## PSxxx-90 Pulse Sensor

#### 2D Laser Scanner



- Long range up to 300 m
- Small spot size
- High lateral resolution
- Fast scan rate
- Very high accuracy in range and angle
- Tough and robust housing, rate IP67
- Multi-echo evaluation technology
- Operating with rain and snow
- Real time Ethernet

#### PSxxx-90 Applications

PSxxx-90 is the backbone of the whole Triple-IN sensors portfolio, providing rapidly and efficiently accurate and detailed 3D data. PSxxx-90 is suitable for both indoor and outdoor applications, ensuring also goals achievement for existing systems integration.

**Automation, profile detection, monitoring, surveying and safety** in different fields are only some of the most suitable applications.

## PSxxx-90 Technical Data

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Maxir lamber Maxir lamber Minin ACCURACY DAT Resol Repeat Accur Divergin scal Diverging	imum Range @ R = 100%, pertian Reflector (m) imum Range @ R = 10%, pertian Reflector (m) imum Range (m)  ATA  Solution (mm) eatability 1 \(\sigma\) @ strong signal (mm) eatability 1 \(\sigma\) @ weak signal (mm) eatability 1 \(\sigma\) @ weak signal (mm)  TIES  rgence ean direction (°) rgence and direction (mrad) rgence perpendicular can direction (°)	95 2.1 1 5 15 ≤ 4 0.095 1.67	80 1.8 1 4 15 ≤ 4	45 0.6 1 4 15 ≤ 4
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Repeate Repeat	eatability 1 $\sigma$ @ strong signal (mm) eatability 1 $\sigma$ @ weak signal (mm) uracy (systematic error) (mm)  TIES  rgence ean direction (°) rgence ean direction (mrad) rgence perpendicular ean direction (°)	15 ≤ 4 0.095 1.67	15 ≤ 4 0.076	15 ≤ 4 0.04
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SPOT PROPERT Diversin scal Diversin scal Diversito scal Diversito scal Diversito scal Spot of Focus  SCAN AND PRO Maxin Scan Maxin OPERATIONAL Normal Mode Beam Meas Scan Scan Gap be Fine Mode Beam Meas Scan Scan Scan Scan Scan Scan Scan Scan	TIES rgence an direction (mrad) rgence perpendicular can direction (°)	<ul><li>≤ 4</li><li>0.095</li><li>1.67</li></ul>	≤ 4 0.076	0.04
SPOT PROPERT  Divery in scale pivery in scale pivery to scale	rgence an direction (°) rgence an direction (mrad) rgence perpendicular can direction (°)	1.67		
Divery in scale Divery in scale Divery in scale Divery to scale Spot of Focus SCAN AND PROMAXING SCAN MAXING SCAN MODERATIONAL Mormal Mode Beam Meas Scan Scan Scan Scan Scan Scan Scan Scan	rgence an direction (°) rgence an direction (mrad) rgence perpendicular can direction (°)	1.67		
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in sca Diver, to sca Diver, to sca Spot o Focus  SCAN AND PRO Maxin Scan Maxin OPERATIONAL Normal Mode Beam Meas Scan Scan Gap b Fine Mode Beam Meas Scan Scan Scan Scan Scan Scan Scan Scan	an direction (mrad) rgence perpendicular can direction (°)		1.33	
to sca Divery to sca Spot of Focus SCAN AND PRO Maxin Scan Maxin OPERATIONAL Normal Mode Beam Meas Scan Scan Gap b Fine Mode Beam Meas Scan Scan Scan Scan	can direction (°)	0.020		0.7
Divery to sea Spot of Focus  SCAN AND PRO Maxin Scan Maxin  OPERATIONAL Normal Mode Beam Meas Scan Scan Scan Scan Meas Fine Mode Beam Meas Scan Scan Scan Scan Scan Scan Scan Scan		0.020	0.020	0.020
to sca Spot of Focus SCAN AND PRO Maxin Scan Maxin OPERATIONAL Normal Mode Beam Meas Scan Scan Gap b Fine Mode Beam Meas Scan Scan Scan Scan	rgence perpendicular		0.020	0.020
Spot of Focus  SCAN AND PRO  Maxin Scan Maxin  OPERATIONAL Normal Mode Beam Meas Scan Scan Gap b  Fine Mode Beam Meas Scan Scan Scan Scan Scan Scan Scan		0.3	0.3	0.3
Focus SCAN AND PRO Maxin Scan Maxin OPERATIONAL Normal Mode Beam Meas Scan Gap b Fine Mode Beam Meas Scan Scan Gap b Fine Mode Scan Scan Scan Scan Scan	can direction (mrad)	0.5	0.5	0.5
Maxin Scan Maxin Scan Maxin Scan Maxin OPERATIONAL Normal Mode Beam Meas Scan Scan Scan Scan Scan Scan Meas Scan Meas Scan Meas Scan Scan Scan Scan Scan Scan Scan Scan	close to the sensor window (mm)	12 x 16	12 x 16	12 x 16
Maxin Scan Maxin OPERATIONAL Normal Mode Beam Meas Scan Scan Gap b Fine Mode Beam Meas Scan Scan Scan Scan	ising distance (m)	45	45	45
Maxir Scan Maxin OPERATIONAL Normal Mode Beam Meas Scan Scan Gap b Fine Mode Beam Meas Scan Scan Scan	OFILE PROPERTIES			
Scan Maxin  OPERATIONAL  Normal Mode Beam Meas Scan Scan Gap b  Fine Mode Beam Meas Scan Scan Scan Scan	imum Scan and Profile Angle	90°	90°	90°
Maxin  OPERATIONAL  Normal Mode  Beam  Meas  Scan  Scan  Gap b  Fine Mode  Beam  Meas  Scan  Scan  Scan  Scan	Mirror Type	4 Mirror Polygon	4 Mirror Polygon	4 Mirror Polygon
OPERATIONAL Normal Mode Beam Meas Scan Scan Gap b Fine Mode Beam Meas Scan Scan Scan	mum Scanning Duty Cycle	50%	50%	50%
Normal Mode Beam Meas Scan Scan Gap b Fine Mode Beam Meas Scan Scan Scan				
Beam Meas Scan Scan Gap b Fine Mode Beam Meas Scan Scan				
Meas Scan Scan Gap b Fine Mode Beam Meas Scan Scan Scan		0.00	0.00	0.00
Scan Scan Gap b Fine Mode Beam Meas Scan Scan Scans	m Scan Angle Step (°)	0.09	0.09	0.09
Scan Gap b Fine Mode Beam Meas Scan Scan Scans	surements in 90° Scan	1000	1000	1000
Gap b Fine Mode Beam Meas Scan Scan Scans	,	20	20	20
Fine Mode Beam Meas Scan Scan Scan	Time @ 90° Scan (ms)	25	25	25
Beam Meas Scan Scan Scans	between Spots in Scan (°)	Overlap 0.005	0.014	0.050
Meas Scan Scan Scans	n Scan Angle Steps in Profile (°)	0.023	0.023	0.023
Scan Scan Scans	surements in 90° Scan	1000	1000	1000
Scan Scans				
Scans	ı Time @ 90° Scan (ms)	20 25	20 25	20 25
		4	4	4
PIOIII	ile Rate (Hz)	5	5	5
	ile Time @ 90° Scan (ms)	200	200	200
	surements in Profile	4000	4000	4000
		0.072	0.053	0.017
overi Fast Mode		0.072	0.055	0.017
	rlap of Spots in Scan (°)	0.18	0.18	0.18
	rlap of Spots in Scan (°)		500	500
	rlap of Spots in Scan (°) m Scan Angle Step (°)		40	40
	rlap of Spots in Scan (°) m Scan Angle Step (°) surements in 90° Scan	500	+∪	12.5
Gap b	rlap of Spots in Scan (°) m Scan Angle Step (°)		12.5	J / J

