TOKINARC®
TOKIN CORPORATION

Instruction Manual

Nozzle Cleaning Station

TKS-R Series

TKS-RC
TKS-RS

Please read this instruction manual before using the product.	Please be sure to deliver this instruction manual to the end user of this product.

TOKIN CORPORATION

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Regarding Safety

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NOTES REGARDING SAFETY

Be sure to read these instructions before using the welding torch.

- In order to ensure safe operation, this equipment should only be set up, inspected and maintained by a qualified person, or by someone who has a through understanding of the welding equipment and who has received sufficient training in its use.
- In order to ensure safe operation, this equipment should only be operated by people who have read these instructions throughly and understood their contents and who have the knowledge and ability to handle the equipment safely.
- It is recommended that instruction in all aspects of safe operation should be obtained from institutions snd associations which provide courses in proper welding techniques taught by qualified welding instructors.
- After reread these instructions, keep them in a safe and easily-accessible place so that they can be reread at a later date as required.
- Please contact TOKIN CORPORATION or its dealer if there are any unclear points in this manual. If there are any questions regarding service, contact the dealer of your purchase or TOKIN CORPORATION. The contact address and the telephone number are printed on the rear cover of this instructions.

1.Precautions for safety

- Different degrees of personal injury or equipment damage can occur if this welding torch is used incorrectly. The terms and symbols which appear in the "NOTES REGARDING SAFETY" section of these instructions are classified into three ranks according to the possible degree of danger or injury that each one warns against.

Symbol	Term	Definition
⚠	DANGER	The instructions which follow this term represent situations where failure to follow the instructions will almost certainly result in severe injury or death.
	WARNING	The instructions which follow this term represent situations where failure to follow the instructions can possibly result in severe injury or death.
	CAUTION	The instructions which follow this term represent situations where failure to follow the instructions may result in injury to the operator or physical damage.

In the above definitions, "severe injury" refers to cases of blindness, physical wounds, burns (high- and medium-temperature), electric shocks, fractures or poisoning which may leave scars or lasting ill-effects and for which medical treatment or prolonged hospitalization may be necessary. "Injury refers to cases of physical wounds, burns and electric shocks for which prolonged medical treatment and hospitalization are not necessary, and "physical damage" refers to extensive damage that may result in damaged property or broken equipment.

2.Items that must always be observed for safety

WARNING ⚠ **These items should be observed at all times in order to prevent the possibility of serious personal injury.**

- Welding torches have been designed and manufactured with full consideration given to safety; however, the warning and cautions given in this "Notes Regarding Safety" section must always be strictly observed during use. If they are not observed, severe injury or death through misoperation may result.
- Do not unauthorized personal come into the area where welding equipment is being used.
- When welding equipment is turned ON, it generates a magnetic field. This magnetic field may adversely affect the operation of some sensors and gauges. For the same reason, people who are using a heartbeat pace maker must not go close to operating welding equipment or go into workshops where welding equipment is being used unless prior medical approval has been obtained.
- In order to ensure safe operation, welding torch, wire feeder and the welding power supply equipment should only be set up, inspected, maintained and repaired by a qualified person, or by someone who has a through understanding of welding equipment and who has received sufficient training in its use.
- In order to ensure safe operation, welding torch should only be operated by people who have read these instructions and the instructions for the wire feeder and power supply equipment through and understood their contents and who have the knowledge and ability to handle the equipment safely.
- Do not use welding torch for any applications other than for arc welding as explained in these instructions and in the instructions for the wire feeder and power supply equipment.

WARNING ⚠ ϟ **These items should be observed at all times in order to prevent the possibility of electric shocks.**

*Touching the charged parts can cause fatal electric shocks or burns. Welding wire, contact tip and tip body are charged whenever the welding torch is turned ON and operating.

- Never Torch charged parts such as welding wire, or contact tip while welding torch is turned ON and operating.
- Grounding of welding power supply case and base metal and tools which are connected electrically to the base metal, must be carried out by a qualified electrician in accordance with the proper electrical engineering regulations.
- Turn OFF all input power supplies by turning OFF the switches in the distribution box before carrying out any inspections or maintenance.
- Inspections and maintenance should be carried out at periodic intervals, and the equipment must not be used until any damaged parts found have been repaired or replaced.
- Do not use cables that are damaged or that have exposed conductors, or that are rated lower than the specified level.
- Make sure that the cable is connected securely and that it is insulated.
- Welding cable should be connected as close as possible to the base metal being welded and it should be connected securely.
- Do not wear gloves which are torn or wet.
- Use a safety strap if welding in raised places.
- Turn OFF all power switches and the input power supply when not using.

CAUTION ⚠  **Wear protective equipment at all times to protect yourself and others against arc beam, welding flashes, flying spatter and slag, and noise.**

*Welding flashes contain harmful ultraviolet and infrared lights which can cause inflammation or burn to eyes.
*Flying spatter and slag can hurt the eyes and cause serious burns.
*The noise generated by welding can cause problems with hearing.

- Always wear protective goggles or welding masks which have sufficient shielding properties when doing welding or when observing welding being done.
- Wear protective glasses to protect the eyes from spatter and slag.
- Hang a curtain around the area where welding is being carried out to prevent welding flashes from affecting passers-by.
- Wear protective clothing such as leather gloves, longsleeves, leg covers and a leather apron for protection while welding.
- Wear noise proof ear protectors if the noise level is too high.

CAUTION ⚠  **Use protective equipment at all times to protect yourself and others against any fumes and gases that may be generated from welding.**

*Fumes and gases are generated when welding is carried out. Inhaling fumes and gases can be dangerous to your health.
*Welding in confined spaces can reduce the oxygen content in the air, which can result in suffocation.

- To provent gas poisoning and suffocation, always use a proper ventilation equipment to vent gases locally or entirely as stipulated by labor safety regulations and air contamination prevention regulations, or use an adequate breathing apparatus.
- When welding in a confined space, make sure that the air is circulating freely, wear some kind of breathing apparatus, and work only under the supervision of a properly trained supervisor.
- Toxic gases may be generated if welding is carried out near where degreasing, cleaning or demisting operations are also being carried out. Avoid welding near places where such operations are being carried out.
- Welding metal which has been plated with zinc will cause toxic fumes. Remove the plating before welding, or wear adequate absorption equipment for protection.

CAUTION ⚠  **Be sure to observe the following to avoid burns from the nozzle and tip or injury from fine wire ends.**

*The nozzle or contact tip becomes very hot after use, and it can cause serious burns if touched.

- Do not touch the nozzle or tip immediately after welding has been completed.
- Do not bring the tip of the welding torch close to your face during wire inching.

CAUTION ⚠  **Be sure to observe the following to avoid fires, explosions and rupturing.**

*Fires can be caused by spatter and base metals which are hot after welding.
*Fire can occur as a result of heat generated by the flow of current if the cable has not been correctly connected or there is an incomplete contact in the current path at the base metal being used.
*Explosions can occur if an arc is generated near containers that contain flammable substances such as gasoline.
*Ruptures can occur if welding sealed objects such as tanks and pipes.

- Do not use the welding torch in places where flying spatter can cause flammable materials to ignite.
- Do not use the welding torch near places where flammable gases are present.
- Keep base metals away from flammable materials immediately after welding as they may have become hot.
- Remove any flammable materials on the other side of ceilings, floors and walls that are being welded as sparks from welding could cause such materials to ignite.
- The welding cable should be connected as close as possible to the base metal being welded, and it should be connected securely.
- Do not weld gas cylinders which still contain gas.
- Do not weld sealed tanks or pipes.
- Keep a fire extinguisher close by the place where welding is being carried out in case a fire starts.

Compulsory

・This user manual provides relevant information for operating the TKS-RC/RS, maintenance and inspection, safety tip and pointers, and specification details. Please always read and understand thoroughly before operating.

・In addition, a basic clause [Regarding Safety] is included in this document. Please always read instructions carefully and operate equipment properly.

Caution

・For the purpose of showing further detail some of the schematics contained in this user manual depict internal parts without covers or other safety devices. When operating the TKS-RC/RS, be sure to always have all covers or other safety devices attached properly in accordance with user manual.

・The drawings and illustrations in this manual represent examples and therefore may differ from actual delivered components.

・For quality improvement, ease of use, and like purposes this user manual may be revised accordingly.

・In case of any remodeling to the TKS-RC/RS done by the customer, this would be outside the limits of the manufacturer and therefore cannot take responsibility for compensation.

1. TKS-RC/RS Overview

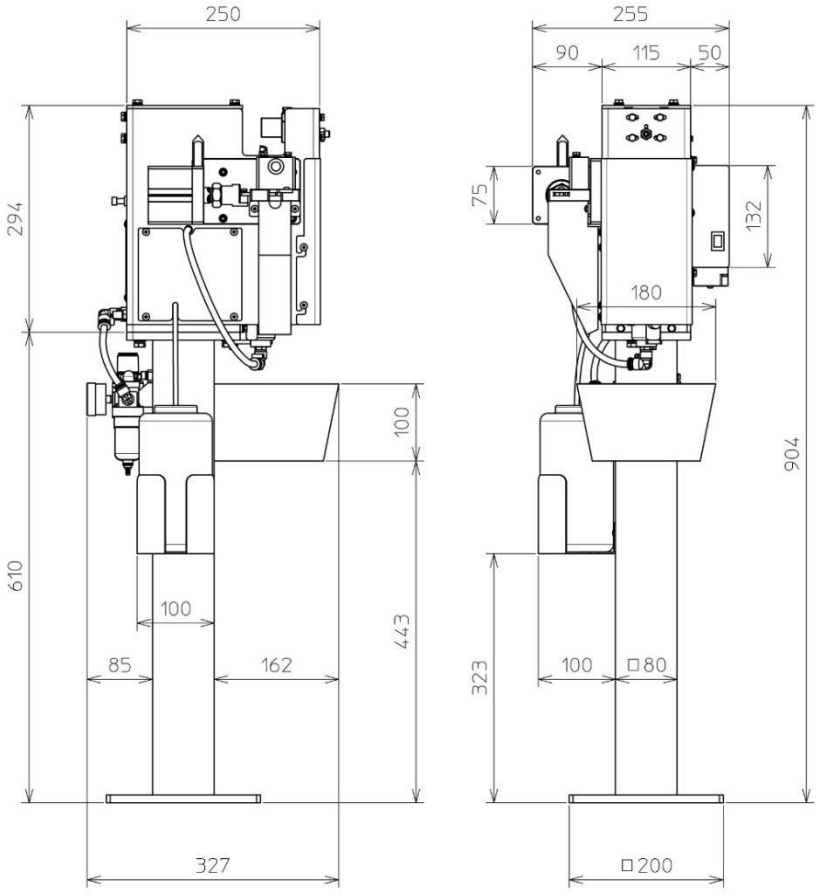
The TKS-RC/RS is equipped with an internal programmable logic controller (PLC) from which a solenoid valve and pneumatic circuit work the wire cutter, nozzle cleaner, and anti-spatter sprayer. This section provides a summary explanation for the TKS-RC/RS.

1.1 Confirming the Contents

In the unlikely event there are contents missing or defective parts please contact the Overseas Trading Department.

