For TIG welding

Welding Torch for Robot Power Cable Hose

< Shock sensor built-in >

MWX-2001 type
MWXC-2001 type
MWX-3501 type
MWXC-3501 type

INSTRUCTION MANUAL

= Safety and Operation =

Instruction Manual No.
1L7620-E-1

First thoroughly read this instruction manual to operate the unit correctly.

- Installation, maintenance, and repair of this welding torch shall be made by qualified persons or persons who fully understand this welding equipment to secure the safety.
- To secure the safety, operation of this welding equipment shall be made by persons who have knowledge and technical skill to fully understand the contents of this manual and handle the equipment.
- Regarding safety education, utilize courses and classes held by head/branch offices of the W elding 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 necessary.
- 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 this 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.:  IMPORTANT : The sign “IMPORTANT” indicates special instructions necessary for the most efficient operation.

IMPORTANT SAFEGUARDS

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.

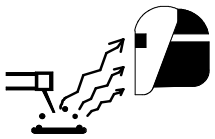
2.2 Observe the following to prevent electric shock.

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

8) 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.
9) Do not touch live electrical parts.
10) Always wear dry insulating gloves and other body protection. Do not wear torn or wet gloves/ work clothes.
11) 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.
12) Do not use cables with insufficient capacity, with damage, or with naked conductors.
13) Be sure to tighten the connections of cables and insulate them in order to prevent personnel from touching those parts easily.
14) DO NOT use a welding machine with its case or cover removed.
15) 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.
16) Make periodic inspection and maintenance. Damaged parts should be repaired before use.
17) Turn off POWER switch when not in use.

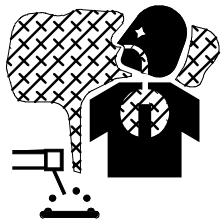
IMPORTANT SAFEGUARDS (continued)

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.

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.

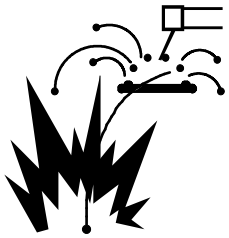
1) KEEP YOUR HEAD out of fumes and DO NOT inhale any.
2) USE FORCED EXHAUST VENTILATION at the arc.
3) VENTILATE the area to prevent build-up of fumes and gases.
4) If ventilation is insufficient, USE APPROVED BREATHING DEVICES.
5) READ AND FOLLOW WARNING LABELS on all containers of welding materials.
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 SAFEGUARDS (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.

IMPORTANT SAFEGUARDS (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.

NOTES ON USE

3. Notes on Use

3.1 Cooling water

⚠ CAUTION	● Be sure to flow 1.2l/min or more of cooling water. (The water pressure at the torch inlet shall be 0.1 ~ 0.3MPa or higher.) Insufficient amount of running water may lead to damage of torch.

- Do not use the water-cooling torch with air cooling.
- Do not use a leaky welding torch as you may get an electric shock.

⚠ CAUTION	● Before use, make sure that the electrode is stuck out of the nozzle tip by 5 ~ 10mm. The nozzle may get damaged by arc heat if the electrode tip remains inside the nozzle.

3.2 Cable hose

⚠ CAUTION	● Do not let cable hoses touch any heated part of the welded, put something heavy on top nor bend them excessively because the welding torch might become damaged.

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	● When grinding the electrode, be sure to wear the protective glasses to protect your eyes.

- When you perform the grinding operation, follow the safety measures for grinder or electrode grinding machine.

⚠ CAUTION	● Be sure to turn off the servo power of the robot before replacing or cleaning the parts (replacement of electrode, torch, etc.).

This instruction manual describes the operation and maintenance of DAIHEN TIG Welding Torch. Before using your torch, carefully read and understand the entire contents of this manual so as to handle and operate the torch properly and safely. Before operating the torch, be sure to read OPERATION.

Note 1 : The contents of this instruction manual are subject to change without prior notice.

2 : This instruction manual has been prepared and printed properly and correctly to the best of our knowledge. Errors and omissions shall be excepted, and in any event, we shall not be held responsible therefore.

3 : This instruction manual shall not be reproduced in whole or in part, in any form or by any means whatsoever without prior permission.

Characteristics

- In an arc welding robot, welding torch may contact a workpiece or jig, deforming the welding torch or damaging the robot main unit. To prevent such accident in case external force exceeding a specified value is applied to the tip (nozzle) of the torch, a shock sensor is incorporated in this welding torch so as to clear the nozzle by external force and output external force detection signal while the nozzle is being cleared, thereby enabling the robot main unit to stop immediately.
- Double collet is used for providing high electrode holding force and stabilized feeding.
- Rear collet body assembly can be separated from the torch main unit. To reduce the electrode replacement time, prepare two or more rear collet body assemblies equipped with new electrodes.
- Wire extension can be easily set when an option electrode adjusting gauge is used.

Operation

① Specifications

This torch is used for automatic TIG welding with alternating current and direct current.

Table 1.1 Specifications

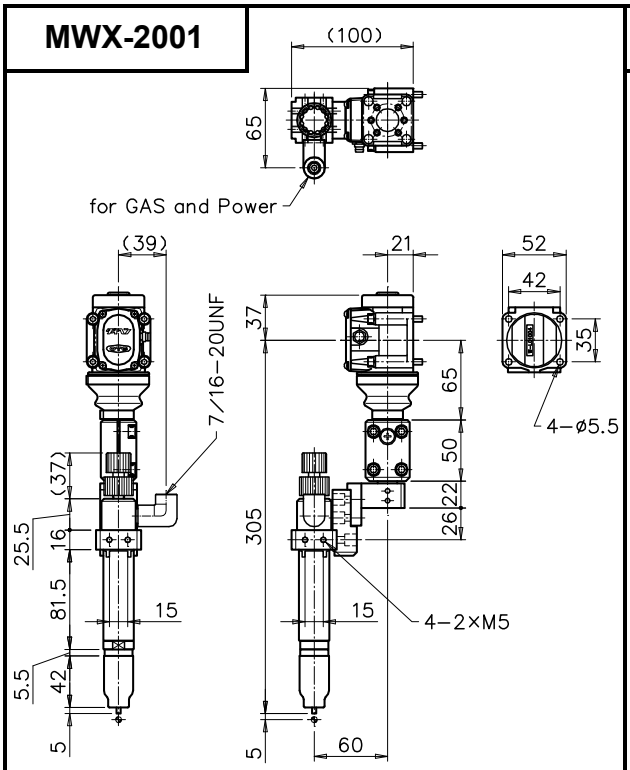
Type		MWX-2001	MWXC-2001	MWX-3501	MWXC-3501
Welding method		TIG welding			
Max. applicable current	DC (positive electrode)	200A		350A	
	AC	160A		300A	
Duty cycle		50%		100%	
Gas in use		Argon gas			
Materials of electrode		Cerium tungsten electrode (Thoriated tungsten, pure tungsten)			
Electrode in use		(φ0.5)、(φ1.0)、(φ1.6)、(φ2.0)、φ2.4、(φ3.0)、(φ3.2)、(φ4.0)		(φ0.5)、(φ1.0)、(φ1.6)、(φ2.0)、(φ2.4)、(φ3.0)、**φ3.2**、(φ4.0)	
Cooling method		Air cooled type		Water cooled type	
Torch shape		Offset type	Angle type	Offset type	Angle type
Applicable cable (cable length)		L7623E(6m)、L7623J(10m)		L7633E(6m)、L7633J(10m)	
Shock sensor		Built-in type			

Note: 1. Options need to be purchased for the electrode sizes in parenthesis.
For details, see Chapter 13.

2. When using MWX-3501 and MWXC-3501 water cooled type torch, water pump (PU301, PU202) need to be purchased in addition to this torch.

