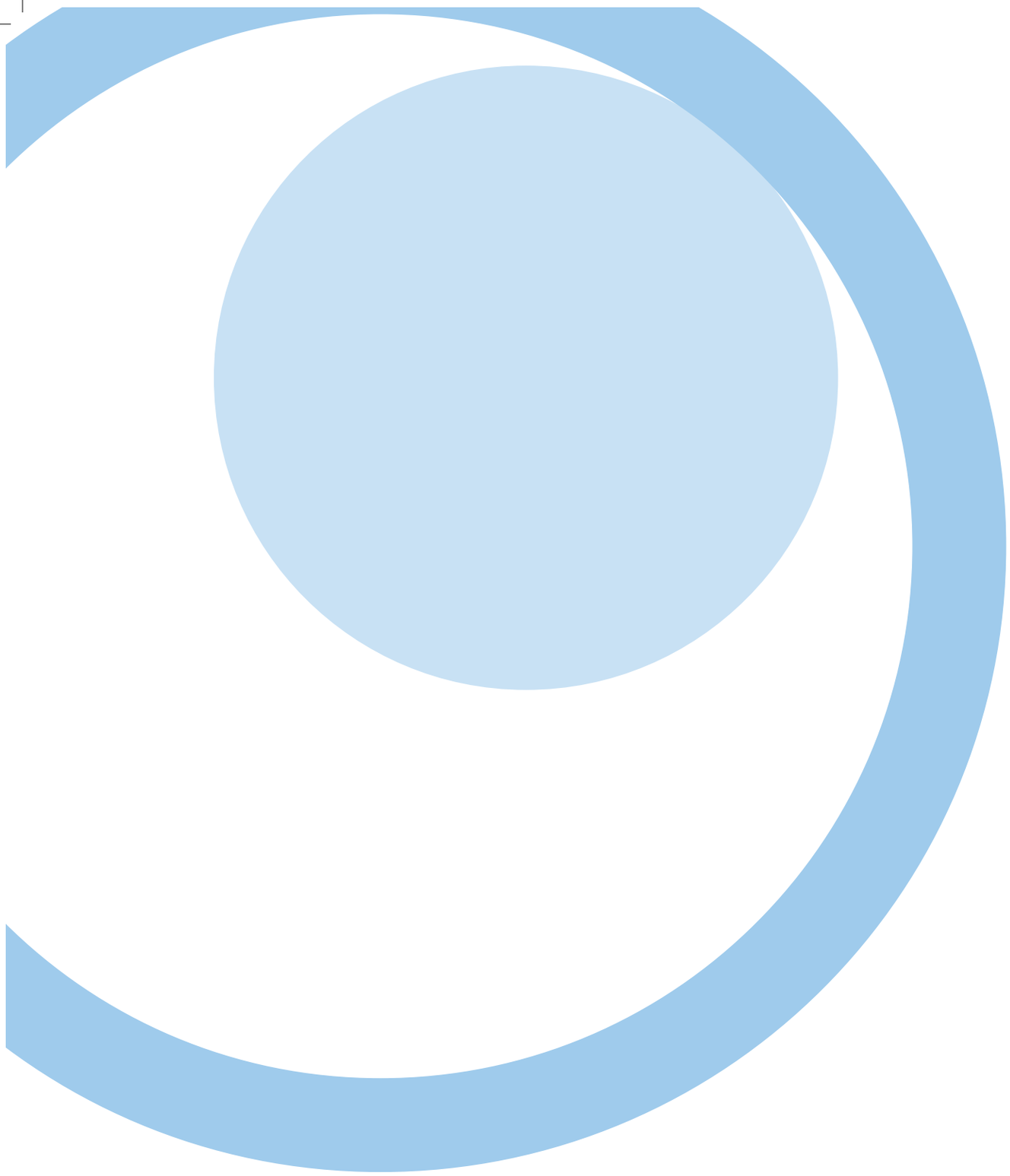
Cubic Photoelectric Sensor

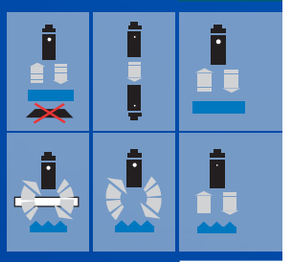


QM series

Miniaturized photoelectric sensors
with high performance

features

- **Cubic miniaturized photoelectric high-performance sensors with long sensing distance**
- **2 kHz switching frequency, background suppression with mechanical adjustment**
- **Wide range of models: diffuse reflection with short, medium and long sensing distance, polarized, reflective for transparent objects, through-beam and background suppression**
- **Available with cable and M8 plug exit or with M8-M12 pig-tail**
- **Selectable LO/DO output state**
- **Completely filled with resin (except background suppression models)**
- **Complete protection against electrical damages**



web content

- **Application notes**
- **Photos**
- **Catalogue / Manuals**

code description

QM R 8 / 0 P - 0 A VE 80

series	QM	Miniaturized cubic photoelectric sensor 12.8x21x31.2 mm
emission	R	RED emission
	I	Infrared emission
type	B	Direct diffuse with sens. adj. 100 mm
	7	Direct diffuse with sens. adj. 400 mm
	8	Direct diffuse with sens. adj. 1,000 mm
	9	Direct diffuse with sens. adj. 1,500 mm
	N	5 m polarized with senisitive adjustment
	C	7 m reflective with senisitive adjustment
	G	0.05...1.5 m or 0.05...1.0 m for transparent objects with adjustment (R)
	L	0.4...4 m for transparent objects with adjustment
	HD	20 m or 30 m emitter + receiver kit with adjustment (R)
	H	Emitter with adjustment
	D	20 m or 30 m receiver without adjustement
	S	30...200 mm or 30...400 mm background suppression (R)
emitter	0	Emitter without check, LO/DO selectable
PNP / NPN output	0	Emitter
	P	PNP output
	N	NPN output
housing	0	Plastic housing
cable / plug output	A	2 m cable exit
	F	M8 4 pin plug cable exit
pig tail plug output		Standard model
	VE	M12 pig-tail output (1)
	VF	M8 3 pin pig tail output (1)
	VG	M8 4 pin pig tail output (1)
cable	80	20 cm cable lenght (pig-tail models)(1)
		Standard model

(1) pig-tail models

available models (*)

function	distance	emission	adjustment	output type	housing	models	
						PNP + NO / NC	NPN + NO / NC
direct diffuse	100 mm	red	•	cable	plastic	QMRB/0P-0A	QMRB/0N-0A
				connector M8		QMRB/0P-0F	QMRB/0N-0F
	400 mm			cable		QMR7/0P-0A	QMR7/07-0A
				connector M8		QMR7/0P-0F	QMR7/0N-0F
		IR		cable		QMI7/0P-0A	QMI7/07-0A
				connector M8		QMI7/0P-0F	QMI7/0N-0F
	1.000 mm	red		cable		QMR8/0P-0A	QMR8/0N-0A
				connector M8		QMR8/0P-0F	QMR8/0N-0F
	1.500 mm	IR		cable		QMI9/0P-0A	QMI9/0N-0A
				connector M8		QMI9/0P-0F	QMI9/0N-0F
polarized	5 m	red		cable		QMRN/0P-0A	QMRN/0N-0A
				connector M8		QMRN/0P-0F	QMRN/0N-0F
retroreflection	7 m	IR		cable		QMIC/0P-0A	QMIC/0N-0A
				connector M8		QMIC/0P-0F	QMIC/0N-0F
for transparent objects	0,05...1,5 m	red		cable		QMRG/0P-0A	QMRG/0N-0A
				connector M8		QMRG/0P-0F	QMRG/0N-0F
	0,05...1,0 m	IR		cable		QMIG/0P-0A	QMIG/0N-0A
				connettore M8		QMIG/0P-0F	QMIG/0N-0F
	0,4...4 m	red		cable		QMRL/0P-0A	QMRL/0N-0A
				connector M8		QMRL/0P-0F	QMRL/0N-0F
emitter	20 m			cable		QMRH/00-0A	
				connector M8		QMRH/00-0A	
receiver			-	cable		QMRD/0P-0A	QMRD/0N-0A
				connector M8		QMRD/0P-0F	QMRD/0N-0F
emitter + receiver			•	cable		QMRHD/0P-0A	QMRHD/0N-0A
				connector M8		QMRHD/0P-0F	QMRHD/0N-0F
emitter	30 m	IR		cable		QMIH/00-0A	
				connector M8		QMIH/00-0F	
receiver			-	cable		QMID/0P-0A	QMID/0N-0A
				connector M8		QMID/0P-0F	QMID/0N-0F
emitter + receiver			•	cable		QMIHD/0P-0A	QMIHD/0N-0A
				connector M8		QMIHD/0P-0F	QMIHD/0N-0F
background suppression	30 - 200 mm	red		cable		QMRS/0P-0A	QMRS/0N-0A
				connector M8		QMRS/0P-0F	QMRS/0N-0F
	30 - 400 mm	IR		cable		QMIS/0P-0A	QMIS/0N-0A
				connector M8		QMIS/0P-0F	QMIS/0N-0F

(*) pig tail available models:
QM**/0*-0AVE80 (pig-tail M12)
QM**/0*-0AVF80 (pig-tail M8, 3 wires)
QM**/0*-0AVG80 (pig-tail M8, 4 wires)

technical specification

direct diffuse models

	QMRB/0*-0*	QMR7/0*-0*	QMR8/0*-0*	QMI7/0*-0*	QMI9/0*-0*
					
nominal sensing distance	100 mm [1]	400 mm [1]	1,000 mm [2]	400 mm [1]	1,500 mm [2]
minimum sensing distance	-				
sensibility adjustment	●				
emission	red (660 nm)			infrared (850 nm)	
hysteresis	≤ 10 %				
repeatability	5 %				
rotary switch	●				
operating voltage	10...30 Vdc				
power on delay	≤ 100 ms				
ripple	≤ 10 %				
no-load supply current	≤ 30 mA			≤ 45 mA	
load current	≤ 100 mA				
supply current	≤ 10 µA				
output voltage drop	2 V max. @ 100 mA				
maximum load current	≤ 100 mA				
output type	PNP or NPN NO or NC				
switching frequency	1 kHz	2 kHz	1 kHz	2 kHz	1 kHz
power on delay	≤ 100 ms				
power supply protections	polarity reversal, over voltage pulses				
output protection	short circuit (auto reset), over voltage pulses				
operating temperature range	- 25°C...+ 70°C (without freeze)				
temperature range	- 30°C...+ 80°C				
temperature drift	10%				
protection degree	IP67 (EN60529) [3]				
EMC	in conformity with the EMC Directive according to EN 60947-5-2				
external light interference	3.000 lux (incandescence lamp), 10.000 lux (sunlight)				
LEDs	yellow (LO/DO output state) green (excess gain)				
housing material	PA66				
optic material	PMMA				
tightening torque	1 Nm [4]				
weight (approximate)	10 g connector / 52 g cable				

[1] White target Kodak 90% 200 x 200 mm [2] White target Kodak 90% 400 x 400 mm [3] Protection guaranteed only with plug cable well mounted [4] Screws, nuts and mounting brackets are not included with the sensor (accessories)

technical specification

background suppression models

	QMRS/0*-0*	QMIS/0*-0*
		
nominal sensing distance	30...200 mm [1]	30...400 mm [1]
minimum sensing distance	5 mm	
sensibility adjustment	●	
emission	red (630 nm)	infrared (850 nm)
hysteresis	≤ 10 %	
repeatability	5 %	
rotary switch	●	
operating voltage	10...30 Vdc	
power on delay	≤ 10 ms	
ripple	≤ 10 %	
no-load supply current	≤ 30 mA	≤ 45 mA
load current	≤ 100 mA	
supply current	≤ 10 µA	
output voltage drop	2 V max. @ 100 mA	
maximum load current	≤ 100 mA	
output type	PNP or NPN NO or NC	
switching frequency	1 kHz	
power on delay	≤ 100 ms	
power supply protections	polarity reversal, over voltage pulses	
output protection	short circuit (auto reset), over voltage pulses	
operating temperature range	- 25°C...+ 70°C (without freeze)	
temperature range	- 30°C...+ 80°C	
temperature drift	10%	
protection degree	IP67 (EN60529) [2]	
EMC	in conformity with the EMC Directive according to EN 60947-5-2	
external light interference	3,000 lux (incandescent lamp), 10,000 lux (sunlight)	
LEDs	yellow (output state LO/DO)	
housing material	PA66	
optic material	PMMA	
tightening torque	1 Nm [3]	
weight (approximate)	10 g connector / 52 g cable	

[1] White target Kodak 90% 200 x 200 mm [2] White target Kodak 90% 400 x 400 mm [3] Protection guaranteed only with plug cable well mounted [4] Screws, nuts and mounting brackets are not included with the sensor (accessories)

technical specification

models for transparent objects

	QMRG/0*-0*	QMIG/0*-0*	QMRL/0*-0*
			
nominal sensing distance	1.5 m	1 m	4 m
minimum sensing distance	0.05 m		0.4 m
sensibility adjustment		●	
emission	red (630 nm)	infrared (850 nm)	red (630 nm)
hysteresis		≤ 10 %	
repeatability		5 %	
rotary switch		●	
operating voltage		10...30 Vdc	
power on delay		≤ 100 ms	
ripple		≤ 10 %	
no-load supply current	≤ 30 mA	≤ 45 mA	≤ 30 mA
load current		≤ 100 mA	
supply current		≤ 10 µA	
output voltage drop		2 V max. @ 100 mA	
maximum load current		≤ 100 mA	
output type		PNP or NPN NO or NC	
switching frequency		2 kHz	
power on delay		≤ 100 ms	
power supply protections		polarity reversal, over voltage pulses	
output protection		short circuit (auto reset), over voltage pulses	
operating temperature range		- 25°C...+ 70°C (without freeze)	
temperature range		- 30°C...+ 80°C	
temperature drift		≤ 10%	
protection degree		IP67 (EN60529) (1)	
EMC		in conformity with the EMC Directive according to EN 60947-5-260947-5-2	
external light interference		3,000 lux (incandescent lamp), 10,000 lux (sunlight)	
LEDs		yellow (output state LO/DO)	
housing material		PA66	
optic material		PMMA	
tightening torque		1 Nm (2)	
weight (approximate)		10 g connector / 52 g cable	

(1) Protection guaranteed only with plug cable well mounted (2) Screws, nuts and mounting brackets are not included with the sensor (accessories)

technical specification

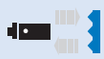
polarized models

	QMRN/0*-0*
	
nominal sensing distance	5 m (1)
minimum sensing distance	5 mm
sensibility adjustment	●
emission	red (630 nm)
hysteresis	≤ 10 %
repeatability	5 %
rotary switch	●
operating voltage	10...30 Vdc
power on delay	≤ 100 ms
ripple	≤ 10 %
no-load supply current	-
load current	≤ 100 mA
supply current	≤ 10 µA
output voltage drop	2 V max. @ 100 mA
maximum load current	≤ 100 mA
output type	PNP or NPN NO or NC
switching frequency	2 kHz
power on delay	≤ 100 ms
power supply protections	polarity reversal, over voltage pulses
output protection	short circuit (auto reset), over voltage pulses
operating temperature range	- 25°C...+ 70°C (without freeze)
temperature range	- 30°C...+ 80°C
temperature drift	≤ 10 %
protection degree	IP67 (EN60529) (2)
EMC	in conformity with the EMC Directive according to EN 60947-5-2
external light interference	3.000 lux (incandescent lamp), 10.000 lux (sunlight)
LEDs	yellow (output state LO/DO) green (excess gain)
housing material	PA66
optic material	PMMA
tightening torque	1 Nm (3)
weight (approximate)	10 g connector / 52 g cable

(1) With RL 110 reflector EG = 2; (2) protection guaranteed only with plug cable well mounted; (3) screws, nuts and mounting brackets are not included with the sensor (accessories).

technical specification

retroreflection models

	QMIC/0*-0*
	
nominal sensing distance	7 m (1)
minimum sensing distance	0,02 m @ RL 110
sensibility adjustment	●
emission	infrared (850 nm)
hysteresis	≤ 10 %
repeatability	5 %
rotary switch	●
operating voltage	10...30 Vdc
power on delay	≤ 100 ms
ripple	≤ 10 %
no-load supply current	≤ 45 mA
load current	≤ 100 mA
supply current	≤ 10 µA
output voltage drop	2 V max. @ 100 mA
maximum load current	≤ 100 mA
output type	PNP or NPN NO or NC
switching frequency	2 kHz
power on delay	≤ 100 ms
power supply protections	polarity reversal, over voltage pulses
output protection	short circuit (auto reset), over voltage pulses
operating temperature range	- 25°C...+ 70°C (without freeze)
temperature range	- 30°C...+ 80°C
temperature drift	≤ 10 %
protection degree	IP67 (EN60529) (2)
EMC	in conformity with the EMC Directive according to EN 60947-5-2
external light interference	3.000 lux (incandescent lamp), 10.000 lux (sunlight)
LEDs	yellow (output state LO/DO) green (excess gain)
housing material	PA66
optic material	PMMA
tightening torque	1 Nm (3)
weight (approximate)	10 g connector / 52 g cable

(1) With RL 110 reflector EG = 2; (2) protection guaranteed only with plug cable well mounted; (3) screws, nuts and mounting brackets are not included with the sensor (accessories).

technical specification

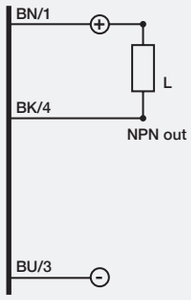
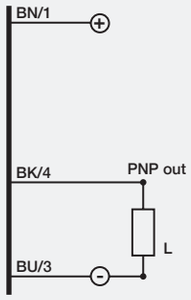
through beam models

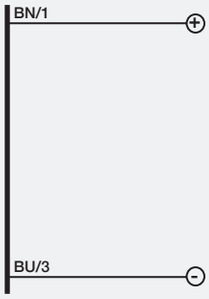
	QMRH/0*-0*	QMRD/0*-0*	QMIH/0*-0*	QMID/0*-0*
nominal sensing distance	20 m (1)		30 m (1)	
minimum sensing distance	-			
sensibility adjustment	●			
emission	red (630 nm)	-	infrared (850 nm)	-
hysteresis	≤ 10 %			
repeatability	5 %			
rotary switch	-	●	-	●
operating voltage	10...30 Vdc			
power on delay	≤ 100 ms			
ripple	≤ 10 %			
no-load supply current	≤ 30 mA		≤ 45 mA	
load current	-	≤ 100 mA	-	≤ 100 mA
supply current	-	≤ 10 µA	-	≤ 10 µA
output voltage drop	-	2 V max. @ 100 mA	-	2 V max. @ 100 mA
maximum load current	-	≤ 100 mA	-	≤ 100 mA
output type	-	PNP or NPN NO or NC	-	PNP or NPN NO or NC
switching frequency	2 kHz	-	2 kHz	-
power on delay	≤ 100 ms			
power supply protections	-	polarity reversal, over voltage pulses	-	polarity reversal, over voltage pulses
output protection	-	polarity reversal, over voltage pulsesi	-	polarity reversal, over voltage pulses
operating temperature range	- 25°C...+ 70°C (without freeze)			
temperature range	- 30°C...+ 80°C			
temperature drift	≤ 10 %			
protection degree	IP67 (EN60529) (2)			
EMC	in conformity with the EMC Directive according to EN 60947-5-2			
external light interference	3,000 lux (incandescent lamp), 10,000 lux (sunlight)			
LEDs	yellow (output state LO/DO), 10,000 lux (sunlight)			
housing material	PA66			
optic material	PMMA			
tightening torque	1 Nm (3)			
weight (approximate)	10 g connector / 52 g cable			

(1) White target Kodak 90% 200 x 200 mm (2) Protection guaranteed only with plug cable well mounted (3) Screws, nuts and mounting brackets are not included with the sensor (accessories)

response diagrams

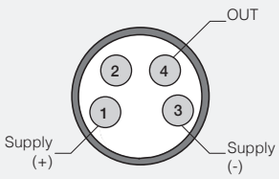
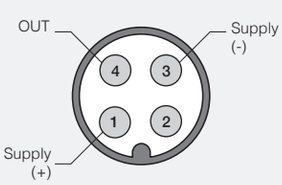
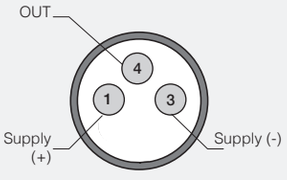
LO/DO selectable output

NPN output	PNP output
	

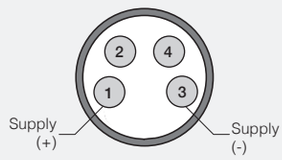
emitter


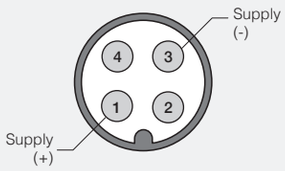
BN	brown
BU	blue
BK	black
WH	white

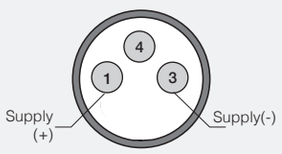
plug

M8 4 pin	QMR*/0*-0F & QMR*/0*-0AVG0 QMI*/0*-0F & QMI*/0*-0AVG0	M12 4 pin (pig tail)	QMR*/0*-0AVE80 QMI*/0*-0AVE80	M8 3 pin (pig tail)	QMR*/0*-0AVF80 QMI*/0*-0AVF80
					

M8 4 pin	QM*H/00-0F & QM*H/00-0AVG80	M12 4 pin (pig tail)	QM*H/0*-0AVE80	M8 3 pin (pig tail)	QM*H/0*-0AVF80



