

S300 PA



ADVANCED MAXI PHOTOELECTRIC MULTIVOLTAGE SENSORS

- Industrial plastic housing with IP67 mechanical protection
- Timing function from 0.6-16 s ON delay, OFF delay and ONE SHOT
- Terminal block for both Vdc and Vac/ Vdc free voltage
- Distance trimmer for mechanical background suppression models

APPLICATIONS

- Packaging end of line, palletizers
- Outdoor or indoor gates control
- Manufacturing plants



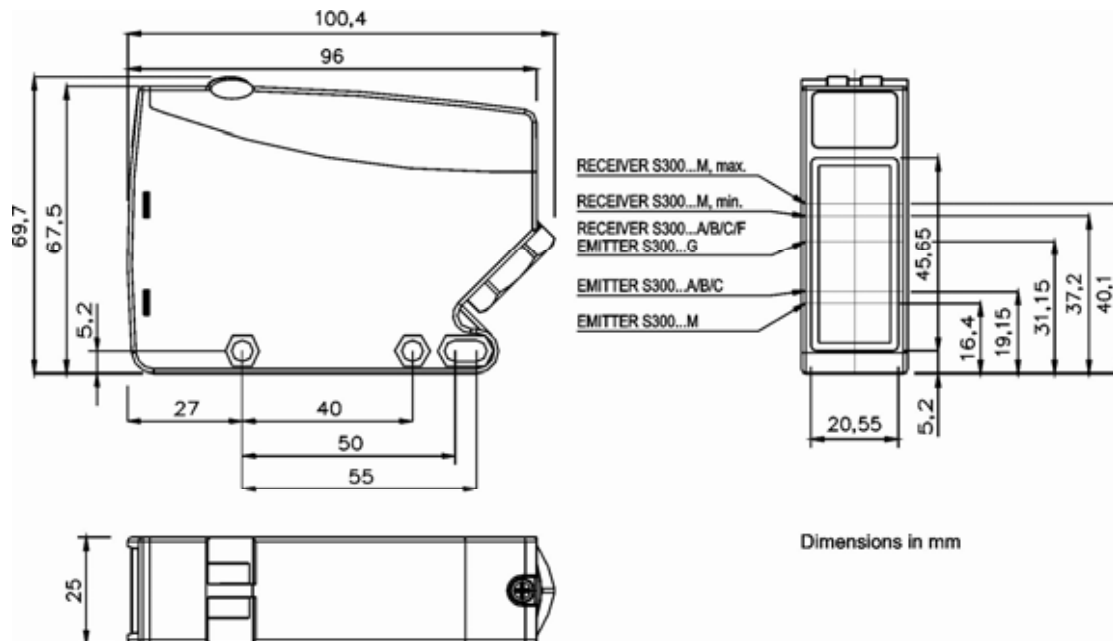
(*)DC models:
ATEX II 3DG

S300 PA		
Through beam	0...50 m	
Retroreflective (on R2 reflector)	0,1...15 m	
Polarized retroreflective	0,1...10 m	
Diffuse proximity	0,05...2 m	
Background suppression	0,2...2 m	
Power supply	Vdc	12...30 V
	Vac	
	Vac/dc	24...240 Vac/24...60 Vdc
Output	PNP	
	NPN	
	NPN/PNP	•
	relay	•
Connection	other	
	cable	
	connector	•
	pig-tail	
Approximate dimensions (mm)	25x100x70	
Housing material	PBT	
Mechanical protection	IP67	

