WSX Laser Drives the Future

ND18 User Manual

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www.wsxlaser.com

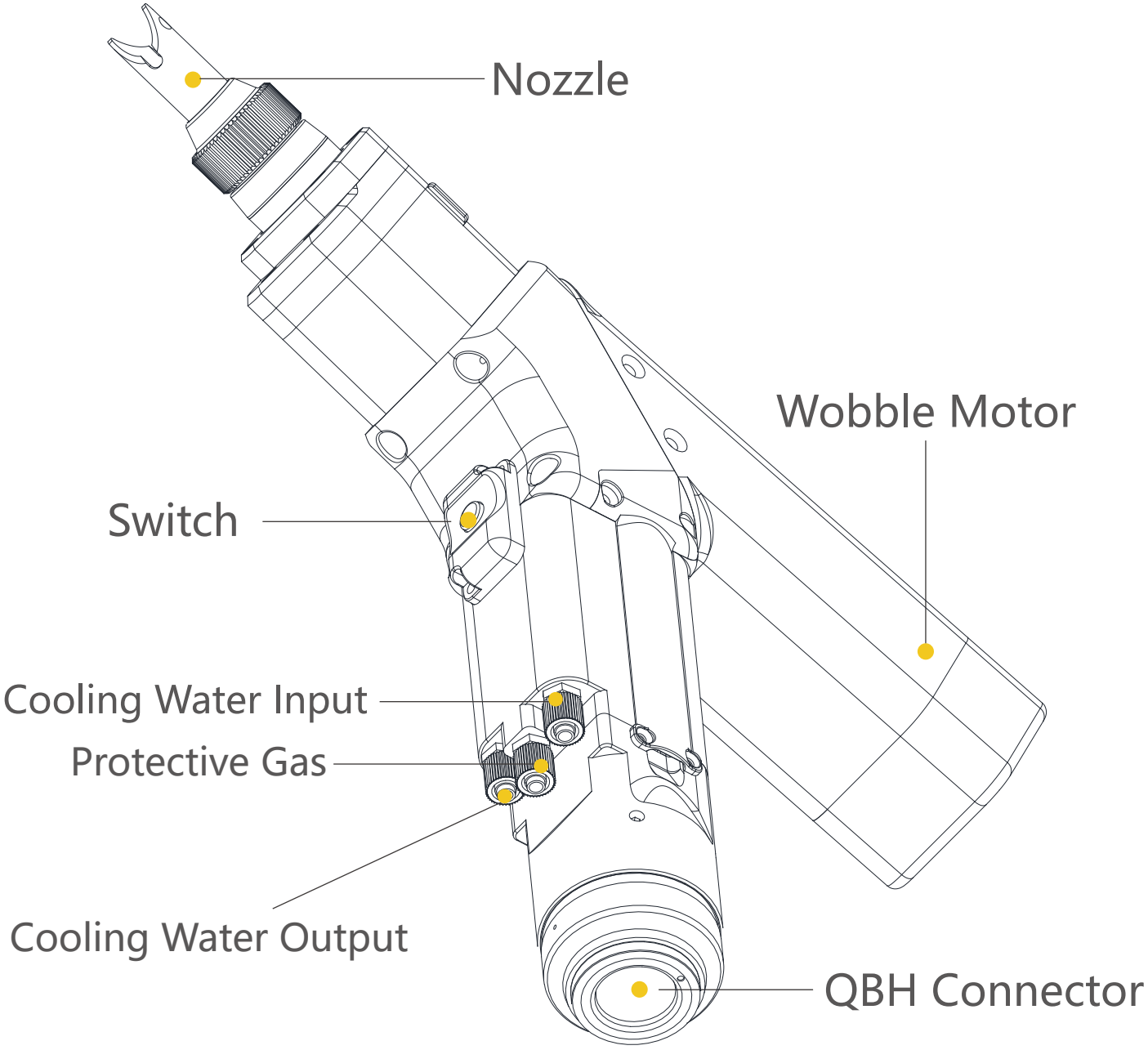
Content

Please read this manual carefully
and make sure you understand
its contents before using the laser head.

Please keep this manual for future
operation and maintenance.

1. Product Description

1.1Product Structure



Note: Cooling water quantity must be sufficient, the water pressure should be above 0.4MPa; Please keep the bending radius of the connected air pipe not less than 30mm.

1.2Main Function

1.2.1 Design and Function

1. Smart internal design and interactive control system expand the tolerance range and welding width of the processing parts, and solve the disadvantage of minor laser welding spot, and provide better welding forming.
2. Light shape, Ergonomic design, advanced structure, and reliable performance ensure comfort grip and simple operation.
3. With multiple safety alarms, the laser will be locked automatically when the workpiece is removed.
4. Nice welding seam, fast welding speed, no consumables, no welding marks, no discoloration, no later polish.
5. This head could be equipped with a variety of angular nozzles to meet the welding needs of different products.

