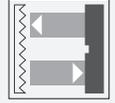




# Retroreflective sensor, NAMUR

## OCS2000-M1K-N2

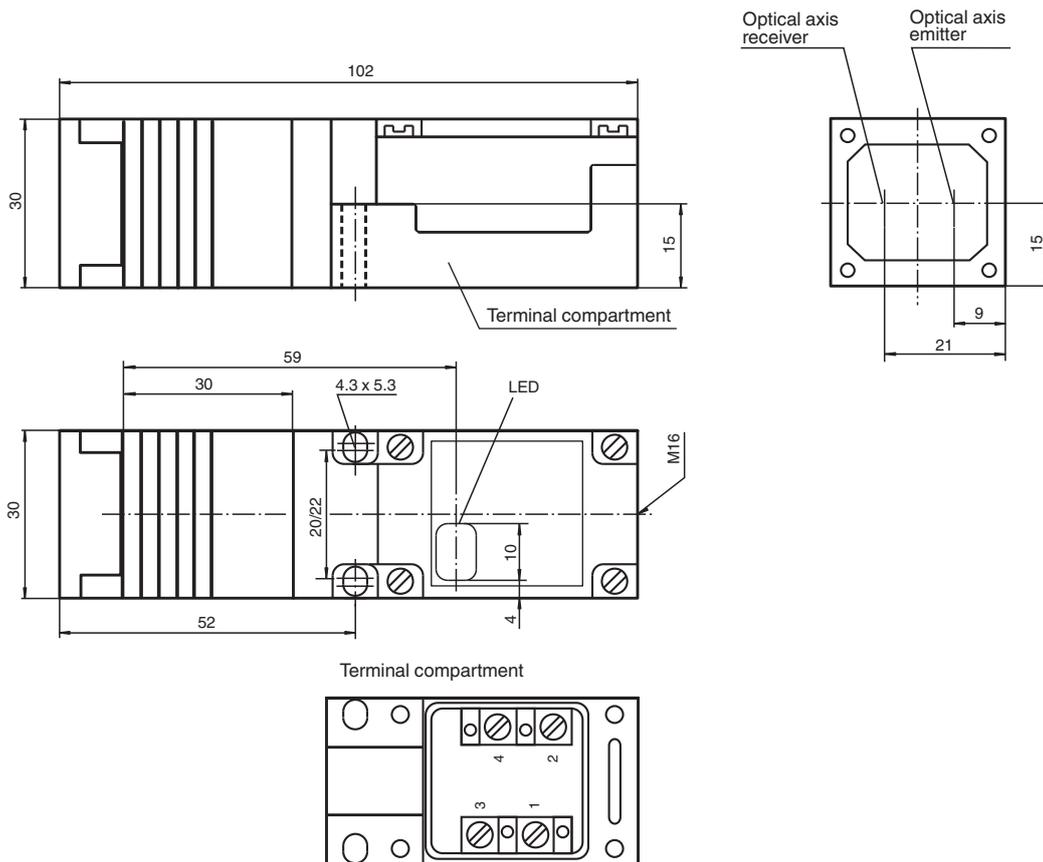


- ATEX-, IECEx approval for zone 20 (Dust) and zone 1 (Gas)
- Intrinsically safe, Ex op is ia IIC T6 Gb/IIIC T 135 °C Da
- Glare protected with polarization filter
- Adjustable sensor head
- Scratch resistant mineral glass lens

NAMUR retroreflective sensor, special design, 2 m detection range, red light, light/dark on, DC version, NAMUR output, terminal compartment



