



**DAIHEN**

**CO<sub>2</sub>/MAG**

**Wire feeding reducer**



L-6649

**Instruction Manual**

= Safety and Operation =

Instruction Manual No.

1K2282-E-3

**First thoroughly read this manual to operate the machine correctly.**

- Installation, maintenance, and repair of this wire feeding reducer should be made by qualified persons or persons who fully understand welding machines for extra safety.
- Operation of this wire feeding reducer should be made by persons who have knowledge and technical skill to understand the contents of this manual well and handle the machine safely for extra safety.
- Regarding safety education, utilize courses and classes held by head/branch offices of the Welding Society/Association and the related societies/associations and qualifying examinations for welding experts/consultant engineers.
- After thoroughly reading this manual first, store it with the warranty in the place where the persons concerned can read at any time. Read it again as occasion demands.
- If incomprehensible, contact our offices. For servicing, contact our local distributor or sales representatives in your country. Our addresses and telephone numbers are listed in the back cover of this Instruction Manual.




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# NOTES ON SAFETY

## 1. Notes on Safety


- Before operating this product, you should first thoroughly read this Instruction Manual to operate the product correctly.
- Precautions in this Instruction Manual are described to prevent you and others from being injured and suffering loss in your property by having the product operated correctly and safely.
- This welding machine is designed and manufactured in due consideration of safety, but you should observe 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.
- Various ranks of accidents resulting in injury, death or damage may be caused by the mishandling of devices. The following safety alert symbols and signal words are used throughout this manual to identify various hazards and special instructions.

-  **DANGER** : Mishandling may create seriously dangerous situation that could cause serious injury or death to personnel. Limited situation of great urgency.
-  **WARNING** : Mishandling may create a dangerous situation that could cause serious injury or death to personnel.
-  **CAUTION** : Mishandling may create a dangerous situation that could cause medium or slight injury to personnel, or material damage.

Hazards and special instructions identified by  **CAUTION** are very important as well because neglecting them may occasionally cause serious injury or death to personnel. Do follow the instructions identified by all three safety alert symbols and signal words because they are all very important.

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** : **IMPORTANT** statements identify special instructions necessary for the most efficient operation.

# IMPORTANT SAFEGUARD

## 2. Precautions for Safety

2.1 Read, understand, and comply with all safety rules described at the beginning of the welding power source manual in addition to the following before initiating arc welding operations.



### WARNING

- Observe the following to prevent a serious accident that results in a serious injury or a death

- 1) This wire feeding reducer is designed and manufactured in due consideration of safety, but you should observe the handling precautions described in this Instruction Manual. If you fail to do so, there may occur an accident resulting in a serious injury or a death.
- 2) Related laws and 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 moving zone of a welding machine and the welding area.
- 4) A person with a pacemaker should not go near 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, and that will have a bad effect on the pacemaker.
- 5) Installation, maintenance and repair of this wire feeding reducer should be done by qualified personnel or those who fully understand a welding torch for further safety.
- 6) Operation of this wire feeding reducer should be done by personnel who have knowledge and technical skill to be able to understand the contents of this manual well and to handle the wire feeding reducer safely.
- 7) This wire feeding reducer must not be used for purposes other than welding.

2.2 Observe the following to prevent an electric shock.



### WARNING

- Do not touch live electrical parts .





- Touching live electrical parts can cause fatal shock or severe burns.

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

## IMPORTANT SAFEGUARD (continued)



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

 <b>WARNING</b>	<ul style="list-style-type: none"> <li>● Do not weld near flammable materials.</li> <li>● Watch for fire: keep a fire extinguisher nearby.</li> <li>● NEVER do welding on inflammables such as a piece of wood or cloth.</li> <li>● Do not weld on closed containers.</li> </ul>
	<ul style="list-style-type: none"> <li>● Heated workpiece, spatters, slag and arc sparks right after welding may cause fire.</li> <li>● 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.</li> <li>● Arc generated on containers of inflammables such as gasoline may cause an explosion.</li> <li>● Welding of airtight tanks and pipes may cause a bursting.</li> <li>● Touching a heated workpiece, spatters, slag or arc sparks will cause a serious burn.</li> </ul>

- 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 SAFEGUARD (continued)

2.4 Rotating portions may cause an accident resulting in injury. Observe the following.

 <b>WARNING</b>	<ul style="list-style-type: none"> <li>● Keep your hands, fingers, hair, and clothes away during operation.</li> </ul>
	<ul style="list-style-type: none"> <li>● If your hands, fingers, hair, and clothes are near the rotating portions such as feeding roll of the wire feeding reducer, there is a danger of an accident resulting in injury by being caught.</li> </ul>

- 1 ) DO NOT use a welding machine with its case or cover removed.
- 2 ) Only qualified persons or persons who understand a wire feeder well should make an inspection and maintenance. Install a guard fence around the welding machine to work so that others may not enter carelessly.
- 3 ) Keep your hands, fingers, hair, and clothes away from the rotating feeding roll.