	Contents	Amount
1	Nozzle Cleaning Station Main Body	1
2	Catch Tray	1
3	Wire Chute	1
4	Bottle	1
5	Bottle Holder	1
6	Lubricating Oil (100 mL)	1
7	Bolt (for fastening 2,3,5)	6
8	Bolt Anchor (M8)	4
9	Check Valve	1

1.2 External Dimensions

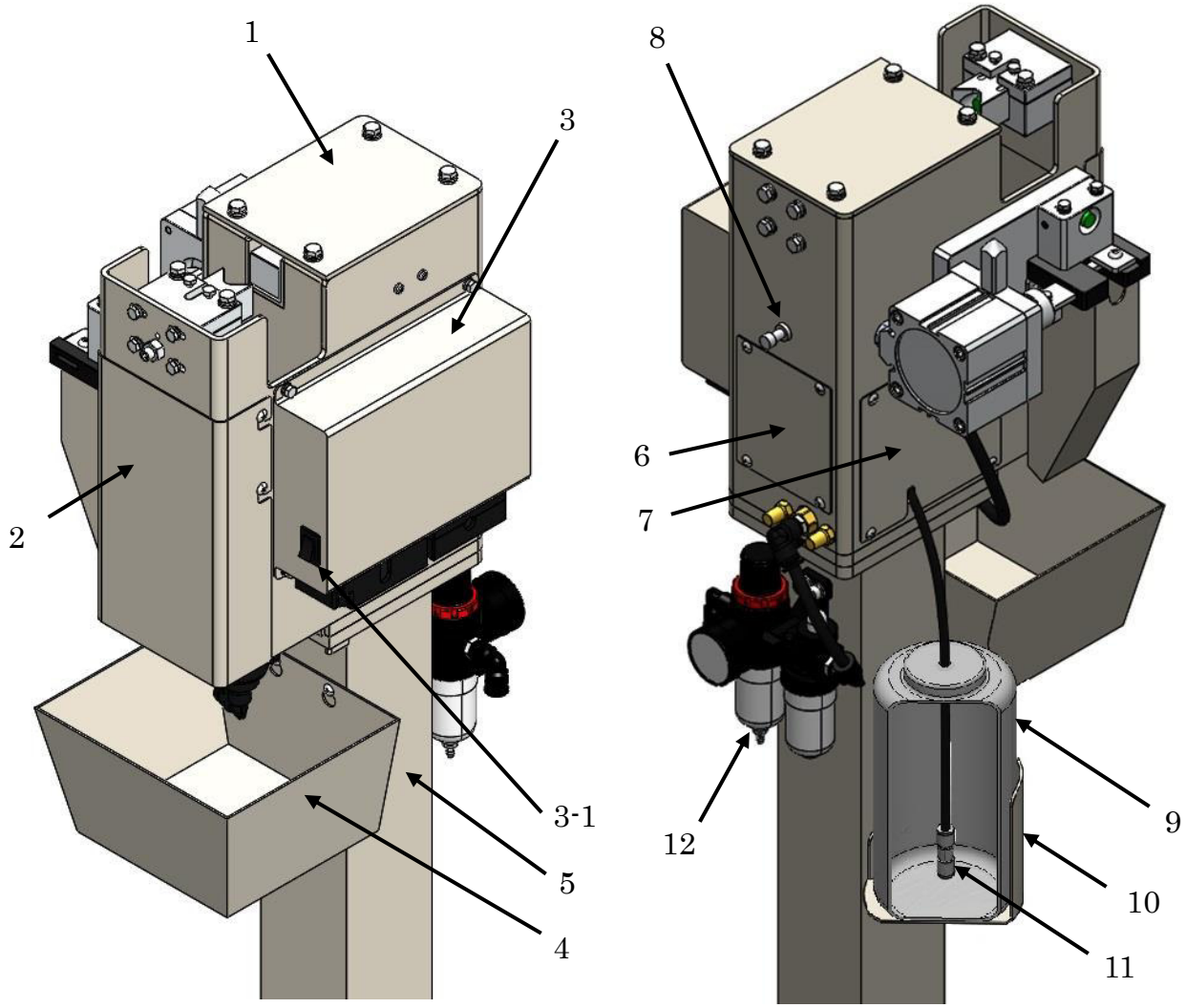


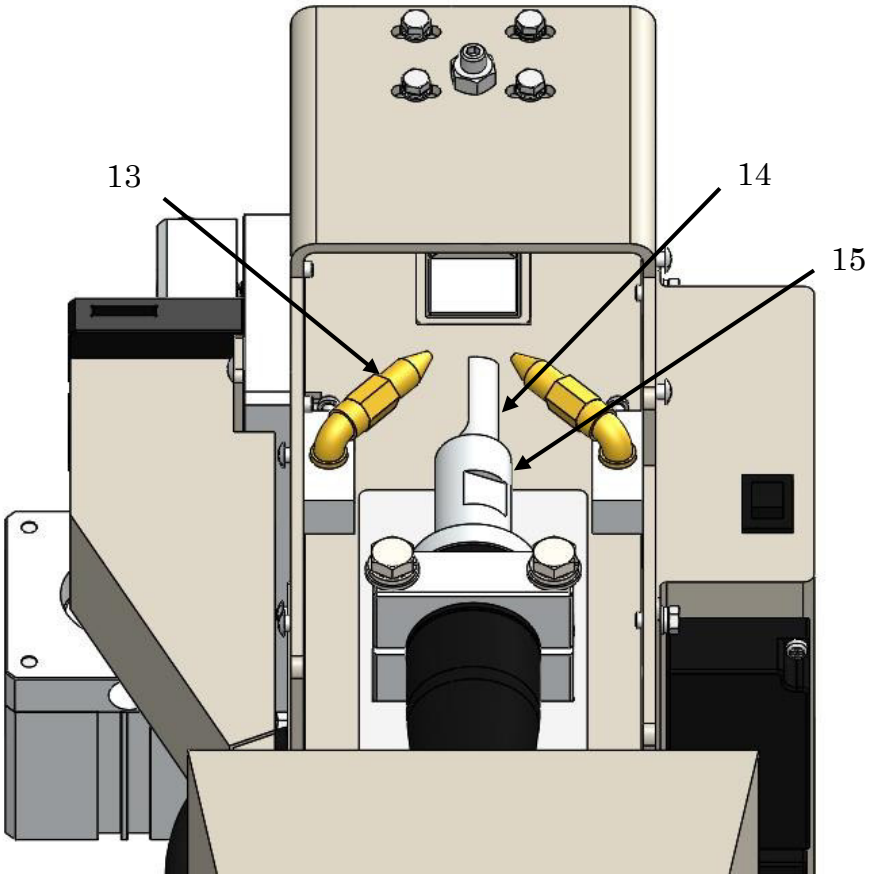
1.3 Specification Chart

Input Power Supply	AC 100-240V／DC 24V(RC only)※1
Operating Voltage	DC 24V
Operating Power Consumption	12.5W
Unclamp Signal Output	AC/DC 5-240V (10W Max.)
Air Pressure	0.5～0.6MPa
Temperature	0～55℃
Relative Humidity	35～85%RH
Wire Cutting Ability (0.6MPa)	Solid Wireϕ1.6 or less, Flux Wireϕ3.2 or less
Weight	25kg

※1 AC and DC24V cannot be used together. (For details see 3. Electric Wiring)

1.4 All Parts Description

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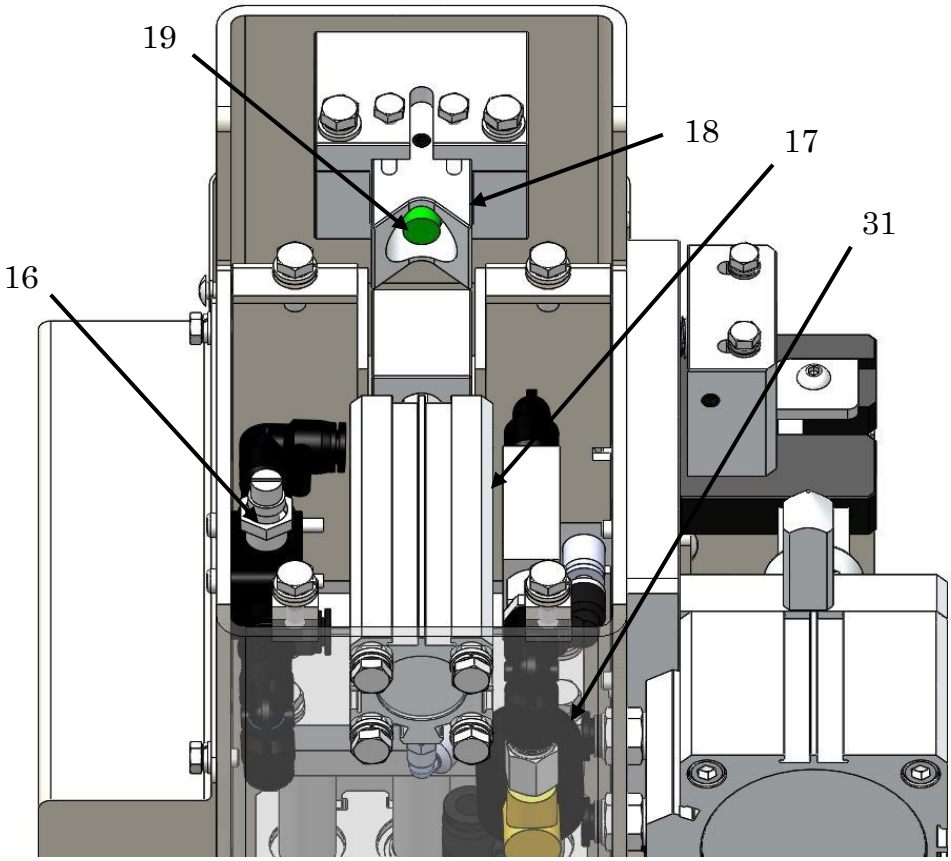
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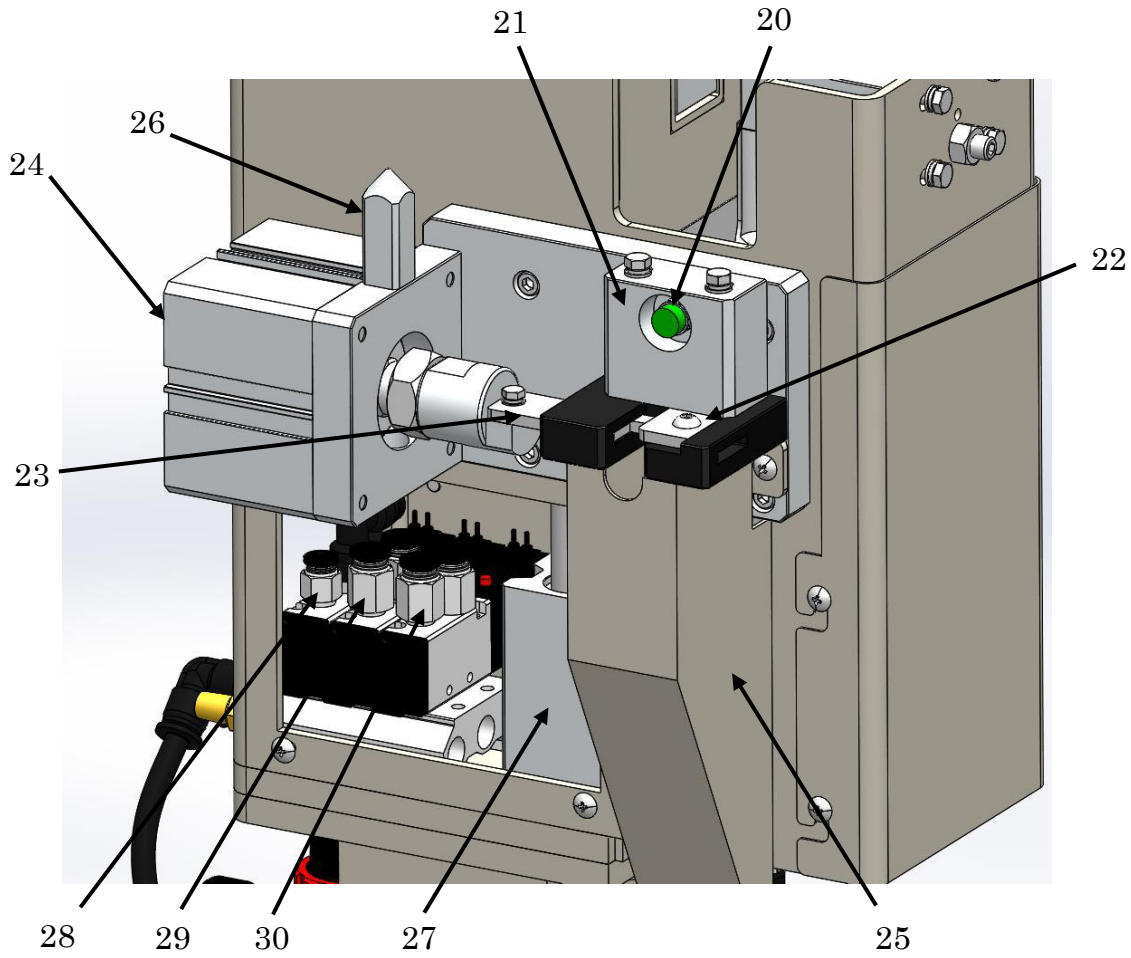


Item No.	Description	Item No.	Description
1	Cover Plate	16	Lift Speed Adjustment Knob
2	Front Cover	17	Nozzle Clamp Cylinder
3	Control Box	18	Fixed Side Nozzle Clamp
3-1	Power Switch	19	Nozzle Clamp Proximity Sensor ※TKS-RS Only
4	Catch Tray	20	Wire Cutter Proximity Sensor ※TKS-RS Only
5	Stand	21	Proximity Sensor Fixed Block ※TKS-RS Only
6	Rear Cover	22	Upper Blade (TKS-R Spec.)
7	Side Cover	23	Lower Blade (TKS-R Spec.)
8	Spray Adjustment Knob	24	Wire Cutter Cylinder
9	Bottle	25	Wire Chute
10	Bottle Holder	26	TCP Indication Fixture (TKS-R Spec.)
11	Check Valve	27	Lift Cylinder
12	FRL Unit	28	Solenoid Valve (For Nozzle Clamp)
13	Spray Nozzle	29	Solenoid Valve (For Wire Cutter)
14	Reamer (TKS-R Spec.)	30	Solenoid Valve (For Air Motor and Lift)
15	Air Motor	31	Solenoid Valve (For Spray)

2. Installation

This sections includes the location and installation method for the TKS-RC/RS.

