

SQ Series

Cubic Photoelectric Sensor

- Compact cubic universal photoelectric sensors (50 x 50mm)
- Excellent performance & high versatility of available versions
- Cable output or revolving M12 connector
- NPN/PNP outputs for VDC models
- SPDT relay output for multi-voltage VDC/VAC models
- Complimentary outputs NO+NC available on VDC models
- Selectable output NO/NC available on multi-voltage VDC/VAC models
- Totally protected against electrical damages
- Diffuse: 1m & 2m
- Background suppression: 500mm
- Polarised: 6m
- Through-beam: 20m
- Two multi-function status LEDs
- IP67



Approval UL: E197668



Product Features

SQ cubic (50x50mm) photoelectric sensor range offers a wide selection of models:

- Direct diffuse with working distance up to 2m
- Background suppression up to 500mm
- Polarised retro-reflective up to 6m
- Through-beam with sensing range up to 20m

Available versions include: VDC models with NPN/PNP and NO+NC selectable outputs. Multi-voltage VDC/VAC models with Relay output or NO/NC contacts.

Compact housing provided with an M12 rotating connector or pre-wired cable allows the user to install the unit easily and fast even where the space is limited.

Highly visible LEDs simplify the alignment phase between sensor and target, and the sturdiness of the housing guarantees a safe and reliable functioning of the product in harsh environments.



Options & Ordering Codes

	DC Models		AC/DC Models		
	Cable	M12 Connector	Cable	Sensing Distance	Sensitivity Adjuster
Diffuse	SQD/B01-C	SQD/B01-P	SQD/C01-C	1m	Y
	SQD/B02-C	SQD/B02-P	SQD/C02-C	2m	Y
Diffuse, Background Supression (BS)	SQG/B00.5-C	SQG/B00.5-P	-	120 to 500mm	Y
Polarised Retro-Reflective	SQP/B06-C	SQP/B06-P	SQP/C06-C	6m	Y
Emitter	SQE/0D20-C	SQE/0D20-P	SQE/0A20-C	20m	N
Receiver	SQR/B020-C	SQR/B020-P	SQR/C020-C	20m	Y

SQ Series

Cubic Photoelectric Sensor

Specifications - Direct Diffuse Models

according to IEC EN 60947-5-2 and IEC EN 60947-5-7



Models	SQD/C01-C	SQD/B01-C SQD/B01-P
Function	Direct Diffuse	
Nominal sensing distance (Sn)	0.1 / 1m * ¹	
Sensing range	0.2 / 1m	
Sensitivity adjustment	Single-turn Potentiometer	
Emission	Infrared LED	
Spot dimension	70mm @ 500mm	
Light-dark selection	Single-turn Potentiometer	-
Operating voltage	12-240 VDC / 24-240 VAC, 50-60Hz	10-30 VDC
Ripple	-	≤ 10%
No-load supply current	≤ 2.5 VA (relay ON)	≤ 40 mA
Load current	-	≤ 200 mA
Output voltage drop	2 V max @ 100 mA	
Maximum load current	3A / 30 VDC 3A / 240 VAC	-
Output type	Relay SPDT electrically isolated	PNP or NPN
Switching frequency	20 Hz	500 Hz
Time delay before availability	≤ 30 ms	-
Supply electrical protection	Transient	Polarity Reversal, Overvoltage Pulses
Output electrical protection	-	Overcurrent, Short Current, Overvoltage
Operating temperature	-20°C...+60°C * ²	
Interference external light	5,000 Lux	
EMC	Conforming to the EC Directive 2004/108/EC requirements acc. to EN 60947-5-2	
Protection degree	IP67 (EN60529)* ³	
Housing material	Body: PC/ABS; Optic: PMMA	
Weight (approx)	110g	110g Cable, 32g Connector

