Shock sensor for Robot
Welding Torch for Robot
Coaxial Power Cable for Robot

For CO_2/MAG

RT3500S /H /L
RT5000S /H /L
RTW5000S /H /L
RZ3500S /H /L
RZ3510S /H /L
RZW5000S /H /L

Instruction Manual

= Safety and Operation =

Instruction Manual No.
1L10603-E-5

Thoroughly read this instruction manual to operate the units correctly.

- Installation, maintenance, and repair of this welding torch shall be made by qualified persons or persons who fully understand welding machines to secure the safety.
- To secure the safety, operation of this welding torch shall be made by persons who have knowledge and technical skill to fully understand the contents of this manual and handle the machine.
- Regarding safety education, utilize courses and classes held by head/branch offices of the Welding Society /Association and the related societies/associations, and qualifying examinations for welding experts/consultant engineers.
- After thoroughly reading this manual, be sure to retain it with the warranty in the place where the persons concerned can read any time. Read it again as occasion demands.
- If incomprehensible, contact our offices. For servicing, contact our local distributor or sales representatives in your country.

  Our addresses and telephone numbers are listed in the back cover of this Instruction Manual.

Contents

NOTES ON SAFETY

1. Notes on Safety

- ●Before operating this product, thoroughly read this instruction manual first to operate the product correctly.
- ●Cautions described in this instruction manual are to prevent you and other people from being injured or damaged by having the product operated correctly and safely.
- ●Although this product is designed and manufactured in due consideration of safety, carefully follow the notes and cautions described in this manual. Otherwise, there may occur an accident causing serious injury or death.
- ●Various ranks of accidents resulting in injury, damage, or death may occur if mishandling the product. The caution alert symbols and signals are classified into three ranks as below, used throughout these instruction manual as well as warning labels put on each unit and device.

Symbol	Signal	Description
	DANGER	Mishandling may cause seriously dangerous situation that could result in serious injury or death to personnel. Limited situation of great urgency.
	WARNING	Mishandling may cause a dangerous situation that could cause serious injury or death to personnel.
	CAUTION	Mishandling may cause a dangerous situation that could cause medium or slight injury to personnel, or material damage.

Hazards and special instructions described by ⚠ CAUTION are very important as well. Neglect of them may occasionally cause serious injury or death to personnel. Therefore, be sure to follow the instructions described by all three safety alert symbols and signal words.

The meanings of "serious injury", "medium or slight injury", and "material damage" are as follows.

Serious injury	:	Injury with a sequela due to a loss of eyesight, injury, burn (high temperature and low temperature), electric shock, a bone fracture, poisoning and so on as well as injury that requires hospital treatment or long treatment as an outpatient.
Medium or slight injury	:	Injury, burn, electric shock and so on that require no hospital treatment nor long treatment as an outpatient.
Material damage	:	Damage to property, and direct and incidental / consequential damage due to the damage to devices.

Ref.: ℹ IMPORTANT : The sign “IMPORTANT” indicates special instructions necessary for the most efficient operation.

IMPORTANT SAFEGUARD

2. Important Safeguard

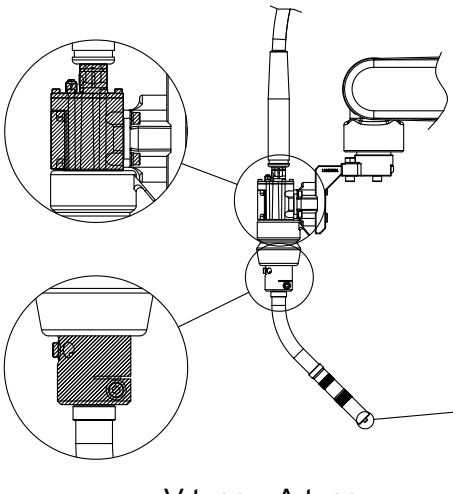
2.1 Read, understand, and comply with all safety rules described at the beginning of each instruction manual in addition to the following ones before starting Arc welding operation.

⚠ WARNING	• Observe the following notices to prevent a serious accident that results in serious injury or death.

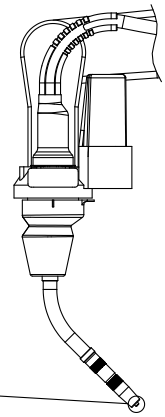
1) This torch is designed and manufactured in due consideration of safety, but you must follow the handling precautions described in this instruction manual. If you fail to do so, there may occur an accident resulting in serious injury or death.
2) Related laws, regulations, and your company's standards should be observed in constructing input power source, selecting an installation area, handling/storing/piping high pressure gas, storing welded products, and disposing wastes.
3) Keep out of the robot operating zone and the welding area.
4) A person with pacemaker should not approach the operating welding machine and the welding area unless his or her doctor permits. A welding machine generates a magnetic field around it during powered, which will have a bad effect on the pacemaker.
5) Installation, maintenance, and repair of this torch should be performed by qualified personnel or those who fully understand a welding torch for further safety.
6) Operation of this torch should be done by personnel who have knowledge and technical skill to fully understand the contents of this manual and to handle the torch safely.
7) This torch must not be used for purposes other than welding.

2.2 Observe the following to prevent electric shock.

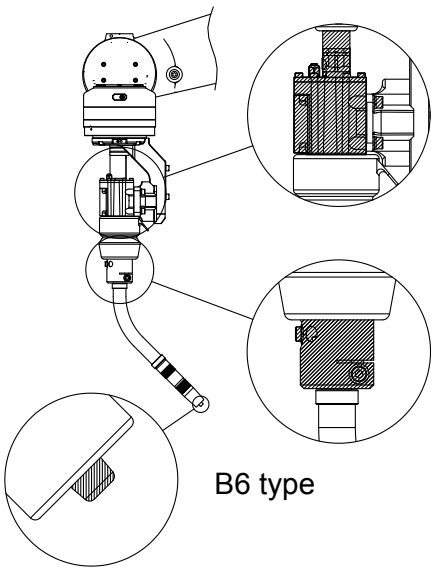
⚠ WARNING	• Do not touch live electrical parts.
	• Touching live electrical parts can cause fatal shock or severe burns.



V type , A type



B4 type

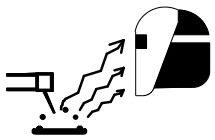


B6 type

IMPORTANT SAFEGUARD (continued)

1) Only qualified personnel should perform grounding work of the welding power supply and workpiece, or a workpiece and powered peripheral jigs while abiding by domestic regulations.
2) Do not touch live electrical parts.
3) Always wear dry insulating gloves and other body protection. Do not wear torn or wet gloves/ work clothes.
4) Before doing the installation, inspection, maintenance, etc. of this product be sure to turn off all the input power sources and check, several minutes later, that there is no charging voltage since the condenser and the like may have been recharged.
5) Do not use cables with insufficient capacity, with damage, or with naked conductors.
6) Be sure to tighten the connections of cables and insulate them in order to prevent personnel from touching those parts easily.
7) DO NOT use a welding machine with its case or cover removed.
8) Secure a firm foothold before initiating work. DO NOT perform work with an unstable foothold or with a foothold at a height of two meters or above.
9) Make periodic inspection and maintenance. Damaged parts should be repaired before use.
10) Turn off POWER switch when not in use.

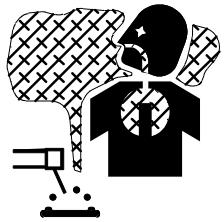
2.3 All the personnel in and around the working area including an operator should wear appropriate protection to protect themselves from arc rays, spatters, slag, and noise produced by welding.

⚠ WARNING	• Install a lightproof wall where arc is generated. • Wear appropriate eye, ear, and body protection.
	• Arc rays may cause inflammation of eyes and burns on skin • Spatter s and slag may cause eye troubles and burns. • Noise may cause hearing problems.

1) Wear lightproof glasses or a welder's shield helmet with a proper shade of filter when welding or watching a welder work.
2) INSTALL ARC PROTECTIVE CURTAINS in between an operator and arc rays.
3) WEAR PROPER SAFETY GLASSES in work area at all times.
4) WEAR PROPER EAR PROTECTION.
5) WEAR PROPER BODY PROTECTION including woolen clothing, flameproof apron and gloves, leather leggings, high boots and leather arm and shoulder gauntlets.
6) WEAR PROPER SAFETY GLASSES to protect eyes and skin from spatters and slag.

IMPORTANT SAFEGUARD (continued)

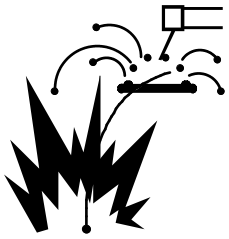
2.4 All the personnel in and around the working area including an operator should wear appropriate protection to protect themselves from fumes and gases produced by welding.

⚠ WARNING	• DO NOT inhale fumes and gases generated by welding. • Ventilate the area sufficiently and wear a welder's shield mask if necessary.
	• Fumes and gases generated by welding have a harmful effect on human body. • Welding in a small area may cause suffocation due to the lack of air.

1) KEEP YOUR HEAD out of fumes and DO NOT inhale any.
2) USE FORCED EXHAUST VENTILATION at the arc.
3) VENTILATE the area to prevent build-up of fumes and gases.
4) If ventilation is insufficient, USE APPROVED BREATHING DEVICES.
5) READ AND FOLLOW WARNING LABELS on all containers of welding materials.
6) Before use, READ AND UNDERSTAND the manufacture's instructions, Material Safety Data Sheets (MSDSs), and follow your employer's safety practices.
7) To prevent gas poisoning and suffocation, use a local ventilator or a respirator specified by your country's domestic laws.
8) Be sure to ventilate the area or wear a respirator by welding in a small place. A well-trained watchman should observe the work.
9) Do not weld near the place where degreasing, cleaning or spraying is carried out. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases. If welding is carried out there, harmful gases may be produced.
10) Toxic fumes and gases are produced when coated steel is welded. Be sure to ventilate the area sufficiently or use a respirator.

IMPORTANT SAFEGUARD (continued)

2.5 Prevent fire, explosion, burns and injury caused by heated workpiece, spatters, slag, and arc sparks right after welding as described below.

⚠ WARNING	● Do not weld near flammable materials. ● Watch for fire: keep a fire extinguisher nearby. ● NEVER do welding on inflammables such as a piece of wood or cloth. ● Do not weld on closed containers.
	● Heated workpiece, spatters, slag and arc sparks right after welding may cause fire. ● Incomplete cable connections, incomplete contacts in the current circuit of the workpiece such as steel frames may cause a fire due to the heat generated when powered. ● Arc generated on containers of inflammables such as gasoline may cause an explosion. ● Welding of airtight tanks and pipes may cause a bursting. ● Touching a heated workpiece, spatters, slag or arc sparks will cause a serious burn.

1) KEEP FLAMMBLE MATERIALES out of the robotic cell.
2) Welders should wear appropriate protection such as flameproof leather gloves, work clothes with long sleeves, a leg cover, a flameproof leather apron in order to prevent burns caused by touching heated workpiece, spatters, slag and arc sparks right after welding.
3) WATCH for fire.
4) Have a fire extinguisher nearby Operators should know how to use it.
5) DO NOT touch heated workpiece and peripheral jigs with inflammables such as a piece of wood or cloth. Doing so might cause not only a fire but also burns.
6) DO NOT put heated workpiece close to inflammables right after welding.
7) Remove inflammables from the place where welding is carried out so that spatters and slag will not strike them.
8) Do not use inflammable gases near the welding sight.
9) Tighten and insulate the cable connections completely.
10) Connect the cables on the workpiece side as close to the welding area as possible to prevent the welding current from traveling along unknown paths and causing electric shock and fire hazards.
11) A gas pipe with gas sealed in, an airtight tank and a pipe must not be welded because they might explode.
12) NEVER do welding on inflammables such as a piece of wood or cloth.
13) When welding a large-size structure such as a ceiling, floor, wall, etc., remove any inflammables hidden behind a workpiece.

2.6 Directions

⚠ **DANGER**	● Do not alter or remodel our products. ● You may get injured or have your equipment damaged because of fire, failure or malfunction caused by altering or remodeling the product. ● The warranty does not cover any altered or remodeled products.

IMPORTANT SAFEGUARD (continued)

For reference

PRINCIPAL SAFETY STANDARDS

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society.

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office.

Recommended Practices for Plasma Arc Cutting, American Welding Society Standard AWS C5.2, from American Welding Society.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society.

National Electrical Code, NFPA Standard 70, from National Fire Protection Association.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales.

Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute.

Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association.

NOTE: The codes listed above may be improved or eliminated. Always refer to the update codes.

NOTES ON USE

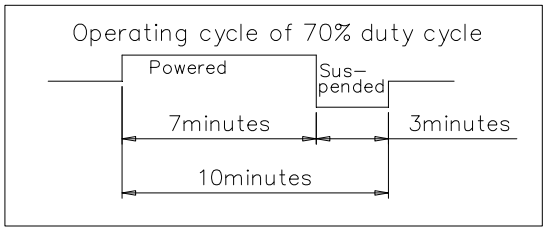
3. Notes on Use

3.1 Duty cycle

⚠ CAUTION	●Use the torch with the specified rated duty cycle or under Otherwise, the welding torch may be deteriorated or burned out.

Welding torch	Rated duty cycle
RT3500S RT3500H RT3500L	350A 80% (CO_2) 350A 60% (MAG)
RT5000S RT5000H RT5000L	500A 50% (CO_2) 350A 70% (MAG)
RTW5000S RTW5000H RTW5000L	500A 70% (CO_2) 400A 60% (MAG)
RZ3500S RZ3500H RZ3500L	350A 80% (CO_2) 350A 60% (MAG)
RZ3510S RZ3510H RZ3510L	350A 50% (CO_2) 250A 50% (MAG)
RZW5000S RZW5000H RZW5000L	500A 70% (CO_2) 400A 60% (MAG)

- The rated duty cycle of 70% indicates that the torch shall be used at the rated welding current for 7 minutes and then suspended for 3 minutes out of 10 minutes.
- Use of the welding torch with the excess rated duty cycle may lead to the temperature rise exceeding the allowable value, resulting in damage or burn.
- When using RTW5000S, RTW5000H, RTW5000L, RZW5000S, RZW5000H, and RZW5000L are sure that DAIHEN genuine coolant is being supplied with the water tank (PU-301).
  Otherwise, the temperature of welding torch may rise to over the allowable value, leading to damage or burn.



3.2 Inching

⚠ WARNING	●Do not look into the tip hole in inching to cheek. ●In inching, the welding torch tip must not be put near to your face, eye, and body.
	●Do not look into the tip hole in inching to check if the wire is fed. The wire may spring out and stick into your face, eyes, and body. It is very dangerous. ●In inching, the welding torch tip must not be put near to your face, eyes, and body. The wire may spring out and stick into your face, eyes, and body to injure.

Set the welding torch straight, feed the wire with pressing the INCH button, and then release the button when the wire is protruded by 10mm from the tip of torch.

3.3 Replacement of Parts

⚠ CAUTION	●To prevent burns, comply with the following cautions.

●Do not directly touch the high-temperature parts of a nozzle, an electrode and so on.
●When welding, wear suitable protection such as leather gloves for welding.
●Do not replace torch tip elements before they cool off.

⚠ CAUTION	●If any parts are damaged, replace them with new ones for further safety and better quality.

●Be sure to place an order for replacement parts at our sales office or our agency.

⚠ CAUTION	●Do not disassemble the shock sensor. If disassembled, gas leak and malfunction may be caused.

3.4 Coolant

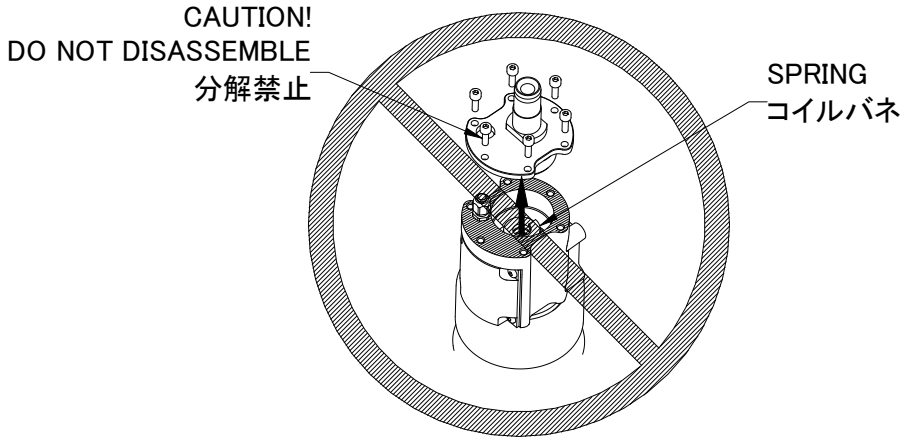
⚠ CAUTION	●Be sure to run the DAIHEN genuine coolant for the liquid-cooled torch. Insufficient amount of running coolant may lead to damage of torch.

3.5 Cable hose

⚠ CAUTION	●Never let cable hoses neither touch any heated part of the welded, put something heavy on top nor bend them excessively because the welding torch might become damaged.

3.6 Shock sensor

⚠ CAUTION	●In the main body of shock sensor inside, a powerful coil spring is had built-in. Because there is a threat that a coil spring protrudes, please do not dismantle a shock sensor.



⚠ CAUTION	●The shock sensor absorbs damage at the speed of the manual operation (or equal with the manual operation). The shock sensor is damaged at the speed faster than manual operation.

Thank you for purchasing DAIHEN CO_2 /MAG welding torch.
Before use, read this instruction manual thoroughly to use the product correctly.

[Note] 1. The contents in this instruction manual are subject to change without prior notice.
2. We have carefully written the instruction manual to eliminate as many errors as possible. Even if any errors are found in the contents, we are not responsible for any damage resulting from those errors.
3. No part of this instruction manual may be reproduced or stored in any form without the express written permission.

1. Specifications

This is the "CO_2 /MAG welding torch" to be used for CO_2/MAG welding. There are two kinds of shock sensors by the type of the manipulator. The shock sensor "SSB" is only for the B4 type manipulator. Welding torch is combined with each shock sensor and used. Hereafter, true constant contact torch (RZ series) is written as "TCC torch".
The specifications are shown in Table 1.1 and Table 1.2. (Refer to Fig.1.1 - 1.12 for the outline drawing.)

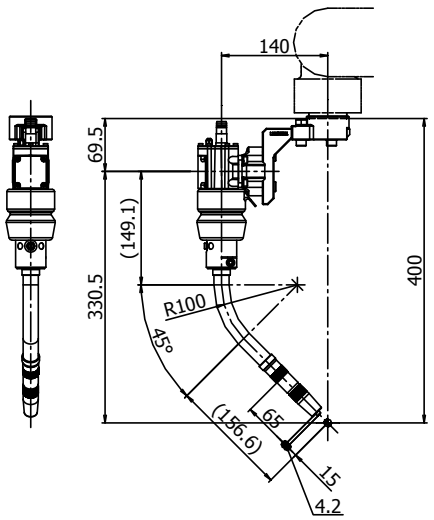
Table 1.1 Specifications of welding torch

Category	Air-cooled 350A torch			Air-cooled 500A torch			Liquid-cooled 500A torch		
Model	RT3500S	RT3500H	RT3500L	RT5000S	RT5000H	RT5000L	RTW5000S	RTW5000H	RTW5000L
Torch type	Straight	Curved (45°)	Curved (31°)	Straight	Curved (45°)	Curved (31°)	Straight	Curved (45°)	Curved (31°)
Welding process	CO_2 (MAG)								
Max. operating current	350A(350A)			500A(350A)			500A(400A)		
Rated duty cycle	80% (60%)			50% (70%)			70% (60%)		
Wire type	Solid wire, Flux cored wire								
Applicable wire	(φ0.8) (φ0.9) (φ1.0) φ1.2 (φ1.4) (φ1.6)						(φ1.2) (φ1.4) φ1.6		
Cooling system	Air cooling						Liquid cooling		
Shock sensor	SSV	SSV、SSB		SSV	SSV、SSB		SSV	SSV、SSB	

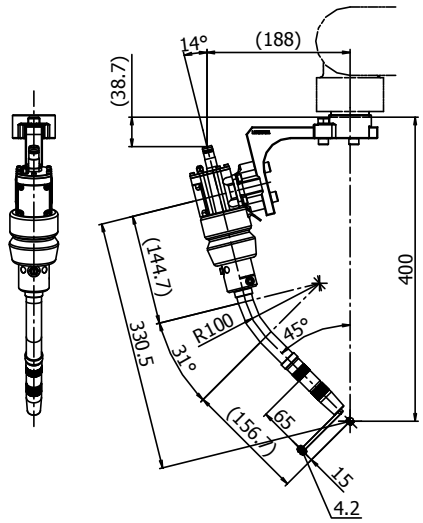
Table 1.2 Specifications of welding torch (TCC torch)

Category	Air-cooled 350A torch (High rated duty cycle type)			Air-cooled 350A torch (First diameter nozzle type)			Liquid-cooled 500A torch		
Model	RZ3500S	RZ3500H	RZ3500L	RZ3510S	RZ3510H	RZ3510L	RZW5000S	RZW5000H	RZW5000L
Torch type	Straight	Curved (45°)	Curved (31°)	Straight	Curved (45°)	Curved (31°)	Straight	Curved (45°)	Curved (31°)
Welding process	CO_2 (MAG)								
Max. operating current	350A(350A)			350A(250A)			500A(400A)		
Rated duty cycle	80% (60%)			50% (50%)			70% (60%)		
Wire type	Solid wire								
Applicable wire	(φ0.9) (φ1.0) φ1.2						φ1.2 (φ1.4) (φ1.6)		
Cooling system	Air cooling						Liquid cooling		
Shock sensor	SSV	SSV、SSB		SSV	SSV、SSB		SSV	SSV、SSB	

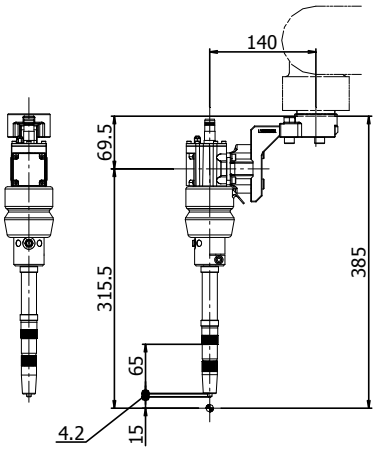
Note) 1. While using RTW5000 series and RZW5000 series are sure that DAIHEN genuine coolant is being supplied with the water tank (PU-301).
2. The maximum operating current and rated duty cycle are different between CO_2 and MAG welding process.
3. Shock sensor function
Arc welding robots may cause the welding torch to come into contact with workpiece or jig, thus resulting in the deformation of the welding torch or damage to the robot itself. To prevent such problem, this welding torch incorporates the shock sensor function that outputs an external force detection signal the instant when the nozzle portion gets displaced to immediately stop the robot if external force larger than that specified is applied to the torch tip portion (nozzle portion). This function is incorporated on the assumption that the welding torch comes into contact with workpiece or jig during robot teaching. Contact of the welding torch with it while in automatic operation may cause damage to the robot or the torch.
The shock sensor function does not provide any guarantees against the accuracy of aiming point of the torch tip portion. After the shock sensor gets activated, ensure the aiming point.
4. None of TCC torch accepts stainless wire and flux cored wire.
Use of the TCC torch, wire straightener (L7812D00) is recommended to stabilize feeding power.
5. Use of the air-blow function requires the air-blow unit and the air-blow kit separately. Refer to the instruction manual for the air-blow unit (1L10686-E-*).



Weight 2.3[kg] 5.06[lb]
Air-cooled 350A CO_2/MAG curved torch
RT3500H with shock sensor “SSV”



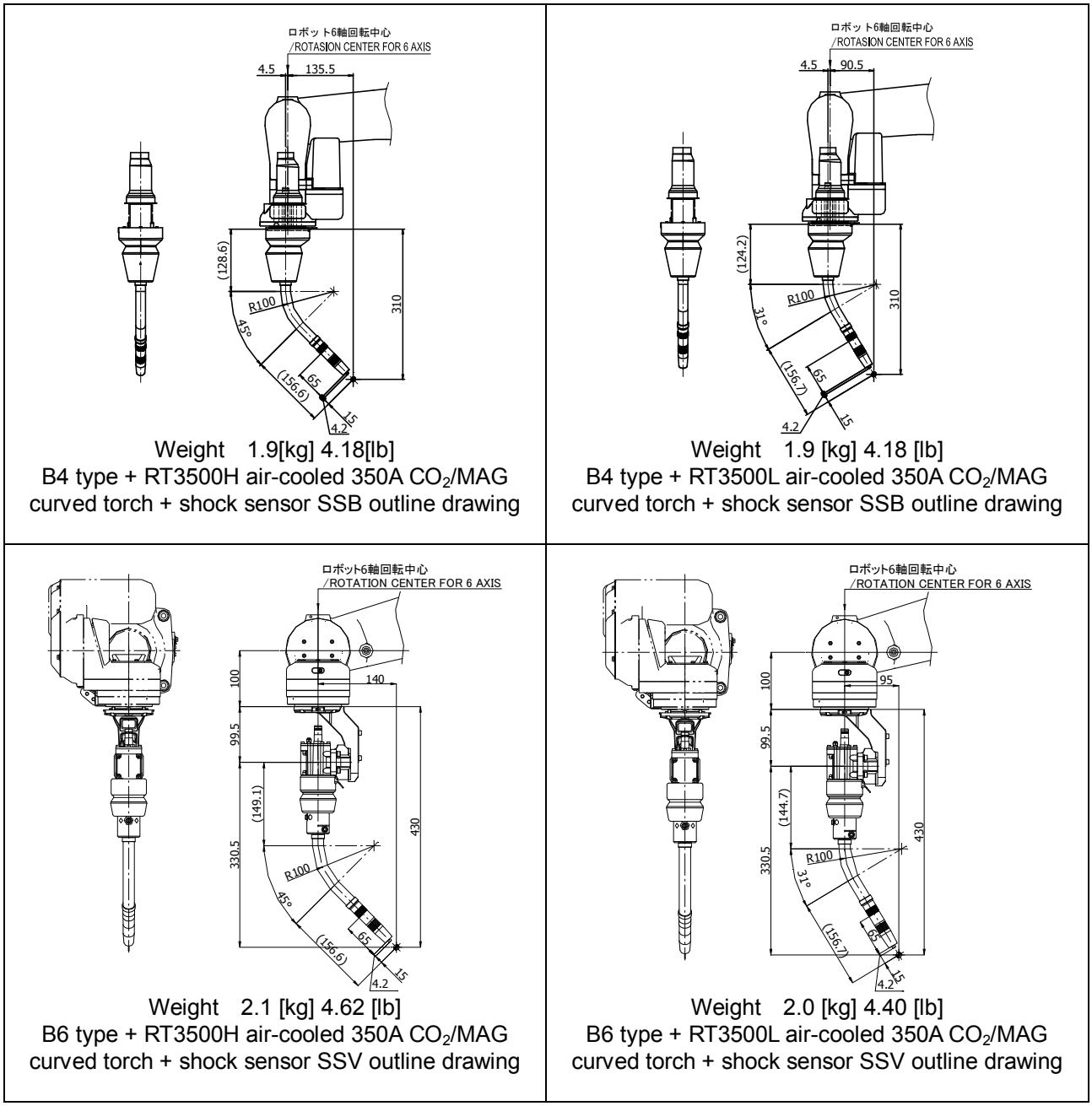
Weight 2.4[kg] 5.28[lb]
Air-cooled 350A CO_2/MAG curved torch
RT3500L with shock sensor “SSV”



Weight 2.1[kg] 4.62[lb]
Air-cooled 350A CO_2/MAG straight torch
RT3500S with shock sensor “SSV”

Fig. 1.1 Outline drawing of air-cooled 350A torch (for V type, A type) Unit (mm)

Note)
1. The shock sensor and the welding torch are distinct products.
   Select the appropriate shock sensor for the robot type in use.
2. The weight shown in each drawing of the torch with shock sensor “SSV” includes the weight of the torch mounting bracket ASSY.



Weight 1.9[kg] 4.18[lb]
B4 type + RT3500H air-cooled 350A CO_2/MAG curved torch + shock sensor SSB outline drawing

Weight 1.9 [kg] 4.18 [lb]
B4 type + RT3500L air-cooled 350A CO_2/MAG curved torch + shock sensor SSB outline drawing

Weight 2.1 [kg] 4.62 [lb]
B6 type + RT3500H air-cooled 350A CO_2/MAG curved torch + shock sensor SSV outline drawing

Weight 2.0 [kg] 4.40 [lb]
B6 type + RT3500L air-cooled 350A CO_2/MAG curved torch + shock sensor SSV outline drawing

Fig. 1.2 Outline drawing of air-cooled 350A torch (for B4 type, B6 type) Unit (mm)

Note)
1. The shock sensor and the welding torch are distinct products.
   Select the appropriate shock sensor for the robot type in use.
2. The weight shown in each drawing of the torch with shock sensor “SSV” includes the weight of the torch mounting bracket ASSY.

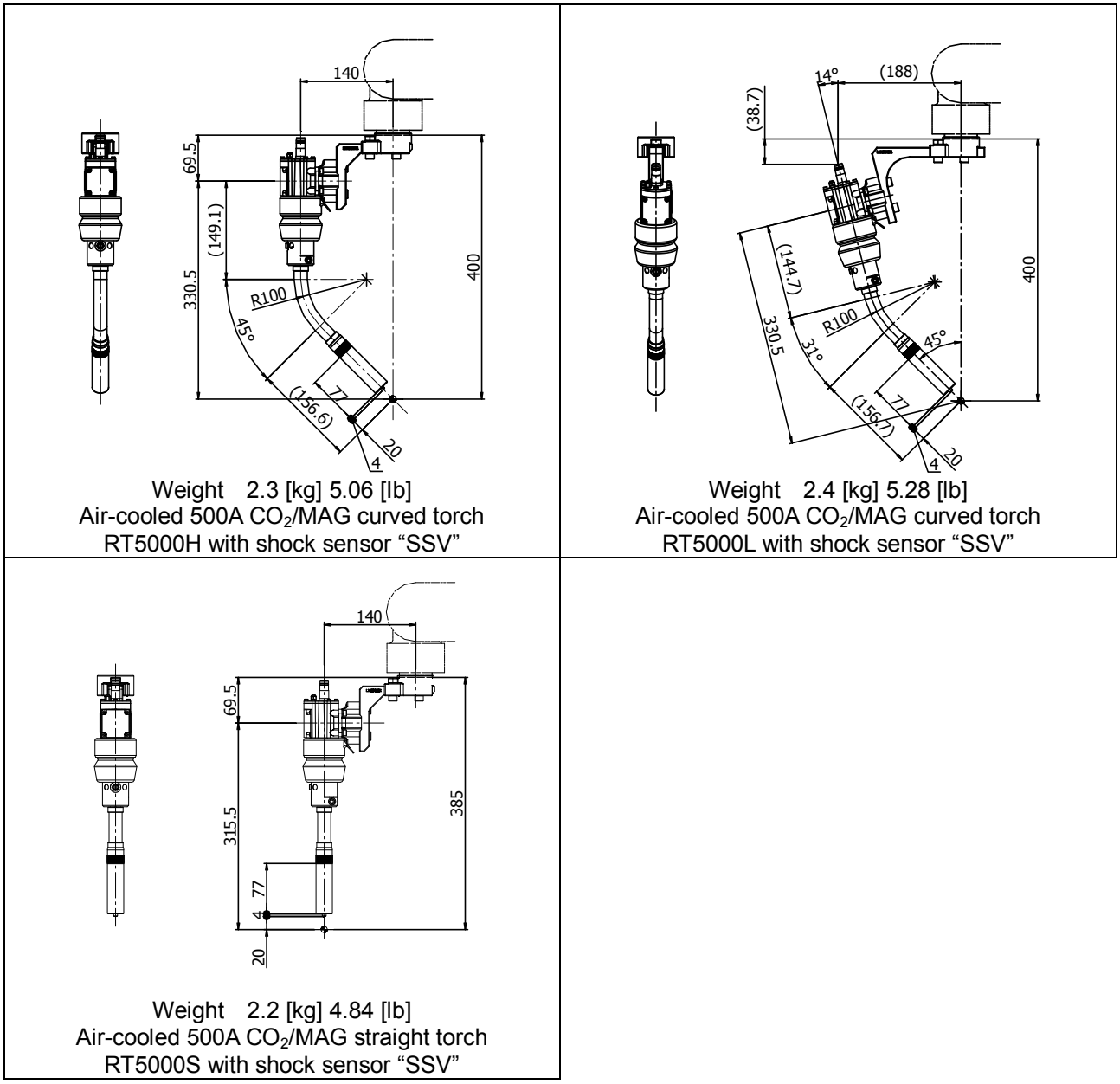
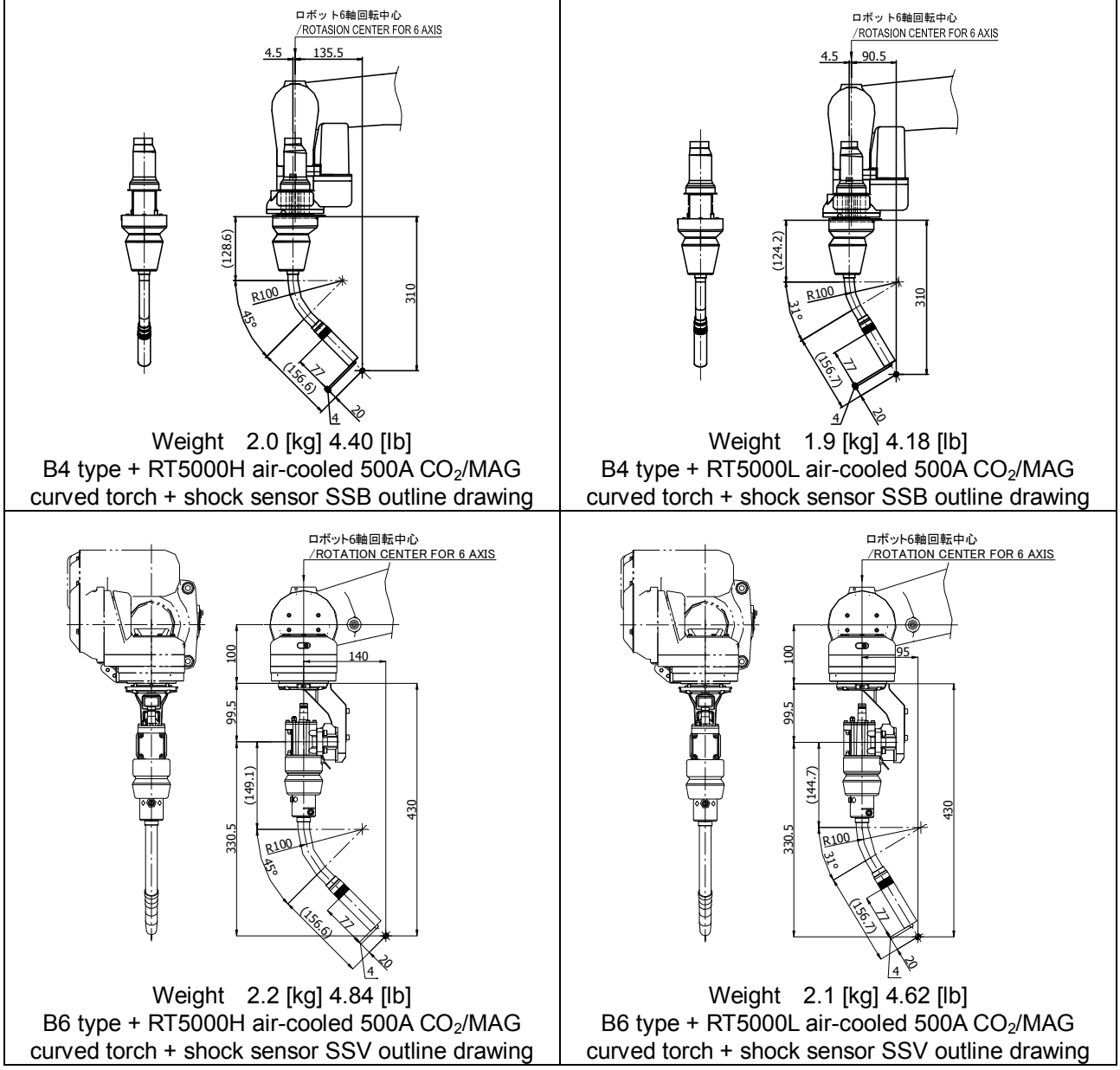


Fig. 1.3 Outline drawing of air-cooled 500A torch (for V type, A type) Unit (mm)

Note)

1. The shock sensor and the welding torch are distinct products.
   Select the appropriate shock sensor for the robot type in use.
2. The weight shown in each drawing of the torch with shock sensor “SSV” includes the weight of the torch mounting bracket ASSY.



Weight 2.0 [kg] 4.40 [lb]
B4 type + RT5000H air-cooled 500A CO_2/MAG curved torch + shock sensor SSB outline drawing

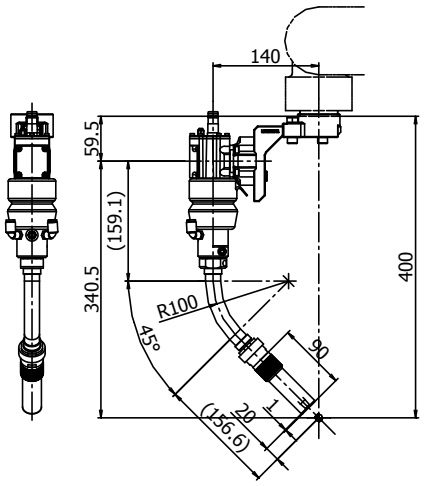
Weight 1.9 [kg] 4.18 [lb]
B4 type + RT5000L air-cooled 500A CO_2/MAG curved torch + shock sensor SSB outline drawing

Weight 2.2 [kg] 4.84 [lb]
B6 type + RT5000H air-cooled 500A CO_2/MAG curved torch + shock sensor SSV outline drawing

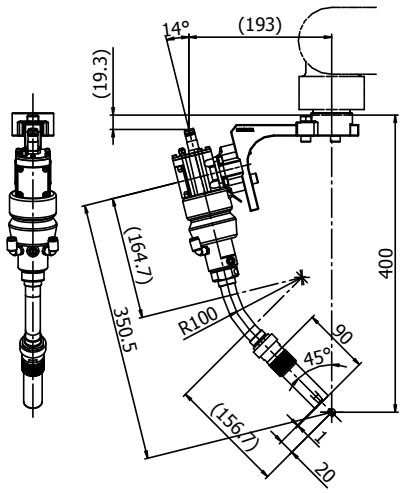
Weight 2.1 [kg] 4.62 [lb]
B6 type + RT5000L air-cooled 500A CO_2/MAG curved torch + shock sensor SSV outline drawing

Fig. 1.4 Outline drawing of air-cooled 500A torch (for B4 type, B6 type) Unit (mm)

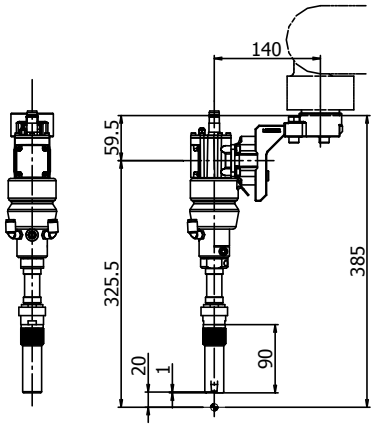
Note)
1. The shock sensor and the welding torch are distinct products.
   Select the appropriate shock sensor for the robot type in use.
2. The weight shown in each drawing of the torch with shock sensor “SSV” includes the weight of the torch mounting bracket ASSY.