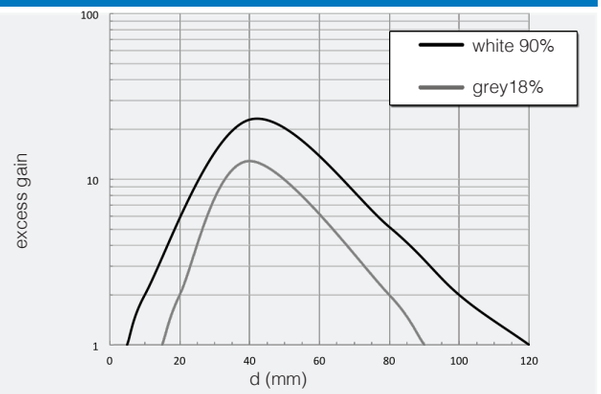




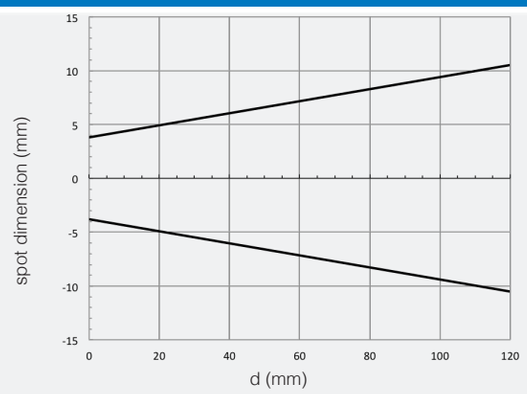
response diagrams

direct diffuse models

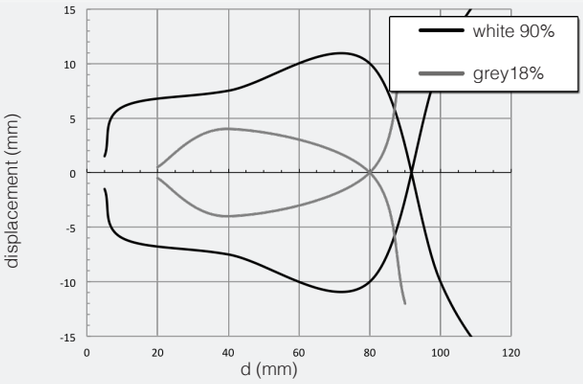
QMRB/-* excess gain**



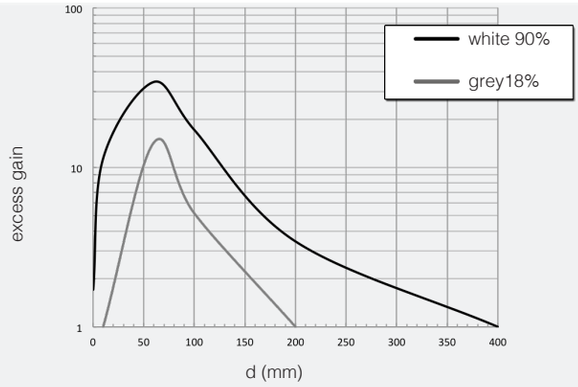
QMRB/-* spot dimension**



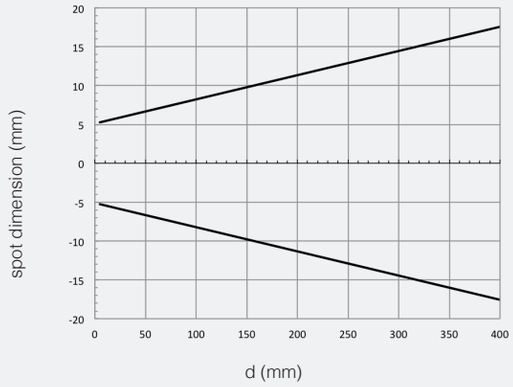
QMRB/-* parallel displacement**



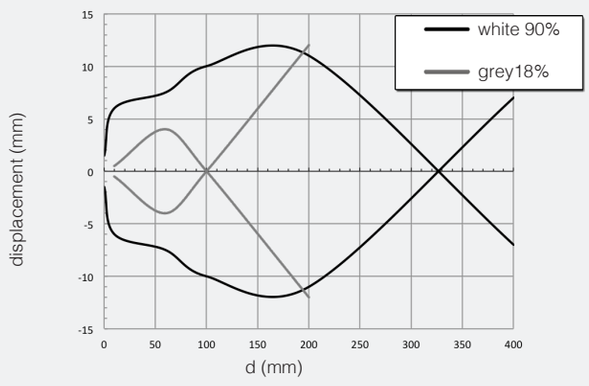
QMR7/-* excess gain**



QMR7/-* spot dimension**



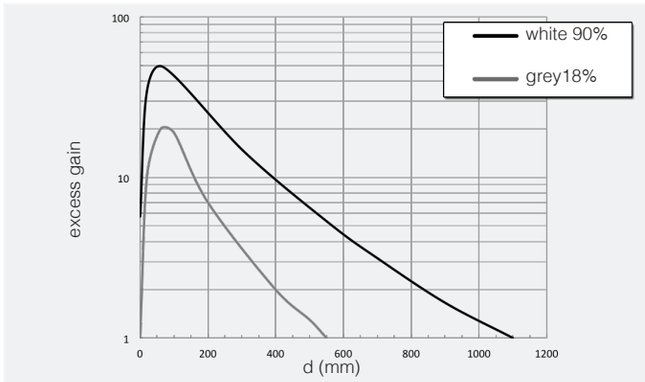
QMR7/-* parallel displacement**



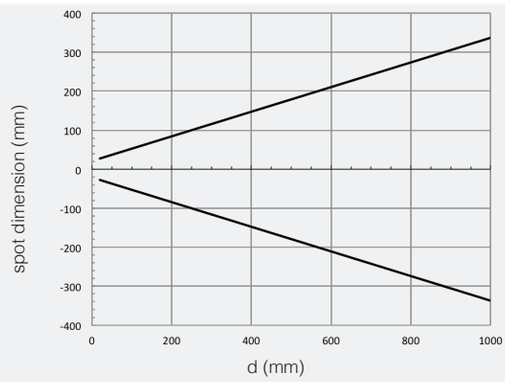
response diagrams

direct diffuse models

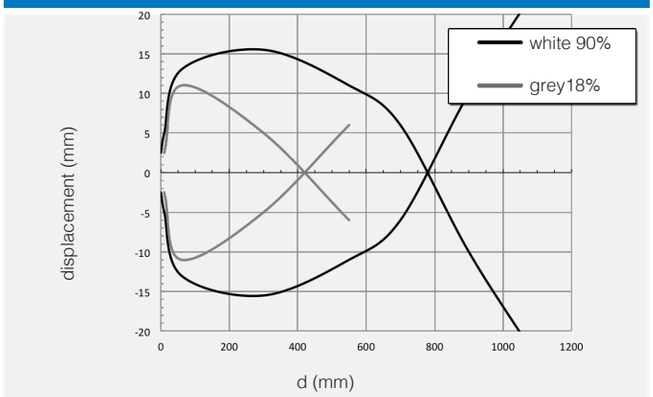
QMR8/**-* excess gain



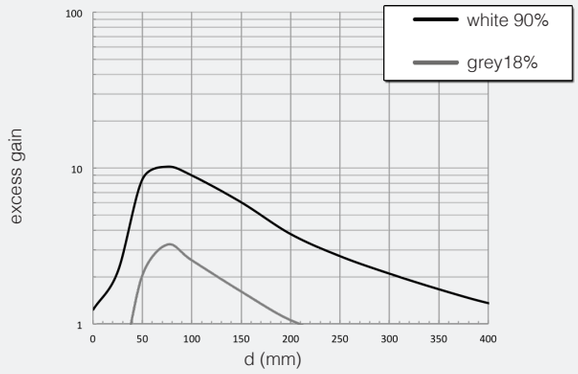
QMR8/**-* spot dimension



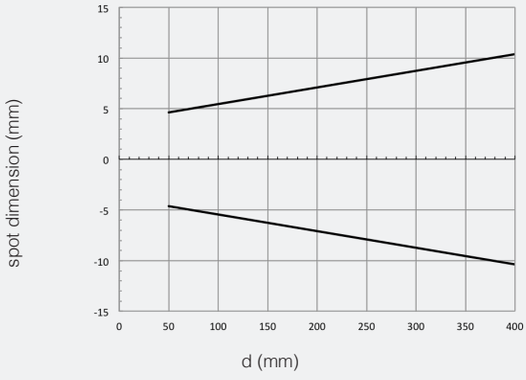
QMR8/**-* parallel displacement



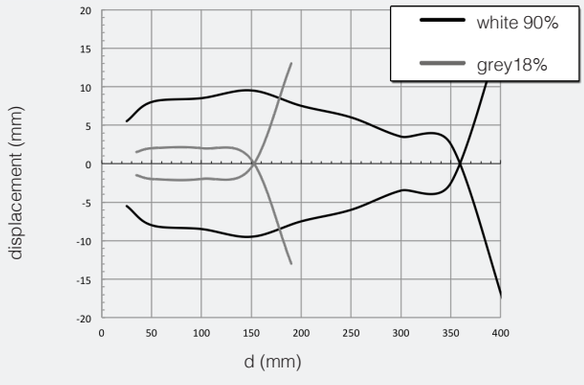
QMI7/**-* excess gain



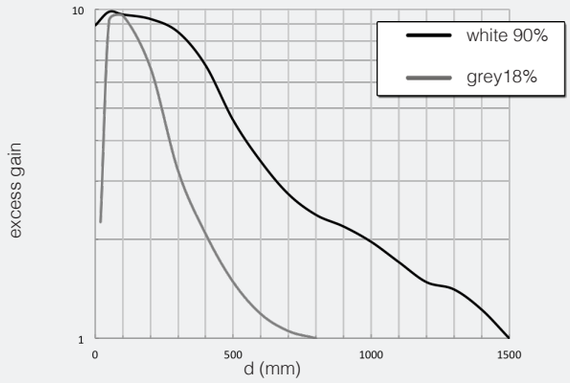
QMI7/**-* spot dimension



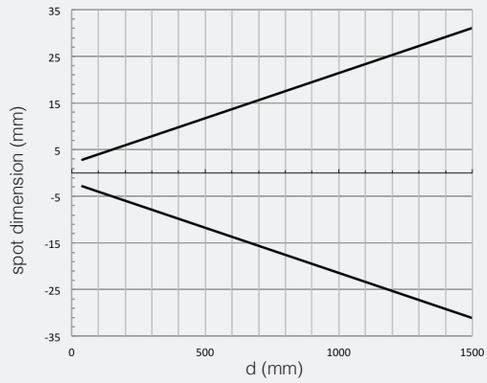
QMI7/**-* parallel displacement



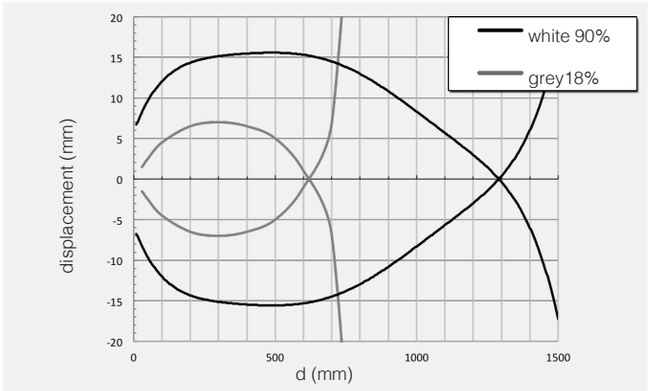
QMI9/**-* excess gain



QMI9/**-* spot dimension



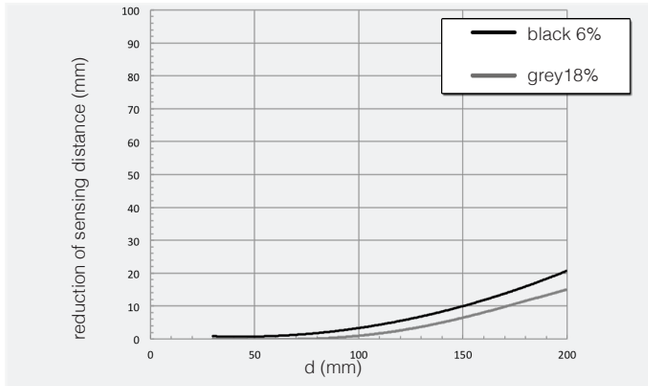
QMI9/**-* parallel displacement



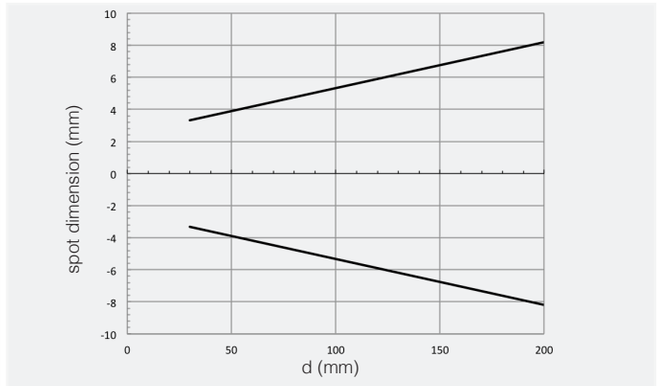
response diagrams

background suppression models

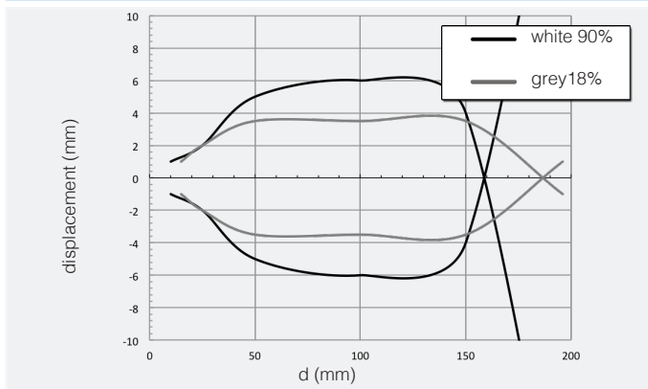
QMRS/**-* reduction of sensing distance



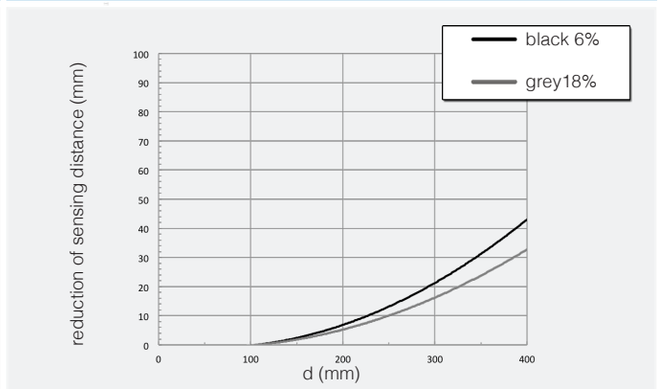
QMRS/**-* spot dimension



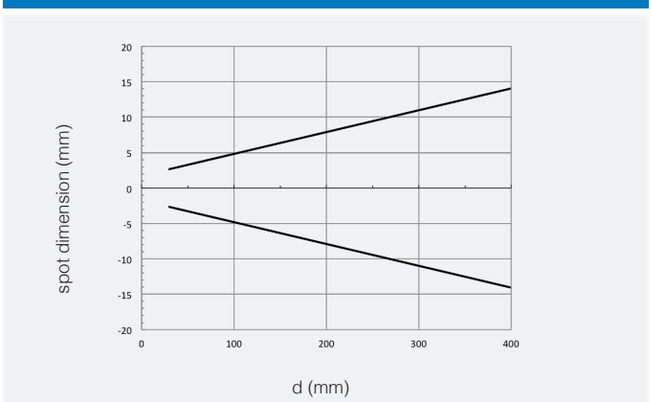
QMRS/**-* parallel displacement



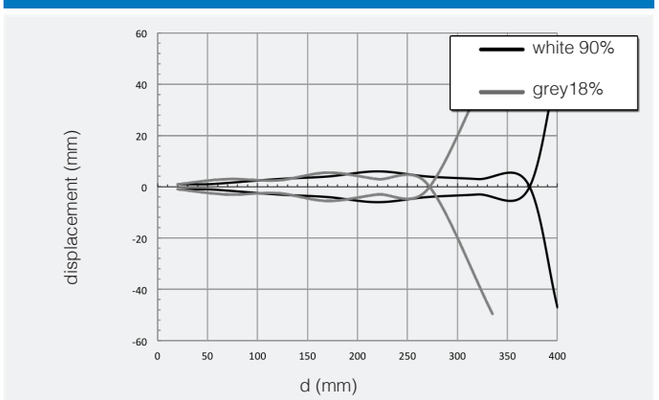
QMIS/**-* reduction of sensing distance



QMIS/**-* spot dimension



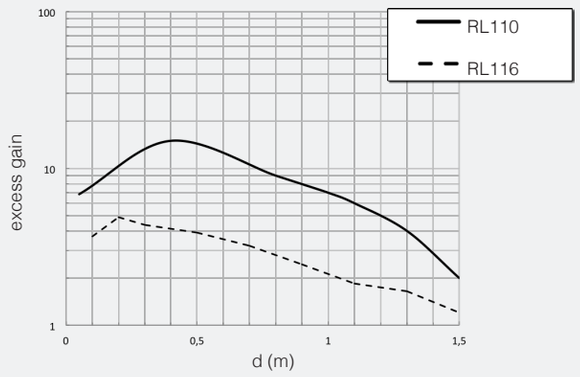
QMIS/**-* parallel displacement



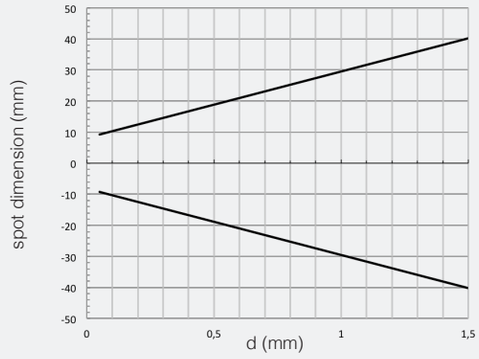
response diagramss

models for transparent objects

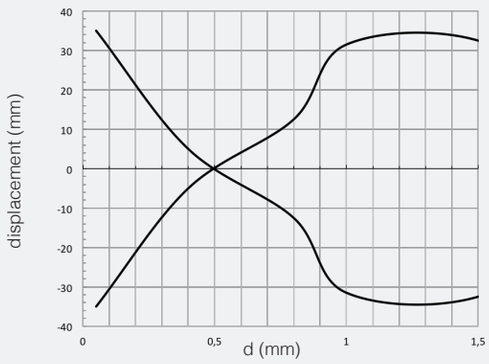
QMRG/**-* excess gain



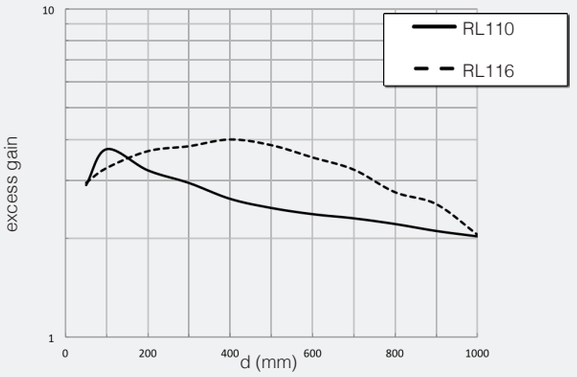
QMRG/**-* spot dimension



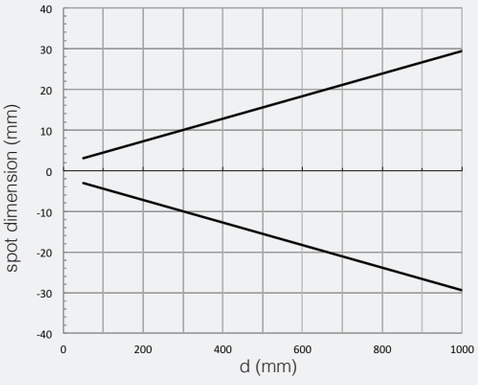
QMRG/**-*parallel displacement



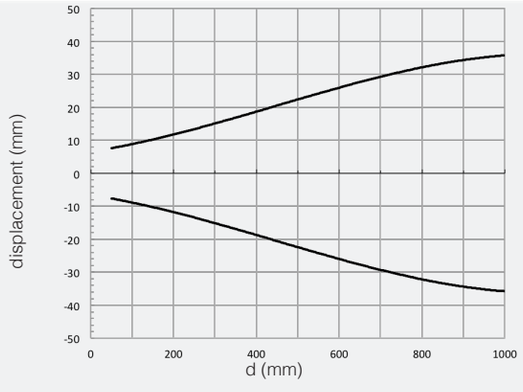
QMIG/**-* excess gain



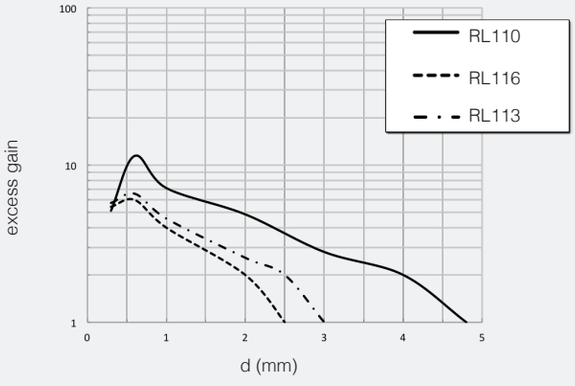
QMIG/**-* spot dimension



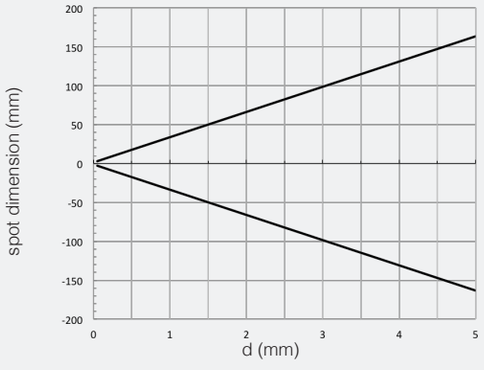
QMIG/**-*parallel displacement



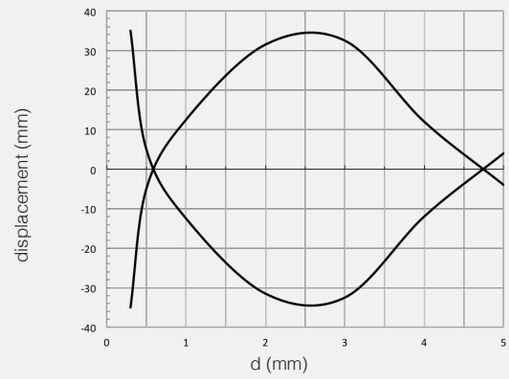
QMRL/**-* excess gain



QMRL/**-* spot dimension



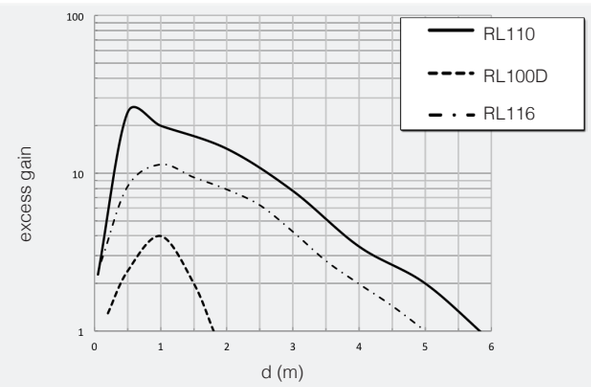
QMRL/-*parallel displacement**



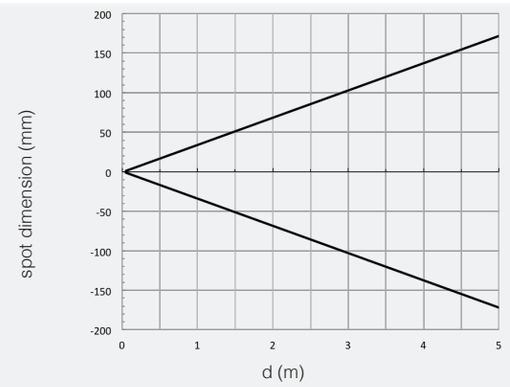
response diagramss

retroreflective polarized models

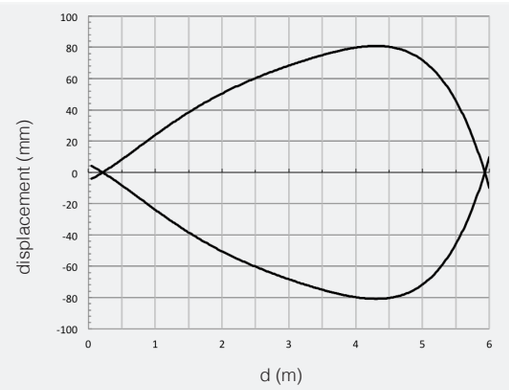
QMRN/-* excess gain**



QMRN/-* spot dimension**



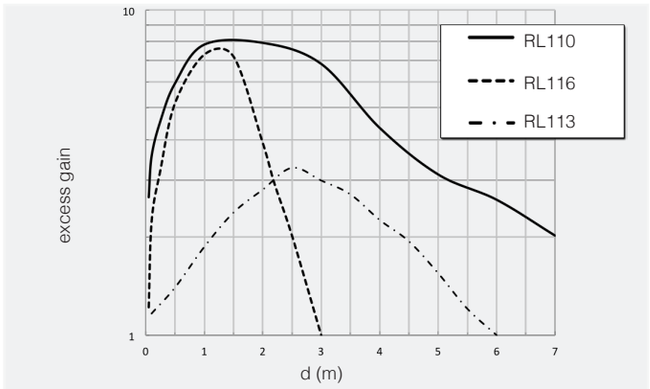
QMRN/-*parallel displacement**



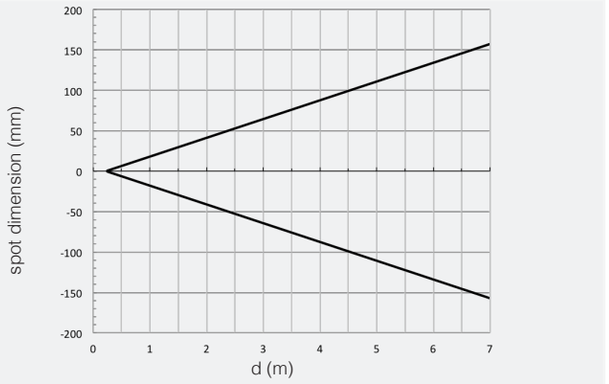
response diagramss

retro-reflective models

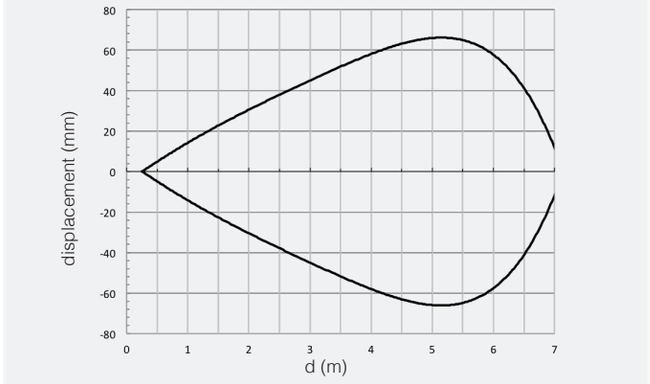
QMIC/-* excess gain**



QMIC/-* spot dimension**



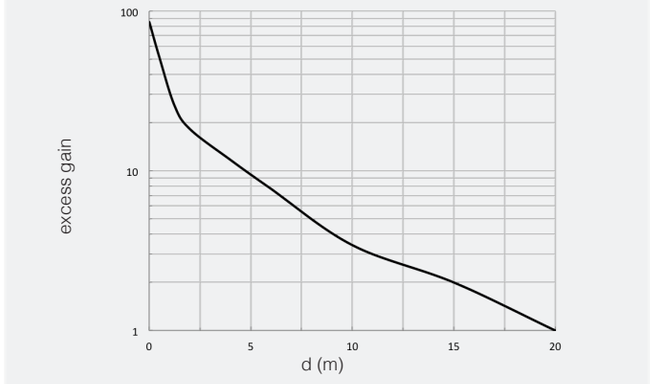
QMIC/-*parallel displacement**



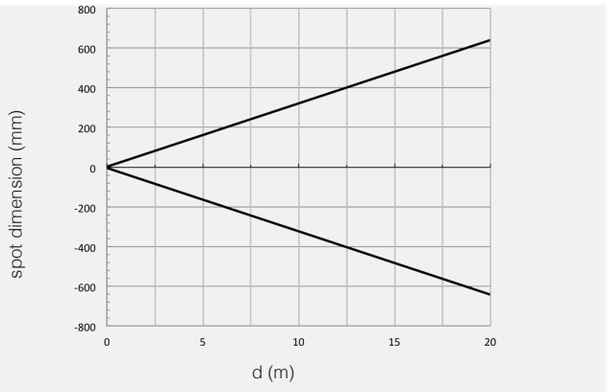
response diagramss

through beam models

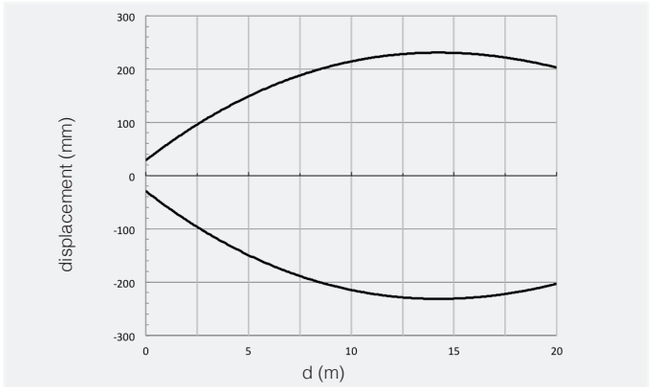
QMRHD/-* excess gain**



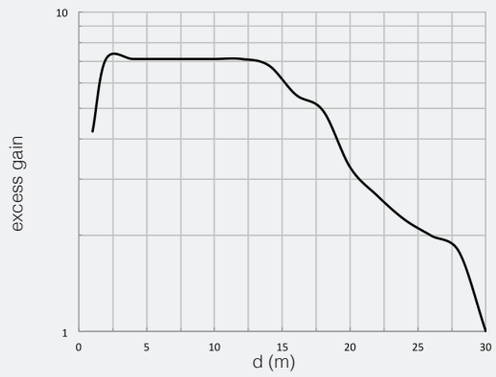
QMRHD/-* spot dimension**



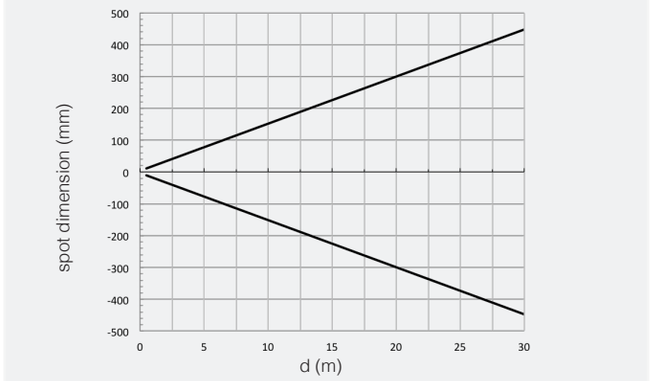
QMRHD/**-*parallel displacement



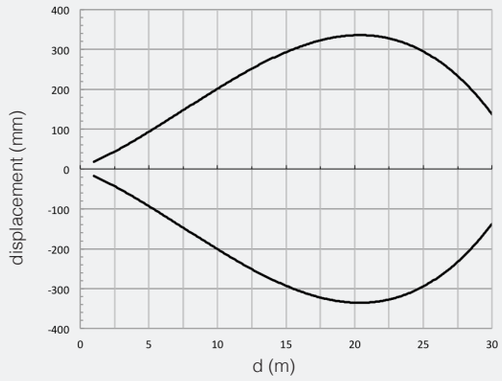
QMIHD/**-* excess gain



QMIHD/**-* spot dimension

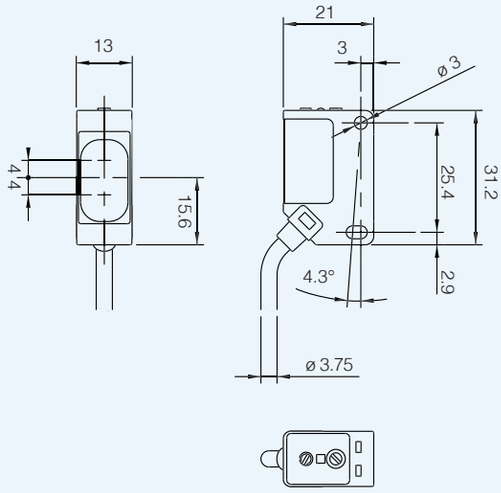


QMIHD/**-*parallel displacement

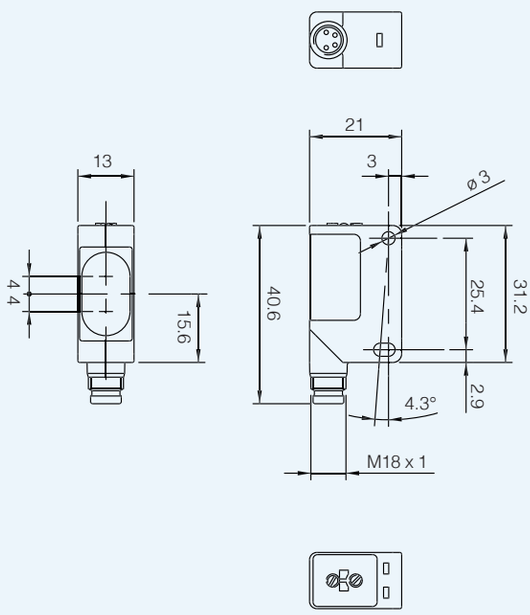


dimensions (mm)

QM**/**-0A

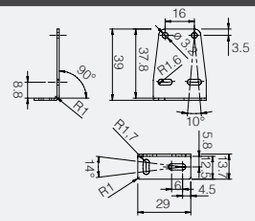


QM**/**-0E

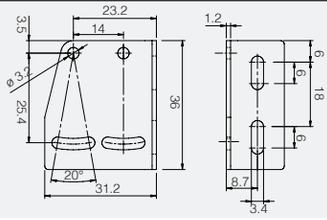


accessories

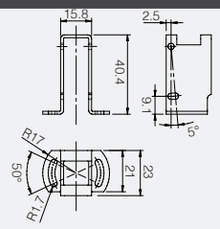
ST 101 / L vertical mounting bracket

product	to be used with	dimensions (mm)	description / installation
	QM Sensors		• ± 5° tip • ± 7° swivel • stainless steel

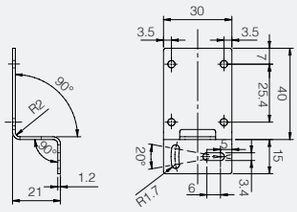
ST 102 / L side mounting bracket

product	to be used with	dimensions (mm)	description / installation
	QM Sensors		• ± 10° tip • stainless steel

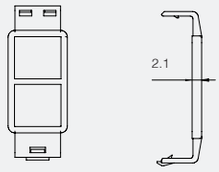
ST 103 [1] / Vertical mounting bracket with protective cover

prodotto	to be used with	dimensions (mm)	description / installation
	QM Sensors		• ± 25° swivel • stainless steel

ST 104 [1] / Horizontal mounting bracket with protective cover

product	to be used with	dimensions (mm)	description / installation
	QM Sensors		• ± 10° swivel • stainless steel

STQM0 / Vertical and horizontals shutters

prodotto	to be used with	dimensions (mm)	description / installation
	QM*HD Sensors		• Vertical and horizontal diaphrams (0.5 - 1.2) • Packing units 2

dia.	0.5	1	2
Sn (EG=1)	1.5 m	2 m	4.5 m
Sn (EG=2)	1 m	1,5 m	4 m
Min. Ø	0.8 mm	1.5 mm	2.5 mm

STQMS [2] / Screws - nuts - lockwashers

