

# TL46



## HIGH PERFORMANCE CONTRAST SENSOR FOR COLORED REGISTRATION MARK DETECTION

- Fastest and accurate low jitter model (TL46-WJ)
- Color mode enhanced model (TL46-WE)
- Wide-spectrum RGB or white LED emission
- 5 different models: basic, standard, enhanced, low jitter, color mode
- Automatic, manual and dynamic settings
- 10, 15, 20, 30 or 50 kHz switching frequencies
- Very low jitter down to 7µs (TL46-WJ...)
- NPN/PNP and analog outputs
- Standard mounting, M12 connector rotatable to 5 positions

### APPLICATIONS

- Packaging and labeling machinery
- Beverage/Food/Cosmetic/Pharmaceutical industries
- Printing machinery
- Flexographic printing machinery



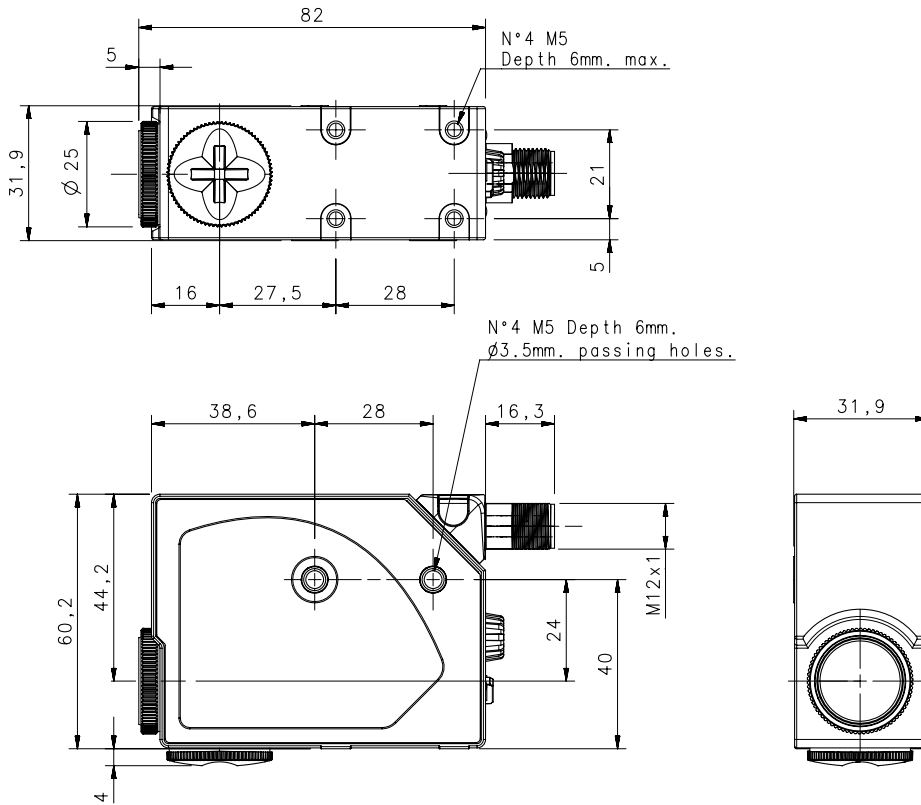
(\*) ATEXII 3DG

TL46		9 ±3 mm
<b>Contrast sensor</b>		18 mm (Lens No.18 glass)
		22 mm (Lens No.22 glass)
		28 mm (Lens No.28 glass)
		40 mm (Lens No.40 glass)
<b>Switching frequency</b>		10 kHz (mod. TL46-WE color mode)
		15 kHz (mod. TL46-W)
		20 kHz (mod. TL46-A/WL)
		30 kHz (mod. TL46-WLF/WE contrast mode)
		50 kHz (mod. TL46-WJ)
<b>Jitter</b>		< 7µs (mod. TL46-WJ)
		16µs (mod. TL46-WLF/WE contrast mode)
		>25µs (mod. TL46-W/WL)
<b>Light emission</b>		RGB LED
		white LED
		Red LED
<b>Setting</b>		push buttons
		trimmer
<b>Power supply</b>	Vdc	10...30 V
	Vac	
	Vac/dc	
<b>Output</b>	NPN	•
	NPN	•
	NPN/PNP	•
	relay	
	other	0...5 V Analog Output
	cable	
<b>Connection</b>	connector	•
	pig-tail	
<b>Approximate dimensions (mm)</b>		31x81x58
<b>Housing material</b>		Aluminium
<b>Mechanical protection</b>		IP67