*1 - White target 90% 200 x 200 mm

*2 - UL homologation: 0...+60°C

*3 - Protection guaranteed only with plug cable correctly secured

SQ Series

Cubic Photoelectric Sensor

Specifications - Direct Diffuse Models

according to IEC EN 60947-5-2 and IEC EN 60947-5-7



Models	SQD/C02-C	SQD/B02-C SQD/B02-P
Function	Direct Diffuse	
Nominal sensing distance (Sn)	0.3 / 2m * ¹	
Sensing range	0.5 / 2m * ¹	
Sensitivity adjustment	Single-turn Potentiometer	
Emission	Infrared LED	
Spot dimension	80mm @ 1m	
Light-dark selection	Single-turn Potentiometer	-
Operating voltage	12-240 VDC / 24-240 VAC, 50-60Hz	10-30 VDC (ripple included)
Ripple	-	≤ 10%
No-load supply current	≤ 2.5 VA (relay ON)	≤ 40 mA
Load current	-	≤ 200 mA
Output voltage drop	-	2.5 VDC max @ 200 mA
Maximum load current	3A / 30 VDC 3A / 240 VAC	-
Output type	Relay SPDT electrically isolated	PNP or NPN
Switching frequency	20 Hz	500 Hz
Time delay before availability	≤ 30 ms	-
Supply electrical protection	Transient	Polarity Reversal, Overvoltage Pulses
Output electrical protection	-	Overcurrent, Short Current, Overvoltage
Operating temperature	-20°C...+60°C * ²	
Interference external light	5,000 Lux	
EMC	Conforming to the EC Directive 2004/108/EC requirements acc. to EN 60947-5-2	
Protection degree	IP67 (EN60529)* ³	
Housing material	Body: PC/ABS; Optic: PMMA	
Weight (approx)	110g	110g Cable, 32g Connector

*¹ - White target 90% 200 x 200 mm

*² - UL homologation: 0...+60°C

*³ - Protection guaranteed only with plug cable correctly secured

SQ Series

Cubic Photoelectric Sensor

Specifications - Background Suppression Models

according to IEC EN 60947-5-2 and IEC EN 60947-5-7



Models	SQG/B00.5-C SQG/B00.5-P
Function	Background Suppression
Nominal sensing distance (Sn)	120 / 500mm * ¹
Minimum working distance	120mm
Sensitivity adjustment	Single-turn Potentiometer
Emission	Infrared LED
Spot dimension	30mm @ 500mm
Light-dark selection	-
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
Time delay before availability	≤ 2 ms
Supply electrical protection	Polarity Reversal, Overvoltage Pulses
Output electrical protection	Short Circuit (Auto Reset), Overvoltage Pulses
Operating temperature	-20°C... +60°C * ²
Interference external light	10,000 Lux
EMC	Conforming to the EC Directive 2004/108/EC requirements acc. to EN 60947-5-2
Protection degree	IP67 (EN60529)* ³
Housing material	Body: PC/ABS; Optic: PMMA
Weight (approx)	130g Cable, 32g Connector

*1 - White target 90% 200 x 200 mm

*2 - UL homologation: 0... +60°C

*3 - Protection guaranteed only with plug cable correctly secured

SQ Series

Cubic Photoelectric Sensor

Technical Specifications

(Polarised Models) according to IEC EN 60947-5-2 and IEC EN 60947-5-7



Models	SQP/C06-C	SQP/B06-C SQP/B06-P
		
Function	Polarised	
Nominal sensing distance (Sn)	0.2 / 6m * ¹	
Minimum working distance	200mm	
Sensitivity adjustment	Single-turn Potentiometer	
Emission	Red Visible LED Light	
Spot dimension	280mm @ 3m	
Light-dark selection	Single-turn Potentiometer	-
Operating voltage	12-240 VDC / 24-240 VAC, 50-60Hz	10-30 VDC (ripple included)
Ripple	-	≤ 10%
No-load supply current	≤ 2.5 VA (relay ON)	≤ 40 mA
Load current	-	≤ 200 mA
Output voltage drop	-	2.5 VDC max @ 200 mA
Maximum load current	3A / 30 VDC 3A / 240 VAC	-
Output type	Relay SPDT electrically isolated	PNP or NPN
Switching frequency	20 Hz	500 Hz
Time delay before availability	-	≤ 1 ms
Supply electrical protection	Transient	Polarity Reversal, Transient
Output electrical protection	-	Overvoltage, Short Circuit
Operating temperature	-20°C...+60°C * ²	
Interference external light	5,000 Lux	
EMC	Conforming to the EC Directive 2004/108/EC requirements acc. to EN 60947-5-2	
Protection degree	IP67 (EN60529)* ³	
Housing material	Body: PC/ABS; Optic: PMMA	
Weight (approx)	110g	110g Cable, 32g Connector

