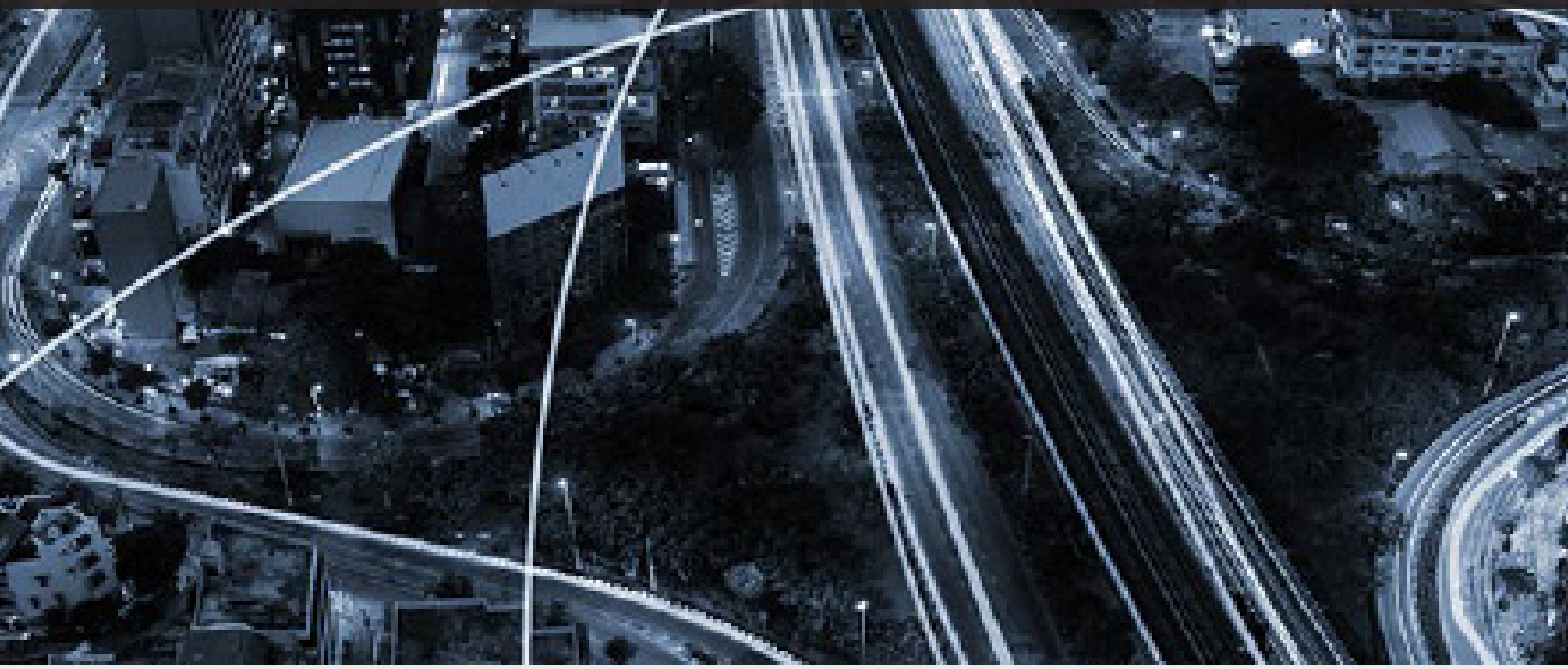
QM series

DATASHEET



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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**

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	5 mm	-			
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 60947-5-2	
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

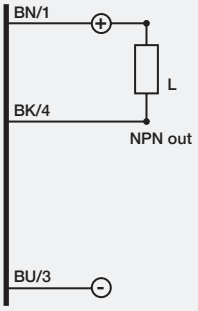
	QMRH/0*-0*	QMRD/0*-0*	QMIH/0*-0*	QMID/0*-0*
				
nominal sensing distance	20 m (1)		30 m (1)	
minimum sensing distance	-			
sensibility adjustment	●			
emission	red (630 nm)	-	infrared (850 nm)	-
hysteresis	≤ 10 %			
repeatability	5 %			
rotary switch	-	●	-	●
operating voltage	10...30 Vdc			
power on 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)

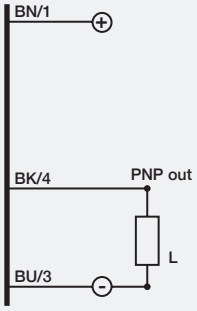
response diagrams

LO/DO selectable output

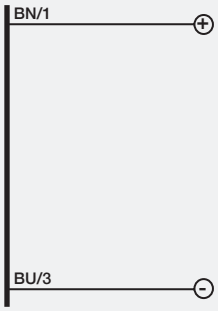
NPN output



PNP output



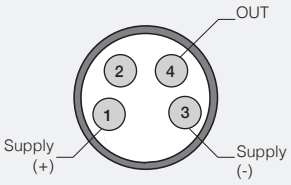
emitter



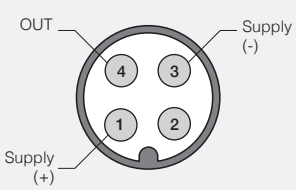
BN	brown
BU	blue
BK	black
WH	white

plug

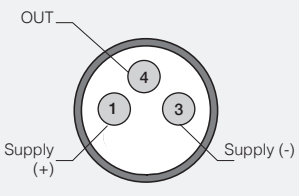
M8 4 pin	QMR*/0*-0F & QMR*/0*-0AVG0 QMI*/0*-0F & QMI*/0*-0AVG0



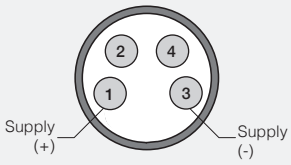
M12 4 pin (pig tail)	QMR*/0*-0AVE80 QMI*/0*-0AVE80