For reference purposes

### 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

# IMPORTANT SAFEGUARD (continued)

## 3. Carrying and Installing


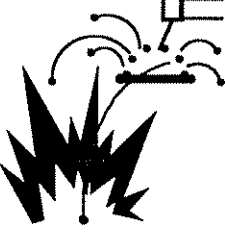

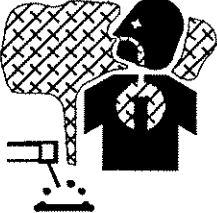
### 3.1 Carrying

Observe the following to prevent an accident in carrying and to prevent a wire feeding reducer from being damaged.

 <b>WARNING</b>	<ul style="list-style-type: none"> <li>● Do not touch live electrical parts.</li> </ul>
	<ul style="list-style-type: none"> <li>● Before moving a wire feeding reducer, the power should be turned off with a switch in a panel box.</li> </ul>
 <b>WARNING</b>	<ul style="list-style-type: none"> <li>● Lift and move this unit only with proper equipment and correct procedures.</li> <li>● Fix devices etc., firmly with a prescribed clamping torque.</li> </ul>
	<ul style="list-style-type: none"> <li>● FALLING EQUIPMENT can cause serious personal injury and equipment damage.</li> <li>● Fixing devices and so on with a clamping torque other than prescribed may result in a fatal injury as devices and so on may turn over, and/or a tool may be thrown away or fall.</li> <li>● Before carrying a wire feeding reducer to a height place with a crane, remove the wire from the wire feeding reducer.</li> </ul>

### 3.2 Installing

In installing a wire feeding reducer, observe the following to prevent a fire caused by welding and to prevent health from being injured by fume and gas.



 <b>WARNING</b>	<ul style="list-style-type: none"> <li>● Do not install a welding machine near flammable materials.</li> <li>● Watch for fire: keep a fire extinguisher nearby.</li> </ul>
	<ul style="list-style-type: none"> <li>● Do not install a welding machine near inflammables and inflammable gas</li> <li>● Remove inflammables so that spatter may not be put on them. If impossible, cover the inflammables with an unflammable material.</li> </ul>
 <b>WARNING</b>	<ul style="list-style-type: none"> <li>● DO NOT inhale fumes and gases generated by welding.</li> <li>● Ventilate the area sufficiently and wear a welder's shield helmet if necessary.</li> </ul>
	<ul style="list-style-type: none"> <li>● To prevent gas poisoning and suffocation, use a local ventilator or a respirator specified by your country's domestic laws.</li> <li>● Be sure to ventilate the area or wear a respirator by welding in a small place.</li> </ul>

## IMPORTANT SAFEGUARD (continued)

### Installation area

- Install a wire feeding reducer in the following area.
  - Indoors with little moisture and little dust with avoiding direct rays of the sun and wind and rain.
  - Ambient temperature : -10 to 40°C Do not expose the arc portion to the wind.  
(The wind may cause welding failure. Prevent the wind with a screen.)

### 4. Connecting

 <b>WARNING</b>	● Before connecting. All the input powers should be turned off with switches in the panel box to prevent an electric shock.
 <b>CAUTION</b>	● Surely tighten the cable connections..

We thank you for your selecting the DAIHEN CO<sub>2</sub> welding wire feeding reducer K-2282.  
Before operating it, you should first thoroughly read this manual to use the reducer correctly.

- [Notes]
1. The Instruction Manual is subject to change without prior notice.
  2. Every effort is made so that the contents in the Instruction Manual may be free from errors. Even if there are any errors, we shall not be responsible for any damages.
  3. Reproduction of all or a part of the Instruction Manual without permission is forbidden.

## 1. Specifications

K-2282 is a wire feeding reducer for a robot, and is used for CO<sub>2</sub> arc welding. Table 1 shows the specifications. (For the outline drawing, refer to Fig. 1.)

Table 1. Specifications

Model	K-2282
Welding process	CO <sub>2</sub> arc welding
Rolling system	2-roll driving system
Applicable wire diameter	(φ0.6), (φ0.8), (φ0.9), φ1.0, (φ1.15), φ1.2, (φ1.4), (φ1.6)
Wire used	Solid wire, wire including flux
Wire feeding speed	Max. 15m/min.



