Inductive sensors

Sn = 4 mm

- Shortest version with M12 x 1 connector
- High stability across entire temperature range

**general data**
- mounting type: shielded
- nominal sensing distance Sn: 4 mm
- hysteresis: 3 ... 20 % of Sr

**electrical data**
- switching frequency: < 2 kHz
- voltage supply range +Vs: 10 ... 30 VDC
- current consumption max.: 10 mA
- voltage drop Vd: < 2 VDC
- output current: < 200 mA
- short circuit protection: yes
- reverse polarity protection: yes

**mechanical data**
- type: cylindrical threaded
- material (sensing face): PBT
- housing material: brass nickel plated
- dimension: 12 mm

**cable**
- housing length: 30,4 mm

**connector M12**
- housing length: 40,4 mm

**ambient conditions**
- operating temperature: -25 ... +75 °C
- protection class: IP 67

**accessories**
- connectors: ESG 34S, ESW 33S

**order reference**
- IFRM 12N1701/L: cable
- IFRM 12N1703/S14L: connector M12
- IFRM 12N3701/L: cable
- IFRM 12N3703/S14L: connector M12
- IFRM 12P1701/L: cable
- IFRM 12P1703/S14L: connector M12
- IFRM 12P3701/L: cable
- IFRM 12P3703/S14L: connector M12

**connection types**
- output circuit: NPN, PNP
- output indicator: LED red

**IFRM 12**

**Sn = 4 mm**

**general data**

<table>
<thead>
<tr>
<th>order reference</th>
<th>connection types</th>
<th>output circuit</th>
<th>output indicator</th>
</tr>
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<tbody>
<tr>
<td>IFRM 12N1701/L</td>
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Inductive sensors

Sn = 4 mm

• High stability across entire temperature range

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<thead>
<tr>
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<tr>
<td>mounting type</td>
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<tr>
<td>nominal sensing distance Sn</td>
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<tr>
<td>hysteresis</td>
<td>3 ... 20 % of Sr</td>
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<tr>
<td>voltage supply range +Vs</td>
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<tr>
<td>current consumption max.</td>
<td>10 mA</td>
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<tr>
<td>voltage drop Vd</td>
<td>&lt; 2 VDC</td>
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<tr>
<td>output current</td>
<td>&lt; 200 mA</td>
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<td>short circuit protection</td>
<td>yes</td>
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<tr>
<td>reverse polarity protection</td>
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<tr>
<td>type</td>
<td>cylindrical threaded</td>
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<td>material (sensing face)</td>
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<tr>
<td>housing material</td>
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<tr>
<td>dimension</td>
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<tr>
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<tbody>
<tr>
<td>housing length</td>
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<td>connector M12</td>
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<tr>
<td>housing length</td>
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<td>-25 ... +75 °C</td>
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<tr>
<td>protection class</td>
<td>IP 67</td>
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<tr>
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<tr>
<td>connectors</td>
<td>ESG 34S, ESW 33S</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>order reference</th>
<th>connection types</th>
<th>output circuit</th>
<th>output indicator</th>
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<tbody>
<tr>
<td>IFRM 12N1701/S14L</td>
<td>connector M12</td>
<td>NPN make function (NO)</td>
<td>3 port LED red</td>
</tr>
<tr>
<td>IFRM 12N1702</td>
<td>cable</td>
<td>NPN make function (NO)</td>
<td>LED red</td>
</tr>
<tr>
<td>IFRM 12N3701/S14L</td>
<td>connector M12</td>
<td>NPN break function (NC)</td>
<td>3 port LED red</td>
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<td>IFRM 12N3702</td>
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<td>NPN break function (NC)</td>
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</tr>
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<td>IFRM 12P1702</td>
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<td>LED red</td>
</tr>
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<td>IFRM 12P3701/S14L</td>
<td>connector M12</td>
<td>PNP break function (NC)</td>
<td>3 port LED red</td>
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<tr>
<td>IFRM 12P3702</td>
<td>cable</td>
<td>PNP break function (NC)</td>
<td>LED red</td>
</tr>
</tbody>
</table>