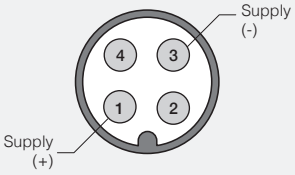


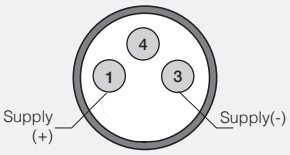
M8 3 pin (pig tail)	QMR*/0*-0AVF80 QMI*/0*-0AVF80



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



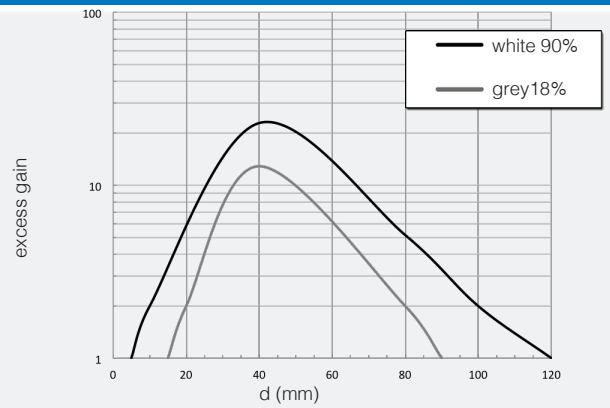




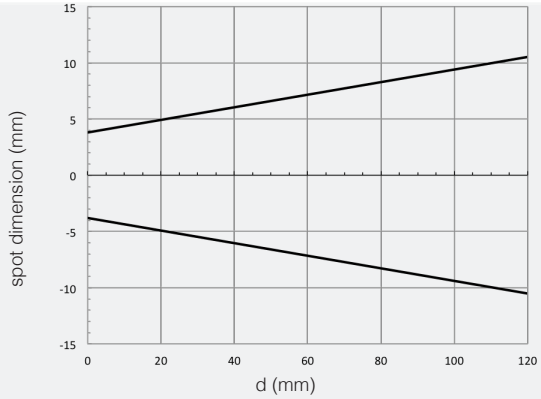
response diagrams

direct diffuse models

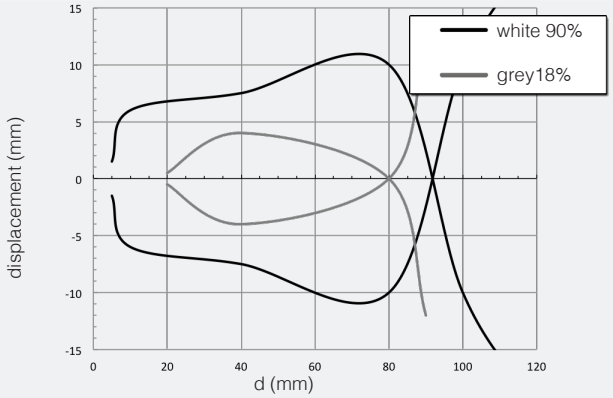
QMRB/**-* excess gain



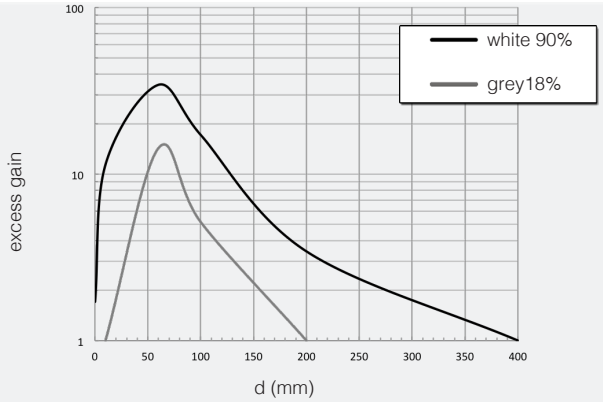
QMRB/**-* spot dimension



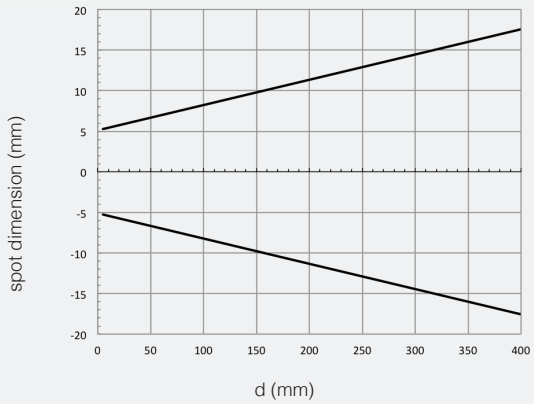
QMRB/**-* parallel displacement



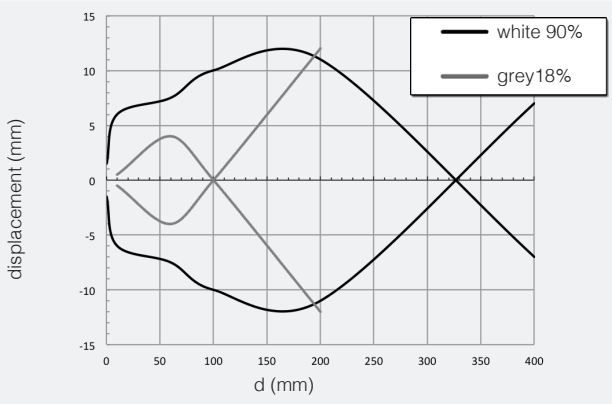
QMR7/**-* excess gain