2.1 Installation Location

Please install the TKS-RC/RS in a location that satisfies the below conditions.

(1) A location the torch end consumables are able to reach.

(2) A location where the TKS-RC/RS will not interfere with other equipment, jigs, or work.

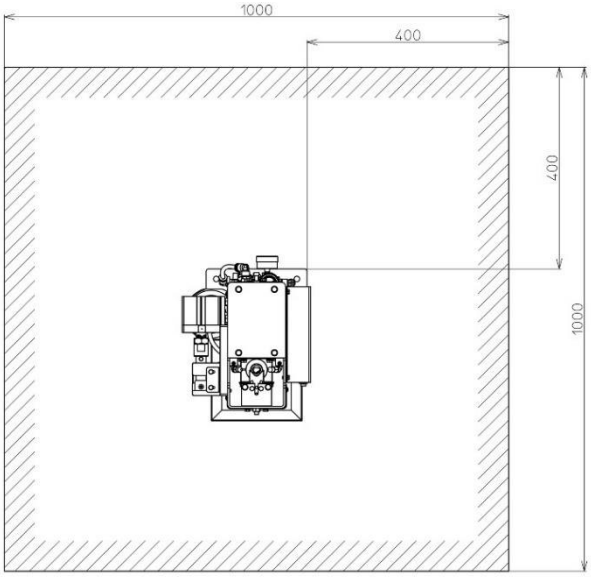
(3) A location where vibration or external forces will not affect the relative position with the robot.

(4) A location where the TKS-RC/RS will not come in contact with oil, spatter, or other debris.

(5) A location away from sources of large electrical noise such as TIG welding machines.

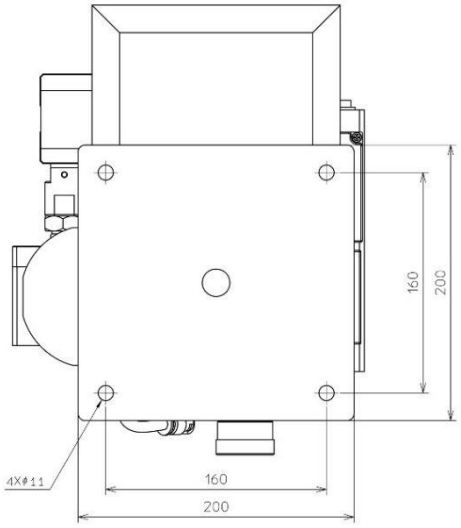
(6) A location where space is reserved for replacing consumables parts, maintenance and inspection, et cetera.

Floor Plan for Installation Location



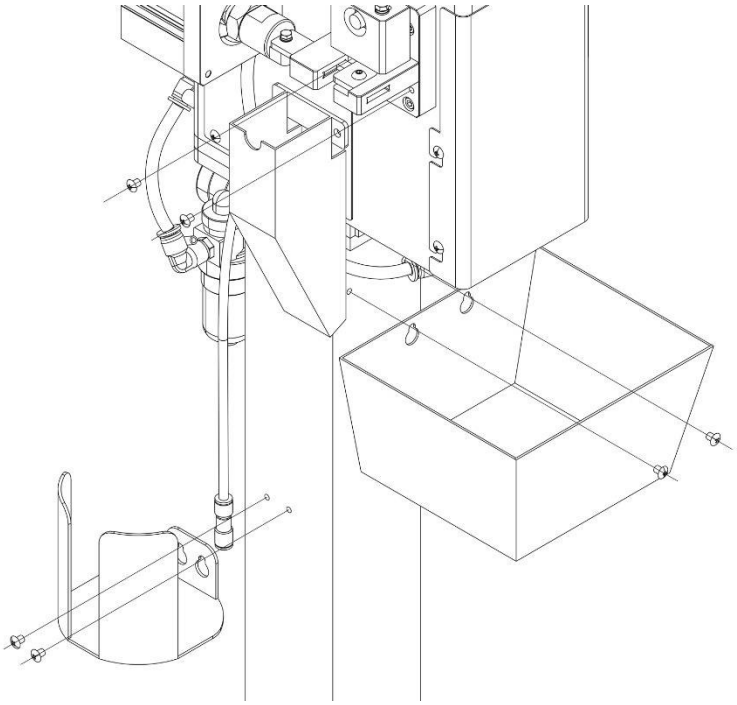
2.2 Dimensions for Mounting the Stand

Using either the included bolt anchors or other fasteners prepared by yourself, please be certain to fasten securely.



2.3 Main Assembly

(1) Please attach the catch tray, wire chute, and bottle holder using the included bolts.



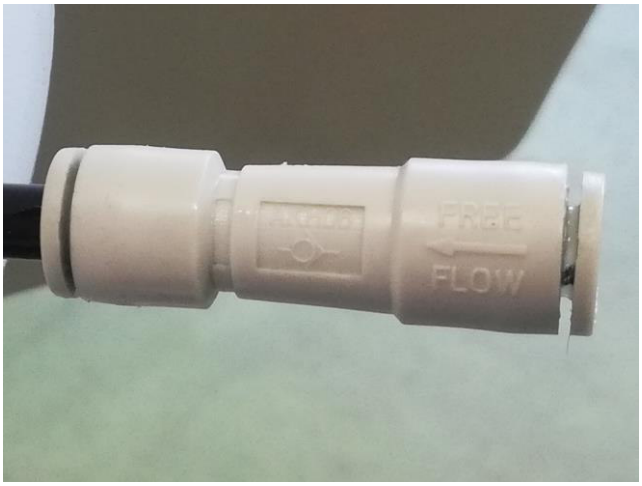
(2) Attaching the Bottle

Remove the cap from the bottle and pass the cap through the tube using the center hole.

Attached the included check value to the end of the tube.

※Be careful of both the check value and bottle cap direction.

Fill up the bottle with spray liquid, screw on the cap, and place in the holder.



3. Electric Wiring

This sections explains the electrical power connection and wire connection methods. Because wiring differs according to specification please confirm the model.

※Please arrange the necessary cables, et cetera for wiring by yourself.

Compulsory

Because there is risk of electric shock when wiring, please always first cut off the power supply to all related equipment.

3.1 TKS-RC Wiring Explanation

The TKS-RC model operates by receiving a trigger signal externally from a manipulator control device.

3.1.1 TKS-RC Regarding the Power Connection

The TKS-RC has two methods for external power supply.

1. AC100-240V Single Phase
2. DC24V 0.625A (Not Less Than)

※The recommend method is AC100-240V. If using DC24V please use a stable power supply.

Danger

If using DC24V power supply absolutely never use together with AC power. This is liable to cause damage to equipment or burns. For this connection the ON/OFF power switch is dependent on the DC24V power supply. Therefore, an additionally switch is not included on the device.

3.1.2 TKS-RC Connection Procedure

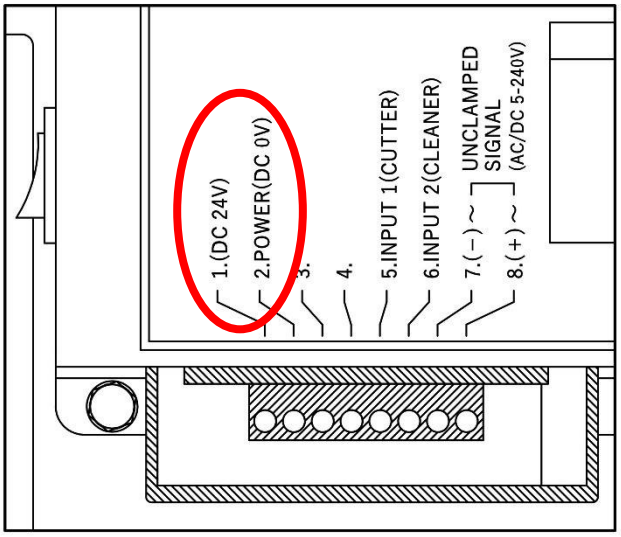
(1) Power Connection

・If AC100-240V Power Supply

Please connect the power cord. (Electric terminal block screw size: M3.)

・If DC24V Power Supply

Please connect 24V to [1.(DC24V)] and 0V to [2.POWER(DC0V)] on the electric terminal block.

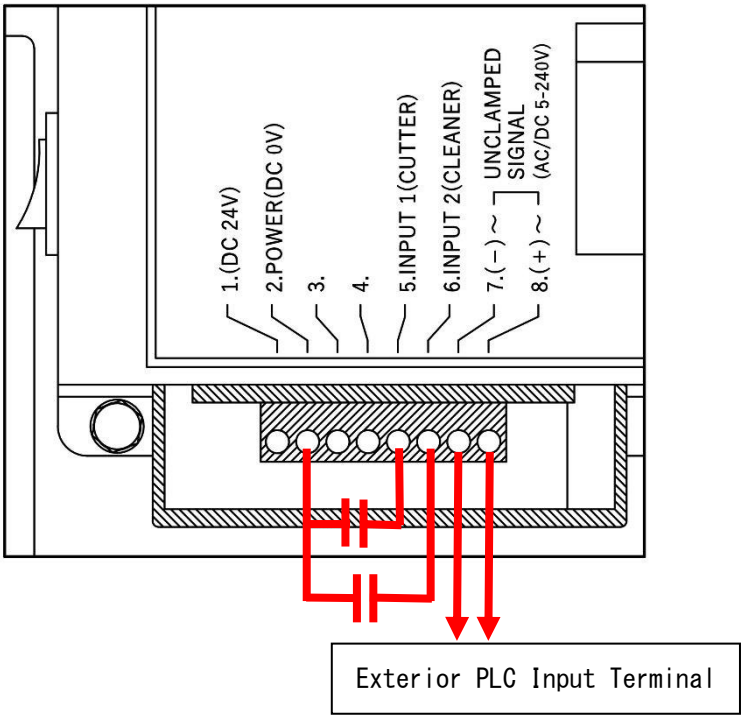


(2) Signal Wire Connection

Please connect the TKS-RC to the external control equipment by dry contact.

Connect [2.POWER(DC0V)] and [5.INPUT1(CUTTER)] on the electric terminal block by dry contact.

Connect [2.POWER(DC0V)] and [6.INPUT2(CLEANER)] on the electric terminal block by dry contact.