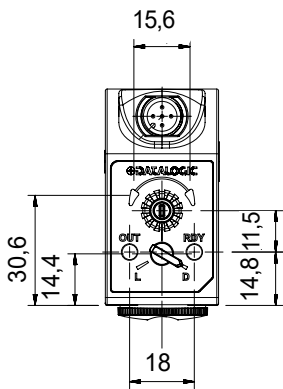
# TECHNICAL DATA

<b>Power supply</b>	10 ... 30 Vdc (limit values)
<b>Ripple</b>	2 Vpp max.
<b>Consumption (output current excluded)</b>	40 mA max. at 24 Vdc (mod. TL46-A) 50 mA max. at 24 Vdc (mod. TL46-W/WJ) 85 mA max. at 24 Vdc 24 Vdc with bargraph ON in threshold adjustment mode, 55 mA max at 24 Vdc with bargraph OFF in normal functioning mode (mod. TL46-WL) 35 mA max. at 24 Vdc (mod. TL46-WLF/WE)
<b>Light emission</b>	white LED 400-700 nm (mod. TL46-A-4xx) red LED 630 nm (mod. TL46-A-6xx) blu LED 465nm/green LED 520 nm/red LED 630 nm (mod. TL46-W/WL/WLF/WE/WJ)
<b>Detection Distance</b>	9 ±3 mm 18 mm (Lens No.18 glass) 22 mm (Lens No.22 glass) 28 mm (Lens No.28 glass) 40 mm (Lens No.40 glass)
<b>Minimum spot dimension</b>	1,5 x 5 mm 0,8x4mm (TL46-WJ)
<b>Depth of field</b>	± 3 mm
<b>Response time</b>	100 µs (mod. TL46-WE color mode) 33 µs (mod. TL46-W) 25 µs (mod. TL46-A/WL) 16 µs (mod. TL46-WLF/WE contrast mode) 10 µs (mod. TL46-WJ)
<b>Switching frequency</b>	10 kHz (mod. TL46-WE color mode) 15 kHz (mod. TL46-W) 20 kHz (mod. TL46-A/WL) 30 kHz (mod. TL46-WLF/WE contrast mode) 50 kHz (mod. TL46-WJ)
<b>Jitter</b>	< 7µs (TL46-WJ) 16µs (TL46-WLF/WE contrast mode) >25µs (TL46-W/WL)
<b>Setting</b>	SET push-buttons (mod. TL46-W/WL/WLF/WE) sensitivity trimmer (mod. TL46-A)
<b>Operating mode</b>	DARK/LIGHT selection by switch (mod. TL46-A) automatic DARK/LIGHT selection (mod. TL46-W/WL/WJ) automatic DARK/LIGHT selection in the target/background detection, selectable via wire in the dynamic detection (mod. TL46-WLF/WE)
<b>Indicators</b>	yellow OUTPUT LED green READY LED, orange DELAY LED and KEYLOCK (Mod TL46-W/WJ) green READY LED, 4-digit display/DELAY LED/KEYLOCK LED (mod. TL46-WLF/WE) orange ARROWS (mod. TL46-A), DELAY LED and KEYLOCK LED 5-segment bargraph (mod. TL46-WL)
<b>Dark/light selection</b>	Switch Automatic Automatic/manual; remote/dynamic
<b>Delay</b>	0...20ms selectable via delay input 0...100ms programmed
<b>Auxiliary function</b>	Keylock (not available on TL46-WE) Fine Hysteresis regulation (TL46-WL/WLF/WE)
<b>Output</b>	PNP (mod. TL46-WJ); PNP or NPN; PNP/NPN (mod. TL46-W/WL/WLF/WE by part number); analog output (mod. TL46-A/W/WL)
<b>Output current</b>	100mA
<b>Saturaton Voltage</b>	=<2V
<b>Analogue Out</b>	0,5...5,5V ±10%; 2V on white target 90% 1...3V ±10%(white 90%) ; 5,5V max
<b>Analogue out impedance</b>	2,2 kΩ (short circuit protection)
<b>Connection</b>	M12 5-pole connector
<b>Dielectric strength</b>	500 Vac, 1 min between electronics and housing
<b>Insulating resistance</b>	>20 MΩ, 500 Vdc between electronics and housing
<b>Electrical protection</b>	class 2, double insulation
<b>Protection device</b>	Reverse polarity protection, overload and short circuit protection
<b>Mechanical protection</b>	IP67
<b>Ambient light rejection</b>	according to EN 60947-5-2
<b>Vibrations</b>	0,5 mm amplitude, 10 ... 55 Hz frequency, for every axis (EN60068-2-6)
<b>Shock resistance</b>	11 ms (30 G) 6 shock for every axis (EN60068-2-27)
<b>Housing material</b>	aluminium
<b>Lens material</b>	mirror (mod. TL46-A), glass (mod. TL46-W/WL/WLF/WJ/WE)
<b>Operating temperature</b>	-10 ... 55 °C
<b>Storage temperature</b>	'-20 ... 70 °C
<b>Weight</b>	170 g max.