QMR7/**-* spot dimension



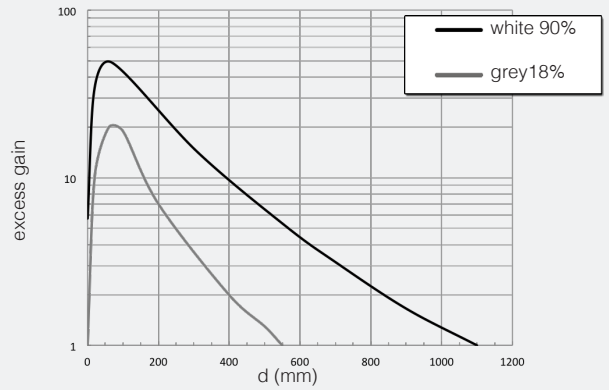
QMR7/**-* parallel displacement



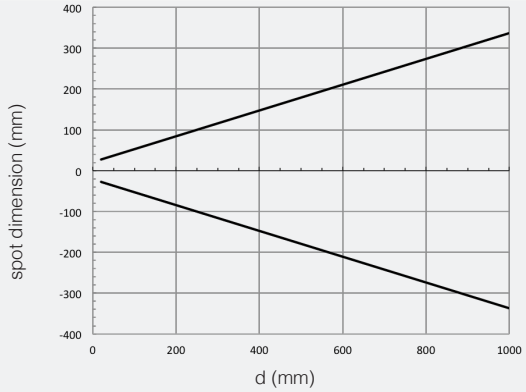
response diagrams

direct diffuse models

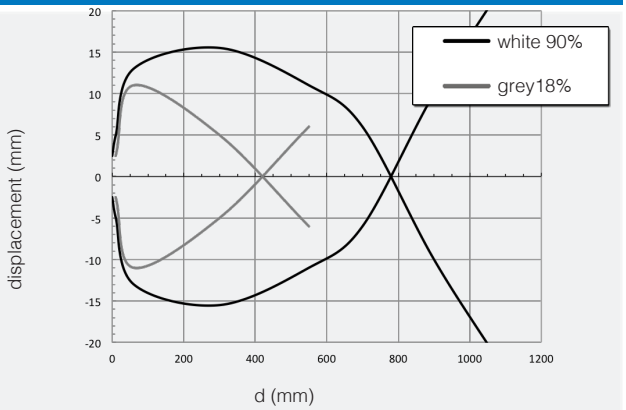
QMR8/**-* excess gain



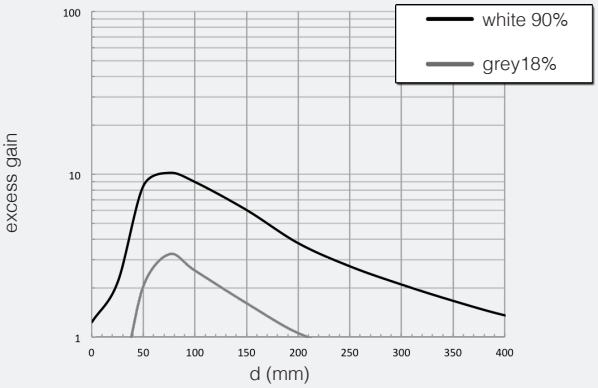
QMR8/**-* spot dimension



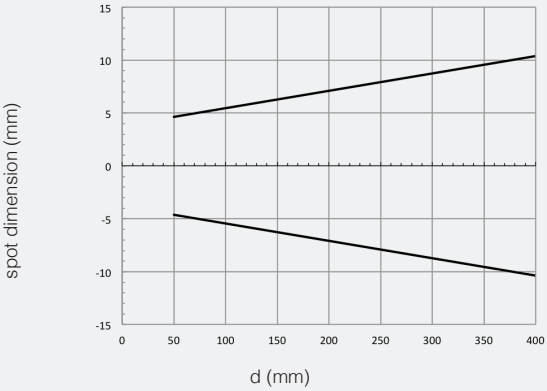
QMR8/**-* parallel displacement



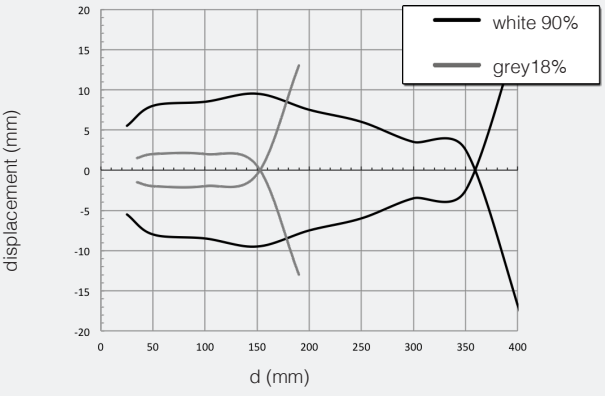
QMI7/**-* excess gain



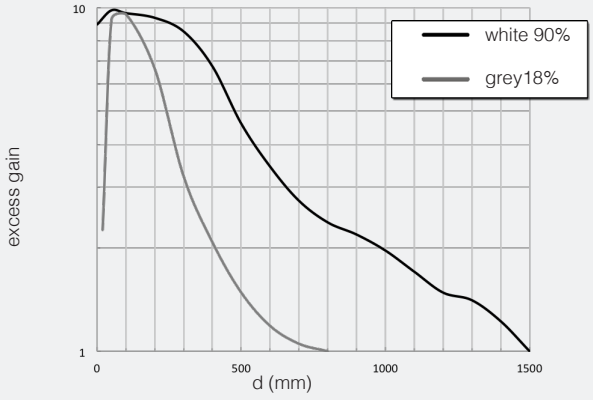
QMI7/**-* spot dimension



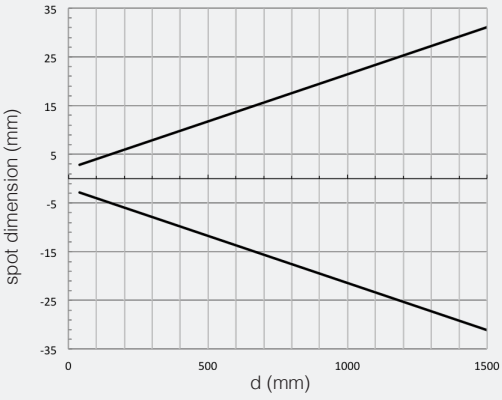
QMI7/**-* parallel displacement