Sensor	PS300-90	PS250-90	PS100-90
MULTI-ECHO EVALUATION			
Echoes evaluated	4	4	4
Selectable echoes	First or last	First or last	First or last
TARGET SURFACE TEMPERATURE			
Temperature Range	T < 500°C	T < 500°C	T < 500°C
LASER DATA			
Measurement Laser			
Measurement Laser Type	Pulse Laser Diode	Pulse Laser Diode	Pulse Laser Diode
Wave Length (nm)	905	905	905
Safety Class; EN 60825-1; 94,96,01	1M	1M	1
Measurement or Pulse Rate (kHz)	40	40	40
Red Laser Marker			
Red Laser Marker (indicate the spot)	DC Laser Diode	DC Laser Diode	DC Laser Diode
Wave Length (nm)	635-678	635-678	635-678
Safety Class; EN 60825-1; 94,96,01	2	2	2
INTERFACES			
Ethernet	UDP 100 Mb/s	UDP 100 Mb/s	UDP 100 Mb/s
RS232 for Sensor Programming	115 kBaud, 8n1	115 kBaud, 8n1	115 kBaud, 8n1
Discrete Switching Outputs	2; programmable	2; programmable	2; programmable
External Encoder Inputs	Incremental Encoder; A, B	Incremental Encoder; A, B	Incremental Encoder; A, B
POWER SUPPLY			
Power Voltage	24 VDC ± 5 VDC	24 VDC ± 5 VDC	24 VDC ± 5 VDC
Direct Power Supply	✓	✓	✓
POE Supply	✓	✓	✓
Power Consumption (W)	7	7	7
Start-up Time (s)	< 30	< 30	< 30
SENSOR PROTECTION			
Ingress Protection	IP67	IP67	IP67
Operating Temperature Range	-30°C to +50°C	-30°C to +50°C	-30°C to +50°C
Temperature Range for Storage	-30°C to + 80°C	-30°C to + 80°C	-30°C to + 80°C
Enclosure	Aluminum, Die Cast; Seawater resistant	Aluminum, Die Cast; Seawater resistant	Aluminum, Die Cast; Seawater resistant
Enclosure Finish	Powder coated	Powder coated	Powder coated
Front Screen	AR-coated glass	AR-coated glass	AR-coated glass
Function in strong Sunshine	Ambient light control	Ambient light control	Ambient light control
DIMENSIONS & WEIGHT		22	
Height x Width x Length (mm)	247 x 121 x 109	247 x 121 x 109	247 x 121 x 109
Weight (kg)	2.6	2.6	2.6

