

DUAL LINE LUBRICATING SYSTEM

MANUAL OPERATED LUBRICATING PUMP

MODEL KMP-221, -231, -261
-231-WP, -261-WP
-121L

INSTRUCTION MANUAL

KOWA CORPORATION

2019.1.17

PRECAUTIONS OF SAFETY

Before the installation, operation, maintenance and inspection, read carefully this instruction manual and other accompanying documents for correct service. Familiarize with the knowledge of equipment. Information of safety and all of cautionary instructions for service.

The precautions of safety are given to each equipment by using safety mark.

The precautions of safety is shown in each equipment of the centralized lubricating system by using safety mark

Particular attention should be called to the places where these safety marks are given.

The safety marks are divided into "WARNING" and "CAUTION".



If mishandled: In case a dangerous situation may occur, it could result in death or serious injury.



If mishandled: In case a middle injury or light injury, and in case a physical damage may occur.

For the matter being mentioned in the CAUTION, it may result in an importance according to circumstances. The important content is given to all of safety mark, and obey it without fail.

This system provides the max. working pressure 21MPa(210kg/cm²).

When each equipment is disassembled and inspected, stop the operation of pump, and release the pressure to perform the operation as 0MPa(0kg/cm²).

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1. FEATURES OF DUAL LINE LUBRICATING SYSTEM

As the composition of industrial machines and devices becomes more integral and intricate, lubrication control of higher order is to be demanded.

DUAL LINE integrated lubricating system is an automatic lubricating device for central lubrication of predetermined quantity of grease (or oil) to a number of lubricating points, developed to meet the requirements for lubrication control of higher level.

Since the required quantity of grease (oil) is supplied to the necessary points without any manual operation, the lubrication work can be rationalized while realizing labour-saving. Besides the effect of easier lubrication control, the system also serves to reduce the running cost.

1) Rationalized Lubricating Work by Optimum Lubrication Avoiding Any Loss of grease and Mis-Operation

Labour saving in lubrication work can be realized by changing from manual drop oiling to scheduled central lubrication. Since the lubrication is automated, lubricant can be supplied in adequate quantity even while the machine is in operation. The centralized arrangement also eliminates the need approach the machines serving for prevention of hazard.

Careless overlook of lubricating points and omitted lubrication are also prevented.

2) Scheduled Lubrication Saving Loss of Grease

Lubrication is scheduled quantity of oil by the measuring valves prevents overs and shorts of grease (or oil) to each lubrication point avoiding any loss of grease or oil.

3) Reduces Running Cost While Serving for Production Control

Adequate and exact lubrication is scheduled quantity minimizes bearing wear and substantially extend the service life. This means saving in cost and labour for bearing replacement and significant improvement in the operating ratio of machines. The reduced bearing friction saves the power cost as well.

4) Makes Lubricant More Durable and Keeps Best Lubrication at All Times

Since the grease (oil) is kept off the atmospheric air all the way from the tank to the lubricating point, there is no worry of deterioration and inclusion of foreign substance, which enables supply of clean grease (oil) at all times.

2. PRINCIPLE OF OPERATION OF DUAL LINE LUBRICATING SYSTEM

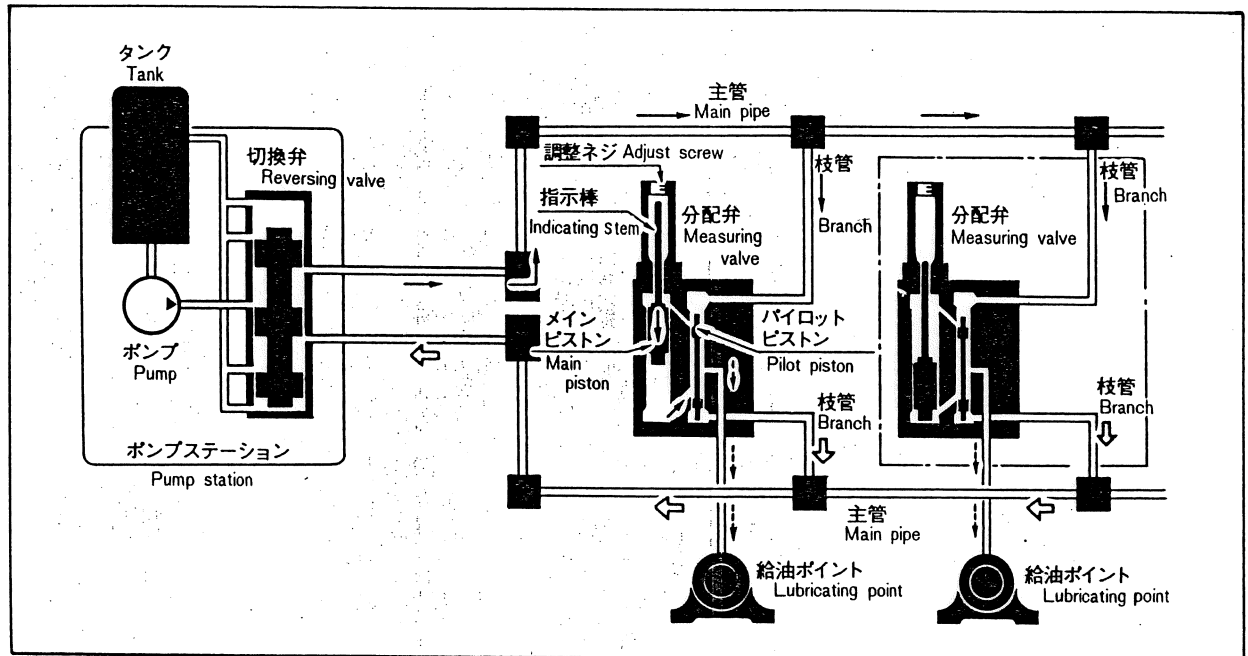


Fig.1

The lubricant (grease or oil) in the tank is sucked and discharged by the oil pump then is transferred to the upper main pipe by pressure through the reversing valve and is delivered to the measuring valves. In the measuring valve (left side), the lubricant pushes down the pilot piston to open the passage to the main piston. Then the lubricant acts on the upper part of the main piston to push it down. The lubricant staying under the main piston by the previous motion is pushed out as shown by arrows and is supplied to the lubricating points going through the pilot piston. At the end of operation, each piston is in the condition as shown by the right side measuring valve.

For the next lubrication, the reversing valve is changed, then the lubricant flows to the lower main valve and the measuring valves are operated in reverse way as described above to feed the lubricant to the lubricating points.

3. FEATURES AND OPERATION OF MANUAL TYPE END SYSTEM

* Features

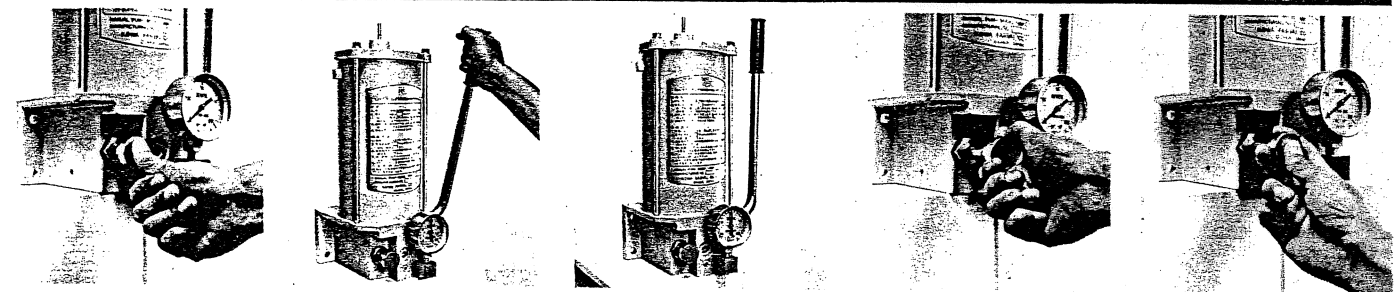
- 1) Most economical lubricating system of simple mechanism
- 2) Best suited for small scale facility
- 3) Simple operation for accurate lubrication
- 4) Suitable for such uses with comparatively long intervals of lubrication

* Operation

The lubricant from the pump goes through the reversing valve (with the handle fully pushed out or pulled to this side) and is transferred to either one of the two main pipes. When the measuring valves operate to complete feeding, the main pipe pressure increases quickly and the end of grease feeding is indicated on the pressure gauge.

For the next lubrication, the reversing handle of the reversing valve is turned to the opposite position (pulled fully to this side or pushed out to the end), then the lubricant is transferred by pressure to the main pipe at the opposite side as before, and the measuring valves operate for lubrication.

■ 操作方法 METHOD OF OPERATION



1. 切換バルブハンドルを一杯に押し込みます。
1. Push in the reversing valve handle to the full stroke.
2. 圧力計が所定の圧力(全分配弁作動圧力)になるまでポンプハンドルを前後に動かします。
2. Manipulate the pump handle back and forth until the pressure gauge indicates a specified point (working pressure of all measuring valves).
3. 全給油ポイントへの給油保証のために、しばらくのあいだ圧力保持を行います。
3. Hold the specified pressure for a while in order to guarantee perfect lubrication to all necessary points.
4. 次に切換バルブハンドルを手前に一杯引き戻して、上記②～③の要領で操作します。
4. Then pull back the reversing valve handle fully, and repeat steps 2. and 3.
5. そして、ライン圧を解除するために切換バルブハンドルを一杯に押し込んでください。以上①～⑤の操作で分配弁の指示棒が1往復(1サイクル)します。
5. Again push in the reversing valve handle fully in order to release the line pressure.

Fig.2

* Piping

- 1) Steel pipes are ordinarily used for the main pipes and the branch pipes, and copper tubes are used for the grease feed pipes.
- 2) Rubber hoses and rotary joints are used for the moving parts.
- 3) The measuring valves are used for bearings and others which require low quantity of lubricant so as to distribute the lubricant supplied by the master measuring valve further in smaller quantity.

4. STRUCTURE AND SPECIFICATIONS OF MANUAL TYPE GREASE(OR OIL) PUMP

This manual type grease pump is small sized and is handy since the operation is performed only by reciprocating the handle. This pump is advantageous for such uses of comparatively less frequent lubrication with less number of lubricating points. Using the pump of higher pressure 210 kg/cm² type, (100 kg/cm² type used oil) the piping can be smaller in diameter and harder lubricating condition can be met. The tank capacity is also available in three different types of 2 liters (for oil), 3 liters, or 6 liters to be selected suitable for the quantity of grease used, and depending also on the installation space, lubrication frequency, and piping condition.