Weight 2.4 [kg] 5.28 [lb]
Liquid-cooled 500A CO_2/MAG curved torch
RTW5000H with shock sensor “SSV”



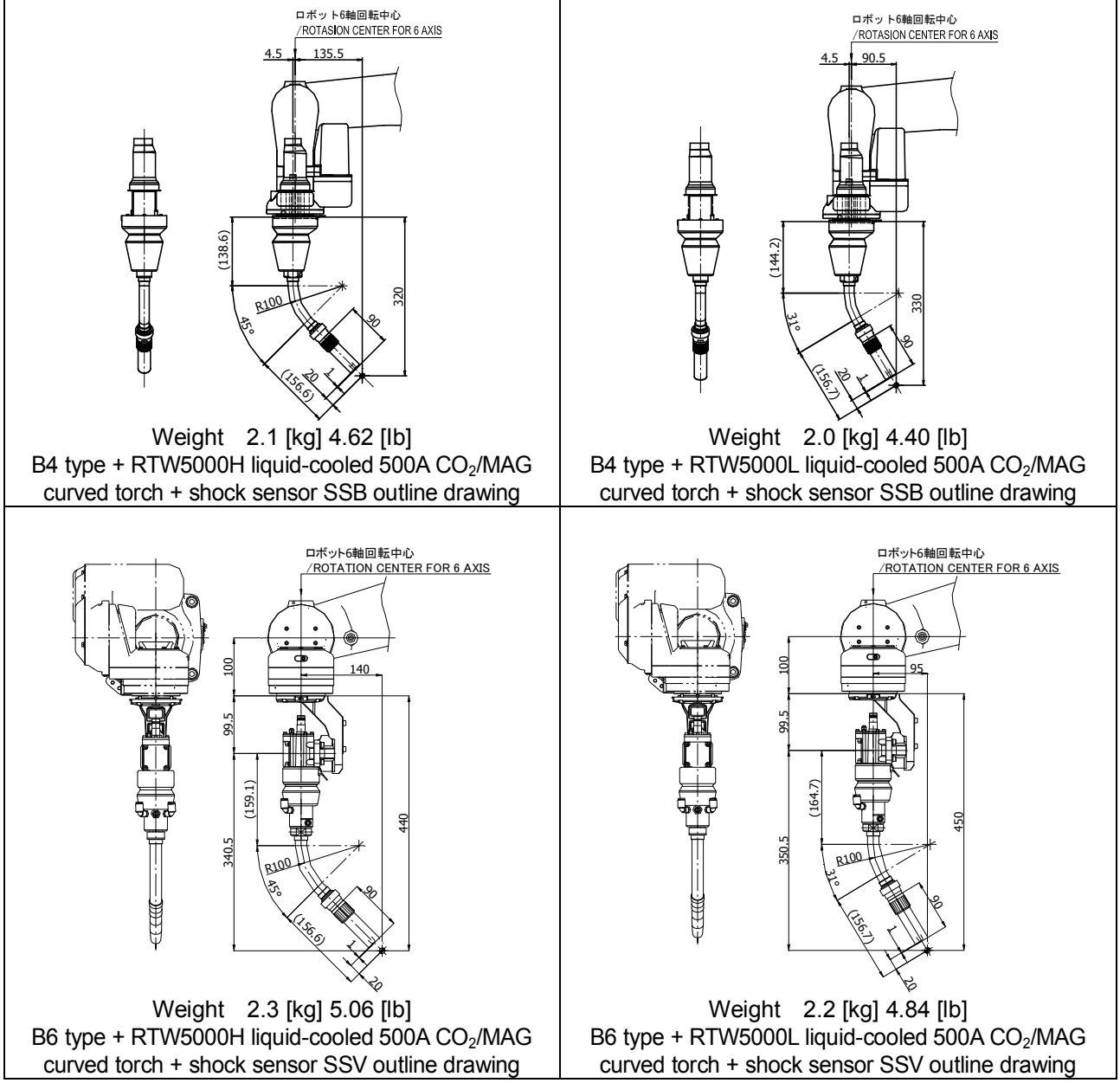
Weight 2.6 [kg] 5.72 [lb]
Liquid-cooled 500A CO_2/MAG curved torch
RTW5000L with shock sensor “SSV”



Weight 2.3 [kg] 5.06 [lb]
Liquid-cooled 500A CO_2/MAG straight torch
RTW5000S with shock sensor “SSV”

Fig. 1.5 Outline drawing of Liquid-cooled 500A torch (for V type, A type) Unit (mm)

Note)
1. The shock sensor and the welding torch are distinct products.
   Select the appropriate shock sensor for the robot type in use.
2. The weight shown in each drawing of the torch with shock sensor “SSV” includes the weight of the torch mounting bracket ASSY.



Weight 2.1 [kg] 4.62 [lb]
B4 type + RTW5000H liquid-cooled 500A CO_2/MAG curved torch + shock sensor SSB outline drawing

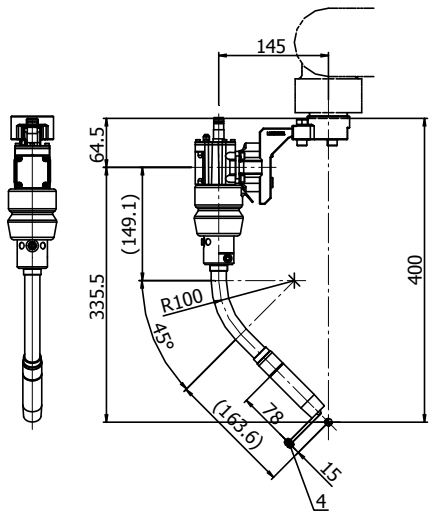
Weight 2.0 [kg] 4.40 [lb]
B4 type + RTW5000L liquid-cooled 500A CO_2/MAG curved torch + shock sensor SSB outline drawing

Weight 2.3 [kg] 5.06 [lb]
B6 type + RTW5000H liquid-cooled 500A CO_2/MAG curved torch + shock sensor SSV outline drawing

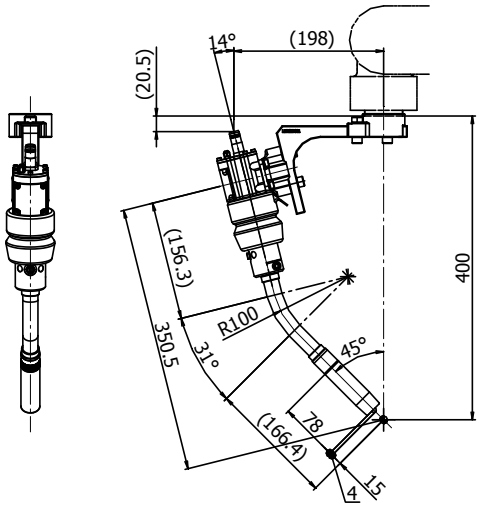
Weight 2.2 [kg] 4.84 [lb]
B6 type + RTW5000L liquid-cooled 500A CO_2/MAG curved torch + shock sensor SSV outline drawing

Fig. 1.6 Outline drawing of Liquid-cooled 500A torch (for B4 type, B6 type) Unit (mm)

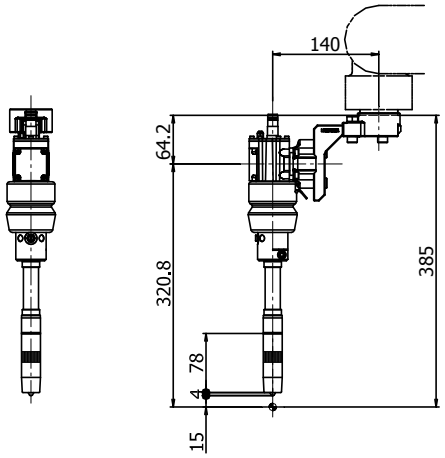
Note)
1. The shock sensor and the welding torch are distinct products.
   Select the appropriate shock sensor for the robot type in use.
2. The weight shown in each drawing of the torch with shock sensor “SSV” includes the weight of the torch mounting bracket ASSY.



Weight 2.3 [kg] 5.06 [lb]
Air-cooled 350A CO_2/MAG TCC curved torch
RZ3500H with shock sensor “SSV”



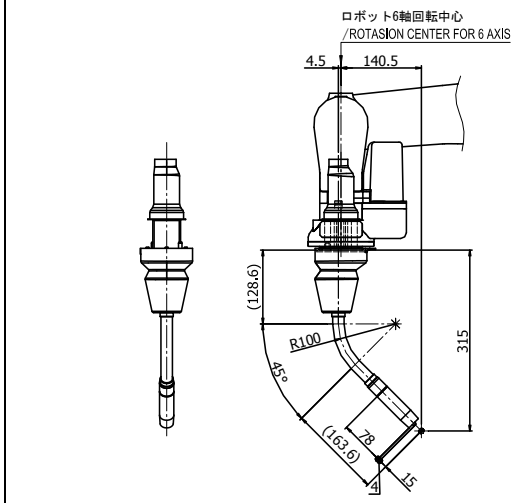
Weight 2.5 [kg] 5.50 [lb]
Air-cooled 350A CO_2/MAG TCC curved torch
RZ3500L with shock sensor “SSV”



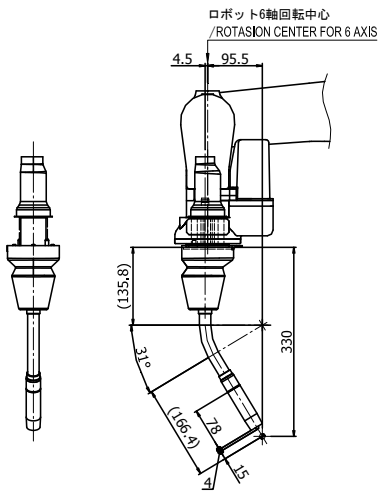
Weight 2.2 [kg] 4.84 [lb]
Air-cooled 350A CO_2/MAG TCC straight torch
RZ3500S with shock sensor “SSV”

Fig. 1.7 Outline drawing of Air-cooled 350A TCC torch (High rated duty cycle type) (for V type, A type) Unit (mm)

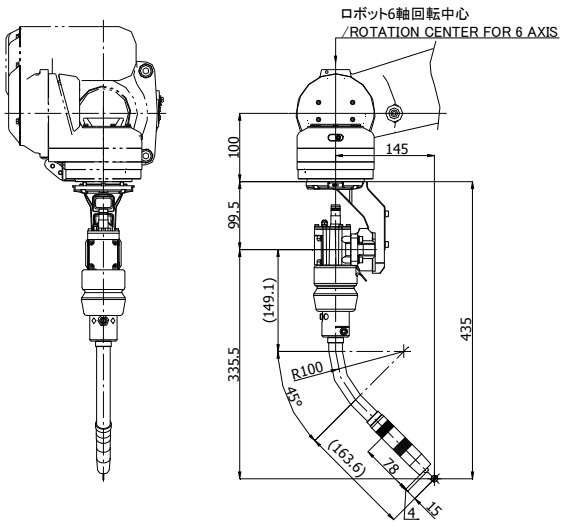
Note)
1. The shock sensor and the welding torch are distinct products.
   Select the appropriate shock sensor for the robot type in use.
2. The weight shown in each drawing of the torch with shock sensor “SSV” includes the weight of the torch mounting bracket ASSY.



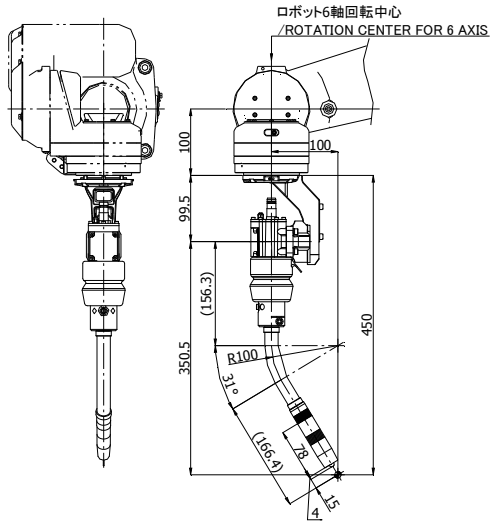
Weight 2.0 [kg] 4.40 [lb]
B4 type + RZ3500H air-cooled 350A CO_2/MAG TCC curved torch + shock sensor SSB outline drawing



Weight 2.0 [kg] 4.40 [lb]
B4 type + RZ3500L air-cooled 350A CO_2/MAG TCC curved torch + shock sensor SSB outline drawing



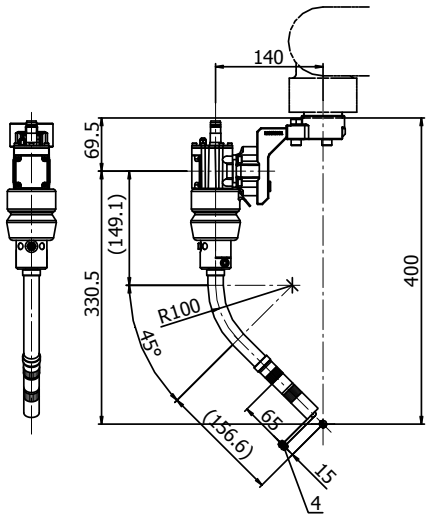
Weight 2.2 [kg] 4.84 [lb]
B6 type + RZ3500H air-cooled 350A CO_2/MAG TCC curved torch + shock sensor SSV outline drawing



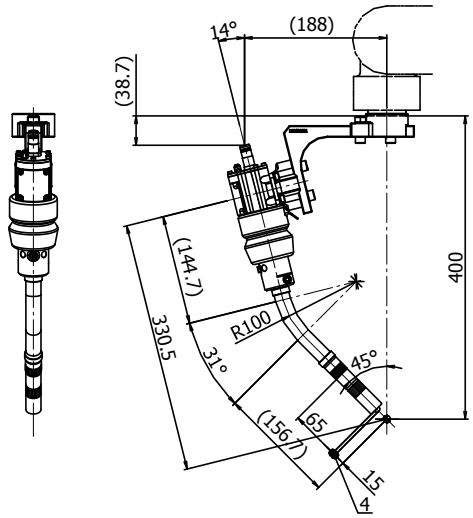
Weight 2.1 [kg] 4.62 [lb]
B6 type + RZ3500L air-cooled 350A CO_2/MAG TCC curved torch + shock sensor SSV outline drawing

Fig. 1.8 Outline drawing of Air-cooled 350A TCC torch (High rated duty cycle type) (for B4 type, B6 type) Unit (mm)

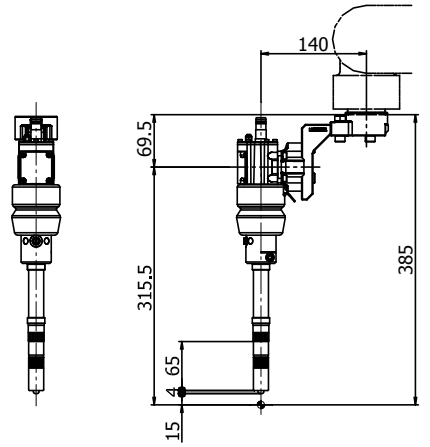
Note)
1. The shock sensor and the welding torch are distinct products.
   Select the appropriate shock sensor for the robot type in use.
2. The weight shown in each drawing of the torch with shock sensor “SSV” includes the weight of the torch mounting bracket ASSY.



Weight 2.3[kg] 5.06[lb]
Air-cooled 350A CO_2/MAG TCC curved torch
RZ3510H with shock sensor “SSV”



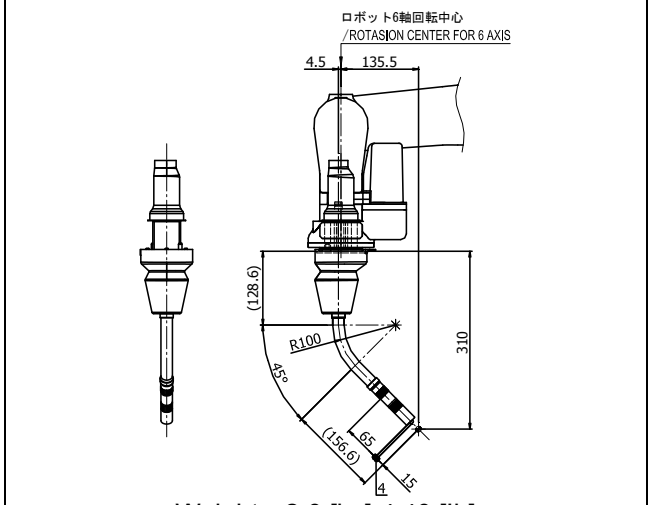
Weight 2.5[kg] 5.50[lb]
Air-cooled 350A CO_2/MAG TCC curved torch
RZ3510L with shock sensor “SSV”



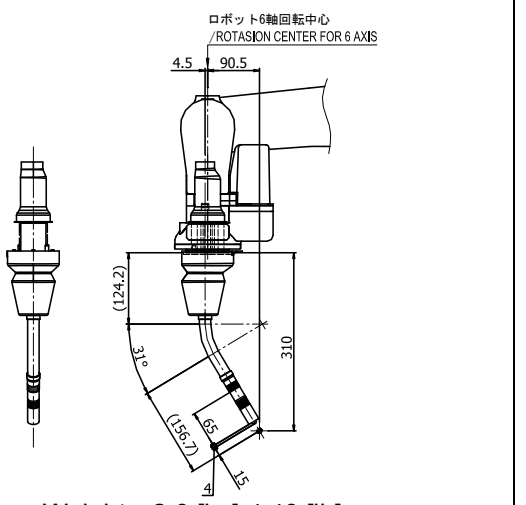
Weight 2.2[kg] 4.84[lb]
Air-cooled 350A CO_2/MAG TCC straight torch
RZ3510S with shock sensor “SSV”

Fig. 1.9 Outline drawing of Air-cooled 350A TCC torch (First diameter nozzle type) (for V type, A type) Unit (mm)

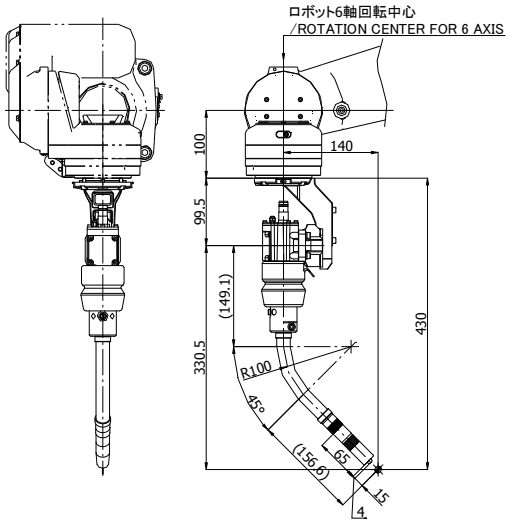
Note)
1. The shock sensor and the welding torch are distinct products.
   Select the appropriate shock sensor for the robot type in use.
2. The weight shown in each drawing of the torch with shock sensor “SSV” includes the weight of the torch mounting bracket ASSY.



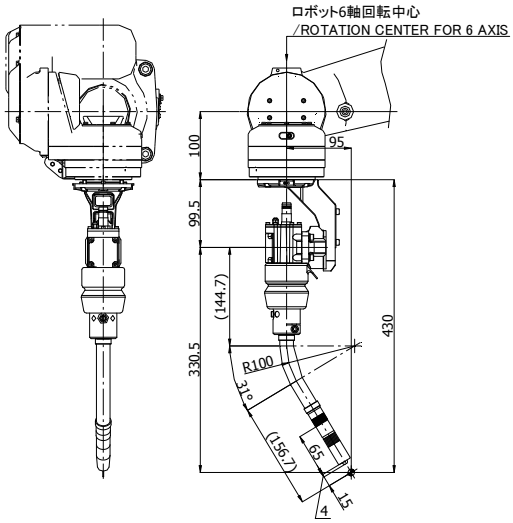
Weight 2.0 [kg] 4.40 [lb]
B4 type + RZ3510H air-cooled 350A CO_2/MAG TCC curved torch + shock sensor SSB outline drawing



Weight 2.0 [kg] 4.40 [lb]
B4 type + RZ3510L air-cooled 350A CO_2/MAG TCC curved torch + shock sensor SSB outline drawing



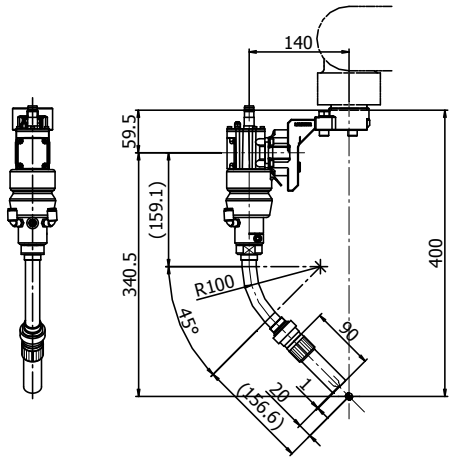
Weight 2.2 [kg] 4.84 [lb]
B6 type + RZ3510H air-cooled 350A CO_2/MAG TCC curved torch + shock sensor SSV outline drawing



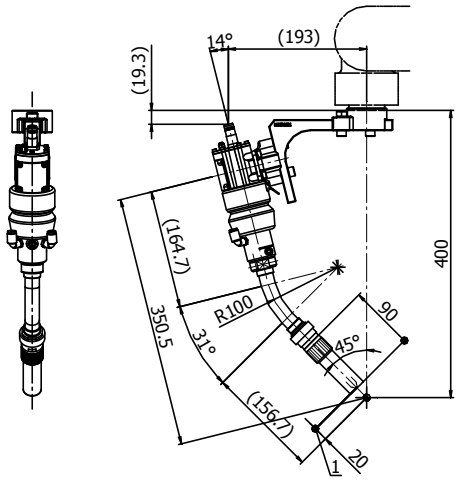
Weight 2.1 [kg] 4.62 [lb]
B6 type + RZ3510L air-cooled 350A CO_2/MAG TCC curved torch + shock sensor SSV outline drawing

Fig. 1.10 Outline drawing of Air-cooled 350A TCC torch (First diameter nozzle type) (for B4 type, B6 type) Unit (mm)

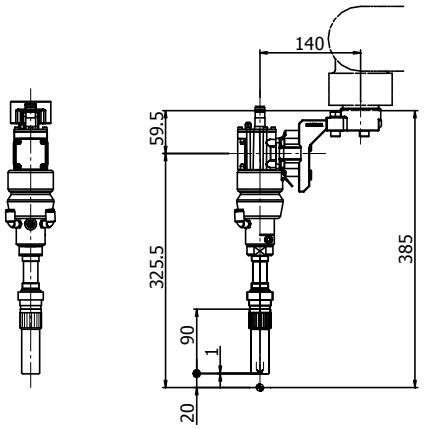
Note)
1. The shock sensor and the welding torch are distinct products.
   Select the appropriate shock sensor for the robot type in use.
2. The weight shown in each drawing of the torch with shock sensor “SSV” includes the weight of the torch mounting bracket ASSY.



Weight 2.4[kg] 5.28[lb]
Liquid-cooled 500A CO_2/MAG TCC curved torch
RZW5000H with shock sensor “SSV”



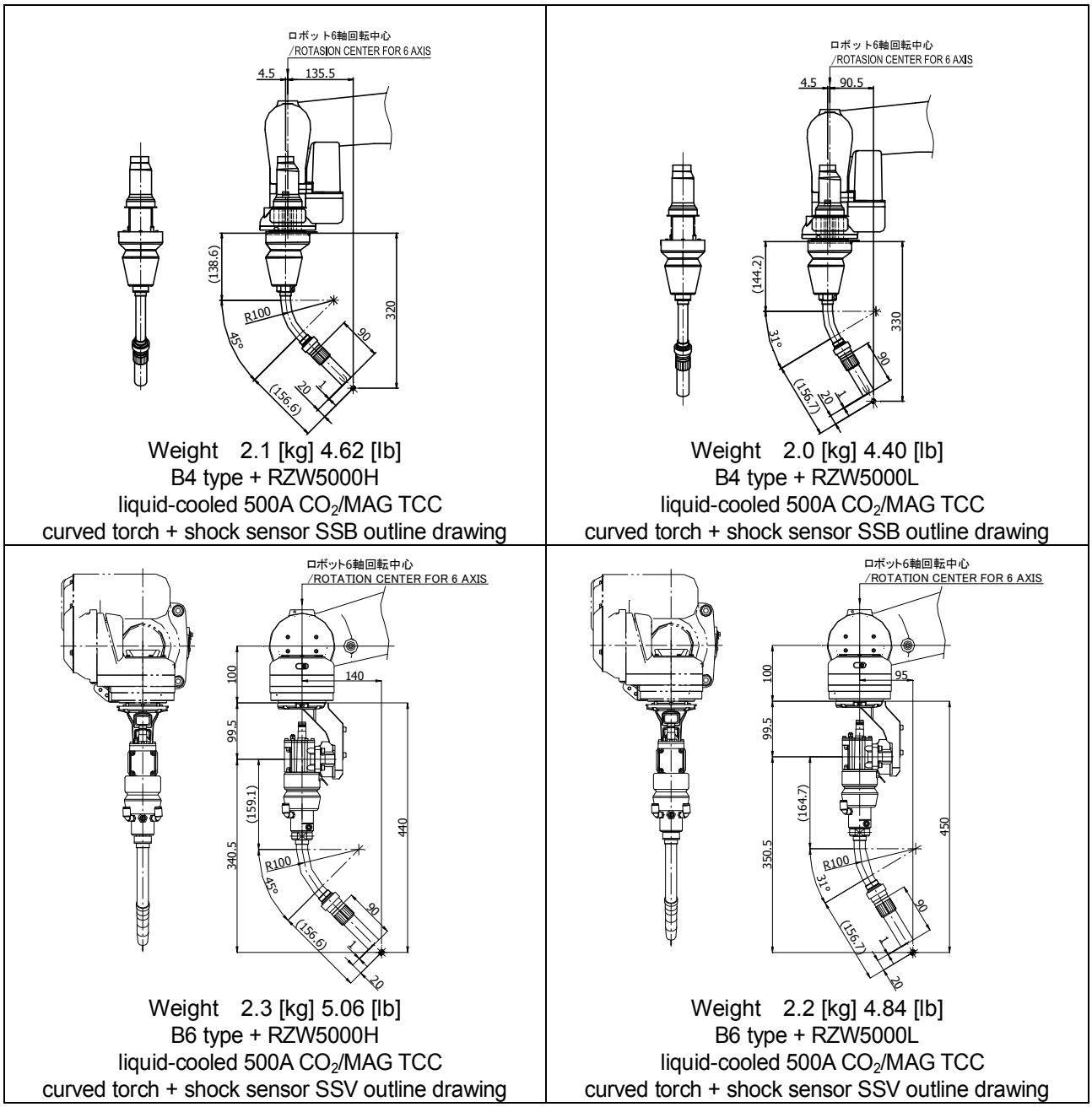
Weight 2.6[kg] 5.72[lb]
Liquid-cooled 500A CO_2/MAG TCC curved torch
RZW5000L with shock sensor “SSV”



Weight 2.3[kg] 5.06[lb]
Liquid-cooled 500A CO_2/MAG TCC straight torch
RZW5000S with shock sensor “SSV”

Fig. 1.11 Outline drawing of Liquid-cooled 500A TCC torch (for V type, A type) Unit (mm)

Note)
1. The shock sensor and the welding torch are distinct products.
   Select the appropriate shock sensor for the robot type in use.
2. The weight shown in each drawing of the torch with shock sensor “SSV” includes the weight of the torch mounting bracket ASSY.



Weight 2.1 [kg] 4.62 [lb]
B4 type + RZW5000H
liquid-cooled 500A CO_2/MAG TCC
curved torch + shock sensor SSB outline drawing

Weight 2.0 [kg] 4.40 [lb]
B4 type + RZW5000L
liquid-cooled 500A CO_2/MAG TCC
curved torch + shock sensor SSB outline drawing

Weight 2.3 [kg] 5.06 [lb]
B6 type + RZW5000H
liquid-cooled 500A CO_2/MAG TCC
curved torch + shock sensor SSV outline drawing

Weight 2.2 [kg] 4.84 [lb]
B6 type + RZW5000L
liquid-cooled 500A CO_2/MAG TCC
curved torch + shock sensor SSV outline drawing

Fig. 1.12 Outline drawing of Liquid-cooled 500A TCC torch (for B4 type, B6 type) Unit (mm)

Note)
1. The shock sensor and the welding torch are distinct products.
   Select the appropriate shock sensor for the robot type in use.
2. The weight shown in each drawing of the torch with shock sensor “SSV” includes the weight of the torch mounting bracket ASSY.

2. Checking the Contents

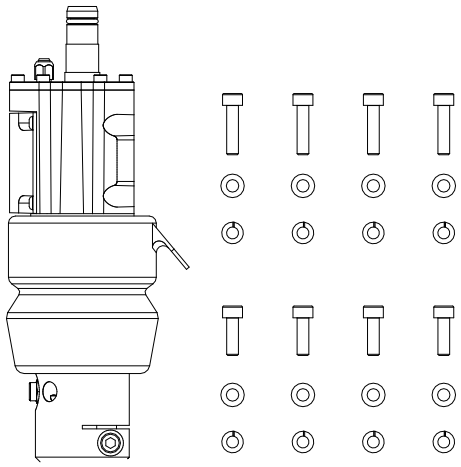
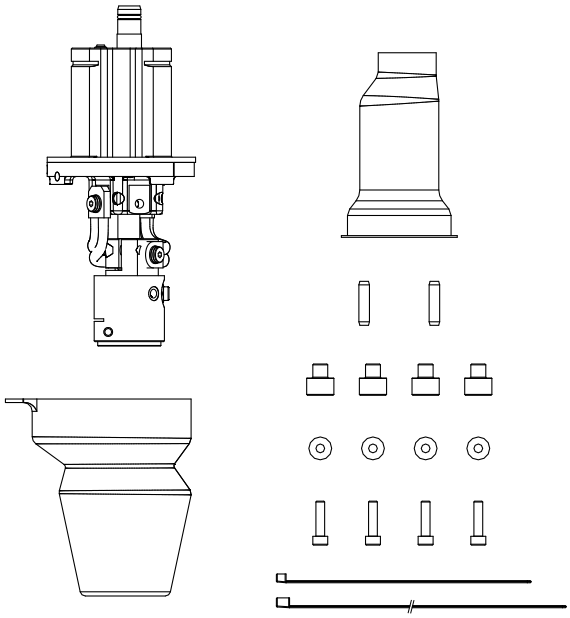
SSV	SSB
	
Shock sensor unit ····· 1 piece **Mounting bolt (M5×15)····· 4 pieces** **Mounting bolt (M5x20)····· 4 pieces** **Spring washer (M5)····· 8 pieces** **Washer (M5)····· 8 pieces**	**Shock sensor unit····· 1 piece** **Hood····· 1 piece** **Power cable cover····· 1 piece** **Mounting bolt（M5×20）·····4 pieces** **Spacer·····4 pieces** **Insulating bushing·····4 pieces** **Insulating dowel pin·····2 pieces** **Cable tie·····2 pieces**

Fig. 2.1 Checking the contents of package

Note) 1. Use the mounting bolts listed above to mount the shock sensor unit on the mounting bracket for SSV and mount the shock sensor unit on the output flange for SSB.

2. Use the cable tie listed above to mount the power cable cover on the coaxial power cable.

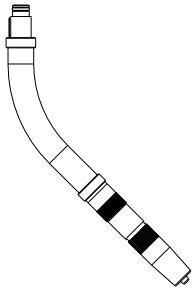
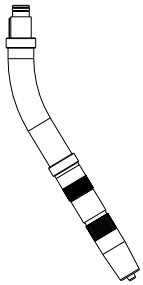
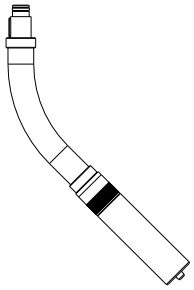
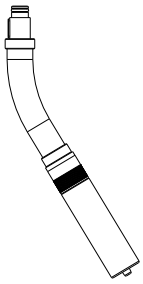
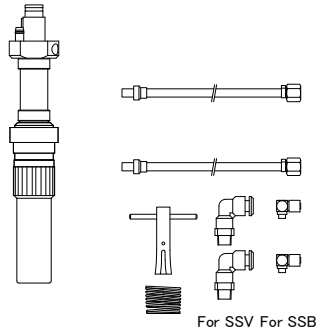
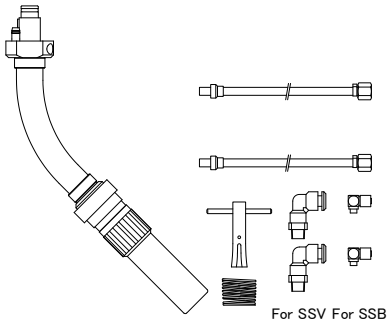
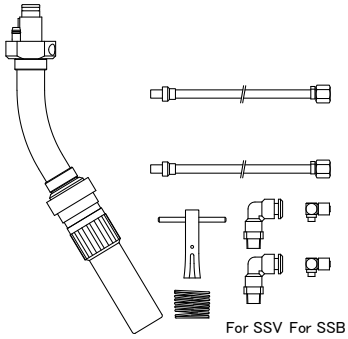
RT3500S	RT3500H	RT3500L
		
Welding torch main body ····· 1 piece	Welding torch main body····· 1 piece	Welding torch main body ····· 1 piece
RT5000S	**RT5000H**	**RT5000L**
		
Welding torch main body ····· 1 piece	Welding torch main body····· 1 piece	Welding torch main body ····· 1 piece
RTW5000S	**RTW5000H**	**RTW5000L**
		
Welding torch main body ····· 1 piece Wrench ····· 1 piece Applicator····· 1 piece Cooling water hose(6m)····· 2 pieces Elbow(For SSB)····· 2 pieces Elbow(For SSV)····· 2 pieces	Welding torch main body····· 1 piece Wrench····· 1 piece Applicator ····· 1 piece Cooling water hose(6m)·····2 pieces Elbow(For SSB) ·····2 pieces Elbow(For SSV)·····2 pieces	Welding torch main body ····· 1 piece Wrench····· 1 piece Applicator····· 1 piece Cooling water hose(6m) ·····2 pieces Elbow(For SSB) ·····2pieces Elbow(For SSV) ·····2 pieces

Fig. 2.2 Checking the contents of package (RT series)

Note) 1. Use of the RTW5000S, RTW5000H, or RTW5000L Liquid-cooled torch requires a water tank in addition to this torch. Purchase the water tank (PU-301) separately.

2. Use the wrench that comes with the Liquid-cooled torch to dismount the contact tip.

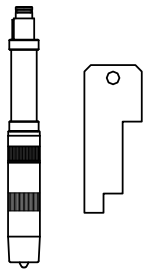
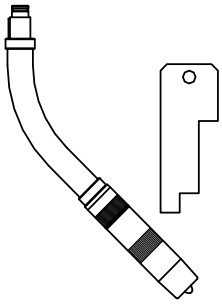
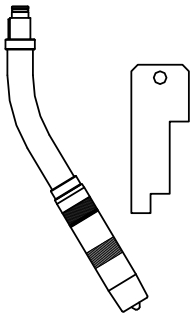
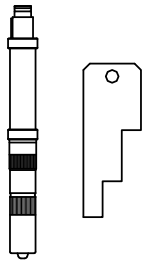
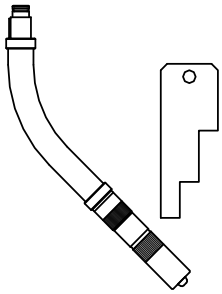
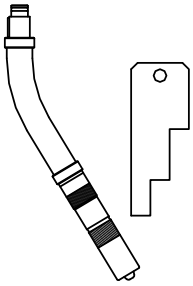
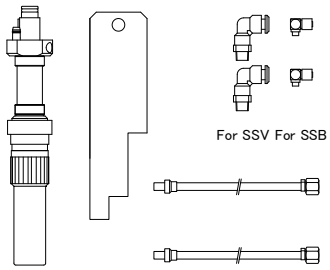
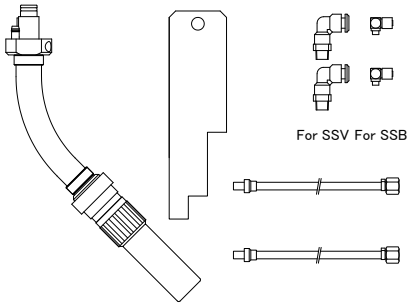
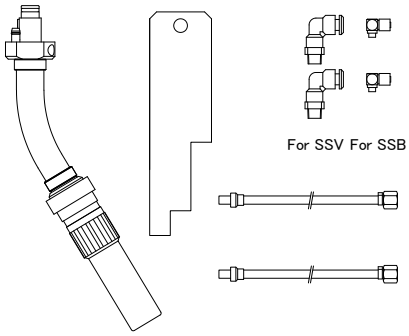
RZ3500S	RZ3500H	RZ3500L
		
Welding torch main body ····· 1 piece Liner gauge ····· 1 piece	Welding torch main body····· 1 piece Liner gauge ····· 1 piece	Welding torch main body ····· 1 piece Liner gauge····· 1 piece
RZ3510S	**RZ3510H**	**RZ3510L**
		
Welding torch main body ····· 1 piece Liner gauge ····· 1 piece	Welding torch main body····· 1 piece Liner gauge ····· 1 piece	Welding torch main body ····· 1 piece Liner gauge····· 1 piece
RZW5000S	**RZW5000H**	**RZW5000L**
		
Welding torch main body ····· 1 piece Liner gauge ····· 1 piece Cooling water hose(6m)····· 2 pieces Elbow(For SSB)····· 2 pieces Elbow(For SSV)····· 2 pieces	Welding torch main body····· 1 piece Liner gauge ····· 1 piece Cooling water hose(6m)·····2 pieces Elbow(For SSB) ·····2 pieces Elbow(For SSV)·····2 pieces	Welding torch main body ····· 1 piece Liner gauge····· 1 piece Cooling water hose(6m) ·····2 pieces Elbow(For SSB) ·····2pieces Elbow(For SSV) ·····2 pieces

Fig. 2.3 Checking the contents of package (RZ series)

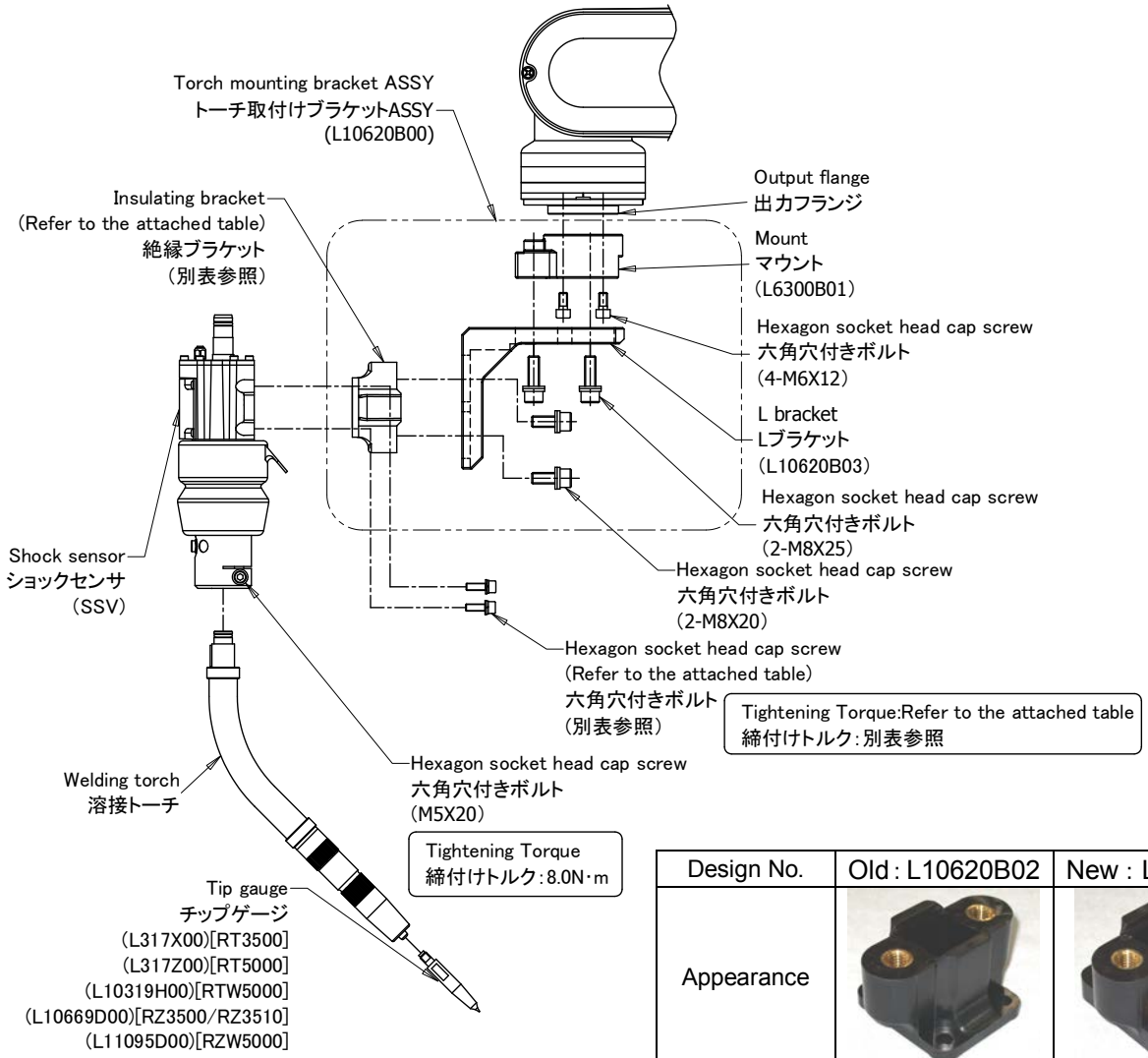
Note) 1. Use of the RZW5000S, RZW5000H, or RZW5000L Liquid-cooled torch requires a water tank in addition to this torch. Purchase the water tank (PU-301) separately.

2. Use the Liner gauge of TCC torch attachment to cut the liner.

3. Installing and Adjusting Procedure of Welding Torch

3.1 Mounting of Welding Torch on V Type/ A Type Manipulator

3.1.1 Mounting of shock sensor and mounting bracket



Design No.	Old : L10620B02	New : L10620B04
Appearance		
Bolt	M5X15	M5X20
Tightening Torque	5.0N・m	7.0N・m

(Note: Purchase the torch mounting bracket ASSY separately.)