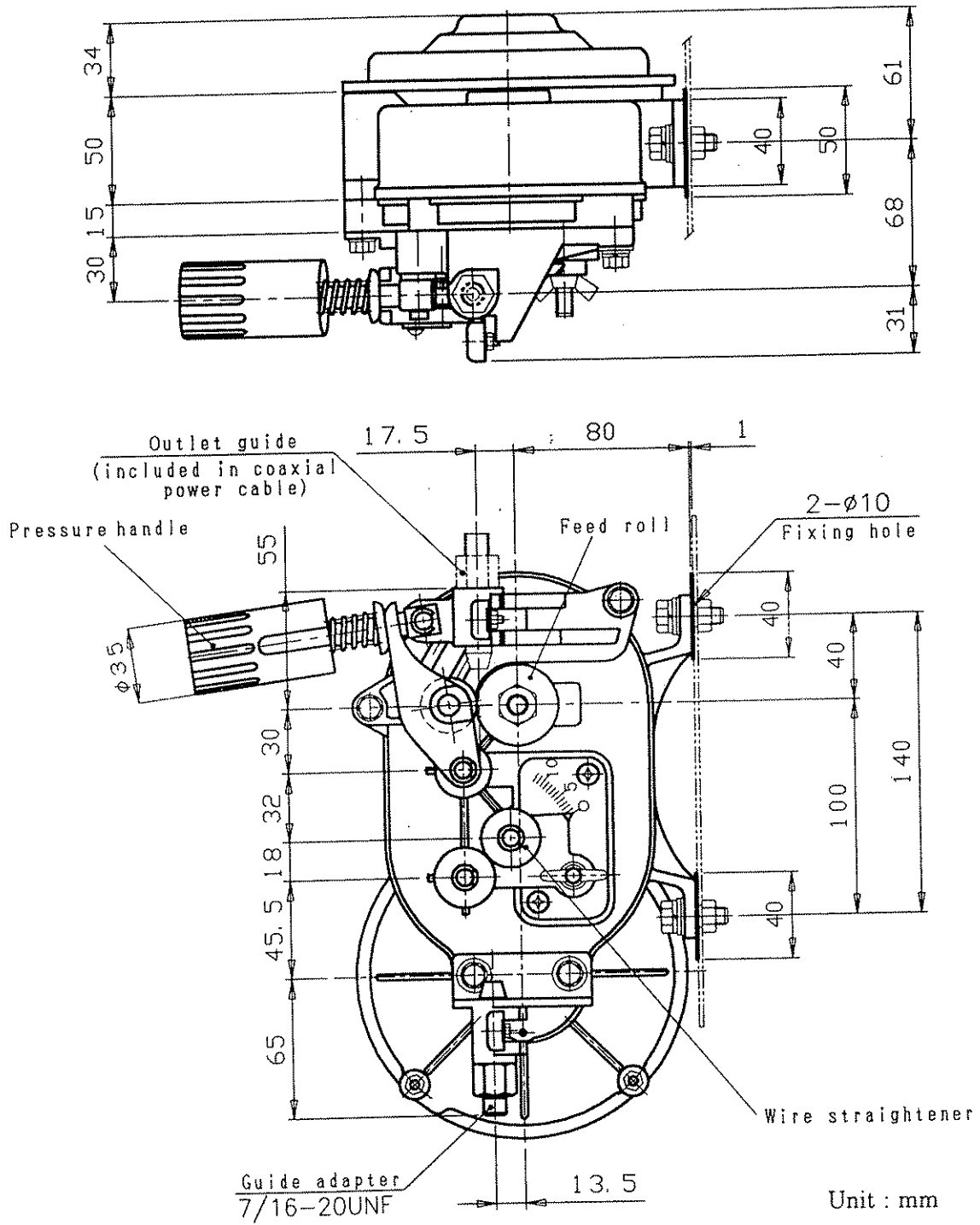


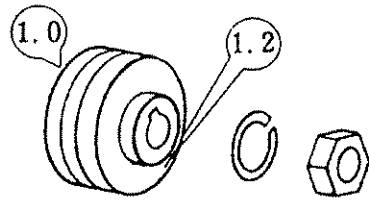
Fig.1 Outline drawing of K-2282 wire feeding reducer

## 2. Preparation for welding

### 2.1 Installation of wire (Refer to Fig.2 and Table 2.)

#### Verifying the wire size and the feeding roll

- ① Check that the feed roll fits the welding wire size.