prodotto	to be used with	dimensions (mm)	description / installation
	QM Sensors	w	• 20 Cross-slotted screw M3x20 • 20 Hexagon nuts M3 • 20 Lockwashers Ø3

[1] It can be used only for cable or pig-tail exit models [2] Components not present in standard sensors packaging

PS series

DC miniaturized cubic photoelectric sensors

features

- **Wide range of models: diffuse, retro-reflective, through-beam**
- **Extremely reduced dimensions**
- **High sensing distance**
- **Sensitivity adjustment**
- **Standard cable exit or M12 plug exit**
- **LED status indicator**
- **IP65 protection degree**
- **Complete protection againts electrical damage**

web content

- **Application notes**
- **Photos**
- **Catalogue / Manuals**

code description

PS 2 / A N - 0 C WW

series	PS	Miniaturized rectangular photoelectric sensor
type	2	100 mm diffuse reflection
	4	200 mm diffuse reflection
	C	3 m retro-reflective
	E	Emitter
	R	Receiver
NO / NC output	0	Emitter / NO/NC selectable output (PSR only)
	A	NO output state
	C	NC output state
NPN / PNP output	0	Emitter
	N	NPN output
	P	PNP output
housing	0	Plastic housing 2 m
cble / plug output	C	Right angle cable exit
	E	Right angle M12 plastic plug cable exit

available models

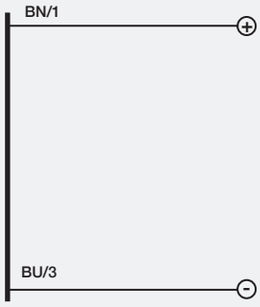
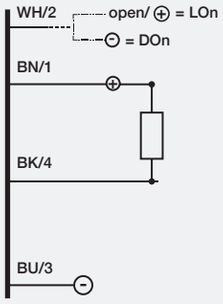
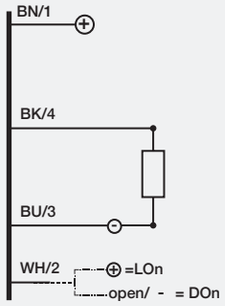
model	distance	output	3 wires				4 wires	
			LO NPN	DO NPN	LO PNP	DO PNP	LO / DO NPN	LO / DO PNP
diffuse reflection	100 mm	cable	PS2/AN-0C	PS2/CN-0C	PS2/AP-0C	PS2/CP-0C	-	-
		plug	PS2/AN-0E	-	PS2/AP-0E	-	-	-
	200 mm	cable	PS4/AN-0C	-	PS4/AP-0C	-	-	-
		plug	PS4/AN-0E	-	PS4/AP-0E	-	-	-
retro-reflexive	2 m	cable	-	-	PSC/AP-0C	-	-	-
		plug	-	-	PSC/AP-0E	PSC/CP-0E	-	-
through-beam	4 m	cable	-	-	-	-	PSE/00-0C	
		plug	-	-	-	-	PSE/00-0E	
		cable	-	-	-	-	PSR/0N-0C	PSR/0P-0C
		plug	-	-	-	-	PSR/0N-0E	PSR/0P-0E

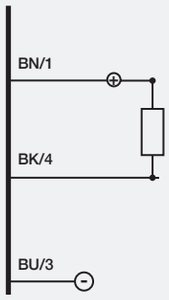
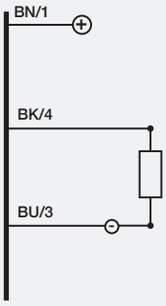
technical specification

	diffuse reflection		retro-reflective	through-beam
	PS2/**-0*	PS4/**-0*	PSC/**-0*	PSE/00-0* PSR/**-0*
				
nominal sensing distance	100 mm (1)	200 mm (1)	3 m (2)	4 m
emission	infrared (880 nm)			
tolerance	+ 15 / - 5 % Sn			-
hysteresis	≤ 5 %		≤ 10 %	
operating voltage	10...30 Vdc max			
ripple	≤ 10 %			
no-load supply current	30 mA max			25 mA (emitter) 30 mA (receiver)
load current	≤ 100 mA			
leakage current	≤ 10 µA @ Vmax			
output voltage drop	1.2 Vmax			
output type	PNP or NPN , NO or NC (NO/NC selectable for PSR models)			
switching frequency	100 Hz			25 Hz
power on delay	200 ms			
temperature range	- 25°C...+ 70°C (without freeze)			
power supply protections	polarity reversal, transient			
supply electrical output	short circuit (autoreset)			
sensitivity adjustment	1 turn trimmer			
temperature range	≤ 10 % Sr			
protection degree	IP65 (EN60529) (3)			
EMC	in conformity with the EMC Directive according to EN 60947-5-2			
external light interference	3,000 lux (incandescent lamp), 10,000 lux (sunlight)			
LEDs	red (output energized)			
housing material	ABS			
optic material	PMMA			
weight (approximate)	70 g connector / 140 g cable (20 g mounting bracket ST07)			

(1) With 100x100 mm white matt paper (2) With standard reflector Ø80 mm (RL110 supplied seperately) (3) Protection guaranteed only with plug cable well mounted

electrical diagrams of the connections

PSE/00-0* emitter	PSR/*N-0* NPN output	PSR/*P-0* PNP output
		

PS*/*N-0* NPN output	PS*/*P-0* PNP output
	

BN	brown
BU	blue
BK	black
WH	white
PK	pink
GY	gray

Notes:

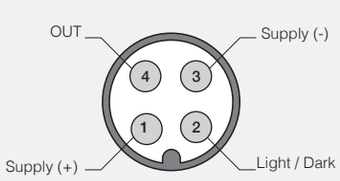
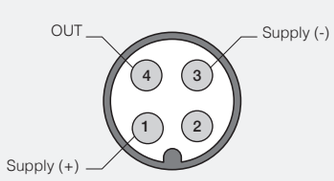
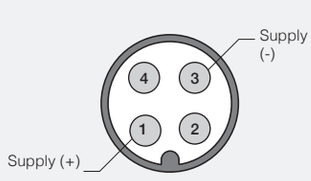
In case of combined load, resistive and capacitive, the maximum admissible capacity C = 0,1 µF, for maximum output volt-age and current.

Wh (white wire): the cable present on the receiver PSR/0*- 0* allows the output state selection.

NPN output: NO state (white and brown on +), NC state (white and blue on -).

PNP output: NO state (white and blue on -), NC state (white and brown on +).

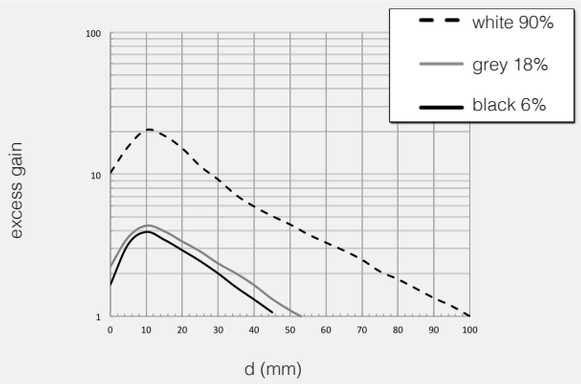
plug

M12 PSR/00-0*	M12 PS*/**-0*	M12 PS2/**-1
		

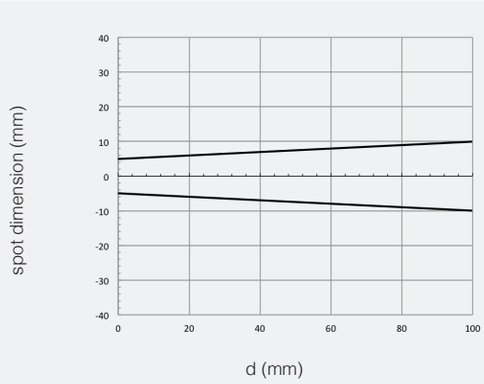
response diagrams

direct reflection models

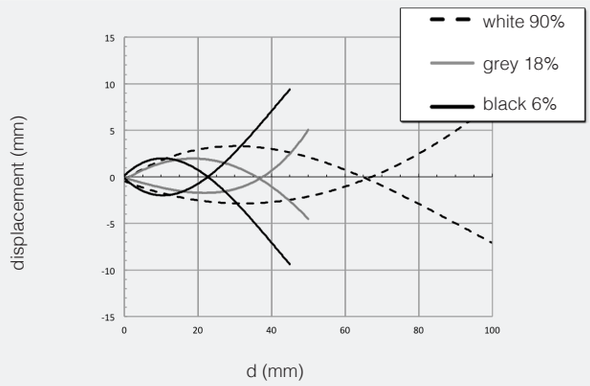
PS2/**-** excess gain



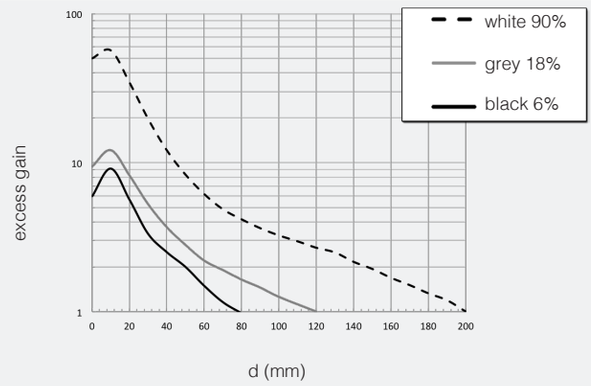
PS2/**-** spot dimension



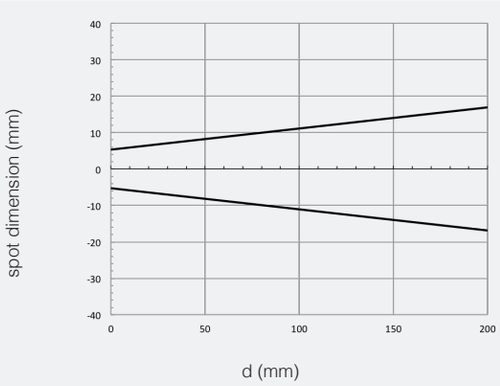
PS2/**-** parallel displacement



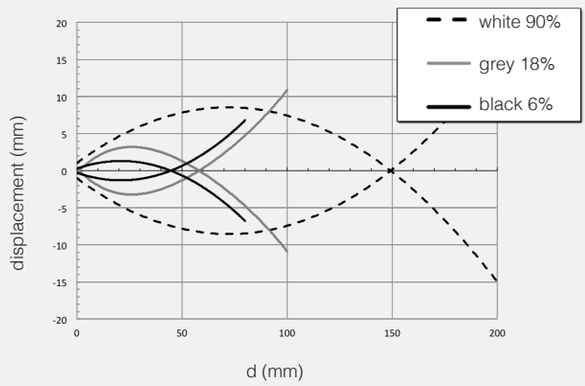
PS4/**-** excess gain



PS4/**-** spot dimension



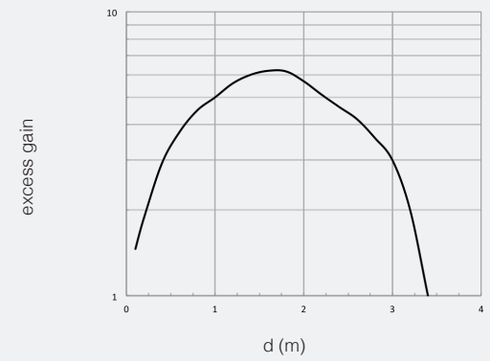
PS4/**-** parallel displacement



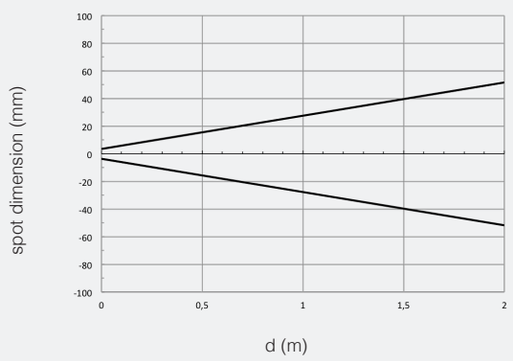
response diagrams

retro-reflective models (detected with RL 110)

