CO_2/ MAG/ MIG Wire feeding unit

OTC DAIHEN Corporation

Wire Feeder

CO2/MAG MIG

AF－4001
AFA－4001
AFT－4201
AFU－4201

Instruction Manual

= Safety and Handling Operation =

Instruction Manual No.

Wire feeding unit [AF-4001/AFA-4001/AFT-4201/AFU-4201]…1L7810-E-6

First, read this instruction manual thoroughly, and operate the unit correctly.

- To ensure the safety, only the qualified personnel or the personnel who has fully understood the welding robot must perform maintenance, inspection and repair work of this unit.
- To ensure the safety, only the personnel who has fully understood this instruction manual and acquired sufficient knowledge and skill must perform the operation work of this unit.
- Regarding the safety education, take courses and classes held by the head/branch offices of Welding Society/Association or related societies/associations.
  Also, utilize the qualifying examination for welding experts/consultant engineers.
- After reading this instruction manual, place it together with a warranty so that the personnel concerned can review anytime as needed.
- If you find anything unclear, or about servicing, contact our local distributor or sales representatives in your country.
  The addresses and telephone numbers for you to contact are listed in the back cover of this instruction manual.

Contents

Note on Safety

1. Note on Safety

- Before operating, thoroughly read this instruction manual, and operate this unit correctly.
- Caution note mentioned in this manual is to use the equipment safely and prevent danger and damage from occurring.
- This wire feeding unit is designed and manufactured upon due consideration of safety. However, be sure to follow the instructions and cautions described in this manual when using it. Otherwise, there may occur an accident resulting in death or a serious injury.
- Mishandling of equipment may cause various levels of accidents and damage. In order to draw attention to mishandling, three levels of safety alert symbols; “DANGER”, “WARNING” and “CAUTION” are adopted throughout this manual. See below for the details.

DANGER : Mishandling may cause death or a serious injury to an operator. Also, the level of urgency to alert is high when a danger occurs. Limited situation of great urgency.

WARNING : Mishandling may cause death or a serious injury to an operator.

CAUTION : Mishandling may cause a medium or slight injury to an operator or property damage.

Even if the matters mentioned in **CAUTION** may occasionally cause a serious injury depending on a condition. Be sure to comply with the notes and instructions.

”Serious injury”, “Medium or slight injury” and “Property damage” mentioned above give the meanings as follows.

Serious injury	:	Injury that leaves sequelae caused by a loss of eyesight, injury, burn (high/low temperature), electric shock, bone fracture, poisoning etc,. Or, injury that requires hospitalization or long-term treatment as an outpatient.
Medium or slight injury	:	Damage including injury, burn (high/low temperature), electric shock and others that does not require either hospitalization or long-term treatment.
Property damage	:	Damage to property and direct/indirect damage to equipment.

Caution Note on Safety

2. Requirements on Safety

2.1 Before starting welding operation, thoroughly read and understand the related safety rules and caution note below in addition to the instruction manual for welding power supply.
Be sure to follow the instructions.

WARNING	● To avoid a fatal physical accident, follow the notes below.

1) This wire feeding unit is designed and manufactured upon due consideration of safety, however be sure to follow the notes described in this instruction manual. If operating this unit without following the instructions, a fatal accident such as death or a serious injury may occur.
2) For selecting the installation area, handling/storing/piping high pressure gas, storing the welded manufactures and disposal of waste, comply with rules and regulations in your company.
3) Keep away from the welding power supply and the welding operation area.
4) A person with a pacemaker must not approach the welding power supply turned ON and the welding operation area without getting the permission by his/her doctor. The welding power supply turned ON generates the magnetic field, which adversely affects on a pacemaker.
5) To ensure safety, only the qualified personnel or those who fully understand this wire feeding unit must perform the maintenance and repair work of the unit. (※1)
6) To ensure safety, only the personnel who fully understand this instruction manual and have sufficient knowledge and skill must operate this wire feeding unit. (※1)
7) Do not use this wire feeding unit for other than welding.

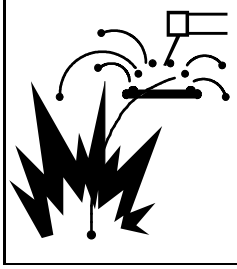
2.2 To avoid the electric shock hazard, follow the note below.

WARNING	● Do not touch the live electric parts.
	Touching live electric parts may cause a fatal shock or a severe burn.

1) Only the qualified personnel must perform the grounding work for the welding power supply, workpiece and jigs electrically connected with workpiece according to the regulations (Technical Standard of Electrical Facilities).
2) Do not touch live electric parts.
3) Be sure to always wear a dry pair of insulating gloves and fatigue uniform. Never wear torn or wet gloves and fatigue uniform.
4) Before performing installation, inspection, maintenance and other works, be sure to turn off all the input-side power. Even if the input-side power is OFF, a capacitor and other components may be still electrically charged. To start operating, therefore, wait for a few minutes after the power was turned OFF until no charged voltage is detected.
5) Do not use connection cables with insufficient capacity, with damage or with naked conductors.
6) Be sure to secure the cable connection and insulate them to prevent personnel from easily touching those parts.
7) Do not use the welding power supply without its case or cover.
8) Before starting operation, secure a firm footing. Also, do not perform operation at unstable footing or at higher place (2m or higher).
9) Carry out maintenance and inspection periodically, and repair the damaged parts before using the equipment.
10) Be sure to turn off the input-side power of equipment if not in use.

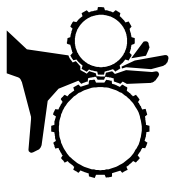
Caution Notes on Safety (continued)

2.3 To avoid a fire and explosion caused by the heated workpiece right after welding, spatter, slag or arc spark, and to avoid injury, follow the notes below.

WARNING	● Do not perform welding near inflammables or combustibles. ● Watch out for a fire and know where a fire extinguisher is placed. ● Never perform welding on flammable materials such as wood or cloth. ● Do not perform welding on workpiece that makes it an airproof container.
	● Heated workpiece right after welding, spatter, slag and arc spark cause a fire. ● Improper cable connection or improper contact in the workpiece-side current circuit such as steel frames may cause an exothermic fire. ● An explosion may occur if generating arc on the container for flammables or combustibles such as gasoline. ● If welding on an airproof tank or pipe, they may burst. ● Heated workpiece right after welding, spatter, slag and arc spark cause a serious burn.

1) Do not perform welding near inflammables or combustibles.
2) To avoid getting a burn by the heated workpiece right after welding, spatter, slag and arc spark, an operator must wear a pair of flameproof leather gloves, a long-sleeve fatigue uniform, a leg cover, a flameproof leather apron and other protective clothes.
3) Always watch out for a fire and other danger.
4) Place a fire extinguisher near the welding work area. Also, each operator must fully know how to use.
5) Do not bring the heated workpiece or the jigs into contact with flammable materials such as wood or cloth. Otherwise, not only a fire may occur but you may also get a burn.
6) Do not bring the heated workpiece right after welding into contact with combustibles.
7) Keep inflammables and combustibles away from the welding work area to avoid spatters.
8) Never use inflammable gas near the welding work area.
9) Firmly secure the cable connection, and insulate them.
10) Connect the workpiece-side cable as nearer to the welding spot as possible.
11) Do not perform welding on gas-filled pipes, airproof tanks and pipes etc. because they may burst.
12) Do not perform welding on flammable materials such as wood or cloth.
13) To perform welding on ceiling, floor, wall etc., be sure to carefully check behind and clear away the combustibles and inflammables.

2.4 If you carelessly touch the rotating part, you may get entangled and injured. Be sure to follow the notes below.

WARNING	● Do not bring your hands, fingers, hair, clothes etc. close to the rotating part.
	● Keep your hands, fingers, hair, clothes etc. away from the rotating part of wire feeding unit such as a feeding roll. You may get entangled and injured.

1) When using a welding power supply, be sure that its case and cover are fixed on.
2) When required to unfix the cover of welding power supply for maintenance, inspection and repair work, only the personnel who has taken the specified course and fully understands the welding power supply must perform the operation. During the operation, keep other people away from the work area by enclosing it.
3) Keep your hands, fingers, hair, clothes etc. away from the feeding roll on rotating.

Reference

< PRINCIPAL SAFETY STANDARDS >

Arc welding equipment ? Installation and use, Technical Specification
IEC 62081, from International Electrotechnical Commission

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.

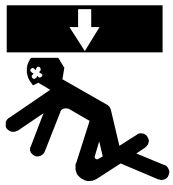
Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute.

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

3. Transport and Installation

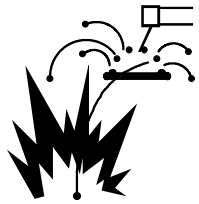
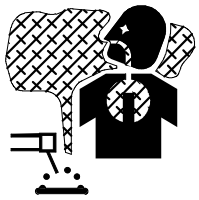
3.1 Transportation

To avoid an accident and damage to the wire feeding unit in transportation, observe the followings.

WARNING	● Do not touch live electrical parts.
	● Before transporting and transferring the wire feeding unit, be sure to turn off the input power by switching in the switch box.
WARNING	● For transporting and hanging of this unit, follow the specified procedures. ● To fix the unit and other peripheral equipment, use the prescribed tightening torque.
	● Falling objects harm personnel and equipment. ● Use the prescribed tightening torque when fixing the unit. Otherwise, a fatal physical injury may be caused because of turnover of the unit, flying or falling of the tool and some other reasons. ● For transporting the wire feeding unit by craning to high, be sure to unset the wire from the unit.

3.2 Installation

For installing the wire feeding unit, observe the following notes to protect operator's health from a fire, an explosion, fumes and gas caused or produced by welding performance.

WARNING	● Do not place the unit near inflammables. ● Watch out for a fire and know where a fire extinguisher is placed.
	● Do not install the welding power supply near inflammables or flammable gas. ● Keep inflammables away from the welding area so that they will not be exposed to spatter. If not possible, cover them with the fireproof cover.
WARNING	● Do not breathe in fumes. ● Ventilate the area enough and wear a protection face guard and other protective equipment as needed.
	● To avoid gas poisoning or asphyxia, use a respirator or adopt a ventilation system prescribed by the laws in your country. ● When performing welding in a tight space, be sure to ventilate the area enough or wear a respirator, and operate in control of the trained observer.

< Installation location >

● Install the wire feeding unit in a place meeting the following conditions.

- Indoor place in which no direct sunlight, wind and weather is exposed, and with little moisture and dust
- The ambient temperature is within the range of -10～40℃.
- No wind is blown to the arc part.

  (Wind may cause a welding failure. Avoid a wind with a windshield or other items.)

4. Connection

WARNING	● To avoid electric shock ,be sure to turn off all the input powers by switching in the switch box before performing the connection work.

CAUTION	● Secure the cable connection firmly.

Thank you very much for purchasing our OTC wire feeding unit AF-4001, AFA-4001, AFT-4201 and AFU-4201 for CO_2/ MAG/ MIG welding. Read this instruction manual thoroughly before using this product, and use the product properly.

[Note] 1. The contents in this manual are subject to change without notice.
2. We have carefully compiled this instruction manual so that we will not make any errors in the content. Even if there errors are found, we are not responsible for any damage caused by the error.
3. No part of this instruction manual may be reproduced, stored in or introduced into a retrieval system, or transmitted in any form or by any means.

1. Specifications

1.1 AF-4001

AF-4001 is the robot dedicated wire feeding unit used for CO_2 / MAG welding.
The specifications are shown in Table 1.1 below. See Fig 1.1 for the external diagram.

Table1. 1 Specifications of AF-4001

Model	AF-4001
Welding method	CO_2 / MAG welding
Rolling system	4-roll system
Applicable wire diameter	(φ0.8) φ0.9 φ1.0 φ1.2 (φ1.4) (φ1.6)
Wire feed rate	1.5~22m/min
Mass (Weight)	Approx. 4kg
Applicable power supply	DM series (DP series with mild steel used)

Note) The standard is that this wire feeding unit builds in the components that support steel wires (φ0.9, φ1.0, and φ1.2). The applicable wire diameter indicated in ( ) is an option.

1.2 AFA-4001

AFA-4001 is the robot dedicated wire feeding unit used for MIG welding. The specifications are shown in Table 1.2 below. See Fig 1.2 for the external diagram.