This pump is also used popularly as the space pump for motor driven type grease pumps. Only the tank of 2 liters capacity is transparent.

5. KIND AND COMPOSITION OF MEASURING VALVES

The following types of measuring valves are used for the DUAL LINE integrated lubrication system depending on the number of oil ports and on the quantity of lubricant supplied each time.

For the outline dimensions and specifications, please refer to the materials shown on the following pages.

KS type (Single discharge port type)

- An abundant delivery may be obtained from one discharge port.
- Since lubricating pistons operate in parallel system, unused discharge ports may be covered with blind plug.
- Lubricating grease quantity may be adjusted in individual discharge ports.
- Each piston is provided with indicator stem for monitoring of state of lubrication.
- Grease quantity can be adjusted with adjusting screw.
- Measured discharge mechanism-specified quantity of grease is always discharged from each discharge port.
- A constant rate measuring system is incorporated to provide always a constant discharge rate.

KW type (Double discharge port type)

- Discharge ports are provided in multiple. This is ideally suited for the case when there are many lubricating ports.
- Lubricating pistons are operated in parallel system.
- Adjustment of the number of lubricating ports is possible only in one place at the left end. This is carried out by removing the blinded screw of the communicating port. The discharge rate will be doubled by this adjustment.
- Each piston is provided with indicator stem for monitoring of state of lubrication.
- Pressure is less than 100kg/cm² for oil service.
- Grease quantity can be adjusted with adjusting screw.

6. CAUTIONARY INSTRUCTION FOR MAINTENANCE

- (1) Before operating the pump, please check the oil level in the grease tank.
Refrain from operating the pump if the follower rod indication is below the minimum oil level. If the tank is empty, replenish grease by using a filling pump (a grease pack enables direct filling of grease to the supply port of the pump from a pail can or square can).
Strictly refrain from opening the upper lid of the pump to supply grease by grabbing with the fingers, for example, as air and dust are allowed inside.
- (2) Before operating the pump handle, the handle of the reversing valve should be pushed fully to the end or pulled completely to this side. Note that the pump handle does not move unless the reversing valve is pushed or pulled to the end, and the pump may be broken if operated forcefully.
- (3) If the pressure increases for the next lubrication with far less number of times of pump handle than the specified number of times, the reversing valve handle shall be turned to the opposite side to repeat the operation all over again as it indicates that the lubricant is continuously supplied to the same main pipe.
Continuous feeding to the same main pipe does not operate the measuring valve and the lubrication falls.
- (4) For newly installed lubricating device, make sure, before operation, that grease is filled to all the pipes (main pipes, branch pipes, and greasing pipes) and the air is drawn completely.
The air mixed in the piping causes such troubles as exceptionally larger number of times of pump handle operation and unstable operation of the measuring valves.
- (5) For this lubricating device, use an extreme-pressure grease of about 310 to 400 fluidity (NLGI #1 to #0).
Use of low fluidity grease increases flow resistance in the piping preventing smooth operation. Since the property of grease differs depending on each kind, adequate grease to the condition of lubrication shall be selected.
- (6) By checking the motion of the indicator rod of the measuring valve (completely raised or lowered), make sure that the lubricant is distributed completely to the whole points of lubrication at certain intervals.
- (7) Periodically disassemble the Y-strainer in the middle of the piping to clean the filter in the strainer.
- (8) Periodically check the piping for no breakage or no slackening.

7. TROUBLE-SHOOTING

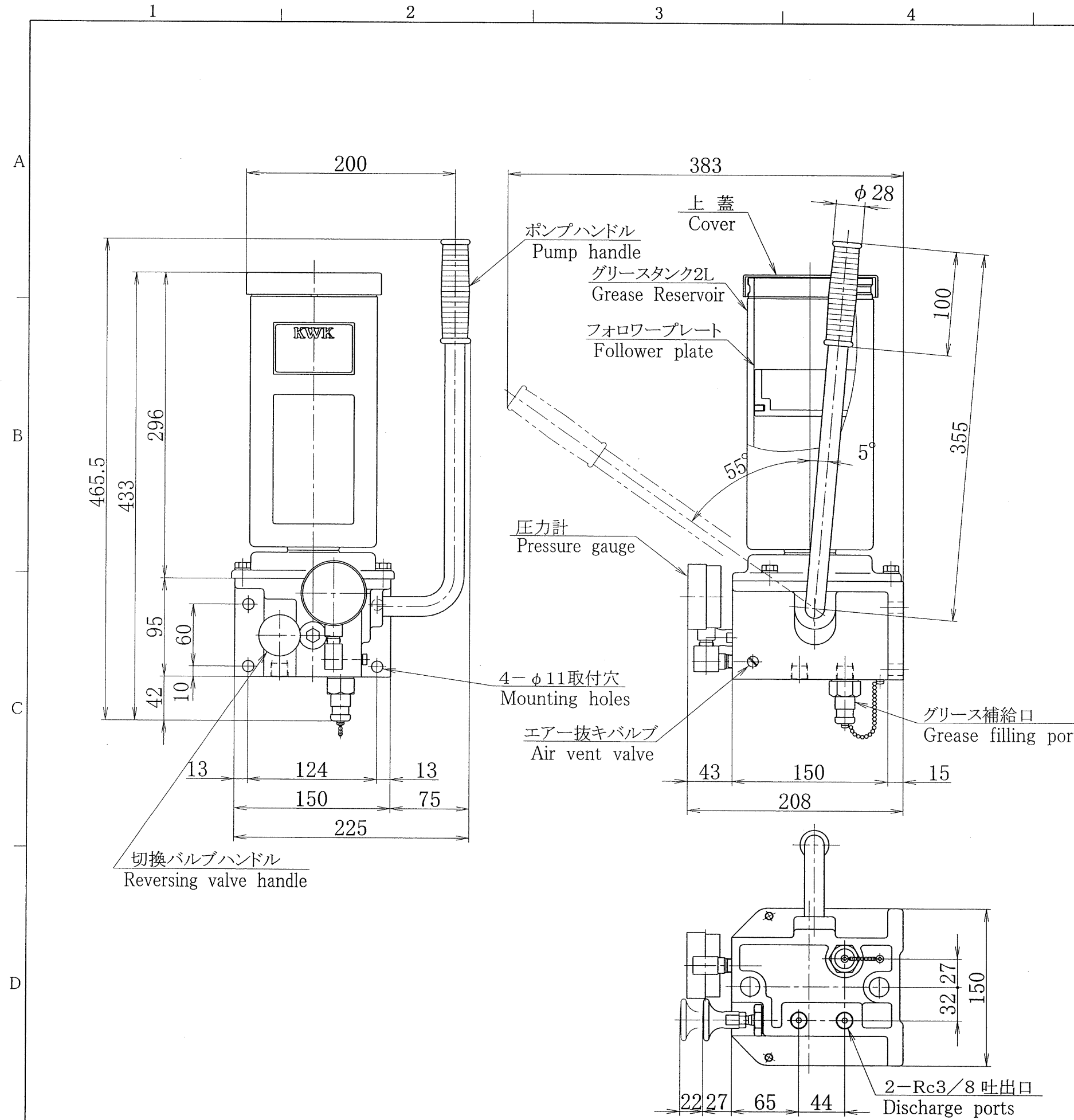
Trouble	Condition	Cause	Counter-measures
Pressure does not increase.	Pump handle does not resist at all.	(1) Air is allowed in the tank and sucking of grease fails.	(1) Replace the grease with the one of the specified fluidity. (2) Push down the follower plate on the top and operate the pump handle at the same time. At this time, keep the air vent of the pump loose and keep operating the pump handle until grease comes out of the air vent.
		(2) Suction inlet of the plunger is loaded with foreign substance preventing grease suction.	(1) Draw out the grease in the tank for cleaning.
		(3) There is no grease in the tank. (The follower rod is lowered.)	(1) With a filling pump, replenish grease to the specified level.
	Number of times of pump handle operation is exceptionally large.	(1) Leakage or breakage of piping.	(1) Repair or replace.
		(2) Malfunction of check valve of the pump. (Clogging of dust on the valve seat)	(1) Disassemble for cleaning or replace if damaged.
		(3) Air is allowed in the piping (main pipe).	(1) Remove the plug at the end of the piping to draw out the air. (Including the branch)
	Others	(1) Defective pressure gauge.	(1) Repair or replace the pressure gauge.
		(1) Interference of pinion gear of the pump with plunger.	(1) Disassemble for repair or replace.

Trouble	Condition	Cause	Counter-measures
Pressure increases but measuring valve does not operate.	Pump handle is unusually heavy or can not be moved.	(1) Blocking of piping (main pipe) (Broken or loaded with foreign substance)	(1) Repair the pipe or clean the inside, or replace the section.
		(2) Blocking of oil passage in the pump. (Grease does not come out of the pump outlet.)	(1) Disassemble for cleaning.
		(3) Valve handle is not switched completely.	(1) Shift the handle to the correct position (pull or push fully to the end.) (2) Disassemble for adjustment or cleaning (if clogged with foreign substance).
		(4) Grease is supplied to the same pipe side as the preceding lubricating without switching the oil passage by the valve handle.	(1) Shift the valve handle.
		(5) Piping is too long or pipe diameter is too small.	(1) Increase the number of units of pump suitably to the performance range (if the piping is too long). (2) Replace the pipe to suitable size or use grease of higher fluidity (if the pipe diameter is too small).
		(6) Viscosity of grease is too high.	(1) Change the grease to the one with specified fluidity.
		(7) Defective measuring valve.	(1) Disassemble for repair or replace.

Trouble	Condition	Cause	Counter-measures
Pressure increases but measuring valve does not operate.	Pressure comes down immediately to zero when the pump handle is stopped even if the switching pressure point is reached.	(1) Malfunction of check valve	(1) Disassemble for cleaning or replace.
		(2) Leakage or breakage of piping (main pipe)	(1) Repair.
	A part of the measuring valves does not function even when the normal switching pressure is reached.	(1) Piston in the measuring valve is clogged with foreign substance.	(1) Disassemble for cleaning.
		(2) Blocking of oil feed pipe (between measuring valve and bearing)	(1) Clean inside of the pipe or repair.
		(3) Strain due to unreasonable fastening at attaching.	(1) Loosen the fixing bolts. Replace the valve if it still fails to operate.
		(4) Back pressure of bearing is too high or oil feed pipe is too thin or too long.	(1) Attach a check valve to the outlet of measuring valve. (2) Increase pump switching pressure. (3) Reduce the quantity of grease supplied or provide a relief valve for the bearing if the bearing is over-filled with grease.

