



S3N

MINIATURE PHOTOELECTRIC SENSOR



- All models with visible and bright red emission
- LED and Laser emission models
- Multiple Background suppression functions
- Shiny and clear object detection
- Single, Double trimmer & Push Button models
- Diffuse proximity up to 100 cm
- Background suppression up to 800 mm (LED trimmer version)
- Polarized RRX 7 m (Red LED emission)

- Polarized RRX 12 m (Red Laser emission)
- Through-beam 20 m and Laser 30 m
- Connection with 2 m Cable or M8 connector
- Rugged IP67 Plastic miniature case
- M3 threaded holes on the front side with metal inserts
- State of the art IO-Link connectivity with extended Smart Tasks



CODE DESCRIPTION

	S3N	-	P	R	-	5	-	B	0	1	-	P	L
series	S3N	Miniature photoelectric sensor											
housing	P	standard housing											
emission	R	Radial LED emission											
	H	Radial LASER emission											
connection	5	M8 connector											
	2	2 m cable											
function	B	Retro Reflex Polarized											
	C	Diffused											
	FG	Through Beam											
	M	Background suppression											
	T	Transparent (not available yet)											
	W	Mark reader (not available yet)											
distance	0	Standard distance											
	1	Long distance											
adjustment	1	Trimmer adjustment											
	3	Teach-In push button											
output	P	PNP output											
	N	NPN output											
	0	IO-Link configurable static output											
output configuration		L/D configurable by trimmer											
	L	Light mode											
	D	Dark mode											
	Z	IO-Link + configurable static output											

TECHNICAL FEATURES

	S3N-PR-*-B01-**-*	S3N-PR-*-C01-**-*	S3N-PR-*-C11-**-*
			
Optical Function	Polarized retroreflective	Diffuse narrow beam	Diffuse beam Long Range
Operating Distance	0.05...7 m on R5	2...250 mm (White 90%)	0...1000 mm (White 90%)
Emission	red LED (635 nm) EC62471 EXEMPT RISK GROUP (RG0)		
Switching Frequency	1 kHz		
Response Time	500 µs		
Supply Voltage	10-30 VDC		
Ripple	≤ 10% peak to peak max.		
No load Current	35 mA max.		
Voltage Leakage	≤ 2 V		
Current Leakage	≤ 300 µA static output; ≤ 400 µA for -03 (IO-Link) models with Push pull enabled		
Load Current	100 mA Max, short circuit protected		
Output Type	PNP or NPN Discrete output all models - IO-Link + static configurable output (S3N...OZ models)		
Indicators	yellow OUTPUT LED - green Power ON LED (blue LED: IO-Link activity (S3N...OZ models)		
Short Circuit Protection	•		
Reverse Polarity Protection	•		
Overvoltage Protection	•		
Insulation Resistance	>20 MΩ 500 Vdc, between electronics and housing		
Ground resistivity	500 Vac 1 min., between electronics and housing		
Shock and Vibration	0.5 mm amplitude - 10 ... 55 Hz frequency for every axis (EN60068-2-6)		
Dimensions	11 x 32 x 20 mm		
Housing Material	Body: technopolymer Fiber Glass reinforced; indicators: TPE		
Actuators Material	POM, PMMA		
Plug Material	Nickel plated brass		
Optical Window Material	PMMA		
Mechanical Protection	IP67		
Electromagnetic Compatibility	according to EN 60947-5-2:2020 requirements		
Certifications	CE, UKCA, cULus (IO-Link: S3N...OZ models)		
Ambient Light Immunity	according to EN 60947-5-2 : 2020		
Operating Temperature	-25 ... +55 °C		
Storage Temperature	-40°C...+70°C		

TECHNICAL FEATURES

	S3N-PR-*-FG01-**-	S3N-PR-5-FG03-OZ	S3N-PR-*-M01-**-	S3N-PR-*-M03-OZ
				
Optical Function	Through beam emitter and receiver		Background suppression	
Operating Distance	0...20 m		3...350 mm 0...800 mm (White 90%) ⁽¹⁾	18...180 mm (Black 6%)
Emission	red LED (635 nm)			
Switching Frequency	500 Hz			
Response Time	1 ms			
Supply Voltage	10-30 VDC			
Ripple	≤ 10% peak to peak max.			
No load Current	35 mA max.			
Voltage Leakage	≤ 2 V			
Current Leakage	≤ 300 µA static output; ≤ 400 µA for -03 (IO-Link) models with Push pull enabled			
Load Current	100 mA Max, short circuit protected			
Output Type	PNP or NPN Discrete output all models - IO-Link + static configurable output (S3N...OZ models)			
Indicators	yellow OUTPUT LED - green Power ON LED (blue LED: IO-Link activity (S3N...OZ models)			
Short Circuit Protection	•			
Reverse Polarity Protection	•			
Overvoltage Protection	•			
Insulation Resistance	>20 MΩ 500 Vdc, between electronics and housing			
Ground resistivity	500 Vac 1 min., between electronics and housing			
Shock and Vibration	0.5 mm amplitude - 10 ... 55 Hz frequency for every axis (EN60068-2-6)			
Dimensions	11 x 32 x 20 mm			
Housing Material	Body: technopolymer Fiber Glass reinforced; indicators: TPE			
Actuators Material	POM, PMMA			
Plug Material	Nickel plated brass			
Optical Window Material	PMMA			
Mechanical Protection	IP67			
Electromagnetic Compatibility	according to EN 60947-5-2:2020 requirements			
Certifications	CE, UKCA, cULus (IO-Link: S3N...OZ models)			
Ambient Light Immunity	according to EN 60947-5-2 : 2020			
Operating Temperature	-25 ... +55 °C			
Storage Temperature	-40°C...+70°C			

⁽¹⁾ on white object with 90% remission

TECHNICAL FEATURES

	S3N-PH-* -B01-**	S3N-PH-5-B03-OZ
		
Optical Function	Polarized retroreflective	
Operating Distance	0.1...12 m on R7	
Emission	Laser light 650 nm (red), Class 1 IEC60825-1 Ed. 3 2014	
Switching Frequency	2 kHz	
Response Time	250 µs	
Supply Voltage	10-30 VDC	
Ripple	≤ 10% peak to peak max.	
No load Current	35 mA max.	
Voltage Leakage	≤ 2 V	
Current Leakage	≤ 300 µA static output; ≤ 400 µA for -03 (IO-Link) models with Push pull enabled	
Load Current	100 mA Max, short circuit protected	
Output Type	PNP or NPN Discrete output all models - IO-Link + static configurable output (S3N...OZ models)	
Indicators	yellow OUTPUT LED - green Power ON LED (blue LED: IO-Link activity (S3N...OZ models)	
Short Circuit Protection	●	
Reverse Polarity Protection	●	
Overvoltage Protection	●	
Insulation Resistance	>20 MΩ 500 Vdc, between electronics and housing	
Ground resistivity	500 Vac 1 min., between electronics and housing	
Shock and Vibration	0.5 mm amplitude - 10 ... 55 Hz frequency for every axis (EN60068-2-6)	
Dimensions	11 x 32 x 20 mm	
Housing Material	Body: technopolymer Fiber Glass reinforced; indicators: TPE	
Actuators Material	Trimmers POM	Push button POM
Plug Material	Nickel plated brass	
Optical Window Material	PMMA	
Mechanical Protection	IP67	
Electromagnetic Compatibility	according to EN 60947-5-2:2020 requirements	
Certifications	CE, UKCA, cULus, CDRH 1 (IO-Link: S3N...OZ models)	
Ambient Light Immunity	according to EN 60947-5-2 : 2020	
Operating Temperature	-25 ... +55 °C	
Storage Temperature	-40°C...+70°C	