Table1. 2 Specifications of AFA-4001

Model	AFA-4001
Welding method	MIG welding
Rolling system	4-roll system
Applicable wire diameter	Aluminum : φ1.0 φ1.2 (φ1.6)
Wire feed rate	1.5~22m/min
Mass (Weight)	Approx. 4.2kg
Standard assembly	Wire straightener
Applicable power supply	DP series (DM series with aluminum used)

Note) The standard is that this wire feeding unit builds in the components that support aluminum (both φ1.0 and φ1.2). The applicable wire diameter indicated in ( ) is an option.

1.3 AFT-4201

AFT-4201 is the robot-dedicated wire feeding unit used for mild steel/ stainless TIG filler welding. The specifications are as shown in Table 1.3. See Fig. 1.3 for the external diagram.

Table 1.3 Specifications of AFT-4201

Model	AFT-4201
Welding method	TIG filler (mild steel/ SUS) welding
Rolling system	4-roll system
Applicable wire diameter	Mild steel (ϕ0.8), ϕ0.9, ϕ1.0, ϕ1.2, (ϕ1.6) Stainless (ϕ0.8), ϕ1.2, (ϕ1.6)
Wire feed rate	0.25 - 5m/min
Mass (Weight)	Approx. 4kg
Applicable power supply	DA series

Note) The standard is that this wire feeding unit builds in the components that support steel wires (ϕ0.9, ϕ1.0, and ϕ1.2). The applicable wire diameter indicated in ( ) is an option.

1.4 AFU-4201

AFU-4201 is the robot-dedicated wire feeding unit used for aluminum TIG filler welding. The specifications are as shown in Table 1.4. See Fig. 1.4 for the external diagram.

Table 1.4 Specifications of AFU-4201

Model	AFU-4201
Welding method	TIG filler (Aluminum) welding
Rolling system	4-roll system
Applicable wire diameter	Aluminum ϕ1.0, ϕ1.2, (ϕ1.6)
Wire feed rate	0.25 - 5m/min
Mass (Weight)	Approx. 4.2kg
Standard assembly	Wire straightener
Applicable power supply	DA series

Note) The standard is that this wire feeding unit builds in the components that support aluminum wires (both ϕ1.0 and ϕ1.2). The applicable wire diameter indicated in ( ) is an option.

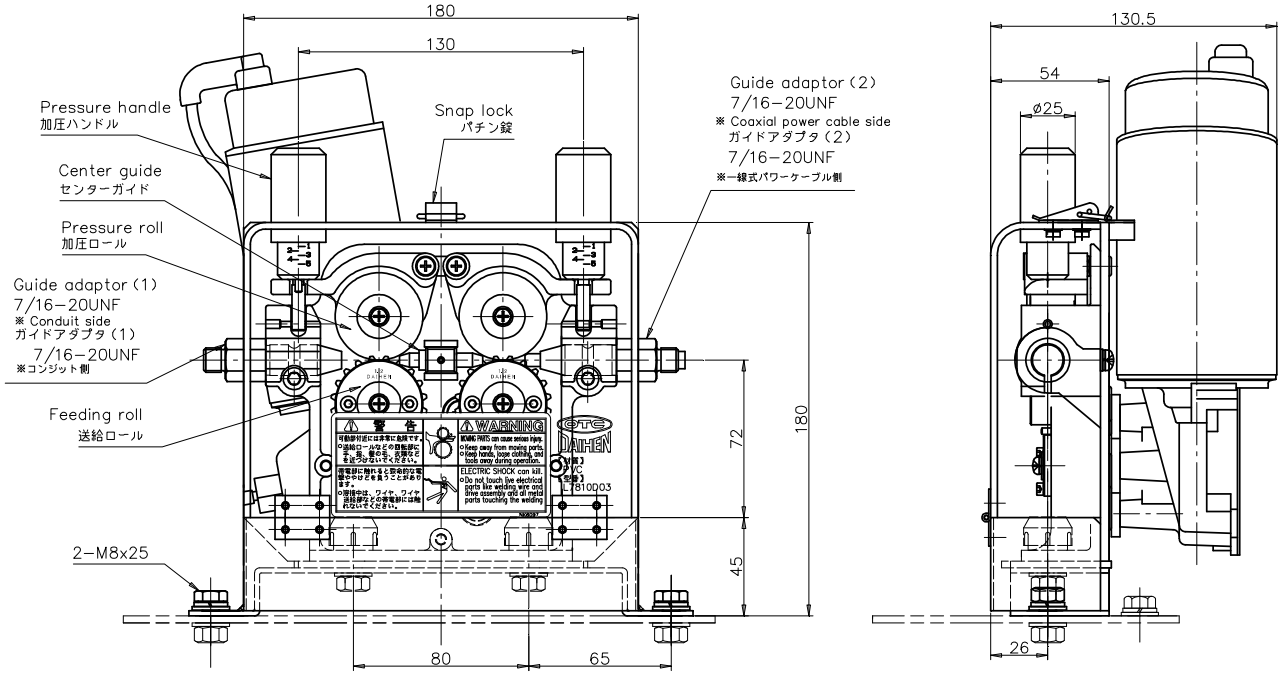


Fig1. 1　External diagram of wire feeding unit :AF-4001　　(Unit：mm)

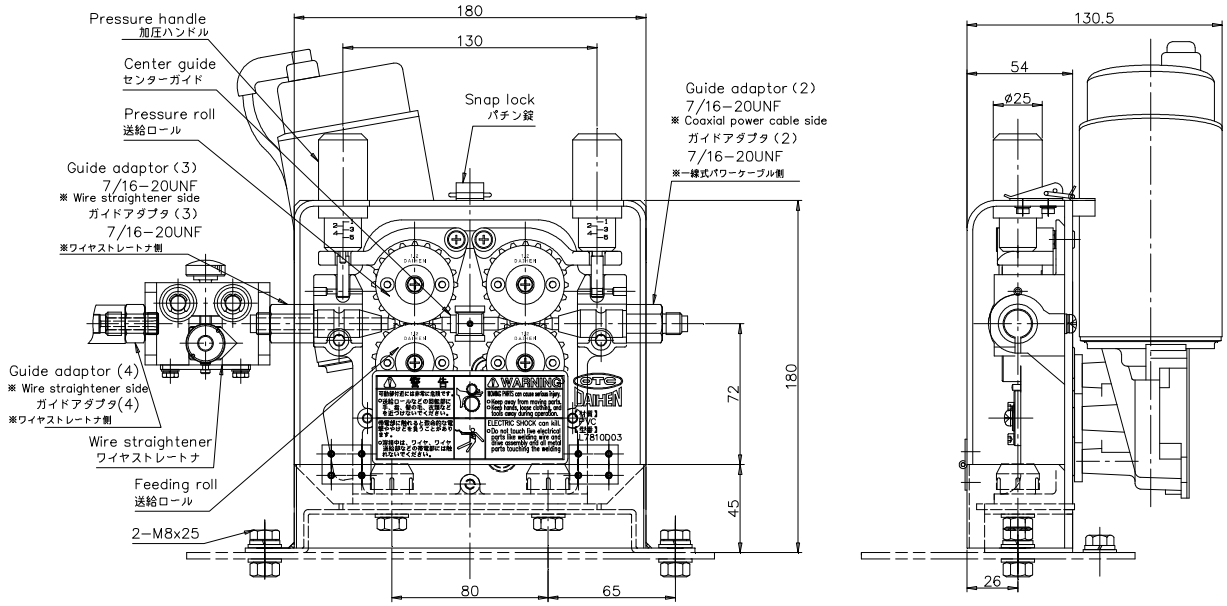


Fig1. 2　External diagram of wire feeding unit : AFA-4001　　(Unit：mm)

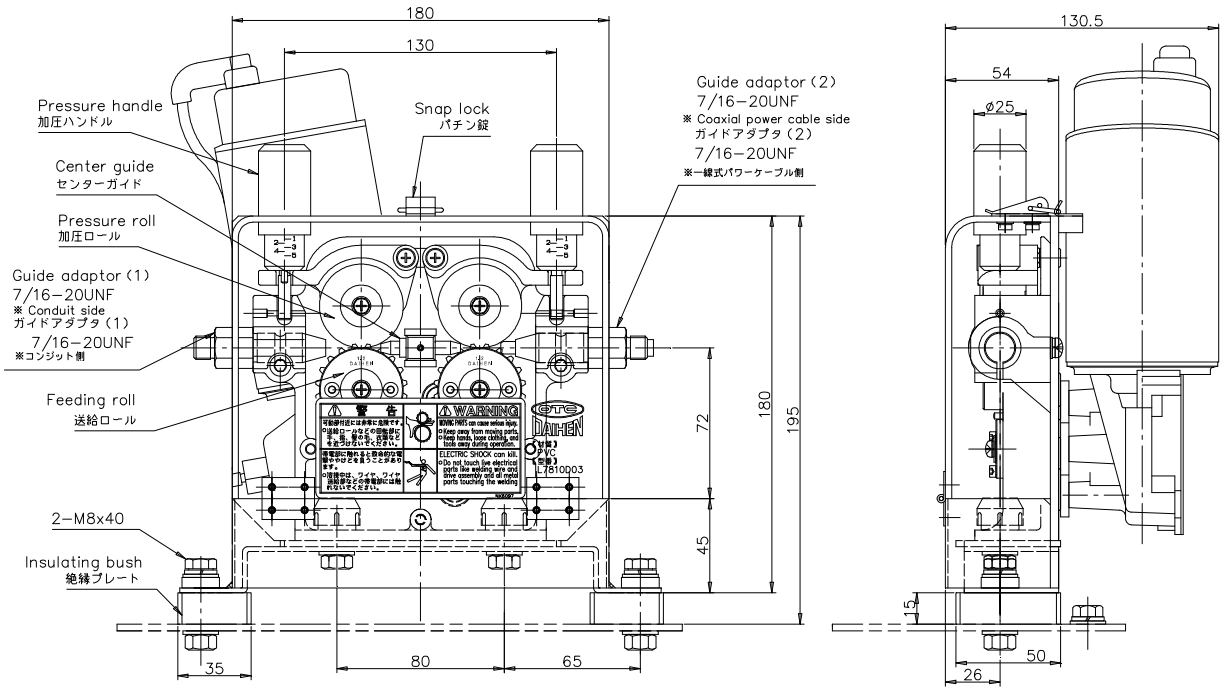


Fig1.3　External diagram of wire feeding unit : AFT-4201 (for TIG filler steel wire)　(Unit: mm)

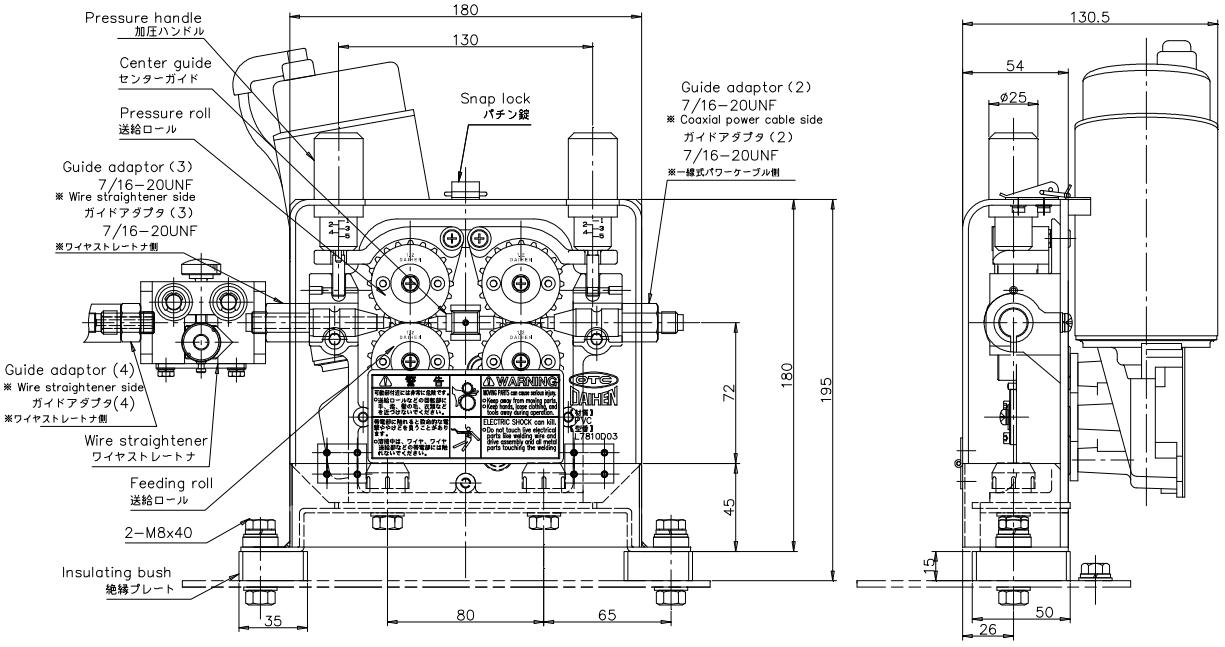


Fig1.4　External diagram of wire feeding unit : AFU-4201 (for TIG filler aluminum wire)　(Unit: mm)

2. Installation on Manipulator (*Almega AX-MV / AX-MG series)*

2.1 Installation on Almega AX-MV series

Follow the procedures below to install this wire feeding unit on the shoulder part of manipulator. The fixing bracket (L7809B: common for AX-MV series) is also separately needed for installation.

