

PROXIMITY SENSORS

BALOGH

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Table of Contents

Selecting a Sensor	1
Composing Your Reference Number	2
Quick Reference	3
Overview	4
Principle Function of the Inductive Sensors	5
Cylindrical Proximity Sensors	6
Cylindrical Proximity Sensors 2 Wires (DC).....	7
Cylindrical Proximity Sensors 3 Wires (DC).....	9
Cylindrical Proximity Sensors 2 Wires (AC).....	11
Cylindrical Proximity Sensors with Connectors.....	13
Rectangular Proximity Sensors	14
Rectangular Proximity Sensors 2 wires (DC).....	15
Rectangular Proximity Sensors 2 wires (AC).....	17
Sensors 26x26 with Wiring Chamber.....	19
Sensors 26x26 Output Cable.....	21
Proximity Sensors with Connection Chambers (84 & 85).....	23
Proximity Sensors with Connection Chamber (Model 71).....	25
Front Adjustable Sensors.....	27
Specialized Proximity Sensors	30
Machine Safety Proximity Sensors.....	31
Intrinsically Safe Proximity Sensors.....	33
Linear Output Inductive Proximity Sensors.....	35
Proximity Sensors with Cabled Output.....	37
Proximity Sensors with Remote Heads.....	39
Ramp Type Proximity Sensors.....	41
Object Detector Proximity Sensors.....	43
Transmitter / Receiver Pairs (Models EB & RB).....	45
Ring Sensors.....	47
Slotted Inductive Sensors.....	49
Multipurpose Sensors	52
Type "M" Sensors (8 - 130 VDC/AC).....	53
Appendix	56
Accessories.....	58
Appendix A - Equivalent Diagrams.....	60
Appendix B.....	62
Mounting Precautions.....	62
Summary of Specific Models.....	63

Selecting a Sensor

Key elements to consider

- Detection distance
- Sensor shape
- 2 or 3 wire

Using the tables below, identify the sensors that will fit your application.

Compose a Reference number

Composition of a Reference number

Example: DB 87 LCF/QC

DB	87	L	C	F	QC
Prefix variables <ul style="list-style-type: none"> • Protection • Housing material 	Sensor shape	Standard features <ul style="list-style-type: none"> E: Output cable B: Output cable w/ compression fitting C: Same as B w/2 mounting holes 	Sensing side <ul style="list-style-type: none"> F: Frontal detection L or S: side or top detection 	Voltage type <ul style="list-style-type: none"> C: Direct current A: Alternating current M: 8-130 VDC/AC 	Function <ul style="list-style-type: none"> F: Normally open O: Normally closed
					Output type <ul style="list-style-type: none"> P: Output positive N: Output negative
					Suffix variables: <ul style="list-style-type: none"> • Special features • Connector type • Voltage restrictions
					} 3 wire only
					} Model 57

Verify your Reference number

Composing your Reference number

Model	Shape	Output rating	Sensing side 57.87.71.89	Voltage type	Output type (3 wires)	Function	Voltage restrictions
IT	4 5 6.5 8	L Trans needed	(*) Front				
AT	12 18						
CT	30 40 37	E Water tight	F Front	C Direct current	P Positive	F Normally open	
DBS	38 39 41 42 57 87	B Cable gland and saddle IP65 clamp	L Side	A Alternating current	N Negative	O Normally closed	*
DB	51 56 65 68 71	C Punch-out holes	S Top (superior)	M Multi-voltage			
AB	49 84 85	/ IP00 Protection	U Universal				
CB	80 89 72						

Model	Description	Characteristics
IT	No protection against overloading, short-circuits, or over-voltages	Flush mounting metal
AT		Non flush mounting Rilsan
CT		Flush mounting Rilsan
DB	Protected against overloading, short-circuits, and over voltages	Flush mounting Metal
DBS		Flush mounting Rilsan
AB		Non flush mounting Rilsan
CB		Non flush mounting Rilsan

Model	Description
DL	Linear Output Sensor
TL	Linear Head
SB	Sensing Ramp
DS	Security Sensor
OS	Security Object
CES	Control Board
LO	Object Reader
OB	BALOGH Object
EB	Transmitter
RB	Receiver

Shape	Construction
4 - 30	Cylindrical
40	Cylindrical
37 - 39	Slotted
41, 42	Slotted
49	with Remote Head
51, 56	Cabled Output
65, 68	Ring
71, 72	Rectangular
84, 85	Rectangular
57, 87	Rectangular
89	Rectangular

Quick Reference

Range	Characteristics	Model	-----Voltage-----			# of Wires	Page
			Range	Current	Voltage		
0.8 mm	Cylinder	Ø 4; M5	C	DC	8 to 24	3	10
1 mm	Cylinder	Ø6.5; M8	C	DC	8 to 48	3	10
2 mm	Cylinder	M 12	C	DC	8 to 48	2	8
4 mm			M	DC/AC	8 to 130	2	50
5 mm	Cylinder	M 18	C	DC	8 to 48	2	8
			A	AC	24 to 220	2	12
			M	DC/AC	8 to 130	2	50
	Rectangular	"57" (20x20 mm)	C	DC	8 to 48	2	16
			A	AC	110 to 220	2	22
8 mm	Cylinder	M 18	C	DC	8 to 48	3	10
			A	AC	24 to 220	2	8
			M	DC/AC	8 to 130	2	12
10 mm	Cylinder	M 30	C	DC	8 to 48	2	8
			A	AC	24 to 220	2	10
			M	DC/AC	8 to 130	2	12
	Rectangular	"87" (26x26 mm)	C	DC	8 to 48	2	16
			A	AC	24 to 220	2	22
		"89" (26x26 mm)	M	DC/AC	8 to 130	2	54
			C	DC	8 to 48	2	20
M	DC/AC	8 to 130	2	20			
15 mm	Cylinder	M 30; M 40	C	DC	24 to 48	3	10
			A	AC	8 to 48	2	8
			M	DC/AC	24 to 220	2	12
	Rectangular	"71" (40x40mm) "72" (disconnectable)	C	DC	8 to 130	2	54
			A	AC	24 to 48	2	26
			M	DC/AC	24 to 220	2	8 & 28
20 mm	Cylinder	M 40	C	DC	8 to 130	2	54
25 mm	Rectangular	"84" with Terminals (55x114x40mm) "51" with cable (70x50x45 mm)	C	DC	24 to 48	3	w/cable 38
			A	AC	8 to 48	2	w/terminal 24
		"71" (40x40 mm) increased capacity	M	DC/AC	24 to 220	2	54
			C	DC	8 to 130	2	We consult (Et. 346)
35 mm	Rectangular	"84" w/terminal (55x11x40) "51" w/cable (70x50x45)	M	DC/AC	8 to 130	2	We consult (Et. 346)
			C	DC	8 to 48	2	
40 mm	Rectangular	"85" w/terminal (80x130x40 mm) "56" w/cable (73x73x55 mm)	C	DC	24 to 48	3	w/cable 38
			A	AC	8 to 48	2	w/terminal 24
			M	DC/AC	24 to 220	2	54
60 mm	Rectangular	"85" w/terminal "56" w/cable	C	DC	8 to 130	2	We consult
			M	DC/AC	8 to 48	2	(Et. 346)

Note: All dimensions in this manual are given in millimeters unless otherwise noted.

Overview

Operating principle

An oscillator maintains an alternating electromagnetic field in the area around the coil. A metallic object, ferrous or otherwise, which enters this field, gives rise to eddy currents; these absorb part of the power output from the oscillator so that the amplitude is reduced. This reduction is detected and converted into an "all or nothing" signal, which is capable of controlling an external load.

Quality

The quality of each and every component of the sensor is critical for the global quality of the product. When comparing two sensors of different manufacturers, the comparison of each element is key. In our BALOGH sensors, we use glass-encased polyamide for the housing, semiconductors, and durable capacitors of the highest quality, which exceed required specifications, especially in the design of the output elements.

Colors

DC Sensors are Orange with Black Cable.

AC Sensors are Sky Blue with White Cable.

Security Sensors are Red.

Protection

All our standard sensors (IT and DB types) are protected against the most powerful industrial radiations, and must be capable of withstanding, without damage, the discharge of a 33,000 pF capacitor charged to 600V between any two terminals. They must also be capable of withstanding any connecting error (in the case of 3 wired, 6 permutations). Furthermore, sensors of the DB series must be able to withstand permanent short-circuiting of the load at 70 degrees C. They automatically become operative again when the short-circuit is broken.

Detectable object

Plate of mild steel (Fe 37), 1mm thick, square in shape with sides equal to the diameter or the smallest dimension of the sensing side or face. For smaller objects or for other metals, the range is reduced.

Warranty

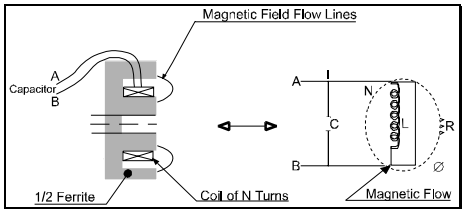
BALOGH Proximity Sensors are warranted against all manufacturing defects for a period of five years from delivery. The warranty takes the form of direct replacement of the proximity sensor, provided that it has been examined by our service department and found to be originally defective. (excludes failure of the semiconductors)

Principle function of the Inductive Sensors

The detection principle of the Inductive Proximity Sensor is the electromagnetic induction phenomenon. They must recognize the following functions:

- Production of the magnetic field of excitation
- Detection of power loss
- Control of a state change by output in accordance with a certain threshold of loss.

Detection module



R_p = Change in resistance of oscillator circuit

C = Capacitance of the oscillatory circuit

R = Magnetic reluctance of circuit

L = Self inductance of coil ($L = \frac{N^2}{R}$)

The value of the inductance is directly linked with the magnetic circuit's reluctance.

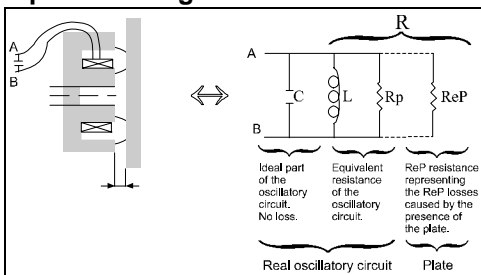
The frequency of the oscillator circuit is given by the

$$\text{relation } \omega_0 = \frac{1}{\sqrt{LC}}$$

The resistive loss of the oscillator circuit is:

$$R_p = \frac{L}{rC}$$

Equivalent diagram



The system, without presence of a metallic piece, possesses a certain quality factor

$$Q_0 = \frac{R_p}{L\omega_0}$$

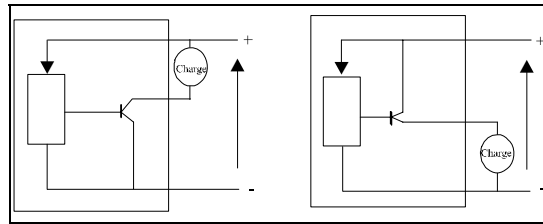
that will have a tendency to degrade with the presence of some metallic piece.

$$Q_0 = \frac{R_p // R_e // R_n}{L\omega_0}$$

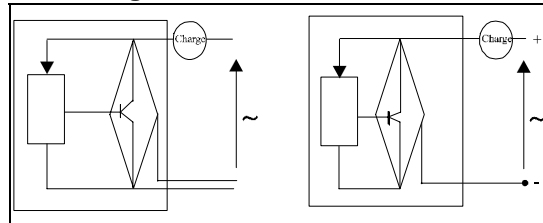
After a certain threshold has been achieved, a change of state will take place on the user's output.

Switching module

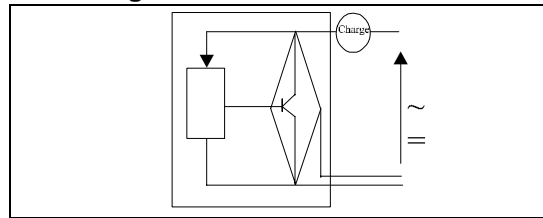
Direct current



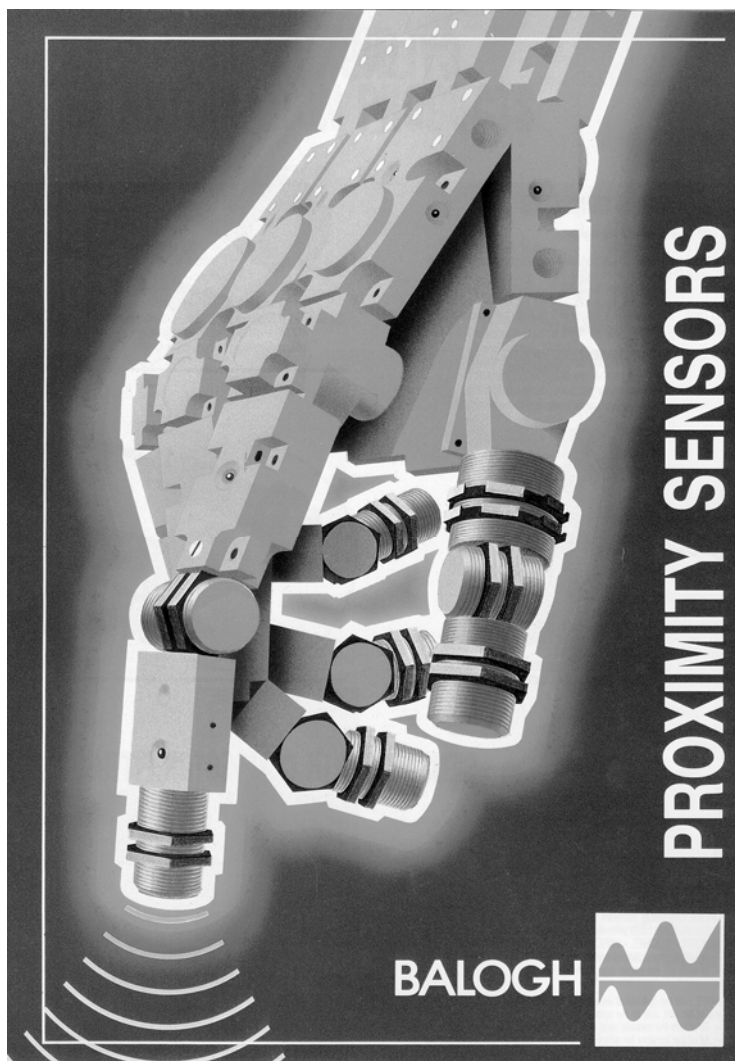
Alternating current



Alternating or Direct current - 2 wires



Cylindrical Sensors



Cylindrical Sensors - 2 wires (DC)

Models 12 - 18 - 30 - 40

Available configurations non-polarized

DB 12 CF	AB 12 CO	CB 18 CF	DB 30 CF	IT 30 CF	DB 40 CO
DB 12 CO	HB 12 CF	CB 18 CO	DB 30 CO	AB 30 CF	IT 40 CF
CB 12 CF	HB 12 CO	AB 18 CF	CB 30 CF	AB 30 CO	
CB 12 CO	IT 18 CF	AB 18 CO	CB 30 CO	DB 40 CF	
AB 12 CF	DB 18 CF				
	DB 18 CO				

Description

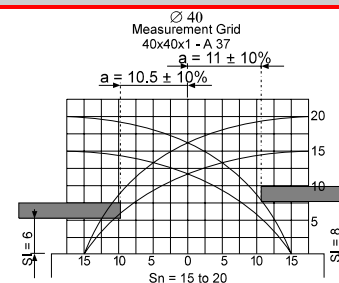
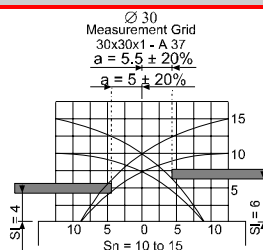
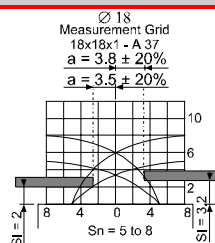
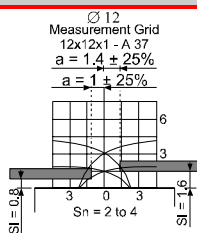
Type: Cylindrical with LED
 Models: 12 - 18 - 30 - 40
 Nominal range: 2 to 20 mm in accordance with the model (see data sheets)
 Supply voltage: 8 to 48 VDC
 Connection: by cable, 2 or 6 mm length, or by connector
 Output: 2 wires non-polarized, DC
 Max. output current: 100 mA DC
 Manufactured in accordance with European norms (CENELEC)



Housing material:

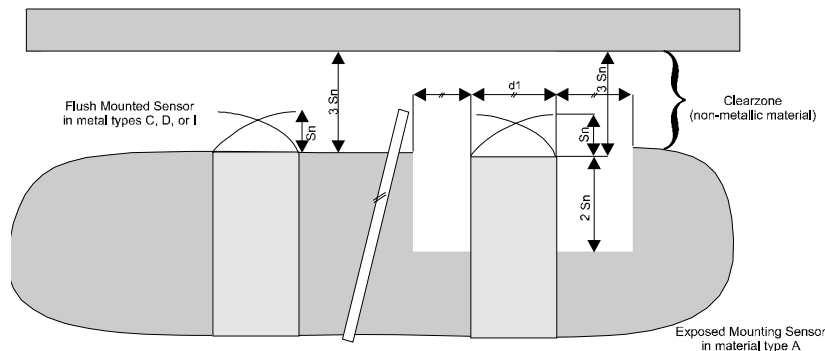
- Metallic
- High performance plastic casing
- For specialized connectors see Appendix A
- Translucent housing with LED, for use with BINDER, TUCHEL, HIRCHMANN, BRAD HARRISON Connectors
- Or with Connection Chamber, using "FASTON" cable terminals \varnothing 30-40
- Or with 80 cm cable and LUMBERG plug

Detection curves



Note: Consult us for copper, brass, aluminum, and certain stainless steels with reduced ranges.

Metallic environment



Technical characteristics at 25°C

Diameter	Ø 12 mm					Ø 18 mm			Ø 30 mm			Ø 40 mm	
Designation	Sym	DB	CB	HB	AB	IT	DB,CB	AB	IT	DB, CB	AB	IT	DB
Nominal range (frontal approach)	Sn	2 mm		4 mm		4mm	5 mm	8mm	10mm	10 mm	15 mm	15 mm	15 mm
Direct voltage (+15%, -20%)	U	8 - 48 V				8 - 48 V			8 - 48 V			8 - 48 V	
Max switching Frequency	F. Max	100 Hz				100 Hz			100 Hz			100 Hz	
Residual voltage (closed)	Ud	4 V				6 V	4 V		6 V	4 V		6 V	4 V
“Extended Temperature” Et. 215		No				No	Yes		No	Yes		No	Yes
Max output current	I Max	100 mA				100 mA			100 mA			100 mA	
Quiescent current drain	I Min	1 mA				1 mA			1 mA			1 mA	
Residual voltage (open)	INA	0.5 mA				0.6mA	0.5 mA		0.6 mA	0.5 mA		0.6 mA	0.5 mA
Weight	m	80 g				150 g			300 g			370 g	
Short-circuit protection	ε T	-25 +70 C				-25 +70 C			-25 +70 C			-25 +70 C	
Restrictions		Yes				No	Yes		No	Yes		No	Yes
Dimensions	Fig.	A		C	A	B	A	A	B	A	A	B	A

Common characteristics

Led output
 Open or closed function
 Non-polarized
 IP-67 protection
 Protected against industrial interference
 Running differential = 0.1 Sn
 Recommended distance = 0.4 Sn
 Maximum drift (f) of T = 0.1 Sn

Configurations

For use with Connector (see Appendix A)
 Ex.: add Suffix /Binder
 For greater temperature range add Suffix ET. 245
 For metal nut version add Suffix /EM
 For shorter versions (40mm), only IT models are available.