1.2.2 Auxiliary Medium

Protective gas

In order to protect the welding position from oxidation, the protective gas should not have any harmful chemical reaction with welding material.
The protective gas must meet the Standard of ISO 8573-1:2010, Class 2.4.3 without impurity particles, water and oil. High purity protective gas will prolong the lifespan of protective window.

2 Technical Specifications

Connector Type: QBH

Max Power: 1500W

Collimating Length: 50mm

Protective Gas: Coaxial

Adjustable Width: 0-4mm

Laser Incident Mode: Coaxial

Laser Wavelength Range: 1070±20

Focusing Length: 80mm/120mm

Weight: 1.36kg

Fit for Raycus, MAX, GW, JPT, Coherent, IPG, SPI, Rofin, nLight, etc.

3. Installation & Connection

3.1 Safety Instructions

Any maintenance or fault survey should be conducted by professional trained personnel who must have got safety training and be aware of the possible danger and safety measure. Users should learn the related safety knowledge and prepare necessary safety devices before using.

Danger - High Pressure!

The gas pressure inside some laser head component can reach to 2.5MPa.

Danger - High Voltage!

Keep the power off during the maintenance and repair.

Danger - Pinching Hand!

During maintenance and repair, do not put hands or any other body parts under the laser head or forward direction of the moving axis.

Danger - Laser!

Keep the power off during the maintenance and repair. The laser machine will generate level 4 laser while working.

Keep the eyes or skins from being directly shot or scattered by laser.

Do not look directly into the laser beam even if wearing eye protecting equipment.

Please wear the goggles which meet the standard of DIN EN 207 & BGV B2.

3.2 Unpacking check

Unpacking check

1. Intact box;
2. The signage should be clear with conformity mark and accord with the purchased models;
3. The upper and lower opening tear-proof seals are not broken or disassembled;
4. If the above does not match, contact the seller.

Open the box

1. The signage surface points to opening surface;
2. Open the box with a knife, and the depth of knifepoint cutting into the box shall not exceed 2mm.

Packing List

Hand-held welding head*1	DC power cable 2m*1
ND18 control box*1	ND18 motor cable 5m*1
Power*1	Switch & security lock cable 5m*1
Nozzle*1	Touch panel*1(7inch，touch，with housing)

Check after opening

1. A packing list inside;
2. Check the products with lists;
3. Please contact us immediately if there are anything unqualified.

3.3 Preparation for Installation Tools

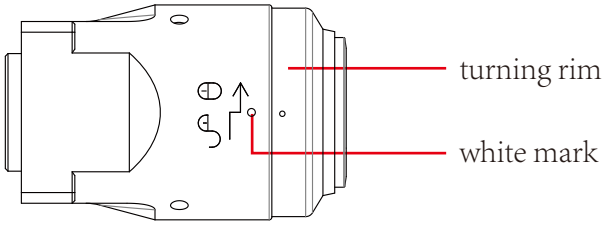
1. A set of metric hexagonal handle;
2. One bag of clean rod, one bottle of anhydrous ethanol(500ml), one package of clean gloves;
3. Clean and dust-free working environment.

Preparation of installation personel

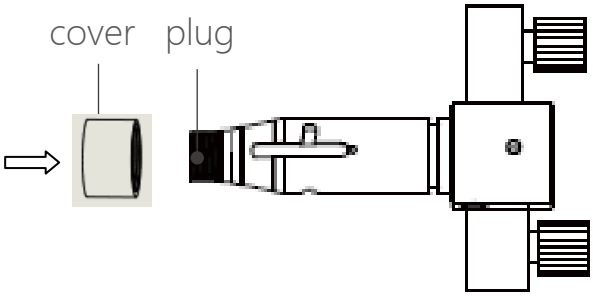
1. Read this manual carefully;
2. Wash hands with soap;
3. Wear dust-free gloves;
4. Wear a mask if necessary.(Note - Dust removal is of utmost importance)

3.4 QBH and Fiber

Step one: Before turning the rim as below, make sure the red marks are aligned to the white marks.

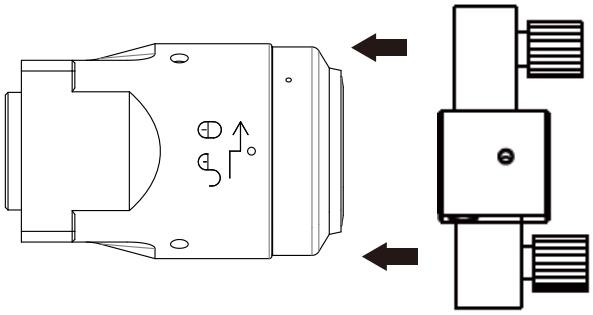


Step two: Remove the dust cover of fiber rod, clean the fiber rod with anhydrous ethanol. Before installing, check the protective cover of fiber plug to see if it is locked, avoid the cover from loosening and effecting the welding performance or burning the fiber and welding head.