*1 - With RL110 reflector

*2 - UL homologation: 0...+60°C

*3 - Protection guaranteed only with plug cable correctly secured

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Cubic Photoelectric Sensor

Technical Specifications

(Emitter Models) according to IEC EN 60947-5-2 and IEC EN 60947-5-7



Models	SQE/OD20-C SQE/OD20-P	SQE/OA20-C
		
Function	Emitter	
Nominal sensing distance (Sn)	20m	
Minimum working distance	-	
Sensitivity adjustment	-	
Emission	Infrared LED	
Spot dimension	880mm @ 10m	
Light-dark selection	-	
Operating voltage	10-30 VDC (ripple included)	12-240 VDC / 24-240 VAC, 50-60Hz
Ripple	≤ 10%	-
No-load supply current	≤ 50 mA	≤ 2.5 VA (relay ON)
Load current	-	
Output voltage drop	-	
Maximum load current	-	
Output type	-	
Switching frequency	-	
Time delay before availability	-	
Supply electrical protection	Polarity Reversal, Transient	Transient
Output electrical protection	-	
Operating temperature	-20°C...+60°C *1	
Interference external light	-	
EMC	Conforming to the EC Directive 2014/30/EC requirements acc. to EN 60947-5-2	
Protection degree	IP67 (EN60529)*2	
Housing material	Body: PC/ABS; Optic: PMMA	
Weight (approx)	110g Cable, 32g Connector	110g

*1 - UL homologation: 0...+60°C

*2 - Protection guaranteed only with plug cable correctly secured

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Cubic Photoelectric Sensor

Technical Specifications

(Receiver Models) according to IEC EN 60947-5-2 and IEC EN 60947-5-7



Models	SQR/B020-*	SQR/C020-C
		
Function	Receiver	
Nominal sensing distance (Sn)	20m	
Minimum working distance	-	
Sensitivity adjustment	Single Turn Potentiometer	
Emission	-	
Spot dimension	-	
Light-dark selection	-	Single Turn Potentiometer
Operating voltage	10-30 VDC (ripple included)	12-240 VDC / 24-240 VAC, 50-60Hz
Ripple	≤ 10%	-
No-load supply current	≤ 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/240 VAC
Output type	PNP or NPN	Free contact of Changeover Relay
Switching frequency	500 Hz	20 Hz
Time delay before availability	≤ 1 ms	-
Supply electrical protection	Polarity Reversal, Transient	Transient
Output electrical protection	Overvoltage, Short Circuit	-
Operating temperature	-20°C...+60°C *1	
Interference external light	10,000 Lux	
EMC	Conforming to the EC Directive 2014/108/EC requirements acc. to EN 60947-5-2	
Protection degree	IP67 (EN60529)*2	
Housing material	Body: PC/ABS; Optic: PMMA	
Weight (approx)	110g Cable, 32g Connector	110g

*1 - UL homologation: 0...+60°C

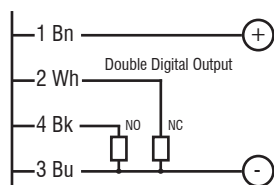
*2 - Protection guaranteed only with plug cable correctly secured

SQ Series

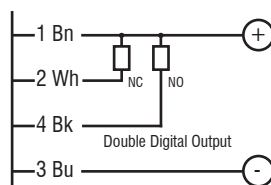
Cubic Photoelectric Sensor

Wiring Connections & Outputs

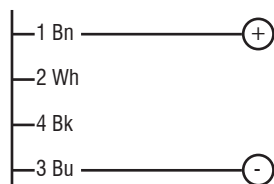
Background suppression, polarised retro-reflective and receiver with PNP output



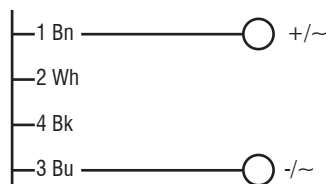
Background suppression, polarised retro-reflective and receiver with NPN output



