Inductive BEROs

5

Summary of ranges

Overview

Operating distance	Cylindrical forms																			
	3 mm diameter	4 mm diameter	M 5	6.5 mm diameter	6.5 mm diameter	M 8	M 8	8 mm diameter	M 12	M 12	12 mm diameter	12 mm diameter	M 18	M 18	18 mm diameter	18 mm diameter	20 mm diameter	M 30	M 30
Embeddable / non-embeddable	b	b	b	b	nb	b	nb	b	b	nb	b	nb	b	nb	b	nb	nb	b	nb
Standard duty																			
0.6 mm	5/20																		
0.8 mm		5/20	5/20																
1 mm						5/22													
1.5 mm				5/24		5/25 5/26		5/25											
2 mm									5/28										
2.5 mm					5/34		5/34												
4 mm										5/42									
5 mm													5/49		5/50				
8 mm														5/56					
10 mm																	5/63	5/62 5/63	
15 mm																			5/69
20 mm																			
25 mm																			
30 mm																			
40 mm																			
Standard duty (PLC)																			
1 mm						5/23													
2 mm									5/29										
2.5 mm																			
4 mm										5/44									
5 mm													5/51						
8 mm														5/57					
10 mm																		5/64	
15 mm																			5/71
20 mm																			
Extra duty (DC 65 V or AC/DC)																			
1 mm						5/23													
2 mm									5/29										
2.5 mm																			
4 mm										5/44									
5 mm													5/51						
8 mm														5/57					
10 mm																	5/63	5/64	
15 mm																			5/71
20 mm																			
30 mm																			
35 mm																			
40 mm																			
With analog output																			
0 ... 6 mm									5/55										

5

Summary of ranges

Cubic designs																		Operating distance
30 mm diameter	30 mm diameter	34 mm diameter	5 mm × 5 mm	8 mm × 8 mm	Box with M 14	Box with M 14	12 mm × 32 mm	12 mm × 40 mm	12 mm × 40 mm	40 mm × 40 mm	40 mm × 40 mm	60 mm × 80 mm	60 mm × 80 mm	80 mm × 100 mm	80 mm × 100 mm	100 mm × 100 mm		
b	nb	nb	b	b	b	nb	b	b	nb	b	nb	b	nb	b	nb	nb		Embeddable / non-embeddable
Standard duty																		
																		0.6 mm
			5/21															0.8 mm
																		1 mm
				5/25														1.5 mm
							5/32	5/32 5/33										2 mm
					5/35													2.5 mm
									5/43									4 mm
						5/50												5 mm
																		8 mm
																		10 mm
										5/70								15 mm
		5/78									5/79							20 mm
												5/85						25 mm
													5/87					30 mm
															5/91			40 mm
Standard duty (PLC)																		
																		1 mm
																		2 mm
					5/36													2.5 mm
																		4 mm
																		5 mm
																		8 mm
																		10 mm
										5/72								15 mm
											5/80							20 mm
Extra duty (DC 65 V or AC/DC)																		
																		1 mm
																		2 mm
					5/36													2.5 mm
																		4 mm
						5/50												5 mm
																		8 mm
																		10 mm
										5/72 5/73								15 mm
		5/78								5/82	5/80							20 mm
													5/87		5/92			30 mm
											5/89							35 mm
														5/92	5/91			40 mm

5

Summary of ranges

Operating distance	Cylindrical forms																			
	3 mm diameter	4 mm diameter	M 5	6.5 mm diameter	6.5 mm diameter	M 8	M 8	8 mm diameter	M 12	M 12	12 mm diameter	12 mm diameter	M 18	M 18	18 mm diameter	18 mm diameter	20 mm diameter	M 30	M 30
Embeddable / non-embeddable	b	b	b	b	nb	b	nb	b	b	nb	b	nb	b	nb	b	nb	nb	b	nb
Extreme ambient conditions (IP68)																			
0.6 mm		5/21	5/21																
1 mm																			
2 mm									5/30		5/30								
2.5 mm				5/37		5/37													
4 mm										5/45 5/46		5/45							
5 mm													5/52		5/52				
8 mm														5/58 5/59		5/58			
10 mm																		5/65	
15 mm																			5/75
Greater rated operating distance																			
2 mm						5/31													
2.5 mm				5/37		5/37													
3 mm				5/38		5/38													
4 mm									5/47										
6 mm							5/54		5/54										
8 mm													5/60						
10 mm										5/67									
12 mm													5/67						
15 mm																		5/73	
20 mm														5/81					
22 mm																		5/84	
25 mm																			
30 mm																			
35 mm																			
40 mm																			5/93
50 mm																			
65 mm																			
No reduction factor																			
1.5 mm						5/27													
3 mm									5/40										
4 mm							5/48												
5 mm													5/53						
8 mm										5/61									
10 mm																		5/66	
12 mm														5/68					
15 mm																			
20 mm																			5/83
25 mm																			
35 mm																			
40 mm																			
75 mm																			
Pressure-resistant up to 500 bar (IP68)																			
3 mm											5/41								

5

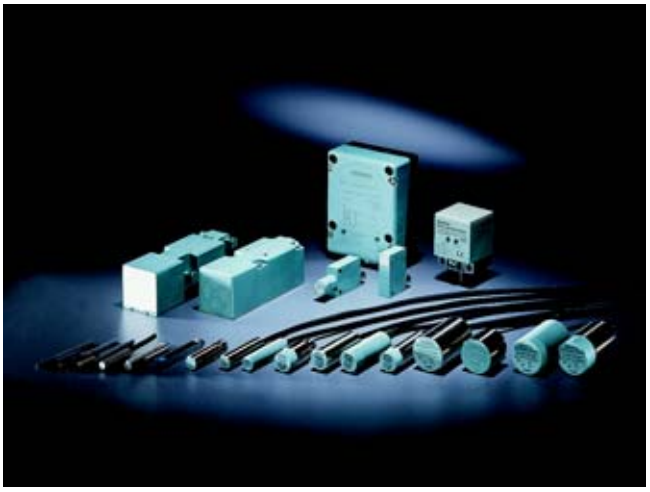
Summary of ranges

Cubic designs																		Operating distance
30 mm diameter	30 mm diameter	34 mm diameter	5 mm × 5 mm	8 mm × 8 mm	Box with M 14	Box with M 14	12 mm × 32 mm	12 mm × 40 mm	12 mm × 40 mm	40 mm × 40 mm	40 mm × 40 mm	60 mm × 80 mm	60 mm × 80 mm	80 mm × 100 mm	80 mm × 100 mm	100 mm × 100 mm	
b	nb	nb	b	b	b	nb	b	b	nb	b	nb	b	nb	b	nb	nb	Embeddable / non-embeddable
Extreme ambient conditions (IP68 / IP69 K)																	
																	0.6 mm
																	1 mm
																	2 mm
																	2.5 mm
																	4 mm
																	5 mm
																	8 mm
5/65																	10 mm
	5/74									5/76							15 mm
Greater rated operating distance																	
																	2 mm
																	2.5 mm
				5/39													3 mm
																	4 mm
																	6 mm
																	8 mm
																	10 mm
																	12 mm
																	15 mm
										5/81 5/82							20 mm
																	22 mm
										5/85	5/95						25 mm
											5/88						30 mm
											5/89						35 mm
											5/94 5/95						40 mm
													5/96				50 mm
															5/96		65 mm
No reduction factor																	
																	1.5 mm
																	3 mm
																	4 mm
																	5 mm
																	8 mm
																	10 mm
																	12 mm
										5/77							15 mm
																	20 mm
											5/86						25 mm
											5/90						35 mm
											5/90						40 mm
																5/97	75 mm

5

Introduction

Overview



The inductive BEROs are position switches that can be operated without contact, that contain no mechanical parts subject to wear, and that are to a large extent insensitive to environmental conditions.

They are used in applications with stringent requirements for reliability, switch point accuracy, service life, number of switching operations, operating speed, and so on.

Area of application

Inductive BEROs are the low-cost method for non-contact detection of metal objects. They are used in sectors in which metal components play an important role, e.g.

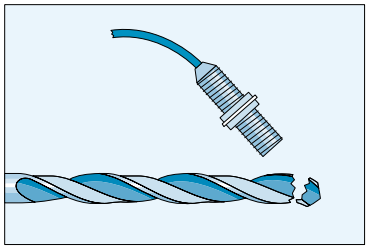
- In the motor industry
- In mechanical engineering
- In the robotics industry
- In conveyor systems and
- In the paper and printing industry

The induction principle and the experience gained by Siemens over many years have made the inductive BEROs what they are: extremely reliable with a very high repeat accuracy and long service life thanks to a lack of wearing parts as well as their insensitivity to temperature, noise, light and water.

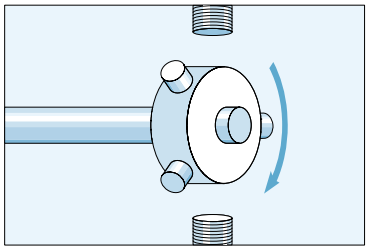
Our customers also benefit from the wide range of inductive BERO proximity switches that Siemens offers. Our complete range meets a wide range of different requirements and leaves no wishes unfulfilled. Inductive BEROs are available

- With operating distances from 0.6 to 75 mm
- In cylindrical and cubic designs
- In the standard version as 3- and 4-wire sensors
- As 2-wire sensors for solid-state inputs
- For extra duty (DC 65 V or AC/DC 320 V)
- To the IP68 degree of protection for extreme environmental conditions
- With increased operating distances
- Without a reduction factor
- As pressure-resistant sensors
- Acc. to DESINA specification
- For direct connection to AS-Interface and
- As intrinsically safe sensors for potentially explosive environments.

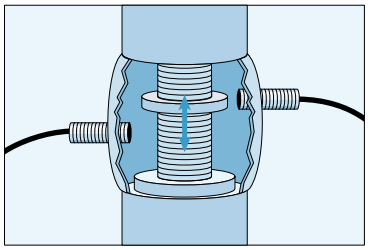
Application examples



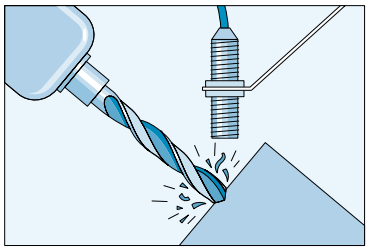
Recognition of broken drills



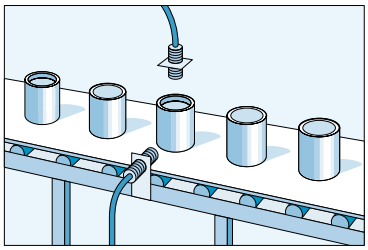
Recognition of setscrews on the wheel for checking of speed or direction



Recognition of valve position (completely open or closed)



Recognition of broken pieces on a mill



Recognition of cans and lids

Introduction

The inductive BERO proximity switches are classified in accordance with their applications or their technical characteristics:

BEROs for standard duty

- Rated operating voltage: DC 15 to 34 V (for 3RG46: DC 10 to 30 V)
- Output
  - 3-wire BERO: 1 NO or 1 NC, up to 200 mA,
  - 4-wire BERO: 1 NO and 1 NC (compatible), pnp up to 200 mA
- Operating distance acc. to standard
- The actuation distance is between 0 and 81 % of the rated operating distance.

BEROs for PLCs (2-wire)

- Rated operating voltage: DC 15 to 34 V
- Output 2-wire BERO: 1 NO, up to 25 mA
- Residual current and voltage drop to suit solid-state inputs
- Operating distance acc. to standard
- The actuation distance is between 0 and 81 % of the rated operating distance.

Advantages:

- Minimum wiring overheads
- Direct replacement of mechanical position switches possible in installations that are not safety-oriented
- Power is supplied from the solid-state input
- npn as well as pnp switching.

BEROs for extra duty

- Rated operating voltage:
  - 3-wire BERO: DC 10 to 65 V
  - 2-wire BERO: AC/DC 20 to 320 V
- Output
  - 3-wire BERO: 1 NO or 1 NC, pnp, up to 300 mA
  - 2-wire BERO: 1 NO or 1 NC, resistive load up to 300 mA
- The actuation distance is between 0 and 81 % of the rated operating distance.

Advantages:

- Problem-free adaptation to different rated operating voltages
- Insensitive to voltage deviations

BEROs for extreme environmental conditions (IP69 K)

- Rated operating voltage:
  - 2-wire BERO: AC/DC 20 to 320 V
  - 3-wire BERO: DC 15 to 34 V, DC 10 to 65 V,
  - 4-wire BERO: DC 15 to 34 V
- Output
  - 3-wire BERO: 1 NO or 1 NC, pnp up to 300 mA
  - 4-wire BERO: 1 NO and 1 NC (antivalent),pnp up to 200 mA
- The actuation distance is between 0 and 81 % of the rated operating distance.

Advantages:

- Can be used under extreme environmental conditions according to IP68 by use of a well-sealed enclosure with a special casting compound.

BEROs with greater operating distance

- Rated operating voltage: DC 10 to 65 V (for 3RG46: DC 10 to 30 V)
- Output 3-wire BERO: 1 NO or 1 NC, pnp up to 300 mA
- Operating distance far above the standard, up to three times the rated operating distance defined in the standard
- The actuation distance is between 0 and 81 % of the rated operating distance.

Advantages:

- Wide range of mounting adjustment
- A smaller type can be selected for the required operating distance
- Reduction of actuation distance is corrected for non-ferrous metals

U BERO without reduction factor

- Rated operating voltage: 3-wire BERO: DC 10 to 30 V
- Output 3-wire BERO: 1 NO, pnp up to 200 mA

Advantages:

- No reduction factor for non-ferrous metals
- Resistant to magnetic fields, i.e. these BEROs are resistant to welding.
  Resistant to magnetic field up to 160 mT r.m.s. = 21 kA at 25.4 mm;
  except 3RG46 48: 140 mT r.m.s.
  3RG46 44: 140 mT r.m.s.
  3RG46 43: 75 mT r.m.s.

BEROs pressure-resistant up to 500 bar (7250 psi)

- Rated operating voltage: DC 10 to 30 V
- Output 3-wire BERO: 1 NO, pnp up to 200 mA
- Operating distance: 3 mm.

Advantages:

- Suitable for extreme dynamic mechanical stress
- Easy to install: BERO can be screw fastened against a stop, no adjustment required
- Sensing face seal is gas-tight

BEROs with analog output

- Rated operating voltage: DC 10 to 30 V
- Output
  - Voltage output DC 0 to 5 V
  - Current output 1 to 5 mA,
- Short-circuit protection, inductive interference protection, total reverse polarity protection
- Non-linearized design
- Connection via cable or S12 connector

Approvals

3RG40, 3RG41 devices with M 12 or M 18 connectors as well as terminal compartments are UL and CSA listed.

For a complete overview, see the Appendix.

Explosion protection

Approvals for Ex zones 2 and/or 22 according to ATEX on request.

Personal safety


NSD00801

The use of the inductive BEROs is not permissible for applications in which the safety of persons is dependent on the function of the BERO.

Introduction

Design

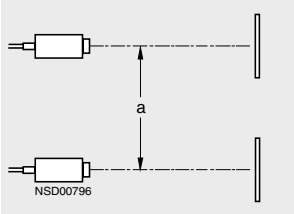
Specifications

IEC 60947-5-2, EN 60947-5-2 (VDE 0660, Part 208)

Minimum clearance

The proximity switches must not interfere with each other. Therefore a minimum distance **a** must be observed between two sensors.

The distance **a** depends on the sensor size and type (see diagrams in selection tables).



Degree of protection

Degree of protection according to IEC 60529.

IP67 degree of protection

Where:

6 Protection against the entry of dust. Complete contact protection (electric).

7 Protection against water when the enclosure is immersed in water under given pressure and time conditions. Entry of water in harmful amounts is not allowed.

Test conditions:
- Immersion depth 1 m
- Time 30 min

IP68 degree of protection

Where:

6 As above.

8 Protection against water when submersed.

The leak test is based on IEC 60068-2-17, test ql. Contrary to the standard, the tested device is stored in steam and not in water since greater stress exists with this type of storage.

Parameters:
- 7.4 Initial conditions: operating distance at T_{amb} = 25 °C ± 5 °C
- 7.5.1 Test liquid: tap water
- 7.5.2 Temperature of test liquid: 105 °C – 5 °C
- 7.5.4 Test pressure: 12 N/cm (1.2 bar)
- 7.5.5 Stress duration: 5 days
- 7.6 Post-treatment: drying at room temperature and cooling. The final measurement is made as soon as the device under test has reached room temperature.
- 7.7 Final measurement: operating distance at T_{amb} = 25 °C ± 5 °C. The permissible change is ± 10% of the initial state.

IP69 K degree of protection

Where:

6 As above.

9 K Protection against water with high-pressure jet cleaning. (i.e.: water directed at extremely high pressure onto the enclosure from all directions must not result in harmful effects.)

Connectors

For the cylindrical types, 8 mm combined plugs or plugs with M 12 threads are offered as standard (3-pole or 4-pole). A cable plug is additionally required for the plug-and-socket connections, see Accessories.

As an option, plugs with an M 18 thread (3-pole) are also offered for the M 18 and M 30 types.

Cables

In general, highly flexible cables with oil-resistant outer sheaths of polyurethane (PUR) are used that are 2 m long as standard.

For applications where cables come into contact with acids or alkalis, please order devices with PVC cables.

For devices used in applications to UL and CSA, PVC cables must be ordered.

See Options for other cable lengths and materials.

Cable length

For the BERO proximity switches, long cables cause:
- Capacitive loading of the output
- Increased injection of interference.

Cables should be shorter than 300 m even under favorable conditions.

Cable routing

The connecting leads of the proximity switches should not be routed in a cable channel alongside cables that are used to switch inductive loads (e.g. contactor coils, solenoid valves, motors) or that carry the current for solid-state motor drives.

The cable lengths should be kept as short as possible; with favorable routing (small coupling capacitance, small interference voltages), the length may be up to 300 m.

Interference can be reduced by means of the following measures:
- Clearance from interfering cables > 100 mm,
- Shielding
- Connection of coils (of contactors, relays or solenoid valves) with RC elements or varistors.

Functions

A high-frequency alternating field is generated in the BERO and emerges at the "sensing face". The physical size of this alternating field determines the "range" of the device. When a material that is a good conductor of electricity and/or magnetism comes into close proximity with the sensing surface, the field is damped. Both states (field damped or undamped) are evaluated in the BERO and result in a change in the output state of the switch.

Built-in protection

The protective circuits built into most BEROs (see selection data) make them easy to handle and protect the devices from damage.

Protection is possible against

- Spurious signals
- Short-circuit and overload (DC)
- Swapped connectors
- Wire-break (connection L– or L+),
- Overvoltage peaks
- Radio interference

Spurious signal suppression

When the operating voltage is applied, the "damped" status is simulated due to the transient condition of the sensor inductor – even when an activation element is not present. Spurious signal suppression prevents the output switching during this period.

Short-circuit and overload protection

All DC voltage devices with three-wire and four-wire connections are equipped with short-circuit and overload protection. Short-circuits between the output and the operating voltage connections do not damage the proximity switches, and may be occur permanently; an unlimited overload is also permissible. For the duration of the short circuit, the LEDs are not functional.

Reverse polarity protection

All DC voltage devices with three-wire and four-wire connections are protected against reverse polarity at all connections.

Wire-break protection

The DC version is designed such that when a wire-break occurs in any connection, the BERO does not output a faulty signal (not for 3RG46 and all 4-wire BEROs). A faulty signal is any non-zero signal that is active for more than 2 ms and whose current is larger than the residual current.

Inductive interference protection

When inductive loads are disconnected, the output voltage rises (without protective elements) to high values whereby the output transistor can be destroyed. The BERO proximity switches are therefore equipped with a Zener diode at the output which limits the disconnection voltage to a safe value (3-wire BERO).

When inductive loads are connected at currents > 100 mA and simultaneously a switching frequency > 10 Hz, it is recommended that a freewheeling diode is directly connected across the load (due to the power losses in the built-in Zener diode).

Radio interference protection

The high-frequency susceptibility has been sufficiently reduced to comply with IEC 61000-4-3, Level 3 (testing level 10 V/m).

Protection against electrostatic charging

The devices are constructed such that electrostatic charging to IEC 61000-4-3, Level 3 (8 kV) does not damage the devices.

Electromagnetic compatibility (EMC)

All inductive BEROs meet the protection requirements of EMC guideline No. 89/336/ECC. This is verified by application of the standard EN 60947-5-2 and certified by the appropriate authority.

The following EMC standards are applicable for the individual tests:

- EN 55011, IEC-CISPR 11,
- EN 55022, IEC-CISPR 22,
- IEC 61000-4-2, Level 3,
- IEC 61000-4-3, Level 3,
- IEC 61000-4-4, Level 3,
- IEC 61000-4-6,
- IEC 60255-5.

Displays (LEDs)

Most BEROs are equipped with one or two LEDs.

The yellow LED indicates the operating status:

- BERO with NO function:
  BERO damped = LED lit
- BERO with NC function:
  BERO not damped = LED lit
- BERO with NO and NC function:
  BERO damped = LED lit.

The green LED indicates that the operating voltage is applied. This function is only available in certain devices.

Introduction

Technical specifications

General technical specifications

Differential travel *H*	$H \leq 0.2\ s_r$
Max. permissible lead length (unshielded)	
• AC	100 m
• DC	300 m
Degree of protection	
• With buried cable	IP67
• With connector and cable plug	IP67
• With wiring space	IP65
• BERO for extreme environment	IP68 or IP69 K
• No reduction factor	
- With brass enclosure	IP67
- With stainless steel enclosure	IP68
Ambient temperature	
• During operation	–25 ... +85 °C [1] [2]
• During storage	–40 ... +85 °C [1]
Shock resistance	30 × *g*, 18 ms duration
Resistance to vibration	55 Hz, 1 mm amplitude
Reduction factor	
• BERO for flush/non-flush mounting (typical values)	
- Stainless steel	0.7 ... 0.9
- Aluminum	0.35 ... 0.5
- Copper	0.2 ... 0.4
- Brass	0.3 ... 0.6
• U BERO	1
Voltage drop	
• 2-wire BERO	≤ 8 V
• 3-wire BERO	≤ 2.5 V
• 4-wire BERO	≤ 2.5 V

1) Up to +70 °C with 3RG41 and 3RG46.

2) Maximum switching current for three-wire BEROs for standard duty at operating temperatures >50 °C is 150 mA.

Fastening nuts

Design	Material	Tightening torque
		nm
M 8	Brass	2
	Stainless steel	5
M 12	Brass	10
	Molded plastic	1
	Stainless steel	25
M 14	Molded plastic	0.5
M 18	Brass	20
	Molded plastic	3
	Stainless steel	50
M 30	Brass	40
	Molded plastic	5
	Stainless steel	100

Options

Longer connection lines

The 3RG40 and 3RG41 inductive BEROs are available with longer connection lines (PUR). The minimum ordering quantity in this case is 10 units.

The 3RG46 inductive BEROs are also available with a longer connection line. The minimum ordering quantity in this case is 50 units. Delivery time on request.

The Order No. must be supplemented by **"–Z"** and the Order code added for the desired length:

Up to 9.9 m in steps of 0.1 m:

Length	Order code
1.0 m	**A 10**
2.1 m	**A 21**
9.9 m	**A 99**

Note: these data do not apply to the standard version with a cable length of 2 m or 3 m.

10 m and above in steps of 1 m:

Length	Order code
10 m	**B 10**
99 m	**B 99**
Example:	**3RG40 12–0AB00–Z**
	B 10

Stainless steel enclosure

Many 3RG4 cylindrical inductive BEROs (from M 12 upwards) with brass enclosure are also available in stainless steel.

Delivery possibilities on request.

Extended temperature range

The 3RG40 BEROs are available for an operating temperature of –40 to +85 °C or –25 to +100 °C.

Delivery possibilities on request.

Special cables

The 3RG40 and 3RG41 inductive BEROs (3RG46 on request) are also available with other types of cable; see table below.

BERO	Type of conductor	Outer diameter	Permissible conductor cross-section
		mm	mm^2
2-wire	LiYY11Y (PUR)	4.5	2 × 0.25
	PVC	4.5	2 × 0.56
3-wire	LiYY11Y (PUR)	4.5	3 × 0.25
	PVC	4.8	3 × 0.56
	PVC (oil-resistant)	4.6	3 × 0.25
	Teflon	4.0	3 × 0.55
	Silicone	5.5	3 × 0.25
4-wire	LiYY11Y (PUR)	4.5	4 × 0.14
	PVC	5.3	4 × 0.34
	PVC (oil-resistant)	4.6	4 × 0.14
	Teflon	4.3	4 × 0.55

The Order No. must be supplemented by **"–Z"**, and the required type of cable and length specified in plain text.

Delivery possibilities on request.

Circuit diagrams

Fig. 1

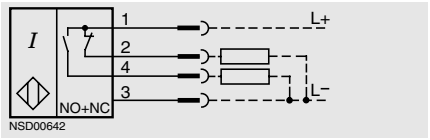


Fig. 2

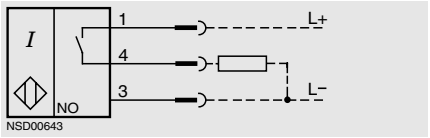


Fig. 3

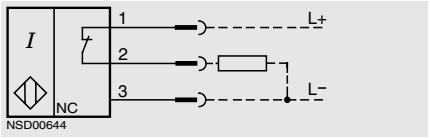


Fig. 4

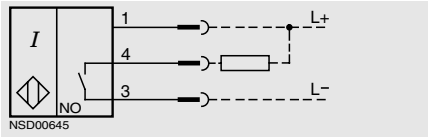


Fig. 5

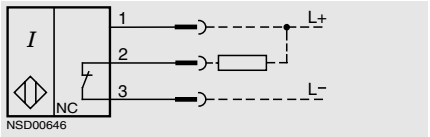


Fig. 6

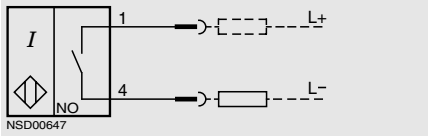


Fig. 7

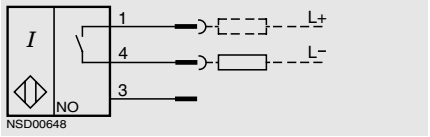


Fig. 8

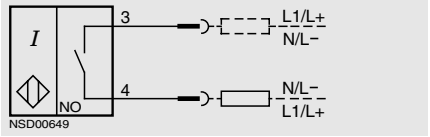


Fig. 9

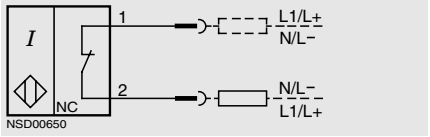


Fig. 10

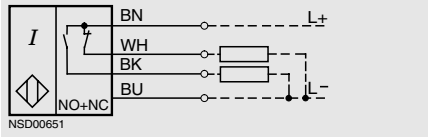


Fig. 11

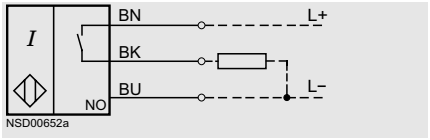


Fig. 12

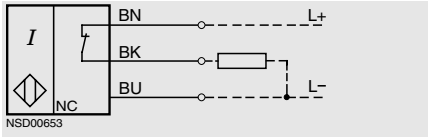


Fig. 13

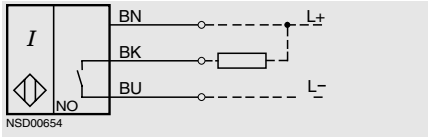


Fig. 14

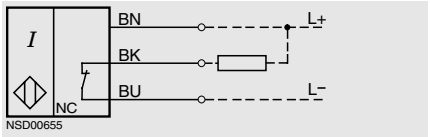


Fig. 15

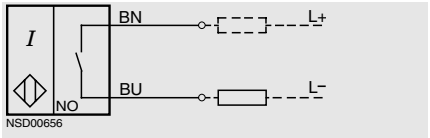


Fig. 16

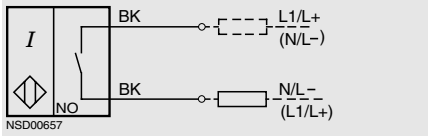


Fig. 17

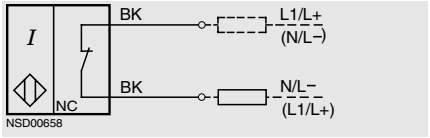


Fig. 18

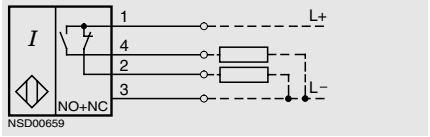


Fig. 19

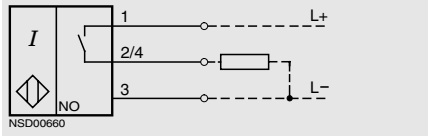


Fig. 20

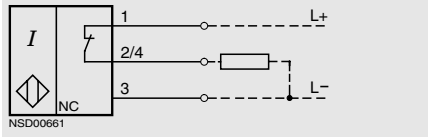


Fig. 21

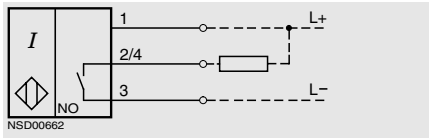


Fig. 22

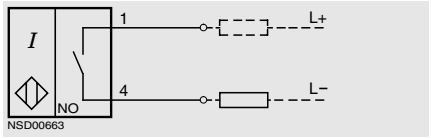


Fig. 23

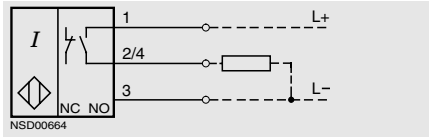


Fig. 24

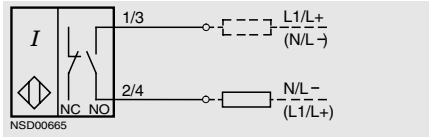


Fig. 25

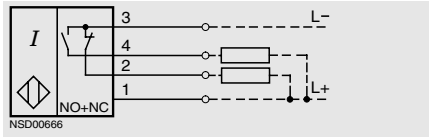


Fig. 26

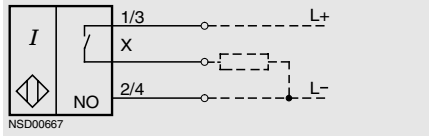


Fig. 27

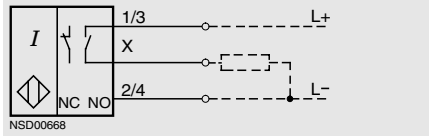


Fig. 28

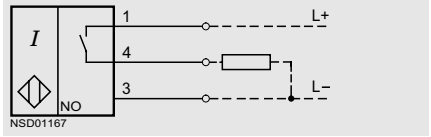


Fig. 29

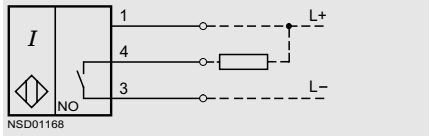
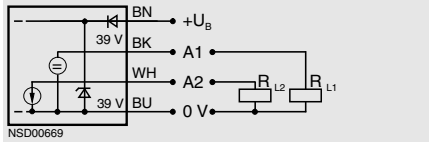


Fig. 30

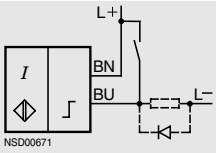
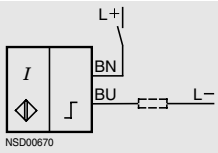
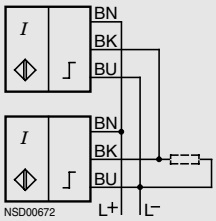
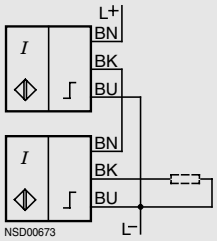
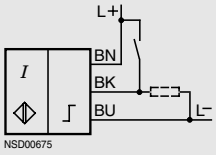
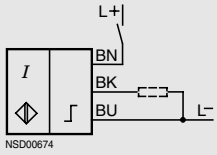
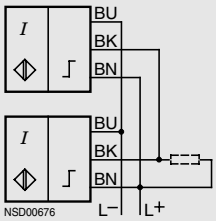
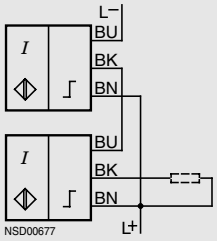
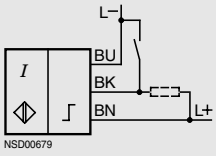
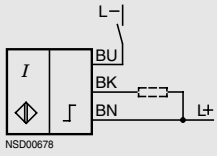
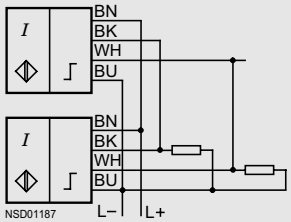
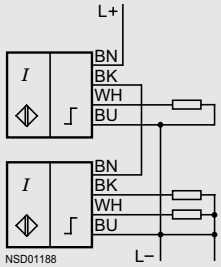
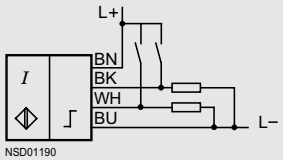
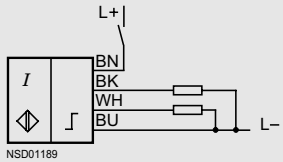
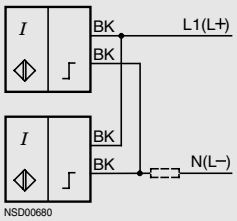
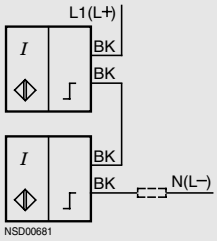
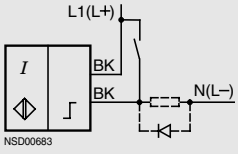
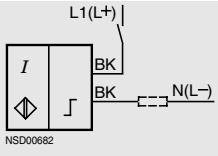


Abbreviations for the color coding
of the connection cables according to IEC 60757:

BK = black BN = brown
BU = blue WH = white

Introduction

Typical circuits

Parallel connection	Series connection [1]	Parallel connection with 1 contact (NO or NC)	Series connection with 1 contact (NO or NC) [1]
DC voltage version			
2-wire BEROs, for PLCs			
Not possible since the total of all BERO off-state currents must be smaller than the holding current of the load	Not possible since $n \leq \frac{U_b - 15\ V}{8\ V}$ U_b PLC: 24 V		
3-wire BEROs, pnp			
	 $n \leq \frac{U_b - U_{min}}{2.5\ V} + 1$ $U_c = U_b - (n \cdot 2.5\ V)$		 Other connections not permissible.
3-wire BEROs, npn			
	 $n \leq \frac{U_b - U_{min}}{2.5\ V} + 1$ $U_c = U_b - (n \cdot 2.5\ V)$		
4-wire BEROs, pnp			
			
AC/DC version			
 The total of all BERO off-state currents must be smaller than the holding current of the load	 $n \leq \frac{U_b}{20\ V}$ $U_c = U_b - (n \cdot 8\ V)$	 With DC voltage operation, a diode must be connected in parallel to the primarily inductive load.	