8. CAUTIONALY INSTRUCTIONS FOR PIPING WORK

- (1) Install the pump at a place of easy operation and avoid heat, dust, rain, etc. as much as possible.
In a place where the atmosphere affects the pump, attach the protective cover to the pump. Install the pump vertically as far as possible.
Also attach the measuring valves to the positions easy to inspect.
- (2) Before proceeding to piping work, clean inside by full flushing to eliminate any residual rags, chips and other foreign substances.
Foreign substances can cause malfunction of respective units of the lubricating device and also cause wear and damage of the bearings to be lubricated.
- (3) The external piping system is as shown in FIG.2.
Be sure to keep connection of the measuring valves in the same direction so as to keep the motion of measuring valve indicator rods uniform for easier inspection.
- (4) Since lubricant is transferred by high pressure in this lubricating device, piping materials for high pressure (normally 100 kg/cm² or 210 kg/cm² for the main and branch pipes and normally 30 kg/cm² for the oil feed pipe). Use of pipes for low-pressure application is hazardous not to mention breakage of the pipes.



改定REV	改定内容 DESCRIPTION	日付DATE	担当SIGN
△	SI単位系へ変更	H15.01.09	大下
△	フォロワープレート変更	H22.5.18	大門
△			
△			

仕様 Specification

形式 Model	KMP-221
タンク容量 Reservoir capacity	2 lit.
吐出量 Discharge capacity (Max)	4.5cm ³ /stroke
吐出圧力 Discharge pressure (Max)	20.6MPa(210kg/cm ²)
取付ボルト・ナット(付属) Mounting bolts & nuts	M10×40L 4sets (Attachment)
標準塗装色 Standard body color	マンセル記号 (Munsell) 2.5G6/2
質量 MASS	16 kg

CUSTOMER			
SPECIFICATION			
加 CHECKED BY 10.5.18	DRAWN BY YUKIE. M	KMP-221手動式給油ポンプ HAND-OPERATED LUBRICATING PUMP	
藤 SPEC. CHIEF 吉	DESIGNED BY K. TANAKA		
10.5.18			
藤 KOWA CORP.	DWG. No.		△ 2
OSAKA JAPAN	KMP-221		
	CFD. No.		
	CODENo.		
3RD ANGLE PROJECTION		SCALE	1/4

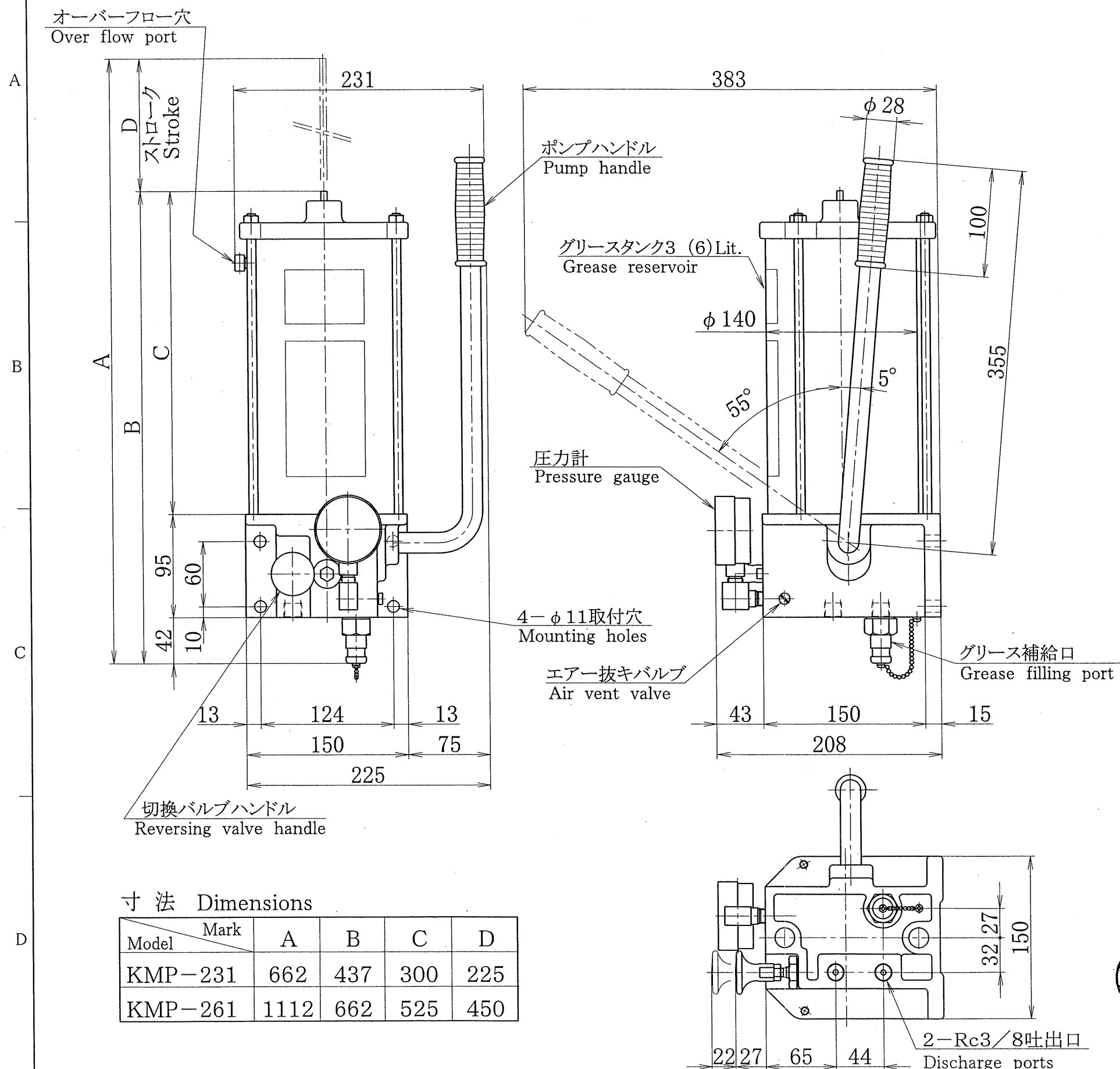
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仕様 Specification

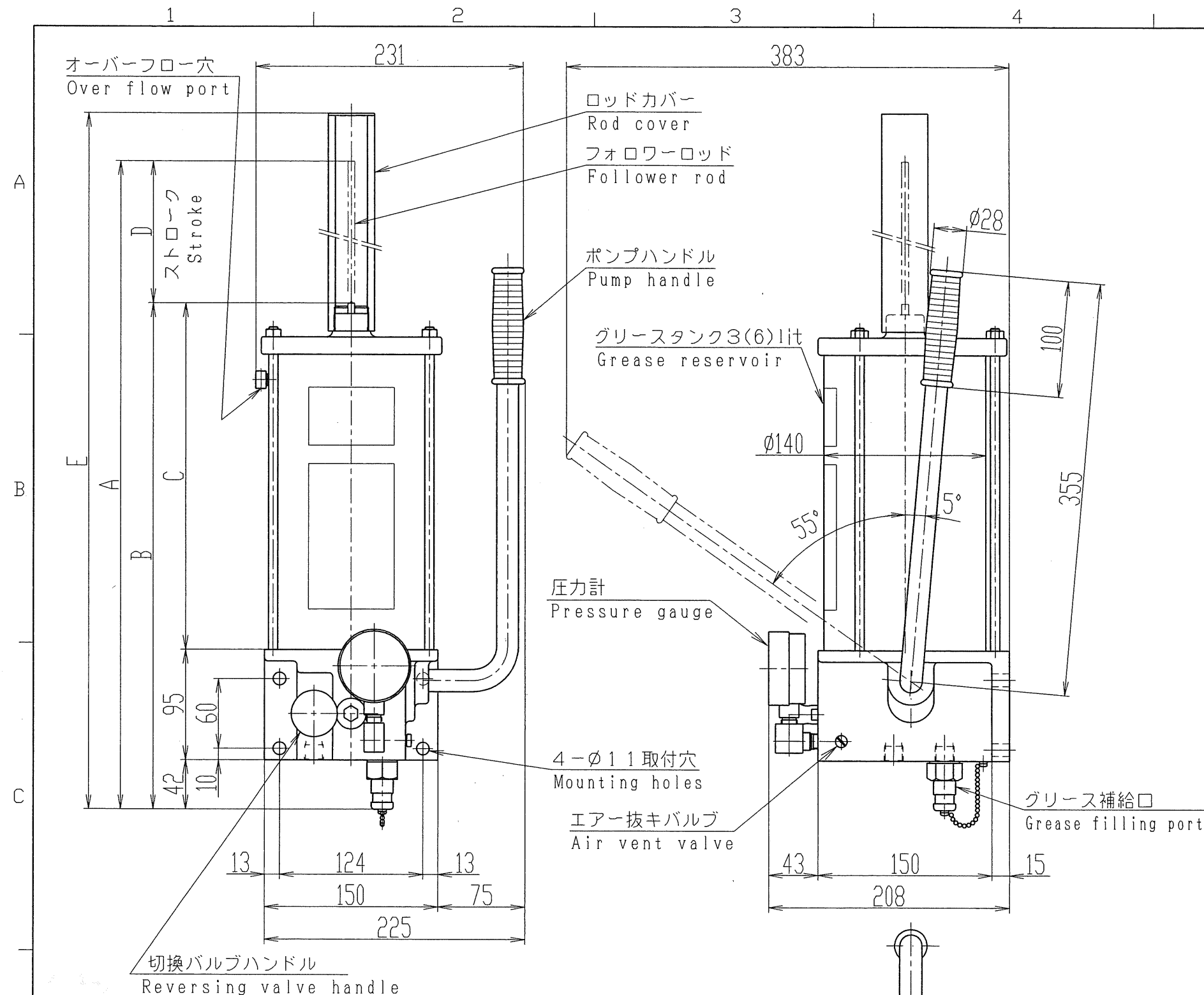
形式 Model	KMP-231	KMP-261
タンク容量 Reservoir capacity	3 lit.	6 lit.
吐出量 Discharge capacity (Max)	4. 5cm ³ /stroke	
吐出圧力 Discharge pressure (Max)	20. 6MPa	
取付ボルト・ナット(付属) Mounting bolts & nuts	M10×40L 4sets (Attachment)	
標準塗装色 Standard body color	マンセル記号 (Munsell) 2. 5G6/2	
質量 Mass	20 kg	23 kg