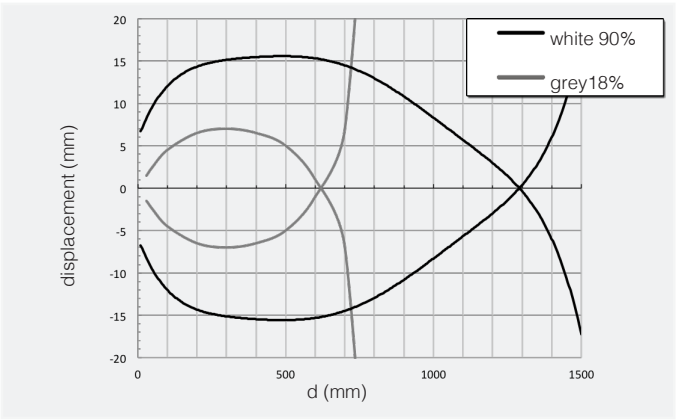
QMI9/**-* excess gain



QMI9/**-* spot dimension



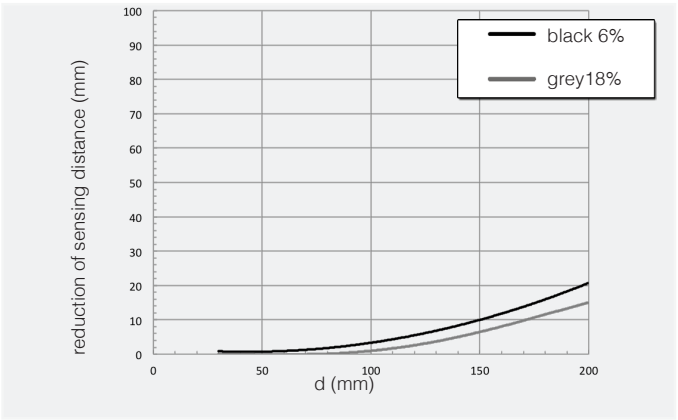
QMI9/**-* parallel displacement



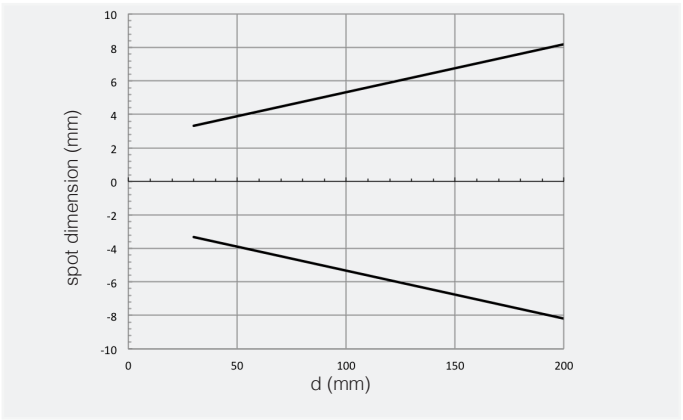
response diagrams

background suppression models

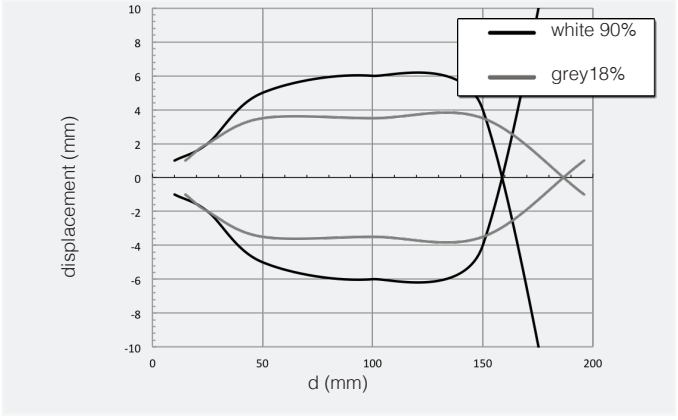
QMRS/**-* reduction of sensing distance



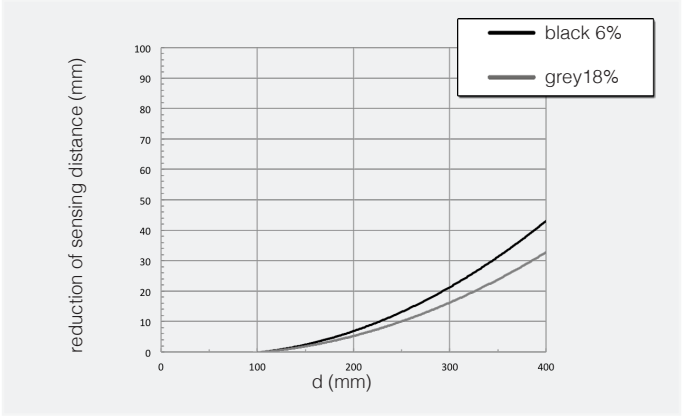
QMRS/**-* spot dimension



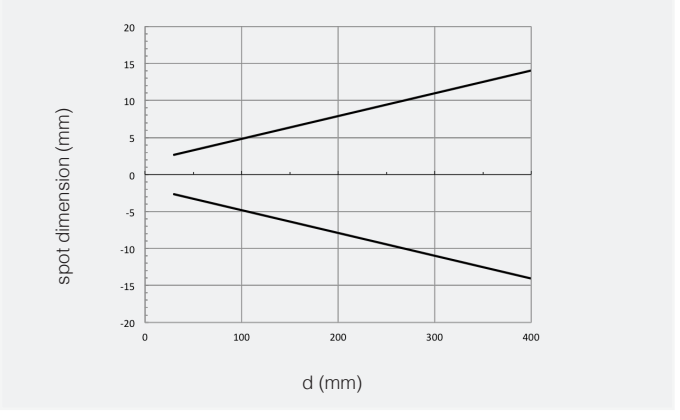
QMRS/**-* parallel displacement



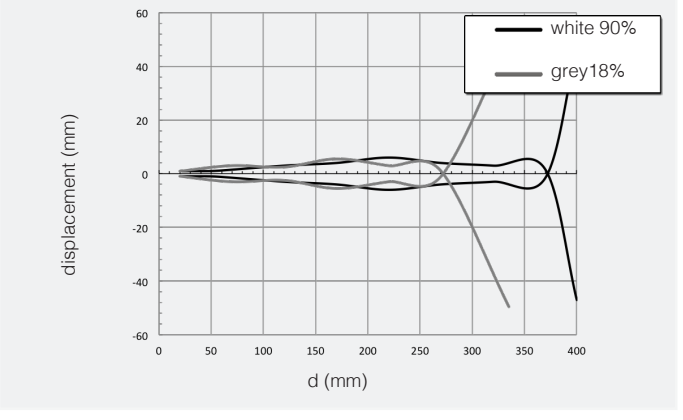
QMIS/**-* reduction of sensing distance



QMIS/**-* spot dimension