(1) Mount the fixing bracket onto the shoulder part of manipulator referring to Fig2.1. Fix it in a position where the coaxial power cable (conduit in the case of AFT(AFU)-4201) bends as gently as possible. The fixing bracket is adjustable back and forth.

(2) Before connecting the coaxial power cable, see Fig2.2 and replace the guide adaptor attached to the coaxial power cable (U785C13) with the guide adaptor attached to this wire feeding unit (2) (L7810D05). In the case of AFT(AFU)-4201 for the TIG filler welding, connect an appropriate conduit according to the wire diameter in use.

(3) After mounting it onto the shoulder part, remove the shoulder cover and refer to Fig2.3 to connect the motor cable, the encoder cable and the voltage detection cable (* only in the case of AF(AFA)-4001) of wire feeding unit with the in-manipulator cables. For cable connection, see “7.1 Electrical connection diagram”. After connecting cables, return the shoulder cover to its original position.

【Note】A solenoid valve, a shock sensor connector and a motion warning lamp (Option) are all included in the manipulator.

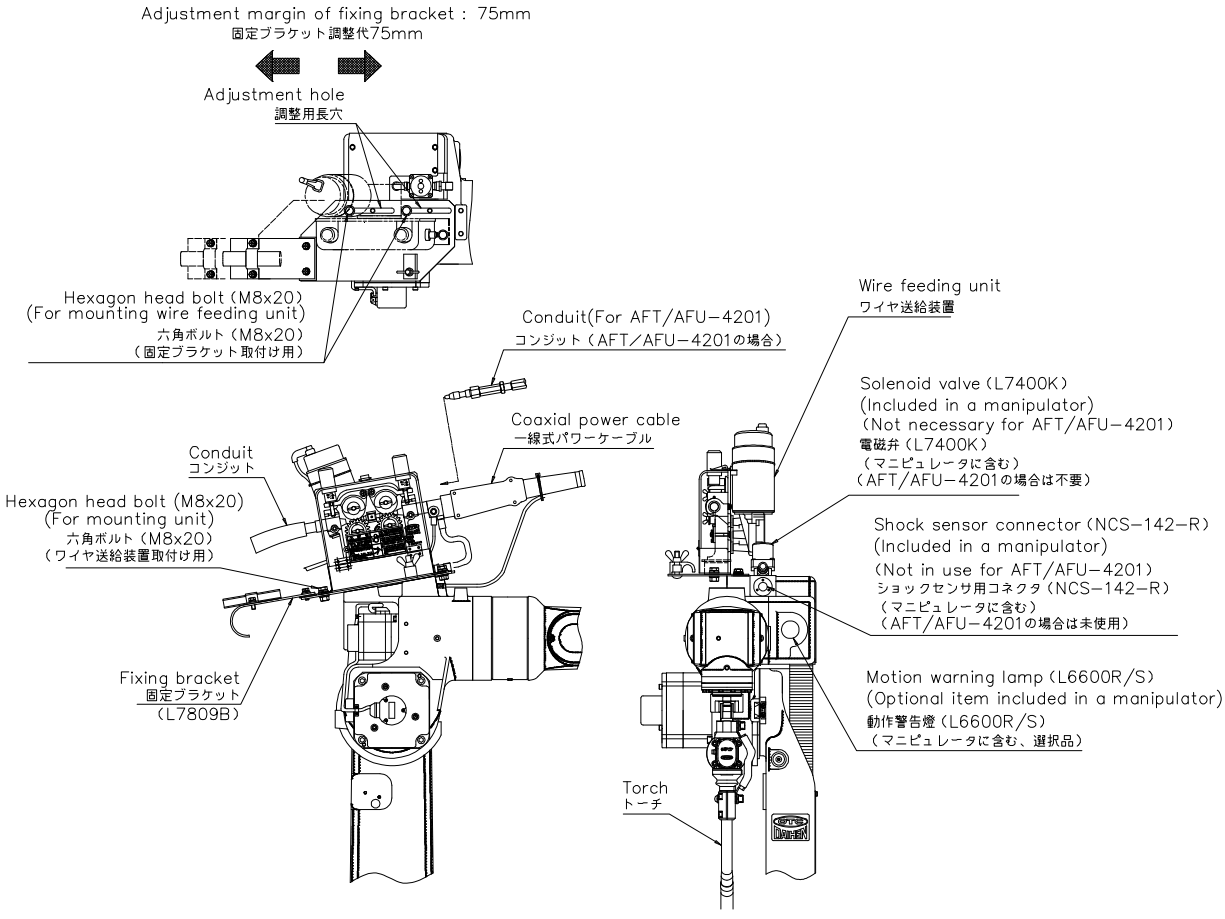


Fig2. 1 Installation on shoulder part of manipulator (Procedure (1))

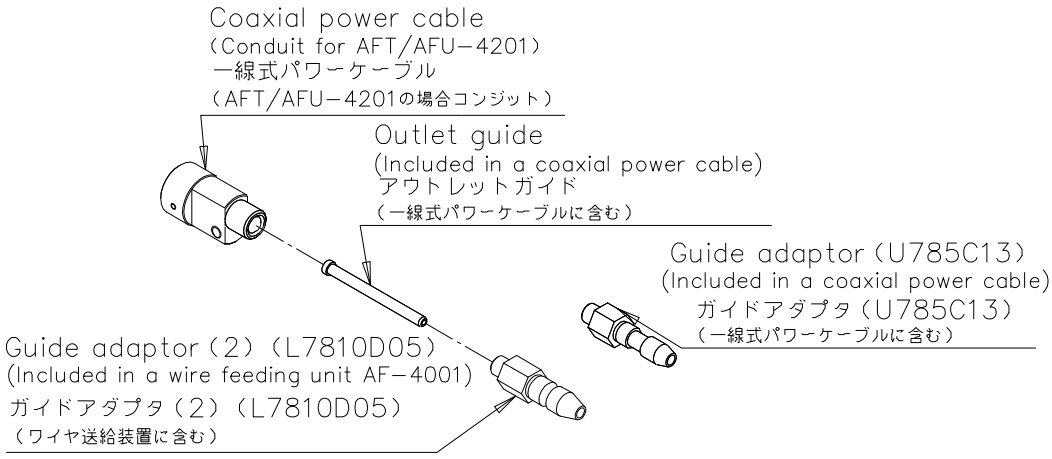


Fig2. 2　Replacement of guide adaptor (Procedure (2))

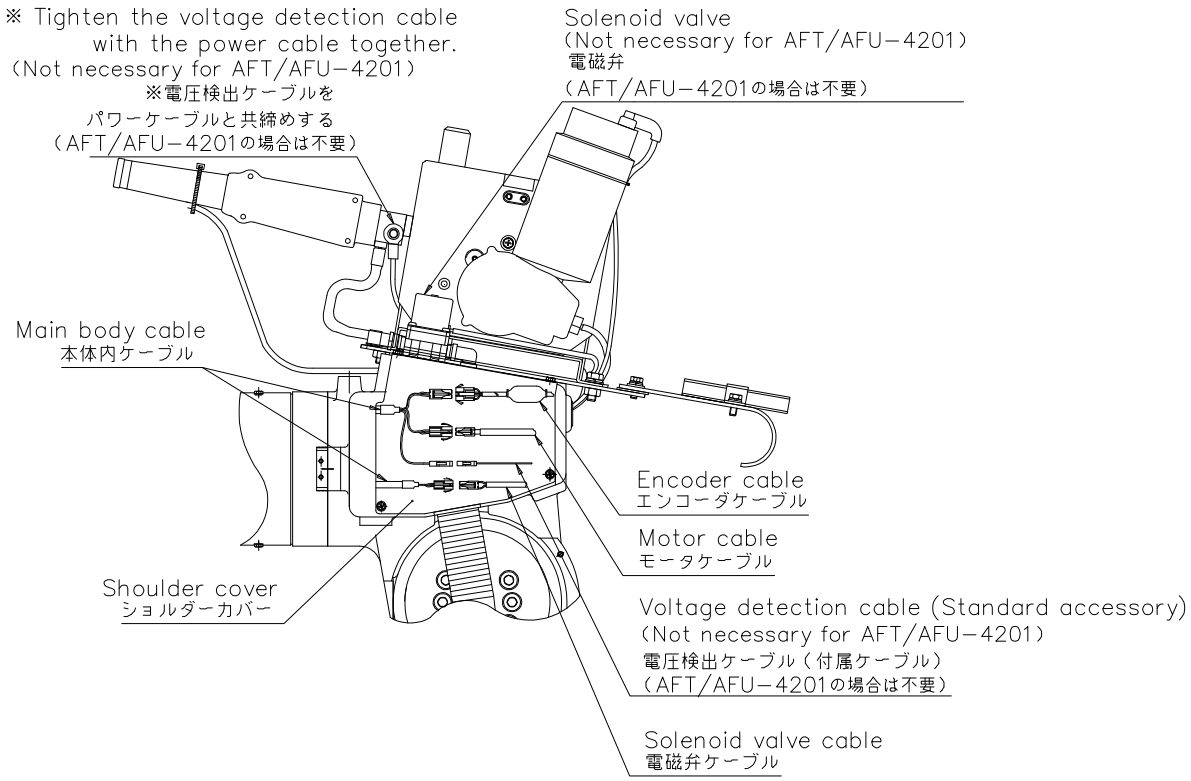


Fig2.3　Cable connection (Procedure (3))

【Note】The solenoid valve cable is not necessary when performing TIG filler welding with AFT(AFU)-4201. Also, do not wire up a shock sensor cable inside the manipulator body. Otherwise, high-frequency noises generated by TIG welding may cause malfunction of the manipulator.

2.2 Installation on Almega AX-MG series

Follow the procedures below to install this wire feeding unit on the upper part of manipulator revolving frame. The wire feeder stand (L7497A) is also separately needed for installation.

(1) Mount the wire feeder stand (L7497A) on the upper part of revolving frame, referring to Fig2.4, and fix the wire feeding unit on it. In the case of AFT(AFU)-4201, be sure to install the attached insulating plate.

(2) Before connecting the coaxial power cable, replace the guide adaptor referring to the procedure (2) in the previous section 2.1. In the case of AFT(AFU)-4201 for the TIG filler welding, connect an appropriate conduit according to the wire diameter in use.

(3) After fixing it on the upper part of manipulator revolving frame, remove the rear cover of wire feeder stand. Then, refer to Fig2.5 and connect the motor cable, the encoder cable, the voltage detection cable (※AF-4001, AFA-4201) and the solenoid valve cable (※AF-4001, AFA-4201) of wire feeding unit with the in-manipulator cables. For cable connection, see "7.1 Electrical connection diagram". After connecting cables, return the rear cover of wire feeder stand to its original position.

【Note】A solenoid valve and a shock sensor connector are equipped with the wire feeder stand and a motion warning lamp (Option) is included in the manipulator.