- Select a feed roll according to the wire used and the wire size. (Refer to Fig.4 and Tables 3 and 4.)
- Mount the feed roll so that the same stamped value as the wire size used may be seen.

#### Installing the wire

- ② Push down the pressure handle.
- ③ Lift up the pressure roll holder.
- ④ Pull out the wire to pass it through the guide adapter. Insert it into the wire straightener and the coaxial power cable outlet guide.
- ⑤ Return the pressure roll holder and the pressure handle in this order as they were.

#### Pressure adjustment and straightener adjustment

- ⑥ Turn the pressure handle to set the pressure corresponding to the wire diameter.
- ⑦ Loosen the Wing nut and turn the hinge to fix in the correct position.

Table 2. Recommended wire pressure adjustment

Wire diameter	Graduation pressure handle	
	Solid wire	Wire including flux
$\phi 1.6$	5 - 6	4 - 5
$\phi 1.2, 1.4$	5 - 6	3 - 4
$\phi 1.0, 0.9$	3 - 4	—
$\phi 0.8$	2 - 3	—

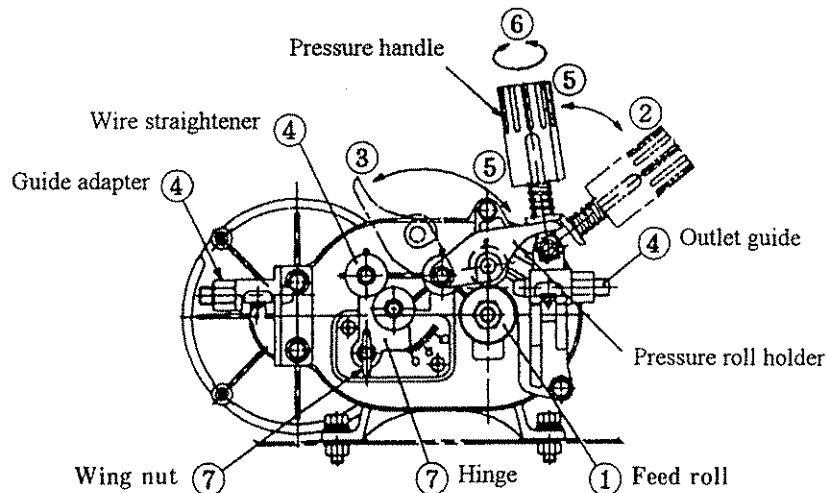


Fig.2 Installation of wire

## 2. Preparation for welding (continued)

### 2.2 Wire feeding by inching operation



#### WARNING



- In inching, the welding torch tip must not be put near to your face, eyes, and body. The wire may spring out and stick into your face, eyes, and body to injure.



#### CAUTION




- In inching do not put your hands, fingers, hair, and clothes near to the rotating portions such as feed roll. There is a danger of an accident resulting in injury by being caught.



#### WARNING

\* If you touch a charged portion, you may have an electric shock or a burn resulting in death.



- Do not touch charged portions such as wire/wire feeder during welding.  are the charged portions during welding.