Dimensions

Ref	d1	d	I4	I2	I1	d3	m	s/p	I3
12	M 12 x1	10		50	42	20	4	17	
18	M 18 x 1	16.5		76	57	28	4	24	40
30	M 30 x 1.5	28	86	76	57	42	5	36	
40	M 40 x 1.5	38	86	76	57	53	5	46	40

Fig. A

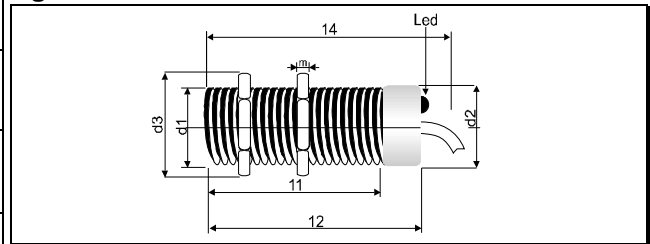


Fig. B

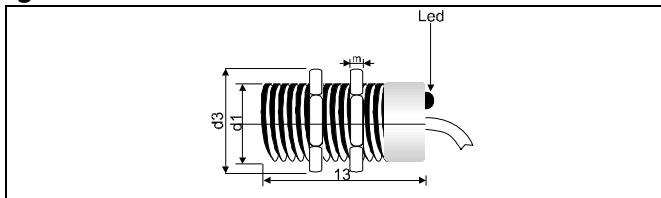
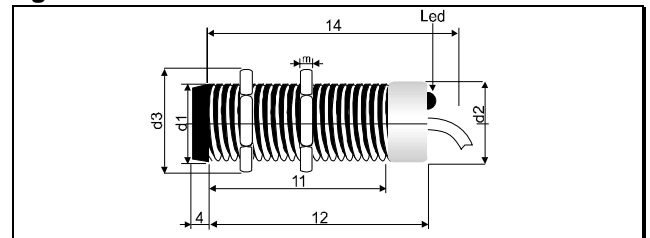


Fig. C



Cylindrical Sensors - 3 wires (DC)

(Models: 4 - 5 - 6.5 - 8 - 12 - 18 - 30 - 40)

Available configurations

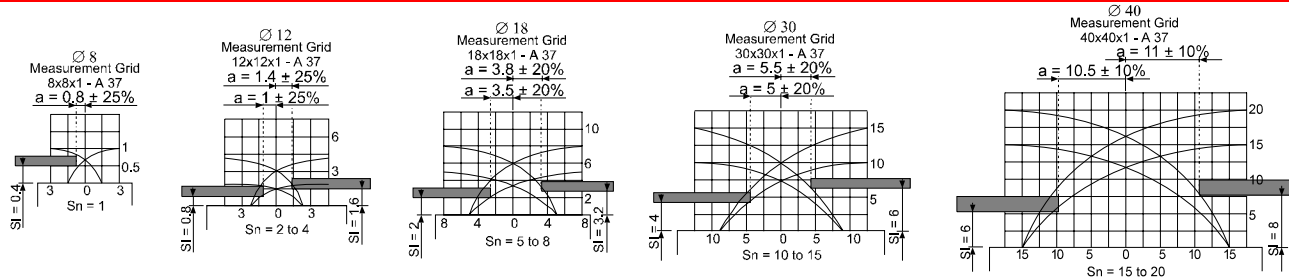
DB 4 CPF 8-24 V	IT 8 CNF 8-24 V/48 V	DB 12 CNF 8-48 V	HB 12 CPO 8-48 V	DB 30 CPF 24-48 V	DB 40 CPF 24-48 V
DB 5 CPF 8-24 V	IT 8 CNO 8-24 V	DB 12 CNO 8-48 V	DB 18 CPF 8-48 V	DB 30 CNO 24-48 V	DB 40 CPO 24-48 V
IT 6.5 CPF 8-48 V	IT 8 LCNF 8-24 V/48 V	DB 12 CNF 8-48 V	DB 18 CPO 24-48 V	DB 30 CPO 24-48 V	DB 40 CNO 24-48 V
IT 6.5 CPO 8-24 V/48V	IT 8 LCPF 8-24 V/48V	CT 12 CPF 8-48 V	DB 18 CNF 24-48 V	DB 30 CNF 24-48 V	DB 40 CNF 24-48 V
IT 6.5 CNF 8-24 V	IT 8 LCPF 8-24 V/48V	CT 12 CPO 8-24 V/48 V	CB 18 CPE 24-48 V	CB 30 CPF 24-48 V	
IT 6.5 CNO 8-24 V	DB 12 CPF 8-48 V	AT 12 CPF 8-48 V	AB 18 CPF 24-48 V	CB 30 CPO 24-48 V	
IT 8 CPF 8-48 V	DB 12 CPO 8-48 V	AT 12 CPO 8-24 V/48	AB 18 CPO 24-48 V	AB 30 CPF 24-48 V	
IT 8 CPO 8-48 V		HB 12 CPF 8-48 V		AB 30 CNF 24-48 V	

Description

Type: cylindrical with LED.
 Nominal range: 0.8 to 20 mm depending on the model (see data sheets).
 Supply voltage: dependent upon model.
 Connection: by 2 or 6m cable, or connectors (see Appendix A)
 Output: 3 wires DC PNP or NPN (see available configurations)
 Max. output current: 50 to 200 mA depending on the model (see technical data sheets).
 Manufactured in accordance with European norms - CENELEC.
 Housing: metallic.
 High performance plastic casing.

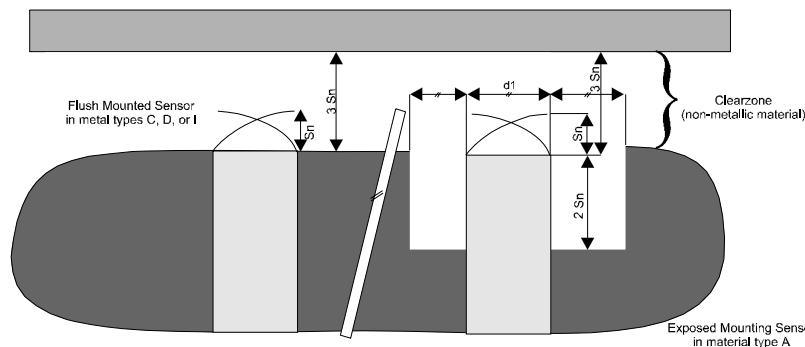


Detection curves



Note: Consult us for copper, brass, aluminum, and certain stainless steels with reduced ranges .

Metallic environment



Technical characteristics at 25°C

Diameter		Ø 4 mm	Ø 5 mm	Ø 6.5 mm	Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm	Ø 40 mm			
Designation	Sym	DB	DB	IT	IT	IT,CT	HB,AT	DB,CB	AB	DB,CD	AB	DB
Nominal range (frontal approach)	Sn	0.8 mm	0.8 mm	1 mm	1 mm	2 mm	4 mm	5 mm	8 mm	10mm	15mm	2 mm
Alternating current (+15%, -20%)	U	8 - 24 V	8 - 24 V	8 - 24 V, 8 - 48 V, or 48 V	8 - 24 V, 8 - 48 V, or 48 V	8 - 48 V or 8 - 24 V		8 - 48 V 24/48		24 - 48 V		24 - 48 V
Max switching frequency	F Max	1000 Hz	1000 Hz	1000 Hz	500 Hz	500 Hz		500 Hz		500 Hz		500 Hz
Residual voltage (closed)	Ud	1.5 V	1.5 V	1.5 V	1.5 V	1.5 V		1.5 V		1.5 V		1.5 V
Extended temperature range Et. 215		No	No	No	No	No		No		No		No
Quiescent current drain	I Max	100 mA	100 mA	50 mA	80 mA	80 mA		80-160 mA		80-160 mA		80-160 mA
Max output current	Io	10 mA	10 mA	10 mA	10 mA	10 mA		20 mA		20 mA		20 mA
Max leakage current (open)	Ur				0.1 V	0.1 V		0.1 V		0.1 V		0.1 V
Weight	m	35 g	35 g	50 g	45 g	80 g		150 g		300 g		370 g
Temperature range	ΔT	-10 +65 C	10 +65 C	-20 +65 C	-20 +70 C		-25 +70 C		25 +70 C		25 +70 C	
Short-circuit protection		Yes	Yes	No	No		No		Yes		Yes	
Dimensions	Fig.	B	A	B	A	B	A	C	A	A		A

Common characteristics

Open or closed function
 IP 67 protection
 Protected against industrial interference
 Running differential = 0.1 Sn
 Recommended distance = 0.4 Sn
 Max. temperature drift = 0.1 Sn

Configurations

- For Connector version please see Appendix A
 Ex.: add Suffix /Binder
 - For 0.8 m output cable with Ø 12 or Ø 18 Connector,

Dimensions

Ref	d1	d2	l4	l2	l1	d3	m	s/p
4	no threads	4		28				
5	M 5 x 0.5			28	23		3	8
6.5	no threads	6.5		40				
8	M 8 x 1	6.5		50	42		4	13
8	no threads			50				
12	M 12 x 1	10		50	42	20	4	17
18	M 18 x 1	16.5		76	57	28	4	24
30	M 30 x 1.5	28	86	76	57	42	5	36
40	M 40 x 1.5	38	86	76	57	53	5	46

Fig. A

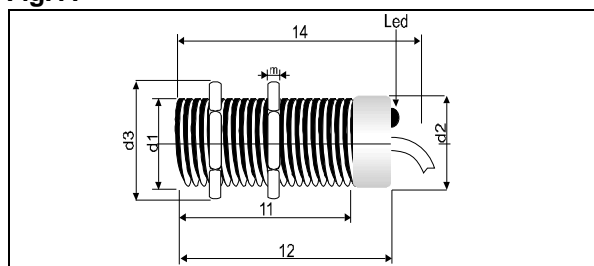


Fig. B

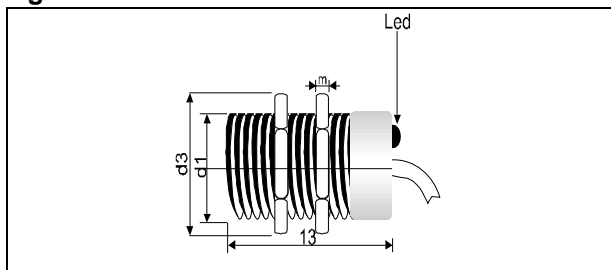
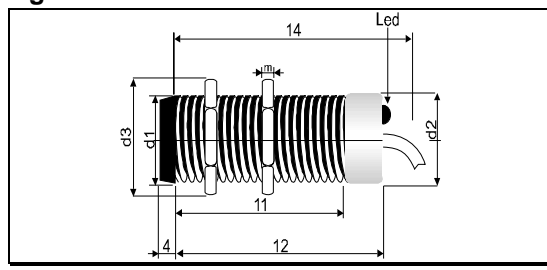


Fig. C



Cylindrical Sensors 2 wires (AC)

Models: 18 - 30 - 40

Available configurations

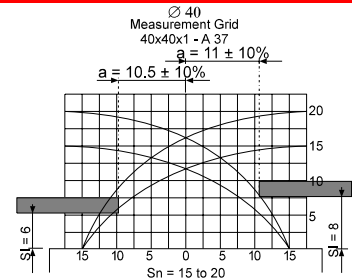
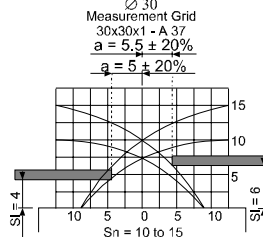
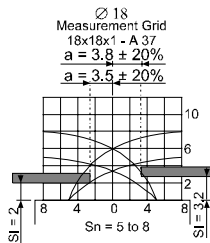
IT 18 AF	IT 30 AF	IT 40 AF
IT 18 AO	IT 30 AO	IT 40 AO
CT 18 AF	CT 30 AF	
CT 18 AO	CT 30 AO	
AT 18 AF	AT 30 AF	
AT 18 AO	AT 30 AO	

Description

Type: cylindrical with LED (models 18 - 30 - 40).
 Nominal range: 5 to 20 mm depending on the model (see technical data sheets).
 Supply voltage: 24 to 220 VAC for \varnothing 18 - 30 - 40.
 Connection: by 2 or 6m cable, or by connector (See Appendix A).
 Output: 2 wires AC.
 Max. output current: 600 mA AC.
 Housing: Metallic high performance plastic casing.

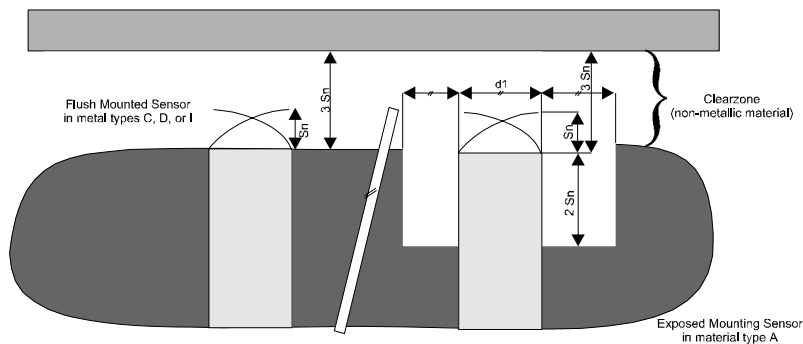


Detection curves



Note: Consult us for copper, brass, aluminum, and certain stainless steels, with reduced ranges.

Metallic environment



Technical Characteristics at 25°C

Diameter		Ø 18 mm		Ø 30 mm		Ø 40 mm
Designation	Sym	IT, CT	AT	IT, CT	AT	IT
Nominal range (frontal approach)	Sn	5 mm	8 mm	10 mm	15 mm	15 mm
Alternating current (+15%, -20%)	U	24-220 V		24-220 V		24-220V
Max switching frequency	F. Max	5 Hz		5 Hz		5 Hz
Residual voltage (closed)	Ud	5 V		5 V		5 V
Extended temperature range Et. 215		No		No		No
Corresponding to EN 50036 Norm		Yes		Yes		Yes
Max output current	I Max	600 mA		600 mA		600 mA
Min output current	I Min	10 mA		10 mA		10 mA
Max leakage current (open)	INA	5 mA		5 mA		5 mA
Weight	m	150 g		300 g		370 g
Temperature range	ΔT	-25 +70 C		-25 +70 C		-25 +70 C
Short-circuit protection		No		No		No
Dimensions	Fig.	A		A		A

Common characteristics

LED output
 Open or closed function
 IP 65 protection
 Protected against industrial interference
 Differential run = 0.1 Sn
 Recommended distance = 0.4 Sn
 Max. temperature drift = 0.1 Sn

Dimensions

Ref	d1	d2	l4	l2	l1	d3	m	s/p
18	M 18 x 1	16.5		76	57	28	4	24
30	M 30 x 1.5	28	86	76	57	42	5	36
40	M 40 x 1.5	38	86	76	57	53	5	46

Fig A.

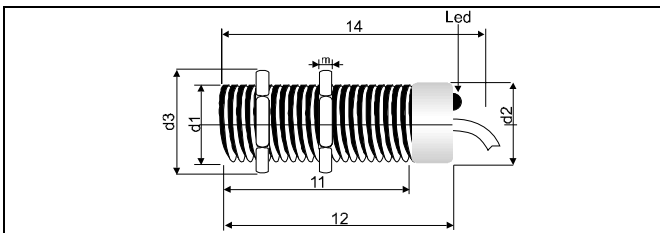
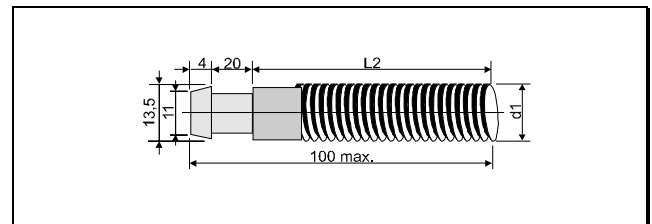


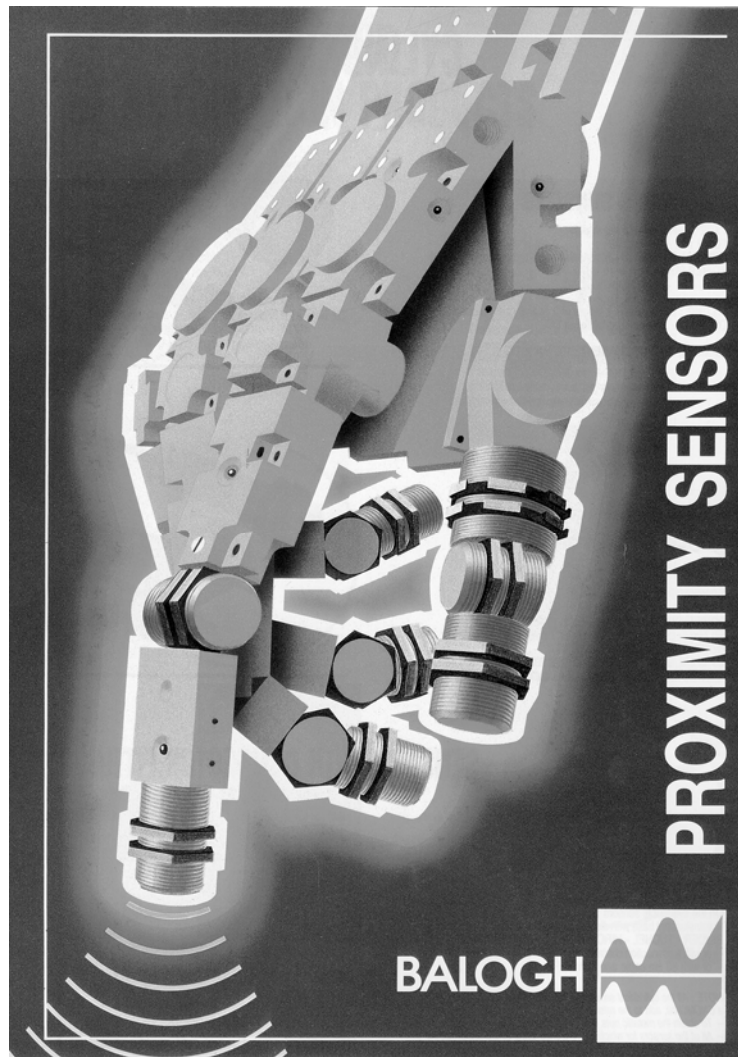
Fig B.



Cylindrical Sensors with Connectors

Male Connectors	Output	Connections	Suffix	Protection	Sensors
	M12 Plastic	1=+VDC 2=Nc 3=Charge 4=Nc	/Binder	IP67	Ø12 2 wires VDC Non-polarized
		1=+VDC 2=Nc 3=Nc 4=Charge	/319		
	M12 Metal	0:1+VDC 2=Charge F:3=+VDC 4=Charge	/BM319		
	M12 Plastic	0:1+VDC 2=Charge F:3=+VDC 4=Charge	/BM382		
	M12 Metal	1=+VDC 2=Nc 3=Charge 4=Nc	/BM345		
	M12 Plastic	1=+VDC 2=Nc 3=-VDC 4= Charge	/BM381		
1=+VDC 2=-VDC 3=-Charge 4= Nc		/381			
		/Binder			
	M18 Plastic	1=+VDC 2=Nc 3=Charge 4=Nc	/Binder	IP67	Ø18 2 wires VDC Non-polarized
		0:1+VDC 2=Charge F:3=+VDC 4=Charge	/382		
		1=~ 2=Nc 3=~ 4=Nc	/Binder		Ø18 2 wires VAC
		1=+VDC 2=-VDC 3=Charge 4=Nc	/Binder		
		1=+VDC 2=Nc 3=-VDC 4= Charge	/381		Ø18 3 wires VDC
		1=+VDC 2=Nc 3=-Nc 4= Charge	/319		
	M12 Plastic	1=+VDC 2=Nc 3=Charge 4=Nc	/345	IP67	Ø18 2 wires VDC Non-polarized
	M12 Metal	1=+VDC 2=Nc 3=-VDC 4=Charge	/BM345		
		1=+VDC 2=Nc 3=-VDC 4=Charge	/BM381	IP67	Ø18 3 wires VDC
		0:1+VDC 2=Charge F:3=+VDC 4=Charge	/BM382	IP67	Ø18 2 wires VDC Non-polarized
		1=+VDC 2=Nc 3=-Nc 4= Charge	/BM319	IP67	
	M12 Plastic	0:+VDC 2=Charge F:3=VDC 4=Charge	/BM381	IP67	Ø18 3 wires VDC
	M18 Plastic	1=+VDC 2=Nc 3=Charge 4=Nc	/Binder	IP67	Ø30 2 Wires VDC Non-polarized
		1=~ 2=Nc 3=~ 4=Nc	/Binder	IP67	Ø30 2 wires VAC
		1=+VDC 2=-VDC 3=Charge 4=Nc	/Binder	IP67	Ø30 3 wires VDC
		0:+VDC 2=Charge F:=3+VDC 4=Charge	/382	IP67	Ø30 2 wires VDC Non-polarized
		1=+VDC 2=Nc 3=-VDC 4=Charge	/381	IP67	Ø30 3 wires VDC

Rectangular Sensors



Rectangular Sensors 2 wires (DC)

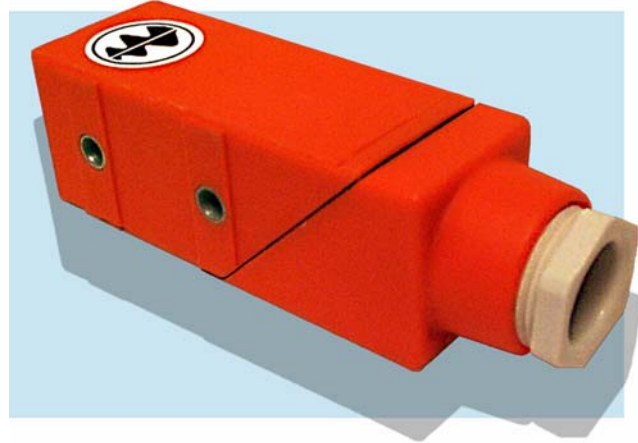
Models: 57 - 87

Available configurations

IT 57 /LCF IT 57 BLCF IT 57 CLCF IT 57 ELCF DB 87 LCF IT 87 LCF
 IT 57 /LCO IT 57 BLCO IT 57 CLCO IT 57 ELCO DB 87 LCO IT 87 LCO
 IT 57 /FCF IT 57 BFCF IT 57 CFCF IT 57 EFCF DB 87 FCO IT 87 FCF
 IT 57 /FCO IT 57 BFCO IT 57 CFCO IT 57 EFCO DB 87 FCF IT 87 FCO

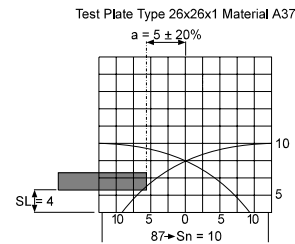
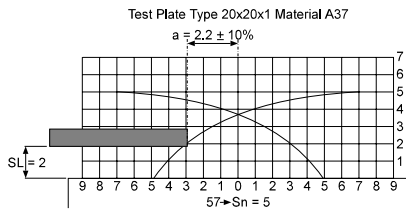
Description

Type: rectangular 26 x 26 (Model 87)
 20 x 20 (Model 57)
 Nominal range: 5 or 10mm
 Supply voltage: 8 to 48 VDC
 High performance plastic casing.
 Connection: by Connection Chamber (post with screw) (87) by Terminal "FASTON" (57).
 Output: 2 wires non-polarized DC.
 Max. output current: 100 mA DC.
 In accordance with NAMUR Specifications (see NAMUR documentation).