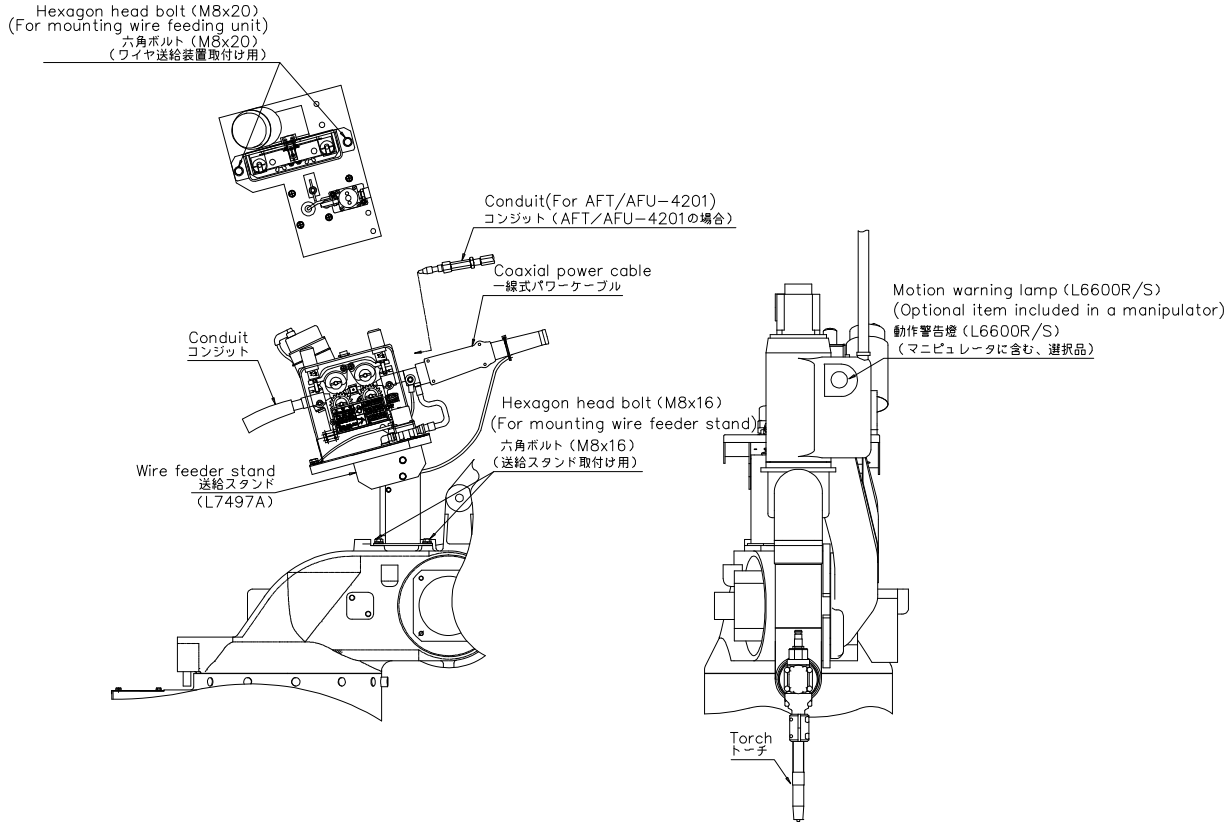


Fig2. 2 Installation on upper part of manipulator revolving frame (Procedure (1))

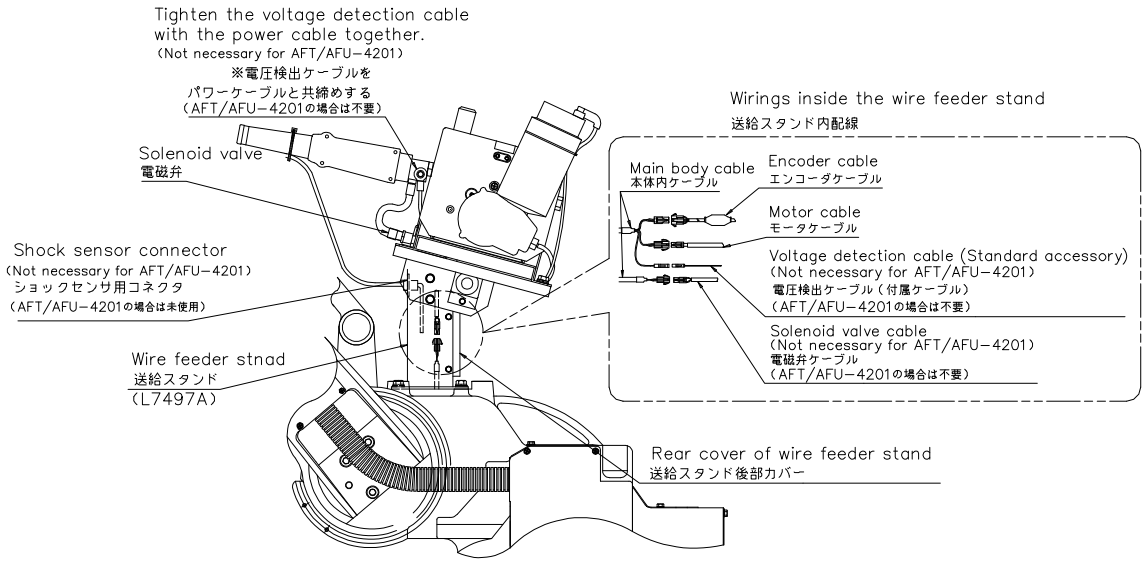


Fig2. 3　Cable connection (Procedure (3))

【Note】The solenoid valve cable is not necessary when performing TIG filler welding with AFT(AFU)-4201. Also, do not wire up a shock sensor cable inside the manipulator body. Otherwise, high-frequency noises generated by TIG welding may cause malfunction of the manipulator.

3. Welding Preparation

3.1 Pressure releasing operation

To pass the wire through into this wire feeding unit or to replace the feeding roll, see Fig3.1 and follow the procedures below.

(1) Release the snap lock and pull the clear cover toward.
(2) Pull the pressure handle toward and lift up the pressure holder.
(3) Pass through a wire into the conduit-side adaptor, the center guide and the adaptor on coaxial power cable side in this order. (For AFT(AFU)-4201, the coaxial power cable is replaced with a conduit.)
(4) To replace the feeding roll, see the following section.
(5) Return the pressure holder and the pressure handle to their original position.

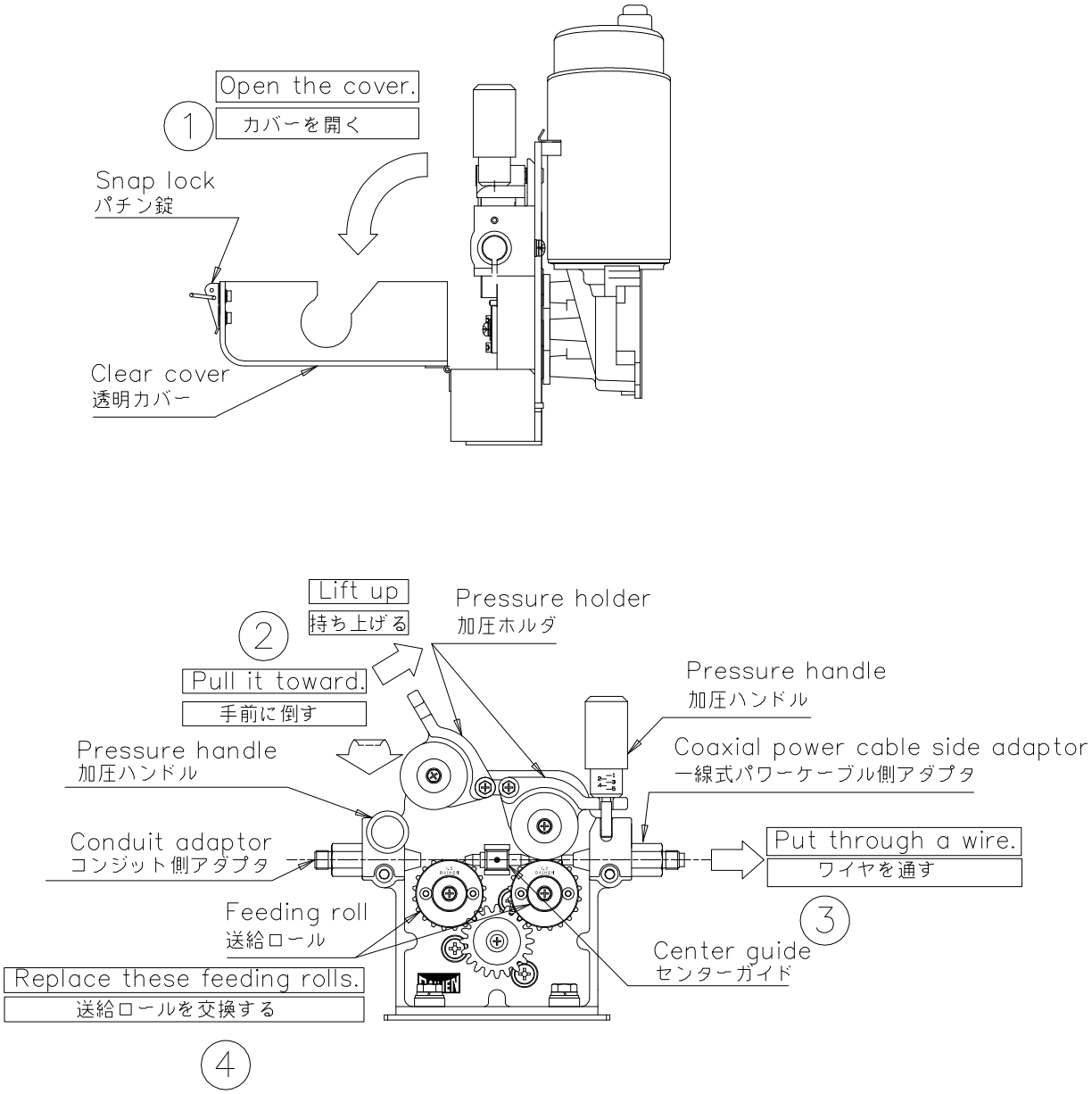


Fig3. 1 Pressure releasing operation

3.2 Mounting of feeding roll

The feeding roll for the wire diameter: ϕ 0.9-1.0/1.2 is built in this wire feeding unit at shipment. If using a wire of different diameter, replace the feeding roll in advance with an appropriate one. To replace the feeding roll, see Fig3.2 and follow the procedures below.

(1) Release the pressure. (Refer to the section 3.1.)
(2) Remove two pieces of setscrews that fix the feeding roll.
(3) Pull out the feeding roll toward.
(4) When replacing the feeding roll, be sure that the wire diameter is indicated, which shows the same as the one actually in use.

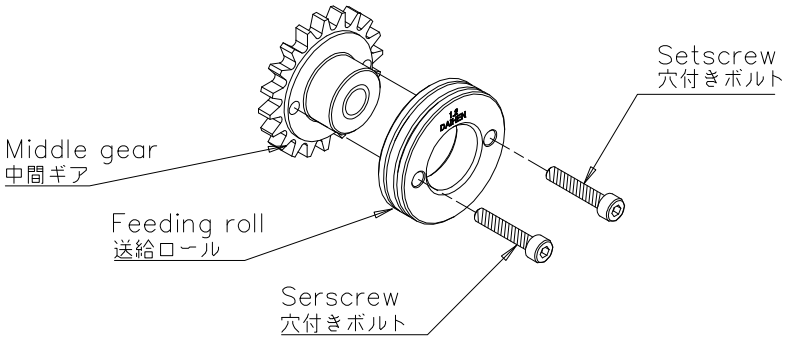


Fig3. 2 Mounting of feeding roll

【Note】If applying an aluminum wire (for AFA-4001), four feeding rolls are required. Use an appropriate one according to the wire diameter.

3.3 Pressure adjustment

Referring to FIg3.4 on the following section, turn the pressure handle and set the pressure according to each wire diameter. The rough standard of set value is as shown in Table3.1 below.

Table3. 1 Rough standard of pressure

Wire diameter	Solid wire Flux-cored wire	Hard aluminum (AFA-4001)	Soft aluminum (AFA-4001)
ϕ 1.6	3~4	2~3	2~3
ϕ 1.4			
ϕ 1.2	2~3	1~2	1~2
ϕ 1.0			
ϕ 0.9			
ϕ 0.8	1~2		

【Note】1. The values in the table above are just rough standards. They may differ depending on the welding conditions and the wire type.