U_b = operating voltage
U_c = minimum actuating voltage of load
n = number of BEROs
U_{min} = minimum permissible operating voltage

1) The power-up delay of the sensors must be considered when determining the switching times.

Abbreviations for the color coding of the connection cables according to IEC 60757:

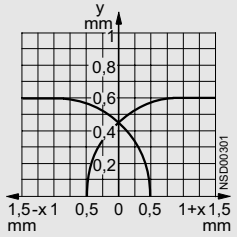
BK = black BN = brown
BU = blue WH = white

Characteristics

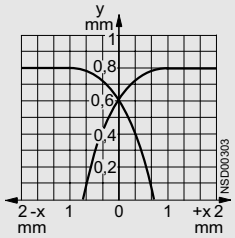
Response curves

The response curves are determined using standard targets according to EN 60947-5-2.

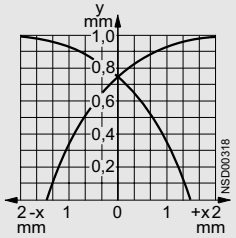
Oper. distance 0.6 mm (normal)
3RG46 00, 46 03, 46 10



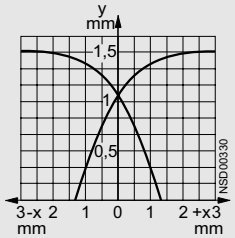
Oper. distance 0.8 mm (normal)
3RG 46 .0, 3RG 46 36



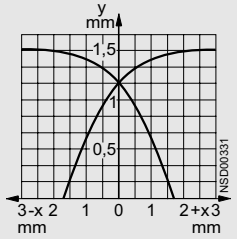
Operating distance 1 mm (normal)
3RG40 11



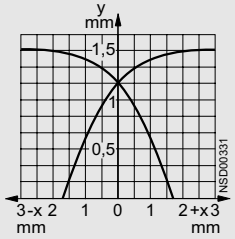
Oper. distance 1.5 mm (normal)
3RG40 ..–...33 (shorty)



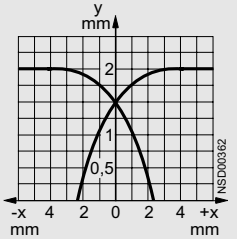
Operating distance 1.5 mm (normal)
3RG40 ..–...05,
3RG46 01, 3RG46 11, 3RG46 37



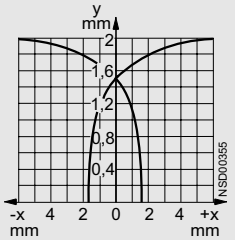
Oper. distance 1.5 mm (U BERO)
3RG46 11



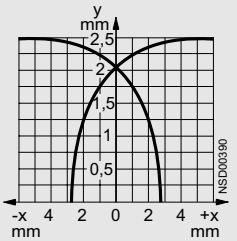
Operating distance 2 mm (normal)
3RG40 12, 3RG40 52, 3RG40 7.



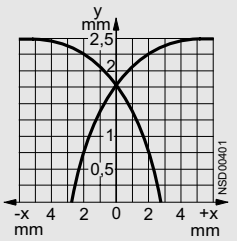
Oper. distance 2 mm (extra duty)
3RG41 11



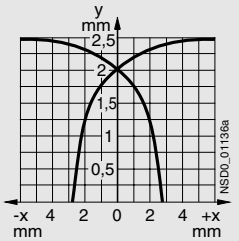
Operating distance 2.5 mm (normal)
3RG40 21, 3RG40 60



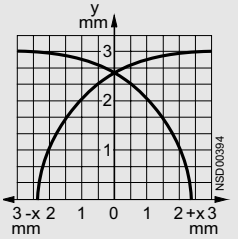
Oper. distance 2.5 mm (normal)
3RG40 72



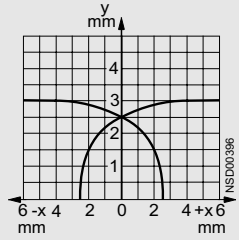
Oper. distance 2.5 mm (extra duty)
3RG46 02, 3RG46 11



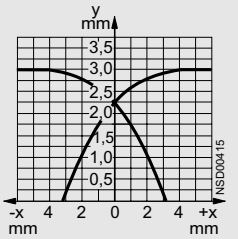
Oper. distance 3 mm (extra duty)
3RG46 11



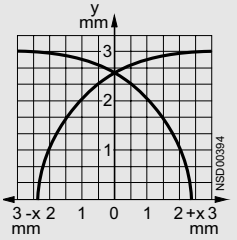
Oper. distance 3 mm (extra duty)
3RG46 02, 3RG46 37



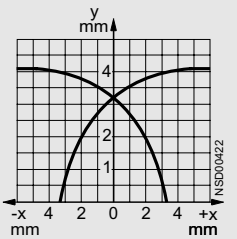
Oper. distance 3 mm (U BERO)
3RG46 12



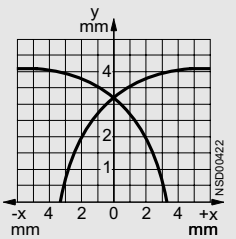
Oper. distance 3 mm (pressure-tight)
3RG46 52



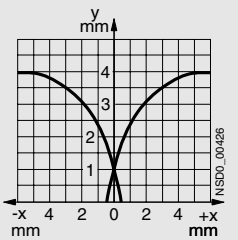
Operating distance 4 mm (normal)
3RG40 22, 3RG40 62



Oper. distance 4 mm (extra duty)
3RG41 12



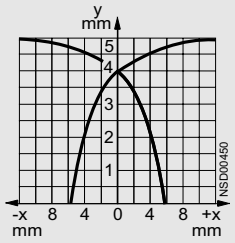
Operating distance 4 mm (U BERO)
3RG46 21



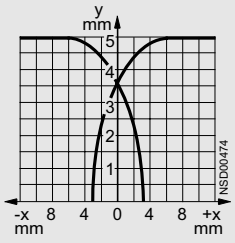
5

Introduction

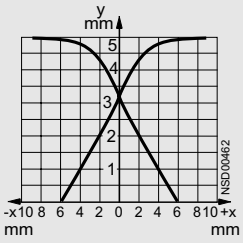
Operating distance 5 mm (normal)
3RG40 13, 3RG40 53



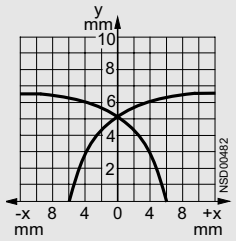
Operating distance 5 mm (normal)
3RG40 82



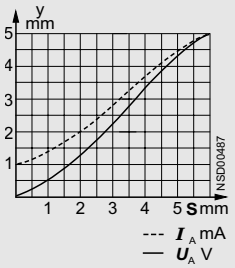
Operating distance 5 mm (U BERO)
3RG46 13



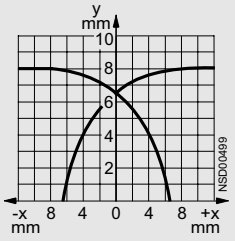
Operating distance 6 mm (extra duty)
3RG46 21, 3RG46 12



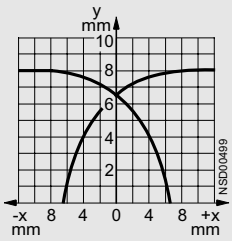
Operating distance 0 ... 6 mm (analog)
3RG46 12



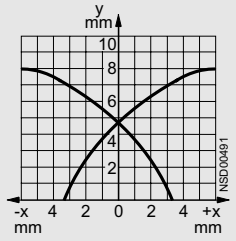
Operating distance 8 mm (normal)
3RG40 23, 3RG40 63



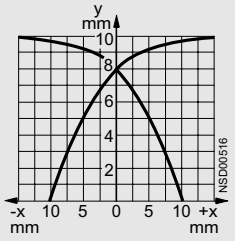
Operating distance 8 mm (extra duty)
3RG41 13



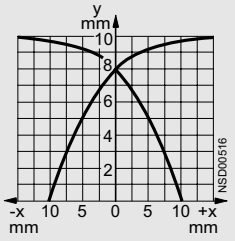
Operating distance 8 mm (U BERO)
3RG46 22



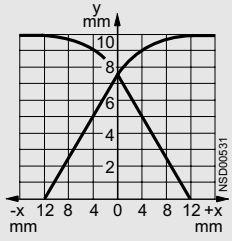
Operating distance 10 mm (normal)
3RG40 14, 3RG40 54, 3RG46 25



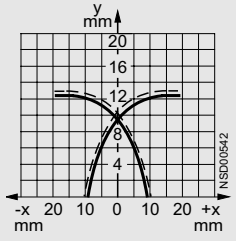
Operating distance 10 mm (extra duty)
3RG46 22



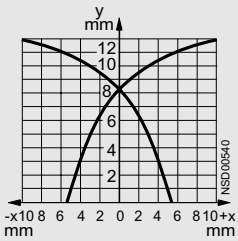
Operating distance 10 mm (U BERO)
3RG46 14



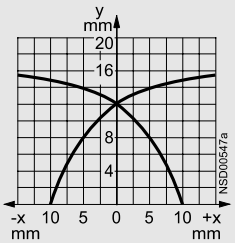
Operating distance 12 mm (extra duty)
3RG46 13



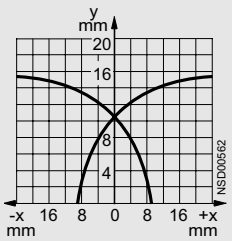
Operating distance 12 mm (U BERO)
3RG46 23



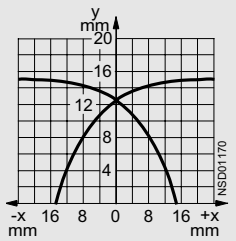
Operating distance 15 mm (normal)
3RG40 24, 3RG40 31, 3RG 40 64



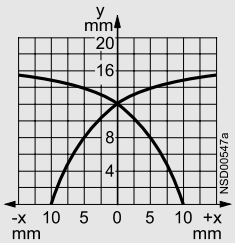
Operating distance 15 mm (normal)
3RG40 30, 3RG40 34



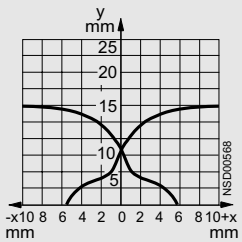
Operating distance 15 mm (normal)
3RG40 38



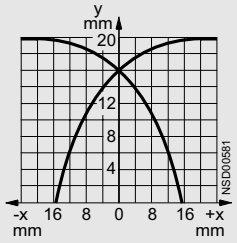
Operating distance 15 mm (extra duty)
3RG46 12



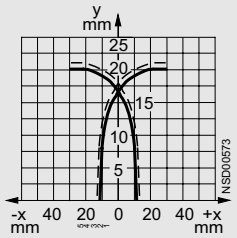
Operating distance 15 mm (U BERO)
3RG46 34, 3RG46 38



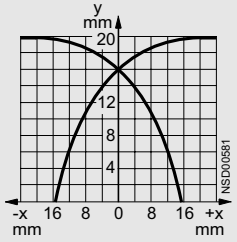
Operating distance 20 mm (normal)
3RG40 41, 3RG46 26



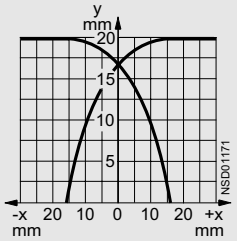
Operating distance 20 mm (extra duty)
3RG46 23



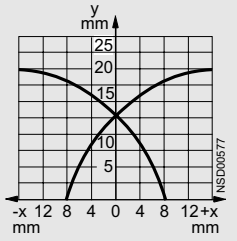
Operating distance 20 mm (extra duty)
3RG 41 34, 3RG46 38



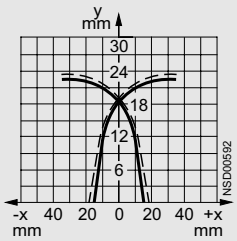
Operating distance 20 mm (extra duty)
3RG41 38



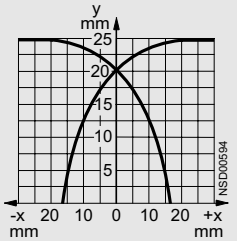
Operating distance 20 mm (U BERO)
3RG46 12



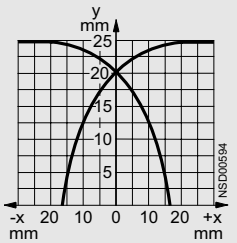
Operating distance 22 mm (extra duty)
3RG46 14



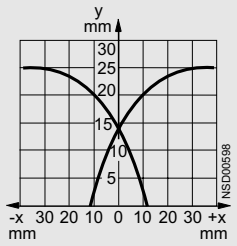
Operating distance 25 mm (normal)
3RG40 32



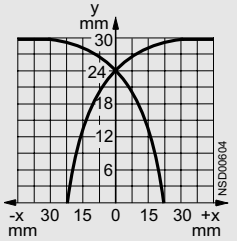
Operating distance 25 mm (extra duty)
3RG41 31, 3RG41 41



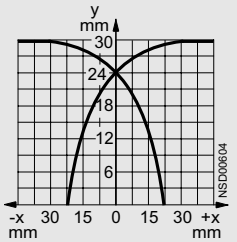
Operating distance 25 mm (U BERO)
3RG46 44, 3RG46 48



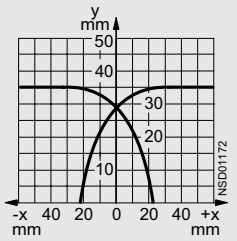
Operating distance 30 mm (normal)
3RG 40 33, 3RG40 42



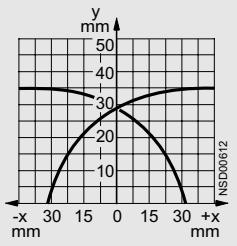
Operating distance 30 mm (extra duty)
3RG41 44



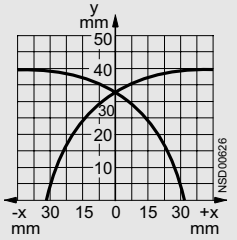
Operating distance 35 mm (extra duty)
3RG41 48



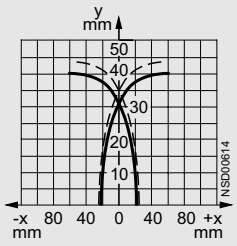
Operating distance 35 mm (U BERO)
3RG46 48



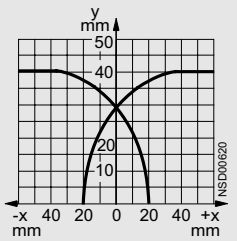
Operating distance 40 mm (normal)
3RG 40 33, 3RG40 43



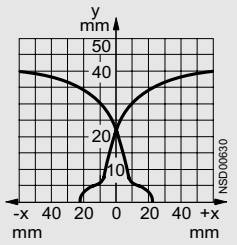
Operating distance 40 mm (extra duty)
3RG46 24



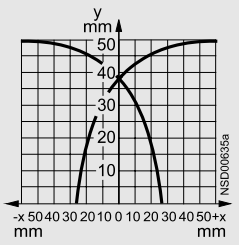
Operating distance 40 mm (extra duty)
3RG41 41



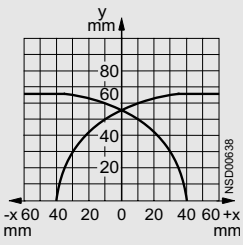
Operating distance 40 mm (U BERO)
3RG46 44



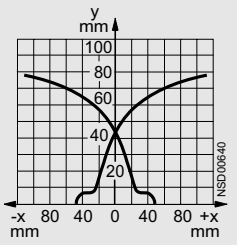
Operating distance 50 mm (extra duty)
3RG41 42



Operating distance 65 mm (extra duty)
3RG41 43



Operating distance 75 mm (U BERO)
3RG46 43



5

Introduction

Further information

BERO lexicon

Terms associated with the technology of proximity switches are explained below. Some of the terms are defined in IEC 60947-5-2.

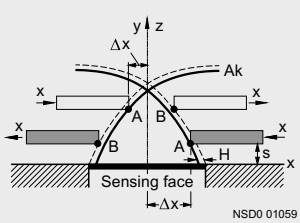
Active surface

The active surface of an inductive proximity switch is the surface through which an electromagnetic field is emitted (IEC).

The corresponding activation element (target) is moved toward this surface to trigger a switching process.

Response curve

The line on which all response points A for a BERO can be found. The curve has been determined using the standard target. The sensor-related characteristics can be obtained from it. The BERO axis z coincides with the y axis.



Ak Response curve
A Response point
B Release point
H Differential travel
s Operating distance
x Direction of movement
Δx Axial distance to target
y Distance from BERO
z Reference axis

Response point A

The position of the actuating element when the signal is output. The reference point is the bottom front edge of the actuating element.

Response delay t_A

The response delay is the duration which the switching element requires for response when the target enters or leaves the sensing range (IEC).

The value is measured at s = 0.5 × s_n.

Non-equivalence

The 4-wire BEROs have two outputs:
- A_1 with NO function and
- A_2 with NC function.

Tightening torque

Excessive tightening of the nuts could mechanically damage the BERO proximity switches. The maximum permissible torques are specified in the Technical specifications.

Switching frequency s_a

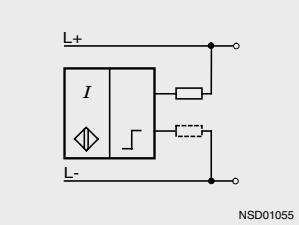
See operating distances

Axial distance to target Δx

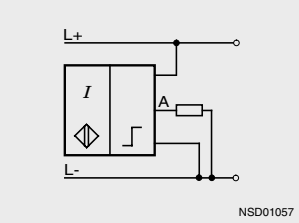
Distance between the actuating element and the BERO axis z at the response point A.

Output

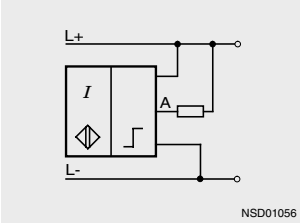
The BERO proximity switches are available with different output connections.



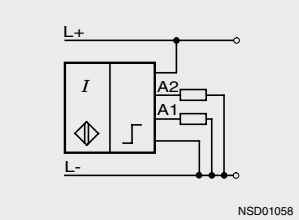
2-wire, DC or AC/DC, load connected in series with BERO



3-wire, DC, pnp, load connected between A and L–



3-wire, DC, npn, load connected between A and L+



4-wire, antivalent, DC, load connected between A_1, A_2 and L–

Output resistance

The BERO proximity switches have a built-in output resistance so that the output voltage can follow the switching status even without an external load. A load resistance must be connected when operating with high switching frequencies (to reduce the electric time constant).

Axial approach

Axial approaching of the target is where its center point is located in the reference axis (IEC).

Rated operational current I_e (output current)

The sensors are designed for a specific maximum output current. If this current is exceeded, even briefly, the built-in overload protection will be activated. Incandescent lamps, capacitors and other strongly capacitive loads (e.g. long leads) have effects similar to an overload.

Power-up delay t_v

Duration between switching on the power supply and the beginning of the proximity switch's operational readiness (IEC). See also spurious switch-on pulse.

Operating voltage

The operating voltage is specified including 10% residual ripple.

Operating temperature

The specified operating temperature range must not be exceeded. The proximity switch could then be damaged, and the operating response is undefined.

Reference axis z

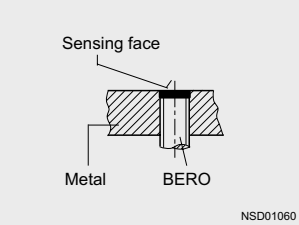
Axis running perpendicular to the active surface and through its center (IEC). See also mounting instructions.

Mounting

Embeddable proximity switches

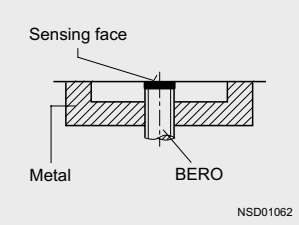
A proximity switch is embeddable if any attenuating material (metal) can be attached around the active surface without influencing the characteristic features (IEC).

To ensure perfect functioning, a gap should be left in front of the active surface.



Non-embeddable proximity switches

A proximity switch is non-embeddable if a certain free zone is required around its active surface in order to retain the characteristic features (IEC).



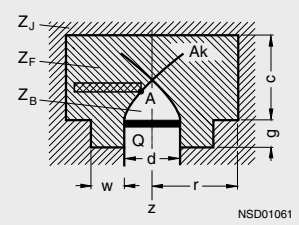
Quasi embeddable proximity switches

A proximity switch that is quasi embeddable also requires a certain free zone. However, flush mounting is permissible in non-attenuating materials.

Free zone

Range around the proximity switch which must be kept free of materials which interfere with the characteristic features of the switch (IEC).

The volume of the free zone is defined by the dimensions r, c and w, g (see graphic).

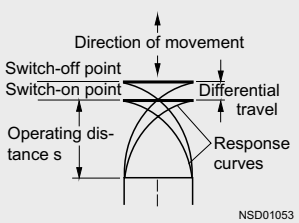


Ak Response curve
A Response point
c, g Partial heights of transition region
d BERO diameter
Q Active surface
r Radius of free zone
w Mounting condition
z Reference axis
Z_B Attenuation zone
Z_F Free zone
Z_J Inactive zone

Differential travel H

Distance between the switching points when the target approaches or is removed from the proximity switch (IEC).

The differential travel causes a defined switching response for the devices. The switching distance always refers to the switch-on point.



Smallest operating current I_m (minimum load current)

The current required to retain the conductivity of the switching elements in the ON state (IEC). This applies to 2-wire BEROs.

Magnetic fields

Permanent magnetic fields and low-frequency alternating fields do not generally influence the function of the proximity switches. Strong fields may saturate the ferrite core of the switch and thus increase the operating distance or switch the device. On the other hand, damage is not probable.

High-frequency fields with frequencies of several hundred kHz can considerably interfere with the function (operating frequency of the sensors). Shielding is recommended in the event of difficulties with interference fields.

Target (actuating element)

Parts made of metal with which BEROs are actuated in service.

Form, material and dimensions influence the response characteristic of the BERO (see reduction factors).

The specified rated operating distances s_n were determined using the minimum surface defined in the standard (see characteristic). The usable operating distance s_u is reduced if the surface is less than the minimum.

Power supply units

Single-phase power supply units must be smoothed with at least 1000 µF/A. For noise suppression reasons, this measure is also necessary with three-phase power supply units.

Introduction

Standard target

The standard target is a defined part used for comparison measurements of the operating distances and sensing ranges (IEC).

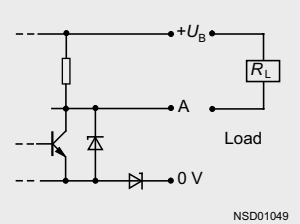
Material of standard target: St 37, 1 mm thick

Dimensions of square standard target: the side length is equal to

- the diameter of the inscribed circle on the active surface of the BERO or
- three times the rated operating distance s_n if $3 \times s_n$ is greater than the diameter of the inscribed circle.

npn connection

The output stage contains an npn transistor which connects the load to the negative operating voltage (0 V). The load is connected between the output and the positive operating voltage ($+U_B$).



Resistance to oil

The proximity switches with degree of protection IP67 are not suitable for permanent operation in an environment containing oil. The following must therefore be observed:

Lubricating oils

Usually present no problem.

Hydraulic oils, cutting oils

These attack most plastics. In particular, the PVC lines become discolored and brittle.

Measures: avoid contact with these liquids if possible, especially on the active surface.

Parallel connection

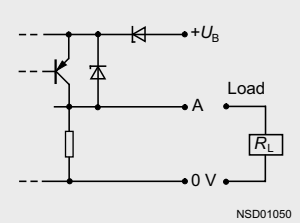
Parallel connection of proximity switches to implement logical functions is possible with 3-wire and 4-wire BEROs without problem, but not with 2-wire BEROs.

Please note:
- The power consumption increases.
- Leakage currents add up so that an impermissible voltage drop may occur at the load even in the off state.

See graphics, page 5/12.

pnp connection

The output stage contains a pnp transistor which connects the load to the positive operating voltage ($+U_B$). The load is connected between the output and the negative operating voltage (0 V).



Programming

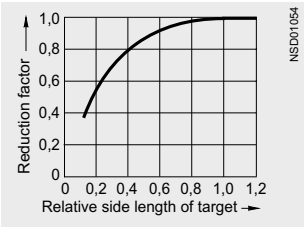
Selection of NO or NC function using slide switch in bottom part of enclosure or plug-in jumper in the electronics base. Only with certain cubic BEROs.

Reduction factors

The specified operating distance s refers to exactly defined measuring conditions (see operating distance). Reduced operating distances usually result with other arrangements. The reduction factors (see Technical specifications) are only approximate values. Deviations may result depending on different alloys and the type.

Influence of geometry

If a smaller target is used than the standard target defined in IEC 60947-5-2, the operating distance must be corrected by a reduction factor.



Series connection

See graphics, page 5/12.

Residual voltage

The residual voltage is the voltage measured across the load with the output disabled.

Residual current i_r

The residual current is the current which flows in the load circuit of the proximity switch in the disabled condition (IEC).

It is used to retain the function, and must primarily be observed with parallel connections.

Residual ripple σ

The maximum value of the residual ripple from peak to peak must not exceed 10% of the rated voltage U_n. The switching response may be undefined if the residual ripple is large. Correction is possible using a larger smoothing capacitor or a regulated power supply.

Release point B

The position, e.g. in the attenuation zone, at which the bottom rear edge of the actuating element is located at the moment the signal changes when removing.

Operating distance

The operating distance is the distance at which a change in signal is caused at the output when the target approaches the active surface along the reference axis (IEC).

Measurement of the operating distance is carried out according to IEC 60947-5-2 using a standard target and axial approach.

Rated operating distance s_n

The rated operating distance is a conventional variable for defining the operating distances. Neither specimen scatter nor changes resulting from external influences such as voltage or temperature are taken into account (IEC).

This operating distance applies when using the standard target according to IEC 60947-5-2. Reduction factors must be considered if the material and/or size of the target differ from those of the standard target.

Real operating distance s_r

Operating distance of a particular proximity switch measured at defined temperature, voltage and mounting conditions (IEC).

This is the operating distance for a particular switch measured according to IEC 60947-5-2. The manufacturing tolerance is 10%:

$0.9\ s_n < s_r < 1.1\ s_n$

Usable operating distance s_u

Operating distance of a particular proximity switch measured under defined conditions (IEC).

This includes the additionally expected deviations caused by the variations in temperature and operating voltage within the specified ranges.

The usable operating distance is between 90 % and 110 % of the real operating distance. This results in the following for a reliable design:

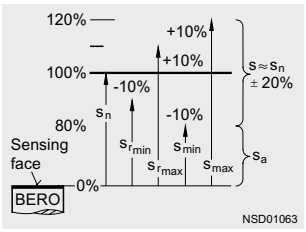
$0.81\ s_n < s_u < 1.21\ s_n$

Ensured operating distance (actuation distance) s_a

Distance from the active surface at which actuation of the proximity switch is ensured under defined conditions (IEC).

The ensured operating distance is between zero and the bottom value of the useful operating distance:

$0 < s_a < 0.81\ s_n$



s_a Actuation distance
s_n Rated operating distance
s_r Real operating distance
s_{min} Min. usable operating distance s_u (= operating distance s_a)
s_{max} Max. useful operating distance s_u

Switching element function

NO function

An NO function results in a flow of load current when the target is sensed, and no flow of the load current when the target is not sensed (IEC).

NC function

An NC function results in no flow of load current when the target is sensed, and a flow of load current when the target is not sensed (IEC).

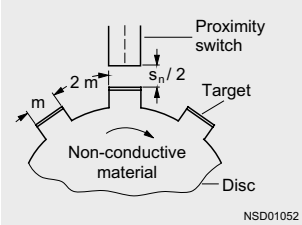
Switching frequency f

Number of switching operations of a proximity switch within a defined time interval (IEC).

The switching frequency is the maximum possible switching rate between the damped and non-damped statuses at which the output circuit still delivers a defined signal sequence corresponding to the activation.

Introduction

It specifies the maximum permissible number of pulses per second at a constant pulse : pause ratio of 1 : 2 and half the rated operating distance sn. The measurement is carried out according to IEC 60947-5-2.



Welding-resistant

Sensors which can be used in strong magnetic fields, e.g. during arc welding, or in fields of electrolysis plants.

The maximum permissible value is specified for specially selected sensors, e.g. U BERO.

Lateral approach

Lateral approach of the target is at right angles to the reference axis (IEC).

Voltage drop

A voltage drop (dependent on the current) occurs across the output transistor in the conductive state; the output voltage does not quite reach the associated operating voltage (to be particularly observed with a series connection and electronic inputs).

Current input

The current input is understood to be the current consumption of the proximity switch required to operate the oscillator, amplifier etc. It does not include the current flowing through the load.

The no-load current I_0 is the current drawn from the power supply without a load being connected.

Temperature drift

The specified operating distances refer to an ambient temperature of 20 °C. Within the permissible temperature range of –25 to +70 °C, the operating distance varies by max. ±10% compared to the value at 20 °C.

The temperature of the target alone has practically no influence on the operating distance.

Repeat accuracy R

The repeat accuracy is the change in the real operating distance s_r at defined conditions (IEC).

The repeat accuracy is measured over a period of 8 hours at an ambient temperature of 23 °C (± 5 °C), any relative humidity within the specified range, and a defined supply voltage.

The difference between any two measurements must not exceed 10 % of the real operating distance s_r. The repeat accuracy is usually far better in the case of measurements immediately following one another.

Operating distance 0.6 mm
Operating distance 0.8 mm

Technical specifications

Class		**Normal**	**Normal**	**Normal**
No. of connecting wires		**3-wire**	**3-wire**	**3-wire**
Design		**Ø 3 mm, mini**	**Ø 4 mm, mini**	**M 5, mini**
Embeddable in metal		**Shielded**	**Shielded**	**Shielded**
Rated operating distance s_n		**0.6 mm**	**0.8 mm**	**0.8 mm**
Enclosure material		Stainless steel	Stainless steel	Stainless steel
Operational voltage (DC)	V	10 ... 30	10 ... 30	10 ... 30
No-load supply current I_0	mA	≤ 10	≤ 10	≤ 10
Rated operational current I_e	mA	100	200	200
Switching frequency f	Hz	5000	5000	5000
Repeat accuracy R	mm	0.01	0.01	0.01
Power-up delay t_v	ms	10	8	10
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	•
• Reverse polarity protection		•	•	•
• Wire-break protection		–	–	–
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP67	IP67	IP67
Type		3RG46 03–2AB00	3RG46 00–1AB00	3RG46 10–.AG00 3RG46 10–.GB00

Selection and ordering data

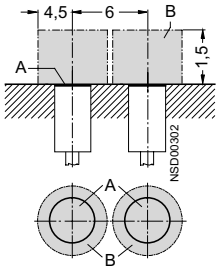
Switching output	Circ. diag. No.	Connector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				3 × 0.055 mm²				3 × 0.14 mm²				3 × 0.14 mm²		
NO contact, pnp	11		▶	**3RG46 03–2AB00**	1 unit	0.023	A	**3RG46 00–1AB00**	1 unit	0.035	▶	**3RG46 10–0AG00**	1 unit	0.038
NO contact, npn	13			–				–			A	**3RG46 10–0GB00**	1 unit	0.037
With 8 mm combined connector														
NO contact, pnp	2	A, C		–				–			▶	**3RG46 10–7AG00**	1 unit	0.012
NO contact, npn	4	A, C		–				–			X	**3RG46 10–7GB00**	1 unit	0.012

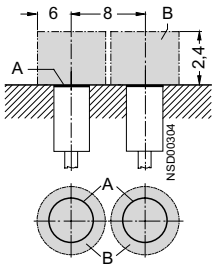
Dimension drawings

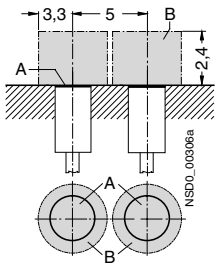
Mounting instructions

Dimension depending on design

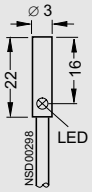
A = active surface
B = metal-free area



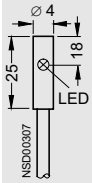




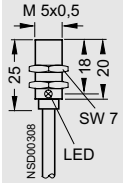
3RG46 03–2AB00



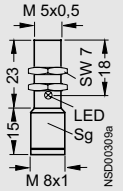
3RG46 00–1AB00



3RG46 10–0..00



3RG46 10–7..00



Wherever you find the abbreviation SW in dimension drawings please note that SW means "spanner width" and Sg means "connecting thread".