寸法 Dimensions

Model	Mark	A	B	C	D
KMP-231		662	437	300	225
KMP-261		1112	662	525	450



CUSTOMER			
SPECIFICATION			
CHECKED BY 15. 1. 10	DRAWN BY K. TANAKA	KMP 手動式給油ポンプ HAND-OPERATED LUBRICATING PUMP	
SEC. CHIEF	DESIGNED BY K. TANAKA		
15. 1. 10			
KOWA CORP.		DWG. No.	KMP-231 1
OSAKA	JAPAN	CFD. No.	
3RD ANGLE PROJECTION		CODE No.	
		SCALE	1/4



寸法 Dimensions

Model	Mark	A	B	C	D	E
KMP-231		662	437	300	225	703
KMP-261		1112	662	525	450	1137

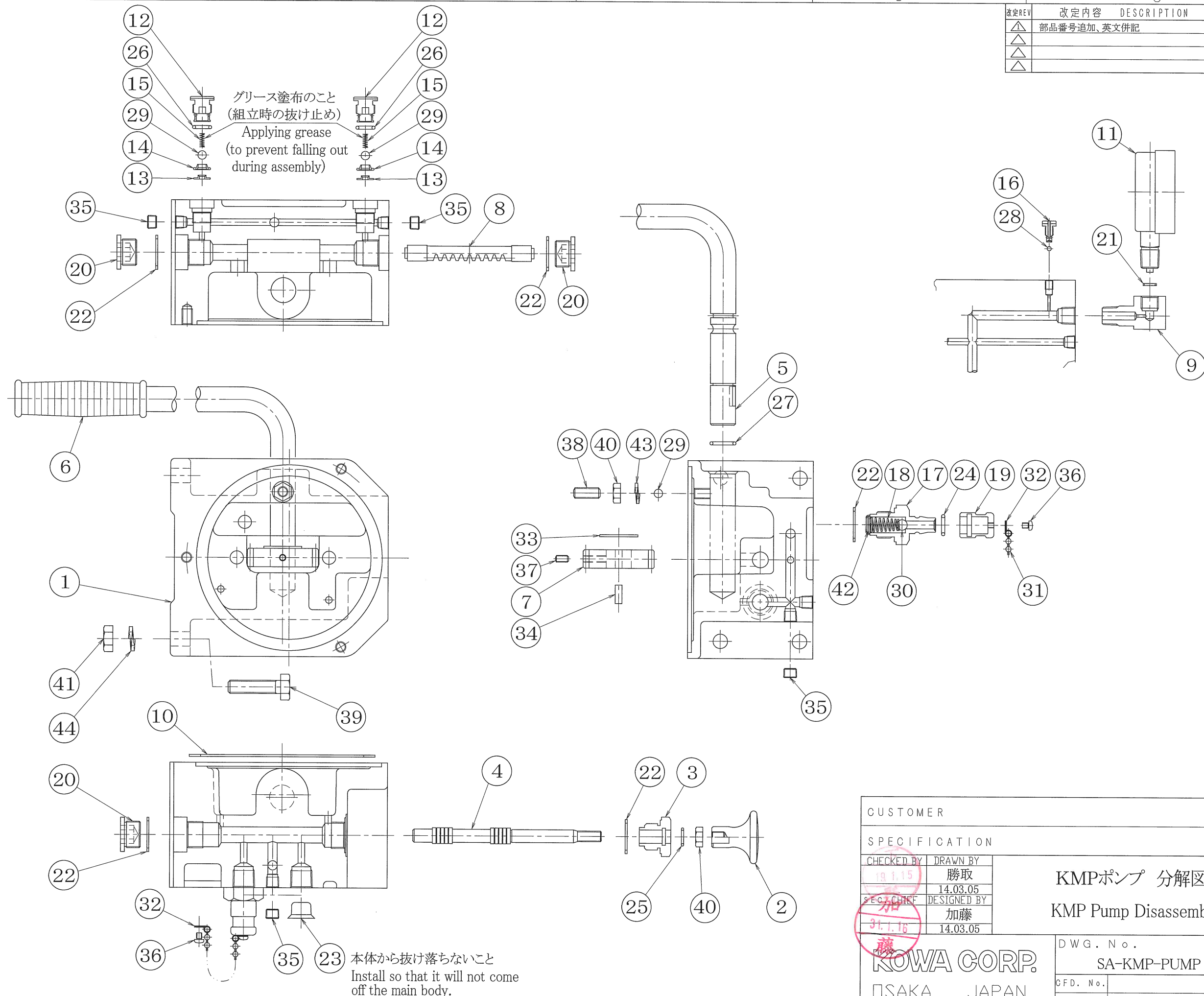
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△			
△			

仕様 Specification

形式 Model	KMP-231-WP	KMP-261-WP
タンク容量 Reservoir capacity	3 lit.	6 lit.
吐出量 Discharge capacity (Max)	4.5cm ³ /stroke	
吐出圧力 Discharge pressure (Max)	20.6MPa	
取付ボルト・ナット (付属) Mounting bolts & nuts	M10X40L 4sets (Attachment)	
標準塗装色 Standard body color	マンセル記号 (Munsell) 2.5G6/2	
質量 MASS	20 kg	23 kg

CUSTOMER	
SPECIFICATION	
CHECKED BY A.O.	DRAWN BY Y.M.
2006.01.31	1999.7.23
SEC. CHIEF	DESIGNED BY K. TANAKA
06.1.31	1999.7.23
KOWA CORP.	DWG. No. KMP231WP
OSAKA JAPAN	CFD. No.
	CODE No.
3RD ANGLE PROJECTION	SCALE 1/4

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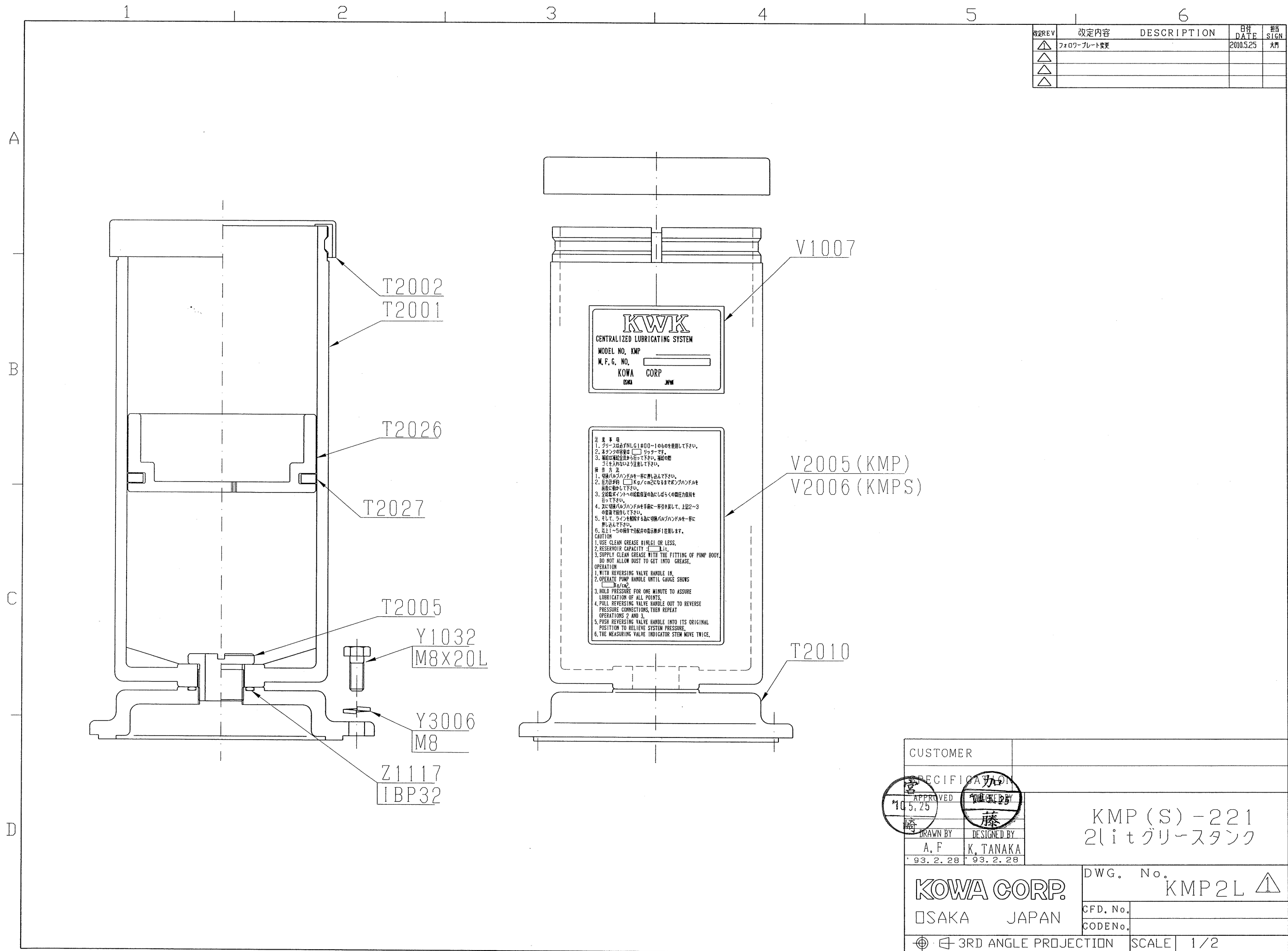
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19.1.15	勝取		
14.03.05			
DESIGNED BY			
加藤		<div> <div>DWG. No.</div> <div>SA-KMP-PUMP</div> </div>	
14.03.05			
<div> <div>KOWA CORP.</div> <div>OSAKA JAPAN</div> </div>		<div> <div>CFD. No.</div> <div></div> </div>	<div> <div>CODE No.</div> <div></div> </div>
<div> <div>3RD ANGLE PROJECTION</div> </div>		<div> <div>SCALE</div> <div></div> </div>	