3. Power cable hose need to be purchased. For details, see Chapter 13.

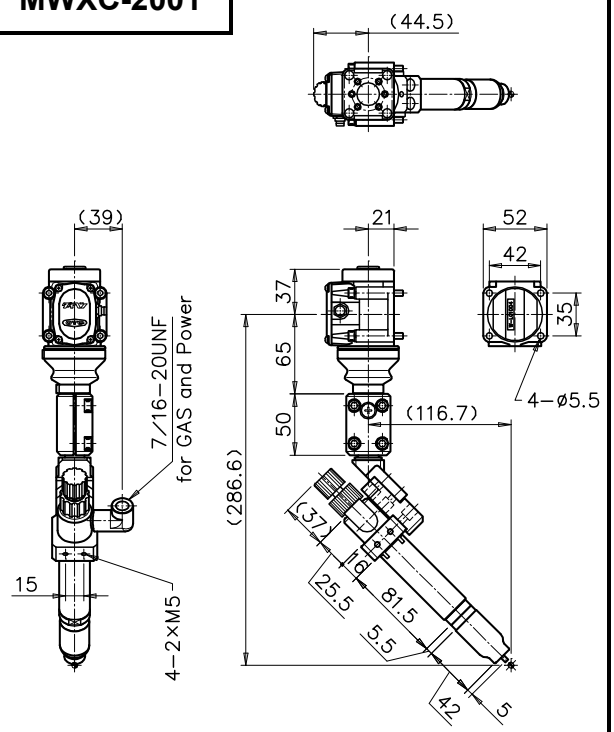
MWX-2001



Weight 1.62 [kg]【2.22 [kg]】

Outline drawing of air cooled 200A offset type TIG torch with a shock sensor

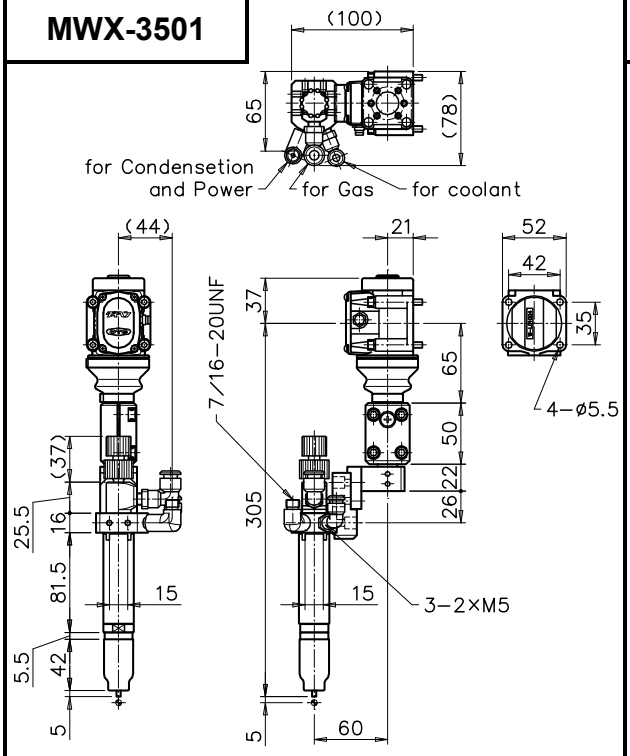
MWXC-2001



Weight 1.58 [kg]【2.18 [kg]】

Outline drawing of air cooled 200A angle type TIG torch with a shock sensor

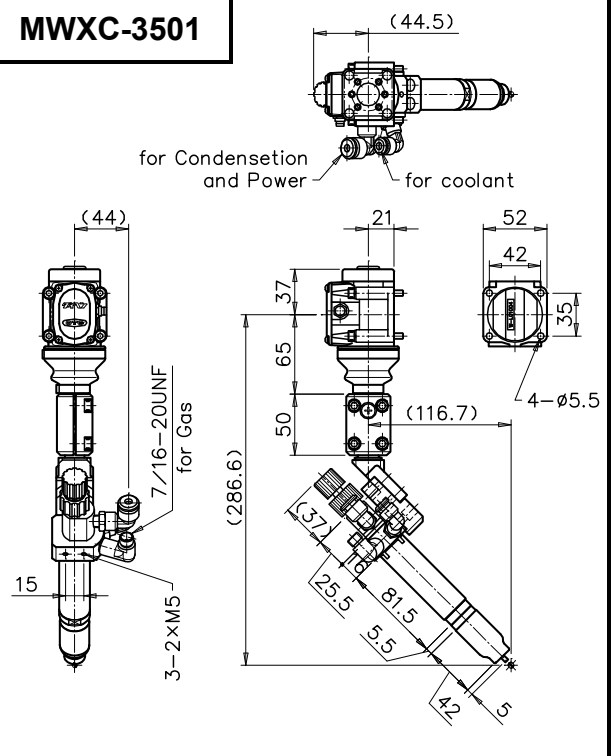
MWX-3501



Weight 1.56 [kg]【2.16 [kg]】

Outline drawing of water cooled 350A offset type TIG torch with a shock sensor

MWXC-3501



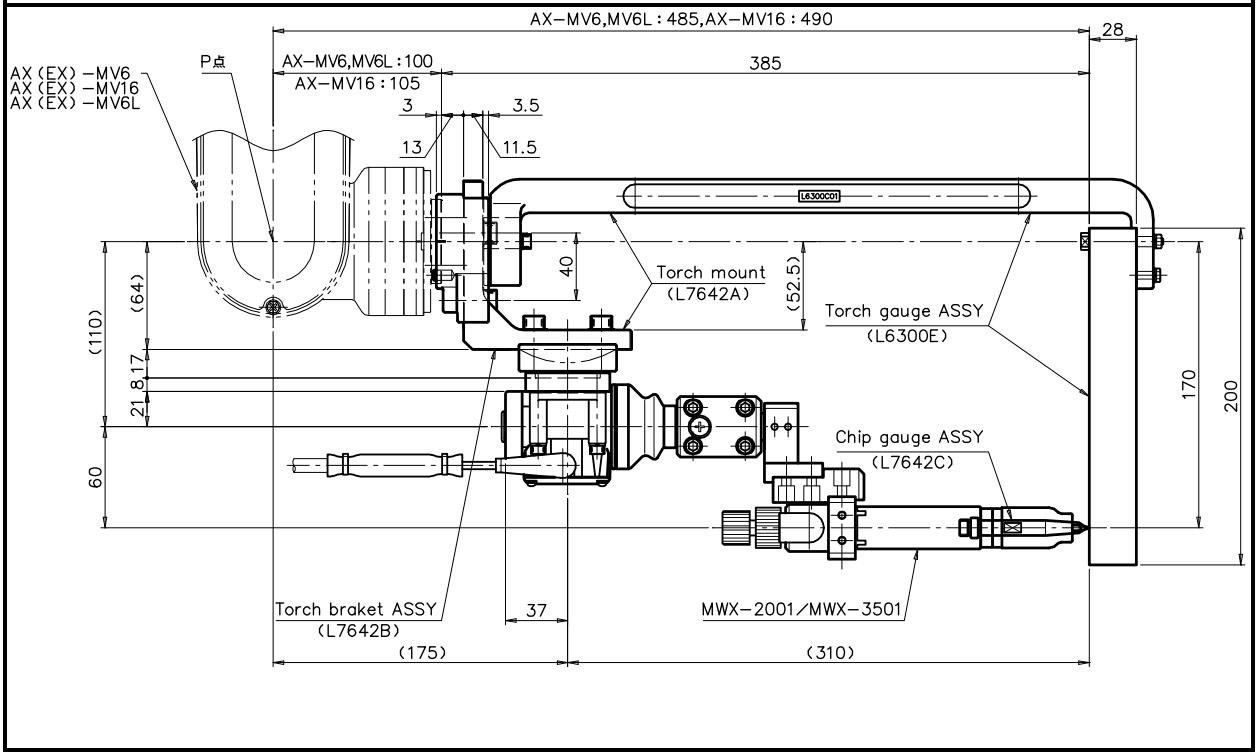
Weight 1.52 [kg]【2.12 [kg]】

Outline drawing of water cooled 350A angle type TIG torch with a shock sensor

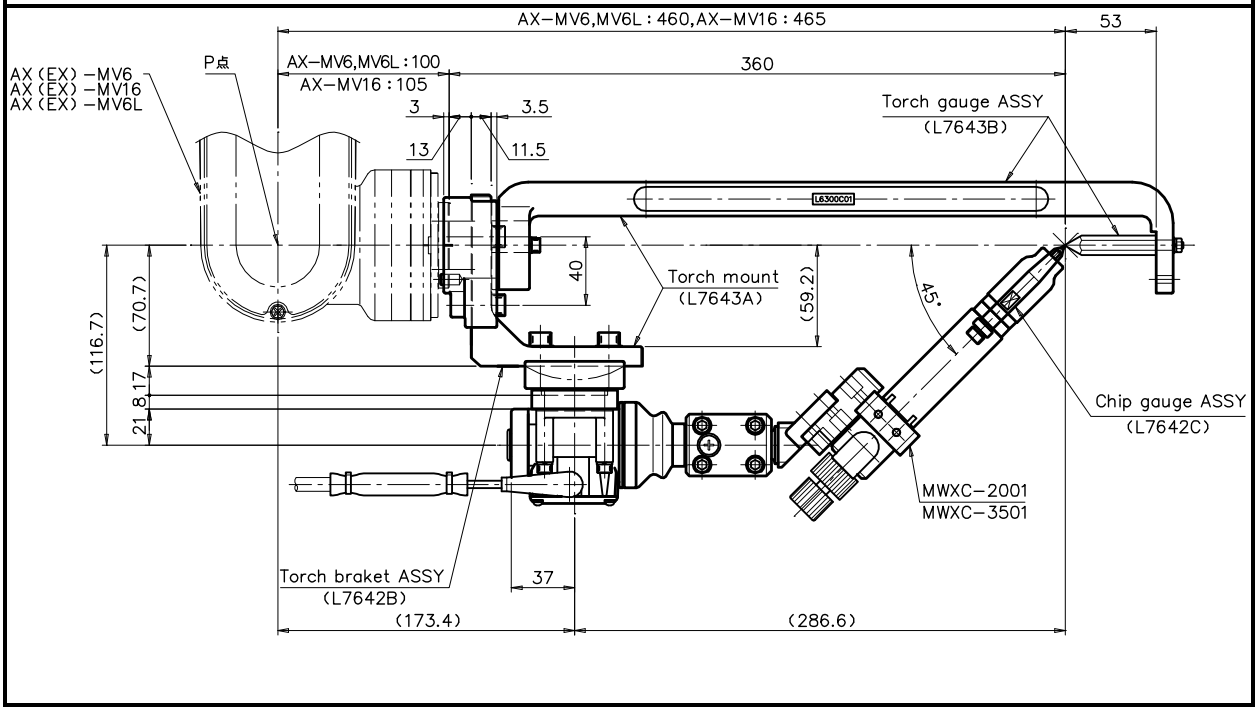
Note: Mass in [(Kg)] is a value when the torch bracket assembly (L7642B) is installed.

Fig. 1.1 Outline Drawing (1) Unit (mm)

Offset type torch 【MWX-2001/3501】＋ torch mount【L7642A】



Angle type torch【MWXC-2001/3501】 ＋ torch mount【L7643A】



Note: This drawing shows a robot equipped with a torch and torch mount.
(Manipulator: AX(EX)-MV6, 6L, 16)

Fig. 1.2 Outline Drawing (2)　Unit (mm)

② Checking the Contents of Package

Make sure that the following items are included when you unpack.

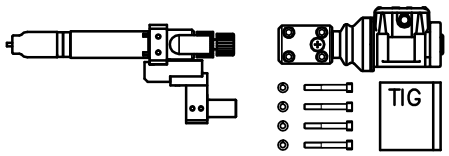
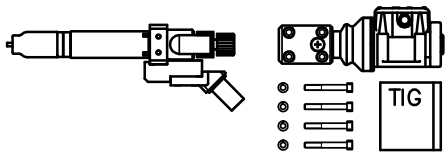
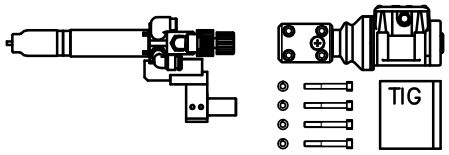
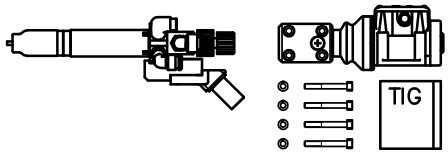
MWX-2001	MWXC-2001
 Shock sensor unit ····· 1set Welding torch/Angle bracket (1) ····· 1set Mounting bolt (M5×40) ····· 4 Spring washer (M5) ····· 4 Instruction manual (1L7620-J) ····· 4	 Shock sensor unit ····· 1set Welding torch/Angle bracket (2) ····· 1set Mounting bolt (M5×40) ····· 4 Spring washer (M5) ····· 4 Instruction manual (1L7620-J) ····· 4
MWX-3501	**MWXC-3501**
 Shock sensor unit ····· 1set Welding torch/Angle bracket (1) ····· 1set Mounting bolt (M5×40) ····· 4 Spring washer (M5) ····· 4 Instruction manual (1L7620-J) ····· 4	 Shock sensor unit ····· 1set Welding torch/Angle bracket (2) ····· 1set Mounting bolt (M5×40) ····· 4 Spring washer (M5) ····· 4 Instruction manual (1L7620-J) ····· 4

Fig. 2.1 Assembly

③ Mounting/Adjusting Torch and Connecting Shock Sensor Cable

3.1 Mounting Torch Bracket Assembly

Torch bracket assembly (L7642B) corresponds to all four types of torch [MWX(C)-2001/MWX(C)-3501].

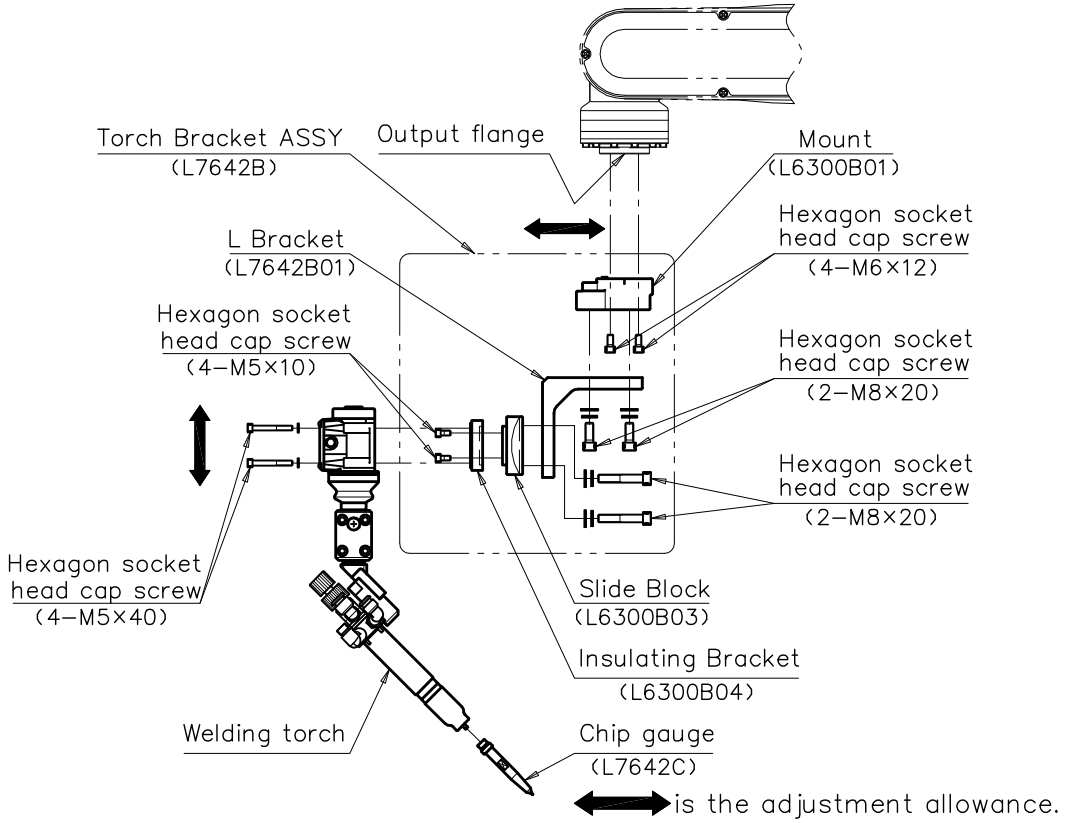


Fig.3.1 Mounting Torch Bracket Assembly

3.2 Mounting Torch Gauge Assembly/Chip Gauge Assembly

Torch gauge assembly varies depending on the torch shape (offset type/angle type).

See Table 3.1 and use the torch gauge assembly corresponding to each torch.

Chip gauge assembly corresponds to all four types of torch [MWX(C)-2001/MWX(C)-3501].

Table 3.1 Correspondence between Torch Type/Model and Torch Gauge Assembly

Torch type	Model	Torch gauge assembly
Offset	MWX-2001, MWX-3501	L6300E
Angle	MWXC-2001, MWXC-3501	L7643B

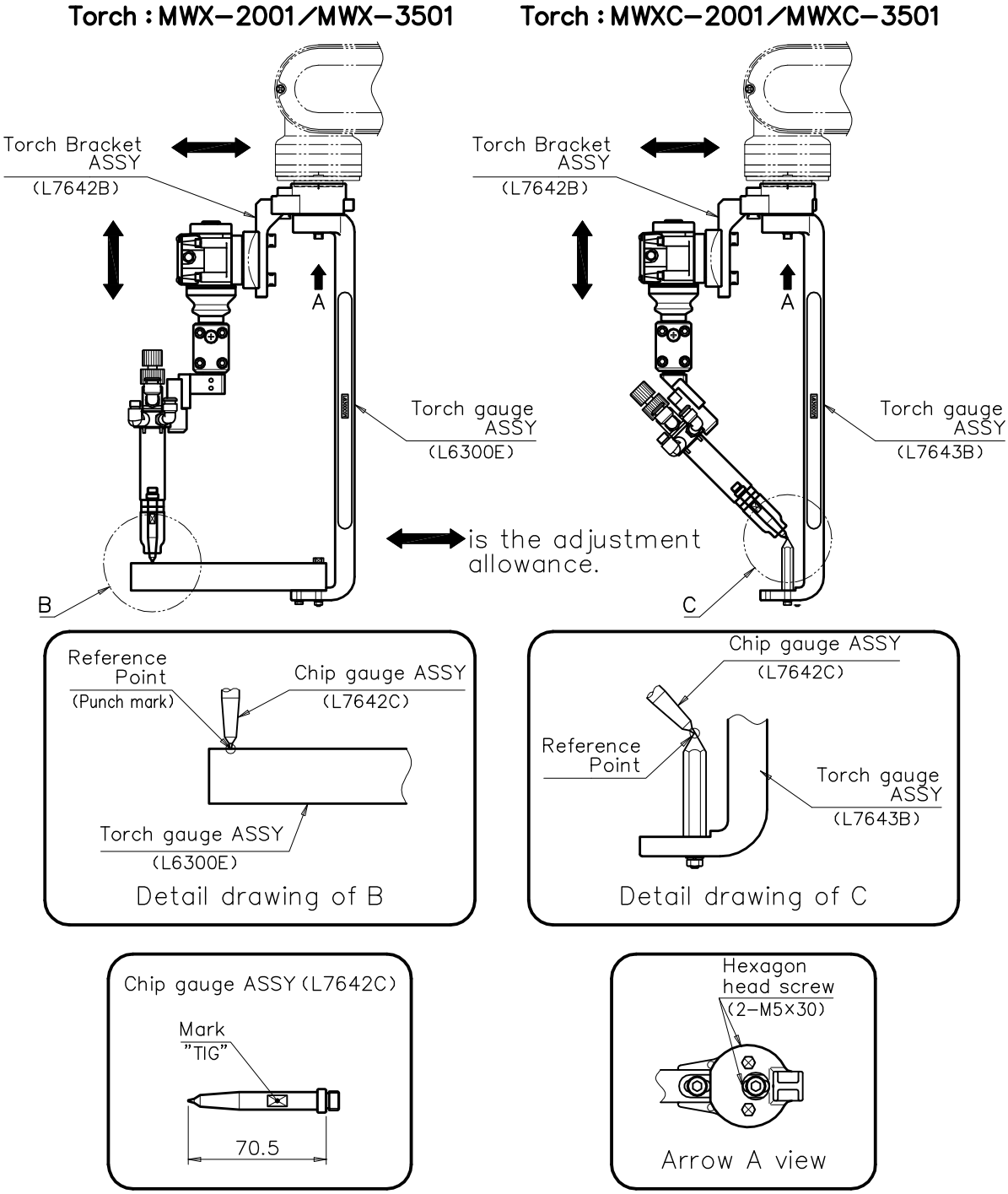


Fig. 3.2 Mounting Torch Gauge Assembly/Chip Gauge Assembly

3.3 Adjusting Welding Torch

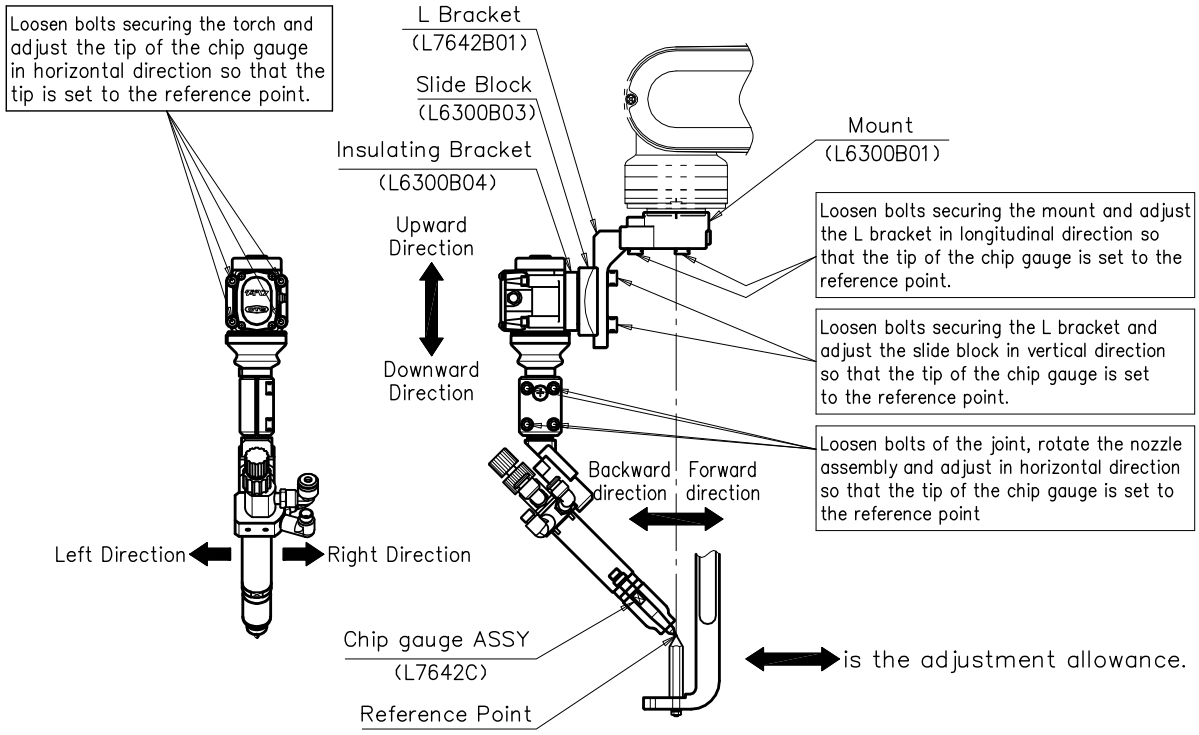


Fig. 3.3 Adjusting Welding Torch

Note: Adjustment method is the same for the offset type torch (MWX-2001/MWX-3501).

