
PRO DUO PUMP (PDP)

액체정량토출시스템 Since 1994

PRECISION LIQUID DISPENSING TECHNOLOGY



Operation Manual

 **TAEHA** Corporation

Contents

1	Safety Precautions	4
2	General Information.....	8
2.1	General Information.....	8
2.2	Warranty.....	8
2.3	Technical Support	8
2.4	Precautions.....	9
3	Pro Duo Pump System (PDP) Feature.....	10
3.1	Pro Duo Pump System	10
3.2	Pro Duo Pump System Features.....	10
3.3	Pro Duo Pump Feature & Specification	11
3.4	Pro Duo Pump Controller Feature & Specification	13
3.5	PDP(Standard Type) System	14
3.6	PDPM (Module Type) System	14
4	Names of each part.....	16
5	Pro Duo Pump Operation.....	18
5.1	Precautions on Use and Assembly	18
5.2	Pro Duo Pump Ready to Use.....	18
6	Pro Duo Pump Disassemble	20
6.1	PDP-005/015/050 Disassemble	20
6.2	PDP-150/500 Disassemble.....	28
6.3	PDP-1000 Disassemble.....	38
7	Pro Duo Pump Partlist.....	48
7.1	PDP-005 Partlist.....	48
7.2	PDP-015 Partlist.....	51
7.3	PDP-050 Partlist.....	54
7.4	PDP-150 Partlist.....	57
7.5	PDP-500 Partlist.....	60

7.6 PDP-1000 Partlist63

8 Maintenance66

8.1 Alarm Display and Action67

8.2 Inspection and Measures68

8.3 Trouble Shooting69

1 Safety Precautions

This manual is applied to products manufactured and sold by Taeha Corp.(here in after referred to as “our company”) and, therefore, must not be used in partial or full copy without permission of our company.

This manual explains the specifications, installation, wiring, maintenance check, abnormal phenomena and measures to be taken for our products. When using this product, please read this manual carefully, pay enough attention to safety and handle it properly.

The safety precautions have been classified into ‘**Danger**’ and ‘**Caution**’.



“**Danger**” : When handled incorrectly, it can cause dangerous situations and may cause death or serious injury.



“**Caution**” means that dangerous situations can occur if handled incorrectly. Also, you may get serious injury or physical damage.

In addition, even if it is indicated as ‘**Caution**’, it may lead to serious consequences depending on the situation. Since this is important for the safety of the user, please make sure you follow the instructions.



Precautions against Electric Shock

Danger

1. This equipment is kept under high pressure for a while even after the main power supply is cut off. When performing a wiring work or inspection that touches all terminals of the terminal block, leave it for at least five minutes after shutting off the power before you start the work.
2. To prevent electric shock and malfunction, please provide Class 3 grounding (100ohm or less, wire diameter 1.6mm or thicker).
3. Inspection and maintenance of this equipment must be performed by a qualified technician(specialist).
4. Do not inspect equipment with wet hands, when the floor is wet or if there is too much moisture. It may cause electric shock.
5. Be careful not to damage the cable, place heavy objects on it or fold it. In case it is damaged, it may cause electric shock.



Precautions against Fire

Danger

1. Do not install this equipment near inflammables, combustible organic solvents or vapors. The heat and electrical operation can cause fire.
2. If this equipment malfunctions, disconnect the main power supply of the equipment. The high current may cause a fire.



Precautions on Wiring

Danger

1. Before conducting wiring work for maintenance etc., be sure to shut off all the external power supplies used by the equipment.
Failure to do so may result in electric shock or damage to the equipment.
2. To supply power or operate the equipment after wiring, be sure to attach the covers inside and outside the equipment. Failure to do so may result in injury and electric shock.

Caution

1. Do not apply main power supply except for that of the voltage specified in this user manual. It may cause malfunction.



2. Make sure that terminal connections and wiring are correct. It may cause malfunction.
3. While the electric current is being applied, do not change the wiring or detach the connector. It may cause injury or equipment failure.
4. If the power wiring in the driving area is wrong, it may cause injury or damage to the equipment due to malfunction. Be careful.

Precautions on Installation



Caution

1. Do not install, store and use in places exposed to conductive dust, corrosive gas, flammable gas, high temperature, condensation, wind and rain, etc.
2. Exposure to direct sunlight for a long time will degrade accuracy of the equipment. Do not install, store or use in areas where there is direct sunlight.
3. When installing in an enclosed space, install a separate cooling fan to allow the outside air to flow in and out, in order to maintain the temperature around the equipment at 40°C or less. Overheating may cause fire or other accidents.

Precautions on Use



Caution

1. Never modify this equipment. It may cause electric shock, injury, fire or breakdown.
2. Once you modify this equipment, it cannot be covered by our warranty for defects.
3. Before use, be sure to check that all covers are properly installed and verify if there is no foreign material inside the equipment. Depending on the circumstances, unexpected operation can occur and may result in injury.
4. If an alarm occurs during use, remove the cause of the alarm, check the safety, and reuse it.

Danger

1. When the equipment of our company is used including robots(multi-joint robot, rectangular coordinate robot, desktop robot), please be sure to install a safety net in the robot operation area, and never approach the operation area during operation.



2. Equipment of our company include driving and rotating parts. Install a safety net on the rotating parts and never approach it during operation.

Precautions for Maintenance and Inspection



Caution

1. When cleaning or repairing the equipment, be sure to turn off the power and check the internal power supply for complete discharging, and then have it carried out by a qualified maintenance specialist. Maintenance by non-experts can cause breakdown.
2. If there is a breakdown of the equipment, do not disassemble the equipment. Please contact our customer support team.
3. If dust accumulates on the equipment, it may cause malfunction. Clean up the equipment periodically. When cleaning, please shut off the external power completely and check whether the equipment has been fully discharged. There is a danger of electric shock.

Precautions for Disposal



Caution

1. When this equipment is disposed of, treat it as industrial waste.

2 General Information

2.1 General Information

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.

2.2 Warranty

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

2.3 Technical Support

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

Head Office

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Fax : +86 512 6805 2921

2.4 Precautions



Danger

1. Be sure to use the designated power supply. The basic power of the equipment is designated as AC220V 50/60Hz.
2. Be sure to use the designated air pressure. The basic air pressure of the equipment is designated as 5kgf/cm².
3. Do not operate with wet hands. There is a risk of electric shock.
4. During operation, do not turn off the power or shut down the air pressure unless the equipment is in danger/caution. Serious problems may arise with the use of equipment.
5. Contactus in case of severe errors in the equipment.

3 Pro Duo Pump System (PDP) Feature

3.1 Pro Duo Pump System

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.

3.2 Pro Duo Pump System Features

- ✓ The specially designed rotary auger pump allows long-term stability for two-component material. The system provides much enhanced pump efficiency and reproducibility, compared with positive displacement.
- ✓ Max ratio and dispensing volume can be easily adjusted by the number of turns and rotational speed of the rotor.
- ✓ A wide range of application options are available based on the viscosity and natural changes in materials.
- ✓ The special pump can handle a broad range of materials, regardless of viscosity and natural changes in materials.
- ✓ Clean dispensing can be achieved because drop formation is prevented by the suck-back function and freely rotate. No detergent is used for maintenance ; instead the mixer part can be replaced. Maintenance is therefore eco-friendly and economical.

3.3 Pro Duo Pump Feature & Specification

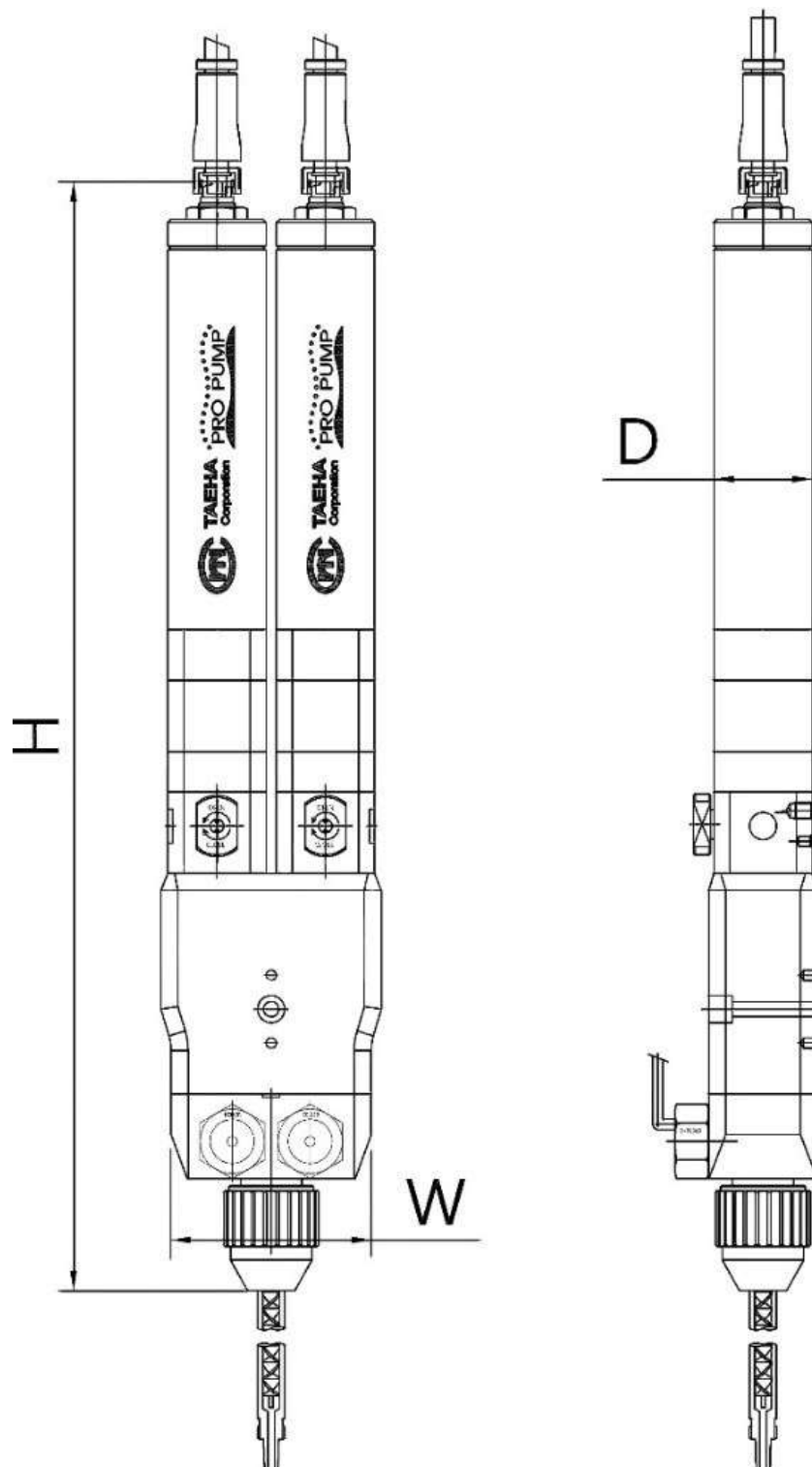


Figure 1. Pro Duo Pump Feature

Table 1. Pro Duo Pump Specification

Item		Specification				
Item	PDP-005	PDP-015	PDP-050	PDP-150	PDP-500	PDP-1000
Dimensions (W x D x H)[mm]	60 x 30 x 260			67 x 35 x 310		67 x 35 x 340
Weight	1.12kg			1.66kg		1.85g
Input Pressure	0 ~ 6kgf/cm²					
Max Dosing Pressure	20kgf/cm²					
Viscosity (cPs)	0 ~ 500,000					
Dosing Volume/Rev	≒ 0.01ml	≒ 0.03ml	≒ 0.1ml	≒ 0.3ml	≒ 1.0ml	≒ 2.0ml
Motor Speed(rpm)	0 ~ 120rpm					
Dosing Flow Rate(Max.)	≒ 1.2ml/min (0.02ml/sec)	≒ 3.6ml/min (0.06ml/sec)	≒ 12ml/min (0.2ml/sec)	≒ 36ml/min (0.6ml/sec)	≒ 120ml/min (2.0ml/sec)	≒ 240ml/min (4.0ml/sec)
Accuracy of Dosing	±1%					
Mixing Ratio	1:1 ~ 10:1					
Stator Material	FFKM / FKM / EPDM					
Material Inlet Port	Module Type : Inlet Adapter Tap Type : G 1/4"					
Material Outlet Port	Luer Lock					
Wetting Part Material	SUS / UHMW-PE / FKM					
Operating Condition	10 ~ 40℃					

3.4 Pro Duo Pump Controller Feature & Specification

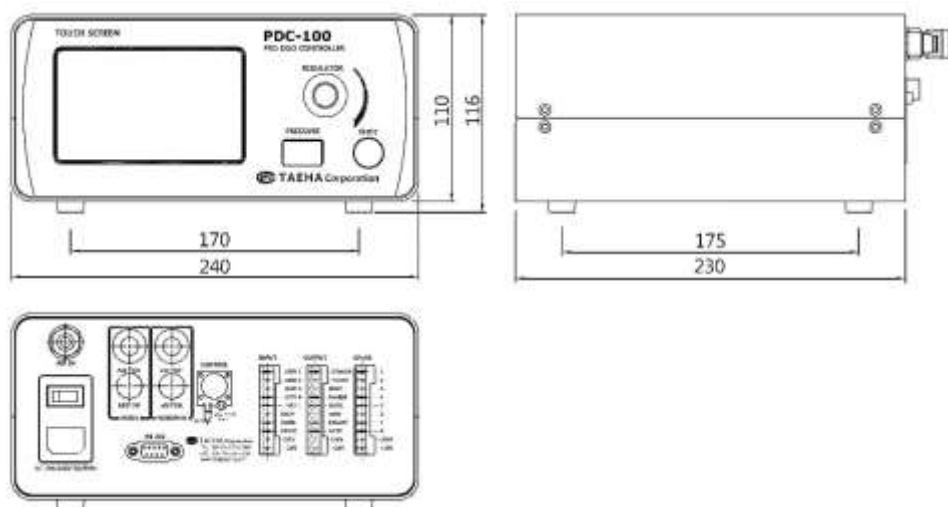


Figure 2. Pro Duo Pump Controller(PDC-100) Feature

Table 2. Pro Duo Pump Controller Specification

Item	Specification	Remarks
Model	PDC-100	
Weight	3.6kg	
Power	AC 220V 50/60Hz, DC24V(max)	±10%
Consumption	Max.200VA	
Display	4.5" TFT LCD	Touch Type
Operation Mode	Time / Steady / Metering / Ratio	3 Mode
Operation Memory	16ch	User Define
Operating Air Pressure	5kgf/cm ² (Humidity less than 5%)	Air Filter : 5μ
Pressure Regulator	0~7kgf/cm ²	
Air In Port	Ø6 Air Hose, Max.7kgf/cm ²	
Air Out Port	Auto Jointer(PH-HR)	
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 Resistant	Less than 0.5G	G : acceleration of gravity

