

S5N-SA/NA SERIES
INSTRUCTION MANUAL

CONTROLS

OUTPUT LED (S5N...B0x/Cxx/T01/F0x/D50/M01)

The yellow LED permanently ON or OFF indicates the output status.
The yellow LED blinking indicates the short circuit protection is turned on the output (D50/F0x/M01 only).

STABILITY LED (S5N...B0x/Cxx/F0x)

The green LED permanently ON indicates that the signal received has an acceptable safety margin respect the output switching value and the sensor is ready to function in a stable operating condition.

POWER ON LED (S5N...G0x/M01)

The green LED ON indicates that the sensor is operating.

SENSITIVITY TRIMMER-ADJ.

Mono-turn trimmer to adjust the operating distance of the sensor (S5N...B01/Cx1/T01/F01).
Multi-turn trimmer to adjust the background suppression distance of the sensor (S5N...M01)
See the "SETTING" paragraph for the functioning mode.

EMISSION POWER REGULATION TRIMMER (S5N...G01)

Mono-turn trimmer to adjust the power of the LED emitter and change the operating distance and the beam between emitter (S5N...G01) and receiver (S5N...F01)

WARNING: in S5N...B01/Cx1/T01/F01/G01 models, the trimmer rotation is limited to 270° by a mechanical stop. Do not apply excessive torque when adjusting (max 40 Nmm).

INSTALLATION

The sensor can be fixed by means of the M18x1 threaded body using CH.24 nuts (1.5Nm maximum tightening torque) or low-profile flared nut provided specifically supplied (plastic version).
Various orientable fixing brackets are available to ease sensor positioning (please refer to the accessories listed in the general catalogue).
The operating distance is measured from the front surface of the sensor lens.

Proximity models (S5N...Cxx/D50/M01):

the object has to be moved closer or further away from the front surface of the sensor lens to improve detection.
In case of lateral translation, the object must move as indicated in the figure.