TECHNICAL DATA

Power supply	12 ... 30 Vdc (mod. S300...2) 24...240 Vac/24...60 Vdc (mod. S300...1)
Ripple	10% max.
Consumption (output current excluded)	35 mA max. (mod. S300...2) 3 VA max. (mod. S300...1)
Light emission	red LED 660 nm (mod. S300...B) IR LED 940 nm (mod. S300...C) IR LED 880 nm (mod. S300...A/G/M)
Setting	sensitivity trimmer (mod. S300...A/B/C/F), DARK/LIGHT dip-switch (mod. S300...A/B/C/F/M) 7-turns distance adjustment trimmer (mod. S300...M) dip-switch mode ON delay/OFF delay/ON-OFF delay/single pulse (ONE-SHOT) (mod. S300...x06) timing trimmer (mod. S300...x06)
Indicators	yellow OUTPUT LED (excl. mod. S300...G) green STABILITY LED, POWER LED (mod. S300...G)
Output	PNP or NPN open collector (mod. S300...2); electromechanical SPDT 250 Vac/30 Vdc (mod. S300...1)
Output current	100 mA (mod. S300...2) 3 A max. (mod. S300...1)
Saturation voltage	2,4 V max.
Response time	1 ms (mod. S300...2-A/B/C/M) 2 ms (mod. S300...2-F/G) 25 ms (mod. S300...1)
Switching frequency	500 Hz (mod. S300...2-A/B/C/M) 250 Hz (mod. S300...2-F/G) 20 Hz max. (mod. S300...1)
Connection	terminal block
Dielectric strength	500 Vac, 1 min between electronics and housing
Insulating resistance	>20 MΩ, 500 Vdc between electronics and housing
Electrical protection	class 2 (mod. S300...2)
Mechanical protection	IP67 (IEC/EN60529)
Ambient light rejection	according to EN 60947-5-2
Vibrations	0,5 mm amplitude, 10 ... 55 Hz frequency, for every axis (EN60068-2-6)
Shock resistance	11 ms (30 G) 6 shock for every axis (EN60068-2-27)
Housing material	PBT 30% glass fiber-reinforced
Lens material	frontal window and lens in PC
Operating temperature	-25 ... 55 °C
Storage temperature	-25 ... 70 °C
Weight	120 g (mod. S300...2), 130 g (mod. S300...1)