3.5 PDP(Standard Type) System

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

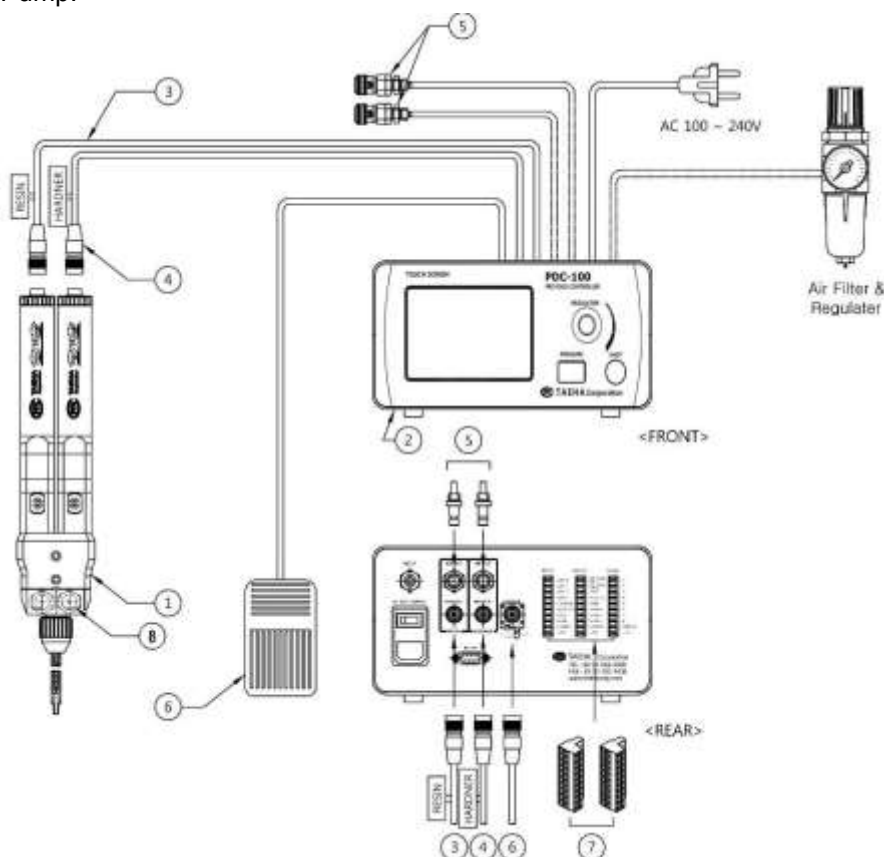


Figure 3. Pro Duo Pump System

Table 3. Pro Duo Pump System

No.	Description	Model	Q'ty	Remarks
1	2K Pump (Pro-Duo Pump)		1 Set	
2	Pro Duo Pump Controller	PDC-100	1 Set	
3	Resin Motor Cable		1 Pc	Length : 2m
4	Hardner Motor Cable		1 Pc	Length : 2m
5	Air Tube Ass'y (Resin, Hardner)	Ø6, Auto Jointer	2 Pcs	Length : 1.5m
6	Foot Switch		1 Pc	Length : 2m
7	Terminal Block	10 Pin	2 Pcs	External I/O Connector
8	Pressure Sensor	50B P3IK91	2 Pcs	Pressure Range : 0 ~ 50bar Output : 0.5 ~ 3.0 VDC Tolerable Pressure : 150bar

3.6 PDPM (Module Type) System

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

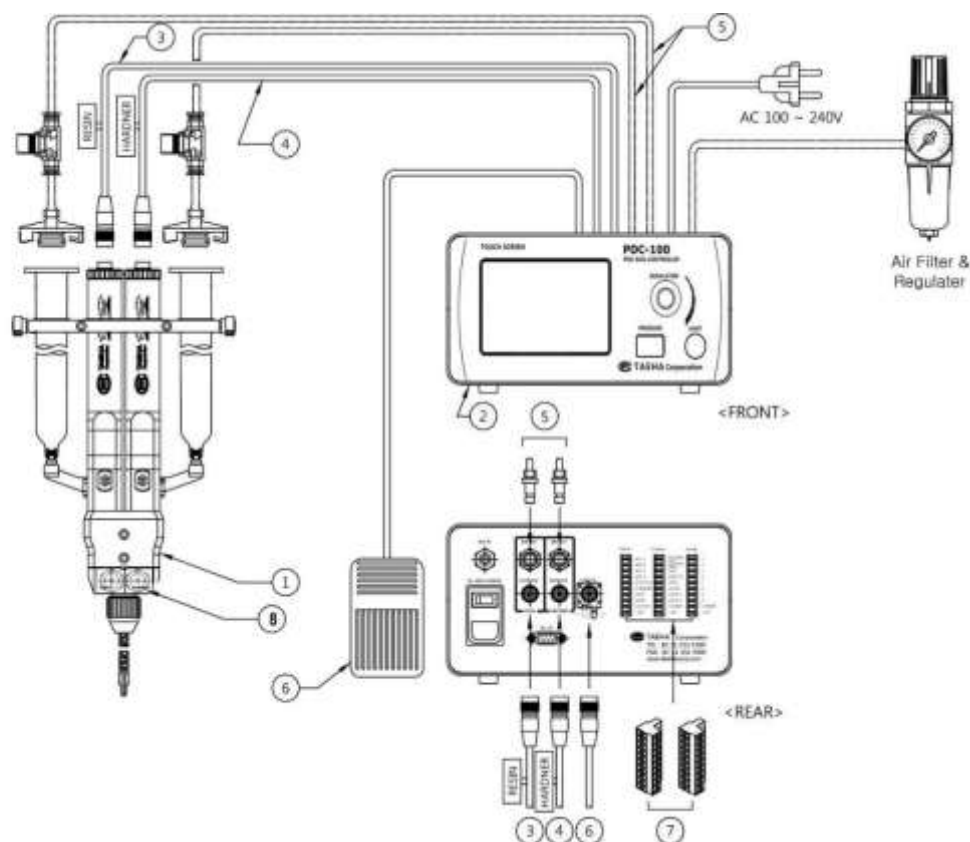


Figure 4. Pro Duo Pump Module Type(PDPM) System

Table 4. PDPM System

No.	Description	Model	Q'ty	Remarks
1	2K Pump (Pro Duo Pump)		1 Set	
2	Pro Duo Pump Controller	PDC-100	1 Set	Pro Duo Pump Controller
3	Resin Motor Cable		1 Pc	Length : 2m
4	Hardner Motor Cable		1 Pc	Length : 2m
5	Air Tube Ass'y (Resin, Hardner)	Ø6, Auto Jointer	2 Pcs	Length : 1.5m
6	Foot Switch		1 Pc	Length : 2m
7	Terminal Block	10 Pin	2 Pcs	External I/O Connector
8	Pressure Sensor	50B P3IK91	2 Pcs	Pressure Range : 0 ~ 50bar Output : 0.5 ~ 30 VDC Tolerable Pressure : 150bar

4 Names of each part

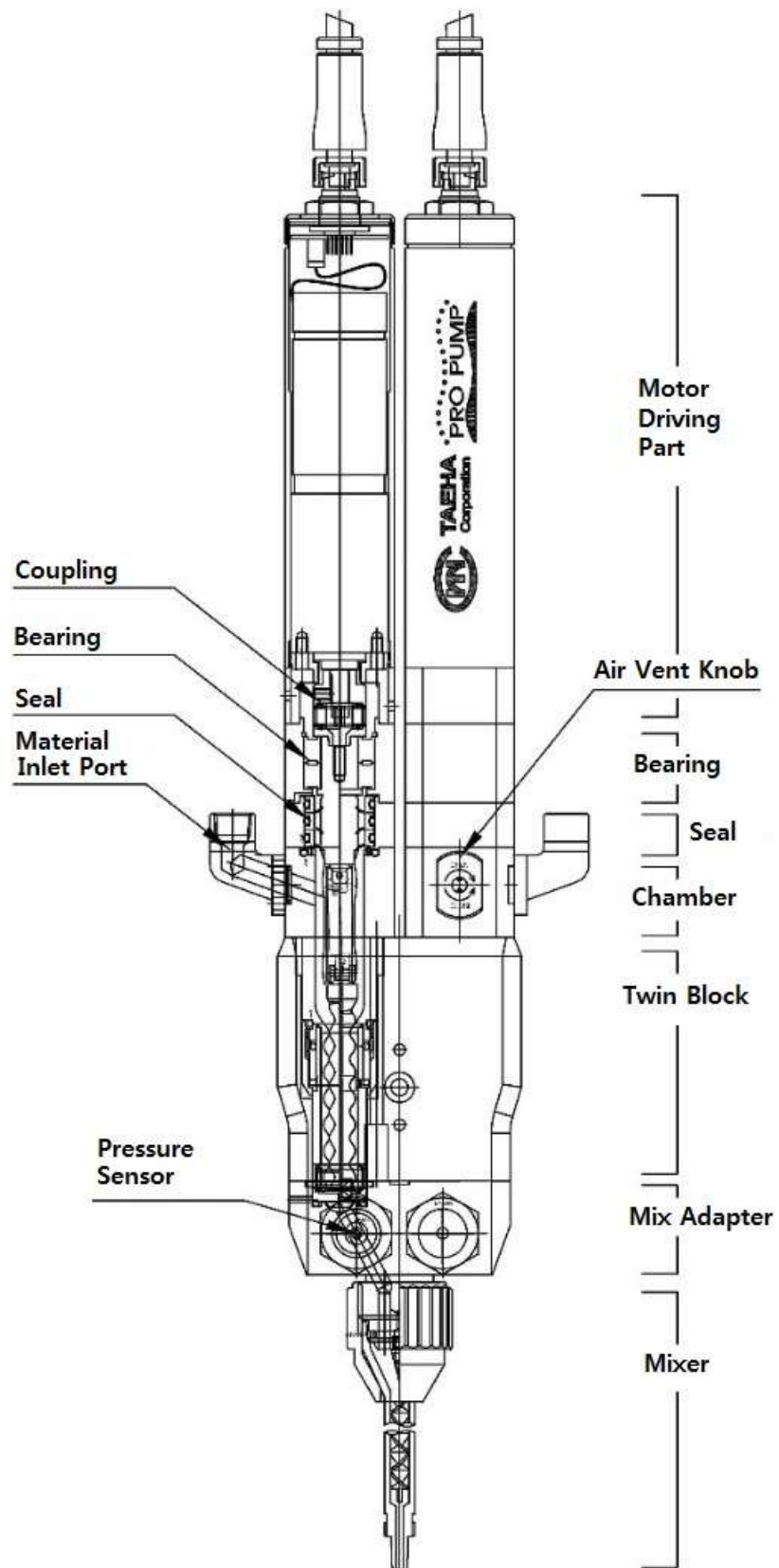


Figure 5. Pro Duo Pump

Table 5. The shape of Mix adapter and Mixer

	A Type	B Type	C Type	F Type
Mix Adapter	A(1:1~2:1)	BA(1:1~2:1)	CA(1:1~2:1)	FA(1:1~2:1)
				
	A(4:1~10:1)	BB(4:1~10:1)	CB(4:1~10:1)	FB(4:1~10:1)
	-			
	-	-	CC(4:1~10:1)	
	-	-		
Mixer				

5 Pro Duo Pump Operation

5.1 Precautions on Use and Assembly

1. In connecting A(Stator) and B(Rotor)

Use C(Fixed 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(Fixed Tool) in clockwise direction.

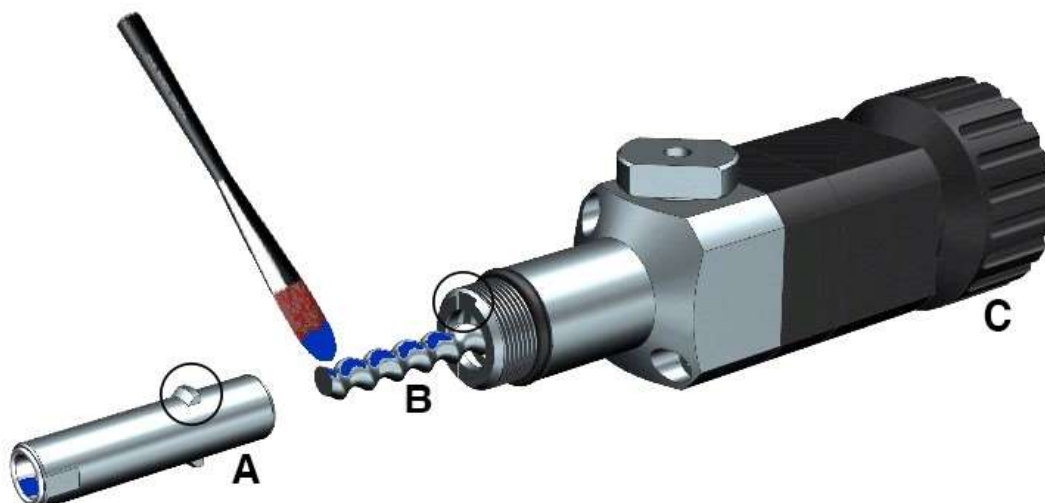


Figure 6.Rotor and Stator Connection

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 part(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.

