

**MAX** 创鑫激光



MFSC 5000M-6000M(G4)

## 使用手册

# 版权说明

“ ”

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## 引 语

MFSC

MFSC 5000M-6000M G4

## 公司简介

2004

<http://www.maxphotonics.com>



深圳市创鑫激光股份有限公司

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

|              |           |
|--------------|-----------|
| .....        | 1         |
| <b>MFSC-</b> | <b>4</b>  |
|              | <b>5</b>  |
| 1- .....     | 5         |
| 2- .....     | 6         |
| 3- .....     | 6         |
| 4- .....     | 7         |
| 5- .....     | 11        |
|              | <b>12</b> |
| 1- .....     | 12        |
| 2- .....     | 12        |
| 3- .....     | 12        |
| 4- .....     | 13        |
| 5- .....     | 13        |
| 6- .....     | 14        |
| 7- .....     | 14        |
|              | <b>16</b> |
| 1- .....     | 16        |
| 2- .....     | 17        |
| 3- .....     | 17        |
| 4-QBH .....  | 18        |
| 5- .....     | 19        |

|    |       |           |
|----|-------|-----------|
| 6- | ..... | 20        |
|    |       | <b>22</b> |
| 1- | ..... | 22        |
| 2- | ..... | 23        |
|    |       | <b>24</b> |
| 1- | ..... | 24        |
| 2- | ..... | 24        |
| 3- | ..... | 24        |
| 4- | ..... | 25        |
| 5- | ..... | 26        |
| 6- | ..... | 27        |
| 7- | ..... | 31        |
|    |       | <b>32</b> |
| 1- | ..... | 33        |
| 2- | ..... | 33        |
|    |       | <b>36</b> |
| 1- | ..... | 36        |
| 2- | ..... | 36        |
|    |       | <b>37</b> |
| 1- | ..... | 37        |
| 2- | ..... | 37        |

MFSC-






MFSC  
>30%  
MFSC

1060nm 1100 nm

Class 4

## 第二章 安全信息

1 -

| 安全标识  | 描述  |
|---|---|
|    |   |
|   |   |
|  |   |
|   |   |

MFSC

1060nm 1100 nm

12KW

2-

### 1、激光防护要求

### 2、激光防护设备商

创鑫为您推荐以下几种激光安全设备供应商提供的材料或装备：

LaserVision USA Kentek Corporation Rochwell Laser Industries

3-

电磁兼容与抗干扰性：

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

激光安全:

EN 60825-1:2014+A11:2021

CDRH 21 CFR 1040.10

电气安全:

EN 60204-1:2018

|         |   |      |         |    |
|---------|---|------|---------|----|
|         |   | MFSC | Class 4 | EN |
| 60825-1 | 8 |      |         |    |

#### 4-

### 1、镜面反射

### 2、配件安全须知

## MFSC

## 3、光学操作须知

1

2

3

4

5

6

7

8

9

10

11

12

“ ”

#### 4、电气操作须知

创鑫强烈建议您阅读下述操作要点后再行操作激光器：

1

2

3

4

440VAC

5

6

360-

360-440VAC

#### 5、激光器操作环境要求

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

2

3

## 5-

如果您需要获取更多的激光器安全方面的信息，请参考如下：

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-

MFSC

主要特性有：

1

2

3

4

5

其应用领域有：

1

2

2-

6.3-6.6

2-

6

6.3-6.6

3-

|                          |                |
|--------------------------|----------------|
| M - F - S - C - XXX - XX |                |
| 1 - 2 - 3 - 4 - 5 - 6    |                |
| 1                        | M Maxphotonics |
| 2                        | F Fiber Laser  |
| 3                        | S Single Mode  |
| 4                        | C ContinueWave |
| 5                        | XXXX XXXX W    |
| 6                        |                |

4-

5-



| 项目          | 功能说明       |
|-------------|------------|
| MAIN SWITCH | 360-440VAC |
| OFF ON      |            |
| EMERGENCY   |            |
| START       |            |
| ALARM       |            |
| ACTIVE      |            |
| POWER       |            |