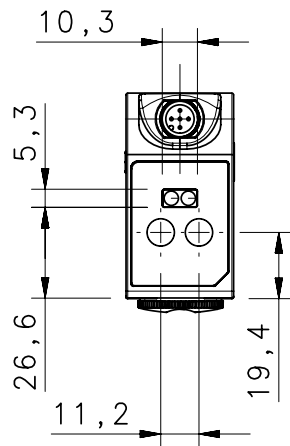
# DIMENSIONS



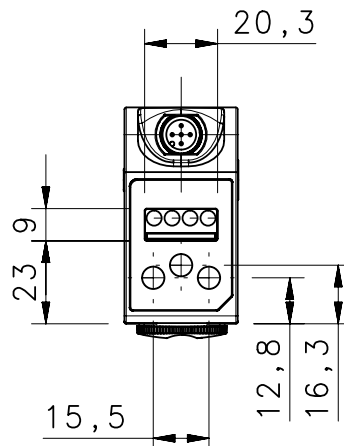
TL46-A



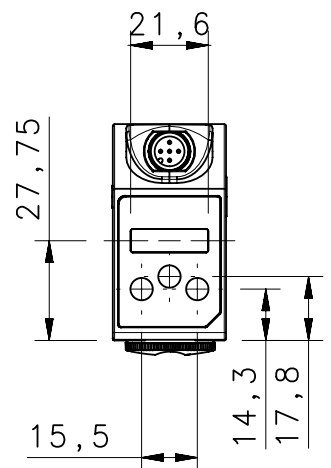
TL46-W/TL46-WJ



TL46-WL



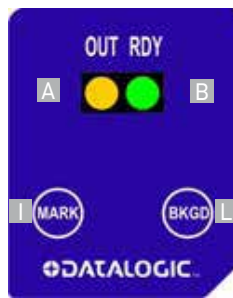
TL46-WLF/WE



# INDICATORS AND SETTINGS

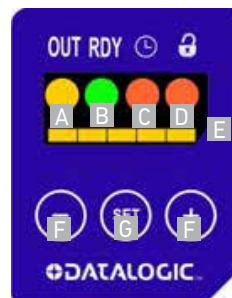


**TL46-A  
TRIMMER**

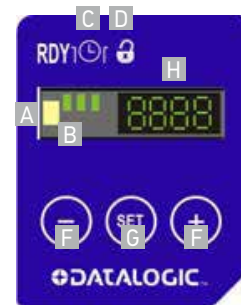


**TL46-W  
BASE**

**TL46-WJ  
LOW JITTER**



