100mJ Laser Target Designator with Rangefinder

Model:JIO-Z100M

Overview

Laser photometer is used in conjunction with DYT field target strike test when target indication is used. It can provide fast and accurate targets for DYT; And can provide the straight-line distance parameters of the target. Compared with similar products, this product is small in size and light in weight.

This model of laser photometer adopts the integrated design, the system includes: laser light source & drive, ranging module, viewing system and control module, etc. 4 modules.

Main function

Target guidance

Target distance determination

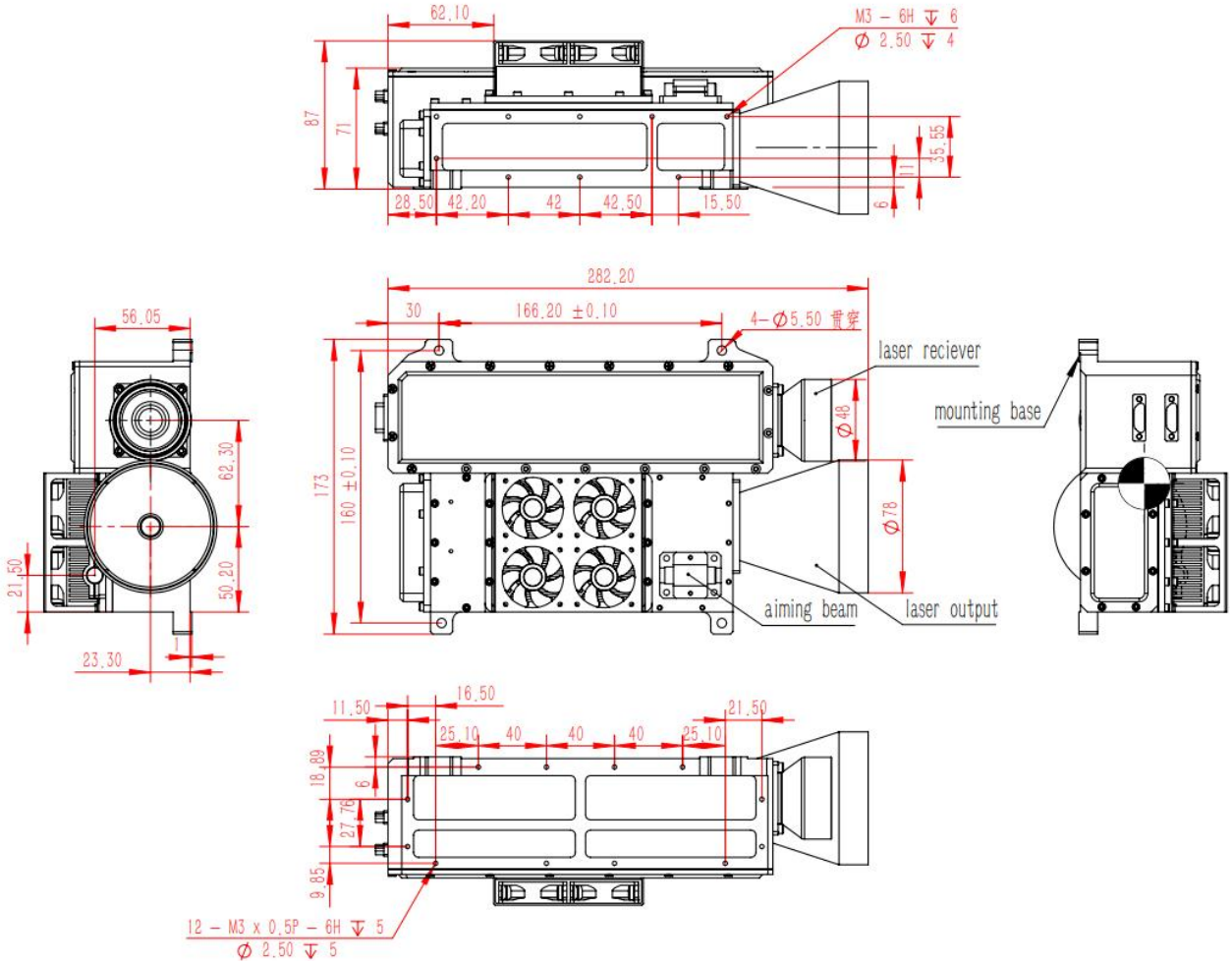
Disassembled aiming beam

Main technical indicators

MAIN PARAMETERS OF LASER LIGHT SOURCE	
Model	JIO-Z100M
Working wavelength	1064nm±1nm
Pump mode	semiconductor side pump
Irradiation frequency	accurate code 45ms—125ms(check code 20Hz)
Trigger method	Both Int. trigger and Ext. trigger (trigger delay : 304us+-1us)
Output energy	≥100mJ@20Hz
Max.Irradiation distance	≥12km
Q switching mode	electro-optical Q switching
Pulse width	10ns ~ 20ns
Beam divergence Angle	Using 0.15mrad (the acceptance method adopts hole-hole method, and the ratio of hole-hole to hole-free is not less than 86.5%)
Pulse energy stability	≤8%(RMS)
Irradiation working cycle	working 90s,interval 60s; 4 cycles (normal temperature or low temperature), 1 cycle(high temperature 60℃)
Power supply	DC 24V±4V
Power	<240W (normal temperature standby current: <2A, peak working current <10A, high and low temperature standby current <3.5A)
Communication serial port	RS422
External trigger interface	3V differential level drive, RS422 interface (delay time is 304us+/-1us from trigger signal to lase out)
Coding type	precise frequency coding, time coding, pseudo random coding
Using precision	<+-1us
LASER RANGING PARAMETERS	
Ranging mode	0~5hz ranging
Maximum measured distance	>30km (20km visibility, 2.3x2.3m typical target, target reflectance > 20%)
Minimum measured distance	300m
Ranging accuracy	±5m
ENVIRONMENTAL ADAPTABILITY	
Low temperature	Operating temperature: -40C
	Storage temperature: -45℃
High temperature	Operating temperature: + 60℃
	Storage temperature: +65℃.
Humid heat	Relative humidity: 95%±3%;