* .../S14L pin 2 & 4 electrically connected
Inductive sensors

**Sn = 4 mm**

**W I R E**

- Extra long housings
- High stability across entire temperature range

---

**general data**
- Mounting type: shielded
- Nominal sensing distance: Sn = 4 mm
- Hysteresis: 3 ... 20 % of Sr

**electrical data**
- Switching frequency: < 2 kHz
- Voltage supply range: +Vs 10 ... 30 VDC
- Current consumption max.: 10 mA
- Voltage drop: Vd < 2 VDC
- Output current: < 200 mA
- Short circuit protection: yes
- Reverse polarity protection: yes

**mechanical data**
- Type: cylindrical threaded
- Material (sensing face): PBT
- Housing material: brass nickel plated
- Dimension: 12 mm
- Cable:
  - Housing length: 50 mm
  - Connector M12:
    - Housing length: 60 mm

**ambient conditions**
- Operating temperature: -25 ... +75 °C
- Protection class: IP 67

**accessories**
- Connectors: ESG 34S, ESW 33S

**connection diagrams**

**order reference**
- IFRM 12N1704/L
- IFRM 12N1704/S14L
- IFRM 12N3704/L
- IFRM 12N3704/S14L
- IFRM 12P1704/L
- IFRM 12P1704/S14L
- IFRM 12P3704/L
- IFRM 12P3704/S14L

**connection types**
- Cable
- Connector M12

**output circuit**
- NPN make function (NO)
- NPN break function (NC)
- PNP make function (NO)
- PNP break function (NC)

**output indicator**
- LED red
- 3 port LED red
**Inductive sensors**  
*GammaProx*

**Sn = 6 mm**

- Version with extended Sn *GammaProx*
- Quasi shielded mounting

### General Data
- **Mounting Type**: Quasi shielded
- **Nominal Sensing Distance (Sn)**: 6 mm
- **Hysteresis**: 2 ... 25% of Sr

### Electrical Data
- **Switching Frequency**: < 400 Hz
- **Voltage Supply Range**: +Vs 12 ... 30 VDC
- **Current Consumption Max.**: 18 mA
- **Voltage Drop Vd**: < 2 VDC
- **Output Current**: < 200 mA
- **Short Circuit Protection**: Yes
- **Reverse Polarity Protection**: Yes

### Mechanical Data
- **Type**: Cylindrical threaded
- **Material (Sensing Face)**: PBT
- **Housing Material**: Brass nickel plated
- **Dimension**: 12 mm

### Cable
- **Housing Length**: 40 mm

### Connector M12
- **Housing Length**: 50 mm

### Ambient Conditions
- **Operating Temperature**: -25 ... +75 °C
- **Protection Class**: IP 67

### Accessories
- Connectors: ESG 34S, ESW 33S

### Remarks
For correct installation refer to chapter 1 “Mounting Instructions”

<table>
<thead>
<tr>
<th>Order Reference</th>
<th>Connection Types</th>
<th>Output Circuit</th>
<th>Output Indicator</th>
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<tbody>
<tr>
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</tr>
<tr>
<td>IFRM 12N17G3/S14L</td>
<td>Connector M12</td>
<td>NPN Make Function (NO)</td>
<td>3 port LED red</td>
</tr>
<tr>
<td>IFRM 12N37G3/L</td>
<td>Cable</td>
<td>NPN Break Function (NC)</td>
<td>LED red</td>
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<td>IFRM 12N37G3/S14L</td>
<td>Connector M12</td>
<td>NPN Break Function (NC)</td>
<td>3 port LED red</td>
</tr>
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<td>IFRM 12P17G3/L</td>
<td>Cable</td>
<td>PNP Make Function (NO)</td>
<td>LED red</td>
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<td>IFRM 12P17G3/S14L</td>
<td>Connector M12</td>
<td>PNP Make Function (NO)</td>
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<td>IFRM 12P37G3/S14L</td>
<td>Connector M12</td>
<td>PNP Break Function (NC)</td>
<td>3 port LED red</td>
</tr>
</tbody>
</table>