**TL46-WL  
STANDARD**

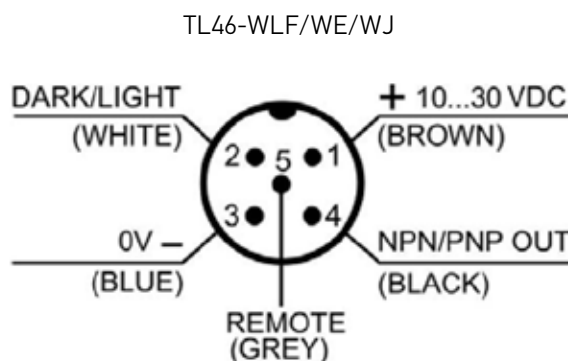
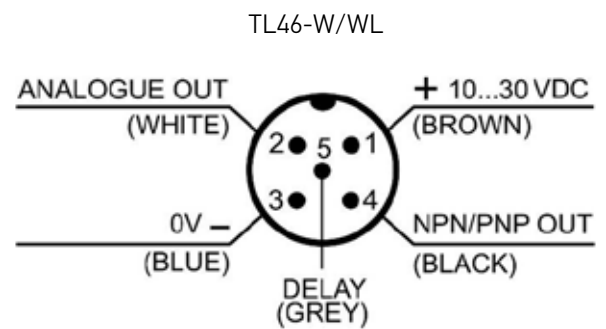
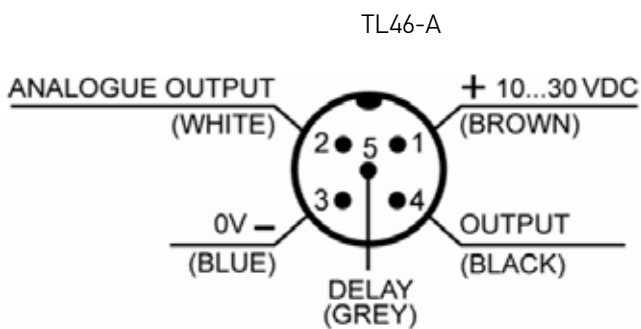


**TL46-WLF  
ENHANCED**

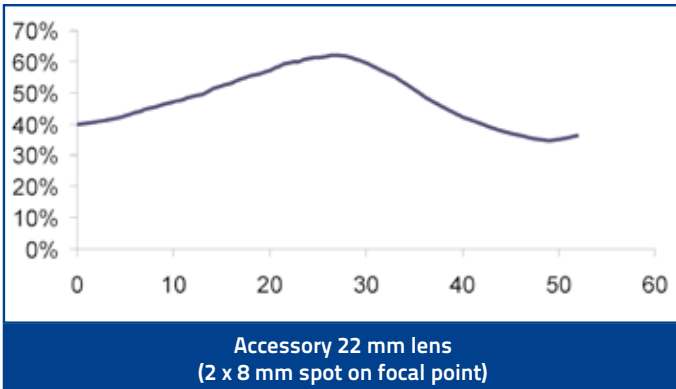
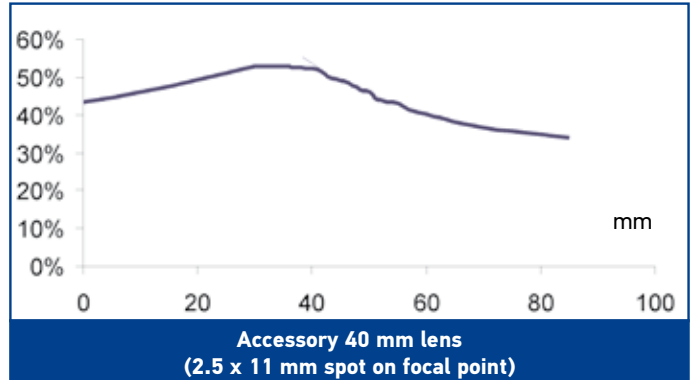
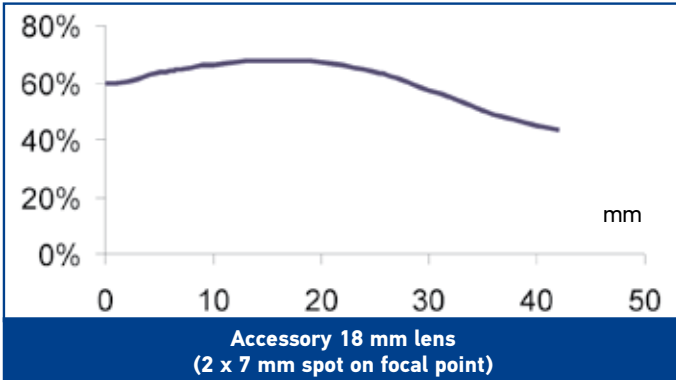
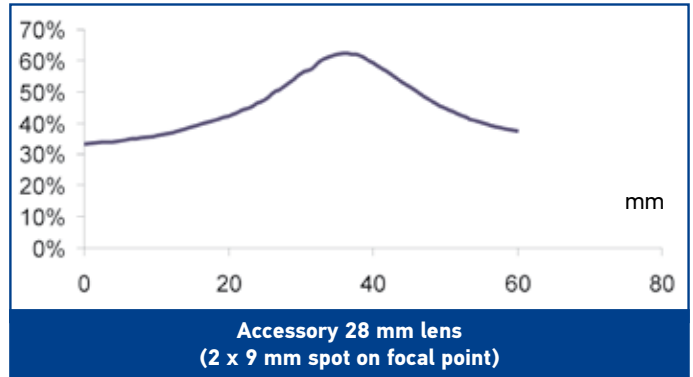
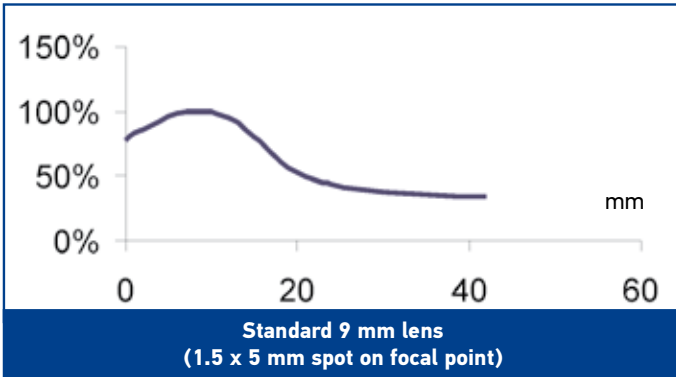
**TL46-WE  
COLOR  
ENHANCED**