3.4 Connecting Shook Sensor Cable (Option)

To connect the shock sensor unit and the shock sensor cable (AX manipulator: L9195B, before AX manipulator: L6569A; option), an adapter cable (L6635B: option) is required.

Connect them as shown in Fig. 3.4.

For connection to the robot control, see the ***instruction manual (Installation and Maintenance) for Almega AX series***.

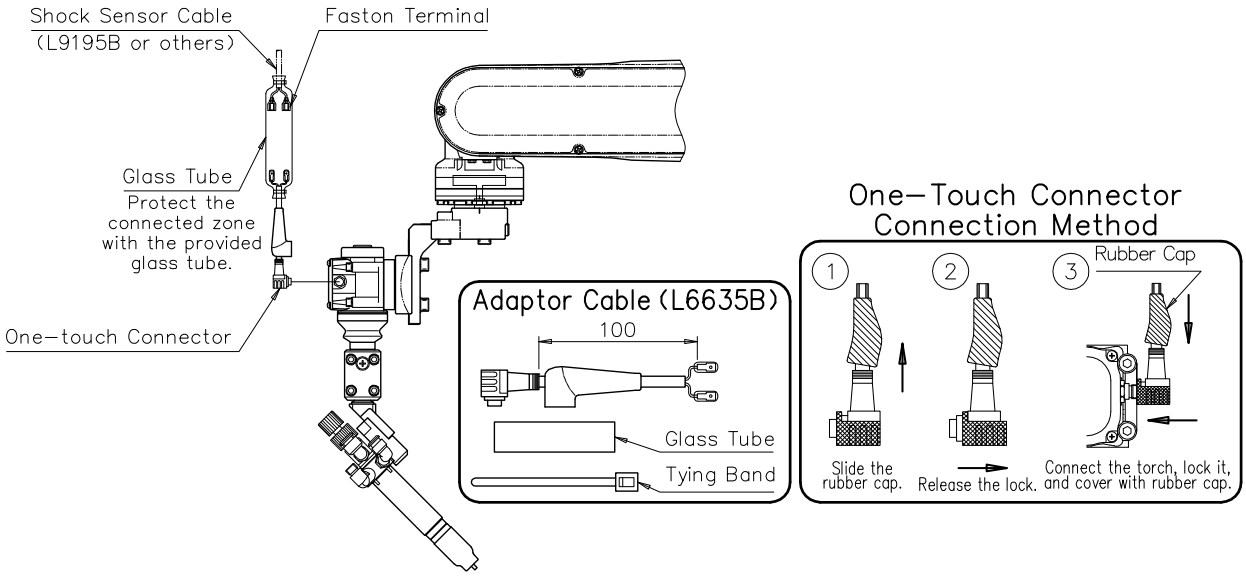


Fig. 3.4 Connecting Shock Sensor Cable (option)

④ Power Cable Hose (option)

4.1 Power Cable Hose

Power cable hose is available as an option item.

See Table 4.1 and select the cable suitable for your specifications.

Note that the power cable hoses are different depending on the water-cooled torch and air-cooled torch.

For details, see Chapter 13 Parts List. For outline drawing, see Fig. 4.1.

Table 4.1 Torch Power Cable

Applicable torch		Cable length	Part name	Part No.
Air-cooled type	MWX-2001 MWXC-2001	6m	Power cable hose 6M	L 7 6 2 3 E
		10m	Power cable hose 10M	L 7 6 2 3 J
Water-cooled type	MWX-3501 MWXC-3501	6m	Power cable hose 6M	L 7 6 3 3 E
		10m	Power cable hose 10M	L 7 6 3 3 J

Note: 1. For connection on the welding power side, see the instruction manual provided for the welding power in use.

2. Power cable hose of different length (power cable hose other than those of 6 meters and 10 meters long) will be manufactured individually. Contact our sales office or our agency.

4.2 With the use of D-series welding power supply

When using the D-series welding power supply (DA300P etc.), the torch adaptor is separately required.

Choose an appropriate torch adaptor according to the specification of torch referring to Table 4.2.

Note that the torch adaptor to be used varies according to the torch type, whether the water-cooled type or the air-cooled type. For the details, see the instruction manual for welding power supply.

Table4.2 Torch adaptor table

Applicable torch		Model of torch adaptor
Air-cooled type	MWX-2001 MWXC-2001	BBAWD-1701
Water-cooled type	MWX-3501 MWXC-3501	BBAWD-1801

(Note1) For the connection, see the instruction manual attached to the welding power supply in use.

IMPORTANT

When applying the D-series welding power supply, be sure to use the torch adaptor. Otherwise, no connection can be made with the welding power supply.

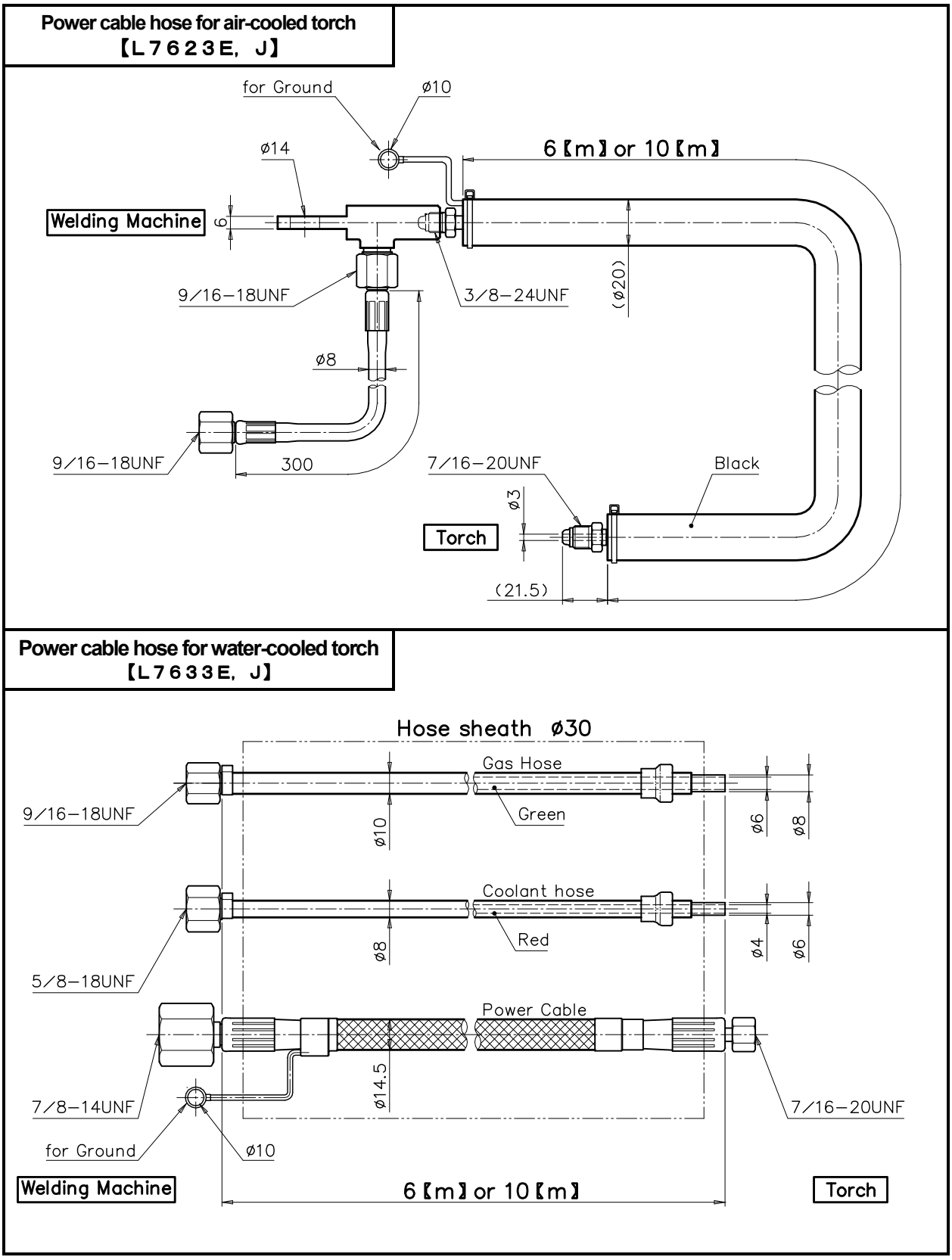


Fig. 4.1 Outline Drawing of Air-Cooled/Water-Cooled Power Cable Hose Unit (mm)

⑤ Wire Guide（Fe・SUS）/Wire Guide（AL）（option）

Wire guide is necessary for customers using TIG filler welding.

Wire guides are available for steel, stainless steel and aluminum

【L7724A：For steel • SUS／20 degrees or 30 degrees of filler inserting angle】
【L7725A：For aluminum／25 degrees or 30 degrees of filler inserting angle】

Bracket assembly (L7640B) is used in common regardless of filler inserting angle and wire diameter, but the part number of the wire guide assembly is different depending on the wire diameter and filler inserting angle.

See Table 5.1 and Table 5.2 and select the wire guide assembly suitable for specifications of the customer.

For details, see Parts List in Chapter 13.　For outline drawing, see Fig. 5.1.

Table 5.1 Bracket Assembly

Part No.	Part name	Remark
L7640**B**	Bracket assembly	Common to all wire guide assemblies

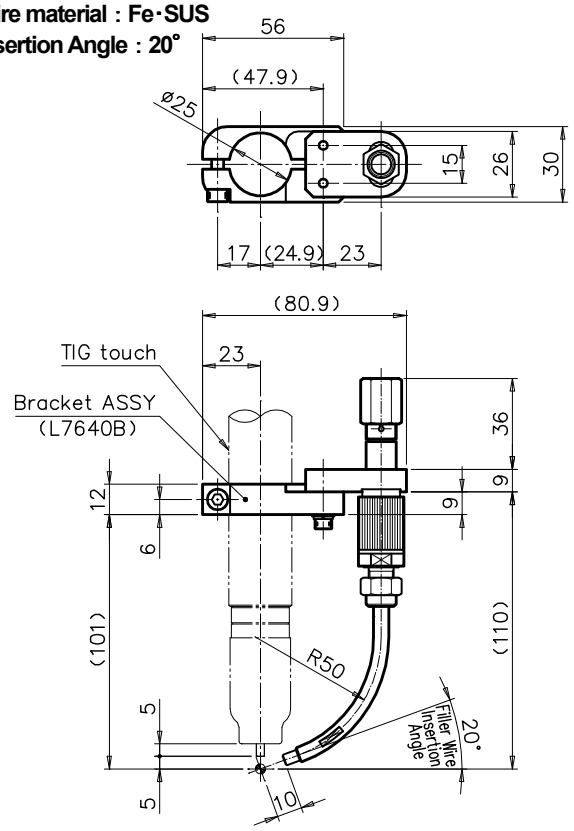
Table 5.2 Wire Guide Assembly（1）～(9) and Wire Used／Filler Wire Inserting Angle

Wire material	Used Wire (Inserting Angle／wire diameter)		Part name	Part No.	Mark				
					collet	guide	guide chip	chip	Inner linner
Fe･SUS	20°	φ0.8	Wire Guide ASSY (1)	L7724B	"1"	"1"	"0.8-1.2" /20	"1"	—
		φ0.9	Wire Guide ASSY (2)	L7724C				"2"	
		φ1.0	Wire Guide ASSY (3)	L7724D				"3"	
		φ1.2	Wire Guide ASSY (4)	L7724E				"5"	
		φ1.4	Wire Guide ASSY (5)	L7724F	"4"	"4"	"1.4-1.6" /20	"6"	
		φ1.6	Wire Guide ASSY (6)	L7724G				"7"	
	30°	φ0.8	Wire Guide ASSY (7)	L7724H	"1"	"1"	"0.8-1.2" /30	"1"	
		φ0.9	Wire Guide ASSY (8)	L7724J				"2"	
		φ1.0	Wire Guide ASSY (9)	L7724K				"3"	
		φ1.2	Wire Guide ASSY (10)	L7724L				"5"	
		φ1.4	Wire Guide ASSY (11)	L7724M	"4"	"4"	"1.4-1.6" /30	"6"	
		φ1.6	Wire Guide ASSY (12)	L7724N				"7"	
Aluminum	20°	φ0.8	Wire Guide ASSY (1)	L7725B	"1"	"1"	"0.8-1.2" /20	"2"	"1"
		φ0.9	Wire Guide ASSY (2)	L7725C				"3"	
		φ1.0	Wire Guide ASSY (3)	L7725D				"4"	
		φ1.2	Wire Guide ASSY (4)	L7725E				"6"	
		φ1.4	Wire Guide ASSY (5)	L7725F	"4"	"4"	"1.4-1.6" /20	"7"	"4"
		φ1.6	Wire Guide ASSY (6)	L7725G				"8"	
	30°	φ0.8	Wire Guide ASSY (7)	L7725H	"1"	"1"	"0.8-1.2" /30	"2"	"1"
		φ0.9	Wire Guide ASSY (8)	L7725J				"3"	
		φ1.0	Wire Guide ASSY (9)	L7725K				"4"	
		φ1.2	Wire Guide ASSY (10)	L7725L				"6"	
		φ1.4	Wire Guide ASSY (11)	L7725M	"4"	"4"	"1.4-1.6" /30	"7"	"4"
		φ1.6	Wire Guide ASSY (12)	L7725N				"8"	

Note: Part number and part name are stamped on collet, guide, guide chip and chip according to the wire diameter.
See the table above and check the stamped printing for conformance with that of your specifications.