KMP ポンプ分解図 用品リスト

KMP Pump Disassembly parts list

品番 No.	名称 part name	部品番号 part No.	数量 quantity	備考 remarks
1	KMPポンプ本体 KMP Pump body	B1002	1	KS-800507
2	切換バルブハンドル Switch valve handle	B1003	1	KS-800120
3	切換バルブ押え Switching valve retainer	B1004	1	KS-800498
4	切換バルブ Switching valve	B1005	1	KS-800214 ϕ 12X143
5	ハンドル(KMP) Handle	B8001	1	KS-800492
6	ハンドルグリップ Handle grip	B8002	1	#56-27
7	ピニオンギヤ Pinion gear	B8003	1	KS-800493
8	プランジャー Plunger	B8006	1	KS-800495 ϕ 12X98
9	ゲージ取付金具 Gauge mounting bracket	B8007	1	KS-800496
10	タンクパッキン Tank packing	T3018	1	ϕ 140X ϕ 124X1.5T
11	圧力計(KWKネーム入) Pressure gauge (with KWK name)	W1001	1	AT1/4X ϕ 60X35MPA
12	チェッキ本体 Check body	X1001	2	KS-801474
13	チェッキバックアップリング Check backup ring	X1002	2	KS-801475
14	シートパッキン Sheet packing	X1003	2	KS-800913
15	コイルスプリング Coil spring	X1004	2	KS-801477
16	エア抜きプラグ Air bleeding plug	X1005	1	KS-800124
17	補給口金具 Supply port fitting	X1101	1	KS-800116
18	スプリング Spring	X1102	1	KS-800118
19	補給口キャップ Supply port cap	X1103	1	KS-800514
20	座付きプラグ Washer based plug	X2012	3	M20X15L
21	銅パッキン(圧力計) Copper packing (pressure gauge)	X3004	1	ϕ 9X ϕ 5.5X1.5T
22	銅パッキン(補給口) Copper packing (supply port)	X3013	5	ϕ 26X ϕ 20.5X1.5T
23	エンドキャップ(赤) Rc3/8 End cap (red) Rc3/8	X4003	1	KS-800867
24	Oリング O ring	Z1009	1	1A P12.5
25	Oリング O ring	Z1106	1	1B P10
26	Oリング O ring	Z1108	2	1B P11
27	Oリング O ring	Z1112	1	1B P15
28	鋼球 Steel ball	Z2001	1	1/8 (ϕ 3.175)
29	鋼球 Steel ball	Z2005	3	1/4 (ϕ 6.35)
30	鋼球 Steel ball	Z2006	1	5/16 (ϕ 7.9375)
31	ボールチェーン Ball chain	Z2201	1	ϕ 4x30M BB40

32	チェーンコネクタ Chain connector	Z2202	2	φ4 BBP-40K
33	E型止め輪 E type snap ring	Z2309	1	E 15
34	キー(両丸) Key (double circle)	Z4401	1	5X5X14
35	沈みプラグ Sunk head plug	Z5001	4	Rc 1/8
36	十字穴付ナベ小ネジ Round head Phillips screws		2	M4 × 8L
37	六角穴付止ネジ Hexagon socket set screw		1	M5 × 10L
38	六角穴付止ネジ Hexagon socket set screw		1	M8 × 20L
39	六角ボルト Hexagon bolt		4	M10 × 40L
40	六角ナット Hexagon nut		2	M8
41	六角ナット Hexagon nut		4	M10
42	平座金 Flat washer		1	M6
43	バネ座金 Spring washer		1	M8
44	バネ座金 Spring washer		4	M10



1

2

3

4

5

6

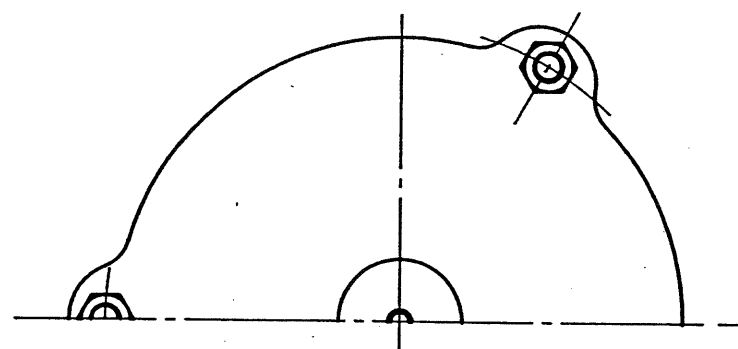
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△				
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A

B

C

D



Y2006

M8

Y3006

M8

T3001

T3004

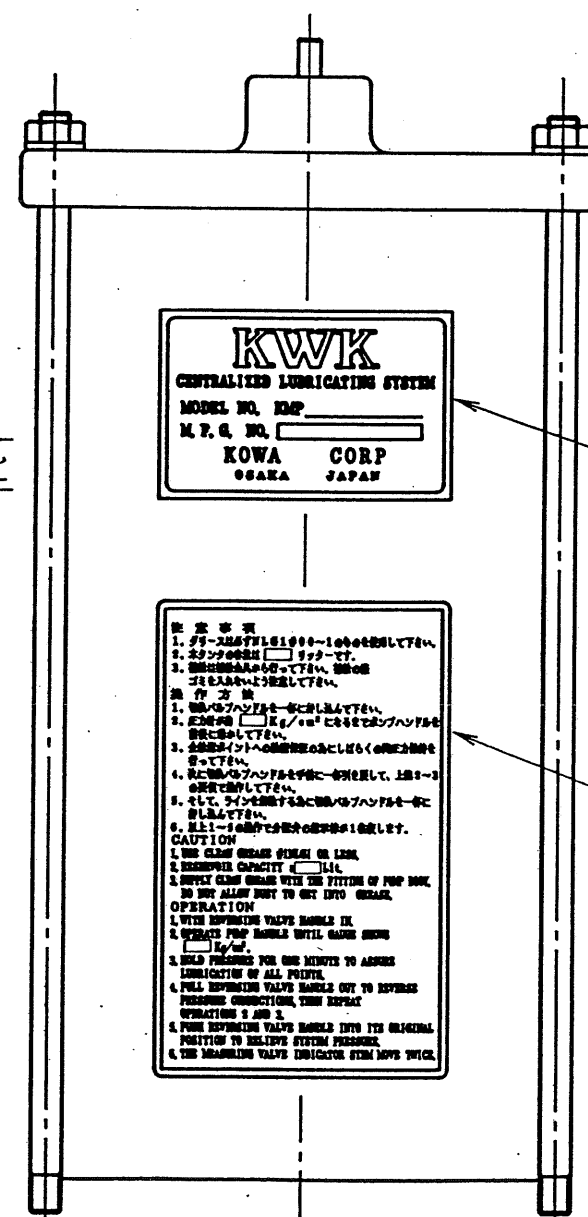
正面から見て
左側になること

T3007

T3005

T3009

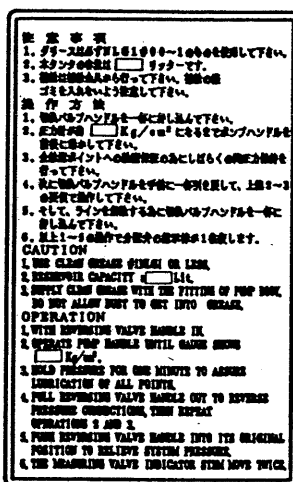
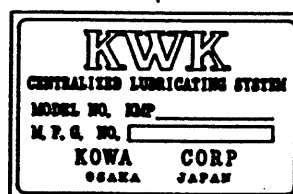
T3002

Y3005
M6Y2005
M6

V1007

V2005 (KMP)

V2006 (KMPS)



CUSTOMER

SPECIFICATION

CHECKED BY

K. TANAKA

93.2.28

SEC. CHIEF

DRAWN BY

A. F

DESIGNED BY

KMP (S) - 3ℓタンク
標準図

KOWA CORP.
OSAKA JAPAN

DWG. No.

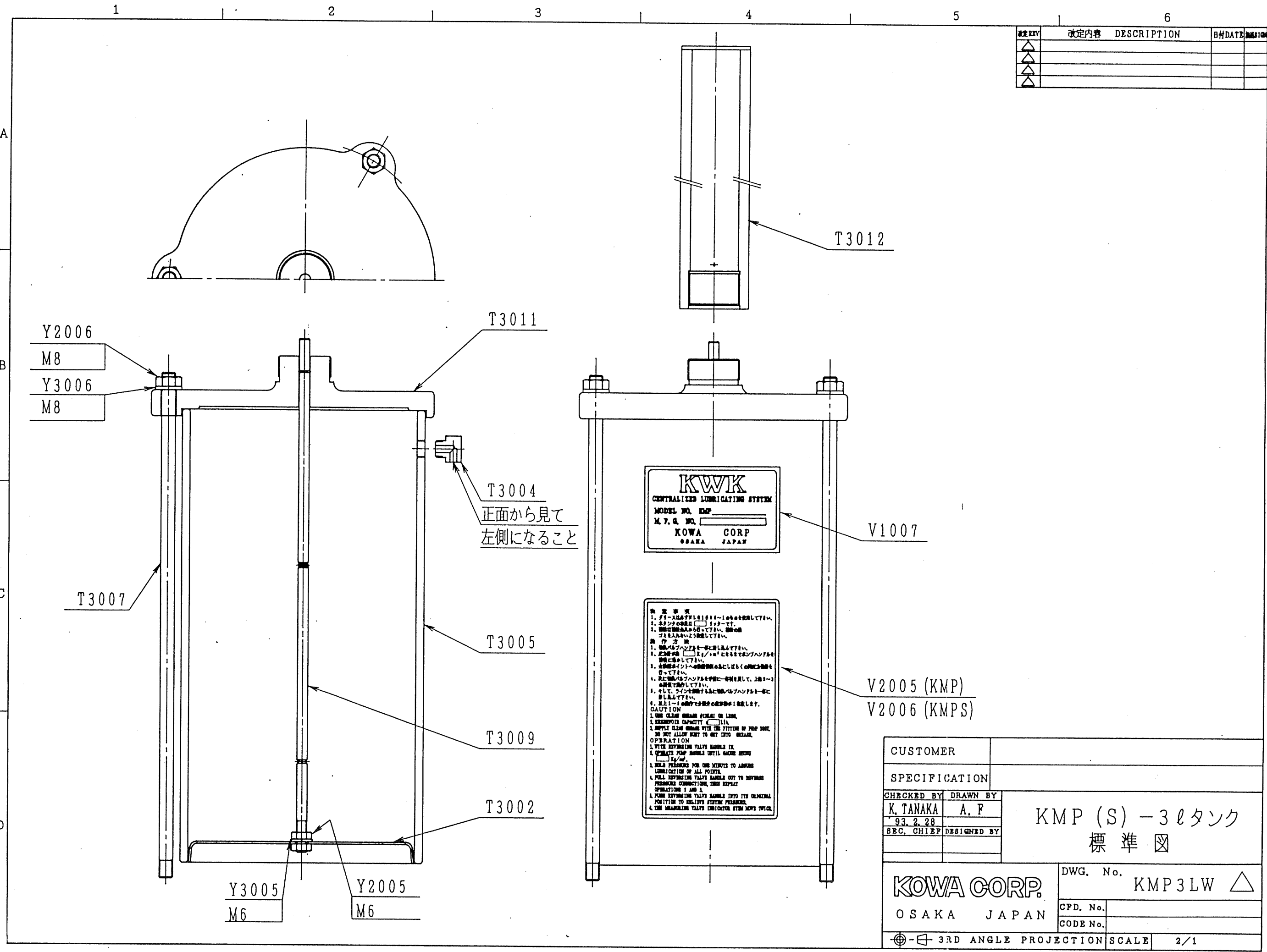
KMP3L △

CFD. No.