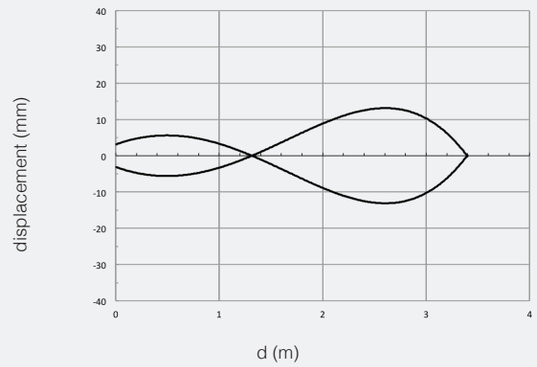
PS2/**-** excess gain



PS2/**-** spot dimension



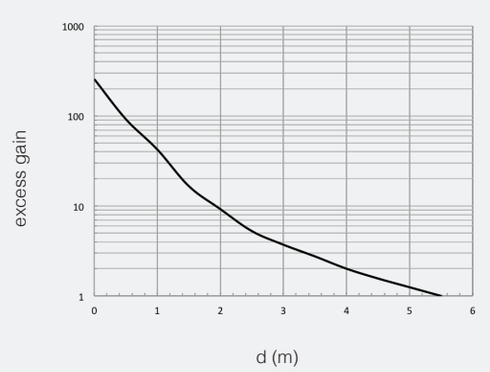
PS2/**-** parallel displacement



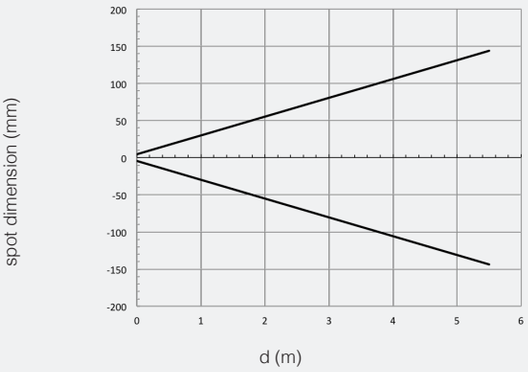
response diagrams

through beam models

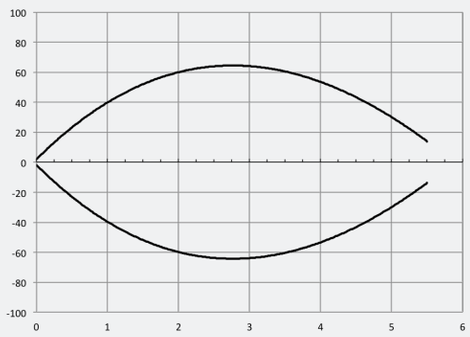
PSE/00-0* - PSR/00-0* excess gain



PSE/00-0* - PSR/00-0* spot dimension

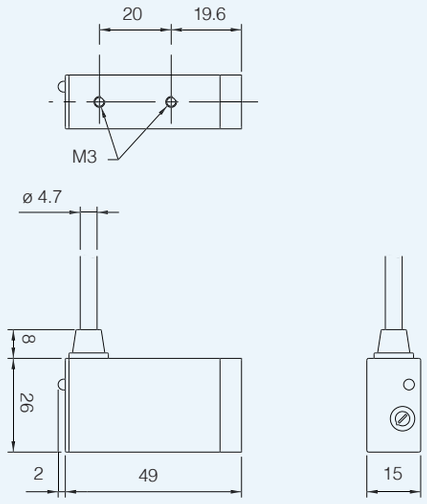


PSE/00-0* - PSR/00-0* parallel displacement

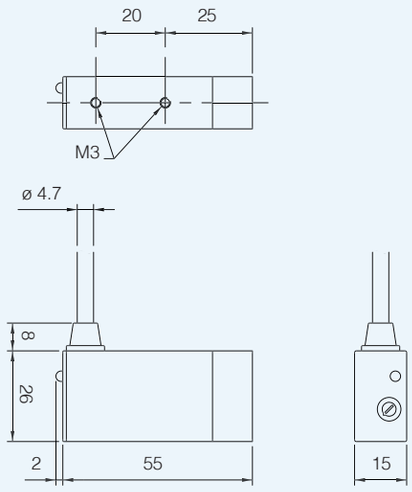


dimensions (mm)

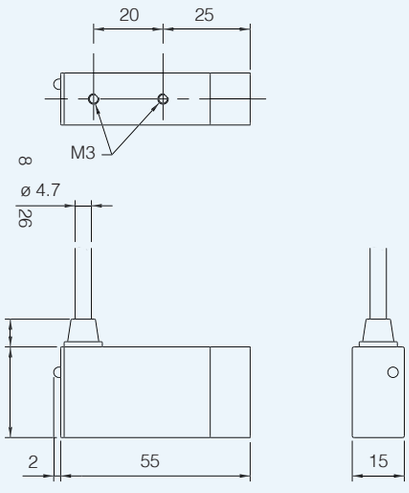
PS2/**-0C - PS4/**-0C



PSC/**-0C - PSE/00-0C - PSR/0*-0C



PS*/**-0E



QX series

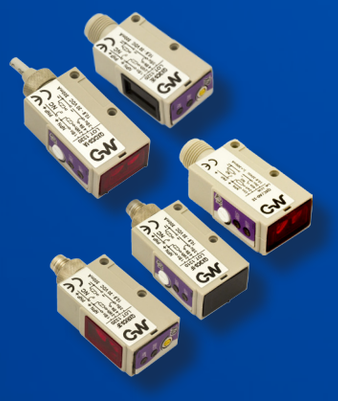
DC miniaturized cubic photoelectric sensors

features

- **Axial and right angle optics**
- **2 LEDs (threshold and signal margin)**
- **Visible red light in retro-reflective, polarized and through-beam models**
- **Long distances capability**
- **Precision beam**
- **Fast response time (0,75-0,5 ms)**
- **NPN-PNP selectable output**
- **High output current (>300 mA)**

web content

- **Application notes**
- **Photos**
- **Catalogue / Manuals**



code description

QX3 / A0 - 1A

series	QX	Miniaturized photoelectric sensor
type	3	Diffuse reflection 300 mm
	C	Retro-reflective 5 m
	P	Polarized 3 m
	X	Emitter with check
	R	Receiver 8 m
output	A	NO output state
	C	NC output state
	0	Emitter
axial / radial optics	1	Axial optics
	2	Right angle optics
cable / plug output	A	Cable exit 2 m
	F	M8 plug cable exit
	E	M12 plug cable exit

available models

axial optic

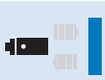
model		distance	cable		plug M8		plug M12	
			NO	NC	NO	NC	NO	NC
direct diffuse		300 mm	QX3/A0-1A	QX3/C0-1A	QX3/A0-1F	QX3/C0-1F	QX3/A0-1E	QX3/C0-1E
retro-reflective		5 m	QXC/A0-1A	QXC/C0-1A	QXC/A0-1F	QXC/C0-1F	QXC/A0-1E	QXC/C0-1E
polarized		3 m	QXP/A0-1A	QXC/C0-1A	QXP/A0-1F	QXP/C0-1F	QXP/A0-1E	QXP/C0-1E
through-beam	emitter	8 m	QXX/00-1A		QXX/00-1F		QXX/00-1E	
	receiver		QXR/A0-1A	QXR/C0-1A	QXR/A0-1F	QXR/C0-1F	QXR/A0-1E	QXR/C0-1E

available models

radial optic

model		distance	cable		plug M8		plug M12	
			NO	NC	NO	NC	NO	NC
direct diffuse		300 mm	QX3/A0-2A	QX3/C0-2A	QX3/A0-2F	QX3/C0-2F	QX3/A0-2E	QX3/C0-2E
retro-reflective		5 m	QXC/A0-2A	QXC/C0-2A	QXC/A0-2F	QXC/C0-2F	QXC/A0-2E	QXC/C0-2E
polarized		3 m	QXP/A0-2A	QXC/C0-2A	QXP/A0-2F	QXP/C0-2F	QXP/A0-2E	QXP/C0-2E
through-beam	emitter	8 m	QXX/00-2A		QXX/00-2F		QXX/00-2E	
	receiver		QXR/A0-2A	QXR/C0-2A	QXR/A0-2F	QXR/C0-2F	QXR/A0-2E	QXR/C0-2E

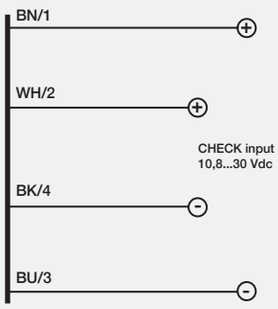
technical specification

	diffuse reflection	retro-reflective	polarized	through-beam
	QX3/*0-**	QXC/*0-**	QXP/*0-**	QXX/*0-** QXR/*0-**
				
nominal sensing distance	300 mm (1)	5 m (2)	3 m (2)	8 m
emission	infrared (880 nm)	red (660 nm)		
minimum detectable object	see characteristic curves			2 mm
tolerance	+ 15 % / - 5 % Sn			-
hysteresis	10 %			
repeatability	5 %			
operating voltage	10,8...30 Vdc			
ripple	10 % max			
load current	20 mA max			20 mA (emitter) 5 mA (receiver)
check voltage	-			10,8...30 Vdc (QXX)
load current	300 mA			
leakage current	100 µA max at 30 Vdc			
output voltage drop	1,2 V max IL = 100 mA			
output type	PNP or NPN selectable			
switching frequency	750 Hz (Tr = 0,5 ms)			500 Hz (Tr = 0,75 ms)
power on delay	200 ms			
operating temperature range	- 25°C...+ 70°C (without freeze)			
power supply protections	polarity reversal, transient			
output protection	short circuit (autoreset)			
protection degree	IP67 (EN60529) (3)			
EMC	in conformity with the EMC Directive according to EN 60947-5-2			
external light interference	3,000 lux (incandescent lamp), 10,000 lux (sunlight)			
LEDs	RED LED (margin low signal) CHECK (QXX) GREEN LED (stability) POWER (QXX)			
housing material	ABS (glass fiber reinforced)			
optic material	acrylic			
weight (approximate)	30 g connector / 70 g cable (single)			

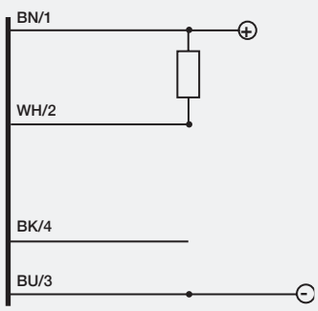
(1) With 100x100 mm white matt paper (2) With standard reflector Ø80 mm (RL110 supplied seperately) (3) Protection guaranteed only with plug cable well mounted

electrical diagrams of the connections

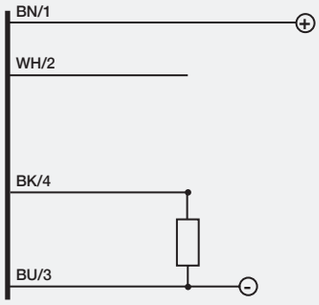
emitter with check



NPN output



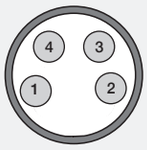
PNP output



BN	brown
BU	blue
BK	black
WH	white

plug

M8

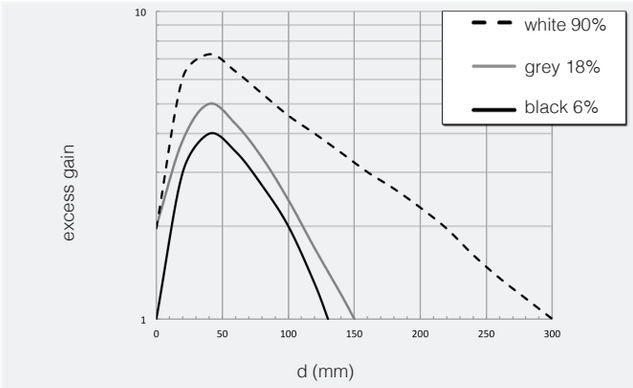


M12

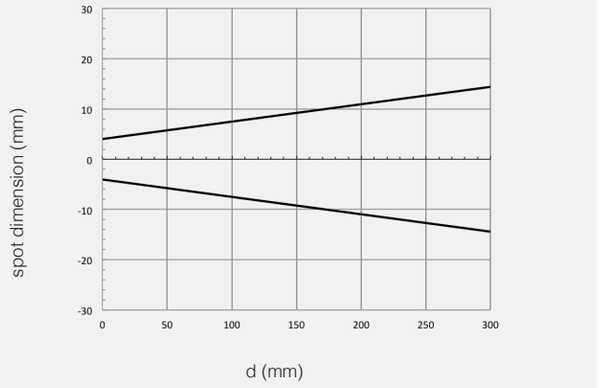
response diagrams

direct reflection models

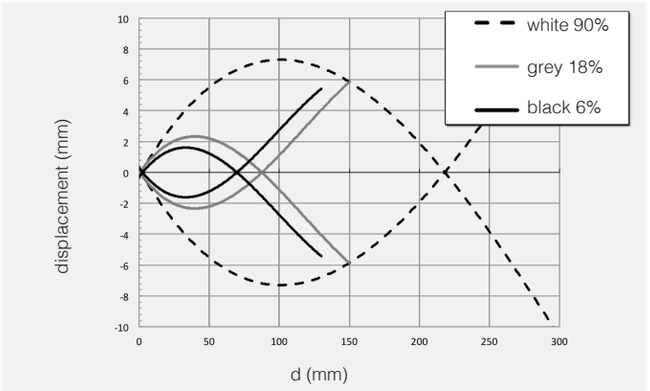
QX3/*0-** excess gain



QX3/*0-** spot dimension



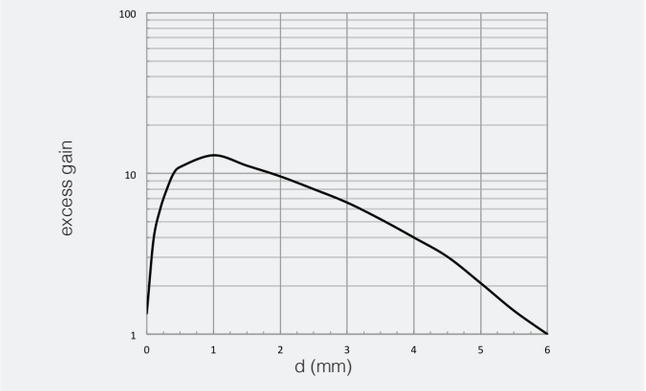
QX3/*0-** parallel displacement



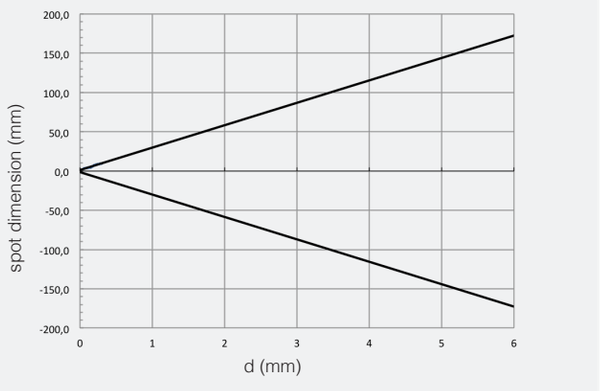
response diagrams

retroreflective models

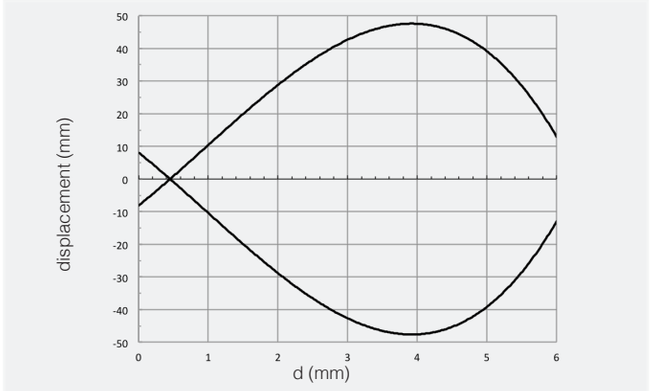
QXC/*0-** excess gain



QXC/*0-** spot dimension



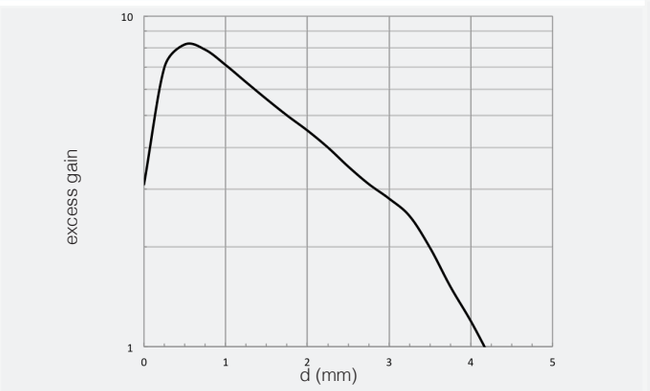
QXC/*0- parallel displacement**



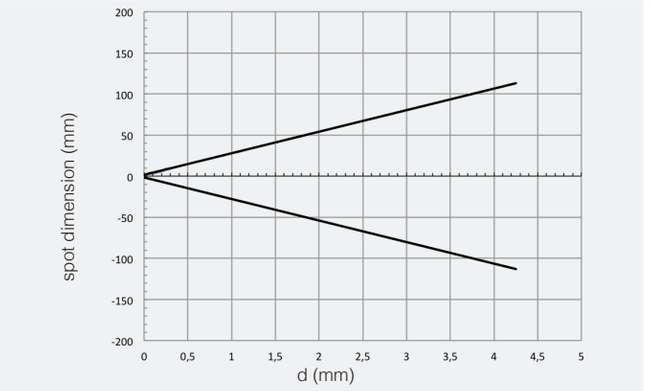
response diagrams

polarized models

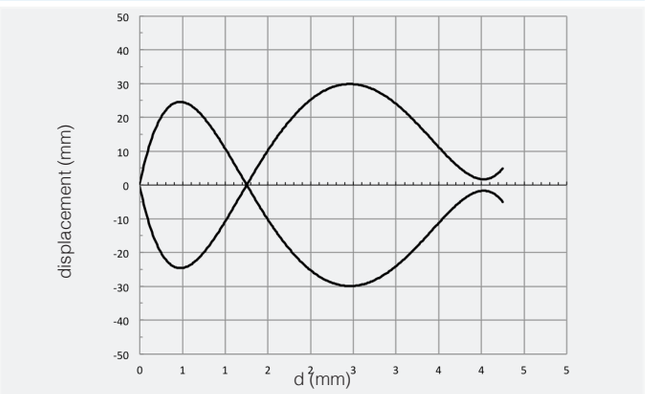
QXP/*0- excess gain**



QXP/*0- spot dimension**



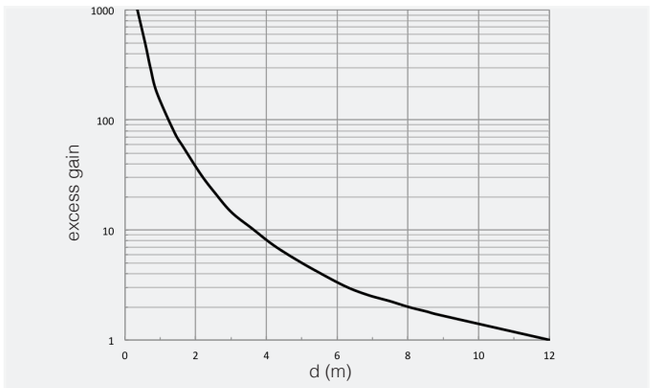
QXP/*0- parallel displacement**



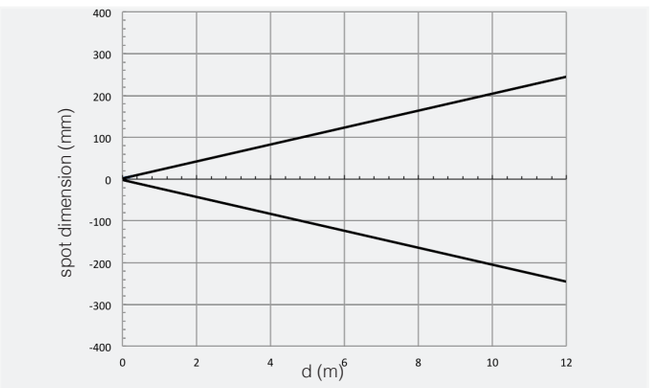
response diagrams

a barriera

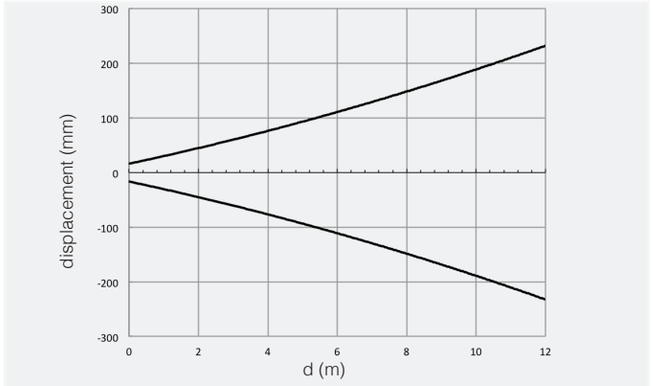
QXX/00-** - QXR/*0-** excess gain



QXX/00-** - QXR/*0-** spot dimension

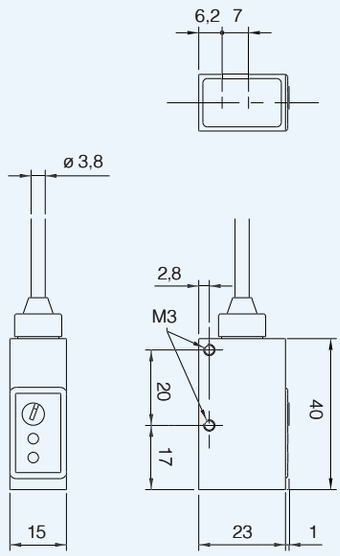


QXX/00-** - QXR/*0-** parallel displacement

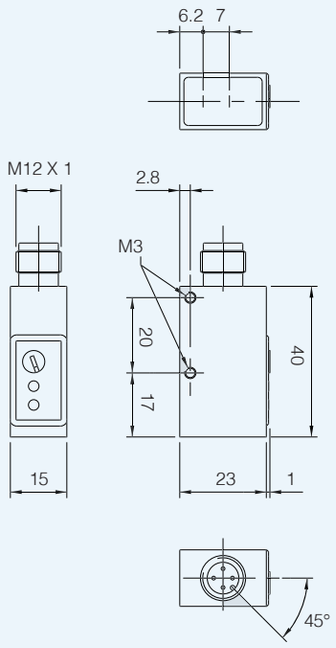


dimensions (mm)

