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# PRO-PUMP SYSTEM

PCP-005/015/050/150/500/1000 Series

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## Operation Manual



## Contents

1	General Information.....	4
1.1	General Information.....	4
1.2	Warranty.....	4
1.3	Technical Support.....	4
2	Pro Pump System (PCP) Feature.....	5
2.1	Pro Pump System.....	5
2.2	Pro Pump System Feature.....	5
2.3	Pro Pump Feature & Specification.....	6
2.4	Pro Pump Controller Feature & Specification.....	8
2.5	PCP(Standard) System.....	9
2.6	PCPM (Module Type) System.....	10
3	Name of each part.....	11
4	Pro Pump Operation.....	12
4.1	Precautions on Use and Assembly.....	12
4.2	Pro Pump Ready to Use.....	13
5	Pro Pump Disassemble.....	14
5.1	PCP-005/015/050 Disassemble.....	14
5.2	PCP-150/500 Disassemble.....	21
5.3	PCP-1000 Disassemble.....	28
6	Pro Pump Partlist.....	36
6.1	PCP-005 Partlist.....	36
6.2	PCP-015 Partlist.....	37
6.3	PCP-050 Partlist.....	38
6.4	PCP-150 Partlist.....	39
6.5	PCP-500 Partlist.....	40

6.6	PCP-1000 Partlist.....	41
7	Maintenance.....	42
7.1	Alarm Display and Action .....	43
7.2	Inspection and Measures .....	44
7.3	Trouble Shooting.....	45

## 1 General Information

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### 1.1 General Information

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This user manual provides the user and the equipment maintenance specialist with essential information for operating the equipment. Therefore, it is strongly recommended that you should thoroughly understand this user manual.

In order to have easy access to this user manual, it must be placed where it can be easily seen, near the equipment.

### 1.2 Warranty

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Except for a separate agreement and the following cases, the warranty period will be one year in the event of defects.

- Following -

1. In case you modify the equipment without permission by Taeha Corp.
2. If someone other than the technical support personnel of Taeha Corp. modifies the equipment or repairs the equipment without using the designated parts.
3. If any spare parts other than those specified by Taeha Corp. have been used for the product.
4. If the defect is due to an intentional damage.
5. If the defect is due to natural disasters.

### 1.3 Technical Support

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If necessary, Taeha Corp. will provide technical support service for the customer. Please contact us by phone or fax.

Head Office

Phone : +82(0)31 552 5300

Fax : +82(0)31 552 5400

## 2 Pro Pump System (PCP) Feature

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### 2.1 Pro Pump System

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This system is a precise pump made using a special eccentric screw structure, it has organizational benefits that are simple in construction but excellent in performance.

It is also a high-performance dispenser equipped with dedicated software that comprises a control panel to perform a variety of tasks.

It is a good system that is designed to provide convenience, accuracy, and diversity for applying dispensers.

Please read this manual to get the most out of your product and do what you want.

### 2.2 Pro Pump System Feature

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- ✓ **Precise and Consistent volume of fluid is dispensed even when environmental factors affect viscosity and pressure in the container.**
- ✓ **Clean dispensing is provided without ball-up through the suck back function, which sucks back the fluid drop formed at the nozzle tip.(Nozzle rotation is not restricted.)**
- ✓ **Consistent dispensing is possible without fluid surging because the pro-pump provides consistent flow by maintaing a stable pressure.**
- ✓ **Disassembly and reassembly for maintenance and cleaning is easy because of simple structure of the pumping unit.**
- ✓ **Precise volume of fluid with filler is dispensed without impairing fillers under the cavity displacement dispensing process.**

### 2.3 Pro Pump Feature & Specification

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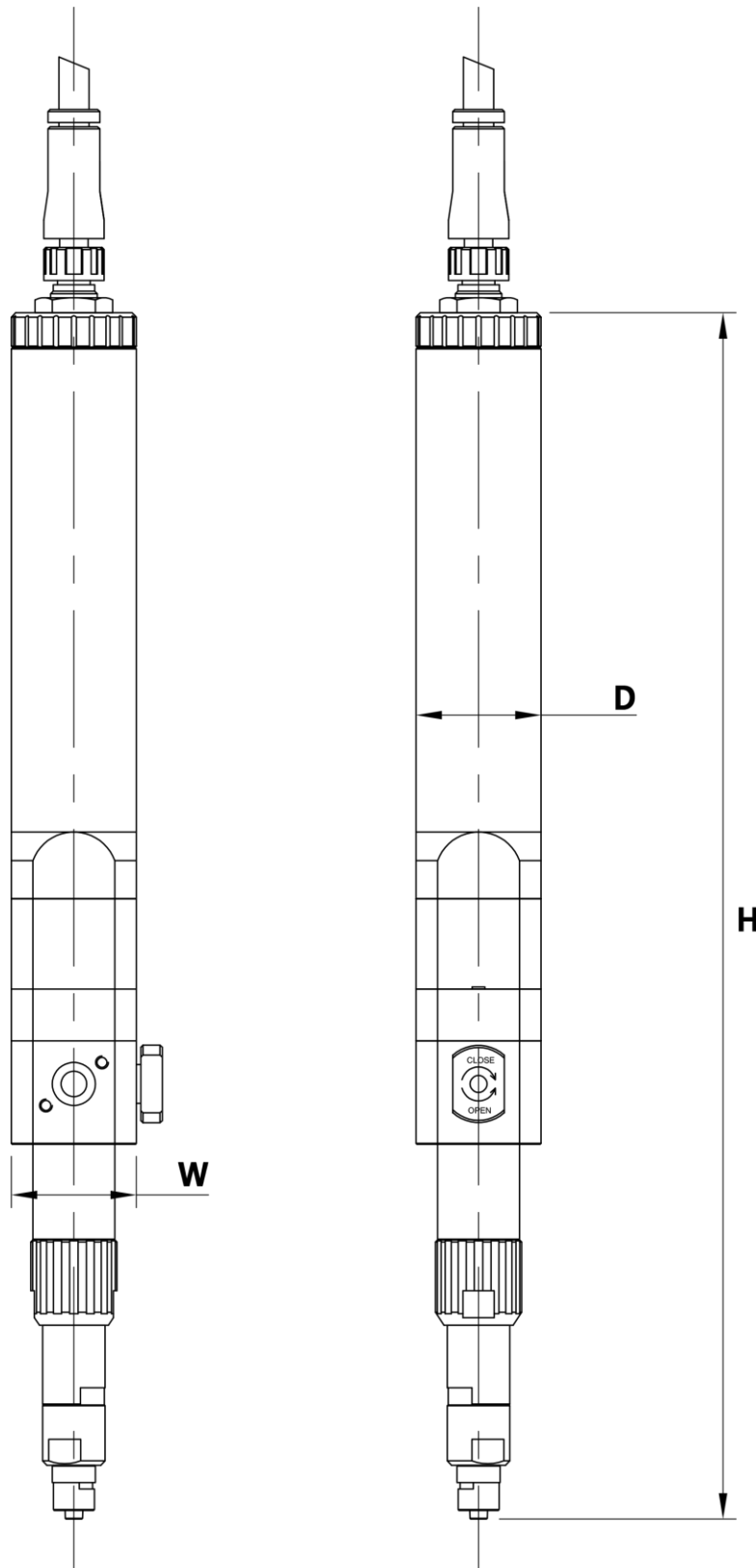


Figure 1. Pro Pump Feature

Table 1. Pro Pump Specification

Item		Specification				
Item	PCP-005	PCP-015	PCP-050	PCP-150	PCP-500	PCP-1000
Dimensions (H x W x D)[mm]	230 x 27 x 27			280 x 29 x 29		312 x 29 x 29
Weight	400g			650g		700g
Input Pressure	0 ~ 0.6 MPa					
Max Dosing Pressure	3.0MPa	2.0MPa			1.0MPa	1.2MPa
Viscosity (cPs)	1 ~ 1,000,000					
Dosing Volume/Rev	≐ 0.0049ml	≐ 0.017ml	≐ 0.049ml	≐ 0.17ml	≐ 0.45ml	≐ 1.1ml
Motor Speed(rpm)	1 ~ 120rpm					
Accuracy of Dosing	± 1%					
Material Inlet Port	Inlet Adapter or BSPT 1/4"					
Material Outlet Port	Luer Lock or BSPT 1/8"				Luer Lock or BSPT 1/4"	
Operating Condition	10 ~ 40°C, 10 ~ 85%RH					

