KOWA SINGLE LINE LUBRICATING SYSTEMS

MOTOR-DRIVEN LUBRICATING PUMP

MODEL : KSP820SX SERIES

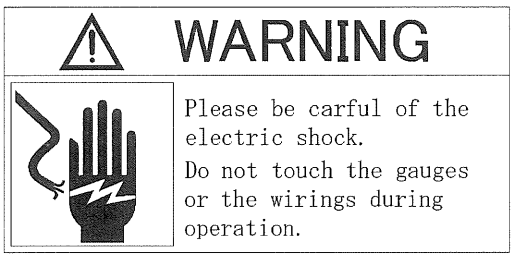
INSTRUCTION MANUAL

KWK KOWA CORPORATION

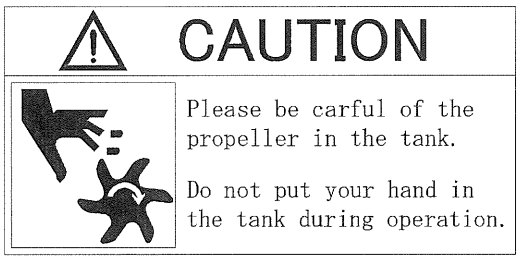
改定発行：2015年7月6日

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 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 obeys it without fail.

○ This system provides the max. Working pressure 21MPa (210kg/cm^2).
When each equipment is disassembled and inspected, stop the operation of pump, and release the pressure to perform the operation as 0MPa (0kg/cm^2).

CONTENTS

Introduction

Thank you very much for purchasing the KOWA SINGLE LINE LUBRICATING SYSTEM.

This Instruction Manual has been compiled as a practical guide for the operation and maintenance of lubricating system which incorporates the model KSP820SX motor driven lubricating pump.

All descriptions contained here in are based on the standard system, which may, therefore, be different from those of the purchased system. Such a problem can be solved by referring to the final specifications. However, it is required to understand that some changes caused by the modification of equipment may not be described in the final specifications.

Guarantee

The guaranteed period for this system will be one year from the commencement of operation.

Any defect or failure occurring during the guaranteed period, for which KWK is liable in design and manufacturing, shall be corrected and / or eliminated by KWK without compensation.

However, any defect or failure caused by improper operation which is not described in this Instruction Manual shall not be guaranteed, even though the defect or failure occurs witch the guaranteed period.

1. GENERAL DESCRIPTION OF KWK SINGLE LINE LUBRICATING SYSTEM

(1) Composition of the system

The system comprises the motor-driven lubricating pump, which will supply grease under a high pressure, external piping, measuring valves and the control panel, which is used to operate the system.

The outline of the system is as given to Fig.1. All the following descriptions are for the type used for greasing.

The motor-driven lubricating pump being employed for the system includes lubricating pump body, electric motor with reduction gear and pail for grease is provided below the pump body.

A pressure gauge is attached to show the discharge pressure of the pump.