5.2 Pro Duo Pump Ready to Use

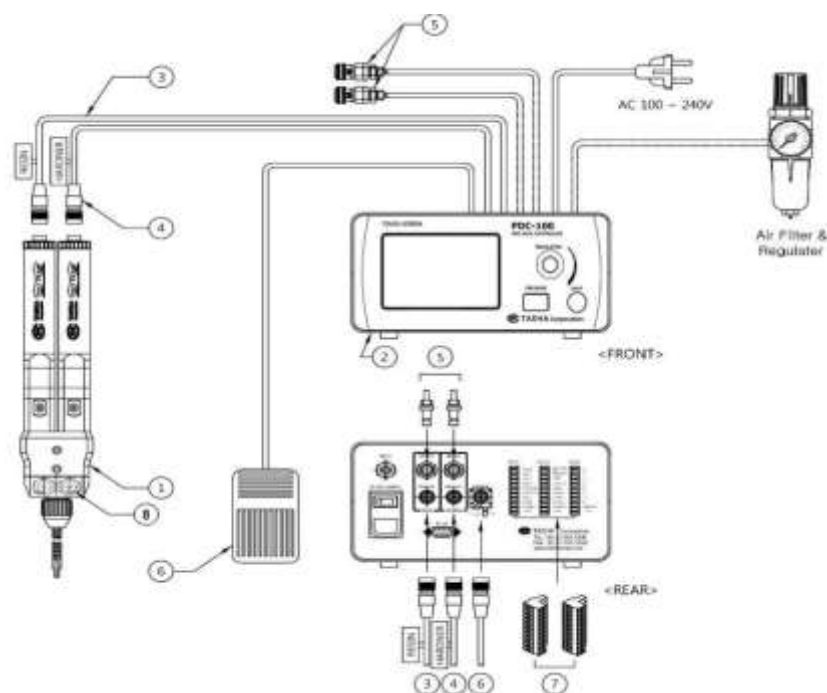


Figure 8. PDP System Composition

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.
 - Motor cable is marked with a resin and hardner, so connectit without changing.
 - Prepare the main air clean and at least 5kgf/cm² seperately.
2. Power on the Pro Duo Pump controller(PDC-100).
3. Make sure the pressure supplied to the material supplier(barrel, cartridge, tank, etc.) is adequate.

Table 6. Suitable setting for each material

Less than 2000cps	1~2kgf/cm ²
Over 2000cps	2~5kgf/cm ²

- Apply according to the guide setting. However, it may vafy depending on the conditions.
4. Open the air vent knob on the Pro Duo Pump.
 - This is to ensure the pump is well supplied materials and eliminated bubbles without driving.
(Turn 1 1/2 turns counterclockwise)
 - When the fluid is flowing sufficiently compared to dosing amount, close and clean the knob.
 5. Select controller mode as 'Ratio' and enter settings.

6 Pro Duo Pump Disassemble

6.1 PDP-005/015/050 Disassemble

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

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



Figure 9

- 2) Turn the wrench Bolts counterclockwise to release the mix adapter.

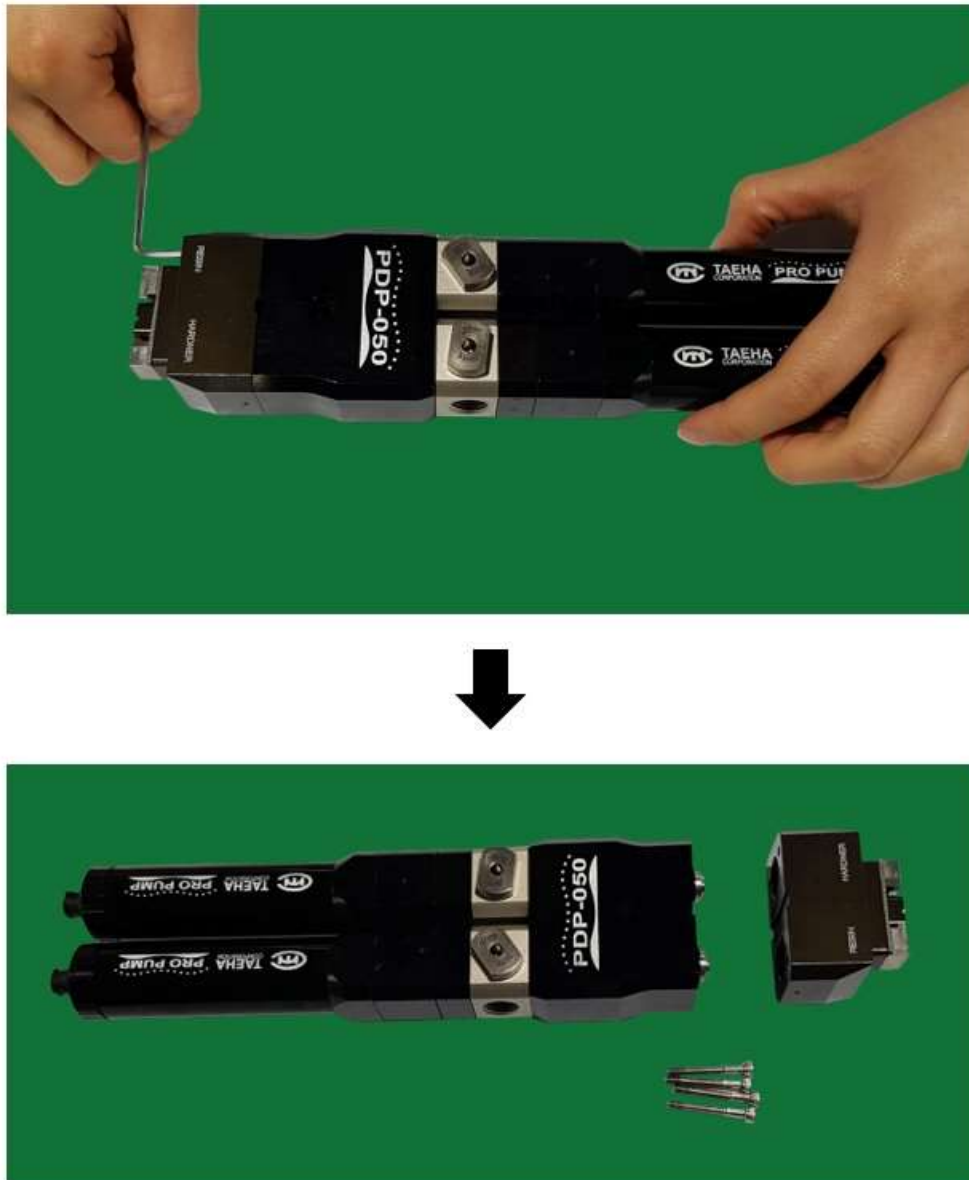


Figure 10

- 3) Turn the wrench bolts counterclockwise to release the twin block.
(Removing twin block will disconnect the two pumps.)

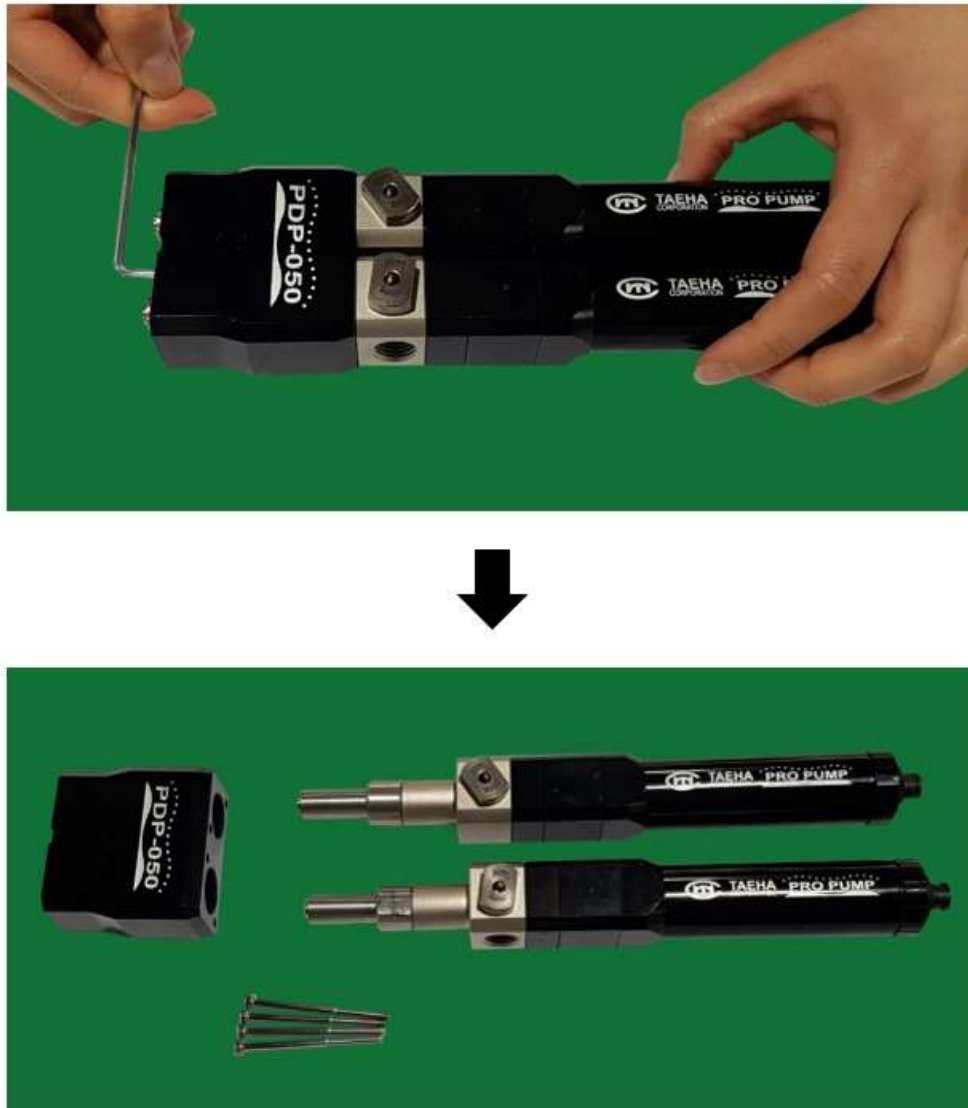


Figure 11

- 4) Hold the pump and remove the stator sleeve and union cap using a spanner.



Figure 12

- 5) Turn the wrench bolts counterclockwise to release the motor.

