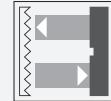




Retroreflective sensor, NAMUR OCS2000-M1K-N2

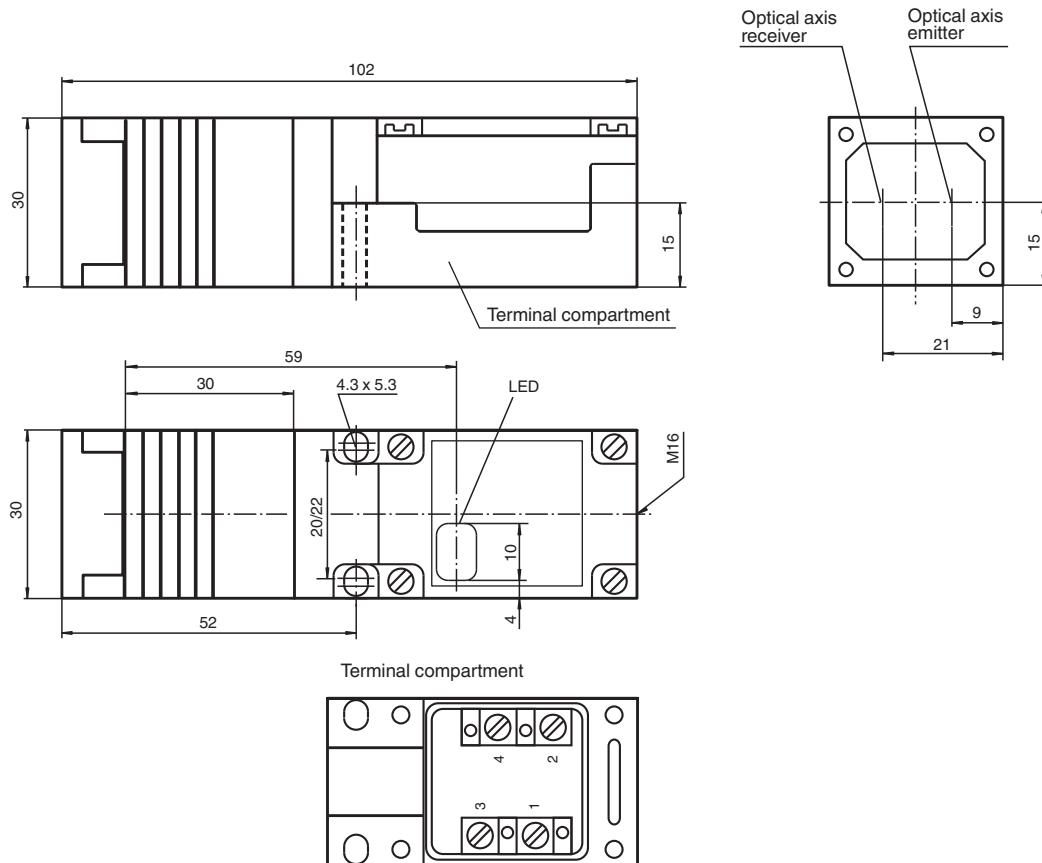


- ATEX-, IECEX approval for zone 20 (Dust) and zone 1 (Gas)
- Intrinsically safe, Ex op is ia IIC T6 Gb/IIIC T 135 °C Da
- Glare protected with polarization filter
- Adjustable sensor head
- Scratch resistant mineral glass lens

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

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
Functional safety related parameters	
MTTF _d	1319 a
Mission Time (T _M)	20 a
Diagnostic Coverage (DC)	0 %
Indicators/operating means	
Function indicator	LED yellow: switching state
Electrical specifications	
Operating voltage	U _B 6 ... 20 V DC (R _i approx. 0 Ohm)
Ripple	5 %
Time delay before availability	t _v 20 ms
Output	
Switching type	light/dark on, programmable
Signal output	1 NAMUR output NC/NO programmable
Switching voltage	8 V DC (R _i 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
Conformity	
Product standard	EN 60947-5-2
Compliance with standards and directives	
Standard conformity	
Standards	EN 60947-5-6:2000
Ambient conditions	
Ambient temperature	-25 ... 70 °C (-13 ... 158 °F)
Storage temperature	-40 ... 80 °C (-40 ... 176 °F)
Mechanical specifications	
Degree of protection	IP20
Connection	M16&bspterminal compartment, core cross section ≤ 2.5 mm ²
Material	
Housing	PBT
Optical face	Scratch resistant mineral glass lens
Mass	100 g
Dimensions	
Height	30 mm
Width	30 mm
Depth	102 mm
ATEX G	
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

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.
Special conditions	
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.
ATEX D	
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: G 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.
Special conditions	
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

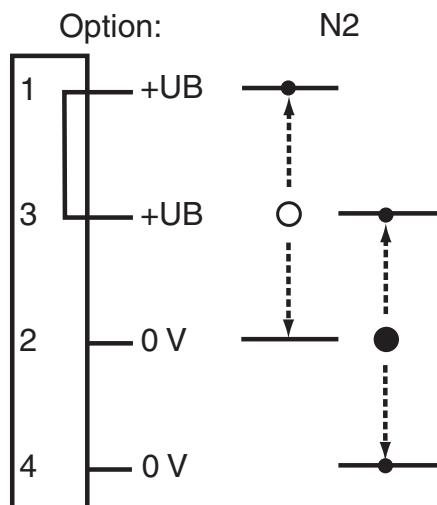
Technical Data

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 ² 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.
IECEx G		
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 _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 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.
Special conditions		
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.
IECEx D		
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 _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 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.
Special conditions		
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.