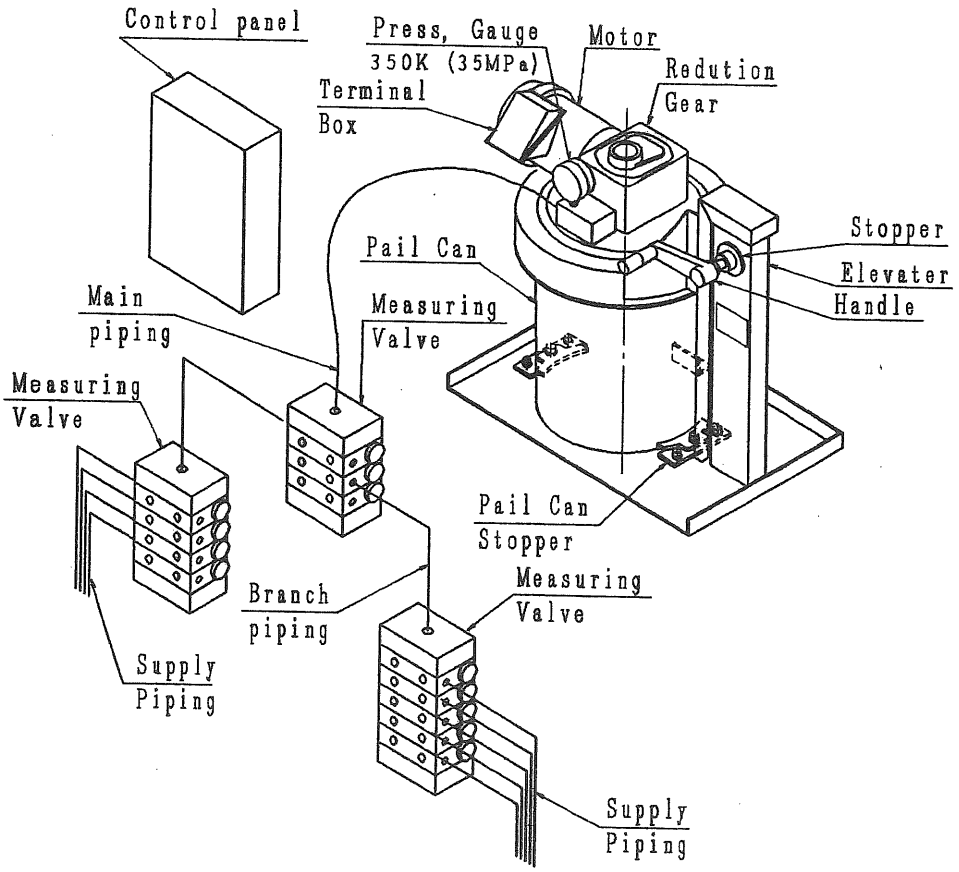


Fig.1

2. FEATURES OF KSP820 TYPE MOTOR-DRIVEN LUBRICATING PUMP

The pail (16kg or 18kg) is set to this motor-driven lubricating pump to feed the grease. This type of pump has been conventionally limited to the low pressure in specification and for filling in applications.

However, this pump has made it possible to discharge under a high pressure and is provided with the following features:

(1) Saving in weight and smaller in size results in easy handling and space saving.

(2) Suction efficiency has been improved by means of stirring blade, and grease level has been reduced evenly. In case of loading and unloading which are defective in a follower plate, its troublesome working has been released.

(3) A low level switch not being loaded in this of pump has become feasible through the compact method.

(4) Double plunger method (no-check valve consisting of plunger for discharge and plunger for opening & closing) has been adopted.
Consequently, the effect of dust is lessened and is forcibly discharged in case of air entrapment.
(In the check valve, the function of pump is lost when dust adheres to the check valve.)

(5) By considering the simplicity in case of replacement of pail, the pump body and manual handle rotary-lift has been developed.

(6) This pump applies to either single line or dual line system.

3. SPECIFICATION

(1) Pump

Type	KSP822～7SX
Driving System of Pump	Motor-driven
Discharge Pressure	Max. 20.6MPa
Discharge Capacity cm^3/min	2=82/100　3=62/75　4=41/50　5=31/38 6=20/25　7=15/18
Reduction Ratio	2=1/15　3=1/20　4=1/15　5=1/20 6=1/30　7=1/40
Pump Method	Double plunger method
Service Grease	Pail (18kg or 16kg) NLGI #1 or less
Motor	3 ϕ　AC200/220V　400/440V　50/60Hz 2～5=0.2kW　6～7=0.1kW
Low Level Switch	50VA AC max.300V Max. switching current 0.5A NO contact Dry contat, it turns ON at low level position.
Mass	822～825=41kg　826,827=40kg　(without pail)

4. CONSTRUCTION AND FUNCTION OF PUMP UNIT

(1) Pump Body

This motor-driven grease pump is constructed as given below: Turning force is converted into reciprocating motion by means of the rotating shaft of pump being directly connected with reduction gear and the cam being fixed to the rotating shaft, and the suction and discharge of grease is accomplished by the use of plunger which reciprocates in pump cylinder and stirring blade being fixed to the rotating shaft.

This pump is not provided with check valve, and it is double plunger type of pump which is sucked and/or discharged by main plunger (for discharge) and valve plunger (for opening and closing).

(2) Operation of pump

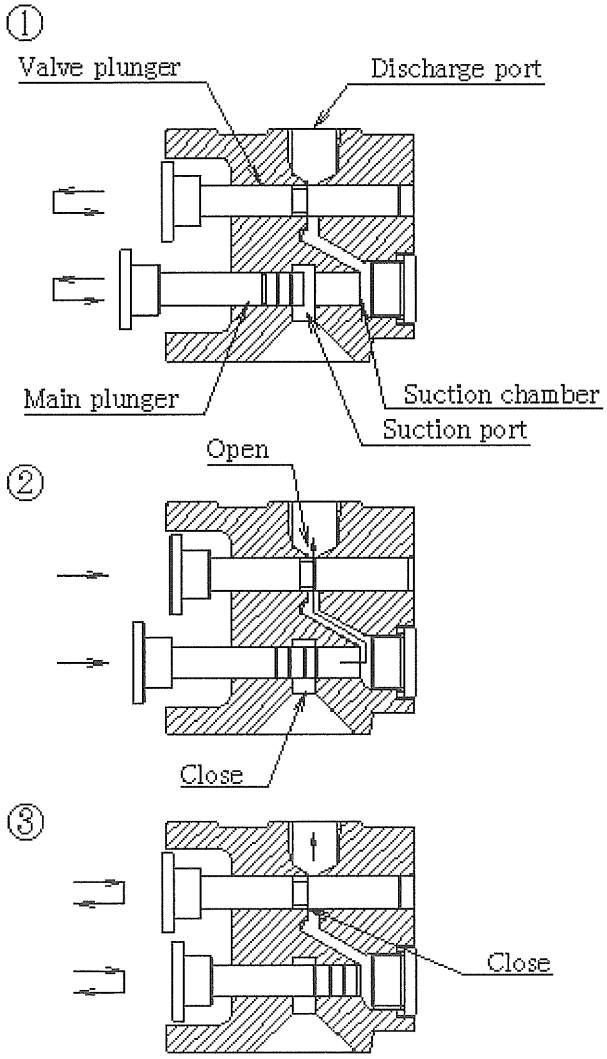


Fig.2

① Main plunger retracts, suction port is opened, and grease enters the suction chamber.
Then, the discharge port is closed by the valve plunger.