DB87 shown

Detection curves



Note: Consult us for copper, brass, aluminum, and certain stainless steels, with reduced ranges.

Metallic environment

Designation	57	87
Clear zone (no metal present) r = (mm)	15	25

Technical characteristics at 25°C

Type		57	57	87	87
Designation	Sym.	IT (L)	IT (F)	IT (L) (F)	DB (F) (L)
Nominal range (frontal approach)	Sn	5 mm	5 mm	10 mm	10 mm
Direct voltage (+15%, - 20%)	U	8-48 V	8-48 V	8-48 V	8-48 V
Max switching frequency	F. Max	100 Hz	100 Hz	100 Hz	100 Hz
Residual voltage (closed)	Ud	6 V	6 V	6 V	4 V
Extended temperature range Et. 215		No	No	Yes	Yes
Max output current	I Max	100 mA	100 mA	100 mA	100 mA
Min output current	I Min	1 mA	1 mA	1 mA	1 mA
Leakage current (open)	INA	0.6 mA	0.6 mA	0.5 mA	0.5 mA
Weight	m	25 g	25 g	80 g	80 g
Temperature range	ε T	-25 +70 C	-25 +70 C	-25 +70 C	-25 +70 C
Short-circuit protection		No	No	No	Yes
Dimensions	Fig.	A	A	B	B

Common characteristics

Open or closed function.
 Non-polarized.
 Protected against industrial interference.
 Differential run = 0.1 Sn
 Recommended distance = 0.4 Sn
 Max. temperature drift = 0.1 Sn

Configurations

-IP 65, with Stuffing Box and Saddle-Mount Terminal "B" (57).
 -IP 65, with Stuffing Box and Screw "C" (57).
 -IP 67, with Cable and Saddle-Mount Terminal (57) "E".

-IP 00, With naked "FASTON" Terminals (57): "/".
 -For 0.8 m output cable with \varnothing 18 Connector, add Suffix "/324".
 -Increased range: Sn 15 mm.
 DB 87 LC * /346.
 DB 87 FC * /346.
 *Function: open or closed.

Accessories

- Cables

Fig. A

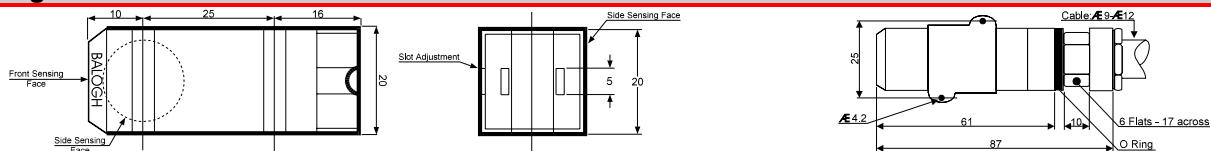
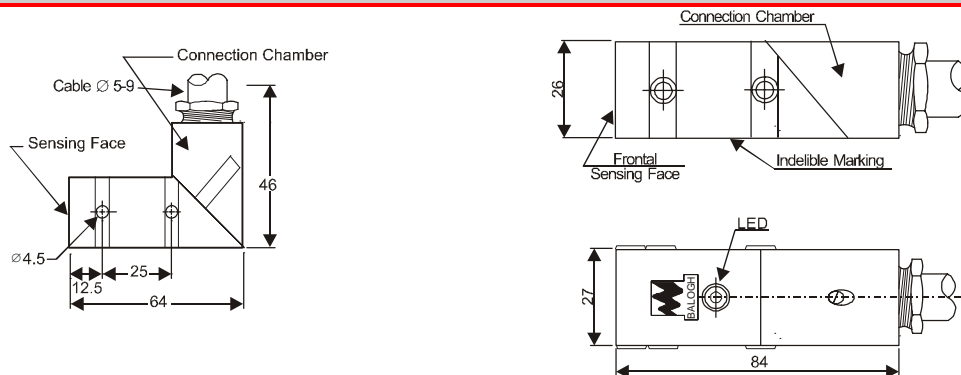


Fig. B



Models: 57 - 87

BALOGH 7699 Kensington Court - Brighton, MI 48116-8561 - (248) 486-RFID - Subject to Modifications

Rectangular Sensors 2 wires (AC)

Available configurations

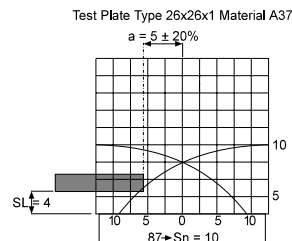
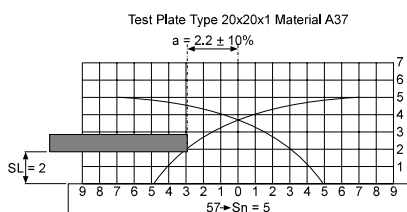
IT 57 EFAF IT 87 FAO
 IT 57 EFAO IT 87 FAF

Description

Rectangular miniature Proximity Sensor (57)
 Reliable and economical
 IP 67 protection with Cable and Saddle Mount Terminal
 High performance plastic casing
 Connection:
 • By cable (57)
 • By posts with screw (87)
 Extended voltage range
 Lateral detection: does not exist in AC



Detection curves



Note: Consult us for copper, brass, aluminum, and certain stainless steels with reduced ranges.

Metallic environment

Designation	57	87
Clear zone (no metal presence) r = mm	15	25

Technical Characteristics at 25° C

Model		57	87
Designation	Sym.	IT	IT
Nominal range (frontal approach)	Sn	5 mm	10 mm
Alternating voltage (+15%, -20%)	U	110-220 V	24-220 V
Maximum switching frequency	F Max	3 Hz	5 Hz
Residual voltage (closed)	Ud	8 V	5 V
Maximum output current	I Max	200 mA	600 mA
Minimum output current	I Min	10 mA	10 mA
Leakage current (open)	INA	5 mA	5 mA
Weight	m	25 g	80 g
Temperature range	ε T	-25 +70 C	-25 +70 C
Short circuit protection		No	No
Dimensions	Fig.	A	B

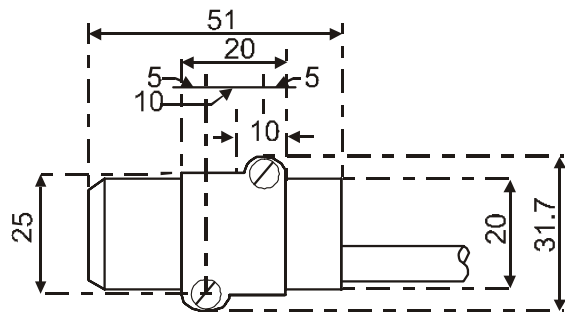
Common characteristics

Fig. A

Open or closed function
 Non-polarized
 IP 67 or IP 65 protection
 Protected against industrial interference
 Differential run = 0.1 Sn
 Recommended distance = 0.4 Sn
 Max. temperature drift = 0.1 Sn

Configuration

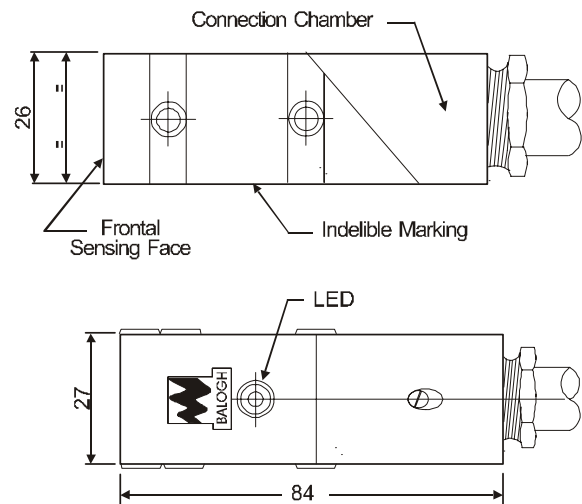
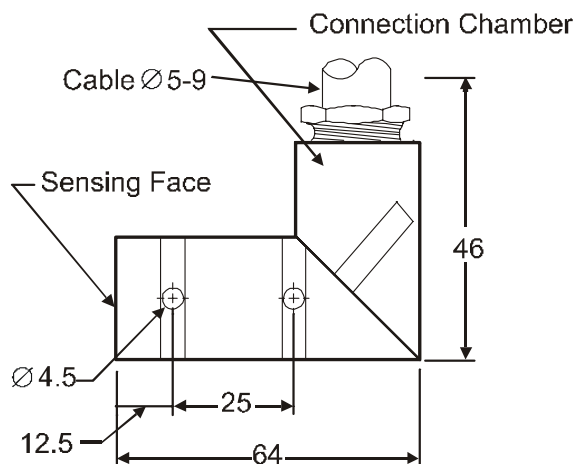
-IP 67 with Cable and Saddle - Mount Terminal "E"
 (without punch-out holes)



Accessories

Cables

Fig. B



Sensors 26x26 with Wiring Chamber

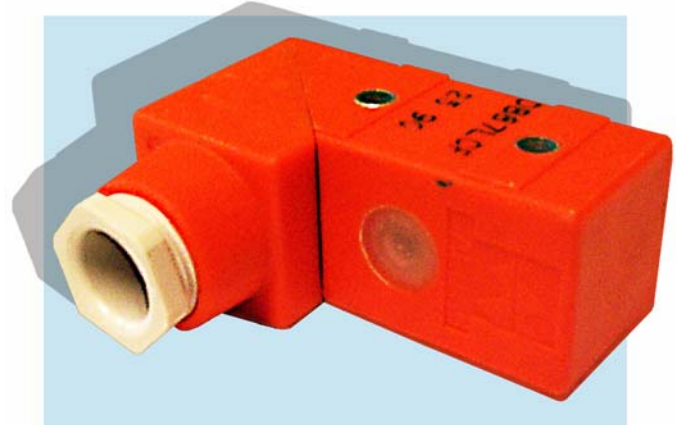
DBS Type 87 for welding applications

Available configurations

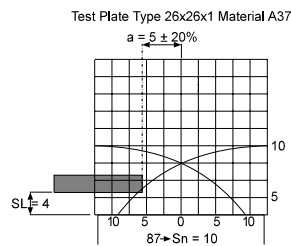
DBS 87 FCF DBS 87 FCO
DBS 87 LCF DBS 87 LCO

Description

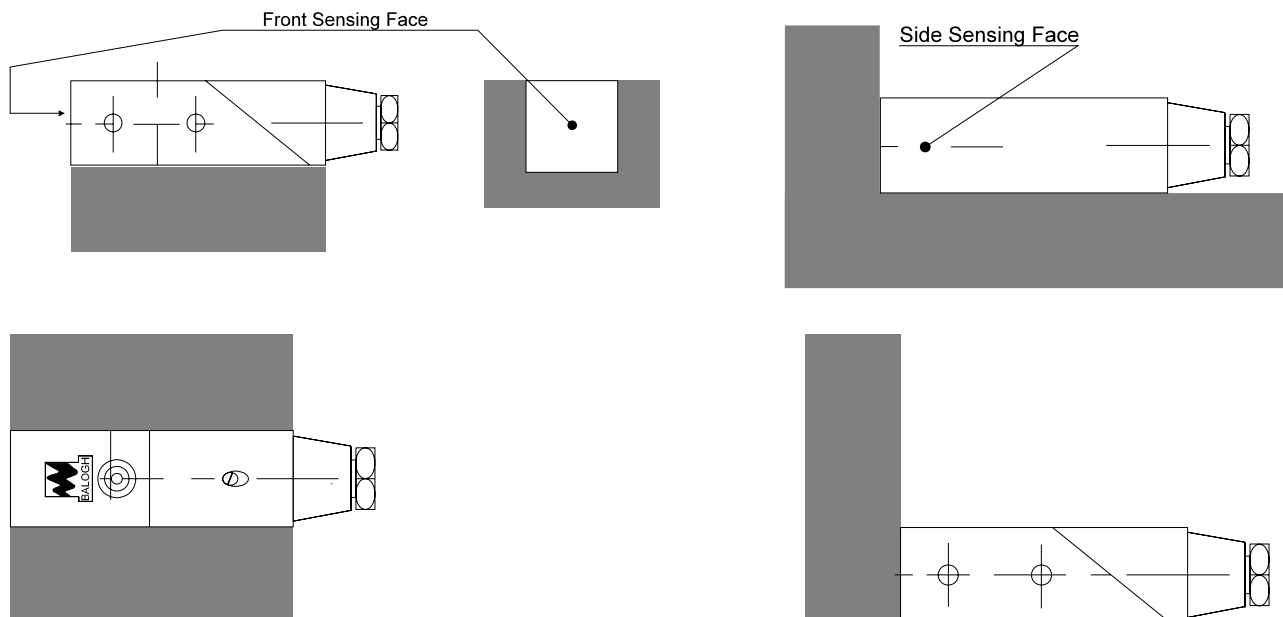
Nominal range: 10 mm.
Supply voltage: 8 to 48 VDC.
Sensor activated by metal (on 3 faces).
Connection: M12 connector screws.
Output: 2 wire non-polarized.
Provides immunity to magnetic fields: 50m Tesla.



Detection curves



Metallic environment



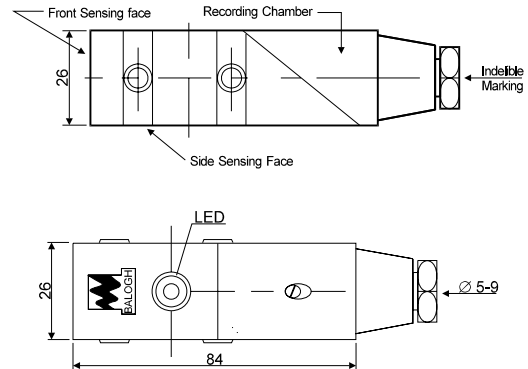
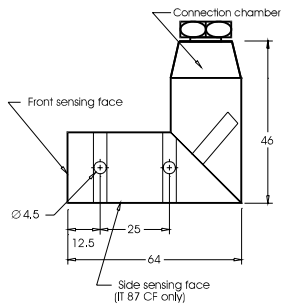
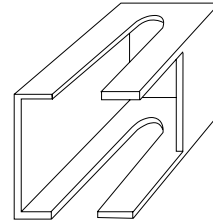
Technical characteristics at 25°C

Designation	Sym.	DBS87 FCF	DBS87 FCO	DBS87 LCF	DBS87 LCO
Nominal range (frontal approach)	Sn	10 mm	10 mm	10 mm	10 mm
Recommended distance for side approach	Sr	4 mm	4 mm	4 mm	4 mm
Direct voltage (+15%, -20%)	U	8 - 48 VDC*	8 - 48 VDC*	8 - 48 VDC*	8 - 48 VDC*
Residual voltage	Ud	4 V	4 V	4 V	4 V
Max switching frequency	F Max	15 kz	15 kz	15 kz	15 kz
Function		Open	Closed	Open	Closed
Max output current	I Max	20 mA	20 mA	20 mA	20 mA
Min output current	I Min	1 mA	1 mA	1 mA	1 mA
Residual voltage	I r	0.5 mA	0.5 mA	0.5 mA	0.5 mA
Degree of protection		IP 65	IP 65	IP 65	IP 65
Weight	m	25 g	25 g	25 g	25 g
Temperature range	Δ T	-25 C + 70 C	-25 C + 70 C	-25 C + 70 C	-25 C + 70 C
Short circuit protection		Yes	Yes	Yes	Yes

* variance <10%

Welding accessory

For models "87" and "89" the CP26 provides covers to be used in welding applications. The CP26 does not generate an inductive proximity sensor range.



Sensors 26 x 26 Output Cable

Type 89, short version

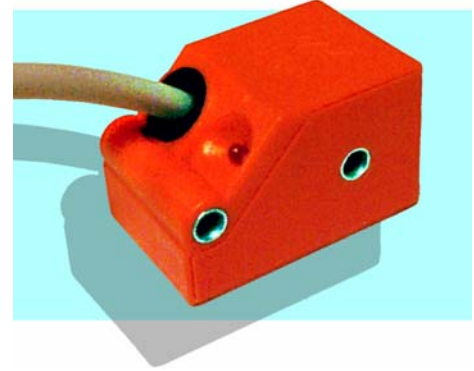
Available configurations

DB 89 LCF	DB 89 LMF	DBS 89 LCO
DB 89 LCO	DB 89 FMO	DBS 89 LCF
DB 89 FCO	DB 89 LMO	DBS 89 FCO
DB 89 FCF	DB 89 FMF	DBS 89 FCF

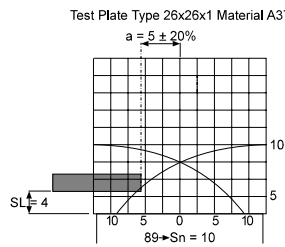
Specify type of Connector or Output

Description

Type: rectangular with 26mm Connection Chamber (short version).
 Nominal range: 10mm.
 Supply voltage: 8 to 48 VDC or 8 to 130 VDC/VAC.
 Connection: cable with or without Connector (see profile).
 Output cable is at 45° to allow the Sensor to be mounted at 90°.
 Output: 2 wire non-polarized.
 Maximum output current: 100 mA.
 Adaptable to harsh industrial environments.
 Sensor activated by metal.

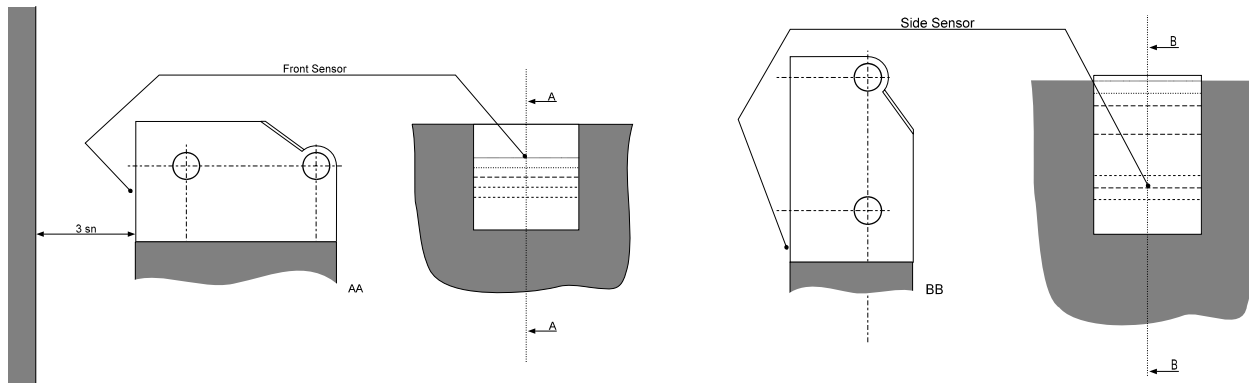


Detection curves



Note: Consult us for copper, brass, aluminum, and certain stainless steels with reduced ranges.

Metallic environment



Technical characteristics at 25°C

Model		89 C	89 M	89 C
Designation	Sym.	DB		DBS*
Nominal range	Sn	10 mm		10 mm
Direct voltage (+15%, -20%)	Uc	8 - 48 VDC		8 - 48 VDC
Universal voltage	Uc/A		8 - 130 VDC and VAC	
Maximum switching frequency	F. max	100 Hz		15 Hz
Degree of protection		IP 67		IP 67
Maximum output current	I Max	100 mA		100 mA
Minimum output current	I Min	1 mA		1 mA
Residual voltage (closed)	Ud	≤ 4 V	≤ 6 V	≤ 4 V
Leakage current	INA	≤ 0.5 mA		≤ 0.5 mA
Weight	m	50 g		50 g
Temperature range	ε T	- 25 to 70 C		- 25 to 70 C

* DBS version provides immunity to magnetic fields, 50 Hz ≤ 50m Tesla.