## 2.4 Pro Pump Controller Feature & Specification

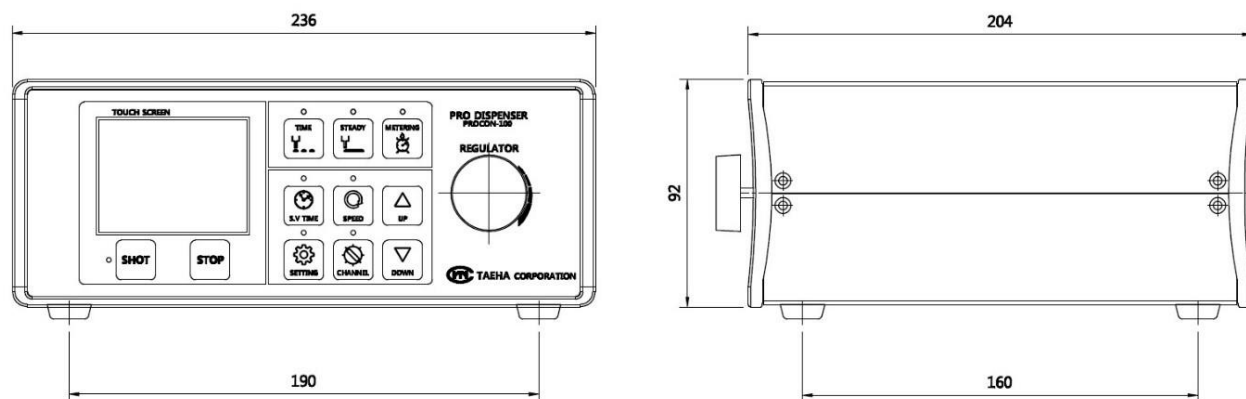


Figure 2. Pro Pump Controller(Procon-100) Feature

Table 2. Pro Pump Controller Specification

Item	Specification	Remarks
Model	Procon-100	
Weight	1.8kg	
Power	AC 220V 50/60Hz, DC24V(max)	±10%
Consumption	Max.200VA	
Display	2.5" TFT LCD	Touch Type
Operation	Touch Panel, Button, Rotary Knob	
Operation Mode	Time / Steady / Metering	3 Mode
Operation Memory	16ch	User Define
Operating Air Pressure	5kgf/cm <sup>2</sup> (Humidity less than 5%)	Air Filter : 5μ
Pressure Regulator	0~7kgf/cm <sup>2</sup>	
Air In Port	Ø6 Air Hose, Max.7kgf/cm <sup>2</sup>	
Air Out Port	Auto Jointer(PH-HR)	
Motor Control	1 EA	
Liquid Indicator Sensor	OK	
External Control	OK	
Interface	RS232, D-SUB 9 PIN	
Input Signal	Contact Input or NPN Open Collector Tr	
Dosing End Signal	NPN Open Collector Tr	
Operating Temperature	10 ~ 40°C	Avoid direct sunlight
Operating Humidity	10 ~ 85%RH	No condensation
Vibration Resistent	Less than 0.5G	G : acceleration of gravity



## 2.5 PCP(Standard) System

A standard type means a structure in which the material suppliers(barrel, cartridge, tank, etc.) are separated from the Pro-Pump.

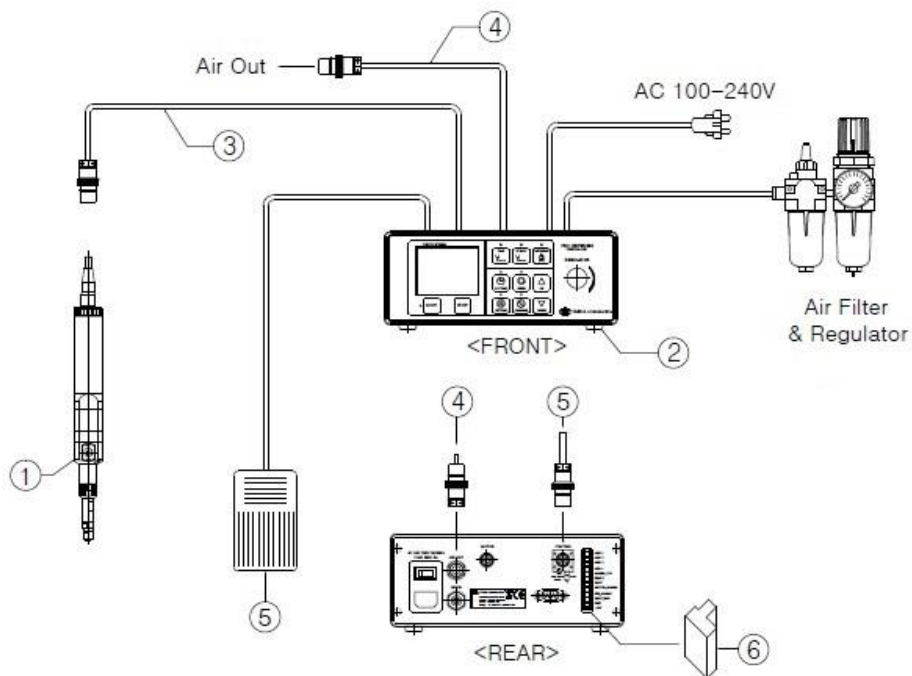


Figure 3. Pro Pump System

Table 3. Pro Pump System

No.	Description	Model	Q'ty	Remarks
1	1K Pump (Pro-Pump)		1 Set	
2	Pro Pump Controller	Procon-100	1 Set	Pro Pump Controller
3	Motor Cable		1 Pc	Length : 3m
4	Air Tube Ass'y	Ø6, Auto Jointer	1 Pc	Length : 2m
5	Foot Switch		1 Pc	Length : 2m Driving signal In/Out Cable
6	Terminal Block	10 Pin	1 Pc	External In/Out Connector

## 2.6 PCPM (Module Type) System

Module type means that the material supplier(barrel, cartridge, tank, etc.) is integral with the Pro Pump unit.

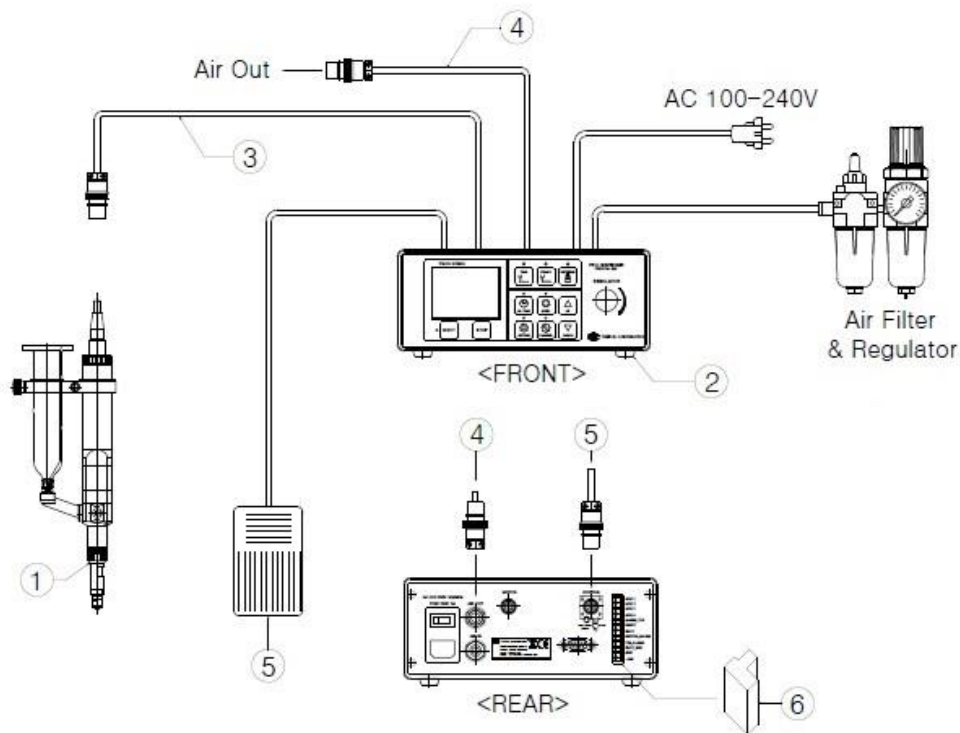


Figure 4. Pro Pump Module Type(PCPM) System

Table 4. PCPM System

No.	Description	Model	Q'ty	Remarks
1	1K Pump (Pro Pump)		1 Set	
2	Pro Pump Controller	Procon-100	1 Set	Pro Pump Controller
3	Motor Cable		1 Pc	Length : 3m
4	Air Tube Ass'y	Ø6, Auto Jointer	1 Pc	Length : 2m
5	Foot Switch		1 Pc	Length : 2m Driving signal In/Out Cable
6	Terminal Block	10 Pin	1 Pc	External In/Out Connector

### 3 Name of each part

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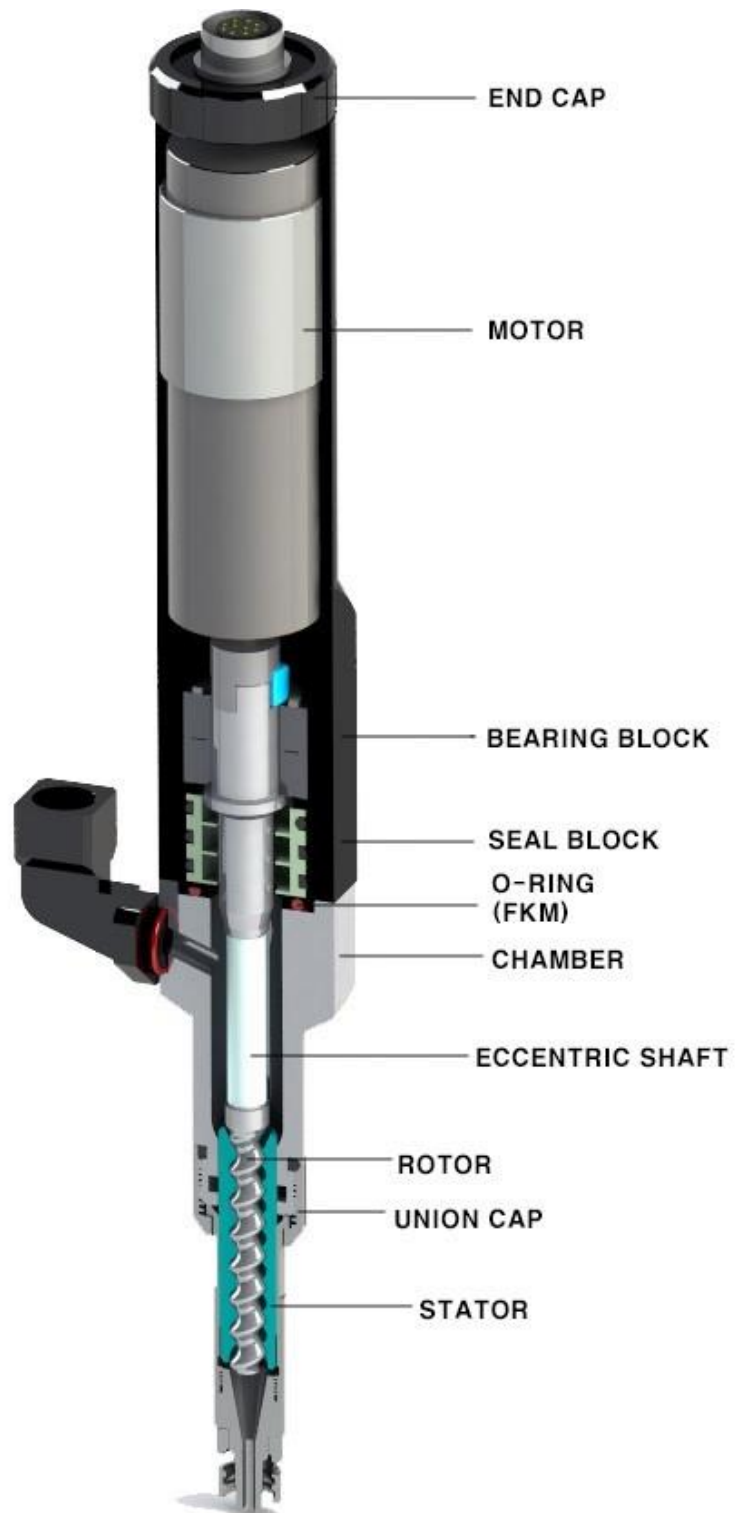