② Main plunger advances, simultaneously the valve plunger advances, the port opens, and grease is pushed out of the discharge chamber to the discharge port.

③ Valve plunger retreats, discharge port and main plunger's port are closed. Simultaneously main plunger begins to retract suction chamber provides negative pressure to prepare suction.

(3) Relief Valve

1) Relief valve

Relief valve is installed to the pump body.

This relief valve is provided for emergency pressure release when the pipe clogged for some reason. If such should happen, the pressurized grease, released from the pipe, is admitted into the pail to protect the lubricating system from being damaged.

The set pressure of relief valve provides 25MPa±0.5MPa.

Type of grease pump	Max. discharge pressure	Set pressure of relief valve
KSP820SX	20.6MPa	25MPa±0.5MPa

2) If the pump reverses

At a test run or when the electric wiring is changed, the pump (motor) sometimes reverses.

If the pump reverses, grease is not discharged, but released into the pail through the function of relief valve.

When the pump reverses, unlike the condition of forward turn of the double plunger timing, the reverse safety valve causes abnormal high pressure in the cylinder, resulting in broken plunger. Therefore, to prevent the breakage, the abnormal high pressure is released to protect the pump.

The reverse of motor adversely affects the pump, and finds it as soon as possible, and care should be exercised to avoid the reverse for a long time.

The correct direction of rotation of pump is shown on arrow name-plate.

(4) Low Level Switch

The low level switch is provided so that pump operation stops and the alarm is given when grease is consumed to a definite limit. The switch turns ON at a low level.

Rating	50VA AC max.300V,Current 0.5A

5. CAUTIONARY INTRUCTIONS OF MAINTENANCE AND HANDLING

(1) Replacement of Grease

In case KSP820SX is used ;

① Lift the pump so that the pail can be taken out by turning the handle for moving up and down. If it reaches the top position, fix the handle by using handle stopper. The stopper is provided with set-screw, and fixes the stopper with the set-screw. Then, careful attention is required whether the handle is fixed sufficiently. This is because it is highly dangerous when the pail moves down during the replacement of pail. Pull out horizontally the emptied grease pail to this side as it is. The pail stopper comes off to take out.

② Push horizontally a new pail from this side to the inner part with the pail stopper opened, and the pail is able to be automatically fixed. If the pail is pushed fully to the inner part, remove handle stopper, and move down the pump. Make sure that it moves down to the bottom position.

6. TEST OPERATION

(1) Confirmation Before Operation

1) Prior to test operation, check that no problem exists in installation, piping, and wiring :

   (a) Are unions and flanges of main supply pipe and branch pipe connected surely ?

   (b) Are sub-supply pipes connected to all bearings to be lubricated ?

   (c) Are the electric wiring works completed on the primary and secondary sides ?

2) Direction of Pump's Rotation

   (a) Turn the power supply switch and control supply switch to ON. Depress the push-button switch for manual starting, and confirm the direction of lubricating pump's rotation. As to the direction of rotation, follow the arrow mark on the coupling cover.

   The correct rotation is clockwise from the motor fan side.

   (b) In case of a reverse rotation, no grease will be discharged. If the pump is rotated reversely, stop it immediately avoid the operation for a long time.

   (c) When the reverse rotation is corrected to the forward rotation, the motor should be rewired by interchanging 2 lines of 3 power lines.

(2) Selection of Grease

There are many kinds of grease in different quality and characteristics.

Select suitable grease to the operating conditions from the recommended kinds of grease as given below.

Generally, any grease is applicable with the range of NLGI Standard No.00～No.1 (Consistely : 430～310).

Note:

1. Molybdenum or graphite-filled grease

   Solid lubricant is on will affect the life of the pump (wear).

   If the particle size is 1μm or less, it can be used almost without problems.

   If the particle size is about 1~3μm, it can be used . But wear becomes violently.

   It can not be used if the particle size is greater than 3μm. (Pump life will be extremely short.)

2. Grease containing metals in powder form such as copper and zinc can not be used.

(3) Flushing

Foreign matter such as spatter & dust in the piping cause the malfunction in the measuring valve as will as the failure of bearing. Hence perform fully cleaning in the piping.

7. MAINTENANCE AND INSPECTION

(1) Cautionary Instructions in case of Replacement of Grease

1) When grease is mixed with other brand, grease may be deteriorated. It is recommended to obtain the adequate instructions from a grease manufacturer when using a different brand of grease.