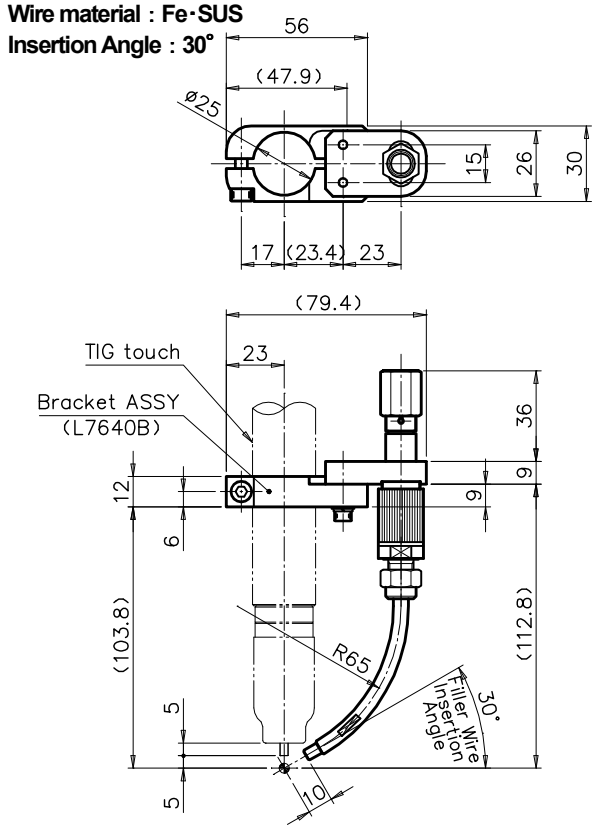
Wire Guide ASSY (1)～(6)【L7724B～L7724G】

Wire material : Fe･SUS
Insertion Angle : 20°



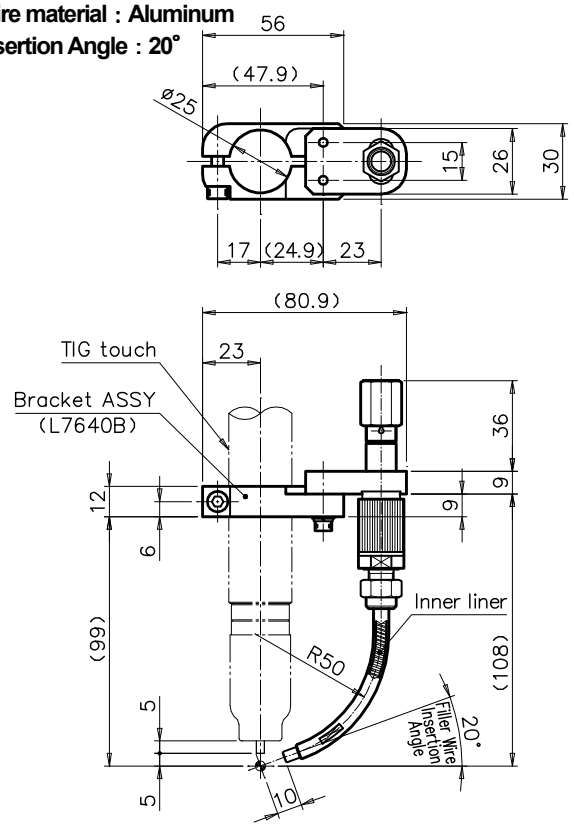
Wire Guide ASSY (7)～(12)【L7724H～L7724N】

Wire material : Fe･SUS
Insertion Angle : 30°



Wire Guide ASSY (1)～(6)【L7725B～L7725G】

Wire material : Aluminum
Insertion Angle : 20°



Wire Guide ASSY (7)～(12)【L7725H～L7725N】

Wire material : Aluminum
Insertion Angle : 30°

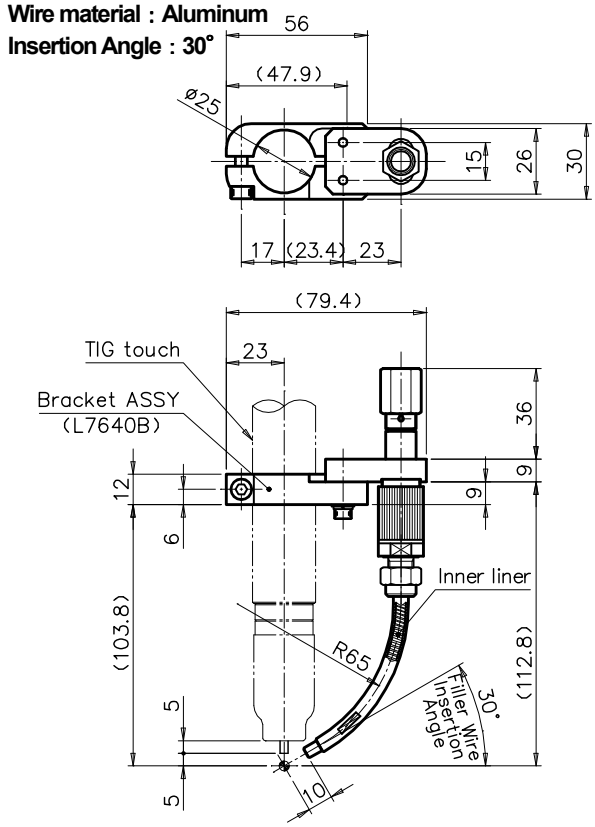


Fig. 5.1 Outline Drawing of Wire Guide (Fe・SUS)/Wire Guide (AL)　Unit (mm)

⑥ Conduit (option)

Customers using TIG filler welding requires a conduit (L7318B-C) for filler wire. Use the conduit in combination with the Wire Guide of Chapter 5. Part number of this conduit is different depending on the wire diameter in use. See Table 6.1 and select the conduit suitable for customer specifications.
For details, see Parts List in Chapter 13.

Table 6.1 Conduit – Applicable Robot/Wire Diameter in Use

Robot	Wire diameter in use	Nominal cable length	Part name	Part No.
AX(EX)V6, AX(EX)V6L AX(EX)V16	ϕ0.8	1.7m	Conduit (1)	L7318B
	ϕ0.9～ϕ1.2		Conduit (2)	L7318C
	ϕ1.6		Conduit (3)	L7318D

Note: Plastic liner (3.4 m) is inserted into this conduit. Cut the plastic liner to a desired length before use.

⑦ Setting the Robot Controller

7.1 Checking the Tool Parameter

On delivery of the robot, the data of the welding torch in use (tool parameter) have been set. For EX manipulator, it is not necessary to modify these data unless changing the torch and others. Just confirm that the following data have been already set.
For AX manipulator, on the other hand, modify the parameters according to the torch you use, referring to Table 7.3.

Table 7.1 Almega EX-V6, 16, 6L

Model	Parameter 1	Parameter 2	Parameter 3	Parameter 4	Parameter 5	Parameter 6
MWX-2001/3501	170	0.0	385	0.0	0.0	180
MWXC-2001/3501	0.0	0.0	360	-45	0.0	180

Table 7.2 Almega AX-V6, 16, 6L

Length			Angle			Gravity			Mass	Moment of inertia			Radius
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
0.0	0.0	400.0	180.0	-45.0	0.0	109.0	0.0	123.0	2.0	0.0	0.0	0.0	0.0

Table 7.3 Tool constants for Almega AX-V6, 16, 6L

For V-series	Length			Angle			Gravity			Mass	Moment of inertia			Radius
	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
MWXC-2001	0.0	0.0	360.0	180.0	-45.0	0.0	90.0	0.0	151.0	2.2	0.0	0.0	0.0	0.0
MWXC-3501							90.0	0.0	148.0	2.1				
MWX-2001	170.0	0.0	385.0	180.0	0.0	0.0	114.0	0.0	148.0	2.2				
MWX-3501							111.0	0.0	146.0	2.1				
For G-series	Length			Angle			Gravity			Mass	Moment of inertia			Radius
	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
MWX-2001	0.0	-310.0	89.5	-90.0	0.0	0.0	0.0	-104.0	54.0	1.7	0.0	0.0	0.0	0.0
MWX-3501							0.0	-102.0	53.0	1.7				

If the data shown in Table 7.1 are not set when using EX manipulator, or if you apply AX manipulator, see the instruction manual for the manipulator you use as below and set the data properly.

Model	Instruction manual for reference
EX manipulator	Chapter 7 in “Utilizing features and functions (1L8300G-E-xx)”
AX manipulator	Chapter 4 in “Installation (1L8800A-E-xx)”

7.2 Checking the Shock Sensor Operation

7.2.1 External Force to Actuate Shock Sensor

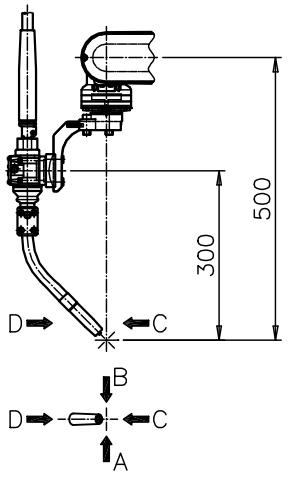


Fig. 7.1 Direction of the external force

Table 7.2 Operating 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.

IMPORTANT

The shock sensor unit is to minimize deformation of the welding torch likely caused by the collision among welding torch, workpiece or jigs, and damage inflicted on the robot body, workpiece or jigs. Therefore, reproducibility on the torch tip cannot be guaranteed if once the shock sensor has been operated. (If once the shock sensor has operated, be sure to check the aiming point of torch again with the torch gauge.)

7.2.2 Checking the Shock Sensor Operation

○ EX manipulator

Check if the message “I 10002-0100 Mechanism shock sensor” appears in Teach mode by pushing in the torch tip with your hand.

The message will disappear by unhanding the torch. If the message does not appear, the shock sensor may be broken. Check the shock sensor again.

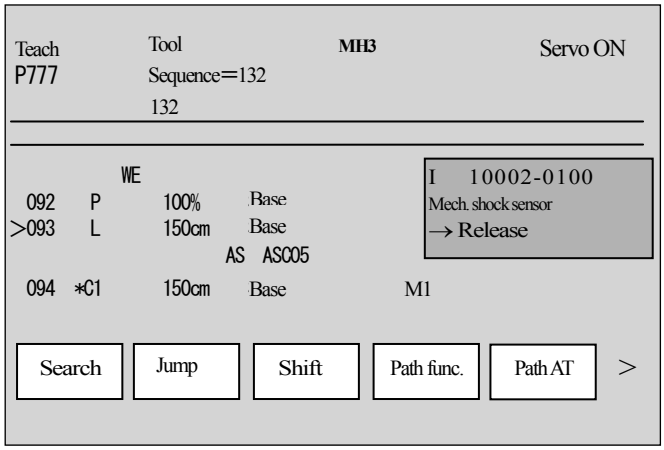


Fig. 7.2 TP screen (EX manipulator)

○ AX manipulator

Push in the torch tip with your hand to check if the following message appears in "[2] Error monitor screen". (See Fig. 7.3)

Error type: Emergency stop error

Error code: A4920

For details of the error monitor screen, refer to Chapter 8 in the Instruction Manual for Manipulator "BASIC OPERATION (1L8800C-E-*)".

If the message does not appear, the shock sensor may be broken. Check the shock sensor again.

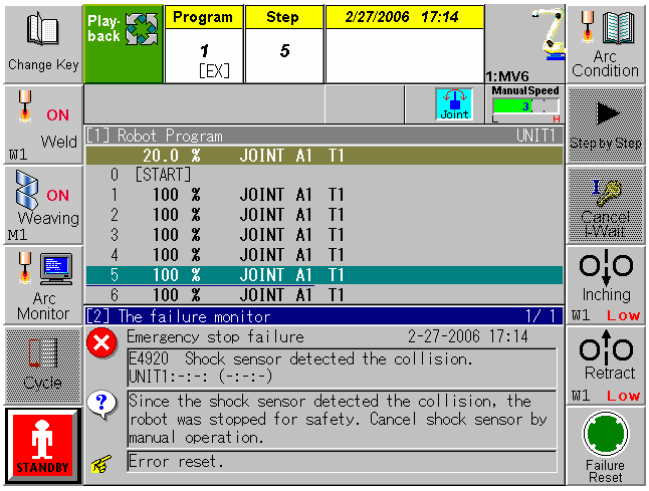


Fig. 7.3 TP screen (AX manipulator)

IMPORTANT

The message shown in Fig.7.2 or Fig.7.3 appears either when the shock sensor is not connected. If the message appears even when not operating the torch tip, check the connection of shock sensor cable.

⑧ Functions of the Main Parts

8.1 Tungsten Electrode

Ceriated tungsten (2% cerium contained) is incorporated for standard specifications.

See Parts List in Chapter 13 for other tungsten electrodes.

8.1.1 Selection of Electrode

Ceriated tungsten (2% cerium contained, gray mark), thoriated tungsten (2% thorium contained, red mark) and pure tungsten (white mark) are commonly used as tungsten electrode.

Table 8.1 Selection of Electrode

Welding method (Power source)	Materials of electrode	Materials of workpiece
DC TIG welding	Ceriated tungsten (2% cerium contained) Thoriated tungsten (2% thorium contained)	Stainless steel, mild steel, brass, high carbon steel, cast iron, copper, titanium, silver
AC TIG welding	Ceriated tungsten (2% cerium contained) Pure tungsten Thoriated tungsten (2% thorium contained)	Aluminum, aluminum casting, magnesium, magnesium casting

Note: The table above lists only typical electrode and workpiece materials.

8.1.2 Selection of Electrode Diameter

Apply welding current within the range specified in Table 8.2 according to electrode diameter.

Table 8.2 Relationship between Electrode Diameter and Welding Current

Electrode diameter mmϕ	Welding current (A)				
	DC TIG Welding (negative electrode)		AC TIG Welding		
	Ceriated tungsten	Thoriated tungsten	Ceriated tungsten	Pure tungsten	Thoriated tungsten
0.5	-	1～20	-	30	50
1.0	-	1～80	-	10～60	20～80
1.6	5～150	5～150	40～130	20～100	40～130
2.0	-	10～200	-	30～130	50～180
2.4	20～250	20～250	70～220	50～160	70～220
3.0	-	40～350	-	80～190	90～260
3.2	50～400	50～400	110～290	100～210	110～290
4.0	-	80～500	-	150～270	170～360

Note: This table describes the standard ranges of welding current that differ according to electrode diameter.

8.2 Selection of Collet and Collet Body

A collet and a collet body are for feeding and holding electrode. They are divided into two kinds depending on whether they have gas lenses. (Ones for gas lenses are incorporated as standards.)

Use a right collet and a collect body according to the size.

8.3 Selection of Nozzle

In order to have a sufficient shielding effect of argon gas, see Table 8.3 and use a right nozzle according to welding current.

Nozzles have good electric insulation, and they especially have excellent shock-resistance and heat-resistance.

The relationship between welding current and nozzle diameter is described in Table 8.4, and the relationship between nozzle No. and inside diameter in Table 8.4.

Table 8.3 Relationship between Welding Current and Nozzle Diameter

Welding current (A)	DC TIG Welding (negative electrode)		AC TIG Welding	
	Nozzle No.	Gas flow rate	Nozzle No.	Gas flow rate
10～100	4,5,6	4～5 l/cm^2	5,6	6～8 l/cm^2
101～150	4,5,6	5～7 l/cm^2	6,7	7～10 l/cm^2
151～200	4,5,6,7,8	6～8 l/cm^2	7,8	7～10 l/cm^2
201～300	5,6,7,8	8～9 l/cm^2	8,10,12	8～15 l/cm^2

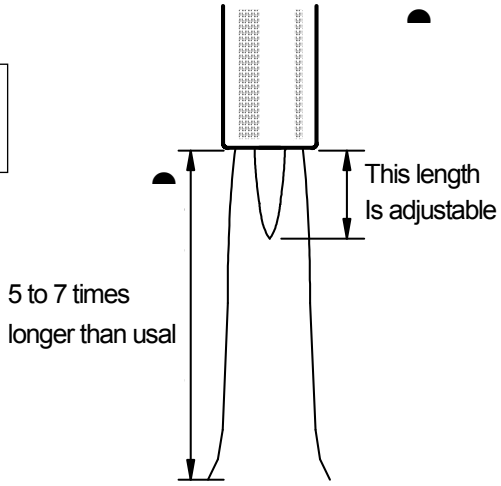
Table 8.4 Relationship between Nozzle No. and Inside Diameter

Nozzle No.	4	5	6	7	8	10	12
Inside diameter(mm)	6.5	8	9.5	11	12.7	16	19

8.4 Nozzle for Gas Lens

When a fluid flows inside a tube, the bigger the value of L/D is, the easier it is to obtain the streamline flow.
(L: length of a tube, D: diameter of a tube)
Gas lens has this logic applied.

Gas lens controls the flow of shield gas at a uniform pace.
Gas lens has the following advantages.



- As gas is spouted from a nozzle in a streamline flow, it has good shield effect.
- Even a small gas flow rate brings about sufficient shield effect.
- As the tungsten extension can be adjustable, more space between a nozzle and a workpiece can be obtained.
- That makes it easier for operator to observe arc and the working area well. Moreover, welding in a narrow area will be feasible.
- The productivity will rise and the damage to a nozzle will be far reduced.

Therefore, a gas nozzle is very useful in high-quality or complicated welding.

