

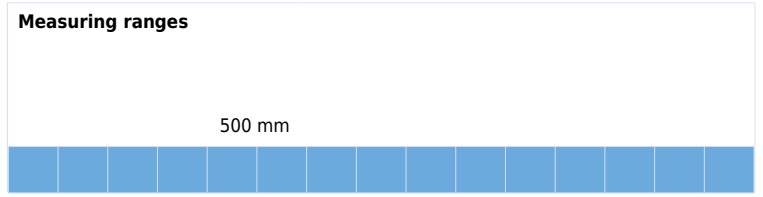
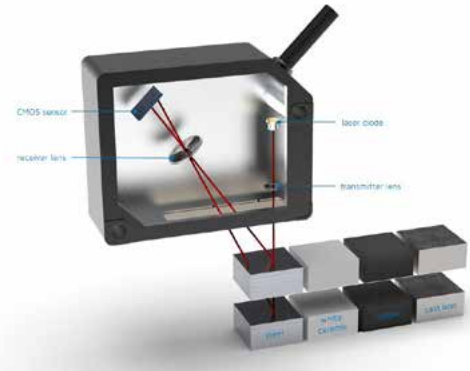
AXIS SERIES | LASER SENSORS

Fast and high-precision sensors, based on the triangulation principle with an excellent price-performance-ratio





- AXIS-MI: Miniature laser triangulation sensors with integrated electronics
- AXIS-P: Performance laser sensors - powerful sensors for factory automation
- AXIS-HP: High-Performance sensors - for high-precision quality testing
- AXIS-LR: Long-Range sensors - for long measuring ranges


The digital laser sensors of the AXIS series measure the distance or the position of an object in a highly reliable, non-contact and wear-free manner. The triangulation principle is used to measure the distance or position of the target. The sensor emits a laser beam which is reflected by the target. Through a lens the reflected light hits a highly sensitive CMOS sensor at a defined angle. A change of the distance to the measuring object causes a change of angle and thus also a shifting light spot on the CMOS sensor. From this the distance to the measuring object is calculated. Thanks to an integrated controller, the sensor automatically adapts to different materials. Stable measurements on difficult or changing surfaces are thus possible. Depending on requirements, AXIS series sensors are available in different sizes and ranges.




Miniature sensors

Small and lightweight designs with high precision	AXIS-MI		<ul style="list-style-type: none"> 10 mm 104 mm
	AXIS-MI		<ul style="list-style-type: none"> 50 mm 300 mm 500 mm


Performance sensors

Powerful sensors for factory automation	AXIS-P		<ul style="list-style-type: none"> 40 mm 100 mm 250 mm 500 mm 800 mm
	AXIS-P-800		

High-Performance sensors

Sensors with measuring accuracy in the sub-micro-meter range	AXIS-HP SHORT-RANGE		<ul style="list-style-type: none"> 40 mm 100 mm 200 mm
	AXIS-HP MID-RANGE		<ul style="list-style-type: none"> 500 mm 900 mm 1350 mm

Long-Range sensors

For distances of up to 13 meters	AXIS-LR LONG-RANGE		<ul style="list-style-type: none"> 3,8 m 13 m
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Accuracy (linearity error of the measuring range)	Measuring rate	Beam shape		Inputs / Outputs				Special features	Page
		point	line	analog	digital interface	input	output		
± 0,08% ± 0,1 % MR 16 ...70mm ± 0,16 % MR 16 ...120mm	2,2 kHz	■		analog	RS 485	teach-in	-	<ul style="list-style-type: none"> Smallest distance-measuring sensor with integrated electronics Rugged metal housing Max. current consumption < 80 mA Supply Voltage 12 - 28 VDC 	4
± 0,08% ± 0,1% MR, 50...200mm ± 0,15% MR, 50...350mm ± 0,23%	2,2 kHz	■	■						alarm
± 0,15% ± 0,2% ± 0,4% ± 0,4% ± 1,25%	2,2 kHz	■	■	analog	-	teach-in/ synch	alarm	<ul style="list-style-type: none"> Automatic power, voltage detection Max. current consumption < 100 mA Supply Voltage 12 - 28 VDC 	6
± 0,06% ± 0,07% ± 0,09%	2,5 kHz	■	■	Analog	RS 485	Synch	alarm and digital output	<ul style="list-style-type: none"> Resolution up to 0.7 μm, linearity deviation up to 0.06 % Measuring distances up to 1500 mm Focus ranges for maximum reliability with demanding measurement objects Excellent ambient light immunity Max. current consumption < 75 mA Supply Voltage 12 - 28 VDC 	7
± 0,12% ± 0,19% ± 0,32%	2,5 kHz	■	■						
± 0,4% ± 0,11%	0,1 kHz	■		Analog		teach-in	alarm	<ul style="list-style-type: none"> Sensors for measuring ranges up to 13 meters Max. current consumption < 250 mA Supply Voltage 12 - 28 VDC 	8