- A** yellow OUTPUT LED
- B** green READY LED
- C** orange DELAY LED
- E** orange KEYLOCK LED
- D** Bargraph
- F** +/- push-buttons
- G** SET push-button
- H** Display
- I** MARK push-button
- L** BKGD push-button
- M** Light/Dark Switch
- N** Orange Indicators Arrows
- O** Sensitivity Adjustment Knob

# CONNECTIONS



# READING DIAGRAMS



VERTICAL SPOT

HORIZONTAL SPOT

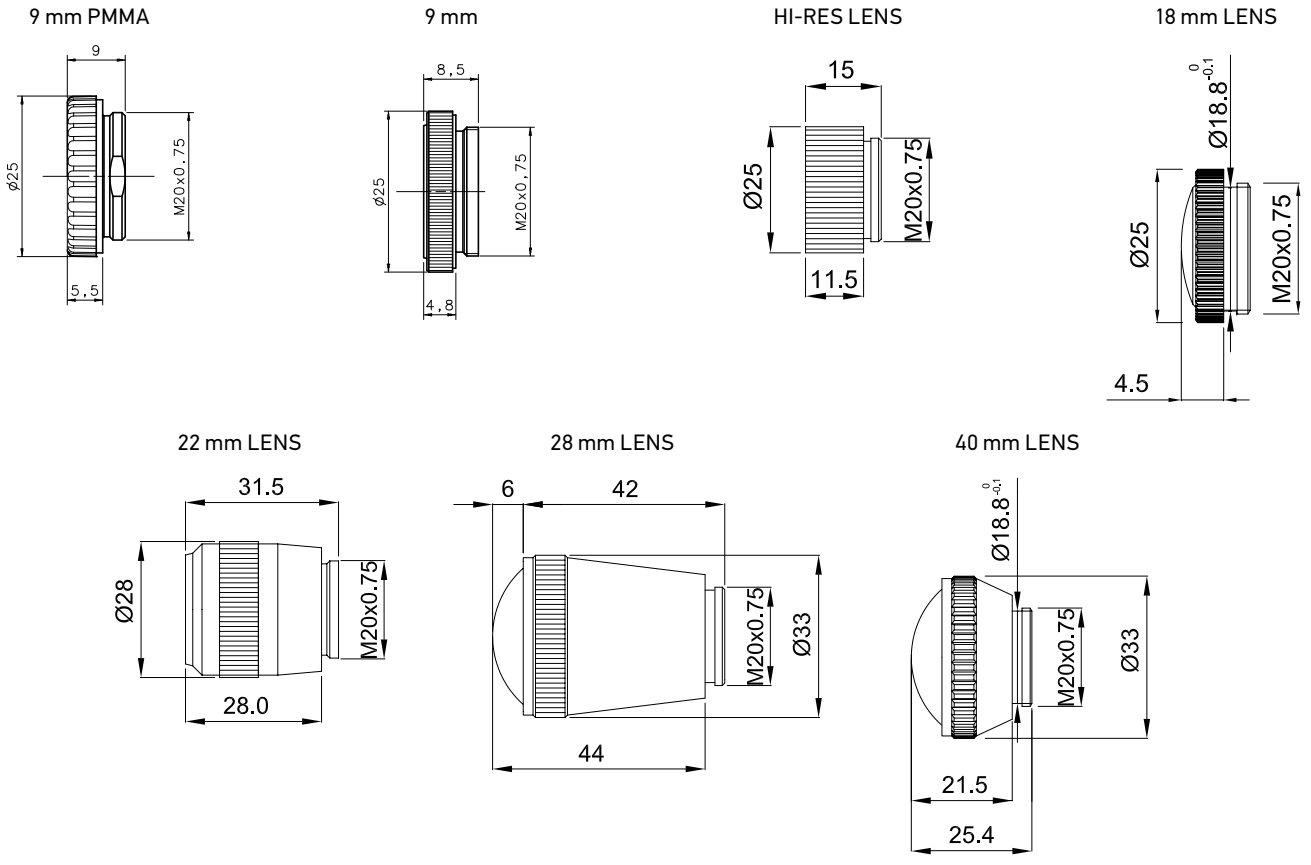


Horizontal spot is present in the TL46 models with final '-L' suffix

# MODEL SELECTION AND ORDER INFORMATION

OPTIC FUNCTION	SETTING & INDICATORS	OUTPUT	EMISSION	MODEL	ORDER No.
Contrast sensor	Trimmer 2 LEDs	PNP	WHITE vertical spot	TL46-A-415	954601070
		NPN	WHITE vertical spot	TL46-A-425	954601080
		PNP	RED vertical spot	TL46-A-615	954601090
		NPN	RED vertical spot	TL46-A-625	954601100
	Push-buttons 2 LEDs	PNP/NPN	R.G.B. vertical spot	TL46-W-815	954601000
			R.G.B. horizontal spot	TL46-W-815L	954601010
		Push buttons 4 LEDs bargraph	R.G.B. vertical spot	TL46-WL-815	954601020
			R.G.B. horizontal spot	TL46-WL-815L	954601030
			R.G.B. vertical spot	TL46-WLF-815	954601040
			R.G.B. horizontal spot	TL46-WLF-815L	954601050