2) When grease being left in the pail is admitted into a new pail in case of replacement of pail, it causes overflow with setting of pump, and avoid it. Be careful to prevent dust from mixing into grease of the new pail.

(2) Preparation for Spare Parts

It is recommended that the following spare parts should be provided to minimize the shut-down period of the system in case of emergency.

1) Pump parts
   (a) Pressure gauge
2) Various measuring valves
3) Control panel
   (a) Indicator lamp
   (b) Fuse
   (c) Various relays
   (d) Timers
4) Miscellaneous
   (a) Flexible hose
   (b) Pipes and joints

(3) Inspection

Periodically inspect the following items :

1) Lubricating time, discharge pressure
2) Operation of indicating rod of measuring valve
3) Possible leakage from piping
4) Possible breakage of equipment
5) Residue in grease can

8. TROUBLE SHOOTING AND REMEDIES

No.	Fault	Possible Cause	Remedies
1	Even if the starting button is depressed, the pump does not start.	Power is not turned to ON.	Turn the power switch operation switch to ON. Check to see if the power is turned ON to the primary side.
		Fuse or breaker drops.	Turn the Molded Case Breaker to ON. Replace the fuse.
		Disconnection of motor circuit.	Repair and check of wiring.
2	Alarm lamp goes on. Even if the clear button is depressed, the alarm button goes on, and pump is not capable being operated.	Pail is emptied.	Change the pail.
		Overload of motor. Galling of reduction gear.	Check & repair. Replacement of reduction gear.
		Disconnection of motor circuit. (Voltage is exerted upon two-phase only of three-phase.)	Repair of wiring or replacement of motor.
		Pressure switch goes ON.	Decrease the pressure in the piping.
3	The needle's movement of pressure gauge for pump is large.	Mixing of the air in the piping.	Release the air in the piping.
4	Alarm lamp goes on. The clear lamp is depressed. (Or the operating power supply is once turned off.) When the operation is conducted, the pump runs. The alarm lamp soon goes on, and the pump stops.	(1) Lubrication is delayed.	
		Galling of plunger or its breakage.	Replacement of pump ass'y.
		Shortage of discharge capacity or discharge pressure caused by wear of cylinder plunger.	Replacement of pump ass'y.
		Air is included in the pump.	Loosen the air vent of pump block, and operate the pump until the air is eliminated.

4		Since the service grease is hard, the suction is not made.	Replace it with soft grease.
		Leakage disengagement.	Repair of piping.
		Improper setting of protective timer.	Reset.
		Improper function of pressure switch.	Check or repair of pressure switch.
		(2) Abnormal high pressure occurs.	
		Measuring valve is choked.	Disassembly and cleaning
		Piping is choked.	Repair of piping.
		Bearing is choked.	Examination and correction of bearing.
		The discharge port of measuring valve is plugged.	Make the correction as per the plan.
		Erroneous setting of pressure switch.	Reset.
5	High operating sound or abnormal noise of pump.	Wear.	Check and repair of reduction gear & lubricating pump body.
6	Water collects in the pail.	Improper properties of the supplied grease.	Check the grease, and make inquiries to the grease makers about it.
		Pump is sprinkled with water.	Fit up the cover.

9. Specifications of measuring valve

Model	Kind of piston	Discharge capacity (cm^3/Stroke)	Number of discharg ports per block
KJ	5T	0.082	2
	5S	0.164	1
	10T	0.164	2
	10S	0.328	1
	15T	0.246	2
	15S	0.492	1
KM	10T	0.164	2
	10S	0.328	1
	15T	0.246	2
	15S	0.492	1
	20T	0.328	2
	20S	0.656	1
	25T	0.41	2
	25S	0.82	1
	30T	0.492	2
	30S	0.984	1
	35T	0.574	2
	35S	1.148	1
KL	25T	0.41	2
	25S	0.82	1
	50T	0.82	2
	50S	1.64	1
	75T	1.23	2
	75S	2.46	1
	100T	1.64	2
	100S	3.28	1
	125T	2.05	2
	125S	4.1	1
	150T	2.46	2
	150S	4.92	1

Operation Record of KWK SINGLE LINE LUBRICATING SYSTEMS

Specifications	
Type of pump	Grease filling method : Concentrated filling, Exclusive pump, etc.
Pump No.	Type of filling pump
Motor voltage _____V	Name of grease used
Type of control panel	Type of measuring valve used
Control system Auto/Manual start	Number of measuring valve used : Approx.
Details of test operation	
Lubricating pump	Control panel
Lubricating pump & Reduction gear oil volume : good / bad	Voltage motor : _____V , control : _____V
Motor rotating direction : normal / reverse	Pilot lamp (power supply) : good / bad
Lubricating pump operation noise : normal / reverse	Pilot lamp (operation) : good / bad
	Pilot lamp (alarm) : good / bad
Lubricating time : min._____sec.	Auto start of pump : good / bad
	Auto stop of pump : good / bad
Lubricating time : min._____sec.	Alarm buzzer (low level switch) : good / bad
	Alarm buzzer (over time) : good / bad
Discharge pressure : _____kg/cm²	Overload of alarm buzzer motor : good / bad
	Timer setting (for start) : hrs.
Discharge pressure : _____kg/cm²	Timer setting (for protection) : min.
	Measuring valve
	All operations : good / bad
Others Grease leakage from piping : yes / no	Damage of piping : yes / no
Special notes	