* .../S14L pin 2 & 4 electrically connected*
Inductive sensors  

**GammaProx**

### Sn = 6 mm

**Wire**

- Version with extended Sn GammaProx
- Quasi shielded mounting

#### General Data

- **Mounting Type**: Quasi shielded
- **Special Type**: Enhanced distance (GammaProx)
- **Nominal Sensing Distance Sn**: 6 mm
- **Hysteresis**: 2...25 % of Sr

#### Electrical Data

- **Switching Frequency**: < 400 Hz
- **Voltage Supply Range**: +Vs 12 ... 30 VDC
- **Current Consumption Max.**: 18 mA
- **Voltage Drop Vd**: < 2 VDC
- **Output Current**: < 200 mA
- **Short Circuit Protection**: Yes
- **Reverse Polarity Protection**: Yes

#### Mechanical Data

- **Type**: Cylindrical threaded
- **Material (Sensing Face)**: PBT
- **Housing Material**: Brass nickel plated
- **Dimension**: 12 mm
- **Cable**: Housing length 50 mm
- **Connector M12**: Housing length 60 mm
- **Operating Temperature**: -25 ... +75 °C
- **Protection Class**: IP 67

#### Accessories

- Connectors: ESG 34S, ESW 33S

#### Remarks

For correct installation refer to chapter 1 “Mounting Instructions”

#### Order Reference

<table>
<thead>
<tr>
<th>Order Reference</th>
<th>Connection Types</th>
<th>Output Circuit</th>
<th>Output Indicator</th>
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<tbody>
<tr>
<td>IFRM 12N17G1/L</td>
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<td>Connector M12</td>
<td>NPN make function (NO)</td>
<td>3 port LED red</td>
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<td>LED red</td>
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<td>Cable</td>
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<td>LED red</td>
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<tr>
<td>IFRM 12P17G1/S14L</td>
<td>Connector M12</td>
<td>PNP make function (NO)</td>
<td>3 port LED red</td>
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</tbody>
</table>

* .../S14L pin 2 & 4 electrically connected
Inductive sensors *GammaProx*

**Sn = 10 mm**

- Version with extended Sn *GammaProx*
- Non shielded mounting

### General Data
- **Mounting Type:** Unshielded
- **Nominal Sensing Distance (Sn):** 10 mm
- **Hysteresis:** 2 ... 25 % of Sr

### Electrical Data
- **Switching Frequency:** < 400 Hz
- **Voltage Supply Range:** +Vs 12 ... 30 VDC
- **Current Consumption Max.:** 18 mA
- **Voltage Drop (Vd):** < 2 VDC
- **Output Current:** < 200 mA
- **Short Circuit Protection:** Yes
- **Reverse Polarity Protection:** Yes

### Mechanical Data
- **Type:** Cylindrical threaded
- **Material (Sensing Face):** PBT
- **Housing Material:** Brass nickel plated
- **Dimension:** 12 mm

### Cable
- **Housing Length:** 40 mm
- **Connector M12 Housing Length:** 50 mm

### Ambient Conditions
- **Operating Temperature:** 0 ... +60 °C
- **Protection Class:** IP 67

### Accessories
- **Connectors:** ESG 34S, ESW 33S

### Order Reference
<table>
<thead>
<tr>
<th>Device</th>
<th>Connection Types</th>
<th>Output Circuit</th>
<th>Output Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFRM 12N13G3/L</td>
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<td>NPN Make Function (NO)</td>
<td>LED Red</td>
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<tr>
<td>IFRM 12N13G3/S14L</td>
<td>Connector M12</td>
<td>NPN Make Function (NO)</td>
<td>3 Port LED Red</td>
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<tr>
<td>IFRM 12N33G3/L</td>
<td>Cable</td>
<td>NPN Break Function (NC)</td>
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<td>Connector M12</td>
<td>PNP Break Function (NC)</td>
<td>3 Port LED Red</td>
</tr>
</tbody>
</table>