### Dimensions



### Technical Data

#### General specifications

Effective detection range 0 ... 2 m

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## Technical Data

Reflector distance		100 ... 2000 mm
Threshold detection range		2 m
Reference target		Retro-reflector C110-2
Light source		LED , 660 nm
Light type		modulated visible red light
Polarization filter		yes
Ambient light limit		≤ 10000 Lux sun light ≤ 7500 Lux halogen light
<b>Functional safety related parameters</b>		
MTTF <sub>d</sub>		1319 a
Mission Time (T <sub>M</sub> )		20 a
Diagnostic Coverage (DC)		0 %
<b>Indicators/operating means</b>		
Function indicator		LED yellow: switching state
<b>Electrical specifications</b>		
Operating voltage	U <sub>B</sub>	6 ... 20 V DC (R <sub>i</sub> approx. 0 Ohm)
Ripple		5 %
Time delay before availability	t <sub>v</sub>	20 ms
<b>Output</b>		
Switching type		light/dark on, programmable
Signal output		1 NAMUR output NC/NO programmable
Switching voltage		8 V DC (R <sub>i</sub> approx. 1 kΩ)
Switching frequency	f	≤ 100 Hz
Current consumption		
Reference target detected		connection 1, 2: ≥ 2.2 mA connection 1, 4: ≤ 1 mA
Reference target not detected		connection 1, 2: ≤ 1 mA connection 1, 4: ≥ 2.2 mA
Response time		5 ms
<b>Conformity</b>		
Product standard		EN 60947-5-2
<b>Compliance with standards and directives</b>		
Standard conformity		
Standards		EN 60947-5-6:2000
<b>Ambient conditions</b>		
Ambient temperature		-25 ... 70 °C (-13 ... 158 °F)
Storage temperature		-40 ... 80 °C (-40 ... 176 °F)
<b>Mechanical specifications</b>		
Degree of protection		IP20
Connection		M16&bspterminal compartment, core cross section ≤ 2.5 mm <sup>2</sup>
Material		
Housing		PBT
Optical face		Scratch resistant mineral glass lens
Mass		100 g
Dimensions		
Height		30 mm
Width		30 mm
Depth		102 mm
<b>ATEX G</b>		
EC-Type Examination Certificate		PTB 01 ATEX 2203 X
Applicant		Pepperl+Fuchs GmbH, Lilienthalstrasse 200, 68307 Mannheim, Germany
CE marking		CE0102
ATEX marking		Zone 1: Ⓜ II 2G Ex ia op is IIC T6...T1 Gb
Directive conformity		2014/34/EU