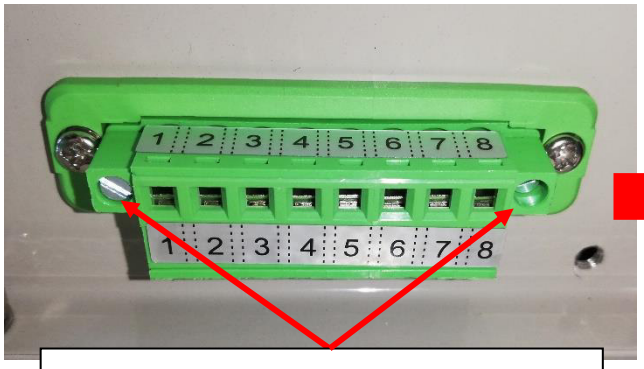


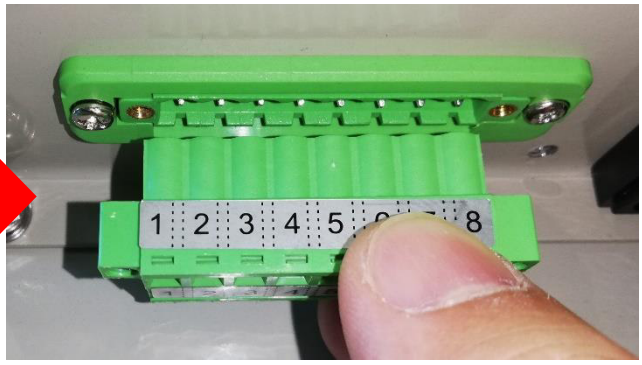
(3) Automatic Switch Connection

Please connect the unclamped signal output automatic switch (UNCLAMPED SIGNAL) to the external PLC input terminal. For the TKS-RC/RS, when the nozzle clamp cylinder is in the unclamped position exterior output to the PLC is possible.

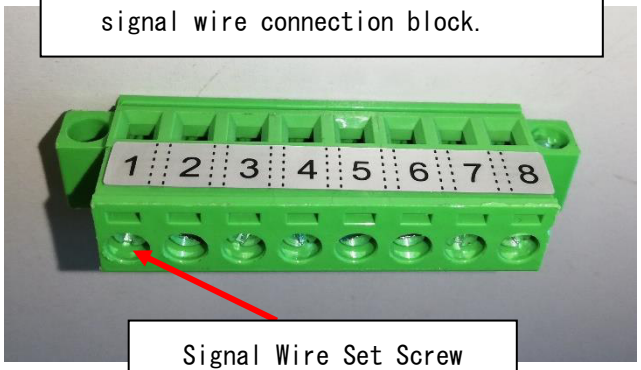
(4) Connecting the Signal Wire

Please connect the signal wire using the below essential points.

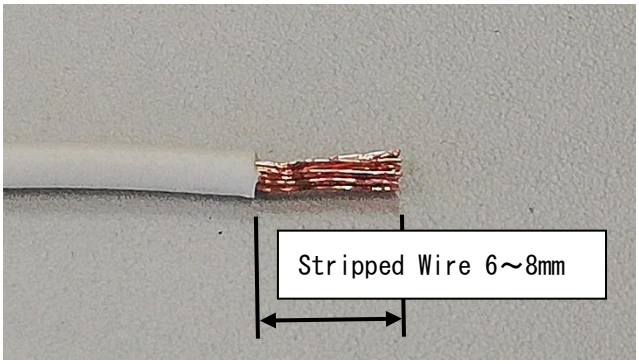


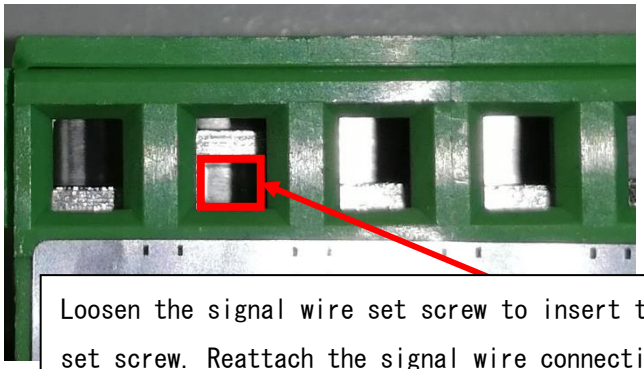


Loosen the bolts and pull out the signal wire connection block.



Signal Wire Set Screw

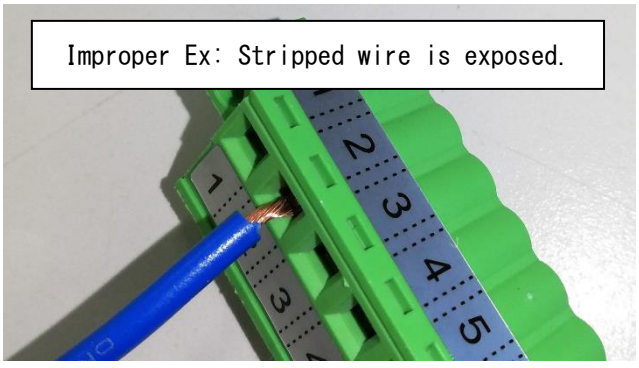




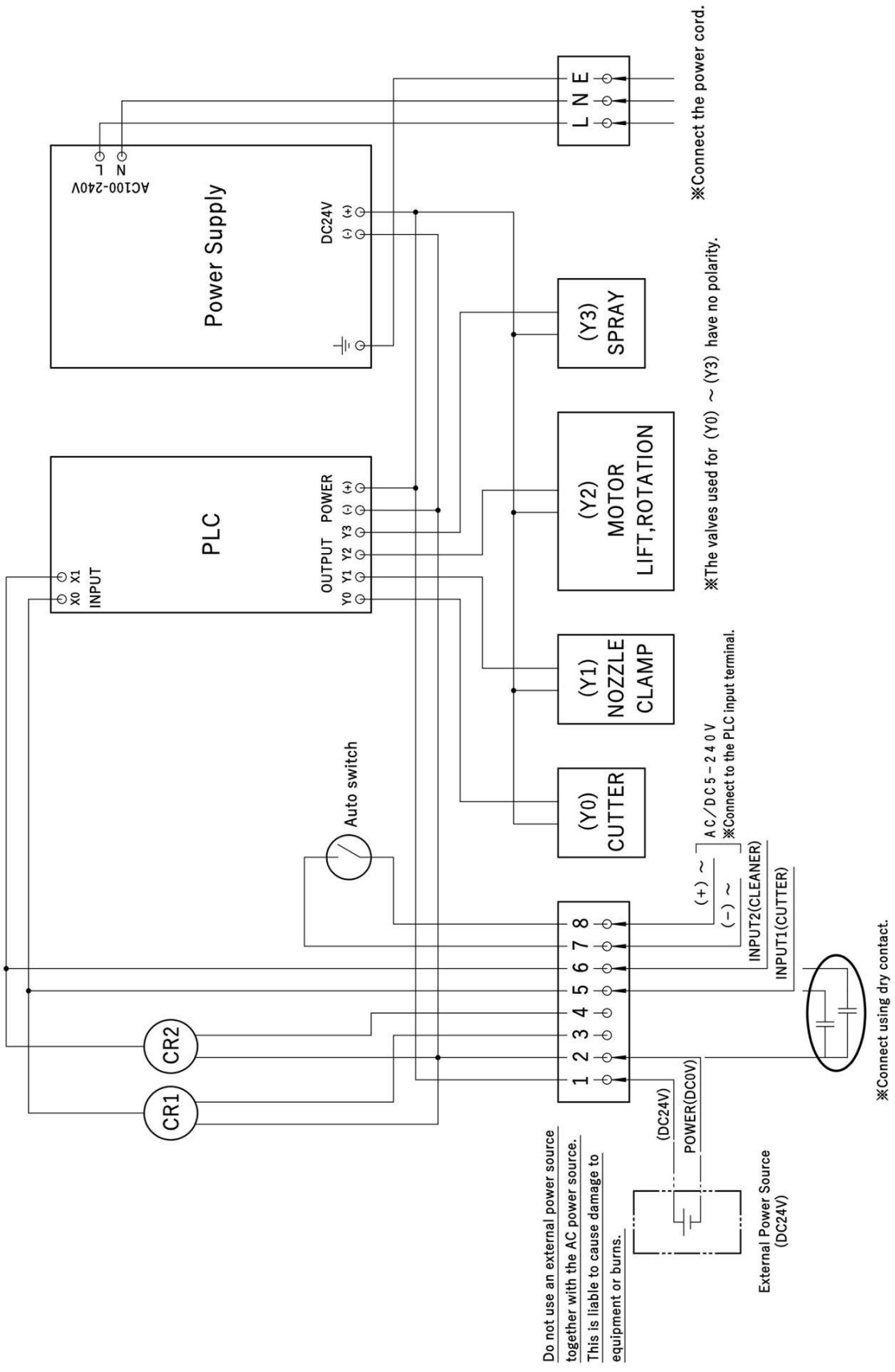
Loosen the signal wire set screw to insert the wire into the opening. Firmly tighten the set screw. Reattach the signal wire connection block to the original position.

Improper Ex: Unstripped wire is clamped.

Improper Ex: Stripped wire is exposed.



3.1.3 TKS-RC Wire Diagram



3.2 TKS-RS Wiring Explanation

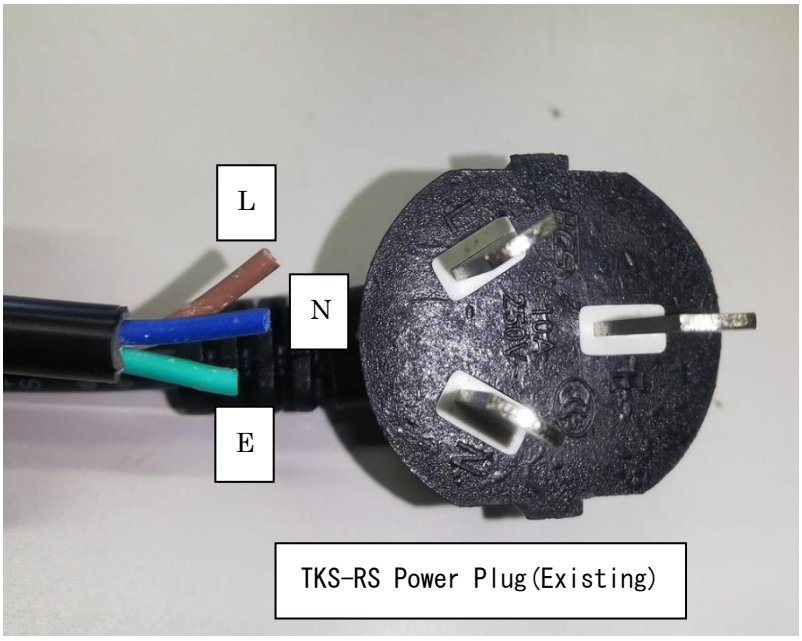
The TKS-RS is equipped with a proximity sensor that triggers the output signal.
When the nozzle is near, the proximity sensor will switch on and output the signal.

3.2.1 TKS-RS Connection Procedure

(1) Connecting the Power Cord

The plug for the power cord is shipped as Chinese specification (2 Type, 3 Pin). If the local specification differs please either attach a new power cable or plug, or purchase an adapter available on the market.

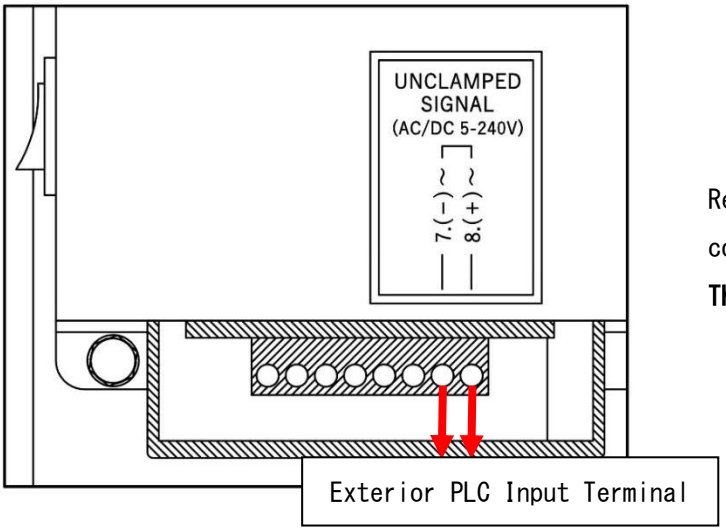
※[Wire Color] L:Brown, N:Blue, E:Green, please attach to the corresponding pins.