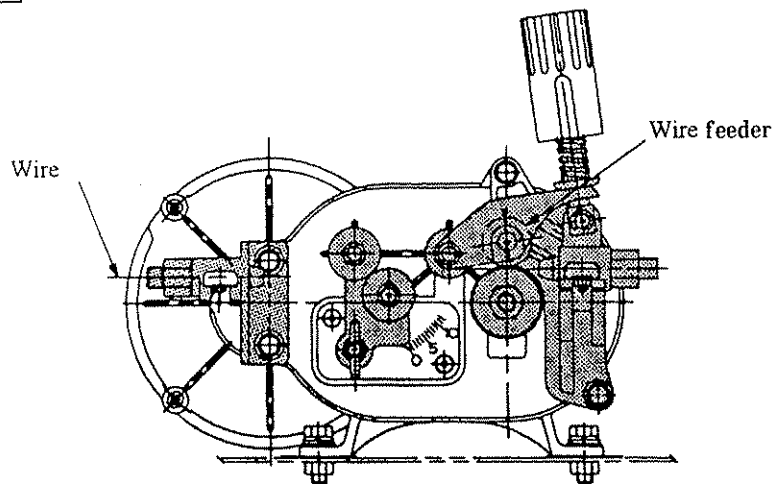


Fig.3 Charged portions

### 3. Maintenance and trouble shooting

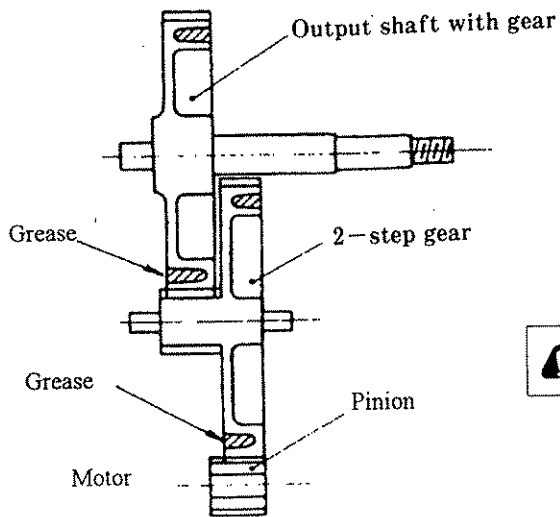
#### 3.1 Daily inspection

Parts	Check point	Problem	Solution
Pressure graduation	<ul style="list-style-type: none"><li>• Check if the pressure fits the wire diameter</li></ul>	Excessive low/high pressure	Adjust to the value shown in Recommended wire pressure adjustment on Page 3
Outlet guide Guide adapter	<ul style="list-style-type: none"><li>• Check if any dirt and cutting dust are accumulated at the inlet of the outlet guide and the guide adapter and around the feed roll</li></ul>	Dirt and cutting dust are accumulated.	Remove them
Feed roll	<ul style="list-style-type: none"><li>• Check if the stamped value of the feed roll fits the wire diameter</li></ul>	The stamped value is different from the wire diameter	Replace the feed roll with the correct one to fit the wire diameter
	<ul style="list-style-type: none"><li>• Check the state of wire contacting surface</li></ul>	It is worn away	Replace with a new roll
Pressure roll	<ul style="list-style-type: none"><li>• Check if it rotates smoothly</li></ul>	If does not rotate smoothly	Replace with a new roll
Cable	<ul style="list-style-type: none"><li>• Check if the cover of the cable is torn or the cable is nearly broken</li></ul>	The cable cover is torn or the cable is nearly broken	Replace with a new cable
	<ul style="list-style-type: none"><li>• Check if the connection is loosen</li></ul>	The connection is loosen	Firmly tighten it

### 3. Maintenance and trouble shooting (continued)

#### 3.2 Annual inspection

##### (1) Grease replacement of reduction gear



Remove the old grease and apply new grease to the gear teeth and sides as shown in the drawing.

Use the grease No.1 of each lithium type.

#### **CAUTION**

Do not replenish grease in the gear box.  
If replenished, the feeding motor may be burnt to be damaged.

##### (2) Replacement of feeding motor



#### **CAUTION**

Do not disassemble the feeding motor.

- Any trouble may be caused.
- Do not check the brush abrasion. Do not replace the brush.

The life of the brush is normally 4,000 hours, but may vary depending on the load condition, the ambient temperature and others. (Approx. 2 years supposing 6 hour working/day)

Replace the feed motor at periodic intervals.

#### 4. Parts list

When any parts of this wire feeding reducer are torn away or broken during operating, refer to Fig.4 & 5 and Tables 3 & 4 to place an order with our offices or agents. In placing an order, inform us of the description and the parts number(or specifications).

Table 3. K-2282 Parts list

No.	PART No.	Description	Qty	Remarks
1	K 1 1 2 3 B 0 1	Gear case	1	
2	4 8 0 2 - 0 0 6	Print motor	1	RMEE-12CB
3	K 1 1 2 3 B 0 2	Pinion	1	
4	3 3 6 1 - 4 0 1	CS type snap ring	3	CSTW-10
5	K 1 1 2 3 B 0 3	2-step gear	1	
6	K 1 1 2 3 B 0 5	Bush	2	
7	K 1 1 2 3 B 0 4	Output shaft with gear	1	
8	K 1 1 2 3 B 0 6	Insulating spacer	1	
9	3 3 1 1 - 0 0 1	Radial ball bearing	1	№6000ZZ
10	3 3 6 1 - 2 0 6	Double-round flat Key	1	4×4×8
11	3 3 1 1 - 0 0 8	Radial ball bearing	1	№6001LL
12	K 1 2 0 0 B 0 1	Gear case	1	
12-1	K 1 2 0 0 B 0 4	Torch holder	( 1 )	
12-2	K 1 2 0 0 B 0 5	Gear case	( 1 )	
12-3	3 3 6 1 - 2 0 8	Spring roll pin	( 1 )	φ3-20
13	U 1 2 3 0 B 1 4	Insulating washer	3	
14	K 1 1 2 3 B 0 7	Spacer	1	
15	U 1 3 7 6 H 0 1	Feed roll(1.0-1.2)	1	Soft steel, For 1.0- φ1.2
16		Washer	1	M 1 0
17		Spring washer	1	M 1 0
18		Nut	1	M 1 0
19	K 1 2 0 0 B 0 2	Bolt fixing plate	1	
20	K 1 1 2 3 F 0 0	Hinge assembly	1 st	
21	K 1 1 2 3 C 0 6	Straight roll(1)	1	With bush
22	K 1 1 2 3 C 0 7	Straight roll(2)	2	With bush
23	3 3 6 1 - 4 0 2	Thrust washer	4	STW-FT8.0×0.5
24	3 3 6 1 - 4 0 3	E type snap ring	4	For φ6
25	3 3 6 1 - 5 0 1	Cup square neck bolt	1	B-type M8-35
26	3 3 6 1 - 5 0 5	Wing nut	1	M8
27	K 1 2 0 0 B 0 3	Leaf spring	1	
28	U 7 8 5 C 1 1	Protective cover	2	
29	K 1 1 2 3 D 0 0	Pressure handle assembly	1 st	

