

Auto Greak Lubricating Systems

INSTRUCTION MANUAL  
for  
AUTO GREAK SYSTEMS

KSP-402  
PNEUMATIC PUMP

KOWA CORPORATION  
Osaka, Japan

2019.1.17

## INDEX

1. Pump structure and descriptions
11. Types of installation method of Auto Greak Systems
  - A. Single end-of-line type Model No.1 (single measuring valve)
  - B. Single end-of-line type Model No.2 (with primary and secondary measuring valves)
  - C. Single loop-line type
111. Installation
  - A. Installation of pump body
  - B. Number of delivery ports and pipe length
  - C. Some important points
- 1V. Test operation and adjustments
  - A. Air supply line
  - B. Grease refilling
  - C. Oil refilling
  - D. Air vent
  - E. Adjustment of discharge amount and discharge pressure
- V. Some hints for repair

Annex: Figure 1; KSP-402 outside view  
Figure 2; Single end-of-line type installation  
Model No.1 (single measuring valve)  
Figure 3; Single end-of-line type installation  
Model No.2 (primary & secondary valves)  
Figure 4; Single loop-line type installation  
Figure 5; Air supply line  
Figure 6; Adjustment of delivery amount  
Figure 7; Air supply pressure and delivery amount  
Figure 8; Air supply pressure and delivery pressure  
  
Drawing No.8001170; KSP-402 (for grease) pump  
body assembly  
Drawing No.8001171; KSP-402L (for oil) pump body  
assembly  
Drawing No.801159; KSP-402 standard 2-liters  
reservoir

## 1. Pump structure and descriptions

### A. Pump structure

This pump is constructed by its three major parts; pump body, air cylinder, and reservoir. By each supply of air, the pump operates once. The operation of the pump is controlled by the three-way flow directing valve, located at the air supply line. When this directing valve opens, air is blown into the cylinder through air supply port. This air pressure presses the piston and spring. A plunger, attached to the piston, operates according to the movement of the piston. When the directing valve shuts, air supply will stop. As a consequence, the spring presses back the piston and its attached plunger. Thus, one cycle of pump operation is completed.

The same cycle is repeated during pump operation. The three-way directing valve is controlled either manually or by a timer. Pump discharge pressure and discharge quantity is variable depending on air pressure and amount of air supply.

### B. Pump descriptions

Part No.	KSP-402	KSP-402L
Use	for grease	for oil
Max. discharge pressure (kg/cm <sup>2</sup> )	200	
Max. operation pressure (kg/cm <sup>2</sup> )	150	60
Delivery amount (cc/stroke)	4	
Weight (kg)	9.5 without reservoir	
Reservoir capacity (litre)	2	
Air supply pressure (kg/cm <sup>2</sup> )	3 to 9	

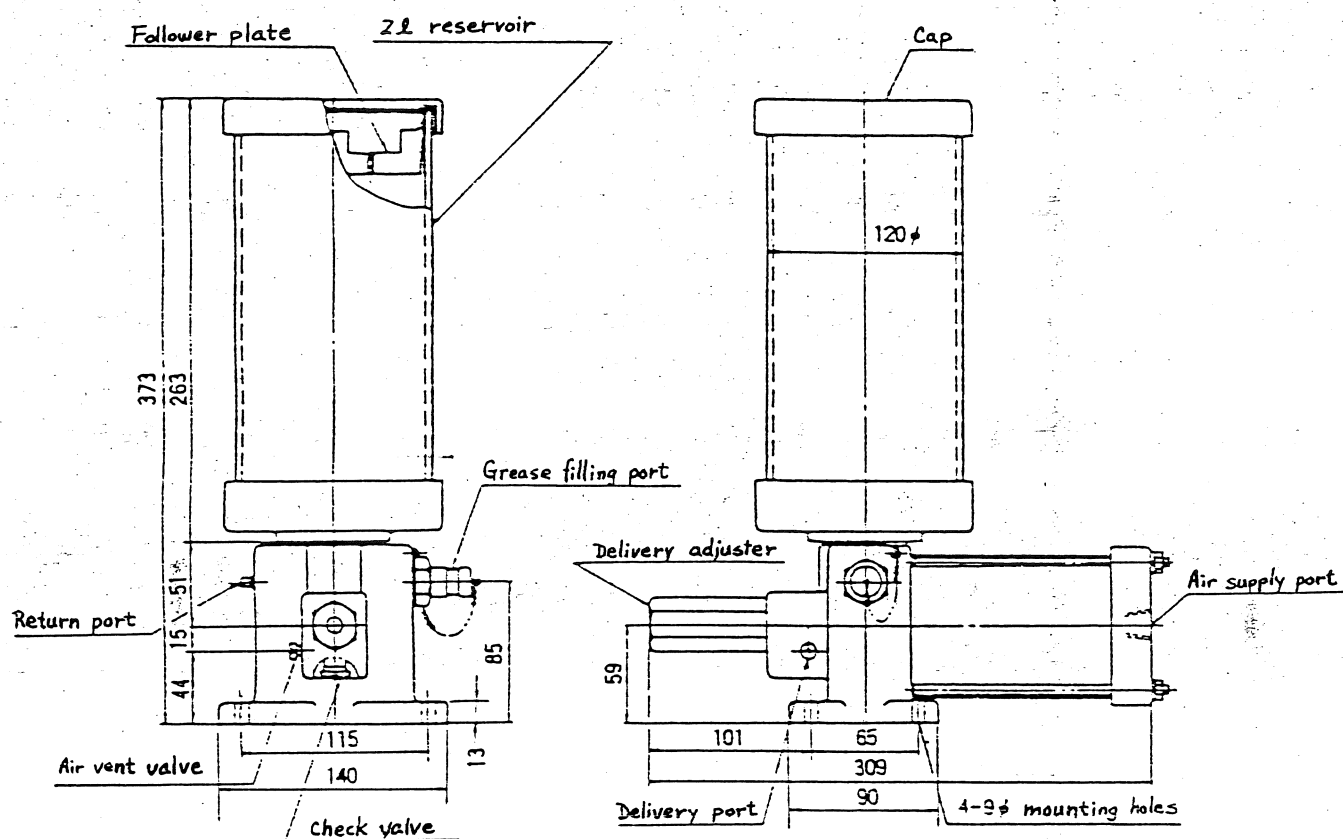


Figure 1: KSP-402 outside view



# 11. Types of installation method of Auto Greack Systems

Following three types of installation may be applied to KSP-402.

## A. Single end-of-line type Model No.1 (single measuring valve)

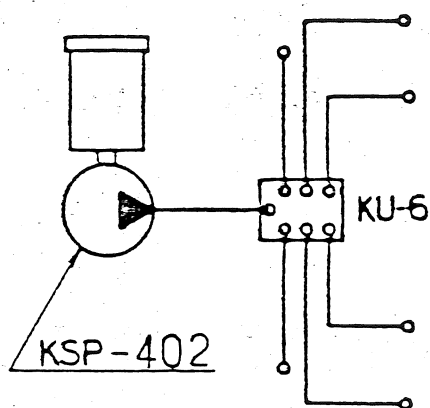


Figure 2

Main supply line is connecting pump discharge port and the inlet of KU type measuring valve. Each discharge port of the measuring valve is directly connected to a lubricating point. Selection of KU type measuring valve depends on the number of lubricating points and required lubricating quantity. No delivery port shall be plugged. If there is any surplus of discharge port, it requires connection with another discharge port by using an auxiliary fitting. In this case, the delivery quantity is doubled.

## B. Sinble end-of-line type Model No.2 (primary and secondary valves)

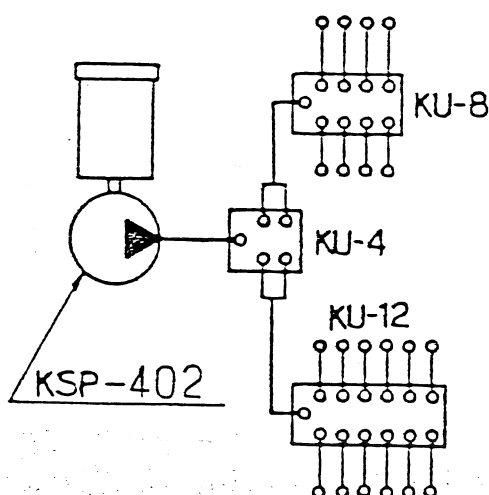
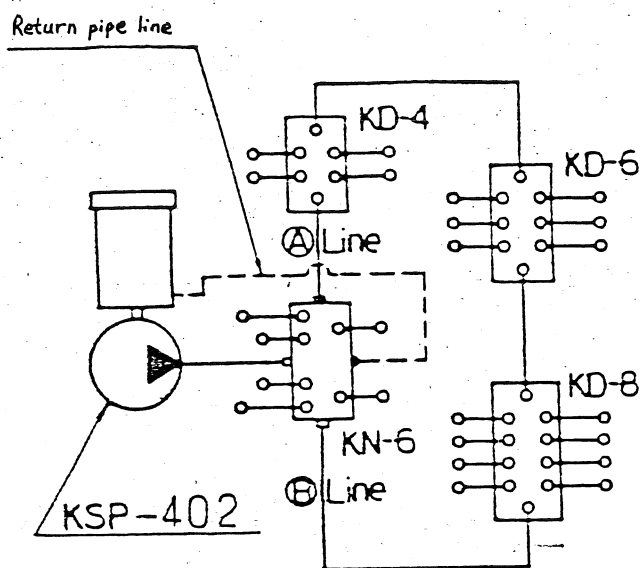


Figure 3

Main supply line is connecting pump discharge port and the inlet of the primary KU type measuring valve. Discharge ports of the primary KU valve are connected to the inlet of the secondary KU valves. Neither KD nor KN valves may be applied in this system.

### C. Single loop-line type



Main supply line is connecting pump discharge port and the inlet of KN-6 valve. Drain port of KN-6 valve is connected back to the reservoir by the return pipe line. Main supply line is to be extended to connect KN-6 valve with KD valves to form a loop as shown in the figure 4. KD valves have 4, 6, 8 or 10 discharge ports. No discharge port should be plugged or left open. Surplus discharge port needs to be jointed with another discharge port by an auxiliary fitting.

Figure 4

When oil, instead of grease, is applied for Auto Greak Systems, KSP-402L and KN-6, KD valves for oil should be applied. These valves are distinguished by red marking.

## III. Installation

### A. Installation of pump body

1. Install so as to facilitate an access for maintenance purposes.
2. Avoid where it is subject to heavy dust, heat, water, or vibration.
3. Install upright.

### B. Number of delivery ports and pipe length

Type of measuring valve	Max. delivery port numbers		Max. main supply line length		Delivery amount / port
	Grease	Oil	Grease	Oil	
KN-6 and KD type	100	150	25 M	50 M	0.3 cc
KU type	24	24	20 M	40 M	0.3 cc

### C. Some important points

1. For main supply line, apply pipes of 8" O.D. for grease and 6" O.D. for oil use. Bite-type fittings will facilitate installation.
2. Lubricating tubes (polyethylene tubes, flexible hoses, or pipes): The length of lubricating tube, from the lubricating point to connecting measuring valve, is normally 3 meters<sup>✓</sup> or less. Depending on the viscosity of lubricant, it may be lengthened.

#### a. Polyethylene tubes:

Each KD valve has 6" sleeves and PF 1/8 attachment nuts, which are to be used for connection of each discharge port of a tube or pipe. Polyethylene tube or pipe must be inserted all the way into the discharge port of measuring valves. If this is not done correctly, it can cause a leakage. Fittings at the side of lubricating points need to be purchased separately. Polyethylene tube is flexible and has good water proof effect. Allowable temperature variation: -20°C to +60°C

#### b. Flexible hoses:

Choose hose fitting, which can be applied for PF 1/8 outlet of measuring valves. Allowable temperature variation: -20°C to +60°C

#### c. Pipes:

Pipes are to be used when the temperature of environment is expected to rise more than 60°C. Use same sleeves and nuts as for polyethylene tubes above. (These are packed with measuring valves.)

Note: If the back pressure of a lubricating point is higher than 7 kg/cm<sup>2</sup>, measuring valves may not work properly even if installation is properly done.

#### IV. Test operation and adjustments

##### A. Air supply line

1. Air supply line to the pump must have a filter, a pressure reducing valve, oiler and a three-way solenoid valve, as shown in the following figure.