### Dimension Drawings

![Dimension Drawings](image)

### Connection Diagrams

```
NPN
BK (4) [WH/BK (2/4)]
BN (1)
BU (3) 0 V

PNP
BK (4) [WH/BK (2/4)]
BN (1)
BU (2) 0 V

* .../S14L pin 2 & 4 electrically connected
```
### General Data
- **Mounting Type**: Unshielded
- **Special Type**: Enhanced Distance (GammaProx)
- **Nominal Sensing Distance (Sn)**: 10 mm
- **Hysteresis**: 2 ... 25% of Sr

### Electrical Data
- **Switching Frequency**: < 400 Hz
- **Voltage Supply Range**: +Vs 12 ... 30 VDC
- **Current Consumption Max.**: 18 mA
- **Voltage Drop Vd**: < 2 VDC
- **Output Current**: < 200 mA
- **Short Circuit Protection**: Yes
- **Reverse Polarity Protection**: Yes

### Mechanical Data
- **Type**: Cylindrical Threaded
- **Material (Sensing Face)**: PBT
- **Housing Material**: Brass nickel plated
- **Dimension**: 12 mm
- **Cable**:
  - **Housing Length**: 50 mm
  - **Connector M12**: Housing Length 60 mm

### Ambient Conditions
- **Operating Temperature**: 0 ... +60 °C
- **Protection Class**: IP 67

### Accessories
- **Connectors**: ESG 34S, ESW 33S

---

#### Order Reference

<table>
<thead>
<tr>
<th>Order Reference</th>
<th>Connection Types</th>
<th>Output Circuit</th>
<th>Output Indicator</th>
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<tbody>
<tr>
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<td>IFRM 12N13G1/S14L</td>
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<td>PNP Break Function (NC)</td>
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</tbody>
</table>
### Inductive sensors

**Sn = 4 mm**

- M8 x 1 quick disconnect
- High stability across entire temperature range

#### general data
- Mounting type: shielded
- Nominal sensing distance $Sn = 4$ mm
- Hysteresis: $3 \ldots 25\%$ of $Sr$
- Output indicator: 4 port LED red

#### electrical data
- Switching frequency: $< 2$ kHz
- Voltage supply range: $+Vs 12 \ldots 30$ VDC
- Current consumption max.: $18$ mA
- Voltage drop $Vd$: $< 3$ VDC
- Output current: $< 200$ mA
- Short circuit protection: yes
- Reverse polarity protection: yes

#### mechanical data
- Type: cylindrical threaded
- Material (sensing face): PBT
- Housing material: brass nickel plated
- Dimension: $12$ mm
- Housing length: $50$ mm
- Connection types: connector M8

#### ambient conditions
- Operating temperature: $-25 \ldots +75$ °C
- Protection class: IP 67

#### accessories
- Connectors: ESG 32S, ESW 31S

#### order reference
- IFRM 12N1701/S35L: NPN make function (NO)
- IFRM 12N3701/S35L: NPN break function (NC)
- IFRM 12P1701/S35L: PNP make function (NO)
- IFRM 12P3701/S35L: PNP break function (NC)

#### dimension drawing

![Dimension drawing of the sensor](image)

#### connection diagrams

![Connection diagrams](image)
High temperature sensors up to +100 °C

Sn = 2 mm / 4 mm

- With integral electronics up to 100°C
- Teflon cable

**General Data**
- Mounting type: shielded
- Special type: high temperature
- Hysteresis: 3...20 % of Sr

**Electrical Data**
- Voltage supply range: +Vs 12...30 VDC
- Current consumption max.: 12 mA
- Voltage drop Vd: < 3 VDC
- Output current: < 50 mA
- Short circuit protection: yes
- Reverse polarity protection: yes