2. Set the pressure handle equally on both right and left sides.

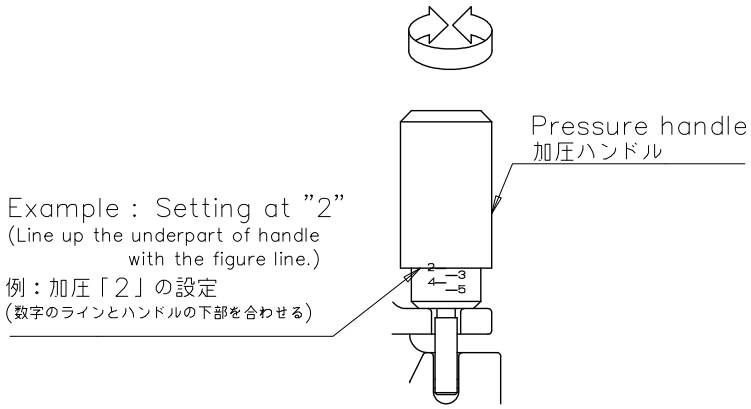


Fig3. 3　Pressure adjustment

3.4　Pressure adjustment for straightener

A straightener is the component to correct wire distortion that is standardized in AFA-4001 and AFU-4201. The model AFA-4001 and AFU-4201 needs not only the pressure adjustment shown in the previous page but also the pressure adjustment for straightener. See the following Table3.2 and Fig3.5 to set the appropriate pressure value.

Table 3. 2　Rough pressure standard for straightener

Wire diameter	Solid wire Flux-cored wire	Hard aluminum (AFA-4001)	Soft aluminum (AFA-4001)
φ1.6	2~3	2~3	2~3
φ1.4	3~4		
φ1.2		3~4	4~5
φ1.0	4~5	4~5	
φ0.9			
φ0.8			

【Note】The values in the table above may differ depending on the welding conditions and wire types.

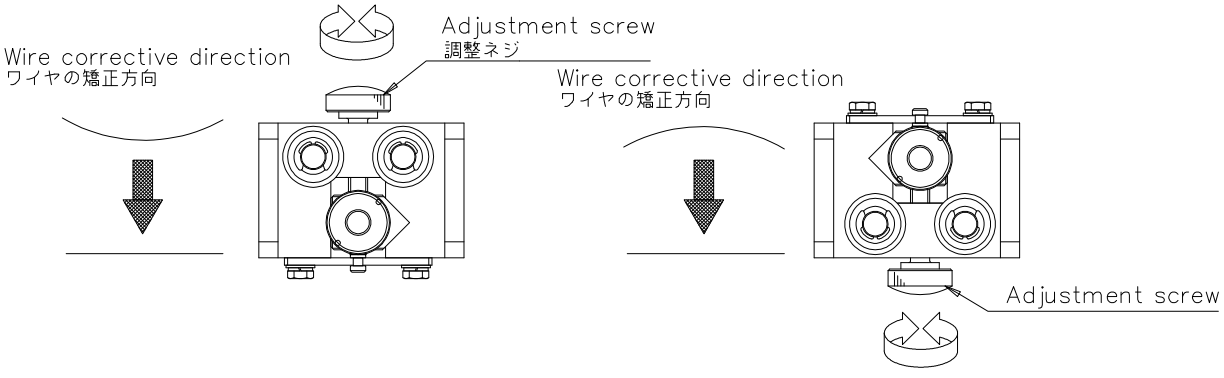


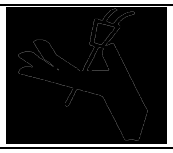
Fig3. 4　Pressure adjustment for straightener

【Note】Depending on the direction of wire distortion, the wire straightener may be mounted upside down as shown in Fig3. 4.

3.5 Wire feeding by inching

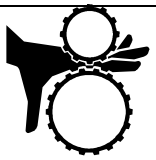
To feed a wire, thoroughly read the following caution notes and perform the operation carefully.

WARNING



- Do not bring your face, eyes, body, etc. close to the torch tip during inching. A wire may fly out and stick into you, causing an injury.

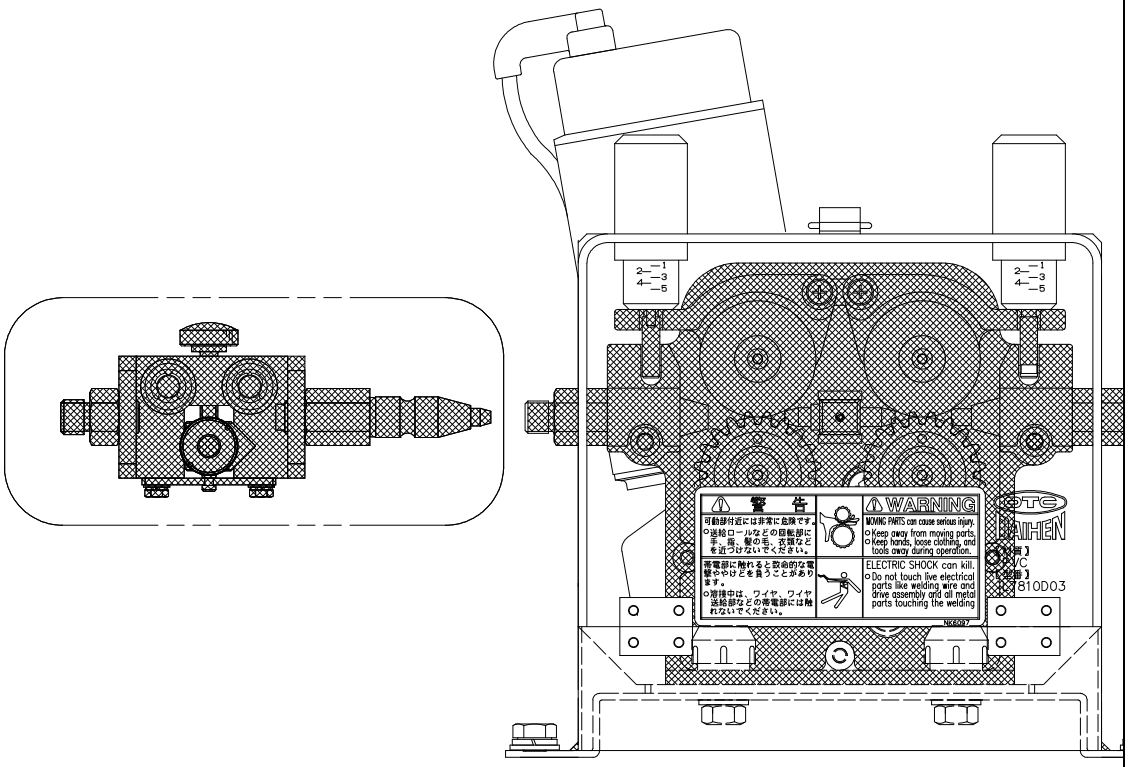
CAUTION



- Do not bring your hands, fingers, hair, clothes, etc. close to the feeding roll part during inching. If doing so, you may be entangled and get injured.

WARNING ※You may get a fatal electric shock or a severe burn if touching the live electric parts.

Do not touch the live electric parts such as a wire or a wire feeding part during welding performance. The shadowed part ▒▒▒▒▒▒ is electrified during welding performance. (Inside the clear cover)



4. Inspection and Maintenance

4.1 Inspection

Carry out inspection on the following points.

Part	Inspection point	Possible trouble	Measures
Pressure scale	● Is the welding pressure appropriate for the wire diameter?	Wire distortion or feeding failure	Refer to Chapter 3.3 “Pressure adjustment” and adjust the welding pressure.
Guide adaptor Center guide	● Is there no dust or wire chips stuck in the guide adaptor or the center guide?	Wire feeding failure	Remove dust and wire chips.
Feeding roll	● Does the mark on feeding roll match the actual wire diameter?	Wire distortion or feeding failure	Use the appropriate feeding roll in accordance with the wire diameter.
	●Is the groove not worn out?		Replace the feeding roll with new one.
Pressure roll	● Does it smoothly rotate?	Wire feeding failure or strange noise	Replace the pressure roll with new one.
Encoder cable	●Is the cable going to be disconnected or its cover broken?	Wire feeding failure or feeding impossibility	Replace the encoder cable with new one.
	● Is not the connector cap off?		Remove dust at the connector part and put the connector cap.
Motor cable	●Is the cable going to be disconnected or its cover broken?	Wire feeding failure or feeding impossibility	Replace the motor cable with new one.
Voltage detection cable	●Is the cable going to be disconnected or its cover broken?	Wire feeding failure or feeding impossibility	Replace the voltage detection cable with new one.
Motor	● Is the motor periodically replaced?	Wire feeding impossibility	Replace the motor. Life duration is approx. 2000 hours (approx. 2yrs).
Wire feeding unit (lower part)	● Are wire chips not stuck?	Wire feeding failure or damage to gears	Clean the unit periodically.

4.2 Replacement of feeding motor

Replace the feeding motor periodically. Life duration of the brush part in the feeding motor depends on the load condition, the ambient temperature, etc., which is normally about 4,000 hours (about 2 years under four operating hours a day).

CAUTION Do not disassemble the feeding motor.

- It may cause a trouble.
- Do not inspect abrasion of the brush, and never replace it.
- The encoder only or the gear box only cannot be separately replaced.

5. Parts List for AF-4001

●If the components get worn out or damaged while using this wire feeding unit, refer to Fig5.1-5.5 and Table 5.1-5.5 and contact our local distributor or sales agent.
When ordering, be sure to give both the item name and the parts No. The items followed by ( ) in the Q'ty column are optional.

5.1 Parts list for wire feeding unit (AF-4001)

Table5. 1 Parts list for wire feeding unit (AF-4001)

Ref. No.	Parts No.	Item	Q'ty	Remarks
1	L7810B00	Wire feeding unit	1set	For details, refer to Chapter 5.2.
2	L7810C00	Assembly parts	1set	For details, refer to Chapter 5.3.
3	L7810D00	Wire feeder cover	1set	For details, refer to Chapter 5.4.
4	L7810E00	Motor cable	1	For the electrical wiring, see Chapter 7.1 in the following page.
5	L7810L00	Encoder cable	1	For the electrical wiring, see Chapter 7.1 in the following page.
6	L7810G	Feeding roll	1set	For details, refer to Chapter 5.5.
7	L7437D00	Voltage detection cable	1	For the electrical wiring, see Chapter 5.6 in the following page.

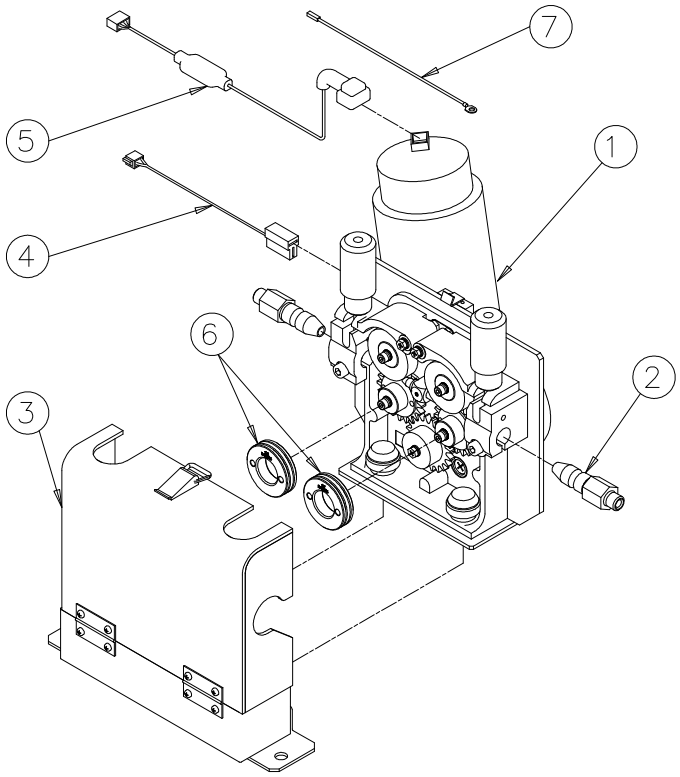


Fig5.1 Exploded diagram of wire feeding unit (AF-4001)

5.2 Parts list for wire feeding unit (L7810B00)

Table5. 2 Parts list for wire feeding unit (L7810B00)