Operating distance 0.6 mm
Operating distance 0.8 mm

Technical specifications

Class		**Normal**	**IP68**	**IP68**
No. of connecting wires		**3-wire**	**3-wire**	**3-wire**
Design		**5 mm × 5 mm, mini**	**Ø 4 mm, mini**	**M 5, mini**
Embeddable in metal		**Shielded**	**Shielded**	**Shielded**
Rated operating distance s_n		**0.8 mm**	**0.6 mm**	**0.6 mm**
Enclosure material		Brass, nickel-plated	Stainless steel	Stainless steel
Operational voltage (DC)	V	10 ... 30	10 ... 30	10 ... 30
No-load supply current I_0	mA	≤ 10	≤ 10	≤ 10
Rated operational current I_e	mA	200	200	200
Switching frequency f	Hz	5000	3000	3000
Repeat accuracy R	mm	0.01	0.01	0.01
Power-up delay t_v	ms	10	8	8
Switching status display		Yellow LED	–	–
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	•
• Reverse polarity protection		•	•	•
• Wire-break protection		–	–	–
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP67	IP68	IP68
Type		3RG46 36–0AG00 3RG46 36–0GB00	3RG46 00–0AG02	3RG46 10–0AG02

Selection and ordering data

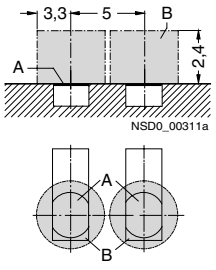
Switching output	Circ. diag. No.	Connector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				3 × 0.14 mm²				3 × 0.14 mm²				3 × 0.14 mm²		
NO contact, pnp	11		A	**3RG46 36–0AG00**	1 unit	0.030	A	**3RG46 00–0AG02**	1 unit	0.035	A	**3RG46 10–0AG02**	1 unit	0.037
NO contact, npn	13		X	**3RG46 36–0GB00**	1 unit	0.027		–				–		

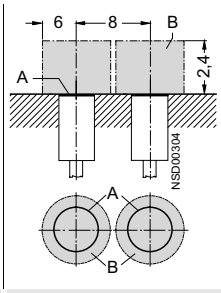
Dimension drawings

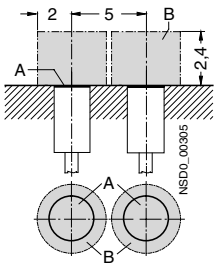
Mounting instructions

Dimension depending on design

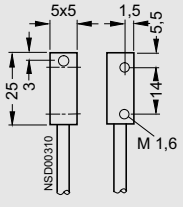
A = active surface
B = metal-free area



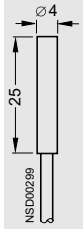




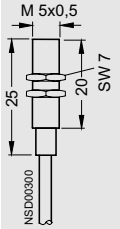
3RG46 36–0..00



3RG46 00–0AG02



3RG46 10–0AG02



5

Operating distance 1 mm

Technical specifications

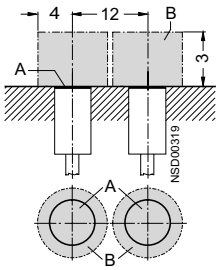
Class		**Normal**	**Normal**
No. of connecting wires		**3-wire**	**4-wire**
Design		**M 8**	**M 8**
Embeddable in metal		**Shielded**	**Shielded**
Rated operating distance s_n		1 mm	1 mm
Enclosure material		Stainless steel	Stainless steel
Operational voltage (DC)	V	15 ... 34	10 ... 30
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)	≤ 1
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	50
Switching frequency f	Hz	1500	1500
Repeat accuracy R	mm	0.1	0.1
Power-up delay t_v	ms	40	40
Switching status display		Yellow LED	Yellow LED
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	•
• Reverse polarity protection		•	•
• Wire-break protection		•	–
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP67	IP67
Type		3RG40 11–.A.00 3RG40 11–.GB00	3RG40 11–.CC00

Selection and ordering data

Switching output	Circ. diag. No.	Connector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				4 × 0.14 mm²		
NO contact, pnp	11		▶	**3RG40 11–0AG00**	1 unit	0.075		–		
NC contact, pnp	12		C	**3RG40 11–0AF00**	1 unit	0.075		–		
NO contact, npn	13		A	**3RG40 11–0GB00**	1 unit	0.076		–		
NO and NC contacts, pnp	10			–			▶	**3RG40 11–0CC00**	1 unit	0.071
With 8 mm combined connector										
NO contact, pnp	2	A, C	▶	**3RG40 11–7AG00**	1 unit	0.017		–		
NC contact, pnp	3	A	C	**3RG40 11–7AF00**	1 unit	0.016		–		
NO and NC contacts, pnp	1	B		–			C	**3RG40 11–7CC00**	1 unit	0.018
With M 12 connector										
NO contact, pnp	2	E, F	▶	**3RG40 11–3AG00**	1 unit	0.020		–		
NC contact, pnp	3	F	C	**3RG40 11–3AF00**	1 unit	0.019		–		
NO contact, npn	4	E, F	C	**3RG40 11–3GB00**	1 unit	0.022		–		
NO and NC contacts, pnp	4	F		–			C	**3RG40 11–3CC00**	1 unit	0.020

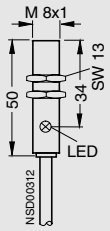
Dimension drawings

Mounting instructions

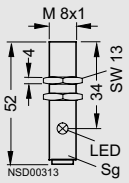


A = active surface
B = metal-free area

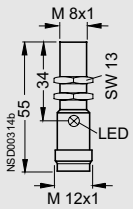
3RG40 11–0..00



3RG40 11–7..00



3RG40 11–3..00



Technical specifications

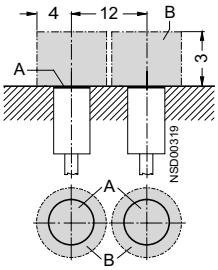
Class		**Normal (PLC)**	**Extra duty (DC 65 V)**
No. of connecting wires		**2-wire**	**3-wire**
Design		**M 8**	**M 8**
Embeddable in metal		**Shielded**	**Shielded**
Rated operating distance s_n		1 mm	1 mm
Enclosure material		Stainless steel	Stainless steel
Operational voltage (DC)	V	15 ... 34	10 ... 65
No-load supply current I_0	mA	≤ 1.5	≤ 10
Rated operational current I_e	mA	25	200
Switching frequency f	mA	2	–
Repeat accuracy R	Hz	1500	5000
Power-up delay t_v	mm	0.1	0.1
Power-up delay	ms	40	40
Switching status display		Yellow LED	Yellow LED
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		–	•
• Reverse polarity protection		•	•
• Wire-break protection		•	•
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP67	IP67
Type		3RG40 11–.JB00	3RG40 11–.AB00 3RG40 11–.AA00

Selection and ordering data

Switching output	Circ. diag. No.	Connector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With 2 m cable, PUR				2 × 0.25 mm²				3 × 0.25 mm²		
NO contact, pnp	11			–			►	**3RG40 11–0AB00**	1 unit	0.077
NC contact, pnp	12			–			C	**3RG40 11–0AA00**	1 unit	0.077
NO contact	15		►	**3RG40 11–0JB00**	1 unit	0.071		–		
With 8 mm combined connector										
NO contact, pnp	2	A		–			►	**3RG40 11–7AB00**	1 unit	0.017
NC contact, pnp	3	A		–			C	**3RG40 11–7AA00**	1 unit	0.019
NO contact	7	A	C	**3RG40 11–7JB00**	1 unit	0.016		–		
With M 12 connector										
NO contact, pnp	2	E, F		–			►	**3RG40 11–3AB00**	1 unit	0.022
NC contact, pnp	3	F		–			C	**3RG40 11–3AA00**	1 unit	0.022
NO contact	6	E, F	A	**3RG40 11–3JB00**	1 unit	0.019		–		

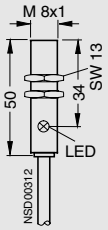
Dimension drawings

Mounting instructions

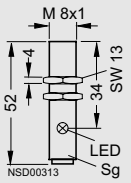


A = active surface
B = metal-free area

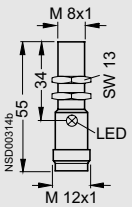
3RG40 11–0JB00



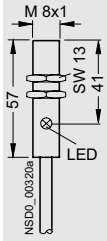
3RG40 11–7JB00



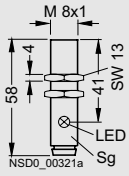
3RG40 11–3JB00



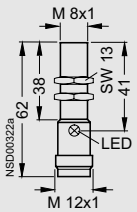
3RG40 11–0A.00



3RG40 11–7A.00



3RG40 11–3A.00



Operating distance 1.5 mm

Technical specifications

Class		**Normal**	**Normal**	**Normal**
No. of connecting wires		**3-wire**	**3-wire**	**3-wire**
Design		**Ø 6.5 mm, mini**	**Ø 6.5 mm, shorty**	**Ø 6.5 mm**
Embeddable in metal		**Shielded**	**Shielded**	**Shielded**
Rated operating distance s_n		1.5 mm	1.5 mm	1.5 mm
Enclosure material		Stainless steel	Stainless steel	Stainless steel
Operational voltage (DC)	V	10 ... 30	15 ... 34	15 ... 34
No-load supply current I_0	mA	≤ 10	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)
Rated operational current I_e	mA	200	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	3000	1500	1500
Repeat accuracy R	mm	0.02	0.1	0.1
Power-up delay t_v	ms	10	40	40
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	•
• Reverse polarity protection		•	•	•
• Wire-break protection		–	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP67	IP67	IP67
Type		3RG46 01–...00	3RG40 50–.A.33 3RG40 50–.G.33	3RG40 50–.A.05 3RG40 50–.G.05

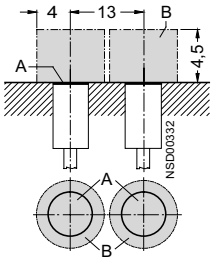
Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Weight per PU	DT	Order No.	PS	Weight per PU	DT	Order No.	PS	Weight per PU
						kg				kg				kg
With 2 m cable, PUR				3 × 0.14 mm²				3 × 0.25 mm²				3 × 0.25 mm²		
NO contact, pnp	11		►	**3RG46 01–1AB00**	1 unit	0.037	C	**3RG40 50–0AG33**	1 unit	0.065	C	**3RG40 50–0AG05**	1 unit	0.068
NC contact, pnp	12			–			C	**3RG40 50–0AF33**	1 unit	0.065	C	**3RG40 50–0AF05**	1 unit	0.066
NO contact, npn	13			–			C	**3RG40 50–0GB33**	1 unit	0.066	C	**3RG40 50–0GB05**	1 unit	0.066
NC contact, npn	14			–			C	**3RG40 50–0GA33**	1 unit	0.066	C	**3RG40 50–0GA05**	1 unit	0.066
With 8 mm combined connector														
NO contact, pnp	2	A	A	**3RG46 01–7AG00**	1 unit	0.010	C	**3RG40 50–7AG33**	1 unit	0.008	C	**3RG40 50–7AG05**	1 unit	0.008
NC contact, pnp	3	A		–			C	**3RG40 50–7AF33**	1 unit	0.008	C	**3RG40 50–7AF05**	1 unit	0.009
NO contact, npn	4	A	X	**3RG46 01–7GB00**	1 unit	0.009	C	**3RG40 50–7GB33**	1 unit	0.010	C	**3RG40 50–7GB05**	1 unit	0.009
NC contact, npn	5	A		–			C	**3RG40 50–7GA33**	1 unit	0.007	C	**3RG40 50–7GA05**	1 unit	0.008

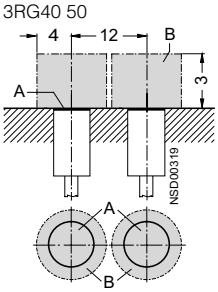
Dimension drawings

Mounting instructions

3RG46 01

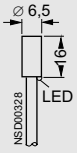


3RG40 50

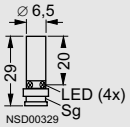


A = active surface
B = metal-free area

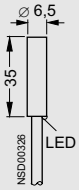
3RG46 01–1AB00



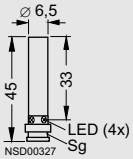
3RG46 01–7..00



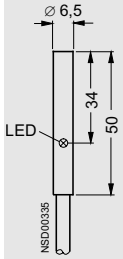
3RG40 50–0..33



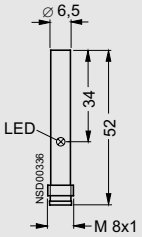
3RG40 50–7..33



3RG40 50–0..05



3RG40 50–7..05



Technical specifications

Class		**Normal**	**Normal**	**Normal**
No. of connecting wires		**3-wire**	**3-wire**	**3-wire**
Design		**M 8, mini**	**Ø 8 mm, shorty**	**8 mm × 8 mm**
Embeddable in metal		**Shielded**	**Shielded**	**Shielded**
Rated operating distance s_n		1.5 mm	1.5 mm	1.5 mm
Enclosure material		Brass, nickel-plated	Stainless steel	Brass, nickel-plated
Operational voltage (DC)	V	10 ... 30	15 ... 34	10 ... 30
No-load supply current I_0	mA	≤ 10	≤ 17 (24 V); ≤ 30 (34 V)	≤ 10
Rated operational current I_e	mA	200	200 (≤ 50 °C); 150 (≤ 85 °C)	200
Switching frequency f	Hz	3000	1500	1000
Repeat accuracy R	mm	0.01	0.1	0.07
Power-up delay t_v	ms	10	40	10
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	•
• Reverse polarity protection		•	•	•
• Wire-break protection		–	•	–
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP67	IP67	IP67
Type		3RG46 11–0AG31 3RG46 11–7..31	3RG40 51–.A.33 3RG40 51–.G.33	3RG46 37–.A.00 3RG46 37–.G.00

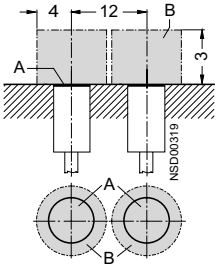
Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Weight per PU	DT	Order No.	PS	Weight per PU	DT	Order No.	PS	Weight per PU
						kg				kg				kg
With 2 m cable, PUR				3 × 0.14 mm²				3 × 0.25 mm²				3 × 0.14 mm²		
NO contact, pnp	11		A	**3RG46 11–0AG31**	1 unit	0.042	A	**3RG40 51–0AG33**	1 unit	0.070	A	**3RG46 37–0AB00**	1 unit	0.053
NC contact, pnp	12			–			C	**3RG40 51–0AF33**	1 unit	0.072		–		
NO contact, npn	13			–			D	**3RG40 51–0GB33**	1 unit	0.070	X	**3RG46 37–0GG00**	1 unit	0.045
NC contact, npn	14			–			C	**3RG40 51–0GA33**	1 unit	0.070		–		
With 8 mm combined connector														
NO contact, pnp	2	A	▶	**3RG46 11–7AG31**	1 unit	0.017	D	**3RG40 51–7AG33**	1 unit	0.012	A	**3RG46 37–7AB00**	1 unit	0.022
NC contact, pnp	3	A	A	**3RG46 11–7AF31**	1 unit	0.017	D	**3RG40 51–7AF33**	1 unit	0.014	X	**3RG46 37–7AA00**	1 unit	0.021
NO contact, npn	4	A	X	**3RG46 11–7GB31**	1 unit	0.020	D	**3RG40 51–7GB33**	1 unit	0.011	X	**3RG46 37–7GG00**	1 unit	0.018
NC contact, npn	5	A		–			C	**3RG40 51–7GA33**	1 unit	0.014		–		

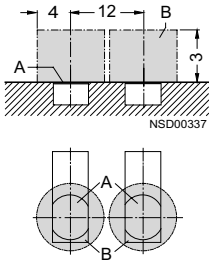
Dimension drawings

Mounting instructions

3RG46 11, 3RG40 51

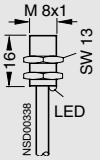


3RG46 37

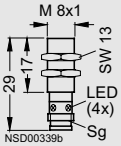


A = active surface
B = metal-free area

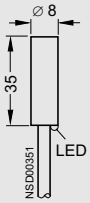
3RG46 11–0AG31



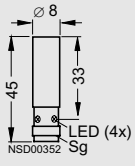
3RG46 11–7..31



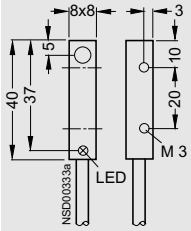
3RG40 51–0..33



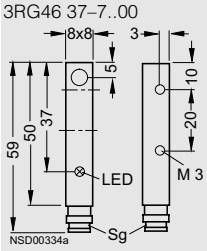
3RG40 51–7..33



3RG46 37–0..00



3RG46 37–7..00



Operating distance 1.5 mm

Technical specifications

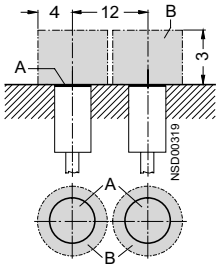
Class		**Normal**	**Normal**	**Normal**
No. of connecting wires		**3-wire**	**3-wire**	**4-wire**
Design		**M 8, shorty**	**M 8**	**M 8**
Embeddable in metal		**Shielded**	**Shielded**	**Shielded**
Rated operating distance s_n		1.5 mm	1.5 mm	1.5 mm
Enclosure material		Stainless steel	Stainless steel	Stainless steel
Operational voltage (DC)	V	15 ... 34	15 ... 34	10 ... 30
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)	≤ 1.0
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)	50
Switching frequency f	Hz	1500	1500	1500
Repeat accuracy R	mm	0.1	0.1	0.1
Power-up delay t_v	ms	40	40	40
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	•
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	–
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP67	IP67	IP67
Type		3RG40 11–.A.33 3RG40 11–.G.33	3RG40 11–.A.05 3RG40 11–.G.05	3RG40 11–.CC05

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				3 × 0.25 mm²				4 × 0.14 mm²		
NO contact, pnp	11		▶	**3RG40 11–0AG33**	1 unit	0.075	▶	**3RG40 11–0AG05**	1 unit	0.076		–		
NC contact, pnp	12		A	**3RG40 11–0AF33**	1 unit	0.073	C	**3RG40 11–0AF05**	1 unit	0.076		–		
NO contact, npn	13		C	**3RG40 11–0GB33**	1 unit	0.072	C	**3RG40 11–0GB05**	1 unit	0.076		–		
NC contact, npn	14		C	**3RG40 11–0GA33**	1 unit	0.074	C	**3RG40 11–0GA05**	1 unit	0.076		–		
NO and NC contacts, pnp	10			–				–			C	**3RG40 11–0CC05**	1 unit	0.069
With 8 mm combined connector														
NO contact, pnp	2	A	▶	**3RG40 11–7AG33**	1 unit	0.016	▶	**3RG40 11–7AG05**	1 unit	0.016		–		
NC contact, pnp	3	A	▶	**3RG40 11–7AF33**	1 unit	0.016	C	**3RG40 11–7AF05**	1 unit	0.016		–		
NO contact, npn	4	A	C	**3RG40 11–7GB33**	1 unit	0.015		–				–		
NC contact, npn	5	A	C	**3RG40 11–7GA33**	1 unit	0.016		–				–		
NO and NC contacts, pnp	1			–				–			C	**3RG40 11–7CC05**	1 unit	0.020
With M 12 connector														
NO contact, pnp	2	E, F		–			▶	**3RG40 11–3AG05**	1 unit	0.020		–		
NC contact, pnp	3	F		–			C	**3RG40 11–3AF05**	1 unit	0.020		–		
NO contact, npn	4	E, F		–			C	**3RG40 11–3GB05**	1 unit	0.020		–		
NC contact, npn	5	F		–			D	**3RG40 11–3GA05**	1 unit	0.022		–		
NO and NC contacts, pnp	1	F		–				–			C	**3RG40 11–3CC05**	1 unit	0.020

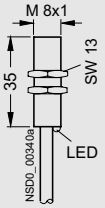
Dimension drawings

Mounting instructions

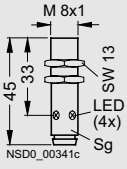


A = active surface
B = metal-free area

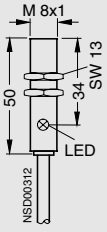
3RG40 11–0..33



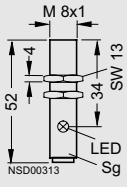
3RG40 11–7..33



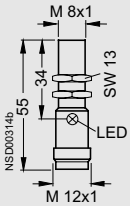
3RG40 11–0..05



3RG40 11–7..05



3RG40 11–3..05



Technical specifications

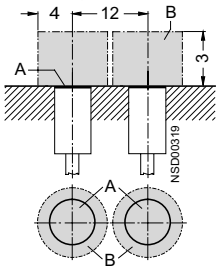
Class		**U BERO (without reduction factor)**
No. of connecting wires		**3-wire**
Design		**M 8**
Embeddable in metal		**Shielded**
Rated operating distance s_n		1.5 mm
Enclosure material		Stainless steel
Operational voltage (DC)	V	10 ... 30
No-load supply current I_0	mA	≤ 13
Rated operational current I_e	mA	150
Switching frequency f	Hz	< 2000
Repeat accuracy R	mm	0.16
Power-up delay t_v	ms	≤ 8
Switching status display		Yellow LED
Protective measures • Spurious signal suppression • Short-circuit-proof/overload-proof • Reverse polarity protection • Wire-break protection • Inductive interference protection • Radio interference protection		• • • • Magnetic field resistant up to 160 mT r.m.s. •
Degree of protection		IP68
Type		3RG46 11–.AN01 3RG46 11–.GN01

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU
						kg
With 2 m cable, PUR				3 × 0.25 mm²		
NO contact, pnp	11		D	**3RG46 11–0AN01**	1 unit	0.058
NO contact, npn	13		D	**3RG46 11–0GN01**	1 unit	0.058
With 8 mm combined connector						
NO contact, pnp	2	A	A	**3RG46 11–7AN01**	1 unit	0.018
NO contact, npn	4	A	D	**3RG46 11–7GN01**	1 unit	0.018
With M 12 connector						
NO contact, pnp	2	E, F	C	**3RG46 11–3AN01**	1 unit	0.023
NO contact, npn	4	E, F	X	**3RG46 11–3GN01**	1 unit	0.023

Dimension drawings

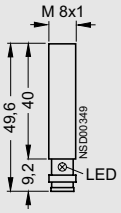
Mounting instructions



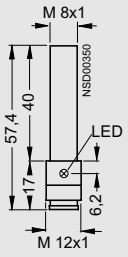
A = active surface
B = metal-free area

3RG46 11–0.N01

3RG46 11–7.N01



3RG46 11–3.N01



5

Operating distance 2 mm

Technical specifications

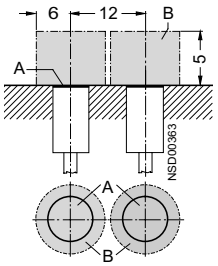
Class		**Normal**	**Normal**	**Normal**	**Normal**
No. of connecting wires		**3-wire**	**4-wire**	**3-wire**	**4-wire**
Design		**M 12, shorty**	**M 12, shorty**	**M 12**	**M 12**
Embeddable in metal		**Shielded**	**Shielded**	**Shielded**	**Shielded**
Rated operating distance s_n		2 mm	2 mm	2 mm	2 mm
Enclosure material		Brass, nickel-plated	Brass, nickel-plated	Brass, nickel-plated	Brass, nickel-plated
Operational voltage (DC)	V	15 ... 34	15 ... 34	15 ... 34	15 ... 34
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)	≤ 1.0	≤ 17 (24 V); ≤ 30 (34 V)	≤ 25 (24 V); ≤ 40 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	50	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	1200	800	1200	1200
Repeat accuracy R	mm	0.1	0.1	0.1	0.1
Power-up delay t_v	ms	40	3	40	40
Switching status display		Yellow LED	Yellow LED	Yellow LED	Yellow LED
Protective measures					
• Spurious signal suppression		•	•	•	•
• Short-circuit-proof/overload-proof		•	•	•	•
• Reverse polarity protection		•	•	•	•
• Wire-break protection		•	–	•	•
• Inductive interference protection		•	•	•	•
• Radio interference protection		•	•	•	•
Degree of protection		IP67	IP67	IP67	IP67
Type		3RG40 12–.A.33 3RG40 12–.G.33	3RG40 12–0CD10 3RG40 12–3CD11	3RG40 12–.A.01 3RG40 12–.G.00	3RG40 12–0CD00 3RG40 12–3CD00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU kg	DT	Order No.	PS	Approx. weight per PU kg
With 2 m cable, PUR				3 × 0.25 mm²				3 × 0.25 mm²		
NO contact, pnp	11		▶	**3RG40 12–0AG33**	1 unit	0.083	▶	**3RG40 12–0AG01**	1 unit	0.088
NC contact, pnp	12		C	**3RG40 12–0AF33**	1 unit	0.089	C	**3RG40 12–0AF01**	1 unit	0.089
NO contact, npn	13		▶	**3RG40 12–0GB33**	1 unit	0.084	▶	**3RG40 12–0GB00**	1 unit	0.088
NC contact, npn	14		C	**3RG40 12–0GA33**	1 unit	0.083	C	**3RG40 12–0GA00**	1 unit	0.089
				4 × 0.14 mm²				4 × 0.14 mm²		
NO and NC contacts, pnp	10		C	**3RG40 12–0CD10**	1 unit	0.080	▶	**3RG40 12–0CD00**	1 unit	0.084
With M 12 connector				3-wire				3-wire		
NO contact, pnp	2	E, F	▶	**3RG40 12–3AG33**	1 unit	0.026	▶	**3RG40 12–3AG01**	1 unit	0.030
NC contact, pnp	3	F	C	**3RG40 12–3AF33**	1 unit	0.029	▶	**3RG40 12–3AF01**	1 unit	0.030
NO contact, npn	4	E, F	A	**3RG40 12–3GB33**	1 unit	0.026	A	**3RG40 12–3GB00**	1 unit	0.033
NC contact, npn	5	F	C	**3RG40 12–3GA33**	1 unit	0.026		–		
				4-wire				4-wire		
NO and NC contacts, pnp	1	F	C	**3RG40 12–3CD11**	1 unit	0.028	▶	**3RG40 12–3CD00**	1 unit	0.030

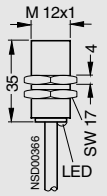
Dimension drawings

Mounting instructions

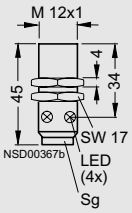


A = active surface
B = metal-free area

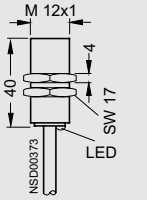
3RG40 12–0..33



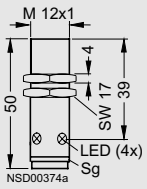
3RG40 12–3..33



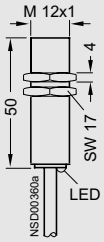
3RG40 12–0CD10



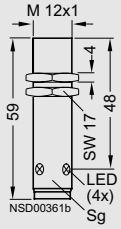
3RG40 12–3CD11



3RG40 12–0..00
3RG40 12–0..01



3RG40 12–3..00
3RG40 12–3..00



Technical specifications

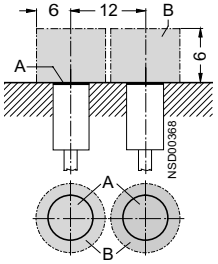
Class		**Normal (PLC)**	**Extra duty (65 V DC)**	**Extra duty (AC/DC)**
No. of connecting wires		**2-wire**	**3-wire**	**2-wire**
Design		**M 12**	**M 12**	**M 12**
Embeddable in metal		**Shielded**	**Shielded**	**Shielded**
Rated operating distance s_n		2 mm	2 mm	2 mm
Enclosure material		Brass, nickel-plated	Brass, nickel-plated	Brass, nickel-plated
Operational voltage				
• DC	V	15 ... 34	10 ... 65	20 ... 320
• AC	V	–	–	20 ... 265
No-load supply current I_0				
• At DC 24 V	mA	1.5	≤ 10	1.0
• At AC 230 V	mA	–	–	1.5
Rated operational current I_e				
• Continuous	mA	25	300	200
• 20 ms	mA	–	–	1800
Minimum load current	mA	2	–	5
Switching frequency f	Hz	700	1200 (NO contact), 4000 (NC contact)	25/1200 (AC/DC)
Repeat accuracy R	mm	0.1	0.1	0.04
Power-up delay t_v	ms	40	40	100
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		–	•	–
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP67	IP67	IP67
Type		3RG40 12–.JB00	3RG40 12–.AB00 3RG40 12–.AA00	3RG40 12–.KB00 3RG40 12–.KA00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				2 × 0.25 mm²				3 × 0.25 mm²				2 × 0.25 mm²		
NO contact, pnp	11			–			►	**3RG40 12–0AB00**	1 unit	0.091		–		
NC contact, pnp	12			–			►	**3RG40 12–0AA00**	1 unit	0.089		–		
NO contact	15		►	**3RG40 12–0JB00**	1 unit	0.083		–				–		
NO contact	16			–				–			►	**3RG40 12–0KB00**	1 unit	0.086
NC contact	17			–				–			C	**3RG40 12–0KA00**	1 unit	0.086
With M 12 connector														
NO contact, pnp	2	E, F		–			►	**3RG40 12–3AB00**	1 unit	0.032		–		
NC contact, pnp	3	F		–			C	**3RG40 12–3AA00**	1 unit	0.032		–		
NO contact	6	E, F	►	**3RG40 12–3JB00**	1 unit	0.030		–				–		
NO contact	8	E, F		–				–			►	**3RG40 12–3KB00**	1 unit	0.032
NC contact	9	F		–				–			C	**3RG40 12–3KA00**	1 unit	0.032

Dimension drawings

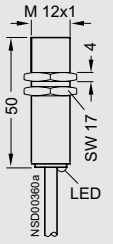
Mounting instructions



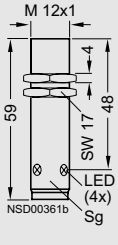
A = active surface
B = metal-free area

The mounting diagram on the previous page applies to 3RG40 12–.JB00

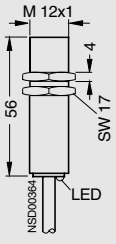
3RG40 12–0JB00



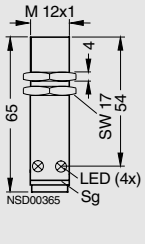
3RG40 12–3JB00



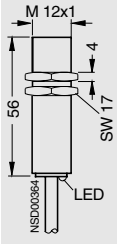
3RG40 12–0A.00



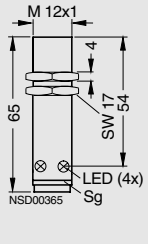
3RG40 12–0A.00



3RG40 12–0K.00



3RG40 12–0K.00



Operating distance 2 mm

Technical specifications

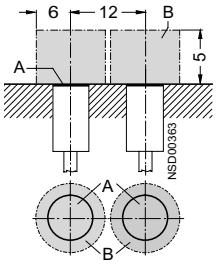
Class		**IP68 / 69 K**	**IP68 / 69 K**	**IP68 / 69 K**
No. of connecting wires		**3-wire**	**3-wire**	**3-wire**
Design		**Ø 12 mm**	**M 12**	**M 12**
Embeddable in metal		**Shielded**	**Shielded**	**Shielded**
Rated operating distance s_n		2 mm	2 mm	2 mm
Enclosure material		Molded plastic	Molded plastic	Brass, nickel-plated
Operational voltage (DC)	V	15 ... 34	15 ... 34	15 ... 34
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	1200	1200	1200
Repeat accuracy R	mm	0.1	0.1	0.1
Power-up delay t_v	ms	40	40	40
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	•
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP68 / 69 K	IP68 / 69 K	IP68 / 69 K
Type		3RG40 52–0A.30 3RG40 52–0G.30	3RG40 12–0A.30 3RG40 12–0G.30	3RG40 12–0AG31 3RG40 12–0GB31

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				3 × 0.25 mm²				PVC, 3 × 0.25 mm²		
NO contact, pnp	11		C	**3RG40 52–0AG30**	1 unit	0.072	A	**3RG40 12–0AG30**	1 unit	0.072	D	**3RG40 12–0AG31**	1 unit	0.090
NC contact, pnp	12		C	**3RG40 52–0AF30**	1 unit	0.073	C	**3RG40 12–0AF30**	1 unit	0.071		–		
NO contact, npn	13		C	**3RG40 52–0GB30**	1 unit	0.074	C	**3RG40 12–0GB30**	1 unit	0.073	C	**3RG40 12–0GB31**	1 unit	0.090
NC contact, npn	14		C	**3RG40 52–0GA30**	1 unit	0.073	C	**3RG40 12–0GA30**	1 unit	0.073		–		

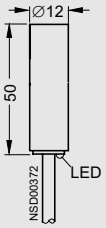
Dimension drawings

Mounting instructions

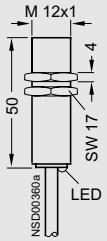


A = active surface
B = metal-free area

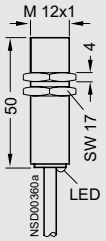
3RG40 52–0..30



3RG40 12–0..30



3RG40 12–0..31



Technical specifications

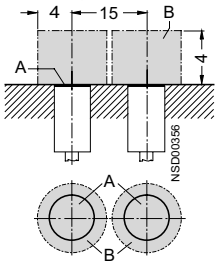
Class		**Greater rated operating distance**	**Greater rated operating distance (VW)**
No. of connecting wires		**3-wire**	**3-wire**
Design		**M 8, shorty**	**M 8**
Embeddable in metal		**Shielded**	**Shielded**
Rated operating distance s_n		2 mm	2 mm
Enclosure material		Stainless steel	Stainless steel
Operational voltage (DC)	V	15 ... 34	10 ... 34
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	600	600 (with –3AG22: 1000)
Repeat accuracy R	mm	0.1	0.1
Power-up delay t_v	ms	40	40
Switching status display		Yellow LED	Yellow LED
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	•
• Reverse polarity protection		•	•
• Wire-break protection		•	•
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP67	IP67
Type		3RG41 11–.A.33 3RG41 11–.G.33	3RG41 11–.AG00 3RG41 11–3AG22

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				3 m, 3 × 0.25 mm²		
NO contact, pnp	11		▶	**3RG41 11–0AG33**	1 unit	0.074	▶	**3RG41 11–0AG00**	1 unit	0.103
NC contact, pnp	12		D	**3RG41 11–0AF33**	1 unit	0.074		–		
NO contact, npn	13		C	**3RG41 11–0GB33**	1 unit	0.074		–		
NC contact, npn	14		C	**3RG41 11–0GA33**	1 unit	0.074		–		
With 8 mm combined connector										
NO contact, pnp	2	A	D	**3RG41 11–7AG33**	1 unit	0.015		–		
NC contact, pnp	3	A	▶	**3RG41 11–7AF33**	1 unit	0.016		–		
NO contact, npn	4	A	C	**3RG41 11–7GB33**	1 unit	0.015		–		
NC contact, npn	5	A	C	**3RG41 11–7GA33**	1 unit	0.015		–		
With M 12 connector										
NO contact, pnp	2	E, F		–			▶	**3RG41 11–3AG00**	1 unit	0.019
NO contact, pnp	2	E, F		–				**3RG41 11–3AG22**	1 unit	0.025

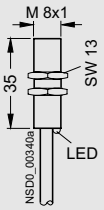
Dimension drawings

Mounting instructions

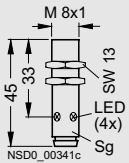


A = active surface
B = metal-free area

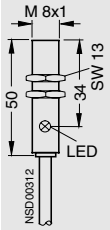
3RG41 11–0..33



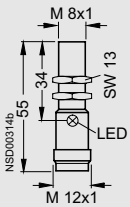
3RG41 11–7..33



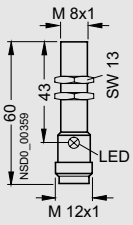
3RG41 11–0..00



3RG41 11–3..00



3RG41 11–3..22



5

Operating distance 2 mm

Technical specifications

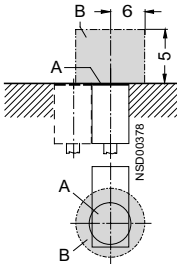
Class		**Normal**	**Normal**
No. of connecting wires		**3-wire**	**4-wire**
Design		**Cubic 12 mm × 40 mm**	**Cubic 12 mm × 32 mm**
Embeddable in metal		**Shielded**	**Shielded**
Rated operating distance s_n		2 mm	2 mm
Enclosure material		Molded plastic	Molded plastic
Operational voltage (DC)	V	15 ... 34	15 ... 34
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)	≤ 1.0
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	800	1200
Repeat accuracy R	mm	0.2	0.1
Power-up delay t_v	ms	40	40
Switching status display		Yellow LED	–
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	•
• Reverse polarity protection		•	•
• Wire-break protection		•	–
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP67	IP67
Type		3RG40 70–.AG45	3RG40 71–0CD00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				4 × 0.14 mm²		
NO contact, pnp	11		C	**3RG40 70–0AG45**	1 unit	0.070		–		
NO and NC contacts, pnp	10			–			►	**3RG40 71–0CD00**	1 unit	0.073
With 8 mm combined connector										
NO contact, pnp	2	A	D	**3RG40 70–7AG45**	1 unit	0.024		–		

Dimension drawings

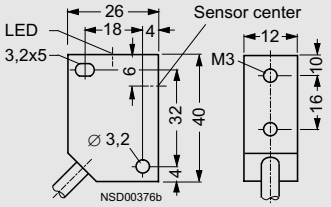
Mounting instructions



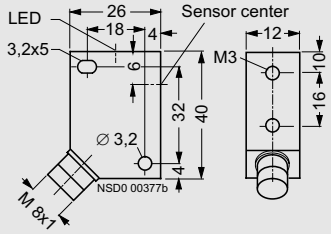
A = active surface
B = metal-free area

These BEROs can be mounted next to one another.