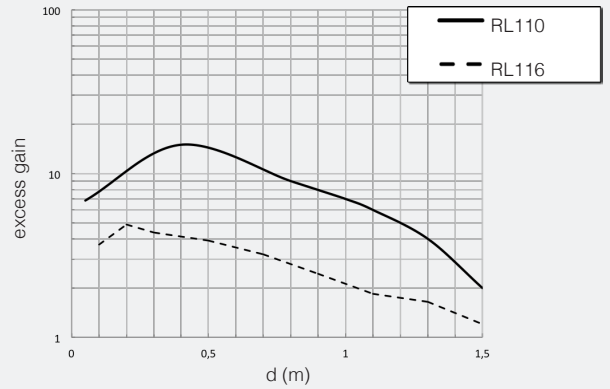
QMIS/**-* parallel displacement



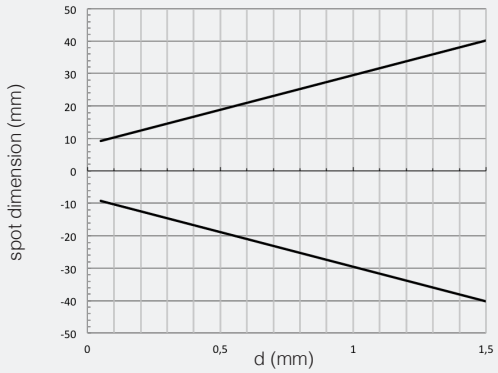
response diagrams

models for transparent objects

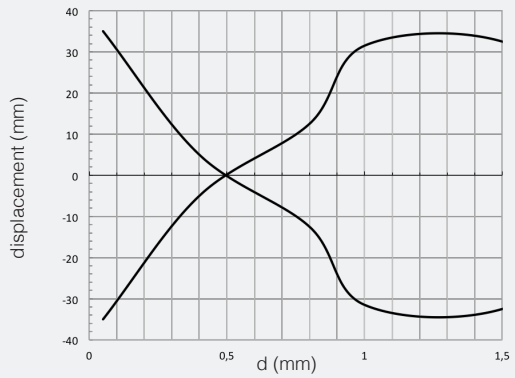
QMRG/**-* excess gain



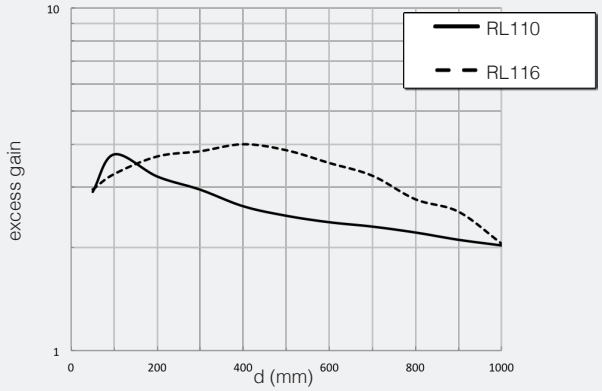
QMRG/**-* spot dimension



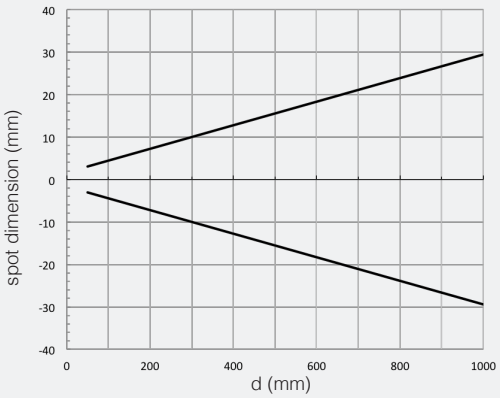
QMRG/**-*parallel displacement



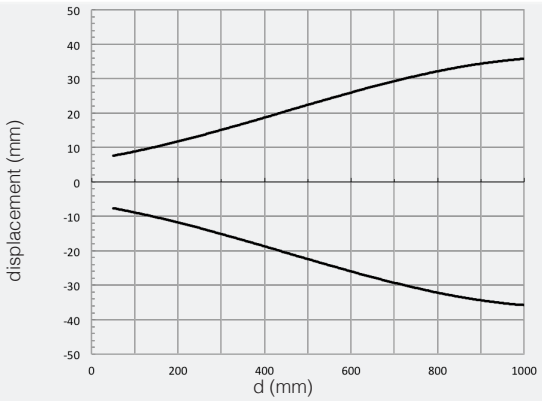
QMIG/**-* excess gain



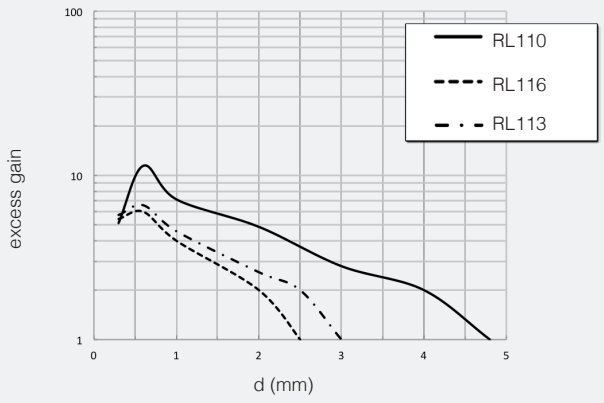
QMIG/**-* spot dimension



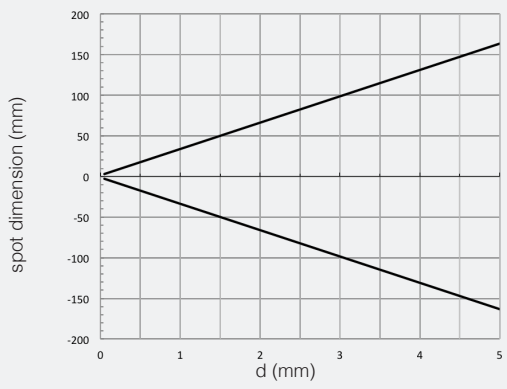
QMIG/**-*parallel displacement