Common characteristics

Open or closed function
 Non-polarized
 Protected against industrial interference
 Protected against short circuits
 Protected against inverse polarities
 Differential run ≤ 0.1 Sn
 Recommended distance = 0.4 Sn
 Maximum temperature drift = 0.1 Sn
 LED

Configuration

DB 89:

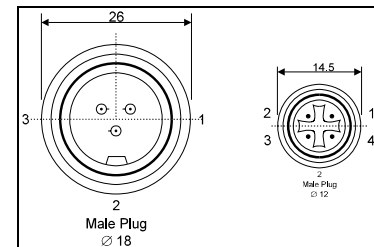
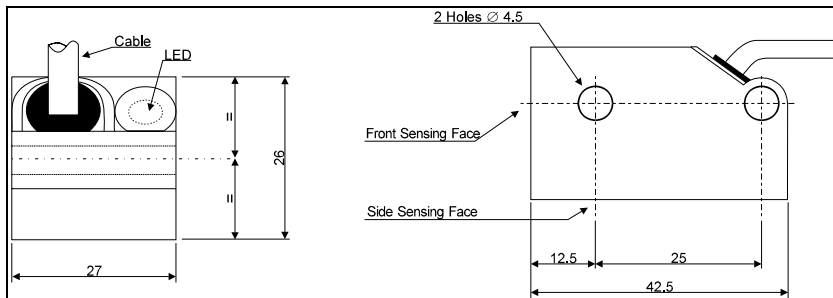
- 2 m Brown output cable. Ex.: DB 89 LCF
- 0.8 m Grey output cable with Ø 18, 3 wire Lumberg Connector. Ex.: DB 89 LCF/375
- 0.8 m Grey output cable with Ø 12, 4 wire Lumberg Connector. (3 wire compatible) Ex.: DB 89 FCF/385
- 0.8 m output cable with Ø 12, 4 wire Lumberg Connector. Add Suffix "/367" (See page 63)
- /396

Accessories

Cables (see page 58)

Applications: special welding

- 0.8 m Orange Ø 18, 3 wire output cable with Lumberg Connector. Add Suffix "/364" Ex.: DB 89 LCO/364
- 0.8 m Ø 12, 4 wire output cable with Lumberg Connector. Add Suffix "/365" Ex.: DBS 89 LCO/365
- 0.8 m Ø 12, 4 wire output cable: with Lumberg Connector. (closed: 3-4, open: 1-2) Add Suffix "/377"



Sensors with Connection Chambers

Models: 84 - 85

Available configurations

2 wires (AC)	2 wires (DC)	3 wires (DC)
IT 84 AF	DB 84 CF	DB 84 CPF
IT 84 AO	DB 84 CO	DB 84 CPO
IT 85 AF	DB 85 CF	DB 85 CPF
IT 85 AO	DB 85 CO	DB 85 CPO

Description

Type: rectangular with Connection Chamber.
Models: 84 and 85.

Nominal range: 25 mm (84) and 40 mm (85)
(adjustable by potentiometer - 85).

Supply voltage:

- 8 to 48 VDC (2 wires)
- 24 to 48 VDC (3 wires)
- 24 to 220 VAC

Connection: by Connection Chamber (post with screw)

Output:

- 2 wires non-polarized DC
- 3 wires DC PNP or NP
- 2 wires AC

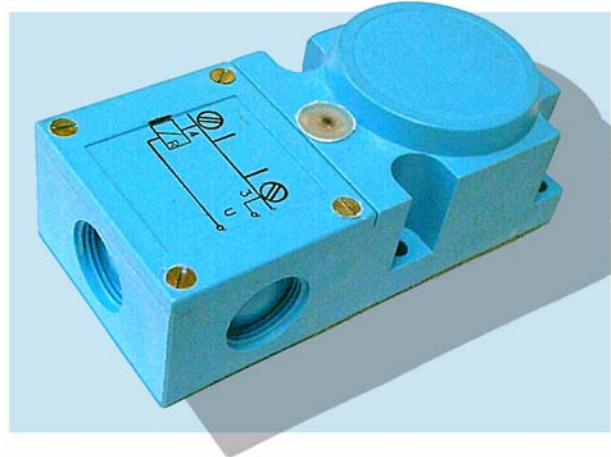
Maximum output current:

- 100 mA DC
- 600 mA AC

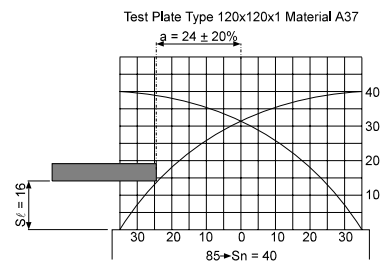
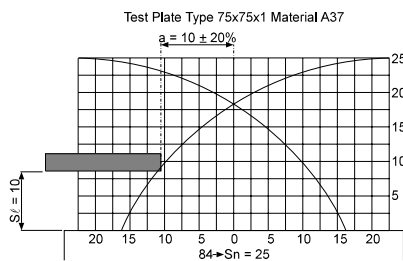
In accordance with European Norms EN 50026 and EN 50038.

High performance plastic casing.

Models in accordance with NAMUR Specifications (see NAMUR documentation).



Detection curves



Note: Consult us for copper, brass, aluminum, and certain stainless steels with reduced ranges.

Metallic environment

Designation	84	85
Clear zone (without metal presence) r = (mm)	60	100

Technical characteristics at 25° C

Type		84 C	84 CP	84 A	85 C	85 CP	85 A
Designation	Sym.	DB	DB	IT	DB	DB	IT
Nominal range (frontal approach)	Sn	25 mm	25 mm	25 mm	40 mm	40 mm	40 mm
Voltage (+15%, - 20%)	U	8 - 48 VDC	24 - 48 VDC	24-220 VAC	8 - 48 VDC	24 - 48 VDC	24-220 VAC
Maximum switching frequency	F Max	100 Hz	1000 Hz	5 Hz	100 Hz	1000 Hz	5 Hz
Residual voltage (closed)	Ud	4 V	1.5 V	5 V	4 V	1.5 V	5 V
Residual voltage (open)	Ur		0.1 V			0.1 V	
Maximum output current	I Max	100 mA	80 - 160 mA	600 mA	100 mA	80 - 160 mA	600 mA
Minimum output current	I Min	1 mA		10 mA	1 mA		10 mA
Maximum leakage current	INA	0.5 mA		5 mA	0.5 mA		5 mA
Weight	m	270 g	270 g	270 g	580 g	580 g	580 g
Temperature range	ε T	-40 +100 C	-25 +70 C	-25 +70 C	-40 +85 C	-25 +70 C	-25 +70 C
Short circuit protection		Yes	Yes	No	Yes	Yes	No
Dimensions	Fig.	A	A	A	B	B	B

Common characteristics

Output indicator (LED)
 Open or closed function
 IP 65 protection
 Protected against industrial interference
 Differential run = 0.1 Sn
 Recommended distance = 0.4 Sn
 Maximum temperature drift = 0.1 Sn

Configuration

Increased range
 Sn: 35 mm => DB 84 CF/346
 Sn: 60 mm => DB 85 CF/346

FIG. A

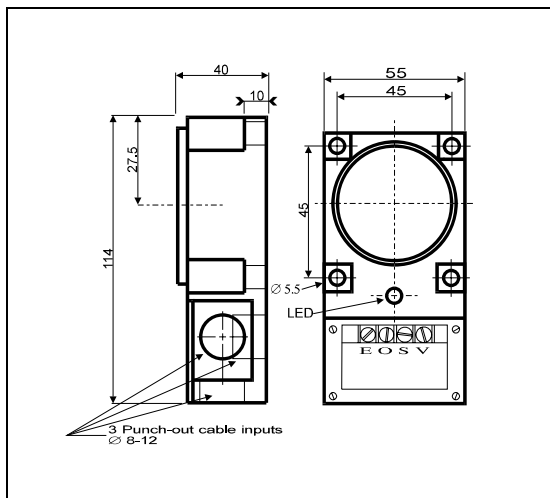
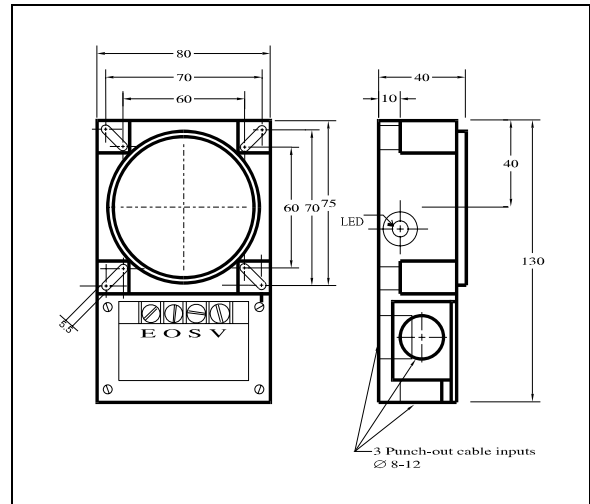


FIG. B



Sensors with Connection Chamber

Model 71

Available configurations

2 wires (DC)		3 wires (DC)		2 wires (AC)	
DB 71 SCF	DB 71 FCO	DB 71 SCPF	DB 71 FCPF	IT 71 FAF	IT 71 SAF
DB 71 SCO	DB 71 UCF	DB 71 SCPO	DB 71 FCPO	IT 71 FAO	IT 71 SAO
DB 71 FCF	DB 71 UCO	IT 71 UCP/	DB 71 FCNF	IT 71 UA/	

Description

Type: Rectangular 40 x 40.

Model: 71.

Nominal range: 15 mm.

Supply voltage:

- 8 to 48 VDC (2 wires)
- 24 to 48 VDC (3 wires)
- 24 to 220 VAC

Connection: by Connection Chamber (posts with screw).

Output:

- 2 wires non-polarized DC
- 3 wires DC PNP or NPN
- 2 wires AC

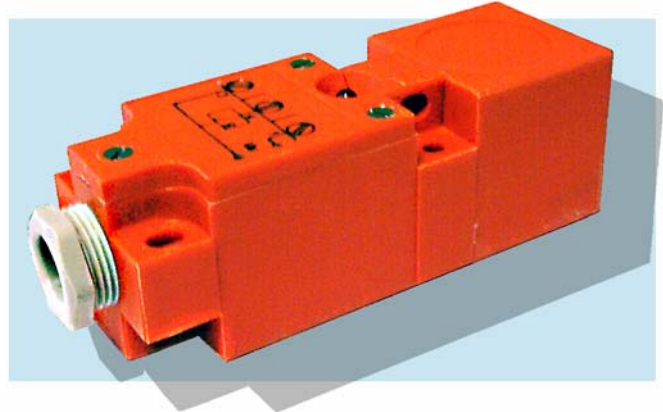
Max. output current:

- 100 mA DC
- 600 mA AC

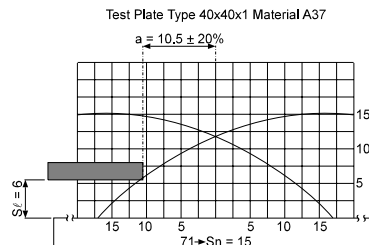
In accordance with European Norms EN 50025 and EN 50037.

High performance plastic casing to insure environmental immunity.

Model in accordance with NAMUR Specifications (see NAMUR documentation).



Detection curves



Note: Consult us for copper, brass, aluminum, and certain stainless steels, with reduced ranges.

Metallic environment

Designation	71
Clear zone (without metal presence) r = (mm)	40

Technical characteristics at 25° C

Model		*71(.)C	*71(.)CP	*71(.)A	71 UA	
Designation	Sym	DB	DB	IT	IT	
Nominal range (frontal approach)	Sn	15 mm	15 mm	15 mm	15 mm	
Voltage (+15%, -20%)	U	8 - 48 VDC	24 - 48 VDC	24 - 220 VAC	24-48 VAC	110-220 VAC
Maximum switching frequency	F. Max	100 Hz	100 Hz	5 Hz	5 Hz	
Residual voltage (closed)	Ud	4 V	1.5 V	5 V	5 V	7 V
“Extended Temperature” range Et. 215		Yes	No	No	no	
Residual voltage (open)	Ur		0.1 V			
Maximum output current	I Max	100 mA	80 - 160 mA	600 mA	600 mA	200 mA
Minimum output current	I Min	1 mA		10 mA	10 mA	10 mA
Leakage current (open)	INA	0.5 mA		5 mA	5 mA	
Weight	m	200 g	200 g	200 g	200 g	
Temperature range	ε T	-25 +70 C	-40 +100 C	-25 +70 C	-25 +70 C	
Short circuit protection		Yes	Yes	No	No	
Quiescent current drain	Io		20 mA			
Dimensions	Fig.	A	A	A	A	

*(.)Switching face

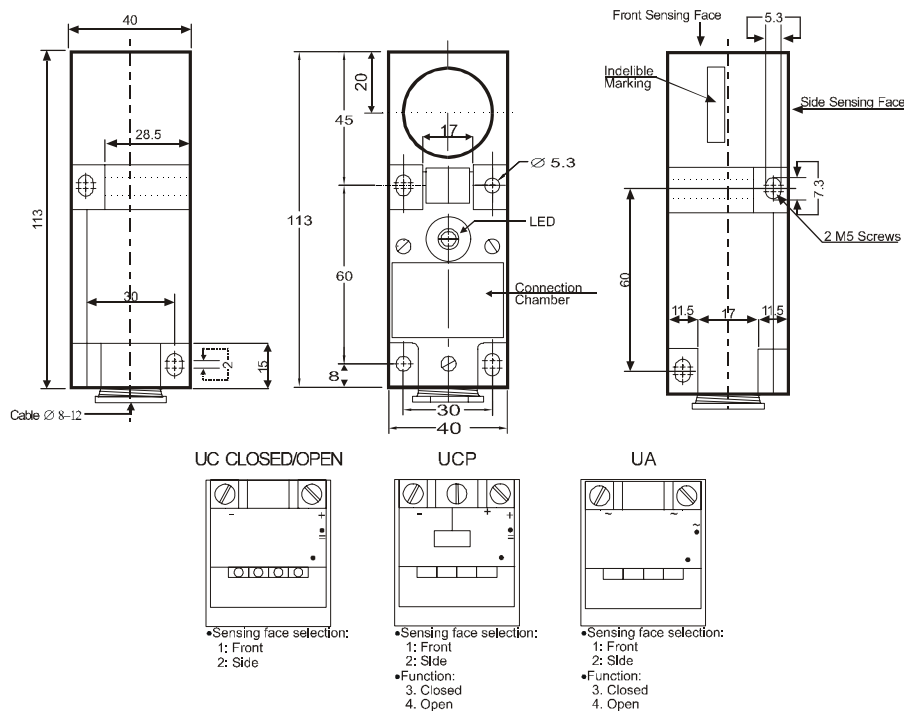
Common characteristics

Output indicator (LED).
 Open or closed function .
 IP 65 protection.
 Protected against industrial interference.
 Differential run = 0.1 Sn
 Recommended distance = 0.4 Sn
 Maximum temperature drift = 0.1 Sn

Configuration

Increased range - Sn: 25 mm
 DB 71 FC */346
 DB 71 SC */346
 *Function: open or closed.

Fig. A



Front Adjustable Sensors

Model 72

Available configurations

DB72 CF
AB72 CF

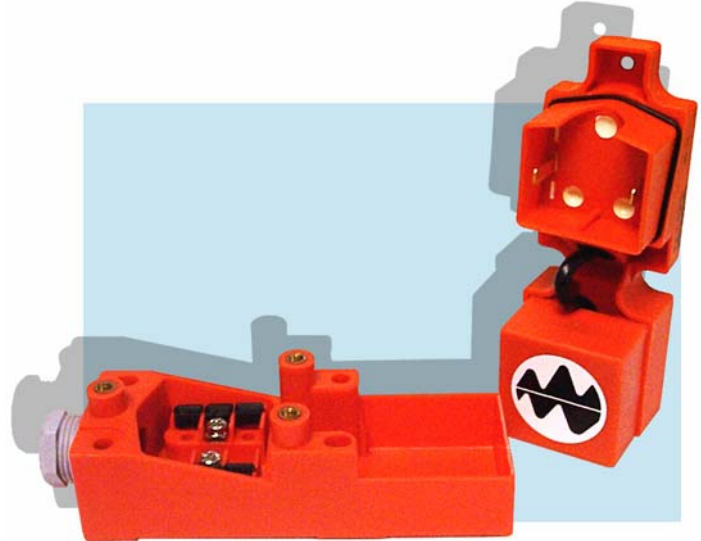
DB72 CX
AB72 CX

DB72 TX*
AB72 TX*

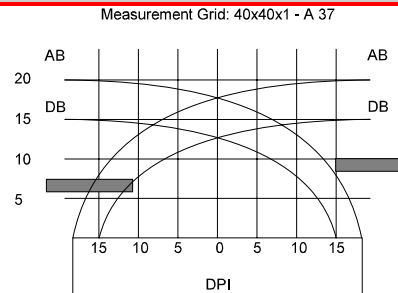
*Consult BALOGH

Description

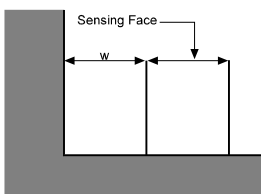
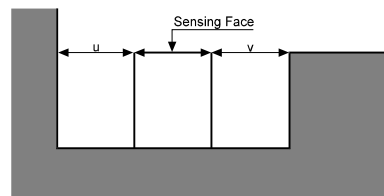
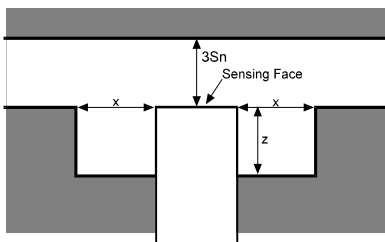
FORMEC, 40 x 40 mm, Fixation: 30 x 60 mm
Nominal range: 15 - 20 mm
Front orientation: 5 detection faces
Detachable
Connection: screw terminals
Output: 2 wires non-polarized



Detection curves



Metallic environment

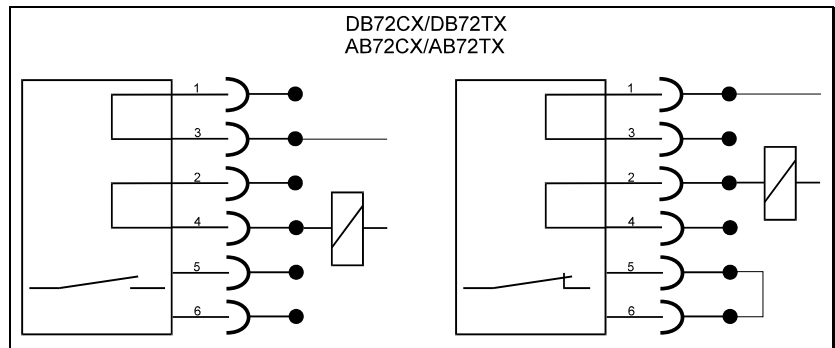
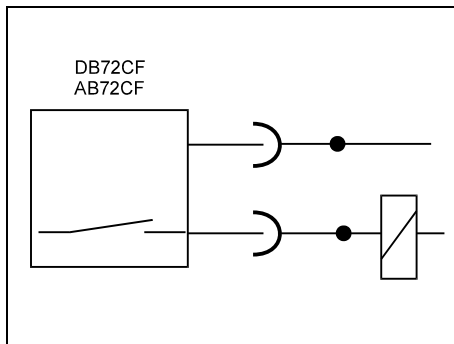


REF	DB72	AB72
X	≥0	≥40
Y	≥40	≥100
Z	≥2	≥40
U	≥40	≥80
V	≥0	≥60
W	≥40	≥60

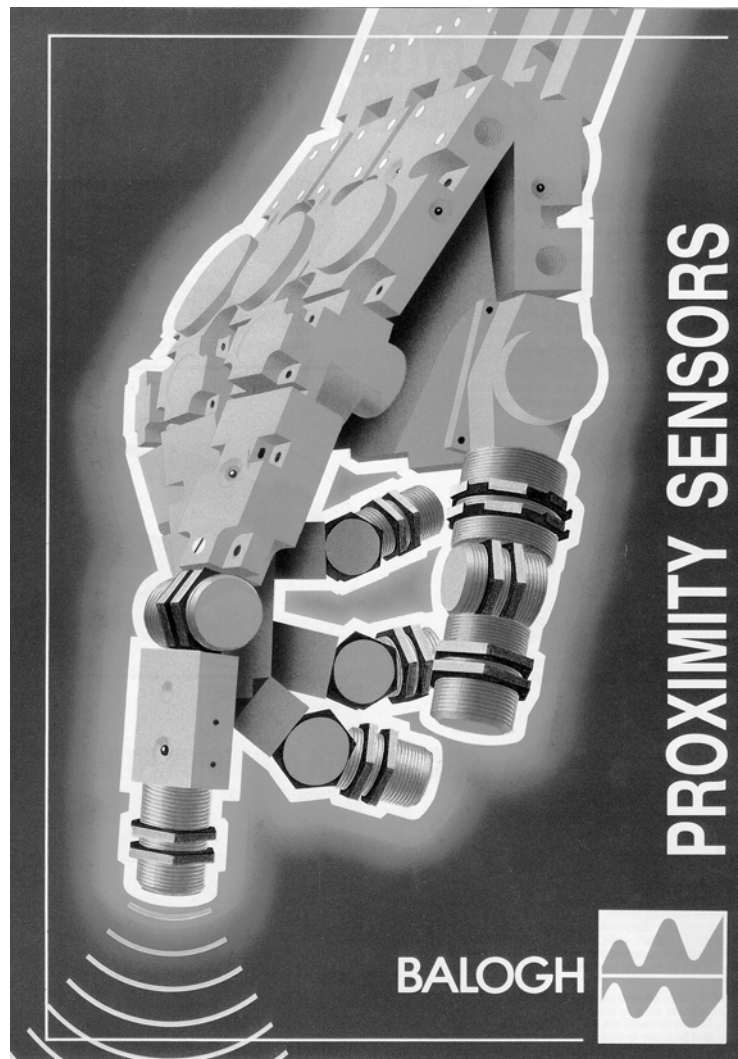
Technical characteristics at 25° C

Designation	Sym.	DB 72CF	AB 72CF	DB 72CX	AB 72CX	DB 72TX	AB 72TX
Nominal range (frontal approach)	Sn	15 mm	20 mm	15 mm	20 mm		
Recommended distance for side approach	Sr	6 mm	8 mm	6 mm	8 mm		
Voltage (+15%, -20%)	U	8- 48 VDC	8- 48 VDC	8- 48 VDC	8- 48 VDC		
Residual voltage	Ud	4 V	4 V	4 V	4 V		
Maximum switching frequency	F. Max	100 Hz	100 Hz	100 Hz	100 Hz		
Function		Open	Open	Closed	Closed		
Maximum output current	I Max	200 mA	200 mA	200 mA	200 mA		
Minimum output current	I Min	1 mA	1 mA	1 mA	1 mA		
Residual voltage	I r	0.5 mA	0.5 mA	0.5 mA	0.5 mA		
Degree of protection		IP 65	IP 65	IP 65	IP 65		
Weight	m	180 g	180 g	180 g	180 g		
Temperature range	C	-25 C +70 C	-25 C +70 C	-25 C +70 C	-25 C +70 C		
Short circuit protection		Yes	Yes	Yes	Yes		

Connections



Specialized Sensors



Machine Safety Sensors

Models: DS - OS - CES

Available configurations

Sensors		Objects		Boards	Board holders
DS 18	DS 71 F	OS 18	OS 40	CES 75 C 24 V	GC O 1
DS 30	DS 71 S	OS 30	OS 71	CES 75 A 24/48 V	
DS 40				CES 75 A 110/220 V	

Description

Model 71: Ø 18 - 30 - 40.