CODE No.

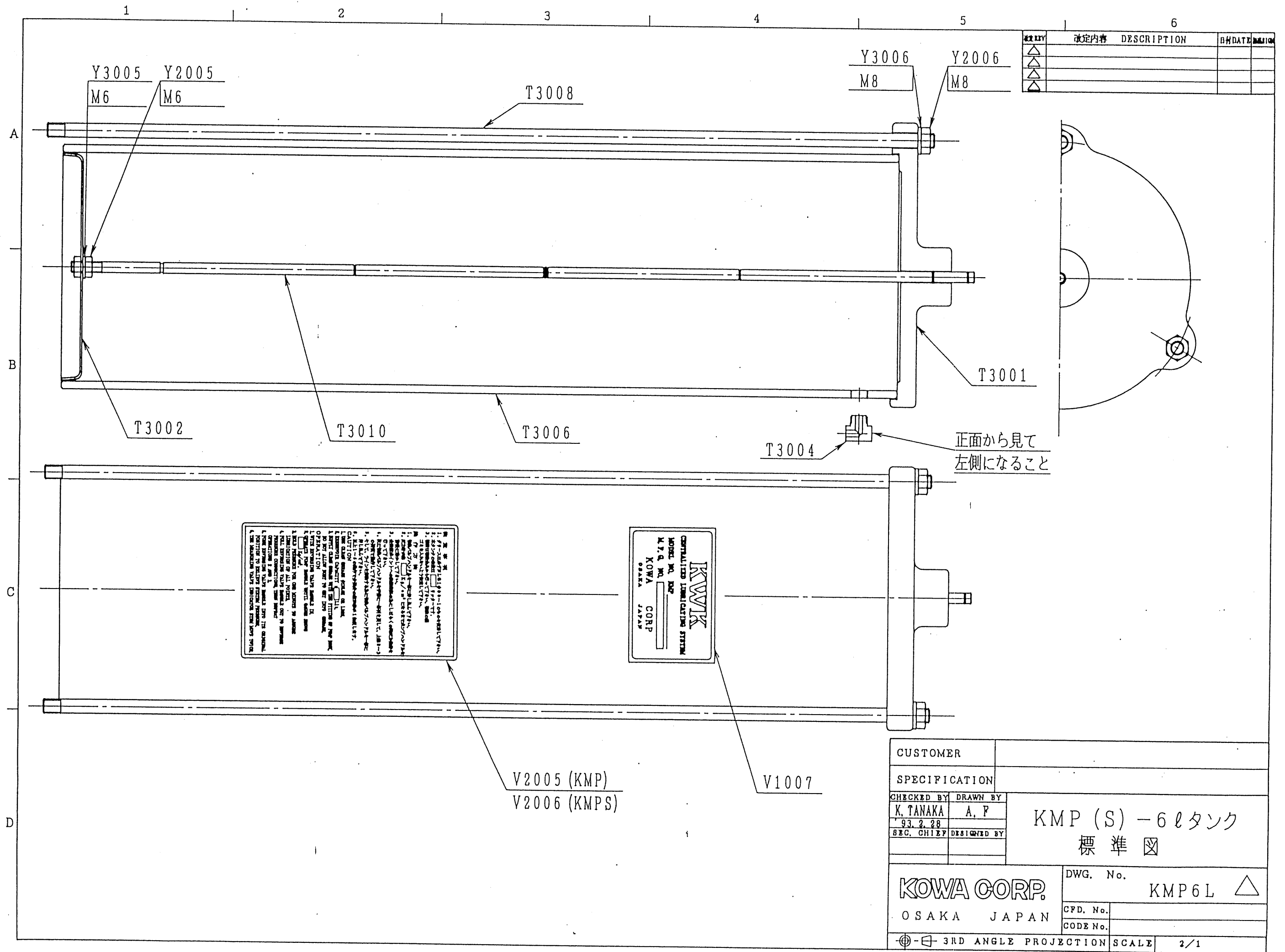
3RD ANGLE PROJECTION

SCALE 2/1



改定内容	DESCRIPTION	日付	改定者
△			
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△			

CUSTOMER			
SPECIFICATION			
CHECKED BY	DRAWN BY	KMP (S) - 3ℓタンク 標準図	
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KOWA CORP.		DWG. No. KMP3LW △	
OSAKA JAPAN		CFD. No.	
		CODE No.	
3RD ANGLE PROJECTION		SCALE 2/1	



決定内容	DESCRIPTION	DATE	REVISION
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正面から見て
左側になること

注意事項
1. 本製品は、使用前に必ず取扱説明書を読み、正しい取組方法を理解してください。
2. 本製品は、使用目的以外には使用しないでください。
3. 本製品は、使用後は必ず清掃を行い、保管してください。
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KVWK
CENTRALIZED IRRADIATING SYSTEM
MODEL NO. KMP
K.P.A. NO.
KOWA
CORP
OSAKA
JAPAN

CUSTOMER			
SPECIFICATION			
CHECKED BY	DRAWN BY	KMP (S) - 6ℓタンク 標準図	
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OSAKA JAPAN		CFD. No.	
		CODE No.	
3RD ANGLE PROJECTION		SCALE	2/1

DUAL LINE LUBRICATING SYSTEM
MANUAL OPERATED LUBRICATING PUMP

KMP-2-TG1

INSTRUCTION MANUAL

KOWA CORPORATION

PRECAUTIONS OF SAFETY

Before the installation, operation, maintenance and inspection, read carefully this instruction manual and other accompanying documents for correct service. Familiarize with the knowledge of equipment. Information of safety and all of cautionary instructions for service.

The precautions of safety are given to each equipment by using safety mark.

The precautions of safety is shown in each equipment of the centralized lubricating system by using safety mark

Particular attention should be called to the places where these safety marks are given.

The safety marks are divided into "WARNING" and "CAUTION".



If mishandled: In case a dangerous situation may occur, it could result in death or serious injury.



If mishandled: In case a middle injury or light injury, and in case a physical damage may occur.

For the matter being mentioned in the CAUTION, it may result in an importance according to circumstances. The important content is given to all of safety mark, and obey it without fail.

This system provides the max. working pressure 21MPa(210kg/cm²).

When each equipment is disassembled and inspected, stop the operation of pump, and release the pressure to perform the operation as 0MPa(0kg/cm²).

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1. FEATURES OF DUAL LINE LUBRICATING SYSTEM

As the composition of industrial machines and devices becomes more integral and intricate, lubrication control of higher order is to be demanded.

DUAL LINE integrated lubricating system is an automatic lubricating device for central lubrication of predetermined quantity of grease (or oil) to a number of lubricating points, developed to meet the requirements for lubrication control of higher level.

Since the required quantity of grease (oil) is supplied to the necessary points without any manual operation, the lubrication work can be rationalized while realizing labour-saving. Besides the effect of easier lubrication control, the system also serves to reduce the running cost.

1) Rationalized Lubricating Work by Optimum Lubrication Avoiding Any Loss of grease and Mis-Operation

Labour saving in lubrication work can be realized by changing from manual drop oiling to scheduled central lubrication. Since the lubrication is automated, lubricant can be supplied in adequate quantity even while the machine is in operation. The centralized arrangement also eliminates the need approach the machines serving for prevention of hazard.

Careless overlook of lubricating points and omitted lubrication are also prevented.

2) Scheduled Lubrication Saving Loss of Grease

Lubrication is scheduled quantity of oil by the measuring valves prevents overs and shorts of grease (or oil) to each lubrication point avoiding any loss of grease or oil.

3) Reduces Running Cost While Serving for Production Control

Adequate and exact lubrication is scheduled quantity minimizes bearing wear and substantially extend the service life. This means saving in cost and labour for bearing replacement and significant improvement in the operating ratio of machines. The reduced bearing friction saves the power cost as well.

4) Makes Lubricant More Durable and Keeps Best Lubrication at All Times

Since the grease (oil) is kept off the atmospheric air all the way from the tank to the lubricating point, there is no worry of deterioration and inclusion of foreign substance, which enables supply of clean grease (oil) at all times.