Figure 5. Name of each part

## 4 Pro Pump Operation

### 4.1 Precautions on Use and Assembly

#### 1. In connection A(Stator) and B(Rotor)

Use C(Fix Tool) to fix the tools and apply solution(material) inside A(Stator) and on B(Rotor). Connect A(Stator) and B(Rotor) and rotate them up to the marked position and rotate C(Fix Tool) in clockwise direction.

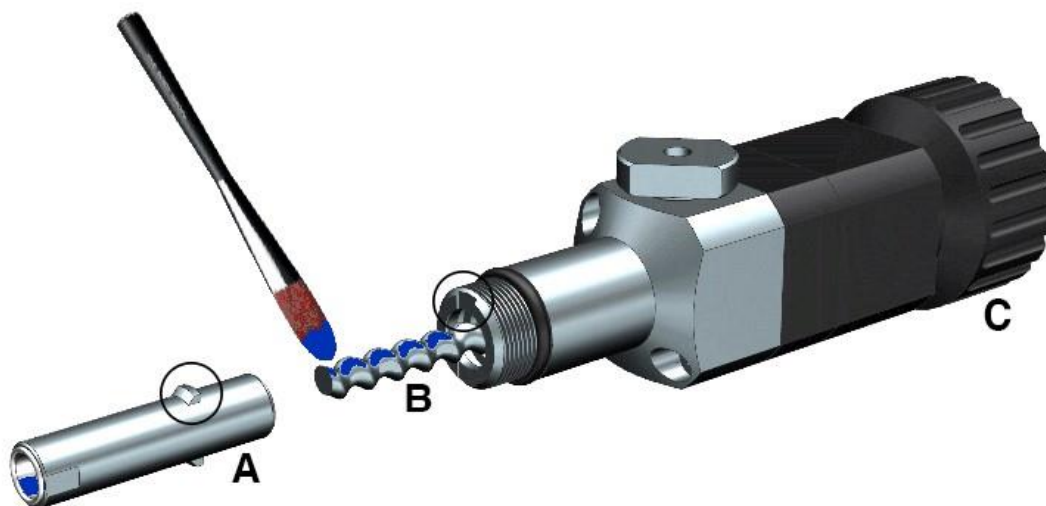


Figure 6. Rotor and Stator Connection

Do not activate the Pump without applying the material to the stator. If so, even for a short duration of time, there might be a damage on the stator.

#### 2. Eliminating bubbles before liquid discharge



Figure 7.  
Eliminating bubbles

When the pump and the controller's settings are finished, before applying the solution to the product, rotate the D(Vent Knob) as the arrow direction one to two rounds to discharge the bubbles and some liquid(about 5~10 seconds).

When it is confirmed that the bubbles are all eliminated, then close it off again.

When eliminating bubbles, set the motor speed at low(5~10RPM) to discharge.

## 4.2 Pro Pump Ready to Use

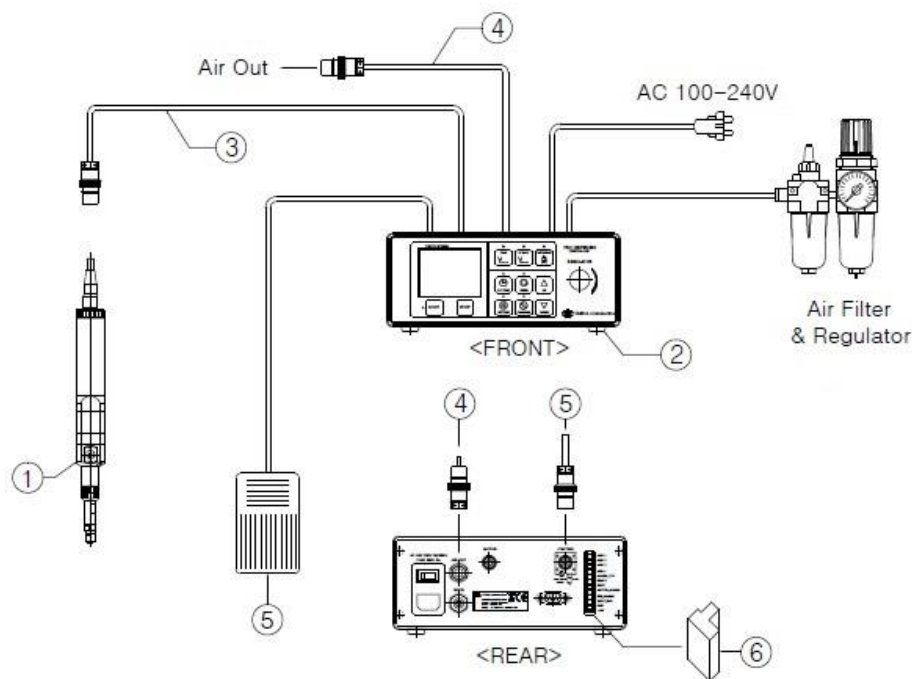


Figure 8. PCP System Composition

1. Connect the air to the Motor Cable and material suppliers as shown <Figure 8>.
  - Please connect foot switch(or external device) to the control terminal.
  - Prepare the main air clean and at least 5kgf/cm<sup>2</sup> separately.
2. Power on the Pro Pump controller(Procon-100).
3. Make sure the pressure supplied to the material supplier(barrel, cartridge, tank, etc.)is adequate.

Table 5. Suitable setting for each material

Less than 2000cPs	1~2kgf/cm <sup>2</sup>
Over 2000cPs	2~5kgf/cm <sup>2</sup>

- Apply according to the guide setting. However,it may vary depending on the conditions.
4. Open the air vent knob on the Pro Pump.
    - This is to ensure the pump is well supplied materials and eliminated bubbles without driving. (Turn 1 1/2 turns counter clockwise.)
    - When the fluid is flowing sufficiently compared to dosing amount, close and clean the knob.

## 5 Pro Pump Disassemble

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### 5.1 PCP-005/015/050 Disassemble

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This section describes the procedure for disassembling the Pro Pump(PCP-005/015/050) for its maintenance.

- 1) Prepare the Pro-Pump(PCP-005/015/050) and tools.



Figure 9

- 2) Use a spanner to remove the union cap.



Figure 10

- 3) Remove the stator sleeve associated with luer lock adapter.



Figure 11



- 4) Turn the two wrench bolts counterclockwise to release the motor.



Figure 12

- 5) Secure one side with the repair tool,  
Use a dedicated spanner to slowly rotate stator counterclockwise to release it.



Figure 13

- 6) Turn the 2 bolts counterclockwise to release the chamber.



Figure 14

- 7) Remove rotor and seal block by rocking them to the left and right.



Figure 15

## 5.2 PCP-150/500 Disassemble

This section describes the procedure for disassembling the Pro Pump(PCP-150/500) for its maintenance.

- 1) Prepare the Pro Pump(PCP-150/500) and tools.



Figure 16

- 2) Use a spanner to remove orifice adapter.



Figure 17

- 3) Hold the pump and remove the union cap using a spanner.



Figure 18

- 4) Turn the two wrench bolts counterclockwise to release the motor.



Figure 19



- 5) Secure one side with the repair tool,  
Use a dedicated spanner to slowly rotate stator counterclockwise to release it.



Figure 20

- 6) Turn the two wrench bolts counterclockwise to release the chamber.



Figure 21

- 7) Remove motor and seal block by rocking them to the left and right.