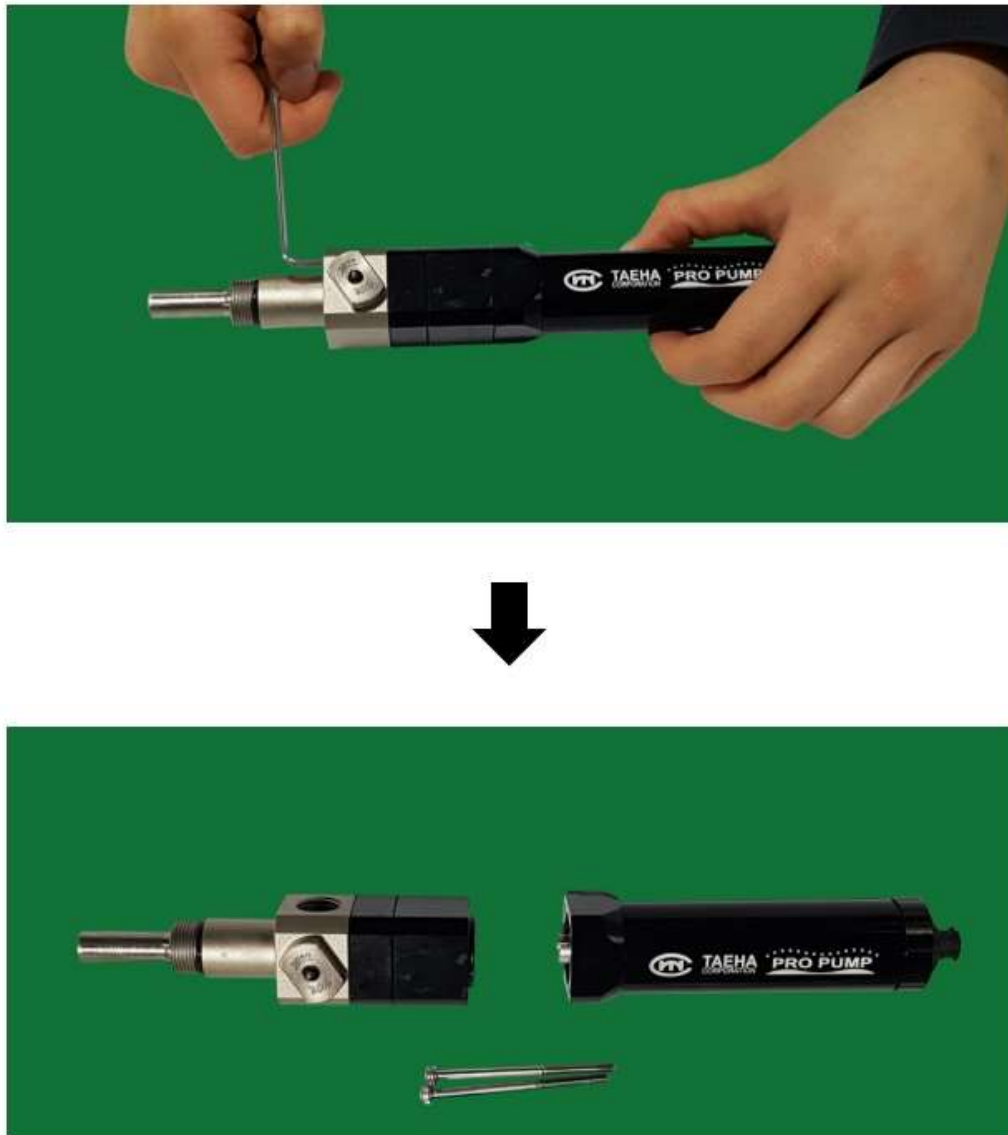


Figure 13

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

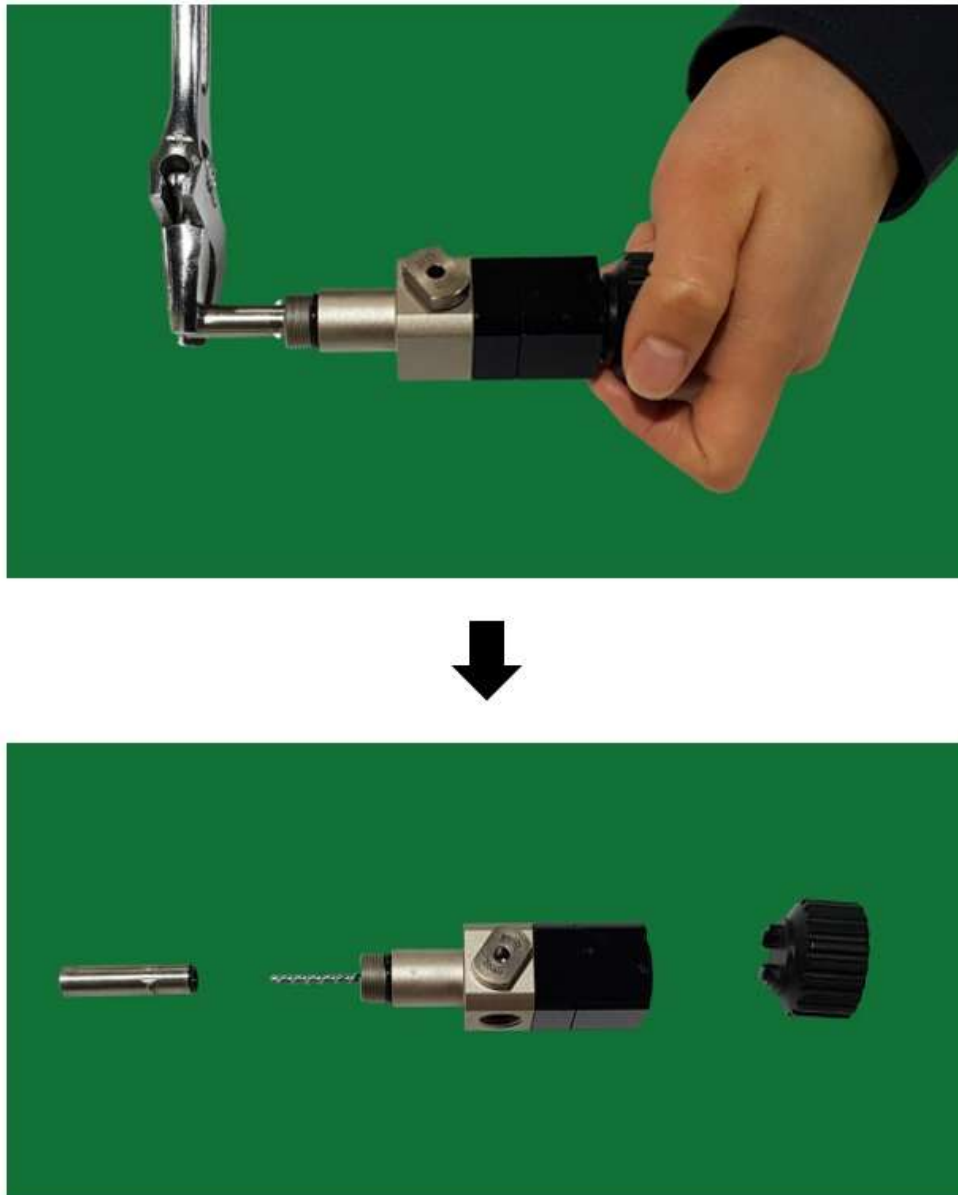


Figure 14

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

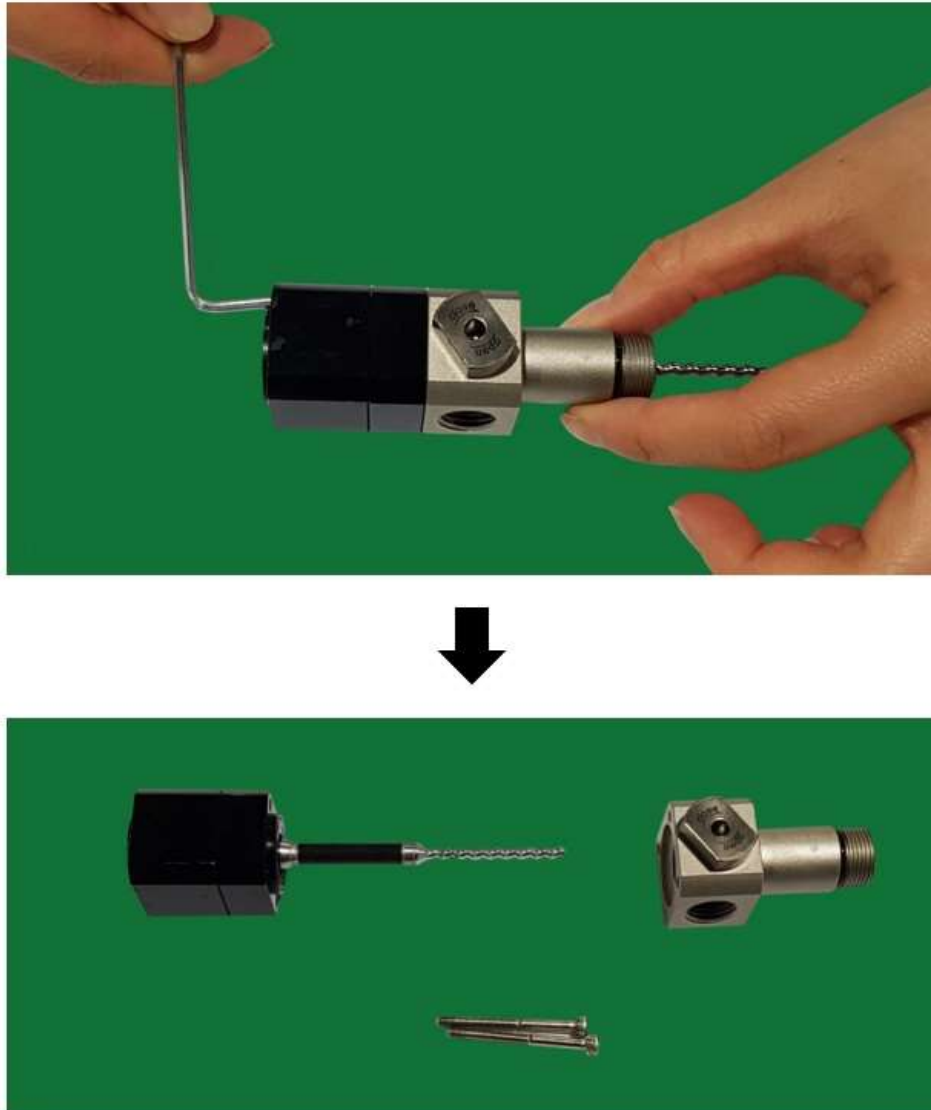


Figure 15

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

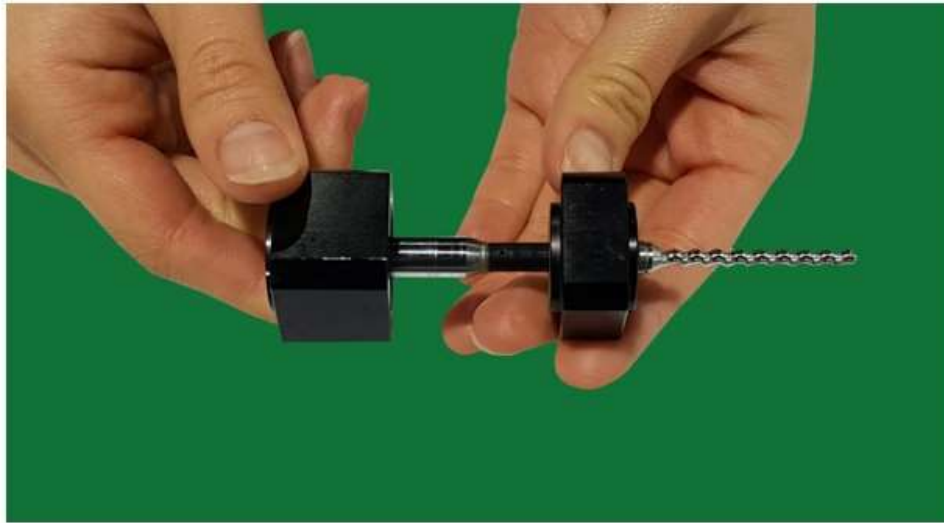


Figure 16

6.2 PDP-150/500 Disassemble

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

- 1) Pro Duo Pump(PDP-150/500)와 공구를 준비합니다.



Figure 17

- 2) Turn the mix cap counterclockwise to release the night cap.



Figure 18

- 3) Turn the wrench bolts counterclockwise to release the mix adapter.

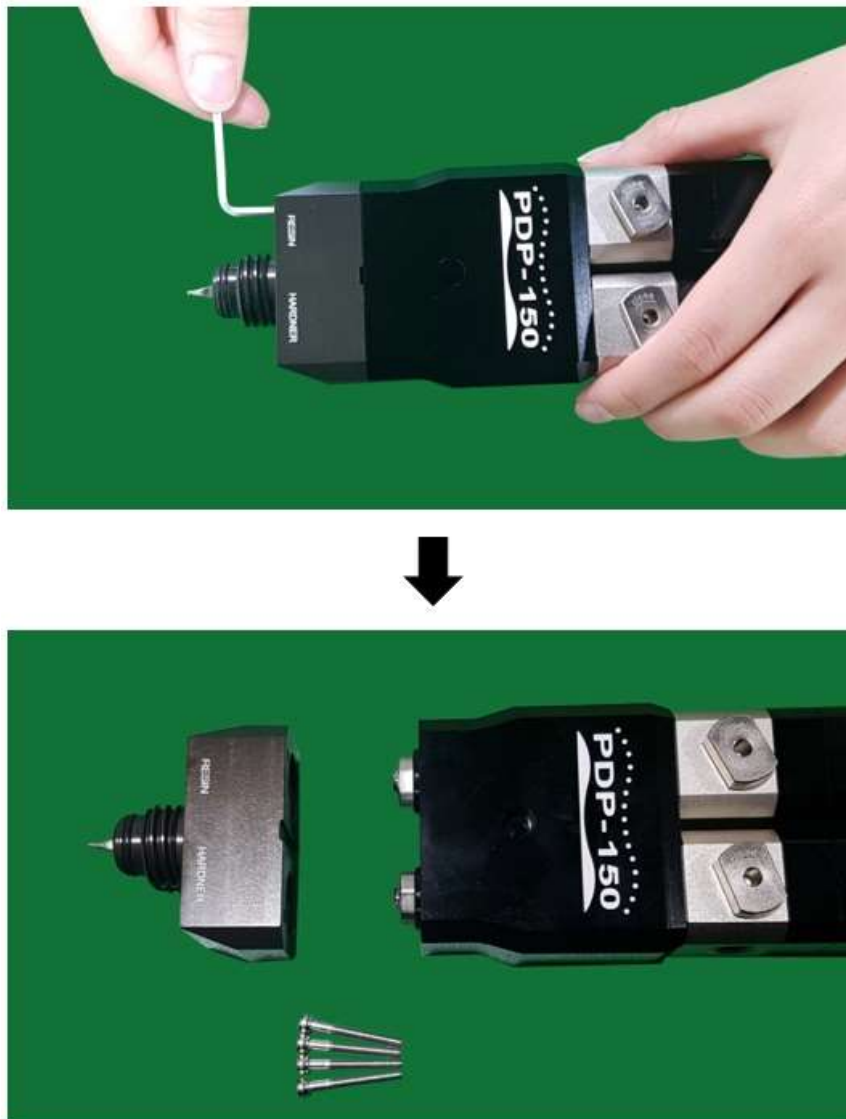


Figure 19

- 4) Turn the wrench bolts counterclockwise to release the twin block.
(Removing twin block will disconnect the two pumps.)



Figure 20

- 5) Hold a pump and remove the orifice adapter using a spanner.



Figure 21

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



Figure 22

- 7) Turn the wrench bolts counterclockwise to release the motor.



Figure 23

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



Figure 24

- 9) Turn the wrench bolts counterclockwise to release the chamber.

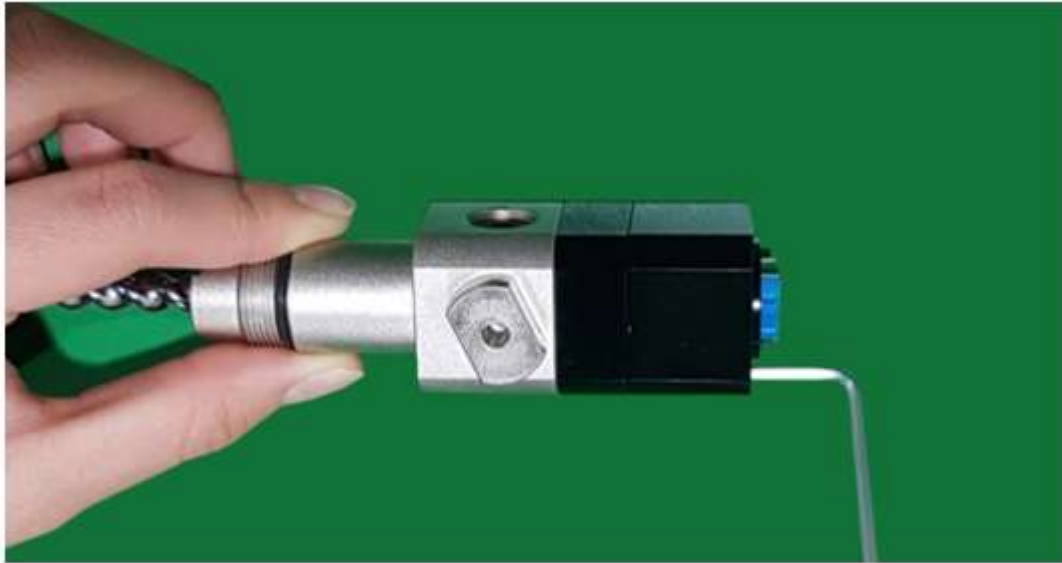


Figure 25

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



Figure 26

6.3 PDP-1000 Disassemble

This section describes the procedure for disassembling the Pro Duo Pump(PDP-100) for its maintenance.