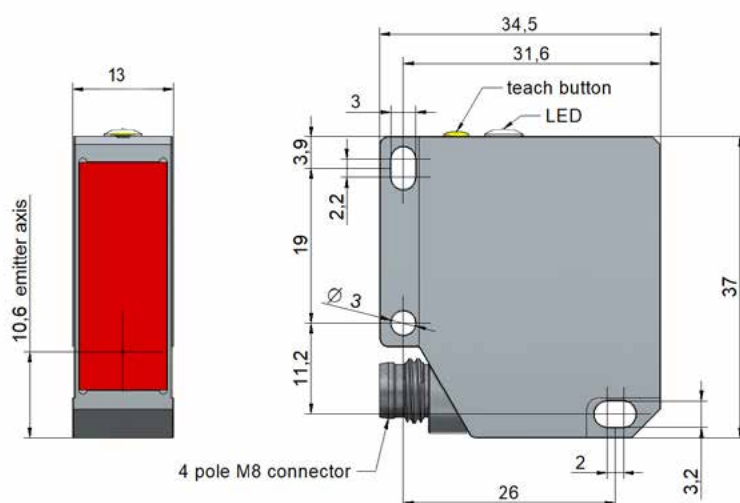
SERIES AXIS-MI | MINIATURE

AXIS-MI	MINIATURE			
Measuring distance [mm]	16...26		16...120	
Measuring ranges [mm]	10		104	
Resolution	1...3,2 μ m		2...35 μ m	
Linearity error	$\pm 0,08$ % Mr		$\pm 0,1$ % Mr , 16 ... 70 mm $\pm 0,16$ % Mr , 16 ... 120 m	
Response / release time	0,4 ms			
Laser class	1			
Temperature drift	$\pm 0,01$ % Sde/K		$\pm 0,04$ % Sde/K	
Beam shape	point			
Housing material	pie-cast zinc			
Dimension	13 x 37 x 34,5 mm			
Connection types	M8, 4-pin			
Operating temperature	-10 ... +50 °C			
Protection class	IP67			
Ambient light immunity	<100 kLux			
Output	current / voltage	RS485	current / voltage	RS485
Digital input	Teach-In			
Additional functions	parameterization using teach-in button or externally			

ORDER CODE BEAM SHAPE LASERPOINT				
Current output	AXIS-MI-10-1	-	AXIS-MI-104 -1	-
Voltage output	AXIS-MI-10-2	-	AXIS-MI-104 -2	-
RS485	-	AXIS-MI-10-9	-	AXIS-MI-104-9

TECHNICAL DRAWINGS

■ AXIS-MI (MEASURING RANGE 10 MM,104 MM)





SERIES AXIS-MI | MINIATURE

AXIS-MI	MINIATURE					
Measuring distance [mm]	50 ... 100		50 ... 350		50 ... 550	
Measuring ranges [mm]	50		300		500	
Resolution	2... 16 µm		1 ... 100 µm		2 ... 160 µm	
Linearity error	± 0,08% Mr		± 0,1% Mr, 50... 200mm ± 0,15% Mr, 50... 350mm		± 0,23% Mr	
Response time / release time	0,4 ms					
Laser class	2					
Temperature drift	± 0,02% Sde/K		± 0,05% Sde/K		± 0,08% Sde/K	
Beam shape	line		point or line			
Housing material	aluminium					
Dimension	13,46x 49 x 40,3 mm					
Connection types	M8, 4-pin					
Operating temperature	-10 ... +50 °C					
Safety class	IP67					
Ambient light immunity	<100 kLux					
Analog	current / voltage	RS485	current / voltage	RS485	current / voltage	RS485
Digital input	teach-In					
Additional functions	parameterization using teach-in button or externally					