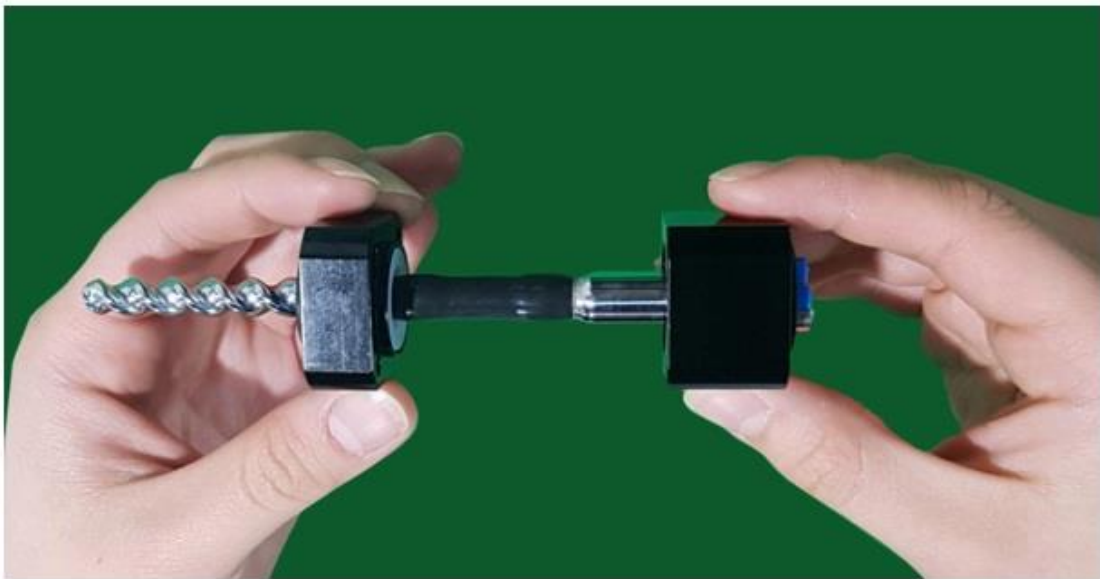


Figure 22

### 5.3 PCP-1000 Disassemble

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This section describes the procedure for disassembling the Pro Pump(PCP-1000) for its maintenance.

- 1) Prepare the Pro Pump(PCP-1000) and tools.



Figure 23

- 2) Turn the two wrench bolts counterclockwise to release the inlet adapter.



Figure 24

- 3) Turn the two wrench bolts counterclockwise to release the motor.



Figure 25

- 4) Hold a pump and remove the luer lock adapter using a spanner.



Figure 26

- 5) Hold a pump and remove the union cap using a spanner.



Figure 27



- 6) Secure one side with the repair tool,  
Use a dedicated spanner to slowly rotate stator counterclockwise to release it.



Figure 28

- 7) Turn the two wrench bolts counterclockwise to release the chamber.

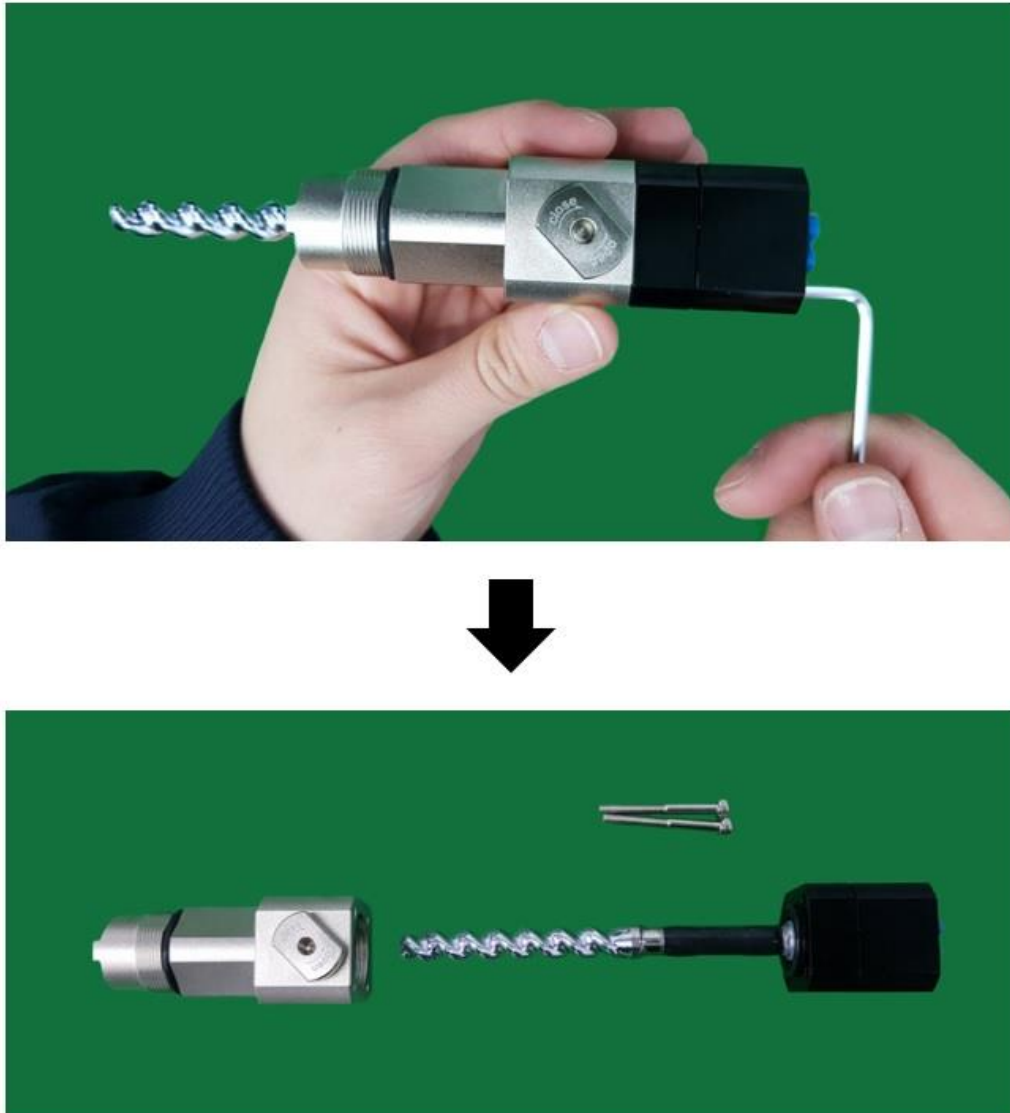


Figure 29

- 8) Remove motor and seal block by rocking them to the left and right.

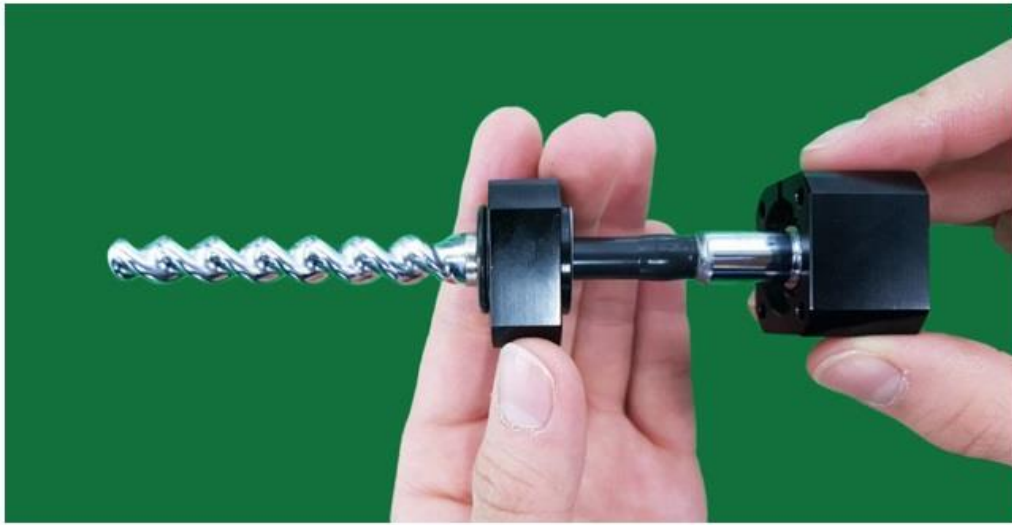
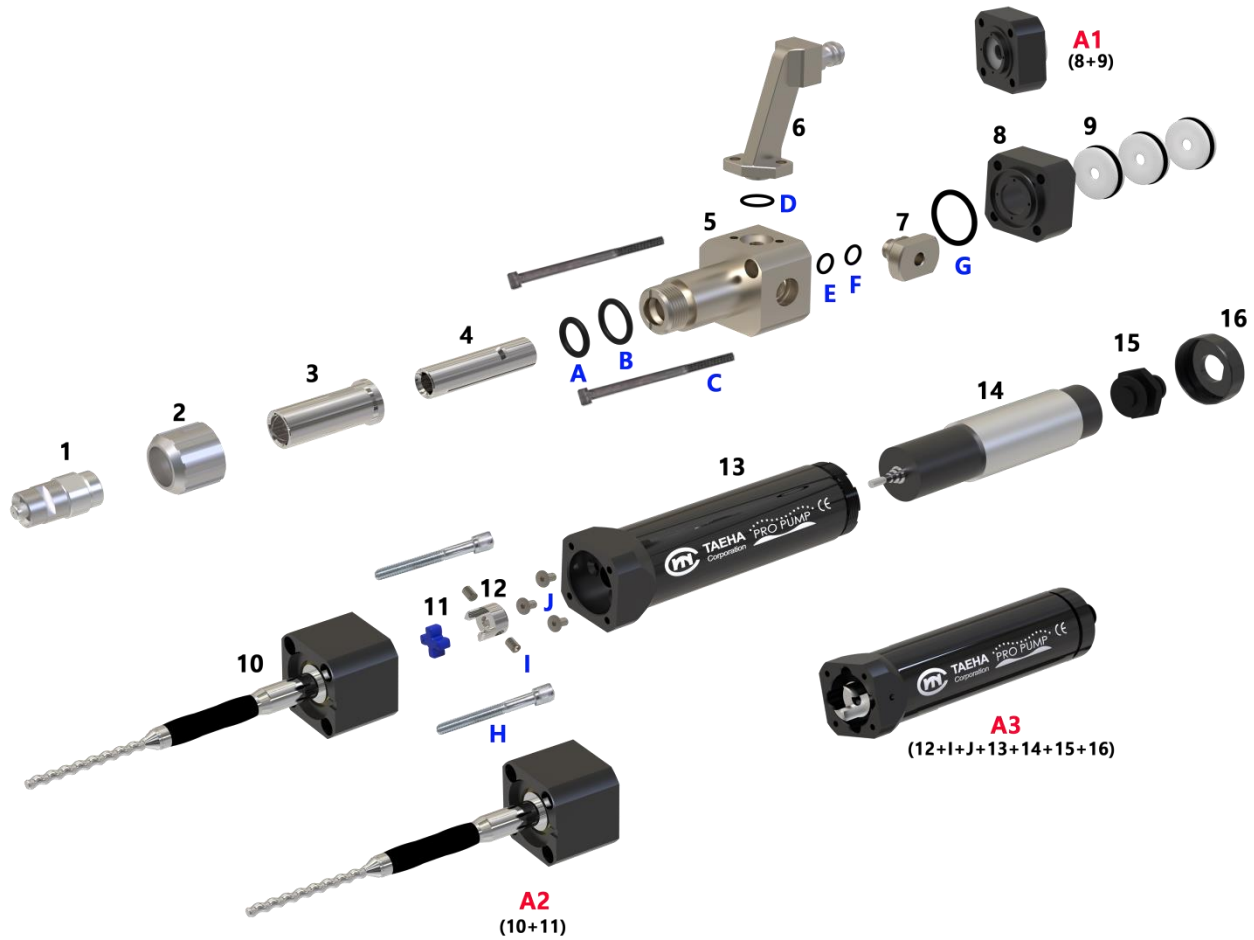