Nominal range: 5 to 15 mm depending on model (see technical data sheets).

Supply voltage:

- 110-220 V
- 24-48 VAC
- 24 VDC

Connections:

The Sensor is equipped with a 2m cable.
The Control Board requires a Euro Board-Holder (GC 01), which allows for Screw Terminal Connections.

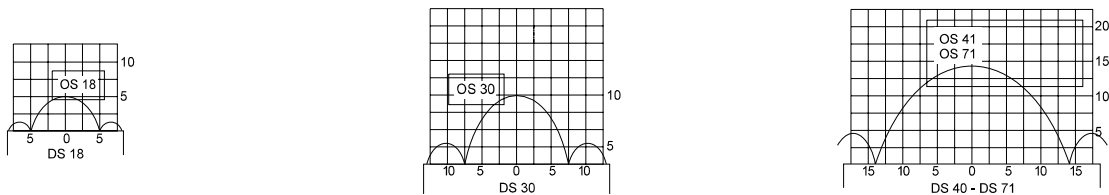
Complete System:

- 1 Object (target) (OS)
- 1 Sensor (DS)
- 1 Control Board (CES)
- 1 Control Board Holder



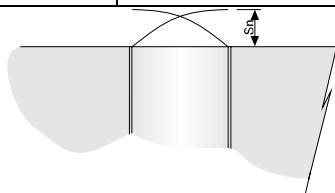
The Security Sensor "DS" can only be activated by the Security Object "OS". This prevents the false triggering of the Sensor, and insures that no other means can be used to defeat the security of the system. The Security Sensor "DS" produces a high frequency field that will induce a voltage potential in the coil of the Security Object "OS" when they are in contact. This induced voltage is rectified, filtered, and used to drive a multi-vibrator circuit. Once the multi-vibrator circuit is operating at the resonant frequency of the "OS" coil, the "DS" security sensor can detect this set frequency and respond with an absolute security signal. This signal is used to drive the two output relay switches on the CES 75 Security Board.

Detection curves



Metallic environment

Designation	71 (not flush mounted)
Clear zone (without metal presence) r = (mm)	40



Intrinsically Safe Sensors

Available configurations

IT 6.5 C08	DB 30 C08	DB 57 BC08	DB 71 SC08
IT 8 C08	DB 40 C08	DB 57 CC08	DB 71 UC08
IT 12 C08	DB 51 C08	DB 57 EC08	DB 84 C08
DB 18 C08	DB 56 C08	DB 71 FC08	DB 85 C08

Description

NAMUR recommendations

LCIE official approval No. 82 60 12 Supply
No. 82 60 13 Sensors

"CENELEC" Norms EN 50 014 Mar 77
EN 50 020 Mar 77

Presentation Ø6.5 - 8 - 12 - 18 - 30 - 40

Models 51 - 56 - 57 - 71 - 84 - 85
(see data sheets)



Security characteristics

Designation	Sym.	SI 83/110 V	SI 83/220 V
Temperature range	ϵT	-25 +70 C	
Maximum switching time	t	20 ms	
Max switching frequency	F (max)	1 Hz	
Weight	m	700 g	
Output power	P (max)	1100 VA	
Admissible exterior capacity	C (ext.)	< 4.3 μ F	
Admissible exterior inductance	L (ext.)	< 70 mH	
Quiescent current drain	Io	50 mA	
Number of channels		2	
Protected against interferences		Yes	

Metallic environment

Designation	6.5 or 8	12	18	30	40	57	51 or 84	71	56 or 85
Clear zone (without metal presence) r = (mm)	3	10	15	25	40	15	60	40	100

Technical characteristics at 25° C

Diameter or Model	Ø6.5mm	Ø 8 mm	Ø 12mm	Ø 18mm	Ø 30mm	Ø 40mm	57	71	51	84	56	85
Designation	Sym.	IT	IT	IT	DB	DB	DB	DB	DB	DB	DB	DB
Nominal range (frontal)	Sn	1 mm	1 mm	2 mm	4 mm	10 mm	15 mm	5 mm	15 mm	25 mm	25 mm	40 mm
Direct voltage (+15%, -20%)	U	8 V	8 V	8 V	8 V	8 V	8 V	8 V	8 V	8 V	8 V	8 V
Max switching frequency	F. Max	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
Degree of protection	IP	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 65, 67, & 00	IP 65	IP 67	IP 65	IP 67
Maximum voltage	U Max	9 V	9 V	9 V	9 V	9 V	9 V	9 V	9 V	9 V	9 V	9 V
Min output current (closed)	I Min.	2.2 mA	2.2 mA	2.2 mA	2.2 mA	2.2 mA	2.2 mA	2.2 mA	2.2 mA	2.2 mA	2.2 mA	2.2 mA
Minimum load impedance	R Min.	950 Ω	950 Ω	950 Ω	950 Ω	950 Ω	950 Ω	950 Ω	950 Ω	950 Ω	950 Ω	950 Ω
Maximum load impedance	R Max.	1050 Ω	1050 Ω	1050 Ω	1050 Ω	1050 Ω	1050 Ω	1050 Ω	1050 Ω	1050 Ω	1050 Ω	1050 Ω
Leakage current (open)	IR	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA
Weight	m	45 g	45 g	80 g	100 g	120 g	160 g	25 g	200 g	290 g	270 g	560 g
Temperature range	ε T	-25 +70C	-25 +70C	-25 +70C	-25 +70C	-25 +70C	-25 +70C	-25 +70C	-25 +70C	-25 +70C	-25 +70C	-25 +70C
Sensor capacity	C(a)	70 nF	70 nF	70 nF	70 nF	70 nF	70 nF	70 nF	70 nF	70 nF	70 nF	70 nF
Sensor inductance	L(a)	3 μH	3 μH	3 μH	3 μH	3 μH	3 μH	3 μH	3 μH	3 μH	3 μH	3 μH
Dimensions	Fig.	(1)	(1)	(2)	p. 9/B	p. 9/B	p. 9/B	p. 17/A	p. 25/A	p. 35/A	p. 23/A	p. 35/B

(1) 1=23 mm (2) 1=25 mm

Common characteristics

Open function

Polarized

Protected against industrial interference's

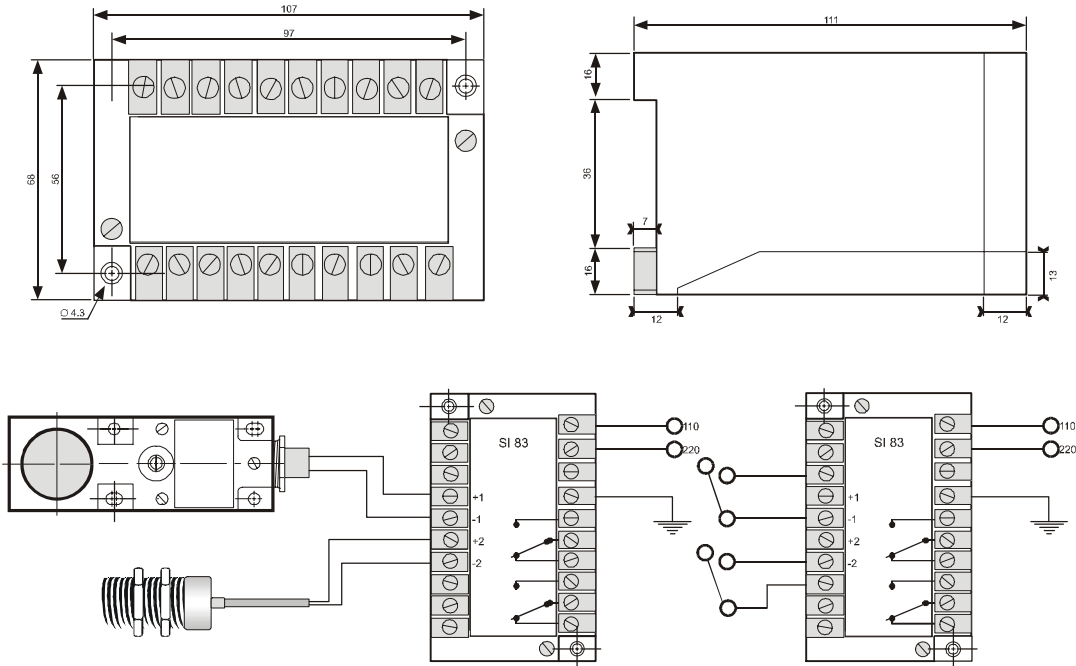
Protected against polarity inversions

Differential run = 0.1 Sn

Recommended distance = 0.4 Sn

Maximum temperature drift = 0.1 Sn

Maximum connection length= 2000 m



Linear Output Inductive Sensors

Models: 84 - 85 - 49

Available configurations

Sensors

DL 84 CP
DL 85 CP
DL 84 CP/4-20 mA
DL 85 CP/4-20 mA

Amplifiers

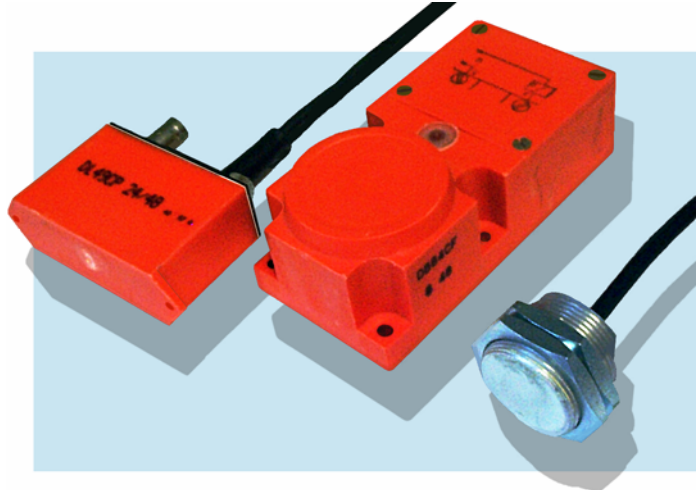
DL 49 CP

Separate heads

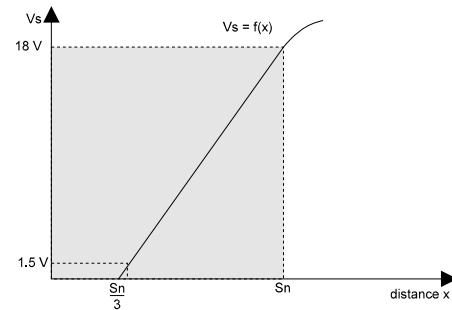
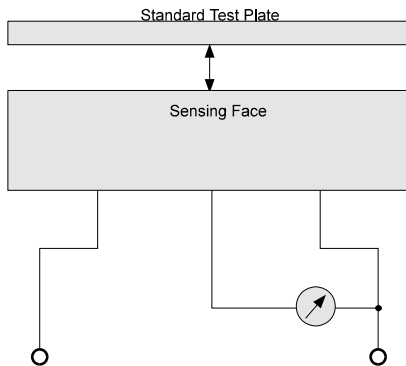
TL 4918
TL 4930

Description

Model: DL
Nominal range: (frontal approach) 5 to 40 mm depending on model
Supply voltage: 24 to 48 VDC
Connections: models 84/85 include Saddle-mount Terminal chamber
Model 49 includes 2m of cable
Model 49 (remote head) includes 5m cable with BNC connection
Output: 3 wires DC PNP or NPN configuration
Maximum output voltage: 18 VDC
High quality enclosure to insure environmental immunity allows measuring of: movement, vibration, etc.
Other outputs are possible - please consult BALOGH



Detection curves



Metallic environment

Designation	84	85	4918	4930
Clear zone (without metal presence) $r = (\text{mm})$	60	100	15	40

Technical characteristics at 25° C

Model		84 CP	85 CP	49 CP (Amp)	TL 4918	TL 4930
Designation	Sym.	DL	DL	DL	TL	TL
Maximum usage distance	Sn	25 mm	40 mm	See Heads	5 mm	10 mm
Voltage (+15%, -20%)	U	24 - 48 V	24 - 48 V	24 - 48 V		
Maximum switching frequency	F. Max	1000 Hz	1000 Hz	1000 Hz		
Degree of protection	IP	IP 65	IP 65	IP 40	IP 40	IP 40
Quiescent current drain	I _o	20 mA	20 mA	20 mA		
Maximum output current	I Max	25 mA	25 mA	25 mA		
Minimum load impedance	R Min	1000 Ω	1000 Ω	1000 Ω		
Maximum load impedance	R Max	∞ Ω	∞ Ω	∞ Ω		
Weight	m	270 g	580 g	140 g		
Temperature range	ε T	-40 +100 C	-40 +100 C	-25 +70 C	-25 +70 C	-25 +70 C
Max non-linearity (1.5<Vs<18)	ε L	10 % Vs	10 % Vs	10 % Vs		
Maximum ripple Vs	ε R	5 % Vs	5 % Vs	5 % Vs		
Dimensions	Fig.	A	B	C	D	D

Common characteristics

Protected against short-circuits
 Protected against industrial interference
 Protected against any connection error
 Protected against breaking of TL cable (49 CP model)

Differential run = 0.1 Sn
 Recommended distance = 0.4 Sn
 Maximum temperature drift = 0.1 Sn

Fig. A

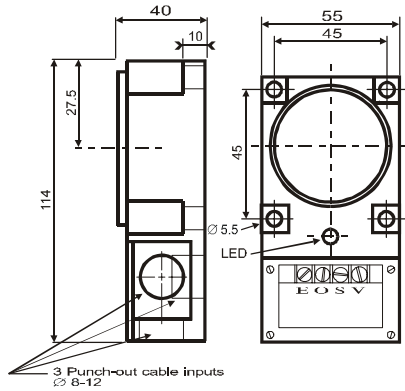


Fig. B

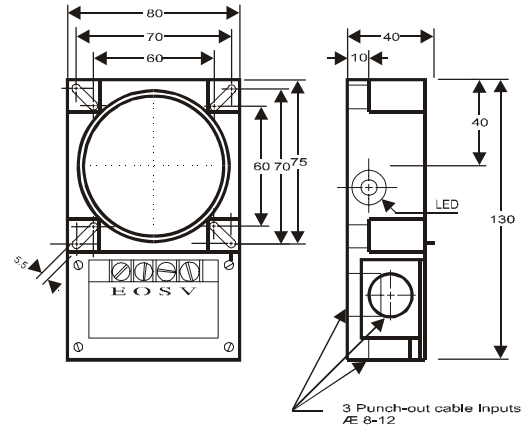


Fig. C

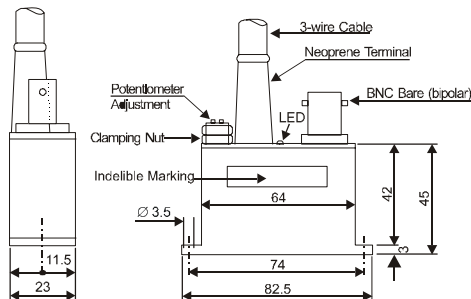
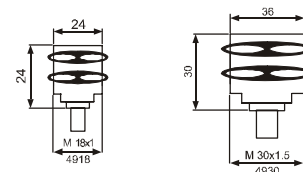


Fig. D



Sensors with Cabled Output

Models: 51 - 56

Available configurations

DB 51 CF	DB 51 CNF	DB 56 CF	DB 56 CNF
DB 51 CO	DB 51 CNO	DB 56 CO	DB 56 CNO
DB 51 CPF	IT 51 AF	DB 56 CPF	IT 56 AF
DB 51 CPO	IT 51 AO	DB 56 CPO	IT 56 AO

Description

For Hostile environments

- Shock rating: 150 g
- Immersion: pressure 2.5 bars

Supply voltage: AC or DC

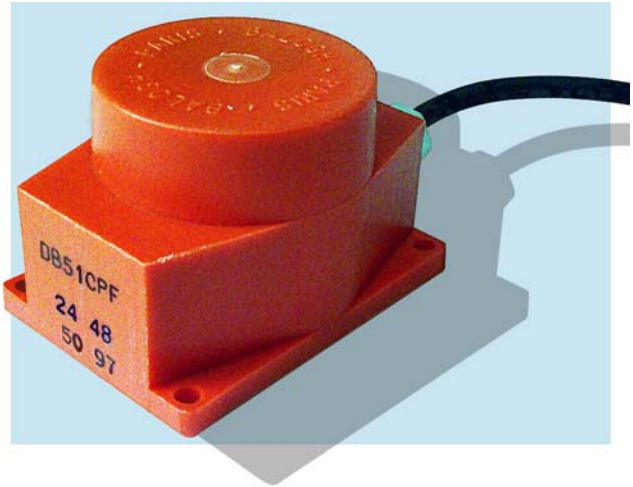
- AC: Orange
- DC: Blue

High quality enclosure for environmental immunity

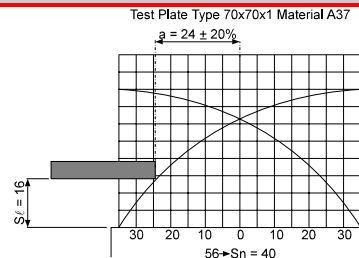
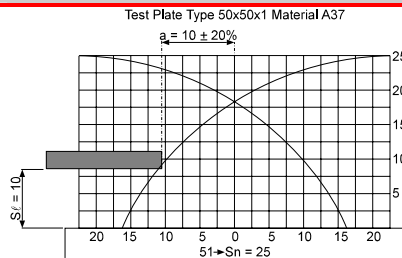
2 meter cable

- DC: Black cable
- AC: White cable

Model in accordance with NAMUR Standards (see NAMUR documentation)



Detection curves



Note: Consult us for copper, brass, aluminum, and certain stainless steels, with reduced ranges.