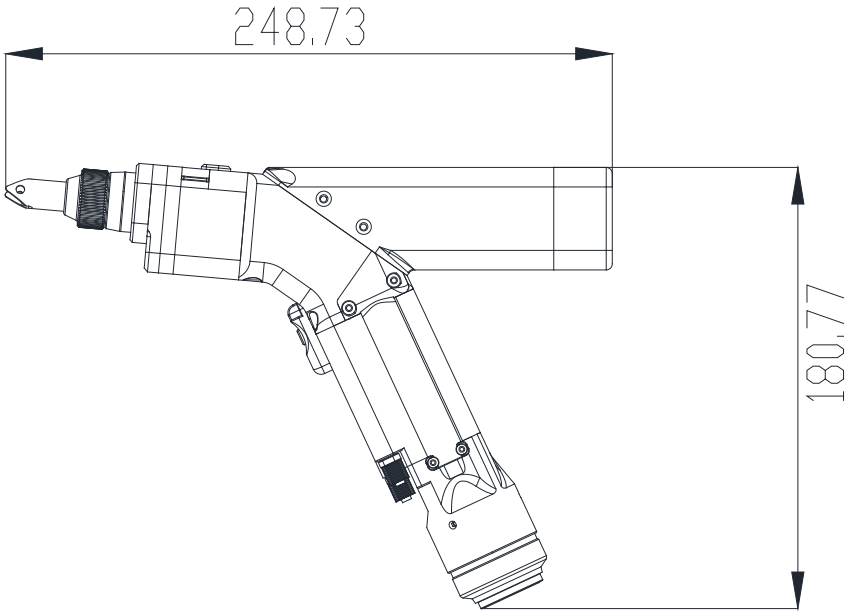
Step three: Remove the dust cover from QBH, place the clean fiber rod and the QBH coaxially, make sure the white mark on the QBH is aligned with the locating slot (long slot on fiber rod), insert the fiber rod into QBH gently, until the fiber rod joints the QBH contact surface.

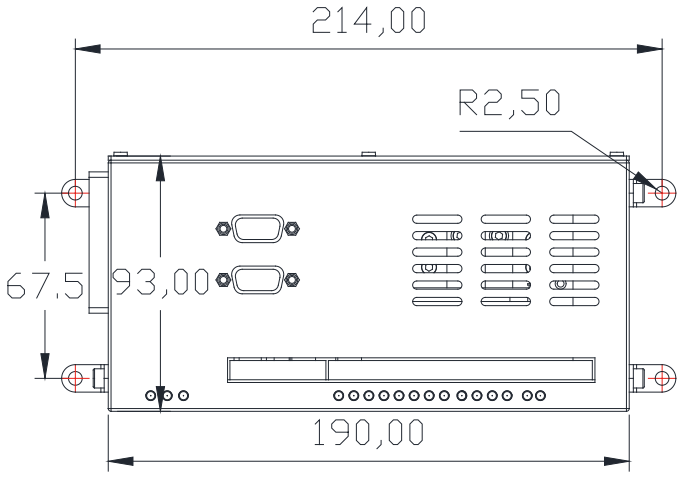
Step four: After inserting the fiber rod into QBH, press the rim gently and turn it about 15 degree along the arrow on the rim. Then pull the rim until its underside is parallel with the top of QBH, turn the rim at the same direction till the limit.

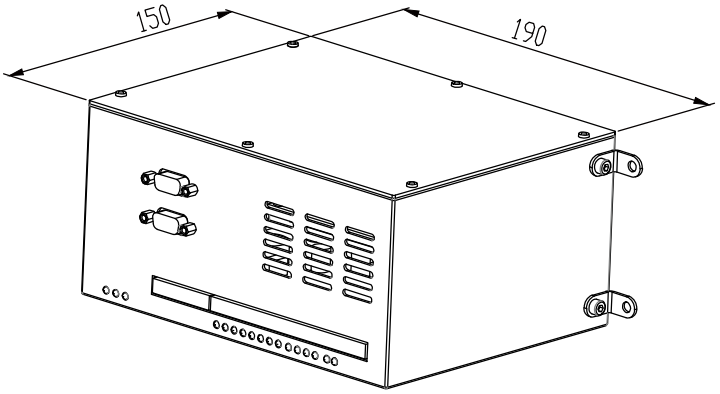


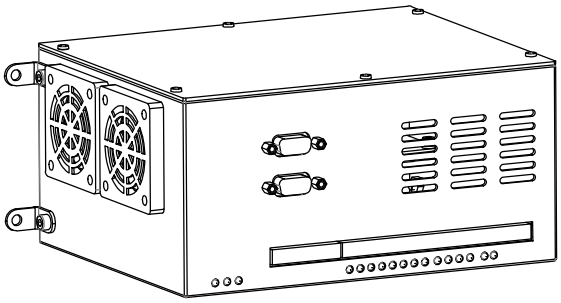
Note: 1. Insert or pull out the fiber rod gently;
2. When inserting or pulling out, QBH and fiber rod should be coaxially;
3. The operation should be kept as dust-free as possible.