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## Technical Data

Standards	EN 60079-0:2012+A11:2013 EN 60079-11:2012 EN 60079-28:2007
Effective internal capacitance $C_i$	max. 75 nF
Effective internal inductance $L_i$	negligibly small
General	The apparatus must be operated in accordance with the data provided in the datasheet and this operating instruction. In particular, the maximum rated voltage and the temperature range must be adhered to. The special conditions must be adhered to! The EU-type examination certificate has to be observed.
Ambient temperature	The temperature ranges, according to temperature class, are given in the EC-Type Examination Certificate.
Installation, commissioning	The associated apparatus must, as a minimum, fulfill the requirements for degree of protection ia and for Groups II or III, as appropriate for the operating conditions. Due to the possible risk of ignition that can occur as a result of faults and/or transient currents in the equipotential bonding system, galvanic isolation in the supply and signal current circuit is preferred. Associated apparatus without galvanic isolation may only be used if the appropriate requirements as set out in IEC 60079-14 are met. The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety.
Maintenance	No modifications must be undertaken on apparatus, which is operated in hazardous areas. Repairs to such apparatus are not permissible.
<b>Special conditions</b>	
Protection from mechanical danger	When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.
Degree of protection required when installing connecting components	IP20 according to IEC 60529:2001
Other conditions	Refer to the relevant EC type examination certificate to see the relationship between the connected circuit type, the maximum permitted ambient temperature and the temperature class as well as effective inner reactances.
<b>ATEX D</b>	
EC-Type Examination Certificate	ZELM 03 ATEX 0196 X
Applicant	Pepperl+Fuchs GmbH, Lilienthalstrasse 200, 68307 Mannheim, Germany
CE marking	CE0102
ATEX marking	Zone 20/21: Ⓢ II 1D Ex ia IIC T 135°C Da
Directive conformity	2014/34/EU
Standards	EN 60079-0:2012+A11:2013 EN 60079-11:2012 EN 60079-28:2007
Effective internal capacitance $C_i$	max. 1200 nF
Effective internal inductance $L_i$	negligibly small
General	The apparatus must be operated in accordance with the data provided in the datasheet and this operating instruction. In particular, the maximum rated voltage and the temperature range must be adhered to. The special conditions must be adhered to! The EU-type examination certificate has to be observed.
Ambient temperature	-25 ... 70 °C (-13 ... 158 °F)
Installation, commissioning	The associated apparatus must, as a minimum, fulfill the requirements for degree of protection ia and for Groups II or III, as appropriate for the operating conditions. Due to the possible risk of ignition that can occur as a result of faults and/or transient currents in the equipotential bonding system, galvanic isolation in the supply and signal current circuit is preferred. Associated apparatus without galvanic isolation may only be used if the appropriate requirements as set out in IEC 60079-14 are met. This certificate does not guarantee that the components installed in the partition isolate the zones completely from one another. Appropriate measures must be taken when the partition is set up to ensure the zones are completely isolated.
Maintenance	No modifications must be undertaken on apparatus, which is operated in hazardous areas. Repairs to such apparatus are not permissible.
<b>Special conditions</b>	
Protection against dangerous electrostatic charging	The device must be installed such that electrostatic discharges can be avoided. If the device is installed in accordance with the instructions provided by the manufacturer, no dangerous electrostatic charge is to be expected given the properties of the device.
Protection from mechanical danger	When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.
Degree of protection required when installing connecting components	IP20 according to IEC 60529:2001

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## Technical Data

Other conditions	Refer to the relevant EC type examination certificate to see the relationship between the connected circuit type, the maximum permitted ambient temperature and the surface temperature class. In applications where high levels of charge are expected (e.g. electrostatic paint, foil manufacture, dust extraction, mechanical friction), structural measures must be taken to limit the surface area of the plastic housing exposed to this charge to approximately 15 cm <sup>2</sup> in order to avoid propagating brush discharge. When setting up a partition between different zones, appropriate measures must be taken to ensure that the components installed in the partition isolate the zones completely from one another.
<b>IECEX G</b>	
Certificate number	IECEX PTB 12.0060 X
Applicant	Pepperl+Fuchs GmbH, Lilienthalstrasse 200, 68307 Mannheim, Germany
IECEX marking	Zone 1: II 2G Ex ia op is IIC T6...T1 Gb
Standards	IEC 60079-0:2011 IEC 60079-11:2011 IEC 60079-28:2006
Effective internal capacitance C <sub>i</sub>	max. 75 nF
Effective internal inductance L <sub>i</sub>	negligibly small
General	The apparatus must be operated in accordance with the data provided in the datasheet and this operating instruction. In particular, the maximum rated voltage and the temperature range must be adhered to. The special conditions must be adhered to. The IECEX certificate must be observed.
Ambient temperature	The temperature ranges, according to temperature class, are given in the EC-Type Examination Certificate.
Installation, commissioning	The associated apparatus must, as a minimum, fulfill the requirements for degree of protection ia and for Groups II or III, as appropriate for the operating conditions. Due to the possible risk of ignition that can occur as a result of faults and/or transient currents in the equipotential bonding system, galvanic isolation in the supply and signal current circuit is preferred. Associated apparatus without galvanic isolation may only be used if the appropriate requirements as set out in IEC 60079-14 are met. The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety.
Maintenance	No modifications must be undertaken on apparatus, which is operated in hazardous areas. Repairs to such apparatus are not permissible.
<b>Special conditions</b>	
Protection from mechanical danger	When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.
Degree of protection required when installing connecting components	IP20 according to IEC 60529:2001
Other conditions	Refer to the relevant EC type examination certificate to see the relationship between the connected circuit type, the maximum permitted ambient temperature and the temperature class as well as effective inner reactances.
<b>IECEX D</b>	
Certificate number	IECEX ZLM 12.0005X
Applicant	Pepperl+Fuchs GmbH, Lilienthalstrasse 200, 68307 Mannheim, Germany
IECEX marking	Ex ia IIIC T135°C Da
Standards	IEC 60079-0:2011 IEC 60079-11:2011
Effective internal capacitance C <sub>i</sub>	max. 1200 nF
Effective internal inductance L <sub>i</sub>	negligibly small
General	The apparatus must be operated in accordance with the data provided in the datasheet and this operating instruction. In particular, the maximum rated voltage and the temperature range must be adhered to. The special conditions must be adhered to. The IECEX certificate must be observed.
Ambient temperature	-25 ... 70 °C (-13 ... 158 °F)
Installation, commissioning	The associated apparatus must, as a minimum, fulfill the requirements for degree of protection ia and for Groups II or III, as appropriate for the operating conditions. Due to the possible risk of ignition that can occur as a result of faults and/or transient currents in the equipotential bonding system, galvanic isolation in the supply and signal current circuit is preferred. Associated apparatus without galvanic isolation may only be used if the appropriate requirements as set out in IEC 60079-14 are met. This certificate does not guarantee that the components installed in the partition isolate the zones completely from one another. Appropriate measures must be taken when the partition is set up to ensure the zones are completely isolated.
Maintenance	No modifications must be undertaken on apparatus, which is operated in hazardous areas. Repairs to such apparatus are not permissible.
<b>Special conditions</b>	
Protection against dangerous electrostatic charging	The device must be installed such that electrostatic discharges can be avoided. If the device is installed in accordance with the instructions provided by the manufacturer, no dangerous electrostatic charge is to be expected given the properties of the device.