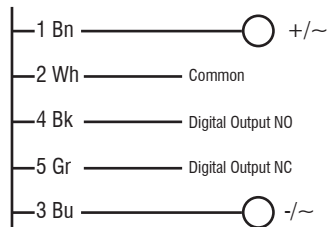
DC emitter



AC/DC emitter

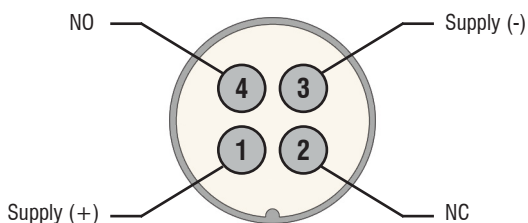


Polarised retro-reflective and receiver

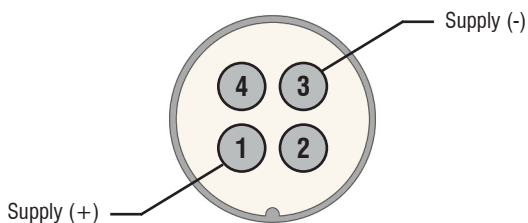


M12 Connector

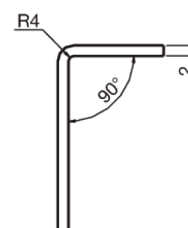
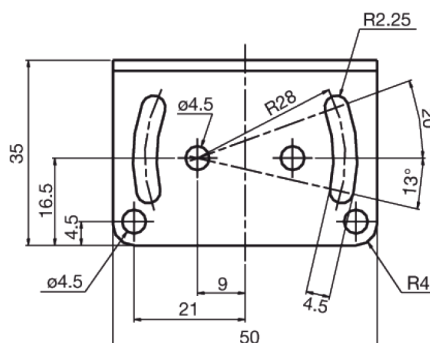
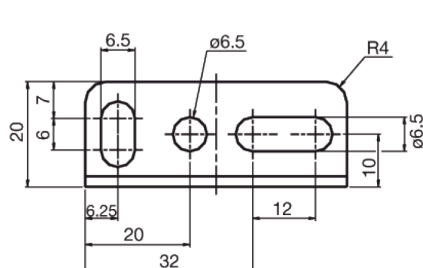
All models excluding Emitter



Emitter model only



Mounting Brackets



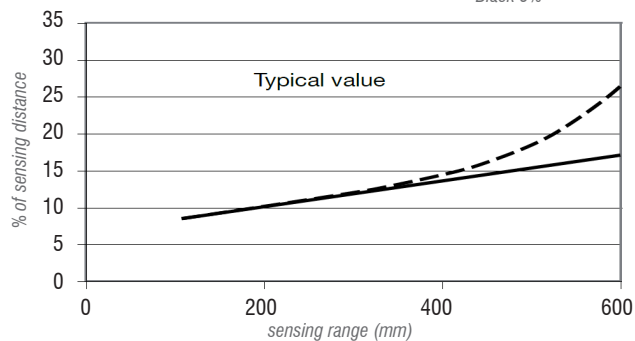
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Response Diagrams

