

**MAX** 创鑫激光



**MFMC 40000-50000(G5) 多模连续光纤激光器**

**使用手册**

## 版权说明

“ ”

---

## 引 语

MFMC

MFMC

## 公司简介

2004

<http://www.maxphotonics.com>



:  
: <http://www.maxphotonics.com>  
: 400-900-9588  
: +86-755-36869371  
: [info@maxphotonics.com](mailto:info@maxphotonics.com)

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# 第一章 特性说明

MFMC  
MFMC  
>30%  
MFMC  
1060nm 1100 nm  
Class 4

## 第二章 安全信息

1 -

MFMC  
40/50KW

1060nm 1100 nm

1

2-

2

LaserVision USA Kentek Corporation Rochwell Laser  
Industries

3-

EN IEC 61000-6-4:2019  
CISPR 16-2-1  
CISPR 16-2-3  
EN IEC 61000-6-2:2019

EN 61000-4-2:2009  
EN 61000-4-3:2020  
EN 61000-4-4:2012  
EN 61000-4-5:2014+A1:2017  
EN 61000-4-6:2014  
EN 61000-4-11:2020

EN 60825-1:2014+A11:2021  
CDRH 21 CFR 1040.10

EN 60204-1:2018

MFMC		CE EMC	
" EMC Directive"	EMC	" EMC"	EN 61000-6-4
EN 61000-6-2			
MFMC		Class 4	21 CFR
J 1040.10 d			
	Class 4	EN 60825-1	9

4-

**2**

MFMC

**3**

1

2

3

4

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6

7

8

9

10

11



12

"

"

**4**

1

360-440VAC, 3P+PE

2

3

4

360-440VAC, 3P+PE

5

创鑫推荐您按照如下的措施操作，以期延长激光器的使用寿命：

1

1.0m

2

1.5m

1m

3

4

5

6

7

Laser Institute of America(LIA)

13501 Ingenuity Drive, Suite 128

Orlando,Florida 32826

Phone:407 380 1553,Fax: 407 380 5588

Toll Free:1 800 34 LASER

American National Standards Institute

ANSI Z136.1, American National Standard for the Safe Use of Lasers

(Available through LIA)

International Electro-technical Commission

IEC 60825-1, Edition 1.2

Center for Devices and Radiological Health

21 CFR 1040.10 - Performance Standards for Light-Emitting Products

US Department of Labor - OSHA

Publication 8-1.7 - Guidelines for Laser Safety and Hazard Assessment.

Laser Safety Equipment

Laurin Publishing

Laser safety equipment and Buyer' s Guides

# 第三章 产品描述

1-

MFMC

- 1
- 2
- 3
- 4
- 5

- 1
- 2

2-

3-

M - F - M - C - XXX - XXXX 1 - 2 - 3 - 4 - 5 - 6		
1		M Maxphotronics
2		F Fiber Laser
3		M Multi-Mode
4		C ContinueWave
5	XXXX	XXXX W
6		

4-

5-



		400VAC
	START	
	ALARM	
	ACTIVE	
	POWER	

6-



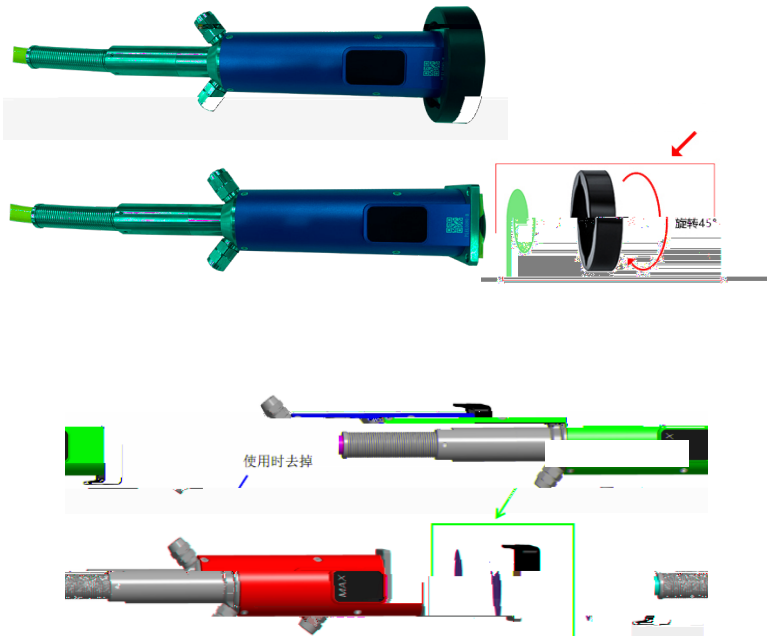
	CTRL	
	ETHERNET	
	WATER OUT	(40kW&50kW 2
	WATER IN	(40kW&50kW 2
	AC 380V	360-440VAC

7-

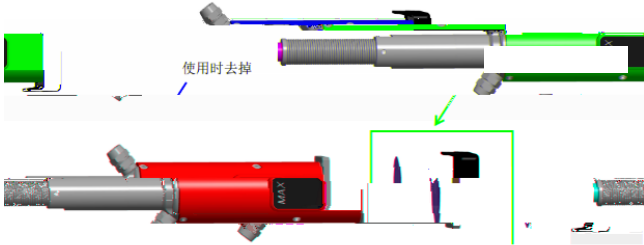
1

LOE

LOE-P LOE-T MFMC-40000



LOE-S MFMC-50000



## 第四章 详细规格

1-

/					
MFMC-40000	100%		40000		W
MFMC-50000	100%		50000		W
		10		100	%
	100%	1070	1080	1090	nm
3dB	100%		5	8	nm
	100% >1h		± 1	± 2	%
	100% >24h		± 2	± 3	%
BPP	100um	4		5.5	mm x mrad
	150um	5.5		6.5	
	200um	8		10	
			150	200	μs
			150	200	μs
	100%			5	KHz
		400			uW
			20 25	30 35	m
	100 150				μm
		200			mm
LOE					