Metallic environment

Designation	51	56
Clear zone (without metal presence)	60	100
r = (mm)		

Technical characteristics at 25° C

Model		51 C	51 CP,51 CN	51 A	56 C	56 CP,56 CN	56 A
Designation	Sym.	DB	DB	IT	DB	DB	IT
Nominal range (frontal approach)	Sn	25 mm	25 mm	25 mm	40 mm	40 mm	40 mm
Supply voltage (+15%, -20%)	U	8 - 48VDC	24 - 48VDC	24-220VAC	8 - 48VDC	24 - 48VDC	24 -220 VAC
Maximum switching frequency	F. Max	100 Hz	1000 Hz	5 Hz	100 Hz	1000 Hz	5 Hz
Residual voltage (closed)	Ud	4 V	1.5 V	5 V	4 V	1.5 V	5 V
Quiescent current drain	Io		20 mA			20 mA	
Residual voltage (open)	Ur		0.1 V			0.1 V	
Maximum output current	I Max	100 mA	80 - 160 mA	600 mA	100 mA	80 - 160 mA	600 mA
Minimum output current	I Min	1 mA		10 mA	1 mA		10 mA
Max leakage current (open)	INA	0.5 mA		5 mA	0.5 mA		5 mA
Weight	m	290 g	290 g	290 g	560 g	560 g	560 g
Temperature range	ε T	-40 +100 C	-25 +70 C	-25 +70 C	-40 +85 C	-40 +70 C	-25 +70 C
Short-circuit protection		Yes	Yes	No	Yes	Yes	No
Dimensions	Fig.	A	A	A	B	B	B

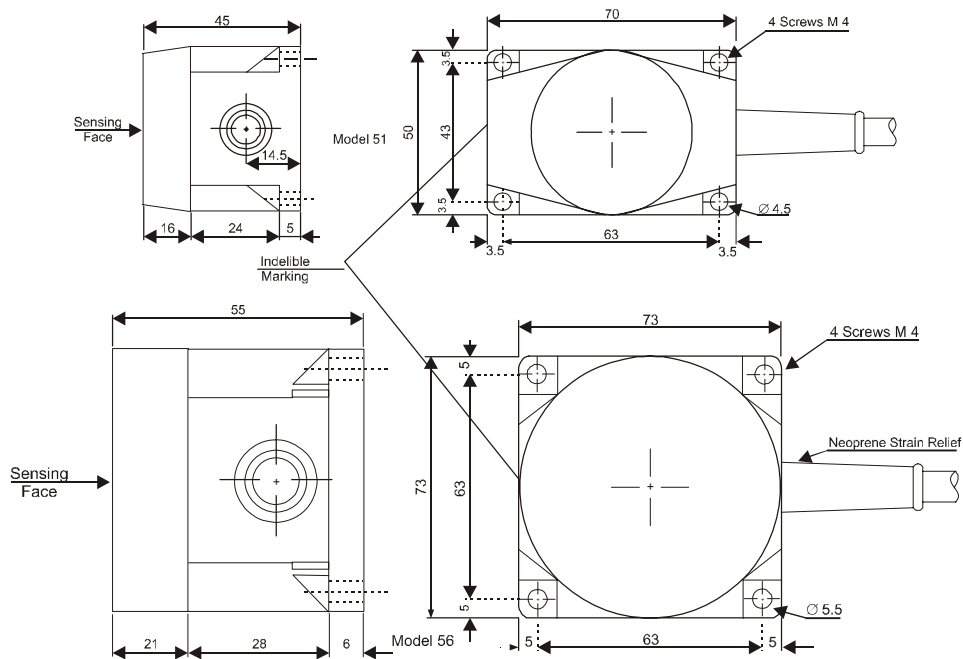
Common characteristics

Output indicator (LED)
 Open or closed function
 IP 67 protection
 CF/346
 Protected against industrial interference
 CF/346

Configuration

Differential run = 0.1 Sn
 Recommended distance = 0.4 Sn
 Maximum temperature drift = 0.1 Sn

Increased range
 Sn: 60 mm => DB 56
 Sn: 35 mm => DB 51



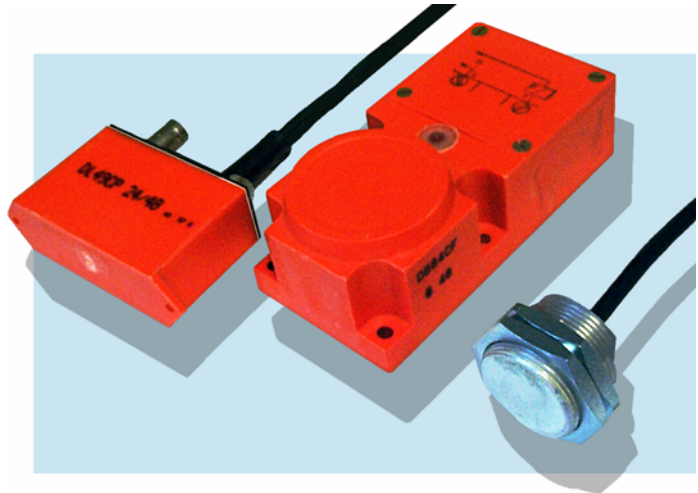
Proximity Sensors with Remote Head

Available configurations

Amplifiers		Heads	
DB 49 MCPF	IT 49 AO/110V	4910	4930
DB 49 MCPO	IT 49 AF/220V	4912	
IT 49 AF/110V	IT 49 AO/220V	4918	

Description

For precision machines
 High performance plastic casing
 - DC type: Orange/Black
 - AC type: Blue/Black
 Neoprene cable: 2 m
 Adjustable potentiometer



Technical characteristics (heads)

			4910	4912	4918	4930
Nominal range at 25 C for frontal approach	Sn ± 10%	mm	5	3	5	10
Recommended distance for side approach	Sl	mm	2	1.2	2	4
Differential run at 25 C	H ± 30 %	mm	0.5	0.3	0.5	1
Flush-mounting in metal					no	yes
Max temperature drift -25C to +70C	ε T		± % Sn		10	
2 m shielded cable with strain relief - bipolar connector					yes	

Metallic environment

Designation	4910	4912	4918	4930
Clear zone (without metal presence) r = (mm)	15	10	15	40

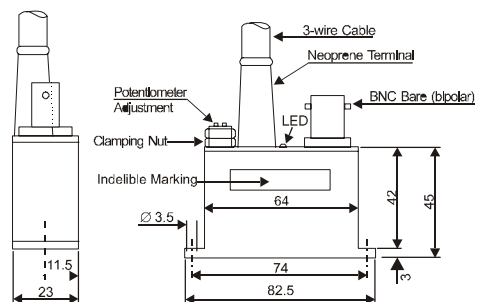
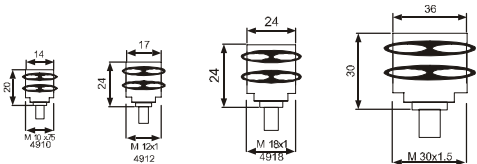
Technical characteristics (sensors) at 25° C

Characteristics	Symbol	DB 49 MCPF	DB 49 MCPO	IT 49 A F 110	IT 49 A O 110	IT 49 A F220	IT 49 A O 220
Minimum ambient temperature	0 Min	-25 C		-25 C		-25 C	
Maximum ambient temperature	0 Max	+70 C		+70 C		+70 C	
Switching time	t	6 μs					
Maximum switching frequency	F. Max	1000 Hz		3 Hz		3 Hz	
Degree of protection	IP	IP 40		IP 40		IP 40	
Weight	m	140 g		140 g		140 g	
DC voltage	U +15% -20%	24 - 48 V					
AC voltage (45 Hz + 60 Hz)	U +15% -20%			110 V		220 V	
Quiescent current drain	Io	20 mA		4 mA		4 mA	
Maximum output current	P Max	2 - 8 W					
Max output current at 25 C	I Max	80 -160 mA		200 mA		200 mA	
Peak current output (25 ms at 25 C)	Ij			1.5 A		1.5 A	
Minimum output current	I Min			7 mA		7 mA	
Minimum load impedance	(R min (Z min)	300 Ω		500 Ω		1000 Ω	
Maximum load impedance	(R max(Z max)	∞		15,000 Ω		30,000 Ω	
Residual voltage (open)	Ur						
Voltage drop (closed)	Ud	1.5 V		8 V		8 V	
Status indicator (LED)		Yes		No		No	
Protected against interference		Yes		Yes		Yes	
Protected against polarity inversion		Yes					
Protected against connection errors		Yes		No		No	

Common characteristics

Protected against industrial interference
 Protected against short-circuits (DB)
 Protected against connecting errors (DB)
 IP 40 protection

Open or closed function
 Differential run = 0.1 Sn
 Recommended distance = 0.4 Sn
 Maximum temperature drift = 0.1 Sn



Ramp Type Sensors

Models: SB 40 - SB 80

Available configurations

SB 40 CF I (mm)	SB 40 AO I (mm)	SB 80 AF I (mm)
SB 40 CO I (mm)	SB 80 CF I (mm)	SB 80 AO I (mm)
SB 40 AF I (mm)	SB 80 CO I (mm)	

Description

Type: "Ramp" or "Ski"

Models: SB 40 - SB 80

Nominal range:

- 15 mm (SB 40)

- 40 mm (SB 80)

Supply voltage:

- 8 to 48 VDC

- 24 to 220 VAC

Connection: by Connection Chamber or

FRB Connector

(polarity: see Appendix B)

Output:

- 2 wires DC non-polarized

- 2 wires AC

Maximum output current:

- 100 ma DC

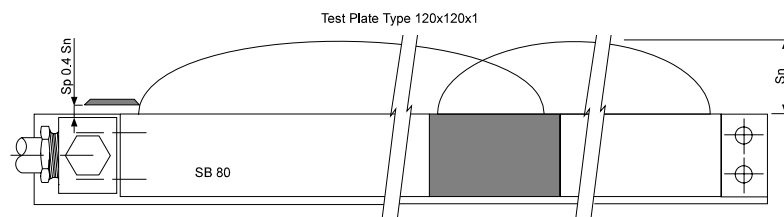
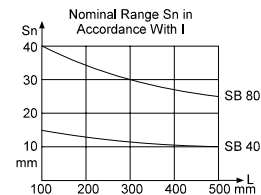
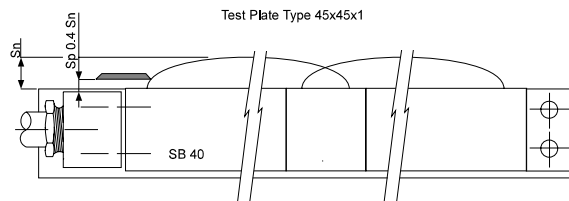
- 600 ma AC

- Note: Useful detection length: 100 to 500 mm in accordance with the model (see technical data sheets)

High performance plastic casing



Detection curves



Note: Consult us for copper, brass, aluminum, and some stainless steels with reduced ranges.

Metallic environment

Designation	SB 40	SB 80
Clear zone (without metal presence) r = (mm)	40	100

Technical characteristics at 25° C

Model		40 C	80 C	40 A	80 A
Designation	Sym.	SB	SB	SB	SB
Nominal range (frontal approach)	Sn	See Curve	See Curve	See Curve	See Curve
DC voltage (+15%, -20%)	U	8 - 48 V	8 - 48 V		
AC voltage (+15%, -20%)	Uac			24 - 220 V	24 - 220 V
Maximum switching frequency	F. Max	100 Hz	100 Hz	5 Hz	5 Hz
Residual voltage (closed)	Ud	4 V	4 V	5 V	5 V
Maximum output current	I Max	100 mA	100 mA	600 mA	600 mA
Minimum output current	I Min	1 mA	1 mA	10 mA	10 mA
Leakage current (open)	INA	0.5 mA	0.5 mA	5 mA	5 mA
Weight	m	450 g to 4000 g on side			
Temperature range	ε T	-25 +70 C	-25 +70 C	-25 +70 C	-25 +70 C
Short-circuit protection		Yes	Yes	No	No
Restrictions					
Dimensions	Fig.	A	B	A	B

Common characteristics

Output indicator (LED)
 Open or closed function
 IP 65 protection
 Protected against industrial interference
 Protected against connection errors
 Differential run = 0.1 Sn
 Recommended distance = 0.4 Sn
 Maximum temperature drift = 0.1 Sn

Configuration

FRB Connector, add suffix "/FRB"

Dimensions

I Sensing Face Length	100	150	200	300	500
L Length of Total Sensor	170	220	270	370	370

Fig. A

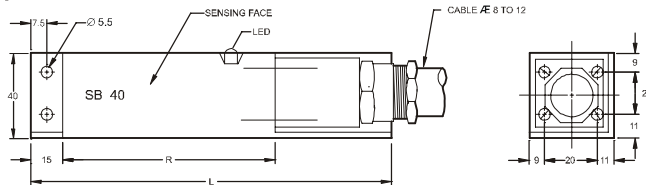
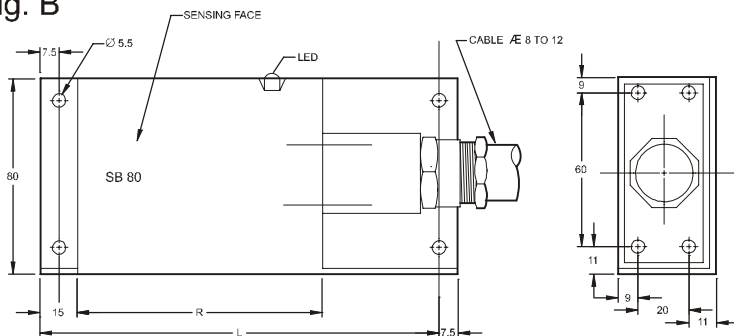


Fig. B



Object Detector Sensors

Models: LO 40 - LO 71

Available configurations

Readers		Objects	
LO 40 B	LO 71 FB	OB 40 B	OB 71 S
LO 40 S	LO 71 LS	OB 71 B	
LO 71 LB	LO 71 FS	OB 40 S	
	LO 85 S*	OB 56 S*	

* Nominal range (frontal approach): 50 mm

Description

Any BALOGH object "OB" in the field of any object reader "LO" will activate the "LO" reader and confirm the object's presence. These systems are available in two versions:

- Orientated, type S (see detection curves)
- Non-orientated, type B (see detection curves)

"Security Object" reader: LO

BALOGH Object: OB

Only the BALOGH object "OB" can operate the reader "LO", avoiding untimely starts caused by objects such as metal rings, tools, metal cuttings...

A metallic object placed between a "LO" and an "OB" whose surface is less than or equal to 1/3 of the sensing face, cannot disturb the operating of the "LO" by the "OB".

These systems are available in two versions:

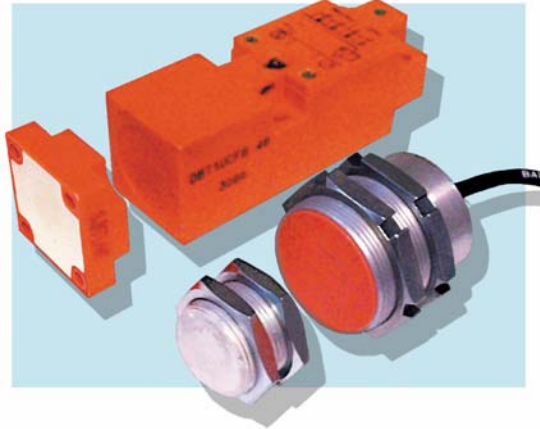
- Orientated, type S
- Non-orientated, type B

Applications:

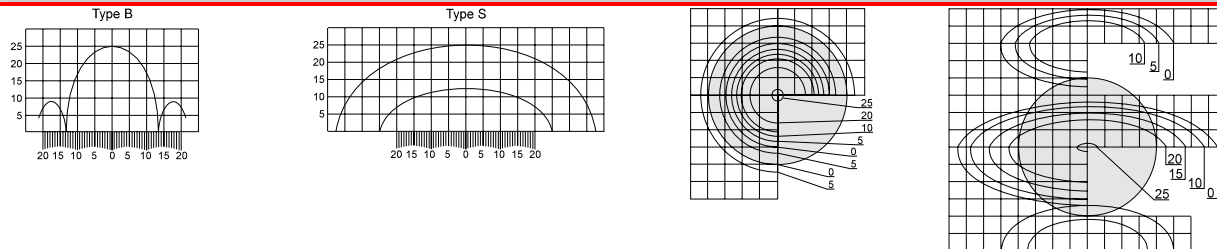
Any situation in need of precision positioning, target selection, security, and a wide range of other applications.

Ex: a reader "LO" in a fixed position, is activated by any moving body with an attached object "OB". This allows the selection or sorting among many moving devices, or among the transported articles themselves.

High performance plastic casing

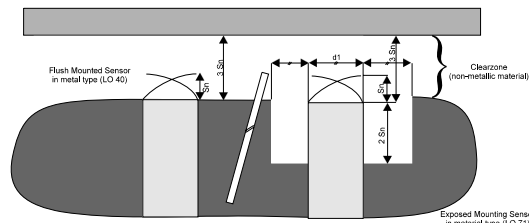


Detection curves



Metallic environment

Designation	71
Clear zone (without metal presence) r = (mm)	40



Technical characteristics at 25°C

Reader		LO 40 B		LO 40 S		LO 71 L/F B		LO 71 L/F S	
Object	Sym.	OB 40 B	OB 71 B	OB 40 S	OB 71 S	OB 40 B	OB 71 B	OB 40 S	OB 71 S
Nominal range (frontal approach)	Sn	20 mm	25 mm	20 mm	25 mm	25 mm	30 mm	25 mm	30 mm
Recommended range (side approach)	Sp	10 mm	13 mm	10 mm	13 mm	13 mm	15 mm	13 mm	15 mm
Reply time	Tr	40 mS	40 mS	40 mS	40 mS	40 mS	40 mS	40 mS	40 mS
Residual voltage (open)	Ur	0.5 V	0.5 V	0.5 V	0.5 V	0.5 V	0.5 V	0.5 V	0.5 V
DC voltage (+15%, -20%)	Ucc	24 - 48 V	24 - 48 V	24 - 48 V	24 - 48 V	24 - 48 V	24 - 48 V	24 - 48 V	24 - 48 V
Quiescent current Drain	Io	20 mA	20 mA	20 mA	20 mA	20 mA	20 mA	20 mA	20 mA
Maximum output current	I Max	80-160mA	80-160mA	80-160mA	80-160mA	80-160mA	80-160mA	80-160mA	80-160mA
Minimum load impedance	R Min	300 Ω	300 Ω	300 Ω	300 Ω	300 Ω	300 Ω	300 Ω	300 Ω
Maximum load impedance	R Max	∞ Ω	∞ Ω	∞ Ω	∞ Ω	∞ Ω	∞ Ω	∞ Ω	∞ Ω
Weight LO	m	260 g	260 g	260 g	260 g	300 g	300 g	300 g	300 g
Weight OB	m	80 g	80 g	80 g	80 g	80 g	80 g	80 g	80 g
Temperature Range	ε T	-25 +70C	-25 +70C	-25 +70C	-25 +70C	-25 +70C	-25 +70C	-25 +70C	-25 +70C
Residual Voltage (closed)	Ud	1.5 V	1.5 V	1.5 V	1.5 V	1.5 V	1.5 V	1.5 V	1.5 V
Dimensions	Fig.	A		A		B		B	

Common characteristics

Protected against industrial interference
 Protected against polarity inversions
 Degree of protection of LO 40 and OB 71: IP 67 LO 71: IP 65
 Temperature drift εT = (+10%, -20%) Sn

Fig. A

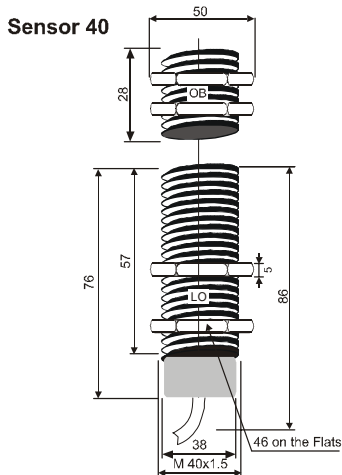


Fig. B

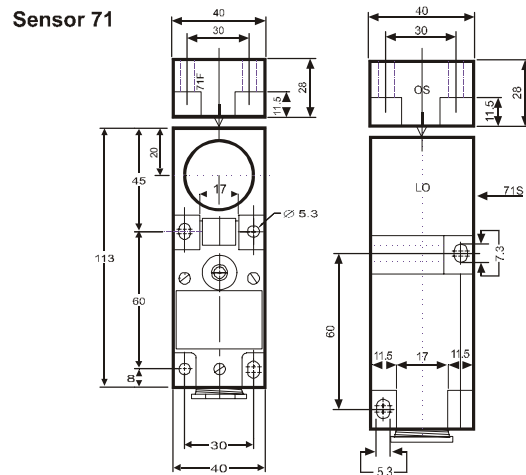
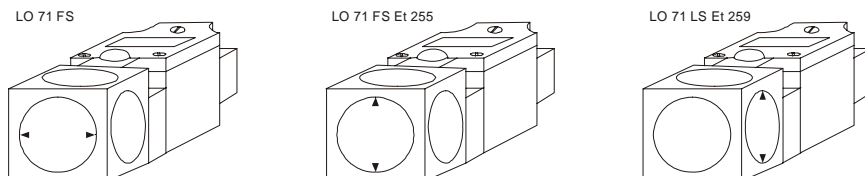