TKS-RS Power Plug(Existing)

(2) Automatic Switch Connection

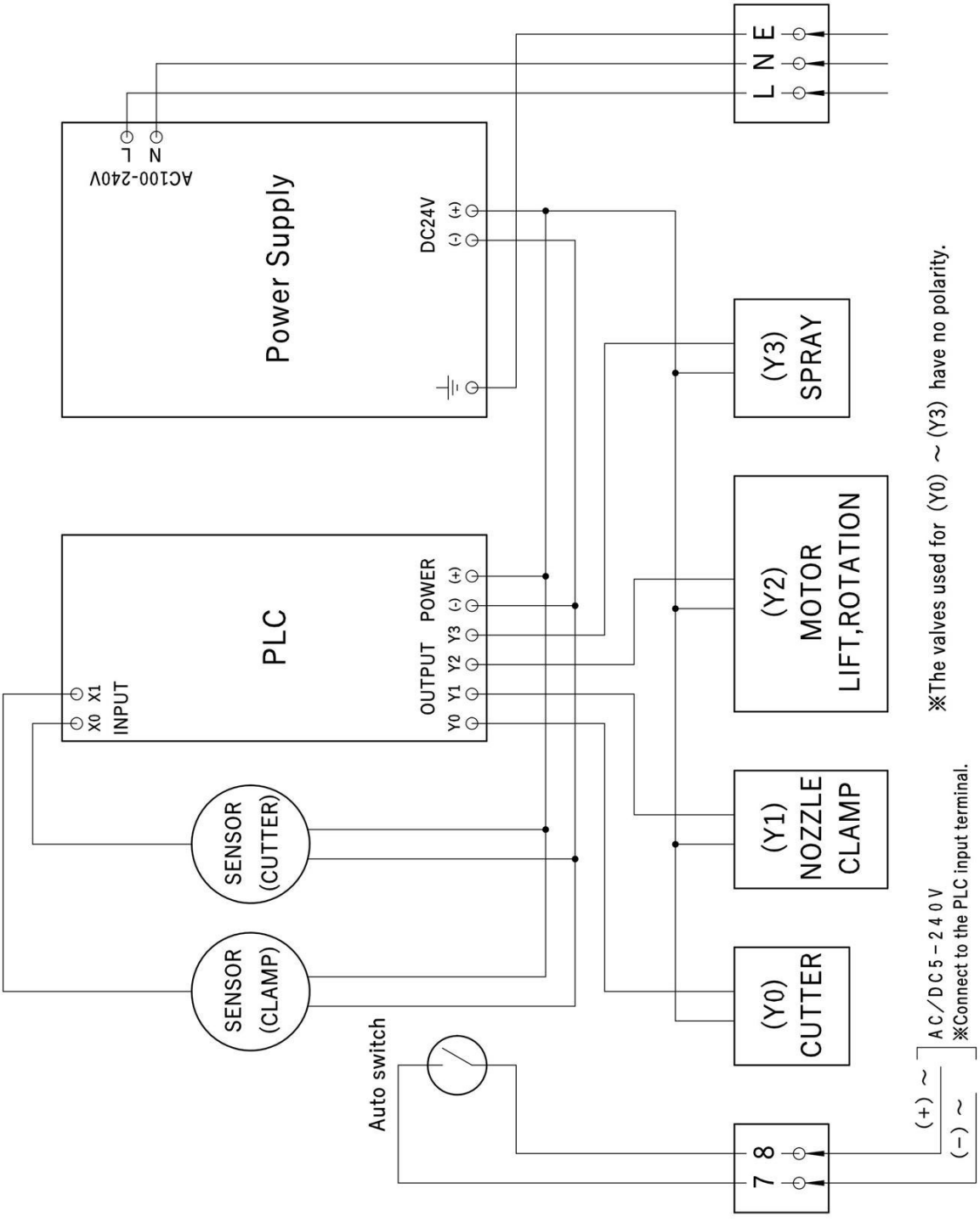
Please connect the unclamped signal output automatic switch (UNCLAMPED SIGNAL) to the external PLC input terminal. For the TKS-RC/RS, when the nozzle clamp cylinder is in the unclamped position exterior output to the PLC is possible.



Exterior PLC Input Terminal

Regarding the wire diagram connection please reference **3.1.2 TKS-RC Connection Procedure** (4).

3.2.2 TKS-RS Wire Diagram



4. Air Piping

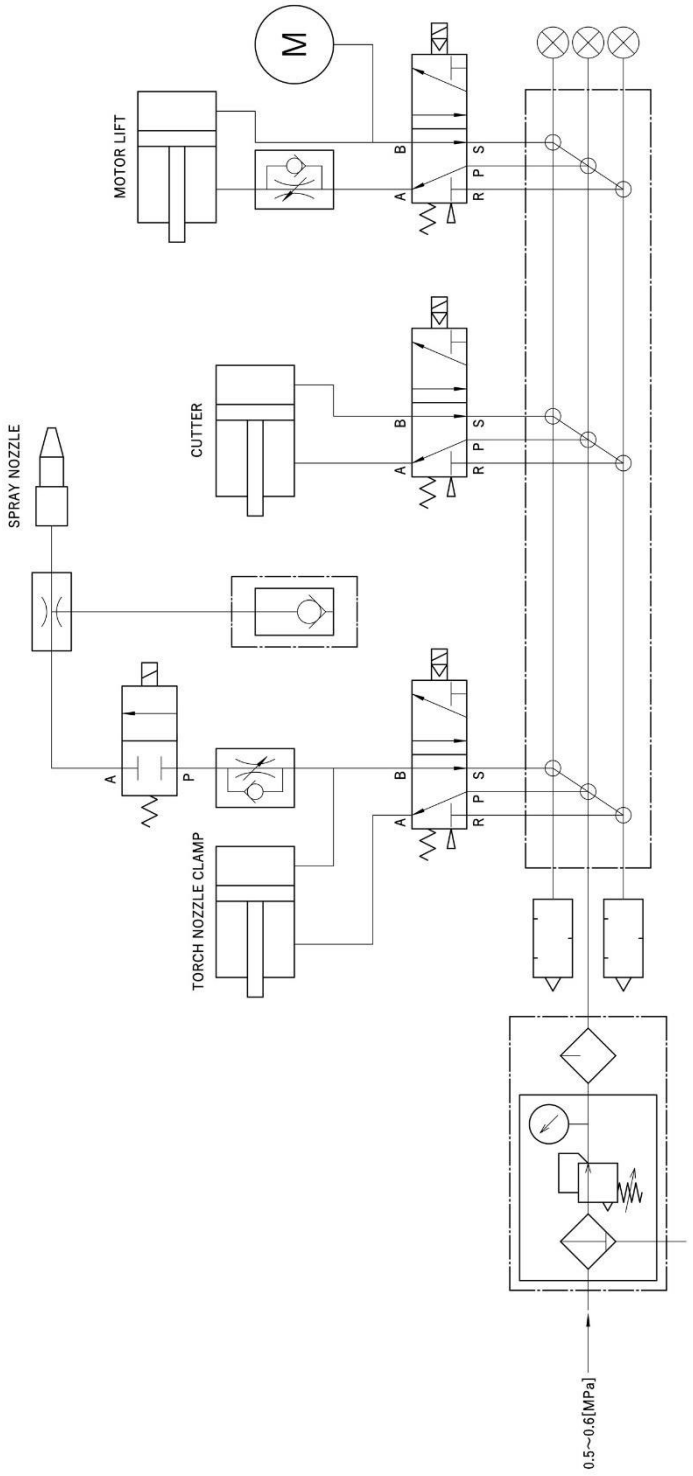
This section is related to the air piping details and configuration method.

Caution

Please use clean air.

Because the air tube is combustible, please sufficiently take into consideration the environment such as welding spatter, high temperature, et cetera.

4.1 Air Piping Diagram



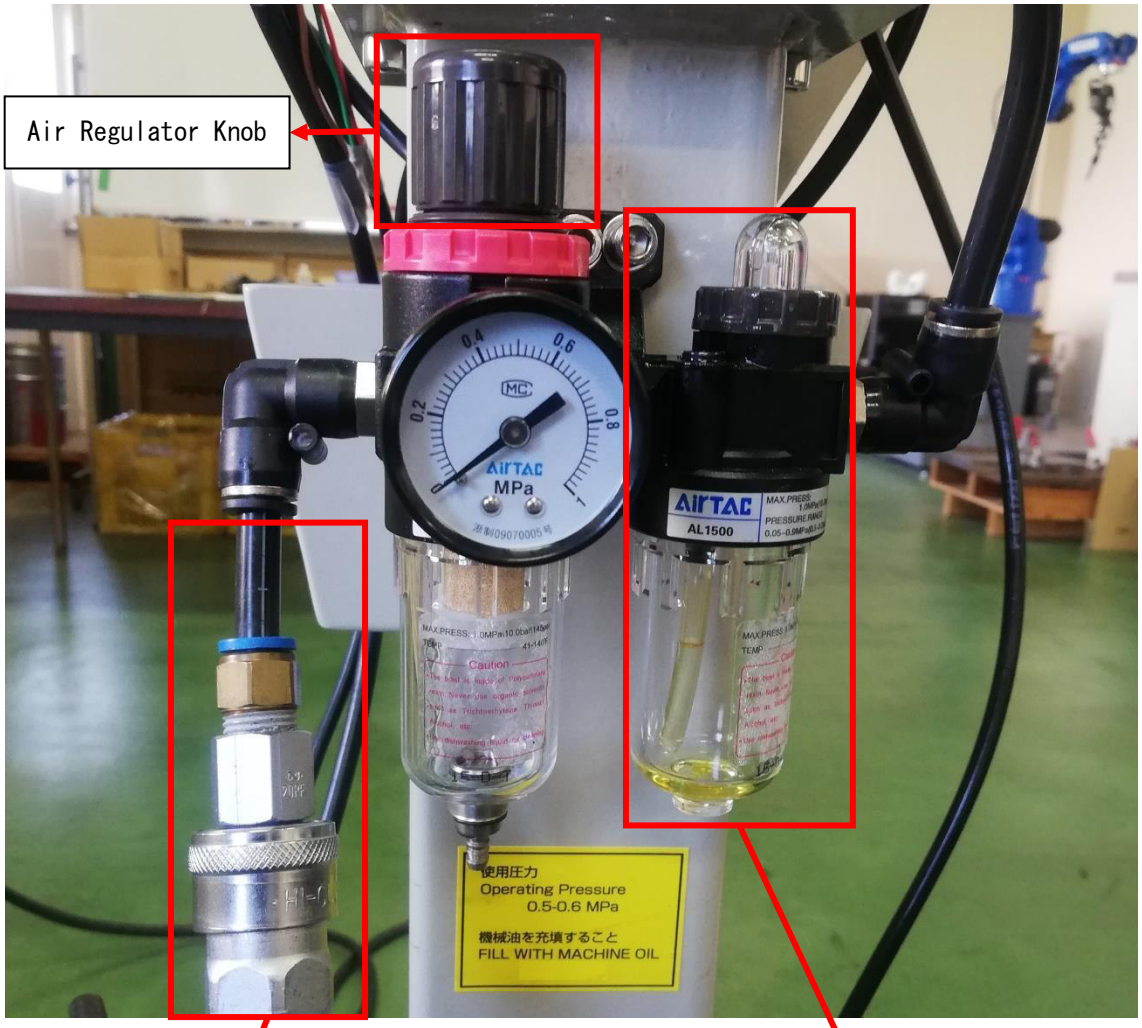
4.2 Pneumatic Connection

Connect the air hose using a quick connection ϕ8 and attached to the FRL unit.

Please set the air pressure range to (0.5～0.6MPa) using the regulator knob.

※Please prepare the quick connection by yourself.

※For smooth teaching, maintenance and inspection, et cetera, using a coupler capable of cutting off the air pressure supply is recommended.