2-

		360	400	440	VAC
	MFMC-40000 100%			132	KW
	MFMC-50000 100%			165	
		10	25	40	
		10		80	%
0 / 0					
		-10	25	60	
1120*1100*1070 W*D*H					mm
	MFMC-40000	857(± 10)			kg
	MFMC-50000	936(± 10)			

3-

1					
2		20	24		
3		4.5		bar	
4	MFMC-40000	450		L/min	
	MFMC-50000	450			
5	MFMC-40000	100		KW	
	MFMC-50000	120			

40

22

;

p 0.5bar

;

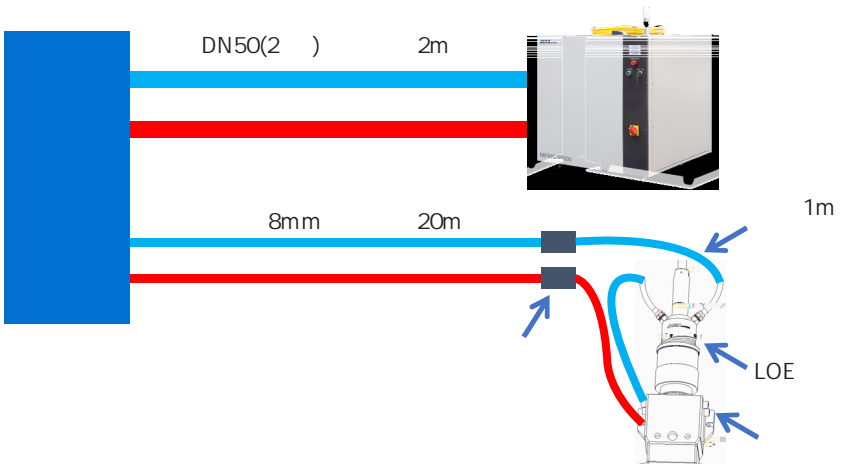
20% ( )

-15C

### 4-LOE

			L/min	bar	
LOE		Ø12	4	4	28-30

8mm 20m;  
 LOE 12 1m;  
 LOE ;  
 LOE p 3bar



5-

1

1000

2

10 - 40

3

10% - 85%

4

- - 对照表														
%	30	35	40	45	50	55	60	65	70	75	80	85	90	95
)	Td( )													
10	-7.0	-5.0	-3.0	-1.3	0.0	1.5	2.5	3.6	4.8	5.8	6.7	7.6	8.4	9.2
11	-6.5	-4.0	-2.0	-0.5	1.0	2.5	3.5	4.8	5.8	6.7	7.7	8.6	9.4	10.2
12	-5.0	-3.0	-1.0	0.5	2.0	3.3	4.4	5.5	6.7	7.7	8.7	9.5	10.9	11.2
13	-4.5	-2.0	-0.2	1.4	2.8	4.1	5.3	6.6	7.7	8.7	9.6	10.5	11.4	12.2
14	-3.2	-1.0	0.7	2.2	3.5	5.1	6.4	7.5	8.6	9.6	10.6	11.5	12.4	13.2
15	-2.3	-0.3	1.5	3.1	4.6	6.0	7.3	8.4	9.6	10.6	11.6	12.5	13.4	14.2
16	-1.3	0.5	2.4	4.0	5.6	7.0	8.3	9.5	10.6	11.6	12.6	13.4	14.3	15.2
17	-0.5	1.5	3.2	5.0	6.5	8.0	9.2	10.2	11.5	12.5	13.5	14.5	15.3	16.2
18	0.2	2.3	4.0	5.8	7.4	9.0	10.2	11.3	12.5	13.5	14.5	15.4	16.4	17.2
19	1.0	3.2	5.0	7.2	8.4	9.8	11.0	12.2	13.4	14.5	15.4	16.5	17.3	18.2
20	2.0	4.0	6.0	7.8	9.4	10.7	12.0	13.2	14.4	15.4	16.5	17.4	18.3	19.2
21	2.8	5.0	7.0	8.6	10.2	11.0	12.9	14.2	15.3	16.4	17.4	18.4	19.3	20.2
22	3.5	5.8	7.8	9.5	11.0	12.5	13.8	15.2	16.3	17.3	18.4	19.4	20.3	21.2
23	4.4	6.8	8.7	10.4	12.0	13.5	14.8	16.2	17.3	18.4	19.4	20.4	21.3	22.2
24	5.3	7.7	9.7	11.4	13.0	14.5	15.8	17.0	18.2	19.3	20.4	21.4	22.3	23.1
25	6.2	8.6	10.5	12.3	14.0	15.4	16.8	18.0	19.1	20.3	21.3	22.3	23.2	23.9
26	7.0	9.4	11.4	13.2	14.8	16.3	17.7	19.0	20.1	21.2	22.3	23.3	24.2	25.1
27	8.0	10.3	12.2	14.0	15.8	17.3	18.7	19.9	21.1	22.2	23.2	24.3	25.2	26.1
28	8.8	11.2	13.2	15.0	16.7	18.0	19.6	20.9	22.0	23.0	24.2	25.2	26.2	27.1
29	9.7	12.0	14.0	15.9	17.6	19.2	20.6	21.3	23.0	24.1	25.2	26.2	27.2	28.1
30	10.5	12.9	14.9	16.8	18.5	20.0	21.4	22.8	23.9	25.1	26.2	27.2	28.2	29.1
31	11.4	13.8	15.9	17.8	19.4	20.9	22.4	23.0	24.8	26.0	26.9	28.2	29.2	30.1
32	12.2	14.7	16.8	18.6	20.3	21.9	23.3	24.6	25.8	27.0	28.1	29.2	30.1	31.1
33	13.0	15.6	17.6	19.6	21.3	22.9	24.2	25.6	26.8	28.0	29.0	30.1	32.1	32.1
34	13.9	16.5	18.6	20.5	22.2	23.8	25.2	26.5	27.7	29.0	29.5	31.1	32.1	33.1
35	14.9	17.4	19.5	21.4	23.0	24.6	26.2	27.5	28.7	29.9	31.0	32.1	33.1	34.1
36	15.7	18.1	20.3	22.2	24.0	25.0	27.0	28.4	29.0	30.9	32.0	33.1	34.1	35.2
37	16.6	19.2	21.2	23.2	24.9	26.5	27.9	29.5	30.7	31.8	33.0	34.1	35.2	36.2
38	17.5	19.9	22.0	23.9	25.8	27.4	28.9	30.3	31.5	32.0	33.9	35.1	36.0	37.0
39	18.1	20.8	23.0	24.9	26.6	28.3	29.8	31.2	32.5	33.8	34.9	36.2	36.8	38.1
40	19.2	21.6	23.8	25.6	27.6	29.2	30.7	32.1	33.5	34.7	35.8	36.8	38.1	39.1