	Temperature: +35℃±2℃
	Storage time: 72h.
IMPACT	

Impact waveform	half sinusoidal pulse
Peak acceleration	10g
Pulse width	11ms
Number of shocks	3 in vertical axial direction
VIBRATION	
Frequency range	5~16Hz single amplitude displacement: 1.5mm
	16~200Hz (16~60Hz for optical equipment) acceleration: 1.5g
One scan time	12min
Duration	vertical axial 36min

Volume of full set



Electrical interface

1. Communication connector (socket model J30J-15ZKP, butt plug model J30J-15TJ) Pin definition

Pin	Definition	Content	Type of signal	Remarks
1	TX+	RS422 Send positive (local)	Output	Object host computer
2	TX -	RS422 Send negative (local)	Output	Object host computer

3	RX+	RS422 Receive positive (local)	Input	Object upper computer
4	RX -	RS422 Receive negative (local)	Input	Object upper computer
5	GND	Ground RS422	Signal ground	Object upper computer
6				Manufacturer's debug special
7				Manufacturer's debug special
8				Manufacturer's debug special
9				Manufacturer's debug special
10				Manufacturer's debug special
11				Manufacturer's debug special
12				Manufacturer's debug special
13				Manufacturer's debug special
14		External time system +	Input	RS422 differential
15		Outer time Tong -	Input	RS422 differential

2. Power connector (plug type J30J02P020P000S0P120, plug type J30J02P020S000S0L000) Pin definition

Pin Number	Definition	Remarks
A，B	24V	The wire color is red
C, D	GND	The wire color is black

Key performance indicators

Power supply and power consumption	Power supply range	20V ~ 33V, DC
	Power consumption	peak power is not more than 240W, standby power is not more than 60W (room temperature)
Reliability	MTBF is not less than 4000h (total firing time is larger than 3 millions)	
Security	Set up a warning device for the laser to work	
	The exit of the laser transmitter is provided with obvious warning signs	
	The equipment is well grounded	
Maintainability	All major functional components and equipment have both fault indicators and indicators for normal operation	
	The average repair time MTTR is not more than 20min	
Electromagnetic compatibility requirements	In the system boot-up process, the equipment can be compatible with other equipment in the system and operate normally	