ORDER CODE BEAM SHAPE LASER POINT

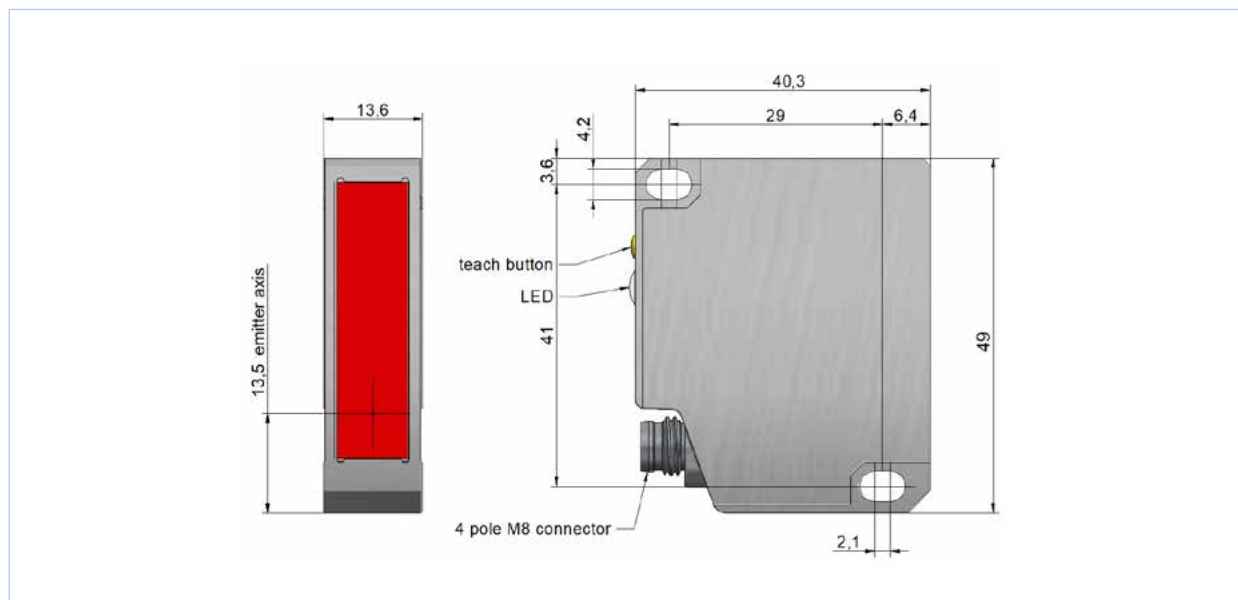
Current output	AXIS-MI-50-1	-	AXIS-MI-300-1	-	AXIS-MI-500-1	-
Voltage output	AXIS-MI-50-2	-	AXIS-MI-300-2	-	AXIS-MI-500-2	-
RS485	-	AXIS-MI-50-9	-	AXIS-MI-300-9	-	AXIS-MI-500-9

ORDER CODE BEAM SHAPE LASER LINE

Current output	AXIS-MI-50-3	-	AXIS-MI-300-3	-	AXIS-MI500-3	-
Voltage output	AXIS-MI-50-4	-	AXIS-MI-300-4	-	AXIS-MI-500-4	-
RS485	-	AXIS-MI-50-10	-	AXIS-MI-300-10	-	AXIS-MI-500-10

TECHNICAL DRAWINGS

■ AXIS-MI (MEASURING RANGE 50 MM, 300 MM, 500 MM)