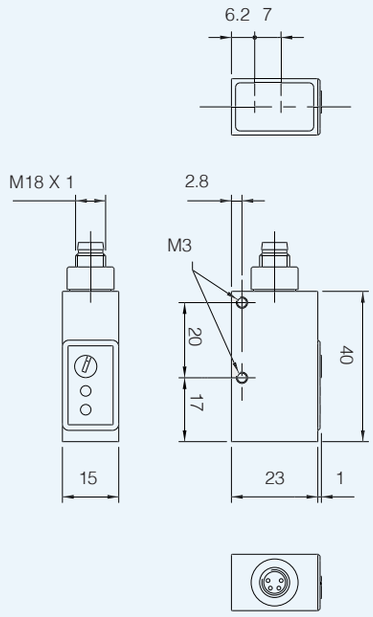
QX*/**-1A



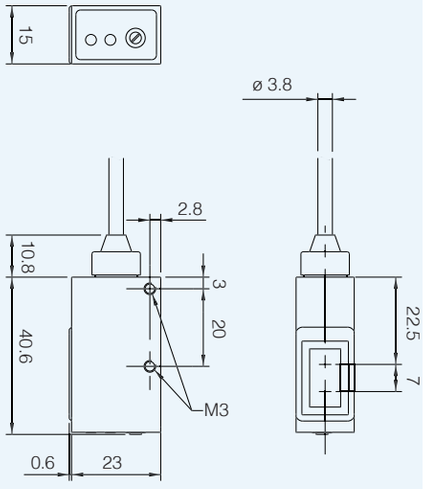
QX*/**-1E



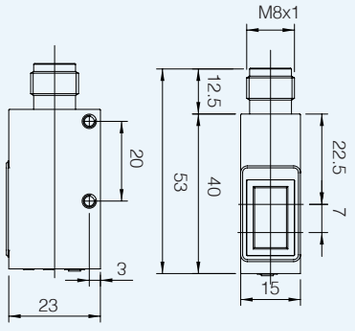
QX*/**-1F



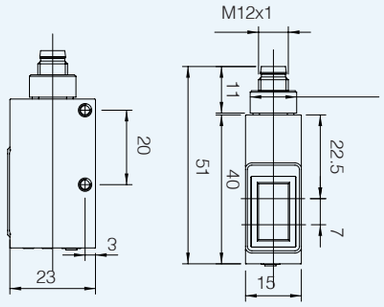
QX*/**-2A



QX*/**-2E



QX*/**-2F



notes

BS - BV series

Cubic photoelectric sensors
DECOUT® output - DC or AC

features

- **Wide range of models: diffuse, retro-reflective, polarized**
- **Muntifunctional DECOUT® output and logic connection possibilities (DC types)**
- **Multivoltage 20-253 Vac and T_{RIAC} output with NO/NC selectable (AC types)**
- **Sensitivity adjustment**
- **Standard cable exit or M12 plug exit**
- **LED status indicator**
- **Completely filled with resin**
- **High sensing range**

web content

- **Application notes**
- **Photos**
- **Catalogue / Manuals**

code description

BS 2 / 0 0 - 0 C

series	BS	DC - rectangular photoelectric sensor
	BV	AC - rectangular multivoltage photoelectric sensor
type	2	100 mm diffuse reflection
	4	200 mm diffuse reflection
	6	400 mm diffuse reflection
	8	1600 mm diffuse reflection
	C	8 m retro-reflective
NO / NC	0	NO / NC selectable output
NPN / PNP	0	NPN / PNP selectable output DC Triac output AC
housing	0	Plastic housing
cable / plug output	C	Right angle cable exit
	E	Right angle M12 plastic plug cable exit

available models

model	distance	output	DC - DECOUT®	AC - TRIAC
diffuse reflection	100 mm	cable	BS2/00-0C	BV2/00-0C
		M12	BS2/00-0E	BV2/00-0E
	200 mm	cable	BS4/00-0C	BV4/00-0C
		M12	BS4/00-0E	BV4/00-0E
	400 mm	cable	BS6/00-0C	BV6/00-0C
		M12	BS6/00-0E	BV6/00-0E
	1.600 m	cable	BS8/00-0C	-
		M12	BS8/00-0E	-
retroreflective	8 m	cable	BSC/00-0C	BVC/00-0C
		M12	BSC/00-0E	BVC/00-0E

technical specification

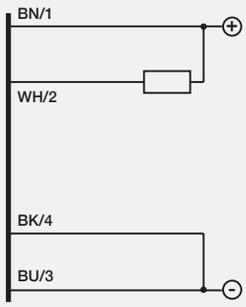
	diffuse reflection				retrorefl.	diffuse reflection			retrorefl.
	BS2/00-0*	BS4/00-0*	BS6/00-0*	BS8/00-0*	BSC/00-0*	BV2/00-0*	BV4/00-0*	BV6/00-0*	BVC/00-0*
									
nominal sensing distance	100 mm (1)	200 mm (1)	400 mm (2)	1.600 mm (2)	8 m (3)	100 mm (1)	200 mm (1)	400 mm (2)	8 m (3)
emission	infrared (880 nm)								
tolerance	+ 15 / - 5 % Sn								
corsa differenziale	5 %				10 %	5 %			10 %
repeatability	5 %								
operating voltage	10...30 Vdc					20...253 Vac / 50...60 Hz			
ripple	10 % max					-			
no-load supply current	25 mA					1,5 W			
load current	100 mA					5 mA / 300 m ARMS			
inrush current	-					6 A (ton = 10 ms)			
leakage current	≤ 10 µA					1,5 m ARMS max (supply V = 253 Vac)			
output voltage drop	1,2 Vmax					2,5 Vmax			
output type	DECOUT® (PNP, NPN, N0, NC selectable)					TRIAC (N0, NC selectable)			
switching frequency	80 Hz					25 Hz			
power on delay	200 ms								
temperature range	- 25°C...+ 70°C (without freeze)								
power supply protections	transient								
supply electrical output	short circuit (autoreset)					-			
temperature drift	≥ 10 % Sr								
protection degree	IP65 (EN60529) (4)								
EMC	in conformity with the EMC Directive according to EN 60947-5-2								
external light interference	3,000 lux (incandescent lamp), 10,000 lux (sunlight)								
LEDs	red (output energized)								
housing material	ABS polyetilene (cable exit)								
optic material	PMMA								
weight (approximate)	185 g (50 g mounting bracket ST01)								

(1) With 100x100 mm white matt paper (2) With 200x200 mm white matt paper (3) With standard reflector Ø80 mm (RL110 supplied seperately) (4) Protection guaranteed only with plug cable well mounted

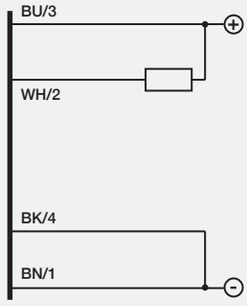
electrical diagrams of the connections

BS*/00-0* DECOUT exit ® (1)

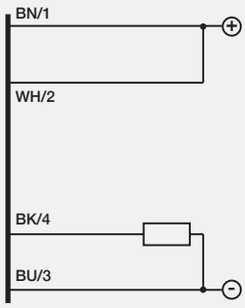
emitter with check



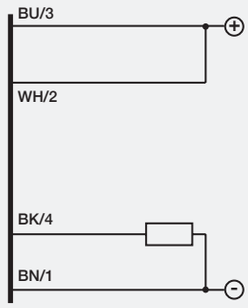
NPN output



PNP output



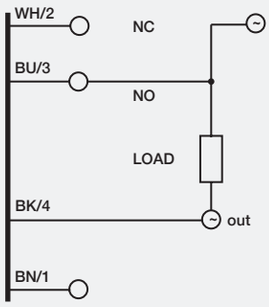
NPN output



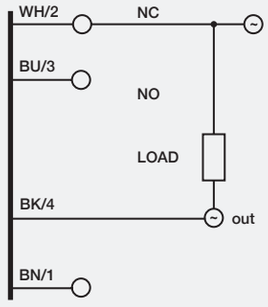
electrical diagrams of the connections

BV*/00-0* T_{RIAC} exit (2)

NO output



NCoutput



BN	brown
BU	blue
BK	black
WH	white

Notes:

(1) In case of combined load, resistive and capacitive, the maximum admissible capacity C = 0,2 µF, for maximum output voltage and current.

(2) Through proper wiring for the connection cable BV models in AC permit one to select the output state.

Output state NO:
BLUE = power supply
WHITE = disconnected (isolate on a terminal)

Output state NC:
WHITE = power supply
BLUE = disconnected (isolate on a terminal)

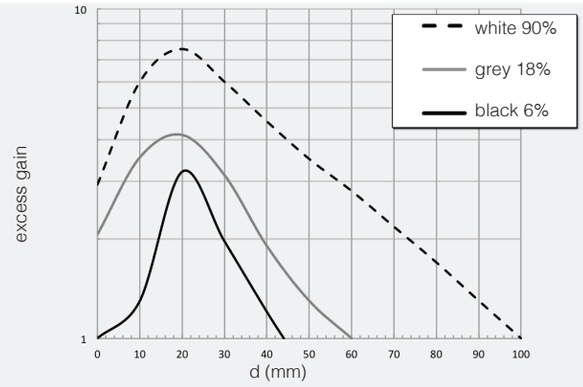
plug

M12

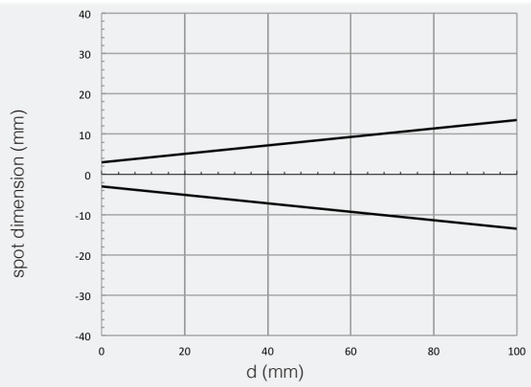
response diagrams

direct diffuse models

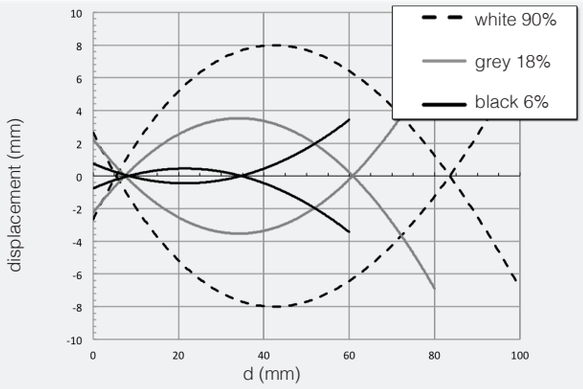
B*2/00-** excess gain



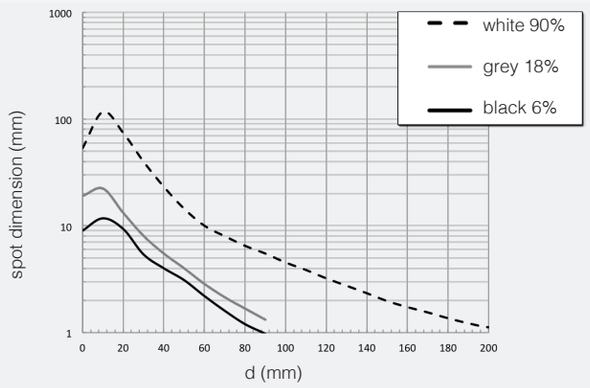
B*2/00-** spot dimension



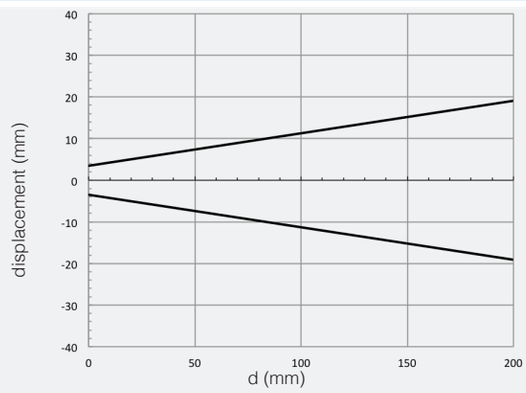
B*2/00-** parallel displacement



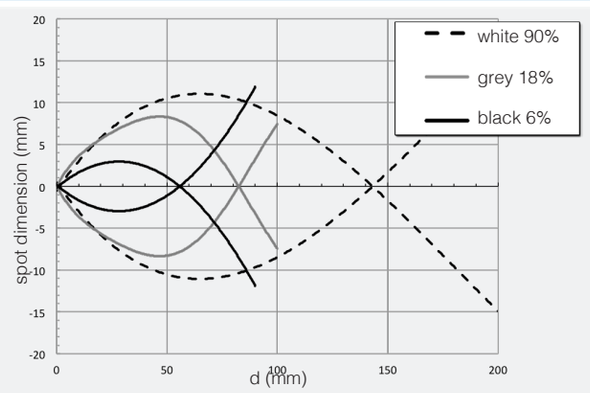
B*4/00-** spot dimension



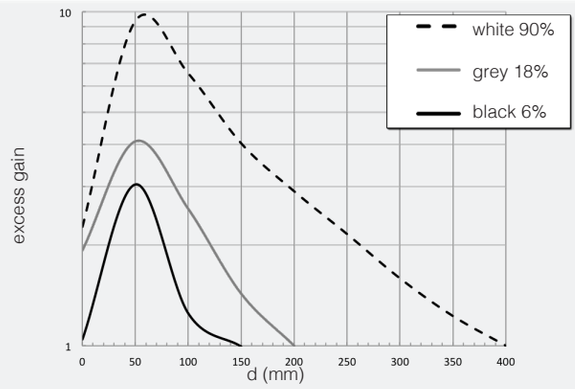
B*4/00-** parallel displacement



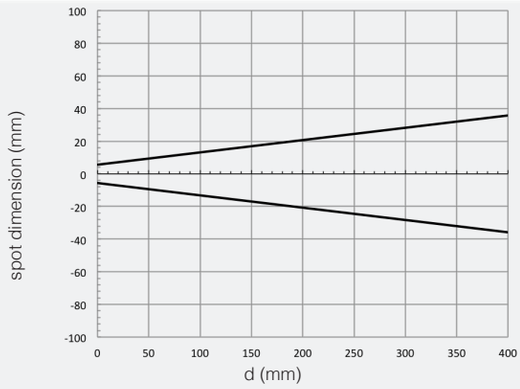
B*4/00-** spot dimension



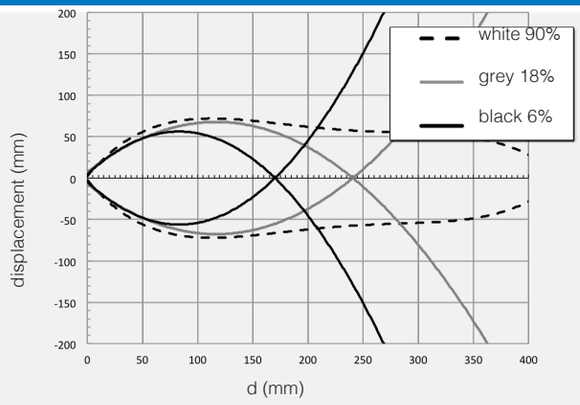
B*6/00-** excess gain



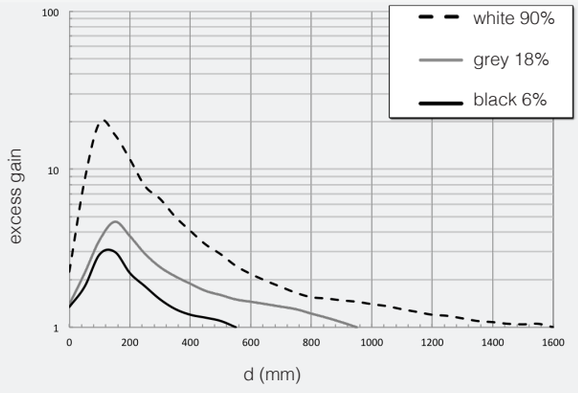
B*6/00-** spot dimension



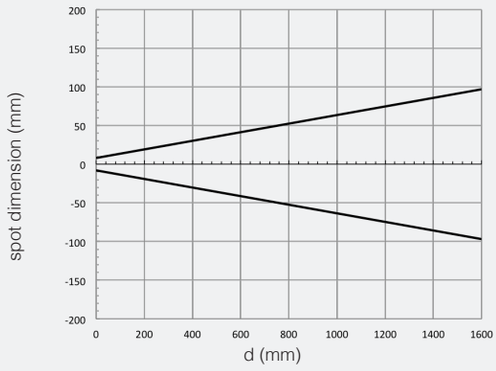
B*6/00-** parallel displacement



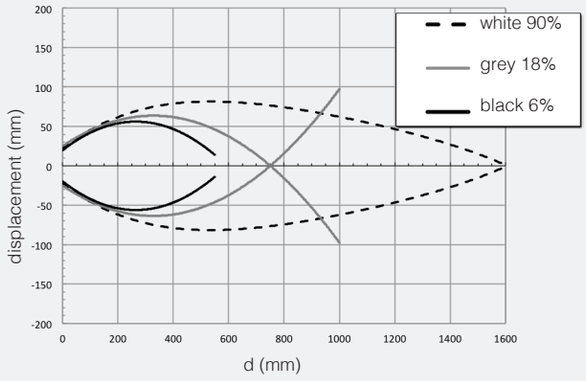
B*8/00-** excess gain



B*8/00-** spot dimension



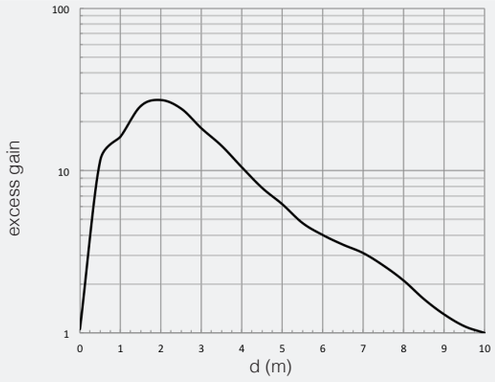
B*8/00-** parallel displacement



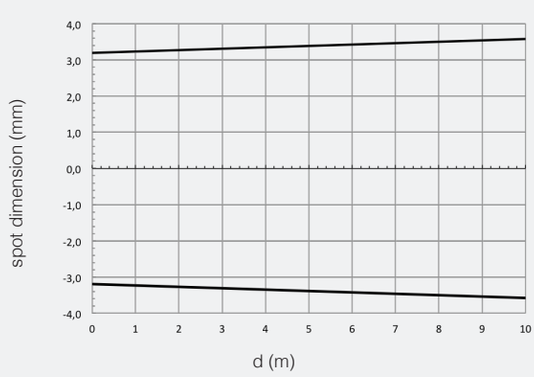
response diagrams

retro-reflective models (diagrams detected with RL110)

B*C/0*-** excess gain



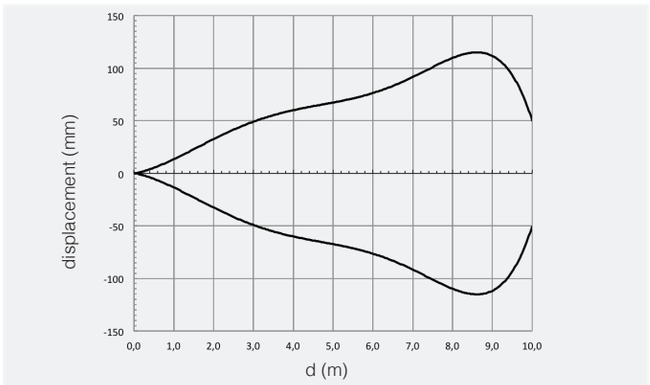
B*C/0*-** spot dimension



response diagrams

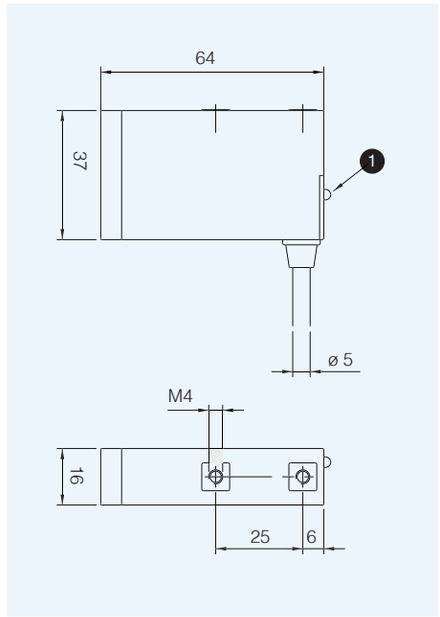
retro-reflective models

B*C/0*- parallel displacement**

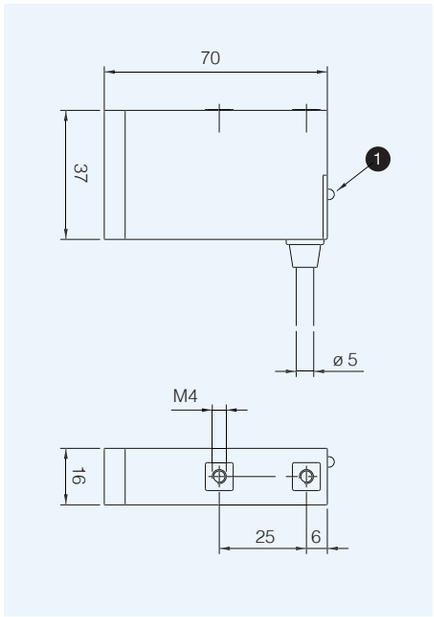


dimensions (mm)