TECHNICAL FEATURES

	S3N-PH-*-M01-**-	S3N-PH-5-M03-OZ	S3N-PH-*-FG01-**-	S3N-PH-5-FG03-OZ
				
Optical Function	Background suppression		Through beam emitter and receiver	
Operating Distance	9...250 mm 0...600 mm (White 90%) ¹⁾	22...130 mm (Black 6%)	0...30 m	
Emission	Laser light 650 nm (red), Class 1 IEC60825-1 Ed. 3 2014			
Switching Frequency	2 kHz	1.5 kHz	2 kHz	
Reponse Time	250 µs	333 µs	250 µs	
Supply Voltage	10-30 VDC			
Ripple	≤ 10% peak to peak max.			
No load Current	35 mA max.			
Voltage Leakage	≤ 2 V			
Current Leakage	≤ 300 µA static output; ≤ 400 µA for -03 (IO-Link) models with Push pull enabled			
Load Current	100 mA Max, short circuit protected			
Output Type	PNP or NPN Discrete output all models - IO-Link + static configurable output (S3N...OZ models)			
Indicators	yellow OUTPUT LED - green Power ON LED (blue LED: IO-Link activity (S3N...OZ models)			
Short Circuit Protection	●			
Reverse Polarity Protection	●			
Overvoltage Protection	●			
Insulation Resistance	>20 MΩ 500 Vdc, between electronics and housing			
Ground resistivity	500 Vac 1 min., between electronics and housing			
Shock and Vibration	0.5 mm amplitude - 10 ... 55 Hz frequency for every axis (EN60068-2-6)			
Dimensions	11 x 32 x 20 mm			
Housing Material	Body: technopolymer Fiber Glass reinforced; indicators: TPE			
Actuatuators Material	POM, PMMA			
Plug Material	Nickel plated brass			
Optical Window Material	PMMA			
Mechanical Protection	IP67			
Electromagnetic Compatibility	according to EN 60947-5-2:2020 requirements			
Certifications	CE, UKCA, cULus (IO-Link: S3N...OZ models)			
Ambient Light Immunity	according to EN 60947-5-2 : 2020			
Operating Temperature	-25 ... +55 °C			
Storage Temperature	-40°C...+70°C			

⁽¹⁾ on white object with 90% remission

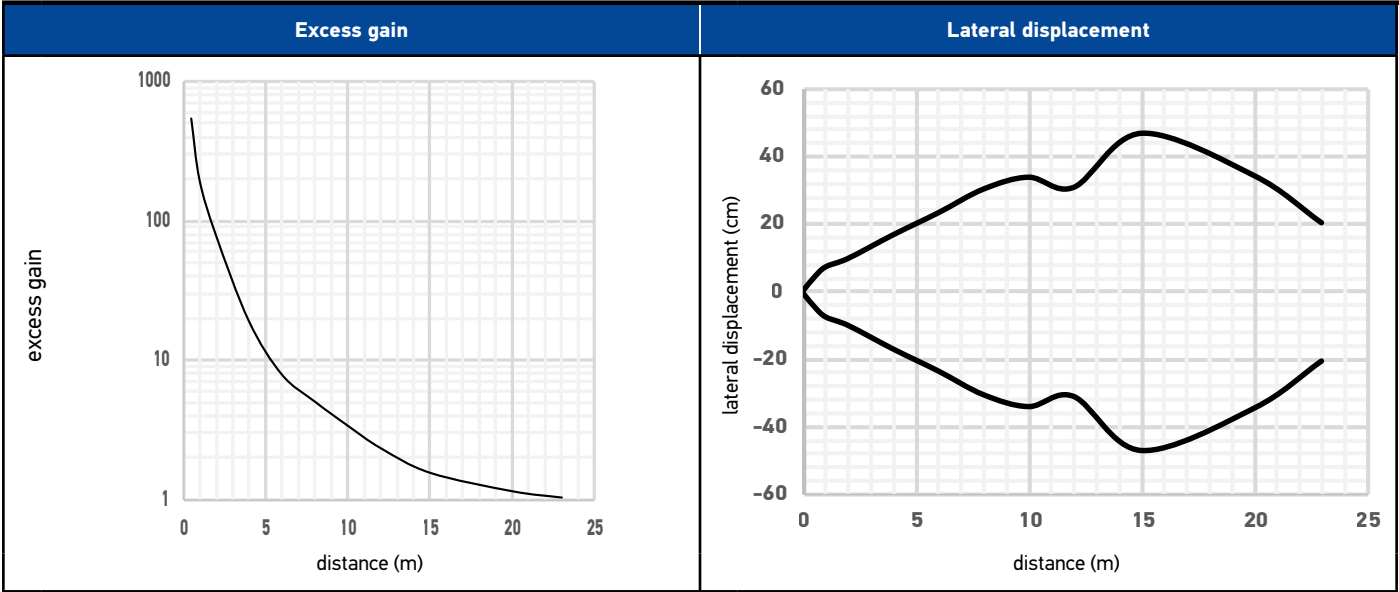
AVAILABLE MODELS

Distance	Adjustment	2 m 3 wires cable Ø 3.5 mm		M8 4pin		
		PNP	NPN	PNP	NPN	IO-Link + Conf. out
Red LED retro reflective polarized 0.05...7 m on R5	1 Trimmer (Adj.) LIGHT	S3N-PR-2-B01-PL (95B010082)	S3N-PR-2-B01-NL (95B010242)	S3N-PR-5-B01-PL (95B010092)	S3N-PR-5-B01-NL (95B010252)	-
	1 Trimmer (Adj.) DARK	S3N-PR-2-B01-PD (95B010102)	S3N-PR-2-B01-ND (95B010262)	S3N-PR-5-B01-PD (95B010112)	S3N-PR-5-B01-ND (95B010272)	-
	2 Trimmers (Adj.+ L/D)	S3N-PR-2-B01-P (95B010592)	S3N-PR-2-B01-N (95B010582)	S3N-PR-5-B01-P (95B010612)	S3N-PR-5-B01-N (95B010602)	-
	Push button	-	-	-	-	S3N-PR-5-B03-OZ (95B010780)
Red LED diffused Narrow Beam 2...250 mm	1 Trimmer (Adj.) LIGHT	S3N-PR-2-C01-PL (95B010042)	S3N-PR-2-C01-NL (95B010202)	S3N-PR-5-C01-PL (95B010052)	S3N-PR-5-C01-NL (95B010212)	-
	1 Trimmer (Adj.) DARK	S3N-PR-2-C01-PD (95B010062)	S3N-PR-2-C01-ND (95B010222)	S3N-PR-5-C01-PD (95B010072)	S3N-PR-5-C01-ND (95B010232)	-
	2 Trimmers (Adj.+ L/D)	S3N-PR-2-C01-P (95B010672)	S3N-PR-2-C01-N (95B010662)	S3N-PR-5-C01-P (95B010692)	S3N-PR-5-C01-N (95B010682)	-
	Push Button	-	-	-	-	S3N-PR-5-C03-OZ (95B010790)
Red LED diffused Long Distance 0...1000 mm	1 Trimmer (Adj.) LIGHT	S3N-PR-2-C11-PL (95B010002)	S3N-PR-2-C11-NL (95B010162)	S3N-PR-5-C11-PL (95B010012)	S3N-PR-5-C11-NL (95B010172)	-
	1 Trimmer (Adj.) DARK	S3N-PR-2-C11-PD (95B010022)	S3N-PR-2-C11-ND (95B010182)	S3N-PR-5-C11-PD (95B010032)	S3N-PR-5-C11-ND (95B010192)	-
	2 Trimmers (Adj.+ L/D)	S3N-PR-2-C11-P (95B010632)	S3N-PR-2-C11-N (95B010622)	S3N-PR-5-C11-P (95B010652)	S3N-PR-5-C11-N (95B010642)	-
	Push Button	-	-	-	-	S3N-PR-5-C13-OZ (95B010800)
Red LED through beam emitter and receiver 0...20 m	1 Trimmer (Adj.) LIGHT	S3N-PR-2-FG01-PL (95B010122)	S3N-PR-2-FG01-NL (95B010282)	S3N-PR-5-FG01-PL (95B010132)	S3N-PR-5-FG01-NL (95B010292)	-
	1 Trimmer (Adj.) DARK	S3N-PR-2-FG01-PD (95B010142)	S3N-PR-2-FG01-ND (95B010302)	S3N-PR-5-FG01-PD (95B010152)	S3N-PR-5-FG01-ND (95B010312)	-
	2 Trimmers (Adj.+ L/D)	S3N-PR-2-FG01-P (95B010712)	S3N-PR-2-FG01-N (95B010702)	S3N-PR-5-FG01-P (95B010732)	S3N-PR-5-FG01-N (95B010722)	-
	Push Button	-	-	-	-	S3N-PR-5-FG03-OZ (95B010810)
Red LED Mechanic BGS 3...350 mm 0...800 mm ⁽¹⁾	1 Trimmer (Adj.) LIGHT	S3N-PR-2-M01-PL (95B010332)	S3N-PR-2-M01-NL (95B010322)	S3N-PR-5-M01-PL (95B010352)	S3N-PR-5-M01-NL (95B010342)	-
	1 Trimmer (Adj.) DARK	-	-	S3N-PR-5-M01-PD (95B010562)	-	-
	2 Trimmers (Adj.+ L/D)	S3N-PR-2-M01-P (95B010752)	S3N-PR-2-M01-N (95B010742)	S3N-PR-5-M01-P (95B010772)	S3N-PR-5-M01-N (95B010762)	-
Red LED bkgd.suppression electronic 0...180 mm on black 6%	Push Button	-	-	-	-	S3N-PR-5-M03-OZ (95B010820)
Distance	Adjustment	2 m 3 wires cable Ø 3.5 mm		M8 4pin		
		PNP	NPN	PNP	NPN	IO-Link + Conf. out
Red Laser Retro Reflex Polarized 0.05...12 m on R7	2 Trimmers (Adj.+ L/D)	S3N-PH-2-B01-P (95B010442)	S3N-PH-2-B01-N (95B010452)	S3N-PH-5-B01-P (95B010462)	S3N-PH-5-B01-N (95B010472)	-
	Push Button	-	-	-	-	S3N-PH-5-B03-OZ (95B010880)
Red Laser Mechanic BGS 9...250 mm 0...600 mm ⁽¹⁾ Red Laser bkgd. suppression electronic 0...130 mm on black 6%	2 Trimmers (Adj.+ L/D)	S3N-PH-2-M01-P (95B010482)	S3N-PH-2-M01-N (95B010492)	S3N-PH-5-M01-P (95B010502)	S3N-PH-5-M01-N (95B010512)	-
	Push Button	-	-	-	-	S3N-PH-5-M03-OZ (95B010900)
Red Laser Through beam emitter and receiver 0...30 m	2 Trimmers (Adj.+ L/D)	S3N-PH-2-FG01-P (95B010522)	S3N-PH-2-FG01-N (95B010532)	S3N-PH-5-FG01-P (95B010542)	S3N-PH-5-FG01-N (95B010552)	-
	Push Button	-	-	-	-	S3N-PH-5-FG03-OZ (95B010890)