REV	改定内容 DESCRIPTION	日付 DATE	担当 CK
△	Drawing No. change.(Pump body)	2007.9.5	KATO
△			
△			
△			

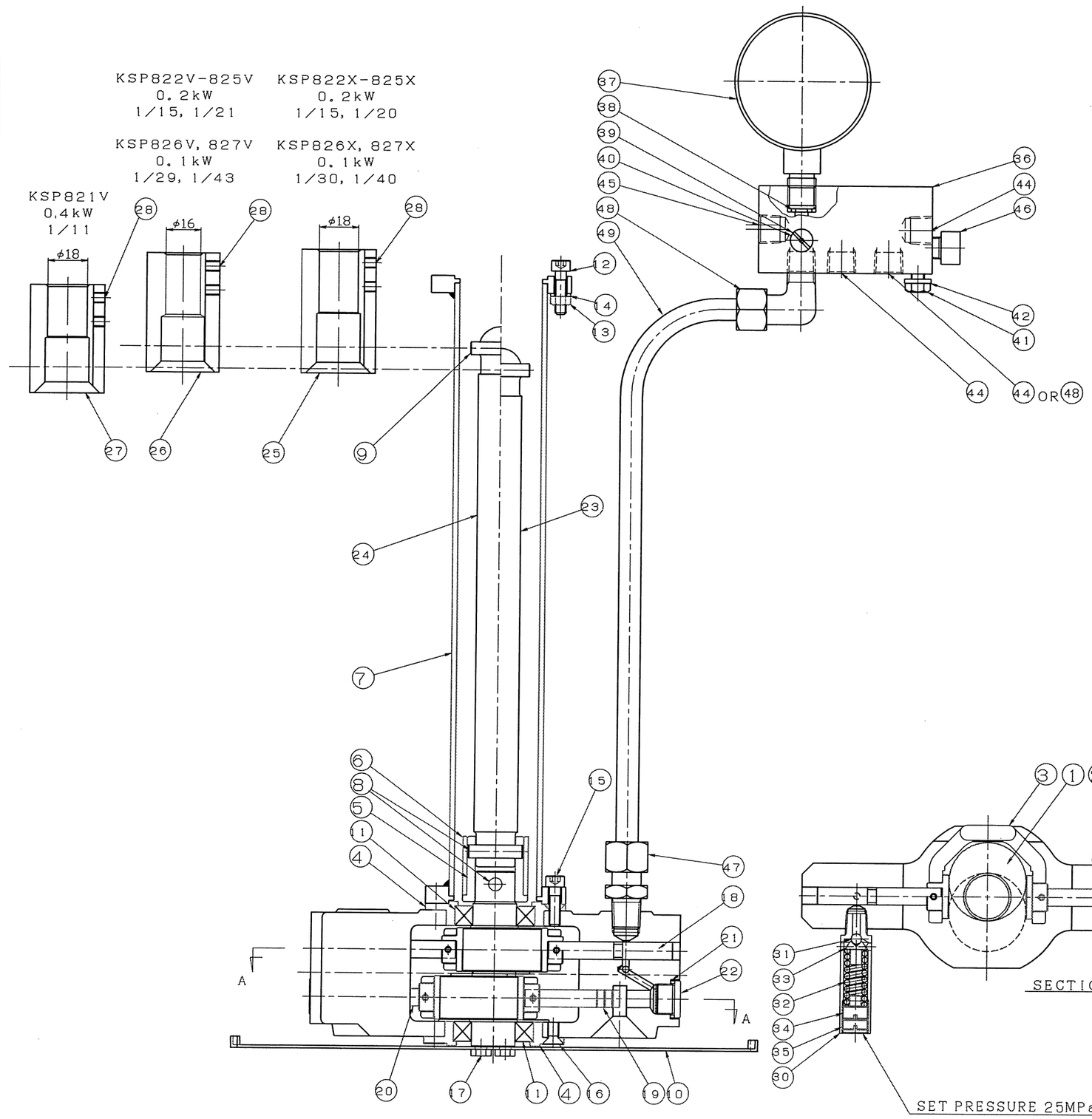
KSP822V-825V
0.2kW
1/15, 1/21

KSP822X-825X
0.2kW
1/15, 1/20

KSP826V, 827V
0.1kW
1/29, 1/43

KSP826X, 827X
0.1kW
1/30, 1/40

KSP821V
0.4kW
1/11



6.42kg	6.49kg	6.20kg	6.50kg	6.21kg	No.	NAME	P. No.	MASS	NOTE
2	2	1	2	1	49	PUMP LINE PIPE φ10X350L	Z9317	0.08	KS-822034
2	2	1	2	1	48	COPPER TUBE ELBOWφ10XRc1/4	OSTF	0.05	
2	2	1	2	1	47	COPPER TUBE JOINTφ10XRc1/4	OSTF	0.05	
1	1	1	1	1	46	FLOW FITTING	T3004	0.02	KS-800136
1	1	1	1	1	45	HEX. SOCKET PLUG Rc3/8	HS-PG	0.02	
2	2	3	2	3	44	HEX. SOCKET PLUG Rc1/4	HS-PG	0.01	
-	-	-	-	-	43	-	-	-	
2	2	2	2	2	42	SPRING WASHER M6	SW	-	
2	2	2	2	2	41	HEX. BOLT M6X12L	HB	-	
1	1	1	1	1	40	AIR VENT VALVE	X1005	0.01	KS-800124
1	1	1	1	1	39	STEEL BALL 1/8	Z2001	-	
1	1	1	1	1	38	COPPER WASHER	X3004	-	φ9Xφ5.5X1.5t
1	1	1	1	1	37	PRESSURE GAUGE 35MPa	W1001	0.30	
1	1	1	1	1	36	DISCHARGE PORT BLOCK	E7405	1.51	820D1-SM6△
2	2	1	2	1	35	AJUST SCREW M12	G8007	0.01	KS-800478△
2	2	1	2	1	34	AJUST SCREW	A8003	0.01	KS-800245
2	2	1	2	1	33	SPRING RETAINER	A8001	0.01	KS-800243
2	2	1	2	1	32	COIL SPRING	A8002	0.01	KS-800244
2	2	1	2	1	31	STEEL BALL 3/16	Z2003	-	
2	2	1	2	1	30	RELIEF VALVE BODY	E3010	0.04	KS-803862△
-	-	-	-	-	29	-	-	-	
2	2	2	2	2	28	HEX. SOCKET SET SCREW M5X5L	HSS	-	
1	-	-	-	-	27	821V-D1 MOTOR COUPLING φ18	E7403	0.21	820D1-SM3
-	1	1	-	-	26	820V-D1 MOTOR COUPLING φ16	E7402	0.25	820D1-SM4