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



Figure 27

- 2) Turn the mix cap counterclockwise to release the night cap.

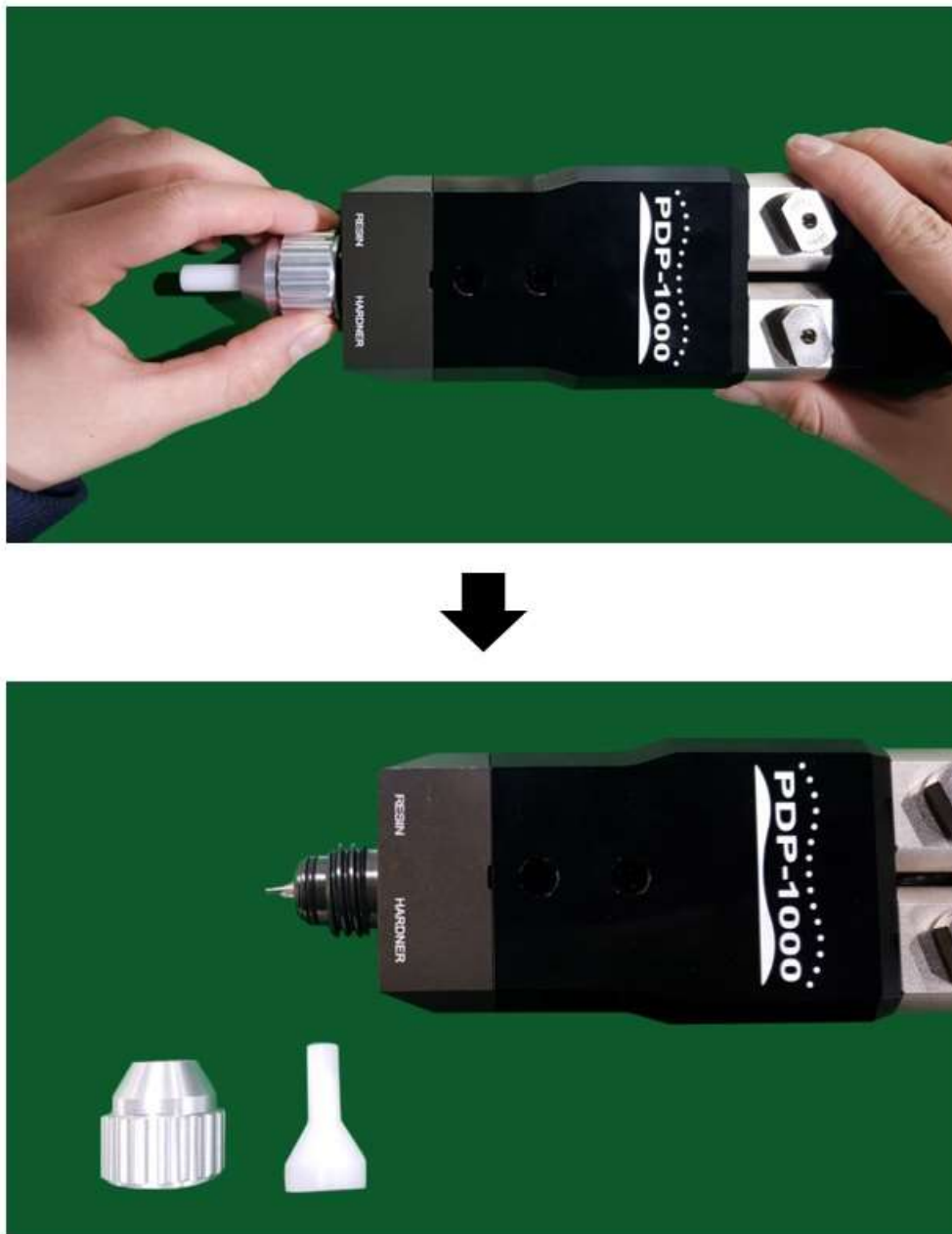


Figure 28

- 3) Turn the wrench bolts counterclockwise to release the mix adapter.

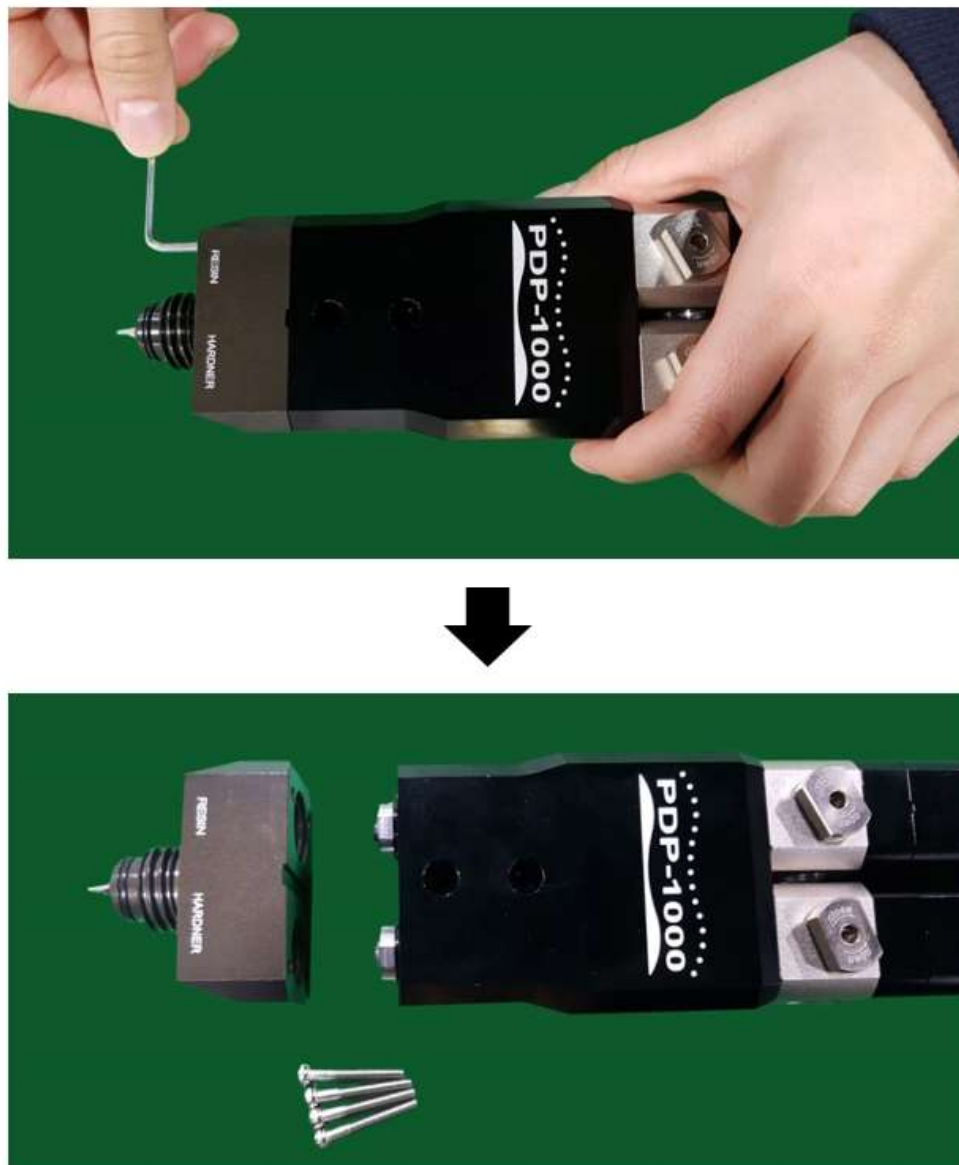


Figure 29

- 4) Turn the wrench bolts counterclockwise to release the twin block.
(Removing twin block will disconnect the two pumps.)



Figure 30

- 5) Hold a pump and remove the orifice adapter using a spanner

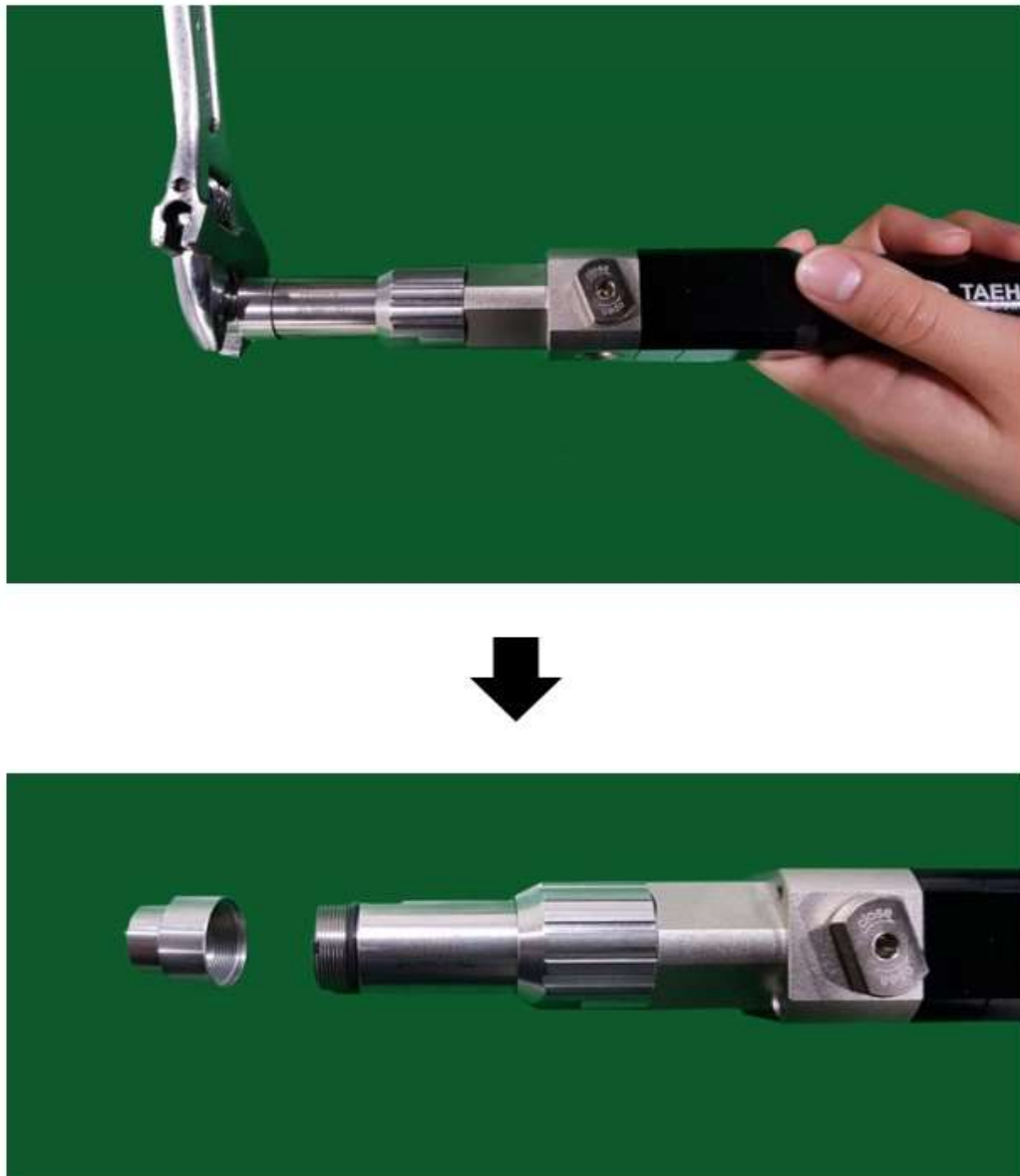


Figure 31

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



Figure 32

- 7) Turn the wrench bolts counterclockwise to release the motor.



Figure 33

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



Figure 34

- 9) Turn the wrench bolts counterclockwise to release the chamber.