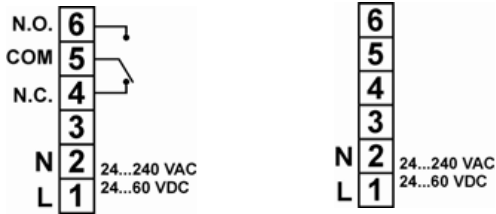
DIMENSIONS



CONNECTIONS

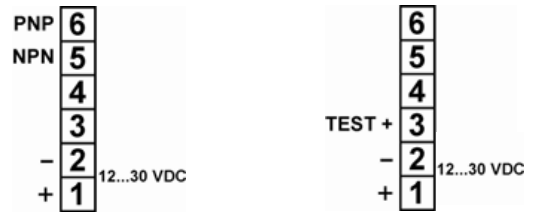
VAC MODELS

Through beam emitter

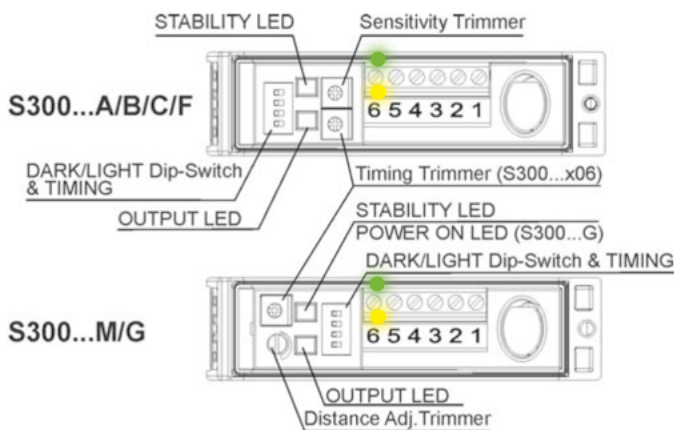


VDC MODELS

Through beam emitter



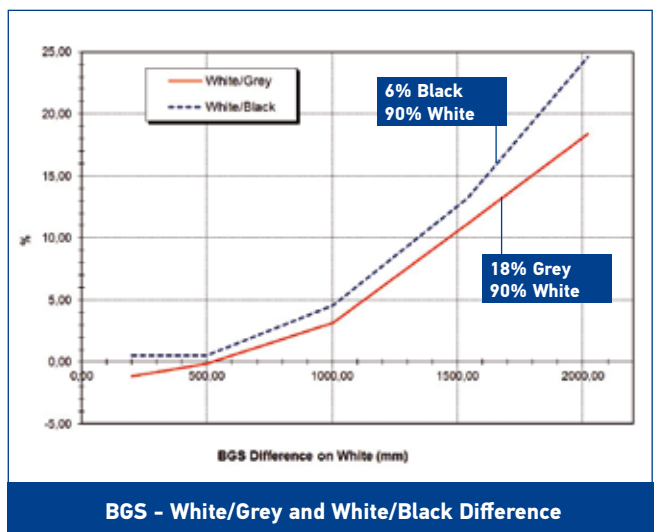