6-



| 项目        | 功能说明       |
|-----------|------------|
| CTRL      |            |
| ETHERNET  |            |
| AC380V    | 360-440VAC |
| WATER OUT | 1          |
| WATER IN  | 1          |

7-

## 1、光纤输出头

QBH

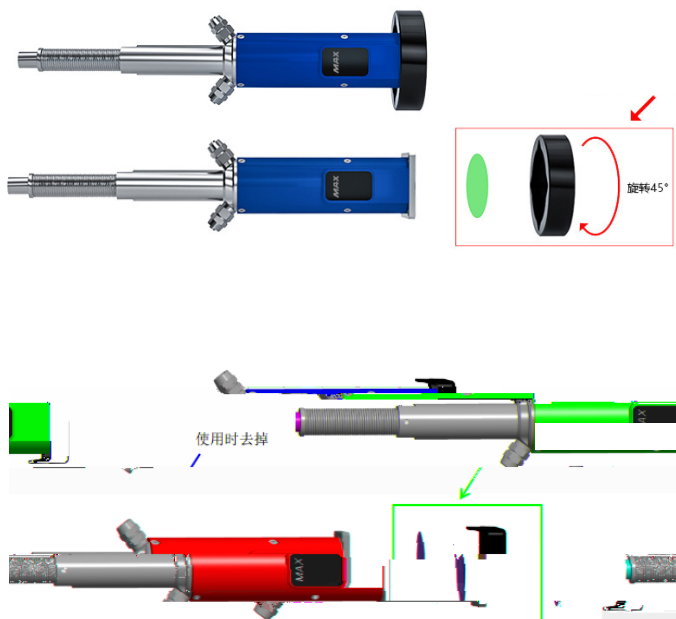
“

”

G.4.3 QBH



## G5 QBH



## 第四章 详细规格

### 1-

| 序号 | 特性参数       | 测试条件              | 最小值     | 典型值  | 最大值  | 单位           |
|----|------------|-------------------|---------|------|------|--------------|
| 1  |            | /                 |         |      |      |              |
| 2  |            |                   |         |      |      |              |
| 3  | MFSC-5000M |                   |         | 5000 |      | W            |
|    | MFSC-6000M |                   |         | 6000 |      | W            |
| 4  |            |                   | 10      |      | 100  | %            |
| 5  |            | 100%              | 1070    | 1080 | 1090 | nm           |
| 6  | 3dB        | 100%              |         | 4    | 7    | nm           |
| 7  |            | 100% >1h          |         | ±1   | ±2   | %            |
| 8  |            | 100% >24h         |         | ±3   | ±5   | %            |
| 9  | BPP        | 100%<br>100um QBH | 3.0     |      | 3.8  | mm x<br>mrad |
| 10 |            | 10% 90%           |         | 150  | 200  | μs           |
| 11 |            | 90% 10%           |         | 150  | 200  | μs           |
| 12 |            | 100%              |         |      | 5    | KHz          |
| 13 |            | 100%              | 200     |      |      | μW           |
| 14 |            |                   |         | 20   |      | m            |
| 15 |            | 100               | 150/200 |      |      | μm           |
| 16 |            |                   | 200     |      |      | mm           |
| 17 |            | QBH LOC           |         |      |      |              |

## 2-

| 序号 | 特性参数       | 测试条件              | 最小值   | 典型值 | 最大值 | 单位  |
|----|------------|-------------------|-------|-----|-----|-----|
| 1  |            |                   | 360   | 400 | 440 | VAC |
| 2  | MFSC-5000M | 100%              |       |     | 17  | KW  |
|    | MFSC-6000M | 100%              |       |     | 20  | KW  |
| 3  |            |                   | 10    |     | 40  |     |
| 4  |            |                   | 10    |     | 85  | %   |
| 5  |            |                   |       |     |     |     |
| 6  |            |                   | -10   |     | 60  |     |
| 7  |            | 400*900*550 W*D*H |       |     |     | mm  |
| 8  | G4.0-4.7   | MFSC-5000M        | 150±5 |     | kg  |     |
|    |            | MFSC-6000M        | 155±5 |     |     |     |
|    | G4.8       | MFSC-5000M        | 142±5 |     |     |     |
|    |            | MFSC-6000M        | 147±5 |     |     |     |