Note: 1. Gas lens is incorporated as standard for an air-cooled torch and a water-cooled torch.
2. When a nozzle for a gas lens is not used, an insulator on Parts List in Item 13 is not necessary.

8.5 Rear Collet Body Assembly

Rear collect body assembly can be separated from the torch body.
To reduce electrode replacement time, prepare more than two rear collect body assemblies equipped with new electrodes.

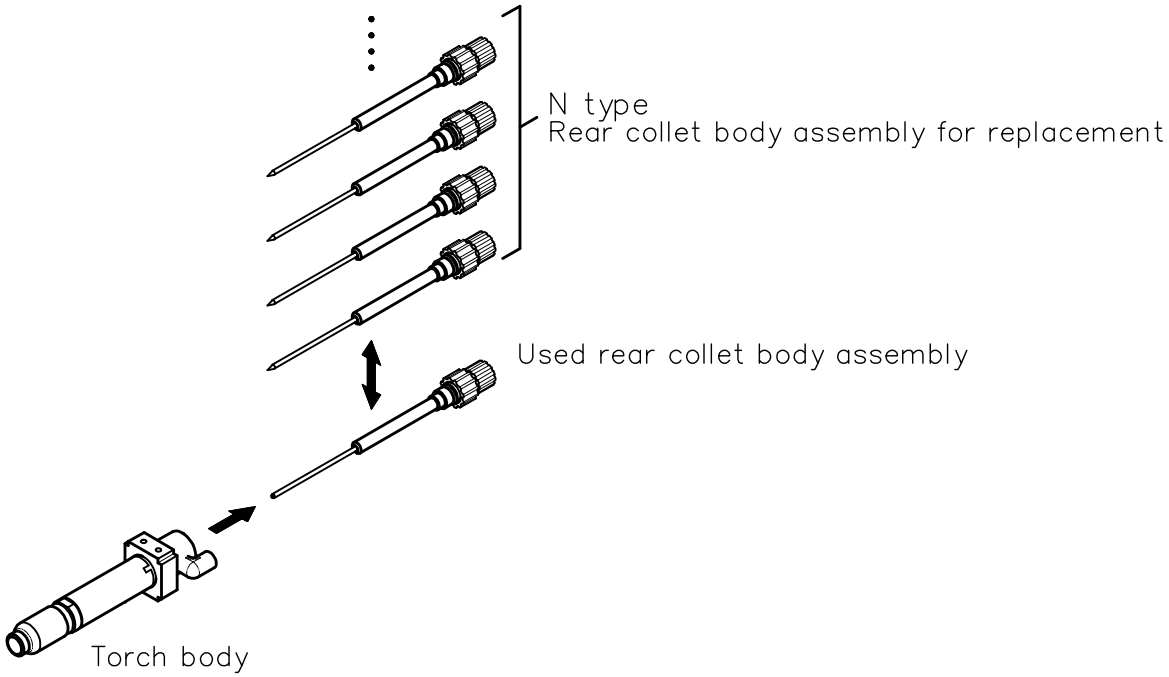


Fig. 8.1 Rear Collet Body Assembly

8.6 Electrode Adjusting Gauge (Option)

Electrode extension can be easily set, using an electrode extension adjusting gauge (L7622P: Option).
Since the rear collet body assembly can be separated from the torch body, electrode can be replaced safely and electrode length can be adjusted from a distant place.

【Adjusting the Electrode extension】

- Pull out the rear collet body assembly from the torch body.
- Loosen the collet holder assembly, insert it into the electrode adjusting gauge of the rear collet body assembly, and fix with wing bolt.
- Set the tip of electrode to a bar.
- Tighten the set screw and fix the electrode.

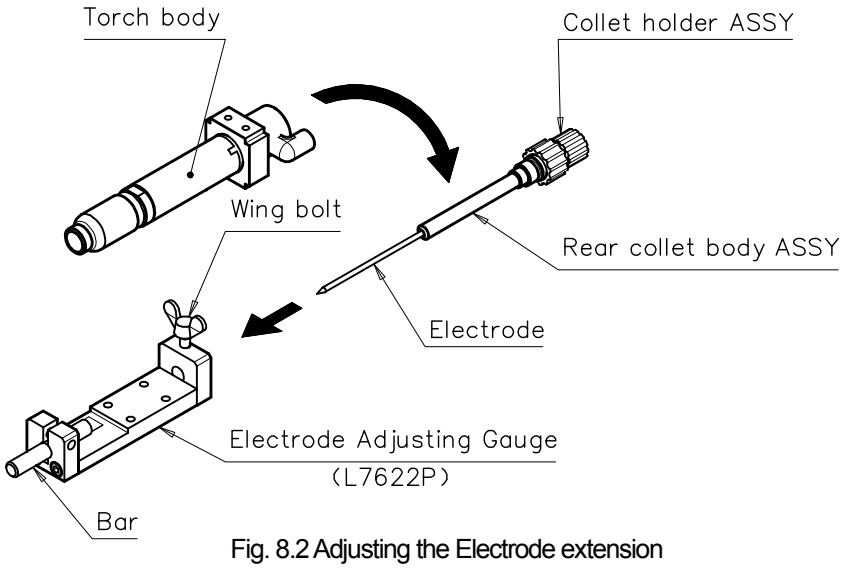


Fig. 8.2 Adjusting the Electrode extension

Note: 1 Grind the electrode before adjusting the electrode extension.
2. Scale plate "0" is set to 5 mm of electrode extension from the tip of the nozzle.

To adjust the wire extension, slide the bar and set to a desired value.
As shown in Fig. 8.3, when the bar is slid to the left, wire extension is long, and when the bar is slid to the right, wire extension is short.
Note that there may be a slight difference in extension depending on tightening of the nozzle.

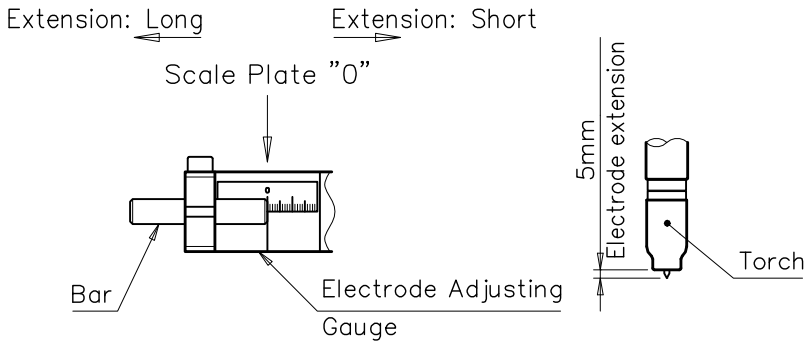


Fig. 8.3 Indication of Scale Plate

⑨ Changing Tungsten Electrode (From ϕ3.2 to ϕ1.6)

9.1 Prepare parts necessary for ϕ1.6.

- Tungsten electrode (ϕ1.6 – 150 mm)
- Collet body (for ϕ1.6)
- Collet (for ϕ1.6)

1 set each

9.2 How to Change

- Remove the set screw of the collet assembly and pull out the collet (rear).

⬇

- Loosen the knob of the rear collet body assembly and remove the nozzle, collet body, tungsten electrode and collet (front).

⬇

- Insert the tungsten electrode (ϕ1.6) into the collet (for ϕ1.6) prepared, and then screw that into the collet body (ϕ1.6).

⬇

(DO NOT forget to install an insulator.)

- Screw the nozzle into the collet body.

⬇

- Insert the collet (for ϕ1.6) into the rear collet body assembly.

⬇

- Adjust the tungsten electrode extension to a suitable length according to the shape of weld zone and weldment or adjust the electrode extension with an electrode adjustment gauge (option).
  For adjusting method, see the item 8.6.

⬇

- When the extension is determined, tighten the knob of the rear collet body assembly, and mount the set screw of the rear collet assembly.

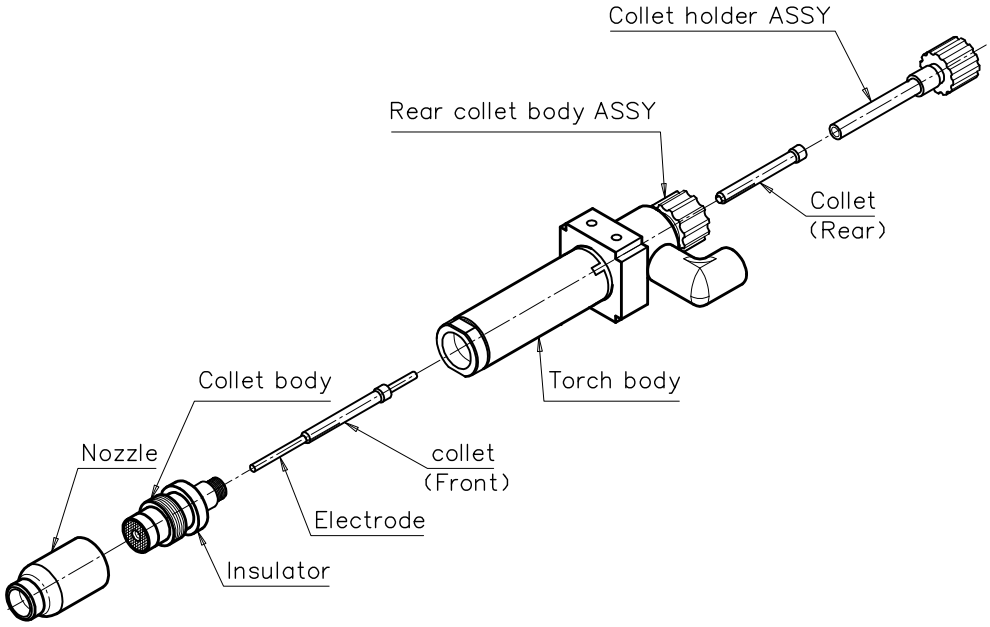


図 9. 1 Changing Tungsten Electrode

⑩ Connection to Welding Power Supply

CAUTION	● Make sure to tighten the collet body and torch body firmly. If either of them is loose even slightly, the collet may be burned and seized or the operator may get burn due to heat-up.

● Refer to the instruction manual for each welding power source, and connect the torch properly.

⑪ Requirements

11.1 When mounting this torch on the robot, connect the lead wire of the power cable to the connection part of the workpiece-side welding cable of the electrode.

11.2 If there is any loosened part in any connection of the torch, heat generation and leakage of water, gas or air may result. Make sure to tighten the connections securely.

11.3 Keep the gas flow rate at 7~8 l /min. for AC and 5~6 l /min. for DC for normal operations. When a gas lens is in used, sufficient shield effect will be obtained at a lower rate. When it is windy, or the workpiece and the torch need to be moved farther away from each other, raise the flow rate as required.

11.4 Keep the flow rate of the coolant at more than 1.2 l /min.
Appropriate water pressure is 0.1 (1kg/cm^2) ~ 0.3 (3kg/cm^2) MPa.
DO NOT use the coolant at the pressure of more than 0.3 MPa (3kg/cm^2).
Lower than 25°C is desirable for the temperature at the inlet.

11.5 Although the cable hose, gas hose, and coolant hose are all protected by hose sheaths, DO NOT put any heavy piece on top of these cables, cause them to contact hot parts of the weldment, nor to be bent by force.

11.6 Always keep the tungsten electrode clean.
1) When spatters stick to the electrode, generate arc on other steel plate, and it will be cleaned.
2) When granular structure is formed on the tip of the electrode, sharpen the tip by a grinder and so on to form acute angles.
3) When the electrode sticks into the molten pool, turn OFF the power, take out the electrode and break it at the lowermost part of the electrode. Then, finish the tip of the electrode with a grinder and so on.

11.7 Keep the nozzle clean as well. Remove its cap occasionally and check for any abnormal conditions.

11.8 Even when any external abnormal conditions cannot be observed, periodic inspection on worn parts is desirable for maintenance of the torch and obtaining fine results of welding.

11.9 The shock sensor unit is to minimize deformation of the welding torch likely caused by the collision among welding torch, workpiece or jigs, and damage inflicted on the robot body, workpiece or jigs. Therefore, reproducibility on the torch tip cannot be guaranteed if once the shock sensor has been operated. (If once the shock sensor has worked, check the aiming point of torch again with the torch gauge.)

⑫ What if the Following Occur

Trouble	Possible causes
No arc generated	1. The connections of welding cable of the torch and workpiece are incomplete.
	2. The fuse of the control unit has blown.
	3. Electromagnetic contactor does not work.
	4. Argon gas has not flowed.
	5. High frequency has not been generated.
Electrode damaged	1. The length of an arc is too short.
	2. The flow rate of argon gas is not enough.
Electrode melted	1. The welding current is too large in proportion to the diameter of electrode.
	2. The polarity of electrode is wrong.
Torch body overheated	1. Coolant has not flowed enough.
	2. The tightened parts became loose.

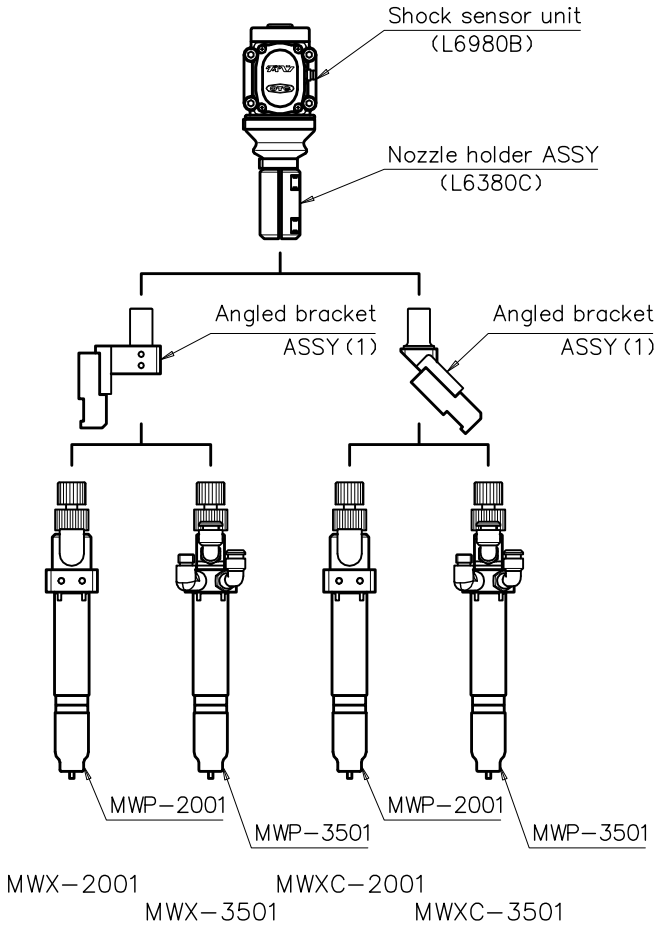
⑬ Parts List

This torch uses a shock sensor unit, hood assembly and nozzle holder. Angle bracket of offset type/angle type and torch body of air-cooled [MWP-2001] type/water-cooled [MWP-3501] type are available, and can be combined for use for various welding purposes.

Note, however, that torch gauge and tool parameters, etc. need to be changed before torch replacement.

When parts of the torch are worn or damaged, refer to Fig. 13.1-13.2 and Table 13.1-13.2 and place orders for replacement to our sales office or our agency.

When ordering, be sure to state the part name and part number of specifications.