Ref. No.	Parts No.	Item	Q'ty	Remarks
1	U5209B01	Bracket	1	
1-1		Setscrew	2	M6x25
2	U5185B08	Coil spring	1	
3	U5185B02	Pressure holder pin	2	
4	U5185S00	Pressure holder (R)	1	Assembly part
5	U5185T00	Pressure holder (L)	1	Assembly part
6	U5185B03	Driving roll shaft	2	
7	U5185P00	Middle gear	2	Assembly part
7-1		P-hole setscrew	4	M4x10
8	U5185B04	Guide block	1	
9	4802-206	Feeding motor	1	
10	U5185B06	Insulating plate	1	
11	U3971B04	Insulating bush	3	
11-1		P-flat head screw	3	M6x20
12	U5185Q00	Driving gear	1	
13	U5185B09	Pressure spring holder	2	
14	U5185B12	Compression spring	2	
15	U5185B10	Pressure handle	2	
16	U5185B11	Pressure bolt	2	
16-1		Parallel pin	2	2.5x14
17	U5185B14	Insulating plate	1	
18	L7810D01	Insulating plate	1	
18-1		P-flat head screw	3	M5x10
19	U5185B13	Insulating bush	2	
19-1		Hexagon head bolt	2	M8x25
20	U5285B15	Insulating cover	2	

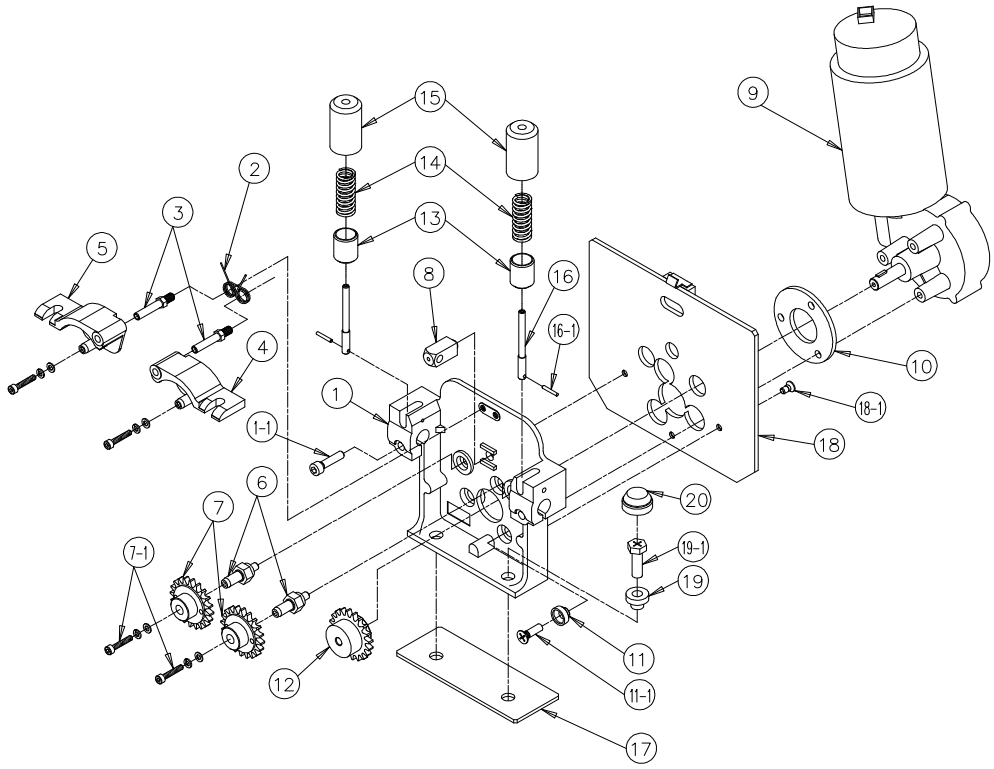


Fig5.2 Exploded diagram of wire feeding unit (L7810B00)

5.3 List of assembly parts (L7810C00)

Table5. 3 Lists of assembly parts (L7810C00)

Ref. No.	Parts No.	Item	Q'ty	Remarks
1	K5439C00	Pressure roll	2	
2	L7810D04	Guide adaptor (1)	1	Conduit side
3	L7810D05	Guide adaptor (2)	1	Coaxial power cable side
4	U5185B05	Center guide	1	

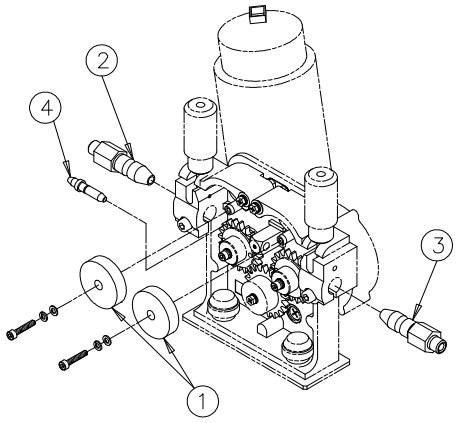


Fig5.3 Exploded diagram of assembly parts (L7810C00)

5.4 Parts list for wire feeder cover (L7810D00)

Table5. 4 Parts list for wire feeder cover (L7810D00)

Ref. No.	Parts No.	Item	Q'ty	Remarks
1	L7810D02	Base plate	1	
2	L7810D03	Clear cover	1	
3	C-23-1	Semi snap lock	1	
3-1		P-flat head screw, Nut	4	M3x8
4	B-1100-1	Flat hinge	2	
4-1		P- round screw, Nut	8	M3x8
5		Flat washer, Nut	2	M8

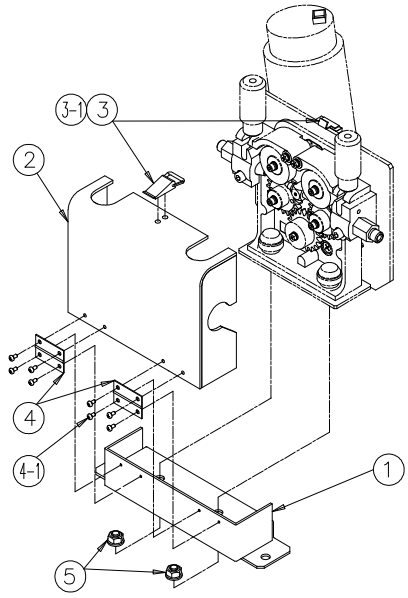


Fig5.4 Exploded diagram of wire feeder cover (L7810D00)

5.5 Parts list for feeding roll (L7810G)

Table5. 5 Parts list for feeding roll (L7810G)

Ref. No.	Parts No.	Item	Q'ty	Remarks
1	K5439B01	Feeding roll (1.4/1.6)	(2)	Option
2	K5439B12	Feeding roll (0.9-1.0/1.2)	2	Standard assembly
3	K5439B13	Feeding roll (0.8/0.9-1.0)	(2)	Option
4	K5439B04	Feeding roll (1.2/1.4)	(2)	Option
5	K5439B05	Feeding roll (1.2/1.2)	(2)	Option
6	K5439B06	Feeding roll (1.4/1.4)	(2)	Option
7	K5439B07	Feeding roll (1.6/1.6)	(2)	Option
8	K5439B09	Feeding roll (0.6/0.8)	(2)	Option
9	K5439B11	Feeding roll (1.2/1.6)	(2)	Option
10		Setscrew	4	M4x16

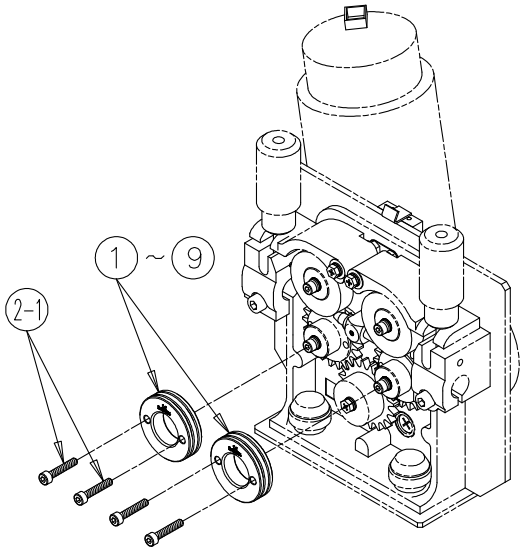


Fig5.5 Exploded diagram of wire feeding roll (L7810G)

Table5. 6 Combination by wire diameter

Wire diameter	Feeding roll	Outlet guide (Included in coaxial power cable)
ϕ 0.8	K5439B13 K5439B09	U2770K01
ϕ 0.9-1.0	K5439B12 K5439B13	U69B34
ϕ 1.2	K5439B12 K5439B04 K5439B05 K5439B11	U69B34 U69B35
ϕ 1.4	K5439B01 K5439B04 K5439B06	U69B35
ϕ 1.6	K5439B01 K5439B07 K5439B11	

6. Parts List for AFA-4001

●If the components get worn out or damaged while using this wire feeding unit, refer to Fig6.1-6.5 and Table 6.1-6.5, and contact our local distributor or sales agent.
When ordering, be sure to give both the item name and the parts No. The items followed by ( ) in the Q'ty column are optional.

6.1 Parts list for wire feeding unit (AFA-4001)

Table6. 1 Parts list for wire feeding unit (AFA-4001)

Ref. No.	Parts No.	Item	Q'ty	Remarks
1	L7810B00	Wire feeding unit	1set	For details, refer to Chapter 5.2.
2	L7812B00	Assembly part (Al)	1set	For details, refer to Chapter 6.2.
3	L7810D00	Wire feeder cover	1set	For details, refer to Chapter 5.4.
4	L7810E00	Motor cable	1	For the electrical wirings, see Chapter 7.1 in the following page.
5	L7810L00	Encoder cable	1	For the electrical wirings, see Chapter 7.1 in the following page.
6	L7812C	Feeding roll	1set	For details, refer to Chapter 6.3.
7	L7437D00	Voltage detection cable	1	For the electrical wirings, see Chapter 5.6.
8	L7812D	Wire straightener	1set	

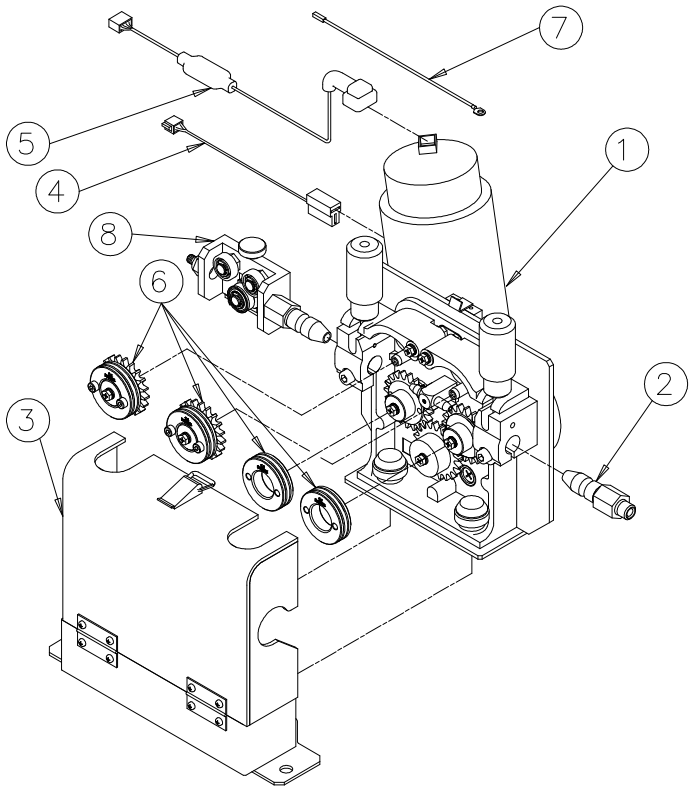


Fig6.1 Exploded diagram of wire feeding unit (AFA-4001)

6.2 List of assembly parts (L7812B00)

Table6. 2 List of assembly parts (L7812B00)

Ref. No.	Parts No.	Item	Q'ty	Remarks
1	U5185P00	Middle gear	2	
2	L7810D05	Guide adaptor (2)	1	Coaxial power cable side
3	U5204B03	Center guide (1.0-1.6)	1	
4	L7812B01	Guide adaptor (3)	1	For connecting straightener
5	U2586F01	Outlet guide	1	Wire diameter (For 1.0-1.2)
6	U2586F02	Outlet guide	(1)	Wire diameter (For 1.6)
7	L7812B02	Guide adaptor (4)	1	For connecting conduit
8	L7812B03	Inlet guide	1	