3.5 Installation and outline drawing









4 Maintenance

4.1 Maintenance of QBH and Fiber

Clean and dust-free working environment is required.

Any laser circuit equipment fitted with a laser head must be carefully dedusted.

Assembly or replacement of lens or other components must be conducted in clean working environment.

Prepare new lens component before removing the old one.

Users could purchase spare lens components from us.

In case that user could not meet the above requirements, it is advised to use nonstick protective film to seal the opening after the removing of the lens immediately.

Minimize the time of laser path being exposed to the air to prevent the dust and dirt entering into the laser head.

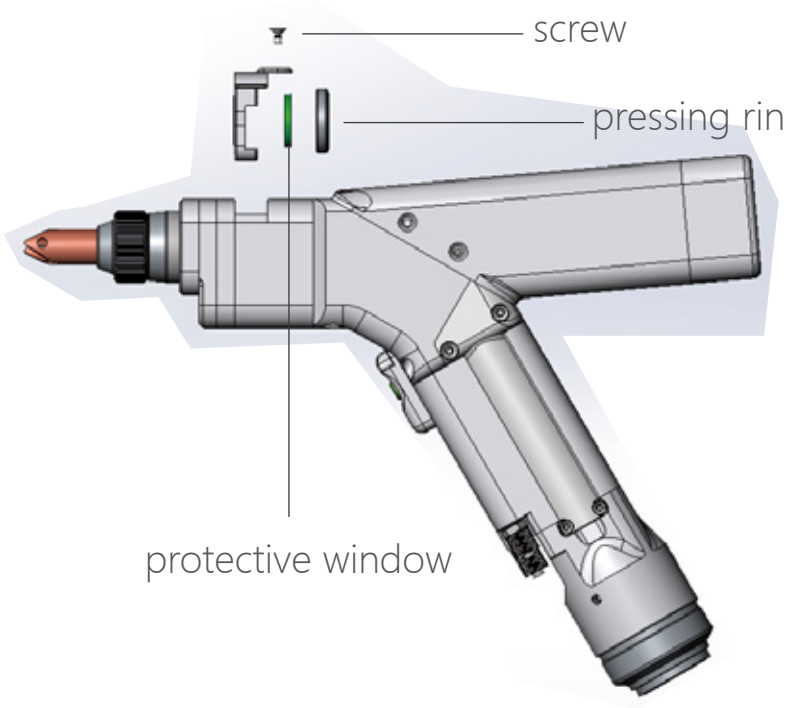
If any safety or protection device has been removed, it must be reinstalled before the equipment being operated or debugged and checked whether the device could run well.

Maintenance of QBH and Fiber Connector

1、Use self-adhesive paper to cover the junction of QBH and fiber connector to prevent dust from entering the gap.

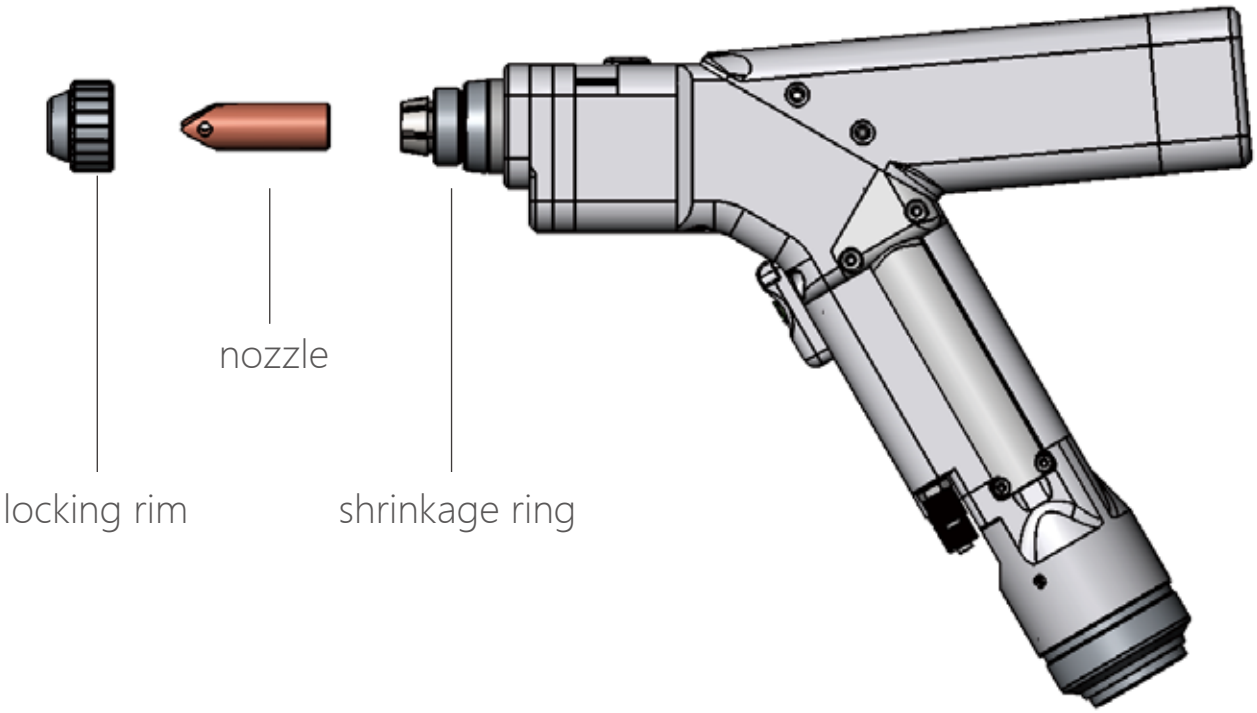
2、Fiber connector water cooling pipe must be connected well to prevent leaking. If QBH has water inside accidentally, please stop using immediately and send it to the factory to handle with.