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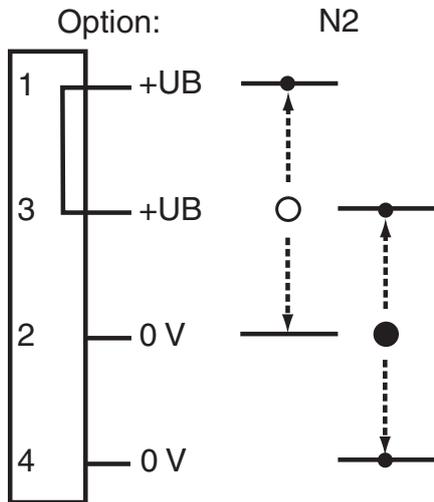
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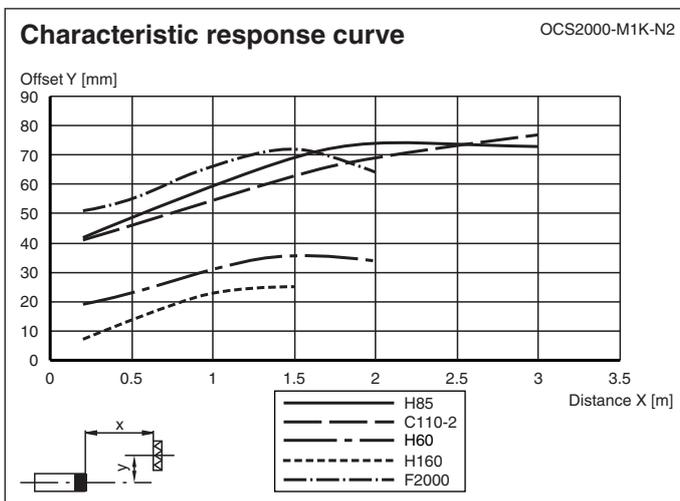
**Technical Data**

Protection from mechanical danger	When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.
Degree of protection required when installing connecting components	IP20 according to IEC 60529:2001
Other conditions	When setting up a partition between different zones, appropriate measures must be taken to ensure that the components installed in the partition isolate the zones completely from one another.