Fig. 3.1 Mounting of torch and shock sensor (for 45° curved / straight torch)

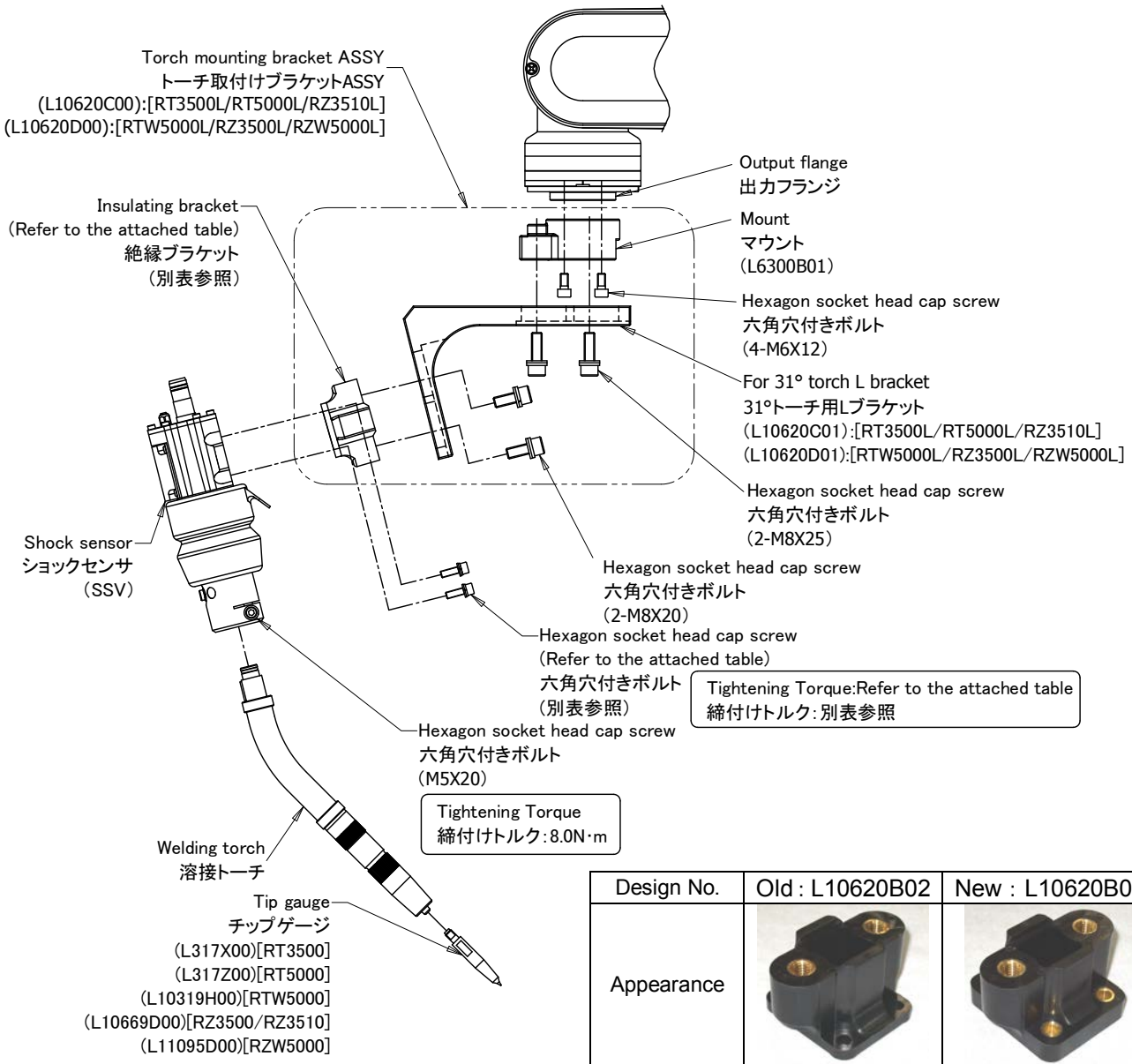
(1) Assemble the mount (L6300B01) onto the output flange of manipulator using 4 pieces of hexagon socket head cap screws (M6×12).

(2) Mount the L-bracket (L10620B03) to the mount that has assembled in the procedure (1) with 2 pieces of hexagon socket head cap screws (M8×25).

(3) Mount the insulating bracket (Refer to the attached table) to the L-bracket that has mounted in the procedure (2) with 2 pieces of hexagon socket head cap screws (M8×20).

(4) Mount the shock sensor onto the insulating bracket with 4 pieces of hexagon socket head cap screws (Refer to the attached table).

(5) Loosen the hexagon socket head cap screw (M5×20) of shock sensor to insert the torch. Fix it by tightening the screw.



Design No.	Old : L10620B02	New : L10620B04
Appearance		
Bolt	M5X15	M5X20
Tightening Torque	5.0N・m	7.0N・m

(Note: Purchase the torch mounting bracket ASSY separately.)

Fig. 3.2 Mounting of torch and shock sensor (for 31° curved torch)

(1) Assemble the mount (L6300B01) onto the output flange of manipulator using 4 pieces of hexagon socket head cap screws (M6×12).

(2) Mount the L-bracket (L10620B01 or L10620D01) to the mount that has assembled in the procedure (1) with 2 pieces of hexagon socket head cap screws (M8×25).
Choose the L bracket according to the type of the welding torch. (For detail, refer to Fig. 3.2)

(3) Mount the insulating bracket (Refer to the attached table) to the L-bracket that has mounted in the procedure (2) with 2 pieces of hexagon socket head cap screws (M8×20).

(4) Mount the shock sensor onto the insulating bracket with 4 pieces of hexagon socket head cap screws (Refer to the attached table).

(5) Loosen the hexagon socket head cap screw (M5×20) of shock sensor to insert the torch. Fix it by tightening the screw.

Important point about bolt used when insulating bracket is mounted

With the shape change of the insulating bracket, bundle two kinds of bolts for insulating bracket mount (M5x15, M5x20).

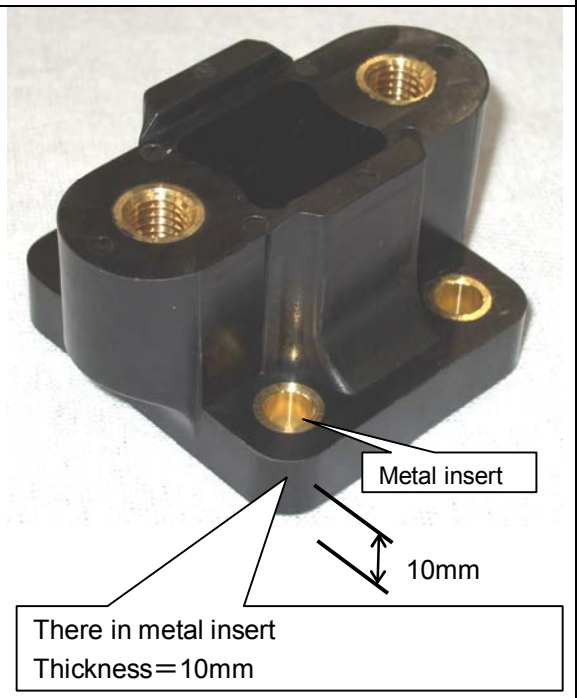
When you mount **old** insulating bracket, please use a bolt of **M5X15**.

When you mount **new** insulating bracket, please use a bolt of **M5X20**.

If you use a different bolt, you cannot fix certainly because the length of bolt is different.

In addition, when you mount insulating bracket, **please use a washer and spring washer by all means**.

Insulating bracket-bolt Correspondence list

	Old insulating bracket L10620B02	New insulating bracket L10620B04
Appearance		
Bolt	M5X**15**	M5X**20**

3.1.2 Mounting the torch gauge

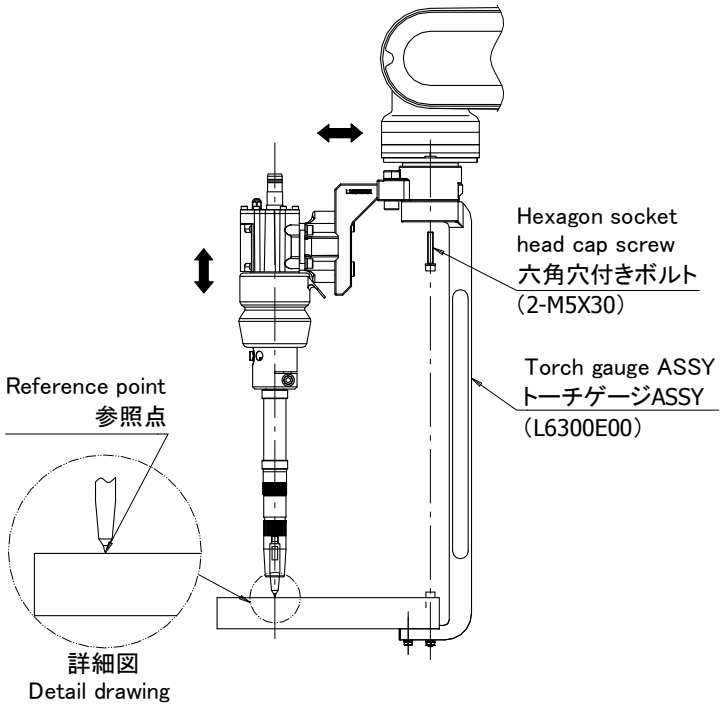


Fig. 3.3 Mounting the torch gauge (for straight torch)

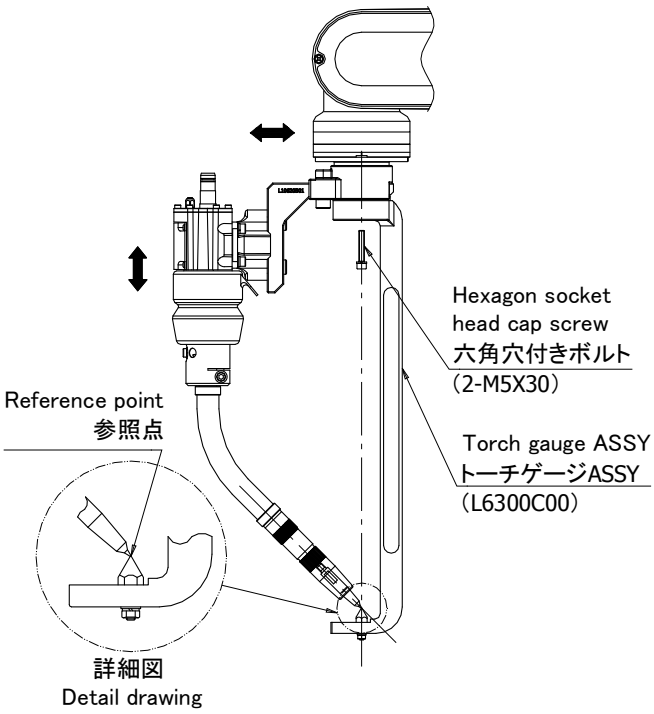


Fig. 3.4 Mounting the torch gauge (for 45° curved torch)

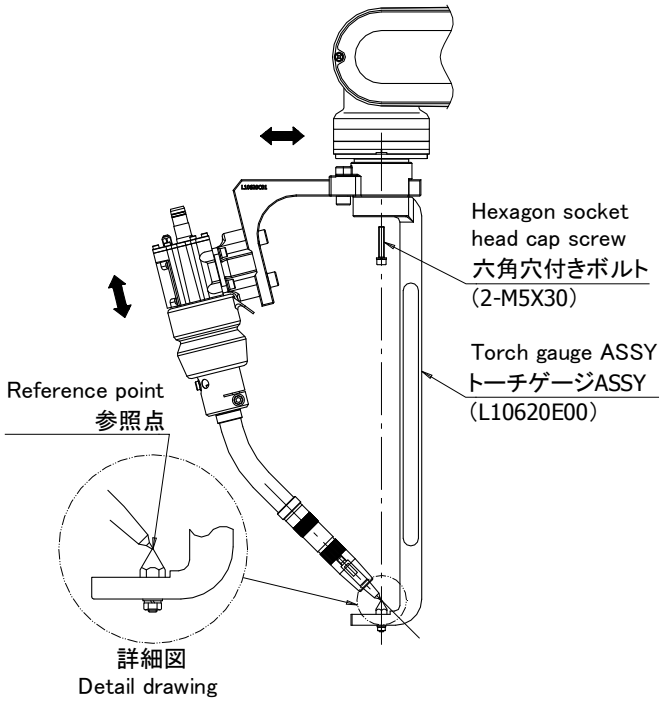


Fig. 3.5 Mounting the torch gauge (for 31° curved torch)

(Note: Purchase the torch gauge ASSY separately.)

(1) Dismount the nozzle and the contact tip from the torch of the RT series.
For RZW5000 Series, dismount the nozzle, tip holder, collet tip and front tip body from the torch.
For RZ3500 Series and RZ3510 Series, dismount the nozzle and tip holder from the torch.

(2) Mount the tip gauge firmly to the torch. (The gauge is an attached component of the torch mount.)
About each tip gauge, confirm it in Table 3.1.

(3) Mount the torch gauge ASSY with 2 pieces of hexagon socket head cap screws (M5x30). (The screws are attached components of the torch gauge Assy.)

(4) Make sure that the reference point of torch gauge matches with the tip gauge end. If not, make adjustments for the reference point to align with it.
Check parts to be used to mount the torch to V type/A type manipulator by Table 3.2 and Table 3.3.

Table 3.1 Type of Tip gauge

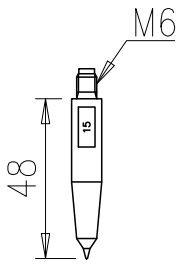
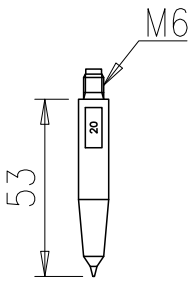
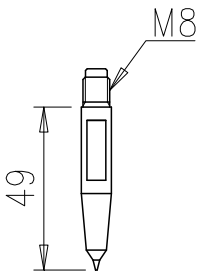
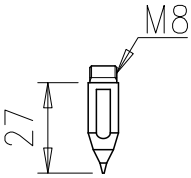
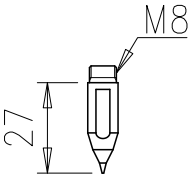
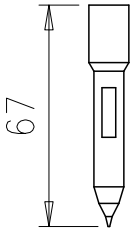
L317X00 for RT3500	L317Z00 for RT5000	L10319H00 for RTW5000	L10669D00 for RZ3500	L10669D00 for RZ3510	L11095D00 for RZW5000
Extension 15mm	Extension 20mm	Extension 20mm	Extension 15mm	Extension 15mm	Extension 20mm
					
RT3500S RT3500H RT3500L	RT5000S RT5000H RT5000L	RTW5000S RTW5000H RTW5000L	RZ3500S RZ3500H RZ3500L	RZ3510S RZ3510H RZ3510L	RZW5000S RZW5000H RZW5000L

Table 3.2 Type of Torch mounting bracket ASSY / Torch gauge ASSY / Tip gauge (RT series)

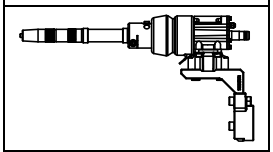
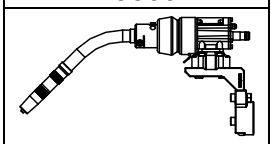
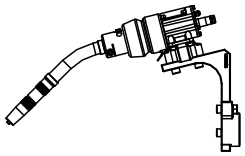
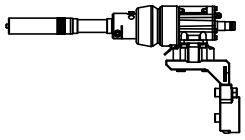
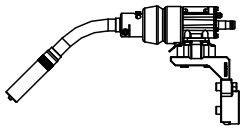
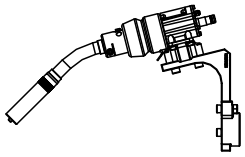
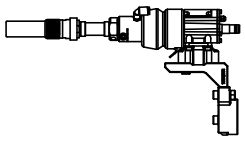
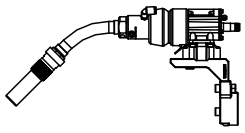
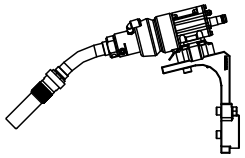
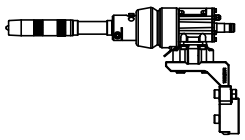
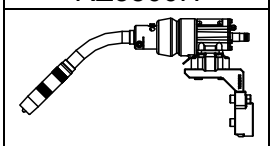
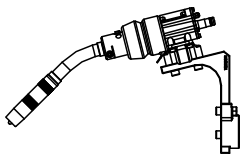
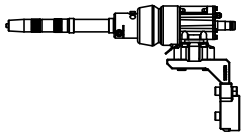
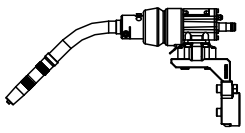
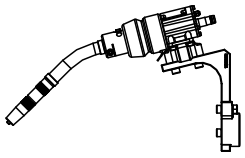
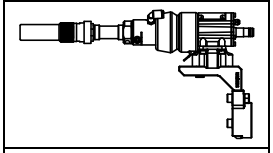
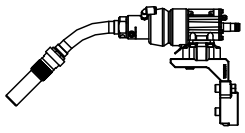
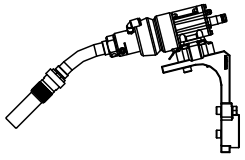
Torch model	Torch mounting bracket ASSY	Torch gauge ASSY	Tip gauge
RT3500S 	L10620B00	L6300E00	L317X00
RT3500H 		L6300C00	
RT3500L 	L10620C00	L10620E00	
RT5000S 	L10620B00	L6300E00	L317Z00
RT5000H 		L6300C00	
RT5000L 	L10620C00	L10620E00	
RTW5000S 	L10620B00	L6300E00	L10319H00
RTW5000H 		L6300C00	
RTW5000L 	L10620D00	L10620E00	

Table 3.3 Type of Torch mounting bracket ASSY / Torch gauge ASSY / Tip gauge (RZ series)

Torch model	Torch mounting bracket ASSY	Torch gauge ASSY	Tip gauge
RZ3500S 	L10620B00	L6300E00	L10669D00
RZ3500H 		L6300C00	
RZ3500L 	L10620D00	L10620E00	
RZ3510S 	L10620B00	L6300E00	L10669D00
RZ3510H 		L6300C00	
RZ3510L 	L10620C00	L10620E00	
RZW5000S 	L10620B00	L6300E00	L11095D00
RZW5000H 		L6300C00	
RZW5000L 	L10620D00	L10620E00	

3.1.3 Adjusting procedure of the torch

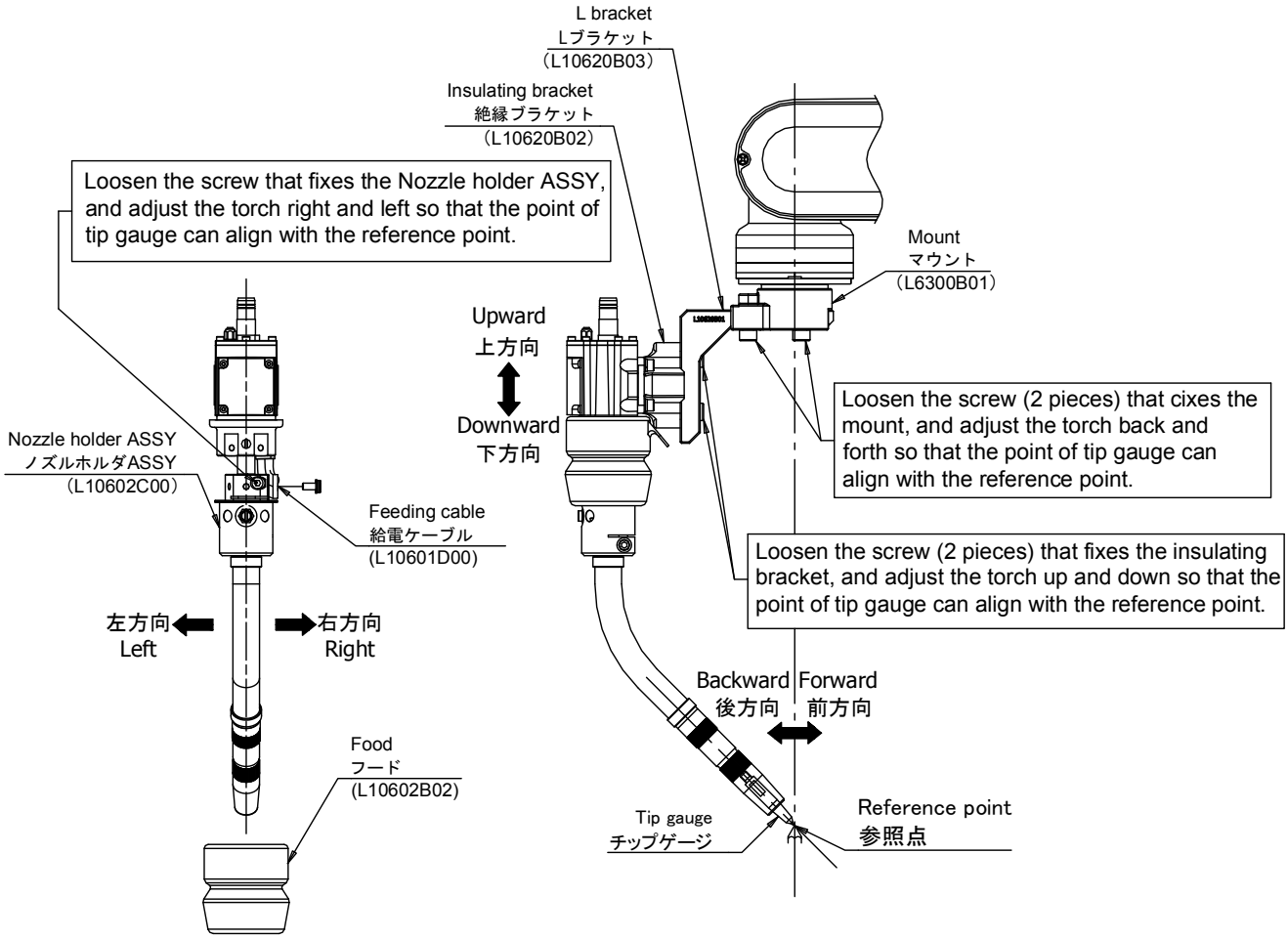


Fig. 3.6 Adjusting procedure of the torch

(1) If the tip gauge end slips out of the reference point of torch gauge in the upward or downward direction, loosen the 2 pieces of hexagon socket head cap screws (M8×20) that fix the insulating bracket (L10620B02 or L10620B04) onto the L-bracket (L10620B03). Correct the position, moving the insulating bracket upward or downward, and then fix it firmly by tightening the screws.

(2) If the tip gauge end slips out of the reference point of torch gauge in the frontward or rearward direction, loosen the 2 hexagon socket head cap screws (M8×25) that fix the mount (L6300B01) onto the L-bracket (L10620B03). Correct the position, moving the mount frontward or rearward, and then fix it firmly by tightening the screws.

(3) If the tip gauge point is out of alignment in the horizontal direction to the reference point of the touch gauge, make alignment adjustment following the procedure shown below.

1. Dismount the hood (L10602B02).
2. Disconnect the power cable (L10601D00) from the nozzle holder assembly (L10602C00), unfasten the hexagon socket head cap screws (M5×20) that fix the nozzle holder to rotate it to the direction of misalignment (or to the left or right), and then make adjustment.
3. Securely fix the nozzle holder and power supply cable, and then mount the hood.

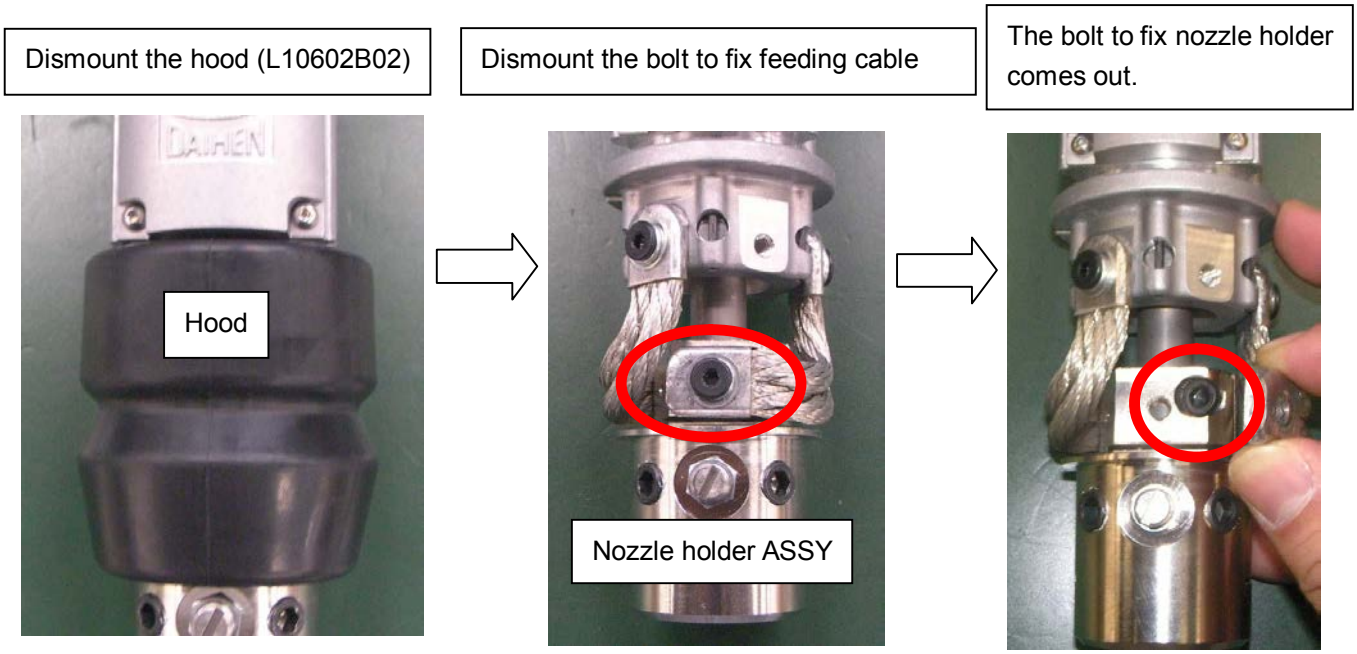


Fig. 3.7 Right and left direction adjusting procedure of the torch

(4) In case that the torch tip is not correctly positioned even after making adjustments as shown in (1) - (3), it is possible that there is a distortion in the L-bracket or the nozzle assembly. Follow the procedures (1) - (3) once again, and if it remains uncorrected, please contact to your nearest sales distributor of our company.

(5) Dismount the torch gauge when the adjusting procedure of torch is finished. Note that you need to create the origin position checking program before removing the tip gauge and mounting the nozzle and the contact tip onto the torch.

3.2 Mounting on B4 Type Manipulator

3.2.1 Mounting of curved torch

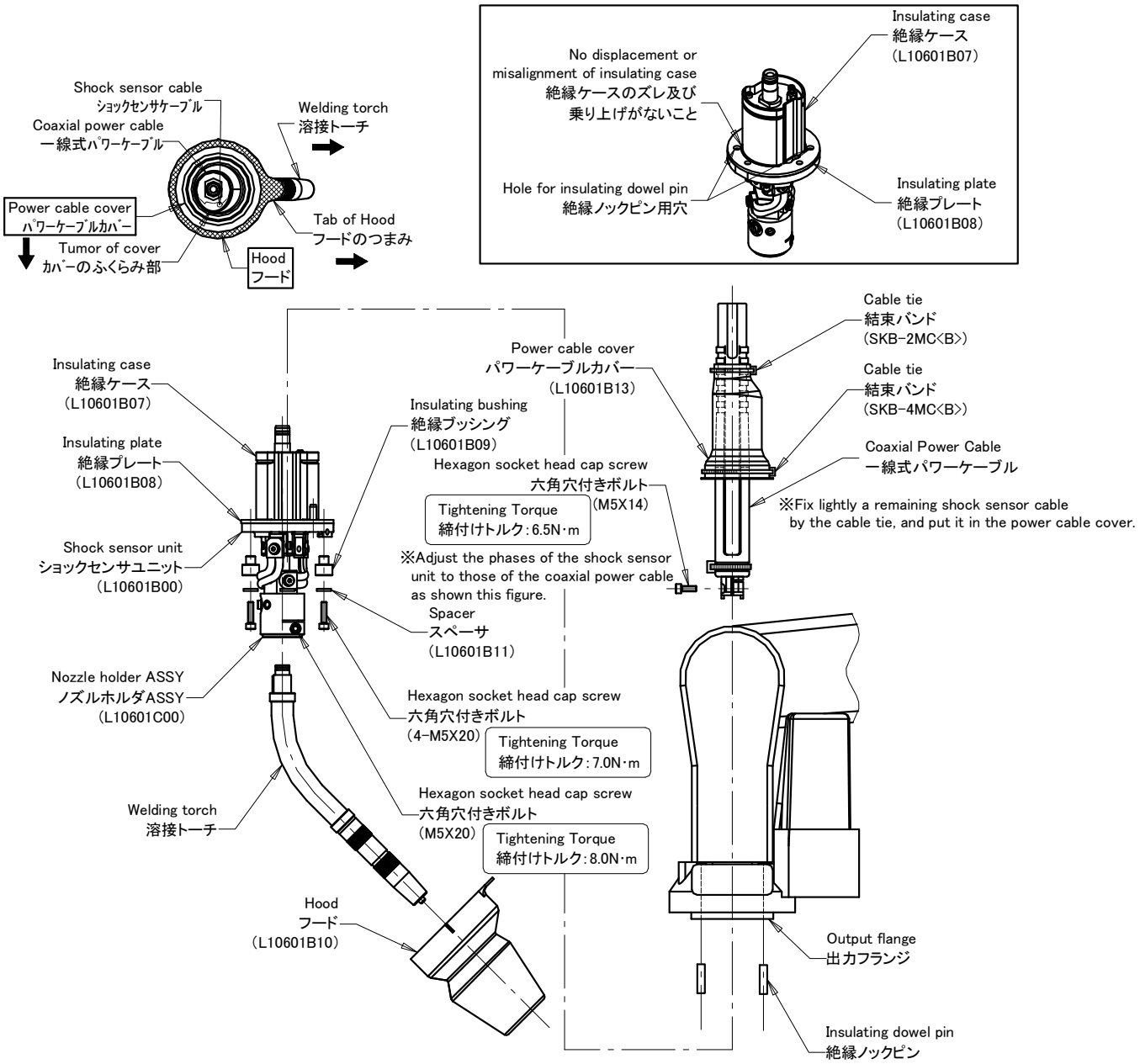


Fig. 3.8 Mounting of torch and shock sensor

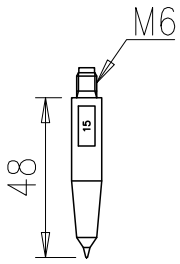
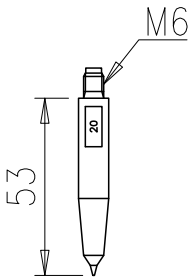
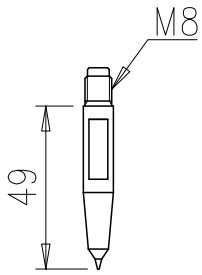
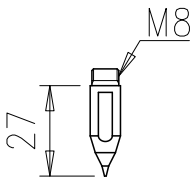
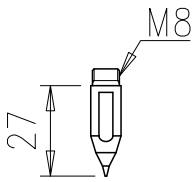
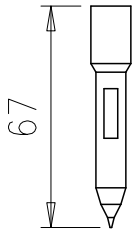
(1) Drive the two insulating dowel pins onto the output flange of manipulator from underneath. (The pins are attached to the shock sensor unit (L10601B00).)
(2) Make sure that the insulating case (L10601B07) and the insulating plate（L10601B08）are fixed properly.
(3) Insert the shock sensor unit into the output flange of manipulator from underneath. Position correctly the holes for insulating dowel pin of shock sensor to the insulating dowel pins.
(4) Mount the insulating bushing (L10601B09) and the spacer (L10601B11) onto the shock sensor unit from underneath, using 4 pieces of hexagon socket head cap screws （M5×20）. (The screws are attached to the shock sensor unit.)
(5) Unfasten the hexagon socket head bolt (M5×20) that fixes the shock sensor, and then insert and fix the welding torch.
(6) Attach the power cable cover (L10601B13) from above, and the hood (L10601B10) from underneath. (Refer to the top view in fig.3.8 for the installation direction.)
To fix the power cable cover, use the cable ties that come with the shock sensor. (Fix the cover at the top and bottom.)

Note) Adjust the phase of the shock sensor to those of the coaxial power cable as shown Fig. 3.8.

3.2.2 Reference point teaching procedure (Creation of home position confirmation program)

(1) Dismount the nozzle and the contact tip from the torch of the RT series.
(2) For RZW5000 Series, dismount the nozzle, tip holder, collet tip and front tip body from the torch. For RZ3500 Series and RZ3510 Series, dismount the nozzle and tip holder from the torch.
(3) Mount the tip gauge firmly to the torch
(4) To set a reference point, prepare a sharp-pointed object fixed to the ground (e.g. tip gauge) (hereinafter referred to as the “reference gauge”).
(5) Align the point of the tip gauge on tip of the reference gauge, and then teach such point as the reference point (2) (point teaching). Use this reference point (2) to confirm the mechanical deviation of the torch.

Table 3.4 Type of Tip gauge

L317X00 for RT3500	L317Z00 for RT5000	L10319H00 for RTW5000	L10669D00 for RZ3500	L10669D00 for RZ3510	L11095D00 for RZW5000
Extension 15mm	Extension 20mm	Extension 20mm	Extension 15mm	Extension 15mm	Extension 20mm
					
RT3500S RT3500H RT3500L	RT5000S RT5000H RT5000L	RTW5000S RTW5000H RTW5000L	RZ3500S RZ3500H RZ3500L	RZ3510S RZ3510H RZ3510L	RZW5000S RZW5000H RZW5000L

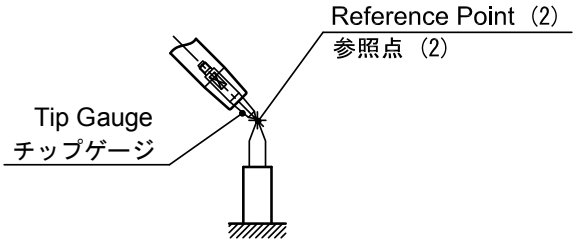


Fig.3.9 Teaching of reference point

3.2.3 Mounting of gauge ASSY (option)

(1) Dismount the nozzle and the contact tip from the torch of the RT series.
For RZW5000 Series, dismount the nozzle, tip holder, collet tip and front tip body from the torch.
For RZ3500 Series and RZ3510 Series, dismount the nozzle and tip holder from the torch.
(2) Mount the tip gauge firmly to the torch.
(3) Dismount the hood from the shock sensor. Mount the gauge ASSY (L10618B00) with the two hexagon socket head cap screws (M5×16) that comes with the gauge ASSY.
(4) To set a reference point, prepare a sharp-pointed object fixed to the ground (e.g. tip gauge (L317X00)) (hereinafter referred to as the “reference gauge”).

Note) This gauge is designed to confirm the origin position of the robot. (Unlike the conventional torch gauges, it is not designed to make measurement of positional accuracy of the torch.) For the adjustment procedure, refer to information in Section 3.2.4.

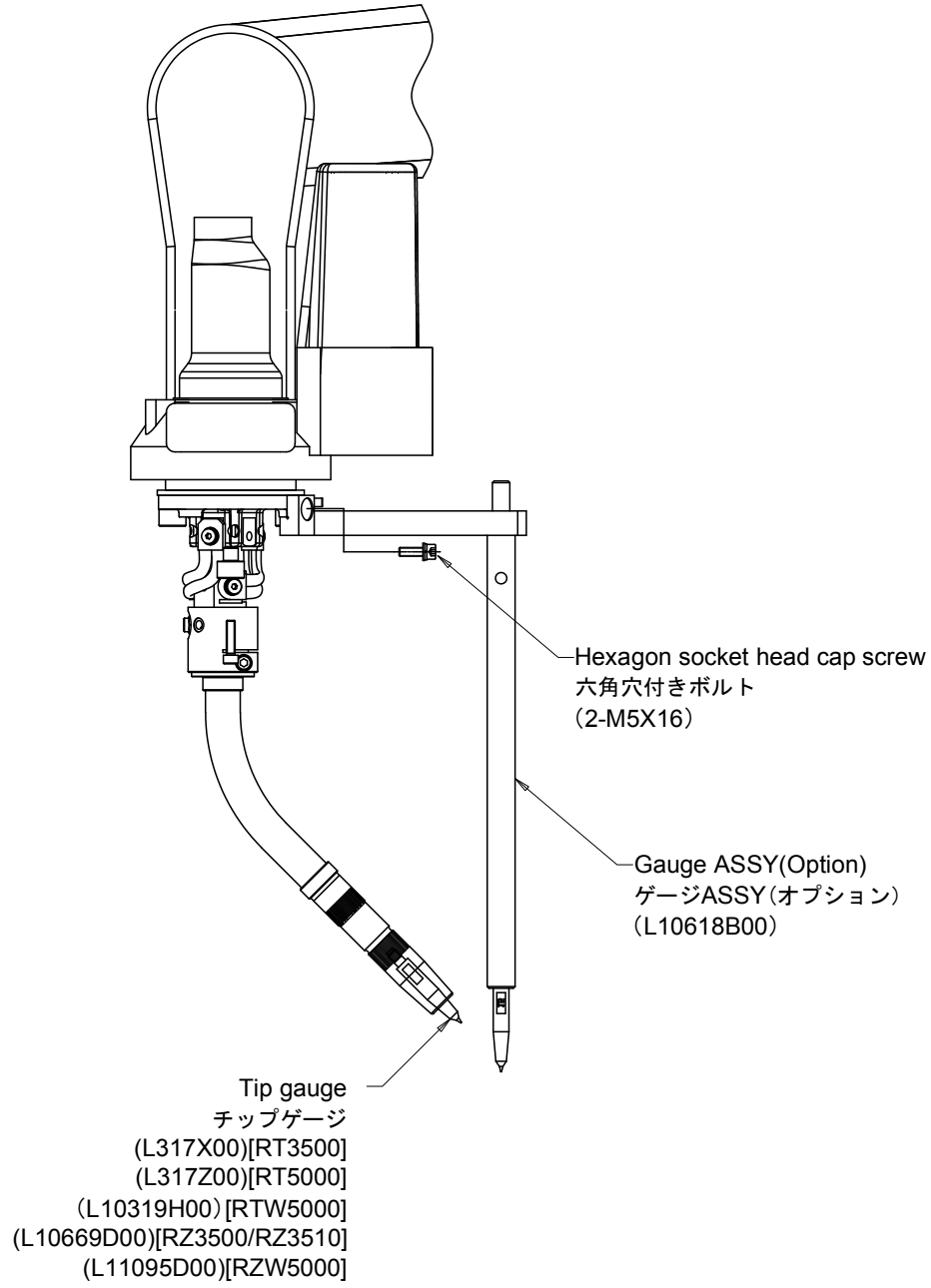


Fig.3.10 Mounting of gauge ASSY

3.2.4 Teaching the reference point using the gauge ASSY (Option)
(Creating the origin position checking program)

(1) Align the point of gauge ASSY with the reference gauge prepared when the gauge ASSY was installed, and teach it as the reference point (1) (point-teaching).
This reference point (1) is used for checking the mechanical deviation of robot.

(2) Align the point of tip gauge secured on the torch tip with the tip of reference gauge, and teach it as the reference point (2) (point-teaching).
This reference point (2) is used for checking the mechanical deviation of torch.

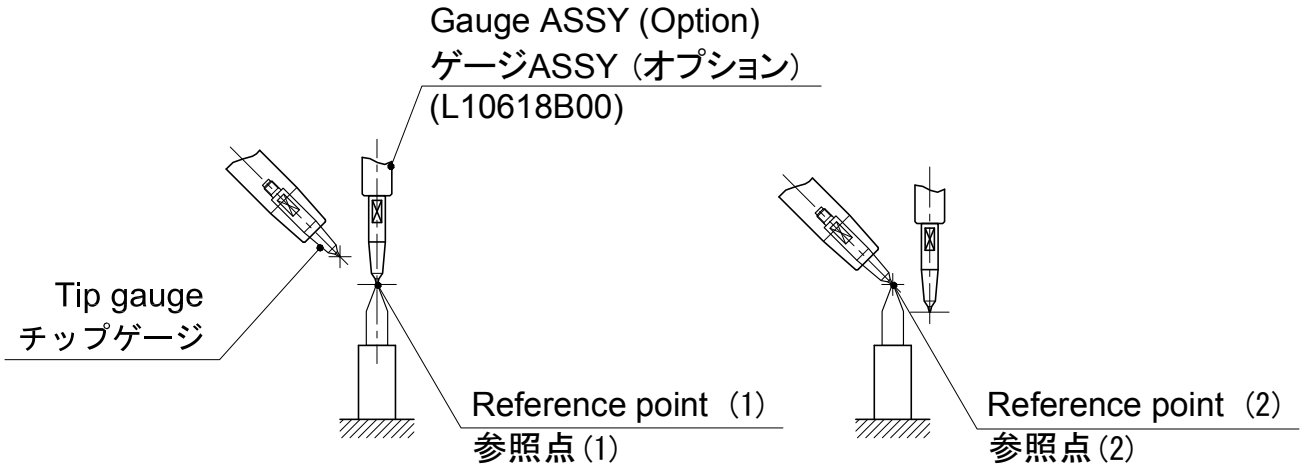


Fig.3.11 Teaching the reference point

3.2.5 Daily check of reference point

In the daily check, see if no deviation has occurred in the reference point (2) taught by the origin-position check program. If any deviation has occurred caused by the torch collision etc., correct it by the prcedure Fig.3.12.

If a deviation has occurred in the reference point (1) taught by the origin-position check program, provided with the gauge ASSY (option), that deviation shall be attributed to the manipulator. Contact our sales department.

If no deviation has occurred in the reference point (1), that deviation shall be attributed to the torch. In this case, correct it by the following procedure.

Note that when checking the reference point (1) first taught, be sure to use the gauge applied in the first. If using a wrong gauge, the precise position accuracy cannot be obtained.