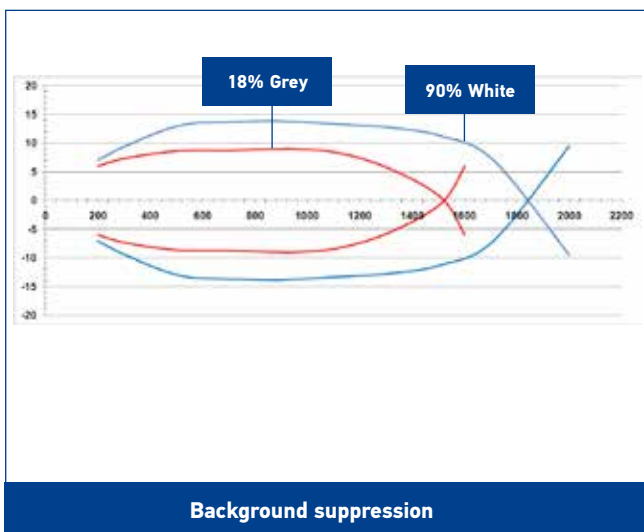
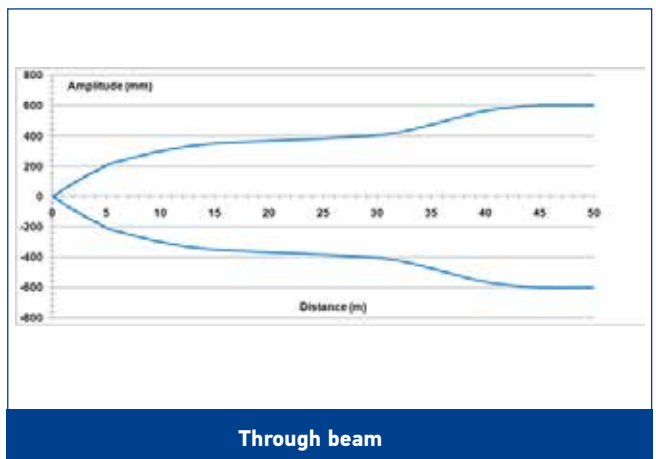
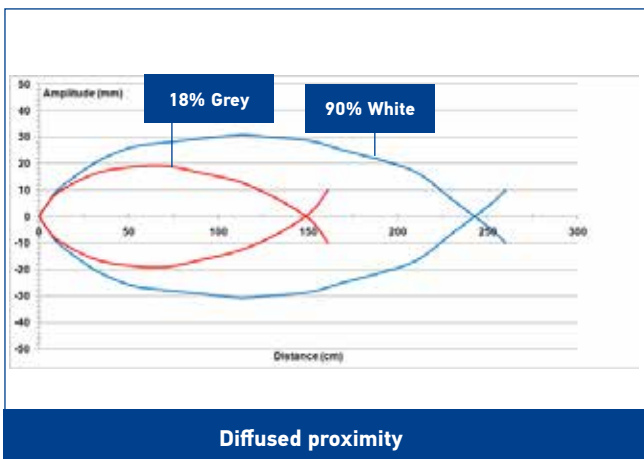
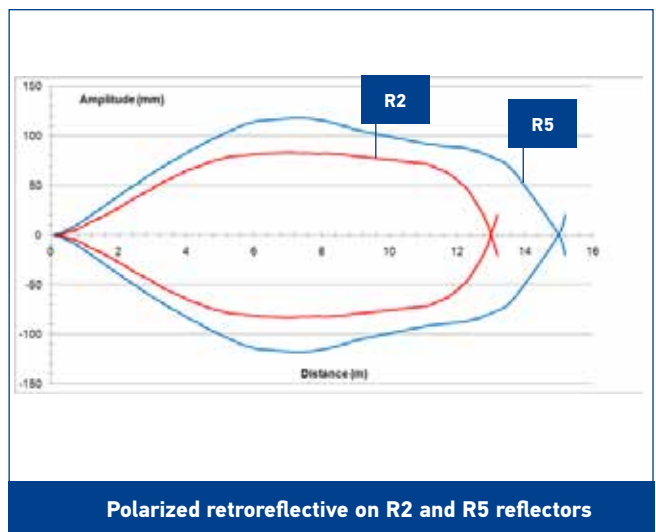
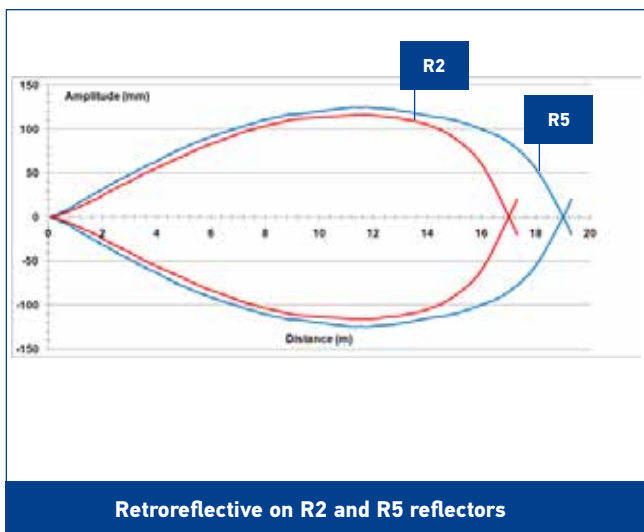
INDICATORS AND SETTINGS