## 3-

| 序号 | 特性         | 参数      | 单位    |
|----|------------|---------|-------|
| 1  |            |         |       |
| 2  |            | 24   20 |       |
| 3  |            | ≥ 4     | bar   |
| 4  | MFSC-5000M | 40      | L/min |
|    | MFSC-6000M | 50      |       |
| 5  | MFSC-5000M | 12      | kw    |
|    | MFSC-6000M | 14      |       |

40

22

 $\Delta p \leq 0.5 \text{ bar}$ 

0

20% ( )

-15C

### 4-QBH 水冷条件

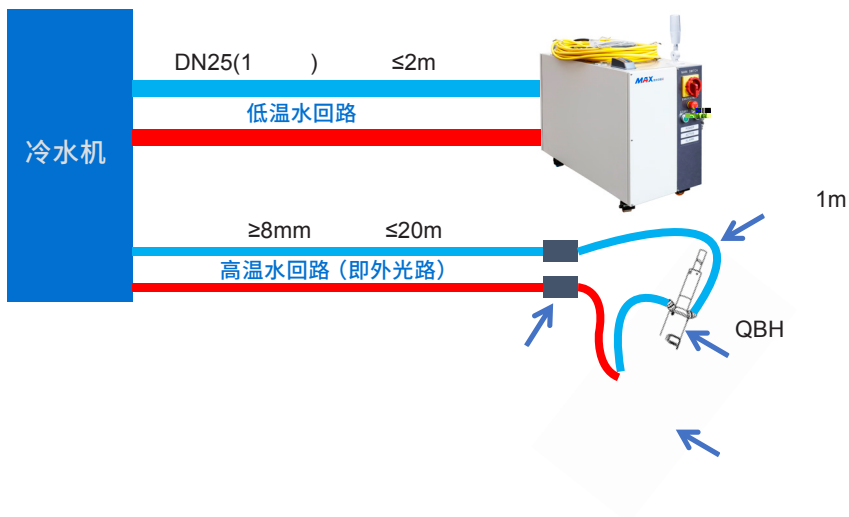
| 冷却方式 | 水管尺寸要求      | 水流量 (L/min) | 水压 (bar) | 冷却水温 (°C) |
|------|-------------|-------------|----------|-----------|
|      | *<br>= 6* 4 | 2           | 3        | 28-30     |

≥8mm ≤20m ;

QBH Φ6 ≤1m ;

QBH ;

Δp≤1.5bar



## 5- 安装环境需求

1 1000

2 10 - 40

3 10% - 85%

4 :