4.2 Replacing protective window



1.Loose the screw, pull out protective window cartridge;
2.Remove the press ring;
3.Take out protective window (D18*2), replace to a new one;
4.After place the protective window in the holder, press the pressing ring (white slip ring should be upper) onto the protective window, protective window should be in the groove of the pressing ring;
5.Insert the protective window cartridge in the welding head, tighten the screw.

4.3 Replacing nozzle

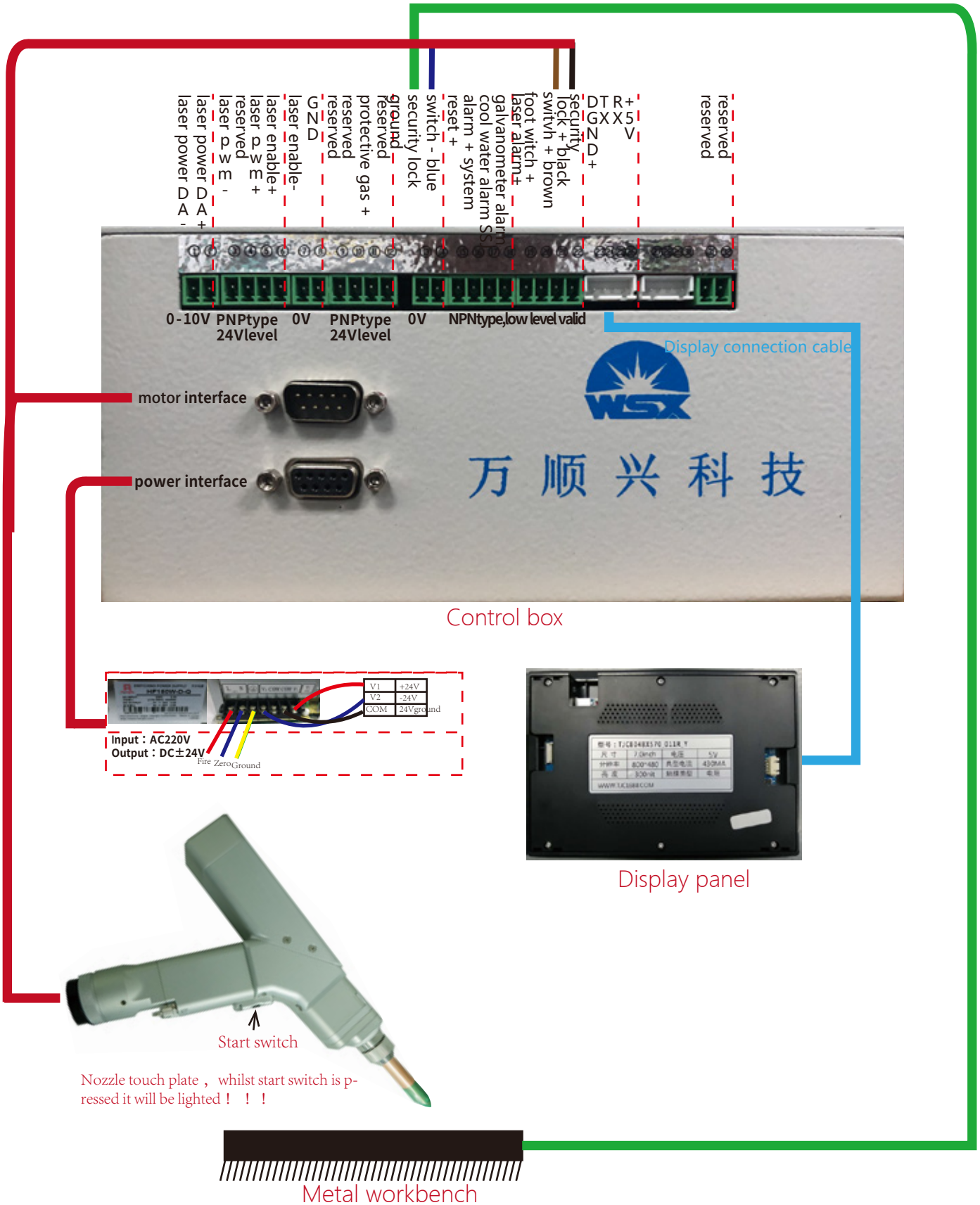


1.Loosen and remove the locking rim;
2.Remove the nozzle, insert the new nozzle into shrinkage ring;
3.Tighten the locking rim.