6-

1

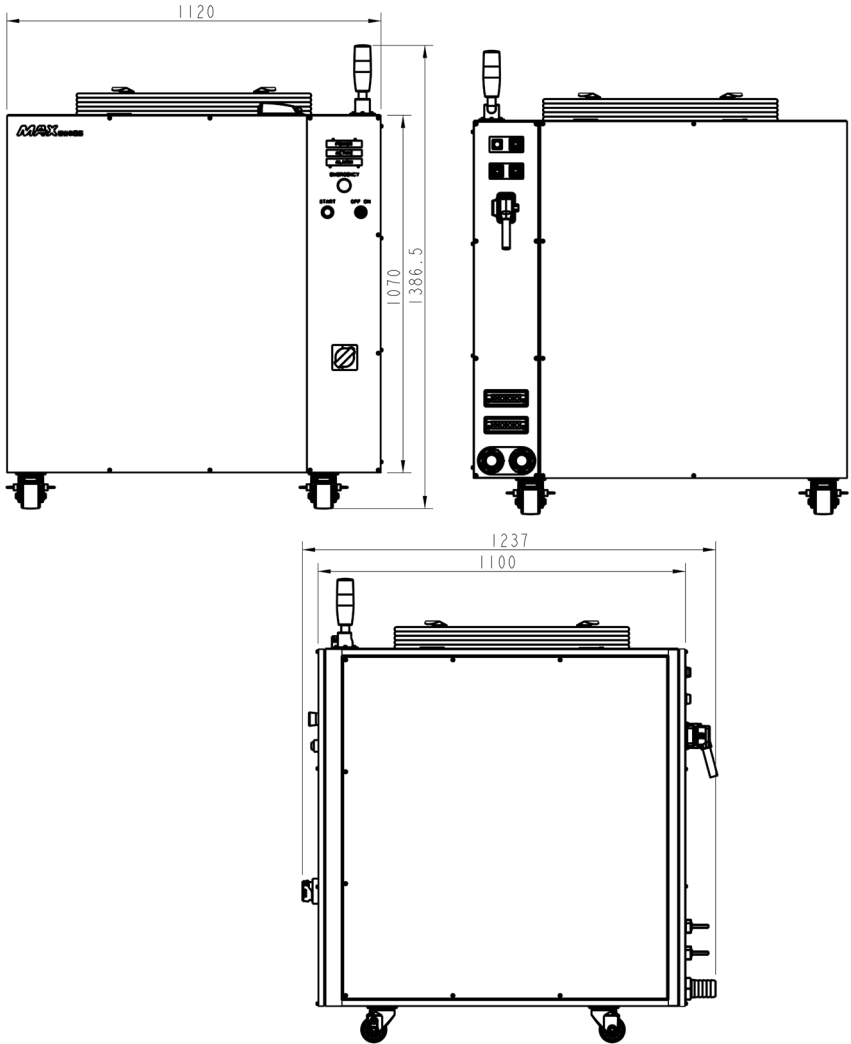
2

3

4

7-

mm



## 第五章 使用指南

1-

2-

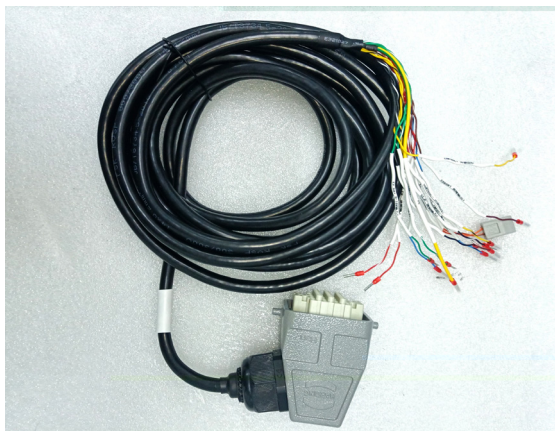
360-440VAC

$\Delta W$	$\Delta VAC$	$\Delta A$	$\Delta A$	$\Delta kW$
MFMC-40000	400V $\pm$ 10%, 3P+PE	180	400A	160
MFMC-50000	400V $\pm$ 10%, 3P+PE	230	400A	200