Figure 30

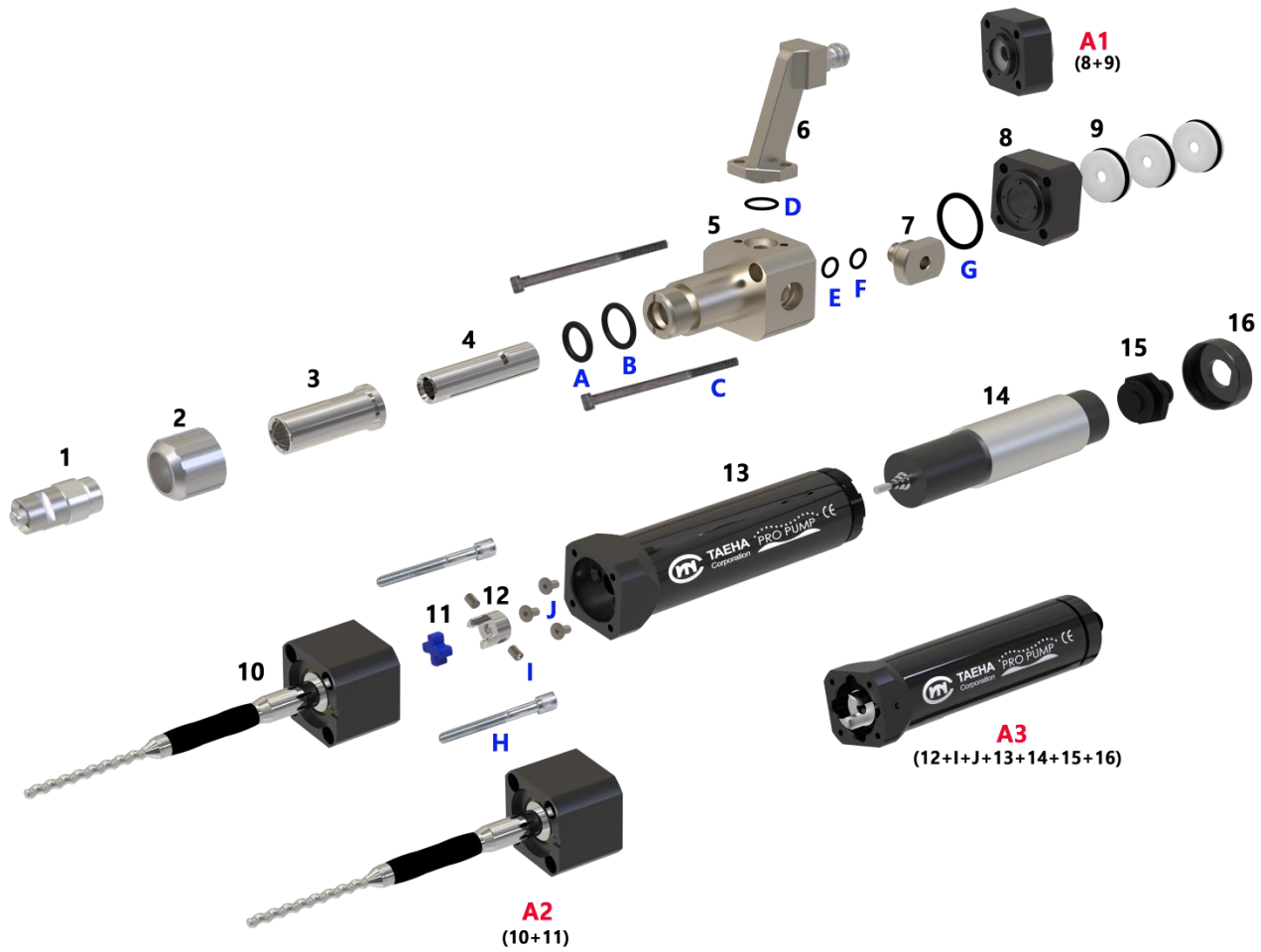
## 6 Pro Pump Partlist

### 6.1 PCP-005 Partlist



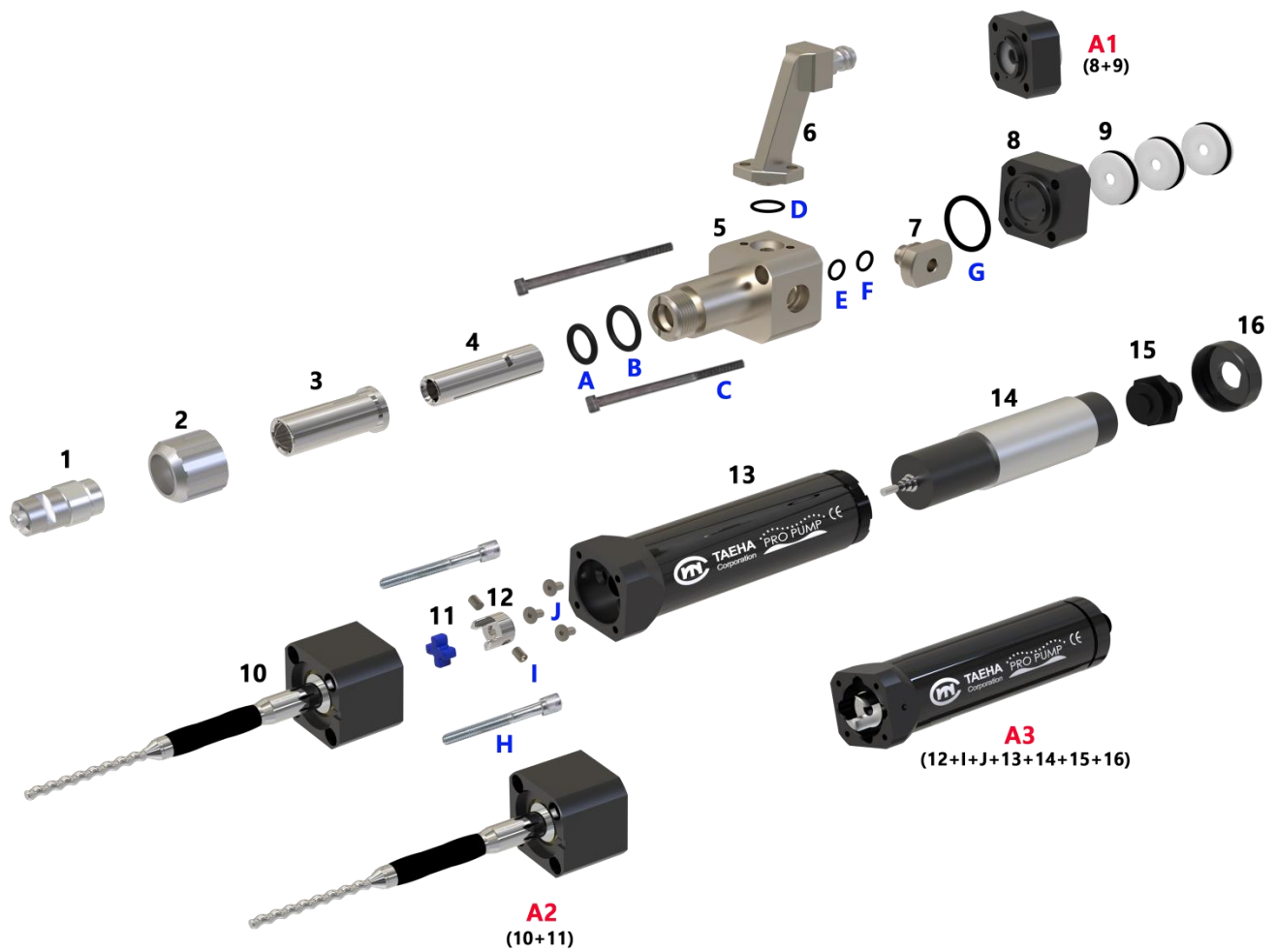
No.	Part No.	Item Name	Q'ty	Material	No.	Part No.	Item name	Q'ty	Material
A1	PCP-005-A1	Seal block ass'y	1		15	PCP-005-15	Connector	1	
A2	PCP-005-A2	Rotor ass'y	1		16	PCP-005-16	Connector cap	1	
A3	PCP-005-A3	Motor ass'y	1		A	PCP-005-A	O-Ring(P9)	1	FKM(1472)
1	PCP-005-1	Luer adapter	1	SUS303	B	PCP-005-B	O-Ring(AS013)	1	FKM(1472)
2	PCP-005-2	Union cap	1	SUS303	C	PCP-005-C	Bolt(M3x55)	2	High-strength
3	PCP-005-3	Stator Sleeve	1	SUS303	D	PCP-005-D	O-Ring(SS8)	1	FKM(1472)
4	PCP-005-4	Stator	1	SUS303	E	PCP-005-E	O-Ring(SS5)	1	FKM(1472)
5	PCP-005-5	Chamber	1	AL2024	F	PCP-005-F	O-Ring(SS5)	1	FKM(1472)
6	PCP-005-6	Inlet Adapter	1	AL6061	G	PCP-005-G	O-Ring(AN016)	1	FKM(1472)
7	PCP-005-7	Vent knob	1	AL6061	H	PCP-005-H	Bolt(M3x35)	2	High-strength
8	PCP-005-8	Seal block	1	AL2011	I	PCP-005-I	Set screw(M3x4)	2	
9	PCP-005-9	Rotary seal(+O-ring)	3	UHMW-PE	J	PCP-005-J	Flat headed bolt(M2.5x5)	3	
10	PCP-005-10	Rotor + bearing block	1						
11	PCP-005-11	Urethane sleeve	1	Poly urethane					
12	PCP-005-12	Coupling driving flange	1	SUS303					
13	PCP-005-13	Motor housing	1	AL2024					
14	PCP-005-14	Motor	1						