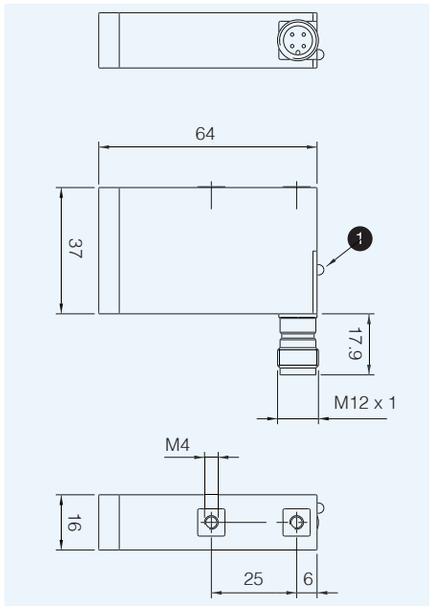
B*2/00-0C - B*4/00-0C - B*6/00-0C - B*8/00-0C



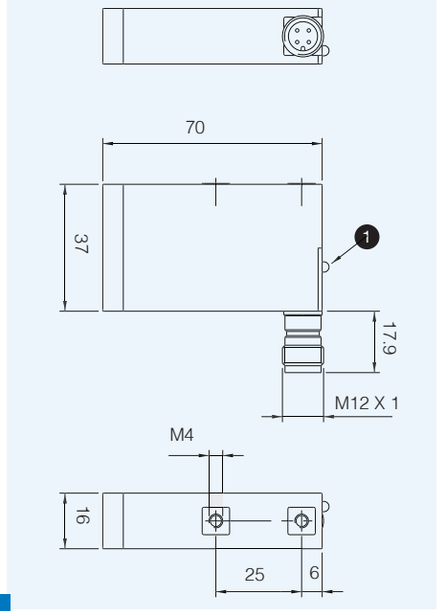
B*C/00-0C



B*2/00-0E-B*4/00-0E-B*6/00-0E-B*8/00-0E



B*C/00-0E



1 red LED (output state)

Plugs CD series - Accessories ST series

Q50 series

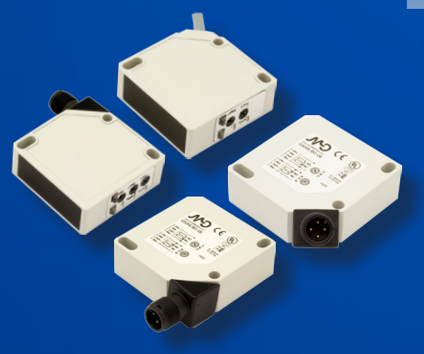
Compact cubic 50 x 50 mm
universal photoelectric sensor

features

- **Universal photoelectric sensor, excellent performances and high versatility due to the wide choice of different versions available**
- **Cable output or revolving connector, NPN/PNP outputs for Vdc models or SPDT relay output for multi -voltage Vdc / Vac models**
- **Complementary outputs NO + NC available on the Vdc models or selectable output NO/NC available on the multi-voltage Vdc/Vac models**
- **Totally protected against electrical damages**
- **Wide choice of optical functions available: Diffuse: 2 m; background suppression: 500 mm; polarized: 6m; through beam: 20 m. Dual multifunction output state LEDs**

web content

- **Application notes**
- **Photos**
- **Catalogue / Manuals**



Compact cubic 50 x 50 mm

code description

Q50 R N / B 0 - 0 E

series	Q50	50 X 50 mm cubic photoelectric sensor
emission	I	LED infrared emission
	R	LED red emission
type	6	Diffuse reflection1 m
	8	Diffuse reflection 2 m
	S	Background Suppression
	N	Polarized
	H	Emitter
	D	Receiver
output	B	Complementary output NO + NC
	0	Emitter NO/ NC selectable
emitter	0	Emitter, NPN or PNP (Supply Voltage 10 ... 30 Vdc)
	T	Emitter, Relay SPDT (Supply Voltage 12... 240 Vdc; 24…240 Vac)
housing	0	Plastic housing
cable/plug output	A	Cable 2 m
	E	Connector M12 4 pins

available models

function	distance	adjustment	DC models		AC / DC models
			cable	M12 connector	cable
diffuse	1 m	●	Q50I6/B0-0A	Q50I6/B0-0E	Q50I6/0T-0A
	2 m		Q50I8/B0-0A	Q50I8/B0-0E	Q50I8/0T-0A
background suppression	120...500 mm		Q50IS/B0-0A	Q50IS/B0-0E	-
polarized	6 m		Q50RN/B0-0A	Q50RN/B0-0E	Q50RN/0T-0A
emitter	20 m	-	Q50IH/00-0A	Q50IH/00-0E	Q50IH/0T-0A
receiver	20 m	●	Q50ID/B0-0A	Q50ID/B0-0E	Q50ID/0T-0A

technical specification

direct diffuse models

	Q50I6/0T-**	Q50I6/B0-**	Q50I8/0T-**	Q50I8/B0-**
				
nominal sensing distance [1]	0.1...2 m [1]		0.3...2 m [1]	
sansing range (Sd)	0.2...2 m [1]		0.5...2 mm [1]	
sensibility adjustment	single-turn potentiometer			
emission	infrared LED			
spot dimension	70 mm @ 500 mm		80 mm @ 1 m	
rotary switch	single-turn potentiometer	-	single-turn potentiometer	-
operating voltage	from 12 to 240 Vdc / from 24 to 240 Vac, 50 to 60 Hz	from 10 to 30 VDC	from 12 to 240 Vdc / from 24 to 240 Vac, 50 to 60 Hz	from 10 to 30 Vdc
ripple	-	≤ 10 %	-	≤ 10 %
no-load supply current	≤ 2.5 VA (relè ON)	≤ 40 mA	≤ 2.5 VA (relè ON)	≤ 40 mA
load current	-	≤ 200 mA	-	≤ 200 mA
output voltage drop Ud	-	≤ 2.5 Vdc @ 200 mA	-	≤ 2.5 Vdc @ 200 mA
maximum load current	3 A/30 Vdc 3 A/240 Vac	-	3 A/30 Vdc 3 A/250 Vac	-
output type	relay SPDT electrically isolated	PNP or NPN	relay SPDT electrically isolated	PNP or NPN
switching frequency	20 Hz	500 Hz	20 Hz	500 Hz
power on delay	≤ 30 ms	-	≤ 30 ms	-
power supply protections	transients	polarity reversal, transient	transients	polarity reversal, transient
output electrical protection	-	short circuit (auto reset) over voltage pulses	-	short circuit (auto reset) over voltage pulses
operating temperature range	- 25°C...+ 60°C [2]			
external light interference	5,000 lux			
EMC	in conformity with the EMC Directive according to EN 60947-5-2			
protection degree	IP67 (EN60529) [3]			
housing material	body: PC/ABS; optic: PMMA			
weight (approximate)	200 g	105 g plug 200 g cable	200 g	105 g plug 200 g cable

[1] White target 90% 200*200 mm [2] UL omologation: 0...+60 °C [3] Protection guaranteed only with plug cable well mounted

technical specification

background suppression models

	Q50IS/0B-**
	background suppression
	
distanza di lavoro nominale [1]	120...500 mm [1]
minimum sensing distance	120 mm
sensibility adjustment	single-turn potentiometer
emission	infrared LED
spot dimension	30 mm @ 500 mm
rotary switch	-
operating voltage	10...30 Vdc (ripple included)
ripple	≤ 10 %
no-load supply current	≤ 40 mA
load current	≤ 200 mA
output voltage drop	≤ 2.5 Vdc @ 200 mA
maximum load current	-
output type	PNP or NPN
switching frequency	500 Hz
power on delay	≤ 2 ms
power supply protections	polarity reversal, over voltage pulses
output electrical protection	short circuit (auto reset), over voltage pulses
operating temperature range	- 25°C...+ 60°C [2]
external light interference	10,000 lux
protection degree	IP67 (EN60529) [3]
EMC	in conformity with the EMC Directive according to EN 60947-5-2
housing material	body: PC/ABS; optic: PMMA
weight (approx)	105 g plug / 200 g cable

[1] White target 90% 200*200 mm [2] UL omologation: 0...+60 °C [3] Protection guaranteed only with plug cable well mounted

technical specification

polarized models

	Q50RN/0T-**	Q50RN/B0-**
		
nominal sensing distance Sn	0.2...6 m [1]	
minimum sensing distance	200 mm	
sensibility adjustment	single-turn potentiometer	
emission	red visible LED light	
spot dimension	280 mm @ 3 m	
rotary switch	single-turn potentiometer	-
operating voltage	from 12 to 240 VDC / from 24 to 240 VAC, 50 a 60 Hz	from 10 to 30 Vdc
ripple	-	≤ 10 %
no-load supply current	≤ 2.5 VA (relay ON)	≤ 40 mA
load current	-	≤ 200 mA
output voltage drop	-	≤ 2.5 VDC @ 200 mA
maximum load current	3 A/30 Vdc 3 A/250 Vac	-
output type	relay SPDT electrically isolated	PNP or NPN
switching frequency	20 Hz	500 Hz
power on delay	-	≤ 1 ms
power supply protections	transients	reverse polarity, transients
output electrical protection	-	overvoltage, short-circuit
operating temperature range	- 25°C...+ 60°C [2]	
external light interference	5,000 lux	
protection degree	IP67 (EN60529) [3]	
EMC	in conformity with the EMC Directive according to EN 60947-5-2	
housing material	body: PC/ABS; optic: PMMA	
weight (approx)	200 g	200 g cable 105 g plug

[1] With RL 110 reflector [2] UL omologation: 0...+60 °C [3] Protection guaranteed only with plug cable well mounted

technical specification

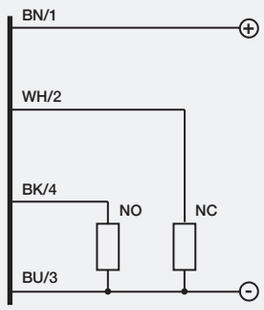
through-beam models

	emitter		receiver	
	Q50IH/00-**	Q50IH/0T-**	Q50ID/B0-**	Q50ID/0T-**
				
nominal sensing distance Sn	20 mm (1)		20 m(1)	
minimum sensing distance	-		-	
sensibility adjustment	-		single-turn potentiometer	
emission	infrared LED		-	
spot dimension	880 mm @ 10 m		-	
rotary switch	-		-	single-turn potentiometer
operating voltage	10...30 Vdc (ripple included)	12 to 240 Vdc / 24 to 240 Vac, 50 to 60 Hz	da 10 a 30 Vdc	12 to 240 Vdc / 24 to 240 Vac, 50 to 60 Hz
ripple	≤ 10 %	-	≤ 10 %	-
no-load supply current	≤ 50 mA	≤ 2.5 VA (relay ON)	≤ 40 mA	≤ 2.5 VA (relay ON)
load current	-		≤ 200 mA	-
output voltage drop	-		≤ 2.5 VDC @ 200 mA	-
maximum load current	-		-	3 A/30 Vdc 3 A/250 Vac
output type	-		PNP or NPN	relay SPDT electrically isolated
switching frequency	-		500 Hz	20 Hz
power on delay	-		≤ 1 ms	-
power supply protections	reverse polarity, transients	transients	reverse polarity, transients	transients
output electrical protection	-		overvoltage, short-circuit	-
operating temperature range	- 20°C...+ 60°C (2)			
external light interference	-		10.000 lux	
protection degree	IP67 (EN60529) (3)			
EMC	in conformity with the EMC Directive according to EN 60947-5-2			
housing material	body: PC/ABS; optic: PMMA			
weight (approx)	200 g cable 105 g plug	200 g	200 g cable 105 g plug	200 g

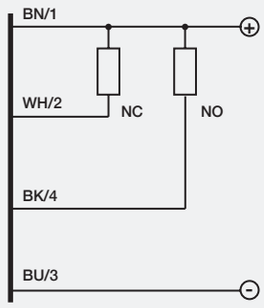
(1) White target 90% 200*200 mm (2) UL omologation: 0...+60 °C (3) Protection guaranteed only with plug cable well mounted

electrical diagrams of the connections

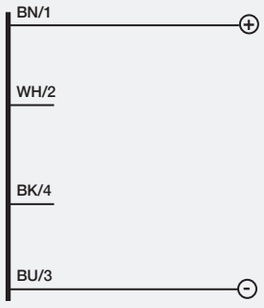
background suppression, polarized retroreflection and receiver with PNP output



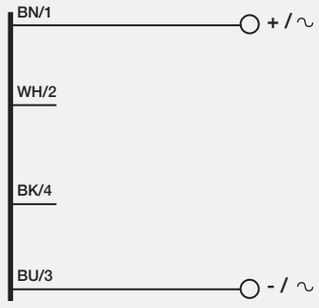
background suppression, polarized retroreflectionand receiver with NPN output



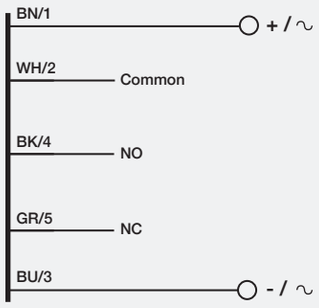
DC emitter



AC/DC emitter



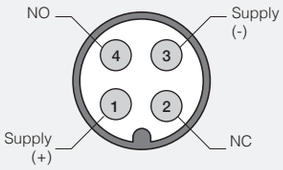
polarized retroreflection and receiver



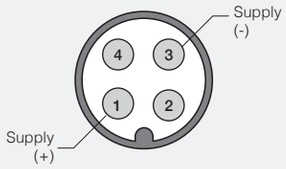
BN	brown
BU	blue
BK	black
WH	white

plug

M8



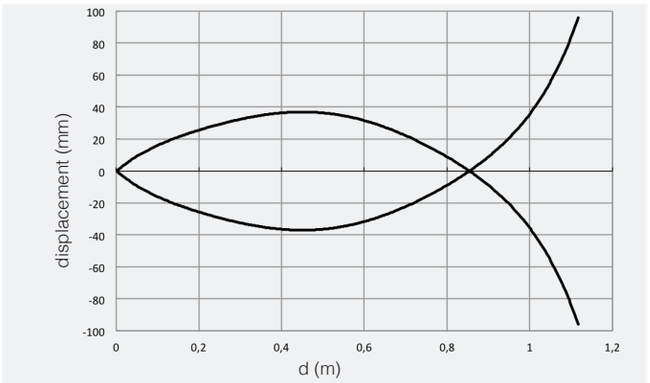
M12



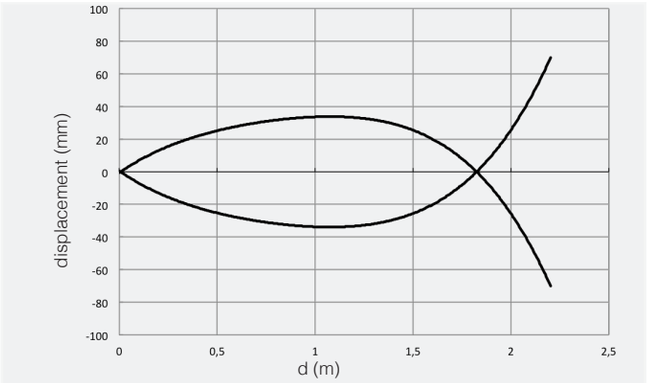
response diagrams

direct reflection models

Q50I6/-** parallel displacement**



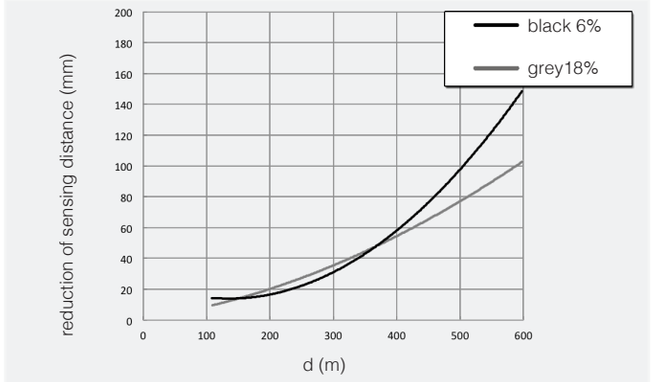
Q50I8/-** parallel displacement**



response diagrams

background suppression models

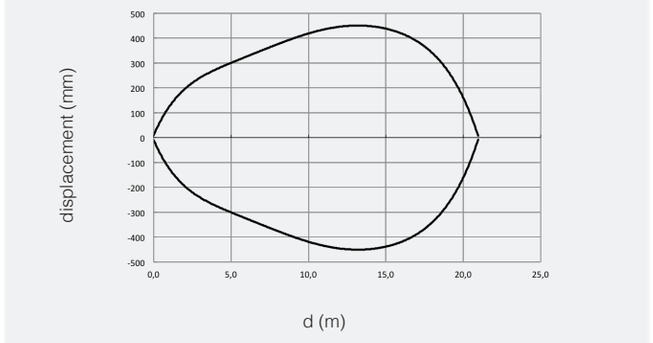
Q50IS/-** reduction of sensing distance**



response diagrams

through-beam models models

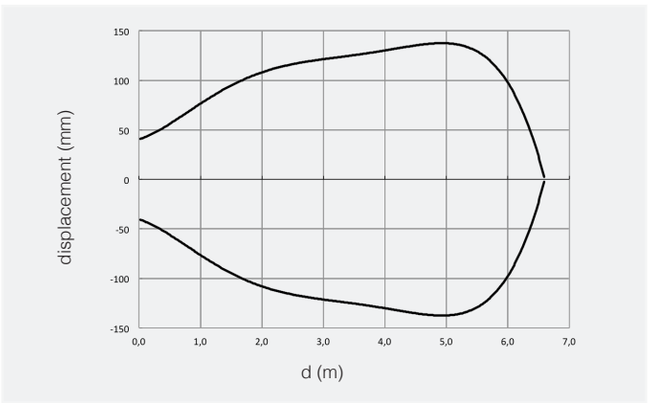
Q50IH/-** & Q50ID/**-** Parallel displacement**



response diagrams

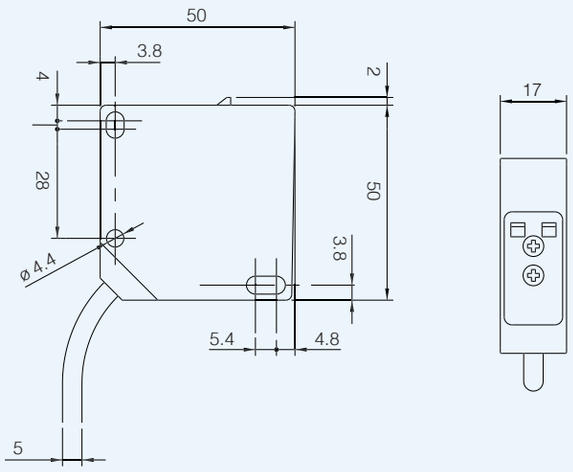
polarized models

Q50RN/-** parallel displacement**

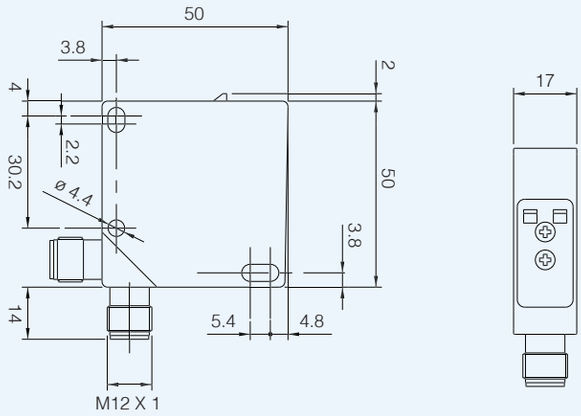


dimensions (mm)

Q50/**-0A**

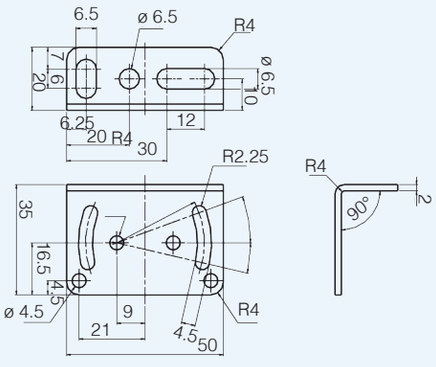


Q50/**-0E**



dimensions (mm)

accessories included in all models



FG series

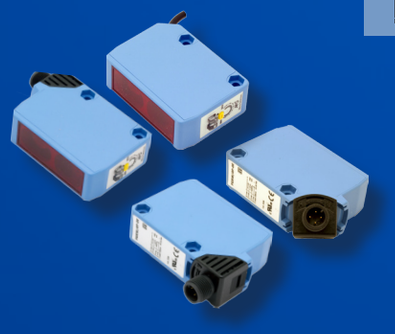
Compact photoelectric switch sensors with high performances and high detection distances

features

- **Cable output or with revolving connector, NPN or PNP output (DC models) and SPDT voltage free relay output (AC models)**
- **Selectable LO/DO output status**
- **Totally protected against electrical damages**
- **Background suppressions models: 310 mm, 600 mm**
- **Reflex polarized sensitivity adjustment 12 m**
- **Emitter and Receiver with max detecting range of 50 m**
- **Double Multifunction LED indicator: output state and using the pointing**
- **Sensitive adjustment models**

web content

- **Application notes**
- **Photos**
- **Catalogue / Manuals**



Cubic
DC - AC compact

code description

FG R W / 0 P - 0 A

series	FG	Compact cubit photoelectric switch
emission	R	Visible red emission LED
type	W	Adjut. dist. background suppression 600 mm
	S	Adjust. dist background suppression 310 mm
	N	Reflex polarized sensitivity adjustment 12 m
	H	Emitter 50 m
	D	Receiver with sensitivity adjustment 50 m
	HD	Emitter + Receiver with sensitivitiy adjustment
supply voltage	0	Supply voltage 10...30 Vdc
	D	Supply voltage 24...240 Vdc / 24...240 Vac
logic output	P	PNP logic output
	N	NPN logic output
	0	Emitter
	T	SPDT voltage free relay output
	0	Plastic housing
cable / plug output	A	Cable exit 2 m
	E	M12 plug cable exit

available models

model	distance	adjustment	cable		plug M12		models AC
			NPN	PNP	NPN	PNP	
background suppression	310 mm	•	FGRS/0N-0A	FGRS/0P-0A	FGRS/0N-0E	FGRS/0P-0E	FGRS/DT-0A
	600 mm		FGRW/0N-0A	FGRW/0P-0A	FGRW/0N-0E	FGRW/0P-0E	FGRW/DT-0A
polarized	12 m		FGRN/0N-0A	FGRN/0P-0A	FGRN/0N-0E	FGRN/0P-0E	FGRN/DT-0A
emitter + receiver	50 m		FGRHD/0N-0A	FGRHD/0P-0A	FGRHD/0N-0E	FGRHD/0P-0E	FGRHD/DT-0A

technical specification

reflex polarized models [1]