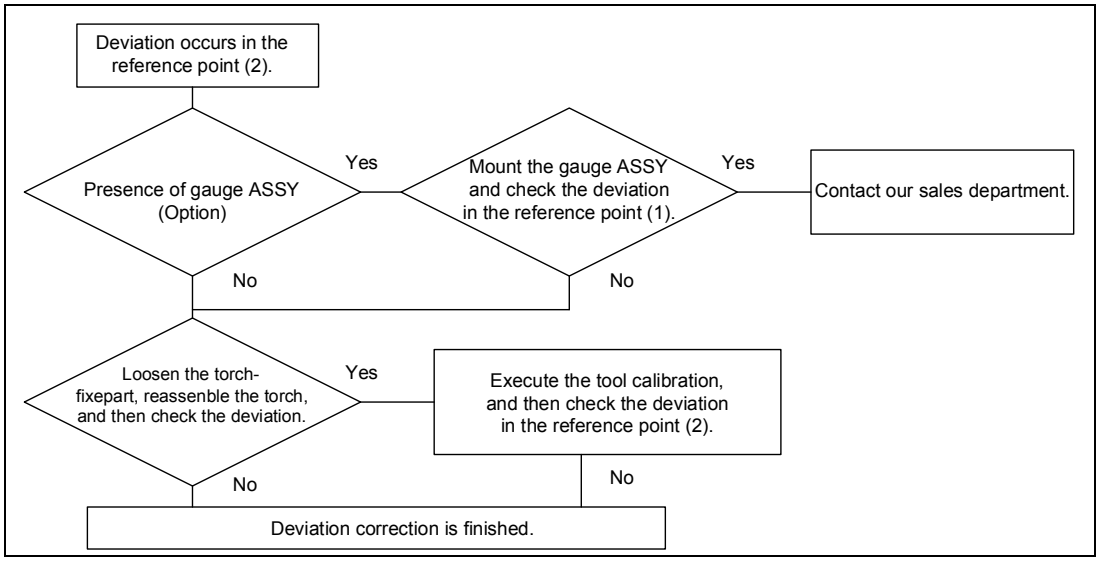


Fig.3.12 Checking procedure when the torch deviated

3.2.6 Adjustment procedure with the tool length automatic setting

(1) Copy the existing origin position check program (Program A for example), and newly create the program B. Running this program B, align the tip of reference gauge and the point of tip gauge fixed on the torch tip by performing the **rectangular manual operation holding the torch posture** from the position of program A to perform teaching (point-teaching).

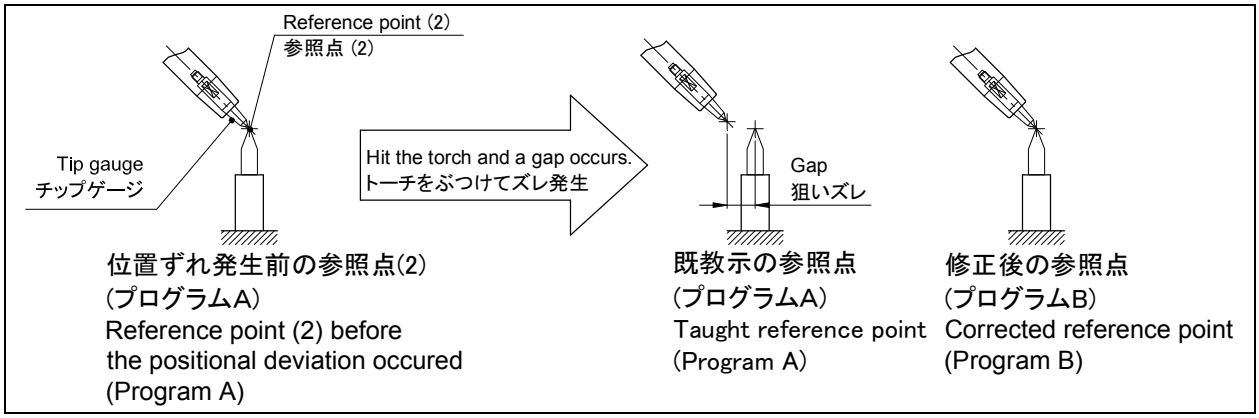


Fig.3.13 Checking the reference point

(2) Perform the 2-point tool length setting. With this setting, the amount of torch (tool) deviation can be automatically reflected to the program. For details of the operation procedure, see the Instruction Manual; section 4.6.2 “Tool length” in INSTALLATION (1L20400A-E-*).
See the Instruction Manual, section 4.5.2 “Tool length” in SETUP (1L21700B-E-*).

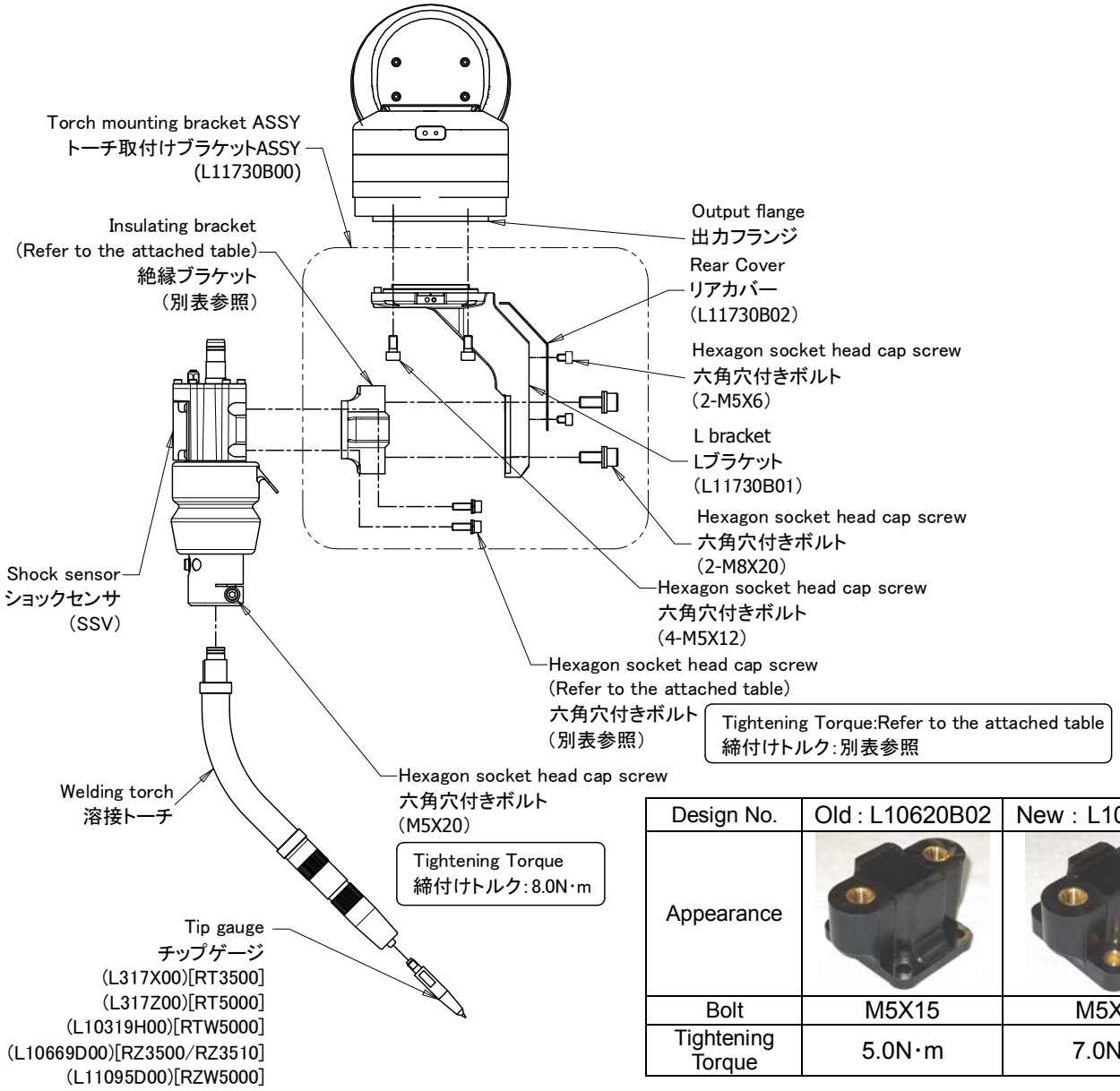
(3) As the tool conversion function is automatically executed, follow the instruction and convert the program that you would like to perform the tool conversion. For details of the operation procedure, see the instruction manual; section 4.6.8 “Tool conversion” in INSTALLATION (1L20400A-E-*).
See the Instruction Manual, section 4.5.8 “tool conversion” in SETUP (1L21700B-E-*).

(4) Call the program A and check that the deviation in the reference point (2) has been corrected, having a proper reference point.

In addition, do not execute the tool conversion function in the program where the reference point (1) has been taught with the optional gauge ASSY provided.
If executing the tool conversion function in all the programs, teach the reference point (1) again.

3.3 Mounting on B6 Type Manipulator

3.3.1 Mounting of shock sensor and mounting bracket



Design No.	Old : L10620B02	New : L10620B04
Appearance		
Bolt	M5X15	M5X20
Tightening Torque	5.0N・m	7.0N・m

(Note: Purchase the torch mounting bracket ASSY separately.)

Fig. 3.14 Mounting of torch and shock sensor

(1) Insert the bracket (L11730B01) into the manipulator output flange from its bottom. Be sure to align the bracket knock pin to the output flange pin hole. Fix the bracket to the manipulator output flange using 4 hexagon socket head cap screws (M5 x 12).

(2) Mount the shock sensor to the insulating bracket using 4 hexagon socket head cap screws (refer to the attached table). Loosen the hexagon socket head cap screws that fix the shock sensor, insert the welding torch and fix it.

(3) Mount the insulating bracket to the bracket using 2 hexagon socket head cap screws (M8 x 20).

3.3.2 Mounting of gauge ASSY (option)

(1) Dismount the nozzle and the contact tip from the torch of the RT series.
For RZW5000 Series, dismount the nozzle, tip holder, collet tip and front tip body from the torch.
For RZ3500 Series and RZ3510 Series, dismount the nozzle and tip holder from the torch.
(2) Mount the tip gauge firmly to the torch.
(3) Dismount the bracket rear cover (L11730B02).
(4) Mount the gauge ASSY (L11730F00) with the two hexagon socket head cap screws (M5×16) that comes with the gauge ASSY.
(5) To set a reference point, prepare a sharp-pointed object fixed to the ground (e.g. tip gauge (L317X00)) (hereinafter referred to as the “reference gauge”).

Note) This gauge is designed to confirm the origin position of the robot. (Unlike the conventional torch gauges, it is not designed to make measurement of positional accuracy of the torch.) For the adjustment procedure, refer to information in Section 3.3.3.

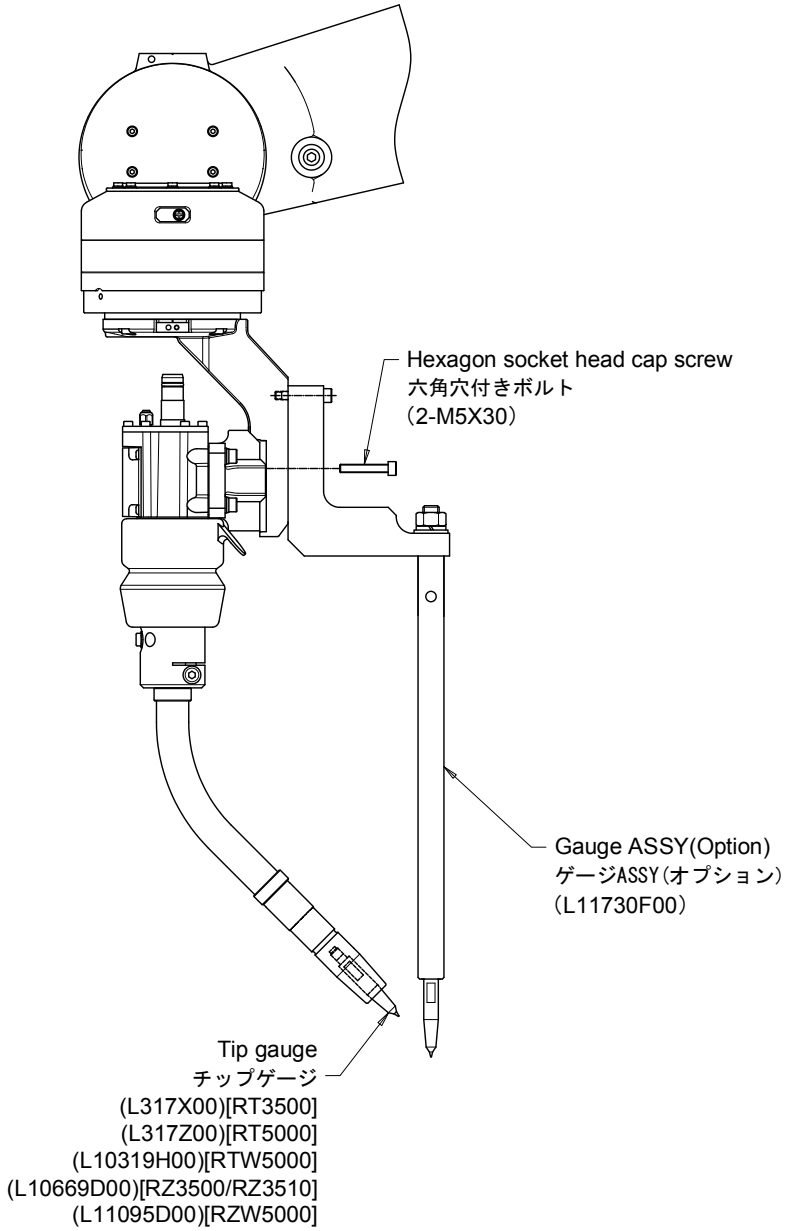


Fig.3.15 Mounting of gauge ASSY

3.3.3 Teaching the reference point using the gauge ASSY (Option)
(Creating the origin position checking program)

(1) Align the point of gauge ASSY with the reference gauge prepared when the gauge ASSY was installed, and teach it as the reference point (1) (point-teaching).
This reference point (1) is used for checking the mechanical deviation of robot.

(2) Align the point of tip gauge secured on the torch tip with the tip of reference gauge, and teach it as the reference point (2) (point-teaching).
This reference point (2) is used for checking the mechanical deviation of torch.

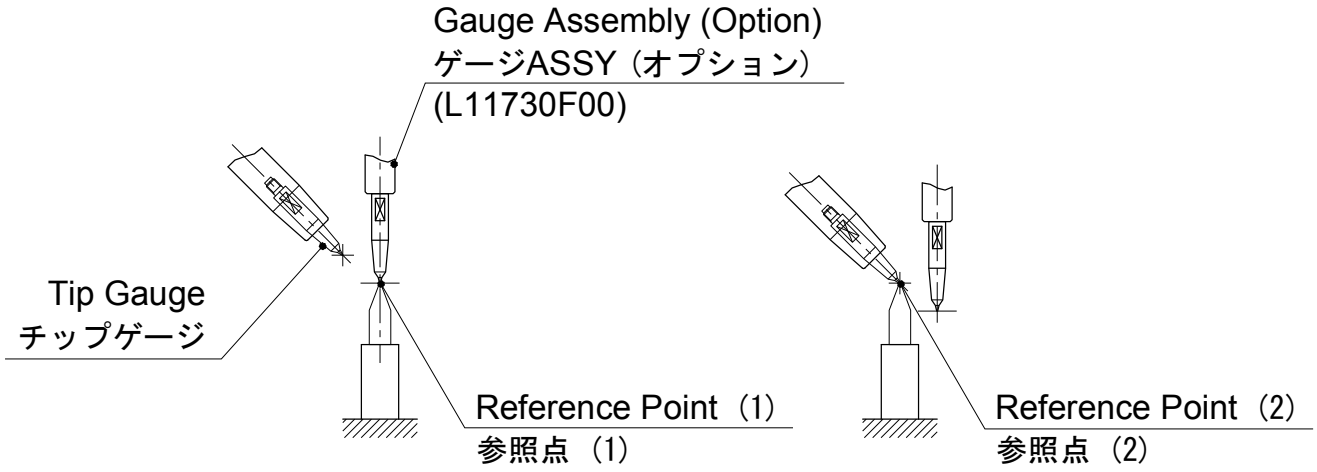


Fig.3.16 Teaching the reference point

3.3.4 Daily check of reference point

In the daily check, see if no deviation has occurred in the reference point (2) taught by the origin-position check program. If any deviation has occurred caused by the torch collision etc., correct it by the prcedure Fig.3.17.

If a deviation has occurred in the reference point (1) taught by the origin-position check program, provided with the gauge ASSY (option), that deviation shall be attributed to the manipulator. Contact our sales department.

If no deviation has occurred in the reference point (1), that deviation shall be attributed to the torch. In this case, correct it by the following procedure.

Note that when checking the reference point (1) first taught, be sure to use the gauge applied in the first. If using a wrong gauge, the precise position accuracy cannot be obtained.

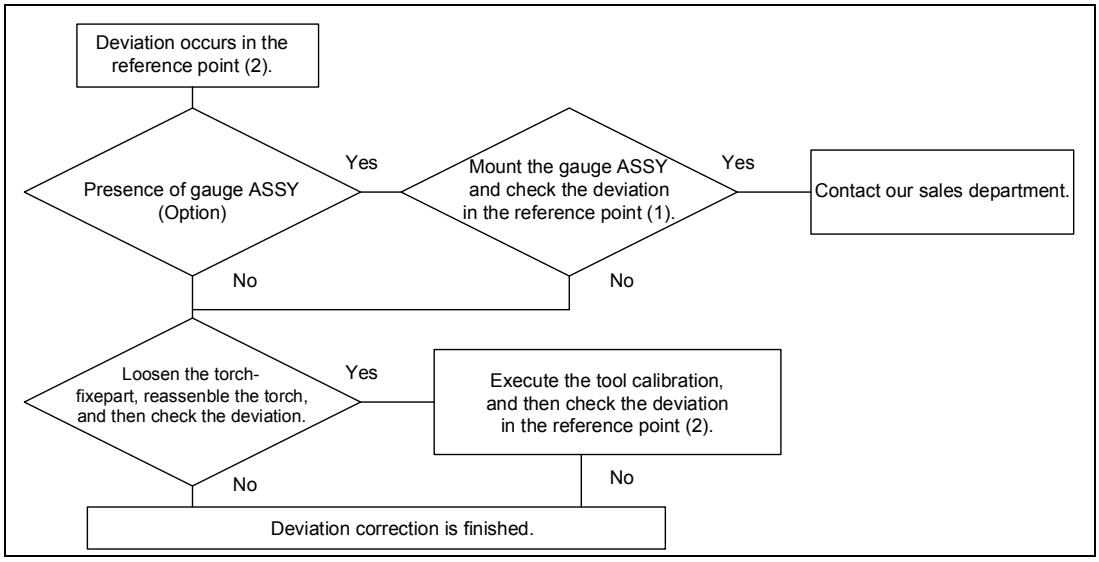


Fig.3.17 Checking procedure when the torch deviated

3.3.5 Adjustment procedure with the tool length automatic setting

(1) Copy the existing origin position check program (Program A for example), and newly create the program B. Running this program B, align the tip of reference gauge and the point of tip gauge fixed on the torch tip by performing the **rectangular manual operation holding the torch posture** from the position of program A to perform teaching (point-teaching).

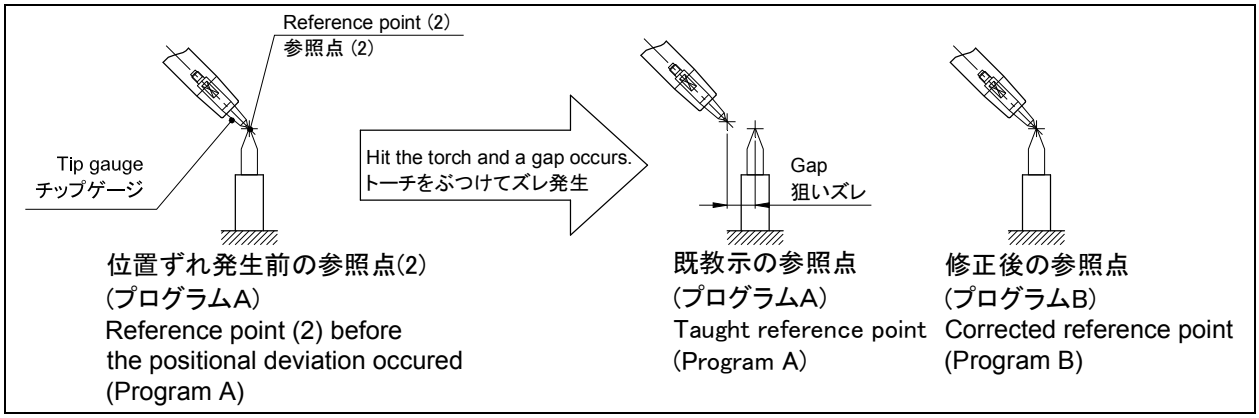


Fig.3.18 Checking the reference point

(2) Perform the 2-point tool length setting. With this setting, the amount of torch (tool) deviation can be automatically reflected to the program. For details of the operation procedure, see the Instruction Manual; section 4.6.2 “Tool length” in INSTALLATION (1L20400A-E-*).
See the Instruction Manual, section 4.5.2 “Tool length” in SETUP (1L21700B-E-*).

(3) As the tool conversion function is automatically executed, follow the instruction and convert the program that you would like to perform the tool conversion. For details of the operation procedure, see the instruction manual; section 4.6.8 “Tool conversion” in INSTALLATION (1L20400A-E-*).
See the Instruction Manual, section 4.5.8 “tool conversion” in SETUP (1L21700B-E-*).

(4) Call the program A and check that the deviation in the reference point (2) has been corrected, having a proper reference point.

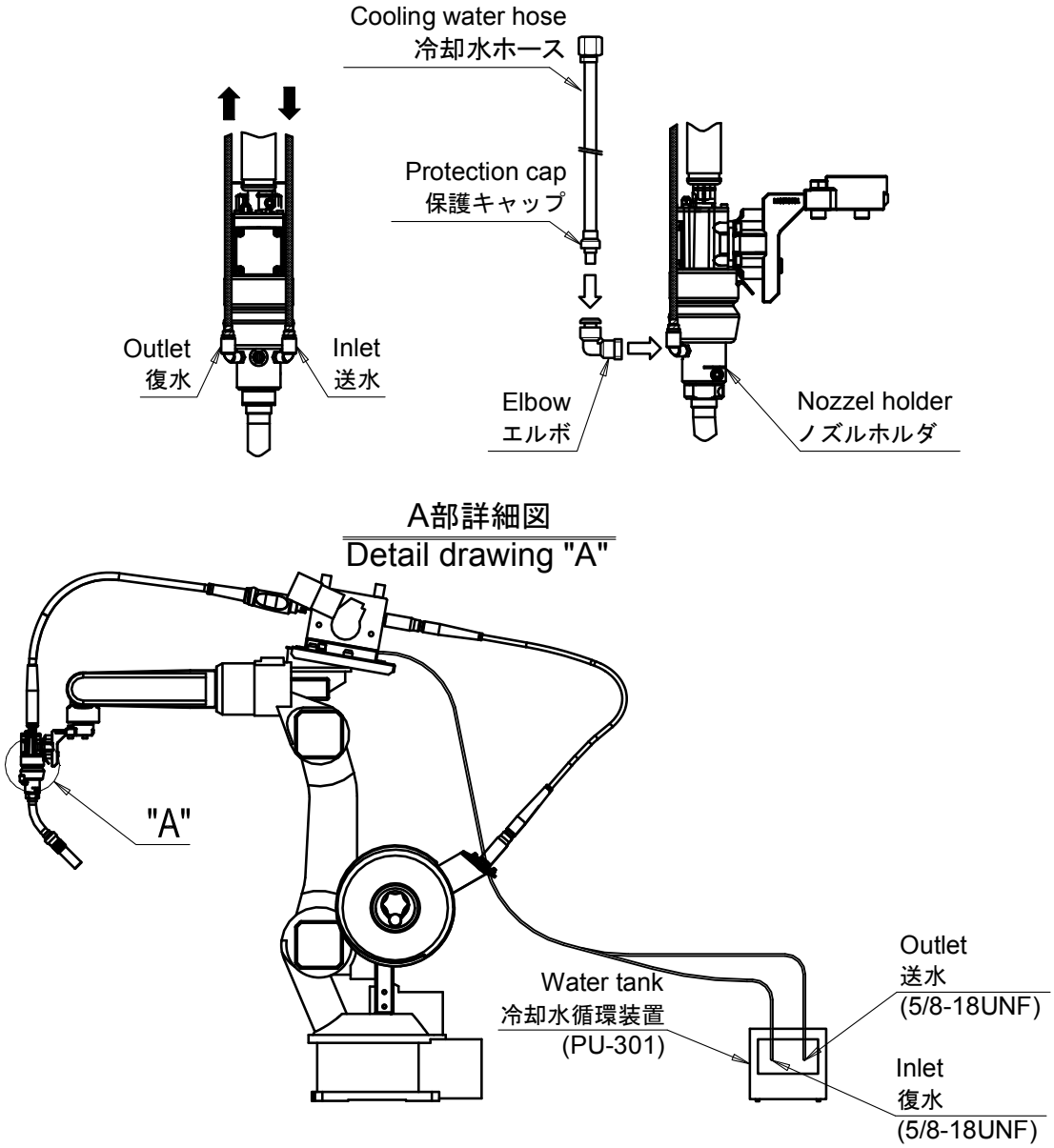
In addition, do not execute the tool conversion function in the program where the reference point (1) has been taught with the optional gauge ASSY provided.
If executing the tool conversion function in all the programs, teach the reference point (1) again.

3.4 Connecting the Liquid-cooled Torch (RTW5000 series, RZW5000 series)

3.4.1 Mounting on V type/ A type manipulator

(1) Remove the taper plugs from the nozzle holder and mount the elbows（WL-06-01）onto it. The elbows are attached components of the liquid-cooled torch.
(2) Connect the cooling water hoses to each of the elbows and fix the protection caps for each.
(3) Run the cooling water hoses along the coaxial power cable to connect them to the water tank (PU-301).
(4) Connect the liquid-cooled torch to the nozzle holder.

Note) Cut the cooling water hose perpendicularly, being careful not to damage the outside surface.
Use special tube cutter when you cut the cooling water hose. Do not cut the cooling water hose with pliers, nippers, scissors, etc., otherwise, the cooling water hose will be deformed and trouble may result.
To mount the cooling water hose, grasp the cooling water hose, slowly push it into the one-touch fitting until it comes to a stop. Pull the cooling water hose back gently to make sure it has a positive seal. Insufficient installation may cause water to leak or the cooling water hose to release.



(Note: Purchase the water tank PU-301 separately.)

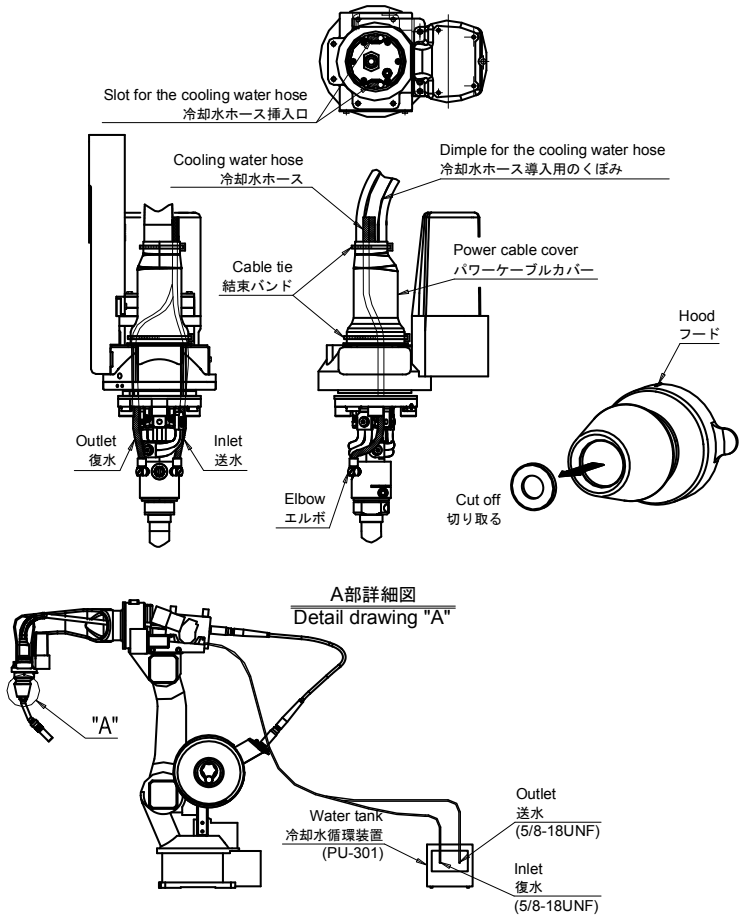
Fig.3.19 Connection procedure of liquid-cooled torch (V type, A type manipulator)

3.4.2 Mounting on B4 type manipulator

The connection of the liquid-cooled torch to the B4 type manipulator requires the hose mounting kit (L7898P00).

(1) Remove the hood from the shock sensor.
(2) Mount the elbows（M-5HL-6-X112）to the nozzle holder. The elbows are attached components of the liquid-cooled torch.
(3) Slide the power cable cover upward along the coaxial power cable.
(4) Insert the cooling water hoses into the power cable cover along the dimple formed on the power cable.
(5) Pass the hoses separately towards the bottom of the shock sensor through the oval openings located on its both sides.
(6) Connect the cooling water hoses to each of the elbows that have been mounted in the procedure (2).
(7) Fix power cable cover with cable ties (Top and bottom).
(8) Cut off the cylindrical dented part from the bottom of the hood and mount the hood onto the shock sensor.
(9) Connect the liquid-cooled torch to the nozzle holder.
(10) Refer to the section 3.5 for the connection of cooling water hose.

Note) Cut the cooling water hose perpendicularly, being careful not to damage the outside surface.
Use special tube cutter when you cut the cooling water hose. Do not cut the cooling water hose with pliers, nippers, scissors, etc., otherwise, the cooling water hose will be deformed and trouble may result.
To mount the cooling water hose, grasp the cooling water hose, slowly push it into the one-touch fitting until it comes to a stop. Pull the cooling water hose back gently to make sure it has a positive seal. Insufficient installation may cause water to leak or the cooling water hose to release.



(Note: Purchase the water tank PU-301 separately.)

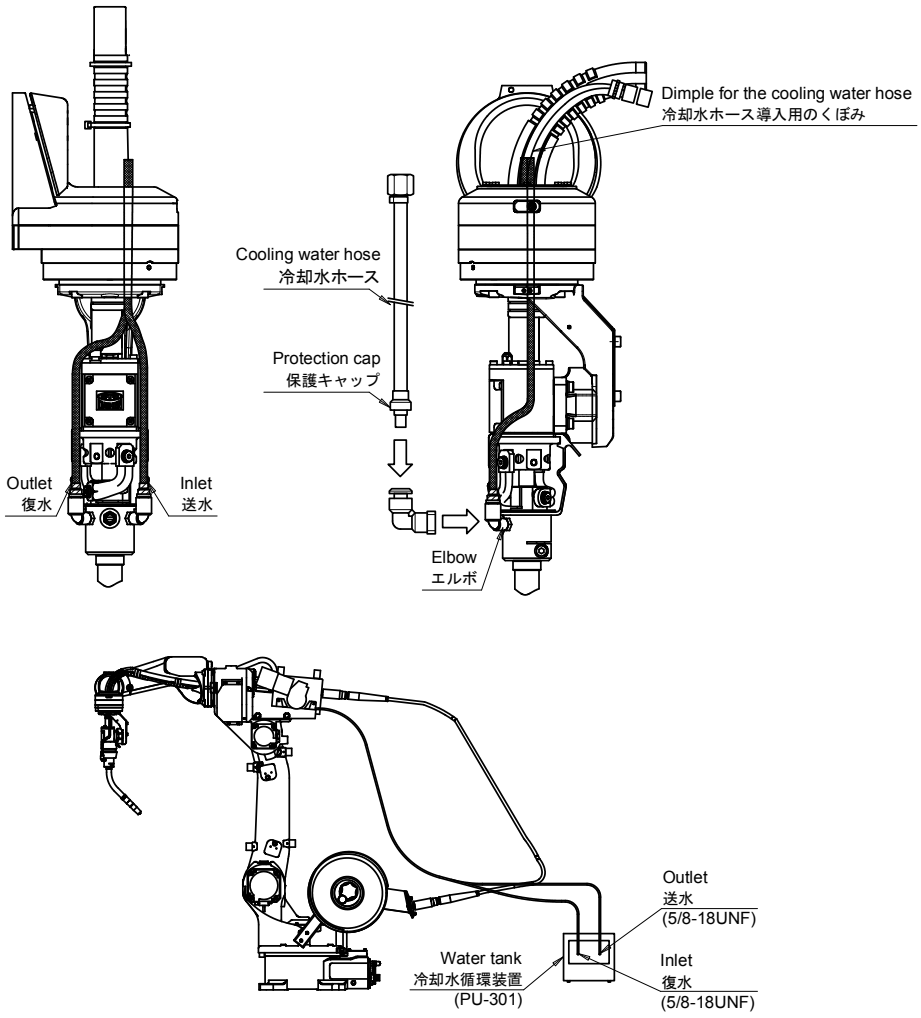
Fig.3.20 Connection procedure of liquid-cooled torch (B4 type manipulator)

3.4.3 Mounting on B6 type manipulator

The connection of the liquid-cooled torch to the B6 type manipulator requires the hose mounting kit (L7898P00).

(1) Remove the taper plugs from the nozzle holder and mount the elbows（WL-06-01）onto it. The elbows are attached components of the liquid-cooled torch.
(2) Connect the cooling water hoses to each of the elbows and fix the protection caps for each.
(3) Run the cooling water hoses along the coaxial power cable to connect them to the water tank (PU-301).
(4) Connect the liquid-cooled torch to the nozzle holder.
(5) Refer to the section 3.5 for the connection of cooling water hose.

Note) Cut the cooling water hose perpendicularly, being careful not to damage the outside surface.
Use special tube cutter when you cut the cooling water hose. Do not cut the cooling water hose with pliers, nippers, scissors, etc., otherwise, the cooling water hose will be deformed and trouble may result.
To mount the cooling water hose, grasp the cooling water hose, slowly push it into the one-touch fitting until it comes to a stop. Pull the cooling water hose back gently to make sure it has a positive seal. Insufficient installation may cause water to leak or the cooling water hose to release.



(Note: Purchase the water tank PU-301 separately.)

Fig.3.21 Connection procedure of liquid-cooled torch (B6 type manipulator)

3.5 Connecting the cooling water Hose

3.5.1 Mounting on B4 type manipulator

(1) Connect the cooling water hose to the torch along with the coaxial power cable.

(2) Bind up the cooling water hose and coaxial power cable with a spiral tube.
Connect spiral tubes to the W/F side as shown with *1 to *3.
[Caution] Slacken off the portions marked with"*"in Fig.3.22.

(3) Adjust the slack in the cooling water hose.
(1) Make the robot posture upright and horizontal.
(2) Rotate the 6th axis to in the maximum (soft limit), and check that no stress is applied to the cooling water hose. [Both +/- side]
(3) Rotate the 6th axis to in the maximum (soft limit) in either + or – side, and 4th axis in the other side of the 6th axis to the maximum (soft limit), and then check that no stress is applied the cooling water hose.
(4) Rotate both the 4th and 6th axis to the maximum (soft limit) respectively in the other side of the above operation (3), and check that no stress is applied to the cooling water hose.

(4) Check the slack of cooling water hose, and secure the spiral tube at its end with a cable tie.

(5) Bind the cooling water hose and coaxial power cable on the W/F side with a cable tie.

(6) Use cable ties that come with the shock sensor to fix the top end of the power cable cover together with the coaxial power cable, shock sensor cable and cooling water hose.

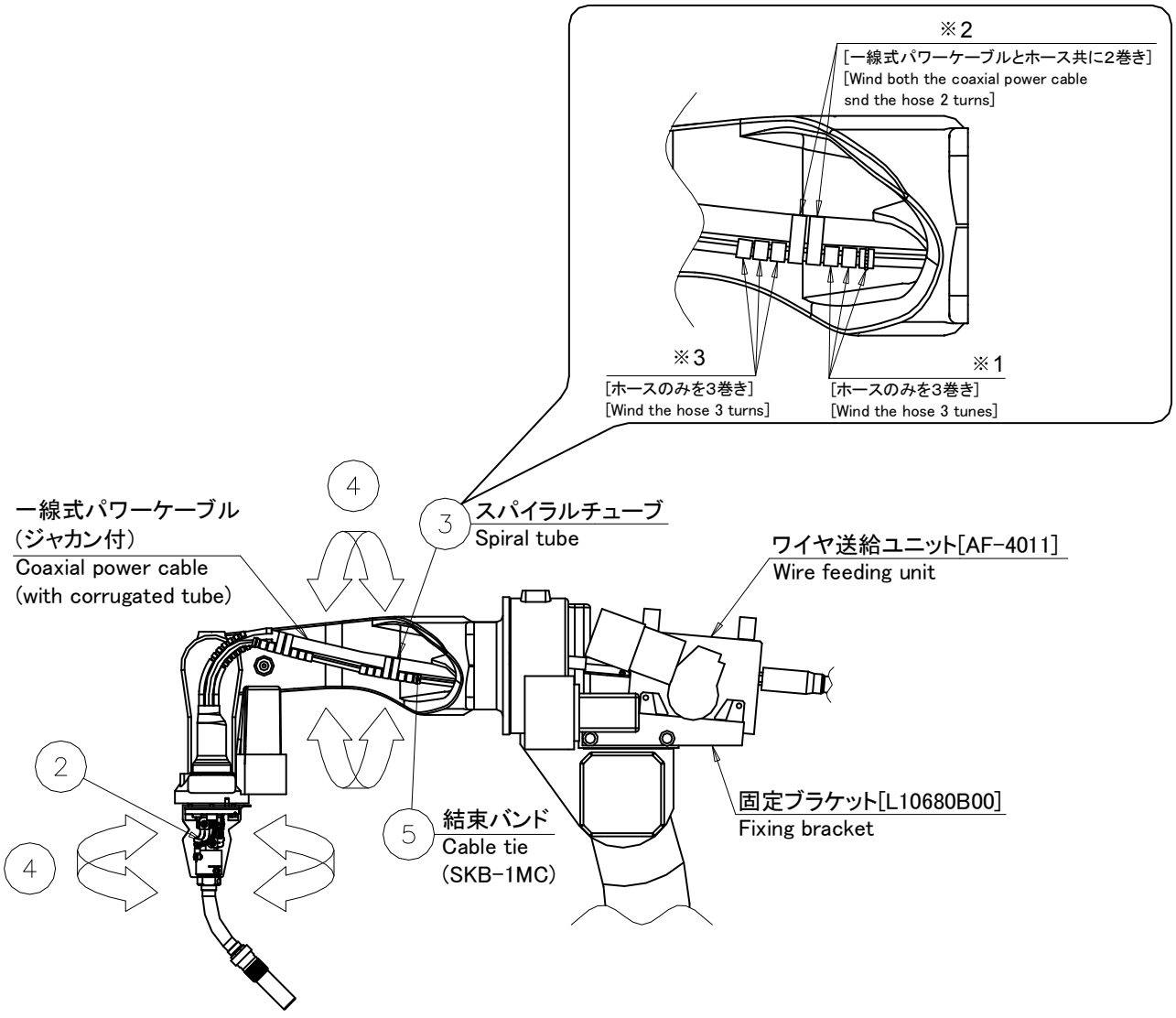


Fig.3.22 Connection of cooling water hose (For B4 type manipulator)

3.5.2 Mounting on B6 type manipulator

(1) Connect the cooling water hose to the torch along with the coaxial power cable.

(2) Bind up the cooling water hose and coaxial power cable with a spiral tube.
Connect spiral tubes to the W/F side as shown with *1 to *3.
[Caution] Slacken off the portions marked with"*"in Fig.3.23.

(3) Adjust the slack in the cooling water hose.
(1) Make the robot posture upright and horizontal.
(2) Rotate the 6th axis to in the maximum (soft limit), and check that no stress is applied to the cooling water hose. [Both +/- side]
(3) Rotate the 6th axis to in the maximum (soft limit) in either + or – side, and 4th axis in the other side of the 6th axis to the maximum (soft limit), and then check that no stress is applied the cooling water hose.
(4) Rotate both the 4th and 6th axis to the maximum (soft limit) respectively in the other side of the above operation (3), and check that no stress is applied to the cooling water hose.

(4) Check the slack of cooling water hose, and secure the spiral tube at its end with a cable tie.

(5) Bind the cooling water hose and coaxial power cable on the W/F side with a cable tie.