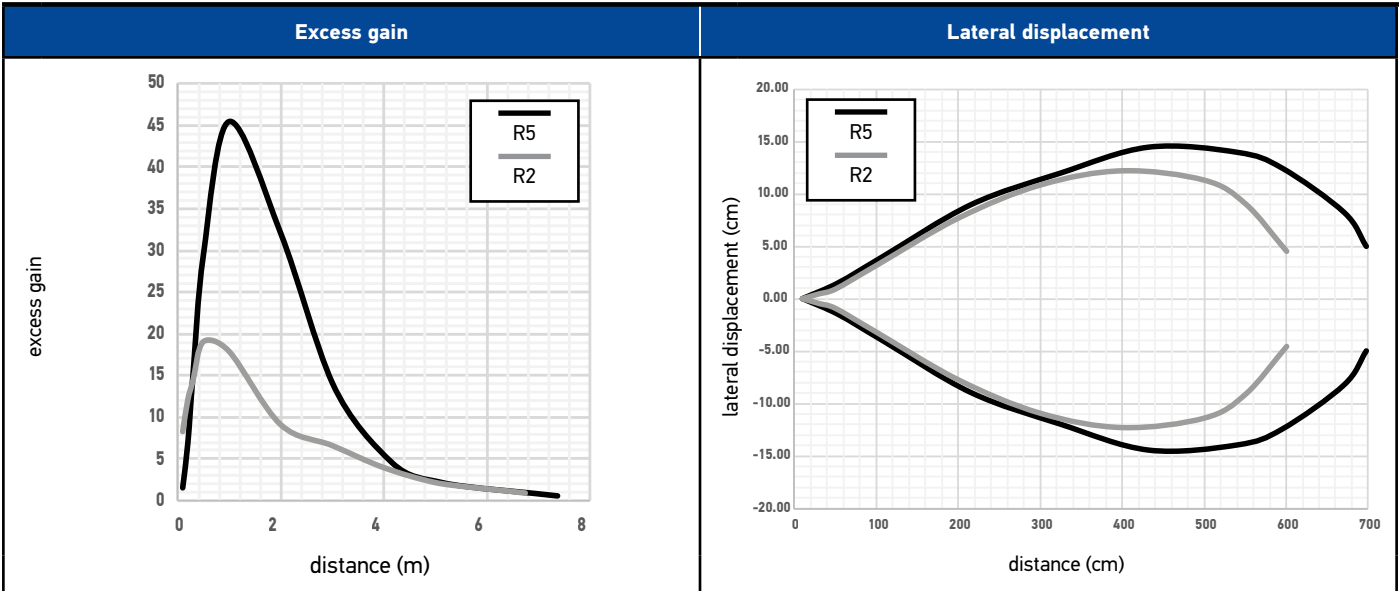
⁽¹⁾ on white object with 90% remission)

RESPONSE DIAGRAMS (LED EMISSION)