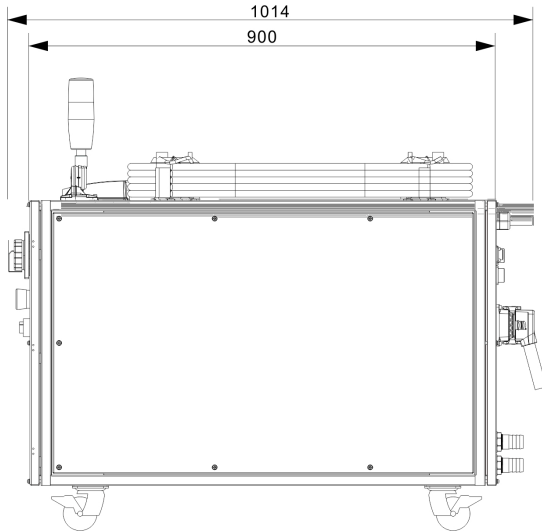
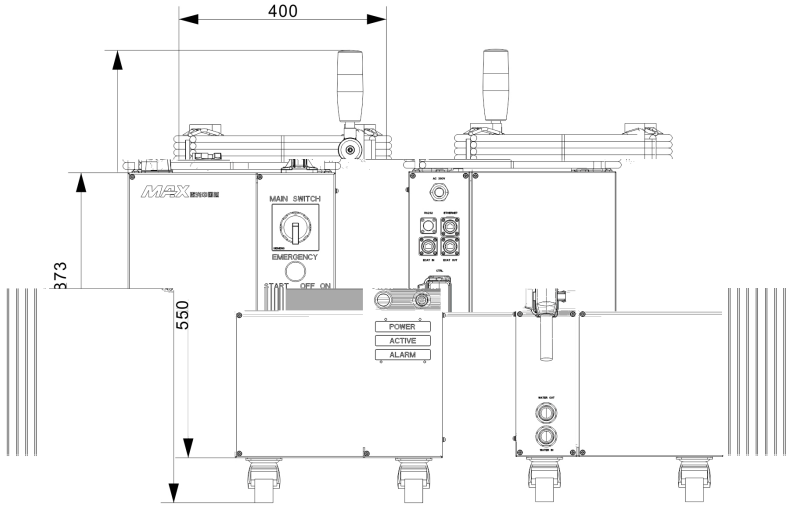
| 相对湿度%<br>环境(°C) | 环境温度、相对湿度、露点对照表 |      |      |      |      |      |      |      |      |      |      |      |      |      |
|-----------------|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                 | 30              | 35   | 40   | 45   | 50   | 55   | 60   | 65   | 70   | 75   | 80   | 85   | 90   | 95   |
| 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 | 20.5 | 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 | 15.8 | 17.6 | 19.4 | 21.0 | 22.4 | 23.8 | 24.9 | 26.0 | 27.0 | 28.0 | 29.0 | 29.9 |
| 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 | 31.0 |
| 33              | 13.0            | 15.6 | 17.6 | 19.6 | 21.3 | 22.9 | 24.2 | 25.6 | 26.8 | 28.0 | 29.0 | 30.0 | 31.0 | 31.9 |
| 34              | 13.9            | 16.5 | 18.6 | 20.5 | 22.2 | 23.8 | 25.2 | 26.5 | 27.7 | 29.0 | 29.9 | 31.0 | 32.0 | 32.9 |
| 35              | 14.9            | 17.4 | 19.5 | 21.4 | 23.3 | 24.6 | 26.2 | 27.5 | 28.7 | 29.9 | 31.0 | 32.0 | 33.0 | 33.9 |
| 36              | 15.7            | 18.1 | 20.3 | 22.2 | 24.0 | 25.0 | 27.0 | 28.4 | 29.0 | 30.9 | 32.0 | 33.0 | 34.1 | 34.1 |
| 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 | 35.2 |
| 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 | 36.0 |
| 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 | 36.8 |
| 40              | 19.2            | 21.6 | 23.8 | 25.8 | 27.6 | 29.2 | 30.7 | 32.1 | 33.5 | 34.7 | 35.8 | 36.8 | 37.1 | 37.1 |

≤28

≤50%

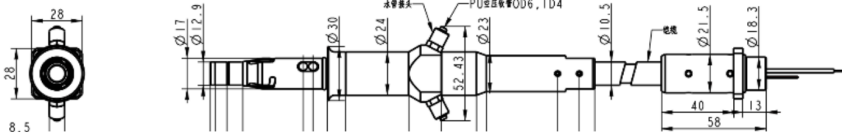
6-

mm



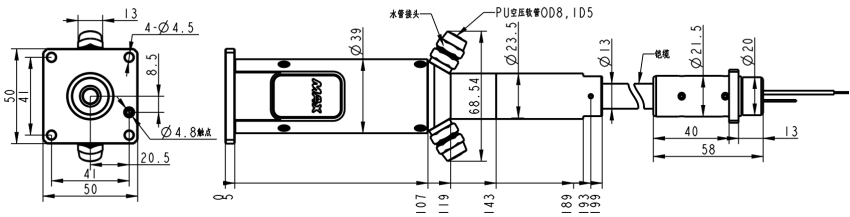
G4.3 QBH

mm



G5 QBH

mm



## 第五章 拆装指南

### 1-

请依据以下步骤进行：

1

2

3 “ ”

