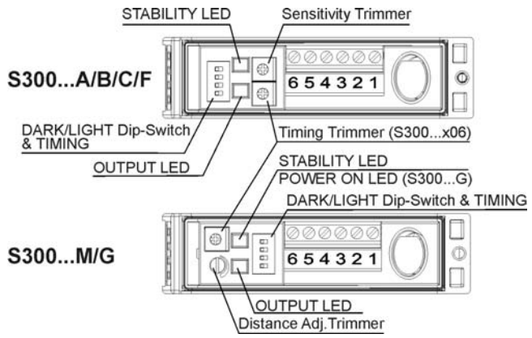
S300-PA SERIES
INSTRUCTION MANUAL

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 apple 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.

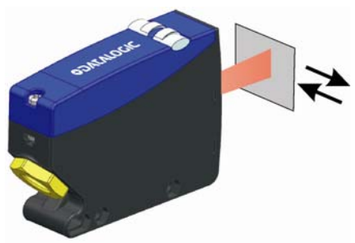
TIMING TRIMMER (S300…x06 exclude S300…G)
Mono-turn trimmers to setting output activation and disactivation delay time.
Please refer to "TIMING FUNCTIONS" paragraph for for procedure indications.
Do not apple more than 0.3Nm tightening torque on the trimmer screw.

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

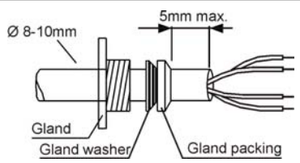
The sensor can be positioned by means of the two housing holes using two screws (M4x35 or longer, 1.2Nm maximum tightening torque).
Various orientable fixing brackets to ease the sensor positioning are available (please refer to the accessories listed in the general catalogue).
The operating distance 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

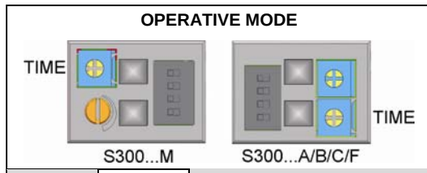


Use a cable of 8 … 10 mm in diameter to ensure water- and dust-proof characteristics.
Two gland packings are supplied; for cables of 8 … 9 mm and 9 … 10 mm in diameter.
Use a proper gland packing and a gland washer, and tighten the gland firmly (torque 10 at 15 Kgf-cm).
Keep the cable insulation within 5 mm from the gland packing as shown above.
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) Dip-switch mode ON delay / OFF delay / ON-OFF delay / Single pulse (ONE-SHOT) (S300…x06) Timig Trimmer (S300…x06 esclude S300...G)	
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-reiforced	
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.	
Connections:	see the "CONNECTIONS" paragraph	

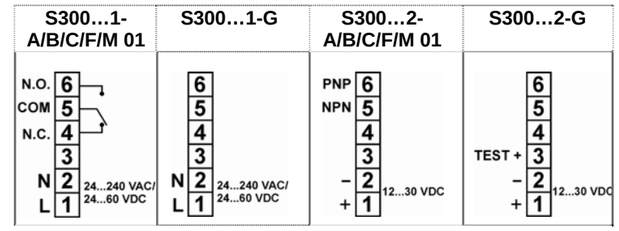
TIMING FUNCTIONS / TIMING DIAGRAM (S300…x06)



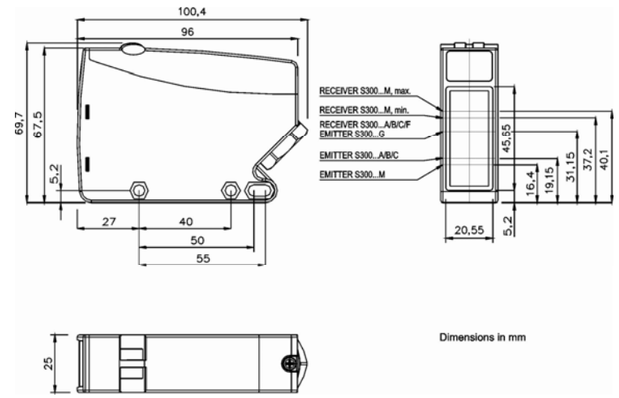
			1	2	3	4
LIGHT		Normal	ON	OFF	OFF	OFF
	TIME	ON delay	ON	ON	OFF	OFF
	TIME	Single pulse (one-shot)	ON	OFF	ON	OFF
	TIME	OFF delay	ON	OFF	OFF	ON
	TIME	ON/OFF delay	ON	ON	OFF	ON
DARK		Normal	OFF	OFF	OFF	OFF
	TIME	ON delay	OFF	ON	OFF	OFF
	TIME	Single pulse (one-shot)	OFF	OFF	ON	OFF
	TIME	OFF delay	OFF	OFF	OFF	ON
	TIME	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 (litgh 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 disactivated.
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.

DECLARATION OF CONFORMITY
We Datalogic Automation declare under our sole responsibility that these products are conform to the 2004/108/CE and successive amendments.

WARRANTY
Datalogic Automation warrants its products to be free from defects.
Datalogic Automation will repair or replace, free of charge, any product found to be defective during the warranty period of 36 months from the manufacturing date.
This warranty does not cover damage or liability deriving from the improper application of Datalogic Automation products.

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826000351 Rev.C