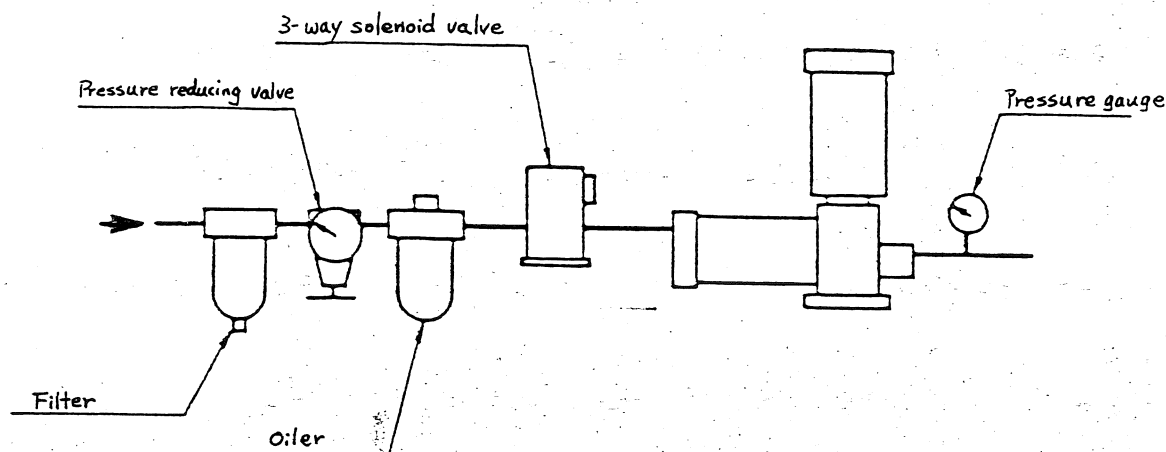


Figure 5

2. The filter must be kept clean, and the oiler should have enough turbine oil at all times. Spindle oil must not be applied.
3. The solenoid air valve should be three-way type.

##### B. Grease refilling

For grease refilling to the pump reservoir, use KWK grease pack, for example KGP-420, and refill through the grease filling port on the pump body.

1. Grease refill must be clean and free of dust and foreign materials.
2. Do not refill from the top of the reservoir by taking off the cap. This can cause pump trouble by letting air or dust to get into the grease.
3. We recommend use of NLGI less than No.1 grease for centralized lubricating systems. NLGI No.2 may be applied only when the operating temperature is more than 10°C constantly.

### C. Oil refilling

A filter is placed at the top of the reservoir below the top cap of KSP-402L. Take off the reservoir cap and refill oil through the filter.

1. Oil refill must be clean.
2. Keep appropriate oil level in the reservoir at all times, during operation.

### D. Air vent

Prior to the pump operation, loosen the air vent valve of the pump body to let out air which may be contained in the grease as air bubbles. When the air bubble is no longer observed and grease starts to come out of this vent, tighten the vent valve.

### E. Adjustment of discharge amount and discharge pressure

Discharge amount (cc/stroke) may be adjusted by taking off the cap of the delivery adjuster and by adjusting the screw inside. (See Figure 6) Adjustment of the screw is checked by adjusting rod. 1 MM difference of this rod will mean 0.15cc difference of discharge. Distance X at maximum is 21 MM, which allows adjustment within the range of 4cc in discharge.

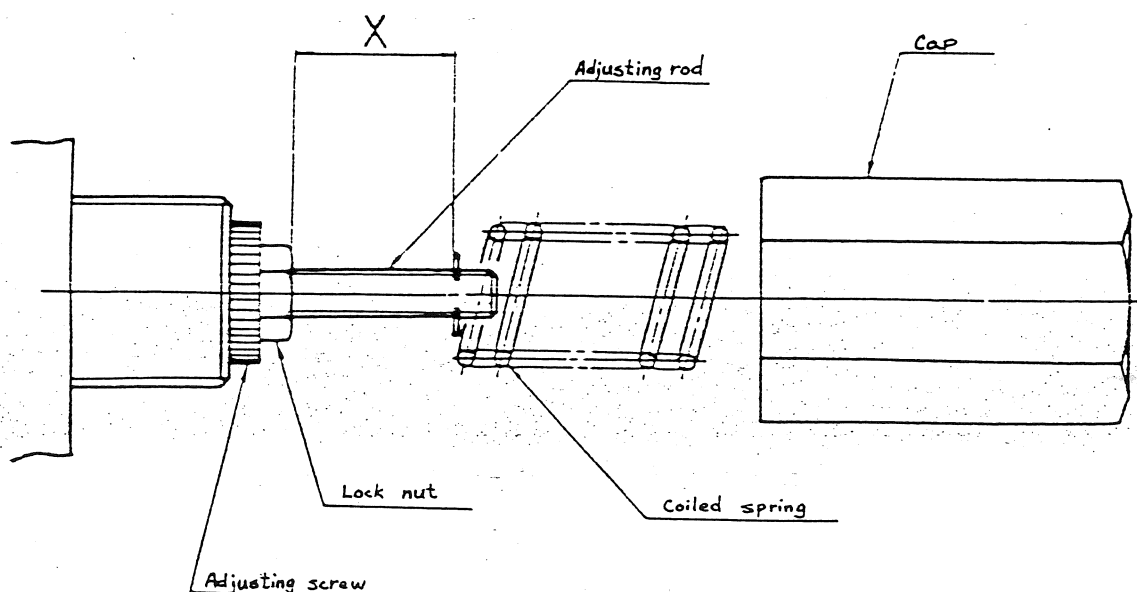


Figure 6: Adjustment of discharge amount

Pump discharge amount and pressure can be adjusted also by controlling air supply to the pump at the reducing valve. Consult the Figures 7 and 8 for such adjustment.

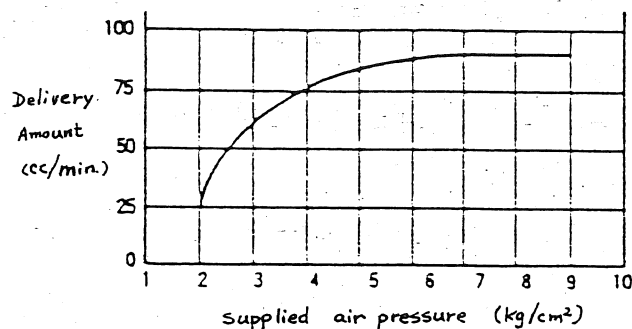


Figure 7  
Air supply pressure and delivery amount

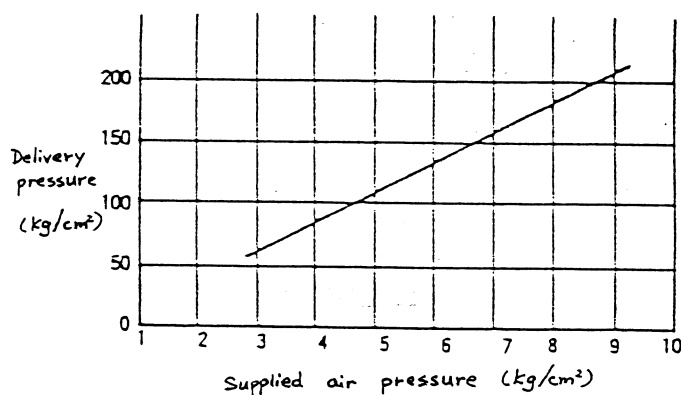
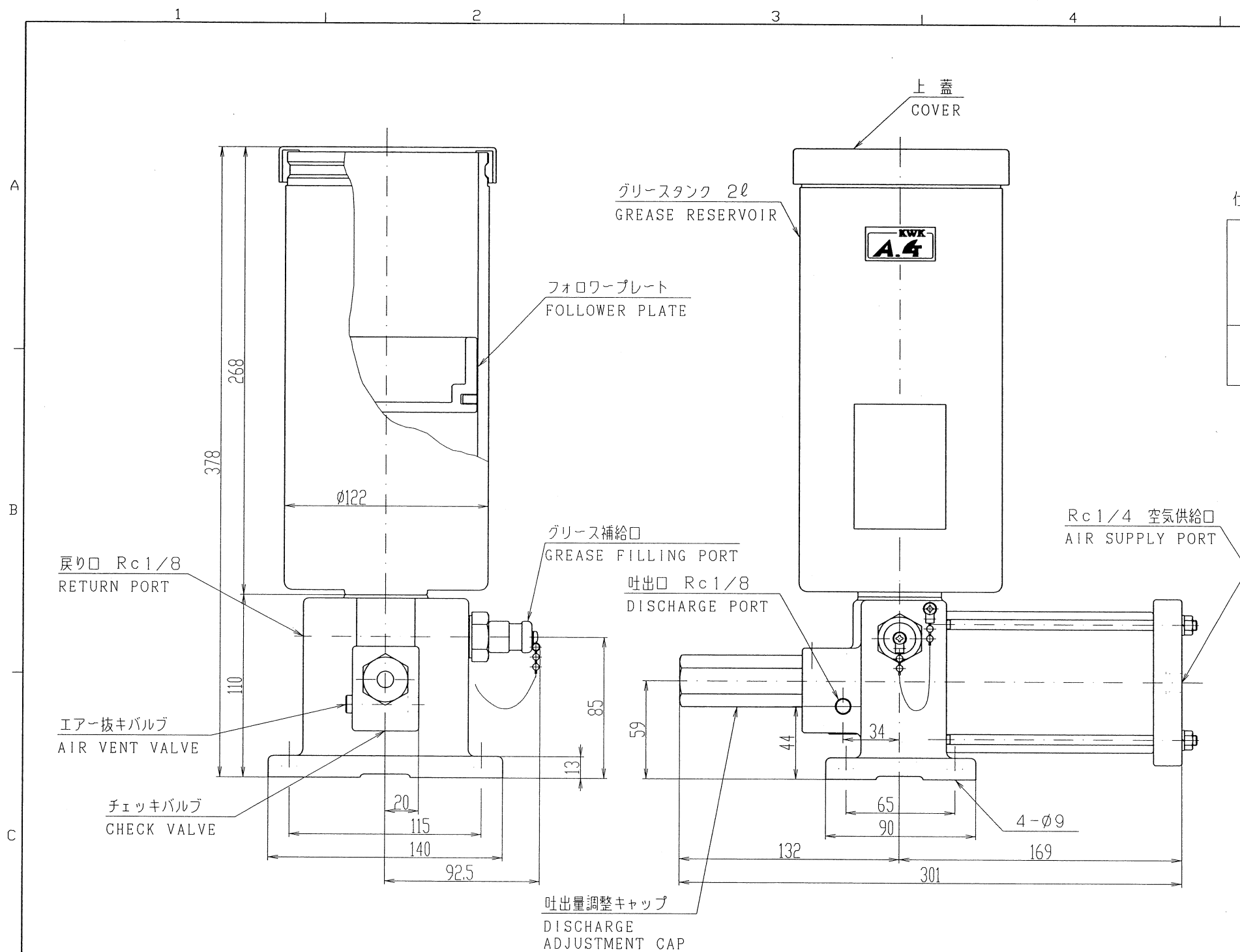


Figure 8  
Air supply pressure and delivery pressure

## V. Some hints for repair

Pump trouble	Possible causes	What to do?
Pump operates but grease (oil) is not being discharged	Reservoir is empty	Refill grease (oil)
	Check valve is locked by a foreign object	Clean up the check valve, exchange it with a new one
	Pump has sucked in air	Vent air by loosening the air vent valve
		Vent air by loosening the connection with the piping at the point of pump discharge port
Pump does not operate	Air supply pressure is too low	Check the air supply line
	Air supply pressure and back pressure have balanced out by a blockage in the piping line	Check of piping lines, measuring valves, or lubricating points
	Oiler breakdown	Repair of oiler
	Pump piston or plunger is locked by intaken object	Repair of piston or plunger, or replacement by a new pump
Measuring valve does not operate	Inside piston is locked	Clean up inside of measuring valve or replace with a new measuring valve
	Air is pumped in	Vent air by loosening fittings at the discharge port of valve. (KD and KN valves have air vent)
	Leakage in the pipe lines	Check of piping lines and repair

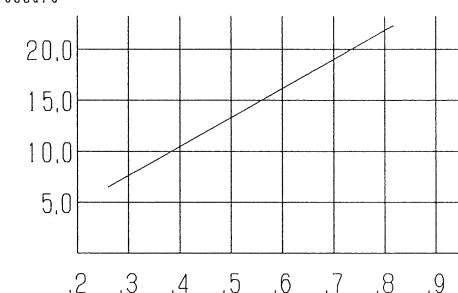


吐出量調整機構詳細図  
Detail of Discharge adjustment

仕様 Specification

型 式 Model	適用油 Lubri- cate	タンク 容 量 (ℓ) Reservoir capacity	吐出量 (cm <sup>3</sup> /st.) Discharge capacity	吐 出 圧 力 (MPa) Discharge pressure	ポンプ レシオ Pump Ratio	質 量 (kg) Mass
KSP-402	グリース Grease	2	0.8~4	2.9~19.6	1/28.7	10.5

吐出圧力 MPa  
Discharge Pressure



空気供給圧力 MPa  
Supply Air Pressure

吐出圧力性能曲線  
Performance Curves

注記。  
エアコントロールパネルを必ず使用して下さい。  
(フィルター、オイル、レギュレーター、電磁弁)

Remarks  
Air control panel should be installed on the  
air supply pipes of the grease pump unit.  
(Air control panel with filter, lubricator, regulator and solenoid valve)

※吐出量の調整は調整ネジのキャップを外し、  
詳細図の0~22mmの長さで適当に調整する。  
1mmが約0.15cm<sup>3</sup>に相当し、22mmで  
最大の4cm<sup>3</sup>になります。

For adjusting the grease discharge, take off the cap  
of the adjusting screw and properly adjust the length  
0~22mm shown in Figure.  
One mm corresponds to 0.15cm<sup>3</sup>, and the maximum length  
22mm to 4cm<sup>3</sup>, the maximum delivery.