Settings

The M model presents a **multiturn adjustment screw** for the adjustment of the background suppression distance using a mechanical variation of the optic triangulation angle. The **other models have a mono-turn electronic trimmer** that adjusts the sensitivity and the sensor operating distance. The operating distance can be increased by rotating the screws clockwise. Trimmers can be used to adjust the output activation and deactivation delay time whilst functioning mode selection is performed through DIP SWITCHES.

DETECTION DIAGRAMS

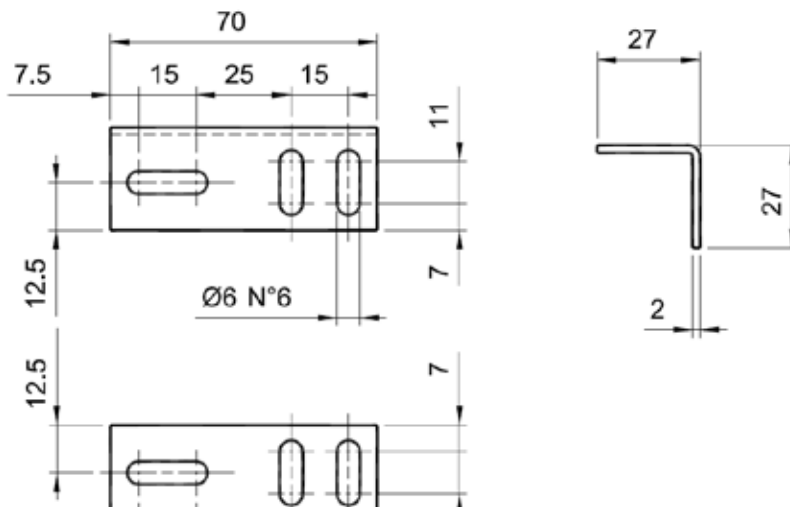


MODEL SELECTION AND ORDER INFORMATION

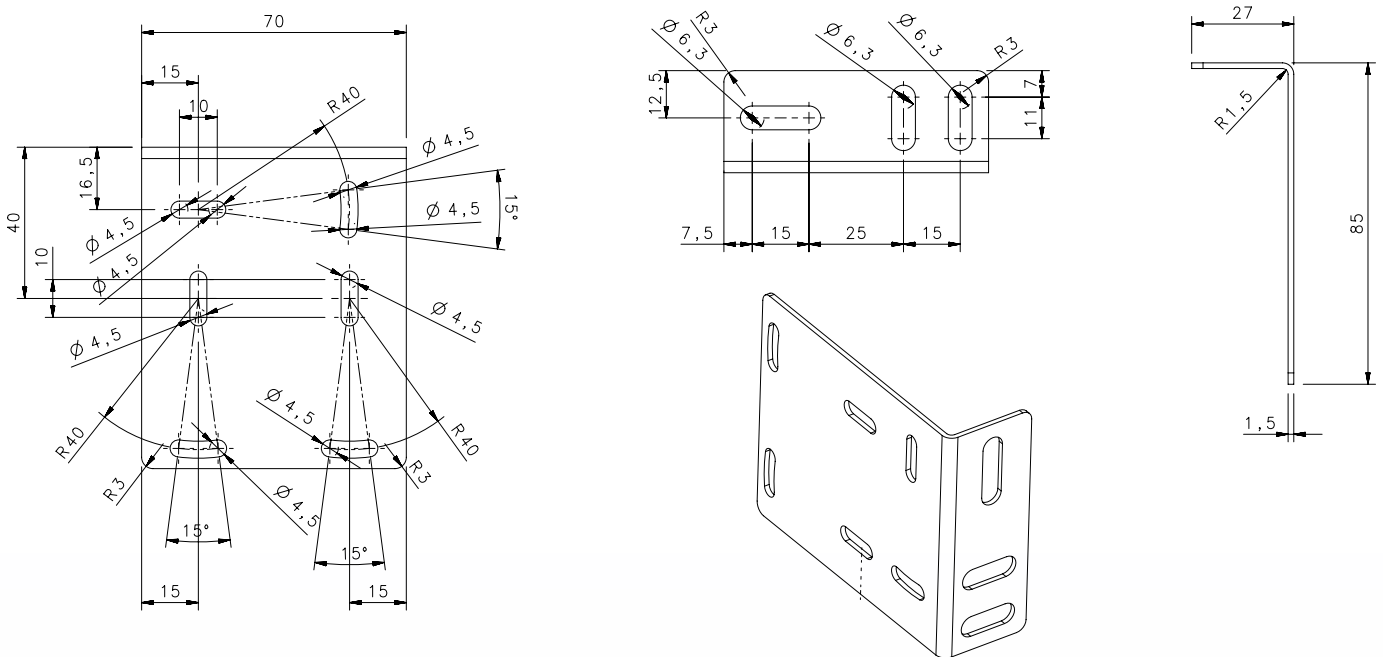
OPTIC FUNCTION	POWER SUPPLY	OUTPUT	SETTING	MODEL	ORDER No.
Retroreflective (IR LED 880 nm)	12...30 Vdc	NPN/ PNP	Sensitivity trimmer and D/L dip-switch	S300-PA-2-A01-OC	951451500
			Timing and sensitivity trimmers, D/L dip-switch	S300-PA-2-A06-OC	951451510
	24...240 Vac/24...60 Vdc	Relay	Sensitivity trimmer and D/L dip-switch	S300-PA-1-A01-RX	951451480
			Timing and sensitivity trimmers, D/L dip-switch	S300-PA-1-A06-RX	951451490
Polarized retroreflective (red LED 660 nm)	12...30 Vdc	NPN/ PNP	Sensitivity trimmer and D/L dip-switch	S300-PA-2-B01-OC	951451540
			Timing and sensitivity trimmers, D/L dip-switch	S300-PA-2-B06-OC	951451550
	24...240 Vac/24...60 Vdc	Relay	Sensitivity trimmer and D/L dip-switch	S300-PA-1-B01-RX	951451520
			Timing and sensitivity trimmers, D/L dip-switch	S300-PA-1-B06-RX	951451530
Diffused proximity (IR LED 940 nm)	12...30 Vdc	NPN/ PNP	Sensitivity trimmer D/L dip-switch	S300-PA-2-C01-OC	951451420
			Timing and sensitivity trimmers, D/L dip-switch	S300-PA-2-C06-OC	951451430
	24...240 Vac/24...60 Vdc	Relay	Sensitivity trimmer and D/L dip-switch	S300-PA-1-C01-RX	951451400
			Timing and sensitivity trimmers, D/L dip-switch	S300-PA-1-C06-RX	951451410
Through beam receiver	12...30 Vdc	NPN/ PNP	Sensitivity trimmer and D/L dip-switch	S300-PA-2-F01-OC	951451600
			Timing and sensitivity trimmers, D/L dip-switch	S300-PA-2-F06-OC	951451610
	24...240 Vac/24...60 Vdc	Relay	Sensitivity trimmer and D/L dip-switch	S300-PA-1-F01-RX	951451580
			Timing and sensitivity trimmers, D/L dip-switch	S300-PA-1-F06-RX	951451590
Through beam emitter (IR LED 880 nm)	12...30 Vdc	-	-	S300-PA-2-G00-EX	951451570
	24...240 Vac/24...60 Vdc		-	S300-PA-1-G00-EX	951451560
Background suppression (IR LED 880 nm)	12...30 Vdc	NPN/ PNP	7-turns distance adjustment trimmer and /L dip-switch	S300-PA-2-M01-OC	951451460
			Timing and 7-turns distance adj. trimmers, D/L dip-switch	S300-PA-2-M06-OC	951451470
	24...240 Vac/24...60 Vdc	Relay	7-turns distance adjustment trimmer and D/L dip-switch	S300-PA-1-M01-RX	951451440
			Timing and 7-turns distance adj. trimmers, D/L dip-switch	S300-PA-1-M06-RX	951451450