2. PRINCIPLE OF OPERATION OF DUAL LINE LUBRICATING SYSTEM

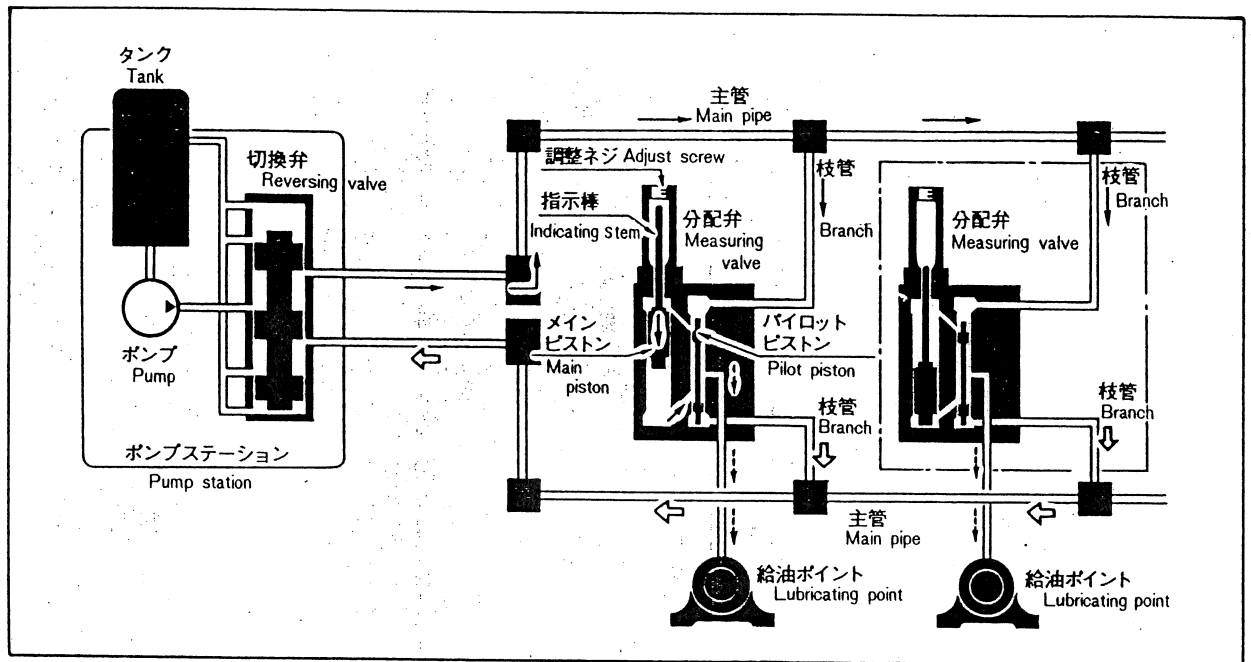


Fig.1

The lubricant (grease or oil) in the tank is sucked and discharged by the oil pump then is transferred to the upper main pipe by pressure through the reversing valve and is delivered to the measuring valves. In the measuring valve (left side), the lubricant pushes down the pilot piston to open the passage to the main piston. Then the lubricant acts on the upper part of the main piston to push it down. The lubricant saying under the main piston by the previous motion is pushed out as shown by arrows and is supplied to the lubricating points going through the pilot piston. At the end of operation, each piston is in the condition as shown by the right side measuring valve.

For the next lubrication, the reversing valve is changed, then the lubricant flows to the lower main valve and the measuring valves are operated in reverse way as described above to feed the lubricant to the lubricating points.

3. FEATURES AND OPERATION OF MANUAL TYPE END SYSTEM

* Features

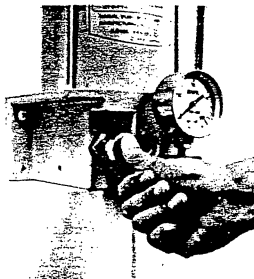
- 1) Most economical lubricating system of simple mechanism
- 2) Best suited for small scale facility
- 3) Simple operation for accurate lubrication
- 4) Suitable for such uses with comparatively long intervals of lubrication

* Operation

The lubricant from the pump goes through the reversing valve (with the handle fully pushed out or pulled to this side) and is transferred to either one of the two main pipes. When the measuring valves operate to complete feeding, the main pipe pressure increases quickly and the end of grease feeding is indicated on the pressure gauge.

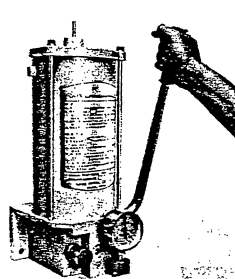
For the next lubrication, the reversing handle of the reversing valve is turned to the opposite position (pulled fully to this side or pushed out to the end), then the lubricant is transferred by pressure to the main pipe at the opposite side as before, and the measuring valves operate for lubrication.

■ 操作方法 METHOD OF OPERATION



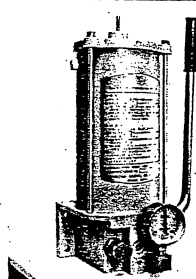
1. 切換バルブハンドルを一杯に押し込みます。

1. Push in the reversing valve handle to the full stroke.



2. 圧力計が所定の圧力(全分配弁作動圧力)になるまでポンプハンドルを前後に動かします。

2. Manipulate the pump handle back and forth until the pressure gauge indicates a specified point (working pressure of all measuring valves).



3. 全給油ポイントへの給油保証のために、しばらくのあいだ圧力保持を行います。

3. Hold the specified pressure for a while in order to guarantee perfect lubrication to all necessary points.



4. 次に切換バルブハンドルを手前に一杯引き戻して、上記②～③の要領で操作します。

4. Then pull back the reversing valve handle fully, and repeat steps 2. and 3.



5. そして、ライン圧を解除するために切換バルブハンドルを一杯に押し込んでください。以上①～⑤の操作で分配弁の指示棒が1往復(1サイクル)します。

5. Again push in the reversing valve handle fully in order to release the line pressure.

Fig.2

* Piping

- 1) Steel pipes are ordinarily used for the main pipes and the branch pipes, and copper tubes are used for the grease feed pipes.
- 2) Rubber hoses and rotary joints are used for the moving parts.
- 3) The measuring valves are used for bearings and others which require low quantity of lubricant so as to distribute the lubricant supplied by the master measuring valve further in smaller quantity.

4. STRUCTURE AND SPECIFICATIONS OF MANUAL TYPE GREASE(OR OIL) PUMP

This manual type grease pump is small sized and is handy since the operation is performed only by reciprocating the handle. This pump is advantageous for such uses of comparatively less frequent lubrication with less number of lubricating points. Using the pump of higher pressure 210 kg/cm² type, (100 kg/cm² type used oil) the piping can be smaller in diameter and harder lubricating condition can be met. The tank capacity is also available in three different types of 2 liters (for oil), 3 liters, or 6 liters to be selected suitable for the quantity of grease used, and depending also on the installation space, lubrication frequency, and piping condition.

This pump is also used popularly as the space pump for motor driven type grease pumps. Only the tank of 2 liters capacity is transparent.

5. KIND AND COMPOSITION OF MEASURING VALVES

The following types of measuring valves are used for the DUAL LINE integrated lubrication system depending on the number of oil ports and on the quantity of lubricant supplied each time.

For the outline dimensions and specifications, please refer to the materials shown on the following pages.

KS type (Single discharge port type)

- An abundant delivery may be obtained from one discharge port.
- Since lubricating pistons operate in parallel system, unused discharge ports may be covered with blind plug.
- Lubricating grease quantity may be adjusted in individual discharge ports.
- Each piston is provided with indicator stem for monitoring of state of lubrication.
- Grease quantity can be adjusted with adjusting screw.
- Measured discharge mechanism-specified quantity of grease is always discharged from each discharge port.
- A constant rate measuring system is incorporated to provide always a constant discharge rate.

KW type (Double discharge port type)

- Discharge ports are provided in multiple. This is ideally suited for the case when there are many lubricating ports.
- Lubricating pistons are operated in parallel system.
- Adjustment of the number of lubricating ports is possible only in one place at the left end. This is carried out by removing the blinded screw of the communicating port. The discharge rate will be doubled by this adjustment.
- Each piston is provided with indicator stem for monitoring of state of lubrication.
- Pressure is less than 100kg/cm² for oil service.
- Grease quantity can be adjusted with adjusting screw.

6. CAUTIONARY INSTRUCTION FOR MAINTENANCE

- (1) Please turn the cartridge case anti-clockwise when the grease cartridge is empty, and exchange it for a new cartridge.

The grease cartridge must screw in surely in the pump when you exchange it.

Air is inhaled in case of shortage of screwing in, and grease leaks.

- (2) Before operating the pump handle, the handle of the reversing valve should be pushed fully to the end or pulled completely to this side. Note that the pump handle does not move unless the reversing valve is pushed or pulled to the end, and the pump may be broken if operated forcefully.
- (3) If the pressure increases for the next lubrication with far less number of times of pump handle than the specified number of times, the reversing valve handle shall be turned to the opposite side to repeat the operation all over again as it indicates that the lubricant is continuously supplied to the same main pipe. Continuous feeding to the same main pipe does not operate the measuring valve and the lubrication falls.
- (4) For newly installed lubricating device, make sure, before operation, that grease is filled to all the pipes (main pipes, branch pipes, and greasing pipes) and the air is drawn completely.
The air mixed in the piping causes such troubles as exceptionally larger number of times of pump handle operation and unstable operation of the measuring valves.
- (5) For this lubricating device, use an extreme-pressure grease of about 310 to 400 fluidity (NLGI #1 to #0).
Use of low fluidity grease increases flow resistance in the piping preventing smooth operation. Since the property of grease differs depending on each kind, adequate grease to the condition of lubrication shall be selected.
- (6) By checking the motion of the indicator rod of the measuring valve (completely raised or lowered), make sure that the lubricant is distributed completely to the whole points of lubrication at certain intervals.
- (7) Periodically disassemble the Y-strainer in the middle of the piping to clean the filter in the strainer.
- (8) Periodically check the piping for no breakage or no slackening.