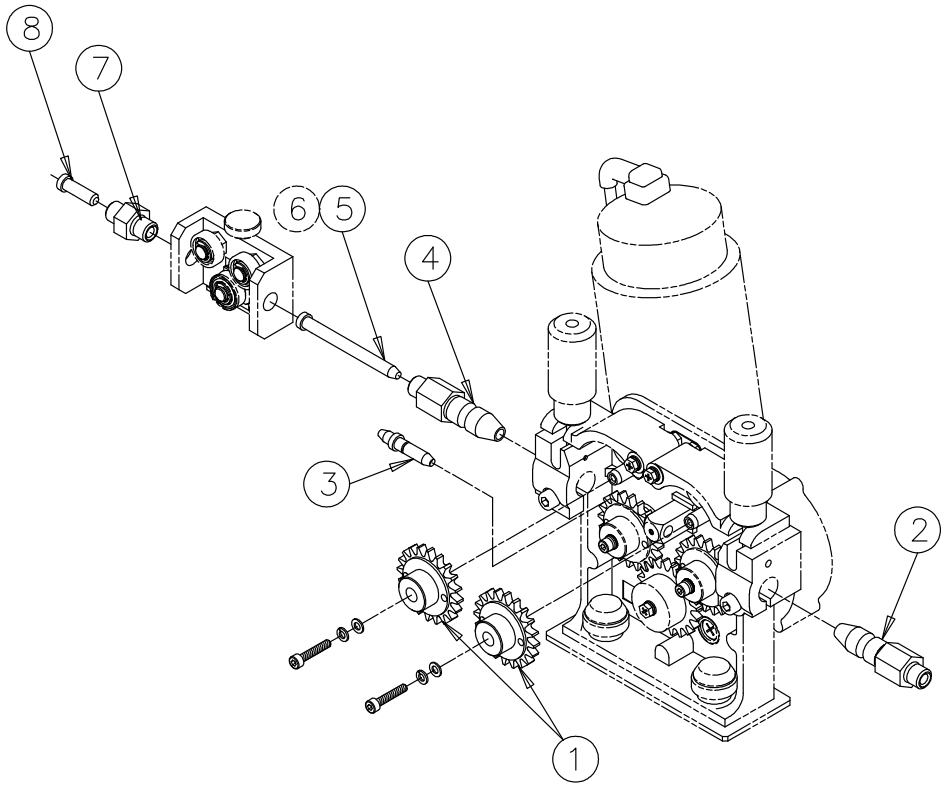


Fig6.2 Exploded diagram of assembly parts (L7812B00)

6.3 Parts list for feeding roll (L7812C)

Table6. 3 Parts list for feeding roll (L7812C)

Ref. No.	Parts No.	Item	Q'ty	Remarks
1	K5463R02	Feeding roll (1.0/1.2)	4	Standard assembly (U-shape groove)
2	K5463R03	Feeding roll (1.2/1.6)	(4)	Option (U-shape groove)
3	K5463R06	Feeding roll (0.8/0.9)	(4)	Option (U-shape groove)
4		Setscrew	8	M4x16

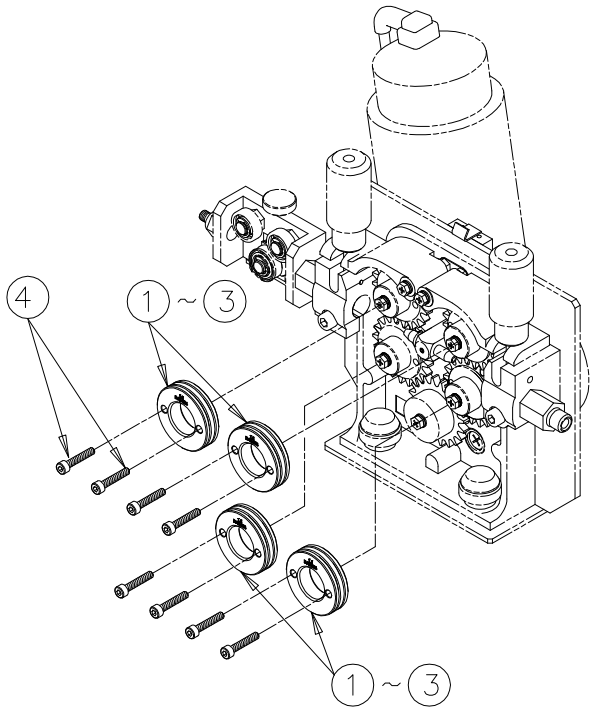


Fig6.3 Exploded diagram of wire feeding roll (L7812C)

Table6. 4 Combination by wire diameter

Wire diameter	Feeding roll	Outlet guide (Coaxial power cable, straightener)
ϕ 1.0	K5463R02 (U-shape groove)	U2586F01
ϕ 1.2	K5463R02 (U-shape groove) K5463R03 (U-shape groove)	
ϕ 1.6	K5463R03 (U-shape groove)	U2586F02

【Note】 The standard wire feeding unit (AFA-4001) is specified for aluminum. If applying it to soft steel or stainless, use the following part for modification. Also, replace the feeding roll referring to Table5.6.

Parts No.	Item	Q'ty	Remarks
L7812E	Assembly part (Fe)	1set	Parts for the soft steel/ stainless specification

7. Parts List for AFT-4201 (for TIG Filler Steel Wire)

●If the parts are getting worn out or damaged while using the wire feeding unit, see Fig. 7.1 ~ 7.4 and Table 7.1 ~ 7.4 to place an order with our sales office or agent. When ordering, be sure to provide the item name and part No. Note that the component indicated by ( ) for its quantity is an optional item.

7.1 Parts list for wire feeding unit (AFT-4201)

Table 7.1 Parts list for wire feeding unit (AFT-4201)

Ref. No.	Part No.	Item	Q'ty	Remarks
1	U5281B00	Feeding frame	1set	
2	L7810C00	Assembly	1set	Refer to the section 5.3 for the details.
3	L7810D00	Feeding cover	1set	Refer to the section 5.4 for the details.
4	L7810G	Feeding roll	1set	Refer to the section 5.5 for the details.
5	L7930B00	Insulation ASSY	1set	
6	L7930C	Wire straightener ASSY	(1set)	Option
7	L7930D00	Motor encoder cable	1set	Refer to the section 9.2 for the electrical wiring diagram.

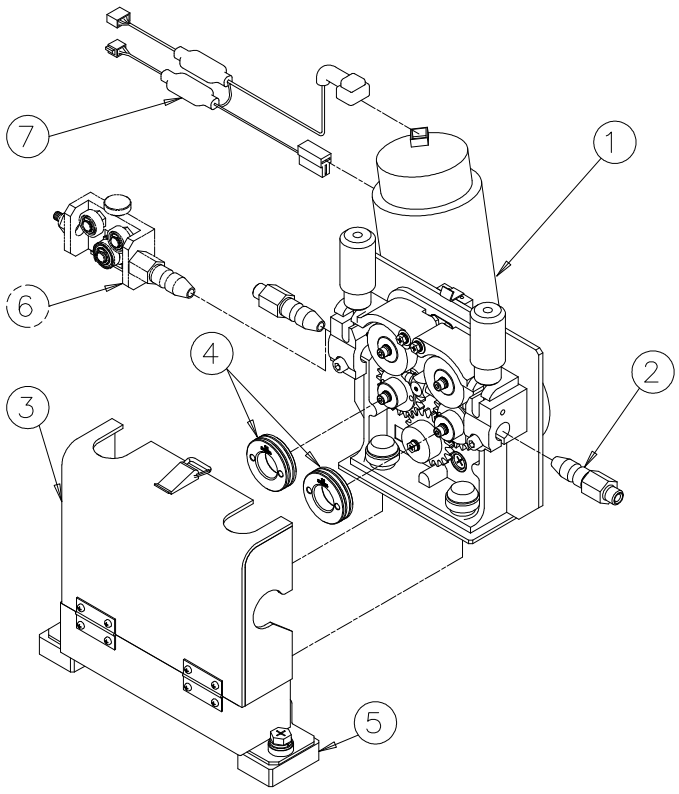


Fig7.1 Exploded diagram of wire feeding unit (AFT-4201)

7.2 Parts list for feeding frame (U5281B00)

Table7.2 Parts list for feeding frame (U5281B00)

Ref. No.	Part No.	Item	Q'ty	Remarks
1	U5209B01	Bracket	1	
1-1		Setscrew	2	M6x25
2	U5185B08	Coil spring	1	
3	U5185B02	Pressure holder pin	2	
4	U5185S00	Pressure holder (R)	1	Assembly
5	U5185T00	Pressure holder (L)	1	Assembly
6	U5185B03	Drive roll shaft	2	
7	U5185P00	Intermediate gear	2	Assembly
7-1		P-slotted bolt	4	M4x10
8	U5185B04	Guide block	1	
9	4802-207	Feed motor	1	
10	U5185B06	Insulating board	1	
11	U3971B04	Insulating bush	3	
11-1		P flat screw	3	M6x20
12	U5185Q00	Drive gear	1	
13	U5185B09	Pressure spring holder	2	
14	U5185B12	Compression spring	2	
15	U5185B10	Pressure handle	2	
16	U5185B11	Pressure bolt	2	
16-1		Spring pin	2	2.5x14
17	U5185B14	Insulating board	1	
18	L7810D01	Insulating board	1	
18-1		P-flat screw	3	M5x10
19	U5185B13	Insulating bush	2	
19-1		Hexagon head bolt	2	M8x25
20	U5185B15	Insulation cover	2	

※The difference between the feeding frame for AF-4001 is the feed motor (part No.9).

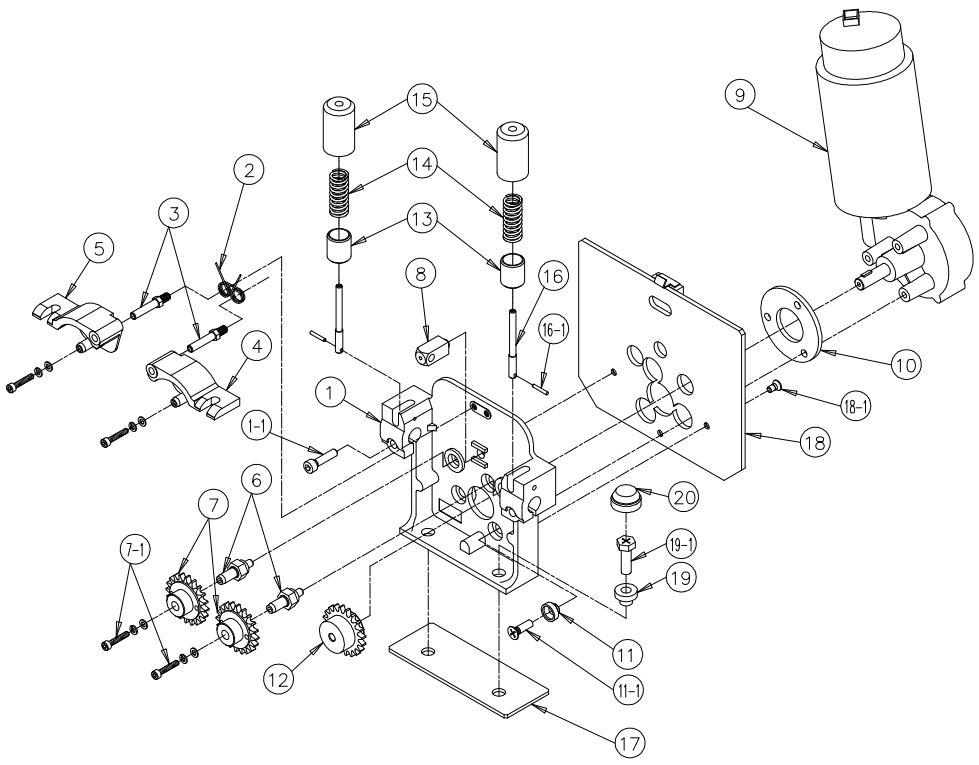


Fig7.2 Exploded diagram of feeding frame (U5281B00)