ACCESSORIES

ST-511



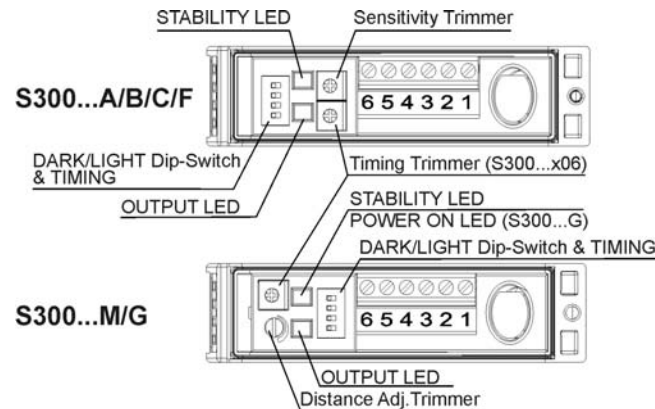
ST-S300-PA



MODEL	DESCRIPTION	ORDER No.
ST-511	mounting bracket	95ACC2810
ST-S300-PA	mounting bracket	95ACC7870

S300-PA SERIES INSTRUCTION MANUAL

CONTROLS

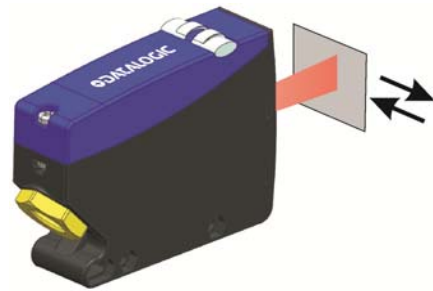


- OUTPUT LED (yellow)**
The yellow LED ON indicates the output status.
- STABILITY LED (green)**
The green LED ON indicates that the sensor has working with a enough safety margin.
- POWER ON LED (green) (S300...G)**
The green LED indicates that the sensor is operating.
- SENSITIVITY TRIMMER (S300...A/B/C/F)**
A mono-turn trimmer adjusts the sensitivity and the sensor operating distance. The operating distance increases, rotating the screws in a clockwise direction. Do not apply more than 0.3Nm tightening torque on the trimmer screw.
- DISTANCE ADJUSTMENT TRIMMER (S300...M)**
The multi-turn trimmer has mechanical stop in clockwise turn and clutch control in anti-clockwise turn, adjusts the suppression distance through the mechanical variation of the optic triangulation angle. Please refer to "SETTINGS" paragraph for procedure indications.
- TIMING TRIMMER (S300...x06 exclude S300...G)**
Mono-turn trimmers to setting output activation and disactivation delay time. Please refer to "TIMING FUNCTIONS" paragraph for for procedure indications. Do not apply more than 0.3Nm tightening torque on the trimmer screw.
- DARK/LIGHT DIP-SWITCH & TIMING (S300...x06 exclude S300...G)**
A mono-turn trimmer to select dark/light mode (for all models) and timing (only timing versions).

WARNING: the maximum mechanical rotation range of the trimmer is 240°. Do not force over of the maximum and minimum positions.

INSTALLATION

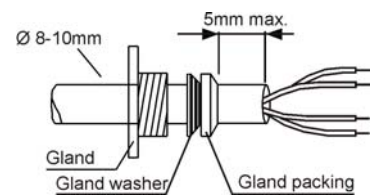
The sensor can be positioned by means of the two housing holes using two screws (M4x35 or longer, 1.2Nm maximum tightening torque). Various orientable fixing brackets to ease the sensor positioning are available (please refer to the accessories listed in the general catalogue). The operating distance is measured from the front surface of the sensor optics. For a correct use, the sensor must be installed orthogonal respect the direction of the object to detect like show in the figure.



Tighten all screws surely to maintain the water-proof characteristics for IP67 (IEC/EN60529). Excessive tightening causes damage. Tighten the screws within the tightening torque range shown in the table.

TIGHTENING TORQUE (Nm)	
Terminal screws	0.5 max
Covers screws	0.5...0.8

CABLE CONNECTION



Use a cable of 8 ... 10 mm in diameter to ensure water- and dust-proof characteristics. Two gland packings are supplied; for cables of 8 ... 9 mm and 9 ... 10 mm in diameter. Use a proper gland packing and a gland washer, and tighten the gland firmly (torque 10 at 15 Kgf-cm). Make sure the gland washer is placed in the gland packing correctly. The wires section must be in the range of 16 up to 26AWG. The stripped length must be 6mm. Make sure that the sensor is not supplied when making connections. Make correct connection to avoid product damage. When connection are made tighten the cable lock nut. Close the cover using the screw lock.