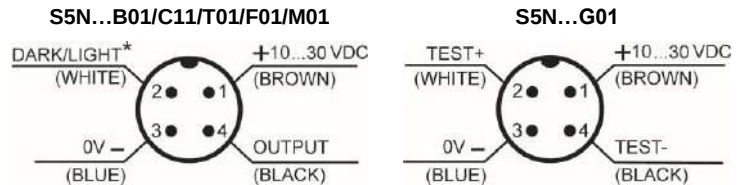


CONNECTIONS

Cable and Pig Tail



M12 Connector

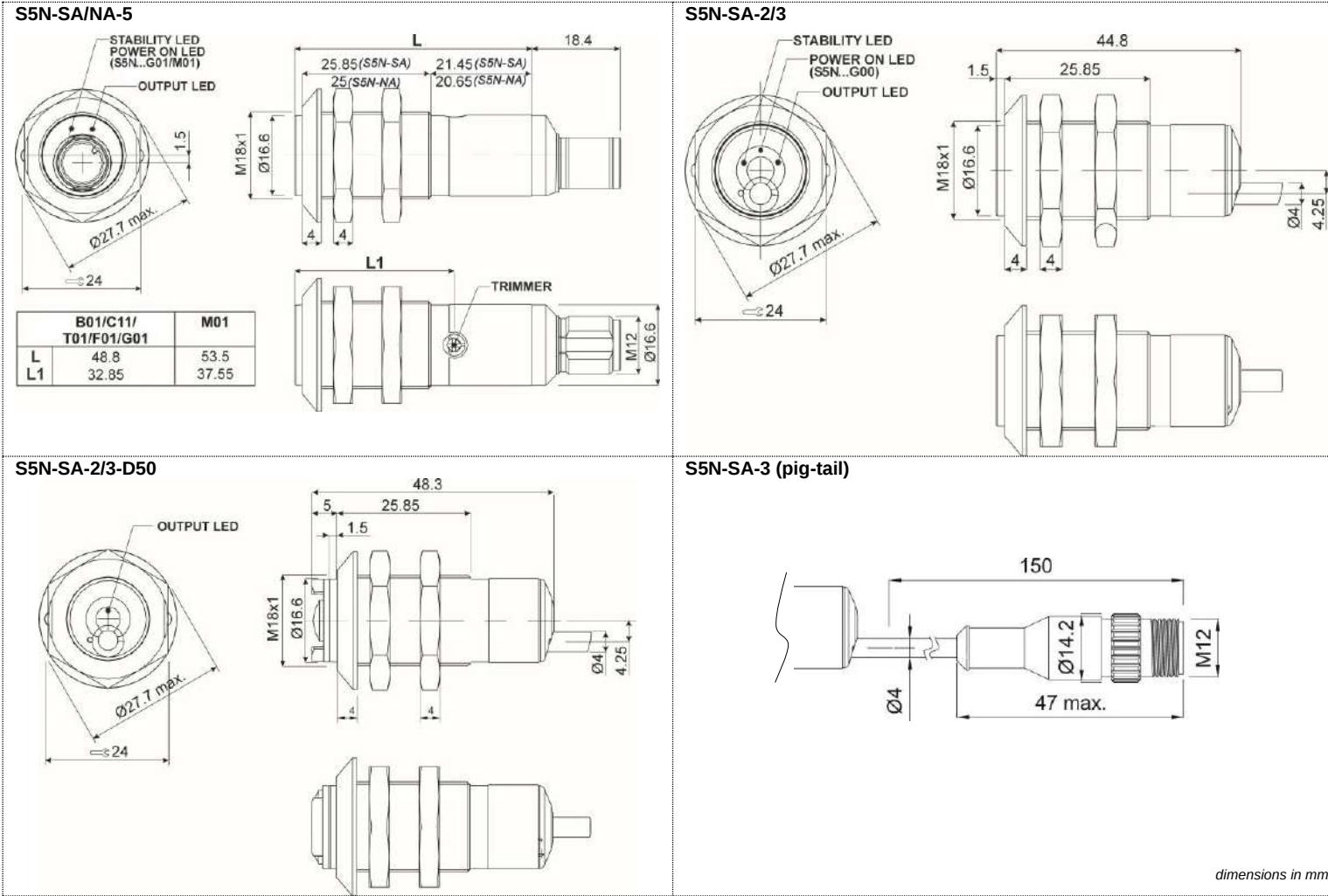


* in case of white wire or pin 2 not connected the sensor operates in LIGHT mode for the proximity models (S5N...Cxx/D50/M01) and in DARK mode for the retroreflex (S5N...B0x/T01) and receiver models (S5N...F0x).

TECHNICAL DATA

Power supply:	10...30 Vcc (limit values)
Ripple:	2 Vpp max.
Current consumption (output current excluded):	30 mA max.
Outputs:	PNP or NPN open collector (overload and short circuit protection). The short circuit is indicated with LED indicator and LED emission blinking (D50/F0x/M01 only)
Output current:	100 mA max.
Capacitive load:	C _{max} ≤ 70nF @24V, I _{load} = 100mA C _{max} ≤ 300nF @24V, I _{load} = 10mA
Output saturation voltage:	2 V max.
Response time:	500 us (S5N...D50) / 1 ms (S5N...B0x/Cxx/T01/M01) / 2 ms (S5N...F0x/G0x)
Switching frequency:	1 KHz (D mod.) / 500 Hz (S5N...B0x/Cxx/T01/M01) / 250 Hz (S5N...F0x/G0x)
Settings:	Mono-turn distance adjustment trimmer (S5N...B01/Cx1/T01/F01) and 4 turns (S5N...M01) Emission power regulation trimmer (S5N...G01)
Indicators:	OUTPUT LED (yellow) (S5N...B0x/Cxx/D50/T01/F0x/M01) STABILITY LED (green) (S5N...B0x/Cxx/F0x) POWER ON LED (green) (S5N...G0x/M01)
Operating temperature:	-25 ... 55 °C
Storage temperature:	-25 ... 70 °C
Insulating strength:	500 Vac 1 min between electronics and housing
Insulating resistance:	>20 MΩ 500 Vdc between electronics and housing
Operating distance (typical values):	B0x: 0.1...4 m on R2 (Ø 63mm reflector) T01: 0.1...0.8 m on R2 (Ø 63mm reflector) F0x/G0x: 0...20 m C10: 0...350 mm / C11: 0...350 mm / C00: 0...100 mm D50: 0...50 mm M01: 40...120 mm
Emission type:	RED (660 nm) (S5N...B0x/T01/D50/M01) INFRARED (880 nm) (S5N...Cxx/G0x)
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)
DARK/LIGHT selection:	white wire or pin 2 not connected: LIGHT mode (S5N...Cxx/D50/M01) / DARK mode (S5N...B0x/T01/F0x); white wire or pin 2 connected to: 0V DARK mode, +Vcc LIGHT mode
Housing material:	ABS TERLURAN (S5N-SA) / INOX AISI 316L (S5N-NA)
Lens material:	PMMA
Mechanical protection:	IP65, IP67, IP69K, Class 2 (Type 1 for S5N-NA)
Connections:	M12-4 pole connector (S5N-SA/NA-5) / 2 m Ø 4 mm cable (S5N-SA-2) 150 mm cable Ø 4 mm with M12-4 pole connector - pig-tail (S5N-SA-3)
Weight:	40 g max M12 version / 55 g max cable version / 35 g max pig-tail version
AtEx 2014/34/EU:	II 3D EX tc IIC IP67 T85°C

DIMENSIONS



SETTING

The following procedures are valid for the LIGHT mode.