7. TROUBLE-SHOOTING

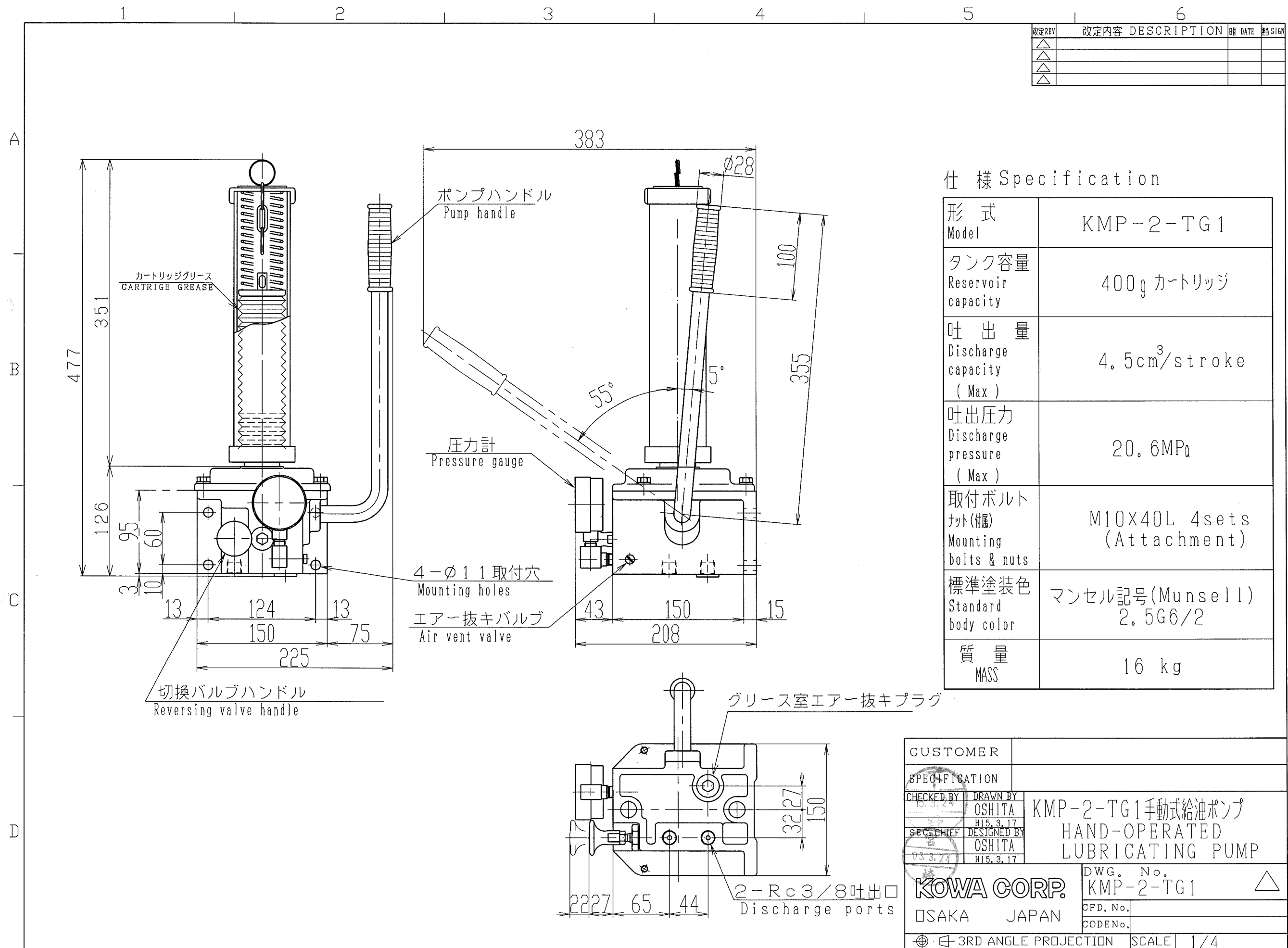
Trouble	Condition	Cause	Counter-measures
Pressure does not increase.	Pump handle does not resist at all.	(1) Air is allowed in the tank and sucking of grease fails.	(1) Replace the grease with the one of the specified fluidity. (2) keep the air vent of the pump loose and keep operating the pump handle until grease comes out of the air vent.
		(2) Suction inlet of the plunger is loaded with foreign substance preventing grease suction.	(1) Exchange it for a new cartridge.
		(3) There is no grease in the tank.	(1) With a filling pump, replenish grease to the specified level.
	Number of times of pump handle operation is exceptionally large.	(1) Leakage or breakage of piping.	(1) Repair or replace.
		(2) Malfunction of check valve of the pump. (Clogging of dust on the valve seat)	(1) Disassemble for cleaning or replace if damaged.
		(3) Air is allowed in the piping (main pipe).	(1) Remove the plug at the end of the piping to draw out the air. (Including the branch)
	Others	(1) Defective pressure gauge.	(1) Repair or replace the pressure gauge.
		(1) Interference of pinion gear of the pump with plunger.	(1) Disassemble for repair or replace.

Trouble	Condition	Cause	Counter-measures
Pressure increases but measuring valve does not operate.	Pump handle is unusually heavy or can not be moved.	(1) Blocking of piping (main pipe) (Broken or loaded with foreign substance)	(1) Repair the pipe or clean the inside, or replace the section.
		(2) Blocking of oil passage in the pump. (Grease does not come out of the pump outlet.)	(1) Disassemble for cleaning.
		(3) Valve handle is not switched completely.	(1) Shift the handle to the correct position (pull or push fully to the end.) (2) Disassemble for adjustment or cleaning (if clogged with foreign substance).
		(4) Grease is supplied to the same pipe side as the preceding lubricating without switching the oil passage by the valve handle.	(1) Shift the valve handle.
		(5) Piping is too long or pipe diameter is too small.	(1) Increase the number of units of pump suitably to the performance range (if the piping is too long). (2) Replace the pipe to suitable size or use grease of higher fluidity (if the pipe diameter is too small).
		(6) Viscosity of grease is too high.	(1) Change the grease to the one with specified fluidity.
		(7) Defective measuring valve.	(1) Disassemble for repair or replace.

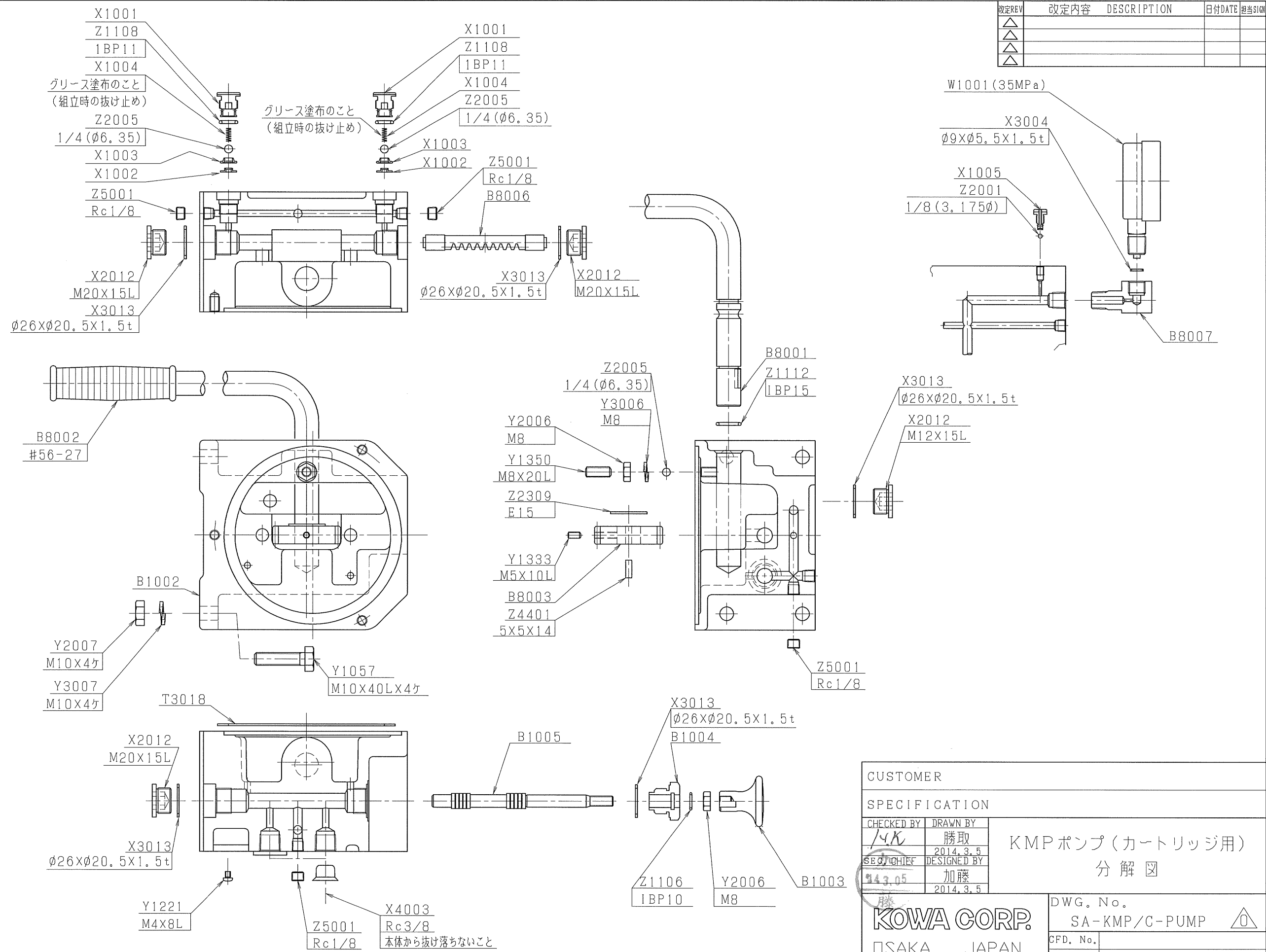
Trouble	Condition	Cause	Counter-measures
Pressure comes down immediately to zero when the pump handle is stopped even if the switching pressure point is reached.	Pressure comes down immediately to zero when the pump handle is stopped even if the switching pressure point is reached.	(1) Malfunction of check valve	(1) Disassemble for cleaning or replace.
		(2) Leakage or breakage of piping (main pipe)	(1) Repair.
	A part of the measuring valves does not function even when the normal switching pressure is reached.	(1) Piston in the measuring valve is clogged with foreign substance.	(1) Disassemble for cleaning.
		(2) Blocking of oil feed pipe (between measuring valve and bearing)	(1) Clean inside of the pipe or repair.
		(3) Strain due to unreasonable fastening at attaching.	(1) Loosen the fixing bolts. Replace the valve if it still fails to operate.
		(4) Back pressure of bearing is too high or oil feed pipe is too thin or too long.	(1) Attach a check valve to the outlet of measuring valve. (2) Increase pump switching pressure. (3) Reduce the quantity of grease supplied or provide a relief valve for the bearing if the bearing is over-filled with grease.

8. CAUTIONALY INSTRUCTIONS FOR PIPING WORK

- (1) Install the pump at a place of easy operation and avoid heat, dust, rain, etc. as much as possible.
In a place where the atmosphere affects the pump, attach the protective cover to the pump. Install the pump vertically as far as possible.
Also attach the measuring valves to the positions easy to inspect.
- (2) Before proceeding to piping work, clean inside by full flushing to eliminate any residual rags, chips and other foreign substances.
Foreign substances can cause malfunction of respective units of the lubricating device and also cause wear and damage of the bearings to be lubricated.
- (3) The external piping system is as shown in FIG.2.
Be sure to keep connection of the measuring valves in the same direction so as to keep the motion of measuring valve indicator rods uniform for easier inspection.
- (4) Since lubricant is transferred by high pressure in this lubricating device, piping materials for high pressure (normally 100 kg/cm² or 210 kg/cm² for the main and branch pipes and normally 30 kg/cm² for the oil feed pipe). Use of pipes for low-pressure application is hazardous not to mention breakage of the pipes.



改定REV	改定内容	DESCRIPTION	日付DATE	担当SIGN
△				
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CUSTOMER			
SPECIFICATION			
CHECKED BY	DRAWN BY	KMP ポンプ (カートリッジ用) 分解図	
Y.K.	勝取		
2014.3.5	2014.3.5		
DESIGNED BY	加藤		
2014.3.5		DWG. No.	
KOWA CORP.		SA-KMP/C-PUMP	
OSAKA JAPAN		CFD. No.	
3RD ANGLE PROJECTION		CODE No.	
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