**Connection Assignment**

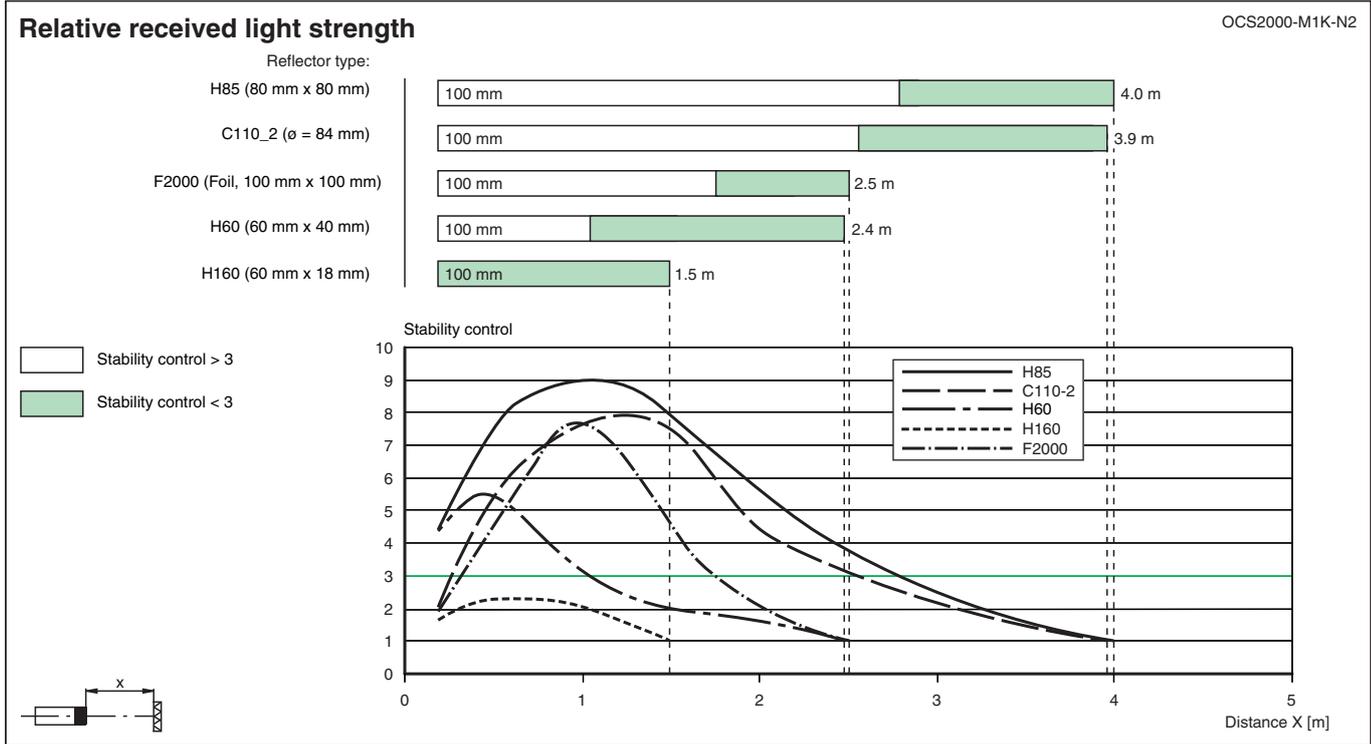


**Characteristic Curve**



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## Safety Information

**Safety Instructions:**

- Read the operating instructions before commissioning
- Installation, connection and adjustments should only be undertaken by qualified personnel
- No safety component according to EU Machinery Directive, may not be used for personal protection or EMERGENCY STOP function.

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