3-

CTRL

55P



CTRL				
1		EX_LOCK_-	-	(ON- ,OFF- )
2		EX_LOCK_+	+	
7		CONTROL-	-	(ON- ,OFF- )
8		CONTROL+	+	
10		EX_DA+	0-10V +	( 1V-10% 10V-100%)
11		EX_DA-	0-10V -	
13		EX_M-	-	HIGH:20VDC V 24VDC LOW:0VDC V 5VDC
14		EX_M+	+	5mA I 15mA
15		EX_EN-	-	HIGH:20VDC V 24VDC LOW:0VDC V 5VDC
16		EX_EN+	+	5mA I 15mA ( :HIGH :LOW)

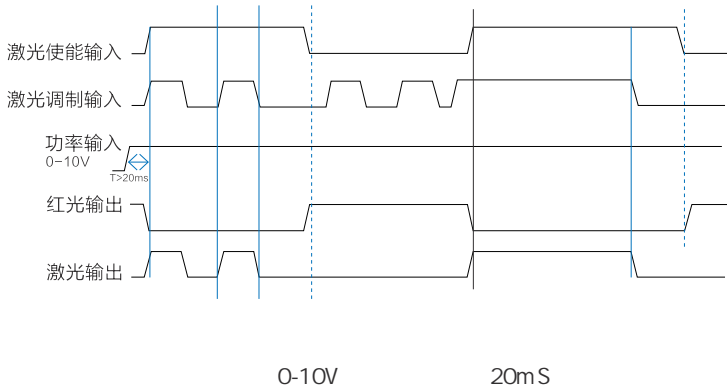
27		EMGERNCY1_ INPUT-	1-	HIGH:20VDC V 24VDC LOW:0VDC V 5VDC
28		EMGERNCY1_ INPUT+	1+	5mA I 15mA ( :HIGH :LOW)
31		ERROR2	2	
32		ERROR1	1	

5-

1

2

3



6-

1

U

名称	修改日期	类型	大小
 G3-Series(Maxphotonics) - 1.0.0.86.rar	2021/8/5 14:10	WinRAR 压缩文件	23,406 KB
 NET4.6.rar	2021/6/30 15:03	WinRAR 压缩文件	63,911 KB

2

NET4.6.rar  
Win10NET46-x86-x64-AllOS-ENU.exe  
.NET 4.6NET46-x86-x64  
-AllOS-ENU.exe

3

G3-Series(Maxphotonics) - 1.0.0.86.rar

G3-

Series(Maxphotonics) - 1.0.0.86.exe

" zh"

" en"

名称	修改日期	类型	大小
 G3-Series(Maxphotonics) - 1.0.0.86.exe	2021/3/29 10:18	应用程序	25,639 KB

4



5



6

PC

/ /DA

**功率**

功率: 0 %  
 频率: 1,000 Hz  
 占空比: 100 %

**启动**

使能: OFF  
 红光: ON  
 持续输出: 0 ms

**状态**

通讯, 报警, 激光, 急停, 锁机, 使用到期  
 SD卡, 外控EN, 外控PWM, 外控Ctrl, 模拟量, 空调, 冷水机, 互换

**报警监控**

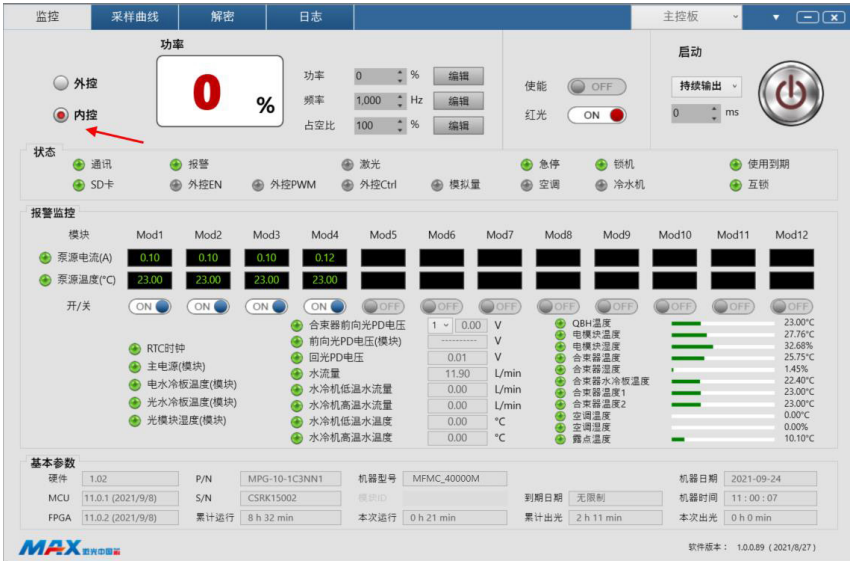
模块	Mod1	Mod2	Mod3	Mod4	Mod5	Mod6	Mod7	Mod8	Mod9	Mod10	Mod11	Mod12
泵源电流(A)	0.11	0.10	0.11	0.12								
泵源温度(°C)	23.00	23.00	23.00	23.00								
开/关	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

**基本参数**

硬件	1.02	P/N	MPG-10-1C3NN1	机器型号	MFMC_4000M	机器日期	2021-09-24
MCU	11.0.1 (2021/9/8)	S/N	CSRK15002	维护日期		机器时间	10:59:58
FPGA	11.0.2 (2021/9/8)	累计运行	8 h 32 min	本次运行	0 h 21 min	累计出光	2 h 11 min
						本次出光	0 h 0 min