## 6.2 PCP-015 Partlist



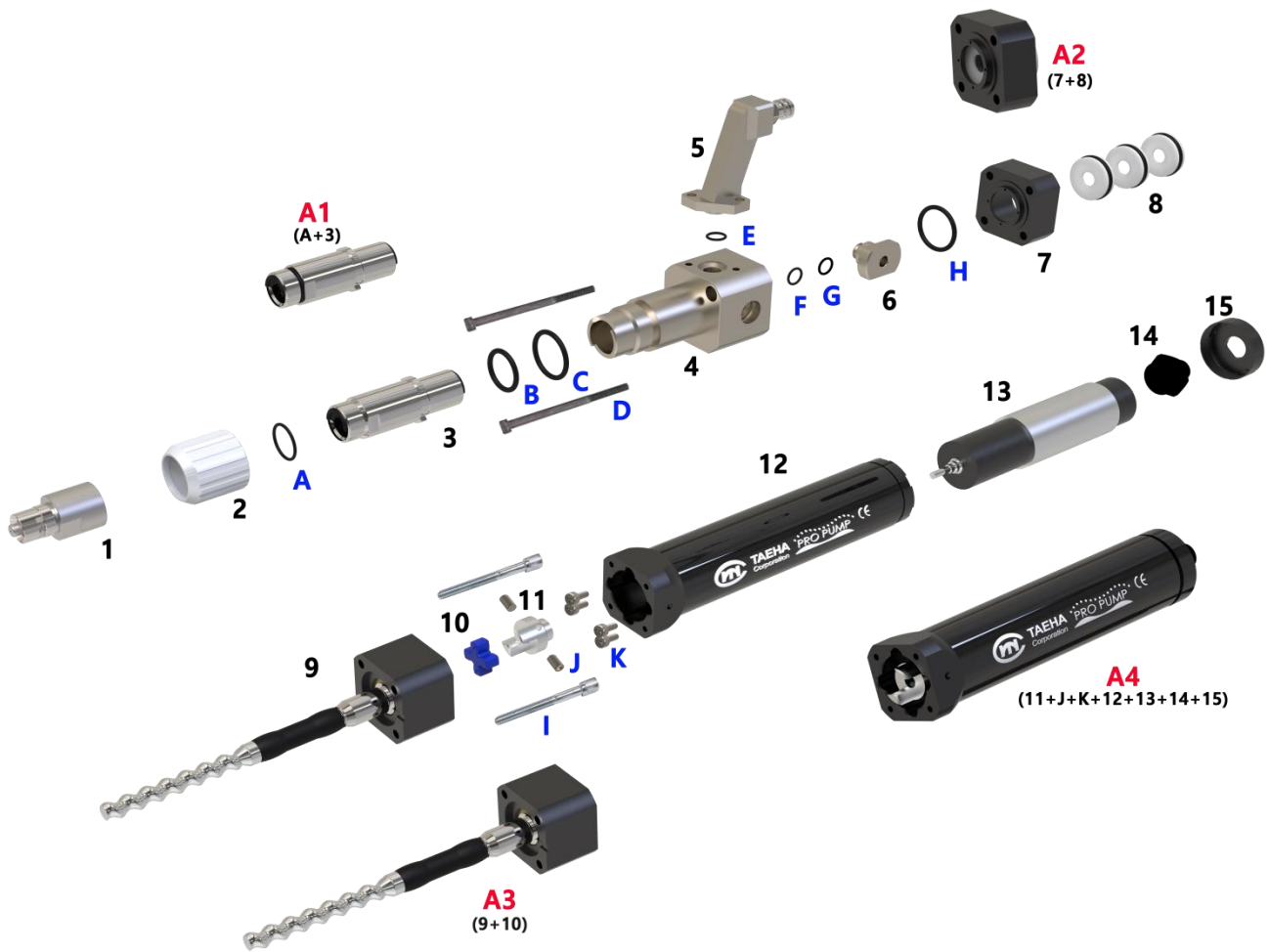
No.	Part No.	Item Name	Q'ty	Material	No.	Part No.	Item name	Q'ty	Material
A1	PCP-015-A1	Seal block ass'y	1		15	PCP-015-15	Connector	1	
A2	PCP-015-A2	Rotor ass'y	1		16	PCP-015-16	Connector cap	1	
A3	PCP-015-A3	Motor ass'y	1		A	PCP-015-A	O-Ring(P9)	1	FKM(1472)
1	PCP-015-1	Luer adapter	1	SUS303	B	PCP-015-B	O-Ring(AS013)	1	FKM(1472)
2	PCP-015-2	Union cap	1	SUS303	C	PCP-015-C	Bolt(M3x55)	2	High-strength
3	PCP-015-3	Stator Sleeve	1	SUS303	D	PCP-015-D	O-Ring(SS8)	1	FKM(1472)
4	PCP-015-4	Stator	1	SUS303	E	PCP-015-E	O-Ring(SS5)	1	FKM(1472)
5	PCP-015-5	Chamber	1	AL2024	F	PCP-015-F	O-Ring(SS5)	1	FKM(1472)
6	PCP-015-6	Inlet Adapter	1	AL6061	G	PCP-015-G	O-Ring(AN016)	1	FKM(1472)
7	PCP-015-7	Vent knob	1	AL6061	H	PCP-015-H	Bolt(M3x35)	2	High-strength
8	PCP-015-8	Seal block	1	AL2011	I	PCP-015-I	Set screw(M3x4)	2	
9	PCP-015-9	Rotary seal(+O-ring)	3	UHMW-PE	J	PCP-015-J	Flat headed bolt(M2.5x5)	3	
10	PCP-015-10	Rotor + bearing block	1						
11	PCP-015-11	Urethane sleeve	1	Poly urethane					
12	PCP-015-12	Coupling driving flange	1	SUS303					
13	PCP-015-13	Motor housing	1	AL2024					
14	PCP-015-14	Motor	1						