-	-	-	1	1	25	820X-D1 MOTOR COUPLING φ18	E7404	0.26	820D1-SM5
-	1	1	1	1	24	MOTOR SHAFT 232L	E7032	0.60	KS-822109△
1	-	-	-	-	23	MOTOR SHAFT 222L	E7031	0.57	KS-822109△
2	2	1	2	1	22	HEX. PLUG M14	X2009	0.01	
2	2	1	2	1	21	COPPER WASHER	X3010	0.01	φ17Xφ14.5X2.0t
-	-	2	-	2	20	GUIDE PISTON ASSY	E7005	0.02	KS-822103△
2	2	1	2	1	19	MAIN PISTON ASSY	E7003	0.03	KS-822103△
2	2	1	2	1	18	VALVE PISTON ASSY	E7004	0.03	KS-822103△
2	2	2	2	2	17	HEX. BOLT M5X12L	E7012	-	
4	4	4	4	4	16	CROSSED FLAT SCREW M5X10L	PSS	-	
4	4	4	4	4	15	HEX. SOCKET BOLT M5X18L	HB	-	
4	4	4	4	4	14	SPRING WASHER M5	SW	-	
4	4	4	4	4	13	HEX. NUT	HN	-	
4	4	4	4	4	12	HEX. SOCKET BOLT M5X20L	CB	-	
2	2	2	2	2	11	D.G BALL BEARING 6904	Z3021	0.04	
1	1	1	1	1	10	AGITATER	E7011	0.06	KS-822216△
1	1	1	1	1	9	CONNECTING PIN φ5.95	E3008	0.01	KS-803830
2	2	2	2	2	8	CONNECTING PIN φ6.0	E3009	0.01	KS-803831△
1	1	1	1	1	7	SUPPORT PIPE	E7010	0.84	KS-822108
1	1	1	1	1	6	COUPLING COVER	E7009	0.04	KS-822007
1	1	1	1	1	5	CAM SHAFT COUPLING	E7008	0.06	KS-822006
2	2	2	2	2	4	BEARING COVER	E7007	0.08	KS-822105
2	2	2	2	2	3	PLUNGER GUIDE	E7006	0.09	KS-822004△
1	1	1	1	1	2	PUMP BODY	E7002	1.22	KS-822102△
1	1	1	1	1	1	CAM SHAFT	E7001	0.41	KS-822201

KSP821-V	KSP822~823-V	KSP824~827-V	KSP822~823-X	KSP824~827-X
Q'ty				

CUSTOMER

SPECIFICATION

CHECKED BY	DRAWN BY
Kato Sep 5'07	KATSUTORI 2006.5.9
SEC. CHIEF	DESIGNED BY
Miyazaki 9.5'07	MIYAZAKI 2006.4.25

KSP820S-D1 PUMP ASSY

KOWA CORP.
OSAKA JAPAN

DWG. No. eSA-820S-D1 △1

GFD. No.