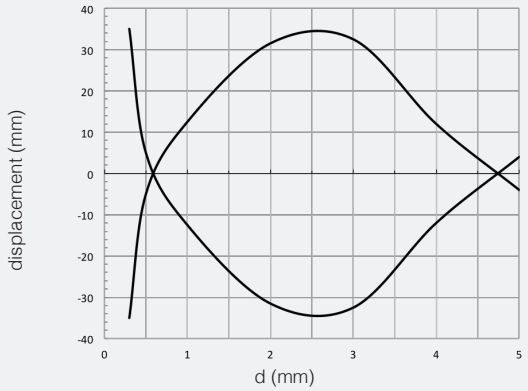
QMRL/**-* excess gain



QMRL/**-* spot dimension



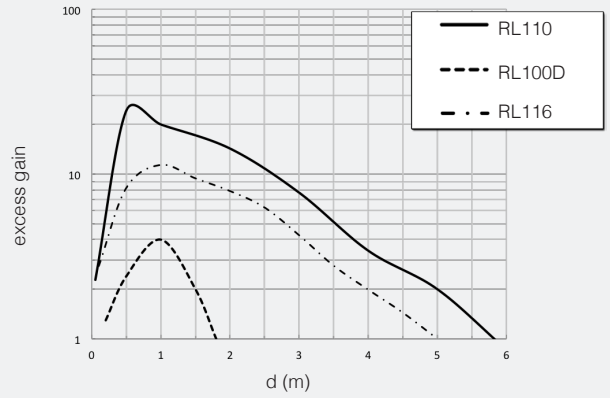
QMRL/**-*parallel displacement



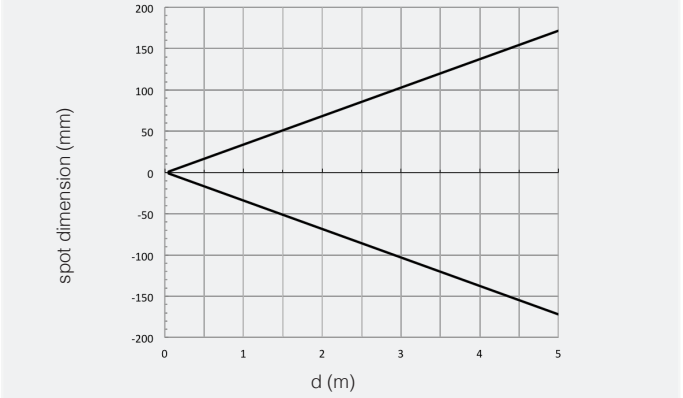
response diagrams

retroreflective polarized models

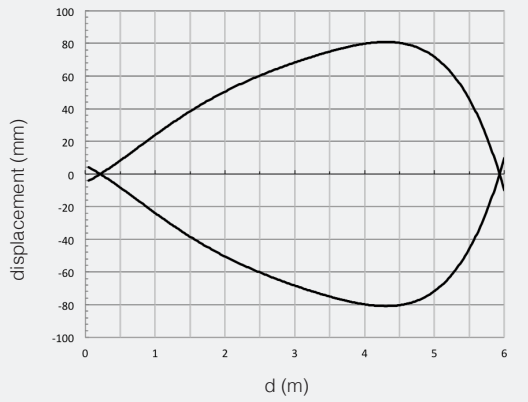
QMRN/**-* excess gain



QMRN/**-* spot dimension



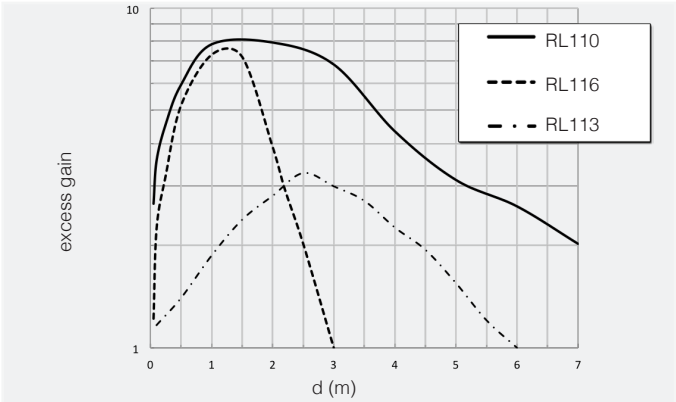
QMRN/**-*parallel displacement



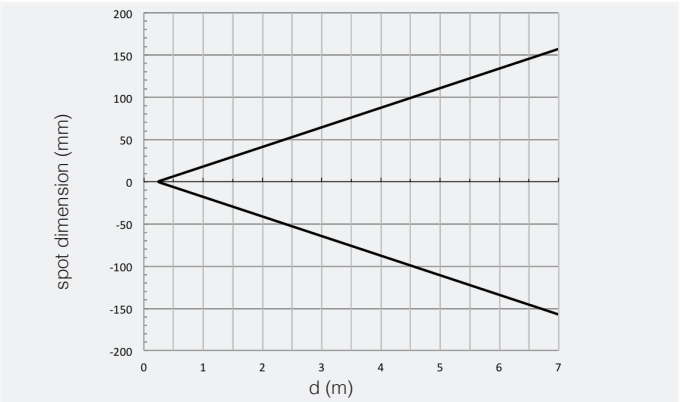
response diagrams

retro-reflective models

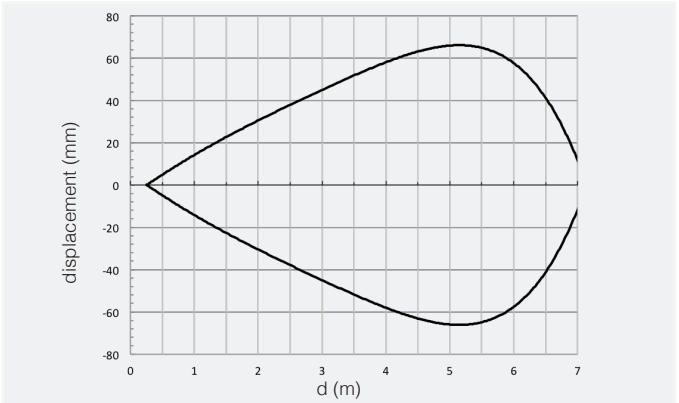
QMIC/**-* excess gain



QMIC/**-* spot dimension