### 6.3 PCP-050 Partlist



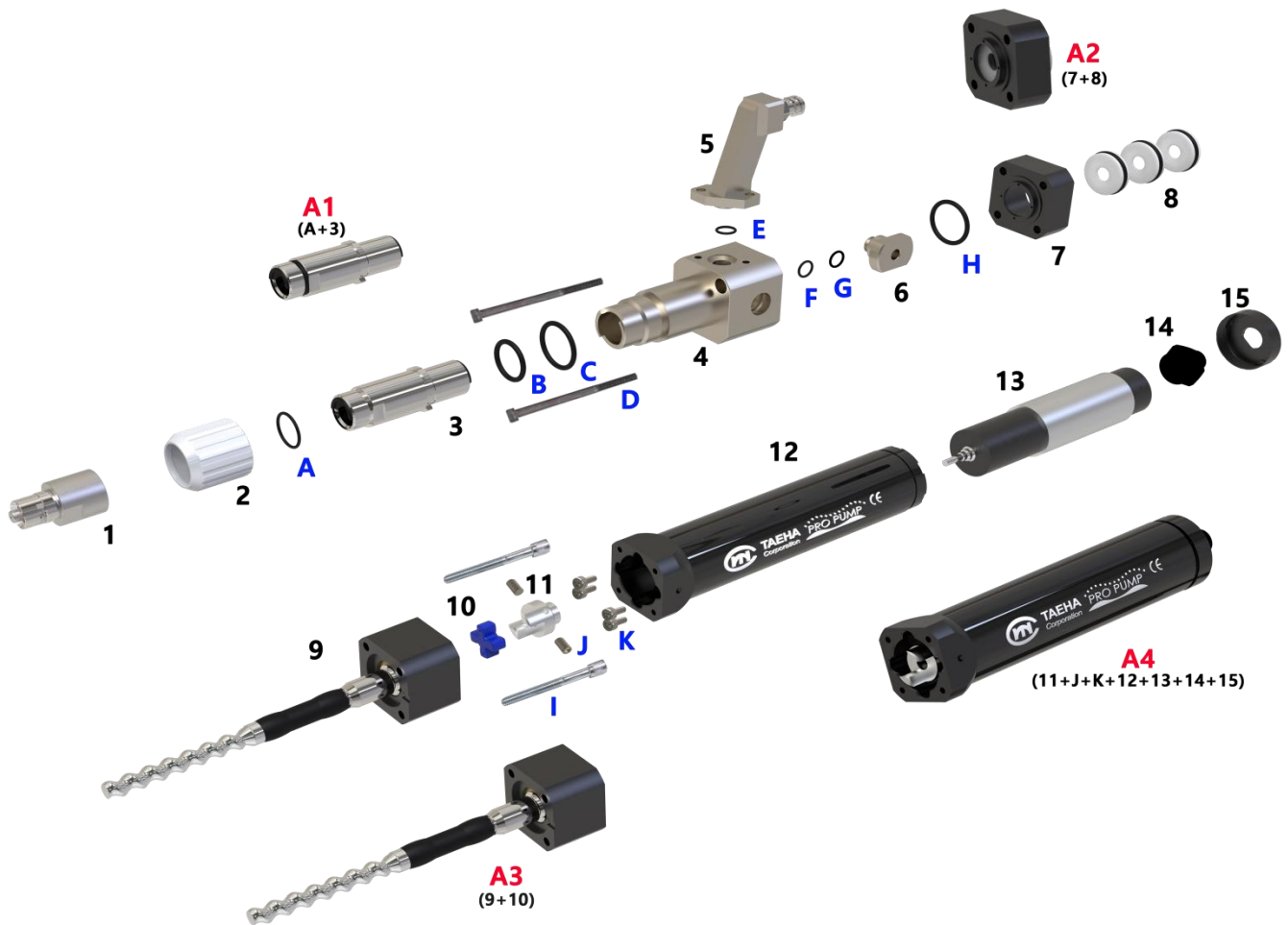
No.	Part No.	Item Name	Q'ty	Material	No.	Part No.	Item name	Q'ty	Material
A1	PCP-050-A1	Seal block ass'y	1		15	PCP-050-15	Connector	1	
A2	PCP-050-A2	Rotor ass'y	1		16	PCP-050-16	Connector cap	1	
A3	PCP-050-A3	Motor ass'y	1		A	PCP-050-A	O-Ring(P9)	1	FKM(1472)
1	PCP-050-1	Luer adapter	1	SUS303	B	PCP-050-B	O-Ring(AS013)	1	FKM(1472)
2	PCP-050-2	Union cap	1	SUS303	C	PCP-050-C	Bolt(M3x55)	2	High-strength
3	PCP-050-3	Stator Sleeve	1	SUS303	D	PCP-050-D	O-Ring(SS8)	1	FKM(1472)
4	PCP-050-4	Stator	1	SUS303	E	PCP-050-E	O-Ring(SS5)	1	FKM(1472)
5	PCP-050-5	Chamber	1	AL2024	F	PCP-050-F	O-Ring(SS5)	1	FKM(1472)
6	PCP-050-6	Inlet Adapter	1	AL6061	G	PCP-050-G	O-Ring(AN016)	1	FKM(1472)
7	PCP-050-7	Vent knob	1	AL6061	H	PCP-050-H	Bolt(M3x35)	2	High-strength
8	PCP-050-8	Seal block	1	AL2011	I	PCP-050-I	Set screw(M3x4)	2	
9	PCP-050-9	Rotary seal(+O-ring)	3	UHMW-PE	J	PCP-050-J	Flat headed bolt(M2.5x5)	3	
10	PCP-050-10	Rotor + bearing block	1						
11	PCP-050-11	Urethane sleeve	1	Poly urethane					
12	PCP-050-12	Coupling driving flange	1	SUS303					
13	PCP-050-13	Motor housing	1	AL2024					
14	PCP-050-14	Motor	1						

### 6.4 PCP-150 Partlist



No.	Part No.	Item Name	Q'ty	Material	No.	Part No.	Item name	Q'ty	Material
A1	PCP-150-A1	Stator ass'y	1		15	PCP-150-15	Connector cap	1	
A2	PCP-150-A2	Seal block ass'y	1		A	PCP-150-A	O-Ring(S10)	1	FKM(1472)
A3	PCP-150-A3	Rotor ass'y	1		B	PCP-150-B	O-Ring(AS014)	1	FKM(1472)
A4	PCP-150-A4	Motor ass'y	1		C	PCP-150-C	O-Ring(AS015)	1	FKM(1472)
1	PCP-150-1	Luer adapter	1	SUS303	D	PCP-150-D	Bolt(M3x55)	2	High-strength
2	PCP-150-2	Union cap	1	SUS303	E	PCP-150-E	O-Ring(SS8)	1	FKM(1472)
3	PCP-150-3	Stator	1	SUS303	F	PCP-150-F	O-Ring(SS5)	1	FKM(1472)
4	PCP-150-4	Chamber	1	AL2024	G	PCP-150-G	O-Ring(SS5)	1	FKM(1472)
5	PCP-150-5	Inlet Adapter	1	AL6061	H	PCP-150-H	O-Ring(AN016)	1	FKM(1472)
6	PCP-150-6	Vent knob	1	AL6061	I	PCP-150-I	Bolt(M3x35)	2	High-strength
7	PCP-150-7	Seal block	1	AL2011	J	PCP-150-J	Set screw(M3x5)	2	
8	PCP-150-8	Rotary seal(+O-ring)	3	UHMW-PE	K	PCP-150-K	Bolt(M3x8)	4	
9	PCP-150-9	Rotor + bearing block	1						
10	PCP-150-10	Urethane sleeve	1	Poly urethane					
11	PCP-150-11	Coupling driving flange	1	SUS303					
12	PCP-150-12	Motor housing	1	AL2024					
13	PCP-150-13	Motor	1						
14	PCP-150-14	Connector	1						

