1.1.2.11 Short Exposure High Power Sensors

1.1.2.11.1 Helios Plus

50W to 12,000W

Features

- No water cooling, up to 12,000W
- Profinet / EtherNet/IP / EtherCAT and RS232 interfaces
- Remote actuated protective cover
- Dual wavelength range IR & visible spectrum
- Field replaceable protective window

Helios Plus - Profinet /
Helios Plus - EtherNet/IP /
Helios Plus - EtherCAT

Helios Plus - EtherNet/IP-M

The Helios Plus measures high power industrial lasers of up to 12kW by measuring the energy of a short time exposure to this power. The laser is set to a pulse of from 0.3 to several seconds. The Helios Plus measures the energy and exposure time of this sample of the power, and from this calculates the power. By keeping the pulse energy under 5 kJ, there is no need for water cooling and the sensor can be kept to a compact size. It works in two wavelength ranges: 900-1100nm (Near IR) and 450-550nm (Blue-Green). The sensor is housed in a dust-resistant industrial body to keep the Helios Plus in clean working order even under harsh factory conditions. Its protective cover can be opened and closed remotely to protect the sensor when not in use. Its protective window is antireflection coated to reduce back reflection from high power beams. The Helios Plus offers three industrial communication protocols: Profinet, EtherNet/IP and EtherCAT, with an additional RS232 interface. It is equipped with two power and two data ports for easy integration into existing line or ring topologies as well as an RS232 connection. The Helios Plus comes with a simple PC application for easier integration into the customer's system.

Helios Plus Model Table:

Model	Description	Communication	Data connectors	Power connectors	P/N
Helios Plus - Profinet V1	Profinet, AIDA compatible connectors for power and data	Profinet, RS232	2x AIDA compatible RJ45 connectors, 1x RS232 - DB9 connector	2x AIDA compatible connectors	**7Z07134**
Helios Plus - EtherNet/IP	EtherNet/IP, AIDA compatible connectors for power and data	EtherNet/IP, RS232	2x AIDA compatible RJ45 connectors, 1x RS232 - DB9 connector	2x AIDA compatible connectors	**7Z07101**
Helios Plus - EtherNet/IP-M	EtherNet/IP, M12 connector for data, Mini 7/8" connector for power	EtherNet/IP, RS232	2x M12 D - coded connectors, 1x RS232 - DB9 connector	2x Mini 7/8" connectors (male / female)	**7Z07104**
Helios Plus - EtherCAT	EtherCAT, AIDA compatible connectors for power and data	EtherCAT, RS232	2x AIDA compatible RJ45 connectors, 1x RS232 - DB9 connector	2x AIDA compatible connectors	**7Z07105**

* For specifications please see page 102 and for drawings see page 103

Specifications of Helios Plus (following the Model Table on page 101)

Use	High power industrial laser measurement
Absorber Type	LP2, absorption ~94%
Power Range	50W - 12kW
Energy Range	100J - 5kJ
Exposure Time (see table below)	0.3- 4s [a]
Wavelength	450 - 550nm, 900 - 1100nm
Aperture	ø50mm
Max Beam Diameter	35mm
Maximum Energy Density	4kJ/cm^2
Calibration Uncertainty	±1.9%
Accuracy [b]	±3% (900 - 1100nm) ±3.5% (450 - 550nm)
Linearity with Energy	±1.5% [c]
Reproducibility	±1%
Response Time	3s
Waiting Time for Next Measurement	12s
Maximum Exposure Before Cooling Down is Necessary	Maximum operating temperature of 60ºC will be reached after exposure to 30kJ (e.g. 6 shots at 5000W, 1s). Cooling down time before another 5kJ shot, 3min.
Power Supply	24 VDC ±5%, max 2A (for daisy-chaining)
Power Consumption	4.8W
Dimensions	Model: Profinet, EtherNet/IP, EtherCAT - (L x W x H) mm - 200 x 100 x 84 (closed); 200 x 123 x 144 (open) Model: EtherNet/IP-M　　　　　　 - (L x W x H) mm - 200 x 122 x 84 (closed); 200 x 145 x 144 (open)
Position of Mounting Holes	6.6 mm holes spaced at 90x190 mm
Weight	Model: Profinet, EtherNet/IP, EtherCAT - 2.5kg, EtherNet/IP-M - 2.7 kg
Indicators	7 indicator LEDs
Operating Temperature	10 - 60ºC
Humidity	10 - 80%

Recommended exposure times and 1/e^2 Gaussian beam diameters	Laser Power W	Recommended Exposure s	Min 1/e^2 beam dia. mm	Laser Power W	Recommended Exposure s	Min 1/e^2 beam dia. mm
	50	2	9	2000	1	12
	100	2	9	5000	1	18
	500	2	9	10000	0.3	22
	1000	1	9	12000	0.3	25

Cover	Motor driven cover opens sideways
Accessories Supplied with Helios Plus	Model: Profinet, EtherNet/IP, EtherCAT - 1. Power Supply Cable (P/N 7Z10458A), 　　　　　　　　　　　　　　　　　　　　 2. Data Cable – Profinet & EtherCAT (7E01298), EtherNet/IP (P/N 7E01299) Model: EtherNet/IP-M　　　　　　　　 - No accessories included
Optional Accessories	Model: Profinet, EtherNet/IP, EtherCAT - 1. D9F to D9M Shielded 10m RS232 Cable (P/N 7E01209), 　　　　　　　　　　　　　　　　　　　　 2. Helios Plus Window Replacement Kit (P/N 7Z08369) Model: EtherNet/IP-M　　　　　　　　 - 1. D9F to D9M Shielded 10m RS232 Cable (P/N 7E01209), 　　　　　　　　　　　　　　　　　　　　 2. Helios Plus Window Replacement Kit (P/N 7Z08369), 　　　　　　　　　　　　　　　　　　　　 3. Power Supply Cable, 7/8" to flying leads termination 2m (P/N 7E01535), 　　　　　　　　　　　　　　　　　　　　 4. Data Cable, EtherNet/IP M12 to RJ45 plug IP67 3m Cable (P/N 7E11211)
Compliance	CE, UKCA, China RoHS
Part number	See P/Ns in Helios Plus Model Table on previous page 101