CUSTOMER			
SPECIFICATION			
CHECKED BY K. TANAKA	DRAWN BY Y. MIYAZAKI	空圧式給油ポンプ PNEUMATIC LUBRICATING PUMP	
93.4.12 SEAL CHIEF	10.5.12 DESIGNED BY 藤	KSP-402 組立図	
10.5.12 KOWA CORP.		DWG. No.	KS-803935
OSAKA JAPAN		CFD. No.	
		CODE No.	
3RD ANGLE PROJECTION		SCALE	1/2





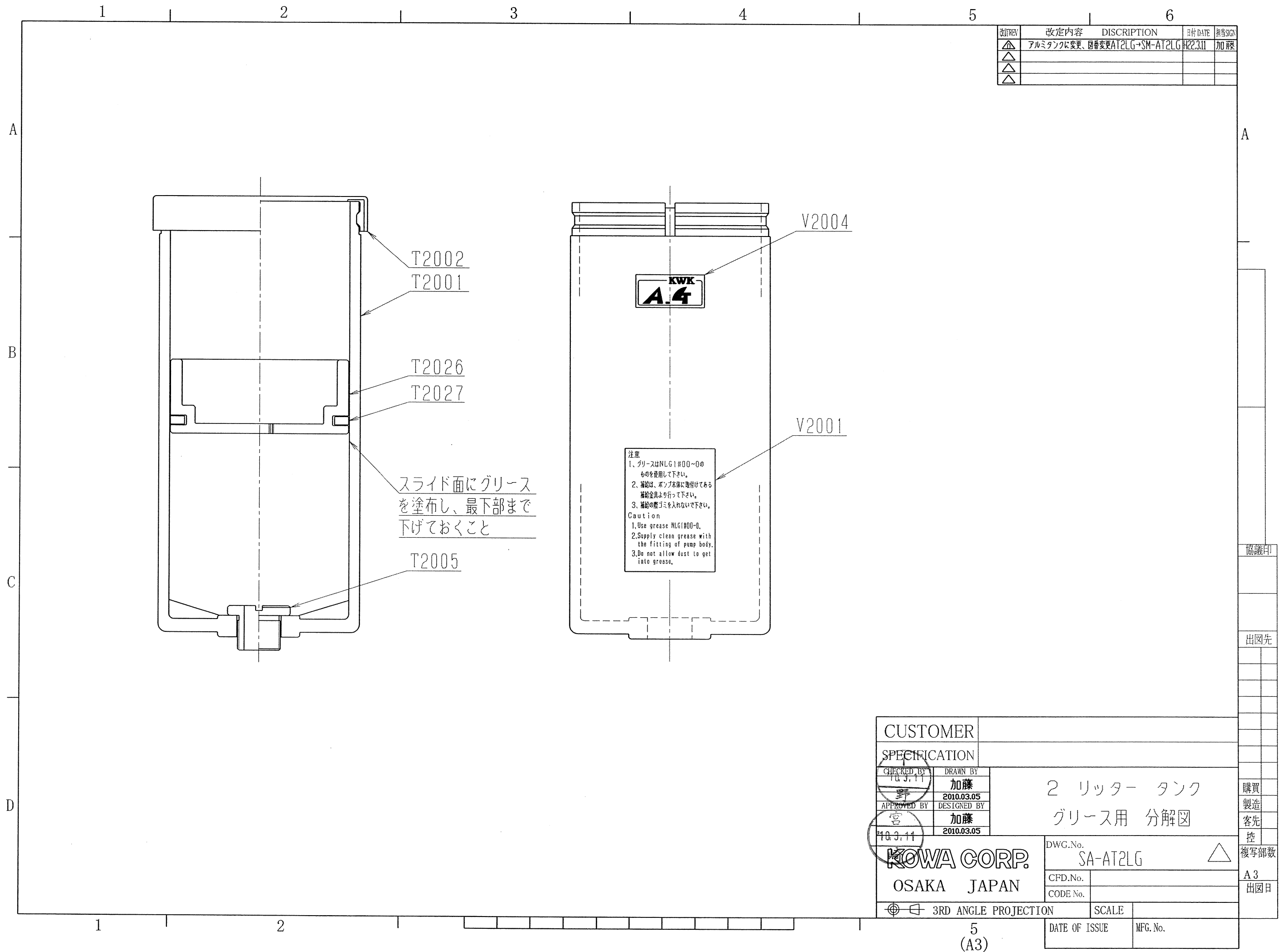


## KSP-402 分解図 用品リスト

### KSP-402 Disassembly parts list

品番 No.	名称 part name	部品番号 part No.	数量 quantity	備考 remarks
1	ポンプ本体 KSP-402 KSP-402 Pump body	D2001	1	KS-800185
2	シリンダー Cylinder	D2002	1	KS-800186 $\phi 80 \times \phi 75 \times 128 \text{L}$
3	ピストン Piston	D2003	1	KS-800188
4	プランジャー Plunger	D2004	1	KS-800190
5	コイルスプリング Coil spring	D2005	1	KS-800187
6	シリンダーカバー Cylinder cover	D2006	1	KS-800189
7	ピストンガイド Piston guide	D2007	1	KS-800194
8	調整ピストン Adjusting piston	D2008	1	KS-800191 $\phi 14$
9	調整棒 Adjusting rod	D2009	1	KS-800192
10	調整ネジ Adjustment screw	D2010	1	KS-800193
11	コイルスプリング Coil spring	D2011	1	KS-800196
12	調整キャップ Adjustment cap	D2012	1	KS-800197
13	タイロッドボルト Tie rod bolt	D2013	4	KS-800200 M6X160
14	吸込口継手 Inlet joint	T2105	1	KS-800552
15	AGポンプ型式銘板 Pump model nameplate	V1005	1	KS-801015
16	チェッキ本体 Check body	X1001	1	KS-801474
17	チェッキバックアップリング Check backup ring	X1002	1	KS-801475
18	シートパッキン Sheet packing	X1003	1	KS-800913
19	コイルスプリング Coil spring	X1004	1	KS-801477
20	エア抜きプラグ Air bleeding plug	X1005	1	KS-800124
21	補給口金具 Supply port fitting	X1101	1	KS-800116
22	スプリング Spring	X1102	1	KS-800118
23	補給口キャップ Supply port cap	X1103	1	KS-800514
24	銅パッキン(補給口) Copper packing (supply port)	X3013	1	$\phi 26 \times \phi 20.5 \times 1.5 \text{T}$
25	エンドキャップ(赤) Rc1/8 End cap (red) Rc1/8	X4001	1	KS-800867 RC1/8
26	エンドキャップ(赤) Rc1/4 End cap (red) Rc1/4	X4002	1	KS-800867 RC1/4
27	エンドキャップ(赤) Rc3/8 End cap (red) Rc3/8	X4003	1	KS-800867 3/8
28	Oリング O ring	Z1009	1	1A P12.5
29	Oリング O ring	Z1016	1	1A P65
30	Oリング O ring	Z1108	1	1B P11
31	Oリング O ring	Z1111	2	1B P14

32	リング O ring	Z1117	1	1B P32
33	リング O ring	Z1302	1	1B G70
34	バックアップリング(E/L) Backup ring (E/L)	Z1505	1	P14
35	バックアップリング(B/C) Backup ring (B/C)	Z1608	1	P-65
36	鋼球 Steel ball	Z2001	1	1/8 (φ 3.175)
37	鋼球 Steel ball	Z2005	1	1/4 (φ 6.35)
38	鋼球 Steel ball	Z2006	1	5/16 (φ 7.9375)
39	チェーンコネクタ Chain connector	Z2202	1	φ 4 BBP-40K
40	ボールチェーン Ball chain	Z2204	1	φ 4x200L
41	E型止め輪 E type snap ring	Z2303	1	E 4
42	沈みプラグ Sunk head plug	Z5001	1	R 1/8
43	六角ボルト Hexagon bolt		4	M8 × 30L
44	十字穴付ナベ小ネジ Round head Phillips screw		1	M4 × 8L
45	六角穴付止ネジ Hexagon socket set screw		1	M6 × 8L
46	六角ナット Hexagon nut		5	M6
47	六角ナット Hexagon nut		4	M8
48	バネ座金 Spring washer		4	M6
49	平座金 Flat washer		1	M6
50	ピン Pin		1	φ 2 × 12L
51	ピン Pin		1	φ 2.5 × 30L



改訂REV	改定内容	DISCRIPTION	日付DATE	担当SIGN
△	アルミタンクに変更、図番変更AT2LGLS→SM-AT2LGLS		H22.3.11	加藤
△	ボールチェーン長さ変更。200L→190L		H26.11.28	勝取
△				
△				

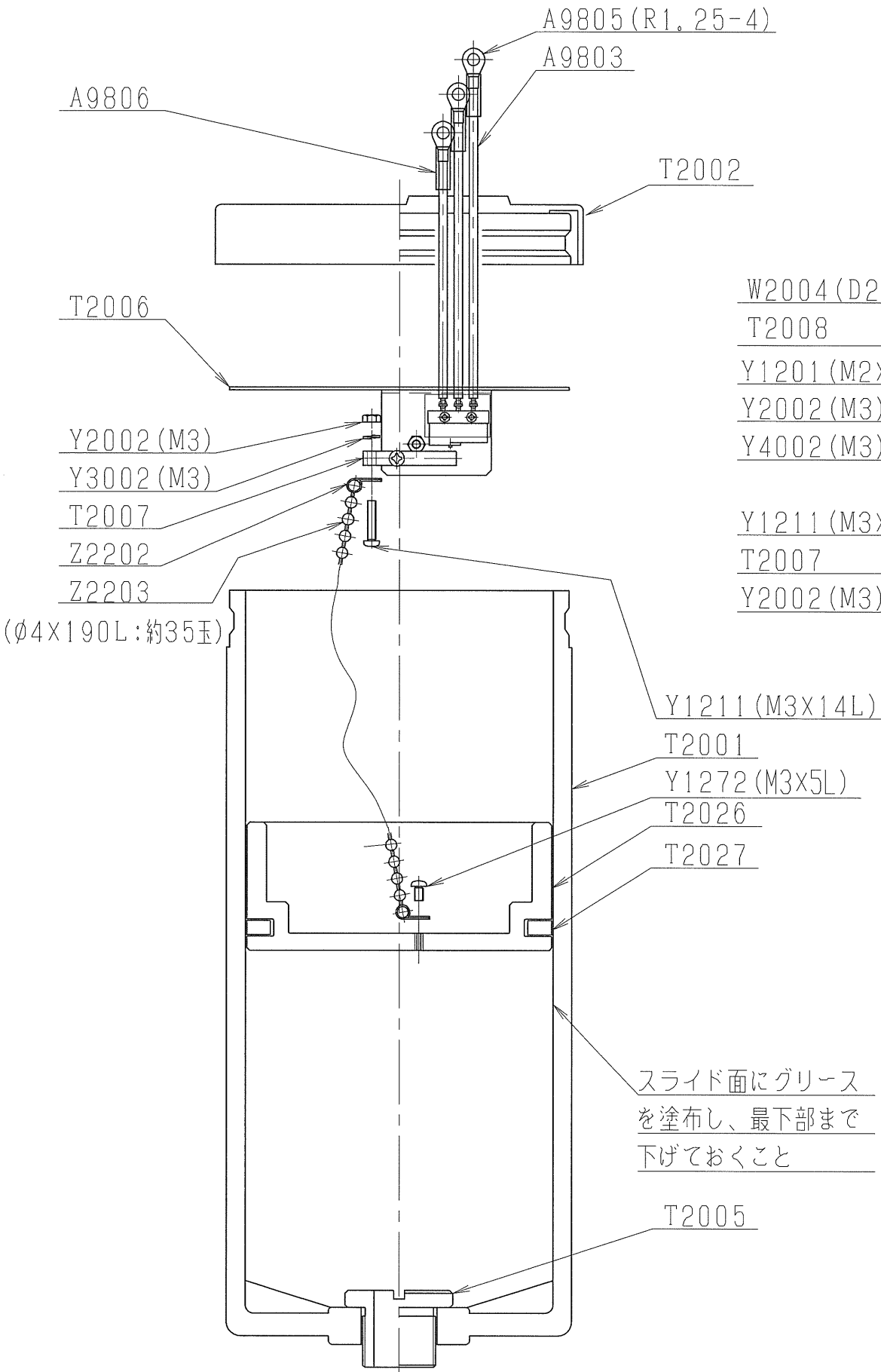
A

A

B

C

D



注意  
1、グリースはNLGI#00~0の  
ものを使用して下さい。  
2、補給は、ポンプ本体に取付けてある  
補給金具より行って下さい。  
3、補給の際ゴミを入れないで下さい。  
Caution  
1、Use grease NLGI#00~0.  
2、Supply clean grease with  
the fitting of pump body.  
3、Do not allow dust to get  
into grease.