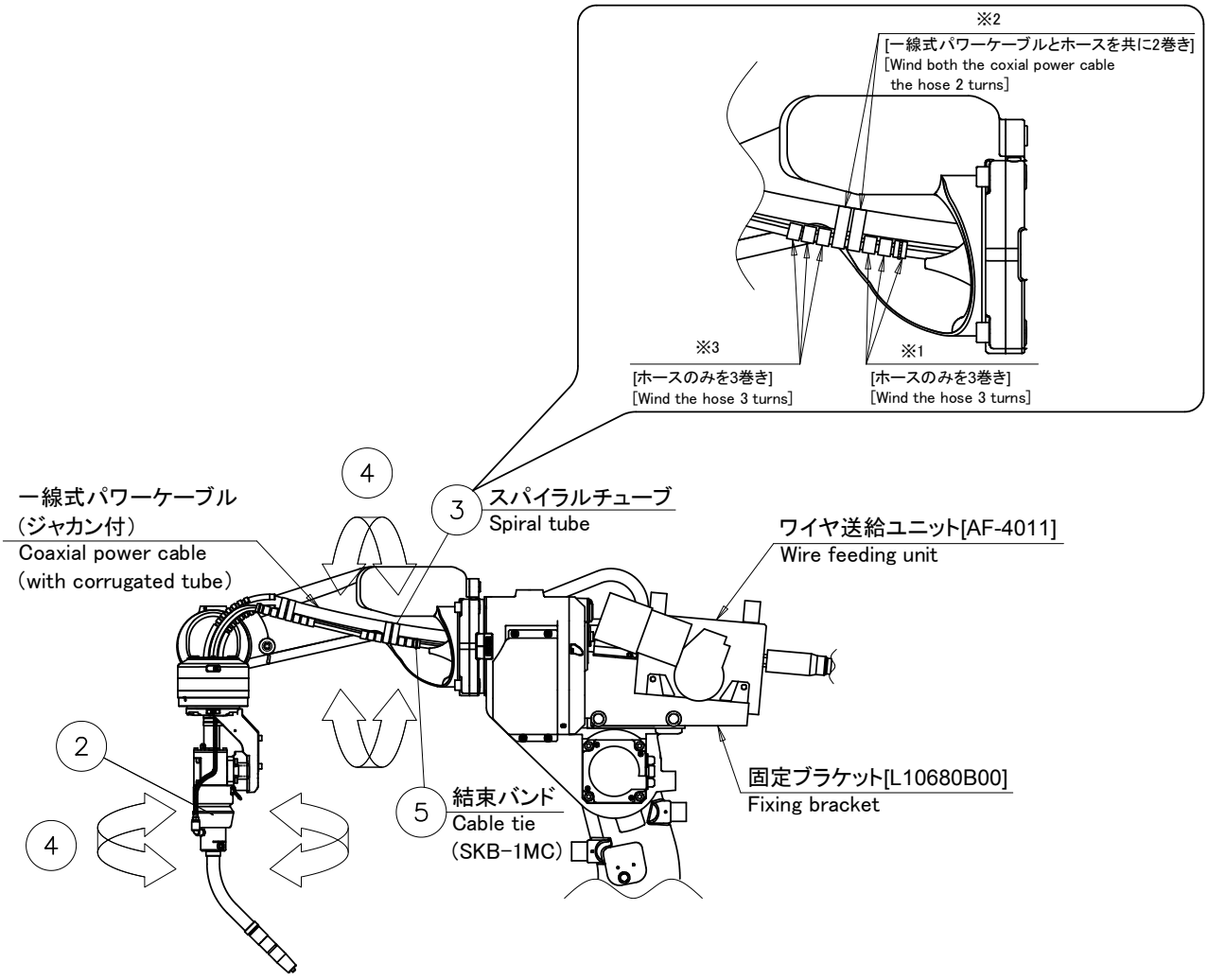


Fig.3.23 Connection of cooling water hose (For B6 type manipulator)

3.6 Handling Instructions for RT series Torch

(1) Be sure to install an orifice. Installation of the orifice is essential, which prevents the short circuit likely to happen between the nozzle and torch body, and also avoids turbulence of the shield gas.

(2) Remove the spatter adhered to the nozzle and contact tip before it gets deposited.

(3) Be sure to use the DAIHEN genuine tip. Use of a worn-out tip with an enlarged diameter causes conduction defect and wire deflection, which results in unstable Arc and aiming deviation. Therefore, replace the tip accordingly before it gets used up.

(4) Gas flow shall be 15 *l* /min or more.

(5) Clean up the inside of liner (included in the coaxial power cable) and of outlet guide with compressed air or others once in 10 days. Otherwise, deposit of sludge and dust will cause defective wire feeding, which leads to poor welding performance.

(6) When the wire is stuck at the tip end, the wire will buckle in the liner or be cut in the feed roll. If keeping wire feed performance under such a condition, feeding failure or Arc shortage may occur. To prevent this, remove the wire between the feed roll and tip end first, and then insert a new wire.

(7) For the teaching program that lets the torch evacuated from the workpiece after welding performance, teach it to pull up the torch obliquely upward so that the shock sensor can work even if the wire sticks on the workpiece.

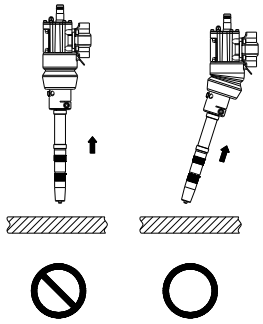


Fig.3.24 Evacuating direction

(8) The shock sensor is the mechanism to protect the torch and manipulator in the case of collision between the torch and workpiece, but does not guarantee the accuracy of the torch tip teaching point (torch aiming point) afterward. After the shock sensor has worked, check the aiming point of torch again with the torch gauge.

In addition, when the torch is returned slowly to release the operation of shock sensor, target point tends to shift. In such a case, move the shock sensor quickly again and the target point returns to the original target point. The shock sensor absorbs the shock caused by the torch colliding at less than a speed of manual operation mode. When the torch collides at a speed of automatic operation mode (at higher than a speed of manual operation mode), the torch may be damaged.

(9) When the screws (M5×20) fixing the torch are loose, the torch tip postion will be off. Tighten the screws using the proper torque value. (See the pages 17, 18, 26 and 31.)

(10) When replacing the O-ring of liquid-cooled torch, take enough care not to hurt the O-ring inside the insulating bush by the screw part of tip body. (Refer to Fig.3.25)

(When mount the insulating bush, use the applicator (Refer to Fig.3.25). The applicator is attached component of liquid-cooled torch.)

Blemish made in the O-ring will cause water leaks.

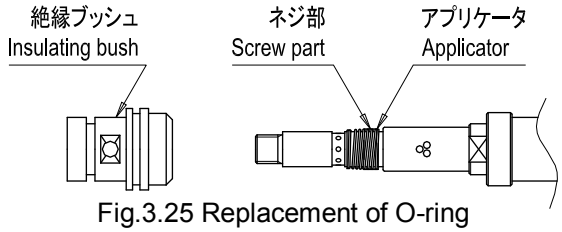


Fig.3.25 Replacement of O-ring

3.7 Handling Instructions for RZ series Torch (TCC torch)

(1) Remove the spatter adhered to the nozzle and tip holder before it gets deposited.

(2) For the collet tip and tip holder, be sure to use the DAIHEN genuine parts.
Using a collet tip or tip holder with enlarged hole-diameter will cause faulty power supply or swaying weld wire, thus resulting unstable arcs or a deviation from the aiming point. To avoid that, replace the tip or tip holder where appropriate.

(3) Gas flow shall be 15 *l*/min or more.

(4) Accumulation of wire chips or dust in the liner (Located in the coaxial power cable), outlet guide, or stop guide will cause faulty power supply to the weld wire, thus having adverse influence on welding. To avoid that, clean such parts at regular intervals with compressed air.

(5) When the wire is stuck at the tip holder first, the wire will buckle in the liner or be cut in the feed roll. If keeping wire feed performance under such a condition, feeding failure or Arc shortage may occur. To prevent this, remove the wire between the feed roll and tip holder first, and then insert a new wire.

(6) To lead the weld wire, unfasten the tip holder or the front tip body. Not doing so may cause the wire to buckle. After the completion of leading the wire, fasten.

(7) Cut the liner to the specified length (refer to information in 4.4 Cutting the Liner), and then fix it with liner clamp in order to prevent the liner from moving when assembling (refer to information in 4.5 Liner Clamp Function).
Furthermore, since too long liner will disable normal pressurization of the torch, check for the liner length according to the procedure described below. Dismount the tip holder or the front tip body, and then press the collet tip with fingers. If the collet tip smoothly travels approximately by 2 mm, then liner is in its normal position. If the collet tip does not smoothly travel or gets stuck to be hard to move, the liner is too long. In this case, cut the liner to the specified length. In addition, note that too short liner may buckle in the torch.

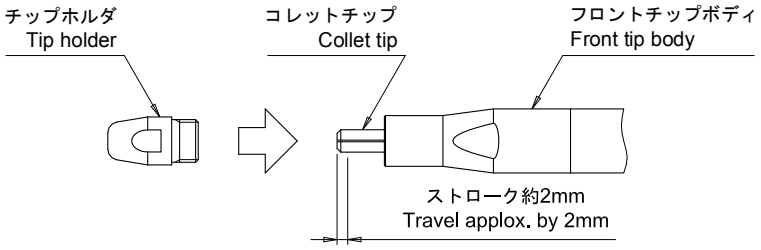


Fig.3.26 Checking the liner

It is convenient to use the liner gauge when the liner is cut.

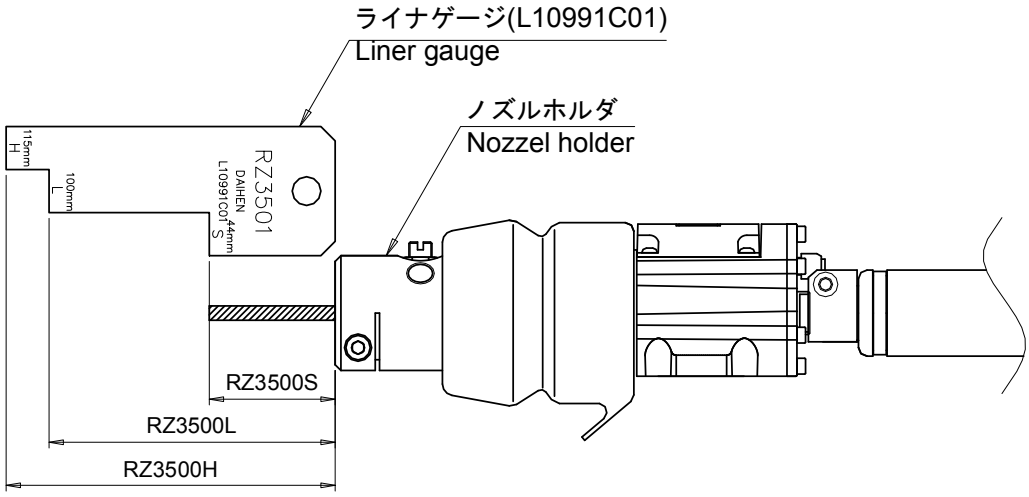


Fig.3.27 Use of liner gauge (case of RZ3500)

(8) To teach a program with the torch evacuated from the weld wire after the completion of welding, pull the torch obliquely upward so that the shock sensor will be activated even if the wire and base metal are deposited together.

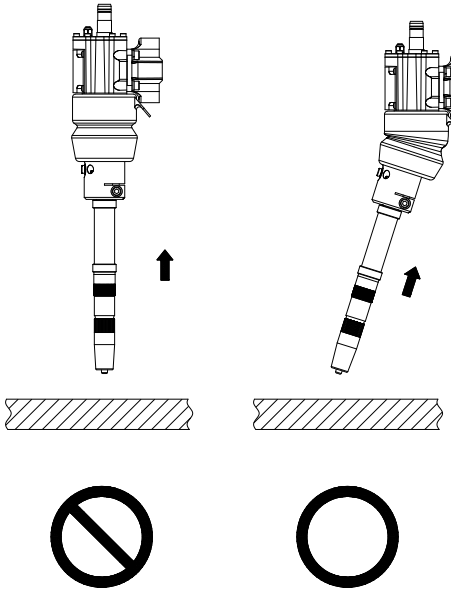


Fig.3.28 Evacuating direction

(9) The shock sensor may cause a slight deviation from the teaching point at the torch tip (i.e., torch aiming point). (If the shock sensor gets activated, recheck for the torch aiming point with the torch gauge.)
In addition, when the torch is returned slowly to release the operation of shock sensor, target point tends to shift. In such a case, move the shock sensor quickly again and the target point returns to the original target point.
The shock sensor absorbs the shock caused by the torch colliding at less than a speed of manual operation mode.
When the torch collides at a speed of automatic operation mode (at higher than a speed of manual operation mode), the torch may be damaged.

(10) On the RZ Series torches (TCC torch), the power supply points are located inside the tip holder. Consequently, note that, the power supply points become farther from the torch in comparison to conventional torch, thus resulting in lower welding current (in case of constant-voltage control) to cause changes in welding conditions.

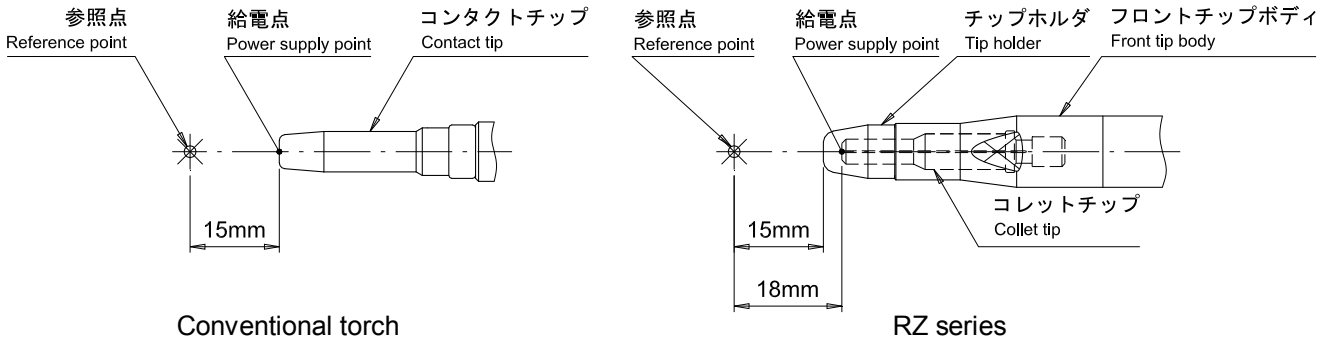


Fig.3.29 Power supply points

〈For reference〉

The RZ Series torches (TCC torch) increase resistance heat generation due to farther power supply points, and thereby can melt more weld wire, thus making it possible to provide proper arc length (arc weld voltage) at low currents.

(11)There is a possibility that the wire comes in contact with the tip holder when the reel wire is used when the wire bending is large. Use of the TCC torch, wire straightener (L7812D00) is recommended to stabilize feeding power.
See the following Table 3.5 and Fig. 3.23 to set the appropriate pressure value.

Table 3.5 Rough pressure standard for wire straightener

Wire diameter	Solid wire
φ1.6	2 to 3
φ1.4	3 to 4
φ1.2	
φ1.0	4 to 5
φ0.9	
φ0.8	

[Note] The values in the table above are just rough standards. They may differ depending on the welding conditions and the wire type.

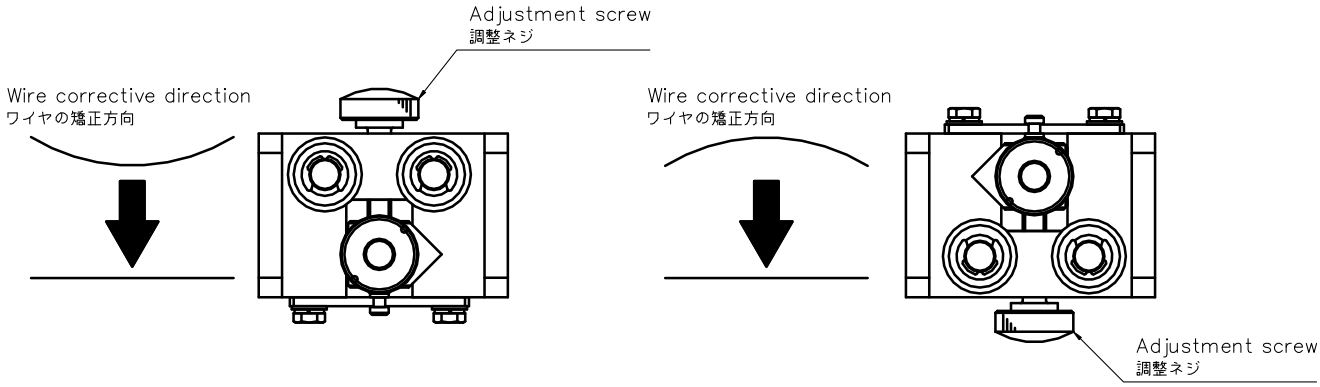


Fig. 3.30 Pressure adjustment for wire straightener

[Note] As shown in the above figure, mount the wire straightener in the opposite direction according to the direction of a bend of wire.

(12)Precautions for replacement of rear tip body, pressurizing shaft, and coil spring to replace the rear tip body, pressurizing shaft, and coil spring, do not dismount these parts with the rear tip body pointing downward. Doing so may cause the coil spring to come off and be missing.

(13)When the screws (M5×20) fixing the torch are loose, the torch tip postion will be off. Tighten the screws using the proper torque value. (See the pages 17, 18, 26 and 31.)

(14)When replacing the O-ring of liquid-cooled torch, take enough care not to hurt the O-ring inside the insulating bush by the screw part of tip body. Blemish made in the O-ring will cause water leaks.

(15)Please clean regularly (*) in the RZ Series torches (TCC torch), and remove the wire powder blocked in the collet tip and the spatter that accumulates in the tip holder and the insulating bushing. There is a possibility that the power feeding becomes unstable for the wire powder blocked in the collet tip and the spatter that accumulates in the tip holder and the insulating bushing when welding long time without cleaning. A regular cleaning can be done by using the air-blow function.

(*) Please clean once a day as a standard. Please raise a frequency of the cleaning according to the state of the spatter accumulation and the wire powder.

4. Coaxial Power Cable for Robot

4.1 Type of Coaxial Power Cables

The coaxial power cable is to lead the wire and shield gas from the wire feeding unit, shock sensor cable, and voltage detection cable (when using DL power supply, M350L or P500L) to the torch. Refer to the table below to choose the coaxial power cable according to the manipulator that you use.

Table 4.1 Type of coaxial power cables

Type	Nominal cable length	Applicable manipulator	Remarks
L-10621	1.1 m	NV6,NV6S,NV8,NV20,NV20A,NV20S,NV25,NA20	●
L-10622	1.2 m	-	△
L-10623	1.3 m	NV6,NV6S,NV8,NV20,NV20A,NV20S,NV25,NA20 (For 31° torch)	●
L-10624	1.4 m	NV6L, NV6LS,NV8L	●
L-10625	1.5 m	-	△
L-10626	1.6 m	NV6L, NV6LS,NV8L (For 31° torch)	△
L-10627	1.7 m	-	△
L-10628	1.8 m	-	△
L-10629	1.9 m	-	△
L-10630	2.0 m	-	△
L-10631	2.1 m	-	△
L-10635	2.5 m	NH5	△
L-10638	0.8 m	NB4,NB4S	●
L-10641	1.2 m	NB4L,NB4LS	●
L-10648	0.8 m	NB4,NB4S (with voltage detection cable)	●
L-10651	1.2 m	NB4L,NB4LS (with voltage detection cable)	●
L-11709	0.9 m	NB6	●
L-11845	1.3m	NB6L	●
L-11713	0.9 m	NB6 (with voltage detection cable)	●
L-11846	1.3m	NB6L (with voltage detection cable)	●

●:Standard, △:Build-to-order

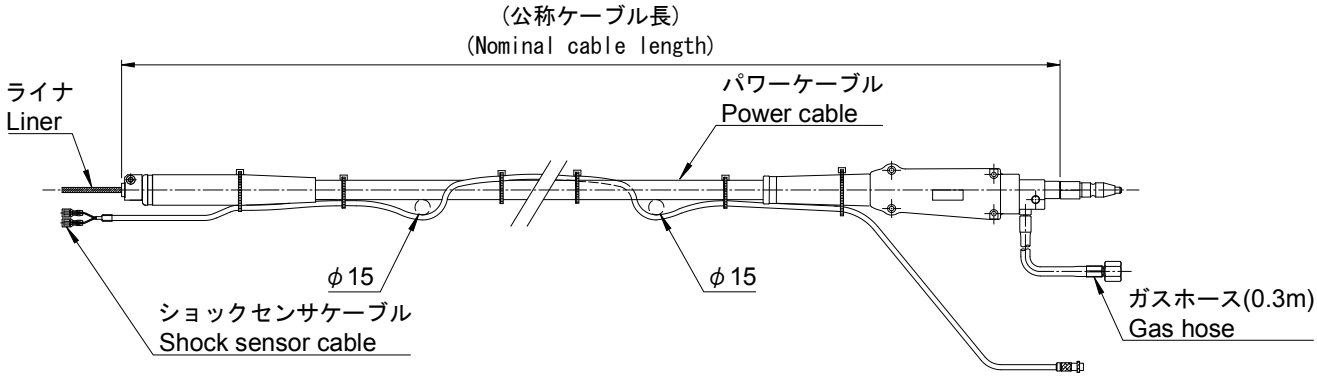


Fig.4.1 Outline drawing of the coaxial power cable
(For NV6／NV6S／NV8／NV20／NV20A／NV20S／NV25／NV6L／NV6LS／NV8L／NH5／NA20 manipulator)

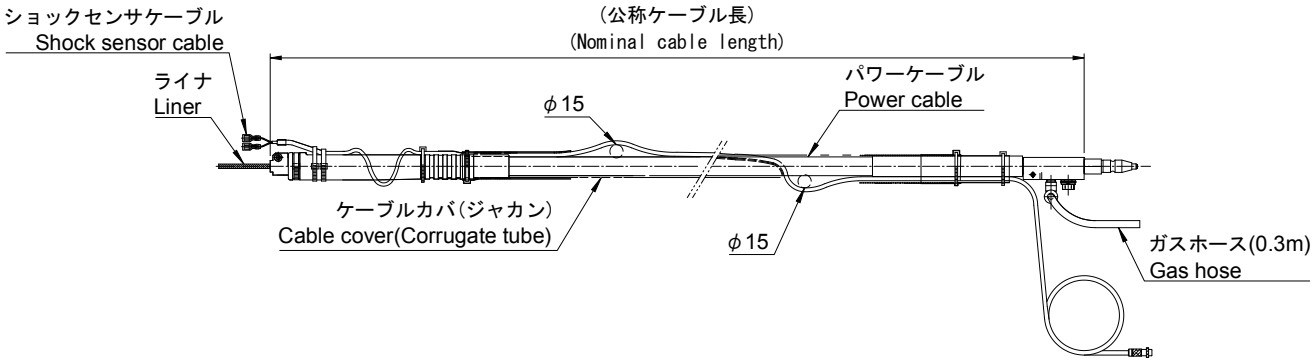


Fig.4.2 Outline drawing of the coaxial power cable
(For NB4／NB4S／NB4L／NB4LS manipulator)

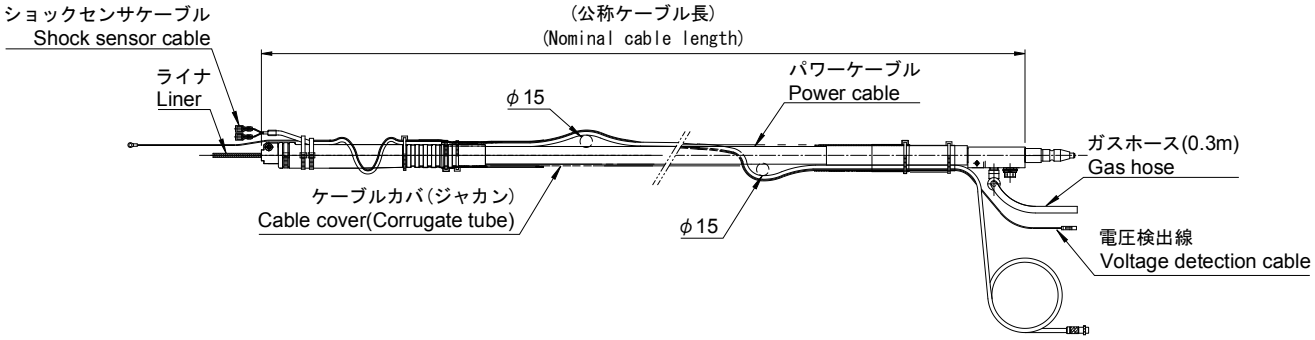


Fig.4.3 Outline drawing of the coaxial power cable
(For NB4／NB4S／NB4L／NB4LS manipulator (with voltage detection cable)

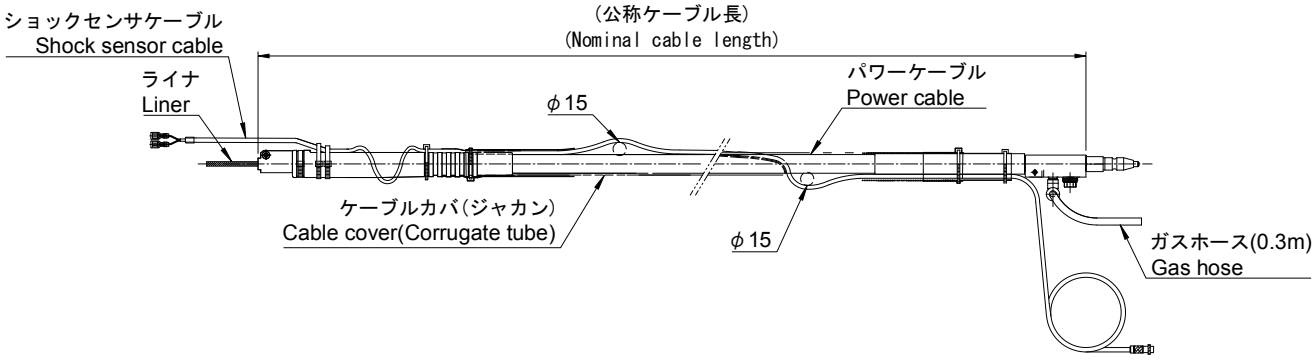


Fig.4.4 Outline drawing of the coaxial power cable (For NB6 / NB6L manipulator)

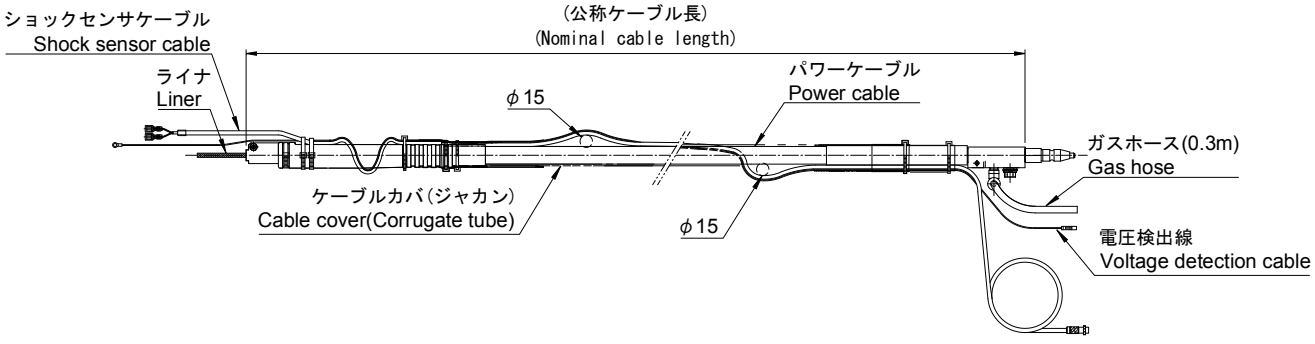


Fig.4.5 Outline drawing of the coaxial power cable
(For NB6 / NB6L manipulator (with voltage detection cable))

4.2 When using DL power supply, M350L or P500L

When using a DL power supply, M350L or P500L on any manipulator other than B type, a voltage detection cable is required in addition to the coaxial power cable described in Table 4.1.

If you use B type manipulator, see Table 4.1 and choose a suitable coaxial power cable (with voltage detection cable) accordingly.

4.2.1 Type of voltage detection cables

To use the DL welding power supply with the manipulator other than B type manipulator, refer to the table below and separately purchase the DL-dedicated voltage detection cable suitable for each manipulator.

Table 4.2 Type of DL W.P.S-dedicated voltage detection cable

No.	Nominal cable length	Applicable coaxial power cable	Applicable manipulator	Remarks
L10667G	1.6 m	L-10621	NV6,NV6S,NV8,NV20,NV20A,NV20S,NV25,NA20	-
L10667H	1.7 m	L-10622	-	-
L10667J	1.8 m	L-10623	NV6,NV6S,NV8,NV20,NV20A,NV20S, NV25,NA20(For 31° torch)	-
L10667K	1.9 m	L-10624	NV6L, NV6LS,NV8L	-
L10667L	2.0 m	L-10625	-	-
L10667M	2.1 m	L-10626	NV6L, NV6LS,NV8L(For 31° torch)	-
L10667P	2.3 m	L-10628	-	-
L10667S	2.6 m	L-10631	-	-
L10667W	3.0 m	L-10635	NH5	-

Note) Contact us for more of the voltage detection cables not listed in the above.

4.2.2 Assembling the voltage detection cable

A voltage detection cable shall be connected with the coaxial power cable laid along the shock sensor cable. Turn the shock sensor cable and voltage detection cable around the coaxial power cable, and then fix the cables with a cable tie, referring to Table 4.3 and Fig.4.6.

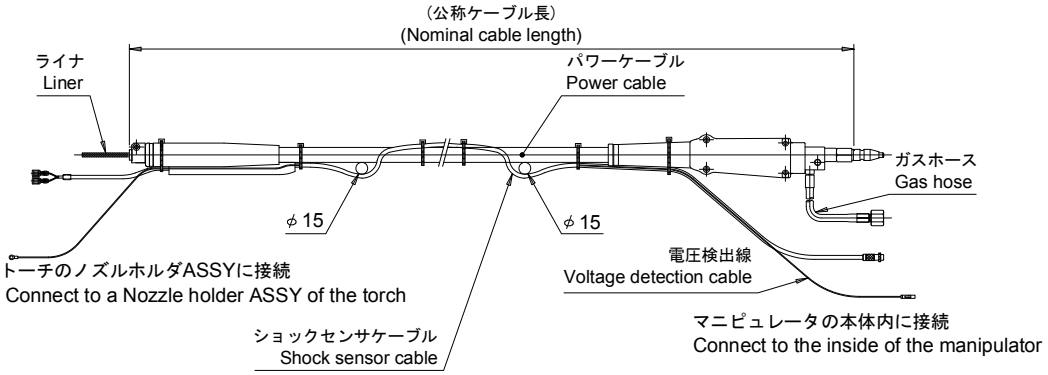


Fig. 4.6 Connection of voltage detection cable (DL power supply, M350L or P500L)

Table 4.3 Turns of shock sensor cable/voltage detection cable

Coaxial power cable	Turns and slack of φ15	Cable length
L-10621	2 turns	1.1m
L-10622	3 turns	1.2m
L-10624	4 turns	1.4m
L-10625	4 turns	1.5m
L-10628	5 turns	1.8m
L-10631	6 turns	2.1m
L-10635	8 turns	2.5m

IMPORTANT

When connecting the shock sensor cable and voltage detection cable to the coaxial power cable, be sure to follow the specified turns (See Table 4.3) and slack of φ15 (See Fig.4.6). Shortage of the turns or insufficient slack may lead to the snapping of shock sensor cable and voltage detection cable, resulting in poor welding performance.

4.2.3 Connecting the voltage detection cable to the shock sensor

Connect a voltage detection wire to the shock sensor as shown in the figure below. To connect a voltage detection wire to SSB, bundle the excess portion of the voltage detection wire together with the shock sensor cable, and then put it in the power cable cover. After that, fix the cover with cable ties.

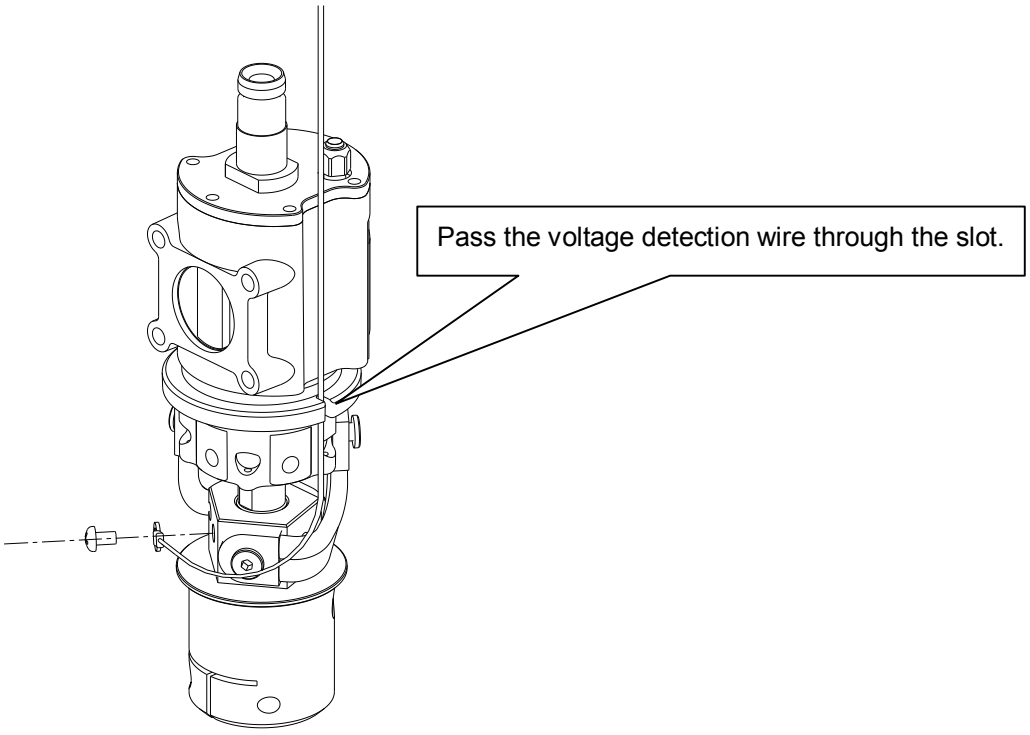


Fig.4.7 Connection the voltage detection cable to the SSV

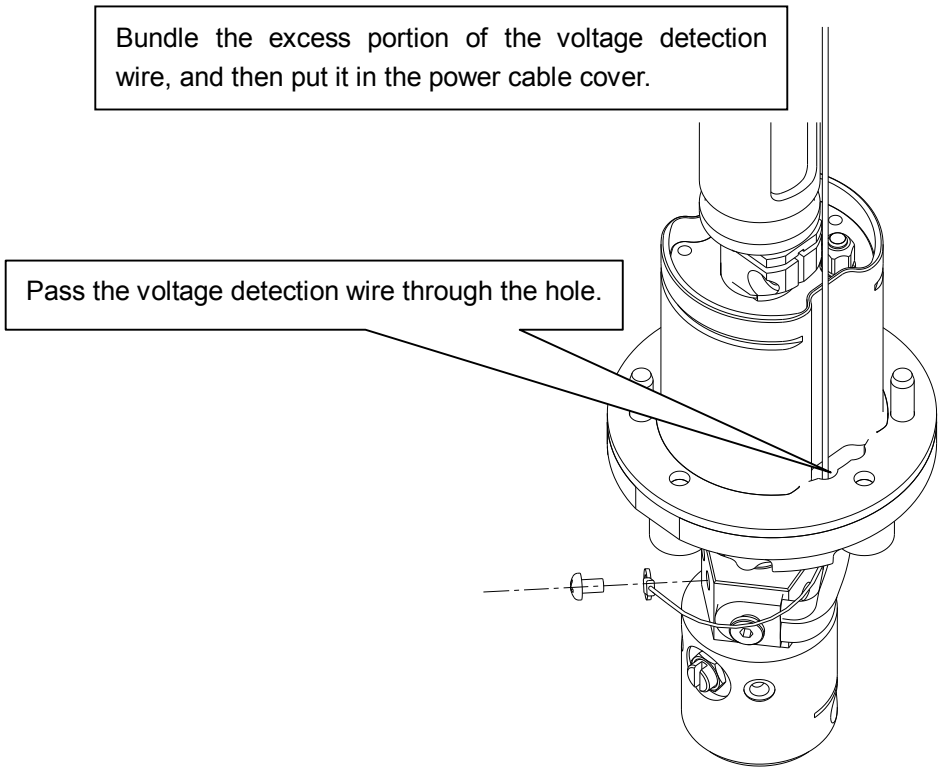


Fig.4.8 Connection the voltage detection cable to the SSB

4.2.4 Replacement procedure the shock sensor cable and the voltage detection cable for B type manipulator

When replacing the shock sensor cable and the voltage detection cable using coaxial power cable for B type manipulator, proceed as follows.

4.2.4.1 Detaching procedure

(1) Cut and remove the shrinking tube which fixes the cable cover.
At this time, take care not to damage cables, etc. below.

(2) Cut the cable tie fixing the cable cover and pull out the cable cover.
At this time, remove the connection assembly on the feeder side and pull out the connection assembly.

(3) Cut the cable tie fixing the shock sensor cable and voltage detecting line and remove them.

4.2.4.2 Installation procedure

(1) Assembling the voltage detection cable and assemble the voltage detection cable to the coaxial power cable body.
In this case, refer to the Table 4.4 and Fig. 4.9, wrap the shock sensor cable and voltage detection cable around the coaxial power cable and fix the cable with the cable tie.

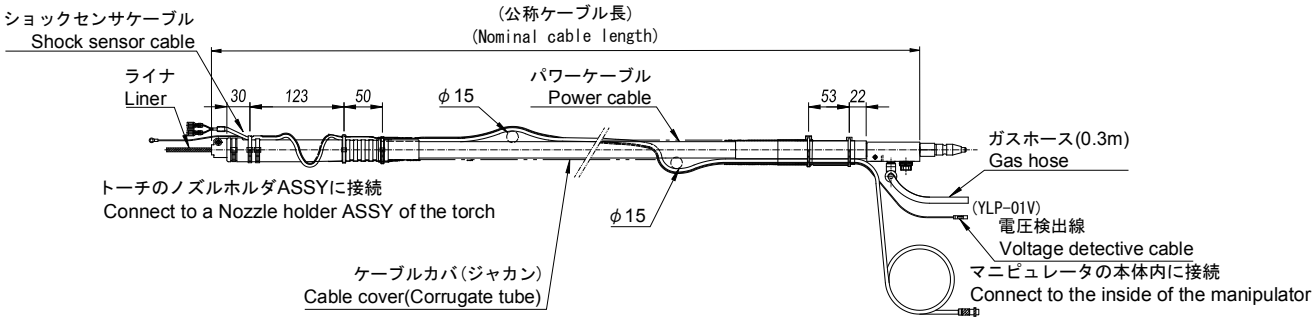


Fig 4.9 Installation procedure (1)

Table4.4 Turns of shock sensor cable/voltage detection cable

Coaxial power cable	Turns and slack of φ15	Cable length
L-10638	1.5 turns	0.8m
L-10641	2.5 turns	1.2m
L-10648	1.5 turns	0.8m
L-10651	2.5 turns	1.2m
L-11709	1.5 turns	0.9m
L-11845	2.5 turns	1.3m
L-11713	1.5 turns	0.9m
L-11846	2.5 turns	1.3m

IMPORTANT

When connecting the shock sensor cable and voltage detection cable to the coaxial power cable, be sure to follow the specified turns (See Table 4.4) and slack of φ15 (See Fig.4.9). Shortage of the turns or insufficient slack may lead to the snapping of shock sensor cable and voltage detection cable, resulting in poor welding performance.

(2) As shown in Fig. 4.10, pass the cable over the coaxial power cable and fix it with the cable tie.
At this time, set the shock sensor side to the groove of the rubber sleeve and fix with the cable tie.
Set the feeder side to the position approximately 75mm from the end and fix with the cable tie.
In addition, refer to Fig. 4.11 and securely fix the cable cover with the cable tie.
Insert the cable cover and install the connection ASSY.

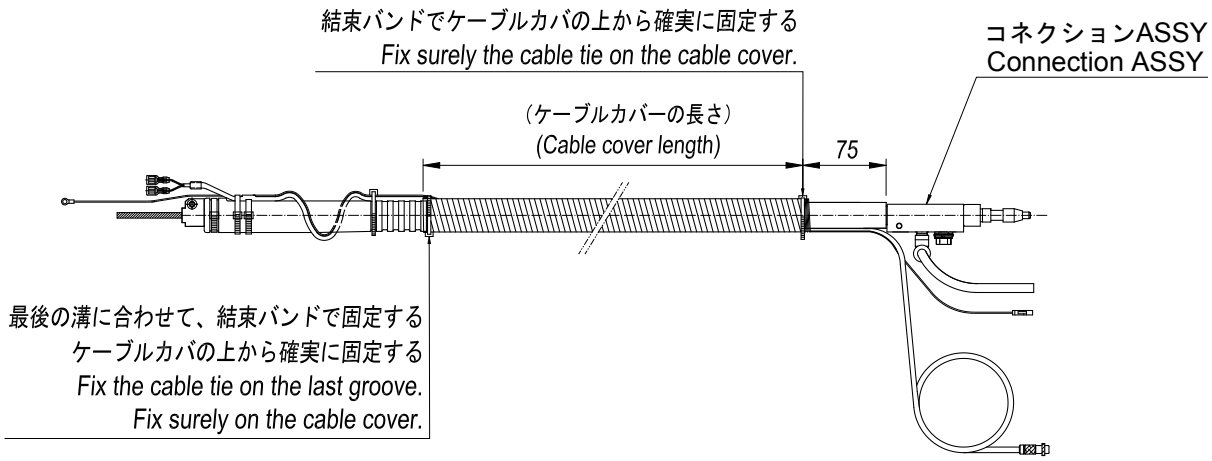


Fig 4.10 Installation procedure (2)

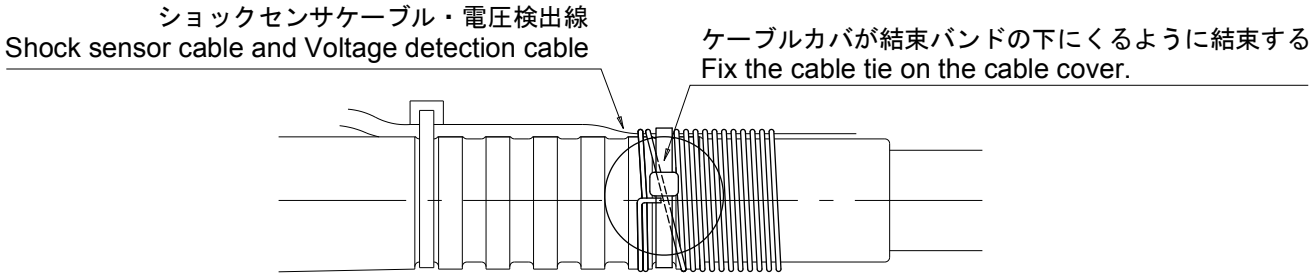


Fig 4.11 Detail of cable cover fixation part

(3) Install the shrinking tube at the position shown in the shaded area of Fig. 4.12 and fix with the cable tie.
Be sure to shrink the shrinking tube properly to eliminate any clearance gap.