软件版本: 1.0.0.89 (2021/8/27)

7

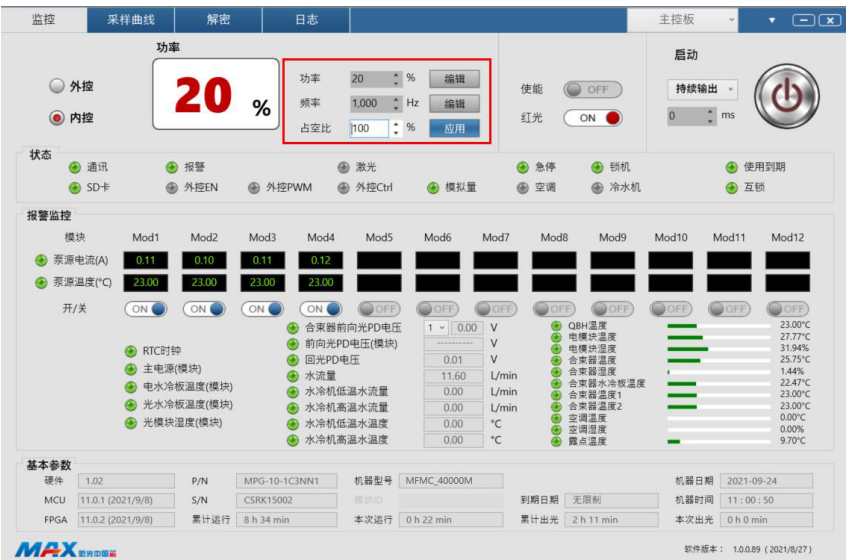


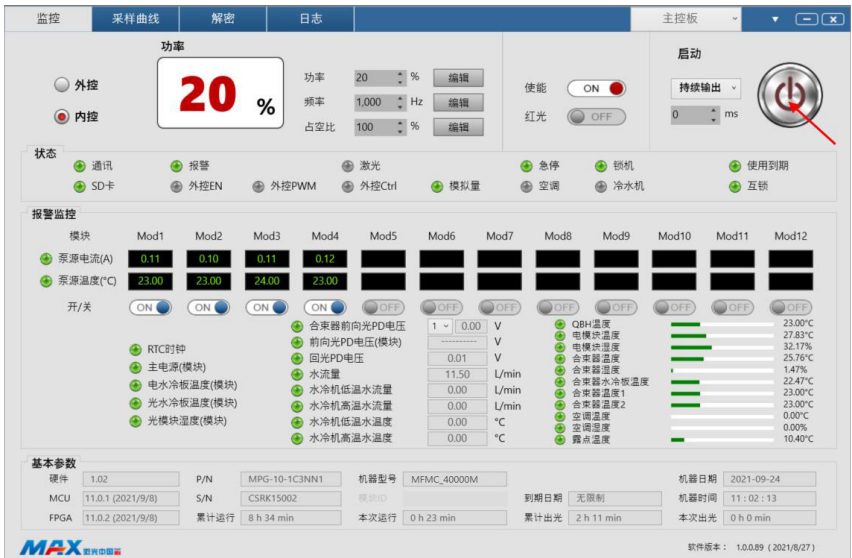
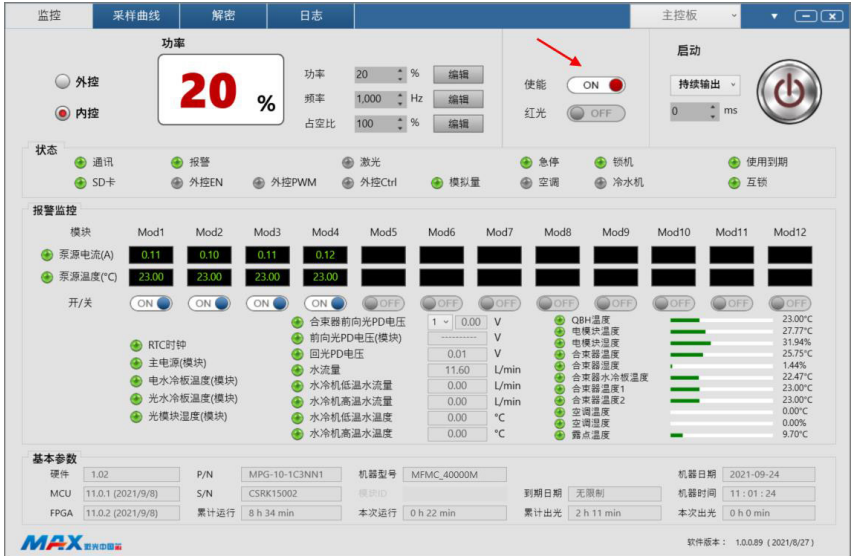
8

&

/

/





11

The screenshot shows the '功率' (Power) section of the MAX monitoring software. A large display shows '20%' power. Below it, there are controls for power percentage (set to 20%), frequency (1,000 Hz), and duty cycle (100%). To the right, there are '启动' (Start) controls including '使能' (ON), '红光' (OFF), and a '持续输出' (Continuous Output) dropdown. A '警告' (Warning) dialog box is open in the center, displaying a yellow warning icon and the text '即响出光, 请戴好防护眼镜!' (Light output immediately, please wear protective eyewear!). The dialog has '确定' (OK) and '取消' (Cancel) buttons. Below the dialog, there is a '报警监控' (Alarm Monitoring) table with columns for modules (Mod1 to Mod12) and various parameters like current, temperature, and flow. At the bottom, there is a '基本参数' (Basic Parameters) section with fields for hardware, MCU, FPGA, P/N, S/N, machine type, and dates.