Figure 35

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



Figure 36

7 Pro Duo Pump Partlist

7.1 PDP-005 Partlist



Figure 37. PDP-005

Table 7. PDP-005 Partlist

No.	Part No.	Item Name	Q'ty	Material	Guarantee	Replacement period
A1	PDP-005-A1	Stator Ass'y	2		-	6 months
A2	PDP-005-A2	Rotor Ass'y	2		-	6 months
A3	PDP-005-A3	Motor Ass'y	2		1 year	
1	PDP-005-1-A	Mix Adapter-A	1	AL6061 / Anodizing(hard)	1 year	
	PDP-005-1-BA	Mix Adapter-BA		AL6061 / Anodizing(hard)	1 year	
	PDP-005-1-BB	Mix Adapter-BB		AL6061 / Anodizing(hard)	1 year	
	PDP-005-1-CA	Mix Adapter-CA		AL6061 / Anodizing(hard)	1 year	
	PDP-005-1-CB	Mix Adapter-CB		AL6061 / Anodizing(hard)	1 year	
	PDP-005-1-CC	Mix Adapter-CC		AL6061 / Anodizing(hard)	1 year	
2	PDP-005-2	Twin Block	1	AL6061 / Anodizing(black)	1 year	
3	PDP-005-3	Union Cap	2	SUS303	1 year	
4	PDP-005-4	Stator Sleeve ($\varnothing 3$ / $\varnothing 1.5$ / $\varnothing 1$ / $\varnothing 0.4$)	2	SUS303	1 year	
5	PDP-005-5-ML	Chamber-ML	2	AL2024 / Anodizing(gray)	1 year	
	PDP-005-5-TL	Chamber-TL		AL2024 / Anodizing(gray)	1 year	
	PDP-005-5-MR	Chamber-MR		AL2024 / Anodizing(gray)	1 year	
	PDP-005-5-TR	Chamber-TR		AL2024 / Anodizing(gray)	1 year	
6	PDP-005-6	Vent Knob	2	AL2024 / Electroless Ni Plating	1 year	
7	PDP-005-7	Seal Block	2	AL2024 / Anodizing(black)	1 year	
8	PDP-005-8	Rotary Seal	6	UHMW-PE	6 months	6 months
9	PDP-005-9	Urethane Sleeve	2	Poly Urethane	1 year	
10	PDP-005-10	Pressure Sensor	2		1 year	
11	PDP-005-11	Sensor Cap	2	AL2011 / Anodizing(black)	1 year	
12	PDP-005-12-A	Inlet Adapter(Cartridge)	2	AL6061 / Anodizing(black)	1 year	
	PDP-005-12-B	Inlet Adapter(Barrel)		AL6061 / Anodizing(black)	1 year	
	PDP-005-12-C	Inlet Adapter (Sealant Cartridge)		AL6061 / Anodizing(black)	1 year	
	PDP-005-12-D	Inlet Adapter(PT1/8")		AL6061 / Anodizing(black)	1 year	
	PDP-005-12-E	Inlet Adapter(PT3/8")		AL6061 / Anodizing(black)	1 year	
13	PDP-005-13-A	Mix Cap-A	1	AL2024 / Anodizing(white)	1 year	
	PDP-005-13-B	Mix Cap-B		AL2024 / Anodizing(white)	1 year	
	PDP-005-13-C	Mix Cap-C		AL2024 / Anodizing(white)	1 year	
	PDP-005-13-D	Mix Cap-D		AL2024 / Anodizing(white)	1 year	
14	PDP-005-14-A	Mix Clip-A	1	AL6061 / Electroless Ni Plating	1 year	
	PDP-005-14-B	Mix Clip-B		AL6061 / Electroless Ni Plating	1 year	
15	PDP-005-15	Sensor Block	1	POM / Anodizing(black)	1 year	
A	PDP-005-A-1	O-Ring(P6) (Mix Adapter-A)	1	FKM(1472)	6 months	6 months
	PDP-005-A-2	O-Ring(SS3) (Mix Adapter-BA)	2	FKM(1472)	6 months	6 months
	PDP-005-A-3	O-Ring(SS3.5) (Mix Adapter-BB)	1	FKM(1472)	6 months	6 months
	PDP-005-A-4	O-Ring(SS2) (Mix Adapter-BB)	1	FKM(1472)	6 months	6 months

	PDP-005-A-5	O-Ring(AS014) (Mix Adapter-C)	1	FKM(1472)	6 months	6 months
B	PDP-005-B	O-Ring(P8)	2	FKM(1472)	6 months	6 months
C	PDP-005-C	O-Ring(P9)	2	FKM(1472)	6 months	6 months
D	PDP-005-D	O-Ring(AS013)	2	FKM(1472)	6 months	6 months
E	PDP-005-E	O-Ring(SS8)	2	FKM(1472)	6 months	6 months
F	PDP-005-F	O-Ring(SS5)	2	FKM(1472)	6 months	6 months
G	PDP-005-G	O-Ring(SS5)	2	FKM(1472)	6 months	6 months
H	PDP-005-H	O-Ring(AN016)	2	FKM(1472)	6 months	6 months
I	PDP-005-I	O-Ring(AN015)	2	FKM(F575)	6 months	6 months
J	PDP-005-J	Bolt(M3x50)	4	High-Strength		
K	PDP-005-K	Bolt(M3x35)	4	High-Strength		
L	PDP-005-L	Bolt(M3x55)	4	High-Strength		
M	PDP-005-M	Bolt(M3x25)	4	High-Strength		
N	PDP-005-N	Bolt(M3x20)	2	High-Strength		
O	PDP-005-O	Bolt(M3x8)	2	High-Strength		

7.2 PDP-015 Partlist



Figure 38. PDP-015

Table 8. PDP-015 Partlist

No.	Part No.	Item Name	Q'ty	Material	Guarantee	Replacement period
A1	PDP-015-A1	Stator Ass'y	2		-	6 months
A2	PDP-015-A2	Rotor Ass'y	2		-	6 months
A3	PDP-015-A3	Motor Ass'y	2		1 year	
1	PDP-015-1-A	Mix Adapter-A	1	AL6061 / Anodizing(hard)	1 year	
	PDP-015-1-BA	Mix Adapter-BA		AL6061 / Anodizing(hard)	1 year	
	PDP-015-1-BB	Mix Adapter-BB		AL6061 / Anodizing(hard)	1 year	
	PDP-015-1-CA	Mix Adapter-CA		AL6061 / Anodizing(hard)	1 year	
	PDP-015-1-CB	Mix Adapter-CB		AL6061 / Anodizing(hard)	1 year	
	PDP-015-1-CC	Mix Adapter-CC		AL6061 / Anodizing(hard)	1 year	
2	PDP-015-2	Twin Block	1	AL6061 / Anodizing(black)	1 year	
3	PDP-015-3	Union Cap	2	SUS303	1 year	
4	PDP-015-4	Stator Sleeve ($\varnothing 3 / \varnothing 1.5 / \varnothing 1 / \varnothing 0.4$)	2	SUS303	1 year	
5	PDP-015-5-ML	Chamber-ML	2	AL2024 / Anodizing(gray)	1 year	
	PDP-015-5-TL	Chamber-TL		AL2024 / Anodizing(gray)	1 year	
	PDP-015-5-MR	Chamber-MR		AL2024 / Anodizing(gray)	1 year	
	PDP-015-5-TR	Chamber-TR		AL2024 / Anodizing(gray)	1 year	
6	PDP-015-6	Vent Knob	2	AL2024 / Electroless Ni Plating	1 year	
7	PDP-015-7	Seal Block	2	AL2024 / Anodizing(black)	1 year	
8	PDP-015-8	Rotary Seal	6	UHMW-PE	6 months	6 months
9	PDP-015-9	Urethane Sleeve	2	Poly Urethane	1 year	
10	PDP-015-10	Pressure Sensor	2		1 year	
11	PDP-015-11	Sensor Cap	2	AL2011 / Anodizing(black)	1 year	
12	PDP-015-12-A	Inlet Adapter(Cartridge)	2	AL6061 / Anodizing(black)	1 year	
	PDP-015-12-B	Inlet Adapter(Barrel)		AL6061 / Anodizing(black)	1 year	
	PDP-015-12-C	Inlet Adapter (Sealant Cartridge)		AL6061 / Anodizing(black)	1 year	
	PDP-015-12-D	Inlet Adapter(PT1/8")		AL6061 / Anodizing(black)	1 year	
	PDP-015-12-E	Inlet Adapter(PT3/8")		AL6061 / Anodizing(black)	1 year	
13	PDP-015-13-A	Mix Cap-A	1	AL2024 / Anodizing(white)	1 year	
	PDP-015-13-B	Mix Cap-B		AL2024 / Anodizing(white)	1 year	
	PDP-015-13-C	Mix Cap-C		AL2024 / Anodizing(white)	1 year	
	PDP-015-13-D	Mix Cap-D		AL2024 / Anodizing(white)	1 year	
14	PDP-015-14-A	Mix Clip-A	1	AL6061 / Electroless Ni Plating	1 year	
	PDP-015-14-B	Mix Clip-B		AL6061 / Electroless Ni Plating	1 year	
15	PDP-015-15	Sensor Block	1	POM / Anodizing(black)	1 year	
A	PDP-015-A-1	O-Ring(P6) (Mix Adapter-A)	1	FKM(1472)	6 months	6 months
	PDP-015-A-2	O-Ring(SS3) (Mix Adapter-BA)	2	FKM(1472)	6 months	6 months
	PDP-015-A-3	O-Ring(SS3.5) (Mix Adapter-BB)	1	FKM(1472)	6 months	6 months
	PDP-015-A-4	O-Ring(SS2) (Mix Adapter-BB)	1	FKM(1472)	6 months	6 months

	PDP-015-A-5	O-Ring(AS014) (Mix Adapter-C)	1	FKM(1472)	6 months	6 months
B	PDP-015-B	O-Ring(P8)	2	FKM(1472)	6 months	6 months
C	PDP-015-C	O-Ring(P9)	2	FKM(1472)	6 months	6 months
D	PDP-015-D	O-Ring(AS013)	2	FKM(1472)	6 months	6 months
E	PDP-015-E	O-Ring(SS8)	2	FKM(1472)	6 months	6 months
F	PDP-015-F	O-Ring(SS5)	2	FKM(1472)	6 months	6 months
G	PDP-015-G	O-Ring(SS5)	2	FKM(1472)	6 months	6 months
H	PDP-015-H	O-Ring(AN016)	2	FKM(1472)	6 months	6 months
I	PDP-015-I	O-Ring(AN015)	6	FKM(F575)	6 months	6 months
J	PDP-015-J	Bolt(M3x50)	4	High-Strength		
K	PDP-015-K	Bolt(M3x35)	4	High-Strength		
L	PDP-015-L	Bolt(M3x55)	4	High-Strength		
M	PDP-015-M	Bolt(M3x25)	4	High-Strength		
N	PDP-015-N	Bolt(M3x20)	2	High-Strength		
O	PDP-015-O	Bolt(M3x8)	2	High-Strength		

7.3 PDP-050 Partlist



Figure 39. PDP-050

Table 9. PDP-050 Partlist

No.	Part No.	Item Name	Q'ty	Material	Guarantee	Replacement period
A1	PDP-050-A1	Stator Ass'y	2		-	6 months
A2	PDP-050-A2	Rotor Ass'y	2		-	6 months
A3	PDP-050-A3	Motor Ass'y	2		1 year	
1	PDP-050-1-A	Mix Adapter-A	1	AL6061 / Anodizing(hard)	1 year	
	PDP-050-1-BA	Mix Adapter-BA		AL6061 / Anodizing(hard)	1 year	
	PDP-050-1-BB	Mix Adapter-BB		AL6061 / Anodizing(hard)	1 year	
	PDP-050-1-CA	Mix Adapter-CA		AL6061 / Anodizing(hard)	1 year	
	PDP-050-1-CB	Mix Adapter-CB		AL6061 / Anodizing(hard)	1 year	
	PDP-050-1-CC	Mix Adapter-CC		AL6061 / Anodizing(hard)	1 year	
2	PDP-050-2	Twin Block	1	AL6061 / Anodizing(black)	1 year	
3	PDP-050-3	Union Cap	2	SUS303	1 year	
4	PDP-050-4	Stator Sleeve ($\varnothing 3 / \varnothing 1.5 / \varnothing 1 / \varnothing 0.4$)	2	SUS303	1 year	
5	PDP-050-5-ML	Chamber-ML	2	AL2024 / Anodizing(gray)	1 year	
	PDP-050-5-TL	Chamber-TL		AL2024 / Anodizing(gray)	1 year	
	PDP-050-5-MR	Chamber-MR		AL2024 / Anodizing(gray)	1 year	
	PDP-050-5-TR	Chamber-TR		AL2024 / Anodizing(gray)	1 year	
6	PDP-050-6	Vent Knob	2	AL2024 / Electroless Ni Plating	1 year	
7	PDP-050-7	Seal Block	2	AL2024 / Anodizing(black)	1 year	
8	PDP-050-8	Rotary Seal	6	UHMW-PE	6 months	6 months
9	PDP-050-9	Urethane Sleeve	2	Poly Urethane	1 year	
10	PDP-050-10	Pressure Sensor	2		1 year	
11	PDP-050-11	Sensor Cap	2	AL2011 / Anodizing(black)	1 year	
12	PDP-050-12-A	Inlet Adapter(Cartridge)	2	AL6061 / Anodizing(black)	1 year	
	PDP-050-12-B	Inlet Adapter(Barrel)		AL6061 / Anodizing(black)	1 year	
	PDP-050-12-C	Inlet Adapter (Selant Cartridge)		AL6061 / Anodizing(black)	1 year	
	PDP-050-12-D	Inlet Adapter(PT1/8")		AL6061 / Anodizing(black)	1 year	
	PDP-050-12-E	Inlet Adapter(PT3/8")		AL6061 / Anodizing(black)	1 year	
13	PDP-050-13-A	Mix Cap-A	1	AL2024 / Anodizing(white)	1 year	
	PDP-050-13-B	Mix Cap-B		AL2024 / Anodizing(white)	1 year	
	PDP-050-13-C	Mix Cap-C		AL2024 / Anodizing(white)	1 year	
	PDP-050-13-D	Mix Cap-D		AL2024 / Anodizing(white)	1 year	
14	PDP-050-14-A	Mix Clip-A	1	AL6061 / Electroless Ni Plating	1 year	
	PDP-050-14-B	Mix Clip-B		AL6061 / Electroless Ni Plating	1 year	
15	PDP-050-15	Sensor Block	1	POM / Anodizing(black)	1 year	
A	PDP-050-A-1	O-Ring(P6) (Mix Adapter-A)	1	FKM(1472)	6 months	6 months
	PDP-050-A-2	O-Ring(SS3) (Mix Adapter-BA)	2	FKM(1472)	6 months	6 months
	PDP-050-A-3	O-Ring(SS3.5) (Mix Adapter-BB)	1	FKM(1472)	6 months	6 months
	PDP-050-A-4	O-Ring(SS2) (Mix Adapter-BB)	1	FKM(1472)	6 months	6 months