13.1 Standard Parts List

Table 13.1.1 MWX-2001 /MWXC-2001 Parts List

No.	Part No. L7620A 【MWX-2001】	Part No. L7621A 【MWXC-2001】	Part name	Q'ty	Remark
1	L6980B		Shock sensor unit	1 st	
2	L6380G		Hood assembly	(1)	For maintenance: Includes those of (1).
3	L6380C		Nozzle holder assembly	1 st	
4	L7620B	-	Angled bracket assembly (1)	1 st	
	-	L7621B	Angled bracket assembly (2)	1 st	
4-1	-	L7621B01	Angle bracket (2)	(1)	
4-2	L7620B02		Insulation plate	(1)	
4-3	3346-129		Cap	(4)	C5
4-4	-		Hex. socket head screw	(4)	M5×15
4-5	-		Spring washer	(4)	For M5
5	L7622A		Air-cooled TIG torch	1 st	MWP-2001 See Table 13.1.3.

Note: No. 1-4: Common to MWX (C)-2001.

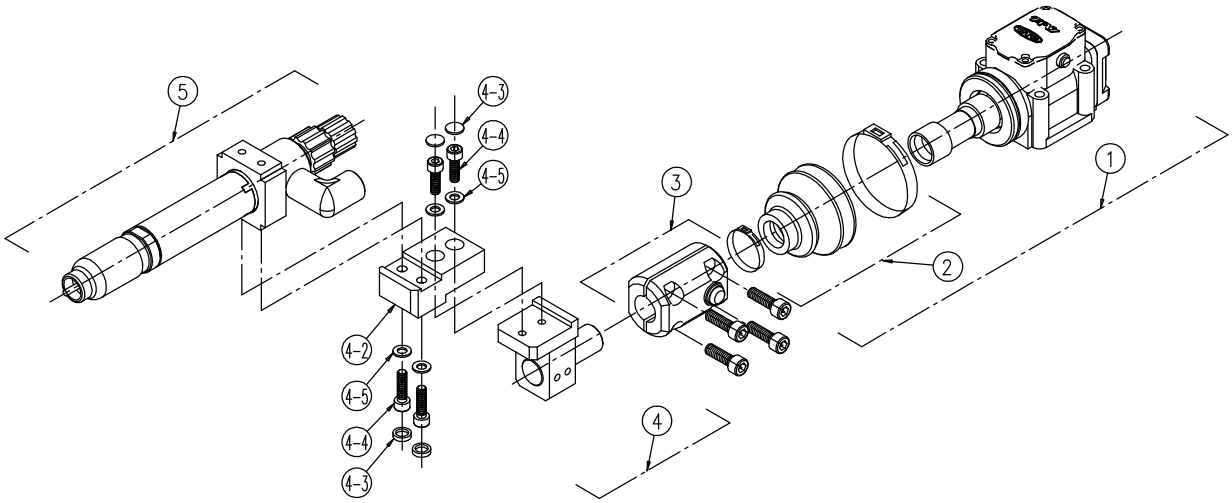


Fig. 13.1.1 MWX-2001 Parts List

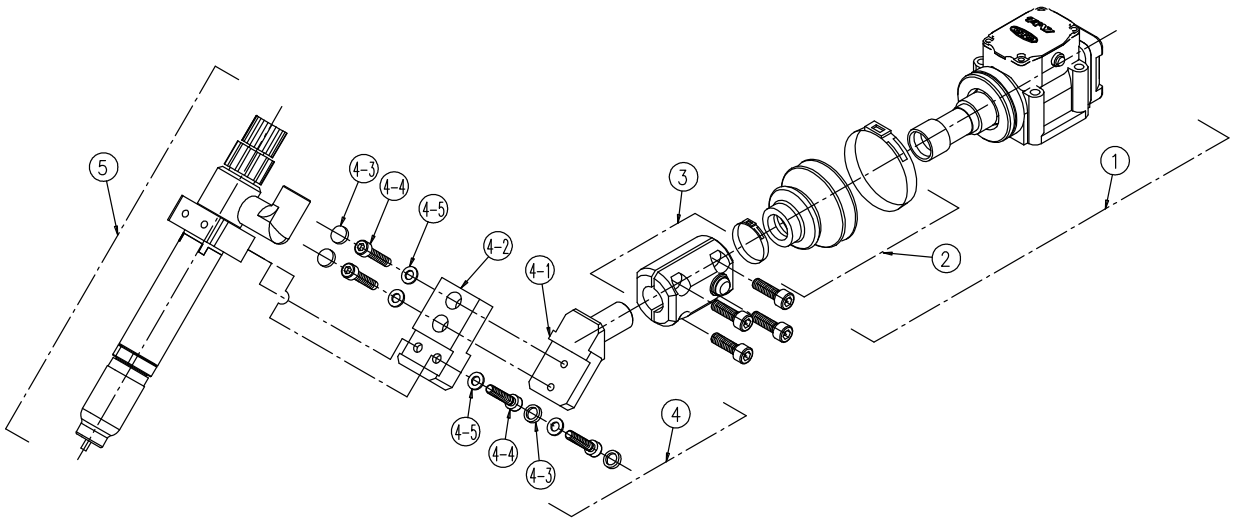


Fig. 13.1.2 MWXC-2001 Parts List

Table 13.1.2 MWX-3501 /MWXC-3501 Parts List

No.	Part No.		Part name	Q'ty	Remark
	L7630A 【MWX-3501】	L7631A 【MWXC-3501】			
1	L6980B		Shock sensor unit	1 st	
2	L6380G		Hood assembly	(1)	For maintenance: Includes those of (1).
3	L6380C		Nozzle holder assembly	1 st	
4	L7620B	-	Angled bracket assembly (1)	1 st	
	-	L7621B	Angled bracket assembly (2)	1 st	
4-1	-	L7621B01	Angle bracket (2)	(1)	
4-2	L7620B02		Insulation plate	(1)	
4-3	3346-129		Cap	(4)	C5
4-4	-		Hex. socket head screw	(4)	M5×15
4-5	-		Spring washer	(4)	For M5
5	L7632A		Water-cooled TIG torch	1 st	MWP-3501 See Table 13.1.4.

Note: No. 1-4: Common to MWX (C)-2001.

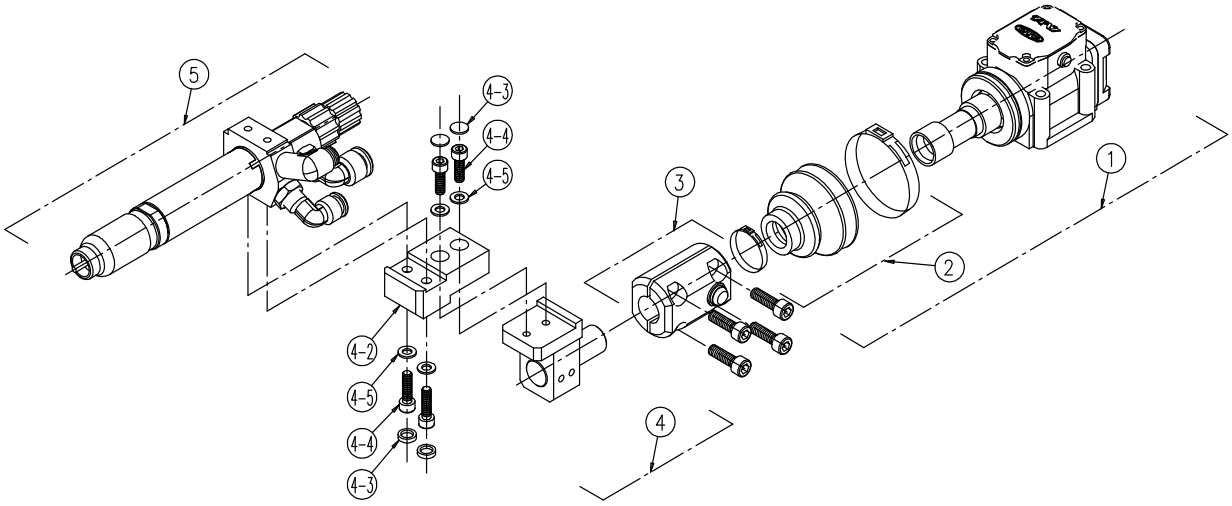


Fig. 13.1.3 MWX-3501 Parts List

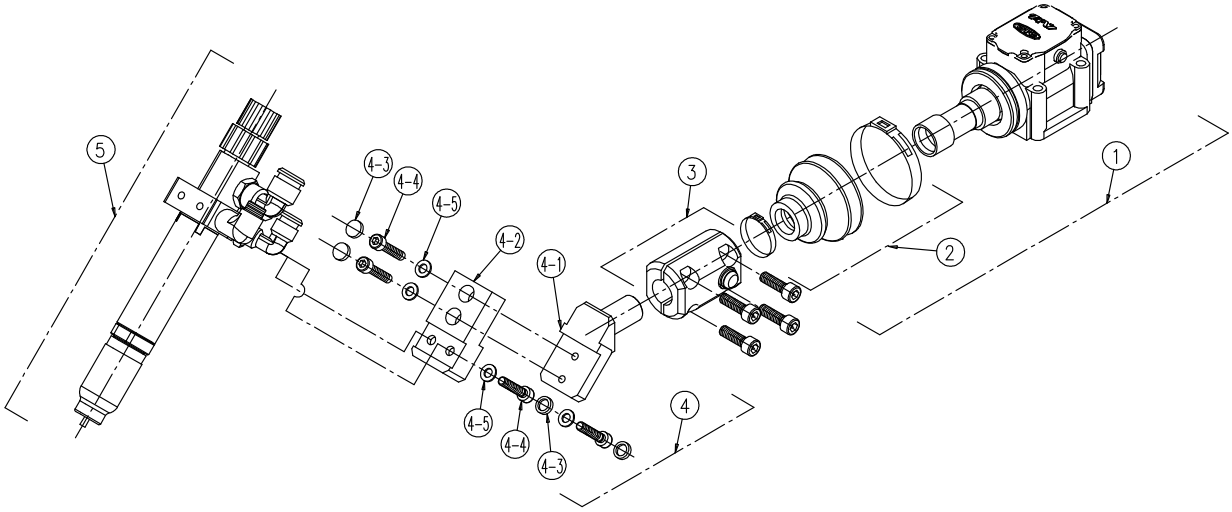


Fig. 13.1.4 MWXC3501 Parts List

Table 13.1.3 MWP-2001 Parts List

No.	Part No. L7622A 【MWP-2001】	Part name	Q'ty	Remark
1	L7622B	**Torch body assembly**	1 st	
2	L7622H	Rear collet body assembly (2.4)	1 st	For electrode diameter ϕ2.4
2-1	L7622Q	Rear collet body (1)	(1)	For electrode diameter ϕ0.5~ϕ3.2
2-2	L7622N	Collet holding assembly	(1)	
2-3	H21B16	Collet (2. 4)	(2)	For electrode diameter ϕ2.4
2-4	3572-012	"O" ring (P12)	(1)	JIS B 2401 P12
3	L7622C	**Insulation sleeve assembly**	1 st	
3-1	L7622C01	Sleeve	(1)	
3-2	L7622C02	Lock nut	(1)	
4	L7622D	**Front collet body assembly**	1 st	
4-1	H21B60	Insulator	(1)	For gas lens
4-2	H21B53	Collet body (2.4)	(1)	For electrode diameter ϕ2.4
4-1	H21B44	Nozzle (No.8)	(1)	
4-4	0870-024	Ceriated tungsten electrode	(1)	ϕ2.4 × 150mm

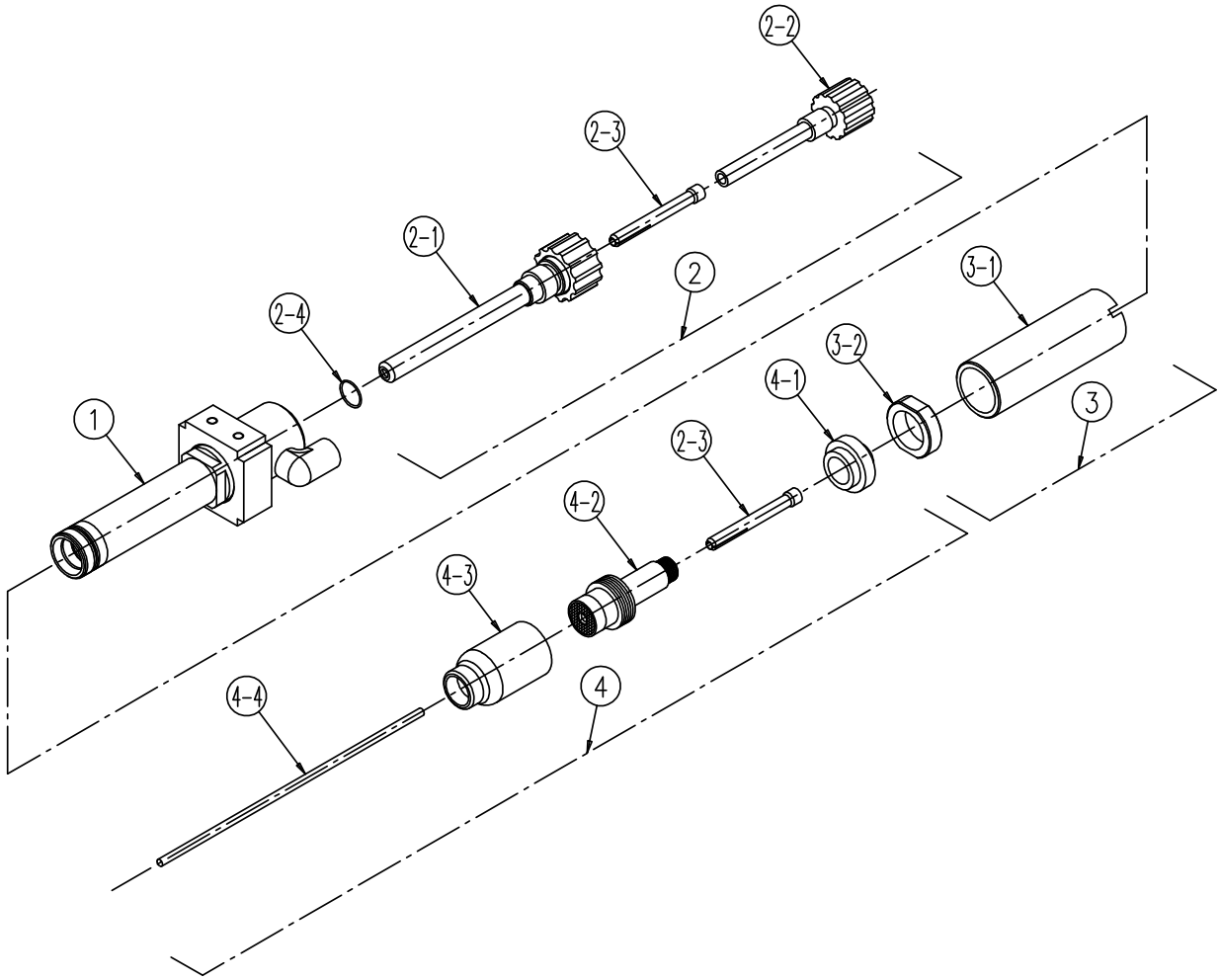


Fig. 13.1.5 MWP-2001 Parts List

Table 13.1.4 MWP-3501 Parts List

No.	Part No. L7632A 【MWP-3501】	Part name	Q'ty	Remark
1	L7632B	**Torch body assembly**	1 st	
1-1	L7622Q	Elbow	(1)	WL-08-01
1-2	L7622N	Elbow	(1)	WL-06-01
2	L7622L	**Rear collet body assembly (3.2)**	1 st	For electrode diameter ϕ3.2
2-1	L7622Q	Rear collet body (1)	(1)	For electrode diameter ϕ0.5~ϕ3.2
2-2	L7622N	Collet holding assembly	(1)	
2-3	H21B17	Collet (3.2)	(2)	For electrode diameter ϕ3.2
2-4	3572-012	"O" ring (P12)	(1)	JIS B 2401 P12
3	L7622C	**Insulation sleeve assembly**	1 st	
3-1	L7622C01	Sleeve	(1)	
3-2	L7622C02	Lock nut	(1)	
4	H561D	**Front collet body assembly**	1 st	
4-1	H21B60	Insulator	(1)	For gas lens
4-2	H21B54	Collet body (3.2)	(1)	For electrode diameter ϕ3.2
4-1	H21B44	Nozzle (No.8)	(1)	
4-4	0870-032	Ceriated tungsten electrode	(1)	ϕ3.2 × 150mm