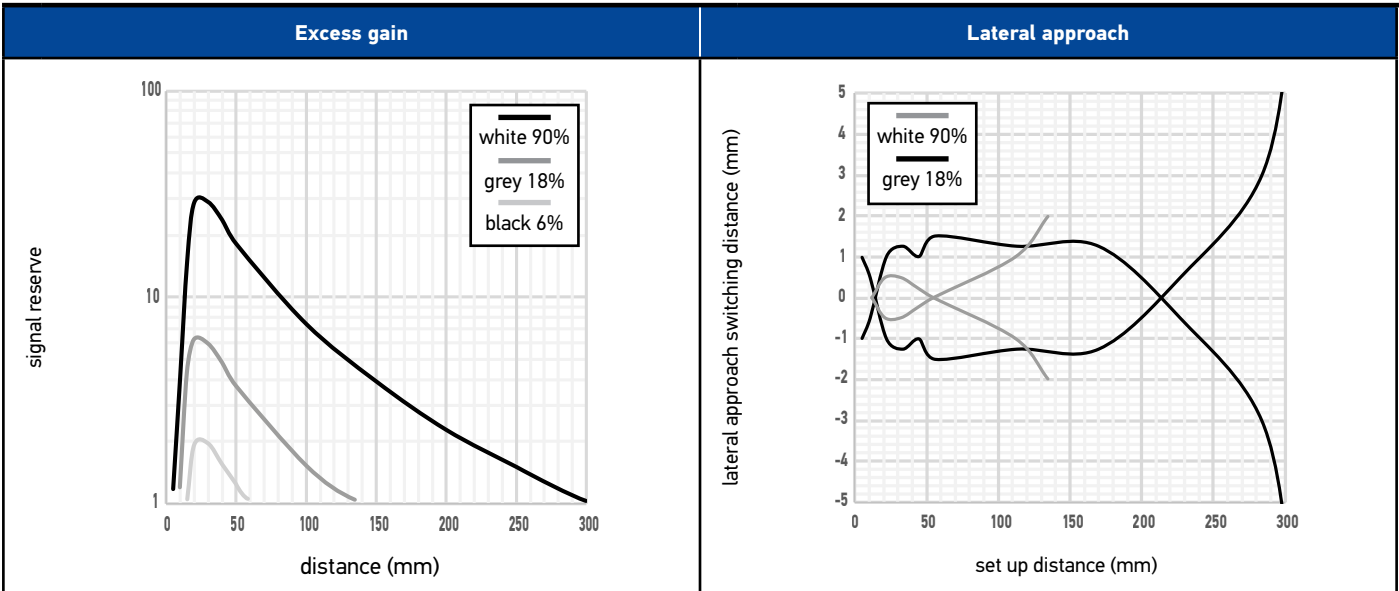
S3N - PR - * - FG** - **



S3N - PR - * - B** - **

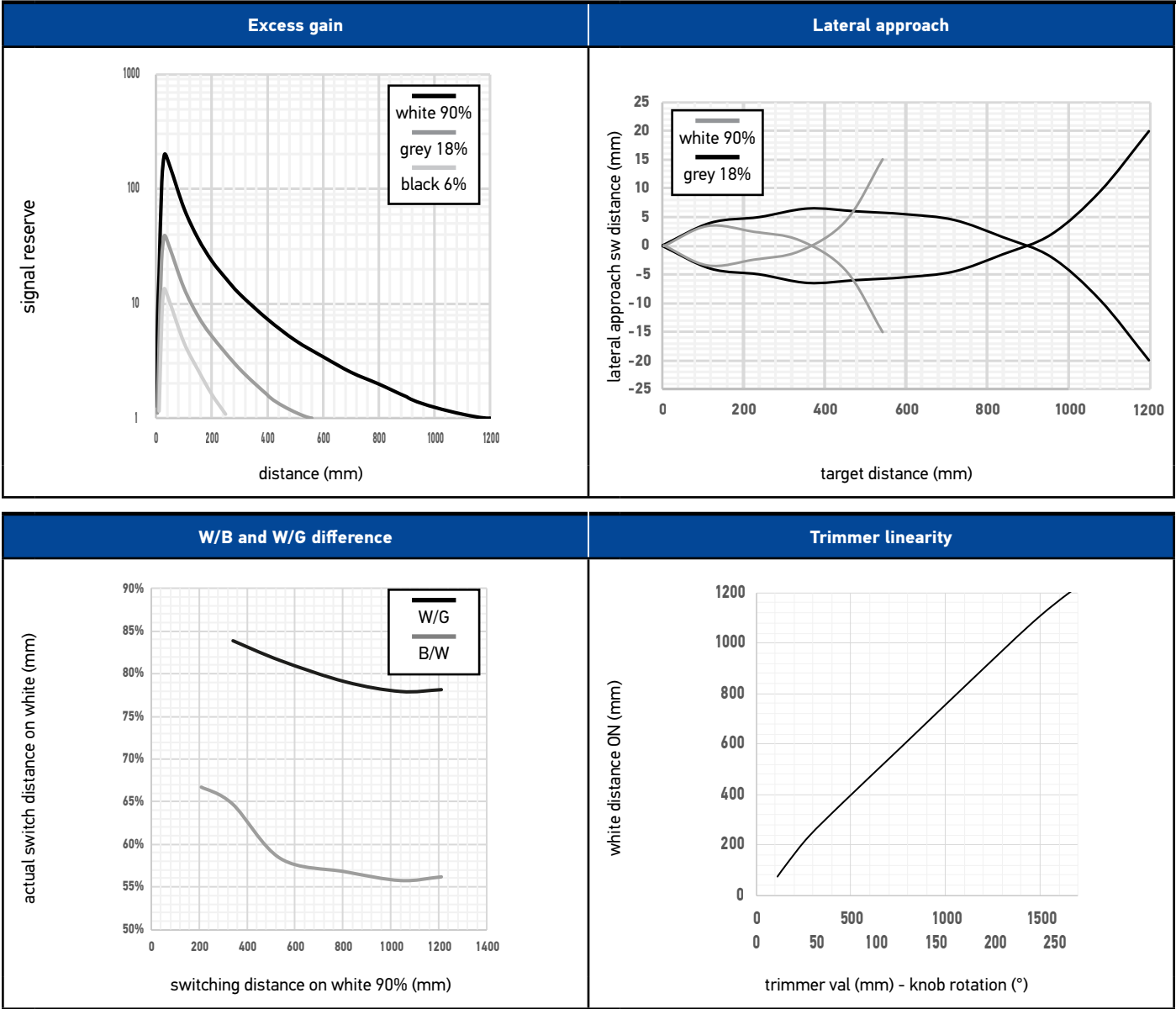


S3N - PR - * - C0* - **

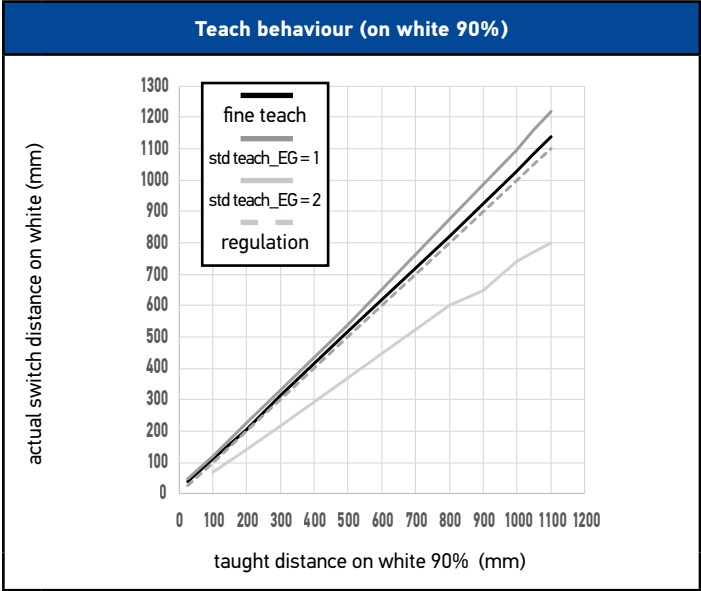


RESPONSE DIAGRAMS (LED EMISSION)

S3N - PR - * - C1* - **

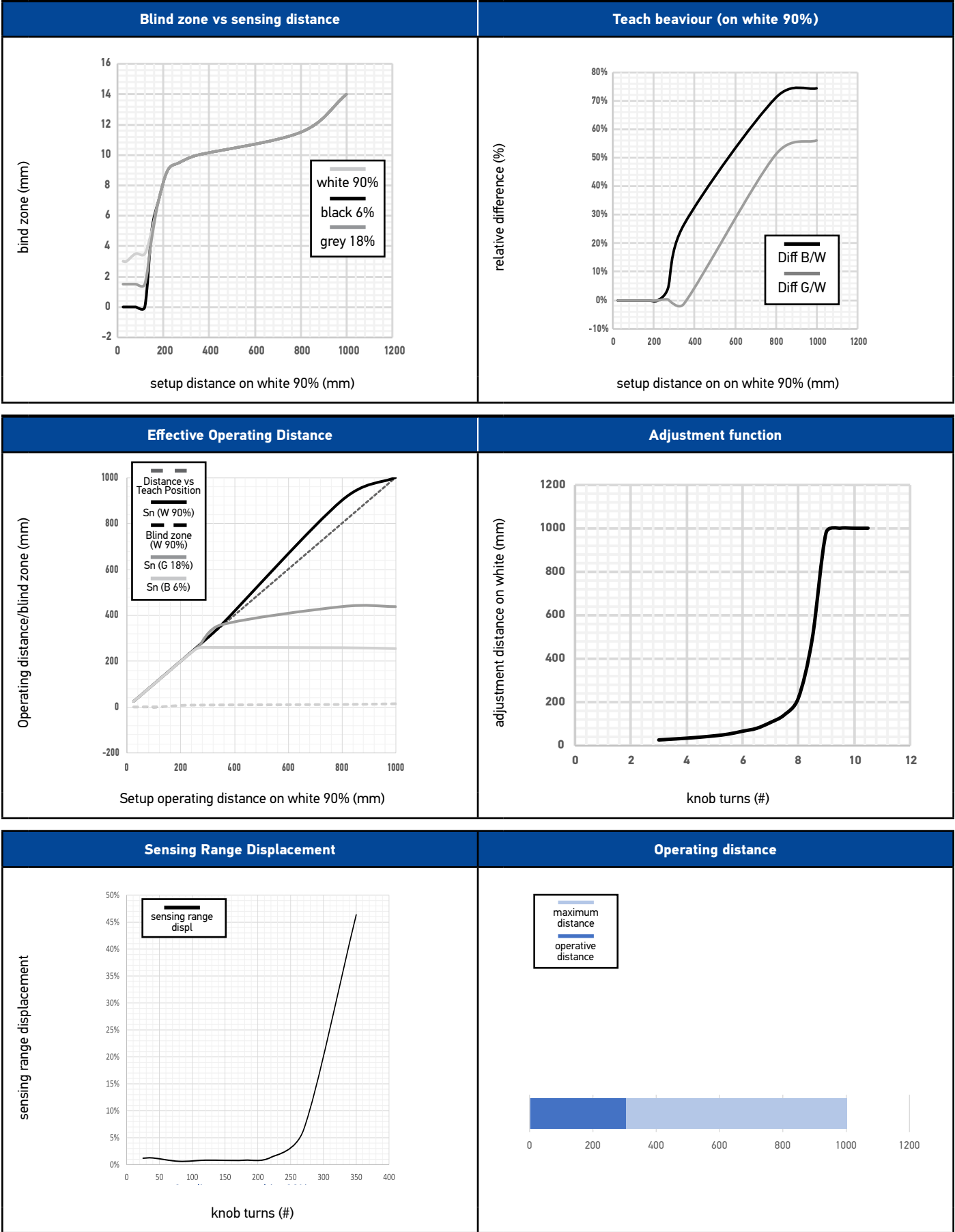


S3N - PR - * - C03 - **



RESPONSE DIAGRAMS (LED EMISSION)