12

The screenshot shows the same MAX monitoring software interface, but with a '密码' (Password) dialog box in the center. The dialog has a text input field containing the characters '密|码' and a green '应用' (Apply) button below it. The background interface is dimmed. The 'MAX' logo and version information are visible at the bottom of the window.

			<p>/ /</p> <p>PD</p> <p>PD 1.</p> <p>2.</p>
<p>2</p>			<p>1.</p> <p>2.</p> <p>3.</p> <p>4.</p> <p>5.</p> <p>3-5</p>
<p>3</p>			

4		QBH	QBH
5			QBH
6			
7		1. 2.	

8



1.  
2.

MOS

9



10



## 第六章 光纤连接器检查和清洁指南

1-

1

2



3

>99.5%

4

5

20



显微镜



酒精



清洁布



棉签



橡胶指套



2-

1

LOE

1000



2

1

" OFF"

2

20

2.2.5

3

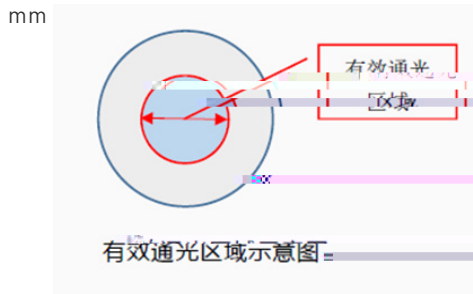
4

3

5

:

	( 16mm )	( 16mm )
40KW-60KW	0.02 0.005	0.1 0.02



3-

1

“OFF”

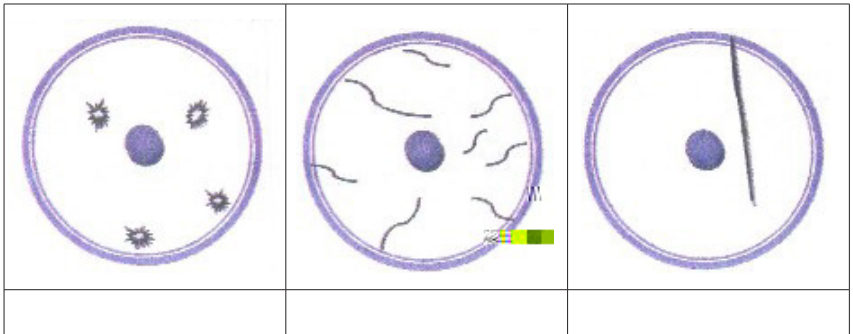
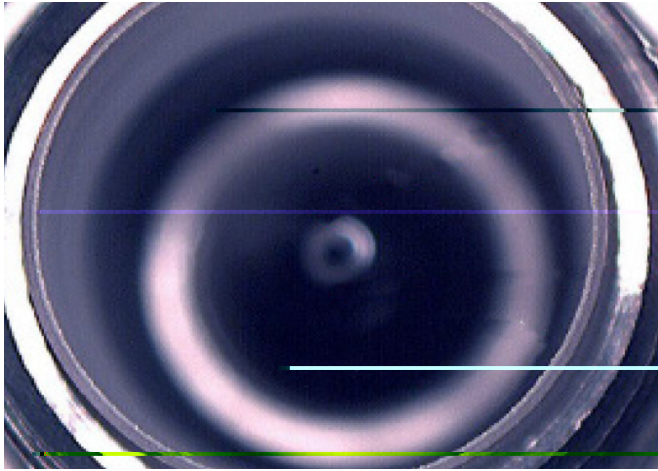
2