Please prepare a quick connection (ϕ8) by yourself.

Please adjust the lubricator (Reference 4.3).

4.3 Adjusting the Lubricator

Caution

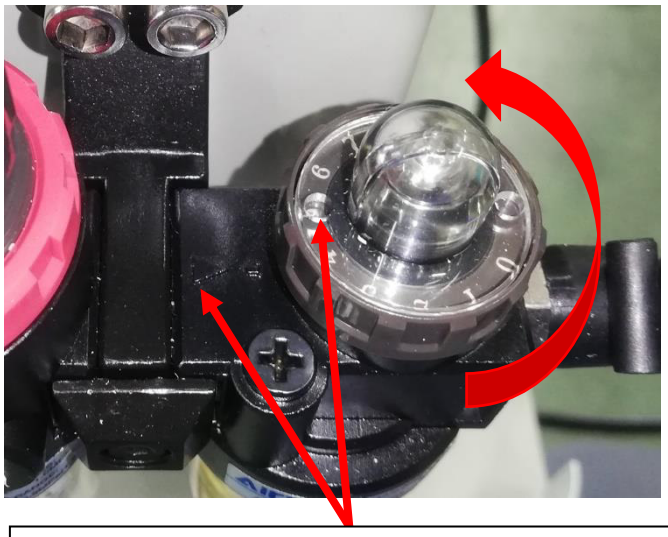
The lubricator’s function is to protect against abnormal wear by supplying the appropriate amount of lubricating oil to the compressed air unit. Since a deficient supply of lubrication will shorten the life of the air motor, please refill periodically as needed. Because there is compressed air inside the container, please cut off the air supply before refilling.

Lubricating Oil: Industrial Lubricating Oil (ISO VG10 or equivalent)

Setup Method: Please adjust the lubricator approximately using the arrow and numbers.

※As a reference please adjust to 1 drip per 3～5 cycles.

Lubricating oil is included so you can use immediately after purchasing. Please prepare further refills by yourself.



Adjust by turning the dial, using the arrow and numbers to approximate. (As the numbers get larger the drip interval gets shorter.)

Lubricating Oil(Included)

Cut off the air pressure, unscrew the container, and fill up with lubricating oil.

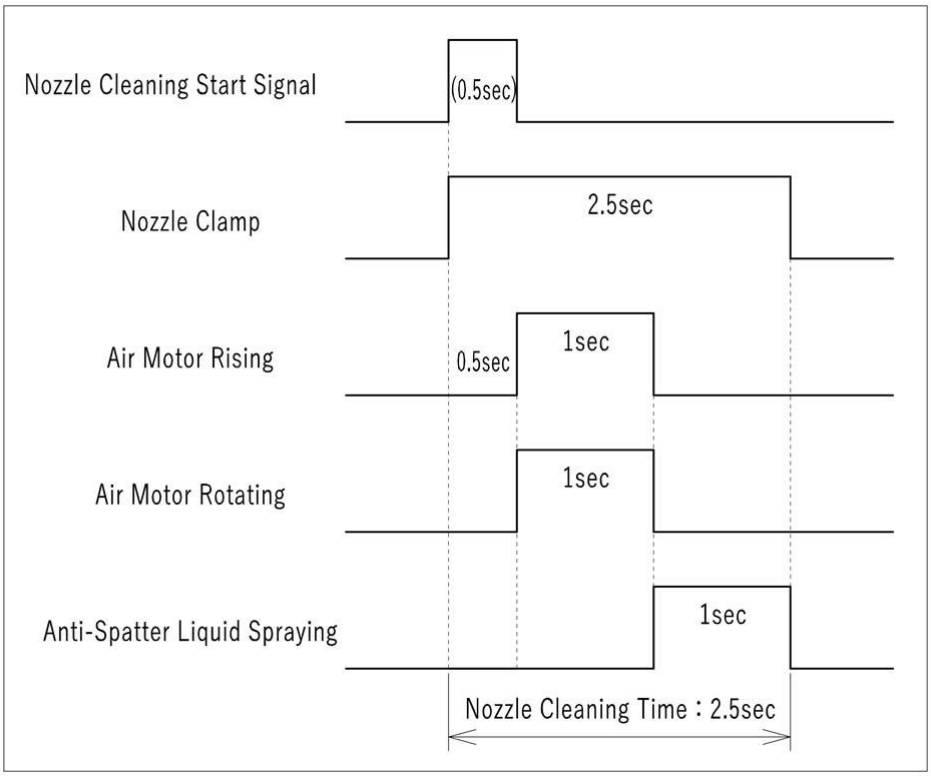
5. Time Chart

The TKS-RC/RC receives a signal from the internal PLC that acts as a trigger to run the successive program. This section explains the program time chart.

5.1 TKS-RC Time Chart

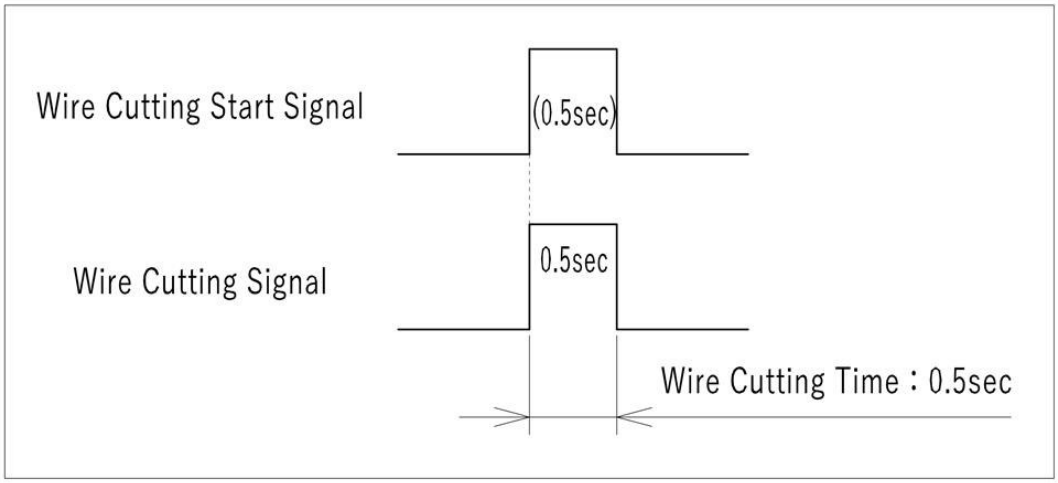
[TKS-RC Nozzle Cleaning Time Chart]

Through the wired relay (3.1) the pulse signal is sent and the programmed time series from the nozzle clamp to anti-spatter liquid spraying operation is carried out in sequence.



[TKS-RC Wire Cutting Time Chart]

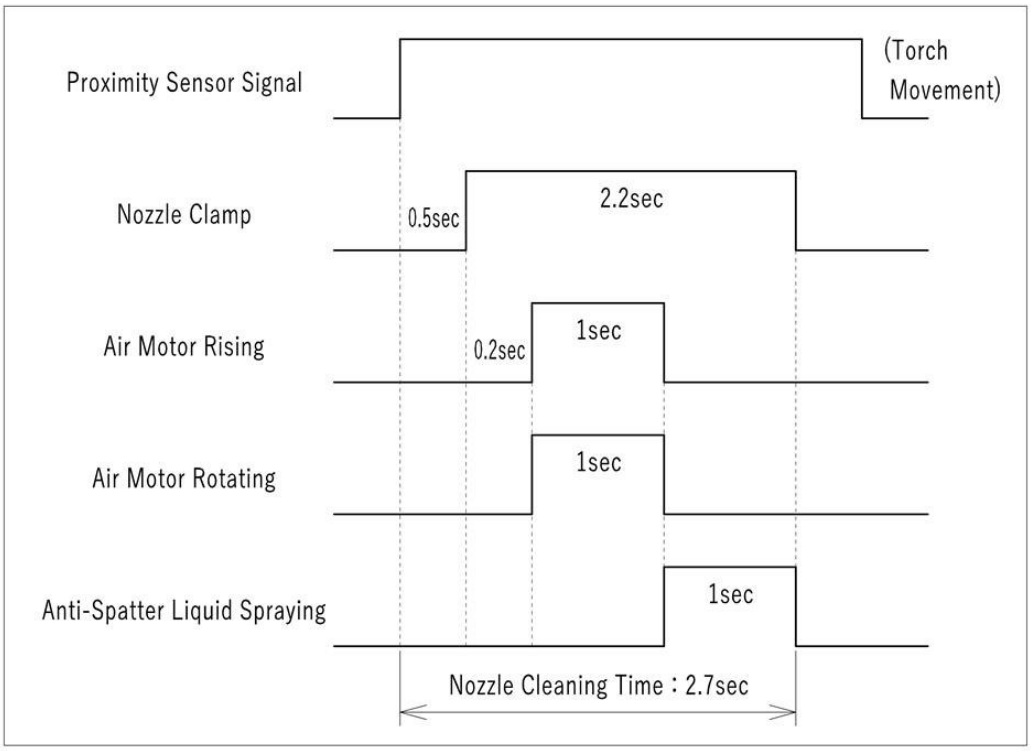
Through the wire relay (3.1) the pulse signal is sent and the programmed time series for wire cutting is carried out.



5.2 TKS-RS Time Chart

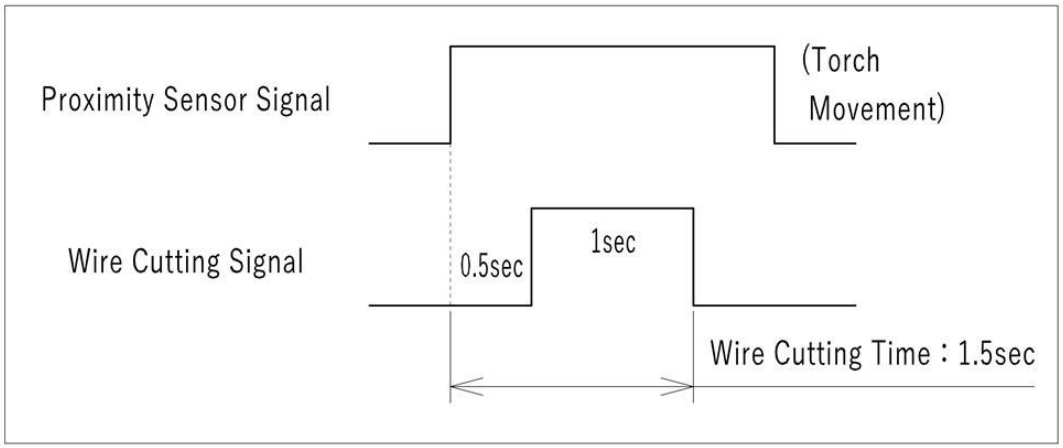
[TKS-RS Nozzle Cleaning Time Chart]

When the nozzle moves into the work start position the nozzle sensor activates and the programmed time series from the nozzle clamp to anti-spatter liquid spraying operation is carried out in sequence.



[TKS-RS Wire Cutting Time Chart]

When the nozzle moves into the work start position the nozzle sensor activates and the programmed time series for wire cutting is carried out.



6. Teaching

Compulsory

・Whenever performing teaching, maintenance and inspection, or the like, always cut off the power and compressed air supply to surrounding equipment.

・Including any test running, whenever the equipment is operating always stand at a safe distance away wearing ear and eye protection.

・Before preforming manipulator teaching or similar, please first carefully read and understand the user manual. Always consider safety whenever operating.

