

3D Printing Galvo System Installation and Operating Environment Requirements

1. Galvo Scanning System Operating Conditions

- I. Operating ambient temperature: 15°C–35°C
- II. Temperature fluctuation for high-precision stable operation: $\pm 2^{\circ}\text{C}$
- III. Stable operating power supply: $\pm 15\text{ VDC}$, $\geq 5\text{ A}$, or $+30\text{--}48\text{ VDC}$, $\geq 5\text{ A}$
- IV. Galvo scanner cooling method: water cooling / air cooling

2. Water-Cooling Conditions for the Galvo Scanning System

- I. Chiller set temperature: 25°C, fluctuation range: $\pm 0.1^{\circ}\text{C}$
- II. Galvo scanning system inlet water pressure: $\geq 4\text{ bar}$
- III. Required flow rate: $\geq 2\text{ L/min}$

Note:

- Distilled water or deionized water must be used as the cooling water for the galvo scanning system.
- Replace the filter element and circulating water every 3 months.

3. Air-Cooling Conditions for the Galvo Scanning System

- I. Air quality standard: ISO 8573.1: 2010 Class 1.4.1
- II. Solid particles: maximum particle size $\leq 5\text{ }\mu\text{m}$;
 $0.1\text{--}0.5\text{ }\mu\text{m}$ particles $\leq 20,000\text{ particles/m}^3$;
 $0.5\text{--}1\text{ }\mu\text{m}$ particles $\leq 400\text{ particles/m}^3$;
 $1.0\text{--}5.0\text{ }\mu\text{m}$ particles $\leq 10\text{ particles/m}^3$
- III. Moisture: pressure dew point $\leq +3^{\circ}\text{C}$
- IV. Oil: total oil content (liquid oil, oil mist, and oil vapor) $\leq 0.01\text{ mg/m}^3$
- V. Air temperature: $23\pm 0.1^{\circ}\text{C}$; inlet pressure $\geq 0.02\text{ MPa}$; air flow rate $\geq 7\text{ L/min}$

4. Installation Environment for the Galvo Scanning System

- I. Operating ambient temperature: 15°C–35°C
- II. Operating ambient humidity: 10%–80%
- III. When using water cooling, avoid operating in the red condensation-risk area shown in the figure below.

The specific control criteria are as follows:

Temperature, Humidity and Dew Point Reference Table														
Relative Humidity (%)	30	35	40	45	50	55	60	65	70	75	80	85	90	95
Ambient Temp. (°C)	Dew Point Td (°C)													
10	-7.00	-5.00	-3.00	-1.30	0.00	1.50	2.50	3.60	4.80	5.80	6.70	7.60	8.40	9.20
11	-6.50	-4.00	-2.00	-0.50	1.00	2.50	3.50	4.80	5.80	6.70	7.70	8.60	9.40	10.20
12	-5.00	-2.00	-1.00	0.50	2.00	3.30	4.40	5.50	6.70	7.70	8.70	9.50	10.90	11.20
13	-4.50	-2.00	-0.20	1.40	2.80	4.10	5.30	6.60	7.70	8.70	9.60	10.50	11.40	12.20
14	-3.20	-1.00	0.70	2.20	3.50	5.10	6.40	7.50	8.60	9.60	10.60	11.50	12.40	13.20
15	-2.30	-0.30	1.50	3.10	4.60	6.00	7.30	8.40	9.60	10.60	11.60	12.50	13.40	14.20
16	-1.30	0.50	2.40	4.00	5.60	7.00	8.30	9.50	10.60	11.60	12.60	13.40	14.30	15.20
17	-0.50	1.50	3.20	5.00	6.50	8.00	9.20	10.20	11.50	12.50	13.50	14.50	15.30	16.20
18	0.20	2.30	4.00	5.80	7.40	9.00	10.20	11.30	12.50	13.50	14.50	15.40	16.40	17.20
19	1.00	3.20	5.00	7.20	8.40	9.80	11.00	12.10	13.40	14.50	15.40	16.50	17.30	18.20
20	2.00	4.00	6.00	7.80	9.40	10.70	12.00	13.20	14.40	15.40	16.50	17.40	18.30	19.20
21	2.80	5.00	7.00	8.60	10.20	11.00	12.90	14.20	15.30	16.40	17.40	18.40	19.30	20.20
22	3.50	7.80	8.80	9.50	11.00	12.50	13.80	15.20	16.30	17.30	18.40	19.40	20.30	21.20
23	4.40	6.80	8.70	10.40	12.00	13.50	14.80	16.20	17.30	18.40	19.40	20.40	21.30	22.20
24	5.30	7.70	9.70	11.40	13.00	14.50	15.80	17.00	18.20	19.30	20.40	21.40	22.30	23.10
25	6.20	8.60	10.50	12.30	14.00	15.40	16.80	18.00	19.10	20.30	21.30	22.30	23.20	23.90
26	7.00	9.40	11.40	13.20	14.80	16.30	17.70	19.00	20.10	21.20	22.30	23.30	24.20	25.10
27	8.00	10.30	12.20	14.00	15.80	17.30	18.70	19.90	21.10	22.20	23.20	24.30	25.20	26.10
28	8.80	11.20	13.20	15.00	16.70	18.00	19.60	20.90	22.00	23.00	24.20	25.20	26.20	27.10
29	9.70	12.00	14.00	15.90	17.60	19.20	20.50	21.30	23.00	24.10	25.20	26.20	27.20	28.10
30	10.50	12.90	14.90	16.80	18.50	20.00	21.40	22.80	23.90	25.10	26.20	27.20	28.20	29.10
31	11.40	13.80	15.90	17.80	19.40	20.90	22.40	23.00	24.80	26.00	26.90	28.20	29.20	30.10
32	12.20	14.70	16.80	18.60	20.30	21.90	23.30	24.60	25.80	27.00	28.10	29.20	30.10	31.10
33	13.00	15.60	17.60	19.60	21.30	22.90	24.20	25.60	26.80	28.00	29.00	30.10	32.20	32.10
34	13.90	16.50	18.60	20.50	22.20	23.80	25.20	26.50	27.70	29.00	29.50	31.10	32.10	33.10
35	14.90	17.40	19.50	21.40	23.00	24.60	26.20	27.50	28.70	29.90	31.00	32.10	33.10	34.10
36	15.70	18.10	20.30	22.20	24.00	25.00	27.00	28.40	29.00	30.90	32.00	33.10	34.00	35.20
37	16.60	19.20	21.20	23.20	24.90	26.50	27.90	29.50	30.70	31.80	33.00	34.10	35.20	36.20
38	17.50	19.90	22.00	23.90	25.80	27.40	28.90	30.30	31.50	32.00	33.90	35.10	36.00	37.00
39	18.10	20.80	23.00	24.90	26.60	28.30	29.80	31.20	32.50	33.80	34.90	36.20	36.80	38.10
40	19.20	21.60	23.80	25.80	27.60	29.20	30.70	32.10	33.50	34.70	35.80	36.80	38.10	39.10