CUSTOMER

SPECIFICATION

CHECKED BY	DRAWN BY
14.11.28	加藤
APPROVED BY	DESIGNED BY
14.11.28	加藤
	2010.03.05

KOWA CORP.  
OSAKA JAPAN

DWG.No.  
SA-AT2LGLS

CFD.No.  
CODE No.

3RD ANGLE PROJECTION

SCALE

DATE OF ISSUE

MFG. No.

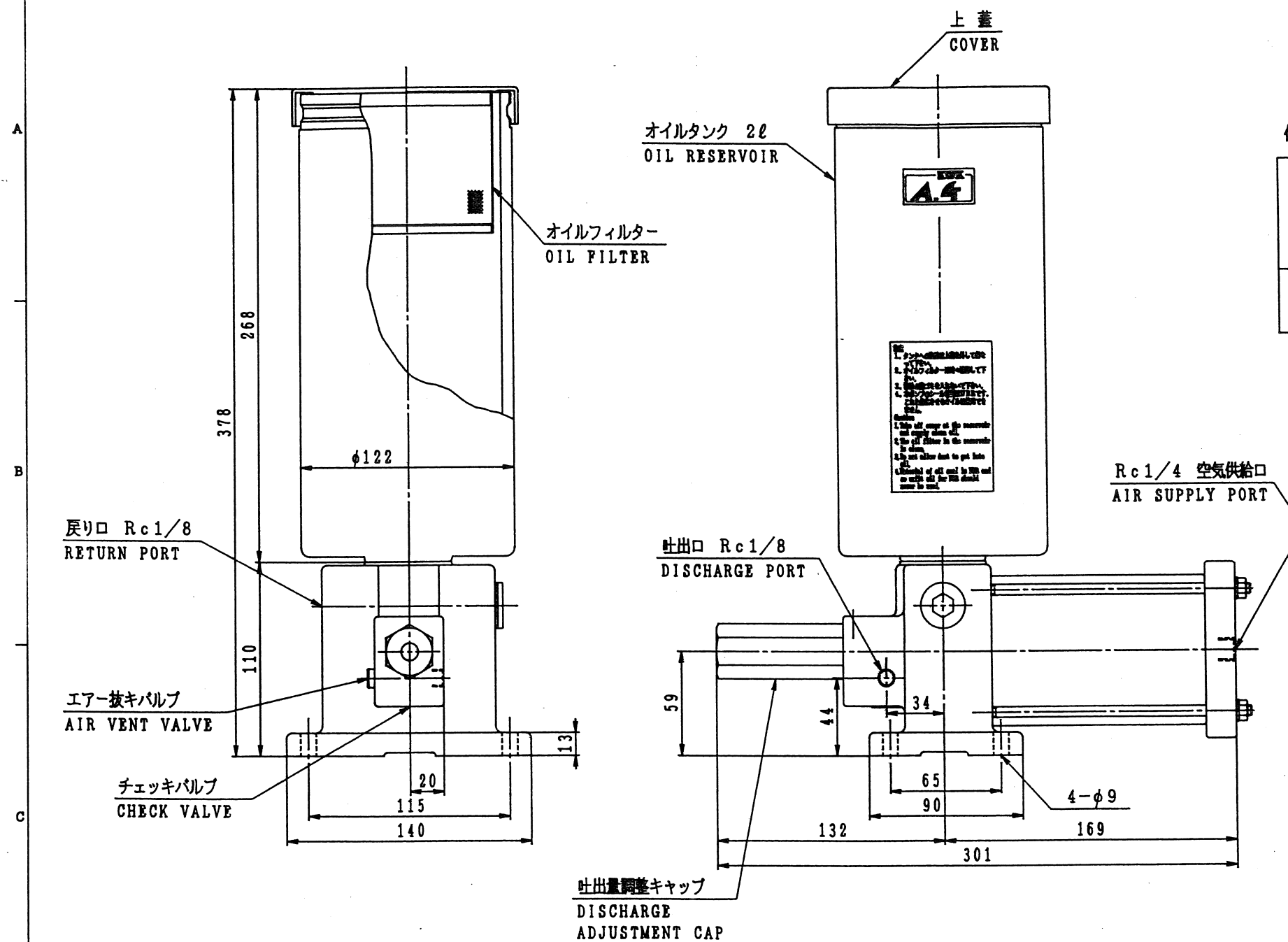
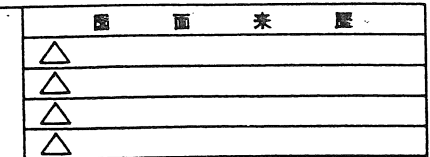
5  
(A3)

協議印

出図先

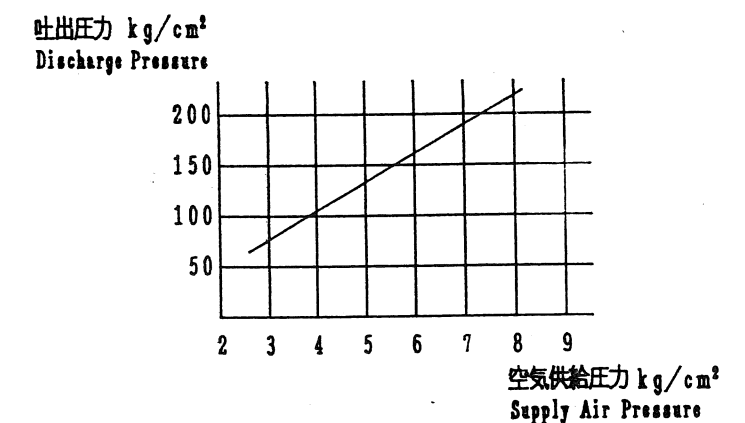
購買  
製造  
客先  
控  
複写部数

A3  
出図日



## 仕様 Specification

型 式	適用油	タンク 容 量 (ℓ)	吐 出 量 (cc/st.)	吐 出 圧 力 (kg/cm <sup>2</sup> )	ポンプ レシオ	重 量 (kg)
Model	Lubri- cate	Reservoir capacity	Discharge capacity	Discharge pressure	Pump Ratio	Weight
KSP-402L	オイル Oil	2	0.8~4	30~100	1/28.7	10.5



### 吐出压力性能曲线

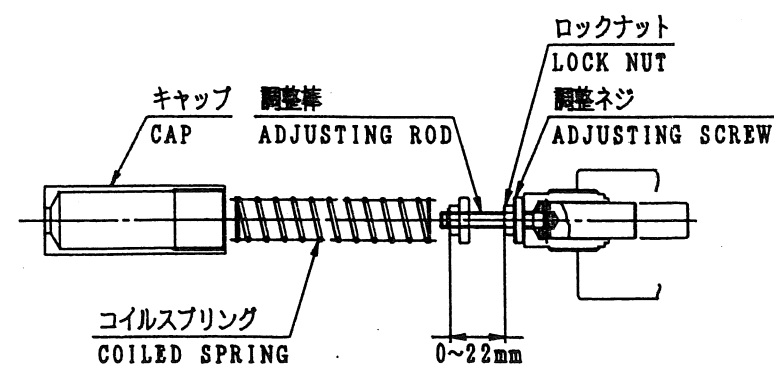
### Performance Curves

生記。

エアーコントロールパネルを必ず使用して下さい。  
(フィルター、オイラー、レギュレーター、電磁弁)

Remarks

Air control panel should be installed on the  
air supply pipes of the grease pump unit.  
(Air control panel with filter, lubricator, regulator and solenoid valve)





**吐出量調整機構詳細図**  
Detail of Discharge adjustment

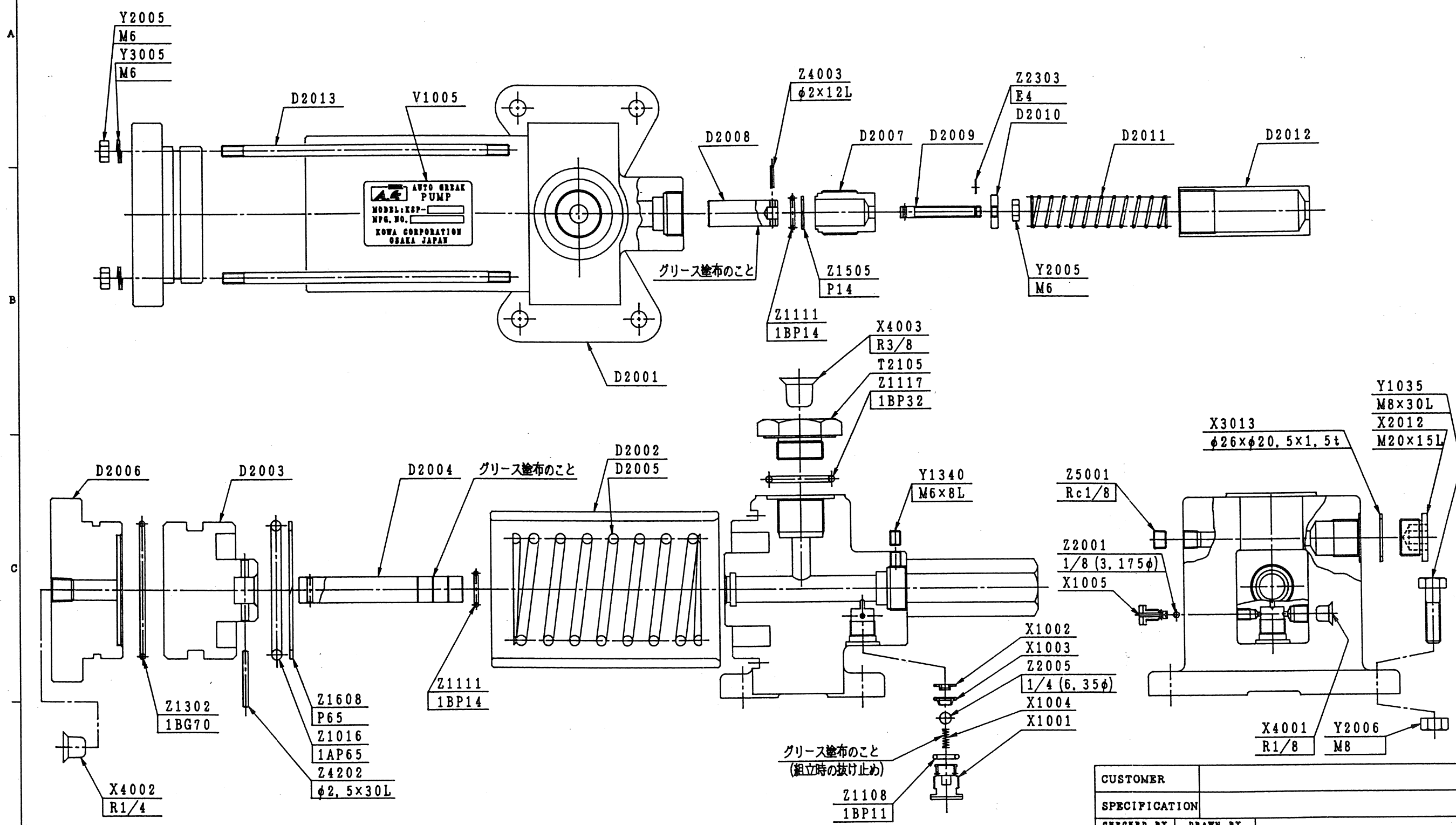
※吐出量の調整は調整ネジのキャップを外し、詳細図の0～22mmの長さで適当に調整する。1mmが約0.15ccに相当し、22mmで最大の4ccになります。




For adjusting the grease discharge, take off the cap of the adjusting screw and properly adjust the length 0~22mm shown in Figure.