S5N...B0x

Place the sensor and the reflector on opposite sides within the maximum operating distance. In the models with sensitivity adjustment, turn completely the trimmer in clockwise.
Moving the sensor both vertically and horizontally, define the points of switch-off and switch-on of the yellow LED (OUT). Mount the sensor in the middle of the defined points and check that the green LED (STABILITY) is ON.

S5N...Cxx

Place the sensor in axis with the object to be detected within the maximum operating distance.
The models without sensitivity adjustment have a fixed operating distance: take attention to this in the positioning.
In the models with sensitivity adjustment, turn the trimmer in clockwise until the yellow LED (OUT) and the green LED (STABILITY) switch ON permanently.

S5N...T01

Place the sensor and the reflector on opposite sides within the maximum operating distance. Turn completely the trimmer in clockwise.
Moving the sensor both vertically and horizontally, define the points of switch-off and switch-on of the yellow LED (OUT).
Mount the sensor in the middle of the defined points.
Turn the trimmer in anti-clockwise until the yellow LED (OUT) switch off, and then in clockwise until to switch-on: this is the best operating condition to detect the transparent objects.

S5N...F0x/G0x

Place the sensors on opposite sides within the maximum operating distance. In the models with sensitivity adjustment (S5N...F01) and power-emission adjustment (S5N...G01), turn completely the trimmers in clockwise.
Moving the emitter (S5N...G0x) both vertically and horizontally, define the points of switch-off and switch-on of the yellow LED (OUT) on the receiver (S5N...F0x).
Mount the sensor in the middle of the defined points and check that the green LED (STABILITY) on the receiver is ON.

S5N...D50

Place the sensor in axis with the object to be detected, taking attention that the operating distance is fixed.

S5N...M01

Place the object to be detected opposite the sensor at a slightly greater distance than desired, within the maximum operating distance. Turn the trimmer to the maximum position (clockwise) and check that the yellow LED (OUT) is ON, then turn the trimmer in anti-clockwise until the yellow LED switch OFF. Verify the adjustment moving the object closer and further the sensor; tune the adjustment if necessary.

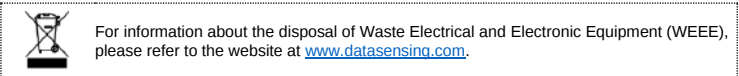
TEST FUNCTION (S5N...G0x)

The TEST+ and TEST- inputs can be used to switch off the emitter light and verify that the system is correctly operating: the receiver output should switch when the test is activated while the beam is uninterrupted: the inputs activating voltage range is 10...30 VDC, respecting the polarity.
The emission is switched OFF connecting TEST+ to VDC and TEST- to 0V.

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



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EN

CE Compliance

CE marking states the compliance of the product with essential requirements listed in the applicable European directive. Since the directives and applicable standards are subject to continuous updates, and since the manufacturer promptly adopts these updates, therefore the EU declaration of conformity is a living document. The EU declaration of conformity is available for competent authorities and customers through the manufacturer’s commercial reference contacts. Since April 20th, 2016 the main European directives applicable to the products require inclusion of an adequate analysis and assessment of the risk(s). This evaluation was carried out in relation to the applicable points of the standards listed in the Declaration of Conformity. These products are mainly designed for integration purposes into more complex systems. For this reason, it is under the responsibility of the system integrator to do a new risk assessment regarding the final installation.

Warning
This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

IT

Conformità CE

La marcatura CE dichiara la conformità del prodotto con i requisiti essenziali elencati nella direttiva europea applicabile. Essendo le direttive e le normative applicabili soggette a continui aggiornamenti, e dato che il costruttore adotta immediatamente tali aggiornamenti, la dichiarazione di conformità CE è un documento vivo. La dichiarazione di conformità CE è disponibile per le autorità competenti e i clienti tramite i contatti commerciali di riferimento al costruttore. Dal 20 aprile 2016, le principali direttive europee applicabili ai prodotti richiedono l'inserimento di un'adeguata analisi e valutazione del/i rischi(o). Tale valutazione è stata realizzata in relazione ai punti applicabili delle normative elencate nella Dichiarazione di Conformità. Questi prodotti sono progettati principalmente per essere integrati in sistemi più complessi. Per questo motivo, l'integratore di sistemi è responsabile della realizzazione di una nuova valutazione dei rischi riguardante l'installazione finale.

Attenzione
Si tratta di un prodotto di Classe A. In un ambiente domestico questo prodotto può generare interferenze radio. In tal caso è necessario prendere le dovute misure.

