   |   | +   |
| ring material PETP operating temperature -25 +70°C system of protection (EN 60529) IP65  connection M12-connector, 3 connection accessories e.g. VK200021, PUR, angular mounting accessories -   | +   | +   |
| operating temperature system of protection (EN 60529)  connection connection accessories  M12-connector, 3 e.g. VK200021, PUR, angular mounting accessories  |   | +<br>60x20x85mm   |
| system of protection (EN 60529)  connection  connection accessories  e.g. VK200021, PUR, angular  mounting accessories  * potentiometer setting  | n 35x20x60mm<br>PA  | +<br>60x20x85mm<br>PA   |
| connection M12-connector, 3 connection accessories e.g. VK200021, PUR, angular mounting accessories -  * potentiometer setting   | n 35x20x60mm<br>PA<br>PETP  | + 60x20x85mm PA PETP  |
| connection accessories e.g. VK200021, PUR, angular mounting accessories  * potentiometer setting   | n 35x20x60mm<br>PA<br>PETP<br>-25 +70°C   | + 60x20x85mm PA PETP -25 +70°C  |
| PUR, angular mounting accessories -  * potentiometer setting   | n 35x20x60mm<br>PA<br>PETP<br>-25 +70°C<br>IP65                                     | +<br>60x20x85mm<br>PA<br>PETP<br>-25 +70°C<br>IP65                          |
| mounting accessories -  * potentiometer setting  | n 35x20x60mm PA PETP -25 +70°C IP65 8-pin M12-connector, 3-pin                      | + 60x20x85mm PA PETP -25 +70°C IP65  M12-connector, 3-pin                   |
| * potentiometer setting  | n 35x20x60mm PA PETP -25 +70°C IP65 8-pin M12-connector, 3-pin 2m e.g. VK200021, 2m | + 60x20x85mm PA PETP -25 +70°C IP65  M12-connector, 3-pin e.g. VK200021, 2m |
| for pulse stretching:  left stop position approx. 10msec  middle position approx. 100msec  right stop position approx. 150msec   | n 35x20x60mm PA PETP -25 +70°C IP65 8-pin M12-connector, 3-pin 2m e.g. VK200021, 2m | + 60x20x85mm PA PETP -25 +70°C IP65  M12-connector, 3-pin                   |



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# inductive sensors

## 2200 ring sensors



| article-no.  | IY500121  | IYK00121  |
|--|---|---|
| version  | static  | static  |
| resolution (steel ball)                                  | 6.0mm   | 10.0mm  |
| article-no.  | IY500125  | IYK00125  |
| version  | dynamic   | dynamic   |
| resolution (steel ball)                                  | 2.5mm   | 5.0mm   |
|  | pot. 2 pot. 1  R  LED 1                           | Pot. 1 pot. 2 LED.1  140  90  70  061  070  070  070  070  070  070 |
| TECHNICAL DATA   | 70<br>80  | 06 21 M12x1   |
| inner ring diameter                                      | 51.0mm  | 101.0mm<br>potentiometer 1  |
| sensitivity adjustment time adjustment                   | potentiometer 1 10 150msec (potentiometer 2)*     | potentiometer 1  10 150msec (potentiometer 2)*                      |
| output signal  | pnp, no   | pnp, no   |
| operating voltage  | 10 35V DC   | 10 35V DC   |
| current consumption (w/o load)                           | < 10mA  | < 10mA  |
| output current (max. load)                               | 200mA   | 200mA   |
| voltage drop (max. load)                                 | 2.5V DC   | 2.5V DC   |
| response time  | ≤ 2msec   | ≤ 2msec   |
| display (signal)   | LED 1 yellow                                      | LED 1 yellow  |
| display (operation)                                      | -   | -   |
| parts speed (max.)                                       | 25m/sec   | 25m/sec   |
| short-circuit protection                                 | +   | +   |
| reverse polarity protection                              | +   | +   |
| design   | 80x20x110mm                                       | 140x45x190mm  |
| housing material   | PA  | PA  |
| ring material  | PETP  | PETP  |
| operating temperature<br>system of protection (EN 60529) | -25 +70°C<br>IP65                                 | -25 +70°C<br>IP65   |
|  |   |   |
| connection connection accessories                        | M12-connector, 3-pin<br>e.g. <b>VK200021</b> , 2m | M12-connector, 3-pin<br>e.g. <b>VK200021</b> , 2m                   |
| connection accessories                                   | PUR, angular                                      | PUR, angular  |
| mounting accessories                                     | -   | -   |
| * potentiometer setting for pulse stretching:            |   |   |
| left stop position approx. 10msec                        |   |   |
| middle position<br>approx. 100msec                       |   |   |
| right stop position<br>approx. 150msec                   |   |   |
|  |   | _   |