One ~~mm~~ corresponds to 0.15cc, and the maximum length 22~~mm~~ to 4cc, the maximum delivery.

CUSTOMER			
SPECIFICATION			
CHECKED BY	DRAWN BY	空圧式給油ポンプ PNEUMATIC LUBRICATING PUMP KSP-402L 組立図	
K. TANAKA	Y. MIYAZAKI		
93.4.12			
SEC. CHIEF	DESIGNED BY		
93.4.12			
KOWA CORP. OSAKA JAPAN		DWG. No. KS-803939  CPD. No. CODE No.	
	3RD ANGLE PROJECTION	SCALE	1/2

図面表
△
△
△
△



CUSTOMER			
SPECIFICATION			
CHECKED BY	DRAWN BY	空圧式給油ポンプ KSP-402L (タンク無) 分解図	
K. TANAKA	Y. M		
'93. 3. 31			
SEC. CHIEF	DESIGNED BY		
 '93. 3. 31			
KOWA CORP.		DWG. No. KS-801171 	
OSAKA JAPAN		CFD. No.	
		CODE No.	
	3RD ANGLE PROJECTION	SCALE	



1

2

3

4

5

6

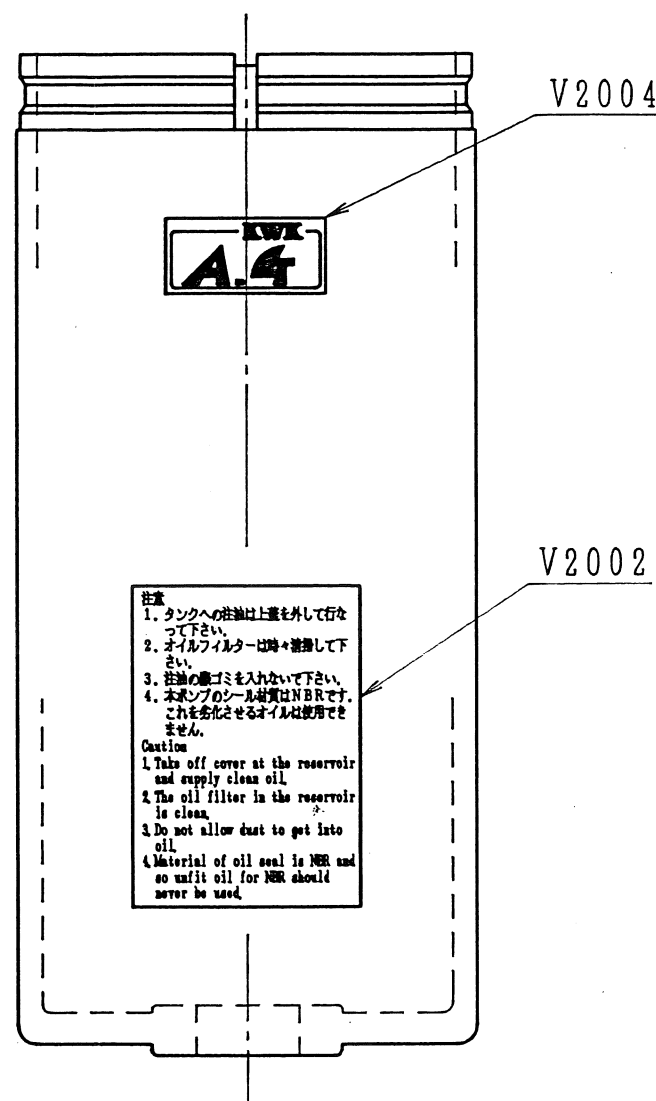
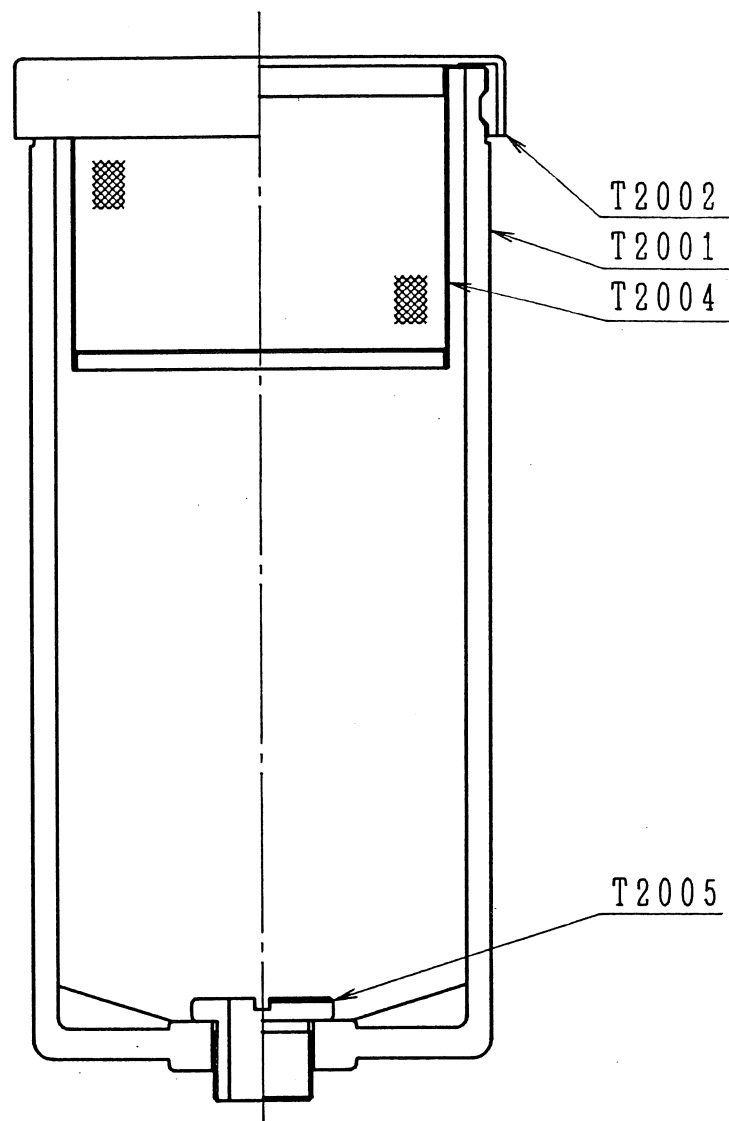
REV	改定内容	DESCRIPTION	DATE	SIGN
△				
△				
△				
△				

A

B

C

D



注意  
1. タンクへの注油は上蓋を外して行な  
って下さい。  
2. オイルフィルターは時々清掃して下  
さい。  
3. 注油の際ゴミを入れないで下さい。  
4. 本ポンプのシール材質はNBRです。  
これを劣化させるオイルは使用でき  
ません。  
Caution  
1. Take off cover at the reservoir  
and supply clean oil.  
2. The oil filter in the reservoir  
is clean.  
3. Do not allow dust to get into  
oil.  
4. Material of oil seal is NBR and  
so unfit oil for NBR should  
never be used.

CUSTOMER			
SPECIFICATION			
CHECKED BY	DRAWN BY	2 リッター タンク オイル用 分解図	
<i>K. Tanaka</i>	K. TANAKA		
72.3.31	92.12.20		
SEC. CHIEF	DESIGNED BY		
KOWA CORP.		DWG. No. AT2LL △	
OSAKA JAPAN		CFD. No.	
		CODE No.	
3RD ANGLE PROJECTION		SCALE	

AUTO GREAK LUBRICATING SYSTEMS

AUTO GREAK LUBRICATING SYSTEM  
AIR-OPERATED PUMP  
KSP-502

INSTRUCTION MANUAL



KOWA CORPORATION

2019.1.17

## CONTENTS

1. Composition and specifications .....	1
(1) Composition .....	1
(2) Specification .....	1
2. Principle of operation .....	2
3. Piping system of AUTOGREAK .....	3
(1) Single end system (single distributing valve system) .....	3
(2) Single end system (double distributing valve system) .....	3
4. Installation, piping .....	4
(1) Installation of main body .....	4
(2) Max. number of lubricating ports and Max. main supply line length .....	4
(3) Cautions for piping .....	4
5. Trial run and adjustment .....	5
(1) Air-feed line .....	5
(2) Grease filling .....	6
(3) Oil filling .....	6
(4) Air drawing .....	6
(5) Discharge pressure and quantity adjustment .....	6
6. Trouble-shooting .....	7

## 1. Composition and specifications

### (1) Composition

This pump comprises a pump proper, an air cylinder, and a switching valve.

The air through the air-feed inlet is supplied into the air cylinder by the switching valve mechanism, then the air piston and the plunger fixed to the air piston are moved back and forth for suction and discharge of grease (oil).

So long as air is supplied to the pump in this manner, the pump operates continuously.

The delivery pressure and delivery quantity of the pump change depending on the pressure and quantity of air supplied.

### (2) Specification

Model	Delivery rate	Delivery pressure (At air press. 8 kg/cm <sup>2</sup> )	Supplied air press.	Weight	Reservoir cap.
KSP-502 2ℓ	0.5cc/stroke	Max.200 kg/cm <sup>2</sup>	3~8 kg/cm <sup>2</sup>	4.5	2 Lit.
KSP-502L 2ℓ					2 Lit.

## 2. Principle of operation

When air is supplied through the air-feed inlet on the switching valve, as shown in Fig.1, the air presses the piston through route (1) and (2).

The pressurized piston moves in pressing direction while compressing the spring A and the plunger fixed to the piston also moves.

After transfer of the piston for certain distance, the valve rod is moved by the spring a-1 provided in the piston.

The switching valve also moves as it is connected to the valve rod and the route (1) is closed. Accordingly, the air supply is suspended.

When the route (1) closes, the route (3) opens to be connected to the discharge port. The air in the cylinder is therefore discharged and the piston and the plunger are pushed back by the spring A.

When the pushed back piston moves certain, distance, the valve is switched again by the piston a-2. Then the route (3) closes and the route (1) opens to supply air. The piston and the plunger repeat reciprocation in this manner.

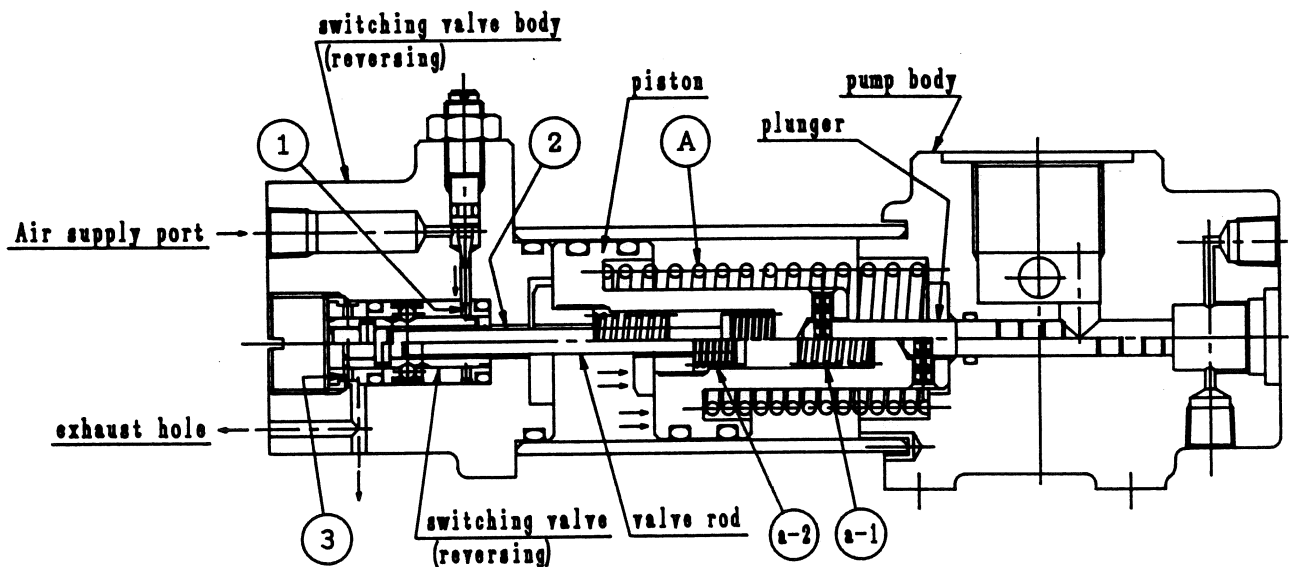


Fig.1

### 3. piping system of AUTOGREAK

This pump is combined with distributing valves, and is intended to deliver grease (oil) under pressure to lubricating points.