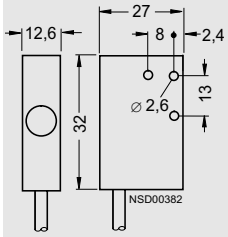
3RG40 70–0AG45



3RG40 70–7AG45



3RG40 71–0CD00



Technical specifications

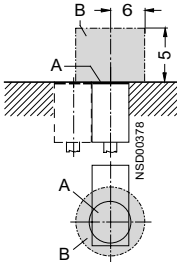
Class		**Normal**	**Normal**
No. of connecting wires		**3-wire**	**4-wire**
Design		**Cubic 12 mm × 40 mm**	**Cubic 12 mm × 40 mm**
Embeddable in metal		**Shielded**	**Shielded**
Rated operating distance s_n		2 mm	2 mm
Enclosure material		Molded plastic	Molded plastic
Operational voltage (DC)	V	15 ... 34	15 ... 34
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 40 (34 V)	≤ 25 (24 V); ≤ 40 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	1200	1200
Repeat accuracy R	mm	0.1	0.1
Power-up delay t_v	ms	40	40
Switching status display		Yellow LED	Yellow LED
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	•
• Reverse polarity protection		•	•
• Wire-break protection		•	•
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP67	IP67
Type		3RG40 70–.A.01	3RG40 70–.CD00, 3RG40 70–7CD01, 3RG40 70–7CD02

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				4 × 0.14 mm²		
NO contact, pnp	11		C	**3RG40 70–0AG01**	1 unit	0.081		–		
NC contact, pnp	12		C	**3RG40 70–0AF01**	1 unit	0.084		–		
NO and NC contacts, pnp	10			–			D	**3RG40 70–0CD00**	1 unit	0.077
With 8 mm combined connector										
NO contact, pnp	2	A	C	**3RG40 70–7AG01**	1 unit	0.025		–		
NO and NC contacts, pnp; LED ≙ NO	1	A		–			C	**3RG40 70–7CD01**	1 unit	0.025
NO and NC contacts, pnp; LED ≙ NC	1	A		–			C	**3RG40 70–7CD02**	1 unit	0.025
With M 12 connector										
NO contact, pnp	2	E, F	C	**3RG40 70–3AG01**	1 unit	0.025		–		
NC contact, pnp	3	F	C	**3RG40 70–3AF01**	1 unit	0.024		–		
NO and NC contacts, pnp	1	F		–			C	**3RG40 70–3CD00**	1 unit	0.024

Dimension drawings

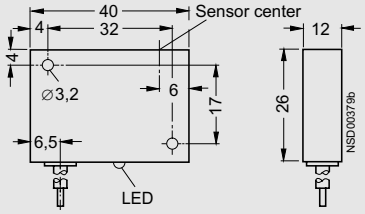
Mounting instructions



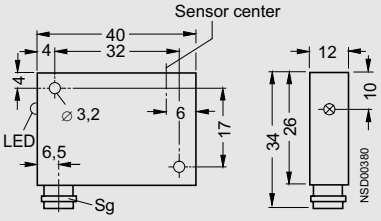
A = active surface
B = metal-free area

These BEROs can be mounted next to one another.

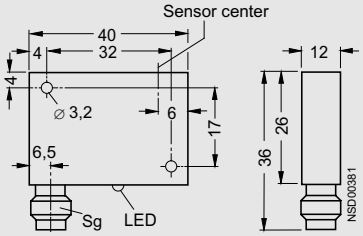
3RG40 70–0..00, 3RG40 70–0..01



3RG40 70–7..01, 3RG40 70–7..02



3RG40 70–3..00, 3RG40 70–3..01



Operating distance 2.5 mm

Technical specifications

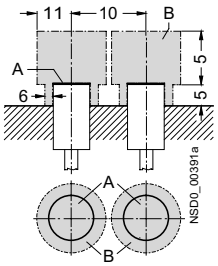
Class		**Normal**	**Normal**
No. of connecting wires		**3-wire**	**3-wire**
Design		**Ø 6.5 mm**	**M 8**
Embeddable in metal		**Unshielded**	**Unshielded**
Rated operating distance s_n		2.5 mm	2.5 mm
Enclosure material		Stainless steel	Stainless steel
Operational voltage (DC)	V	15 ... 34	15 ... 34
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	900	1200
Repeat accuracy R	mm	0.08	0.1
Power-up delay t_v	ms	40	40
Switching status display		Yellow LED	Yellow LED
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	•
• Reverse polarity protection		•	•
• Wire-break protection		•	•
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP67	IP67
Type		3RG40 60–.A.00 3RG40 60–.G.00	3RG40 21–.CD00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				3 × 0.25 mm²		
NO contact, pnp	11		C	**3RG40 60–0AG33**	1 unit	0.066	C	**3RG40 21–0AG33**	1 unit	0.073
NC contact, pnp	12		C	**3RG40 60–0AF33**	1 unit	0.065	C	**3RG40 21–0AF33**	1 unit	0.075
NO contact, npn	13		D	**3RG40 60–0GB33**	1 unit	0.040	C	**3RG40 21–0GB33**	1 unit	0.074
NC contact, npn	14		D	**3RG40 60–0GA33**	1 unit	0.040	C	**3RG40 21–0GA33**	1 unit	0.074
With 8 mm combined connector										
NO contact, pnp	2	A	C	**3RG40 60–7AG33**	1 unit	0.007	C	**3RG40 21–7AG33**	1 unit	0.015
NC contact, pnp	3	A	C	**3RG40 60–7AF33**	1 unit	0.008	C	**3RG40 21–7AF33**	1 unit	0.015
NO contact, npn	4	A	C	**3RG40 60–7GB33**	1 unit	0.007	C	**3RG40 21–7GB33**	1 unit	0.015
NC contact, npn	5	A	D	**3RG40 60–7GA33**	1 unit	0.020	C	**3RG40 21–7GA33**	1 unit	0.016

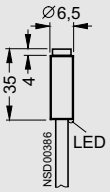
Dimension drawings

Mounting instructions

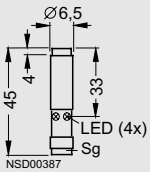


A = active surface
B = metal-free area

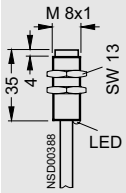
3RG40 60–0..33



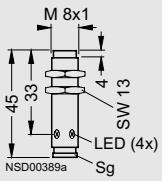
3RG40 60–7..33



3RG40 21–0..33



3RG40 21–7..33



Technical specifications

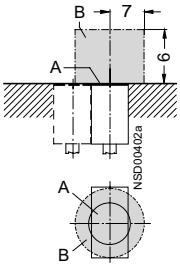
Class		**Normal**	**Normal**
No. of connecting wires		**3-wire**	**4-wire**
Design		**M 14**	**M 14**
Embeddable in metal		**Shielded**	**Shielded**
Rated operating distance s_n		2.5 mm	2.5 mm
Enclosure material		Molded plastic	Molded plastic
Operational voltage (DC)	V	15 ... 34	15 ... 34
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)	≤ 25 (24 V); ≤ 40 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	800	800
Repeat accuracy R	mm	0.1	0.1
Power-up delay t_v	ms	40	40
Switching status display		Yellow LED	Yellow LED
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	•
• Reverse polarity protection		•	•
• Wire-break protection		•	•
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP67	IP67
Type		3RG40 72–.GB.00 3RG40 72–.GA.00	3RG40 72–.CD00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				4 × 0.14 mm²		
NO contact, npn	13		C	**3RG40 72–0GB00**	1 unit	0.086		–		
NC contact, npn	14		A	**3RG40 72–0GA00**	1 unit	0.089		–		
NO and NC contacts, pnp	10			–			►	**3RG40 72–0CD00**	1 unit	0.084
With M 12 connector										
NO contact, npn	4	E, F	C	**3RG40 72–3GB00**	1 unit	0.033		–		
NC contact, npn	5	F	C	**3RG40 72–3GA00**	1 unit	0.032		–		
NO and NC contacts, pnp	1	F		–			A	**3RG40 72–3CD00**	1 unit	0.033

Dimension drawings

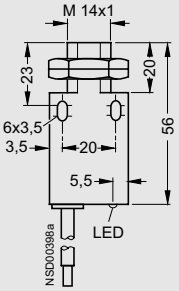
Mounting instructions



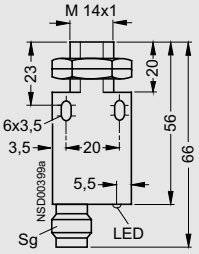
A = active surface
B = metal-free area

These BEROs can be mounted next to one another.

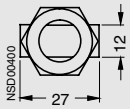
3RG40 72–0..00



3RG40 72–3..00



Plan view



5

Operating distance 2.5 mm

Technical specifications

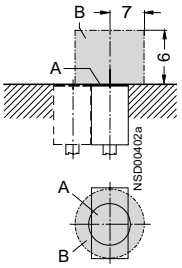
Class		**Normal (PLC)**	**Extra duty (DC 65 V)**	**Extra duty (AC/DC)**
No. of connecting wires		**2-wire**	**3-wire**	**2-wire**
Design		**M 14**	**M 14**	**M 14**
Embeddable in metal		**Shielded**	**Shielded**	**Shielded**
Rated operating distance s_n		2.5 mm	2.5 mm	2.5 mm
Enclosure material		Molded plastic	Molded plastic	Molded plastic
Operational voltage				
• DC	V	15 ... 34	10 ... 65	20 ... 320
• AC	V	–	–	20 ... 265
No-load supply current I_0				
• At DC 24 V	mA	1.5	≤ 10	1.0
• At AC 230 V	mA	–	–	1.5
Rated operational current I_e				
• Continuous	mA	25	300	200
• 20 ms	mA	–	–	1200
Minimum load current	mA	2	–	5
Switching frequency f	Hz	800	800	25/1000 (AC/DC)
Repeat accuracy R	mm	0.1	0.05	0.04
Power-up delay t_v	ms	40	40	100
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		–	•	–
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP67	IP67	IP67
Type		3RG40 72–.JB00	3RG40 72–.AB00 3RG40 72–.AA00	3RG40 72–.KB00 3RG40 72–.KA00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				2 × 0.25 mm²				3 × 0.25 mm²				2 × 0.25 mm²		
NO contact, pnp	11			–			►	**3RG40 72–0AB00**	1 unit	0.089		–		
NC contact, pnp	12			–			C	**3RG40 72–0AA00**	1 unit	0.093		–		
NO contact	15		C	**3RG40 72–0JB00**	1 unit	0.083		–				–		
NO contact	16			–				–			C	**3RG40 72–0KB00**	1 unit	0.083
NC contact	17			–				–			C	**3RG40 72–0KA00**	1 unit	0.084
With M 12 connector														
NO contact, pnp	2	E, F		–			►	**3RG40 72–3AB00**	1 unit	0.033		–		
NO contact	6	E, F	C	**3RG40 72–3JB00**	1 unit	0.032		–				–		
NO contact	8	E, F		–				–			C	**3RG40 72–3KB00**	1 unit	0.034
NC contact	9	F		–				–			C	**3RG40 72–3KA00**	1 unit	0.033

Dimension drawings

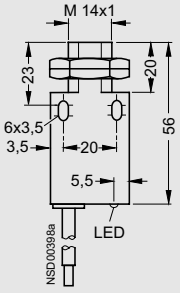
Mounting instructions



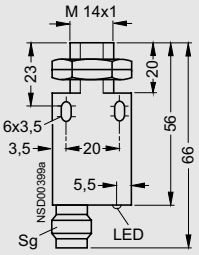
A = active surface
B = metal-free area

These BEROs can be mounted next to one another.

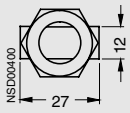
3RG40 72–0..00



3RG40 72–3..00



Plan view



Technical specifications

Class		**Greater rated operating distance (IP68)**	**Greater rated operating distance (IP68)**
No. of connecting wires		**3-wire**	**3-wire**
Design		**Ø 6.5 mm**	**M 8**
Embeddable in metal		**Shielded**	**Semi-shielded**
Rated operating distance s_n		2.5 mm	2.5 mm
Enclosure material		Stainless steel	Stainless steel
Operational voltage (DC)	V	10 ... 30	10 ... 30
No-load supply current I_0	mA	≤ 10	≤ 10
Rated operational current I_e	mA	200	200
Switching frequency f	Hz	1000	1000
Repeat accuracy R	mm	0.15	0.15
Power-up delay t_v	ms	50	50
Switching status display		–	–
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	•
• Reverse polarity protection		•	•
• Wire-break protection		–	–
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP68	IP68
Type		3RG46 02–0AG02	3RG46 11–0AG02

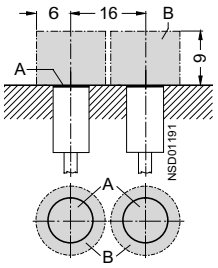
Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With 2 m cable, PUR				3 × 0.14 mm²				3 × 0.14 mm²		
NO contact, pnp	11		A	**3RG46 02–0AG02**	1 unit	0.037	A	**3RG46 11–0AG02**	1 unit	0.046

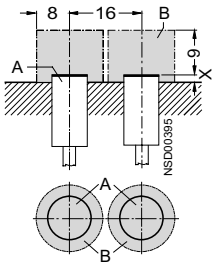
Dimension drawings

Mounting instructions

3RG46 02



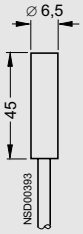
3RG46 11



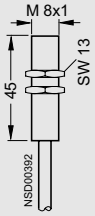
A = active surface
B = metal-free area

X ≥ 1.6 mm when mounted in steel,
X ≥ 0.8 mm when mounted in other metal

3RG46 02–0AG02



3RG46 11–0AG02



Operating distance 3 mm

Technical specifications

Class		**Greater rated operating distance**	**Greater rated operating distance**
No. of connecting wires		**3-wire**	**3-wire**
Design		**Ø 6.5 mm**	**M 8**
Embeddable in metal		**Semi-shielded**	**Semi-shielded**
Rated operating distance s_n		3 mm	3 mm
Enclosure material		Brass, nickel-plated	Brass, nickel-plated
Operational voltage (DC)	V	10 ... 30	10 ... 30
No-load supply current I_0	mA	≤ 10	≤ 10
Rated operational current I_e	mA	200	200
Switching frequency f	Hz	1000	1000
Repeat accuracy R	mm	0.15	0.15
Power-up delay t_v	ms	50	50
Switching status display		Yellow LED	Yellow LED
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	•
• Reverse polarity protection		•	•
• Wire-break protection		–	–
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP67	IP67
Type		3RG46 02–.AB00, 3RG46 02–.AG01 3RG46 02–.GB01	3RG46 11–.AG01 3RG46 11–.GB01

Selection and ordering data

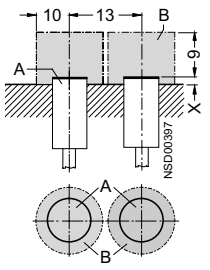
Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With 2 m cable, PUR				3 × 0.14 mm²				3 × 0.14 mm²		
NO contact, pnp	11		A	**3RG46 02–1AB00**	1 unit	0.038	A	**3RG46 11–0AG01**	1 unit	0.048
NO contact, npn	13			–			D	**3RG46 11–0GB01**	1 unit	0.046
With 8 mm combined connector										
NO contact, pnp	2	A	A	**3RG46 02–7AG01**	1 unit	0.013	►	**3RG46 11–7AG01**	1 unit	0.023
With M 12 connector										
NO contact, pnp	2	E, F		–			A	**3RG46 11–3AG01**	1 unit	0.027
NO contact, npn	4	E, F		–			X	**3RG46 11–3GB01**	1 unit	0.030

Dimension drawings

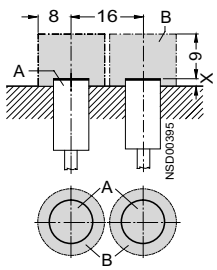
Mounting instructions

Dimension depending on design

A = active surface
B = metal-free area

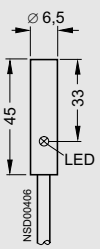


X ≥ 1.3 mm when mounted in steel,
X ≥ 0.65 mm when mounted in other metal

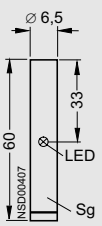


X ≥ 1.6 mm when mounted in steel,
X ≥ 0.8 mm when mounted in other metal

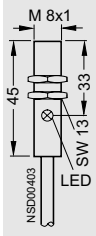
3RG46 02–1AB01



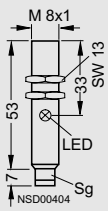
3RG46 02–7AG01



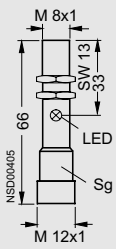
3RG46 11–0..01



3RG46 11–7..01



3RG46 11–3..01



Technical specifications

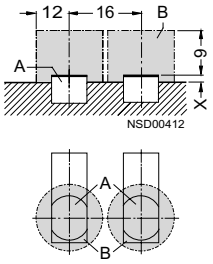
Class		**Greater rated operating distance**
No. of connecting wires		**3-wire**
Design		**8 mm × 8 mm**
Embeddable in metal		**Semi-shielded**
Rated operating distance s_n		3 mm
Enclosure material		Brass, nickel-plated
Operational voltage (DC)	V	10 ... 30
No-load supply current I_0	mA	≤ 10
Rated operational current I_e	mA	200
Switching frequency f	Hz	1000
Repeat accuracy R	mm	0.15
Power-up delay t_v	ms	50
Switching status display		Yellow LED
Protective measures		
• Spurious signal suppression		•
• Short-circuit-proof/overload-proof		•
• Reverse polarity protection		•
• Wire-break protection		–
• Inductive interference protection		•
• Radio interference protection		•
Degree of protection		IP67
Type		3RG46 37–.AG01 3RG46 37–.GB01

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU
						kg
With 2 m cable, PUR				3 × 0.14 mm²		
NO contact, pnp	11		A	**3RG46 37–0AG01**	1 unit	0.045
NO contact, npn	13		X	**3RG46 37–0GB01**	1 unit	0.051
With 8 mm combined connector						
NO contact, pnp	2	A	A	**3RG46 37–7AG01**	1 unit	0.023
NO contact, npn	4	A	B	**3RG46 37–7GB01**	1 unit	0.022

Dimension drawings

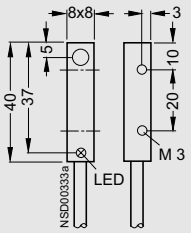
Mounting instructions



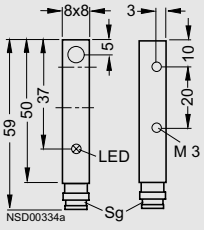
A = active surface
B = metal-free area

X ≥ 2.4 mm when mounted in steel,
X ≥ 1.2 mm when mounted in other metal

3RG46 02–0..01



3RG46 02–7..01



5

Operating distance 3 mm

Technical specifications

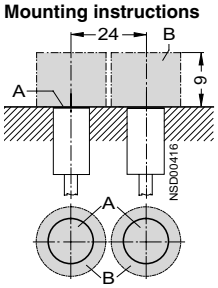
Class		**U BERO (without reduction factor)**
No. of connecting wires		**3-wire**
Design		**M 12**
Embeddable in metal		**Shielded**
Rated operating distance s_n		3 mm
Enclosure material		Brass or stainless steel
Operational voltage (DC)	V	10 ... 30
No-load supply current I_0	mA	≤ 13
Rated operational current I_e	mA	200
Switching frequency f	Hz	3000
Repeat accuracy R	mm	0.04
Power-up delay t_v	ms	8
Switching status display		Yellow LED
Protective measures		
• Spurious signal suppression		•
• Short-circuit-proof/overload-proof		•
• Reverse polarity protection		•
• Wire-break protection		•
• Inductive interference protection		Magnetic field resistant up to 160 mT r.m.s.
• Radio interference protection		•
• Protective insulation		•
Degree of protection		
• Brass enclosure		IP67
• Stainless steel enclosure		IP68
Type		3RG46 12–.AN.. 3RG46 12–.GN..

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU
						kg
With 2 m cable, PUR				3 × 0.14 mm²		
Brass, chrome-plated						
NO contact, pnp	11		A	**3RG46 12–0AN01**	1 unit	0.098
NO contact, npn	13		C	**3RG46 12–0GN01**	1 unit	0.099
Stainless steel						
NO contact, pnp	11		C	**3RG46 12–0AN61**	1 unit	0.097
NO contact, npn	13		C	**3RG46 12–0GN61**	1 unit	0.099
With M 12 connector						
Brass, chrome-plated						
NO contact, pnp	2	E, F	B	**3RG46 12–3AN01**	1 unit	0.029
NO contact, npn	4	E, F	A	**3RG46 12–3GN01**	1 unit	0.029
Brass, teflon-coated						
NO contact, pnp	2	E, F	A	**3RG46 12–3AN05**	1 unit	0.027
NO contact, npn	4	E, F	D	**3RG46 12–3GN05**	1 unit	0.027
Stainless steel						
NO contact, pnp	2	E, F	C	**3RG46 12–3AN61**	1 unit	0.027
NO contact, npn	2	E, F	X	**3RG46 12–3GN61**	1 unit	0.027

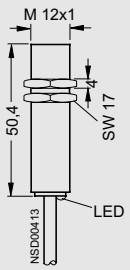
Dimension drawings

Mounting instructions

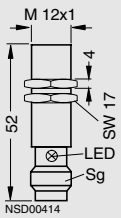


A = active surface
B = metal-free area

3RG46 12–0.N..



3RG46 12–3.N..



Operating distance 3 mm, pressure resistant up to 500 bar

Technical specifications

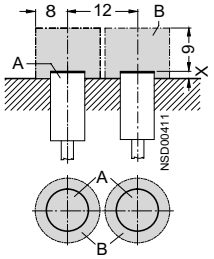
Class		**Pressure-resistant up to 500 bar (7250 psi)**
No. of connecting wires		**3-wire**
Design		**M 14**
Embeddable in metal		**Semi-shielded**
Rated operating distance s_n		3 mm
Enclosure material		Stainless steel, sensor surface aluminium oxide ceramic
Operational voltage (DC)	V	10 ... 30
No-load supply current I_0	mA	≤ 10
Rated operational current I_e	mA	200
Switching frequency f	Hz	500
Repeat accuracy R	mm	0.1
Power-up delay t_v	ms	10
Switching status display		–
Protective measures		
• Spurious signal suppression		•
• Short-circuit-proof/overload-proof		•
• Reverse polarity protection		–
• Wire-break protection		•
• Inductive interference protection		•
• Radio interference protection		–
Degree of protection		IP68
Type		3RG46 52–.P.00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU
						kg
With 2 m cable, PUR				3 × 0.34 mm²		
NO contact, pnp	11		A	**3RG46 52–0PG00**	1 unit	0.132
NC contact, pnp	12		X	**3RG46 52–0PF00**	1 unit	0.137
NO contact, npn	13		X	**3RG46 52–0PB00**	1 unit	0.140
NC contact, npn	14		X	**3RG46 52–0PA00**	1 unit	0.132
With M 12 connector						
NO contact, pnp	2	E, F	C	**3RG46 52–3PG00**	1 unit	0.078
NC contact, pnp	3	F	C	**3RG46 52–3PF00**	1 unit	0.077
NO contact, npn	4	E, F	X	**3RG46 52–3PB00**	1 unit	0.070
NC contact, npn	5	F	X	**3RG46 52–3PA00**	1 unit	0.075

Dimension drawings

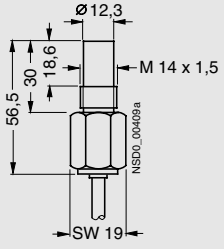
Mounting instructions



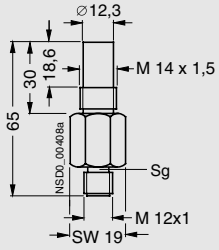
A = active surface
B = metal-free area

X ≥ 2.4 mm when mounted in steel,
X ≥ 1.2 mm when mounted in other metal

3RG46 52–0P.00



3RG46 52–3P.00



5

Operating distance 4 mm

Technical specifications

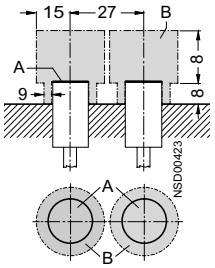
Class		**Normal**	**Normal**	**Normal**	**Normal**
No. of connecting wires		**3-wire**	**4-wire**	**3-wire**	**4-wire**
Design		**M 12, shorty**	**M 12, shorty**	**M 12**	**M 12**
Embeddable in metal		**Unshielded**	**Unshielded**	**Unshielded**	**Unshielded**
Rated operating distance s_n		4 mm	4 mm	4 mm	4 mm
Enclosure material		Brass, nickel-plated	Brass, nickel-plated	Brass, nickel-plated	Brass, nickel-plated
Operational voltage (DC)	V	15 ... 34	15 ... 34	15 ... 34	15 ... 34
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)	1.0	≤ 17 (24 V); ≤ 30 (34 V)	≤ 25 (24 V); ≤ 40 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	50	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	800	800	800	800
Repeat accuracy R	mm	0.2	0.2	0.2	0.2
Power-up delay t_v	ms	40	40	40	40
Switching status display		Yellow LED	Yellow LED	Yellow LED	Yellow LED
Protective measures					
• Spurious signal suppression		•	•	•	•
• Short-circuit-proof/overload-proof		•	•	•	•
• Reverse polarity protection		•	•	•	•
• Wire-break protection		•	–	•	–
• Inductive interference protection		•	•	•	•
• Radio interference protection		•	•	•	•
Degree of protection		IP67	IP67	IP67	IP67
Type		3RG40 22–.A.33 3RG40 22–.G.33	3RG40 22–0CD10 3RG40 22–3CD11	3RG40 22–.A.01 3RG40 22–.G.00	3RG40 22–0CD00 3RG40 22–3CD00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				3 × 0.25 mm²		
NO contact, pnp	11		►	**3RG40 22–0AG33**	1 unit	0.083	►	**3RG40 22–0AG01**	1 unit	0.089
NC contact, pnp	12		C	**3RG40 22–0AF33**	1 unit	0.082	A	**3RG40 22–0AF01**	1 unit	0.089
NO contact, npn	13		C	**3RG40 22–0GB33**	1 unit	0.081	►	**3RG40 22–0GB00**	1 unit	0.089
NC contact, npn	14		C	**3RG40 22–0GA33**	1 unit	0.082	C	**3RG40 22–0GA00**	1 unit	0.088
				4 × 0.14 mm²				4 × 0.14 mm²		
NO and NC contacts, pnp	10		C	**3RG40 22–0CD10**	1 unit	0.079	►	**3RG40 22–0CD00**	1 unit	0.084
With M 12 connector				3-wire				3-wire		
NO contact, pnp	2	E, F	►	**3RG40 22–3AG33**	1 unit	0.024	►	**3RG40 22–3AG01**	1 unit	0.034
NC contact, pnp	3	F	C	**3RG40 22–3AF33**	1 unit	0.024	►	**3RG40 22–3AF01**	1 unit	0.031
NO contact, npn	4	E, F	C	**3RG40 22–3GB33**	1 unit	0.025	►	**3RG40 22–3GB00**	1 unit	0.031
NC contact, npn	5	F	C	**3RG40 22–3GA33**	1 unit	0.025	C	**3RG40 22–3GA00**	1 unit	0.032
				4-wire				4-wire		
NO and NC contacts, pnp	1	F	C	**3RG40 22–3CD11**	1 unit	0.026	C	**3RG40 22–3CD00**	1 unit	0.031

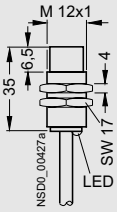
Dimension drawings

Mounting instructions

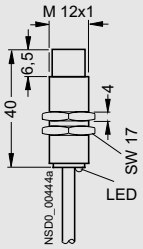


A = active surface
B = metal-free area

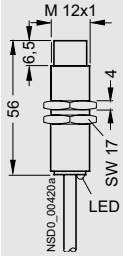
3RG40 22–0..33



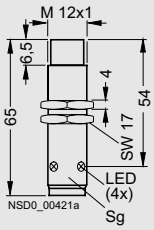
3RG40 22–0CD10



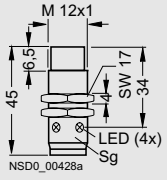
3RG40 22–0..00
3RG40 22–0..01



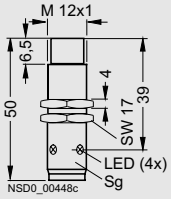
3RG40 12–3..00
3RG40 12–3..00



3RG40 22–3..33



3RG40 22–3CD11



Technical specifications

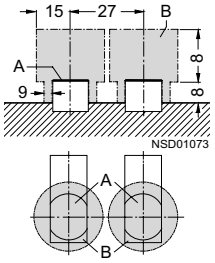
Class		**Normal**
No. of connecting wires		**3-wire**
Design		**Cubic 12 mm × 40 mm**
Embeddable in metal		**Unshielded**
Rated operating distance s_n		4 mm
Enclosure material		Molded plastic
Operational voltage (DC)	V	15 ... 34
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	800
Repeat accuracy R	mm	0.2
Power-up delay t_v	ms	40
Switching status display		Yellow LED
Protective measures • Spurious signal suppression • Short-circuit-proof/overload-proof • Reverse polarity protection • Wire-break protection • Inductive interference protection • Radio interference protection		 • • • • • •
Degree of protection		IP67
Type		3RG40 80–.AG45

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU
						kg
With 2 m cable, PUR				3 × 0.34 mm²		
NO contact, pnp	11		D	**3RG40 80–0AG45**	1 unit	0.082
With 8 mm combined connector						
NO contact, pnp	2	A	A	**3RG40 80–7AG45**	1 unit	0.024

Dimension drawings

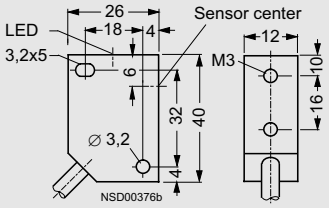
Mounting instructions



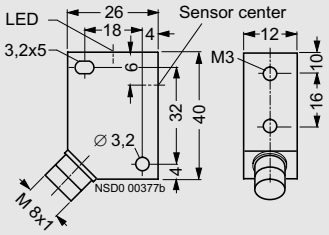
A = active surface
B = metal-free area

These BEROs can be mounted next to one another.