TECHNICAL DATA

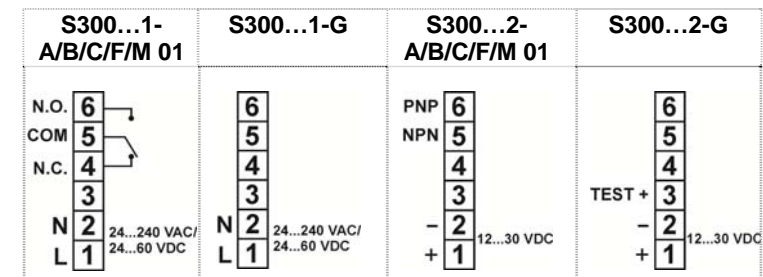
	S300...1-x01 / S300...1-x06	S300...2-x01 / S300...2-x06
Power supply:	24...240 VAC / 24...60 VDC	12...30 VDC Class 2 (UL508)
Ripple:	10% max.	10% max.
Current consumption (output current excluded):	< 3VA	< 35 mA
Outputs:	Electromechanical SPDT 250 Vca / 30 Vcc	PNP / NPN open collector
Output current:	3 A max. (resistive load)	100 mA (resistive load)
Output saturation voltage:	-	< 2.4 V max
Diagnostic function:	-	TEST+ input (S300...G)
Response time:	25 ms	1 ms (S300...A/B/C/M); 2 ms (S300...F/G)
Switching frequency:	20Hz max	500 Hz (S300...A/B/C/M) 250 Hz (S300...F/G)
Weight:	130 g.	120 G.
Emission type:	RED (660nm) S300...B ; INFRARED (940nm) S300...C INFRARED (880 nm) S300...A/G/M	
Operating distance (typical values):	S300...A: 0.1...15 m on R5 reflector (EG 2) / S300...B: 0.1 ... 10 m on R5 reflector (EG 2) S300...C: 5 ... 200 cm on 90% White target (EG 2) / S300...M: 20 ... 200 cm on 90% White target S300...F/G: 0 ... 50 m (EG 2)	
Indicators:	OUTPUT LED (YELLOW) / STABILITY LED (GREEN) POWER ON LED (GREEN) S300...G	
Adjustment:	Sensitivity trimmer (S300...A/B/C/F), DARK/LIGHT dip-switch (S300...A/B/C/F/M) 7-turns distance adjustment trimmer (S300...M)	
Time Delay Range (timing vers.):	0.6...16 s (adjustment by Trimmer)	
Operating temperature:	-25 ... 55 °C	
Storage temperature:	-25 ... 70 °C	
Dielectric strength:	□: 1500 VAC, 1 min between electronics and housing	
Insulating resistance:	> 20 MΩ, □: 500 VDC between electronics and housing	
Ambient light rejection:	according to EN 60947-5-2	
Vibrations:	0.5 mm amplitude, 10 ... 55 Hz frequency, for every axis (EN60068-2-6)	
Shock resistance:	11 ms (30 G) 6 shock for every axis (EN60068-2-27)	
Housing material:	PBT 30% Glass fiber-reinforced	
Lens material:	frontal window and lens in PC	
Mechanical protection:	IP67 (IEC / EN60529)	
UL requirements:	TYPE 1 ENCLOSURE. Use 60 or 75°C copper (CU) conductor and wire size No. 24-20 AWG, stranded or solid. Output Terminal tightening torque of 0.5 Nm. VDC models: they are intended to be connected to a Class 2 transformer or class 2 power supply. VAC models: these devices shall be connected to a power-supply or system, including filters or air-gaps, of overvoltage category II ("load level – secondary circuit of a protected utility transformer"), suitable to control over-voltages at the maximum "rated impulse withstand voltage peak of 1.2KV and with a short-circuit power limit at max 500VA. see the "CONNECTIONS" paragraph	
Connections:	II 3G EX nA II T6 ; II 3D EX ID A22 IP67 T85°C	

TIMING FUNCTIONS / TIMING DIAGRAM (S300...x06)