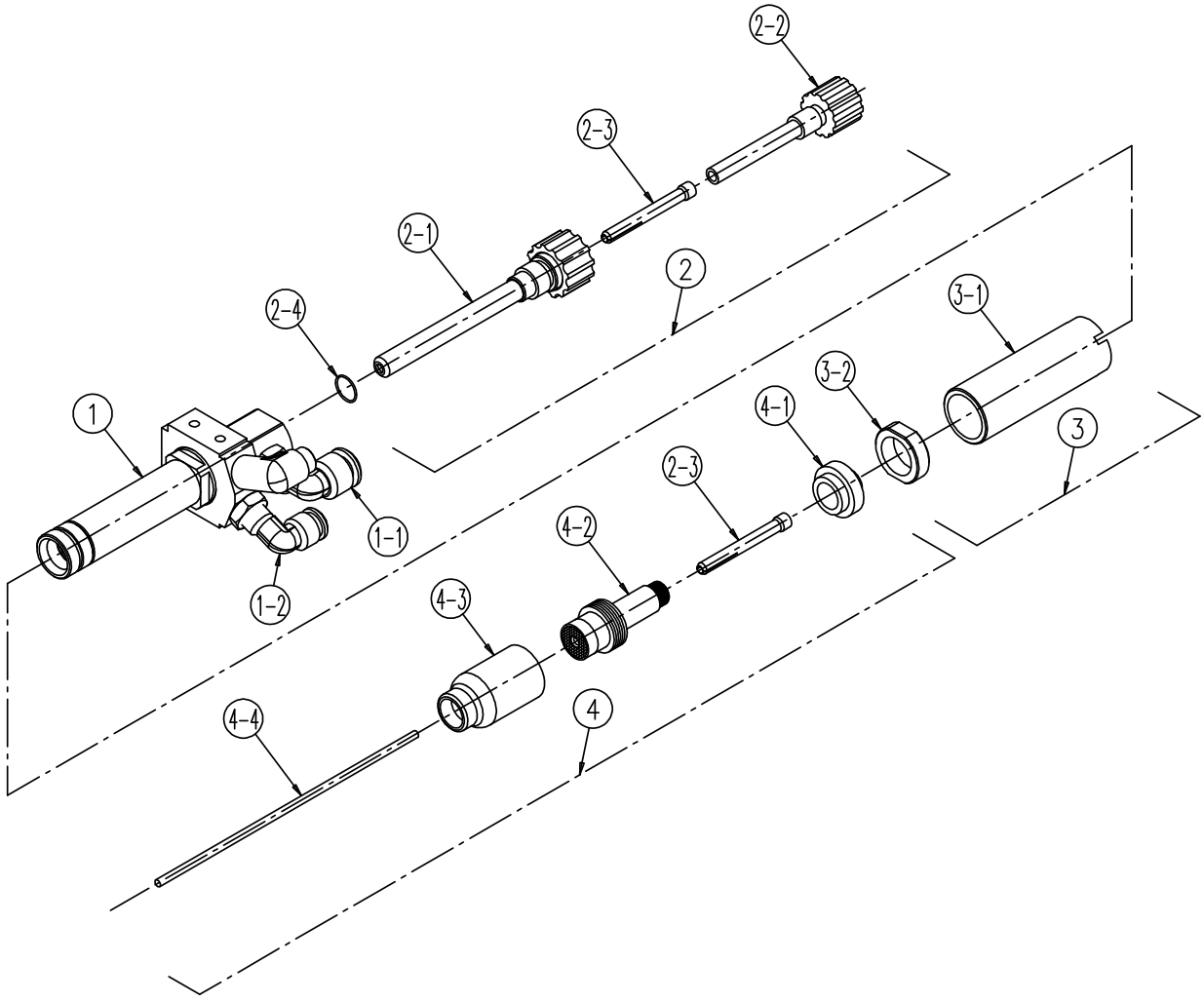
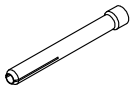


Fig. 13.1.6 MWP-3501 Parts List

13.2 Optional Parts List

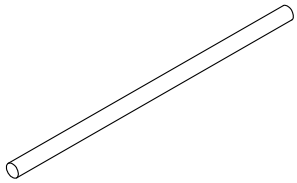
Table 13.2.1 Front collet body assembly Parts List

● Collet



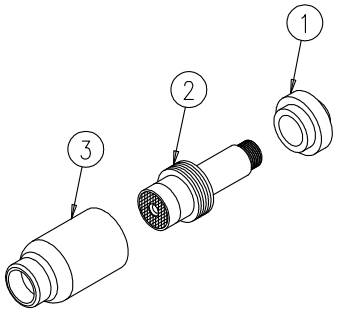
Electrode diameter	Part No.
0.5	H21B13
1.0	H21B14
1.6	H21B15
2.0	H21B64
2.4	H21B16
3.0	H21B65
3.2	H21B17
4.0	H21B63

●Tungsten electrode



Electrode diameter	Part No.		
	Ceriated tungsten	Thoriated tungsten	Pure tungsten
0.5	-	0831-005	0830-005
1.0	-	0831-010	0830-010
1.6	0870-016	0831-016	0830-016
2.0	-	0831-020	0830-020
2.4	0870-024	0831-024	0830-024
3.0	-	0831-030	0830-030
3.2	0870-032	0831-032	0830-032
4.0	-	0831-040	0830-040

●For gas lens specification



① Insulator

Part No.
H21B60

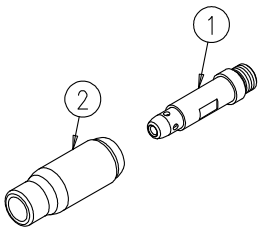
② Collet body

Electrode diameter	Part No.
0.5	H21B50
1.0	H21B51
1.6	H21B52
2.4	H21B53
3.2	H21B54
4.0	H21B61

③ Nozzle

Nozzle No.	Part No.	Remark
4	H21B40	Inside diameter : 6.5mm
5	H21B41	Inside diameter : 8.0mm
6	H21B42	Inside diameter : 9.5mm
7	H21B43	Inside diameter : 11.0mm
8	H21B44	Inside diameter : 12.7mm

●Without gas lens



① Collet body

Electrode diameter	Part No.
0.5	H21B08
1.0	H21B09
1.6	H21B10
2.0	H21B66
2.4	H21B11
3.0	H21B67
3.2	H21B12
4.0	H21B68

② Nozzle

Nozzle No.	Part No.	Remark
4	H21B19	Inside diameter : 6.5mm
5	H21B20	Inside diameter : 8.0mm
6	H21B21	Inside diameter : 9.5mm
7	H21B22	Inside diameter : 11.0mm
8	H21B23	Inside diameter : 12.7mm
10	H21B24	Inside diameter : 16.0mm
12	H21B25	Inside diameter : 19.0mm

Table 13.2.2 Rear collet body assembly Parts List

Electrode diameter	Part name	No.1	No.2	No.3	No.4	Q'ty
0.5	Rear collet body ASSY (0.5) L7622E	Collet holding ASSY L7622N	Collet body ASSY (1) L7622Q	"O" ring 3572-012	Collet (0.5) H21B13	1 set each
1.0	Rear collet body ASSY (1.0) L7622F				Collet (1.0) H21B14	1 set each
1.6	Rear collet body ASSY (1.6) L7622G				Collet (1.6) H21B15	1 set each
2.4	Rear collet body ASSY (2.4) L7622H				Collet (2.4) H21B16	1 set each
2.0	Rear collet body ASSY (2.0) L7622J				Collet (2.0) H21B64	1 set each
3.0	Rear collet body ASSY (3.0) L7622K				Collet (3.0) H21B65	1 set each
3.2	Rear collet body ASSY (3.2) L7622L				Collet (3.2) H21B17	1 set each
4.0	Rear collet body ASSY (4.0) L7622M		Collet body ASSY (2) L7622R		Collet (4.0) H21B63	1 set each

t name
t No.

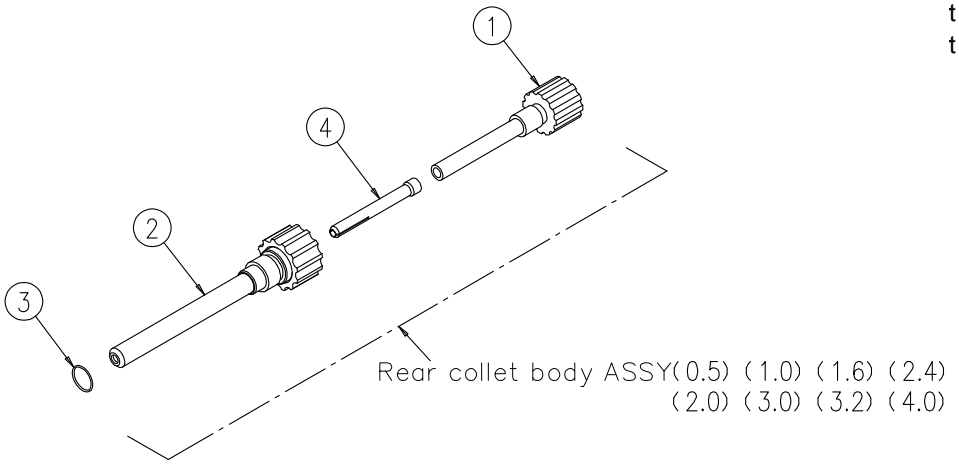


Fig. 13.2.1 Rear collet body assembly Parts List

Table 13.2.3 Electrode adjusting gauge Parts List

No.	Part No.	Part name	Q'ty	Remark
-	L7622P	Electrode adjusting gauge	1st	

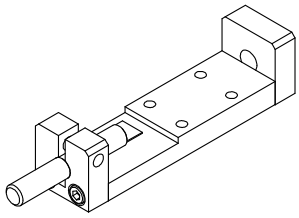


Fig. 13.2.2 Electrode adjusting gauge Parts List

Table 13.2.4 Power Cable Hose (for air-cooled torch) Parts List

Cable length	Part name	No.1	No.2	No.3	Q'ty
6m	Power cable hose 6 M L 7 6 2 3 E	Cable joint H81E	Adaptor hose H13D	Power cable ASSY 6M L7629E	1 set each
10m	Power cable hose 10 M L 7 6 2 3 J			Power cable ASSY 10M L7629J	1 set each

Upper row: Part name
Lower row: Part No.

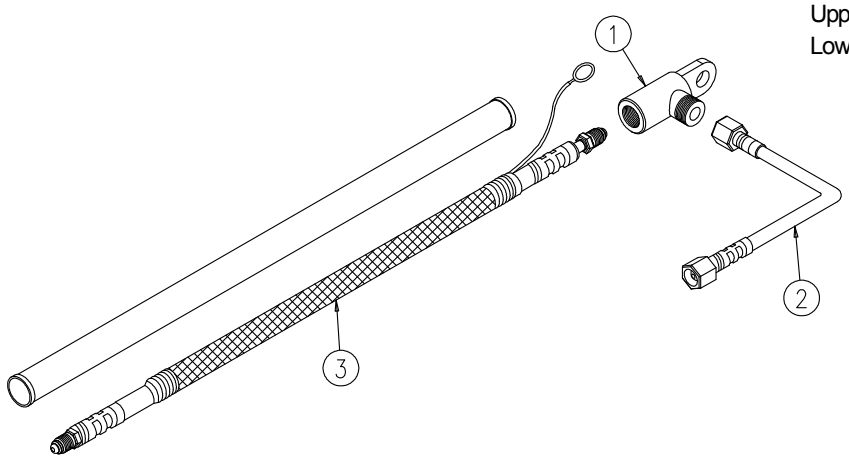


Fig. 13.2.3 Power Cable Hose (for air-cooled torch) Parts List

Table 13.2.5 Power Cable Hose (for water-cooled torch) Parts List

Cable length	Part name	No.1	No.2	No.3	No.4	Q'ty
6m	Power cable hose 6 M L7633E	Power cable ASSY 6M L7688E	Gas hose ASSY 6M L7690E	Coolant hose 6M L7689E	Hose sheath 6M L7691B04	1 set each
10m	Power cable hose 10 M L7633J	Power cable ASSY 10M L7688J	Gas hose ASSY 10M L7690J	Coolant hose 10M L7689J	Hose sheath 10M L7691B08	1 set each

Upper row: Part name
Lower row: Part No.

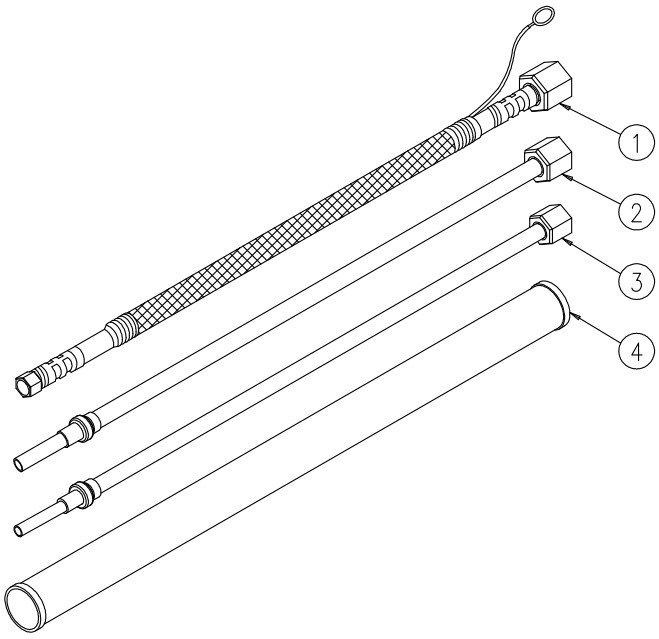


Fig. 13.2.4 Power Cable Hose (for water-cooled torch) Parts List

Table 13.2.6 Wire Guide (Fe・SUS)/ Wire Guide (AL) Parts List

No.	Part No.		Part name	Q'ty	Remark	
	Wire guide (Fe・SUS) 【L7724A】	Wire guide (Al) 【L7725A】				
1	L7640B		**Bracket ASSY**	1st	Common to 20°/30°	
1-1	L7640B01		Holder (1)	(1)		
1-2	L7640B02		Holder (2)	(1)		
1-3	-		Hex. socket head screw	(1)	M5×20	
1-4	-		Hex. socket head screw	(2)	M4×20	
2	L7724B	L7725B	**Wire guide ASSY (1)**	1st	Insertion angle 20° for wire diameter ϕ0.8	Optional parts
3	L7724C	L7725C	**Wire guide ASSY (2)**	1st	Insertion angle 20° for wire diameter ϕ0.9	
4	L7724D	L7725D	**Wire guide ASSY (3)**	1st	Insertion angle 20° for wire diameter ϕ1.0	
5	L7724E	L7725E	**Wire guide ASSY (4)**	1st	Insertion angle 20° for wire diameter ϕ1.2	
6	L7724F	L7725F	**Wire guide ASSY (5)**	1st	Insertion angle 20° for wire diameter ϕ1.4	
7	L7724G	L7725G	**Wire guide ASSY (6)**	1st	Insertion angle 20° for wire diameter ϕ1.6	
8	L7724H	L7725H	**Wire guide ASSY (7)**	1st	Insertion angle 30° for wire diameter ϕ0.8	
9	L7724J	L7725J	**Wire guide ASSY (8)**	1st	Insertion angle 30° for wire diameter ϕ0.9	
10	L7724K	L7725K	**Wire guide ASSY (9)**	1st	Insertion angle 30° for wire diameter ϕ1.0	
11	L7724L	L7725L	**Wire guide ASSY (10)**	1st	Insertion angle 30° for wire diameter ϕ1.2	
12	L7724M	L7725M	**Wire guide ASSY (11)**	1st	Insertion angle 30° for wire diameter ϕ1.4	
13	L7724N	L7725N	**Wire guide ASSY (12)**	1st	Insertion angle 30° for wire diameter ϕ1.6	