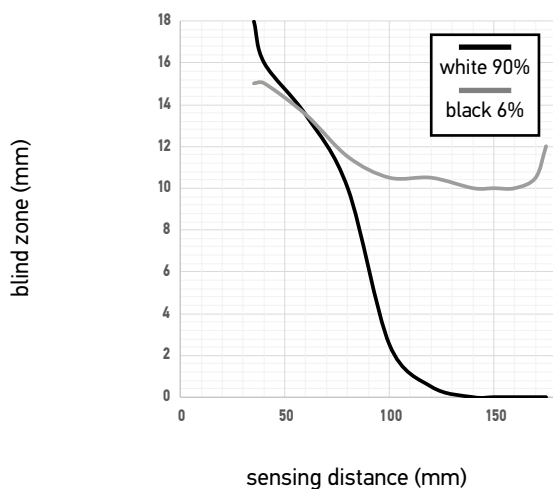
S3N - PR - * - M01 - **



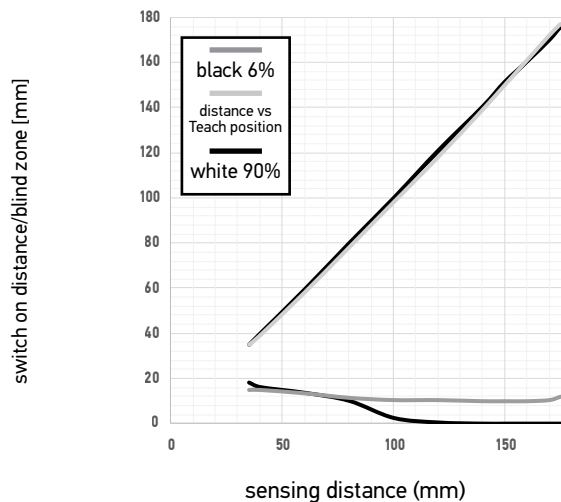
RESPONSE DIAGRAMS (LED EMISSION)