4 QBH

>200mm

5

6

1

7

8

30

## 2-

| 序号 | 名称  | 规格型号      | 单位 | 数量 |
|----|-----|-----------|----|----|
| 1  |     | MFSC-xxxx |    | 1  |
| 2  |     |           |    | 1  |
| 3  |     | 10m       |    | 1  |
| 4  |     |           |    | 2  |
| 5  |     |           |    | 4  |
| 6  |     | Φ25.4mm   |    | 1  |
| 7  |     | 26-38     |    | 2  |
| 8  | QBH | 6x4mm     |    | 1  |

## 第六章 使用指南

1-

“ ”  
“ ”

2-

63A

“ ”

3-

CTRL



## 5000M-6000M(G4) 24P

| CTRL<br>接口插<br>孔序号 | 接线<br>颜色 | 英文标识               | 中文标识    | 备注                                 |
|--------------------|----------|--------------------|---------|------------------------------------|
| 15                 |          | PWM_MODE+          | +       | 20VDC V 28VDC<br>I 15mA            |
| 4                  |          | PWM_MODE-          | -       |                                    |
| 16                 |          | ENABLE+            | +       | 20VDC V 28VDC<br>I 15mA            |
| 3                  |          | ENABLE-            | -       |                                    |
| 12                 |          | PEAK POWER(O-10V)+ | 0-10V + | 1-10VDC 1V<br>10% 10V<br>100%      |
| 5                  |          | PEAK POWER(O-10V)- | 0-10V - |                                    |
| 6                  |          | CONTROL+           | +       | ± ON,<br>± OFF                     |
| 7                  |          | CONTROL-           | -       |                                    |
| 18                 |          | ERROR2             | 2       | ON- V<br>OFF- I<br>30VDC,<br>100mA |
| 23                 |          | ERROR1             | 1       |                                    |
| 1                  |          | LASER_RDY_OUT+     | +       |                                    |
| 2                  |          | LASER_RDY_OUT-     | -       |                                    |
| 8                  |          | EX LOCK+           | +       | ±                                  |
| 19                 |          | EX LOCK-           | -       |                                    |
| 21                 |          | EMG_OFF_OUTSIDE+   | +       | 20VDC V 28VDC<br>I 15mA            |
| 14                 |          | EMG_OFF_OUTSIDE-   | -       |                                    |
| 17                 |          | EX_RED_CONTROL+    | +       |                                    |
| 24                 |          | EX_RED_CONTROL-    | -       |                                    |

## 4-

启动流程如下所示：

1

2

3

4

5 (MAIN SWITCH) ON

6 "ON"

7 START

8

3

3

## 5-

激光器工作模式如下：

1

2

3



3

" G3-Series"



4

RS232

EtherNet

5

" G3-Series"



6

RS232

COM

COM

COM

" "

7

EtherNet

IP2

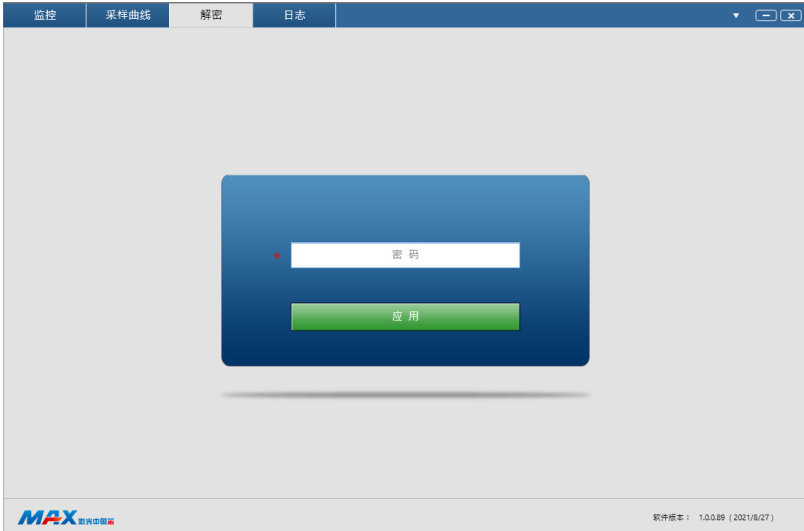
IP

192.168.0.178

" "