Notes: (a) Repetitive pulses can also be measured as long as the total exposure time is within this range.
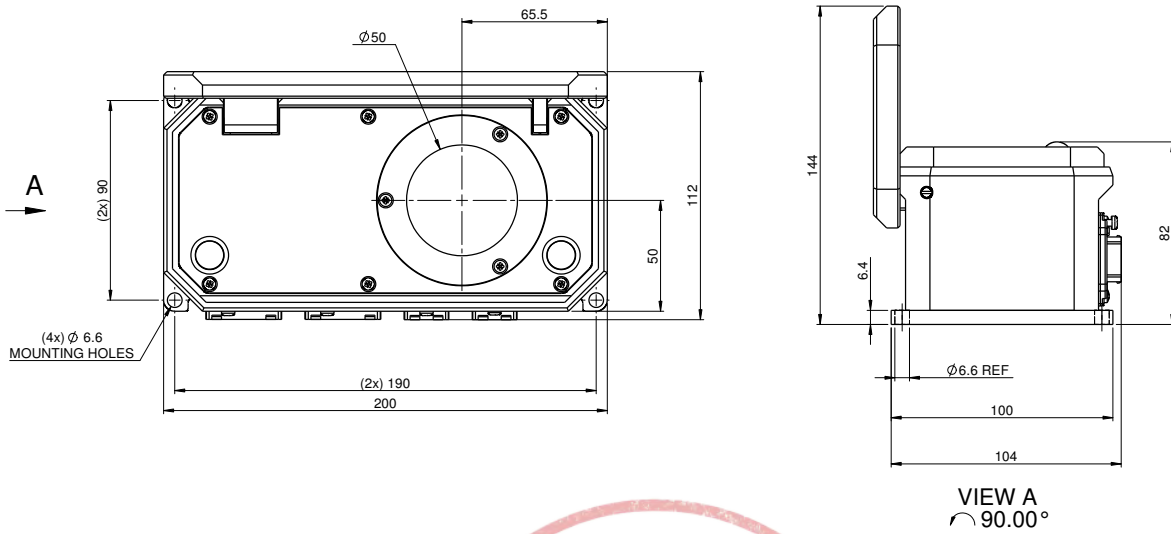　　　 (b) The power is calculated by measuring the energy and exposure time. The laser pulse is assumed to be rectangular for this calculation.
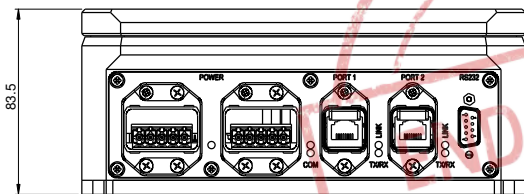　　　 (c) For pulse widths in the range 0.3 – 4s.
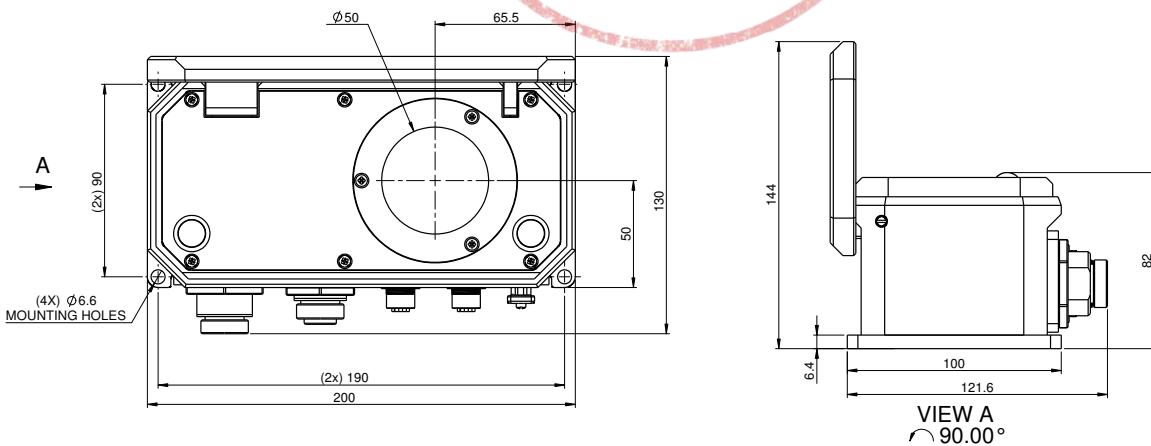
* For drawings please see page 103

Helios Plus Drawings

Helios Plus - Profinet / Helios Plus - EtherNet/IP / Helios Plus - EtherCAT with Cover Open

Helios Plus - Profinet / Helios Plus - EtherNet/IP / Helios Plus - EtherCAT with Cover Closed

Helios Plus - EtherNet/IP-M with Cover Open

Helios Plus - EtherNet/IP-M with Cover Closed