S3N - PR -5 * - M03-0Z

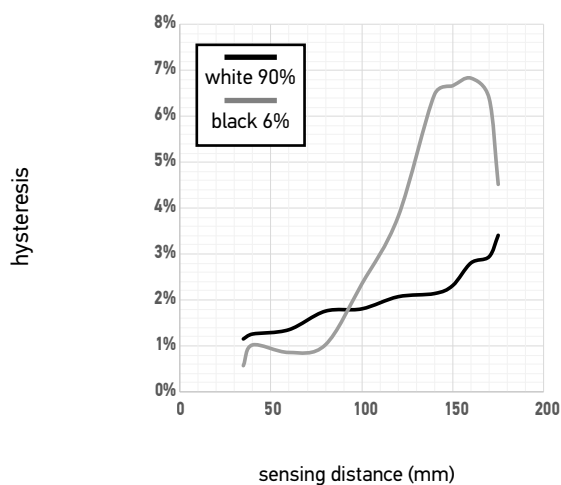
Blind Zone vs Sensing Distance



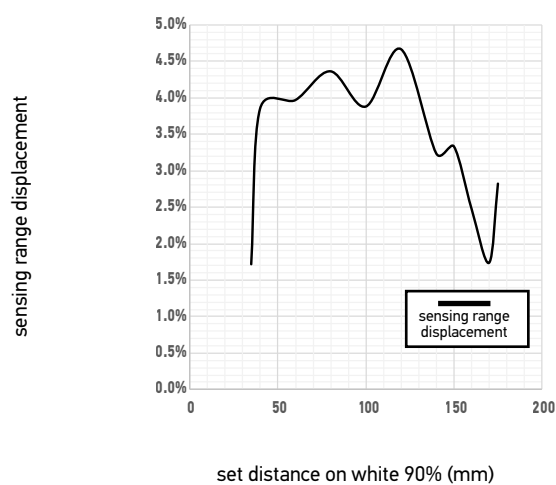
Effective Operative Distance



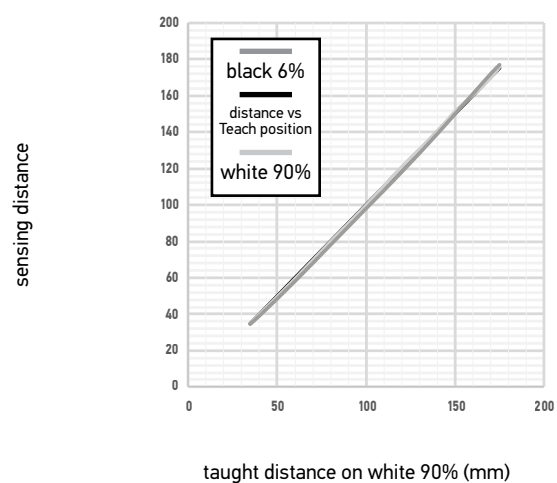
Hysteresis vs Sensing Distance



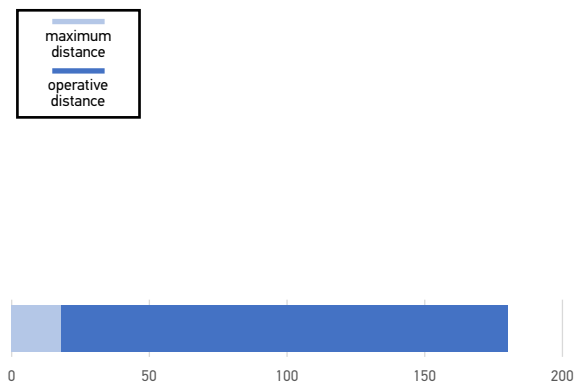
Sensing range displacement



Sensing distance vs taught distance

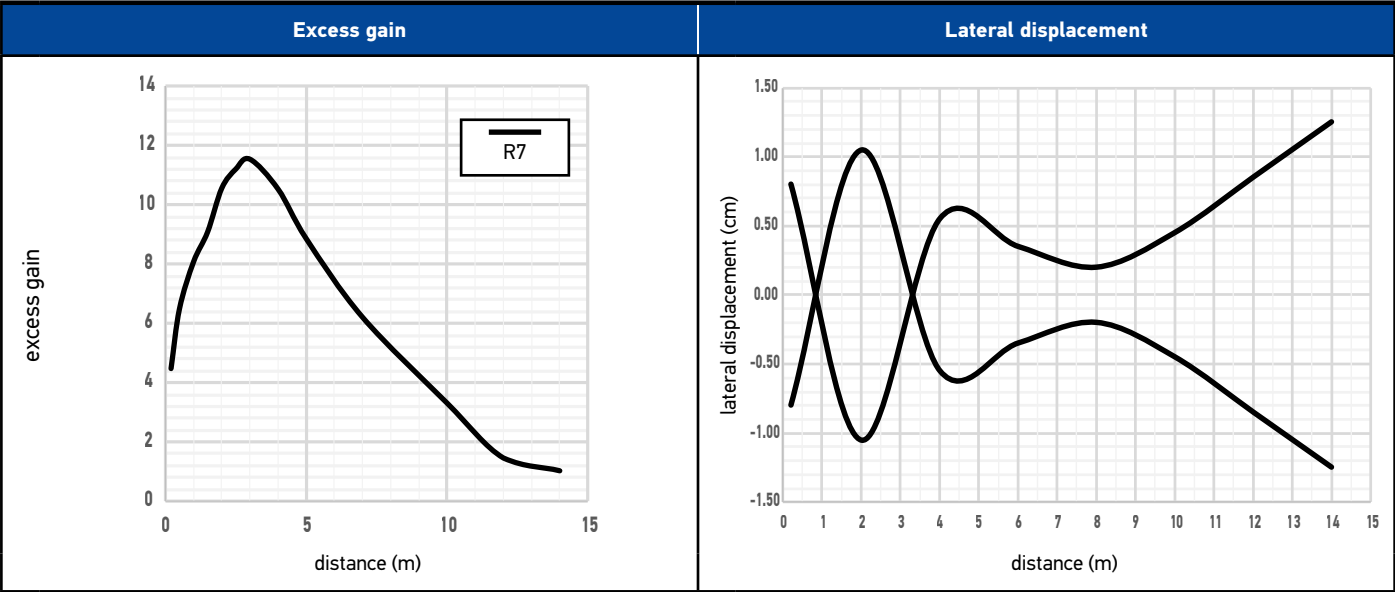


Operating distance

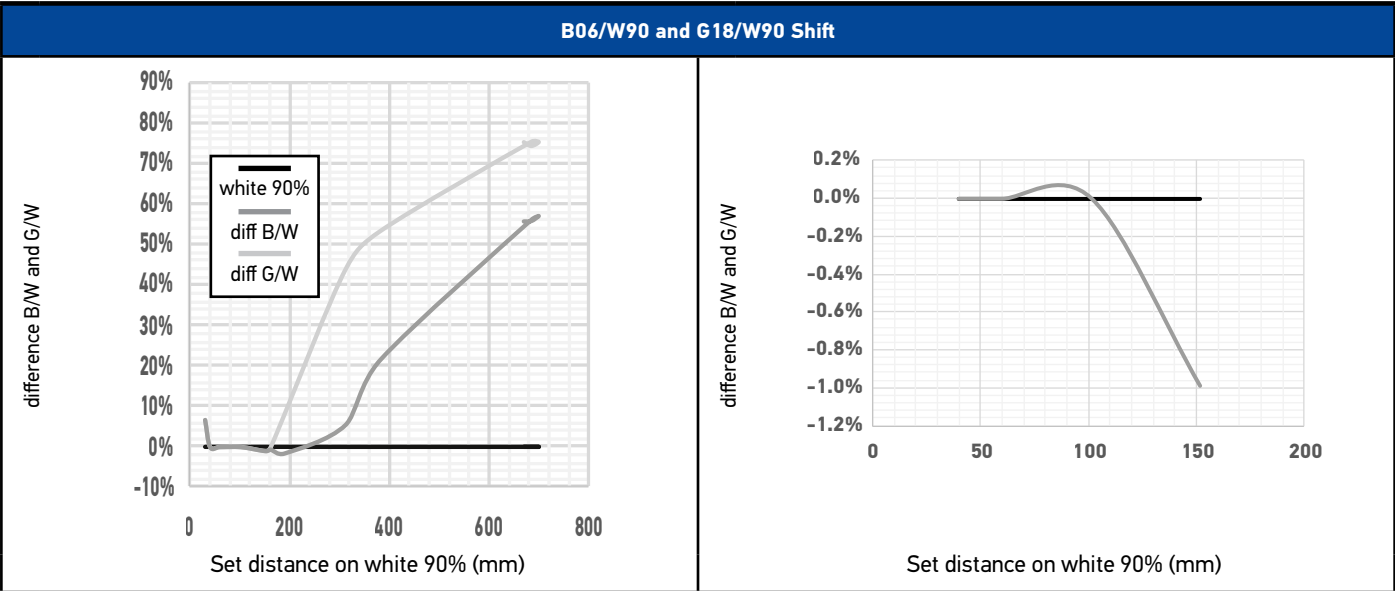
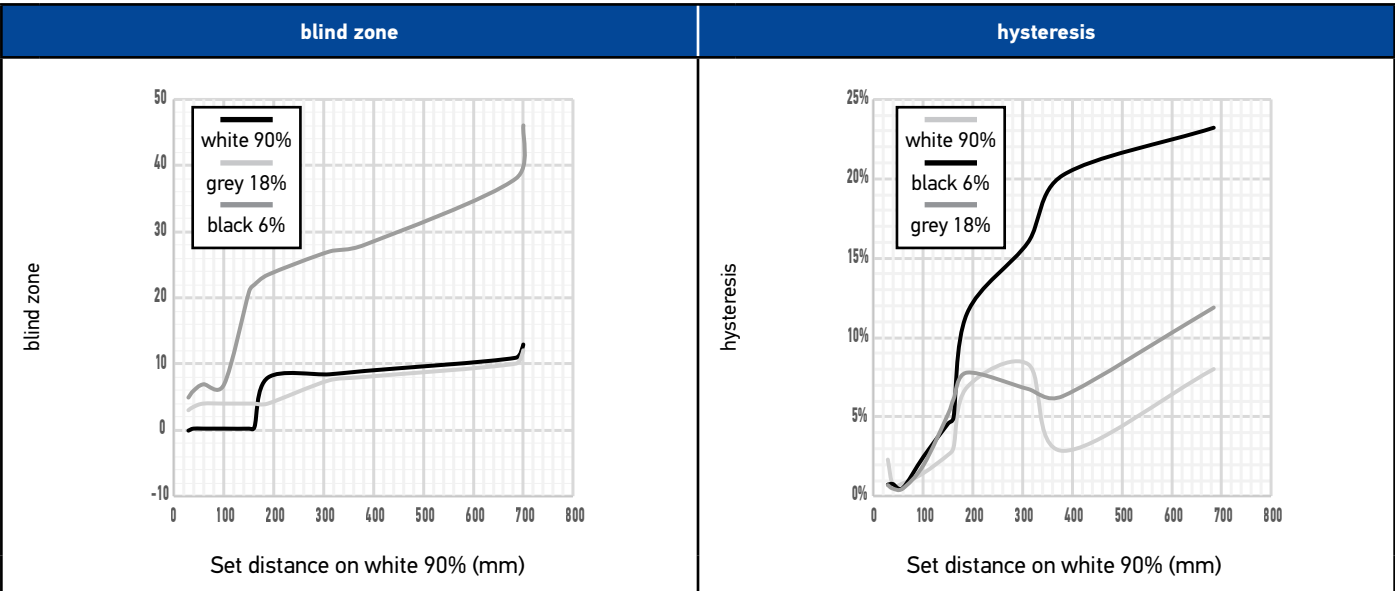


RESPONSE DIAGRAMS (LASER EMISSION)

S3N - PH - * - B** - **

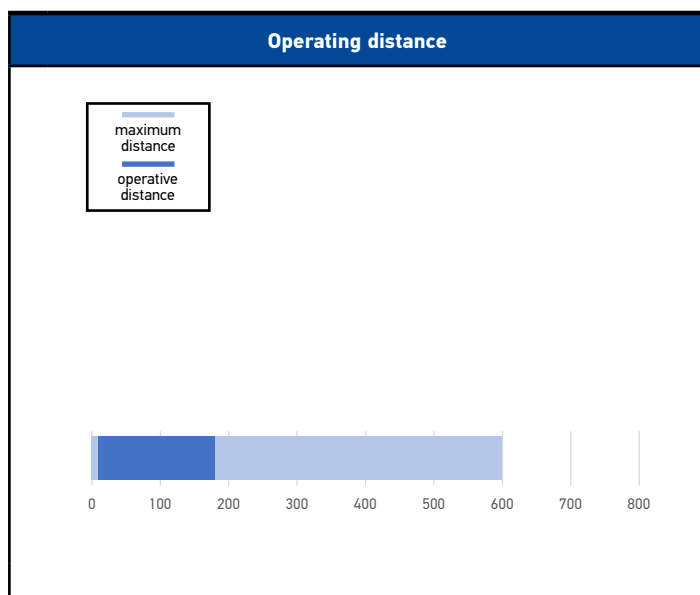
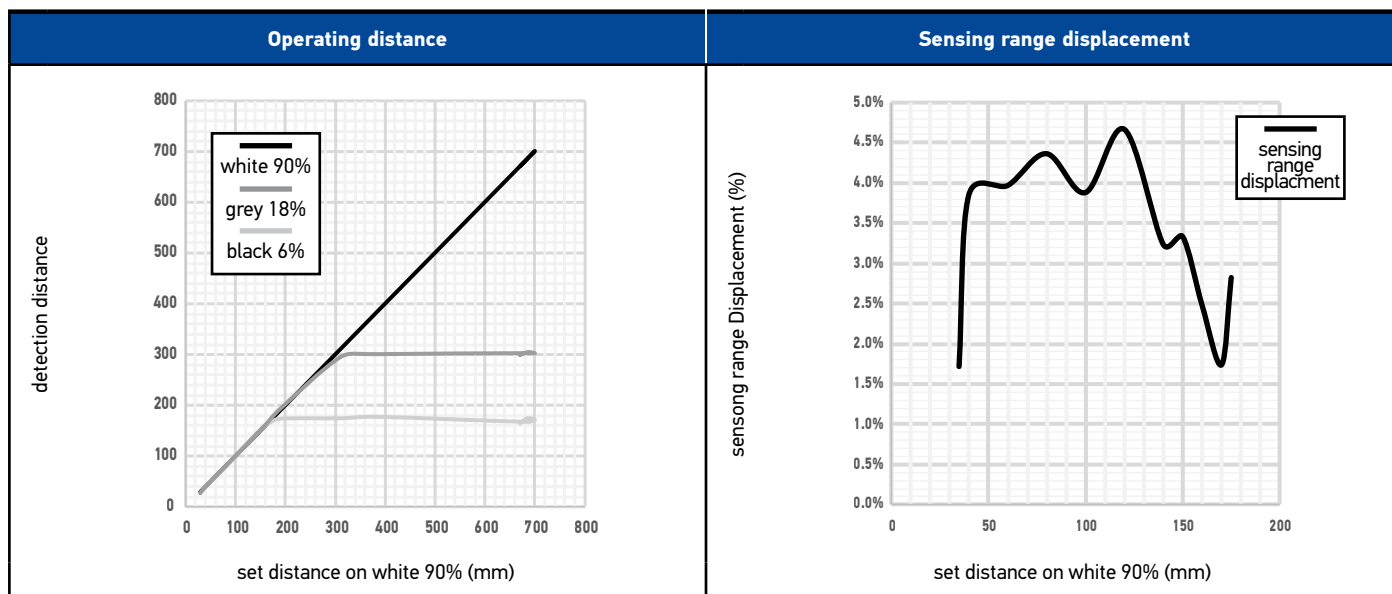