9



## 7-

| 序号 | 故障名称 | 故障原因 | 备注                               |
|----|------|------|----------------------------------|
| 1  | PD   |      |                                  |
| 2  |      |      |                                  |
| 3  |      |      |                                  |
| 4  |      |      | "0-10V"DA                        |
| 5  | QBH  | QBH  | QBH<br>QBH                       |
| 6  |      |      |                                  |
| 7  |      |      | RS232/Ethernet<br>RS232/Ethernet |

## 第七章 光纤连接器检查和清洁指南

### 1-

清洁光纤连接器，您需要如下器材：

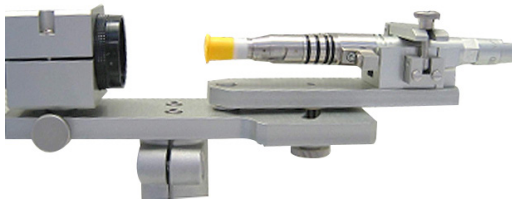
- 1
- 2
- 3
- 4
- 5
- 6
- 7

2-

- 1 "OFF"
  - 2
  - 3 7-1
  - 4 7-2
  - 5
  - 6
  - 7 QBH
  - 8 7-3
- 14



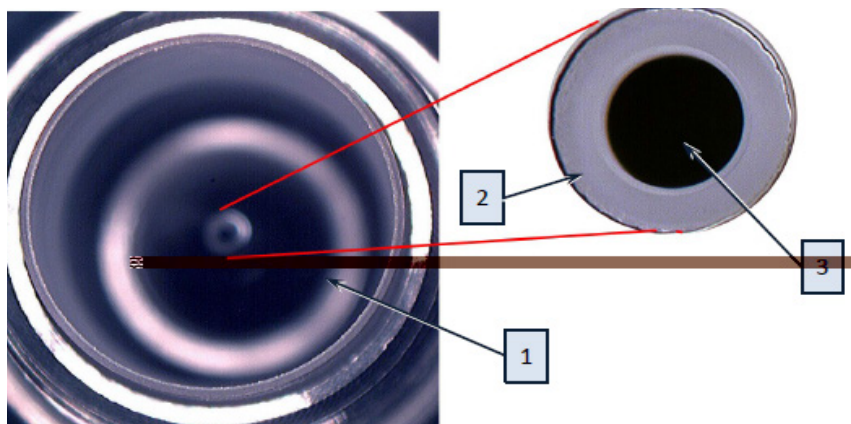
7-1



7-2



7-3

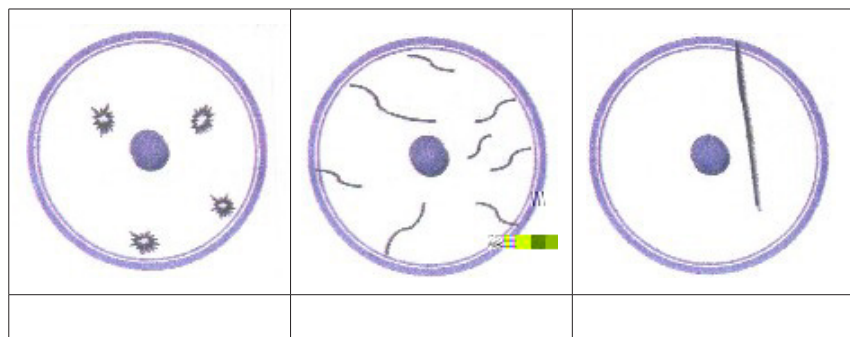


1

2

3

7-4



7-5

## 第八章 服务与维修

1-

2-

400-900-9588

## 第九章 保修声明

1-

2-

1  
2  
3  
4  
5  
6