Table 4. K-2282 Parts list(continued)

No.	PART No.	Description	Q'ty	Remarks
30	U 1 9 9 7 L 0 2	Insulation plate	1	
31	K 1 6 8 7 D 0 2	Conduit connection adapter	1	
32	K 1 6 8 7 D 1 3	Guide adapter	1	
33	U 7 8 5 C 0 9	Leaf spring	1	
34	K 1 1 2 3 C 0 1	Pressure roll holder	1	
35	K 1 1 2 3 C 0 5	Pressure roll shaft	1	
36	3 3 1 1 - 0 0 3	Radial ball bearing	1	No.6200LL
37		Washer	2	M10
38	U 1 9 9 7 C 0 6	Insulating bushing	2	
39	U 2 0 7 0 B 0 1	Insulating sheet	2	
40		Hexagon bolt	2	M8X25
41		Spring washer	2	M8
42		Washer	2	M8
43		Nut	2	M8

## Optional accessories

No.	PART No.	Description	Q'ty	Remarks
44	U 1 3 6 9 N 0 1	Feed roll(1.2-1.6)	1	For( $\phi$ 1.2&1.6)
45	U 1 3 6 9 N 0 2	Feed roll(1.6-1.6)	1	For( $\phi$ 1.6)
46	U 1 3 6 9 N 0 3	Feed roll(1.2-1.4)	1	For( $\phi$ 1.2&1.4)
47	U 1 3 6 9 H 0 2	Feed roll(0.8-1.0)	1	For( $\phi$ 0.8&1.0)
48	U 1 3 6 9 H 0 3	Feed roll(1.2-1.2)	1	For( $\phi$ 1.2)
49	U 1 3 6 9 H 0 4	Feed roll(1.0-1.0)	1	For( $\phi$ 1.0)
50	U 1 3 6 9 H 0 7	Feed roll(0.9-1.0)	1	For( $\phi$ 0.9&1.0)
51	U 1 3 6 9 H 0 8	Feed roll(0.9-1.2)	1	For( $\phi$ 0.9&1.2)
52	U 1 3 6 9 H 0 9	Feed roll(0.9-0.9)	1	For( $\phi$ 0.9)
53	U 1 3 6 9 H 1 0	Feed roll(0.8-0.8)	1	For( $\phi$ 0.8)
54	U 1 3 6 9 H 1 1	Feed roll(0.8-0.9)	1	For( $\phi$ 0.8&0.9)
55	U 1 3 6 9 H 1 2	Feed roll(0.9-1.15)	1	For( $\phi$ 0.9&1.15)
56	U 1 3 6 9 H 1 3	Feed roll(1.4-1.4)	1	For( $\phi$ 1.4)
57	U 1 3 6 9 H 1 4	Feed roll(0.6-0.6)	1	For( $\phi$ 0.6)
58	U 1 3 6 9 H 1 5	Feed roll(0.6-0.8)	1	For( $\phi$ 0.6&0.8)
59	K 9 7 0 E 2 4	Feed roll(1.2-1.2)	1	For( $\phi$ 1.2)
60	K 9 7 0 E 2 5	Feed roll(1.4-1.4)	1	For( $\phi$ 1.4)
61	K 9 7 0 E 9 2	Feed roll(1.2-1.6)	1	For( $\phi$ 1.2&1.6)
62	K 9 7 0 H 2 8	Feed roll	1	Made of ceramic, for( $\phi$ 1.2& $\phi$ 1.4)