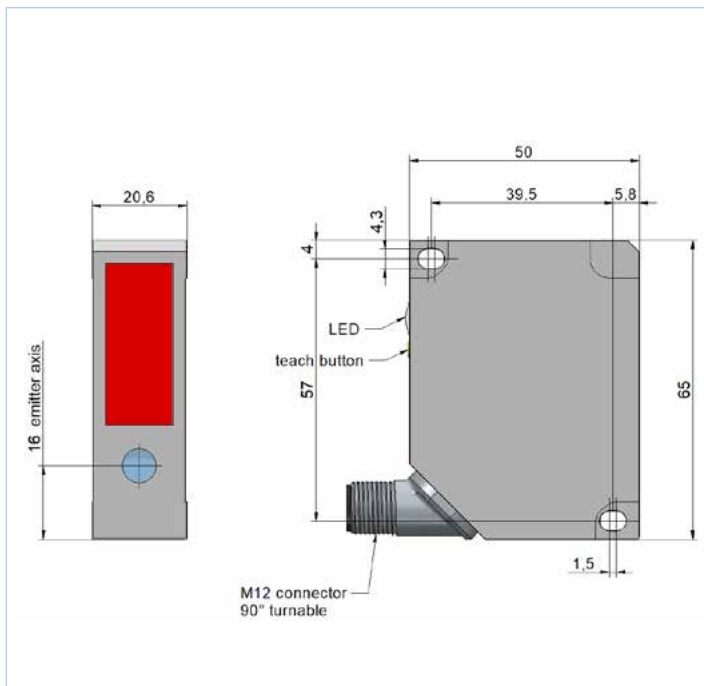
SERIES AXIS-P | PERFORMANCE

	PERFORMANCE								AXIS-P-800
Measuring distance [mm]	30 ...70	30 ...130	50 ...300	100 ...600	30 ...70	30 ...130	50 ... 300	100 ...600	200 ...1000
Measuring ranges [mm]	40	100	250	500	40	100	250	500	800
Resolution [μ m]	4 ...20	5 ...60	10 ...330	15 ...670	4 ... 20	5 ...60	10...330	15...670	20...400
Linearity error	$\pm 12 \dots$ $\pm 60 \mu\text{m}$ $\pm 0,15\%$	$\pm 15 \dots$ $\pm 200 \mu\text{m}$ $\pm 0,20\%$	$\pm 30 \dots$ $\pm 1000 \mu\text{m}$ $\pm 0,40\%$	$\pm 50 \dots$ $\pm 2000 \mu\text{m}$ $\pm 0,40\%$	$\pm 12 \dots$ $\pm 60 \mu\text{m}$ $\pm 0,15\%$	$\pm 15 \dots$ $\pm 200 \mu\text{m}$ $\pm 0,20\%$	$\pm 30 \dots$ $\pm 1000 \mu\text{m}$ $\pm 0,40\%$	$\pm 50 \dots$ $\pm 2000 \mu\text{m}$ $\pm 0,40\%$	$\pm 0,11\dots$ 1,65 mm
Response / release time	0,9 ms				0,9 ms				< 4 ms
Laser class	2				2				
Temperature drift [Sde/K]	-				$\pm 0,015\%$	$\pm 0,03\%$			< 0,02 %
Beam shape	point				point or line				
Housing material	die-cast zinc								aluminium
Dimension [mm]	13,4 × 48,2 × 40								20,4x135x45
Connection types	M12, 5-pin				M12, 8-pin				
Operating temperature	0 ... +50 °C								
Protection class	IP67								
Ambient light immunity	-				50 kLux	40 kLux	8 kLux	10 kLux	< 10 kLux
Analog output	current / voltage output								
Digital output	-				alarm				
Digital input	teach-In				teach-in und sync				
Additional functions	parameterization using teach-in button or externally; automatic power and voltage detection								