The following combinations are possible.

#### (1) Single end system (single distributing valve system)

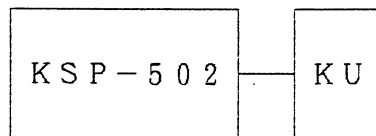


Fig.2

In this system, the main pipe from the lubricating pump is connected to the type KU distributing valve. The KU valve has 4,6,8 or 12 discharge ports depending on the type, which may be selected depending on the number of lubricating points.

Do not stop the discharge ports with blind plug. Communicate the unnecessary ports with furnished joints. In this case, the delivery capacity is doubled.

#### (2) Single end system (double distributing valve system)

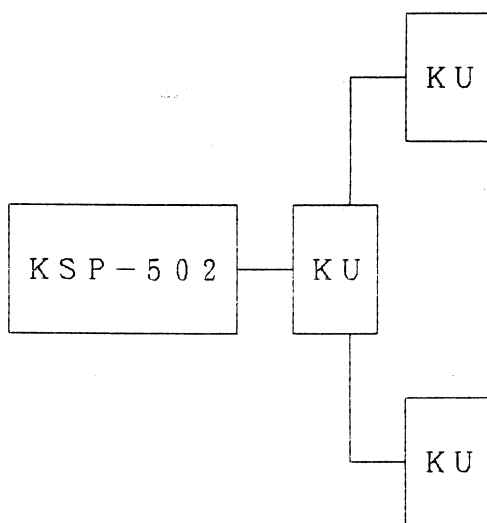


Fig.3

In this system, the main pipe from the lubricating pump is connected to the type KU distributing valve, and the branch pipe is further connected to another KU valve.

#### 4. Installation, piping

##### (1) Installation of main body

- a. Select a proper place convenient for servicing.
- b. Avoid places exposed to dust, heat or water.
- c. Avoid vibrating places.
- d. Install horizontally.

##### (2) Max. number of lubricating ports and Max. main supply line length.

Measuring valve	Max. lub. points		Max. line length		Discharge capacity
	Grease	Oil	Grease	Oil	
K U	2 4	2 4	5~15m	5~15m	0.3cc

##### (3) Cautions for piping

###### 1) Lubricating main pipe (copper tube)

Use copper tube for the lubricating main pipe.

Determine the length of copper tube by referring to table in 4-(2).

In both grease type (copper tube 8 $\phi$ ) and oil type (copper tube 6 $\phi$ ), connect by using copper tube joint with sleeve.

###### 2) Lubricating pipe (polyethylene tube, flexible hose, copper tube)

The standard length of lubricating pipe is 3m, which may be varied somewhat depending on the kind of lubricat.

###### (a) Polyethylene tube

Fix the polyethylene tube to the distributing valve discharge port by using the sleeve (6 $\phi$ ) and nut (Rp 1/8). (At this time, push in the polyethylene tube until it collides against the bottom of the distributing valve discharge port. If tightened in the midway, it may cause leaks.)

The joint at the machine's lubricating port side and distributing valve discharge port side is not furnished. The polyethylene tube is flexible, and excels in water resistance.

Ambient temperature range: -20°C to +60°C.

(b) Flexible hose.

Select size R 1/8 for the hose fitting at the distributing valve discharge port side.

Ambient temperature range:  $-20^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ .

(c) Copper tube

For connection, as in the case of polyethylene tube, tighten with the sleeve and nut.

Warning

If the pressure-proof strength of the lubricating pipes (a) to (c) is sufficient, when the back pressure at the lubricating port exceeds about  $7\text{kg}/\text{cm}^2$ , the operation of the distributing valve may be disturbed.

5. Trial run and adjustment

(1) Air-feed line

1) Be sure to protect the air-feed line to the pump as shown in Fig.4.

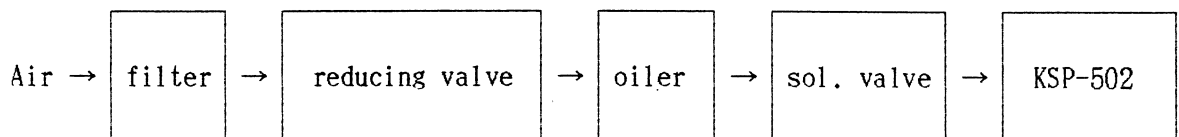


Fig.4

2) Keep the filter always clean and supply turbine oil fully to the oiler.

(Turbine oil #90~#120 or equivalent)

Strictly refrain from using spindle oil.

3) Use a 3-way valve as the air switching valve.

(2-way valve is acceptable for KSP-502 pump.)



(2) Grease filling

Remove the cap of the grease supply port on the pump proper, then supply grease with a grease filling pump (KGP-420 for example). Pay close attention to the following points at this time.

- 1) Always supply clean grease.
- 2) Be sure to supply grease through the grease supply port.

If the upper cover of the tank is opened, air and dust are allowed inside, which can cause troubles.

- 3) Since property of grease differs depending on the kind, use adequate kind of grease suitable to the lubricating condition.

Extreme-pressure grease of about 310 to 400 denseness (NLGI No.1 to No.0) shall be used for this pump.

(3) Oil filling

Remove the top cover of the tank and supply oil through the filter while paying due attention to the following points.

- 1) Always supply clean oil to the tank.
- 2) Be sure to keep the oil level between the upper and lower limits.

(0.55ℓ tank)

(4) Air drawing

Loosen the air vent plug on the pump proper, make sure that the grease (oil) is free from any air bubble, then tighten the plug.

(5) Discharge pressure and quantity adjustment

Adjust the pressure of the supplied air by the reducing valve suitably to the required delivery quantity and pressure. Delivery quantity can also be adjusted by the needle valve attached to the switching valve.

For the relationship between supplied air pressure and delivery quantity and pressure, please refer to ASS'Y Drawing.

## 6. Trouble-shooting

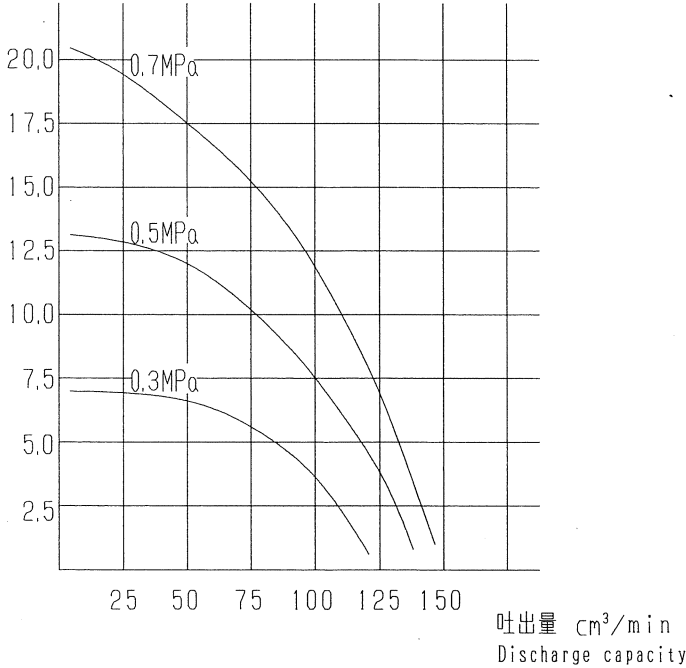
Trouble	Cause	Point to check and countermeasure
Pump does not operate.	Air-feed pressure is lowered.	Check and repair the air-feed line.
	Delivery pressure and air-feed pressure are balanced to stop operation.	Check and repair the delivery line.
	Foreign matter is caught by the change-over valve.	Overhaul the valve or replace.
	Operation continued for a long time under nonoperating condition of oiler.	Replace the parts.
	Foreign matter is caught by the piston.	Replacement
Though pump functions, no grease (oil) comes out.	Tank is empty.	Check the level gauge of the tank and supply grease (oil).
	Foreign matter is caught by check valve of pump.	Overhaul or replace the check valve.
	Air is allowed inside.	Loosen the air vent plug and operate the pump until grease (oil) comes out.
		Loosen the pipe at the pump delivery outlet and discharge the trapped air.
Flow-directing & measuring valve and measuring valve do not operate.	Foreign matter is caught by inside piston.	Overhaul or replace the measuring valve.
	Air is trapped.	Loosen the joints at the outlet of the measuring valve, or loosen the air vent screw to the discharge the air.
	Grease (oil) leakage from the middle of main piping or lubrication piping, or though the joints, or broken pipe or joint.	Retighten the pipes and joints or replace after checking the condition of each pipe.

図 面 来 歴		
△	フォロープレート変更	'10.4.7 大門
△		
△		
△		

仕 様 Specification

型 式	適用油	タンク容量 (ℓ)	吐出量 (cm <sup>3</sup> /st.)	吐出圧力 (MPa)	ポンプレシオ	質量 (kg)
Model	Lubri-cate	Reservoir capacity	Discharge capacity	Discharge pressure	Pump Ratio	Mass
KSP-502	グリース Grease	2	0.5	2.9~19.6	1/32.6	4.5



吐出圧力 MPa  
Discharge Pressure

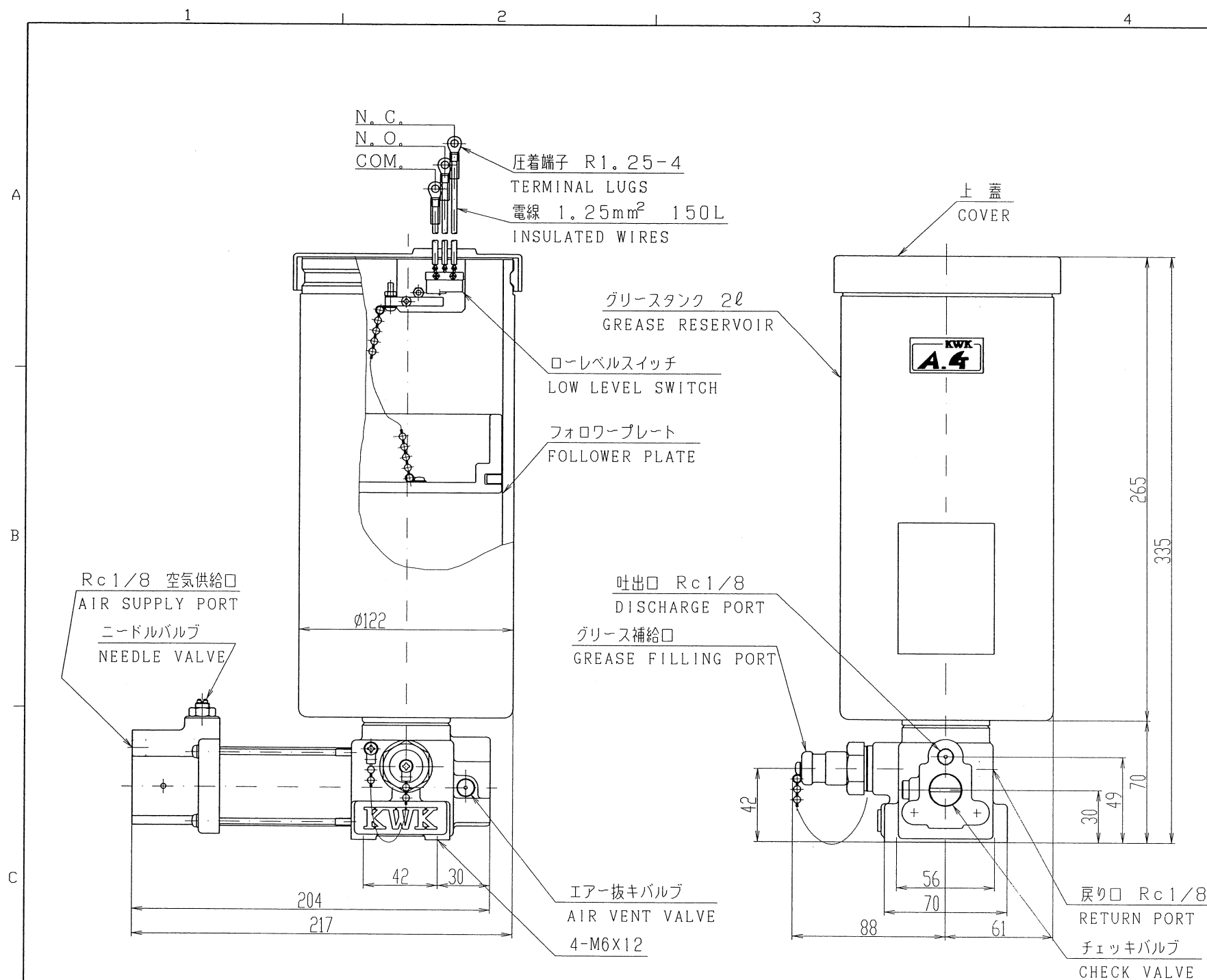


吐出圧力性能曲線  
Performance Curves

注記。  
エアーコントロールパネルを必ず使用して下さい。  
(フィルター、オイルー、レギュレーター、電磁弁)