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### ring sensors 2200

|                                 |  |   | 8  |
|---------------------------------|--|---|--|
| and the man                     | IV040422                                 | 17000122  | 14000122   |
| article-no.                     | IY040122                                 | IY060122  | IY080122   |
| version                         | wire break (static)                      | wire break (static)                               | wire break (static)  |
| resolution (copper wire)        | 0.18mm                                   | <b>0.18mm</b>                                     | <b>0.25mm</b>  |
|                                 | LED 2 pol. 1  9  WM3x4  15  7  80  M12x1 | Q LED 2 DOL 1 S S S S S S S S S S S S S S S S S S | 1 LED 2 POL.1 POL. |
| TECHNICAL DATA                  |  |   |  |
| inner ring diameter             | 4.0mm ±0.2mm                             | 6.0mm ±0.2mm                                      | 8.0mm ±0.2mm   |
| sensitivity adjustment          | potentiometer 1                          | potentiometer 1                                   | potentiometer 1  |
| time adjustment                 | 100msec                                  | 100msec   | 100msec  |
| output signal                   | pnp, no                                  | pnp, no   | pnp, no  |
| operating voltage               | 10 35V DC                                | 10 35V DC   | 10 35V DC  |
| current consumption (w/o load)  | < 10mA                                   | < 10mA  | < 10mA   |
| output current (max. load)      | 200mA                                    | 200mA   | 200mA  |
| voltage drop (max. load)        | 2.5V DC                                  | 2.5V DC   | 2.5V DC  |
| response time                   | ≤ 0.2msec                                | ≤ 0.2msec   | ≤ 0.2msec  |
|                                 |  |   |  |
| display (signal)                | LED 1 yellow                             | LED 1 yellow                                      | LED 1 yellow   |
| display (operation)             | LED 2 green                              | LED 2 green                                       | LED 2 green  |
| parts speed (max.)              | 35m/sec                                  | 35m/sec   | 35m/sec  |
| short-circuit protection        | +  | +   | +  |
| reverse polarity protection     | +  | +   | +  |
| design                          | 35x40x60mm                               | 35x40x60mm  | 35x40x60mm   |
| housing material                | PA                                       | PA  | PA   |
| ring material                   | ceram (ceramic)                          | PETP  | ceram (ceramic)  |
| operating temperature           | -25 +70°C                                | -25 +70°C   | -25 +70°C  |
| system of protection (EN 60529) | IP65                                     | IP65  | IP65   |
| connection                      | M12-connector, 3-pin                     | M12-connector, 3-pin                              | M12-connector, 3-pin   |
| connection accessories          | e.g. <b>VK200021</b> , 2m                | e.g. <b>VK200021</b> , 2m                         | e.g. <b>VK200021</b> , 2m  |
| connection accessories          | PUR, angular                             | PUR, angular                                      | PUR, angular   |
| mounting accessories            |  |   |  |





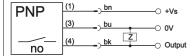
## inductive sensors

### 2200 ring sensors



#### connection

switching devices



wire colors: bn = brown (1), bu = blue (3), bk = black (4)

#### **MOUNTING PARAMETERS**

| article-no.         | distance X (abreast) | distance Y (stacked) | admission boring Z |
|---------------------|----------------------|----------------------|--------------------|
|                     |                      | >                    |                    |
| IY060121 / IY060125 | 0mm                  | 5mm                  | 11mm               |
| IY100121 / IY100125 | 0mm                  | 5mm                  | 15mm               |
| IY150121 / IY150125 | 0mm                  | 5mm                  | 20mm               |
| IY200121 / IY200125 | 0mm                  | 10mm                 | 25mm               |
| IY250121 / IY250125 | 10mm                 | 10mm                 | 32mm               |
| IY350121 / IY350125 | 10mm                 | 35mm                 | 50mm               |
| IY500121 / IY500125 | 10mm                 | 35mm                 | 70mm               |
| IYK00121 / IYK00125 | 10mm                 | 60mm                 | 130mm              |
| IYKE0121 / IYKE0125 | 25mm                 | 100mm                | 170mm              |
| IY040122            | 0mm                  | 5mm                  | 10mm               |
| IY060122            | 0mm                  | 5mm                  | 10mm               |
| IY080122            | 0mm                  | 5mm                  | 15mm               |

This data sheet contains the standard versions only. Kindly request the availability of other output- and connection functions.

We will be pleased to supply the matching cable socket for your devices with connector. Please refer to the list in catalog chapter "accessories" under "cable sockets **ipf**-sensorees" or search our website for "VK".

Warning: Never use these devices in applications where the safety of a person depends on their functionality.