CODE No.

3RD ANGLE PROJECTION

SCALE

DATE OF ISSUE 2006.6.1

MFG. NO.

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複写部数 A1 A3

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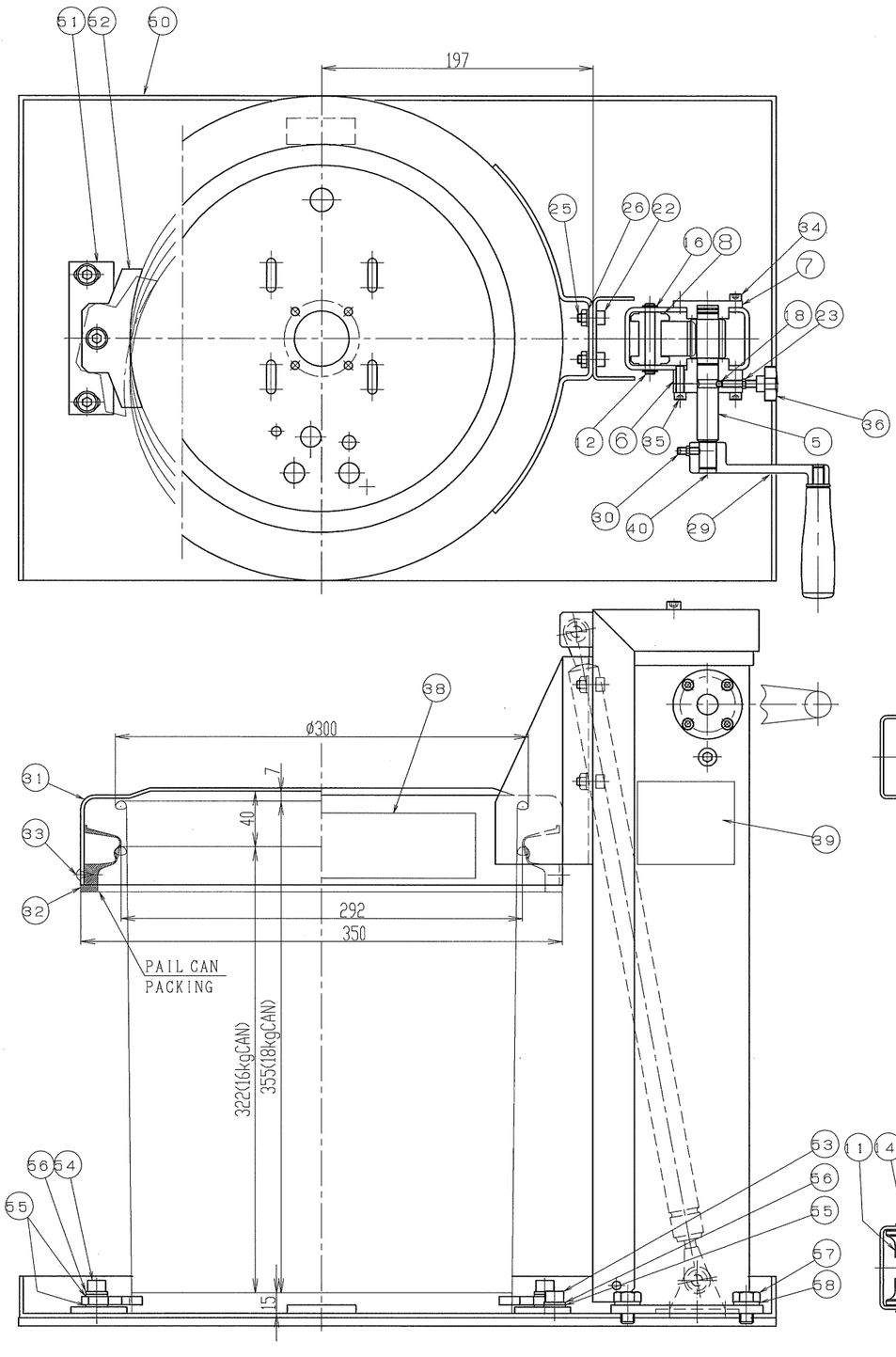
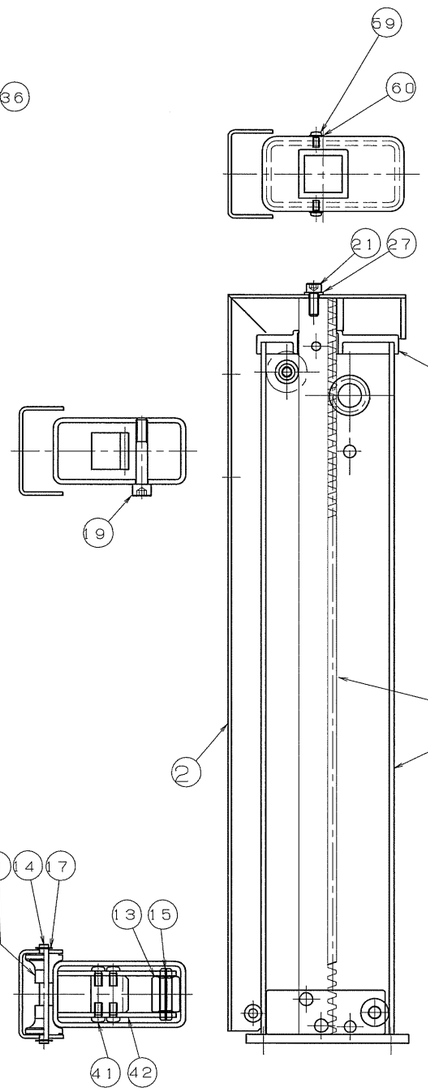
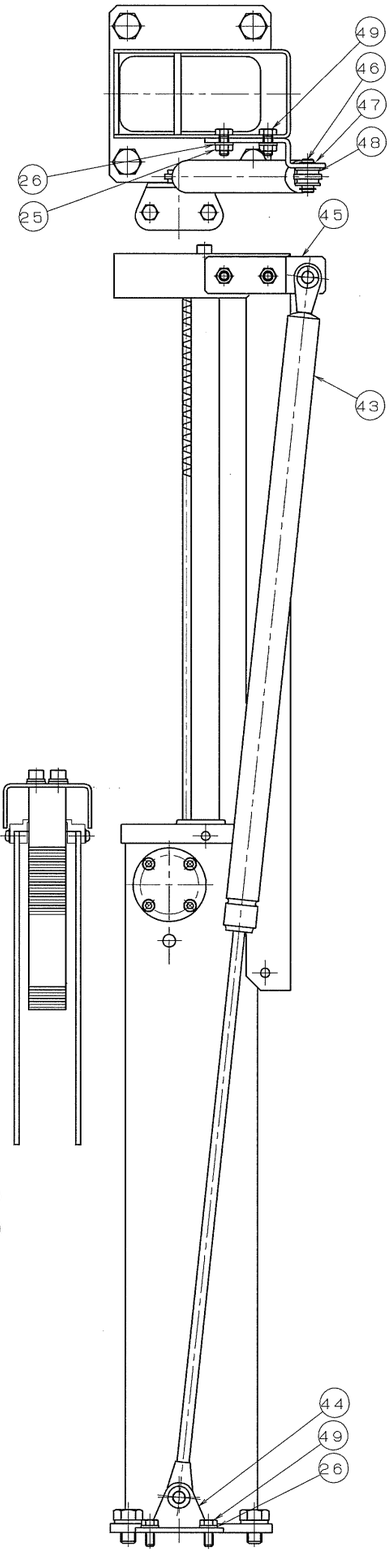