Remarks  
Air control panel should be installed on the  
air supply pipes of the grease pump unit.  
(Air control panel with filter, lubricator, regulator and solenoid valve)

CUSTOMER			
SPECIFICATION			
CHECKED BY 藤	DRAWN BY Y. MIYAZAKI	空圧式給油ポンプ PNEUMATIC LUBRICATING PUMP KSP-502 組立図	
SEC. CHIEF 宮	DESIGNED BY K. TANAKA ' 93. 4. 30		
KOWA CORP. USAKA JAPAN			
 3RD ANGLE PROJECTION		DWG. No. KS-803961	
		CFD. No.	
		CODE No.	
		SCALE	1/2



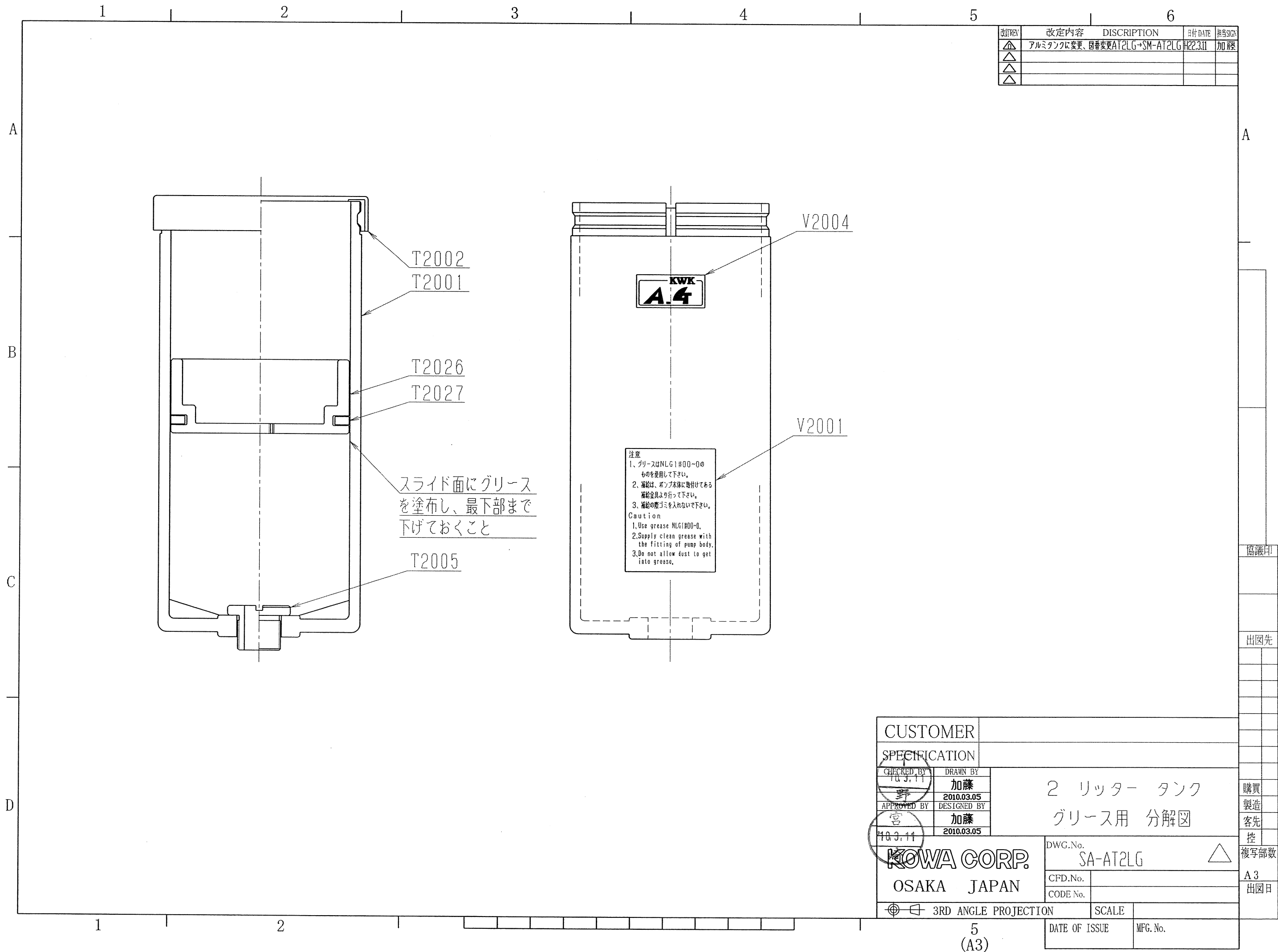


# KSP-502G 分解図 用品リスト

## KSP-502 Disassembly parts list

品番 No.	名称 part name	部品番号 part No.	数量 quantity	備考 remarks
1	KSP-502 ホンプ本体(A) KSP-502 Pump body (A)	D3001	1	KS-800689
2	KSP-502 ホンプ本体(B) KSP-502 Pump body (B)	D3002	1	KS-800690
3	ピストン Piston	D3003	1	KS-800692
4	エアシリンダ Air cylinder	D3004	1	KS-800691 Φ45X2.5tX80L
5	プランジャー Plunger	D3005	1	KS-800694 Φ7x52
6	コイルスプリング Coil spring	D3006	1	KS-800693
7	コイルスプリング Coil spring	D3007	2	KS-800700
8	切換バルブ Switching valve	D3008	1	KS-800695
9	バルブガイド Valve guide	D3009	1	KS-801606
10	イタバネ Leaf spring	D3010	1	KS-800699
11	バルブ押さえ Valve retainer	D3011	1	KS-801483 M20X12
12	バルブロッド Valve rod	D3012	1	KS-800697
13	十字穴付ナベネジ Round head Phillips screw	D3013	4	M4X95L
14	スプリング押え Spring retainer	D3014	1	KS-800701
15	ニードルバルブ Needle valve	D3015	1	KS-800702
16	PGYパッキン PGY packing	D3025	1	PGY-40
17	ベアリング WRI Bearing WRI	D3026	1	GW0623-P0
18	吸込口継手 Inlet joint	T2105	1	KS-800552
19	AGホンプ型式銘板 Pump model nameplate	V1005	1	KS-801015
20	チェッキ本体 Check body	X1001	1	KS-801474
21	チェッキバックアップリング Check backup ring	X1002	1	KS-801475
22	シートパッキン Sheet packing	X1003	1	KS-800913
23	コイルスプリング Coil spring	X1004	1	KS-801477
24	エア抜きプラグ Air bleeding plug	X1005	1	KS-800124
25	補給口金具 Supply port fitting	X1101	1	KS-800116
26	スプリング Spring	X1102	1	KS-800118
27	補給口キャップ Supply port cap	X1103	1	KS-800514
28	銅パッキン(補給口) Copper packing (supply port)	X3013	1	φ26Xφ20.5X1.5T
29	Oリング O ring	Z1009	1	1A P12.5
30	Oリング O ring	Z1101	1	1B P3
31	Oリング O ring	Z1104	1	1B P7

32	リング O ring	Z1108	1	1B P11
33	リング O ring	Z1109	1	1B P12
34	リング O ring	Z1117	1	1B P32
35	リング O ring	Z1201	1	1A G35
36	鋼球 Steel ball	Z2001	3	1/8 (φ 3.175)
37	鋼球 Steel ball	Z2005	1	1/4 (φ 6.35)
38	鋼球 Steel ball	Z2006	1	5/16 (φ 7.9375)
39	ボールチェーン Ball chain	Z2201	1	φ 4×30M BB40
40	チェーンコネクタ Chain connector	Z2202	2	φ 4 BBP-40K
41	沈みプラグ Sunk head plug	Z5001	2	R 1/8
42	スプリングピン Spring pin		1	φ 3 × 18L
43	ピン Pin		1	φ 3 × 8L
44	六角ボルト Hexagon bolt		1	M6 × 15L
45	十字穴付ナベ小ネジ Round head Phillips screw		2	M4 × 8L
46	六角ナット Hexagon nut		1	M8(3種)
47	バネ座金 Spring washer		4	M4
48	バネ座金 Spring washer		1	M6
49	平座金 Flat washer		1	M6





改訂REV	改定内容	DISCRIPTION	日付DATE	担当SIGN
△	アルミタンクに変更、図番変更AT2LGLS→SM-AT2LGLS		H22.3.11	加藤
△	ボールチェーン長さ変更。200L→190L		H26.11.28	勝取
△				
△				

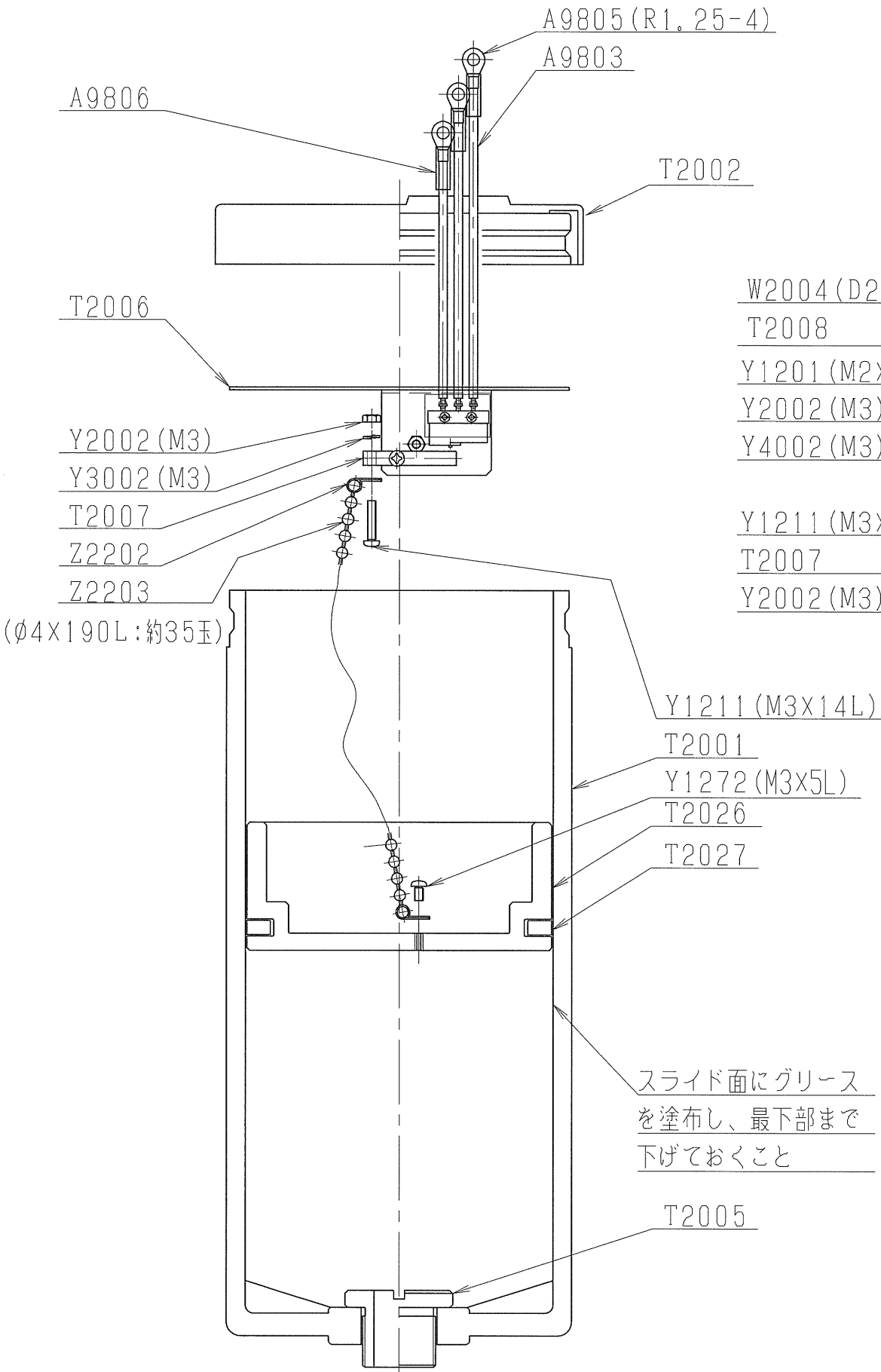
A

A

B

C

D



注意  
1、グリースはNLGI#00~0のものを使用して下さい。  
2、補給は、ポンプ本体に取付けてある補給金具より行って下さい。  
3、補給の際ゴミを入れないで下さい。  
Caution  
1, Use grease NLGI#00~0.  
2, Supply clean grease with the fitting of pump body.  
3, Do not allow dust to get into grease.