3RG40 80–0AG45



3RG40 80–7AG45



5

Operating distance 4 mm

Technical specifications

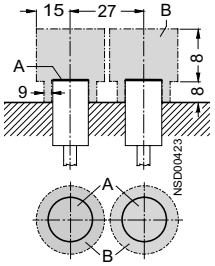
Class		**Normal (PLC)**	**Extra duty (DC 65 V)**	**Extra duty (AC/DC)**
No. of connecting wires		**2-wire**	**3-wire**	**2-wire**
Design		**M 12**	**M 12**	**M 12**
Embeddable in metal		**Unshielded**	**Unshielded**	**Unshielded**
Rated operating distance s_n		4 mm	4 mm	4 mm
Enclosure material		Brass, nickel-plated	Brass, nickel-plated	Brass, nickel-plated
Operational voltage				
• DC	V	15 ... 34	10 ... 65	20 ... 320
• AC	V	–	–	20 ... 265
No-load supply current I_0				
• At DC 24 V	mA	≤ 1.5	≤ 10	1.0
• At AC 230 V	mA	–	–	1.5
Rated operational current I_e				
• Continuous	mA	25	300	200
• 20 ms	mA	–	–	1200
Minimum load current	mA	2	–	5
Switching frequency f	Hz	300	800	25/900 (AC/DC)
Repeat accuracy R	mm	0.2	0.2	0.12
Power-up delay t_v	ms	40	40	100
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		–	•	–
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP67	IP67	IP67
Type		3RG40 22–.JB00	3RG40 22–.AB00 3RG40 22–.AA00	3RG40 22–.KB00 3RG40 22–.KA00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				2 × 0.25 mm²				3 × 0.25 mm²				2 × 0.25 mm²		
NO contact, pnp	11			–			►	**3RG40 22–0AB00**	1 unit	0.092		–		
NC contact, pnp	12			–			C	**3RG40 22–0AA00**	1 unit	0.089		–		
NO contact	15		►	**3RG40 22–0JB00**	1 unit	0.084		–				–		
NO contact	16			–				–			►	**3RG40 22–0KB00**	1 unit	0.086
NC contact	17			–				–			C	**3RG40 22–0KA00**	1 unit	0.087
With M 12 connector														
NO contact, pnp	2	E, F		–			►	**3RG40 22–3AB00**	1 unit	0.033		–		
NC contact, pnp	3	F		–			C	**3RG40 22–3AA00**	1 unit	0.032		–		
NO contact	6	E, F	►	**3RG40 22–3JB00**	1 unit	0.033		–				–		
NO contact	8	E, F		–				–			►	**3RG40 22–3KB00**	1 unit	0.036
NC contact	9	F		–				–			C	**3RG40 22–3KA00**	1 unit	0.033

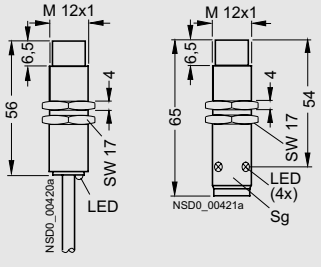
Dimension drawings

Mounting instructions

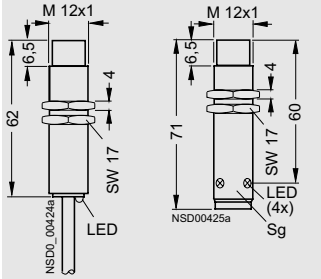


A = active surface
B = metal-free area

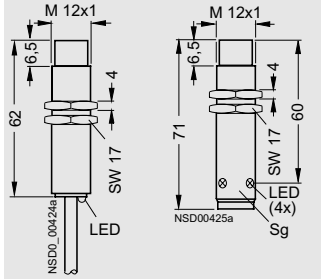
3RG40 22–0JB00 3RG40 22–3JB00



3RG40 22–0A.00 3RG40 22–0A.00



3RG40 22–0K.00 3RG40 22–0K.00



Operating distance 4 mm

Technical specifications

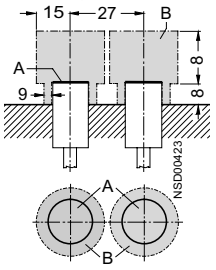
Class		**IP68 / 69 K**	**IP68 / 69 K**	**IP68 / 69 K**
No. of connecting wires		**3-wire**	**3-wire**	**3-wire**
Design		**Ø 12 mm**	**M 12**	**M 12**
Embeddable in metal		**Unshielded**	**Unshielded**	**Unshielded**
Rated operating distance s_n		4 mm	4 mm	4 mm
Enclosure material		Molded plastic	Molded plastic	Brass, nickel-plated
Operational voltage (DC)	V	15 ... 34	15 ... 34	15 ... 34
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	800	800	800
Repeat accuracy R	mm	0.2	0.2	0.2
Power-up delay t_v	ms	40	40	40
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	•
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP68 / 69 K	IP68 / 69 K	IP68 / 69 K
Type		3RG40 62–0A.30 3RG40 62–0G.30	3RG40 22–0A.30 3RG40 22–0G.30	3RG40 22–0AG31 3RG40 22–0GB31

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				3 × 0.25 mm²				PVC, 3 × 0.25 mm²		
NO contact, pnp	11		C	**3RG40 62–0AG30**	1 unit	0.072	C	**3RG40 22–0AG30**	1 unit	0.073	D	**3RG40 22–0AG31**	1 unit	0.089
NC contact, pnp	12		C	**3RG40 62–0AF30**	1 unit	0.074	C	**3RG40 22–0AF30**	1 unit	0.072		–		
NO contact, npn	13		C	**3RG40 62–0GB30**	1 unit	0.074	C	**3RG40 22–0GB30**	1 unit	0.071	C	**3RG40 22–0GB31**	1 unit	0.088
NC contact, npn	14		C	**3RG40 62–0GA30**	1 unit	0.080	C	**3RG40 22–0GA30**	1 unit	0.072		–		

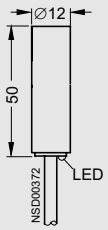
Dimension drawings

Mounting instructions

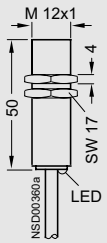


A = active surface
B = metal-free area

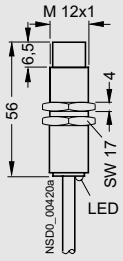
3RG40 62–0..30



3RG40 22–0..30



3RG40 22–0..31



5

Operating distance 4 mm

Technical specifications

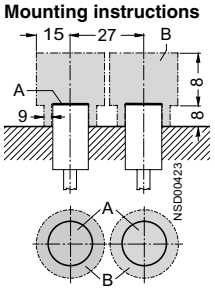
Class		**IP68 / 69 K (DC 65 V)**	**IP68 / 69 K (AC/DC)**
No. of connecting wires		**3-wire**	**2-wire**
Design		**M 12**	**M 12**
Embeddable in metal		**Unshielded**	**Unshielded**
Rated operating distance s_n		4 mm	4 mm
Enclosure material		Molded plastic	Molded plastic
Operational voltage			
• DC	V	10 ... 65	20 ... 320
• AC	V	–	20 ... 265
No-load supply current I_0			
• At DC 24 V	mA	≤ 10	1.0
• At AC 230 V	mA	–	1.5
Rated operational current I_e			
• Continuous	mA	300	200
• 20 ms	mA	–	1200
Minimum load current	mA	–	5
Switching frequency f	Hz	800	25/900 (AC/DC)
Repeat accuracy R	mm	0.2	0.12
Power-up delay t_v	ms	40	100
Switching status display		Yellow LED	Yellow LED
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	–
• Reverse polarity protection		•	•
• Wire-break protection		•	•
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP68 / 69 K	IP68 / 69 K
Type		3RG40 22–.AB30	3RG40 22–.KB30

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				2 × 0.25 mm²		
NO contact, pnp	11		A	**3RG40 22–0AB30**	1 unit	0.074		–		
NO contact	16			–			D	**3RG40 22–0KB30**	1 unit	0.068

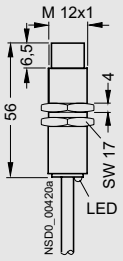
Dimension drawings

Mounting instructions

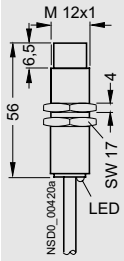


A = active surface
B = metal-free area

3RG40 22–0AB30



3RG40 22–0KB30



Technical specifications

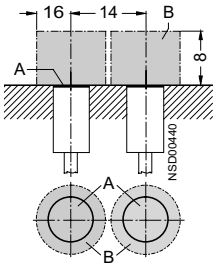
Class		**Greater rated operating distance (VW)**	**Greater rated operating distance (VW)**
No. of connecting wires		**3-wire**	**3-wire**
Design		**M 12, shorty**	**M 12**
Embeddable in metal		**Shielded**	**Shielded**
Rated operating distance s_n		4 mm	4 mm
Enclosure material		Brass, nickel-plated	Brass, nickel-plated
Operational voltage (DC)	V	10 ... 34	10 ... 34
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	400	400
Repeat accuracy R	mm	0.2	0.2
Power-up delay t_v	ms	40	40
Switching status display		Yellow LED	Yellow LED
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	•
• Reverse polarity protection		•	•
• Wire-break protection		•	•
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP67	IP67
Type		3RG41 12–.AG33	3RG41 12–.A.01

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				3 × 0.25 mm²		
NO contact, pnp	11		C	**3RG41 12–0AG33**	1 unit	0.084	►	**3RG41 12–0AG01**	1 unit	0.088
NC contact, pnp	12			–			D	**3RG41 12–0AF01**	1 unit	0.089
With M 12 connector										
NO contact, pnp	2	E, F	►	**3RG41 12–3AG33**	1 unit	0.026	►	**3RG41 12–3AG01**	1 unit	0.030
NC contact, pnp	3	F		–			C	**3RG41 12–3AF01**	1 unit	0.033

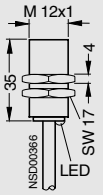
Dimension drawings

Mounting instructions

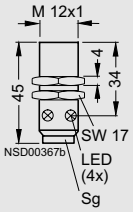


A = active surface
B = metal-free area

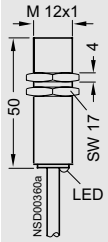
3RG41 12–0AG33



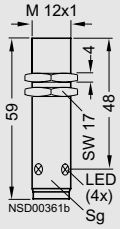
3RG41 12–3AG33



3RG41 12–0A.01



3RG41 12–3A.01



5

Operating distance 4 mm

Technical specifications

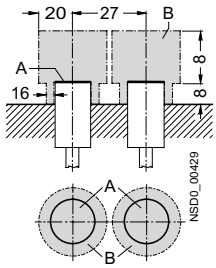
Class		**U BERO (without reduction factor)**
No. of connecting wires		**3-wire**
Design		**M 8**
Embeddable in metal		**Unshielded**
Rated operating distance s_n		4 mm
Enclosure material		Stainless steel
Operational voltage (DC)	V	10 ... 30
No-load supply current I_0	mA	≤ 13
Rated operational current I_e	mA	150
Switching frequency f	Hz	< 2000
Repeat accuracy R	mm	0.16
Power-up delay t_v	ms	≤ 8
Switching status display		Yellow LED
Protective measures • Spurious signal suppression • Short-circuit-proof/overload-proof • Reverse polarity protection • Wire-break protection • Inductive interference protection • Radio interference protection		 • • • • Magnetic field resistant up to 160 mT r.m.s. •
Degree of protection		IP68
Type		3RG46 11–.AN01 3RG46 11–.GN01

Selection and ordering data

Switching output	Circ. diag. No.	Connector type	DT	Order No.	PS	Approx. weight per PU
						kg
With 2 m cable, PUR				3 × 0.25 mm²		
NO contact, pnp	11		A	**3RG46 21–0AN01**	1 unit	0.057
NO contact, npn	13		D	**3RG46 21–0GN01**	1 unit	0.060
With 8 mm combined connector						
NO contact, pnp	2	A	A	**3RG46 21–7AN01**	1 unit	0.018
NO contact, npn	4	A	X	**3RG46 21–7GN01**	1 unit	0.018
With M 12 connector						
NO contact, pnp	2	E, F	A	**3RG46 21–3AN01**	1 unit	0.022
NO contact, npn	4	E, F	D	**3RG46 21–3GN01**	1 unit	0.022

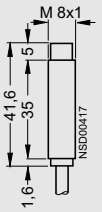
Dimension drawings

Mounting instructions

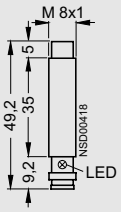


A = active surface
B = metal-free area

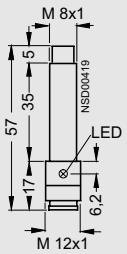
3RG46 21–0.N01



3RG46 21–7.N01



3RG46 21–3.N01



Technical specifications

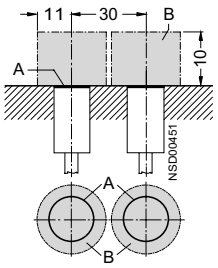
Class		**Normal**	**Normal**	**Normal**
No. of connecting wires		**3-wire**	**3-wire**	**4-wire**
Design		**M 18, shorty**	**M 18**	**M 18**
Embeddable in metal		**Shielded**	**Shielded**	**Shielded**
Rated operating distance s_n		5 mm	5 mm	5 mm
Enclosure material		Brass, nickel-plated	Brass, nickel-plated	Brass, nickel-plated
Operational voltage (DC)	V	15 ... 34	15 ... 34	15 ... 34
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)	≤ 25 (24 V); ≤ 40 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	800	800	800
Repeat accuracy R	mm	0.15	0.15	0.15
Power-up delay t_v	ms	40	40	40
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	•
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP67	IP67	IP67
Type		3RG40 13–.A.33, 3RG40 13–.G.33	3RG40 13–.A.01, 3RG40 13–.G.00	3RG40 13–.CD00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				3 × 0.25 mm²				4 × 0.14 mm²		
NO contact, pnp	11		►	**3RG40 13–0AG33**	1 unit	0.103	►	**3RG40 13–0AG01**	1 unit	0.116		–		
NC contact, pnp	12		C	**3RG40 13–0AF33**	1 unit	0.103	C	**3RG40 13–0AF01**	1 unit	0.117		–		
NO contact, npn	13		C	**3RG40 13–0GB33**	1 unit	0.103	►	**3RG40 13–0GB00**	1 unit	0.116		–		
NC contact, npn	14		C	**3RG40 13–0GA33**	1 unit	0.103	C	**3RG40 13–0GA00**	1 unit	0.116		–		
NO and NC contacts, pnp	10			–				–			►	**3RG40 13–0CD00**	1 unit	0.112
With M 12 connector														
NO contact, pnp	2	E, F	►	**3RG40 13–3AG33**	1 unit	0.052	►	**3RG40 13–3AG01**	1 unit	0.068		–		
NC contact, pnp	3	F	C	**3RG40 13–3AF33**	1 unit	0.051	C	**3RG40 13–3AF01**	1 unit	0.068		–		
NO contact, npn	4	E, F	C	**3RG40 13–3GB33**	1 unit	0.051	C	**3RG40 13–3GB00**	1 unit	0.068		–		
NC contact, npn	5	F	C	**3RG40 13–3GA33**	1 unit	0.052	C	**3RG40 13–3GA00**	1 unit	0.068		–		
NO and NC contacts, pnp	1	F		–				–			►	**3RG40 13–3CD00**	1 unit	0.068

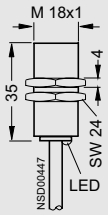
Dimension drawings

Mounting instructions

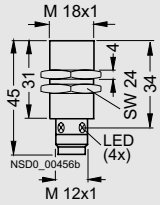


A = active surface
B = metal-free area

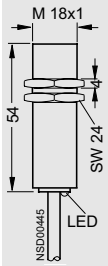
3RG40 13–0..33



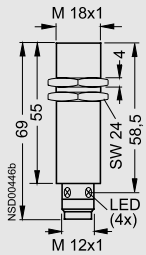
3RG40 13–3..33



3RG40 13–0..00
3RG40 13–0..01



3RG40 13–3..00
3RG40 13–3..01



Operating distance 5 mm

Technical specifications

Class		**Normal**	**Normal**	**Extra duty (DC 65 V)**
No. of connecting wires		**3-wire**	**4-wire**	**3-wire**
Design		**Ø 18 mm (button)**	**M 14**	**M 14**
Embeddable in metal		**Shielded**	**Unshielded**	**Unshielded**
Rated operating distance s_n		5 mm (3.2 mm)	5 mm	2.5 mm
Enclosure material		Molded plastic	Molded plastic	Molded plastic
Operational voltage (DC)	V	10 ... 30	15 ... 34	10 ... 65
No-load supply current I_0	mA	≤ 1.5	≤ 25 (24 V); ≤ 40 (34 V)	≤ 10
Rated operational current I_e	mA	50	200 (≤ 50 °C); 150 (≤ 85 °C)	300
Switching frequency f	Hz	100	300	300
Repeat accuracy R	mm	0.15	0.1	0.1
Power-up delay t_v	ms	1.0	40	40
Switching status display		–	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		–	•	•
• Short-circuit-proof/overload-proof		–	•	•
• Reverse polarity protection		•	•	•
• Wire-break protection		–	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP67	IP67	IP67
Type		3RG40 75–0..00	3RG40 82–.CD00	3RG40 82–.AB00

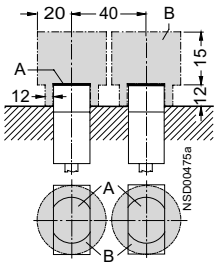
Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS *	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR								4 × 0.14 mm²				3 × 0.25 mm²		
NO contact, pnp	13			–				–			►	**3RG40 82–0AB00**	1 unit	0.089
NO and NC contacts, pnp	10			–			►	**3RG40 82–0CD00**	1 unit	0.084		–		
With M 12 connector														
NO contact, pnp	4	E, F		–				–			A	**3RG40 82–3AB00**	1 unit	0.033
NO and NC contacts, pnp	1	F		–			D	**3RG40 82–3CD00**	1 unit	0.033		–		
With single conductors, 0.5 m, PVC				3 × 0.25 mm²										
NO contact, pnp	11		►	**3RG40 75–0AJ00**	5 units	0.011		–				–		
NC contact, pnp	12		A	**3RG40 75–0AH00**	5 units	0.011		–				–		
NO contact, npn	13		►	**3RG40 75–0GJ00**	5 units	0.011		–				–		

Dimension drawings

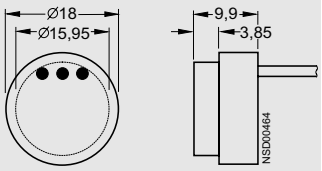
Mounting instructions

3RG40 82

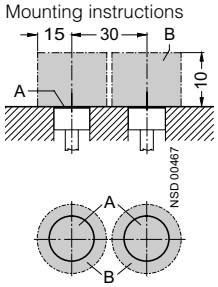


A = active surface
B = metal-free area

3RG40 75

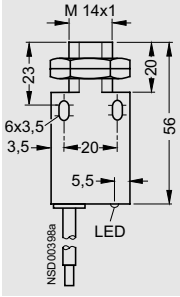


Mounting instructions

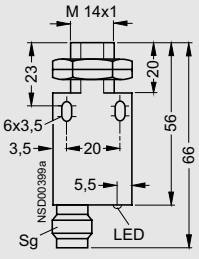


3RG40 75–0GJ00 also possible with non-embedded mounting:
Rated operating distance s_n = 3.2 mm

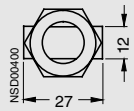
3RG40 82–0..00



3RG40 82–3..00



Plan view



* This quantity or a multiple thereof can be ordered

Technical specifications

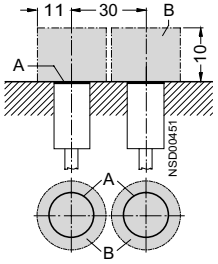
Class		**Normal (PLC)**	**Extra duty (DC 65 V)**	**Extra duty (AC/DC)**
No. of connecting wires		**2-wire**	**3-wire**	**2-wire**
Design		**M 18**	**M 18**	**M 18**
Embeddable in metal		**Shielded**	**Shielded**	**Shielded**
Rated operating distance s_n		5 mm	5 mm	5 mm
Enclosure material		Brass, nickel-plated	Brass, nickel-plated	Brass, nickel-plated
Operational voltage				
• DC	V	15 ... 34	10 ... 65	20 ... 320
• AC	V	–	–	20 ... 265
No-load supply current I_0				
• At DC 24 V	mA	≤ 1.5	≤ 10	1.0
• At AC 230 V	mA	–	–	1.5
Rated operational current I_e				
• Continuous	mA	25	300	300
• 20 ms	mA	–	–	1800
Minimum load current	mA	2	–	5
Switching frequency f	Hz	400	800 (NO contact), 4000 (NC contact)	25/490 (AC/DC)
Repeat accuracy R	mm	0.15	0.15	0.15
Power-up delay t_v	ms	40	40	100
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		–	•	–
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP67	IP67	IP67
Type		3RG40 13–.JB00	3RG40 13–.AB00, 3RG40 13–.AA00	3RG40 13–.KB00, 3RG40 13–.KA00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				2 × 0.25 mm²				3 × 0.25 mm²				2 × 0.25 mm²		
NO contact, pnp	11			–			►	**3RG40 13–0AB00**	1 unit	0.117		–		
NC contact, pnp	12			–			►	**3RG40 13–0AA00**	1 unit	0.117		–		
NO contact	15		►	**3RG40 13–0JB00**	1 unit	0.110		–				–		
NO contact	16			–				–			►	**3RG40 13–0KB00**	1 unit	0.113
NC contact	17			–				–			►	**3RG40 13–0KA00**	1 unit	0.111
With M 12 connector														
NO contact, pnp	2	E, F		–			►	**3RG40 13–3AB00**	1 unit	0.076		–		
NC contact, pnp	3	F		–			C	**3RG40 13–3AA00**	1 unit	0.068		–		
NO contact	6	E, F	►	**3RG40 13–3JB00**	1 unit	0.067		–				–		
NO contact	8	E, F		–				–			►	**3RG40 13–3KB00**	1 unit	0.068
NC contact	9	F		–				–			C	**3RG40 13–3KA00**	1 unit	0.068

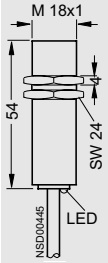
Dimension drawings

Mounting instructions

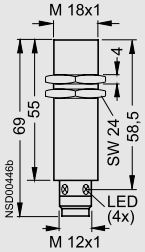


A = active surface
B = metal-free area

3RG40 13–0..00
3RG40 13–0..01



3RG40 13–3..00
3RG40 13–3..01



Operating distance 5 mm

Technical specifications

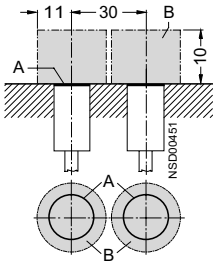
Class		**IP68 / 69 K**	**IP68 / 69 K**	**IP68 / 69 K**
No. of connecting wires		**3-wire**	**3-wire**	**3-wire**
Design		**Ø 18 mm**	**M 18**	**M 18**
Embeddable in metal		**Shielded**	**Shielded**	**Shielded**
Rated operating distance s_n		5 mm	5 mm	5 mm
Enclosure material		Molded plastic	Molded plastic	Brass, nickel-plated
Operational voltage (DC)	V	15 ... 34	15 ... 34	15 ... 34
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	800	800	800
Repeat accuracy R	mm	0.15	0.15	0.15
Power-up delay t_v	ms	40	40	40
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	•
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP68 / 69 K	IP68 / 69 K	IP68 / 69 K
Type		3RG40 53–0A.30, 3RG40 53–0G.30	3RG40 13–0A.30, 3RG40 13–0G.30	3RG40 13–0AG31, 3RG40 13–0GB31

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				3 × 0.25 mm²				PVC, 3 × 0.25 mm²		
NO contact, pnp	11		C	**3RG40 53–0AG30**	1 unit	0.086	C	**3RG40 13–0AG30**	1 unit	0.086	C	**3RG40 13–0AG31**	1 unit	0.117
NC contact, pnp	12		C	**3RG40 53–0AF30**	1 unit	0.084	C	**3RG40 13–0AF30**	1 unit	0.084		–		
NO contact, npn	13		C	**3RG40 53–0GB30**	1 unit	0.086	C	**3RG40 13–0GB30**	1 unit	0.086	D	**3RG40 13–0GB31**	1 unit	0.120
NC contact, npn	14		C	**3RG40 53–0GA30**	1 unit	0.117	C	**3RG40 13–0GA30**	1 unit	0.087		–		

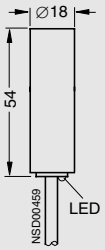
Dimension drawings

Mounting instructions

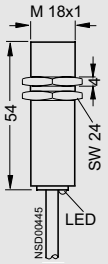


A = active surface
B = metal-free area

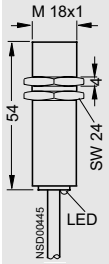
3RG40 53–0..30



3RG40 13–0..30



3RG40 13–0..31



Technical specifications

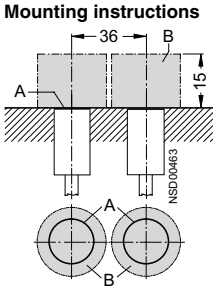
Class		**U BERO (without reduction factor)**
No. of connecting wires		**3-wire**
Design		**M 18**
Embeddable in metal		**Shielded**
Rated operating distance s_n		5 mm
Enclosure material		Brass or stainless steel
Operational voltage (DC)	V	10 ... 30
No-load supply current I_0	mA	≤ 13
Rated operational current I_e	mA	200
Switching frequency f	Hz	2500
Repeat accuracy R	mm	0.1
Power-up delay t_v	ms	≤ 8
Switching status display		Yellow LED
Protective measures		
• Spurious signal suppression		•
• Short-circuit-proof/overload-proof		•
• Reverse polarity protection		•
• Wire-break protection		•
• Inductive interference protection		Magnetic field resistant up to 160 mT r.m.s.
• Radio interference protection		•
• Protective insulation		•
Degree of protection		
• Brass enclosure		IP67
• Stainless steel enclosure		IP68
Type		3RG46 13–.AN.., 3RG46 13–.GN..

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU
						kg
With 2 m cable, PUR				3 × 0.34 mm²		
Brass, chrome-plated						
NO contact, pnp	11		A	**3RG46 13–0AN01**	1 unit	0.120
NO contact, npn	13		X	**3RG46 13–0GN01**	1 unit	0.118
Stainless steel						
NO contact, pnp	11		C	**3RG46 13–0AN61**	1 unit	0.117
NO contact, npn	13		D	**3RG46 13–0GN61**	1 unit	0.113
With M 12 connector						
Brass, chrome-plated						
NO contact, pnp	2	E, F	A	**3RG46 13–3AN01**	1 unit	0.049
NO contact, npn	4	E, F	D	**3RG46 13–3GN01**	1 unit	0.045
Brass, teflon-coated						
NO contact, pnp	2	E, F	X	**3RG46 13–3AN05**	1 unit	0.051
NO contact, npn	4	E, F	X	**3RG46 13–3GN05**	1 unit	0.051
Stainless steel						
NO contact, pnp	2	E, F	C	**3RG46 13–3AN61**	1 unit	0.045
NO contact, npn	2	E, F	D	**3RG46 13–3GN61**	1 unit	0.044

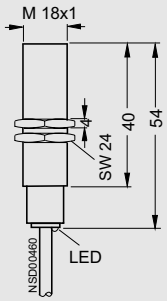
Dimension drawings

Mounting instructions

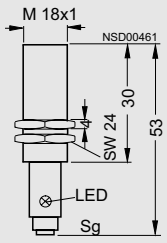


A = active surface
B = metal-free area

3RG46 13–0.N..



3RG46 13–3.N..



Operating distance 6 mm

Technical specifications

Class		**Greater rated operating distance**	**Greater rated operating distance**
No. of connecting wires		**3-wire**	**3-wire**
Design		**M 8**	**M 12**
Embeddable in metal		**Unshielded**	**Semi-shielded**
Rated operating distance s_n		6 mm	6 mm
Enclosure material		Brass, nickel-plated	Brass, nickel-plated
Operational voltage (DC)	V	10 ... 30	10 ... 30
No-load supply current I_0	mA	≤ 10	≤ 10
Rated operational current I_e	mA	200	200
Switching frequency f	Hz	500	800
Repeat accuracy R	mm	0.15	0.15
Power-up delay t_v	ms	15	15
Switching status display		Yellow LED	Yellow LED
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	•
• Reverse polarity protection		•	•
• Wire-break protection		–	–
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP67	IP67
Type		3RG46 21–.A.02, 3RG46 21–.G.02	3RG46 12–.A.01, 3RG46 12–.G.01

Selection and ordering data

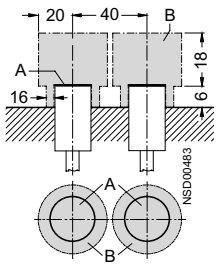
Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With 2 m cable, PUR				3 × 0.14 mm²				3 × 0.34 mm²		
NO contact, pnp	11		►	**3RG46 21–0AG02**	1 unit	0.049	►	**3RG46 12–0AG01**	1 unit	0.102
NO contact, npn	13		X	**3RG46 21–0GB02**	1 unit	0.050	X	**3RG46 12–0GB01**	1 unit	0.102
With 8 mm combined connector										
NO contact, pnp	2	A	►	**3RG46 21–7AG02**	1 unit	0.023		–		
NO contact, npn	4	A	X	**3RG46 21–7GB02**	1 unit	0.021		–		
With M 12 connector										
NO contact, pnp	2	E, F	A	**3RG46 21–3AG02**	1 unit	0.027	►	**3RG46 12–3AB01**	1 unit	0.035
NO contact, nnn	2	E, F	X	**3RG46 21–3GB02**	1 unit	0.027	X	**3RG46 12–3GB01**	1 unit	0.035

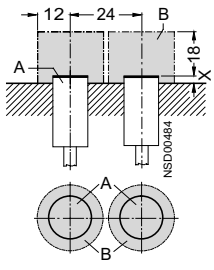
Dimension drawings

Mounting instructions

Dimension depending on design

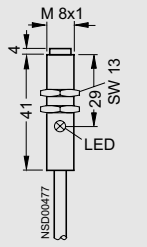
A = active surface
B = metal-free area



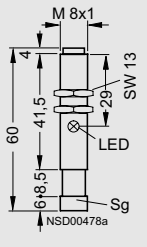


X ≥ 2.4 mm when mounted in steel,
X ≥ 1.2 mm when mounted in other metal

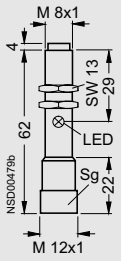
3RG46 21–0..02



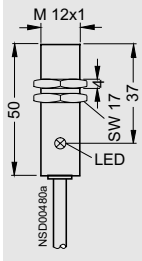
3RG46 21–7..02



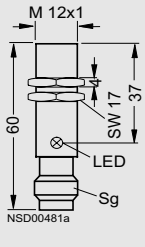
3RG46 21–3..02



3RG46 12–0..01



3RG46 12–3..01



Operating distance 0 to 6 mm, with analog output

Technical specifications

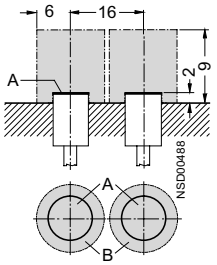
Class		**Analog output**
No. of connecting wires		**4-wire**
Design		**M 12**
Embeddable in metal		**Semi-shielded**
Rated operating distance s_n		0 ... 6 mm
Enclosure material		Brass, nickel-plated
Operational voltage (DC)	V	10 ... 30
No-load supply current I_0	mA	–
Current input, max.	mA	10
Switching frequency f	Hz	1000
Repeat accuracy R	mm	0.3
Power-up delay t_v	ms	50
Output voltage (A1) at 25 °C		
• With s = 0 mm	V	0 (–0 ... +0.2 V)
• With s = 3 mm	V	+2.7 (±0.2 V)
• With s = 6 mm	V	+5.0 (±0.2 V)
Load current at voltage output		Max. 10 mA
Output current (A2) at 25 °C		
• With s = 0 mm	mA	1.0 (±0.2 mA)
• With s = 6 mm	mA	5.0 (±0.2 mA)
Max. resistive load at current output		
• With U_B = 10 V	KΩ	1
• With U_B = 30 V	KΩ	5
Switching status display		–
Protective measures		
• Spurious signal suppression		–
• Short-circuit-proof/overload-proof		•
• Reverse polarity protection		•
• Wire-break protection		–
• Inductive interference protection		•
• Radio interference protection		–
Degree of protection		IP67
Type		3RG46 12–.NB00

Selection and ordering data

Analog output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU
						kg
With 2 m cable, PUR				4 × 0.25 mm²		
Voltage + current	30		A	**3RG46 12–0NB00**	1 unit	0.096
With M 12 connector						
Voltage + current	30	F	A	**3RG46 12–3NB00**	1 unit	0.037

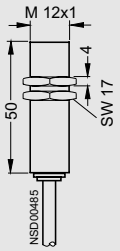
Dimension drawings

Mounting instructions

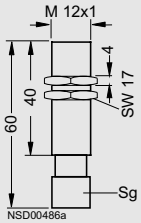


A = active surface
B = metal-free area

3RG46 12–0NB00



3RG46 12–3NB00



5

Operating distance 8 mm

Technical specifications

Class		**Normal**	**Normal**	**Normal**
No. of connecting wires		**3-wire**	**3-wire**	**4-wire**
Design		**M 18, shorty**	**M 18**	**M 18**
Embeddable in metal		**Unshielded**	**Unshielded**	**Unshielded**
Rated operating distance s_n		8 mm	8 mm	8 mm
Enclosure material		Brass, nickel-plated	Brass, nickel-plated	Brass, nickel-plated
Operational voltage (DC)	V	15 ... 34	15 ... 34	15 ... 34
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)	≤ 25 (24 V); ≤ 40 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	500	500	500
Repeat accuracy R	mm	0.2	0.2	0.2
Power-up delay t_v	ms	40	40	40
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	•
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP67	IP67	IP67
Type		3RG40 23–.A.33, 3RG40 23–.G.33	3RG40 23–.A.01, 3RG40 23–.G.00	3RG40 23–.CD00

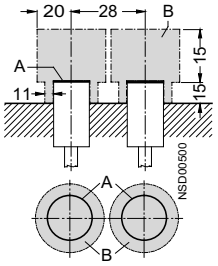
Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				3 × 0.25 mm²				4 × 0.14 mm²		
NO contact, pnp	11		C	**3RG40 23–0AG33**	1 unit	0.101	►	**3RG40 23–0AG01**	1 unit	0.112		–		
NC contact, pnp	12		C	**3RG40 23–0AF33**	1 unit	0.098	C	**3RG40 23–0AF01**	1 unit	0.112		–		
NO contact, npn	13		C	**3RG40 23–0GB33**	1 unit	0.098	C	**3RG40 23–0GB00**	1 unit	0.112		–		
NC contact, npn	14		C	**3RG40 23–0GA33**	1 unit	0.101		–				–		
NO and NC contacts, pnp	10			–				–			►	**3RG40 23–0CD00**	1 unit	0.107
With M 12 connector														
NO contact, pnp	2	E, F	C	**3RG40 23–3AG33**	1 unit	0.047	►	**3RG40 23–3AG01**	1 unit	0.064		–		
NC contact, pnp	3	F	C	**3RG40 23–3AF33**	1 unit	0.047	C	**3RG40 23–3AF01**	1 unit	0.064		–		
NO contact, npn	4	E, F	C	**3RG40 23–3GB33**	1 unit	0.048	C	**3RG40 23–3GB00**	1 unit	0.064		–		
NC contact, npn	5	F	C	**3RG40 23–3GA33**	1 unit	0.045		–				–		
NO and NC contacts, pnp	1	F		–				–			C	**3RG40 23–3CD00**	1 unit	0.064

Dimension drawings

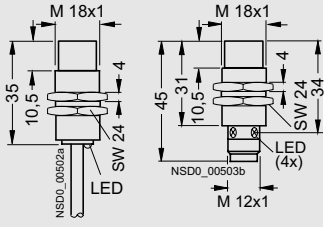
Mounting instructions

3RG40 23–...33

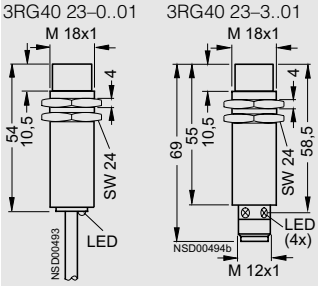


A = active surface
B = metal-free area

3RG40 23–0..33 3RG40 23–3..33



3RG40 23–0..00 3RG40 23–0..01 3RG40 23–3..00 3RG40 23–3..01



Technical specifications

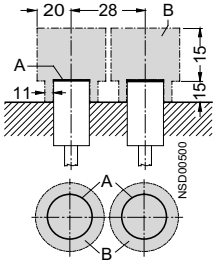
Class		**Normal (PLC)**	**Extra duty (DC 65 V)**	**Extra duty (AC/DC)**
No. of connecting wires		**2-wire**	**3-wire**	**2-wire**
Design		**M 18**	**M 18**	**M 18**
Embeddable in metal		**Unshielded**	**Unshielded**	**Unshielded**
Rated operating distance s_n		8 mm	8 mm	8 mm
Enclosure material		Brass, nickel-plated	Brass, nickel-plated	Brass, nickel-plated
Operational voltage				
• DC	V	15 ... 34	10 ... 65	20 ... 320
• AC	V	–	–	20 ... 265
No-load supply current I_0				
• At DC 24 V	mA	≤ 1.5	≤ 10	1.0
• At AC 230 V	mA	–	–	1.5
Rated operational current I_e				
• Continuous	mA	25	300	300
• 20 ms	mA	–	–	1800
Minimum load current	mA	2	–	5
Switching frequency f	Hz	200	500	25/340 (AC/DC)
Repeat accuracy R	mm	0.2	0.2	0.2
Power-up delay t_v	ms	40	40	100
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		–	•	–
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP67	IP67	IP67
Type		3RG40 23–.JB00	3RG40 23–.AB00, 3RG40 23–.AA00	3RG40 23–.KB00, 3RG40 23–.KA00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				2 × 0.25 mm²				3 × 0.25 mm²				2 × 0.25 mm²		
NO contact, pnp	11			–			►	**3RG40 23–0AB00**	1 unit	0.112		–		
NC contact, pnp	12			–			A	**3RG40 23–0AA00**	1 unit	0.112		–		
NO contact	15		►	**3RG40 23–0JB00**	1 unit	0.107		–				–		
NO contact	16			–				–			►	**3RG40 23–0KB00**	1 unit	0.108
NC contact	17			–				–			C	**3RG40 23–0KA00**	1 unit	0.108
With M 12 connector														
NO contact, pnp	2	E, F		–			►	**3RG40 23–3AB00**	1 unit	0.064		–		
NC contact, pnp	3	F		–			C	**3RG40 23–3AA00**	1 unit	0.065		–		
NO contact	6	E, F	►	**3RG40 23–3JB00**	1 unit	0.064		–				–		
NO contact	8	E, F		–				–			►	**3RG40 23–3KB00**	1 unit	0.064
NC contact	9	F		–				–			C	**3RG40 23–3KA00**	1 unit	0.065