	FGRN/0*-0*	FGRN/DT-0A
		
nominal sensing distance	12 m	
blind zone mm	0.01 m	
scanning distance adjusting	potentiometer 2 turns with position indicator	
emission	red visible LED light	
spot diameter	approx. 260 mm @ 8 m	
rotary switch	control wire	light on
supply voltage	10...30 Vcc (limit value)	24...240 Vac[2] / 24...240 Vcc
ripple	5 Vpp	-
no-load supply current	35 mA	≤ 2 VA
load current (maximum)	100 mA	-
output voltage drop	1,8 V max @100 mA	-
maximum switching current	-	3 A...240 Vac[2] 3 A...30 Vcc[2]
output type	PNP o NPN open collector	relay SPDT electrically isolated
switching frequency	1.000 Hz max	33 Hz max
response time	0,15 ms	15 ms
operation temperature range	- 25°C...+ 55°C	
power supply protections	overvoltage pulses and polarity reversal	
output electrical protection	short circuit, overcurrent, overvoltage	-
protection degree	IP67 (EN60529) [3]	
ambient light immunity	3,000 lux (incandescent lamp), 10,000 lux (sunlight) (luce solare)	
housing material	PBT corpo; PMMA ottica	
cable PVC 2 m	4 x 0.18 mm² ø 3.8 mm	5 x 0.76 mm² ø 6.3 mm
weight (approximate)	150 g cable 40 g plug	160 g

[1] With RL 123 included reflector [2] Ensure spark extinguishing for inductive or capacitive load [3] Protection guaranteed only with plug cable well mounted

technical specification

background suppression

	FGRS/0*-0*	FGRW/0*-0*	FGRS/DT-0A	FGRW/DT-0A
				
nominal sensing distance	90...310 mm [2]	110...600 mm [2]	90...310 mm [2]	110...600 mm [2]
blind zone mm	5...15 mm	10...35 mm	5 ÷ 15 mm	10 ÷ 35 mm
scanning distance adjusting	potentiometer 2 turns with position indicator			
emission	red visible LED light			
spot diameter	30 mm @ 300 mm	30 mm @ 500 mm	30 mm @ 300 mm	30 mm @ 500 mm
rotary switch	control wire		light on	
supply voltage	10...30 Vcc (limit value)		24...240 Vac[2] / 24...240 Vcc	
ripple	5 Vpp		-	
no-load supply current	35 mA		≤ 2 VA	
load current (maximum)	100 mA		-	
output voltage drop	1.8 V max @100 mA		-	
maximum switching current	-		3 A...240 Vac[2] 3 A...30 Vcc[2]	
output type	PNP or NPN open collector		relay SPDT electrically isolated	
switching frequency	160 Hz max		33 Hz massima	
response time	2 ms		15 ms	
output electrical protection	overvoltage pulses and polarity reversal			
power supply protections	short circuit, overcurrent, overvoltage		-	
operation temperature range	- 25 ...+ 55° C			
ambient light immunity	10,000 Lux minimum sunlight 3,000 Lux min HF lamp			
protection degree	IP67 (EN60529) [3]			
housing material	Housing: ABS; optic: PMMA			
cable PVC 2 m	4 x 0.18 mm² ø 3.8 mm		5 x 0.76 mm² ø 6.3 mm	
weight (approximate)	150 g cable 40 g plug		160 g	

[1] White target 90% 100x100 mm [2] Ensure spark extinguishing for inductive or capacitive load [3] Protection guaranteed only with plug cable well mounted

technical specification

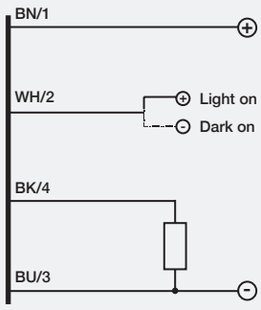
through-beam models

	FGRHD/0*-0*		FGRHD/DT-0A	
	FGRH/0*-0* (emitter)	FGRD/0*-0* (receiver)	FGRH/D0-0A (emitter)	FGRD/DT-0A (receiver)
				
nominal sensing distance	50 m			
scanning distance adjusting	potentiometer 2 turns with position indicator			
emission	red LED light	–	red LED light	–
spot diameter	600 mm @ 20 m	-	600 mm @ 20 m	-
rotary switch	-	control wire	–	light on
supply voltage	10...30 Vcc (limit value)		24...240 Vac[2] / 24...240 Vcc	
ripple	5 Vpp		-	
no-load supply current	≤ 35 mA	≤ 20 mA	≤ 20 mA	≤ 2 mA
load current (maximum)	-	100 mA	-	
output voltage drop	-	1.8 V max @100 mA	-	
maximum switching current	-		3 A...240 Vac[1] 3 A...30 Vcc[1]	
output type	-	PNP or NPN open collector	-	relay SPDT electrically isolated
switching frequency	-	1,000 Hz max	–	33 Hz massima
response time	-	0.5 ms	-	≤ 15 ms
output electrical protection	overvoltage pulses and polarity reversal			
power supply protections	–	short circuit, overcurrent, overvoltage	–	
operation temperature range	- 25 ...+ 55° C			
ambient light immunity	10,000 Lux minimum sunlight 3,000 Lux min HF lamp			
protection degree	IP67 (EN60529) [2]			
housing material	Housing: ABS; optic: PMMA			
cable PVC 2 m	2 x 0.18 mm² ø 3.8 mm	4 x 0.18 mm² ø 3.8 mm	2 x 0.76 mm² ø 6.3 mm	5 x 0.76 mm² ø 6.3 mm
weight (approximate)	80 g plug 300 g cable 2m		310 g	

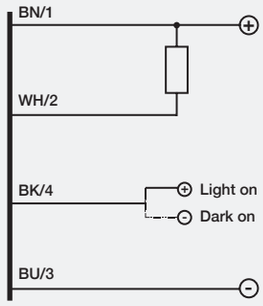
[1] Ensure spark extinguishing for inductive or capacitive load [2] Protection guaranteed only with plug cable well mounted

electrical diagrams of the connections

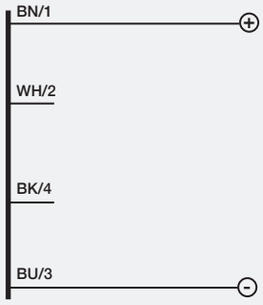
background suppression, polarizated, receiver PNP output



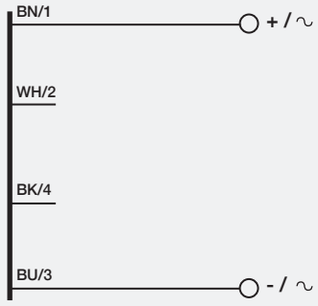
background suppression, polarizated, receiver NPN output



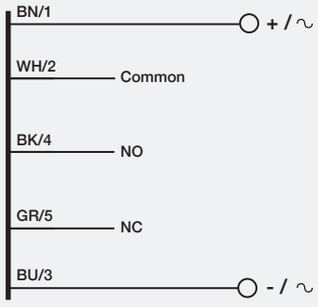
emitter DC



emitter AC/DC

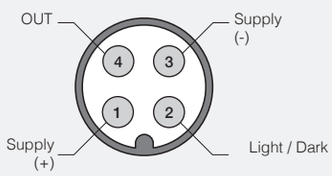
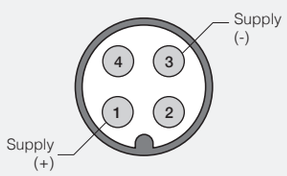


background suppression, reflex with polarizing gilter and receiver with relay output



BN	brown
BU	blue
BK	black
WH	withe
PK	pink
GY	gray

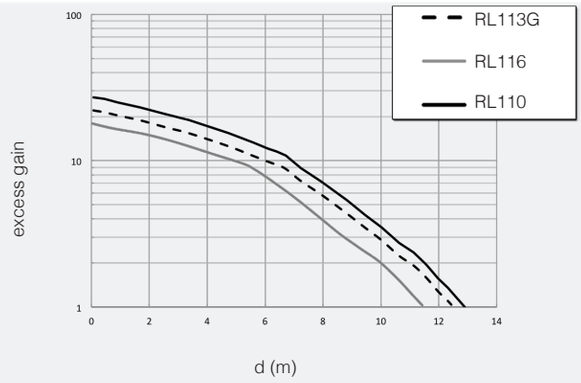
plug

M12 background suppression, polarized, receiver	M12 emitter
	

response diagrams

polarized models

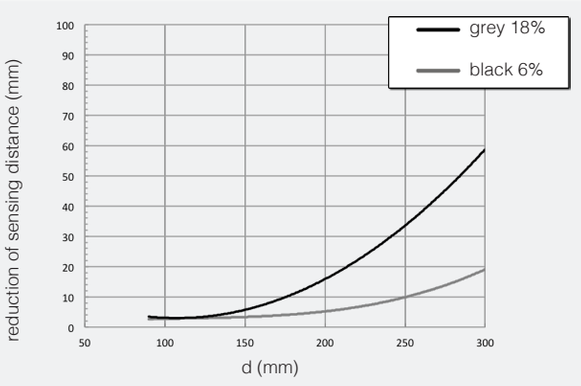
FGRN/-** excess gain**



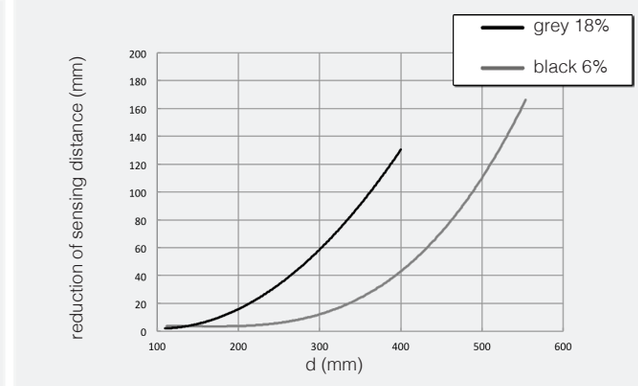
response diagrams

background supression models

FGRS/-** reduction of sensing distance**



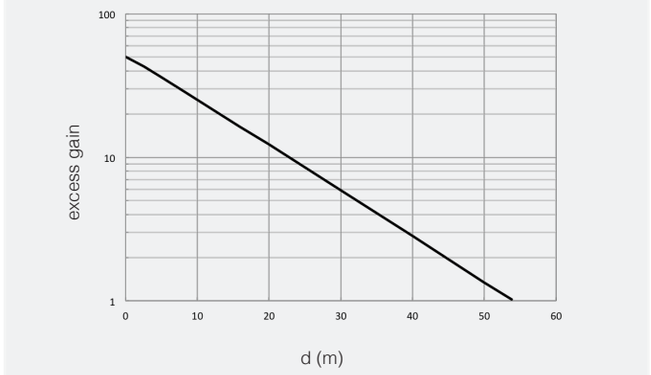
FGRW/-** reduction of sensing distance**



response diagrams

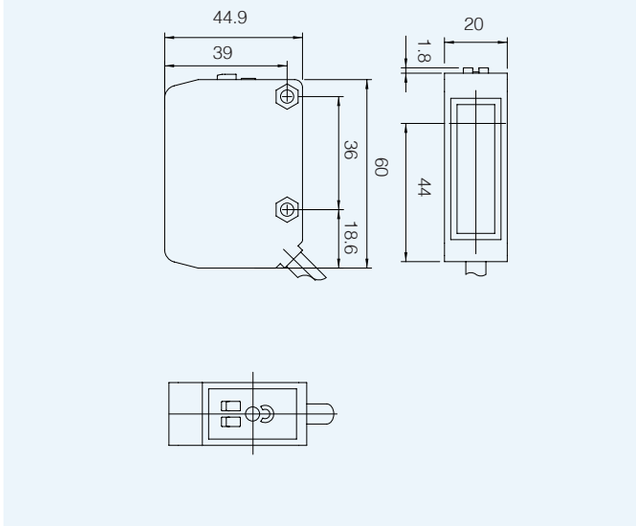
through-beam models

FGRH/-** & FGRH/**-** excess gain**

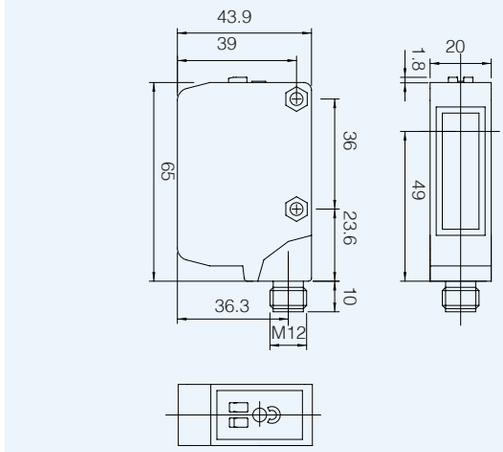


dimensions (mm)

FGR*/-*A**



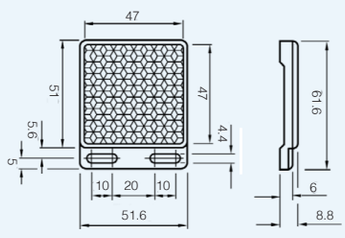
FGR*/-*E**



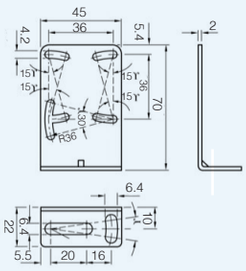
dimensions (mm)

accessories included

RL 123



STFG 00



notes

RX series

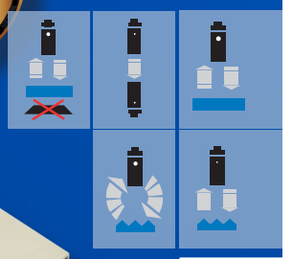
Maxi with static output DC
or with relay output AC/DC

features

- **Models: diffuse reflection, retro-reflective, polarized, through-beam and background suppression**
- **Series with high performances and wide possibilities of installation**
- **High sensing distance and very small dimensions**
- **Relay output or multifunctional DECOUT®**
- **Timer function delay on, delay off, one shot; trimmer for sensitivity adjustment**
- **Switch reducing the emission for fine detection in through-beam types**
- **LED alignment indicator with 360° visibility, 2 LED indicators (stable signal, output)**
- **M12 standard plug cable exit; axial and right angle brackets**

web content

- **Application notes**
- **Photos**
- **Catalogue / Manuals**



Maxi with static output DC or with relay output AC/DC

code description

RX 6 / 0 0 - 1 A

series	RX	Rectangular photoelectric sensor
type	6	1000 mm diffuse reflection
	8	2000 mm diffuse reflection
	C	12 m retro-reflective
	P	8 m polarized retro-reflective
	S	Background suppression 0,05 - 0,3 m
	L	Background suppression 0,25 - 1 m
	E	Emitter 20-60 Vdc / 20-253 Vac
	R	Receiver
timer function	0	Without timer function
	T	With timer function
output	1	DECOUT® output / 10-30Vdc
	3	Relay output / 20-60Vdc - 20-253Vac
fixing slide	A	Without fixing slide
	B	With fixing slide
version		Standard version
	37	RX8 model with sensing distance up to 4,5 m

available models

models without fixing slide

function	distance (m)	10...30 Vdc DECOUT®		20...60 Vdc / 20...253 Vac	relay
		no timer function	timer function	no timer function	timer function
background suppression	0,05...0,3	RXS/00-1A	RXS/0T-1A	RXS/00-3A	RXS/0T-3A
	0,25...1	RXL/00-1A	RXL/0T-1A	RXL/00-3A	RXL/0T-3A
diffuse reflection	1	RX6/00-1A	RX6/0T-1A	RX6/00-3A	RX6/0T-3A
	2	RX8/00-1A	RX8/0T-1A	RX8/00-3A	RX8/0T-3A
	4,5	RX8/00-1A37	RX8/0T-1A37	RX8/00-3A37	RX8/0T-3A37
retroreflective	12	RXC/00-1A	RXC/0T-1A	RXC/00-3A	RXC/0T-3A
polarized	6	RXP/00-1A	RXP/0T-1A	RXP/00-3A	RXP/0T-3A
emitter	-	-	-	RXE/00-3A	-
emitter with check	-	-	-	-	-
receiver	16...32	-	-	RXR/00-3A	RXR/0T-3A

available models

models with fixing slide

function	distance (m)	10...30 Vdc DECOUT®		20...60 Vdc / 20...253 Vac	relay
		no timer function	timer function	no timer function	timer function
background suppression	0,05...0,3	RXS/00-1B	RXS/0T-1B	RXS/00-3B	RXS/0T-3B
	0,25...1	RXL/00-1B	RXL/0T-1B	RXL/00-3B	RXL/0T-3B
diffuse reflection	1	RX6/00-1B	RX6/0T-1B	RX6/00-3B	RX6/0T-3A
	2	RX8/00-1B	RX8/0T-1B	RX8/00-3B	RX8/0T-3B
	4,5	RX8/00-1B37	RX8/0T-1B37	RX8/00-3B37	RX8/0T-3B37
retroreflective	12	RXC/00-1B	RXC/0T-1B	RXC/00-3B	RXC/0T-3B
polarized	6	RXP/00-1B	RXP/0T-1B	RXP/00-3B	RXP/0T-3B
emitter	-	-	-	RXE/00-3B	-
emitter with check	-	-	-	-	-
receiver	16...32	-	-	RXR/00-3B	RXR/0T-3B

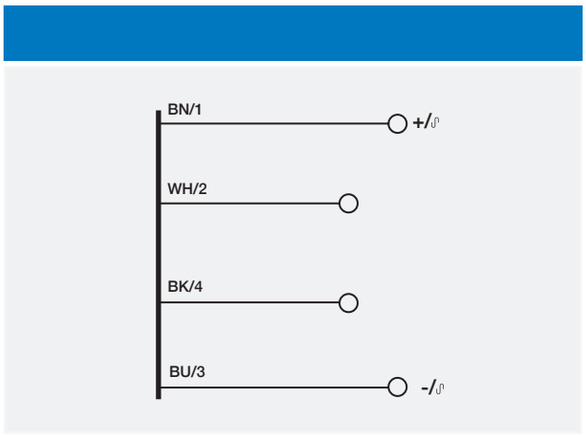
tecnical specification

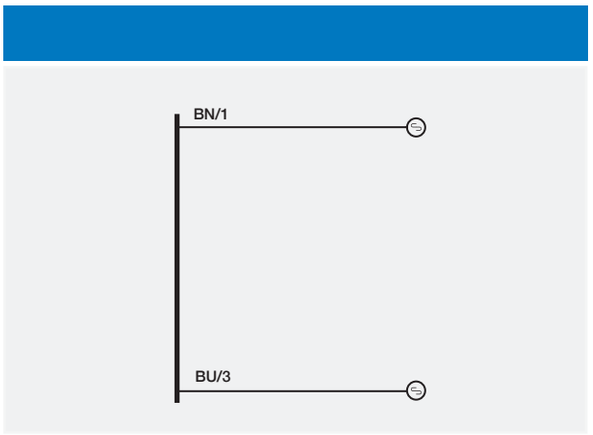
direct diffuse, retro-reflective, backgroud suppression models and through-beam

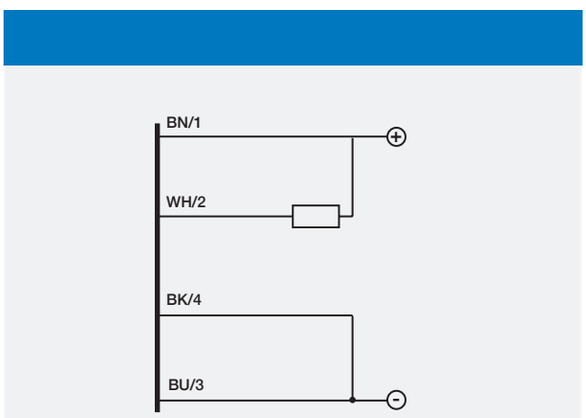
	static output - DC						relay output - AC/DC						
	diffuse reflection		retro-reflective		diffuse reflection		diffuse reflection		retro-reflective		diffuse reflection		through-beam
	-		standard	polarized	background suppr.		-		standard	polarized	background suppr.		without check
	RX6/0*-1*	RX8/0*-1*	RXC/0*-1*	RXP/0*-1*	RXS/0*-1*	RXL/0*-1*	RX6/0*-3*	RX8/0*-3*	RXC/0*-3*	RXP/0*-3*	RXS/0*-3*	RXL/0*-3*	RXE/0*-3* + RXR/0*-3*
													
nominal sensing distance Sn	1 m [1]	2 m [1]	12 m [2]	6 m [2]	0,05... 0,3 m [1]	0,25... 1 m [1]	1 m [1]	2 m [1]	12 m [2]	6 m [2]	0,05... 0,3 m [1]	0,25... 1 m [1]	16 - 32 m
emission	infrared (880 nm)			red (660 nm)	infrared (880 nm)					red (660 nm)	infrared (880 nm)		
tollerance	- 10...+ 30 %		EG ≥ 2 at Sr		0...+ 10 %		- 10...+ 30 %		EG ≥ 2 at Sr		0...+ 10 %		EG≥2 at Sr
hysteresis	2...10% of the nominal sensing distance Sn												10 %
repeatability	5 %												
operating voltage	10...30 Vdc						20...253 Vac / 50 -60 Hz						
ripple	≤ 10 % max						-						-
no-load supply current	25 mA				40 mA		25 mA_{RMS}				30 mA_{RMS}		15 mA_{RMS} 30 mA_{RMS}
load current	≤ 100 mA						-						3A-250 Vac 3A-30 Vdc (750 VA / 90 W)
leakage current	≤ 10 µA						-						
voltage drop	1,2V max						-						
output type	static DECOUT®						relay						
switching frequency	500 Hz						25 Hz						
power on delay	100 ms												
timing functions	from 0,1s to 10s, deley ON, deley OFF, one shot												
supply electrical protections	polarity reversal, transient						transient (AC), over voltages (DC)						
output protection	AI cortocircuito (memoria)						-						
temperature range	- 25°C...+ 70°C (without freeze)			- 25°C... + 60°C	- 25°C...+ 70°C (without freeze)					- 25°C... + 60°C	- 25°C...+ 70°C		
temperature drift	10 % Sr												
protection degree	IP65 (EN60529) [3]												
external light interference	≥ 5.000 lux (incandescent lamp)		≥ 10.000 lux (incandescent lamp)		≥ 5.000 lux (incandescent lamp)				≥ 10.000 lux (incandescent lamp)		≥ 5.000 lux (incandescent lamp)		10.000 lux (incandescent lamp)
emitter LEDs	-												green (supply) red (dist. x 2)
receiver LEDs	rear red (output state), superior red (alignment), green (stable signal)												
housing material	polycarbonate (glass fiber reinforced)												
lenses material	plastic												
weight (approximate)	145 g without fixing slide / 165 g with fixing slide												