CUSTOMER

SPECIFICATION

CHECKED BY	DRAWN BY
14.11.28	加藤
APPROVED BY	DESIGNED BY
14.11.28	加藤
	2010.03.05

2リッタータンク  
ローレベルスイッチ付分解図

KOWA CORP.  
OSAKA JAPAN

DWG.No.  
SA-AT2LGLS

CFD.No.  
CODE No.

3RD ANGLE PROJECTION

SCALE

DATE OF ISSUE

MFG. No.

5  
(A3)

協議印

出図先

購買  
製造  
客先  
控  
複写部数

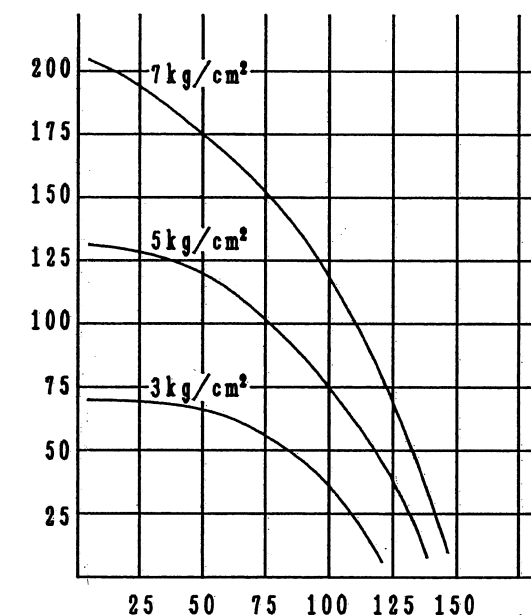
A3  
出図日

図面表
△
△
△
△

# 仕様 Specification

型式 Model	適用油 Lubri- cate	タンク 容量 (ℓ) Reservoir capacity	吐出量 (cc/st.) Discharge capacity	吐出 圧力 (kg/cm <sup>2</sup> ) Discharge pressure	ポンプ レシオ Pump Ratio	重量 (kg) Weight
KSP-502L	オイル Oil	2	0.5	30~100	1/32.6	4.5

吐出圧力 kg/cm<sup>2</sup>  
Discharge Pressure



吐出圧力性能曲線  
Performance Curves

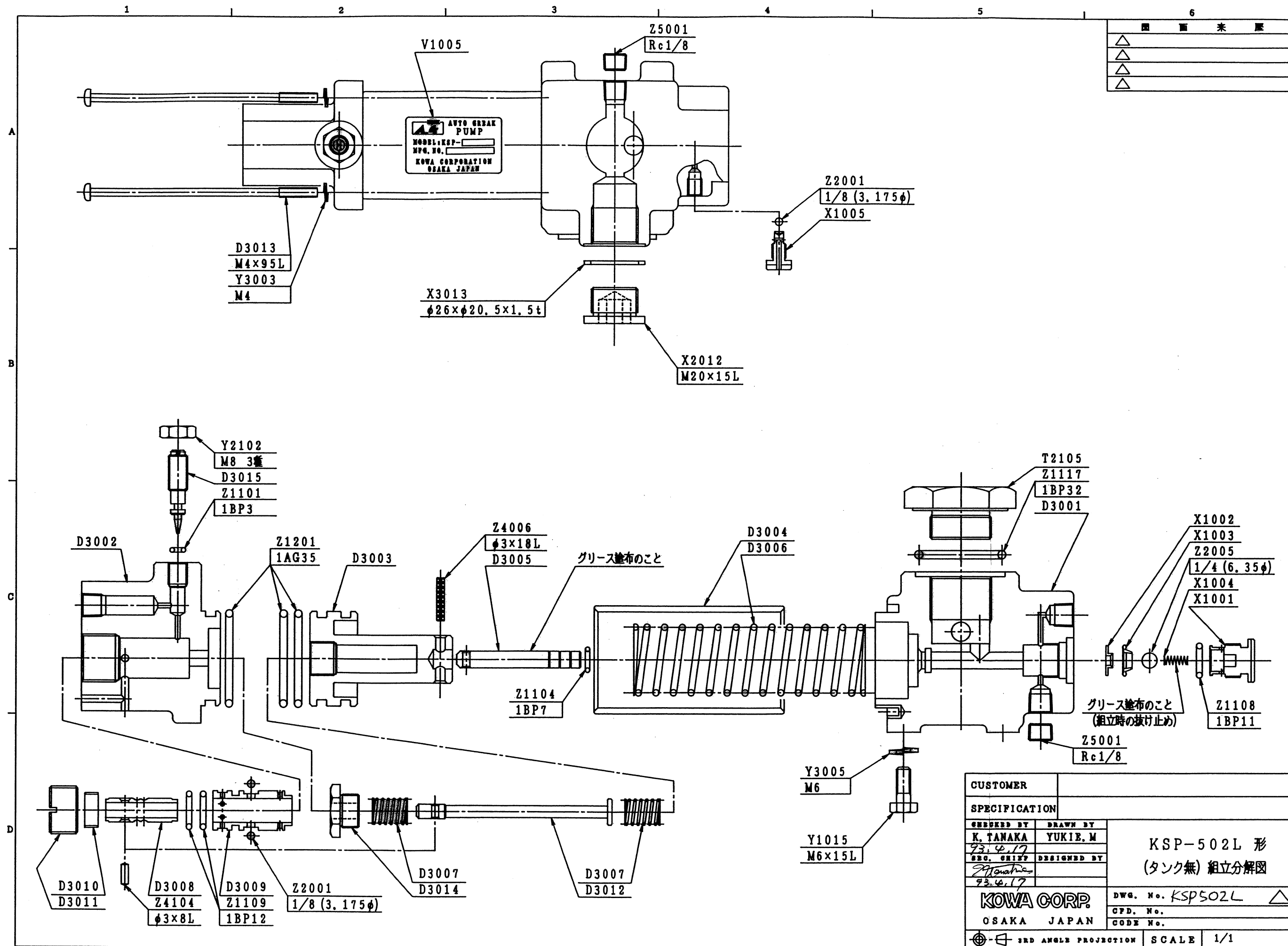
## 注記.

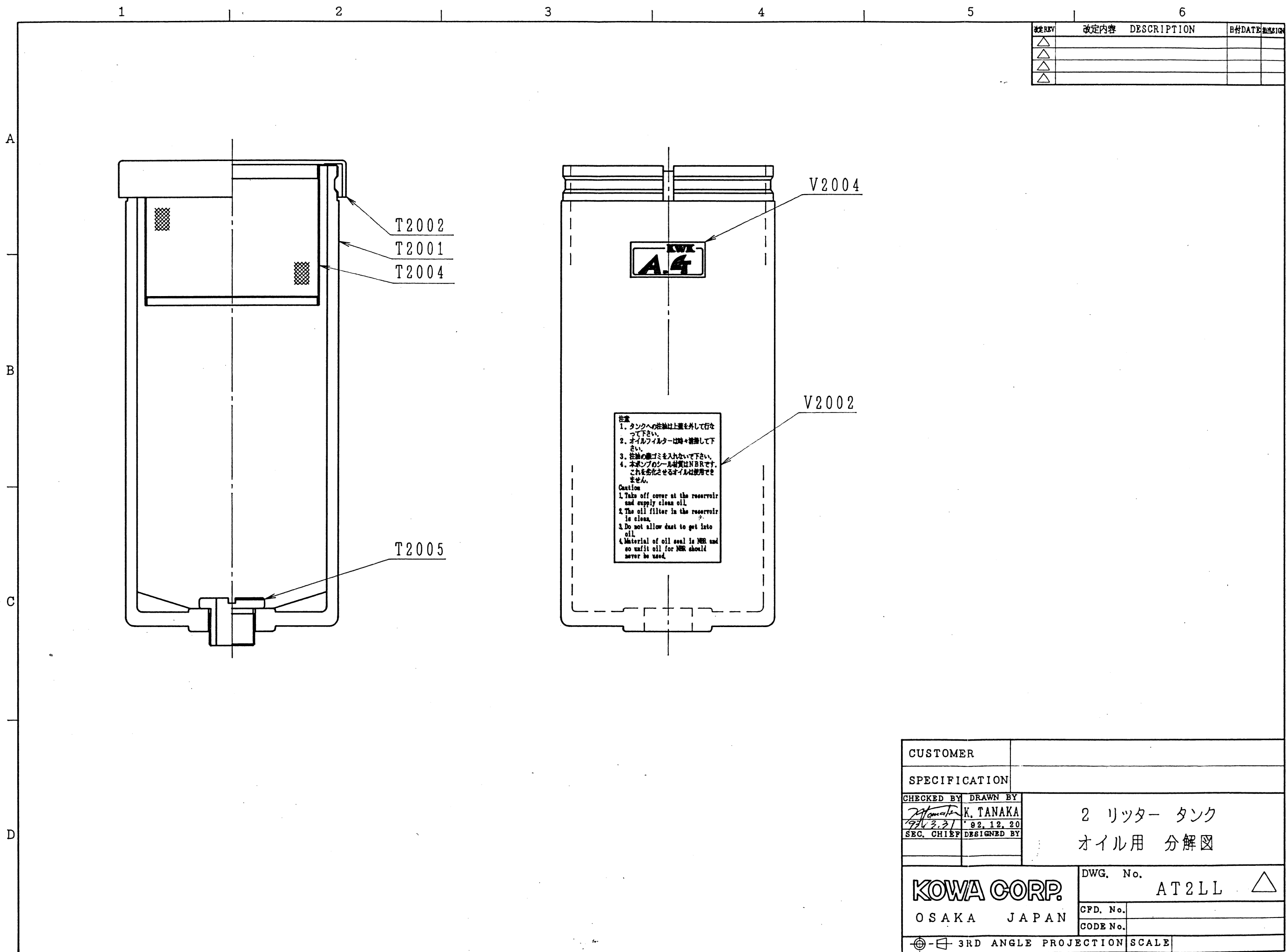
エアコントロールパネルを必ず使用して下さい。  
(フィルター、オイラー、レギュレーター、電磁弁)

## Remarks

Air control panel should be installed on the  
air supply pipes of the grease pump unit.  
(Air control panel with filter, lubricator, regulator and solenoid valve)

CUSTOMER			
SPECIFICATION			
CHECKED BY K. TANAKA 93.4.30	DRAWN BY Y. MIYAZAKI	空圧式給油ポンプ PNEUMATIC LUBRICATING PUMP KSP-502L 組立図	
DESIGNED BY 73.4.30			
KOWA CORP. OSAKA JAPAN		DWG. No. KS-803965	△
		CFD. No.	
		CODE No.	
3RD ANGLE PROJECTION		SCALE	1/2





REV	改定内容	DESCRIPTION	DATE	SIGN
△				
△				
△				
△				

注意  
1. タンクへの注油は上蓋を外して行な  
って下さい。  
2. オイルフィルターは時々清掃して下  
さい。  
3. 注油の際ゴミを入れないで下さい。  
4. 本ポンプのシール材質はNBRです。  
これを劣化させるオイルは使用でき  
ません。  
Caution  
1. Take off cover at the reservoir  
and supply clean oil.  
2. The oil filter in the reservoir  
is clean.  
3. Do not allow dust to get into  
oil.  
4. Material of oil seal is NBR and  
so unfit oil for NBR should  
never be used.

CUSTOMER			
SPECIFICATION			
CHECKED BY <i>K. Tanaka</i> 92.3.31	DRAWN BY K. TANAKA 92.12.20	2 リッター タンク オイル用 分解図	
SEC. CHIEF DESIGNED BY			
KOWA CORP.		DWG. No. AT2LL △	
OSAKA JAPAN		CFD. No.	
		CODE No.	
3RD ANGLE PROJECTION		SCALE	