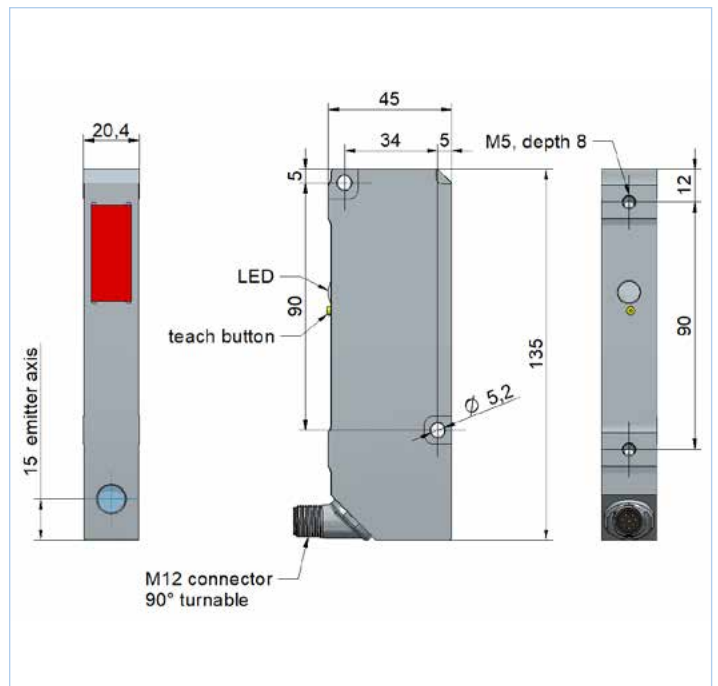
ORDER CODE BEAM SHAPE LASERPOINT									
Current output	AXIS-P-40-1	AXIS-P-100-1	AXIS-P-250-1	AXIS-P-500-1	-	-	-	-	-
Voltage output	AXIS-P-40-2	AXIS-P-100-2	AXIS-P-250-2	AXIS-P-500-2	-	-	-	-	-
Current / voltage	-	-	-	-	AXIS-P-40-7	AXIS-P-100-7	AXIS-P-250-7	AXIS-P-500-7	AXIS-P-800-3
ORDER CODE BEAM SHAPE LASER LINE									
Current / Voltage	-	-	-	-	AXIS-P-40-8	AXIS-P-100-8	AXIS-P-250-8	AXIS-P-500-8	AXIS-P-800-4

TECHNICAL DRAWINGS

■ AXIS-P



■ AXIS-P-800





SERIES AXIS-HP | HIGH-PERFORMANCE

AXIS-HP	SHORT-RANGE			MID-RANGE			
Measuring distance [mm]	30 ...70	40 ...140	50 ...250	100 ...600	100 ... 1000	150 ... 1500	
Measuring ranges [mm]	40	100	200	500	900	1350	
Focus range	55 ... 70 mm	110 ... 140 mm	200 ... 250 mm	400 ... 600 mm	750 ... 1000 mm	1000 ... 1500 mm	
Sweetspots	65 mm	130 mm	240 mm	500 mm	1000 mm	1500 mm	
Resolution [μ m]	0,7 ... 1	1,2 ... 2,5	1,4 ... 6,3	3 ... 24	3 ... 63	13 ... 125	
Repeat accuracy	0,1 ... 0,3 μ m	0,3 ... 0,7 μ m	0,3 ... 2 μ m	1 ... 9 μ m	1 ... 32 μ m	3 ... 63 μ m	
Linearity error	\pm 24 μ m \pm 0,06%	\pm 70 μ m \pm 0,07%	\pm 180 μ m \pm 0,09%	\pm 600 μ m \pm 0,12%	\pm 1710 \pm 0,19%	\pm 4320 μ m \pm 0,32%	
Response / release time	0,8 ms						
Measuring rate	2,5 kHz						
Laser class	1			1	2	1	2
Temperature drift [Sde/K]	\pm 0,009%	\pm 0,014%	\pm 0,025%	\pm 0,038%	\pm 0,065%	\pm 0,1%	
Beam shape	point or line						
Housing material	aluminium						
Housing material	26 x 74 x 55 mm						
Connection types	M12, 8-pin			M12, 8-pin			
Operating temperature	-10 ... +50 °C						
Protection class	IP67						
Ambient light immunity	28 kLux	35 kLux	< 170 kLux	170 kLux	300 kLux	<100 kLux	35 kLux
Analog output	current / voltage output						
Digital interface	RS485						
Digital output	alarm and switching output						
Digital input	sync und RS485						
Additional functions	Distance or tolerance function: Selectable filtering, configurable, digital switching output with adjustable hysteresis in millimeters, various trigger modes, touch display, changeover between current or voltage output, 3 memory slots for parameter settings						