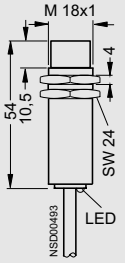
Dimension drawings

Mounting instructions

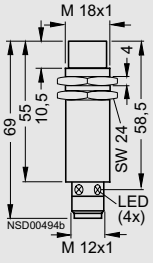


A = active surface
B = metal-free area

3RG40 22–0..00
3RG40 22–0..01



3RG40 22–3..00
3RG40 22–3..01



Operating distance 8 mm

Technical specifications

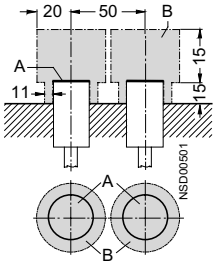
Class		**IP68 / 69 K**	**IP68 / 69 K**	**IP68 / 69 K**
No. of connecting wires		**3-wire**	**3-wire**	**3-wire**
Design		**Ø 18 mm**	**M 18**	**M 18**
Embeddable in metal		**Unshielded**	**Unshielded**	**Unshielded**
Rated operating distance s_n		8 mm	8 mm	8 mm
Enclosure material		Molded plastic	Molded plastic	Brass, nickel-plated
Operational voltage (DC)	V	15 ... 34	15 ... 34	15 ... 34
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	300	300	300
Repeat accuracy R	mm	0.2	0.2	0.2
Power-up delay t_v	ms	40	40	40
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	•
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP68 / 69 K	IP68 / 69 K	IP68 / 69 K
Type		3RG40 63–0A.30, 3RG40 63–0G.30	3RG40 23–0A.30, 3RG40 23–0G.30	3RG40 23–0AG31, 3RG40 23–0GB31

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				3 × 0.25 mm²				PVC, 3 × 0.25 mm²		
NO contact, pnp	11		C	**3RG40 63–0AG30**	1 unit	0.084	C	**3RG40 23–0AG30**	1 unit	0.086	C	**3RG40 23–0AG31**	1 unit	0.114
NC contact, pnp	12		C	**3RG40 63–0AF30**	1 unit	0.084	C	**3RG40 23–0AF30**	1 unit	0.086		–		
NO contact, npn	13		C	**3RG40 63–0GB30**	1 unit	0.084	C	**3RG40 23–0GB30**	1 unit	0.086		–		
NC contact, npn	14		C	**3RG40 63–0GA30**	1 unit	0.087	C	**3RG40 23–0GA30**	1 unit	0.087		–		

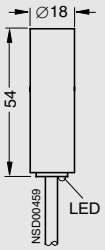
Dimension drawings

Mounting instructions

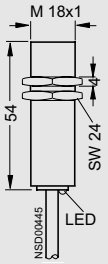


A = active surface
B = metal-free area

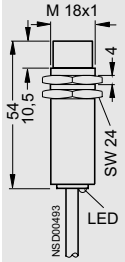
3RG40 63–0..30



3RG40 23–0..30



3RG40 23–0..31



Technical specifications

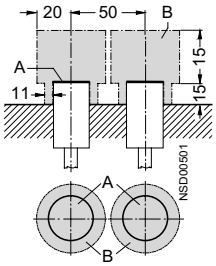
Class		**IP68 / 69 K (DC 65 V)**	**IP68 / 69 K (AC/DC)**
No. of connecting wires		**3-wire**	**2-wire**
Design		**M 18**	**M 18**
Embeddable in metal		**Unshielded**	**Unshielded**
Rated operating distance s_n		8 mm	8 mm
Enclosure material		Molded plastic	Molded plastic
Operational voltage			
• DC	V	10 ... 65	20 ... 320
• AC	V	–	20 ... 265
No-load supply current I_0			
• At DC 24 V	mA	≤ 10	1.0
• At AC 230 V	mA	–	1.5
Rated operational current I_e			
• Continuous	mA	300	300
• 20 ms	mA	–	1800
Minimum load current	mA	–	5
Switching frequency f	Hz	500	25/340 (AC/DC)
Repeat accuracy R	mm	0.2	0.2
Power-up delay t_v	ms	40	100
Switching status display		Yellow LED	Yellow LED
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	–
• Reverse polarity protection		•	•
• Wire-break protection		•	•
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP68 / 69 K	IP68 / 69 K
Type		3RG40 23–0AB30	3RG40 23–0KB30

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				2 × 0.25 mm²		
NO contact, pnp	11		C	**3RG40 23–0AB30**	1 unit	0.087		–		
NO contact	16			–			A	**3RG40 23–0KB30**	1 unit	0.081

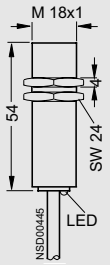
Dimension drawings

Mounting instructions

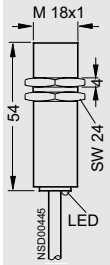


A = active surface
B = metal-free area

3RG40 23–0AB30



3RG40 23–0KB30



Operating distance 8 mm

Technical specifications

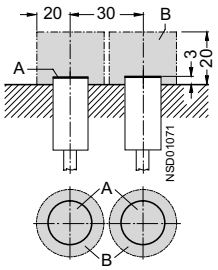
Class		**Greater rated operating distance**
No. of connecting wires		**3-wire**
Design		**M 18**
Embeddable in metal		**Shielded**
Rated operating distance s_n		8 mm
Enclosure material		Brass, nickel-plated
Operational voltage (DC)	V	10 ... 34
No-load supply current I_0	mA	≤ 10
Rated operational current I_e	mA	200
Switching frequency f	Hz	500
Repeat accuracy R	mm	0.2
Power-up delay t_v	ms	3
Switching status display		Yellow LED
Protective measures • Spurious signal suppression • Short-circuit-proof/overload-proof • Reverse polarity protection • Wire-break protection • Inductive interference protection • Radio interference protection		 • • • • • •
Degree of protection		IP67
Type		3RG41 13–.AG01, 3RG41 13–.AG33

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With 2 m cable, PUR				3 × 0.25 mm²						
NO contact, pnp	11		C	**3RG41 13–0AG33**	1 unit	0.101		–		
With 3 m cable, PUR								3 × 0.25 mm²		
NO contact, pnp	11			–			C	**3RG41 13–0AG01**	1 unit	0.151
With M 12 connector										
NO contact, pnp	2	E, F	C	**3RG41 13–3AG33**	1 unit	0.054	►	**3RG41 13–3AG01**	1 unit	0.067

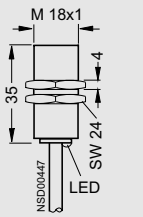
Dimension drawings

Mounting instructions

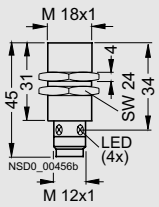


A = active surface
B = metal-free area

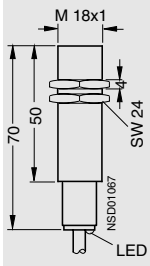
3RG41 13–0..33



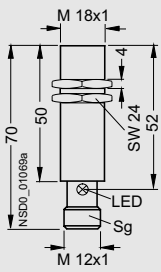
3RG41 13–3..33



3RG41 13–0..01



3RG41 13–3..01



Technical specifications

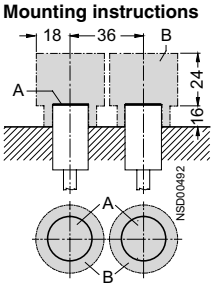
Class		**U BERO (without reduction factor)**
No. of connecting wires		**3-wire**
Design		**M 12**
Embeddable in metal		**Unshielded**
Rated operating distance s_n		8 mm
Enclosure material		Brass or stainless steel
Operational voltage (DC)	V	10 ... 30
No-load supply current I_0	mA	≤ 12
Rated operational current I_e	mA	200
Switching frequency f	Hz	2000
Repeat accuracy R	mm	0.16
Power-up delay t_v	ms	≤ 8
Switching status display		Yellow LED
Protective measures		
• Spurious signal suppression		•
• Short-circuit-proof/overload-proof		•
• Reverse polarity protection		•
• Wire-break protection		•
• Inductive interference protection		Magnetic field resistant up to 160 mT r.m.s.
• Radio interference protection		•
• Protective insulation		•
Degree of protection		
• Brass enclosure		IP67
• Stainless steel enclosure		IP68
Type		3RG46 22–.AN.., 3RG46 22–.GN..

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU
						kg
With 2 m cable, PUR				3 × 0.34 mm²		
Brass, chrome-plated						
NO contact, pnp	11		A	**3RG46 22–0AN01**	1 unit	0.096
NO contact, npn	13		D	**3RG46 22–0GN01**	1 unit	0.096
Stainless steel						
NO contact, pnp	11		C	**3RG46 22–0AN61**	1 unit	0.096
NO contact, npn	13		C	**3RG46 22–0GN61**	1 unit	0.092
With M 12 connector						
Brass, chrome-plated						
NO contact, pnp	2	E, F	A	**3RG46 22–3AN01**	1 unit	0.027
NO contact, npn	4	E, F	D	**3RG46 22–3GN01**	1 unit	0.025
Brass, teflon-coated						
NO contact, pnp	2	E, F	X	**3RG46 22–3AN05**	1 unit	0.026
NO contact, npn	4	E, F	X	**3RG46 22–3GN05**	1 unit	0.025
Stainless steel						
NO contact, pnp	2	E, F	A	**3RG46 22–3AN61**	1 unit	0.025
NO contact, npn	2	E, F	X	**3RG46 22–3GN61**	1 unit	0.024

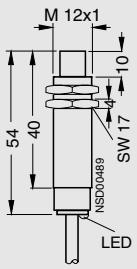
Dimension drawings

Mounting instructions

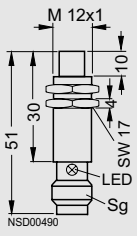


A = active surface
B = metal-free area

3RG46 22–0.N..



3RG46 22–3.N..



Operating distance 10 mm

Technical specifications

Class		**Normal**	**Normal**	**Normal**
No. of connecting wires		**3-wire**	**3-wire**	**4-wire**
Design		**M 30, Shorty**	**M 30**	**M 30**
Embeddable in metal		**Shielded**	**Shielded**	**Shielded**
Rated operating distance s_n		10 mm	10 mm	10 mm
Enclosure material		Brass, nickel-plated	Brass, nickel-plated	Brass, nickel-plated
Operational voltage (DC)	V	15 ... 34	15 ... 34	15 ... 34
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)	≤ 25 (24 V); ≤ 40 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	300	300	300
Repeat accuracy R	mm	0.3	0.3	0.3
Power-up delay t_v	ms	40	40	40
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	•
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP67	IP67	IP67
Type		3RG40 14–.A.33, 3RG40 14–.G.33	3RG40 14–.A.01, 3RG40 14–.G.00	3RG40 14–.CD00

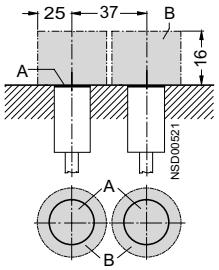
Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				3 × 0.25 mm²				4 × 0.14 mm²		
NO contact, pnp	11		C	**3RG40 14–0AG33**	1 unit	0.163	▶	**3RG40 14–0AG01**	1 unit	0.196		–		
NC contact, pnp	12		C	**3RG40 14–0AF33**	1 unit	0.162	A	**3RG40 14–0AF01**	1 unit	0.197		–		
NO contact, npn	13		C	**3RG40 14–0GB33**	1 unit	0.164	A	**3RG40 14–0GB00**	1 unit	0.196		–		
NC contact, npn	14		C	**3RG40 14–0GA33**	1 unit	0.163		–				–		
NO and NC contacts, pnp	10			–				–			▶	**3RG40 14–0CD00**	1 unit	0.190
With M 12 connector														
NO contact, pnp	2	E, F	A	**3RG40 14–3AG33**	1 unit	0.119	▶	**3RG40 14–3AG01**	1 unit	0.159		–		
NC contact, pnp	3	F	C	**3RG40 14–3AF33**	1 unit	0.120	C	**3RG40 14–3AF01**	1 unit	0.160		–		
NO contact, npn	4	E, F	C	**3RG40 14–3GB33**	1 unit	0.118	C	**3RG40 14–3GB00**	1 unit	0.160		–		
NC contact, npn	5	F	C	**3RG40 14–3GA33**	1 unit	0.121		–				–		
NO and NC contacts, pnp	1	F		–				–			C	**3RG40 14–3CD00**	1 unit	0.160

Dimension drawings

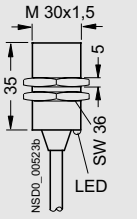
Mounting instructions

3RG40 14–...33

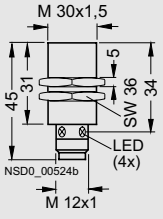


A = active surface
B = metal-free area

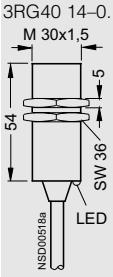
3RG40 14–0..33



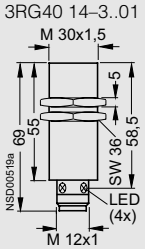
3RG40 14–3..33



3RG40 14–0..00
3RG40 14–0..01



3RG40 14–3..00
3RG40 14–3..01



Technical specifications

Class		**Normal (Mercedes-Benz)**	**Normal**	**Extra duty (AC/DC)**
No. of connecting wires		**4-wire**	**3-wire**	**2-wire**
Design		**M 30**	**Ø 20 mm**	**Ø 20 mm**
Embeddable in metal		**Shielded**	**Unshielded**	**Unshielded**
Rated operating distance s_n		10 mm	10 mm	10 mm
Enclosure material		Brass, nickel-plated	Molded plastic	Molded plastic
Operational voltage				
• DC	V	10 ... 30	10 ... 36	20 ... 250
• AC	V	–	–	20 ... 250
No-load supply current I_0				
• At DC 24 V	mA	15	≤ 5	≤ 0.8
• At AC 230 V	mA	–	–	≤ 2.5
Rated operational current I_e				
• Continuous	mA	300	250	250/100
• 20 ms	mA	–	–	2200
Minimum load current	mA	–	–	5
Switching frequency f	Hz	300	300	25/70 (AC/DC)
Repeat accuracy R	mm	0.3	0.3	0.2
Power-up delay t_v	ms	40	6	15
Switching status display		–	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	–
• Reverse polarity protection		•	•	–
• Wire-break protection		•	–	–
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP67	IP67	IP65
Type		3RG40 14–3CD01	3RG46 25–6AG00	3RG46 25–6KD00

Selection and ordering data

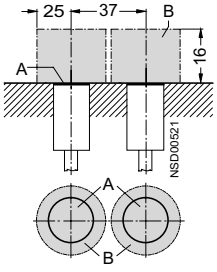
Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With M 12 connector														
NO and NC contacts, pnp	1	F	D	**3RG40 14–3CD01**	1 unit	0.173		–				–		
With terminal compartment								0.5 ... 2.5 mm²				0.5 ... 2.5 mm²		
NO contact, pnp	26			–			A	**3RG46 25–6AG00**	1 unit	0.074		–		
NO or NC contact selectable	24			–				–			A	**3RG46 25–6KD00**	1 unit	0.074

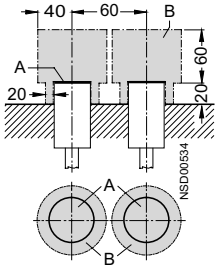
Dimension drawings

Mounting instructions

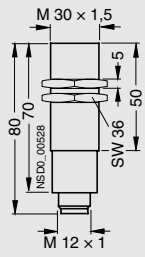
Dimension depending on type

A = active surface
B = metal-free area

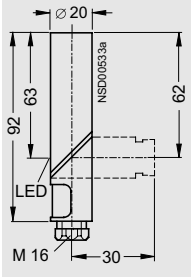




3RG40 14–3CD01



3RG46 25–6..00



Operating distance 10 mm

Technical specifications

Class		**Normal (PLC)**	**Extra duty (DC 65 V)**	**Extra duty (AC/DC)**
No. of connecting wires		**2-wire**	**3-wire**	**2-wire**
Design		**M 30**	**M 30**	**M 30**
Embeddable in metal		**Shielded**	**Shielded**	**Shielded**
Rated operating distance s_n		10 mm	10 mm	10 mm
Enclosure material		Brass, nickel-plated	Brass, nickel-plated	Brass, nickel-plated
Operational voltage				
• DC	V	15 ... 34	10 ... 65	20 ... 320
• AC	V	–	–	20 ... 265
No-load supply current I_0				
• At DC 24 V	mA	≤ 1.5	≤ 10	1.0
• At AC 230 V	mA	–	–	1.5
Rated operational current I_e				
• Continuous	mA	25	300	300
• 20 ms	mA	–	–	1800
Minimum load current	mA	2	–	5
Switching frequency f	Hz	300	300	25/200 (AC/DC)
Repeat accuracy R	mm	0.3	0.3	0.3
Power-up delay t_v	ms	40	40	100
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		–	•	–
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP67	IP67	IP67
Type		3RG40 14–.JB00	3RG40 14–.AB00, 3RG40 14–.AA00	3RG40 14–.KB00, 3RG40 14–.KA00

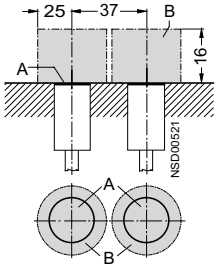
Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				2 × 0.25 mm²				3 × 0.25 mm²				2 × 0.25 mm²		
NO contact, pnp	11			–			►	**3RG40 14–0AB00**	1 unit	0.196		–		
NC contact, pnp	12			–			C	**3RG40 14–0AA00**	1 unit	0.194		–		
NO contact	15		►	**3RG40 14–0JB00**	1 unit	0.189		–				–		
NO contact	16			–				–			►	**3RG40 14–0KB00**	1 unit	0.191
NC contact	17			–				–			►	**3RG40 14–0KA00**	1 unit	0.192
With M 12 connector														
NO contact, pnp	2	E, F		–			►	**3RG40 14–3AB00**	1 unit	0.158		–		
NC contact, pnp	3	F		–			C	**3RG40 14–3AA00**	1 unit	0.159		–		
NO contact	6	E, F	C	**3RG40 14–3JB00**	1 unit	0.160		–				–		
NO contact	8	E, F		–				–			►	**3RG40 14–3KB00**	1 unit	0.158
NC contact	9	F		–				–			C	**3RG40 14–3KA00**	1 unit	0.160

Dimension drawings

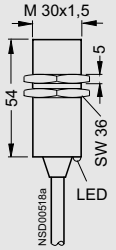
Mounting instructions

3RG40 14–...33

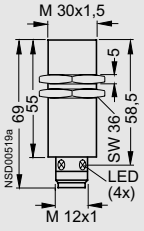


A = active surface
B = metal-free area

3RG40 14–0..00
3RG40 14–0..01



3RG40 14–3..00
3RG40 14–3..01



Technical specifications

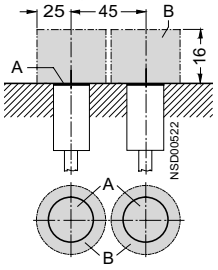
Class		**IP68 / 69 K**	**IP68 / 69 K**	**IP68 / 69 K**
No. of connecting wires		**3-wire**	**3-wire**	**3-wire**
Design		**Ø 30 mm**	**M 30**	**M 30**
Embeddable in metal		**Shielded**	**Shielded**	**Shielded**
Rated operating distance s_n		10 mm	10 mm	10 mm
Enclosure material		Molded plastic	Molded plastic	Brass, nickel-plated
Operational voltage (DC)	V	15 ... 34	15 ... 34	15 ... 34
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	300	300	300
Repeat accuracy R	mm	0.3	0.3	0.3
Power-up delay t_v	ms	40	40	40
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	•
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP68 / 69 K	IP68 / 69 K	IP68 / 69 K
Type		3RG40 54–0A.30, 3RG40 54–0G.30	3RG40 14–0A.30, 3RG40 14–0G.30	3RG40 14–0AG31, 3RG40 14–0GB31

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				3 × 0.25 mm²				PVC, 3 × 0.25 mm²		
NO contact, pnp	11		C	**3RG40 54–0AG30**	1 unit	0.126	C	**3RG40 14–0AG30**	1 unit	0.128	D	**3RG40 14–0AG31**	1 unit	0.199
NC contact, pnp	12		C	**3RG40 54–0AF30**	1 unit	0.126	C	**3RG40 14–0AF30**	1 unit	0.130		–		
NO contact, npn	13		C	**3RG40 54–0GB30**	1 unit	0.126	C	**3RG40 14–0GB30**	1 unit	0.130	D	**3RG40 14–0GB31**	1 unit	0.198
NC contact, npn	14		C	**3RG40 54–0GA30**	1 unit	0.126	C	**3RG40 14–0GA30**	1 unit	0.129		–		

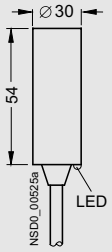
Dimension drawings

Mounting instructions

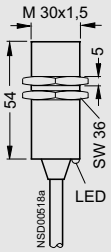


A = active surface
B = metal-free area

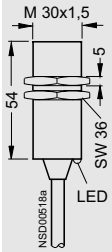
3RG40 54–0..30



3RG40 14–0..30



3RG40 14–0..31



Operating distance 10 mm

Technical specifications

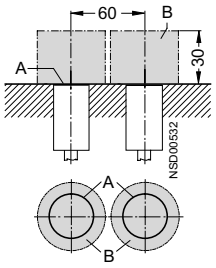
Class		**U BERO (without reduction factor)**
No. of connecting wires		**3-wire**
Design		**M 30**
Embeddable in metal		**Shielded**
Rated operating distance s_n		10 mm
Enclosure material		Brass or stainless steel
Operational voltage (DC)	V	10 ... 30
No-load supply current I_0	mA	≤ 13
Rated operational current I_e	mA	200
Switching frequency f	Hz	2000
Repeat accuracy R	mm	0.2
Power-up delay t_v	ms	≤ 8
Switching status display		Yellow LED
Protective measures		
• Spurious signal suppression		•
• Short-circuit-proof/overload-proof		•
• Reverse polarity protection		•
• Wire-break protection		•
• Inductive interference protection		Magnetic field resistant up to 160 mT r.m.s.
• Radio interference protection		•
• Protective insulation		•
Degree of protection		
• Brass enclosure		IP67
• Stainless steel enclosure		IP68
Type		3RG46 14–.AN.., 3RG46 14–.GN..

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU
						kg
With 2 m cable, PUR				3 × 0.34 mm²		
Brass, chrome-plated						
NO contact, pnp	11		C	**3RG46 14–0AN01**	1 unit	0.188
NO contact, npn	13		X	**3RG46 14–0GN01**	1 unit	0.189
Stainless steel						
NO contact, pnp	11		C	**3RG46 14–0AN61**	1 unit	0.185
NO contact, npn	13		D	**3RG46 14–0GN61**	1 unit	0.182
With M 12 connector						
Brass, chrome-plated						
NO contact, pnp	2	E, F	A	**3RG46 14–3AN01**	1 unit	0.108
NO contact, npn	4	E, F	X	**3RG46 14–3GN01**	1 unit	0.109
Brass, teflon-coated						
NO contact, pnp	2	E, F	X	**3RG46 14–3AN05**	1 unit	0.125
NO contact, npn	4	E, F	X	**3RG46 14–3GN05**	1 unit	0.127
Stainless steel						
NO contact, pnp	2	E, F	C	**3RG46 14–3AN61**	1 unit	0.110
NO contact, npn	2	E, F	X	**3RG46 14–3GN61**	1 unit	0.104

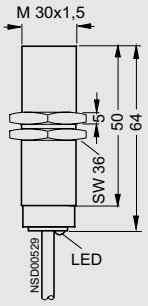
Dimension drawings

Mounting instructions

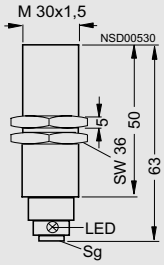


A = active surface
B = metal-free area

3RG46 14–0.N..



3RG46 14–3.N..



Operating distance 10 mm
Operating distance 12 mm

Technical specifications

Class		**Greater rated operating distance**	**Greater rated operating distance**
No. of connecting wires		**3-wire**	**3-wire**
Design		**M 12**	**M 18**
Embeddable in metal		**Unshielded**	**Semi-shielded**
Rated operating distance s_n		**10 mm**	**12 mm**
Enclosure material		Brass, nickel-plated	Brass, nickel-plated
Operational voltage (DC)	V	10 ... 30	10 ... 30
No-load supply current I_0	mA	10	≤ 10
Rated operational current I_e	mA	200	200
Switching frequency f	Hz	400	500
Repeat accuracy R	mm	0.2	0.6
Power-up delay t_v	ms	15	50
Switching status display		Yellow LED	Yellow LED
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	•
• Reverse polarity protection		•	•
• Wire-break protection		–	•
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP67	IP67
Type		3RG46 22–0AG02, 3RG46 22–3AB03	3RG41 12–.A.01

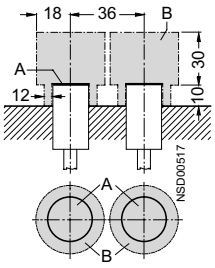
Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With 2 m cable, PUR				3 × 0.34 mm²				3 × 0.34 mm²		
NO contact, pnp	11		▶	**3RG46 22–0AG02**	1 unit	0.094	A	**3RG46 13–1AB01**	1 unit	0.123
NO contact, npn	13			–			X	**3RG46 13–0GB00**	1 unit	0.122
With M 12 connector										
NO contact, pnp	2	E, F	X	**3RG46 22–3AB03**	1 unit	0.034	A	**3RG46 13–3AB01**	1 unit	0.063
NO contact, npn	4	E, F		–			X	**3RG46 13–3GB01**	1 unit	0.060

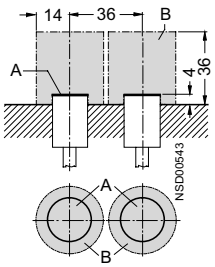
Dimension drawings

Mounting instructions

3RG46 22

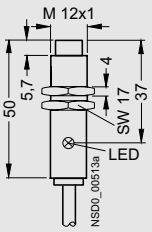


3RG46 13

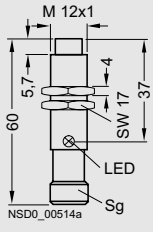


A = active surface
B = metal-free area

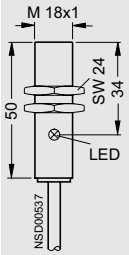
3RG46 22–0AG02



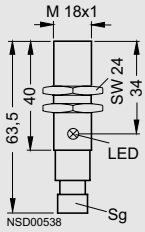
3RG46 22–3AB03



3RG46 13–...0.



3RG46 13–3..01



Operating distance 12 mm

Technical specifications

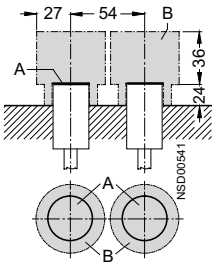
Class		**U BERO (without reduction factor)**
No. of connecting wires		**3-wire**
Design		**M 18**
Embeddable in metal		**Unshielded**
Rated operating distance s_n		12 mm
Enclosure material		Brass or stainless steel
Operational voltage (DC)	V	10 ... 30
No-load supply current I_0	mA	≤ 12
Rated operational current I_e	mA	200
Switching frequency f	Hz	2000
Repeat accuracy R	mm	0.24
Power-up delay t_v	ms	≤ 8
Switching status display		Yellow LED
Protective measures		
• Spurious signal suppression		•
• Short-circuit-proof/overload-proof		•
• Reverse polarity protection		•
• Wire-break protection		•
• Inductive interference protection		Magnetic field resistant up to 160 mT r.m.s.
• Radio interference protection		•
• Protective insulation		•
Degree of protection		
• Brass enclosure		IP67
• Stainless steel enclosure		IP68
Type		3RG46 23–.AN.., 3RG46 23–.GN..

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU
						kg
With 2 m cable, PUR				3 × 0.34 mm²		
Brass, chrome-plated						
NO contact, pnp	11		A	**3RG46 23–0AN01**	1 unit	0.113
NO contact, npn	13		X	**3RG46 23–0GN01**	1 unit	0.115
Stainless steel						
NO contact, pnp	11		C	**3RG46 23–0AN61**	1 unit	0.111
NO contact, npn	13		C	**3RG46 23–0GN61**	1 unit	0.111
With M 12 connector						
Brass, chrome-plated						
NO contact, pnp	2	E, F	A	**3RG46 23–3AN01**	1 unit	0.044
NO contact, npn	4	E, F	D	**3RG46 23–3GN01**	1 unit	0.039
Brass, teflon-coated						
NO contact, pnp	2	E, F	D	**3RG46 23–3AN05**	1 unit	0.045
NO contact, npn	4	E, F	X	**3RG46 23–3GN05**	1 unit	0.044
Stainless steel						
NO contact, pnp	2	E, F	C	**3RG46 23–3AN61**	1 unit	0.042
NO contact, npn	2	E, F	X	**3RG46 23–3GN61**	1 unit	0.037

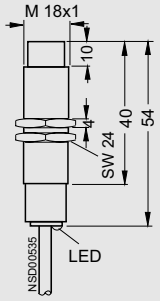
Dimension drawings

Mounting instructions

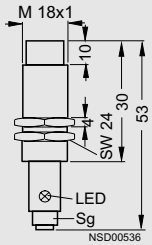


A = active surface
B = metal-free area

3RG46 23–0.N..



3RG46 23–3.N..



Technical specifications

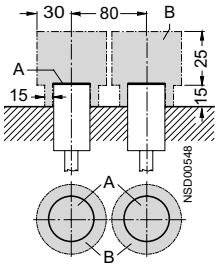
Class		**Normal**	**Normal**	**Normal**
No. of connecting wires		**3-wire**	**3-wire**	**4-wire**
Design		**M 30, Shorty**	**M 30**	**M 30**
Embeddable in metal		**Unshielded**	**Unshielded**	**Unshielded**
Rated operating distance s_n		15 mm	15 mm	15 mm
Enclosure material		Brass, nickel-plated	Brass, nickel-plated	Brass, nickel-plated
Operational voltage (DC)	V	15 ... 34	15 ... 34	15 ... 34
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)	≤ 25 (24 V); ≤ 40 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	300	300	300
Repeat accuracy R	mm	0.4	0.4	0.4
Power-up delay t_v	ms	40	40	40
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	•
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP67	IP67	IP67
Type		3RG40 24–.A.33, 3RG40 24–.G.33	3RG40 24–.A.01, 3RG40 24–.G.00	3RG40 24–.CD00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				3 × 0.25 mm²				4 × 0.14 mm²		
NO contact, pnp	11		C	**3RG40 24–0AG33**	1 unit	0.151	►	**3RG40 24–0AG01**	1 unit	0.184		–		
NC contact, pnp	12		C	**3RG40 24–0AF33**	1 unit	0.148	C	**3RG40 24–0AF01**	1 unit	0.182		–		
NO contact, npn	13		C	**3RG40 24–0GB33**	1 unit	0.151	C	**3RG40 24–0GB00**	1 unit	0.183		–		
NC contact, npn	14		C	**3RG40 24–0GA33**	1 unit	0.150	C	**3RG40 24–0GA00**	1 unit	0.182		–		
NO and NC contacts, pnp	10			–				–			A	**3RG40 24–0CD00**	1 unit	0.179
With M 12 connector														
NO contact, pnp	2	E, F	A	**3RG40 24–3AG33**	1 unit	0.105	►	**3RG40 24–3AG01**	1 unit	0.146		–		
NC contact, pnp	3	F	C	**3RG40 24–3AF33**	1 unit	0.108	C	**3RG40 24–3AF01**	1 unit	0.148		–		
NO contact, npn	4	E, F	C	**3RG40 24–3GB33**	1 unit	0.109	C	**3RG40 24–3GB00**	1 unit	0.146		–		
NC contact, npn	5	F	C	**3RG40 24–3GA33**	1 unit	0.117		–				–		
NO and NC contacts, pnp	1	F		–				–			C	**3RG40 24–3CD00**	1 unit	0.150

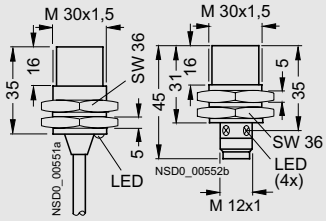
Dimension drawings

Mounting instructions

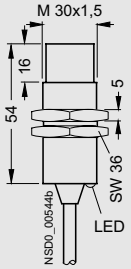


A = active surface
B = metal-free area

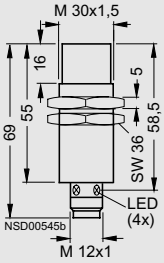
3RG40 24–0..33 3RG40 24–3..33



3RG40 24–0..00
3RG40 24–0..01



3RG40 24–3..00
3RG40 24–3..01



5

Operating distance 15 mm

Technical specifications

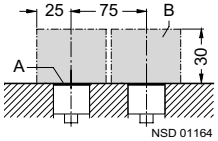
Class		**Normal**	**Normal (Mercedes-Benz)**	**Normal**
No. of connecting wires		**3-wire**	**4-wire**	**4-wire**
Design		**Cubic 40 mm × 40 mm**	**Cubic 40 mm × 40 mm**	**Cubic 40 mm × 40 mm**
Embeddable in metal		**Shielded**	**Shielded**	**Shielded**
Rated operating distance s_n		15 mm	15 mm	15 mm
Enclosure material		Molded plastic	Molded plastic	Molded plastic
Operational voltage (DC)	V	15 ... 34	15 ... 34	15 ... 34
No-load supply current I_0	mA	≤ 25 (24 V); ≤ 40 (34 V)	≤ 30 (24 V); ≤ 50 (34 V)	≤ 30 (24 V); ≤ 40 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	100	100	50
Repeat accuracy R	mm	0.75	0.75	0.75
Power-up delay t_v	ms	100	100	100
Displays				
• Switching status		Yellow LED	Yellow LED	Yellow LED
• Power supply		Green LED	Green LED	Green LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	–	•
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP65	IP65	IP67
Type		3RG40 31–6A.01, 3RG40 31–6GB00	3RG40 31–6CD00, 3RG40 34–6CD00	3RG40 38–3CD00, 3RG40 38–3GD00

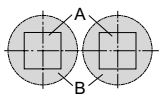
Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With M 12 connector, rotatable														
NO and NC contacts, pnp	1	F		–				–			▶	**3RG40 38–3CD00**	1 unit	0.125
NO and NC contacts, npn	–	F		–				–			▶	**3RG40 38–3GD00**	1 unit	0.130
With terminal compartment														
NO contact, pnp	19		▶	**3RG40 31–6AG01**	1 unit	0.224		–				–		
NC contact, pnp	20		C	**3RG40 31–6AF01**	1 unit	0.223		–				–		
NO contact, npn	21		A	**3RG40 31–6GB00**	1 unit	0.230								
NO and NC contacts, pnp	18			–			▶	**3RG40 31–6CD00**	1 unit	0.226		–		
Version for Mercedes-Benz														
NO and NC contacts, pnp	18			–			▶	**3RG40 34–6CD00**	1 unit	0.224		–		

Dimension drawings

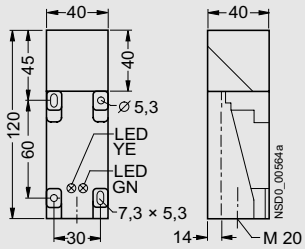
Mounting instructions





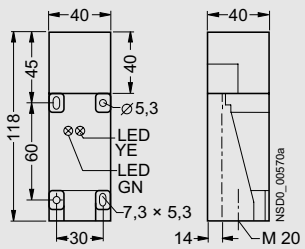
A = active surface
B = metal-free area

3RG40 31–6..0.