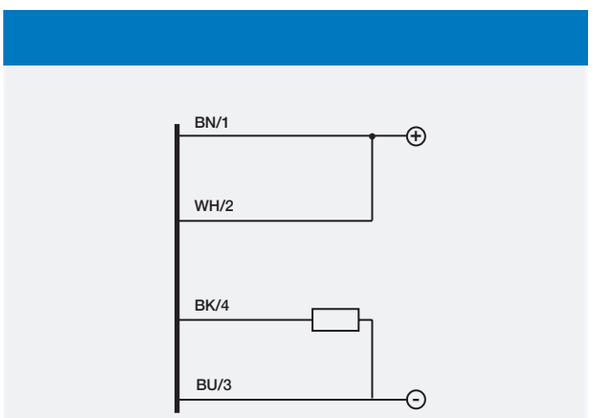
[1] With 100 x 100 mm white matt paper EG=1.5 [2] With standard reflector Ø 80 mm (RL110 supplied seperately) [3] Protection guaranteed only with plug cable well mounted

electrical diagrams of the connections



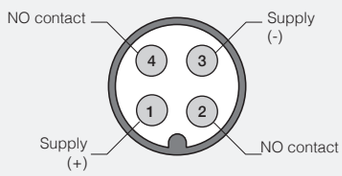


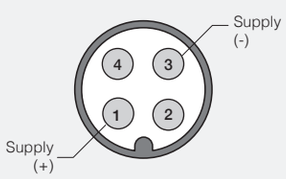


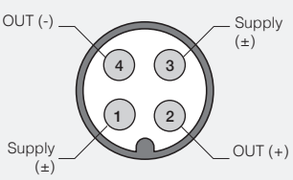


plug

M12 relay output AC-DC	M12 emitter AC-DC	M12 DECOUT®



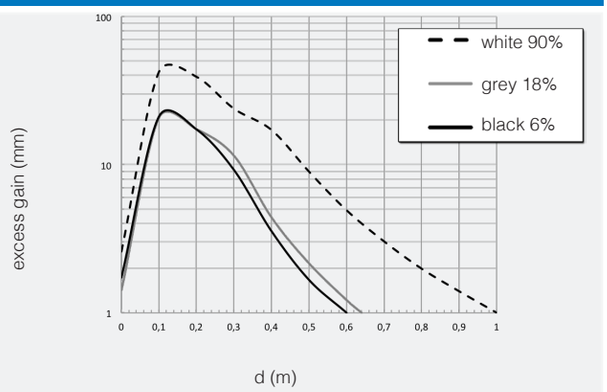


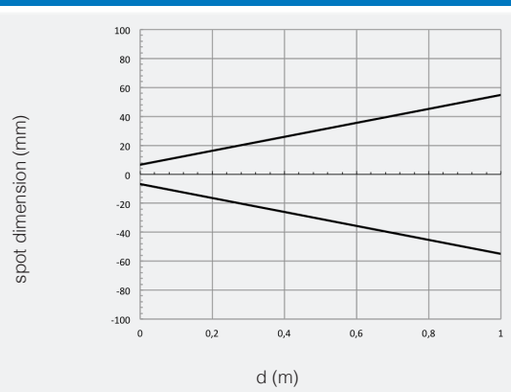


response diagrams

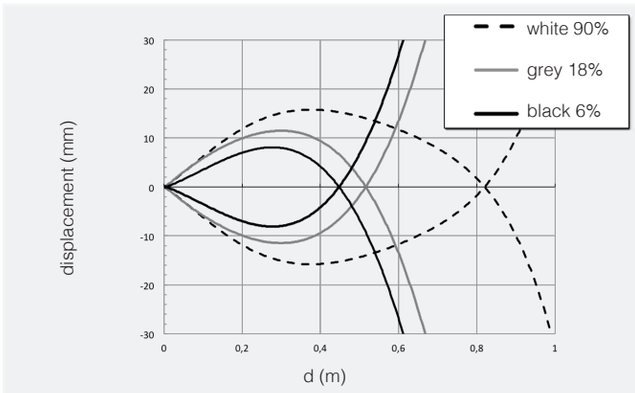
direct diffuse models

RX6/**-** excess gain	RX6/**-** spot dimension

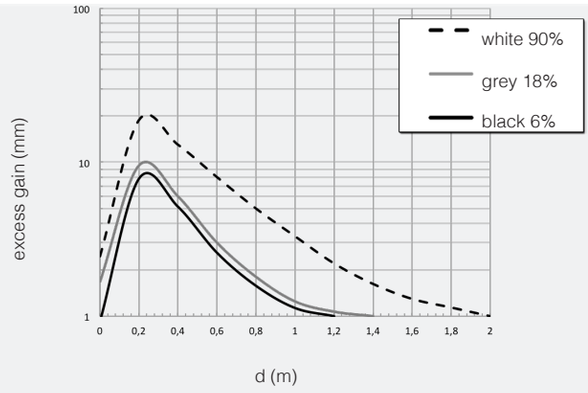




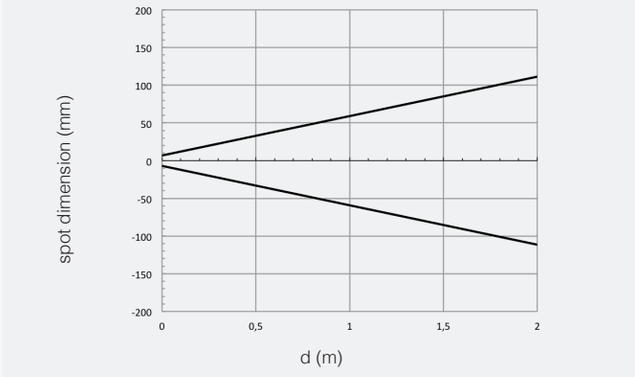
RX6/**-** parallel displacement



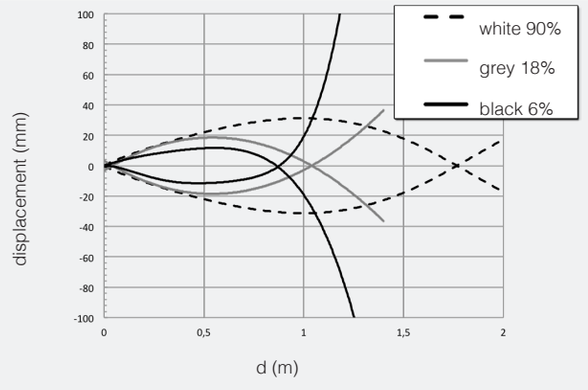
RX8/**-** excess gain



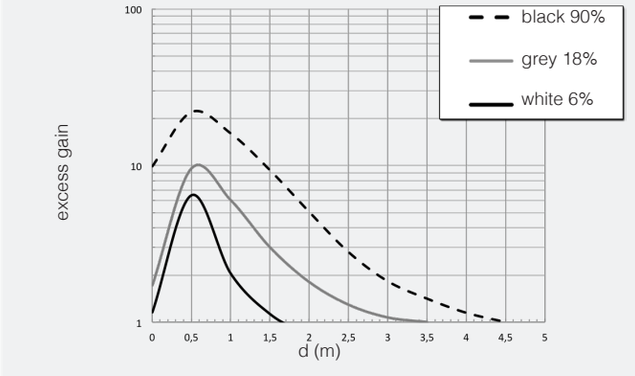
RX8/**-** spot dimension



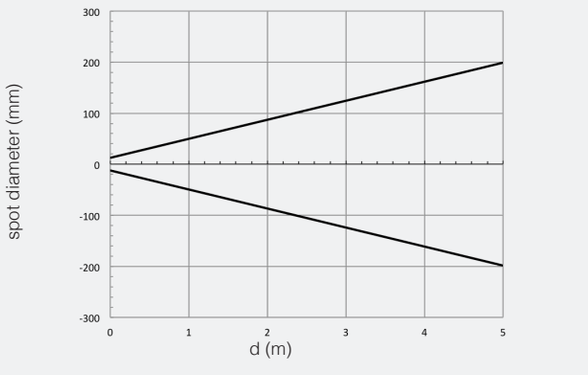
RX8/**-** parallel displacement



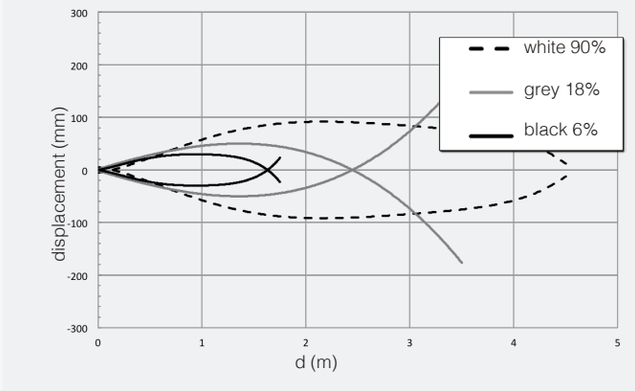
RX8/**-**37 excess gain



RX8/**-**37 spot diameter



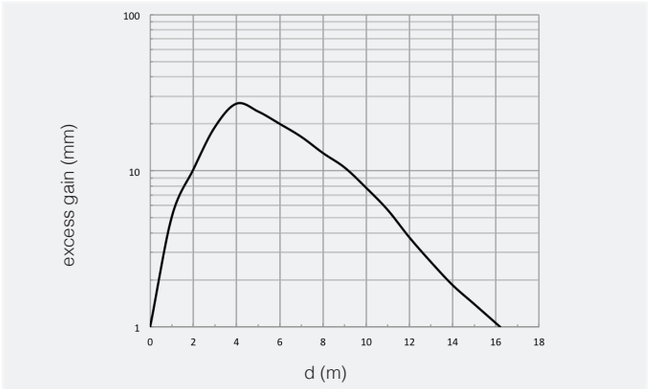
RX8/**-**37 parallel displacement



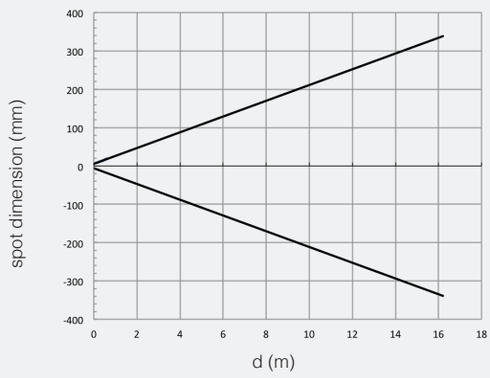
response diagrams

retro-reflective models

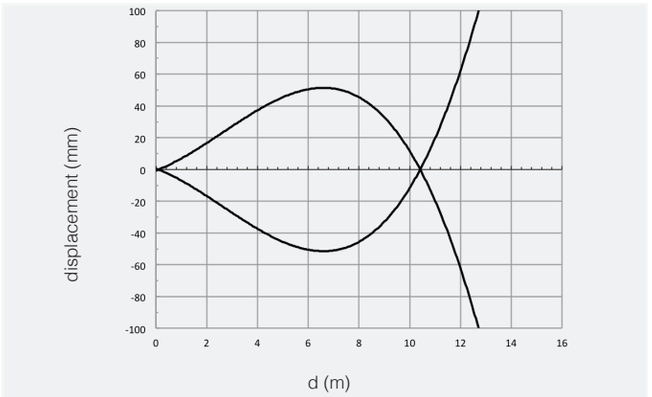
RXC/**-**excess gain



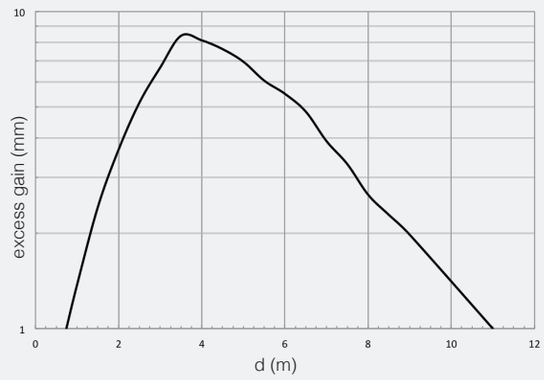
RXC/**-** spot dimension



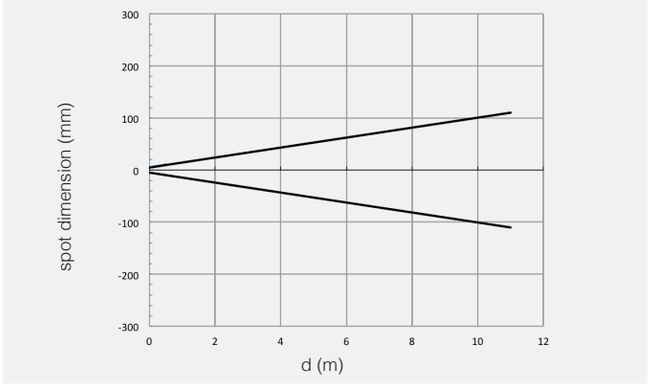
RXC/**-** parallel displacement



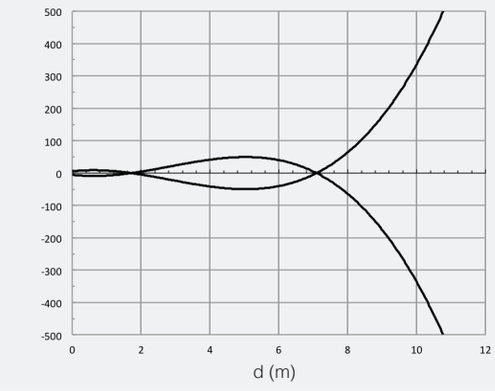
RXC/**-** excess gain



RXC/**-**spot dimension



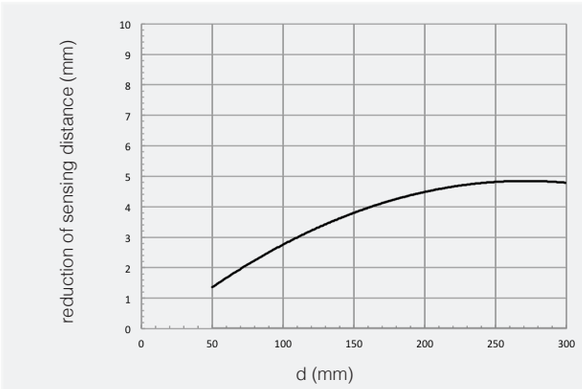
RXC/**-** parallel displacement



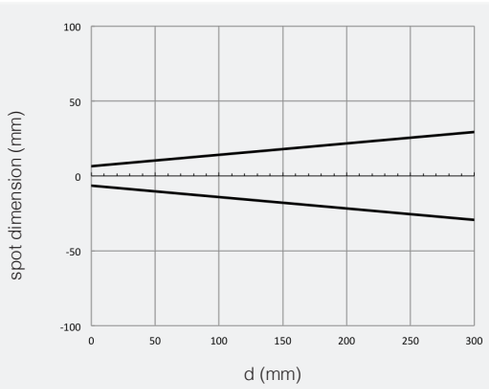
response diagrams

background suppression models

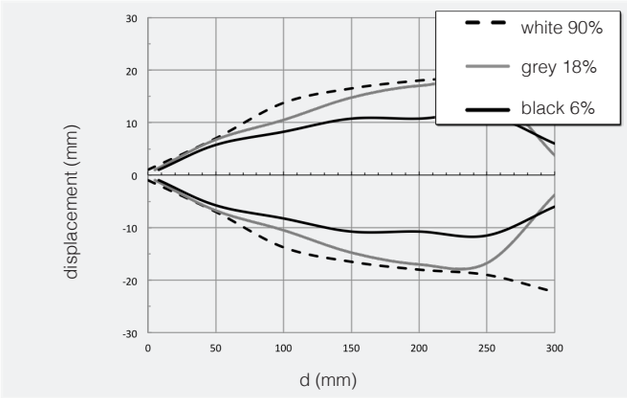
RXS/**-** reduction of sensing distance



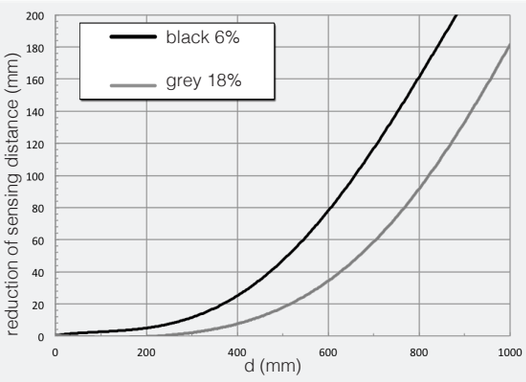
RXS/**-** spot dimension



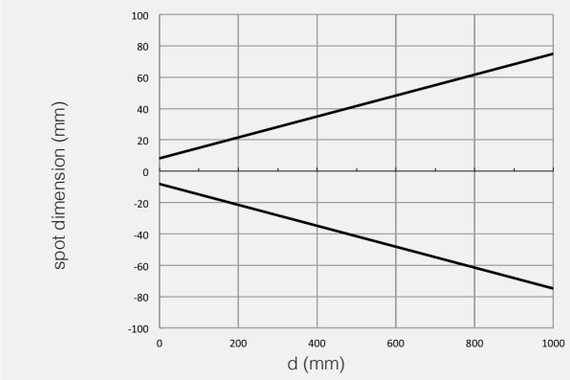
RXS/**-** parallel displacement



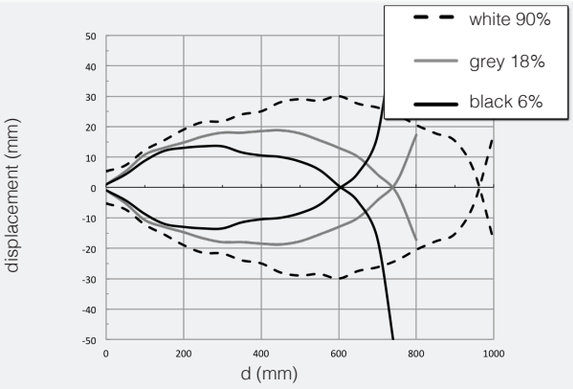
RXL/**-** reduction of sensing distance



RXL/**-**spot dimension



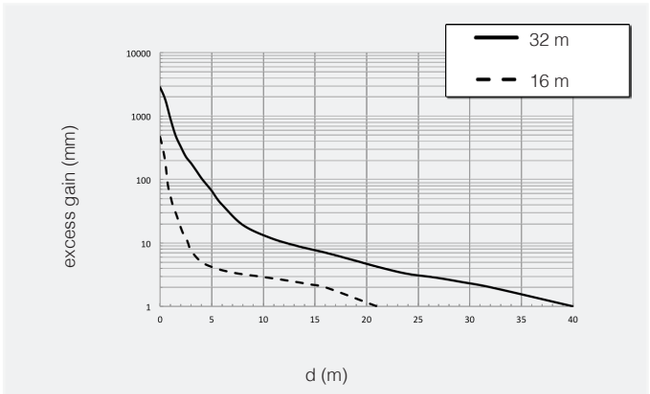
RXL/**-** parallel displacement



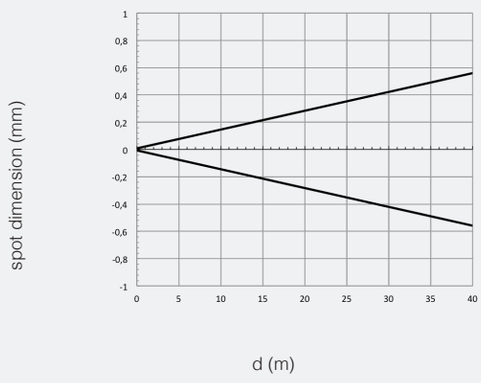
response diagrams

through-beam models

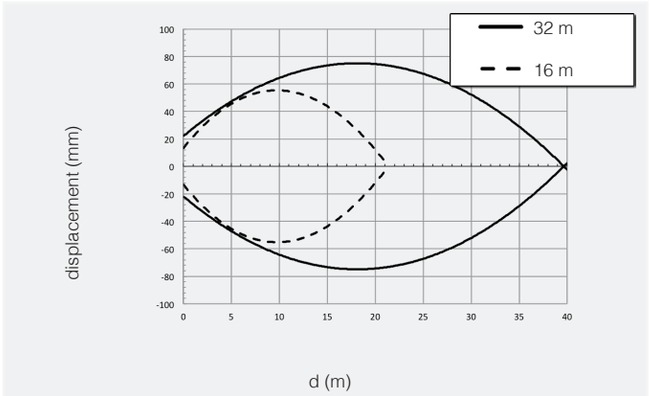
RXE/00-0* - RXR/00-0* excess gain



RXE/00-0* - RXR/00-0* spot dimension

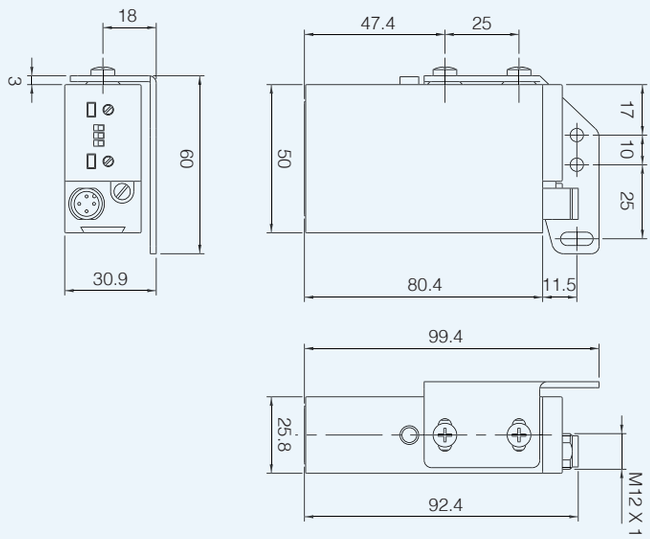


RXE/00-0* - RXR/00-0* parallel displacement



dimensions (mm)

RX*/**-*A



RX*/**-*B