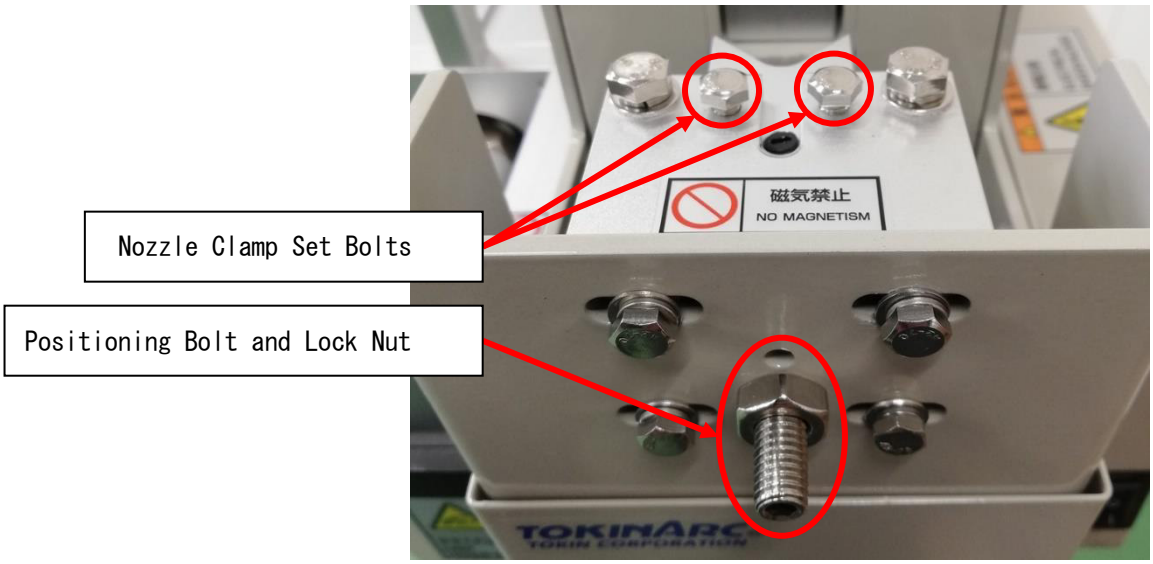
6.1 Nozzle Cleaning Work Positon Teaching

(1) Confirming the Equipment's Power Sources

Please confirm both the TKS-RC/RS power supply and air supply are cut off.

(2) Working Around the Fixed Side Nozzle Clamp

Loosen the set bolts and positioning bolt to release the fixed side nozzle clamp on your side.

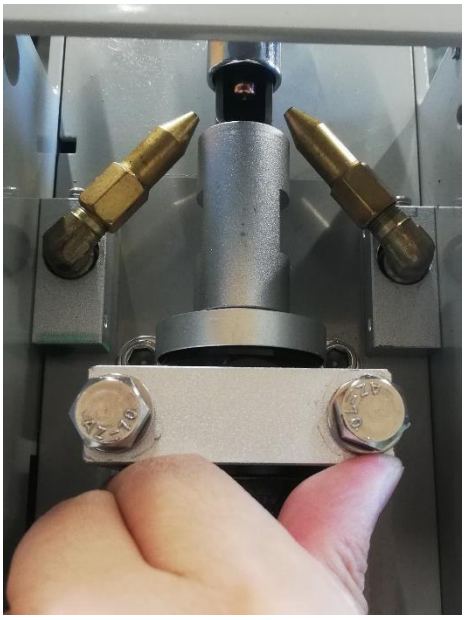


(3) Setting the Torch Position and Cleaning Position

Manually raise the motor to the top stroke, then set the insert depth where the reamer does not interfere with the torch angle, nozzle inner wall, or tip.

(4) Spray Nozzle Direction Adjustment

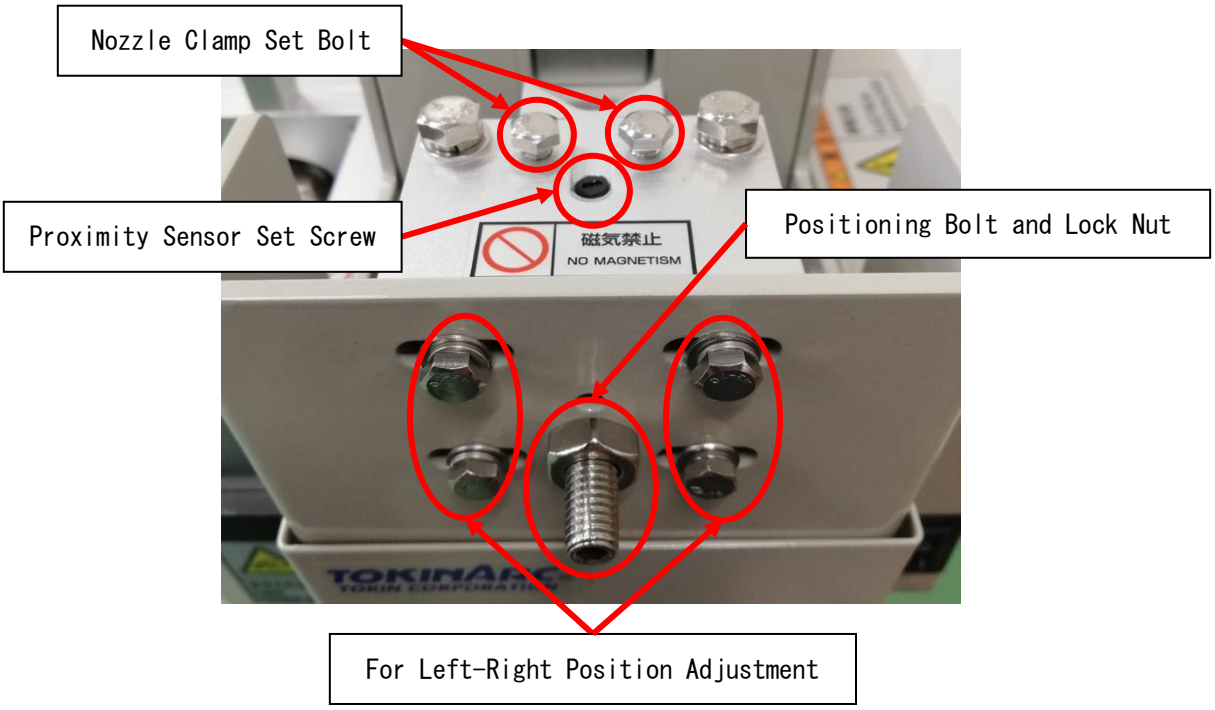
Loosen the spray nozzle set bolt, then adjust the angle so the anti-spatter spray can adhere to the nozzle inner wall, now refasten. Please confirm that when the motor is in the top stroke position there is no interference between the spray nozzles, air motor, or reamer.



(5) Adjusting the Fixed Side Nozzle Clamp

While maintaining the cleaning position set in (3), adjust so that both sides of the V shape fixed side nozzle clamp are lightly touching and fasten using the nozzle clamp set bolts. Rotate the position bolt until it reaches the nozzle clamp, then tighten using the lock nut.

※If the fixed side nozzle clamp is visibly out of alignment please do a left-right adjustment.



(6)Confirming the Proximity Sensor Position (※TKS-RS Only)

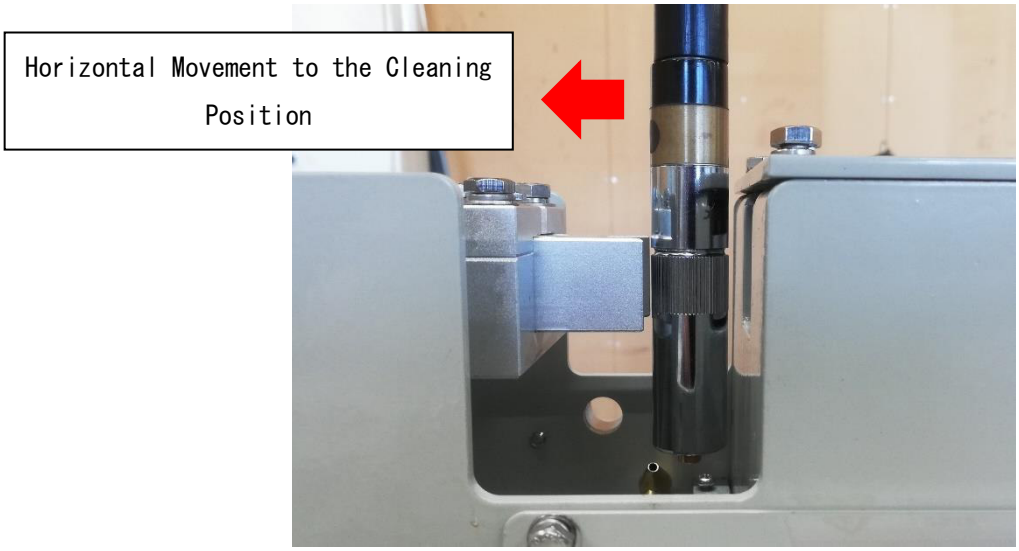
Loosen the proximity sensor set screw to confirm the reaction position (nozzle clearance approx. 1mm), adjust the position and retighten. ※Be careful the proximity sensor does not touch the nozzle.

6.2 Manipulator Movement and Control Teaching

(1) Confirming the Equipment's Power Sources

Please confirm both the TKS-RC/RS power supply and air supply are cut off.

(2) Please teach the torch to come down in the horizontal space apart from the cleaning positon. ※For TKS-RS please teach the torch to come down where the proximity sensor will not actuate (5mm or more apart).



(3) Please move to the cleaning position set in 6.1(3).

(4-1) For TKS-RC

Please set the timer so that work stops on the spot from the nozzle cleaning start signal until cleaning is completed.

(4-2) For TKS-RS

Please set the timer so that work stops on the spot from the nozzle cleaning start signal until cleaning is completed.

(5) Please back out by reverse operation.

6.3 Running a Nozzle Cleaning Movement Test

(1) Turn on the power.

Insert the power plug and turn on the main switch.

(2) Turn on the air.

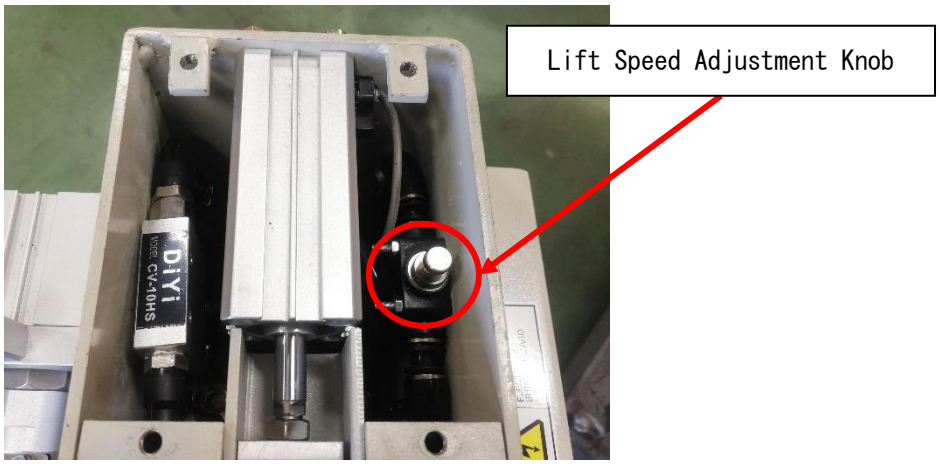
(3) Running a Test

When running a test please confirm the reamer is being inserted without interference to the nozzle and the anti-spatter liquid spraying is operating correctly.

(4) Adjusting the Anti-Spatter Liquid Spray Amount

Please repeat the test several times until you must refill the anti-spatter liquid. After refilling, rotate the spray adjustment knob until the spray does not drip down and set to that amount.

(5) Remove the cover plate and adjust the lift speed by rotating the lift speed adjustment knob. ※Please adjust the top stroke arrival speed to within 1.0 seconds.