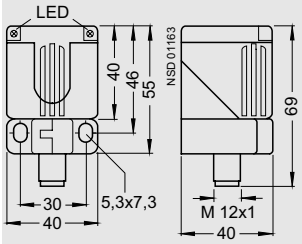
The active surface can be adjusted in 5 directions.

3RG40 34–6..00



The active surface can be adjusted in 5 directions. With screwed sensor.

3RG40 38–3..00



The active surface can be adjusted in 5 directions. With rotatable connector.

Technical specifications

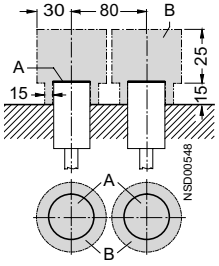
Class		**Normal (PLC)**	**Extra duty (DC 65 V)**	**Extra duty (AC/DC)**
No. of connecting wires		**2-wire**	**3-wire**	**2-wire**
Design		**M 30**	**M 30**	**M 30**
Embeddable in metal		**Unshielded**	**Unshielded**	**Unshielded**
Rated operating distance s_n		15 mm	15 mm	15 mm
Enclosure material		Molded plastic	Molded plastic	Molded plastic
Operational voltage				
• DC	V	15 ... 34	10 ... 65	20 ... 320
• AC	V	–	–	20 ... 265
No-load supply current I_0				
• At DC 24 V	mA	≤ 1.5	≤ 10	1.0
• At AC 230 V	mA	–	–	1.5
Rated operational current I_e				
• Continuous	mA	25	300	300
• 20 ms	mA	–	–	1800
Minimum load current	mA	2	–	5
Switching frequency f	Hz	180	300	25/220 (AC/DC)
Repeat accuracy R	mm	0.4	0.4	0.4
Power-up delay t_v	ms	40	40	100
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		–	•	–
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP67	IP67	IP67
Type		3RG40 24–.JB00	3RG40 24–.AB00, 3RG40 24–.AA00	3RG40 24–.KB00, 3RG40 24–.KA00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				2 × 0.25 mm²				3 × 0.25 mm²				2 × 0.25 mm²		
NO contact, pnp	11			–			C	**3RG40 24–0AB00**	1 unit	0.183		–		
NC contact, pnp	12			–			C	**3RG40 24–0AA00**	1 unit	0.182		–		
NO contact	15		►	**3RG40 24–0JB00**	1 unit	0.178		–				–		
NO contact	16			–				–			►	**3RG40 24–0KB00**	1 unit	0.178
NC contact	17			–				–			►	**3RG40 24–0KA00**	1 unit	0.179
With M 12 connector														
NO contact, pnp	2	E, F		–			►	**3RG40 24–3AB00**	1 unit	0.147		–		
NC contact, pnp	3	F		–			C	**3RG40 24–3AA00**	1 unit	0.148		–		
NO contact	6	E, F	C	**3RG40 24–3JB00**	1 unit	0.148		–				–		
NO contact	8	E, F		–				–			►	**3RG40 24–3KB00**	1 unit	0.148
NC contact	9	F		–				–			C	**3RG40 24–3KA00**	1 unit	0.147

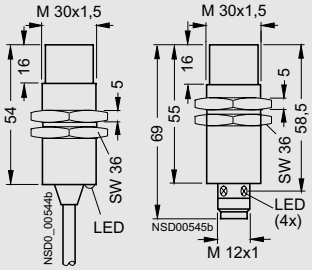
Dimension drawings

Mounting instructions



A = active surface
B = metal-free area

3RG40 24–0..00 3RG40 24–3..00
3RG40 24–0..01 3RG40 24–3..01



Operating distance 15 mm

Technical specifications

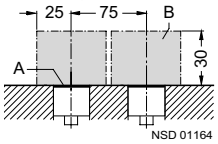
Class		**Normal (PLC)**	**Extra duty (DC 65 V)**	**Extra duty (AC/DC)**
No. of connecting wires		**2-wire**	**3-wire**	**2-wire**
Design		**Cubic 40 mm × 40 mm**	**Cubic 40 mm × 40 mm**	**Cubic 40 mm × 40 mm**
Embeddable in metal		**Shielded**	**Shielded**	**Shielded**
Rated operating distance s_n		15 mm	15 mm	15 mm
Enclosure material		Molded plastic	Molded plastic	Molded plastic
Operational voltage				
• DC	V	15 ... 34	10 ... 65	20 ... 320
• AC	V	–	–	20 ... 265
No-load supply current I_0				
• At DC 24 V	mA	≤ 1.5	≤ 20	1.0
• At AC 230 V	mA	–	–	1.5
Rated operational current				
• Continuous	mA	25	300	300
• 20 ms	mA	–	–	1800
Minimum load current	mA	2	–	5
Switching frequency	Hz	100	100	25/150 (AC/DC)
Repeat accuracy	mm	0.75	0.75	0.75
Power-up delay	ms	100	100	100
Displays				
• Switching status		Yellow LED	Yellow LED	Yellow LED
• Power supply		–	Green LED	–
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		–	•	–
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP65	IP65	IP65
Type		3RG40 31–6JB00	3RG40 31–6AD00	3RG40 31–6KD00

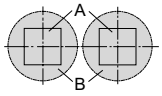
Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With terminal compartment				0.5 ... 2.5 mm²				0.5 ... 2.5 mm²				0.5 ... 2.5 mm²		
No contact	22		▶	**3RG40 31–6JB00**	1 unit	0.222		–				–		
NO or NC contact selectable, pnp	23			–			▶	**3RG40 31–6AD00**	1 unit	0.231		–		
NO or NC contact selectable	24			–				–			▶	**3RG40 31–6KD00**	1 unit	0.229

Dimension drawings

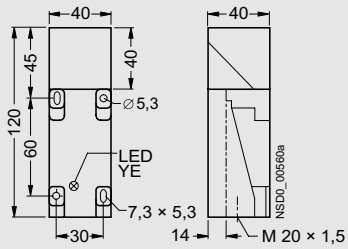
Mounting instructions





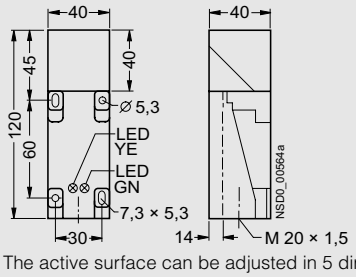
A = active surface
B = metal-free area

3RG40 31–6JB00,
3RG40 31–6KD00



The active surface can be adjusted in 5 directions.

3RG40 31–6AD00



The active surface can be adjusted in 5 directions.

Technical specifications

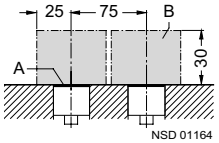
Class		**Extra duty (AC/DC)**	**Greater rated operating distance**
No. of connecting wires		**2-wire**	**3-wire**
Design		**Cubic 40 mm × 40 mm**	**M 30**
Embeddable in metal		**Shielded**	**Shielded**
Rated operating distance s_n		15 mm	15 mm
Enclosure material		Molded plastic	Brass, nickel-plated
Operational voltage			
• DC	V	20 ... 320	15 ... 34
• AC	V	20 ... 265	–
No-load supply current I_0			
• At DC 24 V	mA	1.5	≤ 17 (24 V); ≤ 30 (34 V)
• At AC 230 V	mA	≤ 2.0	–
Rated operational current I_e			
• Continuous	mA	300	200 (≤ 50 °C); 150 (≤ 85 °C)
• 20 ms	mA		–
Minimum load current	mA	≤ 2	–
Switching frequency *f*	Hz	25/50 (AC/DC)	300
Repeat accuracy *R*	mm	0.75	0.4
Differential travel *H*	mm	0.04 ... 3.3	–
Power-up delay t_v	ms	100	40
Switching status display		Yellow LED	Yellow LED
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		–	•
• Reverse polarity protection		–	•
• Wire-break protection		–	•
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP67	IP67
Type		3RG40 38–3KB00	3RG41 14–.AG01

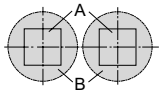
Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
								3 × 0.25 mm²		
With 3 m cable, PUR										
NO contact, pnp	11			–			C	**3RG41 14–0AG01**	1 unit	0.248
With M 12 connector										
NO contact, pnp	2	E, F		–			C	**3RG41 14–3AG01**	1 unit	0.159
With M 12 connector, rotatable										
NO contact	8	E, F	►	**3RG40 38–3KB00**	1 unit	0.130		–		

Dimension drawings

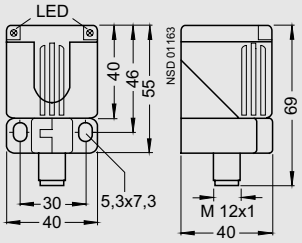
Mounting instructions





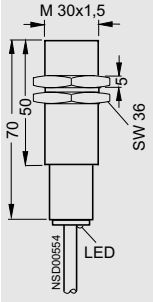
A = active surface
B = metal-free area

3RG40 38–3..00

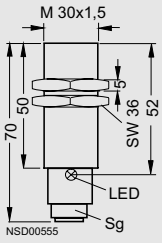


The active surface can be adjusted in 5 directions.
With rotatable connector.

3RG41 14–0AG01



3RG41 14–3AG01



Operating distance 15 mm

Technical specifications

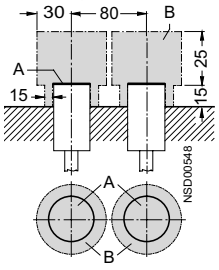
Class		**IP68 / 69 K**	**IP68 / 69 K**	**IP68 / 69 K**
No. of connecting wires		**3-wire**	**3-wire**	**3-wire**
Design		**Ø 30 mm**	**M 30**	**M 30**
Embeddable in metal		**Unshielded**	**Unshielded**	**Unshielded**
Rated operating distance s_n		15 mm	15 mm	15 mm
Enclosure material		Molded plastic	Molded plastic	Brass, nickel-plated
Operational voltage (DC)	V	15 ... 34	15 ... 34	15 ... 34
No-load supply current I_0	mA	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)	≤ 17 (24 V); ≤ 30 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	300	300	300
Repeat accuracy R	mm	0.4	0.4	0.4
Power-up delay t_v	ms	40	40	40
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	•
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP68 / 69 K	IP68 / 69 K	IP68 / 69 K
Type		3RG40 64–0A.30, 3RG40 64–0G.30	3RG40 24–0A.30, 3RG40 24–0G.30	3RG40 24–0AG31, 3RG40 24–0GB31

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				3 × 0.25 mm²				PVC, 3 × 0.25 mm²		
NO contact, pnp	11		C	**3RG40 64–0AG30**	1 unit	0.123	D	**3RG40 24–0AG30**	1 unit	0.128	D	**3RG40 24–0AG31**	1 unit	0.184
NC contact, pnp	12		C	**3RG40 64–0AF30**	1 unit	0.126	C	**3RG40 24–0AF30**	1 unit	0.129		–		
NO contact, npn	13		C	**3RG40 64–0GB30**	1 unit	0.126	C	**3RG40 24–0GB30**	1 unit	0.129	C	**3RG40 24–0GB31**	1 unit	0.185
NC contact, npn	14		C	**3RG40 64–0GA30**	1 unit	0.185	C	**3RG40 24–0GA30**	1 unit	0.130		–		

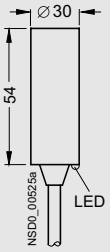
Dimension drawings

Mounting instructions

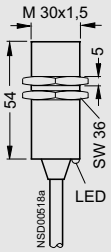


A = active surface
B = metal-free area

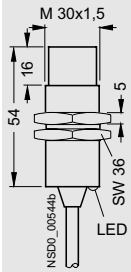
3RG40 64–0..30



3RG40 24–0..30



3RG40 24–0..31



Technical specifications

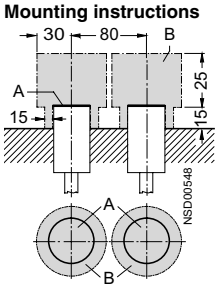
Class		**IP68 / 69 K (DC 65 V)**	**IP68 / 69 K (AC/DC)**
No. of connecting wires		**3-wire**	**2-wire**
Design		**M 30**	**M 30**
Embeddable in metal		**Unshielded**	**Unshielded**
Rated operating distance s_n		15 mm	15 mm
Enclosure material		Molded plastic	Molded plastic
Operational voltage			
• DC	V	10 ... 65	20 ... 320
• AC	V	–	20 ... 265
No-load supply current I_0			
• At DC 24 V	mA	≤ 10	1.0
• At AC 230 V	mA	–	1.5
Rated operational current I_e			
• Continuous	mA	300	300
• 20 ms	mA	–	1800
Minimum load current	mA	–	5
Switching frequency f	Hz	300	25/220 (AC/DC)
Repeat accuracy R	mm	0.4	0.4
Power-up delay t_v	ms	40	100
Switching status display		Yellow LED	Yellow LED
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	–
• Reverse polarity protection		•	•
• Wire-break protection		•	•
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP68 / 69 K	IP68 / 69 K
Type		3RG40 24–0AB30	3RG40 24–0KB30

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With 2 m cable, PUR				3 × 0.25 mm²				2 × 0.25 mm²		
NO contact, pnp	11		C	**3RG40 24–0AB30**	1 unit	0.129		–		
NO contact	16			–			A	**3RG40 24–0KB30**	1 unit	0.124

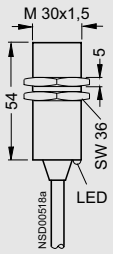
Dimension drawings

Mounting instructions

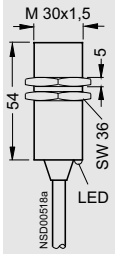


A = active surface
B = metal-free area

3RG40 24–0AB30



3RG40 24–0KB30



Operating distance 15 mm

Technical specifications

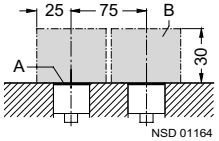
Class		**IP68 / 69 K**	**IP68 / 69 K (DC 65 V)**	**IP68 / 69 K (AC/DC)**
No. of connecting wires		**4-wire**	**3-wire**	**2-wire**
Design		**Cubic 40 mm × 40 mm**	**Cubic 40 mm × 40 mm**	**Cubic 40 mm × 40 mm**
Embeddable in metal		**Shielded**	**Shielded**	**Shielded**
Rated operating distance s_n		15 mm	15 mm	15 mm
Enclosure material		Molded plastic	Molded plastic	Molded plastic
Operational voltage				
• DC	V	15 ... 34	10 ... 65	20 ... 320
• AC	V	–	–	20 ... 265
No-load supply current I_0				
• At DC 24 V	mA	≤ 25 (24 V); ≤ 40 (34 V)	≤ 20	≤ 1.0
• At AC 230 V	mA	–	–	≤ 1.5
Rated operational current I_e				
• Continuous	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	300	300
• 20 ms	mA	–	–	1800
Minimum load current	mA	–	–	5
Switching frequency f	Hz	100	100	25/150 (AC/DC)
Repeat accuracy R	mm	0.75	0.75	0.75
Power-up delay t_v	ms	100	100	100
Switching status display		Yellow LED	Yellow LED	Yellow LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	–
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP68 / 69 K	IP68 / 69 K	IP68 / 69 K
Type		3RG40 30–0CD0.	3RG40 30–0AB0., 3RG40 30–0AA0.	3RG40 30–0KB0., 3RG40 30–0KA0.

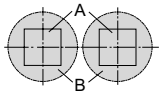
Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With 2 m cable, PUR				4 × 0.14 mm²				3 × 0.25 mm²				2 × 0.25 mm²		
Sensor in longitudinal axis														
NO contact, pnp	11			–			C	**3RG40 30–0AB00**	1 unit	0.342		–		
NC contact, pnp	12			–			C	**3RG40 30–0AA00**	1 unit	0.337		–		
NO and NC contacts, pnp	10		C	**3RG40 30–0CD00**	1 unit	0.333		–				–		
NO contact	16			–				–			C	**3RG40 30–0KB00**	1 unit	0.327
NC contact	17			–				–			C	**3RG40 30–0KA00**	1 unit	0.368
Sensor 90° to longitudinal axis														
NO contact, pnp	11			–			C	**3RG40 30–0AB01**	1 unit	0.351		–		
NC contact, pnp	12			–								–		
NO and NC contacts, pnp	10		C	**3RG40 30–0CD01**	1 unit	0.369		–				–		
NO contact	16			–				–			C	**3RG40 30–0KB01**	1 unit	0.364
NC contact	17			–				–			C	**3RG40 30–0KA01**	1 unit	0.370

Dimension drawings

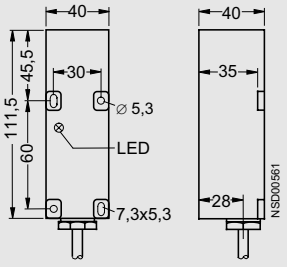
Mounting instructions





A = active surface
B = metal-free area

3RG40 30–0..0.



Technical specifications

Class		**U BERO (without reduction factor)**
No. of connecting wires		**3-wire**
Design		**Cubic 40 mm × 40 mm**
Embeddable in metal		**Shielded**
Rated operating distance s_n		15 mm
Enclosure material		Molded plastic
Operational voltage (DC)	V	10 ... 30
No-load supply current I_0	mA	≤ 15
Rated operational current I_e	mA	200
Switching frequency f	Hz	250
Repeat accuracy R	mm	0.3
Power-up delay t_v	ms	≤ 8
Displays		
• Switching status		Yellow LED
• Power supply		Green LED
Protective measures		
• Spurious signal suppression		•
• Short-circuit-proof/overload-proof		•
• Reverse polarity protection		•
• Wire-break protection		•
• Inductive interference protection		Magnetic field resistant up to 160 mT r.m.s.
• Radio interference protection		•
• Protective insulation		•
Degree of protection		IP68
Type		3RG46 34–6.N01, 3RG46 38–3.N01

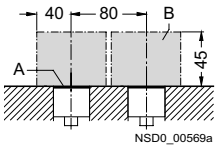
Selection and ordering data

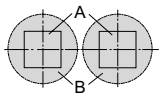
Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With M 12 connector										
NO contact, pnp	2	E, F	A	**3RG46 38–3AN01**	1 unit	0.184		–		
NO contact, npn	4	E, F	A	**3RG46 38–3GN01**	1 unit	0.184		–		
With terminal compartment								0.5 ... 2.5 mm²		
NO contact, pnp	28			–			C	**3RG46 34–6AN01**	1 unit	0.220
NO contact, npn	29			–			A	**3RG46 34–6GN01**	1 unit	0.223

Dimension drawings

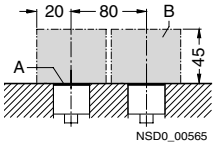
Mounting instructions

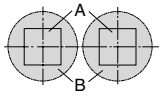
3RG46 38





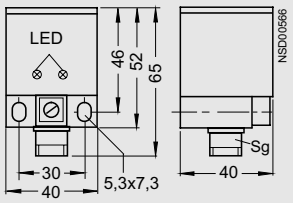
3RG46 34



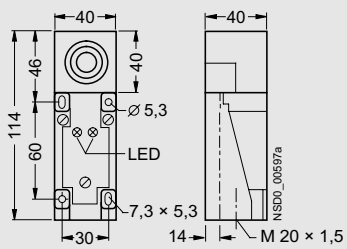


A = active surface
B = metal-free area

3RG46 38–3.N01



3RG46 34–6.N01



The active surface can be adjusted in 5 directions.

Operating distance 20 mm

Technical specifications

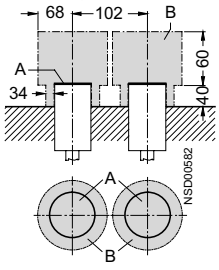
Class		**Normal**	**Extra duty (AC/DC)**
No. of connecting wires		**3-wire**	**2-wire**
Design		**Ø 34 mm**	**Ø 34 mm**
Embeddable in metal		**Unshielded**	**Unshielded**
Rated operating distance s_n		20 mm	20 mm
Enclosure material		Molded plastic	Molded plastic
Operational voltage			
• DC	V	10 ... 36	20 ... 250
• AC	V	–	20 ... 250
No-load supply current I_0			
• At DC 24 V	mA	5	0.8
• At AC 230 V	mA	–	2.5
Rated operational current I_e			
• Continuous	mA	200	250/100
• 20 ms	mA	–	2200
Minimum load current	mA	–	5
Switching frequency f	Hz	350	20/70 (AC/DC)
Repeat accuracy R	mm	0.75	0.75
Power-up delay t_v	ms	20	20
Switching status display		Yellow LED	Yellow LED
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	–
• Reverse polarity protection		•	–
• Wire-break protection		–	–
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP65	IP65
Type		3RG46 26–6AD00	3RG46 26–6KD00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With terminal compartment				0.5 ... 2.5 mm²				0.5 ... 2.5 mm²		
NO or NC contact selectable, pnp	26		A	**3RG46 26–6AD00**	1 unit	0.080		–		
NO or NC contact selectable	24			–			A	**3RG46 26–6KD00**	1 unit	0.080

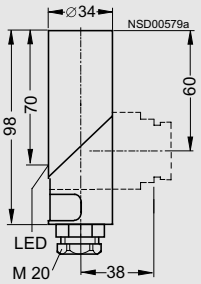
Dimension drawings

Mounting instructions



A = active surface
B = metal-free area

3RG46 26–6..00



Technical specifications

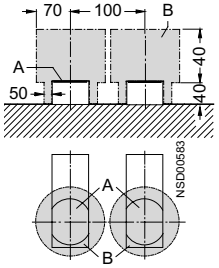
Class		**Normal**	**Normal**
No. of connecting wires		**3-wire**	**4-wire**
Design		**Cubic 40 mm × 40 mm**	**Cubic 40 mm × 40 mm**
Embeddable in metal		**Unshielded**	**Unshielded**
Rated operating distance s_n		20 mm	20 mm
Enclosure material		Molded plastic	Molded plastic
Operational voltage (DC)	V	15 ... 34	15 ... 34
No-load supply current I_0	mA	≤ 25 (24 V); ≤ 40 (34 V)	≤ 30 (24 V); ≤ 50 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	75	75
Repeat accuracy R	mm	0.75	0.75
Power-up delay t_v	ms	100	100
Displays			
• Switching status		Yellow LED	Yellow LED
• Power supply		Green LED	Green LED
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	–
• Reverse polarity protection		•	•
• Wire-break protection		•	•
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP65	IP65
Type		3RG40 41–6A.01, 3RG40 41–6GB00	3RG40 41–6CD00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU kg	DT	Order No.	PS	Approx. weight per PU kg
With terminal compartment										
NO contact, pnp	19		►	**3RG40 41–6AG01**	1 unit	0.222		–		
NC contact, pnp	20		C	**3RG40 41–6AF01**	1 unit	0.230		–		
NO contact, npn	21		C	**3RG40 41–6GB00**	1 unit	0.223		–		
NO and NC contacts, pnp	18			–			►	**3RG40 41–6CD00**	1 unit	0.216

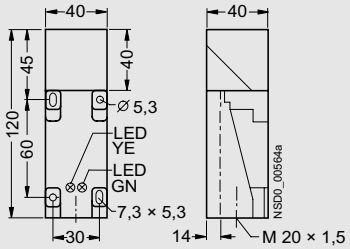
Dimension drawings

Mounting instructions



A = active surface
B = metal-free area

3RG40 41–6..0.



The active surface can be adjusted in 5 directions.

Operating distance 20 mm

Technical specifications

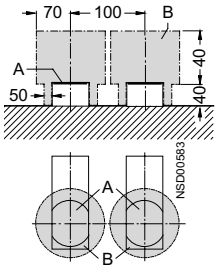
Class		**Normal (PLC)**	**Extra duty (DC 65 V)**	**Extra duty (AC/DC)**
No. of connecting wires		**2-wire**	**3-wire**	**2-wire**
Design		**Cubic 40 mm × 40 mm**	**Cubic 40 mm × 40 mm**	**Cubic 40 mm × 40 mm**
Embeddable in metal		**Unshielded**	**Unshielded**	**Unshielded**
Rated operating distance s_n		20 mm	20 mm	20 mm
Enclosure material		Molded plastic	Molded plastic	Molded plastic
Operational voltage				
• DC	V	15 ... 34	10 ... 65	20 ... 320
• AC	V	–	–	20 ... 265
No-load supply current I_0				
• At DC 24 V	mA	≤ 1.5	≤ 20	1.0
• At AC 230 V	mA	–	–	1.5
Rated operational current I_e				
• Continuous	mA	25	300	300
• 20 ms	mA	–	–	1800
Minimum load current	mA	2	–	5
Switching frequency f	Hz	75	75	25/100 (AC/DC)
Repeat accuracy R	mm	0.75	0.75	1.0
Power-up delay t_v	ms	100	100	20
Displays				
• Switching status		Yellow LED	Yellow LED	Yellow LED
• Power supply		–	Green LED	–
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		–	•	–
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP65	IP65	IP65
Type		3RG40 41–6JB00	3RG40 41–6AD00	3RG40 41–6KD00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With terminal compartment				0.5 ... 2.5 mm²				0.5 ... 2.5 mm²				0.5 ... 2.5 mm²		
NO contact	22		▶	**3RG40 41–6JB00**	1 unit	0.220		–				–		
NO or NC contact selectable, pnp	23			–			▶	**3RG40 41–6AD00**	1 unit	0.224		–		
NO or NC contact selectable	24			–				–			▶	**3RG40 41–6KD00**	1 unit	0.222

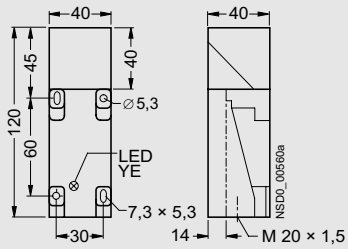
Dimension drawings

Mounting instructions



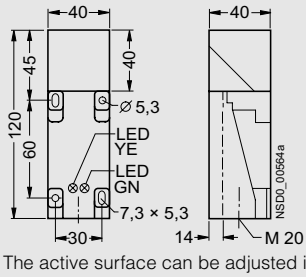
A = active surface
B = metal-free area

3RG40 41–6JB00,
3RG40 41–6KD00



The active surface can be adjusted in 5 directions.

3RG40 41–6AD00



The active surface can be adjusted in 5 directions.

Technical specifications

Class		**Greater rated operating distance**	**Greater rated operating distance**	**Greater rated operating distance**
No. of connecting wires		**3-wire**	**3-wire**	**4-wire**
Design		**M 18**	**Cubic 40 mm × 40 mm**	**Cubic 40 mm × 40 mm**
Embeddable in metal		**Unshielded**	**Shielded**	**Shielded**
Rated operating distance s_n		20 mm	20 mm	20 mm
Enclosure material		Brass, nickel-plated	Molded plastic	Molded plastic
Operational voltage (DC)	V	10 ... 30	10 ... 30	15 ... 34
No-load supply current I_0	mA	≤ 10	9.5	≤ 30 (24 V); ≤ 50 (34 V)
Rated operational current I_e	mA	200	200	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	200	150	30
Repeat accuracy R	mm	1.0	≤2 %	1.5
Power-up delay t_v	ms	100	≤ 8	100
Displays				
• Switching status		Yellow LED	Yellow LED	Yellow LED
• Power supply		–	Green LED	Green LED
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	•
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP67	IP67	IP65
Type		3RG46 23–.AB02, 3RG46 23–.GB02	3RG46 38–3AG01, 3RG46 38–3GB01	3RG41 34–6CD01

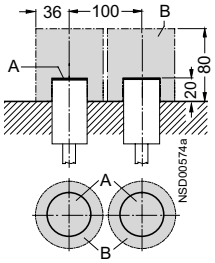
Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Weight per PU	DT	Order No.	PS	Weight per PU	DT	Order No.	PS	Weight per PU
						kg				kg				kg
With 2 m cable, PUR				3 × 0.34 mm²										
NO contact, pnp	11		A	**3RG46 23–0AB02**	1 unit	0.118		–				–		
NO contact, npn	13		X	**3RG46 23–0GB02**	1 unit	0.117		–				–		
With M 12 connector														
NO contact, pnp	2	E, F	▶	**3RG46 23–3AB02**	1 unit	0.059	A	**3RG46 38–3AG01**	1 unit	0.198		–		
NO contact, npn	4	E, F	X	**3RG46 23–3GB02**	1 unit	0.060	X	**3RG46 38–3GB01**	1 unit	0.190		–		
With terminal compartment												0.5 ... 2.5 mm²		
NO and NC contacts, pnp	18			–				–			C	**3RG41 34–6CD01**	1 unit	0.225

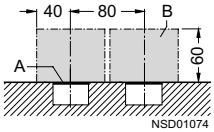
Dimension drawings

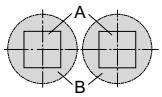
Mounting instructions

3RG46 23



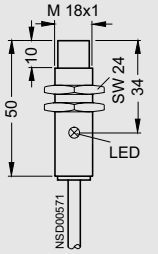
3RG46 38, 3RG41 34



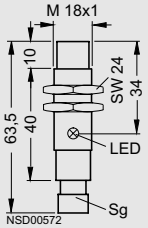


A = active surface
B = metal-free area

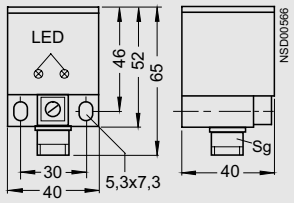
3RG46 23–0..02



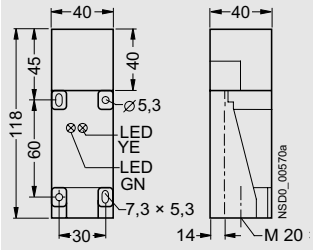
3RG46 23–3..02



3RG46 38–3..01



3RG41 34–6CD01



The active surface can be adjusted in 5 directions. With screwed sensor

Operating distance 20 mm

Technical specifications

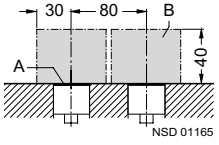
Class		**Greater rated operating distance**	**Greater rated operating distance (AC/DC)**
No. of connecting wires		**4-wire**	**2-wire**
Design		**Cubic 40 mm × 40 mm**	**Cubic 40 mm × 40 mm**
Embeddable in metal		**Shielded**	**Shielded**
Rated operating distance s_n		20 mm	20 mm
Enclosure material		Molded plastic	Molded plastic
Operational voltage			
• DC	V	15 ... 34	20 ... 320
• AC	V	–	20 ... 265
No-load supply current I_0			
• At DC 24 V	mA	≤ 30 (24 V); ≤ 40 (34 V)	1.5
• At U_{max}	mA	–	≤ 2.0
Rated operational current I_e			
• Continuous	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	200
• 20 ms	mA	–	–
Minimum load current	mA	–	< 2
Switching frequency f	Hz	30	25/30 (AC/DC)
Repeat accuracy R	mm	0.75	0.75
Differential travel H	mm	0.05 ... 3.3	0.05 ... 3.3
Power-up delay t_v	ms	100	100
Displays			
• Switching status		Yellow LED	Yellow LED
• Power supply		Green LED	–
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	–
• Reverse polarity protection		•	–
• Wire-break protection		•	–
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP67	IP67
Type		3RG41 38–3CD00, 3RG41 38–3GD00	3RG41 38–3KB00

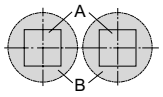
Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With M 12 connector										
NO and NC contacts, pnp	1	F	A	**3RG41 38–3CD00**	1 unit	0.125		–		
NO and NC contacts, npn	–	F	▶	**3RG41 38–3GD00**	1 unit	0.126		–		
NO contact	8	F		–			D	**3RG41 38–3KB00**	1 unit	0.125

Dimension drawings

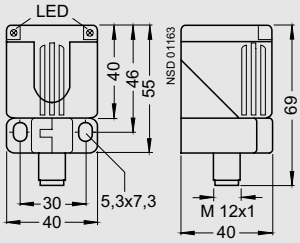
Mounting instructions





A = active surface
B = metal-free area

3RG41 38–3..00



The active surface can be adjusted in 5 directions.
With rotatable connector

Technical specifications

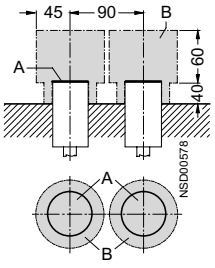
Class		**U BERO (without reduction factor)**
No. of connecting wires		**3-wire**
Design		**M 30**
Embeddable in metal		**Unshielded**
Rated operating distance s_n		20 mm
Enclosure material		Brass or stainless steel
Operational voltage (DC)	V	10 ... 30
No-load supply current I_0	mA	≤ 13
Rated operational current I_e	mA	200
Switching frequency f	Hz	1500
Repeat accuracy R	mm	0.4
Power-up delay t_v	ms	≤ 8
Switching status display		Yellow LED
Protective measures		
• Spurious signal suppression		•
• Short-circuit-proof/overload-proof		•
• Reverse polarity protection		•
• Wire-break protection		•
• Inductive interference protection		Magnetic field resistant up to 160 mT r.m.s.
• Radio interference protection		•
• Protective insulation		•
Degree of protection		
• Brass enclosure		IP67
• Stainless steel enclosure		IP68
Type		3RG46 24–.AN.., 3RG46 24–.GN..