Electric Chapter

5.1 Connection Diagram

Electric connection diagram



5.2 Port definition

Indicator light:

<table>
<tr><td colspan="3">Starting from the voltage side in turn:</td></tr>
<tr><td>Power Indicator</td><td colspan="2">This light is on when 24V power supply is normal.</td></tr>
<tr><td>operation light</td><td colspan="2">This light flashs when the vibrating output is enabled, otherwise the power will be on.</td></tr>
<tr><td>Alarm light</td><td colspan="2">This light will be on when the control card system detects an abnormal and stop output.
The abnormal conditions:
1 receiving alarm signal
2 control card system abnormal</td></tr>
<tr><td colspan="2">Security and valid lock signal indicator</td><td rowspan="9">The indicator light will be on when the input signal connect to low level</td></tr>
<tr><td colspan="2">Welding switch valid signal indicator</td></tr>
<tr><td colspan="2">Foot switch valid signal indicator</td></tr>
<tr><td colspan="2">Laser alarm valid signal indicator</td></tr>
<tr><td colspan="2">Galvanometer alarm valid signal indicator</td></tr>
<tr><td colspan="2">Cooling water alarm valid signal indicator</td></tr>
<tr><td colspan="2">SSJ alarm valid signal indicator</td></tr>
<tr><td colspan="2">Reset valid signal indicator</td></tr>
<tr><td colspan="2"></td><td></td></tr>
<tr><td colspan="2">Laser enable valid signal indicator</td><td rowspan="4">The indicator light will be on when the output signal connect to high level.</td></tr>
<tr><td colspan="2">Protective gas enable valid signal indicator</td></tr>
<tr><td colspan="2">Reserved output valid signal indicator</td></tr>
<tr><td colspan="2">Reserved output valid signal indicator</td></tr>
<tr><td colspan="2">NC</td><td></td></tr>
<tr><td colspan="2">NC</td><td></td></tr>
</table>

Input control port:

<table>
<tr><td colspan="2">When all input ports are connected to low level (0~0.7V), it is a valid signal input. The high level is 24V or left floating, and the access signal is invalid.</td></tr>
<tr><td>Security lock input</td><td>This signal is valid when the welding head is in contact with the welding piece.
It is necessary to ensure that welding piece is connected to the "security lock input-" signal pin of the controller.</td></tr>
</table>

Welding torch switch input	This signal is valid when the switch of torch head is closed
Foot switch input	This signal is valid when the foot switch is closed
Laser alarm input	The laser alarm signal input from this interface, and the low level is regarded as a valid signal.
Galvanometer alarm input	The galvanometer drive card alarm signal input from this interface, and the low level is regarded as a valid signal.
Cooling water alarm input	The cooling water control alarm signal input from this interface, and the low level is regarded as a valid signal.
SSJ alarm input	The SSJ alarm signal input from this interface, and the low level is regarded as a valid signal.
System reset input	When the system needs to be reset, the interface will input low level, the operation light will flash 3 times, and the system parameters will be set to the factory default.
input signal-	These two interfaces are common to all input ports, and the "-" of all input signals can be connected here, and is connected to the "output signal-".
input signal-	

Output control port:

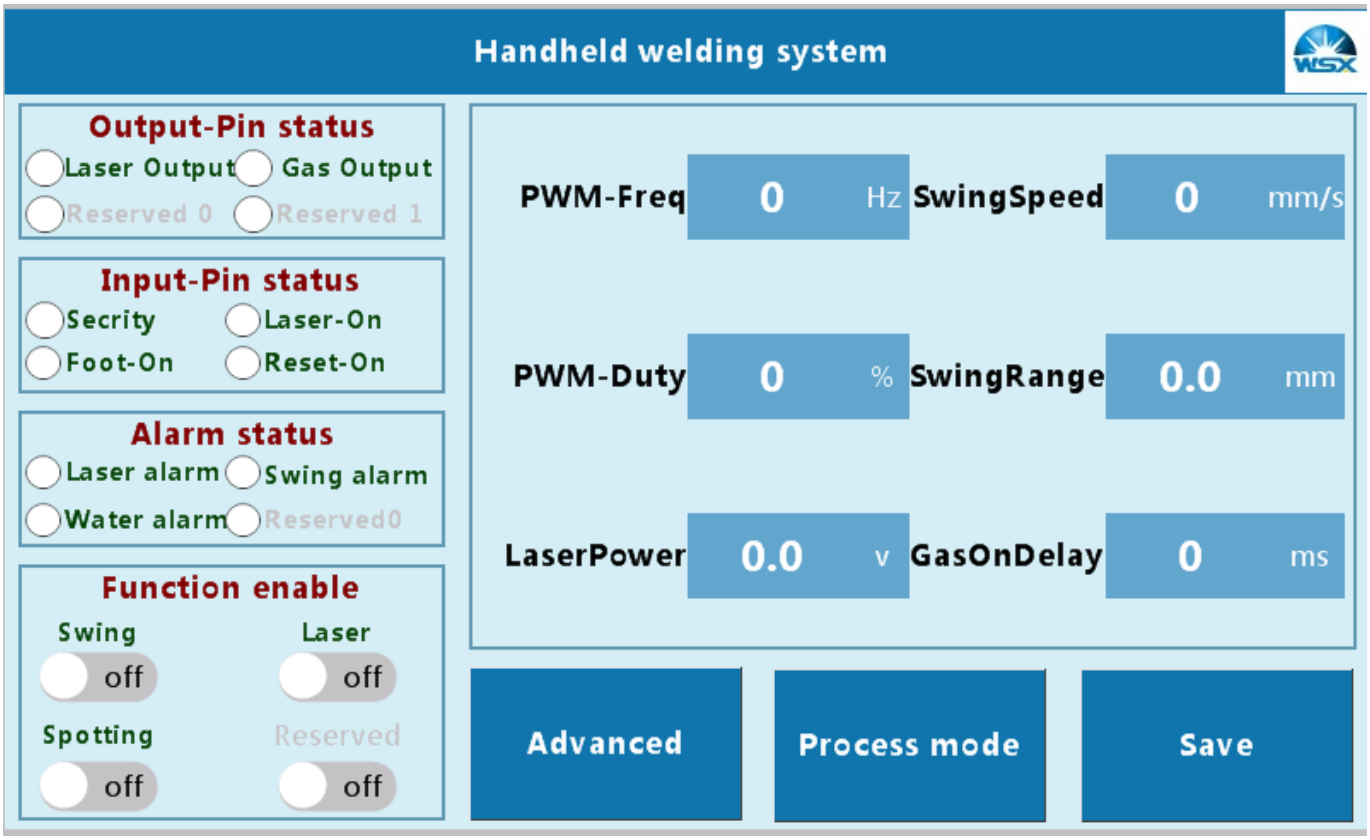
All output ports output high level (≥19V) as valid signals	
Laser enable output +	When the security lock and the torch switch input signal are valid at the same time, this port outputs a high level (≥19V)
Protective gas enable output +	When the protection gas function is enabled, when the security lock and the torch switch input signal are valid at the same time, this port outputs a high level (≥20V).
Output retention +	No function definition
Output retention +	No function definition
output signal-	These two interfaces are common to all outputs, and the "-" of all output signals can be connected here. Also connected to the "input signal -"
output signal-	

Laser control port:

Laser enable +	"Laser enable output +" with the output
Laser PWM+	The output range is 0~100000Hz. The corresponding output value can be adjusted by adjusting the laser frequency parameter.

Laser PWM-	
Laser DA+	The output range is 0~10V, which corresponds to 0%~100% of the laser power. The corresponding output value can be adjusted by adjusting the laser power parameter.
Laser DA-	

5.1 User Interface



Function Description

Output port status

Laser output: The IO indicator lights up when the laser is emitting light.

Gas output: The IO indicator lights up when the gas is working

Reserved output 0: reserved

Reserved output 1: reserved

Input port status

Security lock: The IO indicator lights up when the security lock is locked

Laser-on: This IO indicator lights up when the laser switch is on

Foot-on: This IO indicator lights up when the foot switch is turned on.

Reset-on: program reset at 3S later after reset

Alarm status

Laser alarm: When the laser is abnormal, the alarm lights up, that is, stops working.

Swing alarm: When the galvanometer driver board is abnormal, the alarm lights up, that is, stops working.

Water alarm: When the water cooler is abnormal, the alarm lights up, that is, stops working.