Technical Data

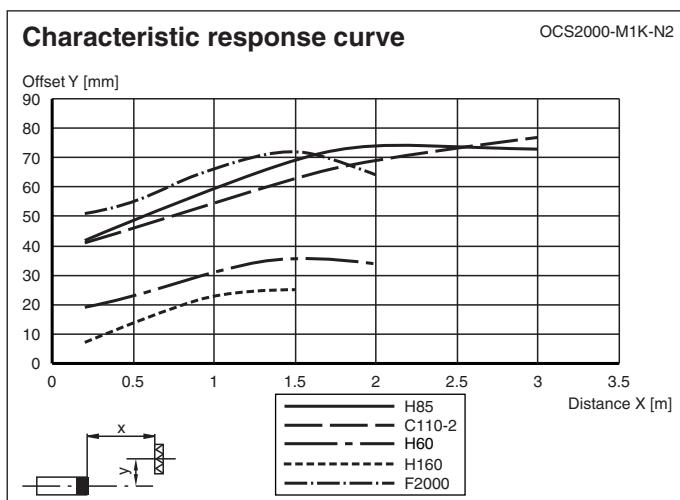
Protection from mechanical danger	When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.
Degree of protection required when installing connecting components	IP20 according to IEC 60529:2001
Other conditions	When setting up 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

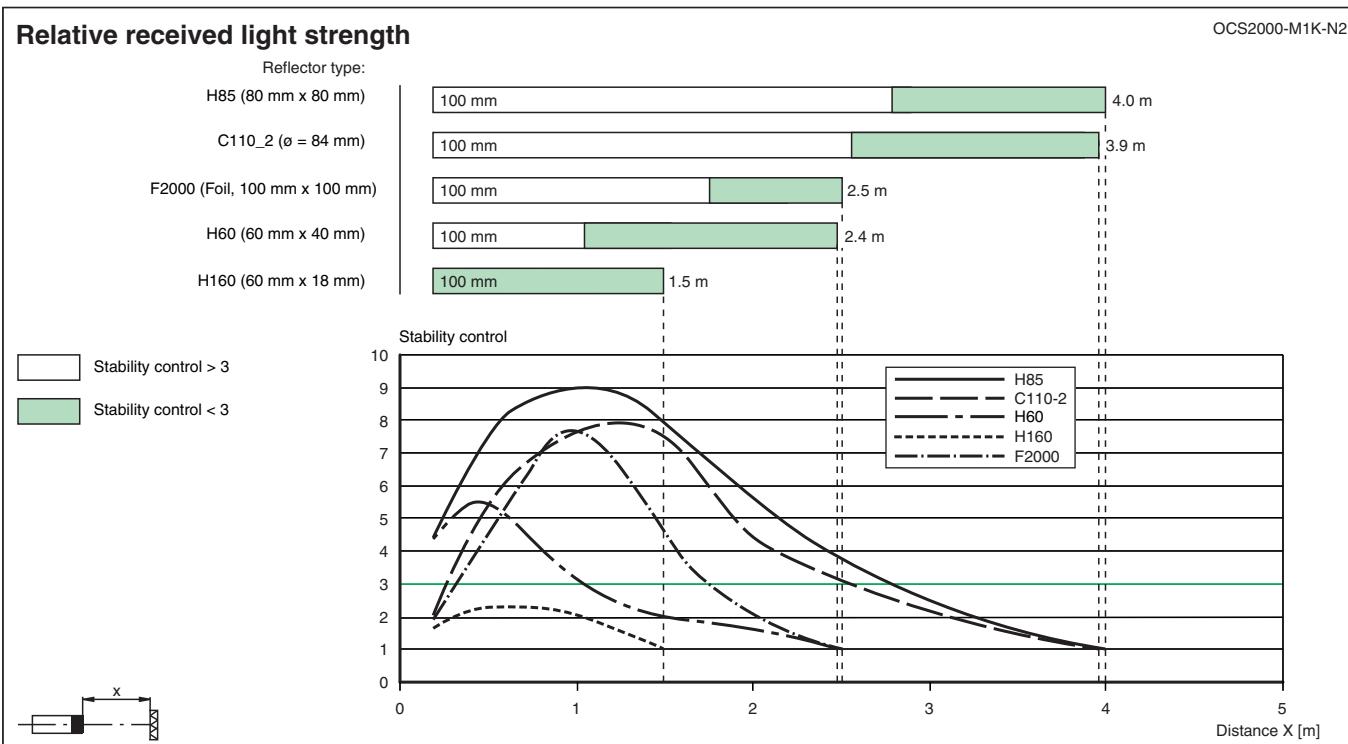


○ = Light on
● = Dark on

Characteristic Curve



Characteristic Curve



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.