	PDP-050-A-5	O-Ring(AS014) (Mix Adapter-C)	1	FKM(1472)	6 months	6 months
B	PDP-050-B	O-Ring(P8)	2	FKM(1472)	6 months	6 months
C	PDP-050-C	O-Ring(P9)	2	FKM(1472)	6 months	6 months
D	PDP-050-D	O-Ring(AS013)	2	FKM(1472)	6 months	6 months
E	PDP-050-E	O-Ring(SS8)	2	FKM(1472)	6 months	6 months
F	PDP-050-F	O-Ring(SS5)	2	FKM(1472)	6 months	6 months
G	PDP-050-G	O-Ring(SS5)	2	FKM(1472)	6 months	6 months
H	PDP-050-H	O-Ring(AN016)	2	FKM(1472)	6 months	6 months
I	PDP-050-I	O-Ring(AN015)	6	FKM(F575)	6 months	6 months
J	PDP-050-J	Bolt(M3x50)	4	High-Strength		
K	PDP-050-K	Bolt(M3x35)	4	High-Strength		
L	PDP-050-L	Bolt(M3x55)	4	High-Strength		
M	PDP-050-M	Bolt(M3X25)	4	High-Strength		
N	PDP-050-N	Bolt(M3x20)	2	High-Strength		
O	PDP-050-O	Bolt(M3x8)	2	High-Strength		

7.4 PDP-150 Partlist

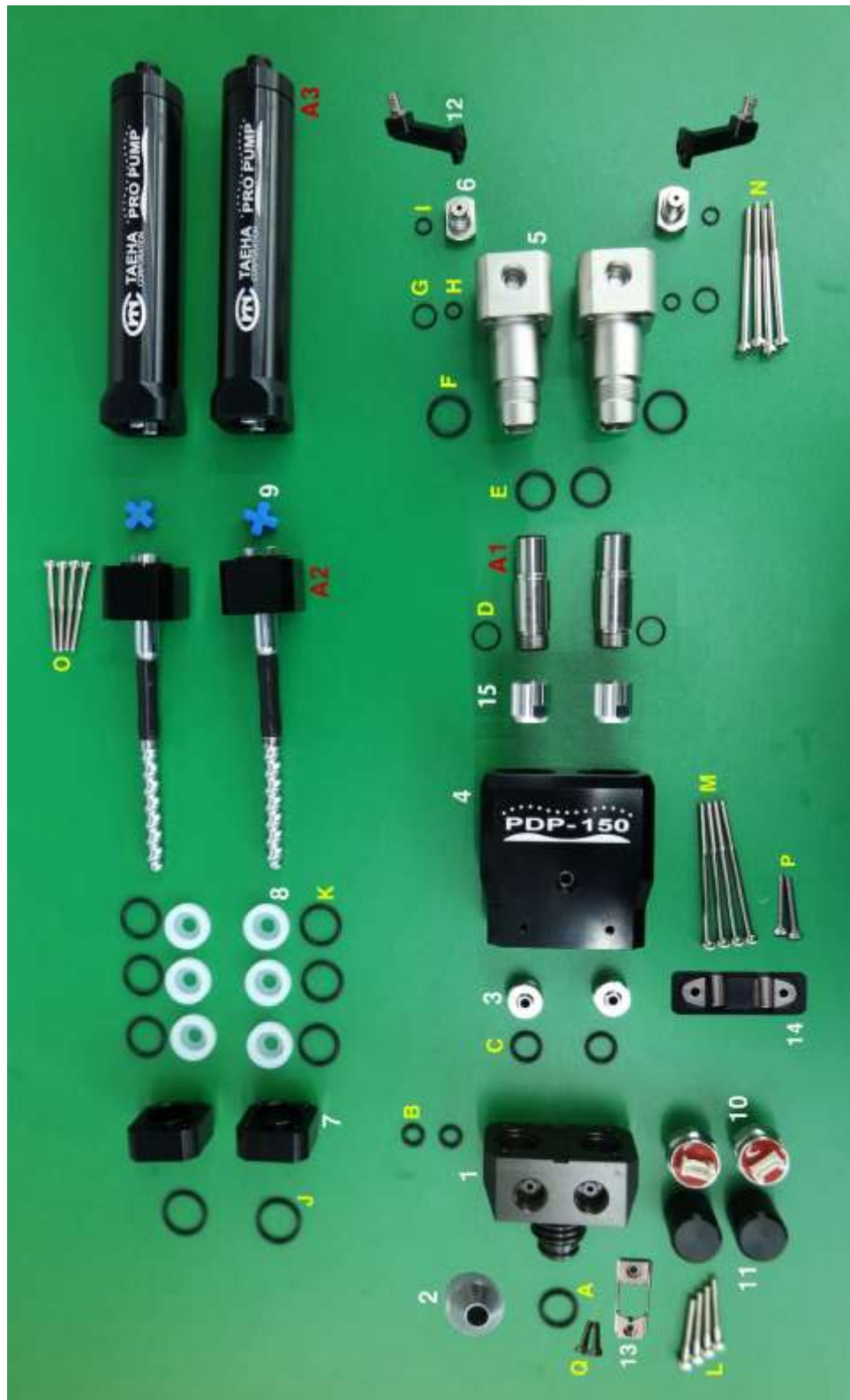


Figure 40. PDP-150

Table 10. PDP-150 Partlist

No.	Part No.	Item Name	Q'ty	Material	Guarantee	Replacement period
A1	PDP-150-A1	Stator Ass'y	2		-	6 months
A2	PDP-150-A2	Rotor Ass'y	2		-	6 months
A3	PDP-150-A3	Motor Ass'y	2		1 year	
1	PDP-150-1-A	Mix Adapter-A	1	AL6061 / Anodizing(hard)	1 year	
	PDP-150-1-BA	Mix Adapter-BA		AL6061 / Anodizing(hard)	1 year	
	PDP-150-1-BB	Mix Adapter-BB		AL6061 / Anodizing(hard)	1 year	
	PDP-150-1-CA	Mix Adapter-CA		AL6061 / Anodizing(hard)	1 year	
	PDP-150-1-CB	Mix Adapter-CB		AL6061 / Anodizing(hard)	1 year	
	PDP-150-1-CC	Mix Adapter-CC		AL6061 / Anodizing(hard)	1 year	
2	PDP-150-2-A	Mix Cap-A	1	AL2024 / Anodizing(white)	1 year	
	PDP-150-2-B	Mix Cap-B		AL2024 / Anodizing(white)	1 year	
	PDP-150-2-C	Mix Cap-C		AL2024 / Anodizing(white)	1 year	
	PDP-150-2-D	Mix Cap-D		AL2024 / Anodizing(white)	1 year	
3	PDP-150-3	Orifice Adapter ($\varnothing 4$ / $\varnothing 1$ / $\varnothing 0.6$ / $\varnothing 0.4$)	2	SUS303 / Electrolytic Polishing	1 year	
4	PDP-150-4	Twin Block	1	AL6061 / Anodizing(black)	1 year	
5	PDP-150-5-ML	Chamber-ML	2	AL2024 / Anodizing(gray)	1 year	
	PDP-150-5-TL	Chamber-TL		AL2024 / Anodizing(gray)	1 year	
	PDP-150-5-MR	Chamber-MR		AL2024 / Anodizing(gray)	1 year	
	PDP-150-5-TR	Chamber-TR		AL2024 / Anodizing(gray)	1 year	
6	PDP-150-6	Vent Knob	2	AL2024 / Electroless Ni Plating	1 year	
7	PDP-150-7	Seal Block	2	AL2024 / Anodizing(black)	1 year	
8	PDP-150-8	Rotary Seal	6	UHMW-PE	6 months	6 months
9	PDP-150-9	Urethane Sleeve	2	Poly Urethane	1 year	
10	PDP-150-10	Pressure Sensor	2		1 year	
11	PDP-150-11	Sensor Cap	2	AL2011 / Anodizing(black)	1 year	
12	PDP-150-12-A	Inlet Adapter(Cartridge)	2	AL6061 / Anodizing(black)	1 year	
	PDP-150-12-B	Inlet Adapter(Barrel)		AL6061 / Anodizing(black)	1 year	
	PDP-150-12-C	Inlet Adapter (Sealant Cartridge)		AL6061 / Anodizing(black)	1 year	
	PDP-150-12-D	Inlet Adapter(PT3/8")		AL6061 / Anodizing(black)	1 year	
13	PDP-150-13-A	Mix Clip-A	1	AL6061 / Electroless Ni Plating	1 year	
	PDP-150-13-B	Mix Clip-B		AL6061 / Electroless Ni Plating	1 year	
14	PDP-150-14	Sensor Block	1	POM / Anodizing(black)	1 year	
15	PDP-150-15	Union Cap	2	SUS303	1 year	
A	PDP-150-A-1	O-Ring(P6) (Mix Adapter-A)	1	FKM(1472)	6 months	6 months
	PDP-150-A-2	O-Ring(SS3) (Mix Adapter-BA)	2	FKM(1472)	6 months	6 months
	PDP-150-A-3	O-Ring(SS3.5) (Mix Adapter-BB)	1	FKM(1472)	6 months	6 months
	PDP-150-A-4	O-Ring(SS2) (Mix Adapter-BB)	1	FKM(1472)	6 months	6 months
	PDP-150-A-5	O-Ring(AS014)	1	FKM(1472)	6 months	6 months

		(Mix Adapter-C)				
B	PDP-150-B	O-Ring(AS010)	2	FKM(1472)	6 months	6 months
C	PDP-150-C	O-Ring(AS012)	2	FKM(1472)	6 months	6 months
D	PDP-150-D	O-Ring(SS10)	2	FKM(1472)	6 months	6 months
E	PDP-150-E	O-Ring(AS014)	2	FKM(1472)	6 months	6 months
F	PDP-150-F	O-Ring(AS015)	2	FKM(1472)	6 months	6 months
G	PDP-150-G	O-Ring(SS8)	2	FKM(1472)	6 months	6 months
H	PDP-150-H	O-Ring(SS5)	2	FKM(1472)	6 months	6 months
I	PDP-150-I	O-Ring(SS5)	2	FKM(1472)	6 months	6 months
J	PDP-150-J	O-Ring(AN016)	2	FKM(1472)	6 months	6 months
K	PDP-150-K	O-Ring(AN015)	6	FKM(F575)	6 months	6 months
L	PDP-150-L	Bolt(M3x25)	4	High-Strength		
M	PDP-150-M	Bolt(M3x55)	4	High-Strength		
N	PDP-150-N	Bolt(M3x55)	4	High-Strength		
O	PDP-150-O	Bolt(M3x35)	4	High-Strength		
P	PDP-150-P	Bolt(M3x20)	2	High-Strength		
Q	PDP-150-Q	Bolt(M3x8)	2	High-Strength		