1

20

180°

2



2

3

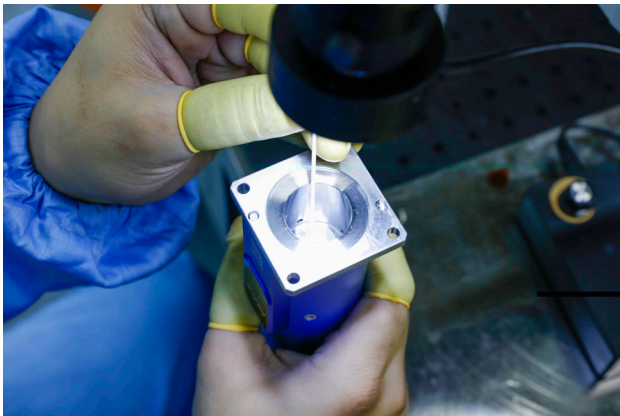
1



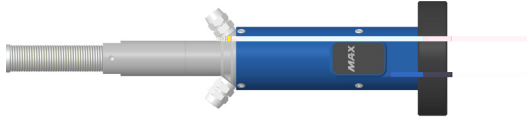
2

20

3.2.1



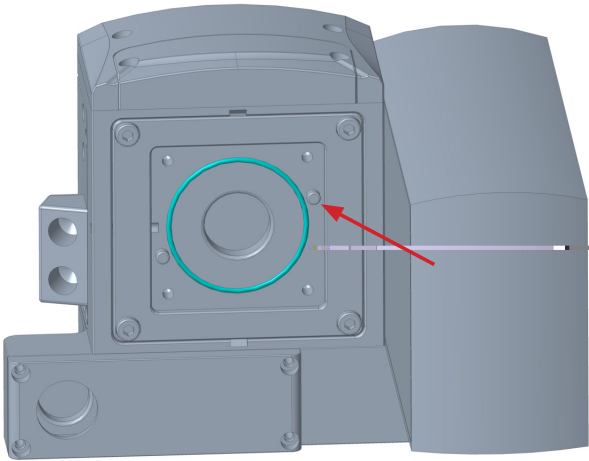
3



## 4-LOE

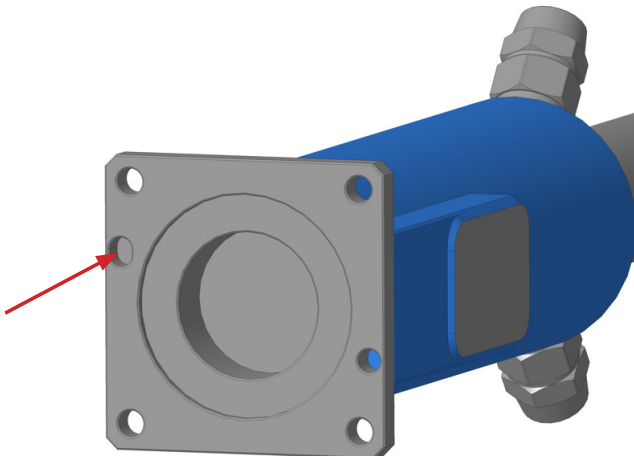
1

1



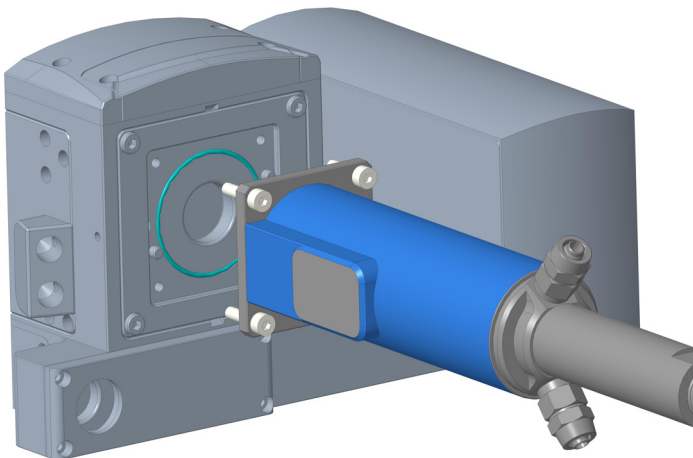
2

LOE



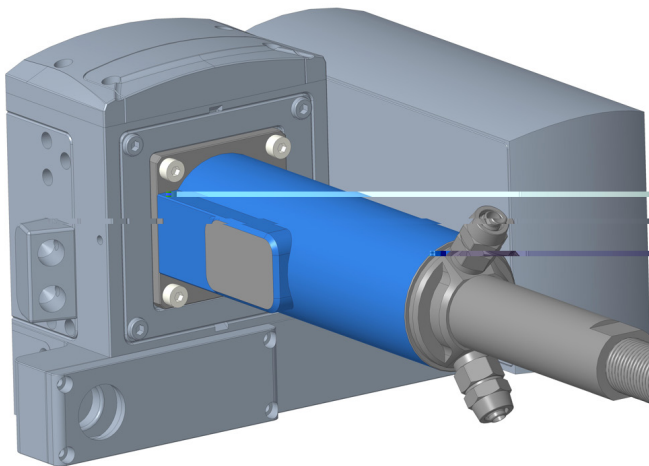
3

LOE



2

LOE



# 第七章 拆装指南

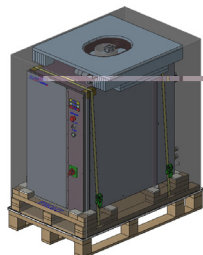
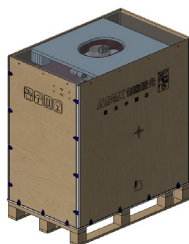
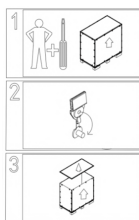
1-



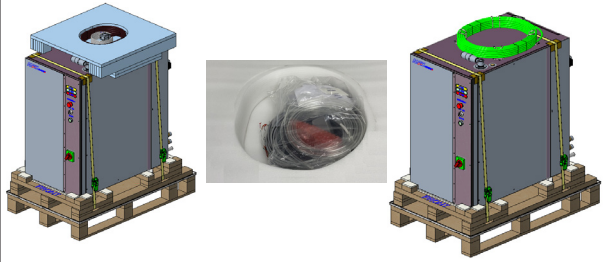
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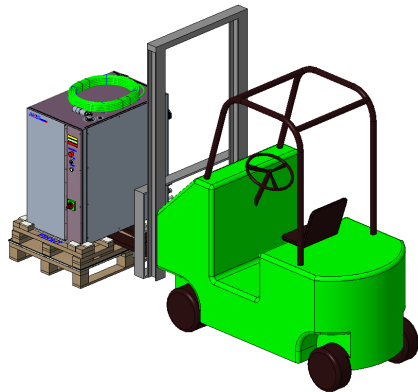
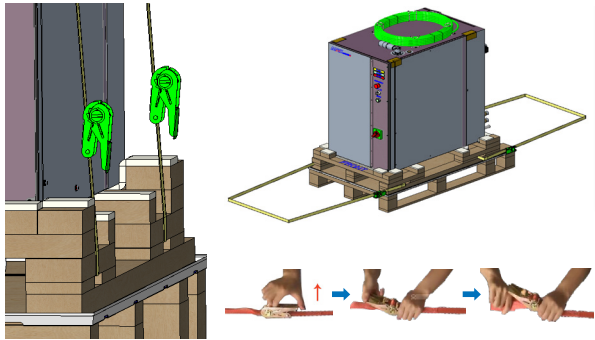