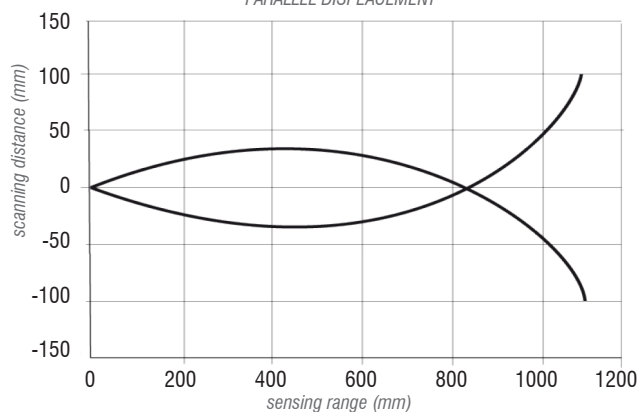
SQG/*****

— Grey 18%, White 90%
- - Black 6%



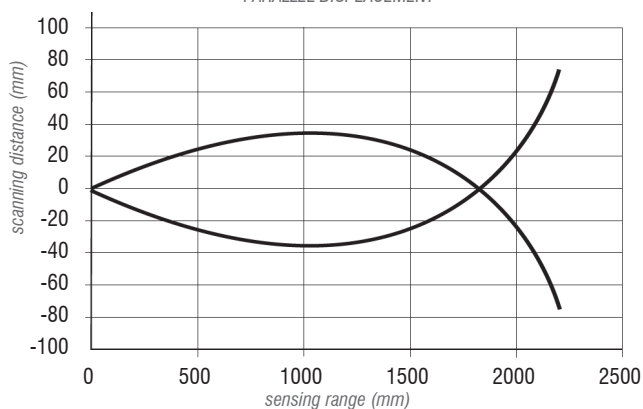
SQD/C01-C SQD/B01-*

PARALLEL DISPLACEMENT



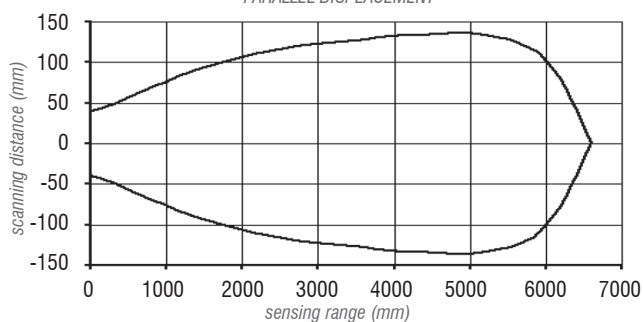
SQD/C02-C SQD/B02-*

PARALLEL DISPLACEMENT



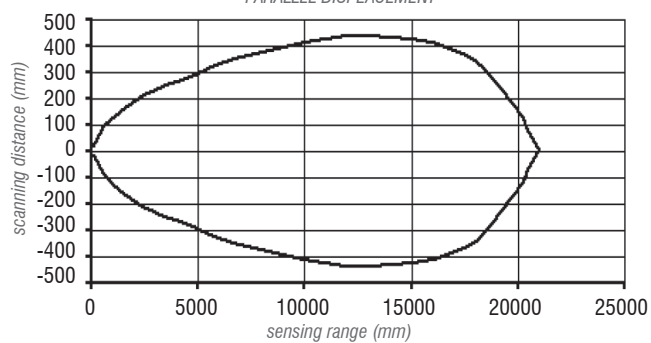
SQP/C06-C SQP/B06-*

PARALLEL DISPLACEMENT



SQE/0D20-* SQR/C020-C SQR/B020-*

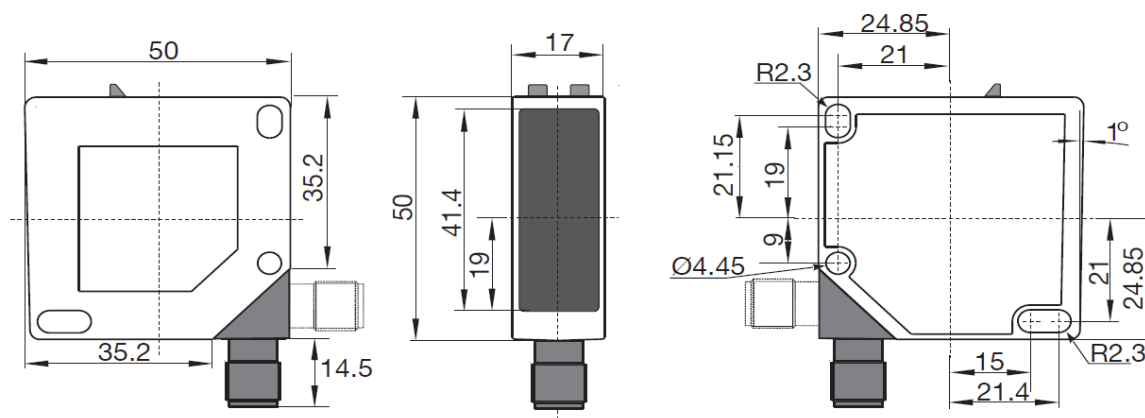
PARALLEL DISPLACEMENT



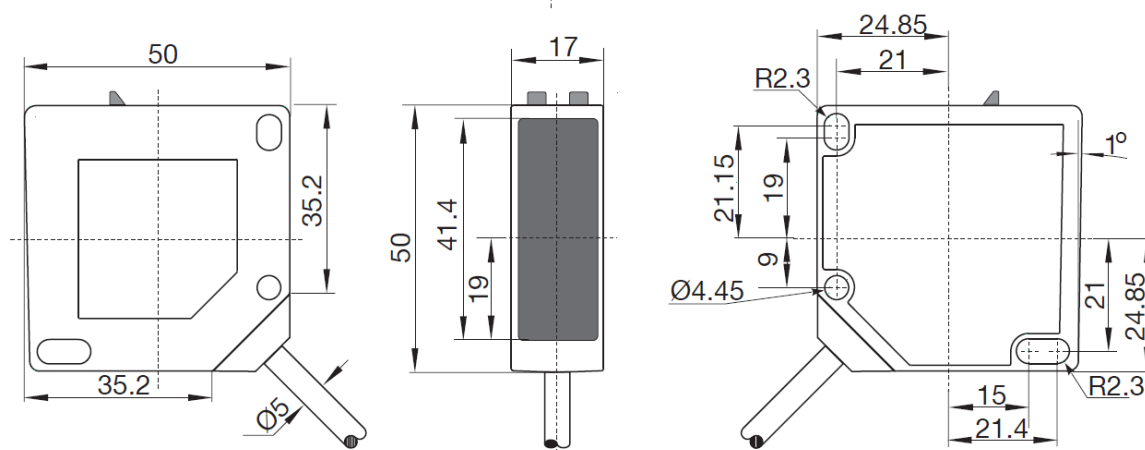
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Connector



Cable



SQD/B01-*, SQD/C01-*, SQP/C06-C, SQR/B020-*,
SQD/B02-*, SQD/C02-*, SQP/B06-*, SQR/C020-C

SQG/B00.5-*

SQE/0A20-C, SQE/0D20-*