Fig C



Note: For any other directional orientation, please consult BALOGH

BALOGH 7699 Kensington Court - Brighton, MI 48116-8561 - (248) 486-RFID - Subject to Modifications

Transmitter/Receiver Pairs

Models: EB - RB

Available configurations

Transmitters	Receivers
EB 71 A	RB 71 A
EB 71 C	RB 71 CP
EB 84 A	RB 84 A
EB 84 C	RB 84 CP
EB 85 A	RB 85 A
EB 85 C	RB 85 CP

Description

Transmitter: EB

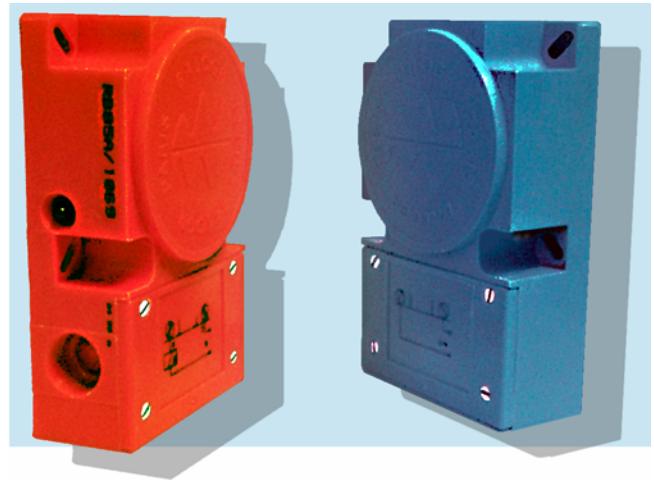
Receiver: RB

The Receiver is activated when:

- The Transmitter is within the transmission field
- The Transmitter is connected to a power supply
- The control input E is at logic "1" (DC only)

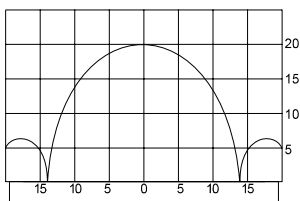
Applications:

- Stopping a moving device at pre-determined areas
 - Non-contact data transmission
- High performance plastic casing

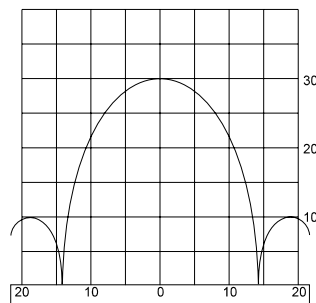


Detection curves

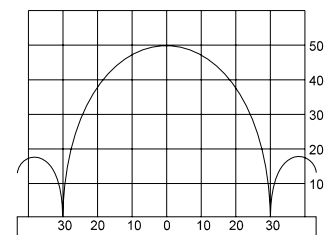
EB - RB 71



EB - RB 84



EB - RB 85



Metallic environment

Designation	EB/RB 71	EB/RB 84	EB/RB 85
Clear zone (without metal presence) r = (mm)	40	60	100

Distance between two EB 71s = 100 mm

Distance between two EB 84s = 150 mm

Distance between two EB 85s = 250 mm

Technical characteristics at 25°C

Type		71 C		84 C		85 C		71 A		84 A		85 A	
Designation	Sym.	RB	EB	RB	EB	RB	EB	RB	EB	RB	EB	RB	EB
Nominal range (front approach)	Sn	20 mm		30 mm		50 mm		20 mm		30 mm		50 mm	
Nominal range (side approach)	Sp	10 mm		15 mm		25 mm		10 mm		15 mm		25 mm	
Maximum switching frequency	F Max	500 Hz		500 Hz		500 Hz		5 Hz		5 Hz		5 Hz	
Residual voltage (closed)	Ud	1.5 V		1.5 V		1.5 V		5 V		5 V		5 V	
Supply voltage (+15%, -20%)	U	24 - 48 VDC		24 - 48 VDC		24 - 48 VDC		24-220 VAC		24-220 VAC		24-220 VAC	
Maximum supply voltage	I Max	20mA	10mA	20mA	10mA	20mA	10mA		10mA		10mA		10mA
Minimum output current	I Min							10		10		10	
Maximum output current	I Max	100mA		100mA		100mA		600mA		600mA		600mA	
Maximum leakage current	INA							5 mA		5 mA		5 mA	
Residual voltage (open)	Ur	0.1 V		0.1 V		0.1 V							
Weight (EB or RB)	m	200 g		270 g		580 g		200 g		270 g		580 g	
Temperature range	ε T	-25 +70 C		-25 +70 C		-25 +70 C		-25 +70 C		-25 +70 C		-25 +70 C	
Control input impedance	Re		10 K Ω		10 K Ω		10 K Ω						
Dimensions	Fig.	See p.		See p.		See p.		See p.		See p.		See p.	

Common characteristics

Protected against polarity inversions

IP 65 protection

Protected against industrial interference

Protected against short-circuits

Indication by LED differential run = 0.1 Sn recommended distance = 0.5 Sn

Ring Sensors

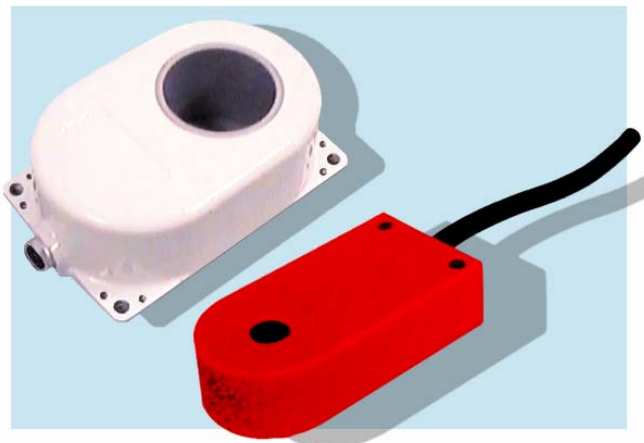
Models: 65 - 68

Available configurations

DB 65/30 CPF DB 65/100 CPF IT 68 CO
DB 65/50 CPF DB 65/180 CPF IT 68 CNF
DB 65/80 CPF DB 65/250 CPF IT 68 CPF

Description

Type: nug
Models: 65 and 68
Nominal Range: Passage diameter from 2 to 180 mm and 290 x 245 mm (see technical data sheets).
Supply voltage: 8 to 24 V or 24 to 48 VDC.
Connection: 2m cable, or by LEM or FRB connector (see appendix B)
Output: 3 wires DC PNP
Maximum leakage current: 100 mA
Note: passage speed for model 65: 0.3 to 20 msec.
Calibrated signal duration (50 msec.) upon request output in "all or nothing" form.
Flat metallic envelope construction (65)
Incorporated electronics
Direct control of relays
Auto-regulated against temperature effects (model 65)
Alternative casing \varnothing 16 and 30 mm
High performance plastic casing



Metallic environment

Designation	65	68
Clear zone (without metal presence) r = (mm)	50	Dependent upon model

Technical characteristics at 25°C

Model and Dimension of Passage		65/30 CPF	65/50 CPF	65/80 CPF	65/100 CPF	65/180 CPF	65/250 CPF	68 C O	68 C (N/P) F
Designation	Sym.	DB	DB	DB	DB	DB	DB	IS	IT
Smallest detectable object (A 37)	∅	2 mm	4 mm	6 mm	7 mm	13 mm	35 mm	*2 - 12 mm	*2 - 12 mm
DC voltage (+15%, -20%)	U	24-48 V	24-48 V	24-48 V	24-48 V	24-48 V	24-48 V	8 - 24 V	8 - 24 V
Max switching frequency	F Max	7 Hz	7 Hz	7 Hz	7 Hz	7 Hz	7 Hz	500 Hz	500 Hz
Degree of protection	IP	IP 65	IP 65	IP 65	IP 65	IP 65	IP 65	IP 67	IP 67
Quiescent current drain	I _o	20 mA	20 mA	20 mA	20 mA	20 mA	20 mA		10 mA
Max output current	I _{Max}								100 mA
Minimum load impedance	R Min	300 Ω	300 Ω	300 Ω	300 Ω	300 Ω	300 Ω	1100 Ω	240 Ω
Maximum load impedance	R Max	∞ Ω	∞ Ω	∞ Ω	∞ Ω	∞ Ω	∞ Ω	5600 Ω	100,000 Ω
Passage speed (min/max)	V	3 - 20 mS	3 - 20 mS	3 - 20 mS	3 - 20 mS	3 - 20 mS	3 - 20 mS	**3000 μS	**10 μS
Weight	m	1300 g	1300 g	1800 g	2000 g	3000 g	6300 g	45 g	45 g
Temperature range	ε T	-25 +70 C	-25 +70 C	-25 +70 C	-25 +70 C	-25 +70 C	-25 +70 C	-20 +65C	-20 +65 C
Residual voltage (closed)	U _d	1.5 V	1.5 V	1.5 V	1.5 V	1.5 V	1.5 V		1.5 V
Duration of output signal	t _s	50 mS	50 mS	50 mS	50 mS	50 mS	50 mS		
Dimensions	Fig.	A	A	A	A	A	C	B	B

* ∅ of passage 2,3,4,5,6,8,10,12 mm **Switching time

Common characteristics

Protected against industrial interference (65 - 68)

Protected against short-circuits (65)

Protected against polarity inversions (65 - 68)

Dimensions

∅ 1	∅ 2	A	a	B	b	E	x	y	z
180	9	290	250	240	200	70	30	10	30
100									
80	7	200	175	150	125	55	0	7	48
50									
30	7	150	135	100	85	55	0	5	65

FIG. A

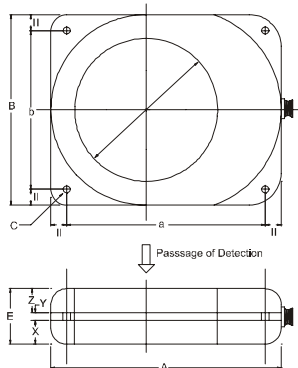
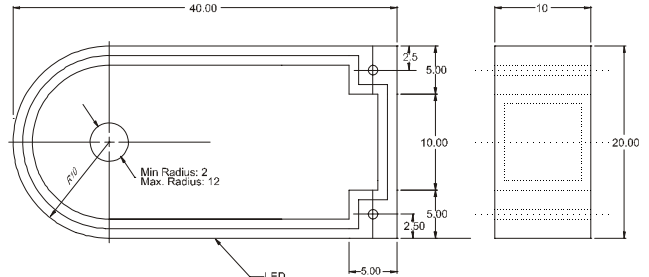


FIG. B



Slotted Inductive Sensors

Models: 37 - 38 - 39 - 41 - 42

Available configurations

IT 37 CPF 24 V IT 39 CPF 8 - 48 V IT 42 CPO 24 V

IT 37 CPF 48 V IT 41 CNF 24 V

IT 38 CPF 24 V IT 41 CPF 24 V

IT 38 CPF 48 V IT 41 CPF 48 V

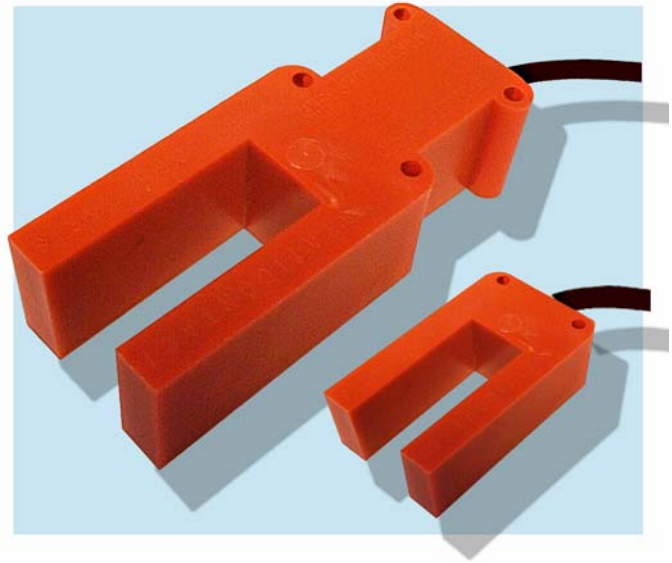
Description

Slot width: 4 - 20 mm

High performance plastic casing

Model 42 type Schindler, adopted for lift-controls

Upon request: models depending on the customers' specifications



Technical characteristics at 25° C

Model		37 CPF	37 CPF	38 CPF	38 CPF	39 CPF	41 C (N/P) F	41 CPF	42 CPO
Designation	Sym.	IT	IT	IT	IT	IT	IT	IT	IT
Slot width		8 mm	8 mm	20 mm	20 mm	8 mm	4 mm	4 mm	20 mm
DC voltage (+15%, -20%)	U	24 V	48 V	24/48 V	24/48 V	8 - 48 V	24 or 48 V	48 V	24 V
Max switching frequency	F Max	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz
Degree of protection	IP	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
Quiescent current drain	I _o	10 mA	10 mA	10 mA	10 mA	10 mA	10 mA	10 mA	10 mA
Maximum output current	I Max	80 mA	80 mA	80 mA	80 mA	80 mA	100 mA	80 mA	100 mA
Minimum load impedance	R Min	300 Ω	600 Ω	300 Ω	600 Ω	600 Ω	300 Ω	600 Ω	270 Ω
Maximum Load impedance	R Max	∞ Ω	∞ Ω	∞ Ω	∞ Ω	∞ Ω	∞ Ω	∞ Ω	∞ Ω
Weight	m	170 g	170 g	200 g	200 g	90 g	90 g	90 g	200 g
Temperature range	∈ T	0 +60 C	0 +60 C	0 +60 C	0 +60 C	0 +60 C	0 +60 C	0 +60 C	0 +60 C
Residual VS ripple	∈ T	10%	10%	10%	10%	10%	10%	10%	10%
Dimensions	Fig.	C	C	D	D	E	A	A	B

Common characteristics

Function open
 Protected against industrial interference
 Maximum temperature drift = 0.1 Sn

Fig. A

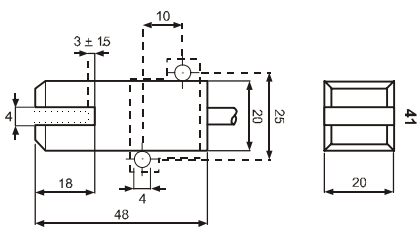


Fig. B

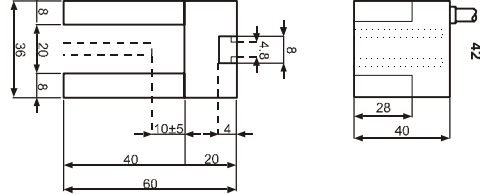


Fig. C

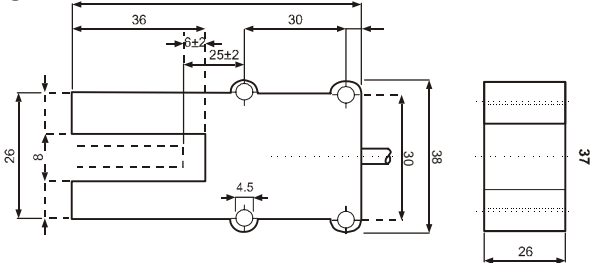


Fig. D

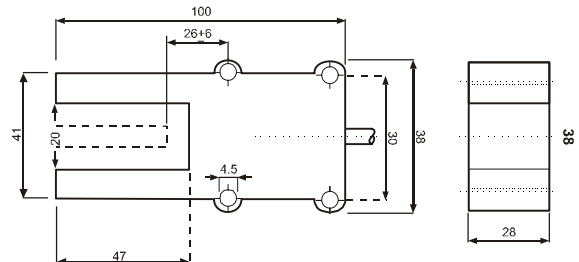
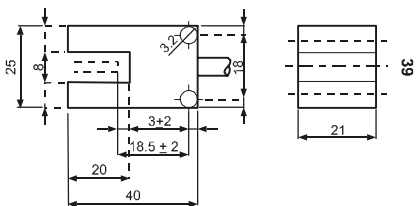
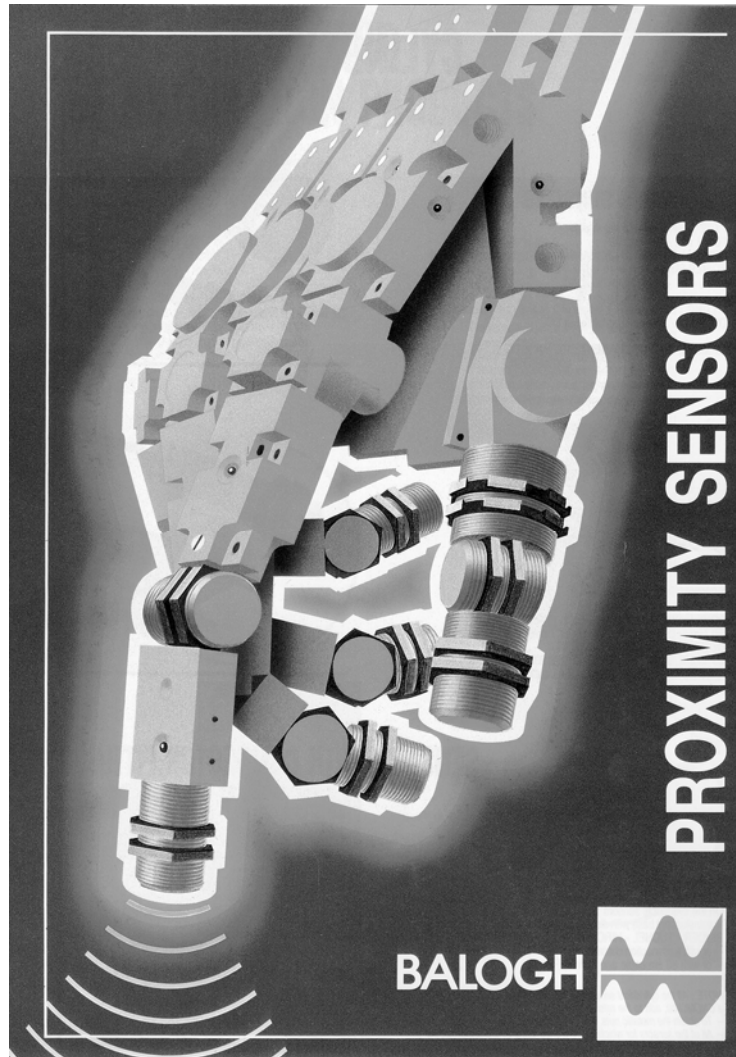


Fig. E



Multipurpose Sensors



Type "M" Sensors

Model M = 8-130 VDC/AC

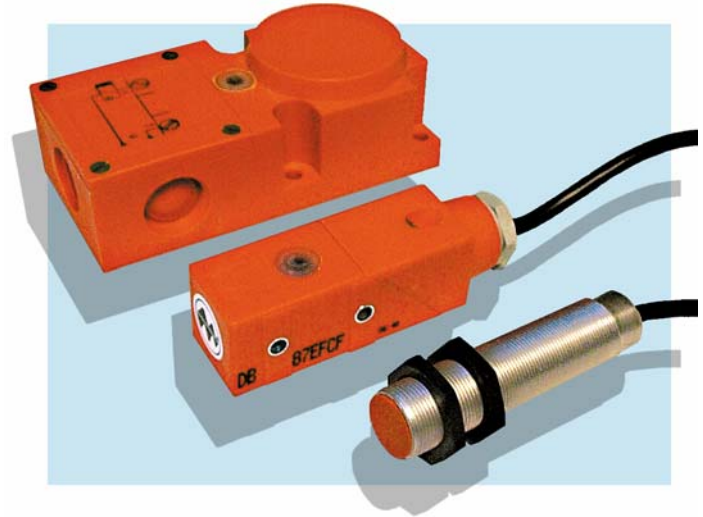
Available configurations

DB 12 M*	DB 51 M*	DB 85 M*
HB 12 M*	DB 56 M*	DB 87 FM*
DB 18 M*	DB 71 SM*	SB 80 M*
DB 30 M*	DB 71 FM*	DB 87 LM*
DB 40 M*	DB 84 M*	

*Function to be specified (open or closed)

Description

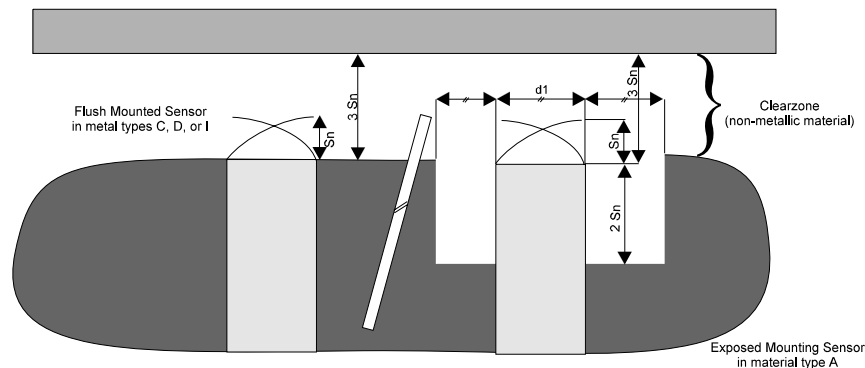
Supply voltage: 8 to 130 VDC/AC
 Residual voltage: 7 V maximum
 Leakage current: 0.4 mA DC and AC
 Output current: 100 mA
 Switching frequency: 100 Hz DC and AC
 Protection: short-circuit and over-voltage (DC and AC)
 Temperature range: -25 C +70 C
 High performance plastic casing