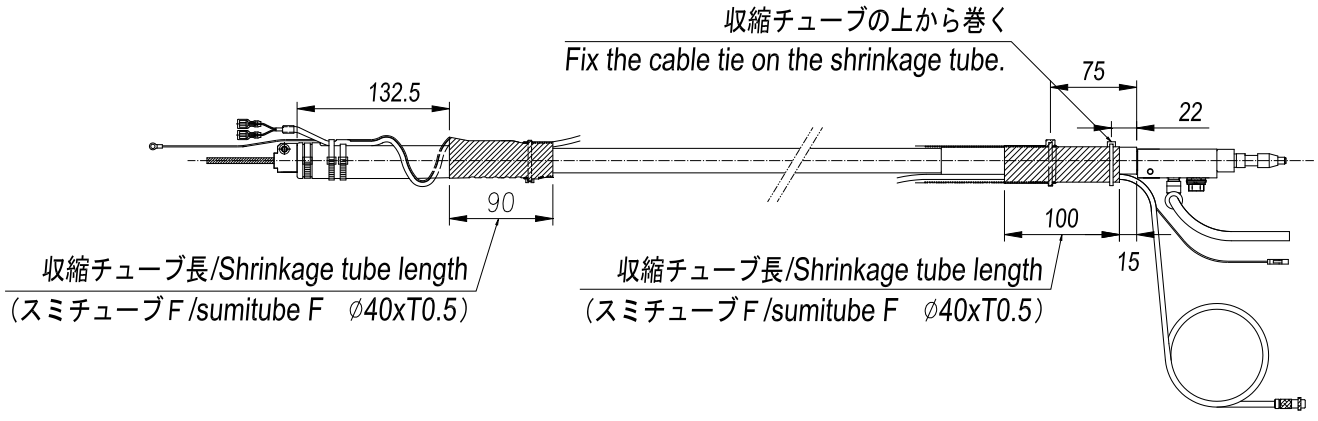


Fig 4.12 Installation procedure (3)

4.3 Connection of Coaxial Power Cable

4.3.1 V type, A type manipulator

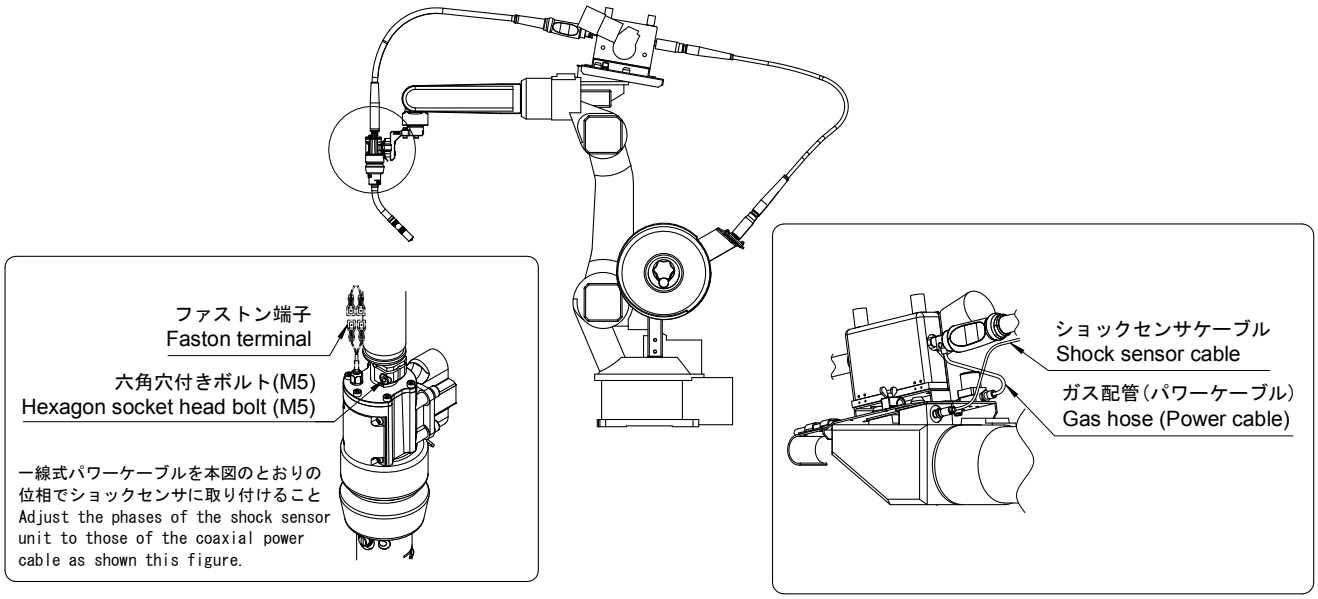


Fig.4.13 Connection of the coaxial power cable (V type, A type manipulator)

Protect the FASTON terminal of the shock sensor cable with the silicon tube that comes with the coaxial power cable, and then secure it to the coaxial power cable with the cable tie.
Adjust the phases of the shock sensor unit to those of the coaxial power cable as shown Fig. 4.13.

4.3.2 B4 type manipulator

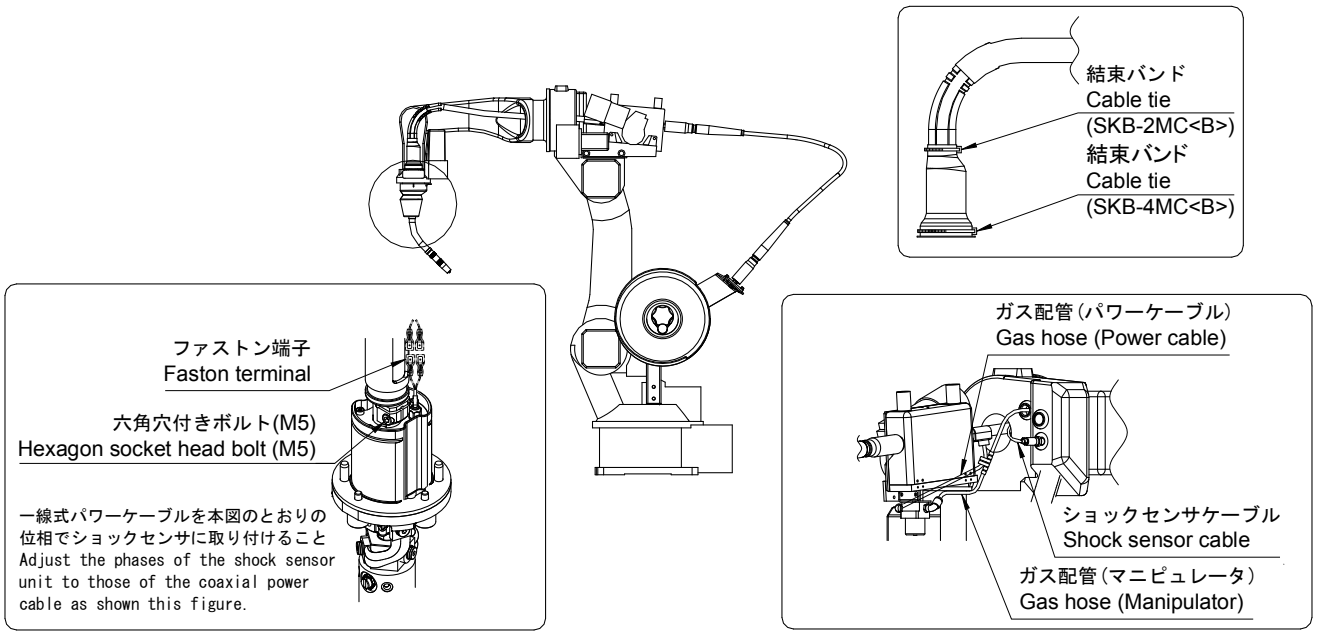


Fig.4.14 Connection of the coaxial power cable (B4 type manipulator)

After shock sensor cable connection, to bundle the excess portion of the shock sensor cable, and then put it in the power cable cover. Then the secure it to the coaxial power cable with the cable tie.
Adjust the phases of the shock sensor unit to those of the coaxial power cable as shown Fig. 4.14.

4.3.3 Adjustment of the coaxial power cable (For B4 type manipulator)

(1) Mount a torch, wire feeding unit (fixing bracket), and coaxial power cable.
(2) Operate the 5th axis to the maximum (soft limit) toward the manipulator's inner side as shown in Fig.4.15.
(3) Operate the 6th axis to the maximum (soft limit). (Either in the + or – side.)
(4) Adjust the fixing bracket in the above posture so that the coaxial power cable does not collide with the cover (see Fig.4.15).

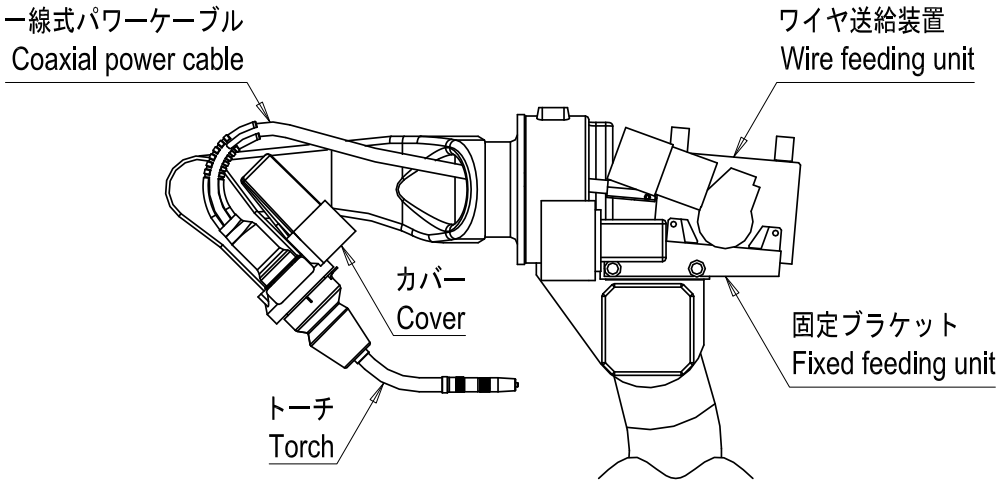
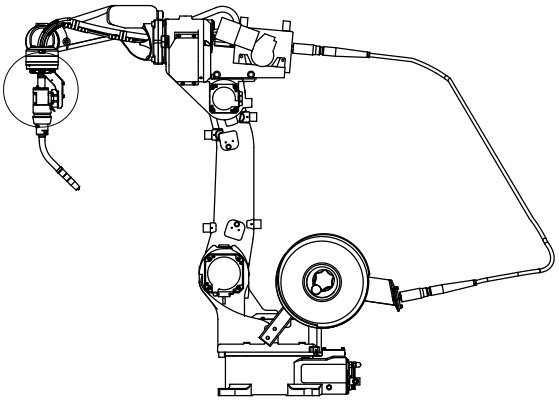


Fig.4.15 Adjustment of the coaxial power cable (For B4 type manipulator)

4.3.2 B6 type manipulator



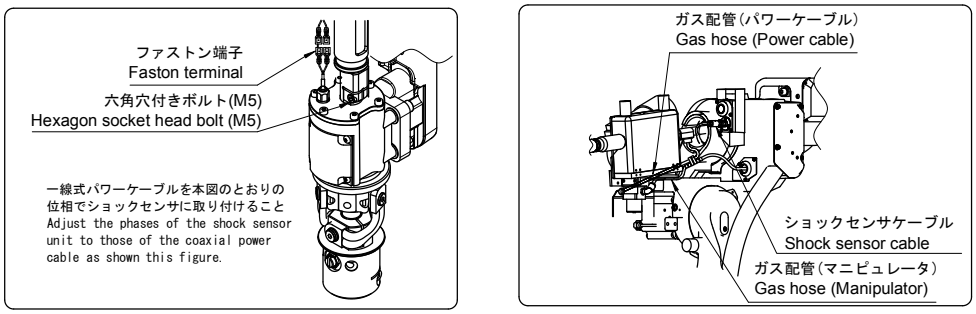


Fig.4.16 Connection of the coaxial power cable (B6 type manipulator)

After shock sensor cable connection, to bundle the excess portion of the shock sensor cable, and then put it in the power cable cover. Then the secure it to the coaxial power cable with the cable tie. Adjust the phases of the shock sensor unit to those of the coaxial power cable as shown Fig. 4.16.

4.3.3 Adjustment of the coaxial power cable (For B6 type manipulator)

(1) Mount a torch, wire feeding unit (fixing bracket), and coaxial power cable.

(2) Operate the 5th axis to the maximum (soft limit) toward the manipulator's inner side as shown in Fig.4.17.

(3) Drive 6th axis to the "+" side

(4) Drive 6th axis to angle of -90°

(5) Check that the coaxial power cable goes into the arm without being caught during operation (2) to(4).

(6) If the coaxial power cable is caught and does not go into the arm, adjust the wire feeding unit position back and forward..

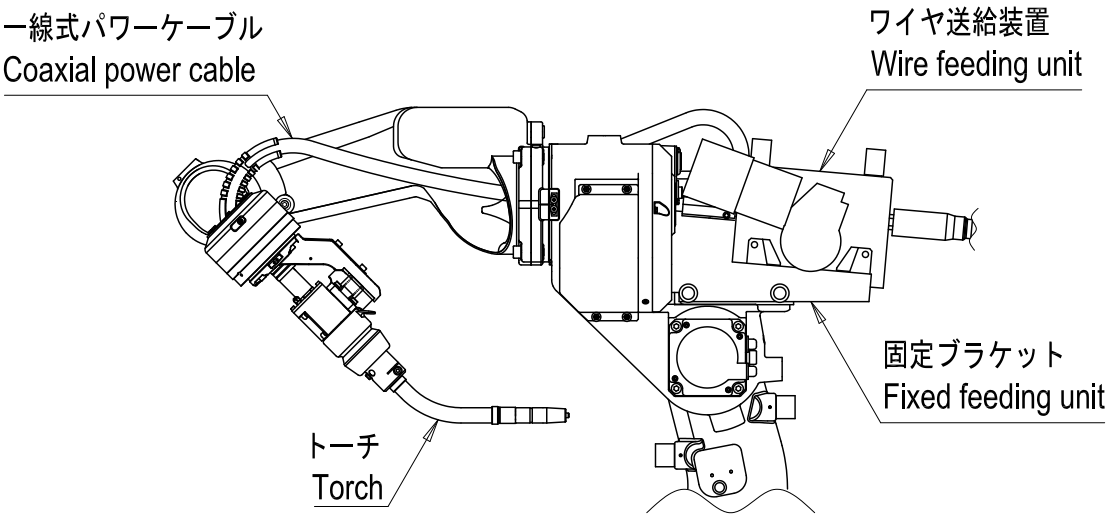


Fig.4.17 Adjustment of the coaxial power cable (For B6 type manipulator)

4.4 Cutting the Liner

Cut the liner according to the length of each torch, referring to Fig. 4.18 and Table 4.5, Fig.4.19 and Table 4.6. Rasp the edge of the liner's cut section to eliminate burrs.

Also, take enough care not to bend a liner or burr the hole when cutting.

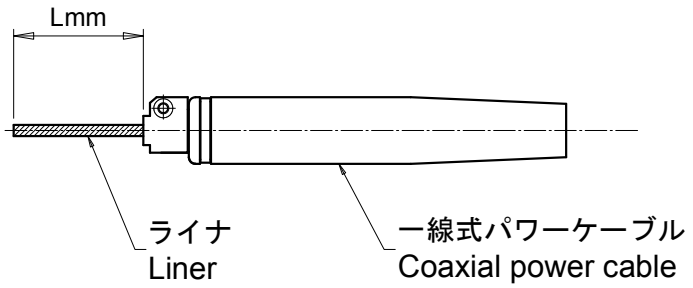


Fig.4.18 Cutting the liner from the coaxial power cable

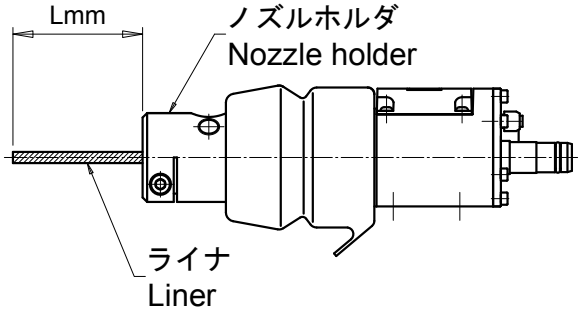


Fig.4.19 Cutting the liner from the shock sensor

Note) The liner cutting length is common to B type and V type manipulator.

Table 4.5 Length of liner from coaxial power cable (Rough measure)

Torch model	L (mm)
RT3500S	291
RT3500H	360
RT3500L	331
RT5000S	274
RT5000H	343
RT5000L	314
RTW5000S	288
RTW5000H	356
RTW5000L	338
RZ3500S	202
RZ3500H	272
RZ3500L	258
RZ3510S	210
RZ3510H	278
RZ3510L	250
RZW5000S	253
RZW5000H	321
RZW5000L	303

Table 4.6 Length of liner from nozzle holder (Rough measure)

Torch model	L (mm)
RT3500S	128
RT3500H	197
RT3500L	168
RT5000S	111
RT5000H	180
RT5000L	151
RTW5000S	124
RTW5000H	193
RTW5000L	174
RZ3500S	39
RZ3500H	110
RZ3500L	95
RZ3510S	47
RZ3510H	115
RZ3510L	87
RZW5000S	90
RZW5000H	158
RZW5000L	140

4.5 Liner Clamp Function

A liner clamp function is equipped with the nozzle holder of each shock sensor.
During welding, weld wire may sway to cause unstable wire feeding due to clearance between the sensor and the liner in the coaxial power cable. This problem will result in faulty weld arc start or fluctuations in the protrusion length of weld wire.
The liner clamp unit has the effect of reducing the behavior of weld wire by binding the coil liner.

(1) Unfasten the lock nut, and then thoroughly pull out the clamp screw.
(2) Insert the coaxial power cable.
(3) Gradually turn the clamp screw until it hits against the liner, and then make it 1/4 turns.
(4) Clamp the liner with the lock nut.

Note) Turning the clamp screw excessively will crush the liner to disable weld wire feeding.
Note) To dismount the coaxial power cable or the liner, unclamp the liner clamp first.

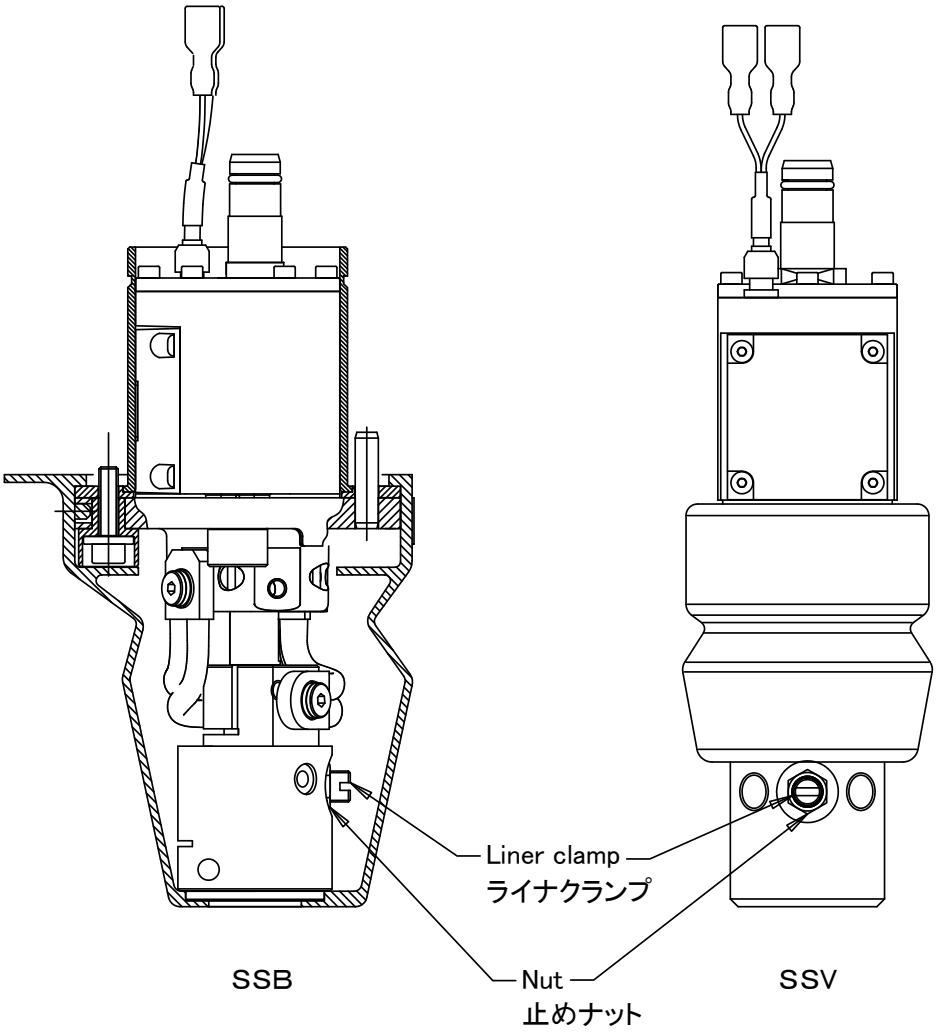


Fig.4.20 Liner clamp

4.6 Connecting the cable hanger

The following cable hanger assembly is separately required for NV6L / NV6LS / NV8L. Be sure to use them.

・Cable hanger assembly : L11885B

(1) Attach the cable hanger to the manipulator, referring to Fig.4.21. Insulate the manipulator and the cable hanger by using the supplied insulating plate (1), insulating bush.

(2) Mount the included hose cover from above the coaxial power cable and lower it under the cable hanger with the cable clamp. Refer to Fig.4.21 and attach the cable clamp at the position where the spring is vertically downward in the manipulator basic position. Tighten both ends of the hose cover with a cable-tie.

Note) When clamping on the torch side, even if the J5 and J6 axis link soft limit is within the range, the coaxial power cable and the manipulator may interfere with each other, so fix them at the position shown in the Fig.4.21.

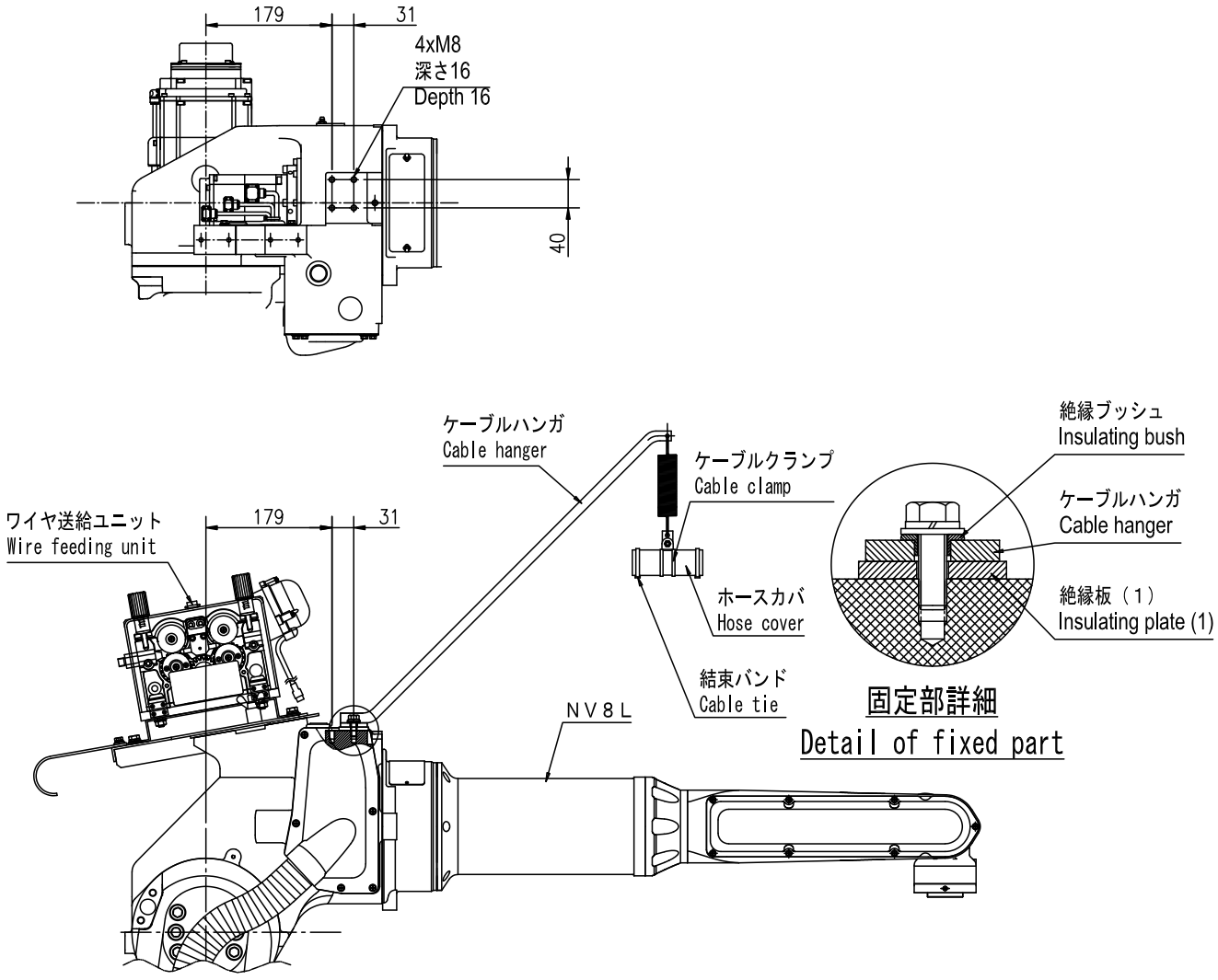


Fig.4.21 Connecting the cable hanger (NV6L / NV6LS / NV8L)

5. Setting the Robot Controller

5.1 Checking the Tool Parameter

On delivery of the robot, the data of the welding torch (tool parameter) in use are not set.
Then, specify the tool parameter depending on the type of robot and torch as described below.
For the installation posture of torch, see Fig. 5.1 and Fig. 5.2.

Table 5.1 Tool constants of arc welding torch (for V type, A type manipulator) manufactured by DAIHEN

N series - V・A type	Length			Angle			Center of G			Weight	Moment of inertia			Radius	Reference drawing
	X [mm]	Y [mm]	Z [mm]	Rx [deg]	Ry [deg]	Rz [deg]	Gx [mm]	Gy [mm]	Gz [mm]	Mass [kg]	Ix kgm^2	Iy kgm^2	Iz kgm^2	r mm	
RT3500S	140.0	0.0	385.0	180.0	0.0	0.0	118.0	0.0	127.0	2.1	0.050	0.090	0.030	0.0	(1)
RT5000S									128.0	2.2			0.040		
RTW5000S							119.0		129.0	2.3	0.060				
RZ3500S							118.0		126.0	2.2					
RZ3510S									128.0	2.1	0.050		0.030		
RZW5000S							119.0		129.0	2.3	0.060		0.040		
RT3500H	0.0	0.0	400.0	180.0	-45.0	0.0	107.0	0.0	140.0	2.3	0.070	0.100	0.030	0.0	(2)
RT5000H									142.0						
RTW5000H										2.4	0.080	0.110			
RZ3500H							111.0		141.0	2.3	0.070				
RZ3510H							107.0		140.0	2.3	0.070	0.100			
RZW5000H							111.0		142.0	2.4	0.080	0.110			
RT3500L	0.0	0.0	400.0	180.0	-45.0	0.0	119.0	0.0	148.0	2.4	0.080	0.120	0.040	0.0	(3)
RT5000L									149.0						
RTW5000L							121.0		146.0	2.6		0.130	0.050		
RZ3500L							126.0		142.0	2.5					
RZ3510L							119.0		148.0	2.4		0.120	0.040		
RZW5000L							121.0		146.0	2.6		0.130	0.050		

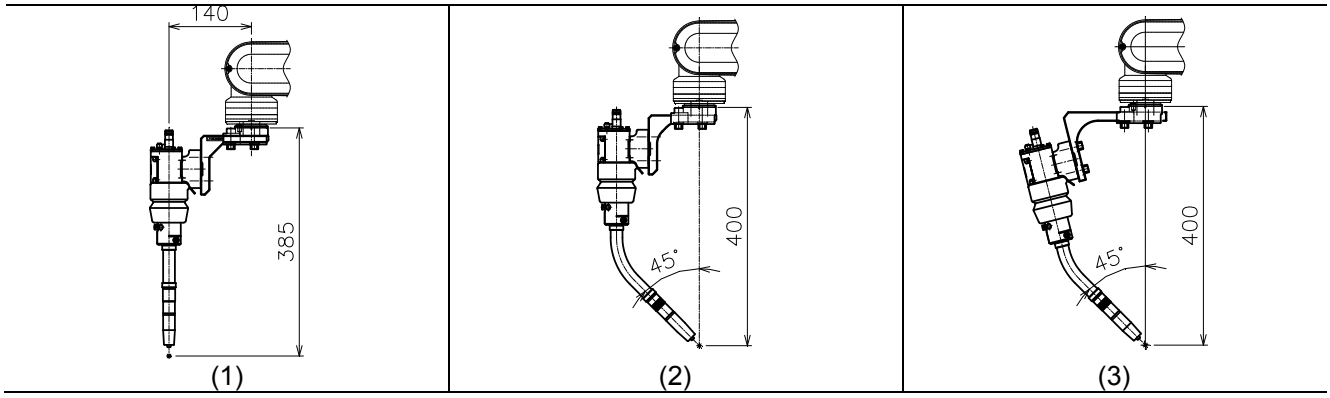


Fig.5.1 installation form of torch (for V type ,A type manipulator)

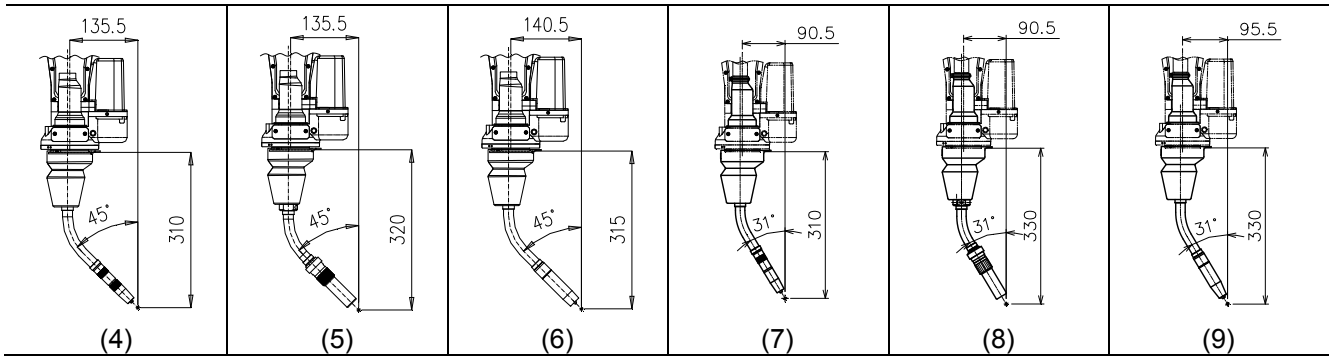
Note) The weigh shown in Table 5.1 includes the weight of the torch mounting bracket ASSY.

Refer to the instruction manual for each manipulator if the data in Table 5.1 have not been set.

Type	Reference instruction manual
AII manipulator	Chapter 4, INSTALLATION (1L20400A-E-*)
FD manipulator	Chapter 4, SETUP (1L21700B-E-*)

Table 5.2 Tool constants of arc welding torch (for B4 type manipulator) manufactured by DAIHEN

N series - B4 type	Length			Angle			Center of G			Weight	Moment of inertia			Radius	Reference drawing
	X [mm]	Y [mm]	Z [mm]	Rx [deg]	Ry [deg]	Rz [deg]	Gx [mm]	Gy [mm]	Gz [mm]	Mass [kg]	Ix kgm^2	Iy kgm^2	Iz Kgm^2	r mm	
RT3500H	-135.5	0.0	310.0	180.0	-45.0	0.0	-10.0	0.0	74.0	1.9	0.030	0.030	0.000	0.0	(4)
RT5000H							-11.0		76.0	2.0					
RTW5000H			320.0				-12.0		85.0	2.1	0.040	0.040			(5)
RZ3500H	-140.5		315.0						79.0	2.0	0.030				(6)
RZ3510H	-135.5		310.0				-10.0		74.0	1.9		0.030			(4)
RZW5000H			320.0				-12.0		85.0	2.1	0.040	0.040			(5)
RT3500L	-90.5	0.0	310.0	180.0	-31.0	0.0	-5.0	0.0	69.0	1.9	0.030	0.030	0.000	0.0	(7)
RT5000L							-6.0		70.0						
RTW5000L			330.0						82.0	2.0	0.040	0.040			(8)
RZ3500L	-95.5						-7.0		78.0		0.030	0.030			(9)
RZ3510L	-90.5		310.0				-5.0		69.0	1.9					(7)
RZW5000L			330.0				-6.0		82.0	2.0	0.040	0.040			(8)



(4) (5) (6) (7) (8) (9)

Fig.5.2 Installation form of torch (for B4 type manipulator)

Refer to the instruction manual for each manipulator if the data in Table 5.2 have not been set.

Type	Reference instruction manual
AII manipulator	Chapter 4, INSTALLATION (1L20400A-E-*)
FD manipulator	Chapter 4, SETUP (1L21700B-E-*)

Table 5.3 Tool constants of arc welding torch (for B6 type manipulator) manufactured by DAIHEN

N series - B6 type	Length			Angle			Center of G			Weight	Moment of inertia			Radius	Reference drawing
	X [mm]	Y [mm]	Z [mm]	Rx [deg]	Ry [deg]	Rz [deg]	Gx [mm]	Gy [mm]	Gz [mm]	Mass [kg]	Ix kgm^2	Iy kgm^2	Iz Kgm^2	r mm	
RT3500H	-140.0	0.0	430.0	180.0	-45.0	0.0	-17.0	0.0	175.0	2.1	0.100	0.100	0.000	0.0	⑩
RT5000H							-19.0		177.0	2.2					
RTW5000H			440.0				-20.0		186.0	2.3	0.110	0.120			⑪
RZ3500H	-145.0		435.0						185.0	2.2		0.110			⑫
RZ3510H	-140.0		430.0				-17.0		175.0		0.100	0.100			⑩
RZW5000H			440.0				-20.0		186.0	2.3	0.110	0.120			⑪
RT3500L	-95.0	0.0	430.0	180.0	-31.0	0.0	-13.0	0.0	164.0	2.0	0.080	0.080	0.000	0.0	⑬
RT5000L							-15.0		172.0	2.1	0.090	0.090			
RTW5000L			450.0						183.0	2.2	0.110	0.110			⑭
RZ3500L	-100.0						-16.0		176.0	2.1	0.100	0.100			⑮
RZ3510L	-95.0		430.0				-13.0		164.0		0.080	0.080			⑬
RZW5000L			450.0				-15.0		183.0	2.2	0.110	0.110			⑭

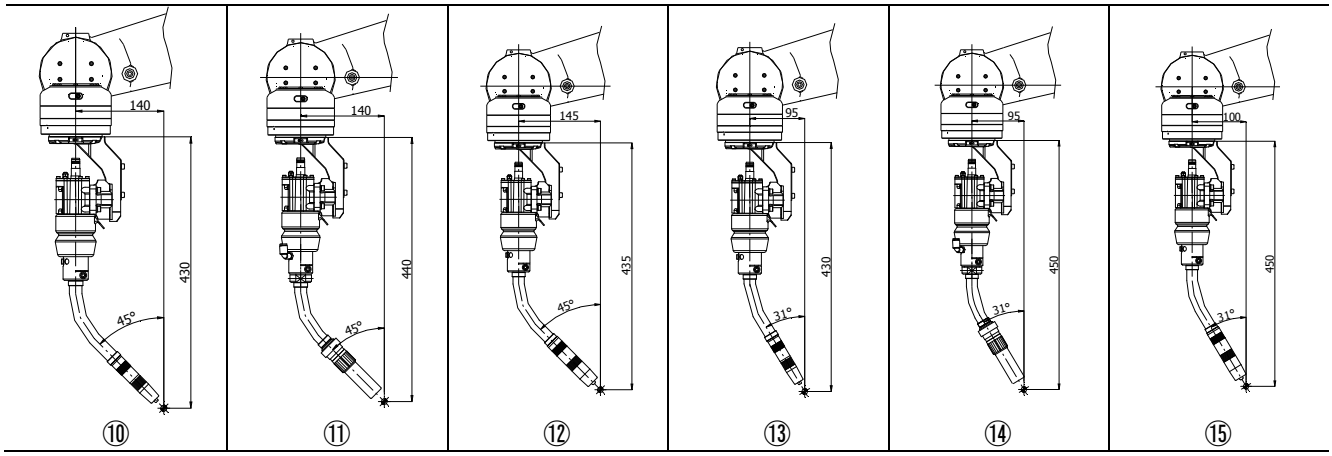


Fig.5.3 Installation form of torch (for B6 type manipulator)

Refer to the instruction manual for each manipulator if the data in Table 5.3 have not been set.

Type	Reference instruction manual
AII manipulator	Chapter 4, INSTALLATION (1L20400A-E-*)
FD manipulator	Chapter 4, SETUP (1L21700B-E-*)

5.2 Checking the Shock Sensor Operation

5.2.1 External force for actuating the shock sensor

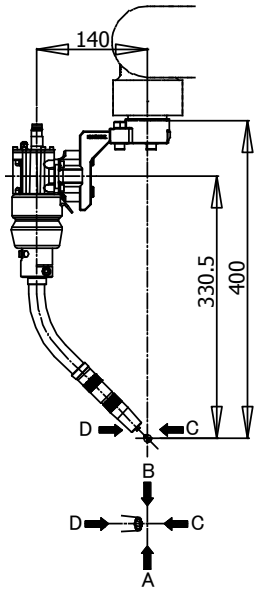


Table 5.4 External force

Direction	External force (kg)
A	3.0
B	3.0
C	3.0
D	3.0

The left table shows the rough standard load to actuate the shock sensor when the external force is applied on the torch tip. These values depend on the shape and length of the torch.

Fig.5.4 Direction of the external force

5.2.2 Checking the shock sensor operation

○ AII, FD controller

Press the torch tip in by hand and check that the following message appears on

[2] The failure monitor screen (See Fig.5.5).

Error category : Emergency stop failure

Error code : A4920

The message will disappear by unhanding the torch.

If no message is displayed, the shock sensor cable might cause a short circuit. In contrast, if any message remains displayed, the shock sensor cable might not be connected or might have breaks.

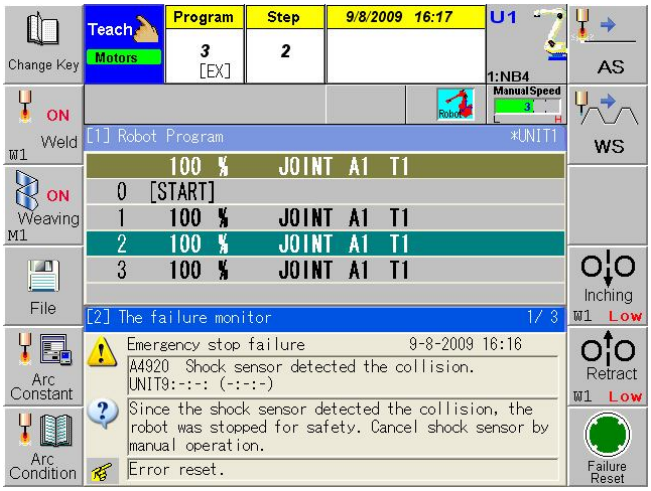


Fig.5.5 TP screen
(AII controller)

* For details of the failure monitor screen, refer to Chapter 8 in the Instruction Manual for Manipulator “BASIC OPERATION” (1L20400C-E-*) in AII controller.
Refer to Chapter in the Instruction Manual for Manipulator “CONTROL AND MAINTENANCE FUNCTION” (1L21700L-E-*) in FD controller.