7.3 Parts list for insulation ASSY (L7930B00)

Table7.3 Parts list for insulation ASSY (L7930B00)

Ref. No.	Part No.	Item	Q'ty	Remarks
1	L7930B01	Insulating board	2	
2	U5185B13	Insulating bush	2	
3		P-slotted bolt	2	M8x40

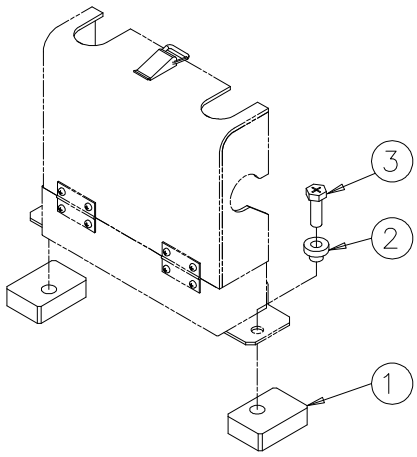


Fig7.3 Exploded diagram of insulation ASSY (L7930B00)

【Reference】

Table7.4 Combination list by wire diameter

Wire diameter	Feeding roll	Conduit
ϕ0.9-1.0	K5439B12 K5439B13	L7318B (Length: 3.4m) * Gauging cut shall be made for a liner. (Roughly 1.6m)
ϕ1.2	K5439B12 K5439B04 K5439B05 K5439B11	L7318C (Length: 3.4m) * Gauging cut shall be made for a liner. (Roughly 1.6m)
ϕ1.4	K5439B01 K5439B04 K5439B06	L7318D (Length: 3.4m) * Gauging cut shall be made for a liner. (Roughly 1.6m)
ϕ1.6	K5439B01 K5439B07 K5439B11	

8. Parts List for AFU-4201 (for TIG Filler Aluminum Wire)

●If the parts are getting worn out or damaged while using the wire feeding unit, see Fig. 8.1 and Table 8.1 to place an order with our sales office or agent. When ordering, be sure to provide the item name and part No. Note that the component indicated by ( ) for its quantity is an optional item.

8.1 Parts list for wire feeding unit (AFU-4201)

Table 8.1 Parts list for wire feeding unit (AFU-4201)

Ref. No.	Part No.	Item	Q'ty	Remarks
1	U5281B00	Feeding frame	1set	Refer to the section 7.2 for the details.
2	L7812B00	Assembly	1set	Refer to the section 6.2 for the details.
3	L7810D00	Feeding cover	1set	Refer to the section 5.4 for the details.
4	L7812C	Feeding roll	1set	
5	L7930B00	Insulation ASSY	1set	Refer to the section 7.4 for the details.
6	L7812D	Wire straightener ASSY	1set	
7	L7930D00	Motor encoder cable	1set	Refer to the section 9.2 for the electrical wiring diagram.

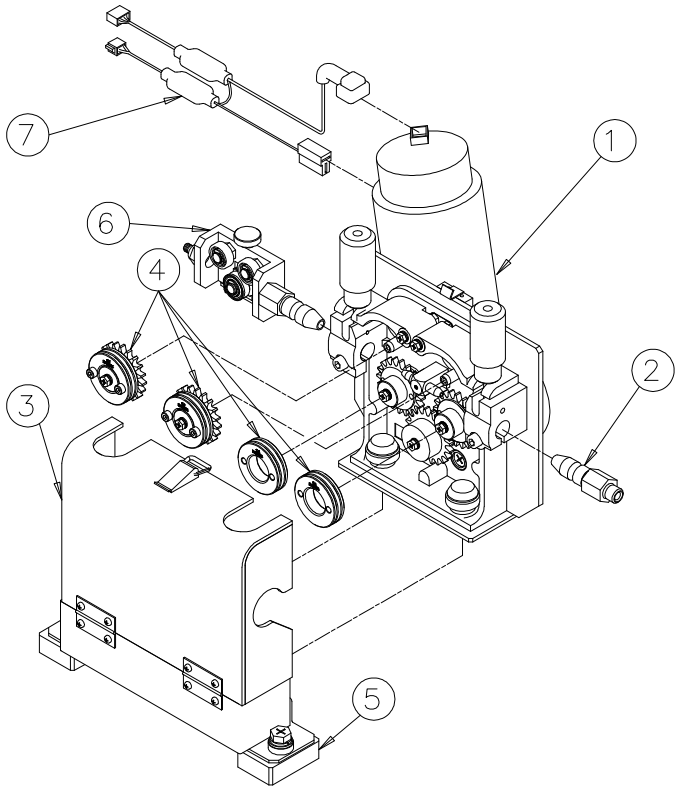
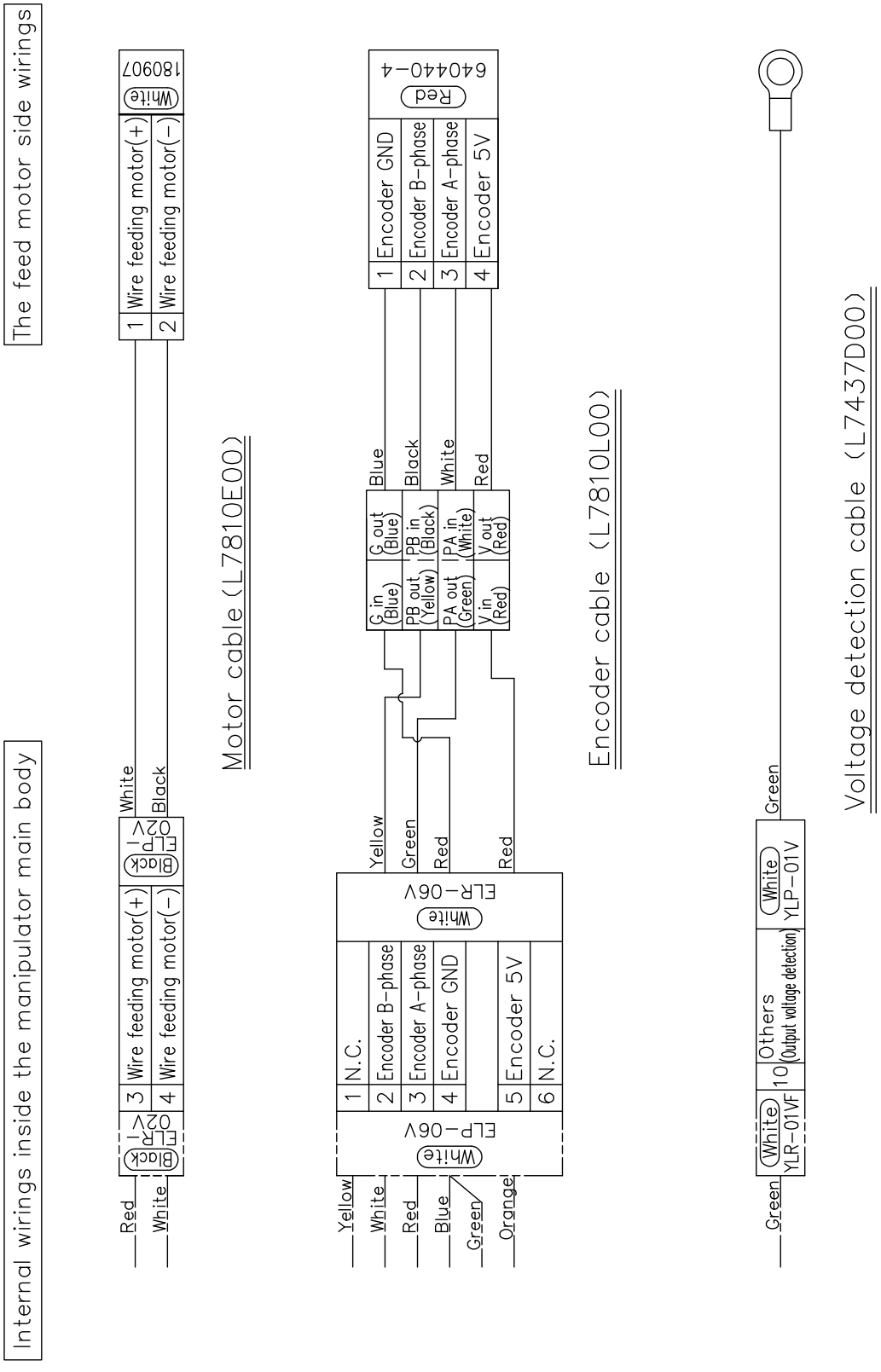


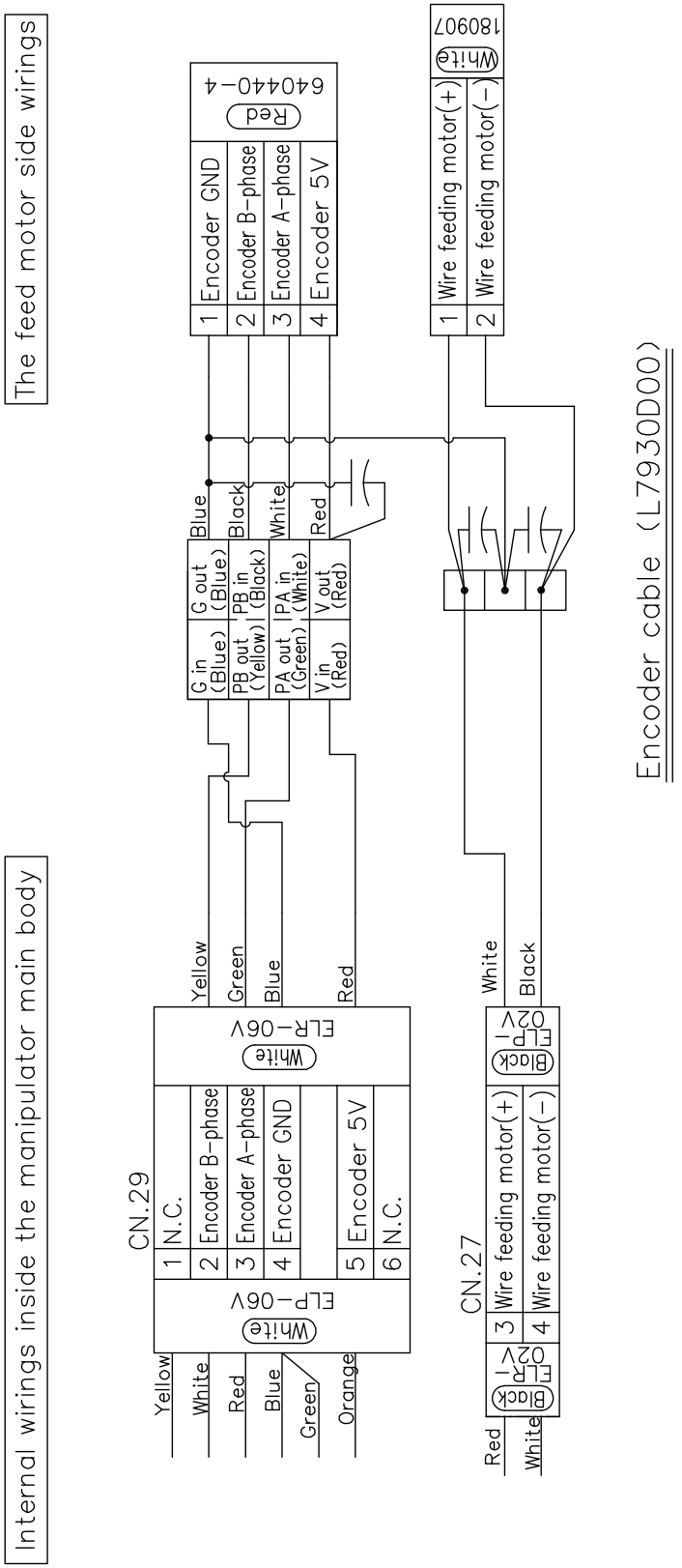
Fig8.1 Exploded diagram of wire feeding unit (AFU-4201)

9. Electrical Wiring Diagram

9.1 Electrical wiring diagram (L7810E00, L7810L00, L7437D00)



9.2 Electrical wiring diagram (L7930D00)



INSTRUCTION MANUAL for CO_2/MAG/MIG wire feeding unit
[AF-4001/AFA-4001/AFT-4201/AFU-4201]

No. 1L7810-E-6 6th Edition, Issue #1 September /2006