Detection curves

Please refer to the corresponding model

Metallic environment



Designation	12	18	30	40	51	56	71	84	85	87	89
Clear zone (without metal presence) r = (mm)	18	27	45	60	60	100	40	60	100	25	12

Technical characteristics at 25° C

Model		Ø12 mm M			Ø 18 mm M			Ø 30 mm M			Ø 40 mm M	51 M	56 M	71 M	84 M	85 M	87 M	89 M
Designation	Sym.	DB	CB	AB	DB	CB	AB	DB	CB	AB	DB	DB	DB	DB	DB	DB	DB	DB
Nominal range (frontal)	Sn	2	2	4	5	5	8	10	10	15	15	25	40	15	25	40	10	10
Universal voltage (+15%, -20%) DC or AC	U	8-130V			8-130V			8-130V			8-130V	8-130V	8-130V	8-130V	8-130V	8-130V	8-130V	8-130V
Max switching frequency	F. Max	100 Hz			100 Hz			100 Hz			100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
Degree of protection	IP	IP 67			IP 67			IP 67			IP 67	IP 67	IP 65	IP 65	IP 65	IP 65	IP 65	IP 67
Maximum output current	I Max	100mA			100mA			100mA			100mA	100mA	100mA	100mA	100mA	100mA	100mA	100mA
Minimum output current	I Min	1 mA			1 mA			1 mA			1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA
Residual voltage (closed)	Ud	6 V			6 V			6 V			6 V	6 V	6 V	6 V	6 V	6 V	6 V	6 V
Residual current (open)	INA	0.4 mA			0.4 mA			0.4 mA			0.4 mA	0.4 mA	0.4 mA	0.4 mA	0.4 mA	0.4 mA	0.4 mA	0.4 mA
Weight	m	80 g			150 g			300 g			370 g	290 g	560 g	200 g	270 g	580 g	80 g	50 g
Temperature range	ε T	-25 +70C			-25 +70C			-25 +70C			-25 +70C	-25 +70C	-25 +70C	-25 +70C	-25 +70C	-25 +70C	-25 +70C	-25 +70C
Dimensions	Fig.	p. 9/A			p. 9/A			p. 9/A			p. 9/A	p. 41/A	p. 41/B	p. 25/A	p. 25/A	p. 25/B	p. 17/B	p.21
Version Et. 215		No			Yes			Yes			Yes	Yes	No	Yes	Yes	No	Yes	Yes

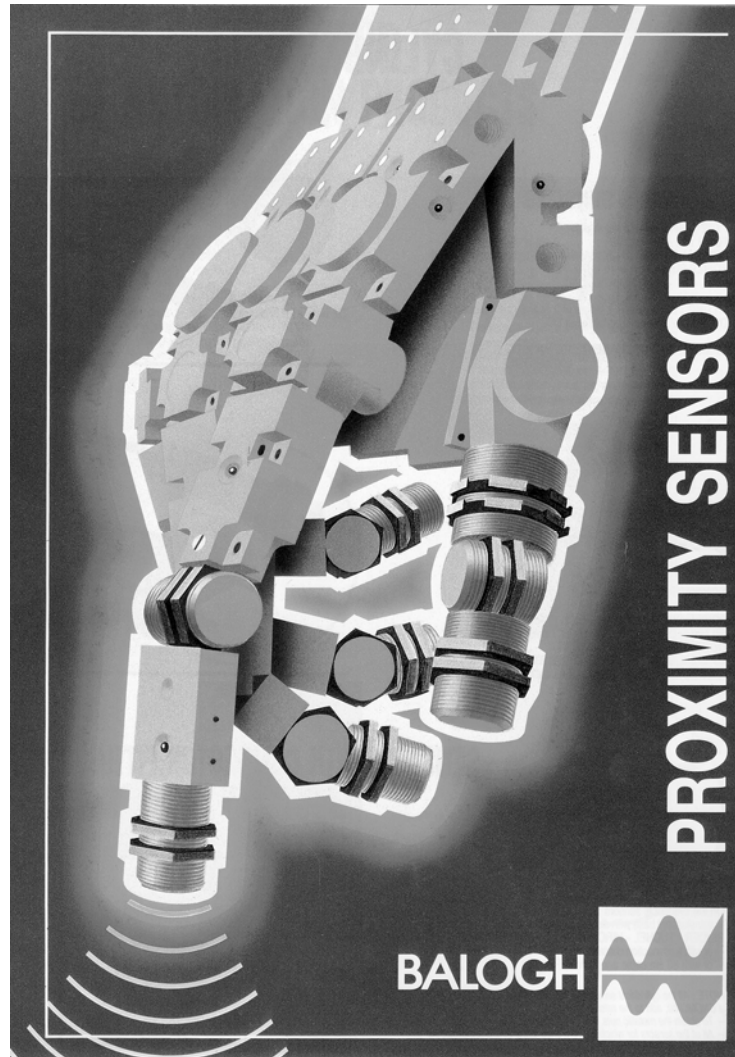
Common characteristics

Open or closed function
 Non-polarized
 Protected against industrial interference
 Protected against short-circuits and over-voltages
 Differential run = 0.1 Sn
 Recommended distance = 0.4 Sn
 Maximum temperature drift = 0.1 Sn

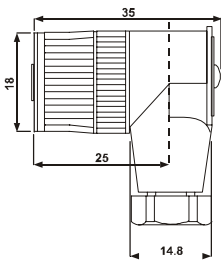
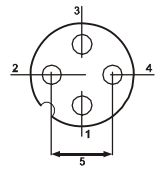
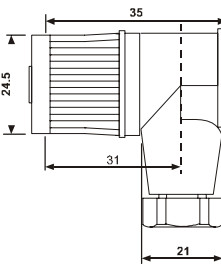
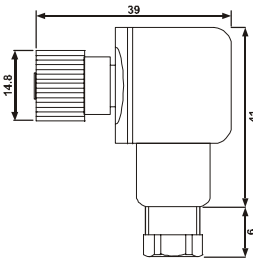
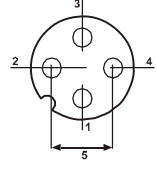
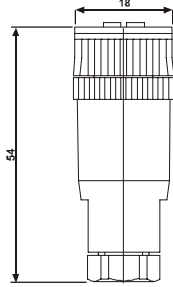
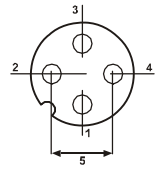
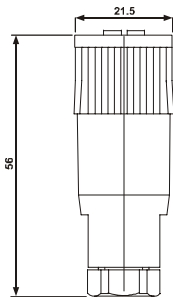
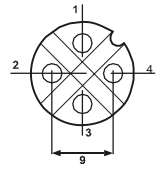
Mechanical dimensions

Please refer to the corresponding model

Appendix

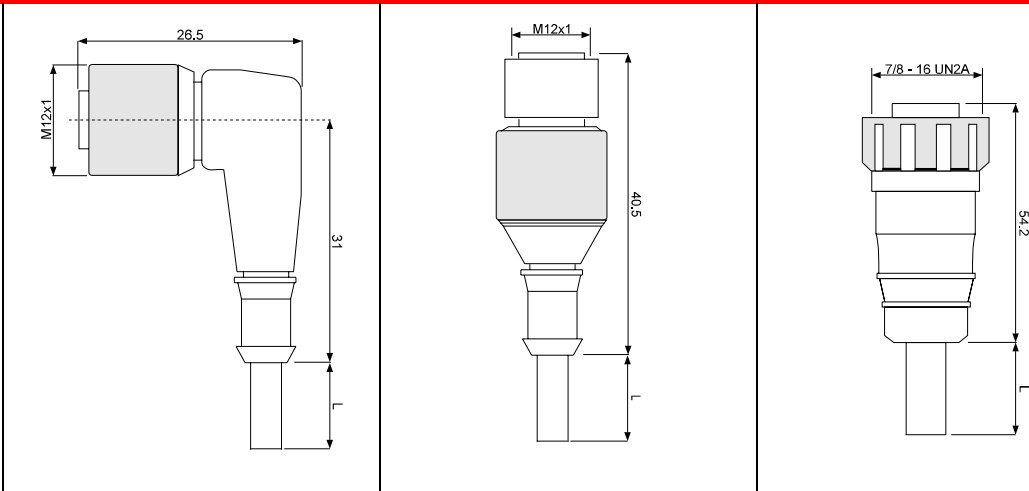


Accessories

	Female Plugs	Reference	Connectors	Protection	Sensor Adapters
ELBOW PLUGS		FFBC 4/12		IP67	Output \varnothing 12 4 pins (2 and 3 wires)
		FFBC 4/18		IP67	Output \varnothing 18 & 30 4 pins (2 and 3 wires)
		FFHC 4/12		IP67	Output \varnothing 12 4 pins (2 and 3 wires)
STRAIGHT PLUGS		FFBD 4/12		IP67	Output \varnothing 12 4 pins (2 and 3 wires)
		FFBD 4/18		IP67	\varnothing 18 & 30 (2 and 3 wires)

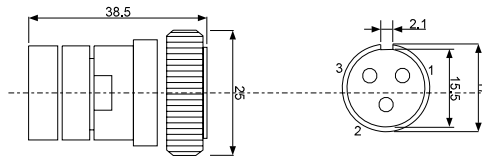
Accessories

Female plugs with cables



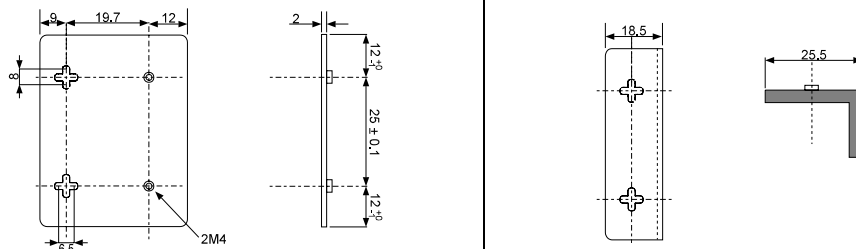
Reference	FFLC4/12/2M	FFLC4/12/5M	FFLD4/12/2M	FFLD4/12/5M	FFLD3/18/2M	FFLD3/18/5M
Cable lengths	2 m	5 m	2 m	5 m	2 m	5 m
Plugs						
Color	1 = brown 2 = - 3 = blue 4 = black	1 = brown 2 = - 3 = blue 4 = black	1 = brown 2 = - 3 = blue 4 = black	1 = brown 2 = - 3 = blue 4 = black	1 = brown 2 = yellow/green 3 = blue	1 = brown 2 = yellow/green 3 = blue
Protection	IP67	IP67	IP67	IP67	IP67	IP67

FRB plug



Reference	FRB
Plugs	1: + (brown) 2: Output (black) 3: - (blue)
For models	Ramp Sensor (SB 40 - SB 80) - Model 52 - Ring Sensor DB 65 (∅ 180 or 250)

Mounting support for models 87 and 89

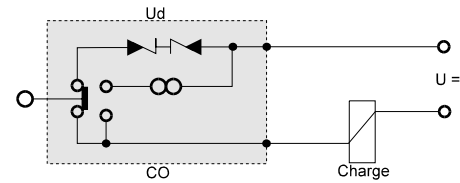
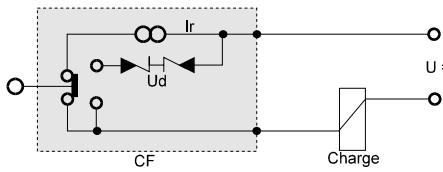


Reference	SD26	SC26
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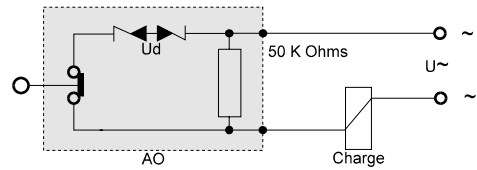
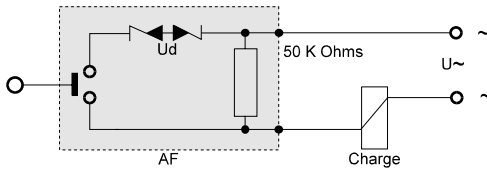
Appendix A

Equivalent diagrams (general range)

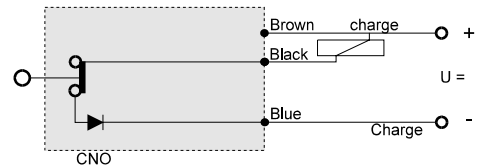
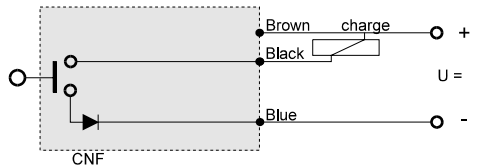
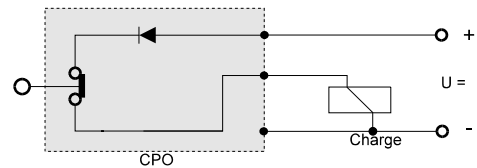
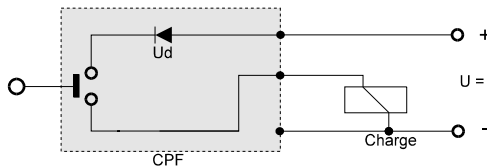
2 wires DC - non-polarized



2 wires AC

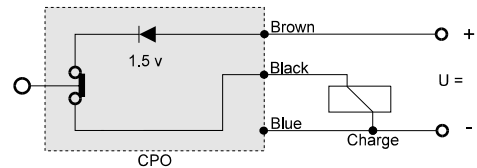
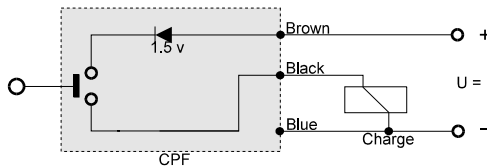


3 wires DC, PNP and NPN



Equivalent diagrams (models associated with a remote head)

3 wires DC

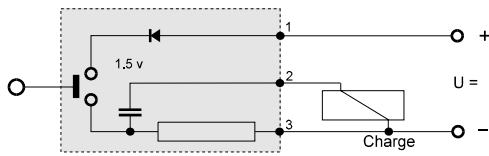


3 wires AC

Appendix A

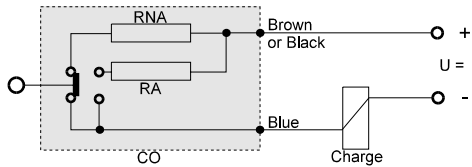
Equivalent diagrams (type 65)

3 wires DC

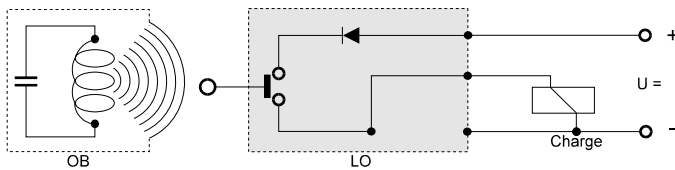


Equivalent diagrams (types 68-Ø 6.5-8-12-18)

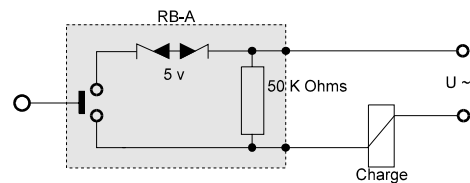
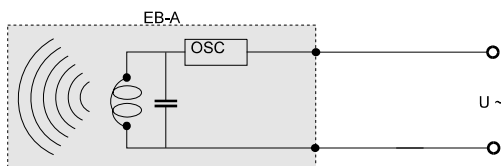
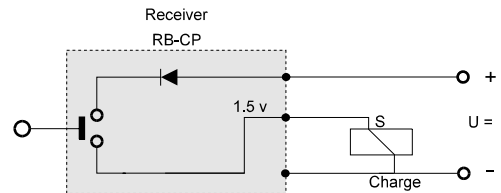
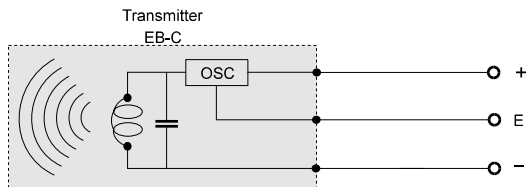
2 wires polarized



Equivalent diagrams (types LO-OB)



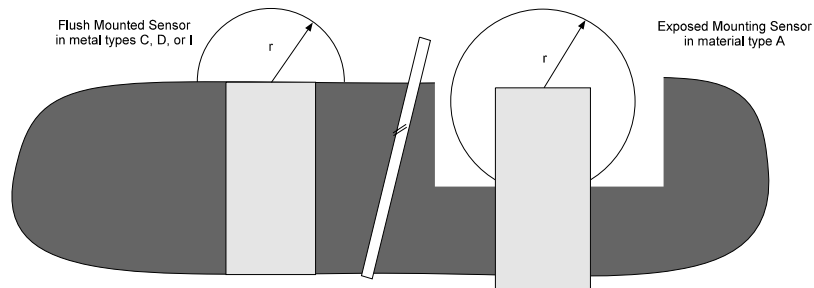
Equivalent diagrams (types EB-RB)



Appendix B

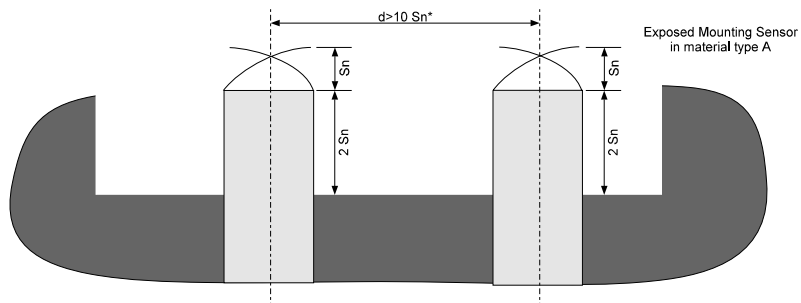
Sensor precautions

Clear zone without metal presence



The ray r represents the ray of a minimal sphere without the presence of metallic materials.

Distance between two Sensors side-by-side

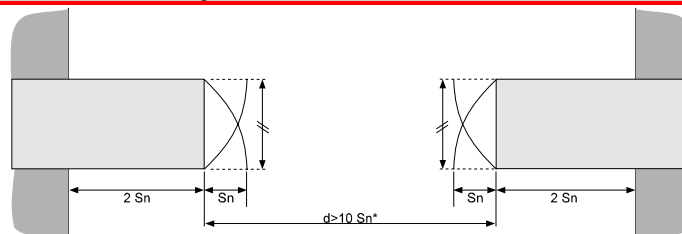


The distance d represents the minimum distance between two Sensors set up side by side.

* Distance can be decreased up to $3 S_n$.

For smaller distances, please inquire. (ET 237)

Distance between Sensors with separate heads



The distance d represents the minimum recommended distance between Sensors set up with separate heads.

S_n = Nominal range of the Sensor at 25 C.

Appendix B

Summary of specific models

ET 214	"85" without adjusting
ET 215	Extended temperature range (-40 to 100 C)
ET 317	6 m cable
ET 319	Binder output \varnothing 12 mm (boundaries 1 and 4)
ET 324	"87" Lumberg plug and 0.8 m cable
ET 344	"87" Binder output \varnothing 12 mm
ET 345	"18" Binder output with reduction \varnothing 12 mm
ET 346	"51, 56, 71, 84, 87, 85" with greater sensing range
ET 358	"12, 18, 89" 0.8 m gray output cable with 4 pin \varnothing 12 mm Lumberg connector
ET 237	Shift in frequency allows two sensors to be located near each other
ET 367	"12, 18, 89" 0.8 m gray output cable with \varnothing 12 mm, 4 pin Lumberg connector manufactured in accordance with CENELEC norms. Pins 3-4 (normally open version) Pins 1-2 (normally closed version)
ET 377	"89" Special welding model - 0.8 m orange output cable with \varnothing 12 mm, 4 pin Lumberg connector. Pins 3-4 (normally open version) Pins 1-2 (normally closed version)
ET 381	"12, 18, 30" Standard plugs for sensors with 3 wire connectors 1 = +VDC 3 = -VDC 2 = Nc 4 = charge (normally open version) See page 14
ET 382	"12, 18, 30" standard plugs for sensors with 2 wire connectors Pins 3-4 (normally open version) Pins 1-2 (normally closed version) See page 14
ET 397	"89" Special welding model - 0.15 m output cable with \varnothing 12 mm, 4 pin connector. Pins 1-4 (normally open version) Pins 1-2 (normally closed version)