Options		PS300-90	PS250-90	PS100-90
Order No.	Description			
1001	Customized focusing distance	From 3 to < 45 m	From 3 to < 45 m	From 3 to < 45 m
1002	Enlarged beam divergence	up to 0.2°x0.2°	up to 0.09°x0.09°	None
1003	Spirit level, 0°-90° field of view	✓	✓	$\checkmark$
1004	Spirit level, 45°-135° field of view	✓	✓	✓
1005	Spirit level, 90°-180° field of view	✓	✓	✓

Accessories for all versions		
Order No.	Description	
1051	Window protection tube	
1081	Developer kit for PSxxx-90	
9051	Power Over Ethernet Injector in: 100-240 VAC out: 24 VDC	
9052	Serial, Power and Multifunction cable, 5 m, 90°	
9053	8 pin Ethernet data cable with POE support, 5 m, 90°	
9061	8 pin Ethernet data cable with POE support, 10 m, 90°	
9069	Triple-IN universal adapter for tribrach	
9070	Center plug for tribrach	
9071	Tribrach adapter	
9072	Universal tribrach	
9074	Sensor holder, sensor field of view: 45°-135°	
9075	Sensor holder, sensor field of view: 90°-180°	

## PSxxx-90 HT – Special Versions

PSxxx-90 HT are special versions dedicated to High Temperature operating conditions.

Technical data are based on standard PSxxx-90 sensors, with essential improvements to stand hard working conditions where temperature is extremely high, such as in steel industry.

	PS250-90 HT	PS100-90 HT
Order No.	2700	2600
TARGET SURFACE TEMPERATURE		
Target Temperature Range	T ≤ 1200°C	T ≤ 1200°C
WORKING RANGE		
Maximum Range @ R = 100%, lambertian Reflector (m)	100	50
Maximum Range @ R = 10%, lambertian Reflector (m)	30	20
Minimum Range (m) Sensor must be protected!	2.5	1.8

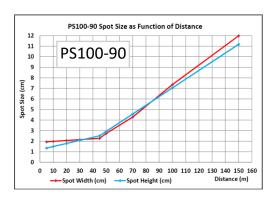
#### PSxxx-90 Features as function of Target Distance

#### **SPOT SIZE vs TARGET DISTANCE**

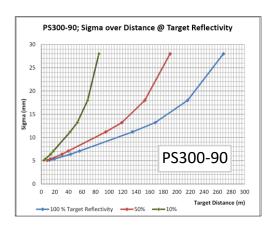
# PS300-90 Spot Size as Function of Distance 70 65 60 55 50 45 40 35 20 25 20 15 PS300-90

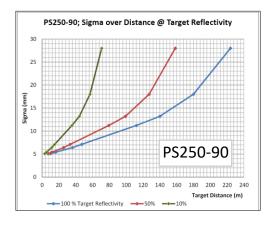
→ Spot Height (cm) → Spot Width (cm)

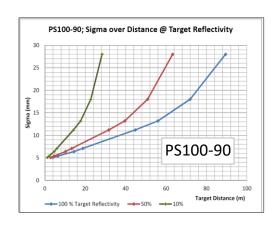
## PS250-90 Spot Size as Function of Distance PS250-90 35 Spot Size (cm) 25 20 15 10 20 80 100 120 140 160 180 200 220 240 260 → Spot Height (cm) → Spot Width (cm)