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**Wire feeding reducer (K-2282) Instruction Manual**

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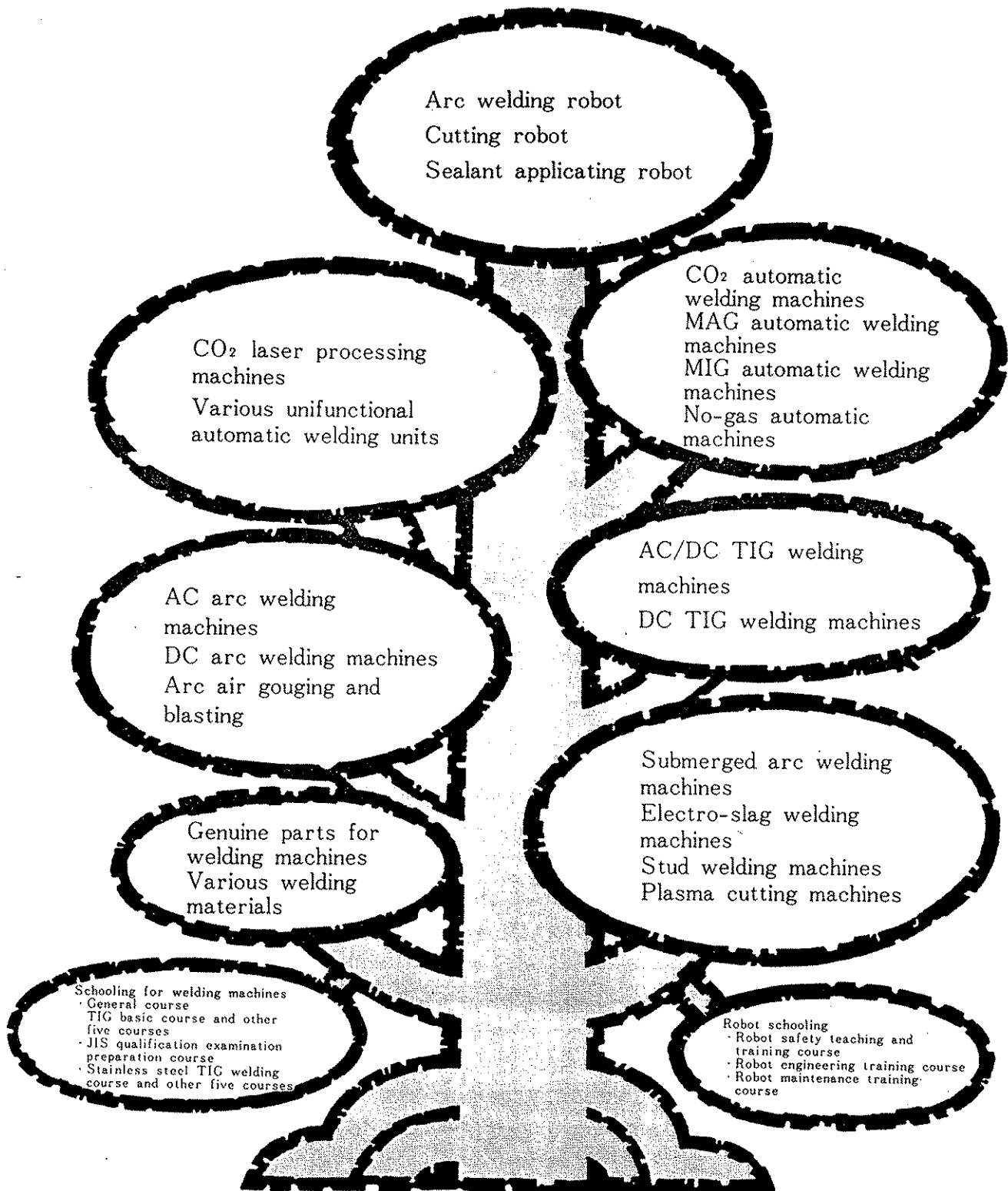
No. 1 K2282-1 First edition first printed on 27 February, 1997  
No. 1 K2282-E-2 Second edition first printed on 13 January, 1999  
No. 1 K2282-E-3 Third edition first printed on 23 April, 1999



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**Various kinds of welding machines are available from DAIHEN.**  
**DAIHEN produces and sells every kinds of welding machines.**