ORDER CODE BEAM SHAPE LASERPOINT

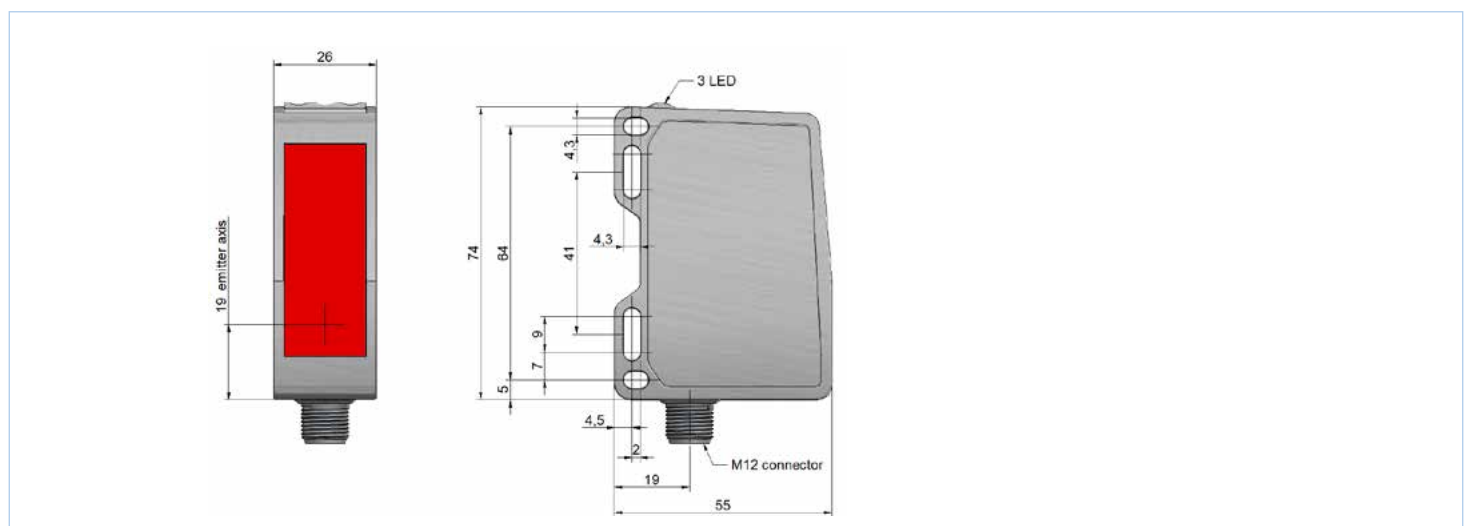
Function: distance	AXIS-HP-40-1	AXIS-HP-100-1	AXIS-HP-200-1	AXIS-HP-500-1	AXIS-HP-500-5	AXIS-HP-900-1	AXIS-HP-900-5	AXIS-HP-1350-1	-
Function: tolerance	AXIS-HP-40-2	AXIS-HP-100-2	AXIS-HP-200-2	-	-	-	-	-	-

ORDER CODE BEAM SHAPE LASER LINE

Function: distance	AXIS-HP-40-3	AXIS-HP-100-3	AXIS-HP-200-3	AXIS-HP-500-3	AXIS-HP-500-7	AXIS-HP-900-3	AXIS-HP-900-7	AXIS-HP-1350-3	AXIS-HP-1350-7
Function: tolerance	AXIS-HP-40-4	AXIS-HP-100-4	AXIS-HP-200-4	-	-	-	-	-	-