**Mechanical Data**
- Type: cylindrical threaded
- Connection types: cable

**Ambient Conditions**
- Operating temperature: -25...+100 °C
- Protection class: IP 67

<table>
<thead>
<tr>
<th>Order Reference</th>
<th>Nominal Sensing Distance Sn</th>
<th>Switching Frequency</th>
<th>Output Circuit</th>
<th>Dimension</th>
<th>Housing Material</th>
<th>Housing Length</th>
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<td>2 mm</td>
<td>&lt; 5 kHz</td>
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<td>8 mm</td>
<td>stainless steel</td>
<td>30 mm</td>
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<tr>
<td>IFRM 08P1707</td>
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<td>8 mm</td>
<td>stainless steel</td>
<td>30 mm</td>
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<tr>
<td>IFRM 12N1707</td>
<td>4 mm</td>
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<td>brass nickel plated</td>
<td>40 mm</td>
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<td>PNP make function (NO)</td>
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<td>brass nickel plated</td>
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</table>
Inductive NAMUR sensors

Sn = 2 mm / 4 mm

- Shielded and unshielded versions

**electrical data**

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<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tbody>
<tr>
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<td>&lt; 2 kHz</td>
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<tr>
<td>normal operating voltage</td>
<td>8.2 VDC</td>
</tr>
<tr>
<td>voltage supply range +Vs</td>
<td>5 ... 30 VDC</td>
</tr>
<tr>
<td>current consumption undamped</td>
<td>&gt; 4 mA</td>
</tr>
<tr>
<td>current consumption damped</td>
<td>&lt; 1 mA</td>
</tr>
<tr>
<td>current consumption max.</td>
<td>10 mA</td>
</tr>
<tr>
<td>residual ripple</td>
<td>&lt; 10% Vs</td>
</tr>
</tbody>
</table>

**mechanical data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td>cylindrical threaded</td>
</tr>
<tr>
<td>housing material</td>
<td>brass nickel plated</td>
</tr>
<tr>
<td>dimension</td>
<td>12 mm</td>
</tr>
<tr>
<td>connection types</td>
<td>cable</td>
</tr>
</tbody>
</table>

**ambient conditions**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>operating temperature</td>
<td>-25 ... +75 °C</td>
</tr>
<tr>
<td>protection class</td>
<td>IP 67</td>
</tr>
</tbody>
</table>

**safe maximum values**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC-type-examination Certificate</td>
<td>PTB 03 ATEX 2146</td>
</tr>
<tr>
<td>marking</td>
<td>II 1G EEx ia IIIC T5/6</td>
</tr>
<tr>
<td>current li</td>
<td>&lt; 37 mA</td>
</tr>
<tr>
<td>voltage Ui</td>
<td>&lt; 13.5 VDC</td>
</tr>
<tr>
<td>power Pi</td>
<td>&lt; 0.125 W</td>
</tr>
<tr>
<td>internal capacitance Ci</td>
<td>&lt; 50 nF</td>
</tr>
<tr>
<td>internal inductance Li</td>
<td>&lt; 0.2 mH</td>
</tr>
<tr>
<td>operating temperature Ta (temp. class T5)</td>
<td>-20 ... +80 °C</td>
</tr>
<tr>
<td>operating temperature Ta (temp. class T6)</td>
<td>-20 ... +40 °C</td>
</tr>
</tbody>
</table>

**order reference**

<table>
<thead>
<tr>
<th>Reference</th>
<th>Sensing Distance</th>
<th>Mounting Type</th>
<th>Housing Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFRM 12X9103</td>
<td>4 mm</td>
<td>unshielded</td>
<td>34 mm</td>
</tr>
<tr>
<td>IFRM 12X9503</td>
<td>2 mm</td>
<td>shielded</td>
<td>30 mm</td>
</tr>
</tbody>
</table>

**dimension drawings**

**connection diagram**

**operating data according to EN 50227**

\[
+Vs = 8.2 \text{ V} \\
R_L = 1 \text{ k}\Omega \\
T = 20 \degree \text{C} \\
Sn \text{ at } 1.8 \text{ mA}
\]

- for applications in hazardous areas

**For applications in hazardous area**