S3N - PH - * - M01 - **

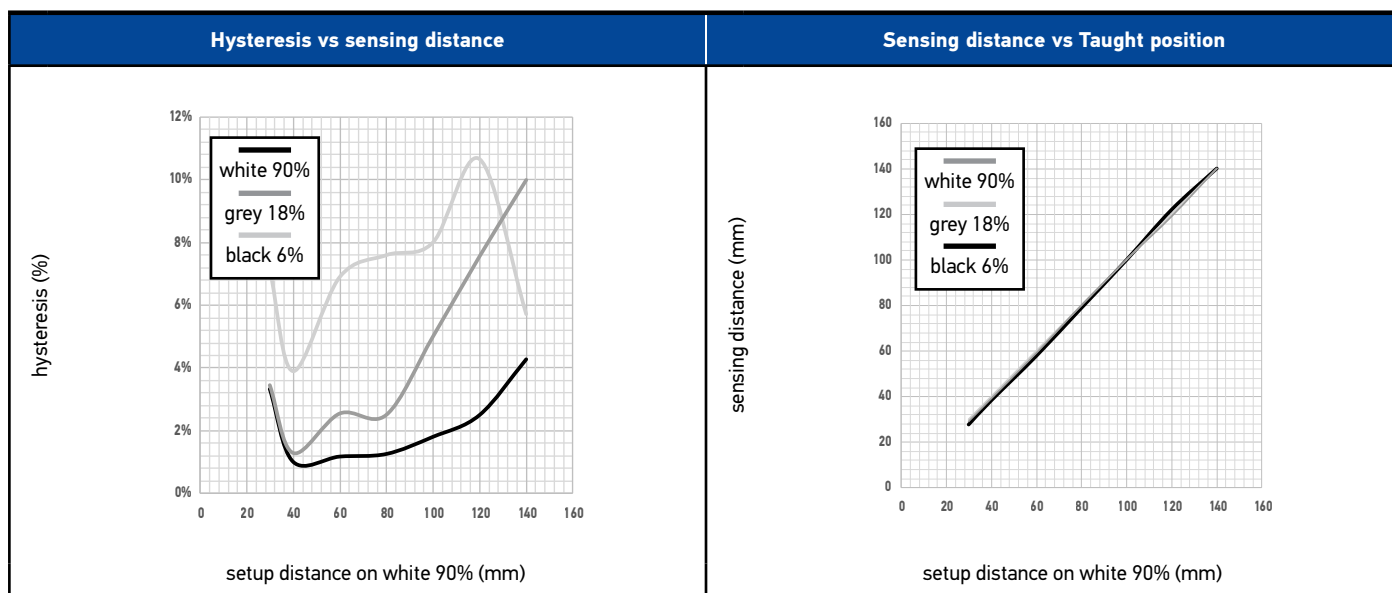


RESPONSE DIAGRAMS (LASER EMISSION)

S3N - PH - * - M01 - **

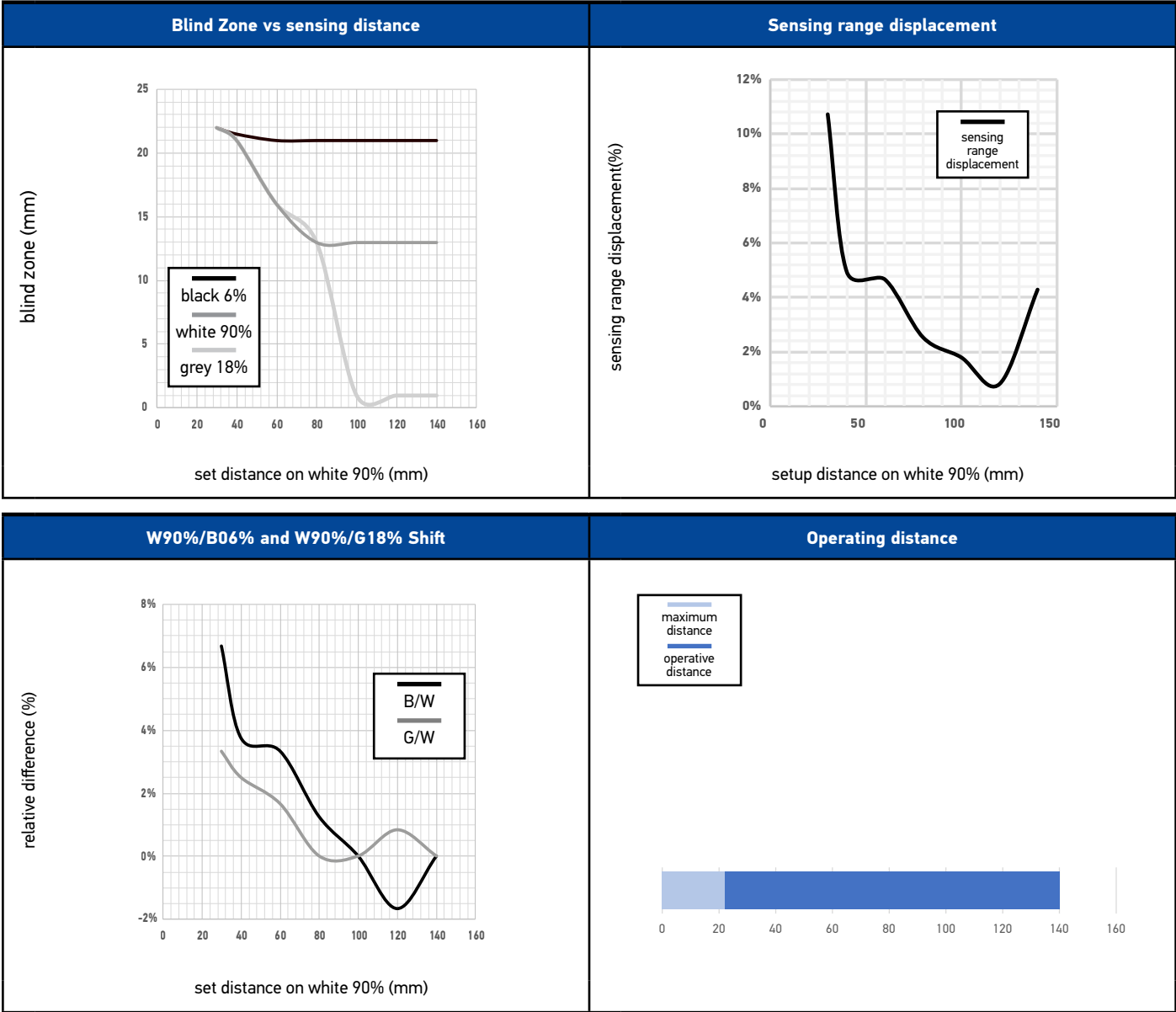


S3N - PH - * - M03 - **

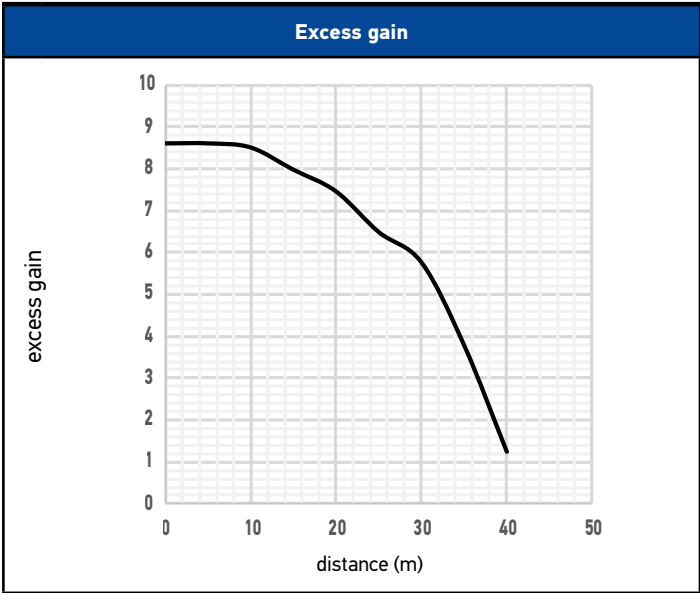


RESPONSE DIAGRAMS (LASER EMISSION)