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## ITEMS OF MAIN PRODUCTS

### ARC WELDING MACHINES

AC ARC WELDING MACHINES

DC ARC WELDING MACHINES

CO<sub>2</sub> GAS-SHIELDED ARC WELDING MACHINES

MAG ARC WELDING MACHINES

MIG ARC WELDING MACHINES

TIG ARC WELDING MACHINES

SUBMERGED ARC WELDING MACHINES

NO-GAS-SHIELDED ARC WELDING MACHINES

STUD WELDING MACHINES

### AIR PLASMA CUTTING MACHINES

### ARC WELDING ROBOT

### CO<sub>2</sub> LASER EQUIPMENTS

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4. Parts list (continued)

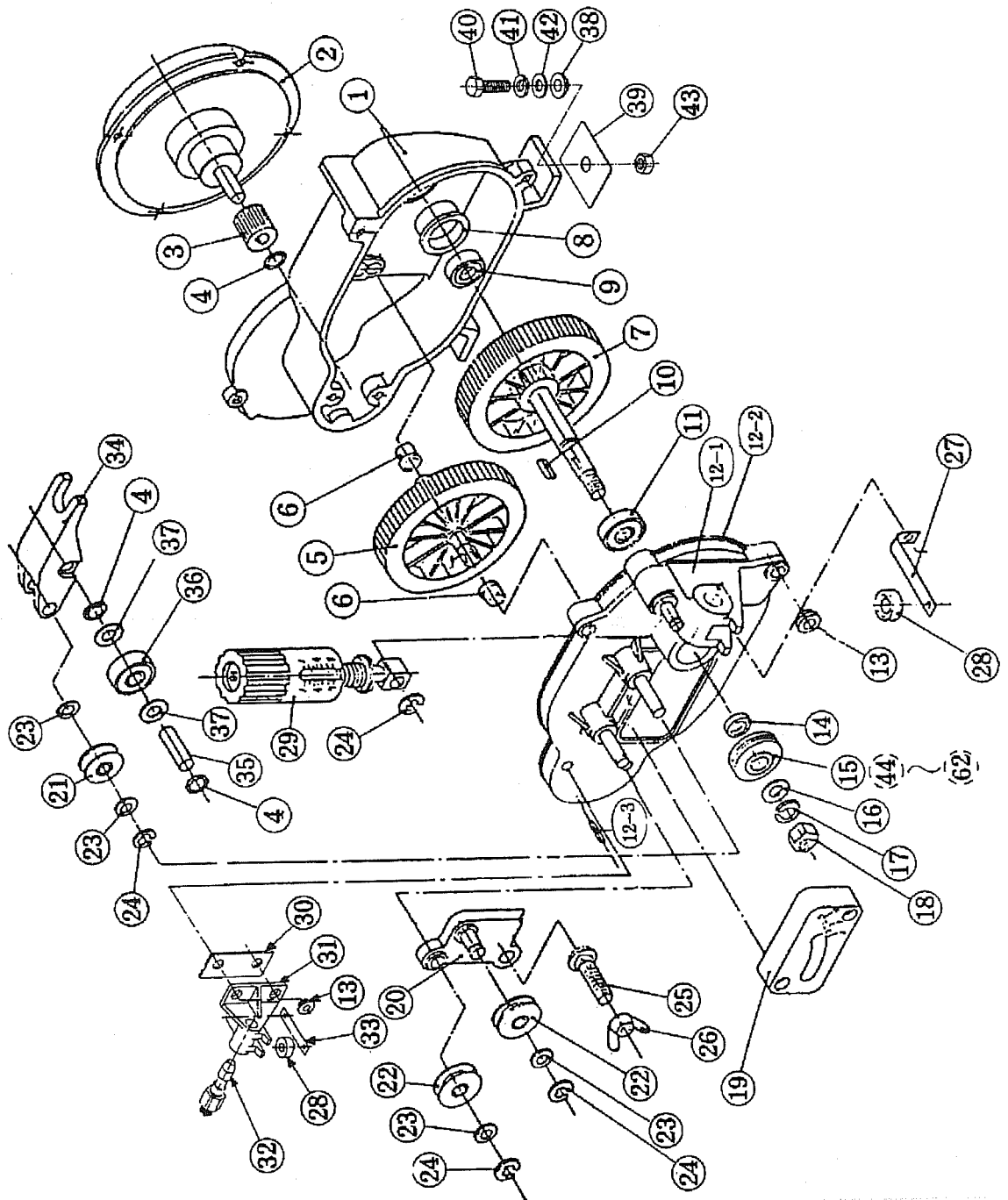


Fig.4 Deal drawing of wire feeding reducer