7.5 PDP-500 Partlist

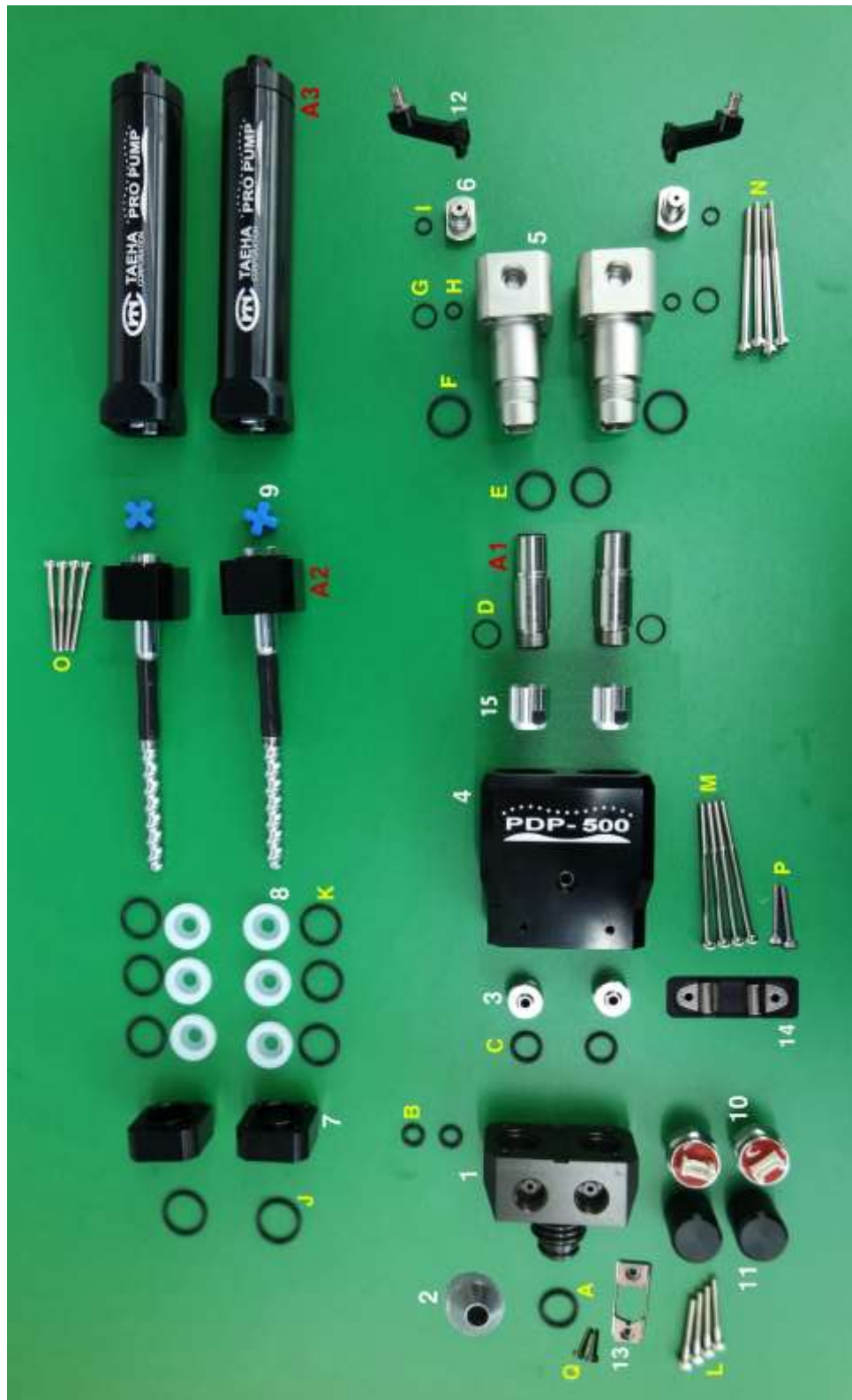


Figure 41. PDP-500

Table 11. PDP-500 Partlist

No.	Part No.	Item Name	Q'ty	Material	Guarantee	Replacement period
A1	PDP-500-A1	Stator Ass'y	2		-	6 months
A2	PDP-500-A2	Rotor Ass'y	2		-	6 months
A3	PDP-500-A3	Motor Ass'y	2		1 year	
1	PDP-500-1-A	Mix Adapter-A	1	AL6061 / Anodizing(hard)	1 year	
	PDP-500-1-BA	Mix Adapter-BA		AL6061 / Anodizing(hard)	1 year	
	PDP-500-1-BB	Mix Adapter-BB		AL6061 / Anodizing(hard)	1 year	
	PDP-500-1-CA	Mix Adapter-CA		AL6061 / Anodizing(hard)	1 year	
	PDP-500-1-CB	Mix Adapter-CB		AL6061 / Anodizing(hard)	1 year	
	PDP-500-1-CC	Mix Adapter-CC		AL6061 / Anodizing(hard)	1 year	
2	PDP-500-2-A	Mix Cap-A	1	AL2024 / Anodizing(white)	1 year	
	PDP-500-2-B	Mix Cap-B		AL2024 / Anodizing(white)	1 year	
	PDP-500-2-C	Mix Cap-C		AL2024 / Anodizing(white)	1 year	
	PDP-500-2-D	Mix Cap-D		AL2024 / Anodizing(white)	1 year	
3	PDP-500-3	Orifice Adapter ($\varnothing 4$ / $\varnothing 1$ / $\varnothing 0.6$ / $\varnothing 0.4$)	2	SUS303 / Electrolyc Polishing	1 year	
4	PDP-500-4	Twin Block	1	AL6061 / Anodizing(black)	1 year	
5	PDP-500-5-ML	Chamber-ML	2	AL2024 / Anodizing(gray)	1 year	
	PDP-500-5-TL	Chamber-TL		AL2024 / Anodizing(gray)	1 year	
	PDP-500-5-MR	Chamber-MR		AL2024 / Anodizing(gray)	1 year	
	PDP-500-5-TR	Chamber-TR		AL2024 / Anodizing(gray)	1 year	
6	PDP-500-6	Vent Knob	2	AL2024 / Electroless Ni Plating	1 year	
7	PDP-500-7	Seal Block	2	AL2024 / Anodizing(black)	1 year	
8	PDP-500-8	Rotary Seal	6	UHMW-PE	6 months	6 months
9	PDP-500-9	Urethane Sleeve	2	Poly Urethane	1 year	
10	PDP-500-10	Pressure Sensor	2		1 year	
11	PDP-500-11	Sensor Cap	2	AL2011 / Anodizing(black)	1 year	
12	PDP-500-12-A	Inlet Adapter(Cartridge)	2	AL6061 / Anodizing(black)	1 year	
	PCP-500-12-B	Inlet Adapter(Barrel)		AL6061 / Anodizing(black)	1 year	
	PDP-500-12-C	Inlet Adapter (Sealant Cartridge)		AL6061 / Anodizing(black)	1 year	
	PDP-500-12-D	Inlet Adapter(PT3/8")		AL6061 / Anodizing(black)	1 year	
13	PDP-500-13-A	Mix Clip-A	1	AL6061 / Electroless Ni Plating	1 year	
	PDP-500-13-B	Mix Clip-B		AL6061 / Electroless Ni Plating	1 year	
14	PDP-500-14	Sensor Block	1	POM / Anodizing(black)	1 year	
15	PDP-500-15	Union Cap	2	SUS303	1 year	
A	PDP-500-A-1	O-Ring(P6) (Mix Adapter-A)	1	FKM(1472)	6 months	6 months
	PDP-500-A-2	O-Ring(SS3) (Mix Adapter-BA)	2	FKM(1472)	6 months	6 months
	PDP-500-A-3	O-Ring(SS3.5) (Mix Adapter-BB)	1	FKM(1472)	6 months	6 months
	PDP-500-A-4	O-Ring(SS2) (Mix Adapter-BB)	1	FKM(1472)	6 months	6 months

	PDP-500-A-5	O-Ring(AS014) (Mix Adapter-C)	1	FKM(1472)	6 months	6 months
B	PDP-500-B	O-Ring(AS010)	2	FKM(1472)	6 months	6 months
C	PDP-500-C	O-Ring(AS012)	2	FKM(1472)	6 months	6 months
D	PDP-500-D	O-Ring(SS10)	2	FKM(1472)	6 months	6 months
E	PDP-500-E	O-Ring(AS014)	2	FKM(1472)	6 months	6 months
F	PDP-500-F	O-Ring(AS015)	2	FKM(1472)	6 months	6 months
G	PDP-500-G	O-Ring(SS8)	2	FKM(1472)	6 months	6 months
H	PDP-500-H	O-Ring(SS5)	2	FKM(1472)	6 months	6 months
I	PDP-500-I	O-Ring(SS5)	2	FKM(1472)	6 months	6 months
J	PDP-500-J	O-Ring(AN016)	2	FKM(1472)	6 months	6 months
K	PDP-500-K	O-Ring(AN015)	6	FKM(F575)	6 months	6 months
L	PDP-500-L	Bolt(M3x25)	4	High-Strength		
M	PDP-500-M	Bolt(M3x55)	4	High-Strength		
N	PDP-500-N	Bolt(M3x55)	4	High-Strength		
O	PDP-500-O	Bolt(M3x35)	4	High-Strength		
P	PDP-500-P	Bolt(M3x20)	2	High-Strength		
Q	PDP-500-Q	Bolt(M3x8)	2	High-Strength		

7.6 PDP-1000 Partlist



Figure 42. PDP-1000

Table 12. PDP-1000 Partlist

No.	Part No.	Item Name	Q'ty	Material	Guarantee	Replacement period
A1	PDP-1000-A1	Stator Ass'y	2		-	6 months
A2	PDP-1000-A2	Rotor Ass'y	2		-	6 months
A3	PDP-1000-A3	Motor Ass'y	2		1 year	
1	PDP-1000-1-A	Mix Adapter-A	1	AL6061 / Anodizing(hard)	1 year	
	PDP-1000-1-BA	Mix Adapter-BA		AL6061 / Anodizing(hard)	1 year	
	PDP-1000-1-BB	Mix Adapter-BB		AL6061 / Anodizing(hard)	1 year	
	PDP-1000-1-CA	Mix Adapter-CA		AL6061 / Anodizing(hard)	1 year	
	PDP-1000-1-CB	Mix Adapter-CB		AL6061 / Anodizing(hard)	1 year	
	PDP-1000-1-CC	Mix Adapter-CC		AL6061 / Anodizing(hard)	1 year	
2	PDP-1000-2-A	Mix Cap-A	1	AL2024 / Anodizing(white)	1 year	
	PDP-1000-2-B	Mix Cap-B		AL2024 / Anodizing(white)	1 year	
	PDP-1000-2-C	Mix Cap-C		AL2024 / Anodizing(white)	1 year	
	PDP-1000-2-D	Mix Cap-D		AL2024 / Anodizing(white)	1 year	
3	PDP-1000-3	Union Cap	2	SUS303	1 year	
4	PDP-1000-4	Orifice Adapter ($\varnothing 4$ / $\varnothing 2$ / $\varnothing 0.8$)	2	SUS303 / Electrolytic Polishing	1 year	
5	PDP-1000-5	Twin Block	1	AL6061 / Anodizing(black)	1 year	
6	PDP-1000-6-ML	Chamber-ML	2	AL2024 / Anodizing(gray)	1 year	
	PDP-1000-6-TL	Chamber-TL		AL2024 / Anodizing(gray)	1 year	
	PDP-1000-6-MR	Chamber-MR		AL2024 / Anodizing(gray)	1 year	
	PDP-1000-6-TR	Chamber-TR		AL2024 / Anodizing(gray)	1 year	
7	PDP-1000-7	Vent Knob	2	AL2024 / Electroless Ni Plating	1 year	
8	PDP-1000-8	Seal Block	2	AL2024 / Anodizing(black)	1 year	
9	PDP-1000-9	Rotary Seal	6	UHMW-PE	6 months	6 months
10	PDP-1000-10	Urethane Sleeve	2	Poly Urethane	1 year	
11	PDP-1000-11	Pressure Sensor	2		1 year	
12	PDP-1000-12	Sensor Cap	2	AL2011 / Anodizing(black)	1 year	
13	PDP-1000-13-A	Inlet Adapter(Cartridge)	2	AL6061 / Anodizing(black)	1 year	
	PDP-1000-13-B	Inlet Adapter(Barrel)		AL6061 / Anodizing(black)	1 year	
	PDP-1000-13-C	Inlet Adapter (Sealant Cartridge)		AL6061 / Anodizing(black)	1 year	
	PDP-1000-13-D	Inlet Adapter(PT3/8")		AL6061 / Anodizing(black)	1 year	
14	PDP-1000-14-A	Mix Clip-A	1	AL6061 / Electroless Ni Plating	1 year	
	PDP-1000-14-B	Mix Clip-B		AL6061 / Electroless Ni Plating	1 year	
A	PDP-1000-A-1	O-Ring(P6) (Mix Adapter-A)	1	FKM(1472)	6 months	6 months
	PDP-1000-A-2	O-Ring(SS3) (Mix Adapter-BA)	2	FKM(1472)	6 months	6 months
	PDP-1000-A-3	O-Ring(SS3.5) (Mix Adapter-BB)	1	FKM(1472)	6 months	6 months
	PDP-1000-A-4	O-Ring(SS2) (Mix Adapter-BB)	1	FKM(1472)	6 months	6 months
	PDP-1000-A-5	O-Ring(AS014) (Mix Adapter-C)	1	FKM(1472)	6 months	6 months

B	PDP-1000-B	O-Ring(AS010)	2	FKM(1472)	6 months	6 months
C	PDP-1000-C	O-Ring(AS012)	2	FKM(1472)	6 months	6 months
D	PDP-1000-D	O-Ring(S15)	2	FKM(1472)	6 months	6 months
E	PDP-1000-E	O-Ring(AS017)	2	FKM(1472)	6 months	6 months
F	PDP-1000-F	O-Ring(AS017)	2	FKM(1472)	6 months	6 months
G	PDP-1000-G	O-Ring(AS019)	2	FKM(1472)	6 months	6 months
H	PDP-1000-H	O-Ring(SS8)	2	FKM(1472)	6 months	6 months
I	PDP-1000-I	O-Ring(SS5)	2	FKM(1472)	6 months	6 months
J	PDP-1000-J	O-Ring(SS5)	2	FKM(1472)	6 months	6 months
K	PDP-1000-K	O-Ring(AN016)	2	FKM(1472)	6 months	6 months
L	PDP-1000-L	O-Ring(AN015)	6	FKM(F575)	6 months	6 months
M	PDP-1000-M	Bolt(M3x25)	4	High-Strength		
N	PDP-1000-N	Bolt(M3x60)	4	High-Strength		
O	PDP-1000-O	Bolt(M3x55)	4	High-Strength		
P	PDP-1000-P	Bolt(M3x35)	4	High-Strength		
Q	PDP-1000-Q	Bolt(M3x8)	2	High-Strength		

8 Maintenance

This equipment is composed of robot part responsible for motion operation, dispenser(Pro Duo Pump) responsible for dispensing and dispenser controller.

- Please check whether the material feeding system has enough material or not.
(If the pump works without material, it might be damaged.)
- If there is unusual sound, when the pump works, please stop to operate the pump immediately, then check the operation parts in detail.

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

Danger	
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. Do not perform Megger test(insulation resistance measurement). It may cause malfunction	

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.

8.1 Alarm Display and Action

The desk top 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.

8.2 Inspection and Measures

Table 13. Pro Duo Pump Inspection and Measures

Inspection Item	Inspection Cycle	What to check and what to do
Ambient Environment	Occasionally	Confirm that it meets the usage standards of the equipment.
Power Supply Voltage	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	1) Check for abnormal vibration or abnormal noise. 2) Check for abnormal heat generation. 3) Check for abnormal vibration or abnormal noise on the bearing part.
Other Checks	Periodically	1) Fastening condition of the fixed parts and joints in the equipment. 2) Joined and tightened condition of wiring. 3) Arrangement condition around the equipment.

8.3 Trouble Shooting

Table 14. Pro Duo Pump Trouble Shooting

Trouble	Possible Cause & Correction
When there is no discharge	1. Confirm the tank's air supply. 2. Confirm the controller power supply. 3. Confirm if there is the solution. 4. Confirm if the conduit has the solution loaded. 5. Confirm the air fitting connection. 6. Confirm solution conduit fitting connection. 7. Confirm the nozzle. 8. Confirm pump motor.
When there is discharge amount change	1. Confirm if there is change in the controller setting values. 2. Confirm if there is the solution hardening within the chamber. 3. Confirm if the needle is stuffed. 4. Confirm if there are bubbles in the solution conduit and within the chamber. 5. Confirm if there is tank air supply pressure changes. 6. Confirm if there is a leak in the liquid connection fitting.
When nozzle end leaks after the discharge during the waiting time	1. Confirm if there is abrasion in the stator rubber. 2. Confirm if tank air pressure is set up. (Tank air pressure is set up with the solution to move to the pump chamber.) 3. Confirm if there is the pump drive motor's continuous movement.
When the pump drive motor doesn't move	1. Confirm motor cable connection. 2. Confirm the controller setup values. 3. Confirm the electric supplier's supply state. 4. Confirm if there is the solution hardening within pump chamber.
When solution leaks out of the pump	1. Confirm if the o-ring is damaged between chamber and seal block. 2. Confirm seal block's rotary seal abrasion state.
When pump operation accompanies noise	1. Confirm to see if the bearing block bearing is damaged. 2. Confirm if the seal block rotary seal is abraded. 3. Confirm if the motor reducer is damaged.