(6) Confirm the lubricator and adjust the lubricating oil drip speed. (For adjustment method reference 4.3)

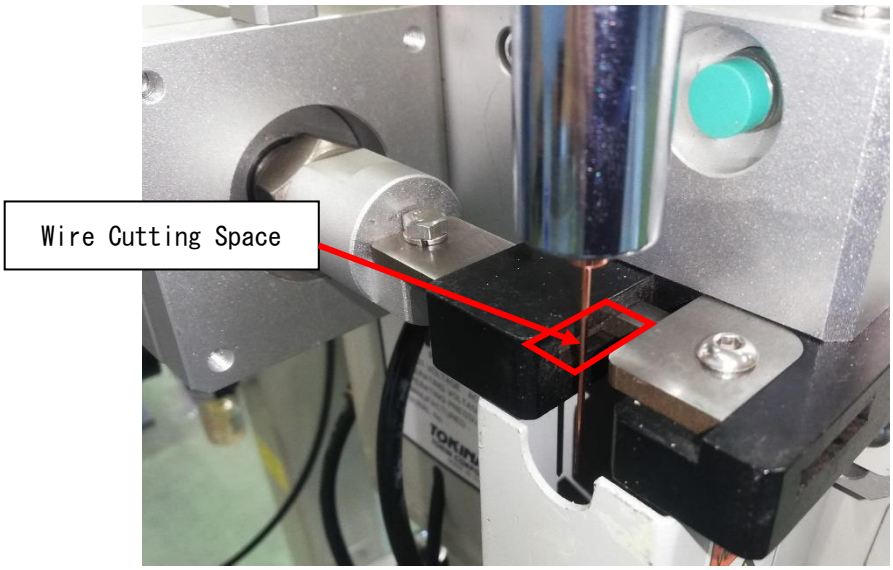
6.4 Wire Cutter Teaching

(1-1) For TKS-RC

Move the torch end to within the wire cutting space.

(1-2) For TKS-RS

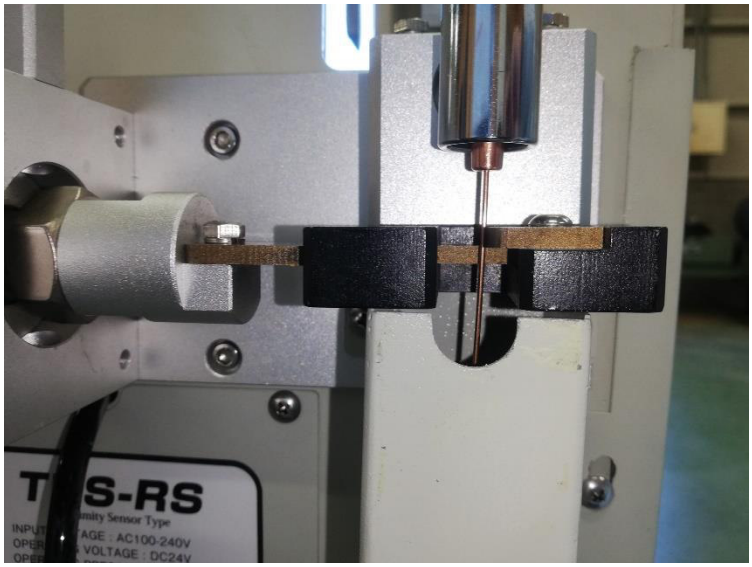
Move the torch end to within the wire cutting space but where the proximity sensor will not actuate (5mm or more apart).

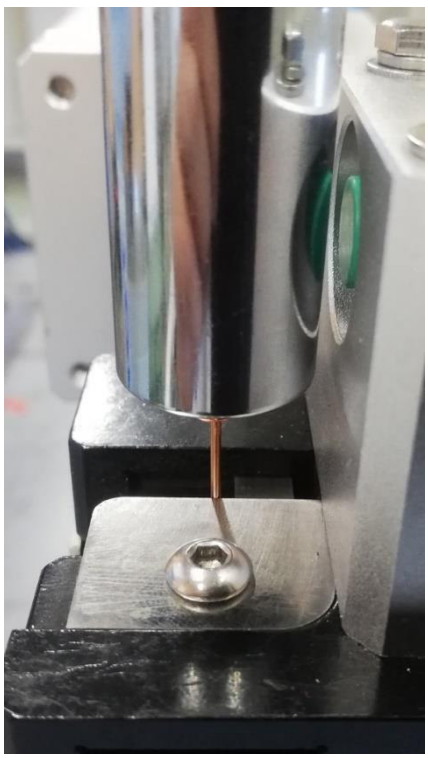


(2) Use inching to bring the melted portion of the wire to where it will be cut off.

※For wire inching and retract operations please reference the user manual for the equipment you are using.

(3) Move the torch so that the wire touches the top blade.





(4-1) For TKS-RC

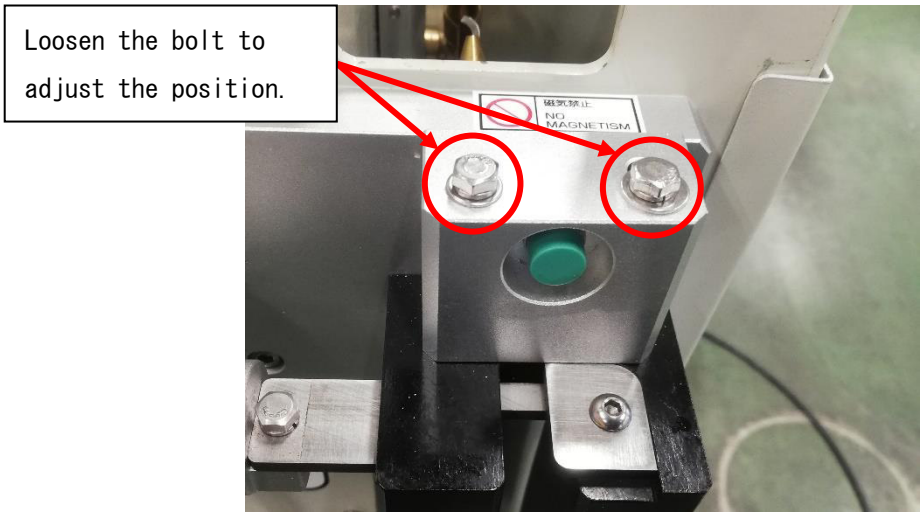
Please set the timer so that work stops on the spot from the wire start signal until wire cutting is completed.

(4-2) For TKS-RS

Please set the timer so that work stops on the spot from the wire start signal until wire cutting is completed.

(5) Confirming the Proximity Sensor Positon (※TKS-RS Only)

Loosen the proximity sensor set block screw to confirm the reaction position (nozzle clearance approx. 1mm), adjust the position and retighten. ※Be careful the proximity sensor does not touch the nozzle.

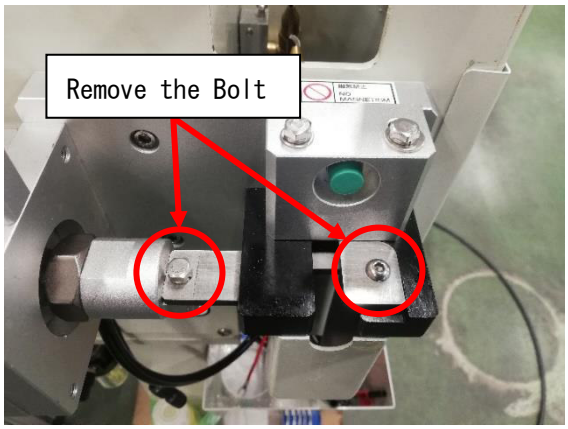


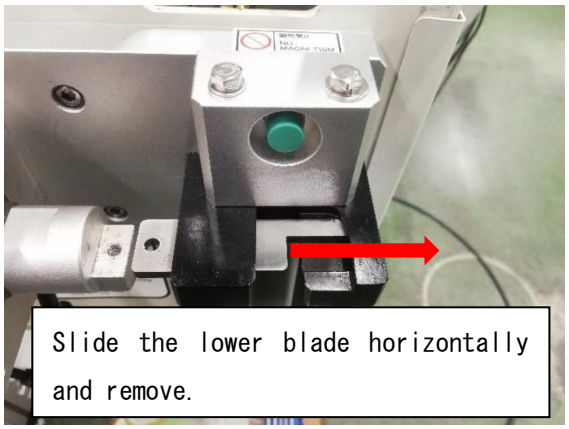
7. Maintenance and Replacing Consumable Parts

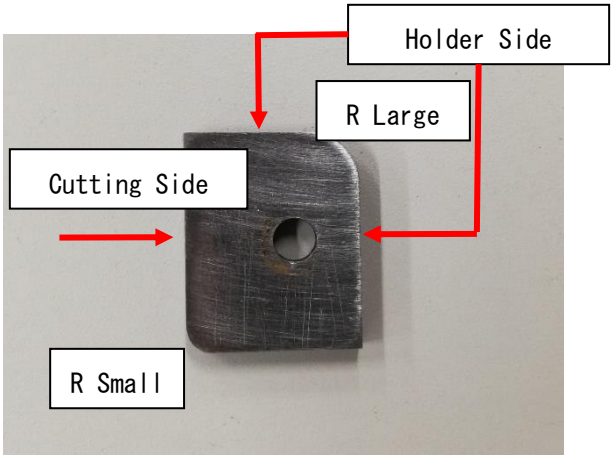
Danger

Whenever performing maintenance and inspection or replacing consumable parts always cut off the power and air supply to surrounding equipment.

(1) Replacing the Wire Cutter Blade

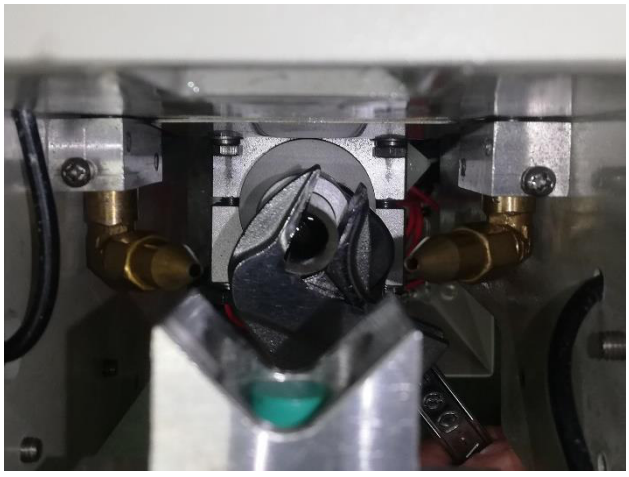






(2) Replacing the Reamer

Hold the air motor using one wrench and using a separate wrench unscrew the reamer. To avoid any damage to the threads from accumulated spatter, please clean out the air motor side connection before attaching the new reamer.



(3) Refilling the Anti-Spatter Liquid

Please open the lid and refill periodically.

(4) Refilling the Lubricating Oil

After cutting off the air supply unscrew the lubricator container, please refill periodically with (ISO VG10 or Equivalent).

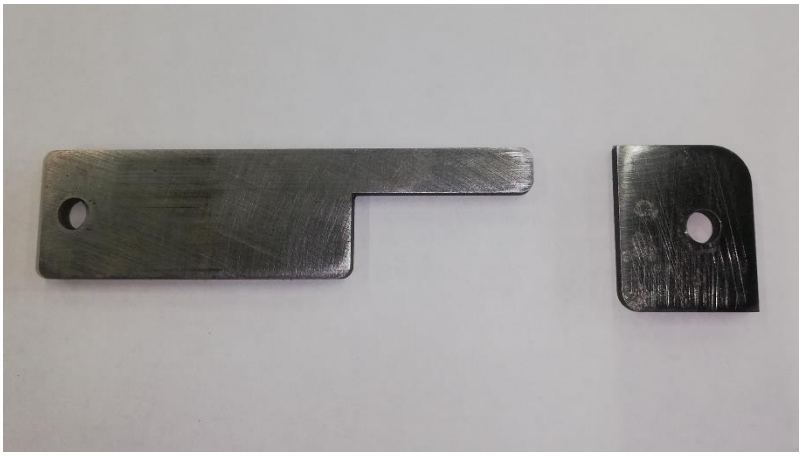
8. Replacement Parts List

・Reamer

Part No.	Part Name	Dimensions (mm)	
		Blade Outer Diameter (A)	Blade Inner Diameter (B)
03571A	TKS-R Nozzle Cleaner Reamer(OD 18mm)	18	14
03572A	TKS-R Nozzle Cleaner Reamer(OD 15mm)	15	11
03573A	TKS-R Nozzle Cleaner Reamer(OD 12mm)	12	8
03574A	TKS-R Nozzle Cleaner Reamer(OD 11mm)	11	7.4

・TKS-R Wire Cutting Blade Set

Part No. ：03575A



Nozzle Cleaning Station TKS-R Series

July, 2020 Ver1.0 First Edition

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