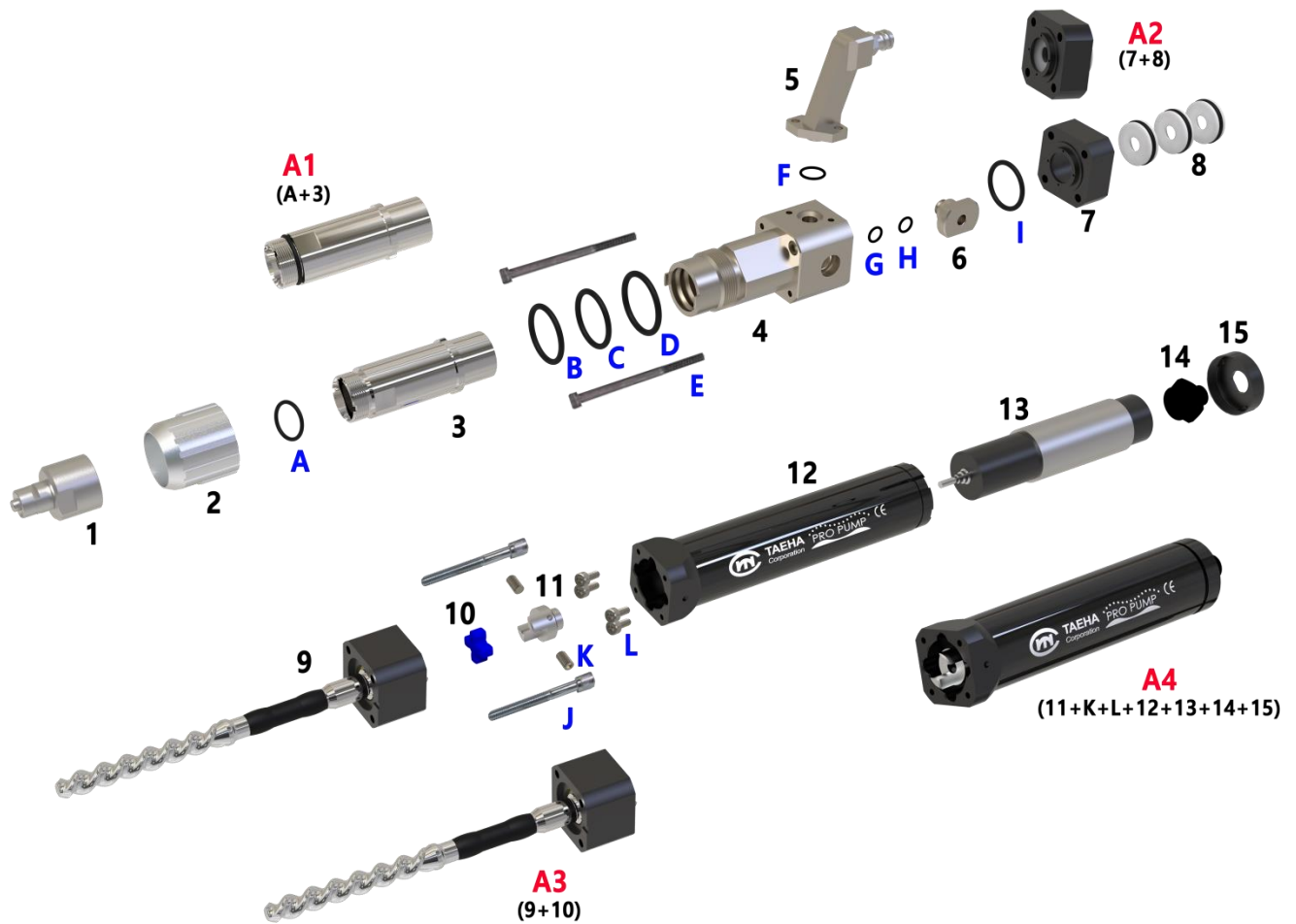
### 6.5 PCP-500 Partlist



No.	Part No.	Item Name	Q'ty	Material	No.	Part No.	Item name	Q'ty	Material
A1	PCP-500-A1	Stator ass'y	1		15	PCP-500-15	Connector cap	1	
A2	PCP-500-A2	Seal block ass'y	1		A	PCP-500-A	O-Ring(S10)	1	FKM(1472)
A3	PCP-500-A3	Rotor ass'y	1		B	PCP-500-B	O-Ring(AS014)	1	FKM(1472)
A4	PCP-500-A4	Motor ass'y	1		C	PCP-500-C	O-Ring(AS015)	1	FKM(1472)
1	PCP-500-1	Luer adapter	1	SUS303	D	PCP-500-D	Bolt(M3x55)	2	High-strength
2	PCP-500-2	Union cap	1	SUS303	E	PCP-500-E	O-Ring(SS8)	1	FKM(1472)
3	PCP-500-3	Stator	1	SUS303	F	PCP-500-F	O-Ring(SS5)	1	FKM(1472)
4	PCP-500-4	Chamber	1	AL2024	G	PCP-500-G	O-Ring(SS5)	1	FKM(1472)
5	PCP-500-5	Inlet Adapter	1	AL6061	H	PCP-500-H	O-Ring(AN016)	1	FKM(1472)
6	PCP-500-6	Vent knob	1	AL6061	I	PCP-500-I	Bolt(M3x35)	2	High-strength
7	PCP-500-7	Seal block	1	AL2011	J	PCP-500-J	Set screw(M3x5)	2	
8	PCP-500-8	Rotary seal(+O-ring)	3	UHMW-PE	K	PCP-500-K	Bolt(M3x8)	4	
9	PCP-500-9	Rotor + bearing block	1						
10	PCP-500-10	Urethane sleeve	1	Poly urethane					
11	PCP-500-11	Coupling driving flange	1	SUS303					
12	PCP-500-12	Motor housing	1	AL2024					
13	PCP-500-13	Motor	1						
14	PCP-500-14	Connector	1						



### 6.6 PCP-1000 Partlist



No.	Part No.	Item Name	Q'ty	Material	No.	Part No.	Item name	Q'ty	Material
A1	PCP-1000-A1	Stator ass'y	1		15	PCP-1000-15	Connector cap	1	
A2	PCP-1000-A2	Seal block ass'y	1		A	PCP-1000-A	O-Ring(S15)	1	FKM(1472)
A3	PCP-1000-A3	Rotor ass'y	1		B	PCP-1000-B	O-Ring(AS017)	1	FKM(1472)
A4	PCP-1000-A4	Motor ass'y	1		C	PCP-1000-C	O-Ring(AS017)	1	FKM(1472)
1	PCP-1000-1	Luer adapter	1	SUS303	D	PCP-1000-D	O-Ring(AS019)	1	FKM(1472)
2	PCP-1000-2	Union cap	1	SUS303	E	PCP-1000-E	Bolt(M3x55)	2	High-strength
3	PCP-1000-3	Stator	1	SUS303	F	PCP-1000-F	O-Ring(SS8)	1	FKM(1472)
4	PCP-1000-4	Chamber	1	AL2024	G	PCP-1000-G	O-Ring(SS5)	1	FKM(1472)
5	PCP-1000-5	Inlet Adapter	1	AL6061	H	PCP-1000-H	O-Ring(SS5)	1	FKM(1472)
6	PCP-1000-6	Vent knob	1	AL6061	I	PCP-1000-I	O-Ring(AN016)	1	FKM(1472)
7	PCP-1000-7	Seal block	1	AL2011	J	PCP-1000-J	Bolt(M3x35)	2	High-strength
8	PCP-1000-8	Rotary seal(+O-ring)	3	UHMW-PE	K	PCP-1000-K	Set screw(M3x5)	2	
9	PCP-1000-9	Rotor + bearing block	1		L	PCP-1000-L	Bolt(M3x8)	4	
10	PCP-1000-10	Urethane sleeve	1	Poly urethane					
11	PCP-1000-11	Coupling driving flange	1	SUS303					
12	PCP-1000-12	Motor housing	1	AL2024					
13	PCP-1000-13	Motor	1						
14	PCP-1000-14	Connector	1						


## 7 Maintenance

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This equipment is composed of robot part responsible for motion operation, dispenser(Pro Pump) responsible for dispensing and dispenser controller, so regular inspections are required.

- Make sure there are sufficient materials in the material inlet port.  
(If the pump is idle without materials, it will be damaged by overheating.)
- If any abnormal sound occurs during the operation or starting operation, stop the operation immediately and check.

In order to prevent malfunctions caused by various factors, please perform occasional(user-determined) and periodic(within a year) inspections.

Danger	
<p>Be sure to take necessary measures such as manual mode of the equipment, emergency stop, power off, etc. before performing maintenance and inspection. If the power is not turned off, any material inside the equipment or the inspector may be detected by the sensor, which may occur movement of the equipment. It may also cause electric shock.</p> <p>Do not perform megger test(insulation resistance measurement). It may cause malfunction.</p>	

As the functional use time of parts becomes long, aging may occur and it may cause the failure of the equipment. Check regularly for trouble prevention and preservation of the equipment, and, in case of abnormality, replace parts.

## 7.1 Alarm Display and Action

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The desktop dispensing system informs the user of the occurrence of alarms in the following ways when errors occur.

- Front Touch Panel
- Teach Pendant's Alarm Message Display
- System status I/O contact point output

The related alarm codes can be checked through the front touch panel, where each alarm code is displayed.

Classification of abnormal phenomena is as follows.

- Alarms that may occur due to hardware protection or internal element breakage
- Alarms that may occur from incorrect settings when setting motion programs and points
- Alarms that may occur due to other mishandling, etc.

If an alarm occurs in the hardware protection system during operation, the output to the motor is cut off and the servo is turned off. In order to restart operation, it is necessary to remove the cause of alarm and then release it for normal operation.

Caution
Some alarms cannot be released even after reset. In this case, you must reboot(power On/Off) after completing action for the relevant error.

## 7.2 Inspection and Measures

Table 6. Pro Pump Inspection and Measures

Inspection	Cycle	What to check and what to do	Remarks
Environment	Occasionally	Confirm that it meets the usage standards of the equipment.	
Power Supply	Occasionally	Check if the power is AC220V and 50/60Hz.	
Appearance of Equipment	Periodically	Check if the connection parts(connector, terminal block, etc.)are loose, and tightly fasten the loose parts.	
Cables	Periodically	Check if the cover is peeled or there is severe bending.	
Internal State of Equipment	Periodically	Keep it clean to prevent so that the contamination by dust or solution does not interfere with the operation of the equipment.	
Supplied Air	Occasionally	Check the piping connection, joints, or if there is no leakage so that the supplied air maintains normal pressure.	
Purge Condition	Occasionally	If the equipment is stopped for more than 10 minutes, dispense a certain volume depending on the set time so that hardening does not occur at the end of the valve.	
Robot	Occasionally	<ol style="list-style-type: none"> <li>1) Check for abnormal vibration or abnormal noise.</li> <li>2) Check for abnormal heat generation.</li> <li>3) Check for abnormal vibration or abnormal noise on the bearing part.</li> </ol>	
Other Checks	Periodically	<ol style="list-style-type: none"> <li>1) Fastening condition of the fixed parts and joints in the equipment.</li> <li>2) Joined and tightened condition of wiring.</li> <li>3) Arrangement condition around the equipment.</li> </ol>	

### 7.3 Trouble Shooting

Table 7. Pro Pump Trouble Shooting

Trouble	Possible Cause & Correction
<p><b>If the dispensing is not possible</b></p>	<ol style="list-style-type: none"> <li>1. Check the air supply in the tank.</li> <li>2. Check the controller power supply.</li> <li>3. Check whether the solution is there.</li> <li>4. Check if the solution is loaded in the conduit line.</li> <li>5. Check the connection of the air fitting.</li> <li>6. Check the connection of the air fitting in the conduit line of solution.</li> <li>7. Check whether the nozzle is clogged.</li> <li>8. Check whether the pump motor is operating.</li> </ol>
<p><b>If there is a change in the dispensing volume</b></p>	<ol style="list-style-type: none"> <li>1. Check if there is any change in the setting value of the controller.</li> <li>2. Check if there is any solidification of the solution in the chamber.</li> <li>3. Check if there is any clogging in the needle.</li> <li>4. Check if there is any air bubble in the conduit line and chamber.</li> <li>5. Check if there is a change in the tank air supply pressure.</li> <li>6. Check if there is a leak in the liquid connection fitting.</li> </ol>
<p><b>If there is a leak in nozzle end during the standby time after dispensing</b></p>	<ol style="list-style-type: none"> <li>1. Check if there is an abrasion in the rubber part of stator.</li> <li>2. Check if the tank air pressure has been set high. (The pressure setting for the tank air must be set to the extent that the fluid is transported to the pump chamber.)</li> <li>3. Check if there is continuous operation of the pump drive motor.</li> </ol>
<p><b>If the pump drive motor does not operate</b></p>	<ol style="list-style-type: none"> <li>1. Check the connection of the motor cable.</li> <li>2. Check the set value of the controller.</li> <li>3. Check the power supply status.</li> <li>4. Check if the solution is solidified in the pump chamber.</li> </ol>
<p><b>If the solution leaks out of the pump</b></p>	<ol style="list-style-type: none"> <li>1. Check if o-ring between chamber and seal block has been damaged.</li> <li>2. Check the status of abrasion of the rotary seal in the seal block.</li> </ol>
<p><b>If an abnormal noise occurs while the pump is operating</b></p>	<ol style="list-style-type: none"> <li>1. Check if the bearing in the bearing block has been damaged.</li> <li>2. Check the status of abrasion of the rotary seal in the seal block.</li> <li>3. Check the condition of the motor reducer.</li> </ol>