6. Troubleshooting

Phenomena	Possible cause
No arc generation	・ Contact failure or breaking of welding cable.
No smooth wire feeding Unstable welding performance	・ Shortage of wire pressure in the feed roll. ・ Tip wear. ・ Outlet guide wear. ・ Wire waste powder has deposited in a wire feeding path.
Wire contact on tip	・ No smooth wire feeding. ・ The hole on the tip became larger. ・ The distance between tip and workpiece is too short.
Shock sensor cannot be released.	・ Contact failure or breaking of shock sensor cable. ・ Nozzle is bent. * When a contact accident occurs and the robot operation stops by the shock sensor's detection signal, first investigate the cause of the accident. Pay close attention while operating the robot or restoring the power without known cause. It may be hazardous. To release the contact, see the Instruction Manual for robot controller "BASIC OPERATIONS" and "TEACHING". See the Instruction Manual for robot controller "CONTROL AND MAINTENANCE FUNCTION"
Aim deviation	・ Orifice is not mounted. * If an orifice is not mounted, spatter will be deposited inside to lead conduction between the nozzle and tip body. This will result in anomalous arc discharge and bending in the tip body. ・ The torch fixing screws (M5×20) are loose. * Use the proper torque value to tighten them. (See the page 17, 18, 26 and 31.) ・ The shock sensor has worked because of hitting the torch. * Move back the torch quickly so that the aiming point will be coincident with the original point.
Poor shielding	・ Specified tip and nozzle are not mounted. ・ Breaking in the hose (the air-blow torch).
<TCC torch> Unsmooth wire feeding Unstable welding	・ Spatter accumulation on the tip holder. Or, the wire powder is blocked in the collet tip. * Spatter accumulation on the tip holder makes power supply to wire very unstable and may cause the wire feeding resistance to increase. Remove spatter and wire powder accordingly to keep the tip holder clean for good performance in welding. The collet tip can be cleaned by the air-blow function. ・ Inappropriate length of liner. * When welding is performed with inappropriately longer liner, higher-than-necessary pressure is applied onto the collet tip and the wire feeding becomes unstable, causing unstable welding. Be sure to cut a liner correctly according to the length of each torch for correct operation. (See the page 53). ・ Welding without liner clamp used. * The movement of robot may cause the unfixed liner to move inside the coaxial power cable. At this time, higher-than-necessary pressure is applied onto the collet tip and the wire feeding becomes unstable.
<TCC torch> Cannot wire feeding	・ Wire caught at the collet tip. * When the wire is passed through the torch or retracted, the wire gets caught at the slit of the collet tip. Loosen the tip holder for proper feeding.
<TCC torch> The wire clings in the tip holder and collet tip point	・ The arc start is unstable. * Confirm extension and the welding condition setting is proper. Execute items as follow to improve the arc start when the wire clings happens frequently. ・ Throw the after-flow. (about one second) ・ Use the robot RS control. ・ Wire cut before the arc start.

7. Shock sensor (SSV sensor installation type) SSV-RS(L10990A)

7.1 Summary

This shock sensor is provided with a processing surface on the nozzle holder to install our sensor products and customer supplied tools based on the standard V type, A type shock sensor (SSV).

Basic specification is the same as that of SSV. In this section, only points which are different from those of SSV are stated.

7.2 Outline drawing

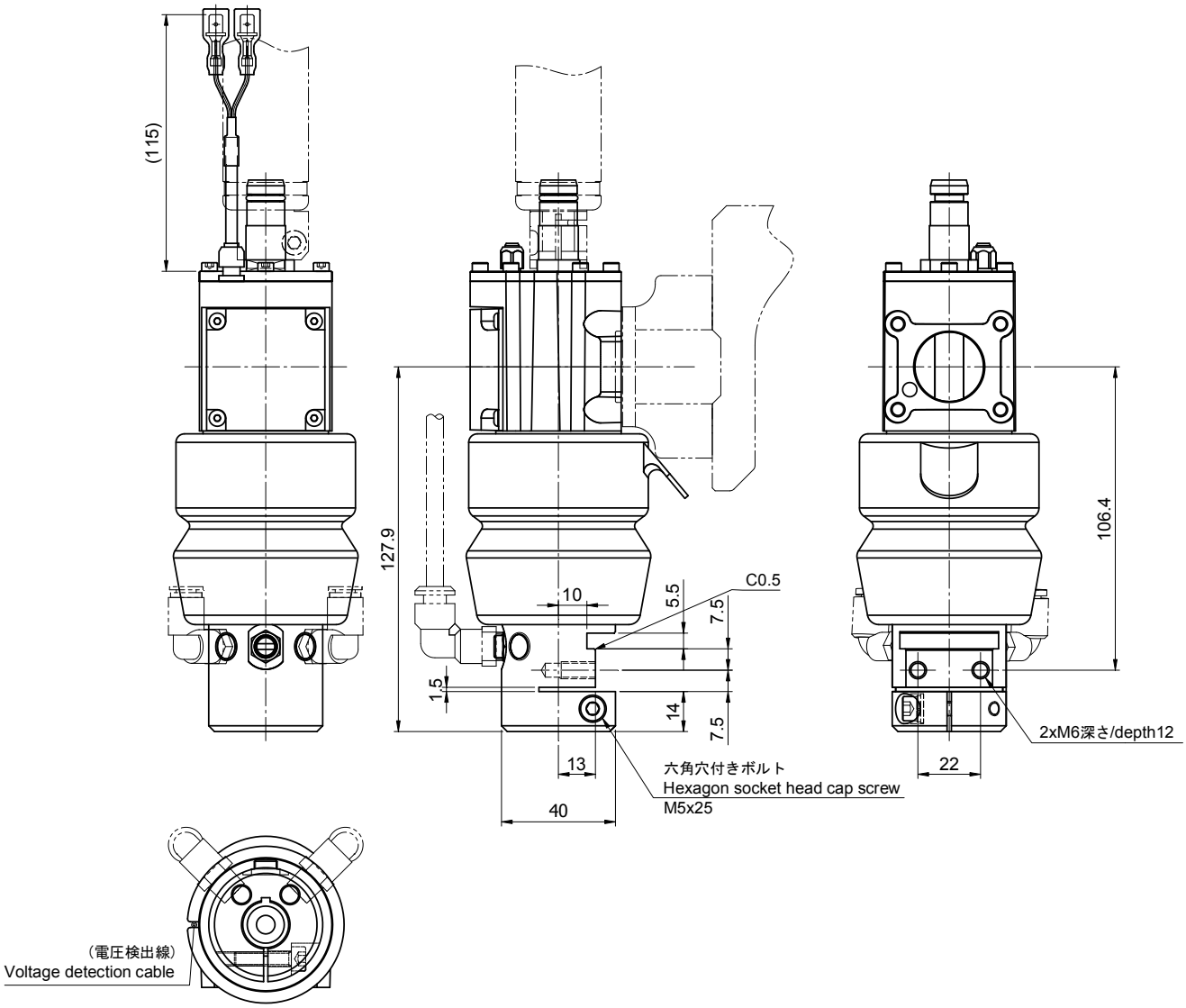


Fig. 7.1 Outline drawing of SSV-RS shock sensor (SSV sensor installation type)

7.3 Equipment installation procedure

7.3.1 Equipment installation dimensions

To install the equipment, use M6 taps at 2 locations in the outline drawing of the preceding item.

Be sure to provide a clearance to prevent the equipment from touching the torch clamp section. Details are as shown in Fig. 7.2.

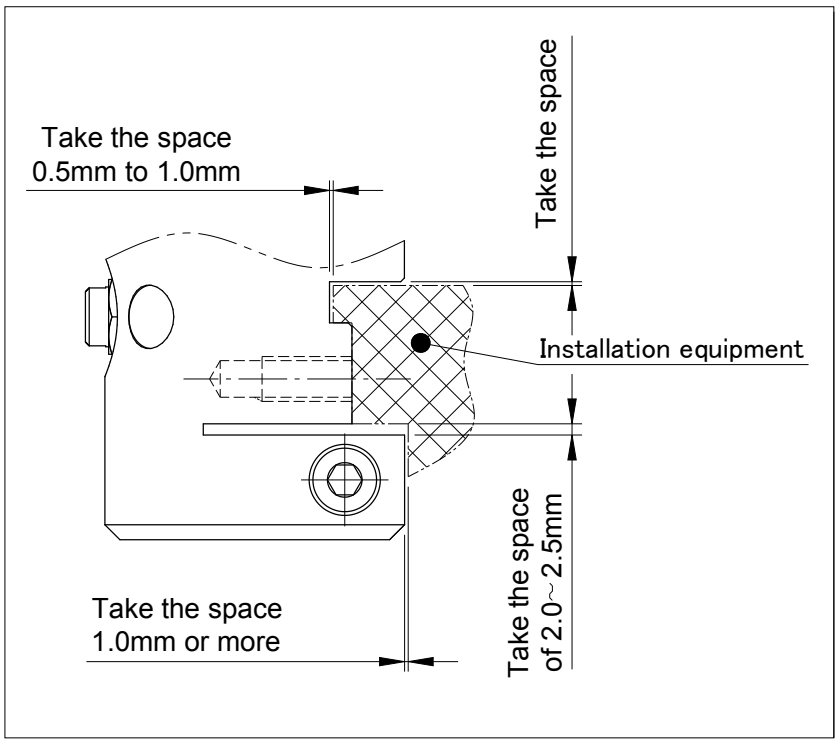


Fig. 7.2 Note on installation of shock sensor to the equipment

7.3.2 Insulation design

Equipment installing section (nozzle holder) is a conductive part of welding current. When installing equipment such as a sensor, be sure to insulate the equipment to prevent the welding current from flowing to the equipment, causing short circuit (damage).

8. Replacement Parts for Various Wire Diameters

8.1 Replacement Parts for Various Wire Diameters of Torch

Following parts shall be changed depending on the wire diameter in use.

【Torch related】
(1) Contact tip
(2) Collet tip
(3) Tip holder
【Coaxial power cable】
(4) Coil liner
(5) Outlet guide
【Wire feeding unit】
(6) Feeding roll
(7) Inlet guide

Use the parts suitable for each wire diameter when changing the welding wire.
The parts are listed as follows.

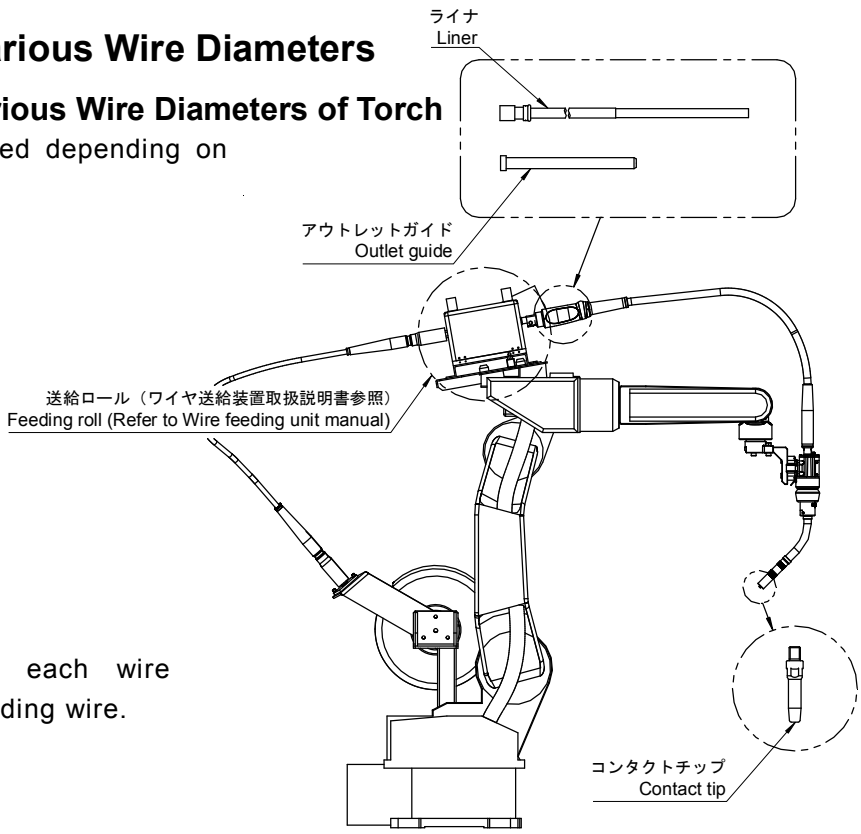
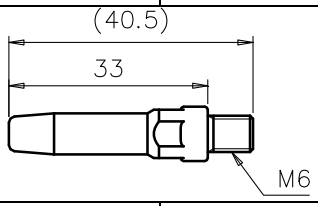


Fig.8.1 Replacement parts for various wire diameters of torch

Note) For the feeding roll, see the instruction manual for wire feeding unit.
We provide options for the nozzle. See the Table 8.5 for more details.

● Standard
△ Option

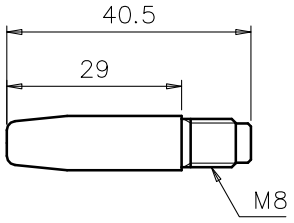
Table 8.1 Combination of contact tip

Torch model \ Wire dia.	φ0.8	φ0.9	φ1.0	φ1.2	φ1.4	φ1.6
Part No.	L7250B01	L7250B02	L7250B03	L7250B04	L7250B05	L7250B06
Outline drawing						
RT3500S	△	△	△	●	△	△
RT3500H	△	△	△	●	△	△
RT3500L	△	△	△	●	△	△
RT5000S	△	△	△	●	△	△
RT5000H	△	△	△	●	△	△
RT5000L	△	△	△	●	△	△
RTW5000S(*)	-	-	-	△	△	△
RTW5000H(*)	-	-	-	△	△	△
RTW5000L(*)	-	-	-	△	△	△

(*) Mounting of a M6 contact tip on the RTW5000 Series torch requires a M6 tip nut (L10302C02) separately.

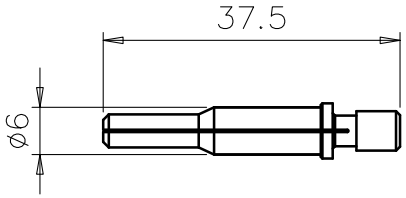
● Standard
△ Option

Table 8.2 Combination of contact tip (M8)

Wire dia. / Torch model	φ1.2	φ1.4	φ1.6
Part No.	L10361B04	L10361B05	L10361B06
Outline drawing			
RTW5000S	△	△	●
RTW5000H	△	△	●
RTW5000L	△	△	●

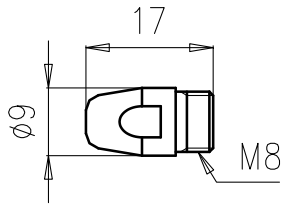
● Standard
△ Option

Table 8.3 Combination of collet tip

Wire dia / Torch model	φ0.9	φ1.0	φ1.2	φ1.4	φ1.6
Part No.	L10669C02	L10669C03	L106669C04	L10669C05	L10669C06
Outline drawing					
RZ3500S	△	△	●	-	-
RZ3500H	△	△	●	-	-
RZ3500L	△	△	●	-	-
RZ3510S	△	△	●	-	-
RZ3510H	△	△	●	-	-
RZ3510L	△	△	●	-	-
RZW5000S	-	-	●	△	△
RZW5000H	-	-	●	△	△
RZW5000L	-	-	●	△	△

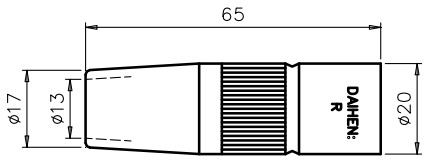
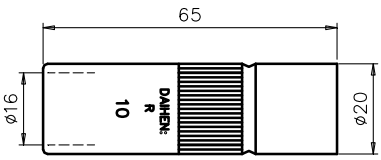
● Standard
△ Option

Table 8.4 Combination of tip holder

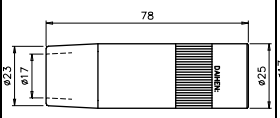
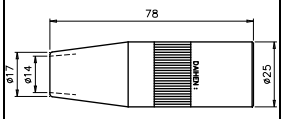
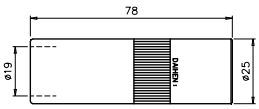
Wire dia. / Torch model	φ0.9-φ1.2	φ1.4	φ1.6
Part No.	L10669B06	L10669B07	L10669B08
Outline drawing			
RZ3500S	●	-	-
RZ3500H	●	-	-
RZ3500L	●	-	-
RZ3510S	●	-	-
RZ3510H	●	-	-
RZ3510L	●	-	-
RZW5000S	●	△	△
RZW5000H	●	△	△
RZW5000L	●	△	△

● Standard
△ Option

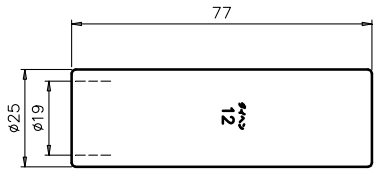
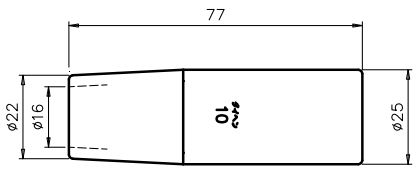
Table 8.5 Combination of nozzle

Nozzle dia. / Torch model	φ17	φ20
Part No.	L10603C02	L10603C03
Outline drawing		
RT3500S	●	△
RT3500H	●	△
RT3500L	●	△
RZ3510S	△	●
RZ3510H	△	●
RZ3510L	△	●

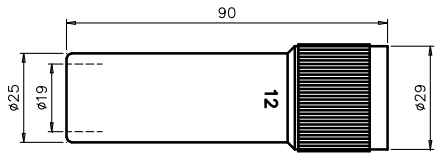
● Standard
△ Option

Nozzle dia. / Torch model	φ23	φ17	φ25	φ23
Part No.	L10612C06	L10612C04	L10612C05	U5377G01
Outline drawing				
RZ3500S	●	△	△	△
RZ3500H	●	△	△	△
RZ3500L	●	△	△	△

● Standard
△ Option

Nozzle dia. / Torch model	φ25	φ22
Part No.	U2774E01	U2774E04
Outline drawing		
RT5000S	●	△
RT5000H	●	△
RT5000L	●	△

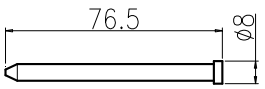
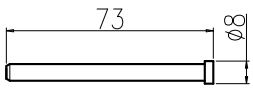
● Standard
△ Option

Nozzle dia. / Torch model	φ25
Part No.	U724E01
Outline drawing	
RTW5000S	●
RTW5000H	●
RTW5000L	●
RZW5000S	●
RZW5000H	●
RZW5000L	●

8.2 Replacement Parts for Various Wire Diameters of Coaxial Power Cable

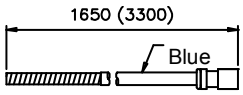
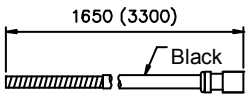
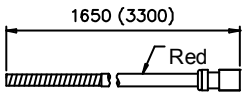
Table 8.6 Combination of the outlet guide

● Standard
△ Option

Wire dia. / Coaxial power cable	φ0.8	φ0.9～1.2	φ1.2～1.6
Part No.	U2770K01	U69B34	U69B35
Outline drawing			
L-10621／1.1M	△	●	△
L-10622／1.2M	△	●	△
L-10623／1.3M	△	●	△
L-10624／1.4M	△	●	△
L-10625／1.5M	△	●	△
L-10626／1.6M	△	●	△
L-10627／1.7M	△	●	△
L-10628／1.8M	△	●	△
L-10631／2.1M	△	●	△
L-10635／2.5M	△	●	△
L-10638／0.8M	△	●	△
L-10641／1.2M	△	●	△
L-10648／0.8M	△	●	△
L-10651／1.2M	△	●	△
L-11709／0.9M	△	●	△
L-11845／1.3M	△	●	△
L-11713／0.9M	△	●	△
L-11846／1.3M	△	●	△

● Standard
△ Option

Table 8.7 Combination of the liners

Wire dia / Coaxial power cable	φ0.8～0.9		φ0.9～1.2		φ1.2～1.6	
Part No.	L6611D03	U4353G01	L6611D02	U4170H02	L6611D01	U4173G04
Outline drawing						
L-10621／1.1M	△	-	●	-	△	-
L-10622／1.2M	△	-	●	-	△	-
L-10623／1.3M	△	-	●	-	△	-
L-10624／1.4M	-	△	-	●	-	△
L-10625／1.5M	-	△	-	●	-	△
L-10626／1.6M	-	△	-	●	-	△
L-10627／1.7M	-	△	-	●	-	△
L-10628／1.8M	-	△	-	●	-	△
L-10631／2.1M	-	△	-	●	-	△
L-10635／2.5M	-	△	-	●	-	△
L-10638／0.8M	△	-	●	-	△	-
L-10641／1.2M	△	-	●	-	△	-
L-10648／0.8M	△	-	●	-	△	-
L-10651／1.2M	△	-	●	-	△	-
L-11709／0.9M	△	-	●	-	△	-
L-11845／1.3M	△	-	●	-	△	-
L-11713／0.9M	△	-	●	-	△	-
L-11846／1.3M	△	-	●	-	△	-

Note） The liner (length:3300mm) is used when the coaxial power cable (L-10621 – L-10635) is 1.4m or longer.

9. Parts List

For this torch, a shock sensor unit, hood ASSY, nozzle holder, and power-feeding cable are the common parts.　A nozzle fitting part is interchangeable for all the models.

Note)　1. When interchanging the nozzle ASSY, also change the torch gauge, tool parameter and others.
　　2. Note that the built-in parts (liner, tip, etc.) may also need to be interchanged.

If the components are worn out or damaged while using this torch, see the following table and contact our sales agent.　When ordering, be sure to provide the item name and part No. (or the specification).

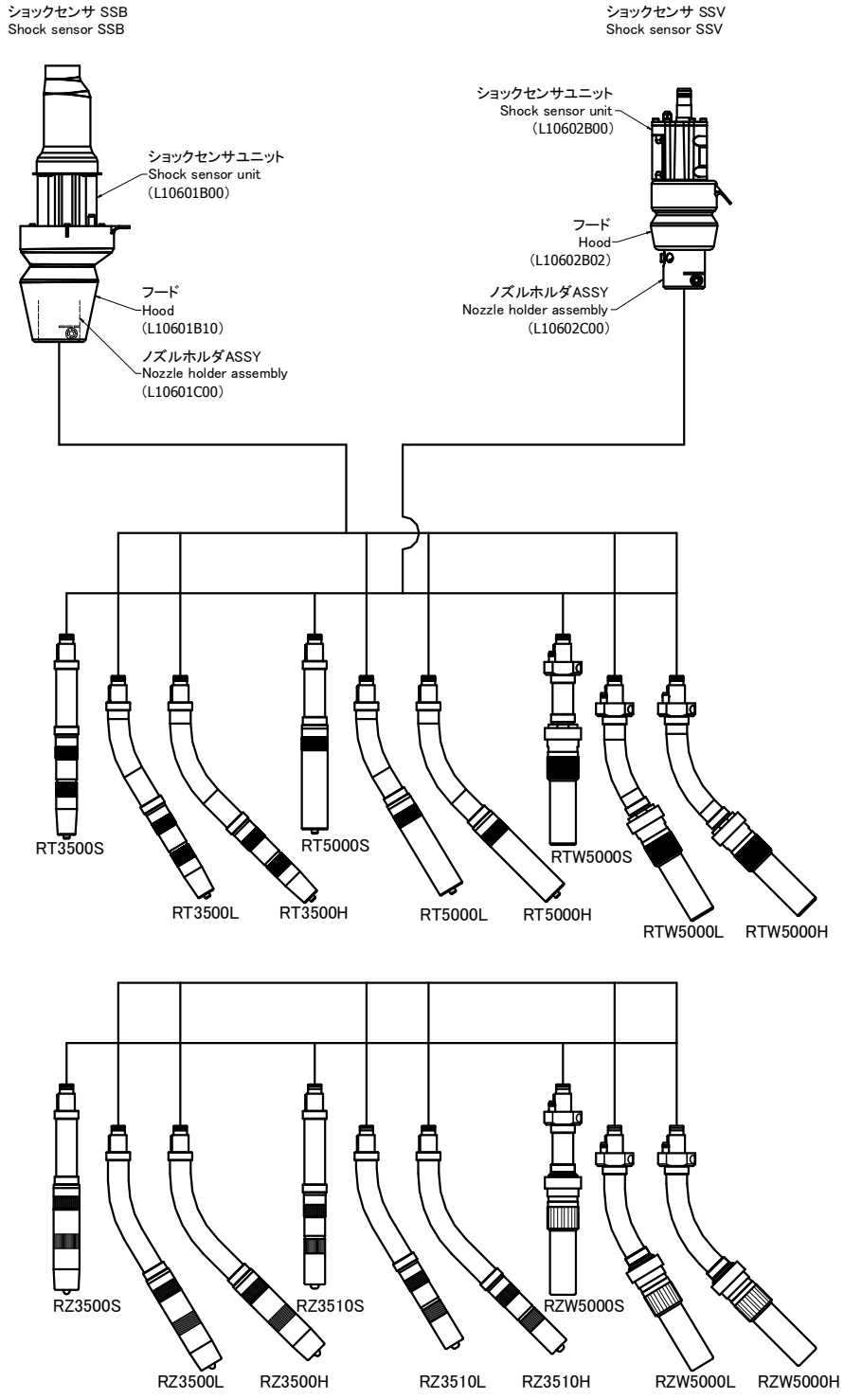


Fig.9.1 Combination of the shock sensor and nozzle fitting part

Table 9.1 Parts list for RT3500S, RT3500H, RT3500L

№	Part No.	Item	Qt.	Remarks
1	L10603B00	Torch body ASSY	1	For straight torch
2	L10605B00	Torch body ASSY	(1)	For 45° curved torch
3	L10604B00	Torch body ASSY	(1)	For 31° curved torch
1-1	3574-017	" O " - RING	(1)	Include the torch body ASSY
1-2	100-1238	Parallel key	(1)	Include the torch body ASSY
1-3	L10603B04	Teflon bushing	(2)	Include the torch body ASSY
4	L10603C01	Tip body	1	
5	L10603E01	Tip body	(1)	Include the air-blow kit
6	L10603D00	Insulator	1	
7	L6380F01	Spring Washer	(1)	Include the insulator
8	U4167G02	Orifice	1	
9	L7250B04	Contact tip 1.2	1	
10	L7250B01	Contact tip 0.8	(1)	Option
11	L7250B02	Contact tip 0.9	(1)	Option
12	L7250B03	Contact tip 1.0	(1)	Option
13	L7250B05	Contact tip 1.4	(1)	Option
14	L7250B06	Contact tip 1.6	(1)	Option
15	L10603C02	Nozzle(No.8)	1	
16	L10603C03	Nozzle(No.10)	(1)	Option

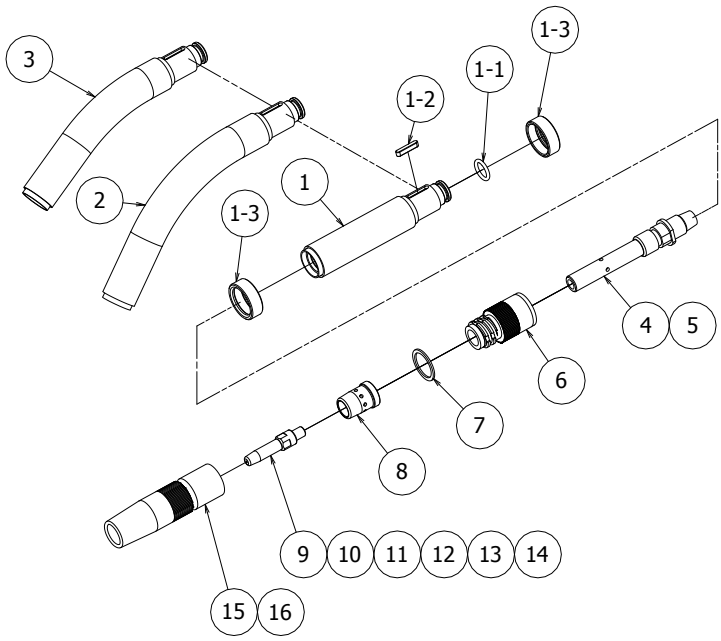


Fig.9.2 Exploded diagram for RT3500S, RT3500H, RT3500L

Note) Use of the air-blow function requires the air-blow kit (tip body) L10603E00, and the air-blow unit separately. Refer to the instruction manual for air-blow unit (1L10686-E-*).

Table 9.2 Parts list for RT3500S, RT3500H, RT3500L (For MTX(C)-3531)

№	Part No.	Item	Qt.	Remarks
1	L10603F01	Tip body	1	Conversion parts
MTX(C)−3531 consumables				
2	U608T00	Insulator	1	
2-1	L6380F01	Spring Washer	(1)	Include the insulator
3	U2437H01	Orifice	1	
4	L7250B04	Contact tip 1.2	1	
5	L7250B01	Contact tip 0.8	(1)	Option
6	L7250B02	Contact tip 0.9	(1)	Option
7	L7250B03	Contact tip 1.0	(1)	Option
8	L7250B05	Contact tip 1.4	(1)	Option
9	L7250B06	Contact tip 1.6	(1)	Option
10	L6380F03	Nozzle(No.8)	1	
11	L6380F04	Nozzle(No.10)	(1)	Option
12	L6380F05	Nozzle(No.8S)	(1)	Option

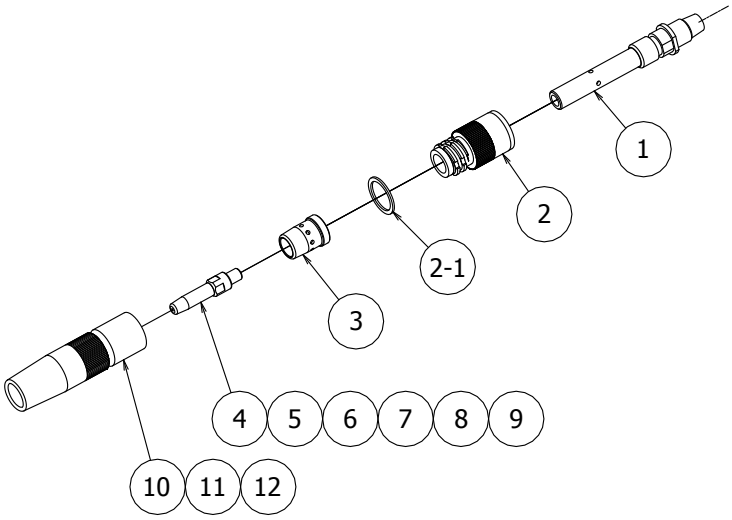


Fig.9.3 Exploded diagram for RT3500S, RT3500H, RT3500L

Note) Activity ratio becomes equal to MTX(C)-3531,as for CO_2 welding as for 350A 50% and MAG welding as for 250A 50%.

Table 9.3 Parts list for RT5000S, RT5000H, RT5000L

№	Part No.	Item	Qt.	Remarks
1	L10606B00	Torch body ASSY	1	For straight torch
2	L10608B00	Torch body ASSY	(1)	For 45° curved torch
3	L10607B00	Torch body ASSY	(1)	For 31° curved torch
1-1	3574-017	" O " - RING	(1)	Include the torch body ASSY
1-2	100-1238	Parallel key	(1)	Include the torch body ASSY
1-3	L10603B04	Teflon bushing	(2)	Include the torch body ASSY
4	L10606C01	Tip body	1	
5	L10606D01	Tip body	(1)	Include the air-blow kit
6	L6218C01	Tip holder	1	
7	U5377L00	Insulator	1	
7-1	L6573C02	Spring Washer	(1)	Include the insulator
8	U2774E03	Orifice	1	
9	L7250B04	Contact tip 1.2	1	
10	L7250B01	Contact tip 0.8	(1)	Option
11	L7250B02	Contact tip 0.9	(1)	Option
12	L7250B03	Contact tip 1.0	(1)	Option
13	L7250B05	Contact tip 1.4	(1)	Option
14	L7250B06	Contact tip 1.6	(1)	Option
15	U2774E01	Nozzle(No.12)	1	
16	U2774E04	Nozzle(No.10)	(1)	Option

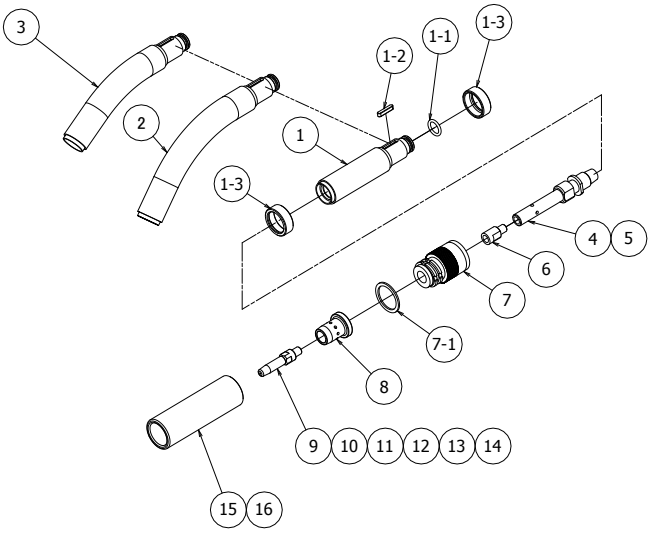


Fig.9.4 Exploded diagram for RT5000S, RT5000H, RT5000L

Note) Use of the air-blow function requires the air-blow kit (tip body) L10606D00, and the air-blow unit separately. Refer to the instruction manual for air-blow unit (1L10686-E-*).

Table 9.4 Parts list for RTW5000S, RTW5000H, RTW5000L

№	Part No.	Item	Qt.	Remarks
1	L10609B00	Torch body ASSY	1	For straight torch
2	L10611B00	Torch body ASSY	(1)	For 45°curved torch
3	L10610B00	Torch body ASSY	(1)	For 31°curved torch
1-1	3574-017	" O " - RING	(1)	Include the torch body ASSY
1-2	100-0652	" O " - RING	(2)	Include the torch body ASSY
1-3	L10609B08	Rubber bush	(2)	Include the torch body ASSY
4	U2969K03	Cap nut	1	
5	3574-003	" O " - RING	1	
6	3574-002	" O " - RING	2	
7	L6571C01	Insulating bush	1	
8	3574-006	" O " - RING	1	
9	L6571C02	Front body	1	
10	L6571C03	Nut	1	
11	U3766K01	Orifice	1	
12	L10302C01	Tip Nut	1	
13	L10361B04	Tip 1.2R	(1)	Option
14	L10361B05	Tip 1.4R	(1)	Option
15	L10361B06	Tip 1.6R	1	
16	L10302C02	Tip Nut(M6)	(1)	Option
17	L7250B04	Contact tip 1.2	(1)	Option
18	L7250B05	Contact tip 1.4	(1)	Option
19	L7250B06	Contact tip 1.6	(1)	Option
20	U724E01	Nozzle(No.12)	1	
-	L10268K00	Cooling water hose(6M)	2	
-	L10268L00	Cooling water hose(8M)	(2)	Option
-	L10268M00	Cooling water hose(10M)	(2)	Option
-	L10609D00	Liquid-cooled converter assembly	1	
-	4739-355	Elbow (For SSV)	(2)	Include the Liquid-cooled converter assembly
-	100-2080	Hose elbow(For SSB)	(2)	Include the Liquid-cooled converter assembly

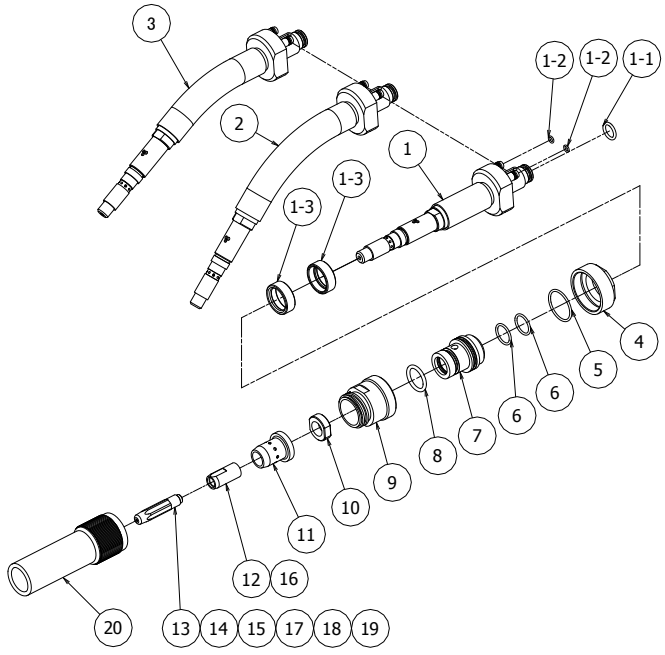


Fig.9.5 Exploded diagram for RTW5000S, RTW5000H, RTW5000L

Table 9.5 Parts list for RZ3500S, RZ3500H, RZ3500L

№	Part No.	Item	Qt.	Remarks
1	L10612B00	Torch body ASSY	1	For straight torch
2	L10614B00	Torch body ASSY	(1)	For 45° curved torch
3	L10613B00	Torch body ASSY	(1)	For 31° curved torch
1-1	3574-017	" O " - RING	(1)	Include the torch body ASSY
1-2	100-1238	Parallel key	(1)	Include the torch body ASSY
1-3	L10603B04	Teflon bushing	(2)	Include the torch body ASSY
4	4739-469	Coil spring	1	
5	L10612C03	Pressurizing shaft	1	
6	L10612C02	Rear tip body	1	
7	U5626X00	Insulator	1	
7-1	L6573C02	Spring Washer	(1)	Include the insulator
8	U5685M02	Orifice	1	
9	L10669C02	Collet tip 0.9	(1)	Option
10	L10669C03	Collet tip 1.0	(1)	Option
11	L10669C04	Collet tip 1.2	1	
12	L10612C01	Front tip body	1	
13	L10669B06	Tip Holder 1.2	1	For φ0.9～1.2
14	L10612C06	Nozzle(No.10)	1	
15	L10612C04	Nozzle(No.8)	(1)	Option
16	L10612C05	Nozzle(No.12)	(1)	Option
17	U5377G01	Nozzle	(1)	Option

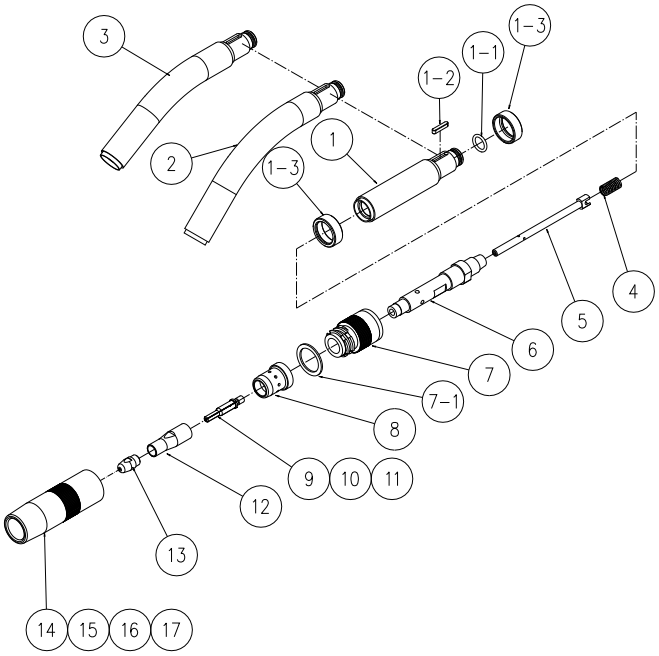


Fig.9.6 Exploded diagram for RZ3500S, RZ3500L, RZ3500H

Note) Past tip holder (L10669F02~05) can be used. However, tip holder described in the parts list is recommended.