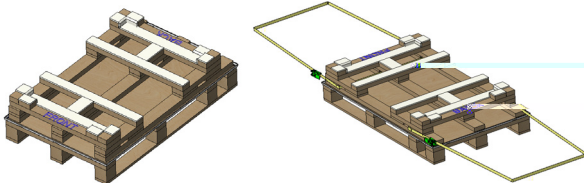
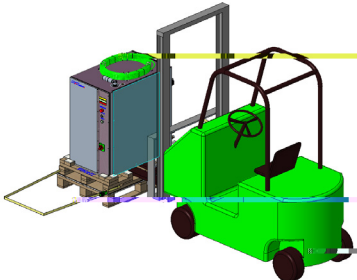
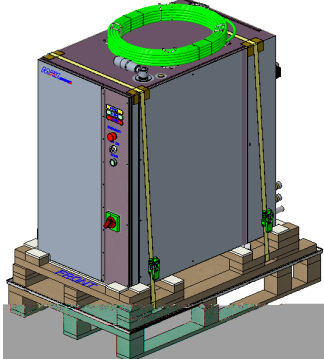
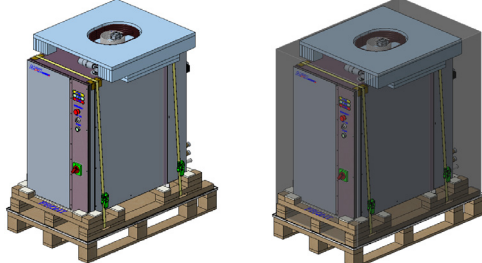
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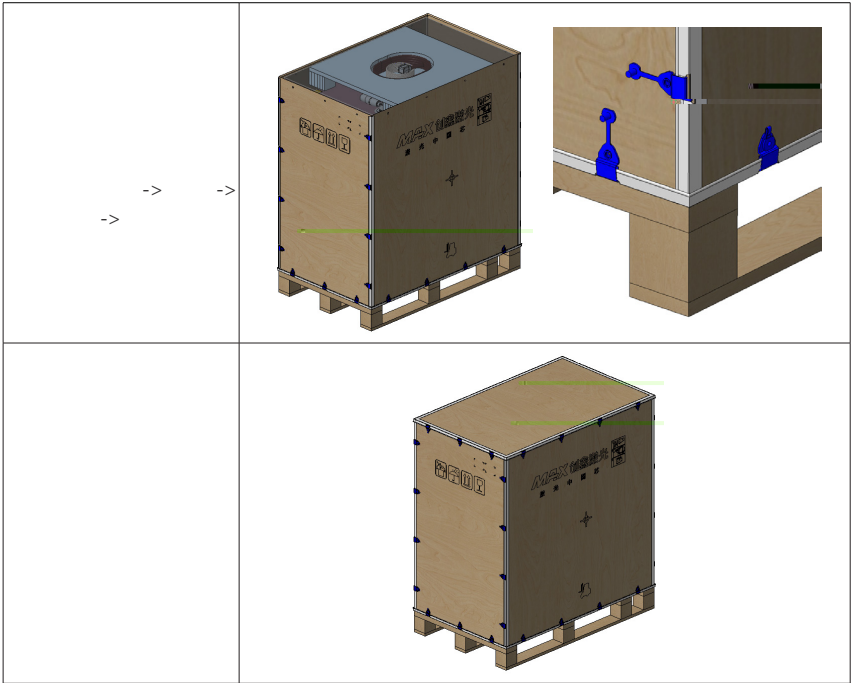


- 1.
- 2.
- 3.

180°



	
	
<p>4</p> <ol style="list-style-type: none"><li>1.</li><li>2.</li><li>3.</li><li>4.</li><li>5.</li></ol>	
<p>PE</p>	



2-

1		MFMC-XXX		1
2				1
3		10m		1
4				2
5	U			1
6				1
7		63mm-51mm		1
8		60-63mm		2
9	LOE	Ø12*2mm		1
10				1
11		PCBA		1
12		MFMC		1
13				1
14				1

## 第八章 服务与维修

1-

18682447838

2-

1

1 7X24

400-900-9588

1 -> 2

-> 3

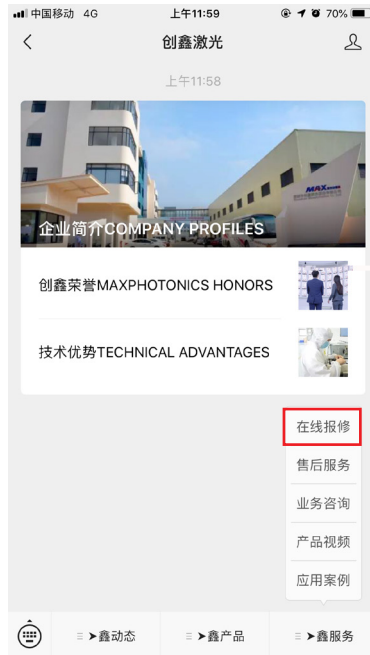
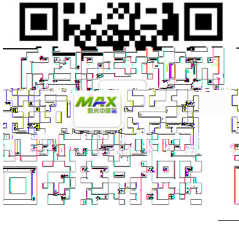
-> 4

-> 5

18682446878

18682447838

2



3

2

1

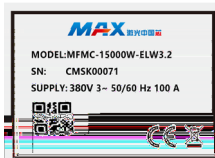
PN

2

SN

3

4



## 第九章 保修声明

1-

2-

1  
2  
3  
4  
5  
6