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU
						kg
With 2 m cable, PUR				3 × 0.34 mm²		
Brass, chrome-plated						
NO contact, pnp	11		A	**3RG46 24–0AN01**	1 unit	0.165
NO contact, npn	13		A	**3RG46 24–0GN01**	1 unit	0.170
Stainless steel						
NO contact, pnp	11		A	**3RG46 24–0AN61**	1 unit	0.164
NO contact, npn	13		D	**3RG46 24–0GN61**	1 unit	0.174
With M 12 connector						
Brass, chrome-plated						
NO contact, pnp	2	E, F	A	**3RG46 24–3AN01**	1 unit	0.091
NO contact, npn	4	E, F	D	**3RG46 24–3GN01**	1 unit	0.089
Brass, teflon-coated						
NO contact, pnp	2	E, F	D	**3RG46 24–3AN05**	1 unit	0.108
NO contact, npn	4	E, F	X	**3RG46 24–3GN05**	1 unit	0.108
Stainless steel						
NO contact, pnp	2	E, F	X	**3RG46 24–3AN61**	1 unit	0.086
NO contact, npn	2	E, F	X	**3RG46 24–3GN61**	1 unit	0.086

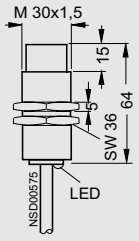
Dimension drawings

Mounting instructions

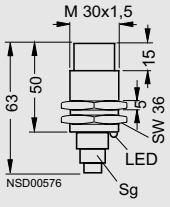


A = active surface
B = metal-free area

3RG46 24–0.N..



3RG46 24–3.N..



Operating distance 22 mm

Technical specifications

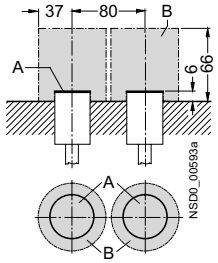
Class		**Greater rated operating distance**
No. of connecting wires		**3-wire**
Design		**M 30**
Embeddable in metal		**Semi-shielded**
Rated operating distance s_n		**22 mm**
Enclosure material		Brass, nickel-plated
Operational voltage (DC)	V	10 ... 30
No-load supply current I_0	mA	≤ 10
Rated operational current I_e	mA	200
Switching frequency f	Hz	100
Repeat accuracy R	mm	1.1
Power-up delay t_v	ms	200
Displays		
• Switching status		Yellow LED
• Power supply		–
Protective measures		
• Spurious signal suppression		•
• Short-circuit-proof/overload-proof		•
• Reverse polarity protection		•
• Wire-break protection		•
• Inductive interference protection		•
• Radio interference protection		•
Degree of protection		IP67
Type		3RG46 14–.AB00, 3RG46 14–.GB00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU
						kg
With 2 m cable, PUR				3 × 0.34 mm²		
NO contact, pnp	11		A	**3RG46 14–0AB00**	1 unit	0.210
NO contact, npn	13		X	**3RG46 14–0GB00**	1 unit	0.210
With M 12 connector						
NO contact, pnp	2	E, F	A	**3RG46 14–3AB00**	1 unit	0.158
NO contact, npn	4	E, F	X	**3RG46 14–3GB00**	1 unit	0.154

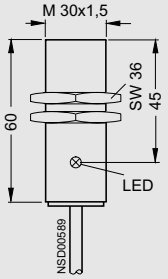
Dimension drawings

Mounting instructions

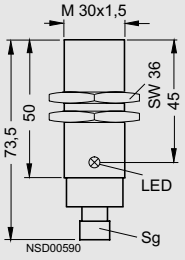


A = active surface
B = metal-free area

3RG46 14–0..00



3RG46 14–3..00



Technical specifications

Class		**Normal**	**Greater rated operating distance (DC 65 V)**
No. of connecting wires		**4-wire**	**3-wire**
Design		**Cubic 60 mm × 80 mm**	**Cubic 40 mm × 40 mm**
Embeddable in metal		**Shielded**	**Semi-shielded**
Rated operating distance s_n		25 mm	25 mm
Enclosure material		Molded plastic	Molded plastic
Operational voltage (DC)	V	15 ... 34	10 ... 65
No-load supply current I_0	mA	≤ 30 (24 V); ≤ 50 (34 V)	20
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	300
Switching frequency f	Hz	70	50
Repeat accuracy R	mm	1.0	1.5
Power-up delay t_v	ms	100	100
Displays			
• Switching status		Yellow LED	Yellow LED
• Power supply		Green LED	Green LED
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	•
• Reverse polarity protection		•	•
• Wire-break protection		•	•
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP65	IP67
Type		3RG40 32–6CD00	3RG41 31–6AD0.

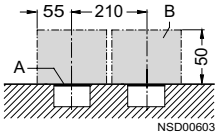
Selection and ordering data

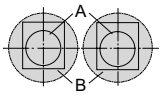
Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With terminal compartment				0.5 ... 2.5 mm²				0.5 ... 2.5 mm²		
NO or NC contact selectable, pnp	23			–			►	**3RG41 31–6AD00**	1 unit	0.225
NO and NC contacts, pnp	18		A	**3RG40 32–6CD00**	1 unit	0.269		–		
Version for Opel (increased EMC)										
NO or NC contact selectable, pnp	23			–			C	**3RG41 31–6AD04**	1 unit	0.240

Dimension drawings

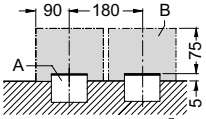
Mounting instructions

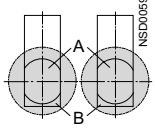
3RG40 32





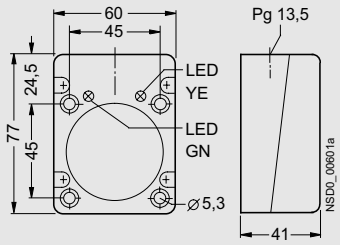
3RG41 31



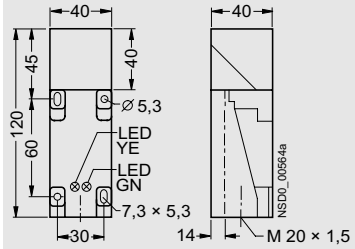


A = active surface
B = metal-free area

3RG40 32–6CD00



3RG41 31–6AD0.



The active surface can be adjusted in 5 directions.

Operating distance 25 mm

Technical specifications

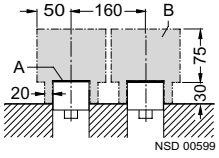
Class		**U BERO (without reduction factor)**
No. of connecting wires		**3-wire**
Design		**Cubic 40 mm × 40 mm**
Embeddable in metal		**Unshielded**
Rated operating distance s_n		25 mm
Enclosure material		Molded plastic
Operational voltage (DC)	V	10 ... 30
No-load supply current I_0	mA	≤ 15
Rated operational current I_e	mA	200
Switching frequency f	Hz	250
Repeat accuracy R	mm	0.5
Power-up delay t_v	ms	≤ 8
Displays		
• Switching status		Yellow LED
• Power supply		Green LED
Protective measures		
• Spurious signal suppression		•
• Short-circuit-proof/overload-proof		•
• Reverse polarity protection		•
• Wire-break protection		•
• Inductive interference protection		Magnetic field resistant up to 140 mT r.m.s.
• Radio interference protection		•
• Protective insulation		•
Degree of protection		IP68
Type		3RG46 44–6.N01, 3RG46 48–3.N02

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With M 12 connector										
NO contact, pnp	2	E, F	A	**3RG46 48–3AN01**	1 unit	0.181		–		
NO contact, npn	4	E, F	A	**3RG46 48–3GN01**	1 unit	0.180		–		
With terminal compartment								0.5 ... 2.5 mm²		
NO contact, pnp	28			–			D	**3RG46 44–6AN02**	1 unit	0.212
NO contact, npn	29			–			X	**3RG46 44–6GN02**	1 unit	0.212

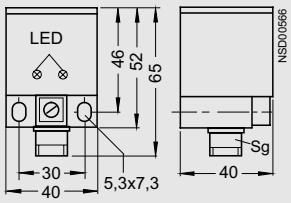
Dimension drawings

Mounting instructions

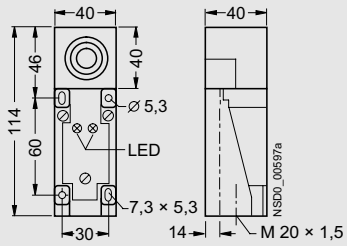


A = active surface
B = metal-free area

3RG46 48–3.N01



3RG46 44–6.N02



The active surface can be adjusted in 5 directions.

Technical specifications

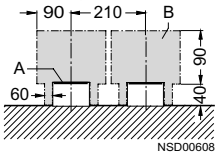
Class		**Normal**	**Extra duty (DC 65 V)**	**Extra duty (AC/DC)**
No. of connecting wires		**4-wire**	**3-wire**	**2-wire**
Design		**Cubic 60 mm × 80 mm**	**Cubic 60 mm × 80 mm**	**Cubic 60 mm × 80 mm**
Embeddable in metal		**Unshielded**	**Unshielded**	**Unshielded**
Rated operating distance s_n		30 mm	30 mm	30 mm
Enclosure material		Molded plastic	Molded plastic	Molded plastic
Operational voltage				
• DC	V	15 ... 34	10 ... 65	20 ... 320
• AC	V	–	–	20 ... 265
No-load supply current I_0				
• At DC 24 V	mA	≤ 30 (24 V); ≤ 50 (34 V)	≤ 40	1.0
• At AC 230 V	mA	–	–	1.5
Rated operational current I_e				
• Continuous	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	300	300
• 20 ms	mA	–	–	1800
Minimum load current	mA	–	–	5
Switching frequency f	Hz	50	50	25/60 (AC/DC)
Repeat accuracy R	mm	1.0	1.0	1.0
Power-up delay t_v	ms	100	100	100
Displays				
• Switching status		Yellow LED	Yellow LED	Yellow LED
• Power supply		Green LED	Green LED	–
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	–
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP65	IP65	IP65
Type		3RG40 42–6CD00	3RG40 42–6AD00	3RG40 42–6KD00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With terminal compartment				0.5 ... 2.5 mm²				0.5 ... 2.5 mm²				0.5 ... 2.5 mm²		
NO and NC contacts, pnp	18		C	**3RG40 42–6CD00**	1 unit	0.268		–				–		
NO or NC contact selectable, pnp	23			–			►	**3RG40 42–6AD00**	1 unit	0.269		–		
NO or NC contact selectable	24			–				–			►	**3RG40 42–6KD00**	1 unit	0.268

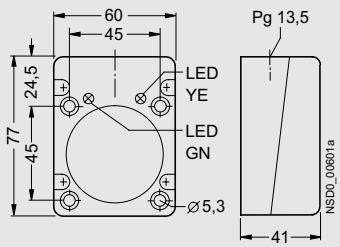
Dimension drawings

Mounting instructions

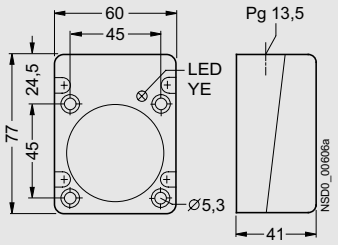


A = active surface
B = metal-free area

3RG40 42–6CD00,
3RG40 42–6AD00



3RG40 42–6KD00



Operating distance 30 mm

Technical specifications

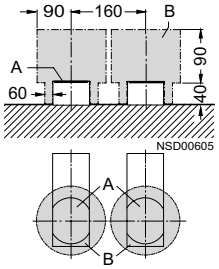
Class		**Greater rated operating distance (Mercedes-Benz)**
No. of connecting wires		**4-wire**
Design		**Cubic 40 mm × 40 mm**
Embeddable in metal		**Unshielded**
Rated operating distance s_n		30 mm
Enclosure material		Molded plastic
Operational voltage (DC)	V	15 ... 34
No-load supply current I_0	mA	≤ 30 (24 V); ≤ 50 (34 V)
Rated operational current I_e	mA	200 (≤ 50 °C); 150 (≤ 85 °C)
Switching frequency f	Hz	30
Repeat accuracy R	mm	1.5
Power-up delay t_v	ms	100
Displays		
• Switching status		Yellow LED
• Power supply		Green LED
Protective measures		
• Spurious signal suppression		•
• Short-circuit-proof/overload-proof		•
• Reverse polarity protection		•
• Wire-break protection		•
• Inductive interference protection		•
• Radio interference protection		•
Degree of protection		IP65
Type		3RG41 44–6CD01

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU
						kg
With terminal compartment			0.5 ... 2.5 mm²			
NO and NC contacts, pnp	18		C	**3RG41 44–6CD01**	1 unit	0.224

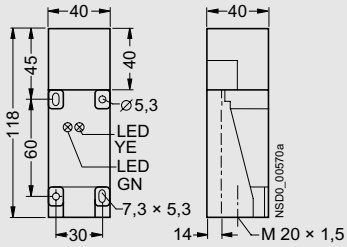
Dimension drawings

Mounting instructions



A = active surface
B = metal-free area

3RG41 44–6CD01



The active surface can be adjusted in 5 directions.
With screwed sensor

Technical specifications

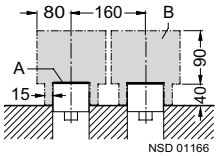
Class		**Greater rated operating distance**	**Greater rated operating distance (AC/DC)**
No. of connecting wires		**4-wire**	**2-wire**
Design		**Cubic 40 mm × 40 mm**	**Cubic 40 mm × 40 mm**
Embeddable in metal		**Unshielded**	**Unshielded**
Rated operating distance s_n		35 mm	35 mm
Enclosure material		Molded plastic	Molded plastic
Operational voltage			
• DC	V	15 ... 34	20 ... 320
• AC	V	–	20 ... 265
No-load supply current I_0			
• At DC 24 V	mA	≤ 30 (24 V); ≤ 40 (34 V)	1.5
• At U_{max}	mA	–	≤ 2.0
Rated operational current I_e			
• Continuous	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	300
• 20 ms	mA	–	
Minimum load current	mA	–	< 2
Switching frequency f	Hz	30	25/30 (AC/DC)
Repeat accuracy R	mm	0.75	0.75
Differential travel H	mm	0.05 ... 7.7	0.05 ... 7.7
Power-up delay t_v	ms	100	100
Displays			
• Switching status		Yellow LED	Yellow LED
• Power supply		Green LED	–
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	–
• Reverse polarity protection		•	–
• Wire-break protection		•	–
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP67	IP67
Type		3RG41 48–3CD00, 3RG41 48–3GD00	3RG41 48–3KB00

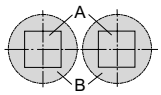
Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With M 12 connector										
NO and NC contacts, pnp	1	F	A	**3RG41 48–3CD00**	1 unit	0.129		–		
NO and NC contacts, npn	–	F	C	**3RG41 48–3GD00**	1 unit	0.132		–		
NO contact	8	F		–			D	**3RG41 48–3KB00**	1 unit	0.133

Dimension drawings

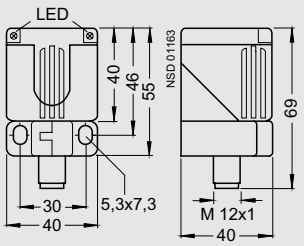
Mounting instructions





A = active surface
B = metal-free area

3RG41 48–3..00



The active surface can be adjusted in 5 directions.
With rotatable connector

Operating distance 35 mm
Operating distance 40 mm

Technical specifications

Class		**U BERO (without reduction factor)**	**U BERO (without reduction factor)**
No. of connecting wires		**3-wire**	**3-wire**
Design		**Cubic 40 mm × 40 mm**	**Cubic 40 mm × 40 mm**
Embeddable in metal		**Unshielded**	**Unshielded**
Rated operating distance s_n		**35 mm**	**40 mm**
Enclosure material		Molded plastic	Molded plastic
Operational voltage (DC)	V	10 ... 30	10 ... 30
No-load supply current I_0	mA	≤ 15	≤ 15
Rated operational current I_e	mA	200	200
Switching frequency f	Hz	250	250
Repeat accuracy R	mm	0.7	0.8
Power-up delay t_v	ms	≤ 8	≤ 8
Displays			
• Switching status		Yellow LED	Yellow LED
• Power supply		Green LED	Green LED
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	•
• Reverse polarity protection		•	•
• Wire-break protection		•	•
• Inductive interference protection		Magnetic field resistant up to 140 mT r.m.s.	Magnetic field resistant up to 140 mT r.m.s.
• Radio interference protection		•	•
• Protective insulation		•	•
Degree of protection		IP68	IP68
Type		3RG46 48–3.N11	3RG46 44–6.N01

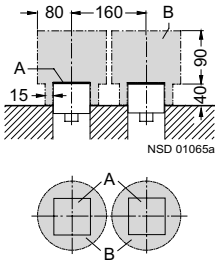
Selection and ordering data

Switching output	Circ. diag. No.	Connector type	DT	Order No.	PS	Approx. weight per PU kg	DT	Order No.	PS	Approx. weight per PU kg
With M 12 connector										
NO contact, pnp	2	E, F	A	**3RG46 48–3AN11**	1 unit	0.145		–		
NO contact, npn	4	E, F	D	**3RG46 48–3GN11**	1 unit	0.150		–		
With terminal compartment								0.5 ... 2.5 mm²		
NO contact, pnp	28			–			A	**3RG46 44–6AN01**	1 unit	0.214
NO contact, npn	29			–			D	**3RG46 44–6GN01**	1 unit	0.211

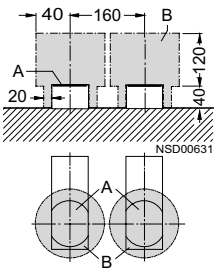
Dimension drawings

Mounting instructions

3RG46 48–3.N11

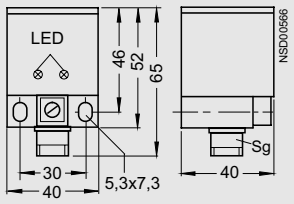


3RG46 44–6.N01

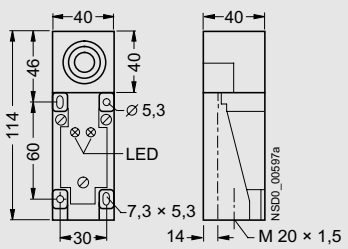


A = active surface
B = metal-free area

3RG46 48–3.N11



3RG46 44–6.N01



The active surface can be adjusted in 5 directions.

Technical specifications

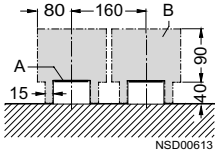
Class		**Normal**	**Extra duty (DC 65 V)**	**Extra duty (AC/DC)**
No. of connecting wires		**4-wire**	**3-wire**	**2-wire**
Design		**Cubic 80 mm × 100 mm**	**Cubic 80 mm × 100 mm**	**Cubic 80 mm × 100 mm**
Embeddable in metal		**Unshielded**	**Unshielded**	**Unshielded**
Rated operating distance s_n		40 mm	40 mm	40 mm
Enclosure material		Molded plastic	Molded plastic	Molded plastic
Operational voltage				
• DC	V	15 ... 34	10 ... 65	20 ... 320
• AC	V	–	–	20 ... 265
No-load supply current I_0				
• At DC 24 V	mA	≤ 30 (24 V); ≤ 50 (34 V)	≤ 40	1.0
• At AC 230 V	mA	–	–	1.5
Rated operational current I_e				
• Continuous	mA	200 (≤ 50 °C); 150 (≤ 85 °C)	300	300
• 20 ms	mA	–	–	1800
Minimum load current	mA	–	–	5
Switching frequency f	Hz	10	10	25/60 (AC/DC)
Repeat accuracy R	mm	1.0	1.0	1.0
Power-up delay t_v	ms	200	200	100
Displays				
• Switching status		Yellow LED	Yellow LED	Yellow LED
• Power supply		Green LED	Green LED	–
Protective measures				
• Spurious signal suppression		•	•	•
• Short-circuit-proof/overload-proof		•	•	–
• Reverse polarity protection		•	•	•
• Wire-break protection		•	•	•
• Inductive interference protection		•	•	•
• Radio interference protection		•	•	•
Degree of protection		IP65	IP65	IP65
Type		3RG40 43–6CD00	3RG40 43–6AD00	3RG40 43–6KD00

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg				kg
With terminal compartment				0.5 ... 2.5 mm²				0.5 ... 2.5 mm²				0.5 ... 2.5 mm²		
NO and NC contacts, pnp	18	C		**3RG40 43–6CD00**	1 unit	0.436		–				–		
NO or NC contact selectable, pnp	23			–			►	**3RG40 43–6AD00**	1 unit	0.437		–		
NO or NC contact selectable	24			–				–			►	**3RG40 43–6KD00**	1 unit	0.436

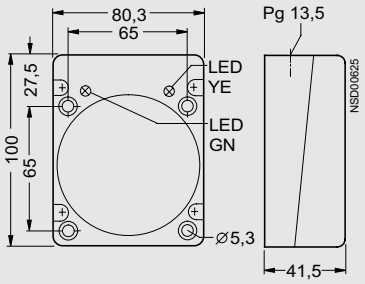
Dimension drawings

Mounting instructions

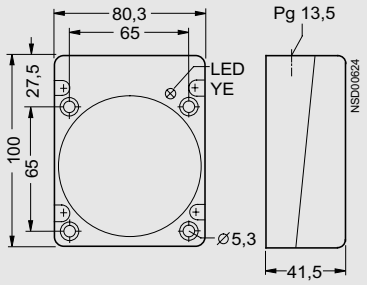


A = active surface
B = metal-free area

3RG40 43–6CD00,
3RG40 43–6AD00



3RG40 43–6KD00



Operating distance 40 mm

Technical specifications

Class		**Extra duty (DC 65 V / Ford)**	**Extra duty (AC/DC)**
No. of connecting wires		**3-wire**	**2-wire**
Design		**Cubic 80 mm × 100 mm**	**Cubic 80 mm × 100 mm**
Embeddable in metal		**Non-embeddable / embeddable**	**Non-embeddable / embeddable**
Rated operating distance s_n		**30 mm / 40 mm**	**30 mm / 40 mm**
Enclosure material		Molded plastic	Molded plastic
Operational voltage			
• DC	V	10 ... 65	20 ... 320
• AC	V	–	20 ... 265
No-load supply current I_0			
• At DC 24 V	mA	≤ 40	1.0
• At U_{max}	mA	–	1.5
Rated operational current I_e			
• Continuous	mA	300	300
• 20 ms	mA	–	1800
Minimum load current	mA	–	5
Switching frequency f	Hz	10	25/60 (AC/DC)
Repeat accuracy R	mm	2	2
Power-up delay t_v	ms	200	100
Displays			
• Switching status		Yellow LED	Yellow LED
• Power supply		Green LED	–
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	–
• Reverse polarity protection		•	•
• Wire-break protection		•	•
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP65	IP65
Type		3RG40 33–6AD01	3RG40 33–6KD01

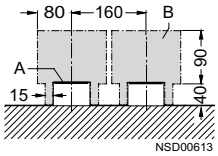
Selection and ordering data

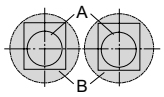
Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With terminal compartment				0.5 ... 2.5 mm²				0.5 ... 2.5 mm²		
NO or NC contact selectable, pnp	23		A	**3RG40 33–6AD01**	1 unit	0.438		–		
NO or NC contact selectable	24			–			C	**3RG40 33–6KD01**	1 unit	0.434

Dimension drawings

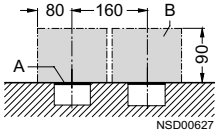
Mounting instructions

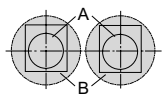
Operating distance 30 mm





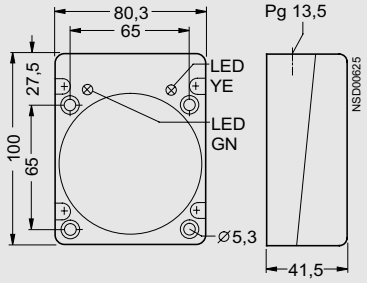
Operating distance 40 mm



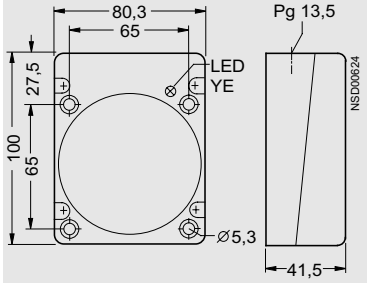


A = active surface
B = metal-free area

3RG40 33–6AD01



3RG40 33–6AD01



Technical specifications

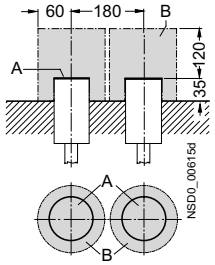
Class		**Greater rated operating distance**
No. of connecting wires		**3-wire**
Design		**M 30**
Embeddable in metal		**Unshielded**
Rated operating distance s_n		40 mm
Enclosure material		Brass, nickel-plated
Operational voltage (DC)	V	10 ... 30
No-load supply current I_0	mA	≤ 10
Rated operational current I_e	mA	200
Switching frequency f	Hz	100
Repeat accuracy R	mm	1.1
Power-up delay t_v	ms	200
Displays		
• Switching status		Yellow LED
• Power supply		–
Protective measures		
• Spurious signal suppression		•
• Short-circuit-proof/overload-proof		•
• Reverse polarity protection		•
• Wire-break protection		•
• Inductive interference protection		•
• Radio interference protection		•
Degree of protection		IP67
Type		3RG46 24–.AB02, 3RG46 24–.GB02

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU
						kg
With 2 m cable, PUR				3 × 0.34 mm²		
NO contact, pnp	11		A	**3RG46 24–0AB02**	1 unit	0.205
NO contact, npn	13		X	**3RG46 24–0GB02**	1 unit	0.206
With M 12 connector						
NO contact, pnp	2	E, F	►	**3RG46 24–3AB02**	1 unit	0.153
NO contact, npn	4	E, F	X	**3RG46 24–3GB02**	1 unit	0.154

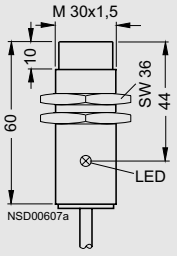
Dimension drawings

Mounting instructions

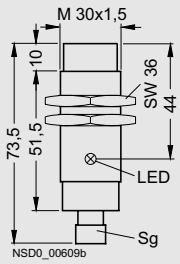


A = active surface
B = metal-free area

3RG46 24–0..02



3RG46 24–3..02



Operating distance 40 mm

Technical specifications

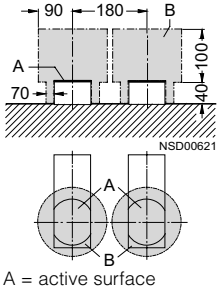
Class		**Greater rated operating distance (DC 65 V)**
No. of connecting wires		**4-wire**
Design		**Cubic 40 mm × 40 mm**
Embeddable in metal		**Unshielded**
Rated operating distance s_n		40 mm
Enclosure material		Molded plastic
Operational voltage (DC)	V	10 ... 65
No-load supply current I_0	mA	20
Rated operational current I_e	mA	300
Switching frequency f	Hz	20
Repeat accuracy R	mm	1.5
Power-up delay t_v	ms	100
Displays		
• Switching status		Yellow LED
• Power supply		Green LED
Protective measures		
• Spurious signal suppression		•
• Short-circuit-proof/overload-proof		•
• Reverse polarity protection		•
• Wire-break protection		•
• Inductive interference protection		•
• Radio interference protection		•
Degree of protection		IP65
Type		3RG41 41–6AB03, 3RG41 41–6AD0.

Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU
						kg
With terminal compartment				0.5 ... 2.5 mm²		
NO contact, pnp	19		C	**3RG41 41–6AB03**	1 unit	0.226
NO or NC contact selectable, pnp	23		D	**3RG41 41–6AD00**	1 unit	0.227
Version for Opel (increased EMC)						
NO or NC contact selectable, pnp	23		C	**3RG41 41–6AD04**	1 unit	0.232

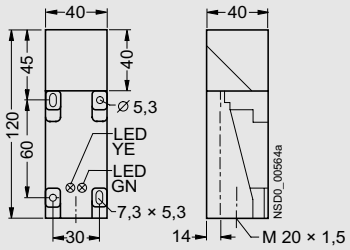
Dimension drawings

Mounting instructions



A = active surface
B = metal-free area

3RG41 41–6A.0.



The active surface can be adjusted in 5 directions.

Technical specifications

Class		**Greater rated operating distance (DC 65 V)**
No. of connecting wires		**4-wire**
Design		**Cubic 40 mm × 40 mm**
Embeddable in metal		**Unshielded**
Rated operating distance s_n		**25 mm or 40 mm, selectable**
Enclosure material		Molded plastic
Operational voltage (DC)	V	10 ... 65
No-load supply current I_0	mA	20
Rated operational current I_e	mA	300
Switching frequency f	Hz	20
Repeat accuracy R	mm	1.5
Power-up delay t_v	ms	100
Displays		
• Switching status		Yellow LED
• Power supply		Green LED
Protective measures		
• Spurious signal suppression		•
• Short-circuit-proof/overload-proof		•
• Reverse polarity protection		•
• Wire-break protection		•
• Inductive interference protection		•
• Radio interference protection		•
Degree of protection		IP67
Type		3RG41 41–3AB0.

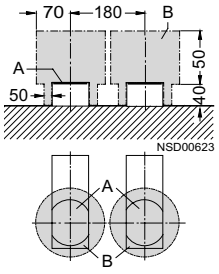
Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU
						kg
With M 12 connector						
NO contact, pnp	2	E, F	C	**3RG41 41–3AB02**	1 unit	0.230
Connector can be offset in steps of 30°						
NO contact, pnp	2	E, F	C	**3RG41 41–3AB01**	1 unit	0.234

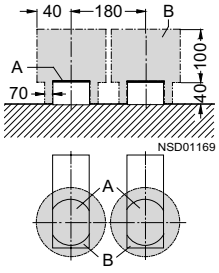
Dimension drawings

Mounting instructions

Operating distance 25 mm

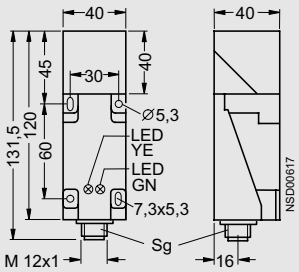


Operating distance 40 mm



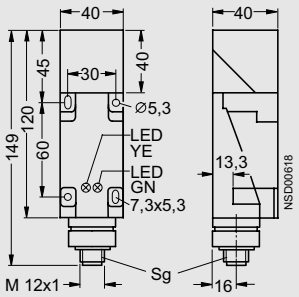
A = active surface
B = metal-free area

3RG41 41–3AB02



The active surface can be adjusted in 5 directions.

3RG41 41–3AB01



The active surface can be adjusted in 5 directions.

Operating distance 50 mm
Operating distance 65 mm

Technical specifications

Class		**Greater rated operating distance (DC 65 V)**	**Greater rated operating distance (DC 65 V)**
No. of connecting wires		**3-wire**	**3-wire**
Design		**Cubic 60 mm × 80 mm**	**Cubic 80 mm × 100 mm**
Embeddable in metal		**Unshielded**	**Unshielded**
Rated operating distance s_n		**50 mm**	**65 mm**
Enclosure material		Molded plastic	Molded plastic
Operational voltage (DC)	V	10 ... 65	10 ... 65
No-load supply current I_0	mA	20	20
Rated operational current I_e	mA	300	300
Switching frequency f	Hz	20	10
Repeat accuracy R	mm	1.5	2
Power-up delay t_v	ms	100	100
Displays			
• Switching status		Yellow LED	Yellow LED
• Power supply		Green LED	Green LED
Protective measures			
• Spurious signal suppression		•	•
• Short-circuit-proof/overload-proof		•	•
• Reverse polarity protection		•	•
• Wire-break protection		•	•
• Inductive interference protection		•	•
• Radio interference protection		•	•
Degree of protection		IP65	IP65
Type		3RG41 42–6AD00	3RG41 43–6AD00

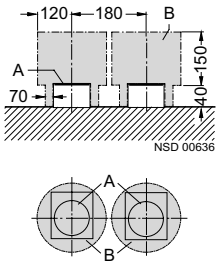
Selection and ordering data

Switching output	Circ. diag. No.	Con-nector type	DT	Order No.	PS	Approx. weight per PU	DT	Order No.	PS	Approx. weight per PU
						kg				kg
With terminal compartment			0.5 ... 2.5 mm²				0.5 ... 2.5 mm²			
NO or NC contact selectable, pnp	23		C	**3RG41 42–6AD00**	1 unit	0.278	C	**3RG41 43–6AD00**	1 unit	0.461

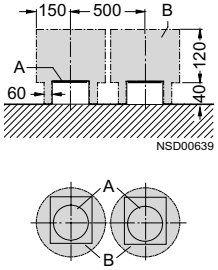
Dimension drawings

Mounting instructions

3RG41 42

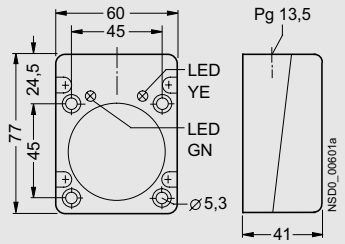


3RG41 43

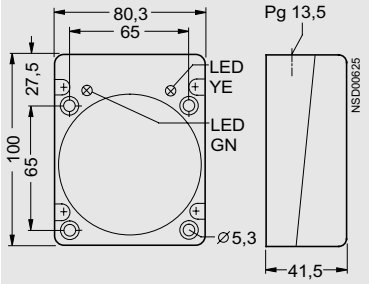


A = active surface
B = metal-free area

3RG41 42–6AD00



3RG41 43–6AD00



Technical specifications

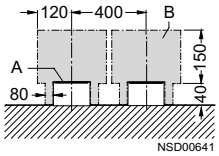
Class		**U BERO (without reduction factor)**
No. of connecting wires		**3-wire**
Design		**Cubic 80 mm × 80 mm**
Embeddable in metal		**Unshielded**
Rated operating distance s_n		75 mm
Enclosure material		Molded plastic
Operational voltage (DC)	V	10 ... 30
No-load supply current I_0	mA	≤ 15
Rated operational current I_e	mA	200
Switching frequency f	Hz	250
Repeat accuracy R	mm	1.5
Power-up delay t_v	ms	≤ 8
Switching status display		Yellow LED
Protective measures		
• Spurious signal suppression		•
• Short-circuit-proof/overload-proof		•
• Reverse polarity protection		•
• Wire-break protection		•
• Inductive interference protection		Magnetic field resistant up to 75 mT r.m.s.
• Radio interference protection		•
• Protective insulation		•
Degree of protection		IP67
Type		3RG46 43–6AN01, 3RG46 43–6GN01

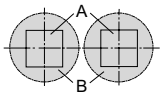
Selection and ordering data

Switching output	Circ. diag. No.	Connector type	DT	Order No.	PS	Approx. weight per PU
						kg
With terminal compartment				0.5 ... 2.5 mm²		
NO contact, pnp	28		A	**3RG46 43–6AN01**	1 unit	0.271
NO contact, npn	29		X	**3RG46 43–6GN01**	1 unit	0.272

Dimension drawings

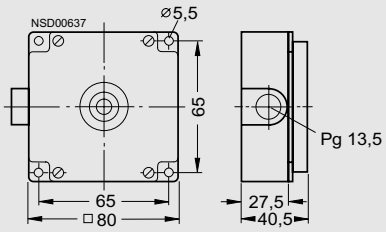
Mounting instructions





A = active surface
B = metal-free area

3RG46 43–6.N01



Notes