Table 9.6 Parts list for RZ3510S, RZ3510H, RZ3510L

№	Part No.	Item	Qt.	Remarks
1	L10994B00	Torch body ASSY	1	For straight torch
2	L10996B00	Torch body ASSY	(1)	For 45° curved torch
3	L10995B00	Torch body ASSY	(1)	For 31° curved torch
1-1	3574-017	" O " - RING	(1)	Include the torch body ASSY
1-2	100-1238	Parallel key	(1)	Include the torch body ASSY
1-3	L10603B04	Teflon bushing	(2)	Include the torch body ASSY
4	4739-469	Coil spring	1	
5	L10994C03	Pressurizing shaft	1	
6	L10994C02	Rear tip body	1	
7	L10603D00	Insulator	1	
7-1	L6380F01	Spring Washer	(1)	Include the insulator
8	U4167G02	Orifice	1	
9	L10669C02	Collet tip 0.9	(1)	Option
10	L10669C03	Collet tip 1.0	(1)	Option
11	L10669C04	Collet tip 1.2	1	
12	L10994C01	Front tip body	1	
13	L10669B06	Tip holder 1.2	1	For φ0.9～1.2
14	L10603C02	Nozzle(No.8)	(1)	Option
15	L10603C03	Nozzle(No.10)	1	

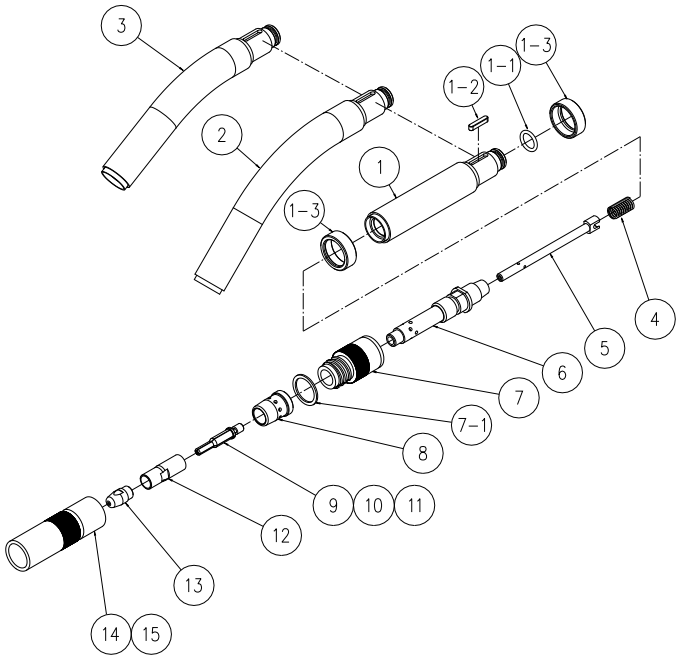


Fig.9.7 Exploded diagram for RZ3510S, RZ3510H, RZ3510L

Table 9.7 Parts list for RZW5000S, RZW5000H, RZW5000L

№	Part No.	Item	Qt.	Remarks
1	L11095B00	Torch body ASSY	1	For straight torch
2	L11097B00	Torch body ASSY	(1)	For 45° curved torch
3	L11096B00	Torch body ASSY	(1)	For 31° curved torch
1-1	3574-017	" O " - RING	(1)	Include the torch body ASSY
1-2	100-0652	" O " - RING	(2)	Include the torch body ASSY
1-3	L10609B08	Rubber bush	(2)	Include the torch body ASSY
4	U2969K03	Cap nut	1	
5	3574-003	" O " - RING	1	
6	3574-002	" O " - RING	2	
7	L11095C03	Insulating bush	1	
8	3574-006	" O " - RING	1	
9	L11095C04	Front body	1	
10	L11095C05	Nut	1	
11	U5685M02	Orifice	1	
12	4739-469	Coil spring	1	
13	L11095C02	Pressurizing shaft	1	
14	L11095C01	Rear tip body	1	
15	L10669C04	Collet tip 1.2	1	
16	L10669C05	Collet tip 1.4	(1)	Option
17	L10669C06	Collet tip 1.6	(1)	Option
18	L10612C01	Front tip body	1	
19	L10669B06	Tip holder 1.2	1	
20	L10669B07	Tip holder 1.4	(1)	Option
21	L10669B08	Tip holder 1.6	(1)	Option
22	U724E01	Nozzle (No. 12)	1	
-	L10268K00	Cooling water hose(6M)	2	
-	L10268L00	Cooling water hose(8M)	(2)	Option
-	L10268M00	Cooling water hose(10M)	(2)	Option
-	L10609D00	Liquid-cooled converter assembly	1	
-	4739-355	Elbow (For SSV)	(2)	Include the Liquid-cooled converter assembly
-	100-2080	Hose elbow(For SSB)	(2)	Include the Liquid-cooled converter assembly

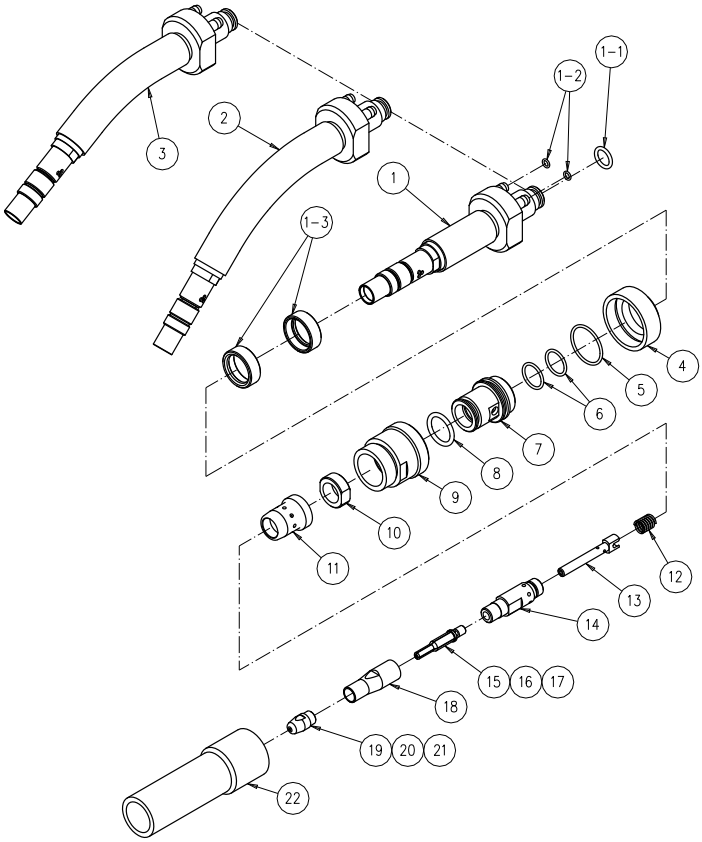


Fig.9.8 Exploded diagram for RZW5000S, RZW5000H, RZW5000L

Table 9.8 Parts list for SSB

№	Part No.	Item	Qt.	Remarks
1	L10601D00	Power-feeding cable ASSY	2	
2	L10601C00	Nozzle holder ASSY	1	
3	L10601B10	Hood	1	
4	3574-017	"O"-RING	1	
5	L10601B13	Power cable cover	1	
6	L10601B09	Insulating bushing	4	
7	100-0650	Washer	4	
8	100-0651	Insulating dowel pin	2	
9	L10601B00	Shock sensor unit	1	
10	L10771B00	Shock sensor unit	(1)	Reinforced spring type

*) As for reinforced spring shock sensor SSB-R, only the shock sensor unit is different.

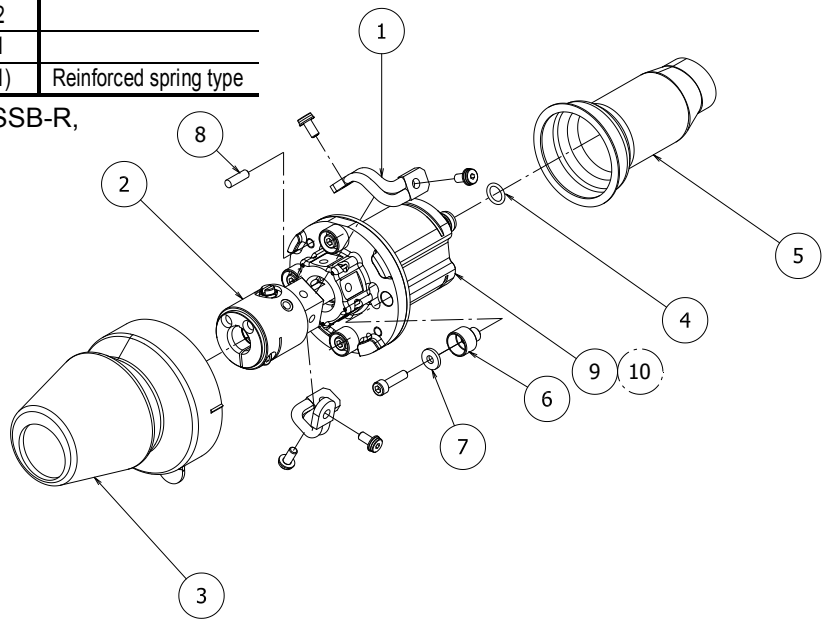


Fig.9.9 Exploded diagram for SSB

Table 9.9 Parts list for SSV

№	Part No.	Item	Qt.	Remarks
1	L10601D00	Power-feeding cable ASSY	2	
2	L10602C00	Nozzle holder ASSY	1	
3	L10602B02	Hood	1	
4	3574-017	"O"-ring	1	
5	L10602B00	Shock sensor unit	1	
6	L10772B00	Shock sensor unit	(1)	Reinforced spring type

*) As for reinforced spring shock sensor SSV-R, only the shock sensor unit is different.

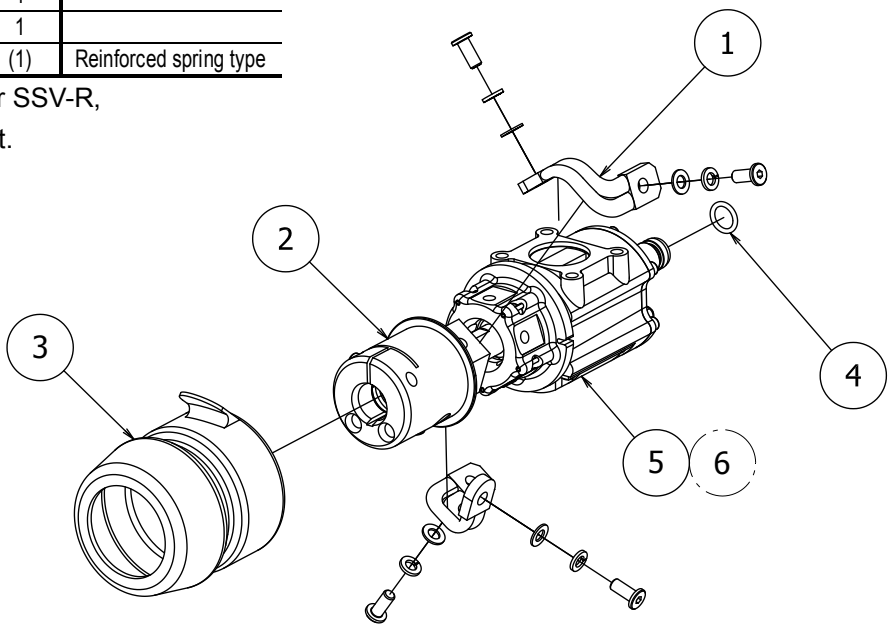


Fig.9.10 Exploded diagram for SSV

Table 9.10 Parts list for SSV-RS

№	Part No.	Item	Qt.	R e m a r k s
1	L10601D00	Power-feeding cable ASSY	2	
2	L10990B00	Nozzle holder ASSY	1	
3	L10602B02	H o o d	1	
4	3574-017	“ O ” - r i n g	1	
5	L10772B00	Shock sensor unit	1	Reinforced spring type

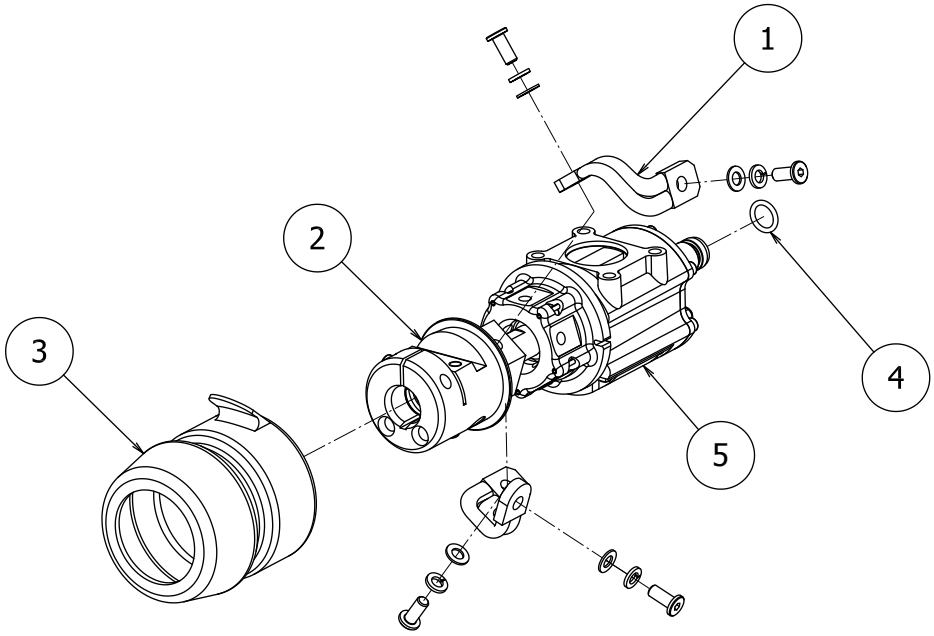


Fig 9.11 Exploded diagram for SSV-RS

Table 9.11 Parts list for the coaxial power cable (For V type, A type manipulator)

№	Part No.	Item	Qt.	Remarks
1	See Table. below.	Power cable ASSY	1st	
2	See Table. below.	Shock sensor cable	1st	
3	L6611B00	Gas hose ASSY	1st	
4	L6611C01	Power adaptor	1	
5	U5035K00	Cable clamp	1st	
6	L7810D05	Guide adaptor	1	
7	U69B34	Outlet guide (0.9~1.2)	1	
8	U69B35	Outlet guide (1.2~1.6)	(1)	Option
9	U2770K01	Outlet guide (0.8)	(1)	Option
10	L6611D02	Liner (0.9～1.2)	1	For L-10621~L-10623
11	U4170H02	Liner (0.9～1.2)	1	For L-10624~L-10635
12	L6611D01	Liner (1.2～1.6)	(1)	For L-10621~L-10623
13	U4173G04	Liner (1.2～1.6)	(1)	For L-10624~L-10635
14	L6611D03	Liner (0.8～0.9)	(1)	For L-10621~L-10623
15	U4353G01	Liner (0.8～0.9)	(1)	For L-10624~L-10635

№	Part No.	Item	Qt.	Remarks
	【List of Power cable ASSY】			
1	L6580B00	Power cable ASSY (1.1M)	1st	For L-10621
	L6580C00	Power cable ASSY (1.2M)	1st	For L-10622
	L6580D00	Power cable ASSY (1.3M)	1st	For L-10623
	L6580E00	Power cable ASSY (1.4M)	1st	For L-10624
	L6580F00	Power cable ASSY (1.5M)	1st	For L-10625
	L6580G00	Power cable ASSY (1.6M)	1st	For L-10626
	L6580H00	Power cable ASSY (1.8M)	1st	For L-10628
	L6580J00	Power cable ASSY (2.1M)	1st	For L-10631
	L6580K00	Power cable ASSY (2.5M)	1st	For L-10635
	【List of Shock sensor cable】			
2	L10666J00	Shock sensor cable (8)	1st	For L-10621
	L10666K00	Shock sensor cable (9)	1st	For L-10622
	L10666L00	Shock sensor cable (10)	1st	For L-10623
	L10666M00	Shock sensor cable (11)	1st	For L-10624
	L10666N00	Shock sensor cable (12)	1st	For L-10625
	L10666P00	Shock sensor cable (13)	1st	For L-10626
	L10666R00	Shock sensor cable (15)	1st	For L-10628
	L10666U00	Shock sensor cable (18)	1st	For L-10631
	L10666Y00	Shock sensor cable (22)	1st	For L-10635

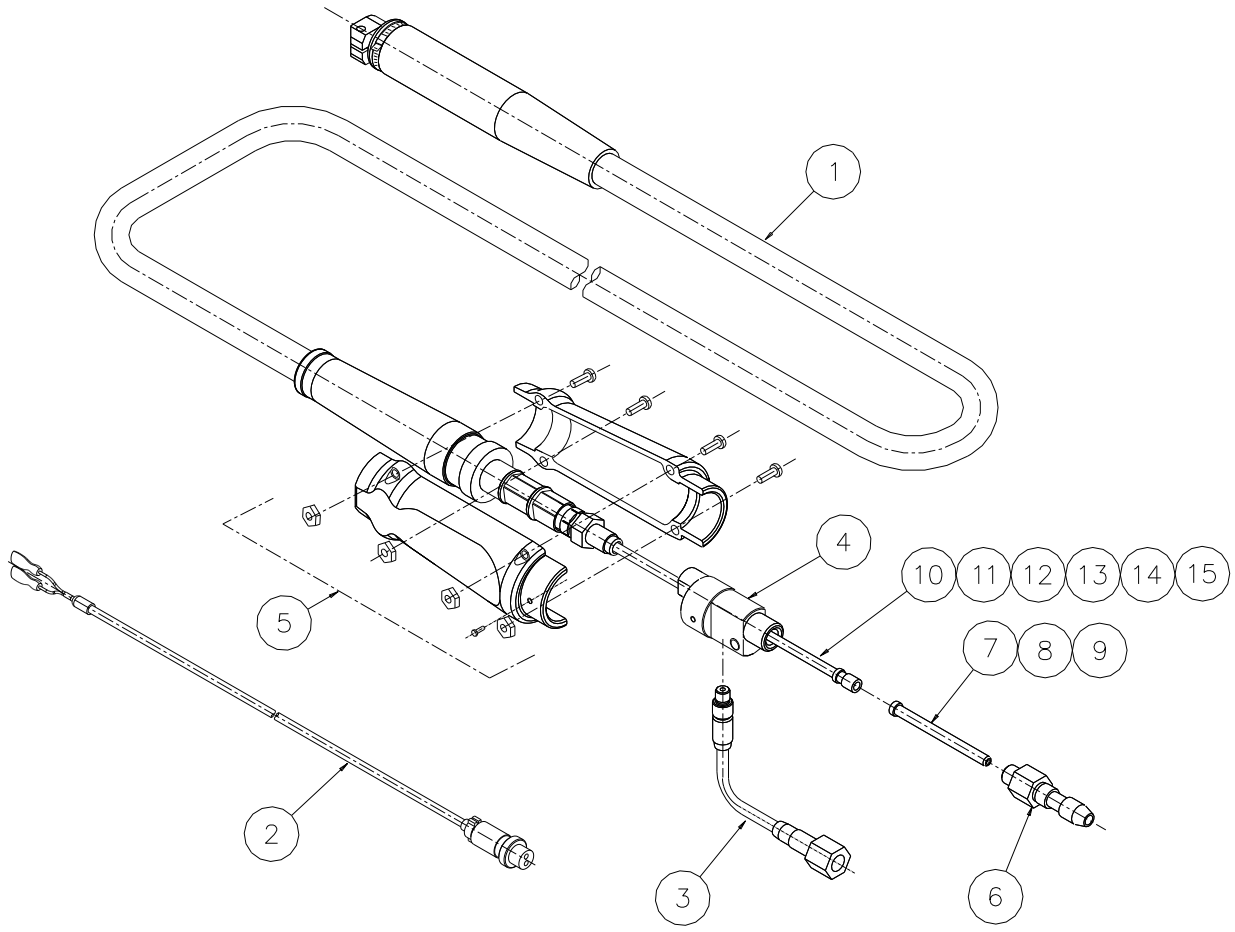


Fig.9.12 Exploded diagram for the coaxial power cable (For A type, V type manipulator)

Table 9.12 Parts list for the coaxial power cable (For B4 type manipulator)

№	Part No.	Item	Qt.	Remarks
1	L10638B00	Power cable ASSY	1st	For NB4(S)
	L10641B00	Power cable ASSY	1st	For NB4L(S)
2	L10110C00	Connection ASSY	1st	
2-1	L10110C01	Connection	(1)	
2-2	KQ2L08-01S	Elbow	(1)	(SMC)
3	L10638D00	Cable cover ASSY	1st	For NB4(S)
	L10641D00	Cable cover ASSY	1st	For NB4L(S)
4	L7810D05	Guide adaptor	1	
5	U69B34	Outlet guide (0.9~1.2)	1	
6	U69B35	Outlet guide (1.2~1.6)	(1)	Option
7	U2770K01	Outlet guide (0.8)	(1)	Option
8	L6611D02	Liner (0.9～1.2)	1	
9	L6611D01	Liner (1.2～1.6)	(1)	Option
10	L6611D03	Liner (0.8～0.9)	(1)	Option
11	L10666F00	Shock sensor cable (5)	1st	For NB4(S)
12	L10666K00	Shock sensor cable (9)	1st	For NB4L(S)

№	Part No.	Item	Qt.	Remarks
【For the maintenance of Shock sensor cable】				
11	L10638F00	Shock sensor cable (For maintenance)	1st	For NB4(S)
	L10641F00	Shock sensor cable (For maintenance)	1st	For NB4L(S)

Note) When the shock sensor cable is replaced, purchase the shock sensor cable for maintenance.
The SUMITUBE and the cable tie for the installation are contained in the shock sensor cable for maintenance.

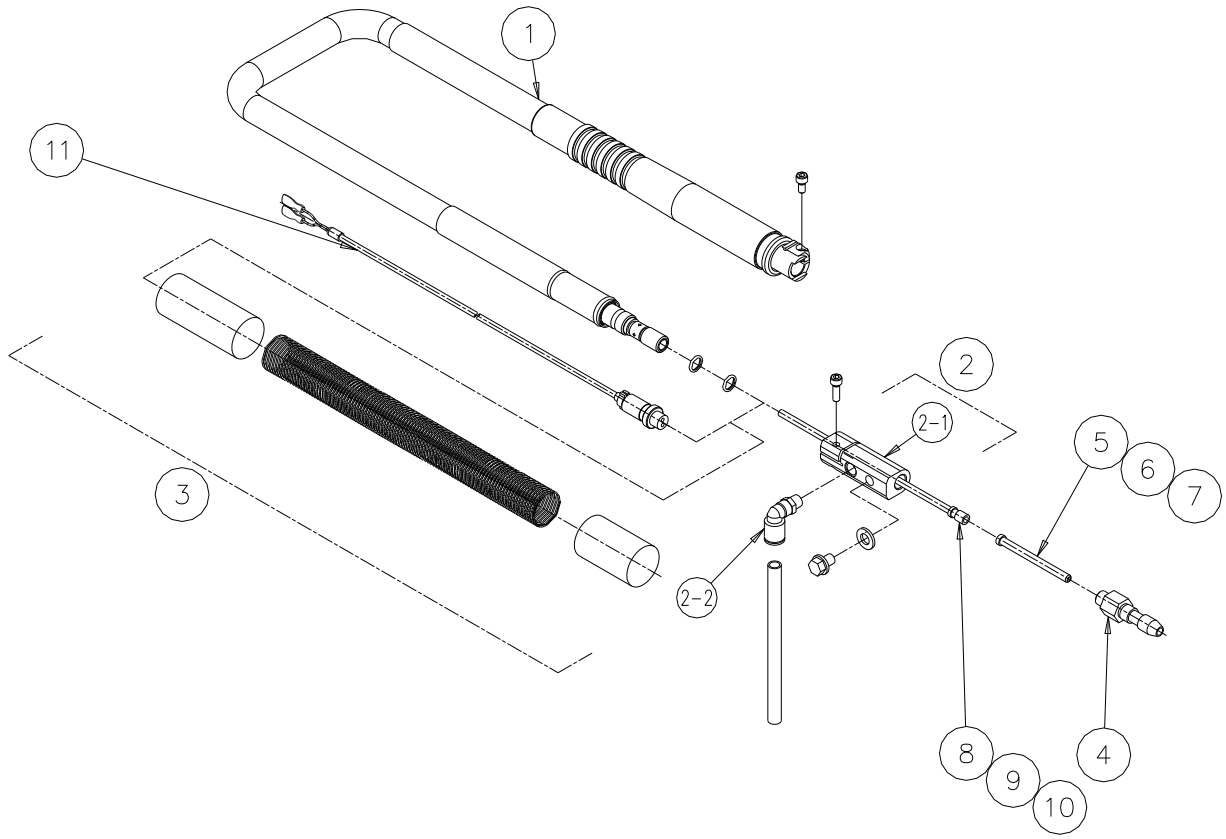


Fig.9.13 Exploded diagram for the coaxial power cable (For B4 type manipulator)

Table 9.13 Parts list for the coaxial power cable (For B4 type manipulator [DL power supply, M350L or P500L])

№	Part No.	Item	Qt.	Remarks
1	L10638B00	Power cable ASSY	1st	For NB4(S)
	L10641B00	Power cable ASSY	1st	For NB4L(S)
2	L10110C00	Connection ASSY	1st	
2-1	L10110C01	Connection	(1)	
2-2	KQ2L08-01S	Elbow	(1)	(SMC)
3	L10638D00	Cable cover ASSY	1st	For NB4(S)
	L10641D00	Cable cover ASSY	1st	For NB4L(S)
4	L7810D05	Guide adaptor	1	
5	U69B34	Outlet guide (0.9~1.2)	1	
6	U69B35	Outlet guide (1.2~1.6)	(1)	Option
7	U2770K01	Outlet guide (0.8)	(1)	Option
8	L6611D02	Liner (0.9~1.2)	1	
9	L6611D01	Liner (1.2~1.6)	(1)	Option
10	L6611D03	Liner (0.8~0.9)	(1)	Option
11	L10666F00	Shock sensor cable	1st	For NB4(S)
	L10666K00	Shock sensor cable	1st	For NB4L(S)
12	L10667D00	Voltage detection cable	1st	For NB4(S)
	L10667J00	Voltage detection cable	1st	For NB4L(S)

№	Part No.	Item	Qt.	Remarks
【For the maintenance of shock sensor cable】				
11	L10638F00	Shock sensor cable (For maintenance)	1st	For NB4(S)
	L10641F00	Shock sensor cable (For maintenance)	1st	For NB4L(S)
【For the maintenance of voltage detection cable】				
12	L10648G00	Voltage detection cable (For maintenance)	1st	For NB4(S)
	L10651G00	Voltage detection cable (For maintenance)	1st	For NB4L(S)

Note) When the shock sensor cable and the voltage detection cable are replaced, purchase the one for maintenance.
The SUMITUBE and the cable tie for the installation are contained in the one for maintenance.

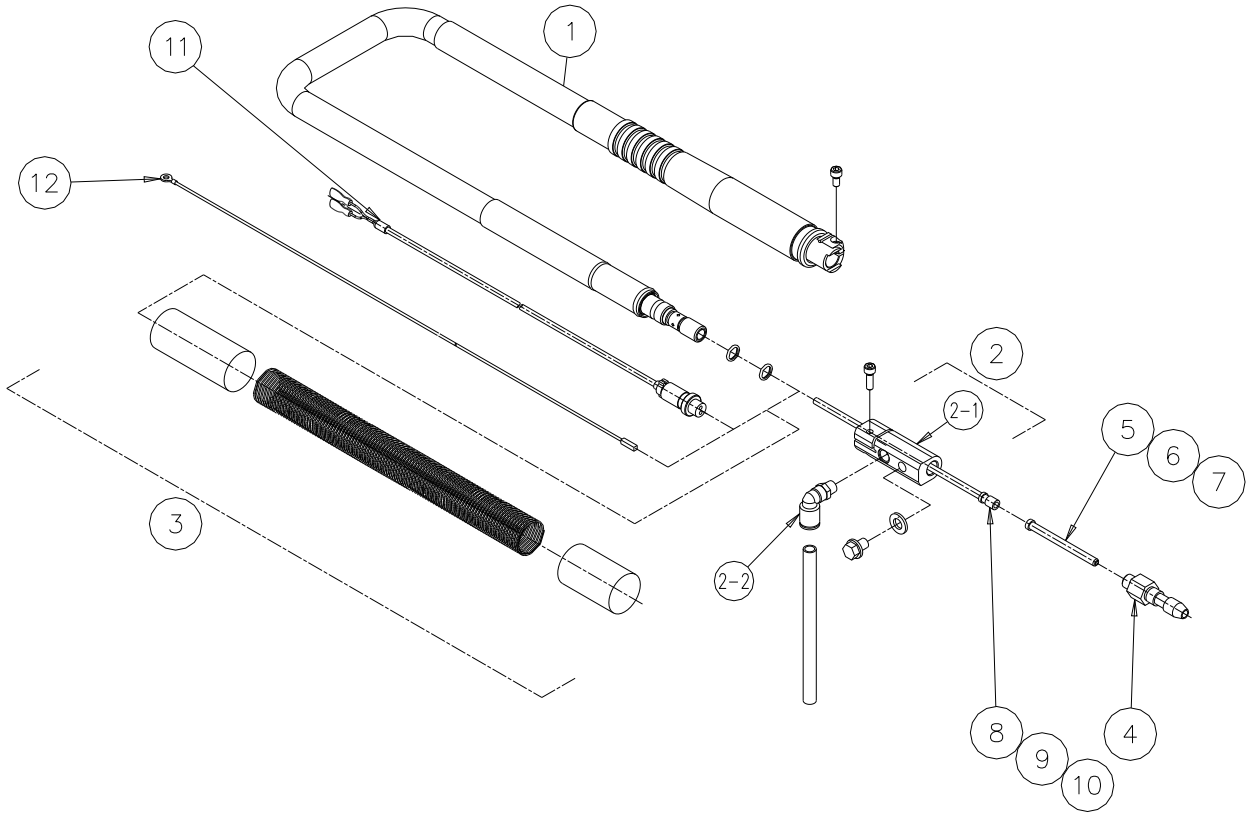


Fig.9.14 Exploded diagram for the coaxial power cable
(For B4 type manipulator [DL power supply, M350L or P500L])

Table 9.14 Parts list for the coaxial power cable (For B6 type manipulator)

№	Part No.	Item	Qt.	Remarks
1	L11713B00	Power cable ASSY	1st	For NB6
	L11845B00	Power cable ASSY	1st	For NB6L
2	L10110C00	Connection ASSY	1st	
2-1	L10110C01	Connection	(1)	
2-2	KQ2L08-01S	Elbow	(1)	(SMC)
3	L11713D00	Cable cover ASSY	1st	For NB6
	L11845C00	Cable cover ASSY	1st	For NB6L
4	L7810D05	Guide adaptor	1	
5	U69B34	Outlet guide (0.9~1.2)	1	
6	U69B35	Outlet guide (1.2~1.6)	(1)	Option
7	U2770K01	Outlet guide (0.8)	(1)	Option
8	L6611D02	Liner (0.9～1.2)	1	
9	L6611D01	Liner (1.2～1.6)	(1)	Option
10	L6611D03	Liner (0.8～0.9)	(1)	Option
11	L10666F00	Shock sensor cable (5)	1st	For NB6
	L10666L00	Shock sensor cable (10)	1st	For NB6L

№	Part No.	Item	Qt.	Remarks
【For the maintenance of Shock sensor cable】				
11	L10638F00	Shock sensor cable (For maintenance)	1st	For NB6
	L11845F00	Shock sensor cable (For maintenance)	1st	For NB6L

Note) When the shock sensor cable is replaced, purchase the shock sensor cable for maintenance.
The SUMITUBE and the cable tie for the installation are contained in the shock sensor cable for maintenance.

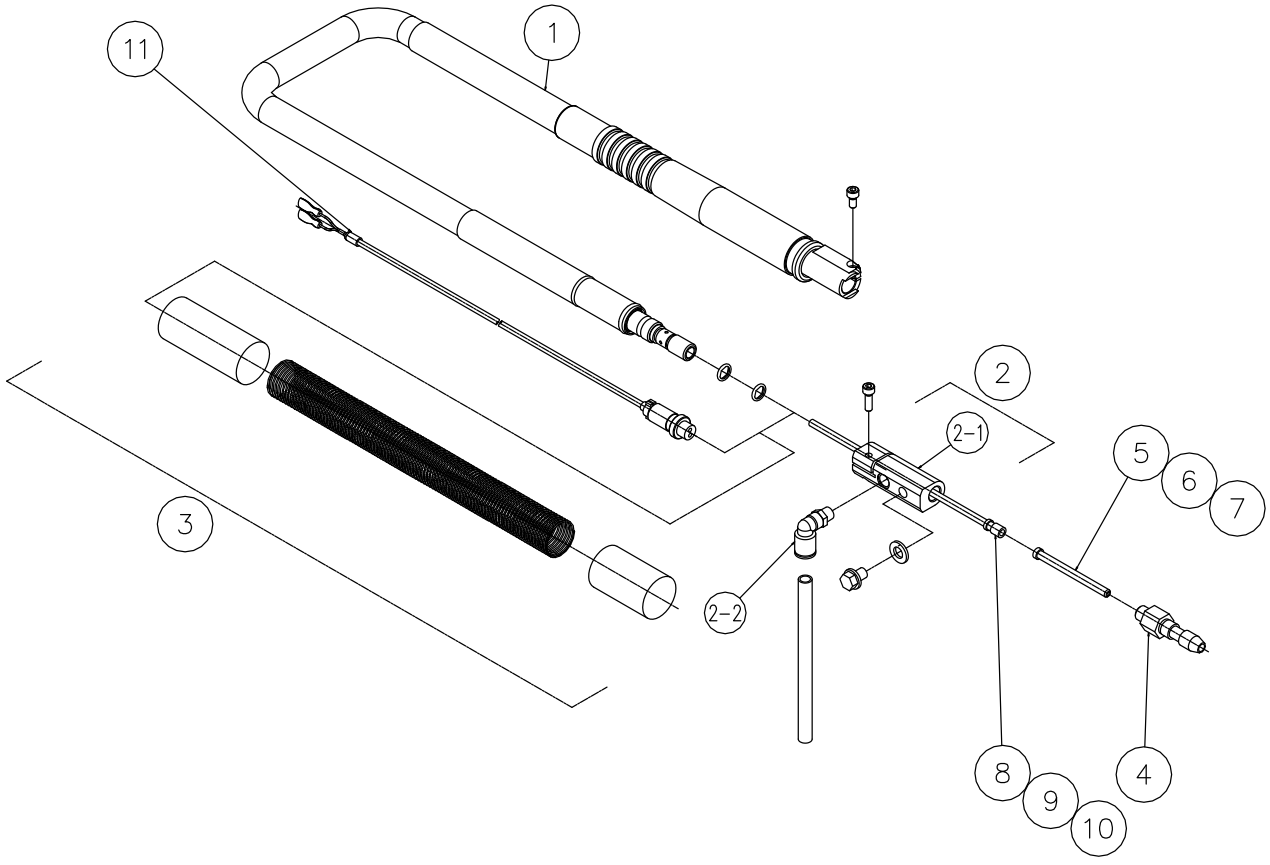


Fig.9.15 Exploded diagram for the coaxial power cable (For B6 type manipulator)

Table 9.15 Parts list for the coaxial power cable (For B6 type manipulator [DL W.P.S])

№	Part No.	Item	Qt.	Remarks
1	L11713B00	Power cable ASSY	1st	For NB6
	L11845B00	Power cable ASSY	1st	For NB6L
2	L10110C00	Connection ASSY	1st	
2-1	L10110C01	Connection	(1)	
2-2	KQ2L08-01S	Elbow	(1)	(SMC)
3	L11713D00	Cable cover ASSY	1st	For NB6
	L11846C00	Cable cover ASSY	1st	For NB6L
4	L7810D05	Guide adaptor	1	
5	U69B34	Outlet guide (0.9~1.2)	1	
6	U69B35	Outlet guide (1.2~1.6)	(1)	Option
7	U2770K01	Outlet guide (0.8)	(1)	Option
8	L6611D02	Liner (0.9~1.2)	1	
9	L6611D01	Liner (1.2~1.6)	(1)	Option
10	L6611D03	Liner (0.8~0.9)	(1)	Option
11	L10666F00	Shock sensor cable(5)	1st	For NB6
	L10660L00	Shock sensor cable(10)	1st	For NB6L
12	L10667E00	Voltage detection cable	1st	For NB6
	L11846E00	Voltage detection cable	1st	For NB6L

№	Part No.	Item	Qt.	Remarks
【For the maintenance of shock sensor cable】				
11	L10638F00	Shock sensor cable (For maintenance)	1st	For NB6
	L11845F00	Shock sensor cable (For maintenance)	1st	For NB6L
【For the maintenance of voltage detection cable】				
12	L11713E00	Voltage detection cable (For maintenance)	1st	For NB6
	L11846F00	Voltage detection cable (For maintenance)	1st	For NB6L

Note) When the shock sensor cable and the voltage detection cable are replaced, purchase the one for maintenance.
The SUMITUBE and the cable tie for the installation are contained in the one for maintenance.

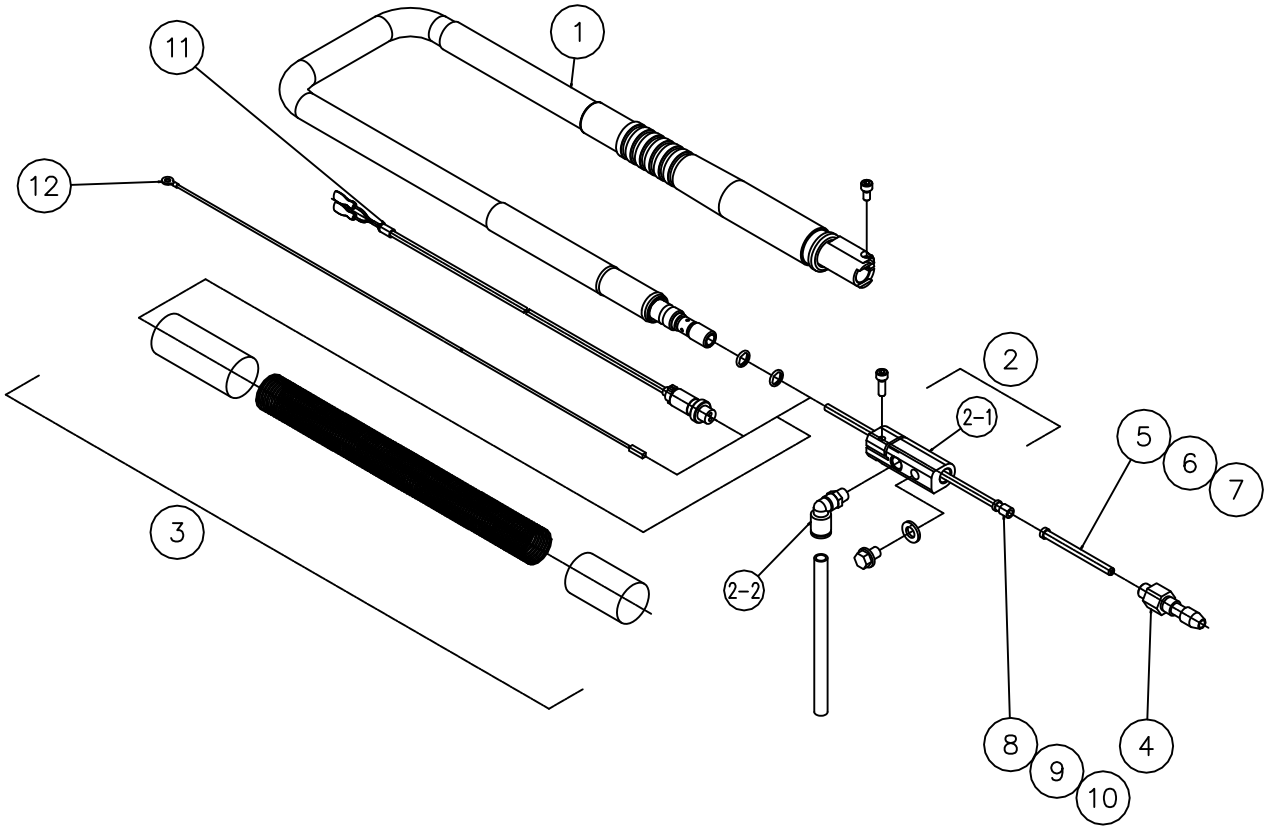


Fig.9.16 Exploded diagram for the coaxial power cable
(For B6 type manipulator [DL power supply, M350L or P500L])

Instruction Manual for CO_2/MAG Welding Torch

RT3500S／H／L　RT5000S／H／L
RTW5000S／H／L　RZ3500S／H／L
RZ3510S／H／L　RZW5000S／H／L

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DAIHEN Corporation
4-1, Koyocho-nishi, Higashinada-ku, Kobe, Hyogo 658-0033, Japan
Phone: +81-78-275-2006, Fax: +81-78-845-8159

DAIHEN Inc.
1400 Blauser Drive Tipp City, Ohio 45371, USA
Phone: +1-937-667-0800, Fax: +1-937-667-0885

OTC DAIHEN EUROPE GmbH
Krefelder Strasse 677, D-41066 Mönchengladbach, Germany
Phone: +49-2161-694970, Fax: +49-2161-6949761

DAIHEN VARSTROJ welding cutting and robotics d.d.
Industrijska ulica 4, 9220 Lendava - Lendva, Slovenija
Phone: +386-25-788-826, Fax: +386-25-751-277

OTC Industrial (Shanghai) Co.,Ltd.
6F, Building B,ORIENTO Plaza, 388 North Fuquan Road,
Changning District,Shanghai, China 200335
Phone: +86-21-5882-8633, Fax: +86-21-5882-8846

OTC (Taiwan) Co.,Ltd.
2F No.153, Huanbei Rd., Chung Li City, Taoyuan Hsien, Taiwan
Phone: +886-3-461-3962, Fax: +886-3-434-2394

OTC DAIHEN Asia Co.,Ltd.
23/43, 16th F1.Sorachai Building, 23 Soi 63 Sukhumvit Road,
Klongtonnua, Wattana, Bangkok 10110, Thailand
Phone: +66-2-714-3201, Fax: +66-2-714-3204

OTC DAIHEN INDIA PVT.LTD.
V. M. TOWER, Plot No. 54A, Ground Floor Unit-1,
Sector-18, Gurgaon-122015 Haryana, India
Phone:+91 124-4239368, +91 124-4239364

PT.OTC DAIHEN INDONESIA
Blok G1A-20, Jl. Kenari ll, Delta Silicon V,
Lippo Cikarang Industrial Park, Bekasi 17550 Indonesia
Phone:+6221-2957-7566, Fax:+6221-2957-7567

DAIHEN Korea Co., Ltd.
85, Hyeongoksandan-ro, Cheongbuk-myeon, Pyeongtaek-si, Gyeonggi-do, 451-831,Korea.
Phone: +82-31-686-7459, Fax: +82-31-686-7465

Upon contact, advise MODEL and MANUAL NO.

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