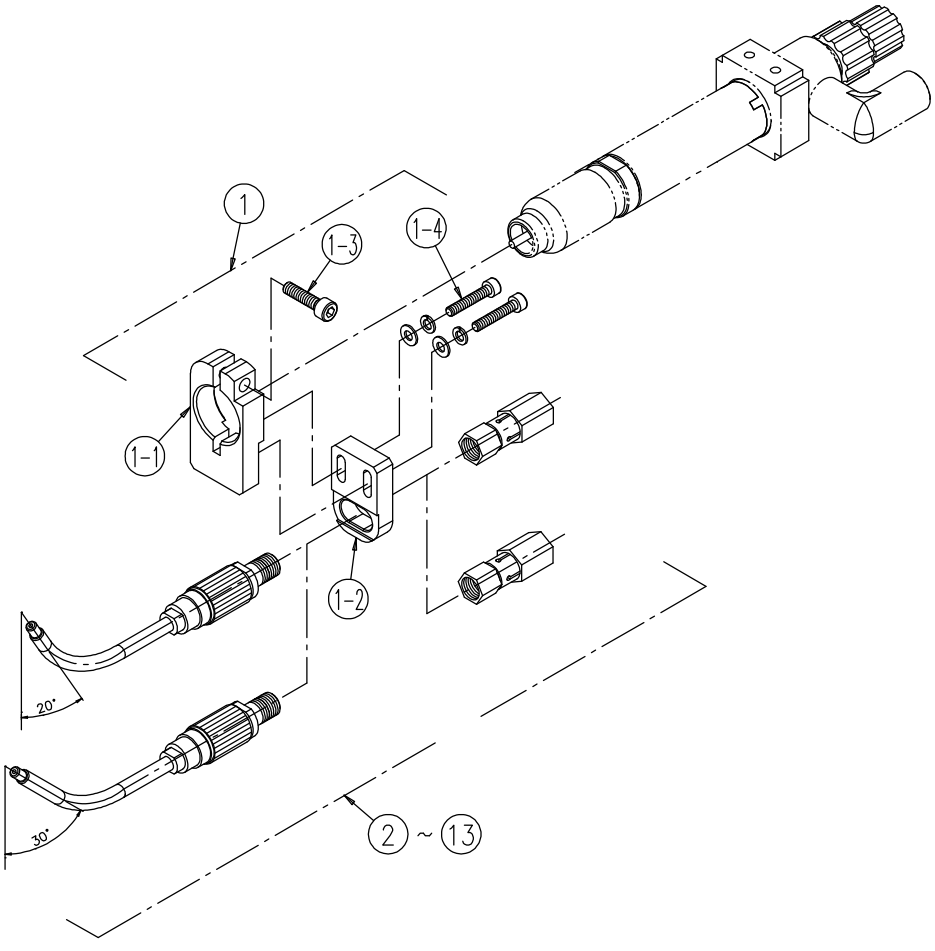


Fig. 13.2.5 Wire Guide (Fe・SUS)/ Wire Guide (AL) Parts List

Table 13.2.7 Wire Guide Assembly (1) ～(12) Parts List (Fe • SUS)

No.		Part No.						Part name	Q'ty	Remark
Wire diameter (Fe･SUS)		For ϕ0.8	For ϕ0.9	For ϕ1.0	For ϕ1.2	For ϕ1.4	For ϕ1.6			
Inserting angle	20°	L7724B	L7724C	L7724D	L7724E	L7724F	L7724G			
	30°	L7724H	L7724J	L7724K	L7724L	L7724M	L7724N			
1		L7294S03						Collet lock	1	
2		L7294S08				-		Collet (1)	1	Mark "1"
		-				L7294S11		Collet (4)	1	Mark "4"
3		L7640C01				-		Guide (1)	1	Mark "1"
		-				L7640C02		Guide (2)	1	Mark "4"
4		L7640C03						Adjusting screw	1	
5		L7640C04						Cap nut	1	
6		L7640C05						Washer	1	
7		L7640C06						Nut	1	
8		L7640C07						Nozzle tightening nut	1	
9		L7724B01 (*1)				—		Guide chip 20 (1)	1	L7724B～L7724E
		-				L7724F01 (*1)		Guide chip 20 (2)	1	L7724F L7724G
		L7724H01 (*2)				-		Guide chip 30 (1)	1	L7724H～L7724L
		-				L7724M01 (*2)		Guide chip 30 (2)	1	L7724M L7724N
10		L7726B01	-	—	—	—	—	Chip (1)	1	Mark "1"
		-	L7726B02	—	—	—	—	Chip (2)	1	Mark "2"
		-	—	L7726B03	—	—	—	Chip (3)	1	Mark "3"
		-	—	—	L7726B05	—	—	Chip (5)	1	Mark "5"
		-	—	—	—	L7726B06	—	Chip (6)	1	Mark "6"
		-	—	—	—	—	L7726B07	Chip (7)	1	Mark "7"

Note *1: Used for wire guide assembly of inserting angle 20°
*2: Used for wire guide assembly of inserting angle 30°

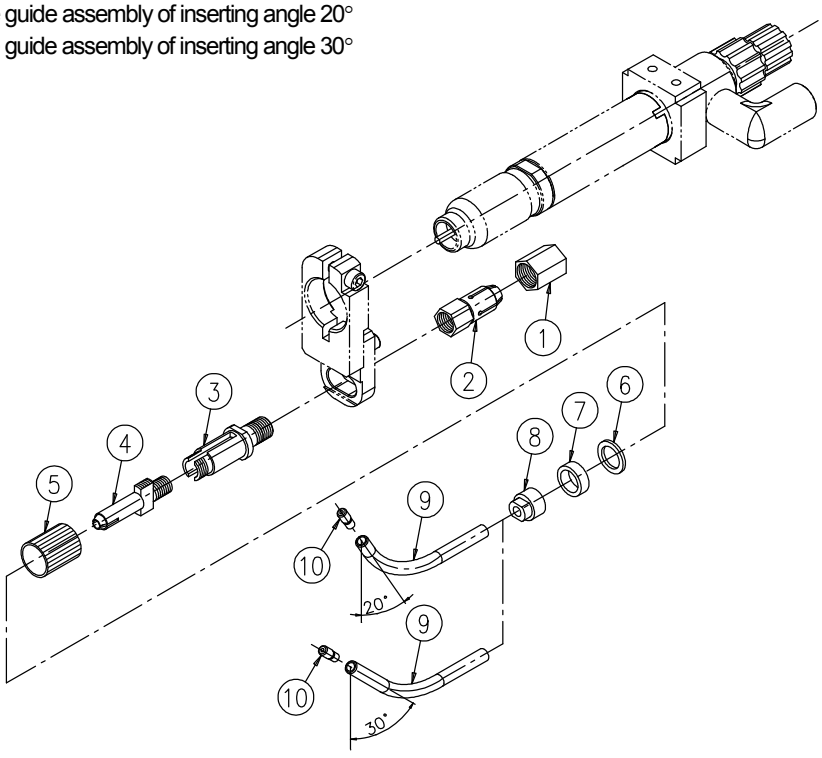


Fig. 13.2.6 Wire Guide Assembly (1) ～(12) Parts List (Fe • SUS)

Table 13.2.8 Wire Guide Assembly (1) ～(12) Parts List (Aluminum)

No.		Part No.						Part name	Q'ty	Remark
Wire diameter (Fe･SUS)		For ϕ0.8	For ϕ0.9	For ϕ1.0	For ϕ1.2	For ϕ1.4	For ϕ1.6			
Inserting angle	20°	L7725B	L7725C	L7725D	L7725E	L7725F	L7725G			
	30°	L7725H	L7725J	L7725K	L7725L	L7725M	L7725N			
1		L7294S03						Collet lock	1	
2		L7294S08				-		Collet (1)	1	Mark "1"
		-				L7294S11		Collet (4)	1	Mark "4"
3		L7640C01				-		Guide (1)	1	Mark "1"
		-				L7640C02		Guide (2)	1	Mark "4"
4		L7725B03						Adjusting screw	1	Mark "AL"
5		L7640C04						Cap nut	1	
6		L7640C05						Washer	1	
7		L7640C06						Nut	1	
8		L7640C07						Nozzle tightening nut	1	
9		L7725B01 (*1)						Guide chip 20	1	L7725B～L7725G
		L7725H01 (*2)						Guide chip 30	1	L7725H～L7725N
10		L7725B02				-		Inner liner (1)	1	Mark "1"
		-				L7725F01		Inner liner (2)	1	Mark "4"
10		L7726B02	—	—	—	—	—	Chip (2)	1	Mark "2"
		—	L7726B03	—	—	—	—	Chip (3)	1	Mark "3"
		—	—	L7726B04	—	—	—	Chip (4)	1	Mark "4"
		—	—	—	L7726B06	—	—	Chip (6)	1	Mark "6"
		—	—	—	—	L7726B07	—	Chip (7)	1	Mark "7"
		—	—	—	—	—	L7726B08	Chip (8)	1	Mark "8"

Note *1: Used for wire guide assembly of inserting angle 20°

*2: Used for wire guide assembly of inserting angle 30°

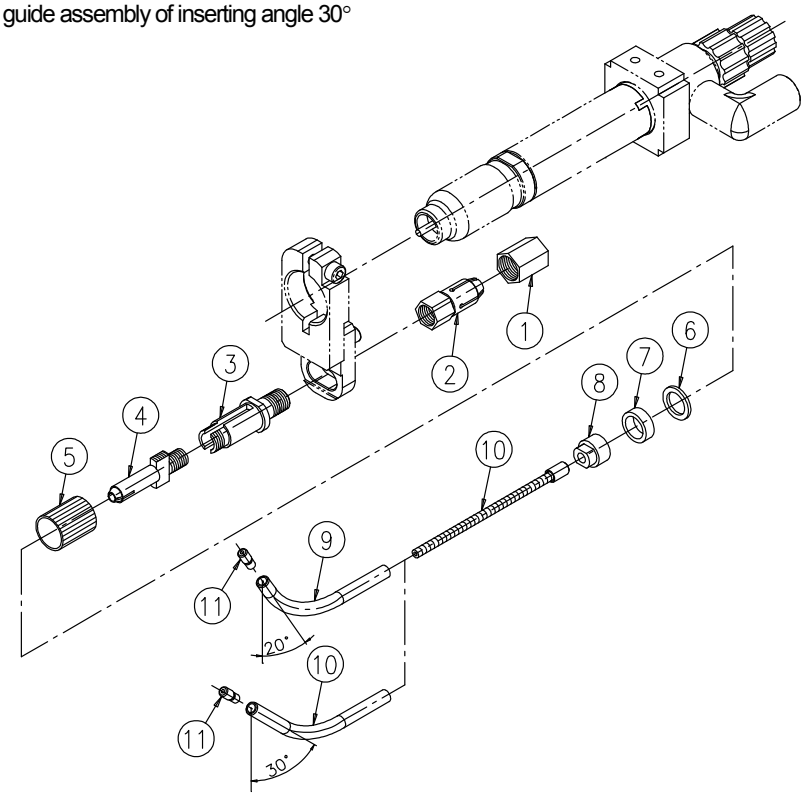


Fig. 13.2.7 Wire Guide Assembly (1) ～(12) Parts List (Aluminum)

Table 13.2.9 TIG Filler Conduit Parts List

No.	Part No.			Part name	Q'ty	Remark
Wire diameter	For Φ0.8～Φ0.9	For Φ1.0～Φ1.2	For Φ1.6			
	L7318B	L7318C	L7318D			
	Conduit (1)	Conduit (2)	Conduit (3)			
1	U785C13			Guide adaptor	1	
2	K970F67	-	-	Outlet guide	1	For Φ0.8～Φ0.9
	U2586F01		-			For Φ0.8～Φ1.2
	-	-	U2586F02			For Φ1.6
3	L7318B01	-	-	Plastic liner (1)	1	Liner length: 3.4 m
	-	U3567C02	-	Plastic liner (2)		Liner length: 3.4 m
	-	-	U3567C01	Plastic liner		Liner length: 3.4 m
4	L7318B05			Collet lock	1	
5	L7318B06		-	Collet (1)	1	For Φ0.8～Φ0.9
	-	-	L7318B07	Collet (2)	1	For Φ1.6
6	4739-480			Nut	1	ANN12-1.0

Note: Applicable robots are AX(EX)-MV6, AX(EX)-MV6L and AX(EX)-MV16.

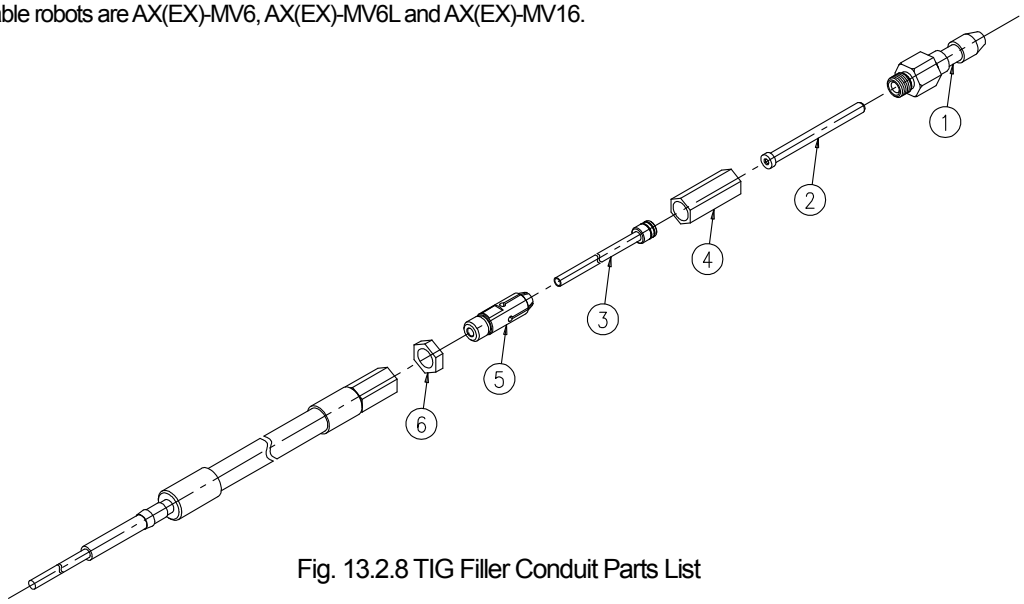


Fig. 13.2.8 TIG Filler Conduit Parts List

Table 13.2.10 Shock sensor cable Parts List

Part No.	Part name	Q'ty	Remark
L6569A	Shock sensor cable	1	For EX manipulator with the noise filter
L9195B	Shock sensor cable 7m	1	For AX manipulator without the noise filter
L9195C	Shock sensor cable 12m	1	
L9195D	Shock sensor cable 17m	1	

Table 13.2.11 Adaptor cable Parts List

Part No.	Part name	Q'ty	Remark
L6635B	Adaptor cable	1	

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