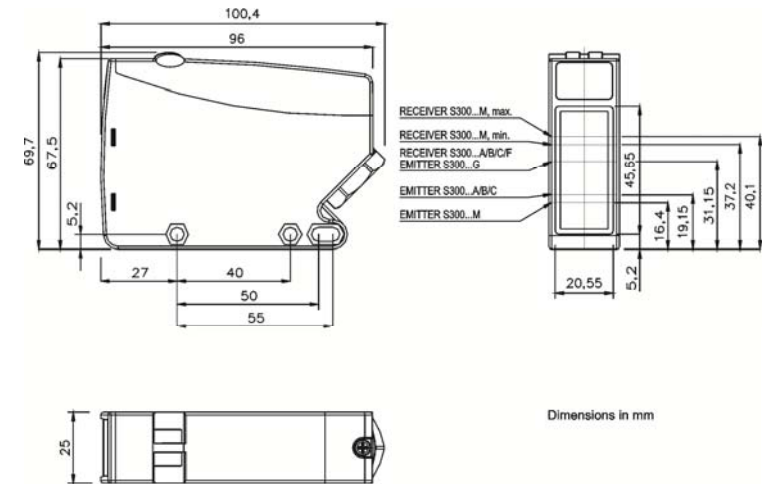
	OPERATIVE MODE	DIP-SWITCH POSITION	LIGHT INPUT			
			1	2	3	4
LIGHT	TIME	Normal	ON	OFF	OFF	OFF
		ON delay	ON	ON	OFF	OFF
		Single pulse (one-shot)	ON	OFF	ON	OFF
		OFF delay	ON	OFF	OFF	ON
		ON/OFF delay	ON	ON	OFF	ON
DARK	TIME	Normal	OFF	OFF	OFF	OFF
		ON delay	OFF	ON	OFF	OFF
		Single pulse (one-shot)	OFF	OFF	ON	OFF
		OFF delay	OFF	OFF	OFF	ON
		ON/OFF delay	OFF	ON	OFF	ON

NOTE: The timing functions are selected by dip-switches. The sensors without timing functions have only the LIGHT/DARK dip-switch and normal operative mode. The yellow LED in lighted with output ON and dark with output OFF. The delay variation is not linear with trimmer rotation in order to be more sensitive with shorter delay time. The variation is more sensitive up to half rotation (short delay), from half rotation up to end rotation the variation is faster.

CONNECTIONS



DIMENSIONS



SETTINGS

- S300...A and S300...B setting**
Position the sensor and reflector on opposite sides. Turn the sensitivity trimmer to maximum. Find the points where the yellow LED (OUT) in both vertical and horizontal positions and fix the sensor in the centre between these points. Optimum operation is obtained when both LEDs switch ON. If necessary, reduce sensitivity using the trimmer, in order to detect very small targets. In order to improve alignment, repeat the procedure detailed above whilst progressively reducing the sensitivity.
- S300...C setting**
Position the sensor and turn the sensitivity trimmer at minimum: the yellow LED is OFF (light mode). Place the target opposite the sensor. Turn the sensitivity trimmer clockwise until the yellow LED turns ON (Target detected state, pos.A). Remove the target, the yellow LED turns OFF. Turn the trimmer clockwise until the yellow LED turns ON (Background detected state, pos.B). The trimmer reaches maximum if the background is not detected. Turn the trimmer in intermediate position C, between the two positions A and B. The green LED must be ON.
- S300...F/G setting**
Position the sensors on opposite sides. Turn the sensitivity trimmer to maximum. Find the points where the yellow LED (OUT) is switched ON and OFF in both vertical and horizontal positions, and fix the sensor in the centre between these points. Optimum operation is obtained when both LEDs switch ON. If necessary, reduce sensitivity using the trimmer, in order to detect very small targets. In order to improve alignment, repeat the procedure detailed above whilst progressively reducing the sensitivity.
- S300...M setting**
Suppression distance setting
a) Position object to detect in front of the sensor at the distance required. Turn distance adjustment screw (ADJ) to minimum: yellow LED OFF. Rotate trimmer in a clockwise direction until the yellow LED turns ON. Object detection condition (pos.A).
b) Remove object and ensure that the background is in front of the sensor: yellow LED OFF. Rotate screw in a clockwise direction until the yellow LED turns ON: background detection condition (pos.B).
c) Rotate screw in an anti-clockwise direction until the trimmer reaches an intermediate point between position A and C. The sensor is now ready to function correctly in stable conditions.

DIAGNOSTIC FUNCTIONS

TEST+ input (only S300-PA-2-G)
The TEST+ input can be used to inhibit the emitter and verify that the system is correctly operating. The TEST function is activated if the TEST+ input is connected to a voltage between 10...30V, whereas if the TEST+ input is connected to GND or it is not connected the function is deactivated. Activating the TEST the output switches from ON to OFF (in light mode), testing the total operation.

The sensors are NOT safety devices, and so MUST NOT be used in the safety control of the machines where installed.

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Helpful links at www.datalogic.com: [Contact Us](#), [Terms and Conditions](#), [Support](#).

The warranty period for this product is 36 months. See General Terms and Conditions of Sales for further details.

Under current Italian and European laws, Datalogic is not obliged to take care of product disposal at the end of its life. Datalogic recommends disposing of the product in compliance with local laws or contacting authorised waste collection centres.

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