TECHNICAL DRAWINGS

AXIS-HP





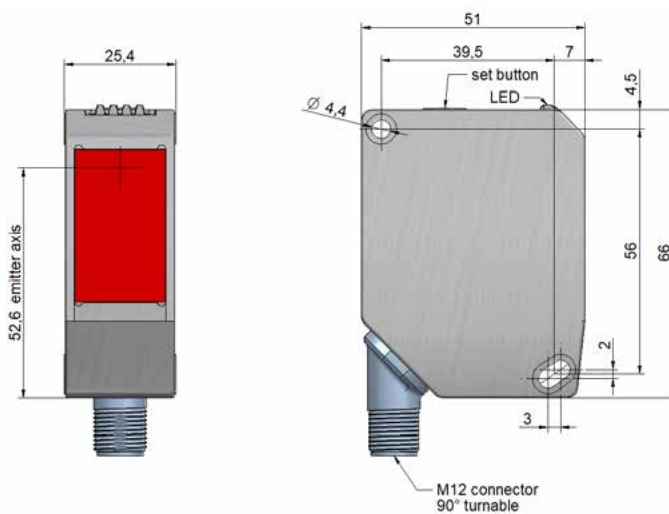
SERIES AXIS-LR | LONG-RANGE

AXIS-LR	LONG-RANGE	
Measuring distance [mm]	200 ... 4000	200 ... 13 000
Measuring ranges [mm]	3800	12 800
Resolution	1,3 mm	5 mm
Repeat accuracy	± 5 mm	± 15 mm
Linearity error	± 15 mm ± 0,49%	± 15 mm ± 0,11%
Response / release time	20 ms	
Laser class	2	
Temperature drift [Sde/K]	± 0,005% Sde/K	± 0,003% Sde/K
Beam shape	point	
Housing material	aluminium	
Dimension	25,4 × 66 × 51 mm	
Connection types	M12, 5-pin	
Operating temperature	-25 ... +50 °C	
Protection class	IP67	
Ambient light immunity	40 kLux	
Analog output	current / voltage output	
Digital output	alarm	
Digital input	teach-In	
Additional functions	parameterization using teach-in button or externally	

ORDER CODE BEAM SHAPE LASERPOINT		
Current output	AXIS-LR-3800-1	AXIS-LR-12800-1
Voltage output	AXIS-LR-3800-2	

TECHNICAL DRAWINGS

■ AXIS-LR



ACCESSORIES

■ CONNECTION CABLE (SHIELDED) FOR CONNECTOR OUTPUT

CABLE WITH STRAIGHT CONNECTOR		CABLE WITH ANGULAR CONNECTOR			
AXIS-MI	K4P2M-S-M8	2 m	AXIS-MI	K4P2M-SW-M8	2 m
	K4P5M-S-M8	5 m		K4P5M-SW-M8	5 m
	K4P10M-S-M8	10 m		K4P10M-SW-M8	10 m
AXIS-P / AXIS-LR	K5P2M-S-M12	2 m	AXIS-P / AXIS-LR	K5P2M-SW-M12	2 m
	K5P5M-S-M12	5 m		K5P5M-SW-M12	5 m
	K5P10M-S-M12	10 m		K5P10M-SW-M12	10 m
AXIS-P, AXIS-P-800 / AXIS-HP	K8P2M-S-M12	2 m	AXIS-P, AXIS-P-800 / AXIS-HP	K8P2M-SW-M12	2 m
	K8P5M-S-M12	5 m		K8P5M-SW-M12	5 m
	K8P10M-S-M12	10 m		K8P10M-SW-M12	10 m

■ MOUNTING ACCESSORIES

AXIS-MI	mounting bracket L design, steel
AXIS-P	mounting bracket L design, steel
AXIS-HP	mounting bracket X7 L design 90°, accessories included
	mounting bracket X7 L design 30° horizontal, accessories included
	mounting bracket X7 L design 30° vertical, accessories included

■ FLEXMOUNT SERIES, MOUNTING ACCESSORIES

FLEXMOUNT	
AXIS-MI, measuring range 10mm, 104mm	■ Simple and fast assembly
AXIS-MI, measuring range 50mm, 300mm, 500mm	■ Clamps out of stainless steel; ball pivots out of galvanized steel; mounting panel out of stainless steel

■ **AXIS-MI | M8**

PIN	CABLE COLOUR	FUNCTION	
		ANALOG	RS485
1	brown	+Vs	
2	white	teach-in	Rx/ Tx -
3	blue	0 V	
4	black		Rx/ Tx +

■ **AXIS-P | M12**

PIN	FUNCTION	CABLE COLOUR
1	+Vs	brown
2	analog	white
3	0 V	blue
4	n.c.	black
5	ext. teach	grey

■ **AXIS-P, AXIS-P-800 | M12**

PIN	FUNCTION	CABLE COLOUR
1	n.c.	white
2	+Vs	brown
3	analog I	green
4	ext. teach	yellow
5	alarm	grey
6	analog U	pink
7	0 V	blue
8	sync. in	red

■ **AXIS-HP | M12**

PIN	FUNCTION	CABLE COLOUR
1	Rx/Tx-	white
2	+Vs	brown
3	analog	green
4	out	yellow
5	alarm	grey
6	Rx/Tx+	pink
7	0 V	blue
8	sync. in	red

■ **AXIS-LR | M12**

PIN	FUNCTION	CABLE COLOUR
1	+Vs	brown
2	analog	white
3	0 V	blue
4	alarm	black
5	ext. teach	grey