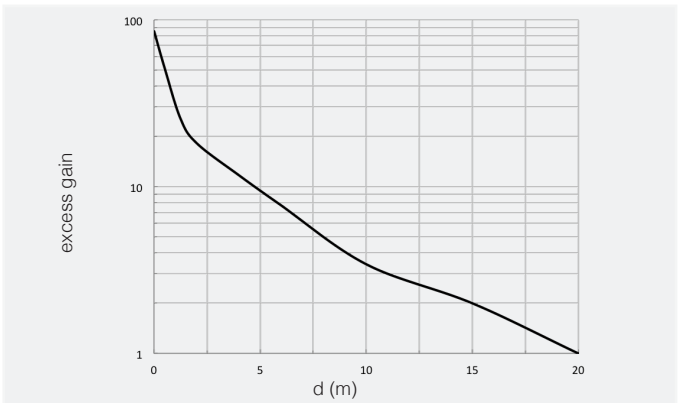
QMIC/**-*parallel displacement



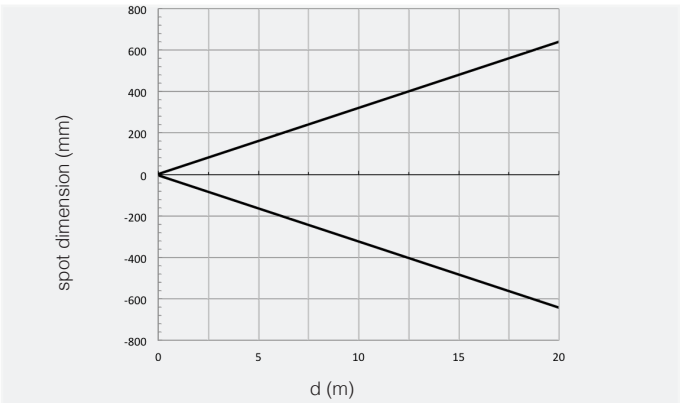
response diagrams

through beam models

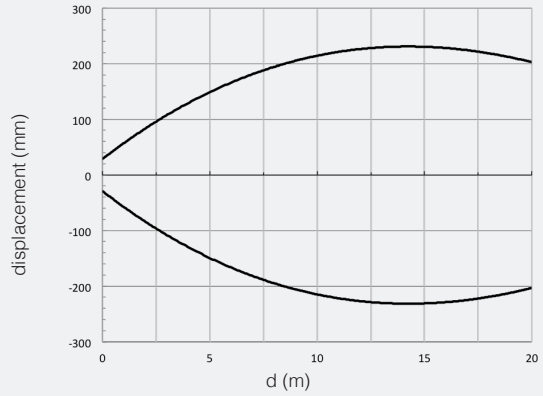
QMRHD/**-* excess gain



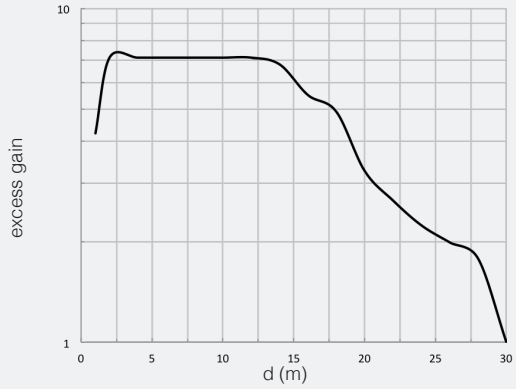
QMRHD/**-* spot dimension



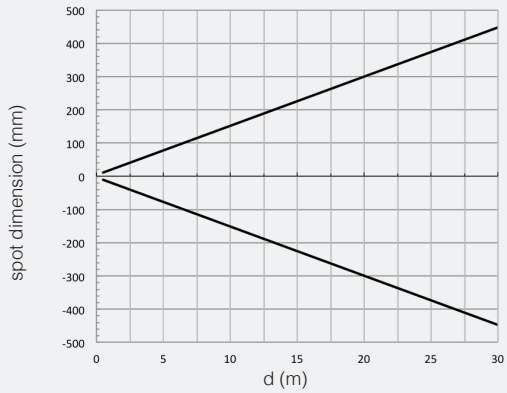
QMRHD/**-*parallel displacement



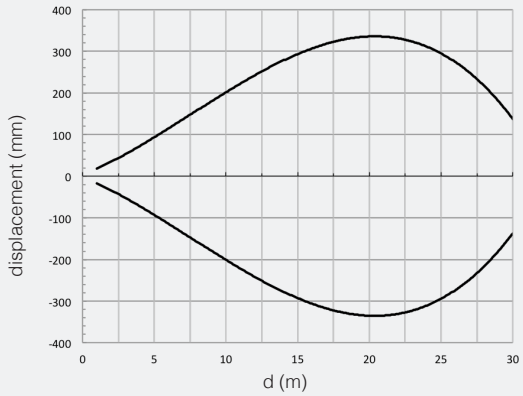
QMIHD/**-* excess gain



QMIHD/**-* spot dimension

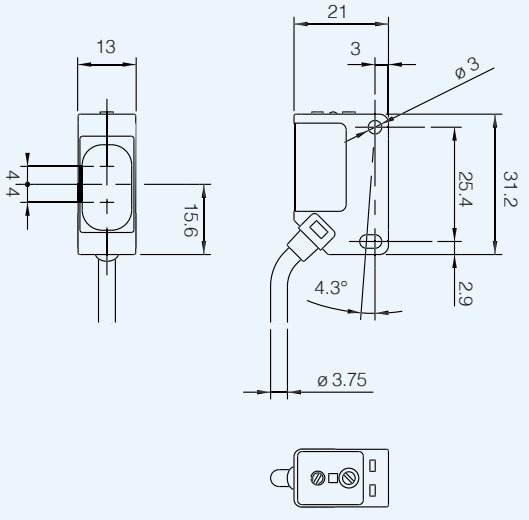


QMIHD/**-*parallel displacement

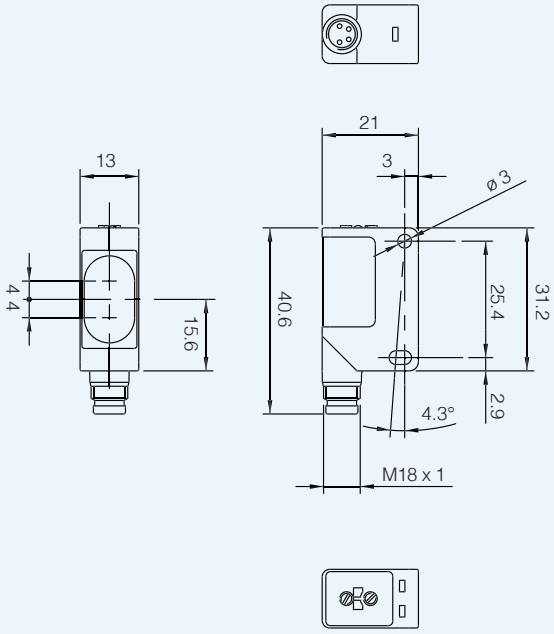


dimensions (mm)