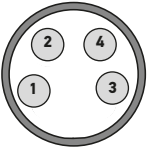
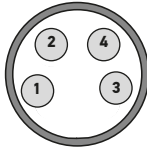
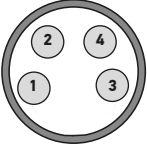
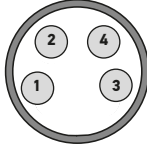
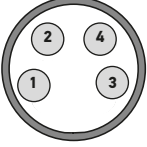
S3N - PH - * - M03 - **



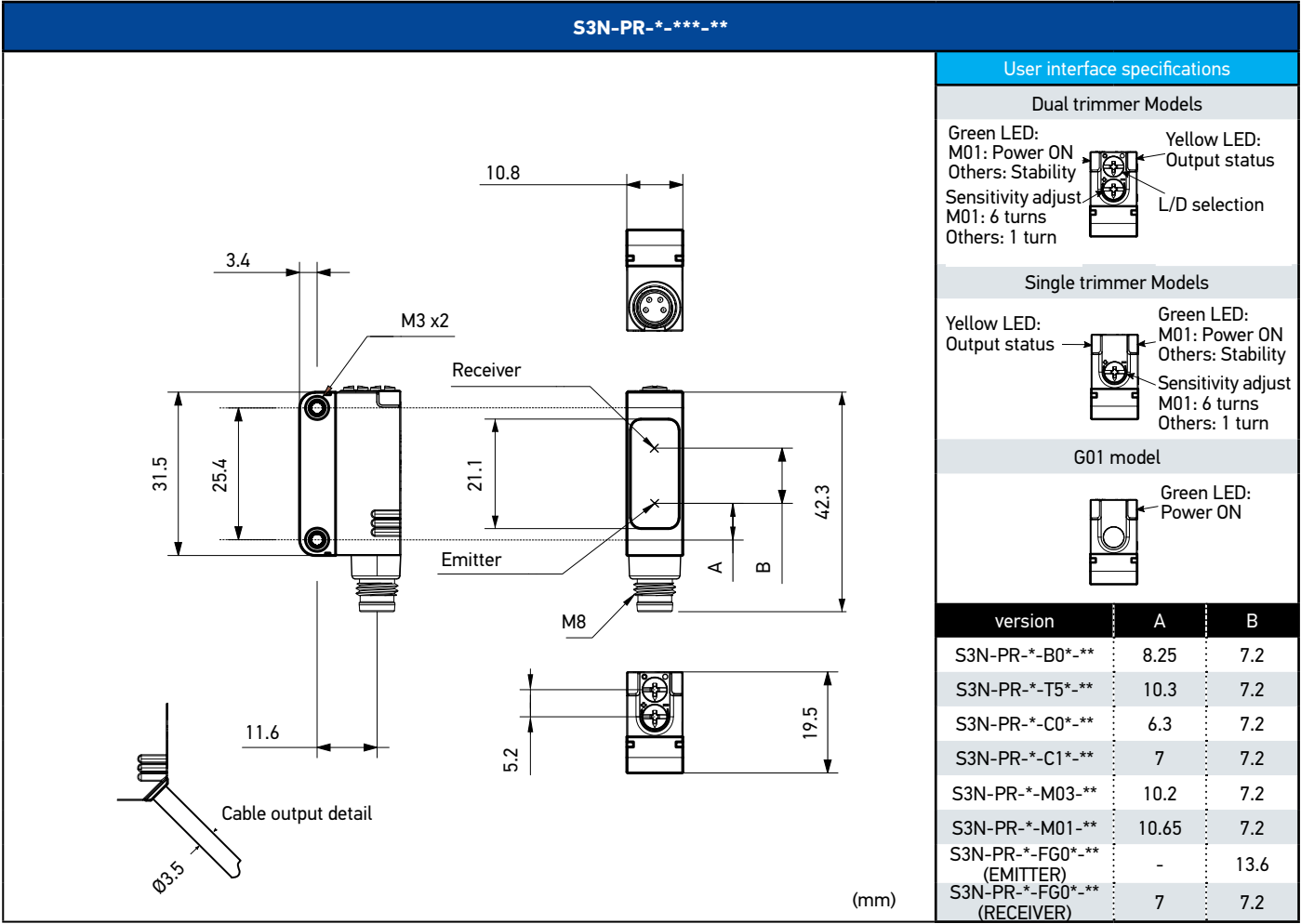
S3N - PH - * - FG** - **



CONNECTION DIAGRAMS

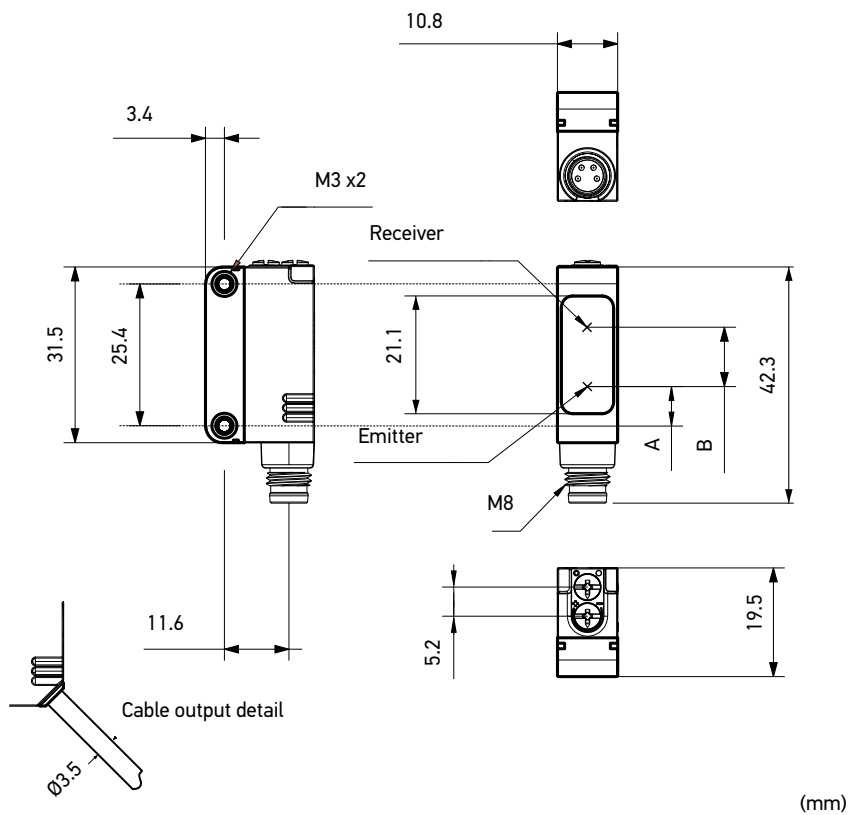
S3N-P*-*-***-N*	S3N-P*-*-***-P*
 BN — 1 — +10...30 VDC BK — 4 — NPN OUT BU — 3 — 0V WH — 2 — NC	 BN — 1 — +10...30 VDC BK — 4 — PNP OUT BU — 3 — 0V WH — 2 — NC
S3N-P*-5-*03-OZ	S3N-P*-*-G03-OZ
 BN — 1 — +10...30 VDC BK — 4 — C/Q BU — 3 — 0V WH — 2 — NPN/PNP OUT	 BN — 1 — PIN 1: 10...30 VDC BK — 4 — PIN 4: C/Q BU — 3 — PIN 3: 0 V WH — 2 — PIN 2: NC
S3N-P*-*-G**-**	
 BN — 1 — PIN 1: 10...30 VDC BK — 4 — PIN 4: 0 V or NC BU — 3 — PIN 3: 0 V WH — 2 — PIN 2: NC	

DIMENSIONS



DIMENSIONS

S3N-PH-*-*-*-*

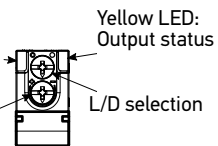


User interface specifications

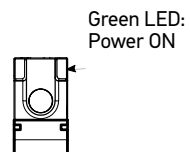
Dual trimmer Models

Green LED:
M01: Power ON
Others: Stability

Sensitivity
adjust
M01: 6 turns
Others: 1 turn



G01 model



version	A	B
S3N-PH-*-*B0*-*	6.2	7.2
S3N-PH-*-*M03*-*	10.2	7.2
S3N-PH-*-*M01*-*	10.65	7.2
S3N-PH-*-*FG0*-* (EMITTER)	-	13.8
S3N-PH-*-*FG0*-* (RECEIVER)	7	7.2