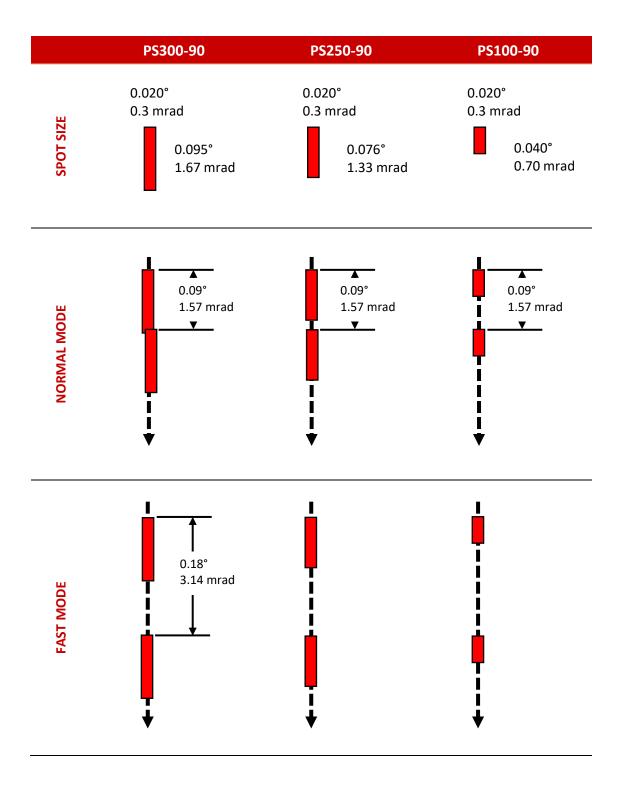
#### **SIGMA vs TARGET DISTANCE**



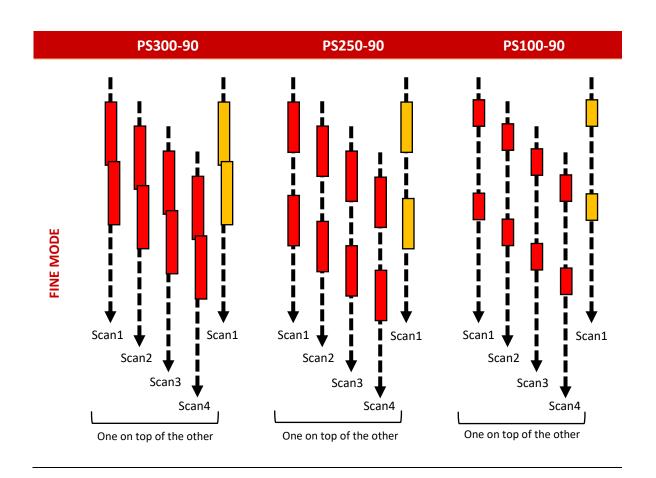




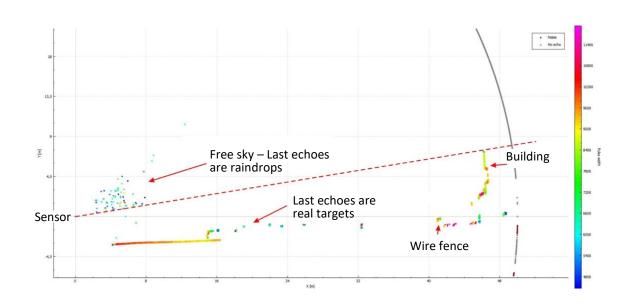
## PSxxx-90 Spot Size and Scan Modes



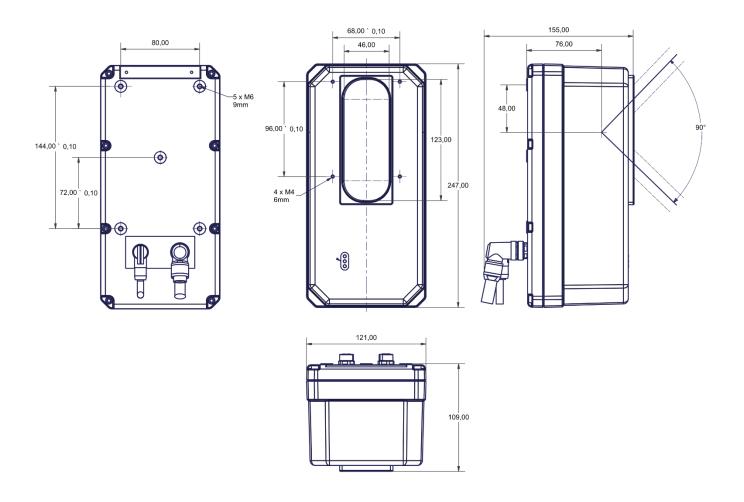
#### PSxxx-90 Spot Size and Scan Modes



## PSxxx-90 Multi-echoes Evaluation



#### PSxxx-90 Dimensions Drawings



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