QM**/**-0A

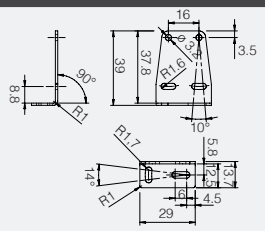


QM**/**-0E

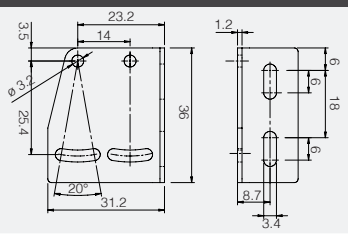


accessories

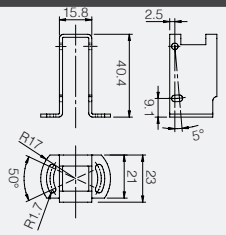
ST 101 / L vertical mounting bracket

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

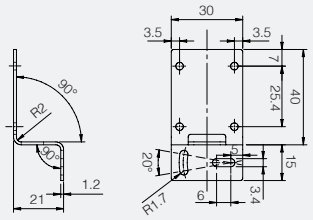
ST 102 / L side mounting bracket

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

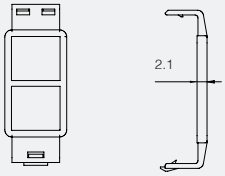
ST 103 [1] / Vertical mounting bracket with protective cover

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	-	• 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