Contrast low jitter sensor	Push buttons 4 LEDs display	PNP	R.G.B. vertical spot	TL46-WJ-815	954601110
		R.G.B. horizontal spot	TL46-WJ-815L	954601120	
Color contrast sensor		NPN	R.G.B. vertical spot	TL46-WE-815	954601130
			R.G.B. vertical spot	TL46-WE-825	954601140

# ACCESSORIES



MODEL	DESCRIPTION	ORDER No.
Lens No.9	glass lens with 9 mm focus	95ACC2670
Lens No.9 PMMA	plastic lens with 9 mm focus	95ACC2540
Lens Hi-Res	additional focussing glass lens with 9 mm focus (*)	95ACC1050
Lens No.18	glass lens with 18 mm focus	95ACC2680
Lens No.22	glass lens with 22 mm focus	95ACC1100
Lens No.28	glass lens with 28 mm focus	890000194
Lens No.40	glass lens with 40 mm focus	95ACC2740

\* focussing lens to screw between the sensor and the normal 9 mm lens

# CABLES

TYPE	DESCRIPTION	LENGTH	MODEL	ORDER No.
Axial M12 Connector	5-pole, grey, P.V.C.	3 m	CS-A1-03-G-03	95ACC2110
		5 m	CS-A1-03-G-05	95ACC2120
		10 m	CS-A1-03-G-10	95ACC2140
	5-pole, U.L., black, P.V.C	3 m	CS-A1-03-U-03	95ASE1170
		5 m	CS-A1-03-U-05	95ASE1180
		10 m	CS-A1-03-U-10	95ASE1190
		15 m	CS-A1-03-U-15	95ASE1200
		25 m	CS-A1-03-U-25	95ASE1210
		50 m	CS-A1-03-U-50	95A252700