Reserved 0: reserved

Parameter setting description

PWM-Freq: set the light output frequency

SwingSpeed: the speed at which the lens oscillates

PWM-Duty: set the light duty cycle

Swingrange: set the amplitude of the oscillation of the galvanometer

LserPower: set the optical power

GasOnDelay: setting the delay time for turning on the gas

Function enable

Swing: Turn galvanometer on or off

Laser spotting: turn on the spot mode switch

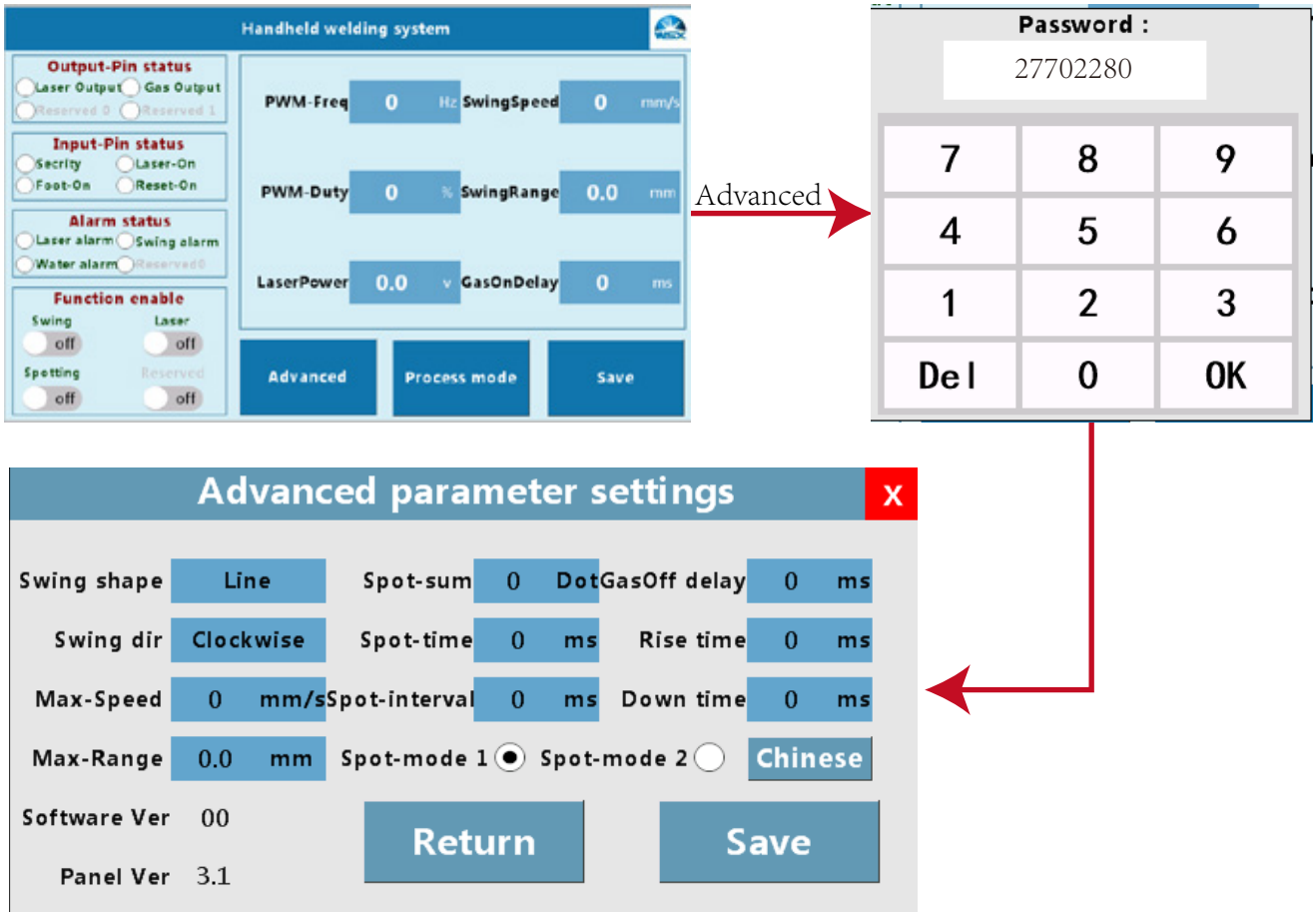
Spotting:turn laser spot on or off

Reserved: reserved

Advanced parameters: Click to enter the advanced settings interface

Process mode: The function has not been developed yet, so stay tuned!

Parameter save: save current settings for processing



Advanced parameters:

Click the advanced parameter button on the display interface to enter the password input interface, set the corresponding parameters click the save parameter to exit the interface

Swing shape: the shape of the oscillating lens
Swing dir: set the swing direction to counterclockwise or clockwise
MAX-Speed: set the maximum speed of motor swing
MAX-Range: set the maximum amplitude of the oscillating motion
Spot-sum: set the number of points of light
Spot-time:set the length of time the light is emitted
Spot-interval:set point to spotting light interval
DotGasOff delay:set the delay time for turning off the gas
Rise time:Set the Slow rise time.
Down time:Set the slow descent time.

Spotting mode: spotting is divided into two modes
Spot-mode 1 :Mode 1 is the continuous light exit mode. Press the switch to immediately exit the laser. Release the switch and close it immediately.
Spot-mode 2:Mode 2 is a switch, which can output pulsed laser, the number of points, the duration of the laser, and the interval can be adjusted. Release the switch and close it immediately.

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