DE

EG-Konformität

Die CE-Kennzeichnung bestätigt die Konformität des Produkts mit den wesentlichen Anforderungen der geltenden europäischen Richtlinien. Da die Richtlinien und anwendbaren Normen laufend aktualisiert werden und der Hersteller diese Aktualisierungen umgehend übernimmt, ist die EU-Konformitätserklärung ein fortschreitendes Dokument. Die EU-Konformitätserklärung ist für zuständige Behörden und Kunden über die Handelskontakte von dem Hersteller erhältlich. Seit dem 20. April 2016 erfordern die wichtigsten für diese Produkte anwendbaren Europäischen Richtlinien die Integration einer angemessenen Analyse und der Bewertung der Risiken. Diese Bewertung wird in Bezug auf die anwendbaren Punkte der in der Konformitätserklärung aufgelisteten Normen durchgeführt. Diese Produkte werden in erster Linie für die Integration in komplexere Systeme ausgelegt. Aus diesem Grund liegt es in der Verantwortung des Systemintegrators, eine neue Risikobewertung der Endinstallation vorzunehmen.

Warnung
Dies ist ein Produkt nach Klasse A. In einem häuslichen Umfeld kann dieses Produkt Funkstörungen auslösen, gegebenenfalls hat der Benutzer dann angebrachte Maßnahmen zu ergreifen.

FR

Conformité CE

La marque CE indique la conformité du produit aux exigences essentielles énoncées dans la directive européenne applicable. Les directives et les normes applicables sont sujettes à des mises à jour de manière continue et le constructeur adopte rapidement ces mises à jour ; la déclaration de conformité UE est par conséquent un document vivant. La déclaration de conformité UE est disponible aux autorités compétentes et aux clients à travers les interlocuteurs commerciaux de référence des constructeurs. Depuis le 20 Avril 2016 les principales directives européennes applicables aux produits exigent l'inclusion d'une analyse et d'une évaluation adéquates du/des risque/s. Cette évaluation a été réalisée en relation avec les points applicables des normes indiquées dans la Déclaration de Conformité. Ces produits sont principalement conçus à des fins d'intégration dans des systèmes plus complexes. Pour cette raison, il est de la responsabilité de l'intégrateur de système d'effectuer une nouvelle évaluation des risques concernant l'installation finale.

Avertissement
Ceci est un produit de Classe A. Dans un environnement domestique, ce produit peut provoquer des interférences radio auquel cas l'utilisateur peut se trouver dans l'obligation de prendre des mesures adéquates.

ES

Conformidad CE

La marca CE establece la conformidad del producto con los requisitos fundamentales enumerados en la directiva europea aplicable. Debido a que las directivas y normativas aplicables están sujetas a actualización continua, como el constructor adopta estas actualizaciones de inmediato, la declaración de conformidad UE es un documento activo. La declaración de conformidad UE está disponible para las autoridades competentes y para los clientes a través de los contactos comerciales de referencia del constructor. Desde el 20 de abril de 2016, las principales directivas europeas aplicables a los productos exigen la inclusión de un idóneo análisis y evaluación de riesgos. Esta evaluación ha sido efectuada sobre los puntos aplicables de la normativa indicada en la Declaración de Conformidad. Estos productos han sido diseñados a fin de ser integrados en sistemas más complejos. Por ello, es responsabilidad del integrador del sistema efectuar una nueva evaluación de riesgos relativa a la instalación final.

Advertencia
Este es un producto de Clase A. En un entorno doméstico, este producto puede causar interferencias radioeléctricas; en este caso, el usuario debería tomar medidas adecuadas.

NL

EU-conformiteitsverklaring

Met de CE-markering wordt verklaard dat het product voldoet aan de essentiële eisen zoals vermeld in de toepasselijke Europese richtlijnen. Daar de richtlijnen en de toepasselijke normen onderhevig zijn aan voortdurende aanpassingen, en de fabrikant deze aanpassingen direct toepast, is de EU-conformiteitsverklaring een levend document. De EU-conformiteitsverklaring is beschikbaar voor bevoegde autoriteiten en klanten via contactgegevens voor commerciële referentie. Sinds 20 april 2016 vereisen de belangrijkste Europese richtlijnen de inclusie van een adequate risicoanalyse- en beoordeling. Deze beoordeling werd uitgevoerd met betrekking tot de toepasselijke punten van de normen zoals vermeld in de Conformiteitsverklaring. Deze producten zijn voornamelijk ontworpen voor integratie in complexere systemen. Om deze reden is het de verantwoordelijkheid van de systeemintegrator om een nieuwe risicobeoordeling uit te voeren met betrekking tot de definitieve installatie.

Waarschuwing
Dit is een Klasse A product. In een woonomgeving kan dit product radiostoring veroorzaken, in welk geval de gebruiker mogelijk verplicht is om adequate maatregelen te treffen.