Environmental adaptability requirements

Temperature	Operating temperature	-40℃ ~ +60℃	
	Storage temperature	-45℃ ~ +70℃	
Humid heat	Relative humidity	95% ± 3%	
	Temperature	+25°C±2°C	
	Storage time	72h	
Vibration	Vibration spectrum shape	20Hz to 80Hz	+3dB/oct

	(grms=6.06)	80Hz to 350Hz	G2/0.04 Hz
		350Hz to 2000Hz	-3dB/oct
	Vibration direction and time	vibrate in two direction for at least 10min. (vibration in two direction i.e. x axis that is along the laser axis and z direction too)	
	Control point	should be selected in the fixture or shaking table surface near the maximum stiffness of the product, large equipment can use multi-point average control	
	Monitoring point	the monitoring point should be selected in the key part of the product under test, so that the root mean square acceleration response does not exceed the maximum allowable design (grms=6.06)	
	Installation requirements	The specimen is firmly attached to the shaking table, and for products equipped with shock absorbers, the shock absorbers should be removed before testing	
	Performance check	During vibration testing with the equipment powered on, all performance indicators must meet the technical requirements specified in the design document. In the event of a failure, repairs are allowed. After the repair, the spectral value should be reduced to 0.01g²/Hz, grms=3.03, and the specimen should be subjected to vibration in the direction most susceptible to vibration for 10 minutes during the acceptance test.	
Temperature cycle	Temperature range	Power-on test	-40±3℃ ~ +55±2℃
	Rate of temperature change	Temperature rise	10℃/min
		Cooling	10℃/min
	Cycle times	Ten cycles should be completed, ensuring that the last 2 cycles are without faults. If a fault occurs during the last 2 cycles, after repairs, an additional 2 fault-free cycles are required.	
	Cycle time	One cycle time is 4h, one cycle includes temperature rise → temperature stay → cooling → temperature stay → temperature rise	
	High and low temperature residence time	the residence time depends on the heat capacity of the specimen. Based on the principle of product thermal or cold permeability, the internal temperature of the specimen is maintained for 5min after reaching stability	
	The requirements of the product under test	general temperature cycle test with the whole machine, should be as far as possible to open the cover	
	Check and repair	In the power test equipment, after each temperature cycle test, it is necessary to confirm that the equipment is free of faults before proceeding to the next temperature cycle	
Drenching requirements	Drenching is carried out with the whole equipment		
transportation	Equipment needs to be transported as a whole vehicle		

<table>
<tr><td rowspan="8">requirements</td><td colspan="3">If the product has not undergone a road transport test, you can perform an indoor transport simulation test using a simulation transport table. This test involves conducting a sinusoidal cyclic vibration test to assess the product's performance</td></tr>
<tr><td colspan="3">The requirements of the simulated transport table test are as follows</td></tr>
<tr><td rowspan="4">Test conditions</td><td>Frequency</td><td>5Hz ~ 200Hz</td></tr>
<tr><td>Amplitude</td><td>5Hz ~ 7Hz</td></tr>
<tr><td colspan="2">Amplitude 12mm ~ 8mm</td></tr>
<tr><td colspan="2">7Hz ~ 200Hz equal acceleration 1.5g</td></tr>
<tr><td>Direction</td><td colspan="2">vertical axle direction and side;Orientation: vertical and lateral to the axle</td></tr>
<tr><td>Cycle time</td><td colspan="2">log-scan 5Hz ~ 200Hz ~ 5Hz, 12min per cycle;When the resonant frequency of the specimen is measured below 5Hz, the test frequency can be extended to 2Hz, 2Hz ~ 200Hz ~ 2Hz scanning, scanning time should be 15min.The vibration time in each direction is 90min</td></tr>
<tr><td colspan="3">Vibration test condition allowable deviation is the same as broadband random vibration test</td></tr>
<tr><td colspan="3">After the transportation test, check for any signs of damage or structural loosening, and conduct an inspection of technical indices to ensure they meet the design requirements</td></tr>
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