改定REV	改定内容DESCRIPTION	日付DATE	承認SIGN
1	エレベータ用フレーム取付ピス修正・エレベータ側面図修正	2012.12.27	水野
2			
3			
4			

Total 20.26kg

No.	NAME	P. No.	Q'ty	MASS	NOTE
60	PLANE WASHER M4	PW	2	0.01	
59	CROSSED PAN SCREW M4X12L	PNS	2	0.06	
58	SPRING WASHER M10	SW	4	0.01	
57	HEX. BOLT M10X16L	HB	4	0.08	
56	SPRING WASHER M8	SW	6	0.01	
55	PLANE WASHER M8	PW	8	0.01	
54	HEX. SOCKET BOLT M8X16L	CB	2	0.02	
53	HEX. SOCKET BOLT M8X18L	CB	4	0.05	
52	PAIL CAN STOPPER	E7042	2	0.23	KS-822063 ⚠2
51	PAIL CAN STOPPER	E7041	2	0.23	KS-822063 ⚠1
50	PUMP BASE	E7040	1	4.33	KS-822061 ⚠
49	HEX. BOLT M6X14L	HB	4	0.02	
48	PLANE WASHER M8	PW	3	-	
47	E-SNAP RING E5	ER	2	-	S60CM
46	PIN	E9003	1	0.01	KS-822056
45	BLACKET	E9002	1	0.01	KS-822155
44	BLACKET KIT G13	E9001	1	0.05	
43	AIR SPRING Y2114	E9001	1	0.53	GS066-3059F
42	GUIDE ROLLER PLATE(LOWER SIDE)	E7312	2	0.06	KS-804766 ⚠
41	CROSSED PAN SCREW M5X10L	PNS	4	0.06	KS-804627
40	HANDLE CAP	E7310	1	-	KS-804704
39	NAME PLATE	V1107	1	-	KS-822072
38	NAME PLATE	V2022	1	-	KS-822086
37	HEX. BOLT M4X22L	HB	2	0.01	
36	KT-B1 M5-25L	E7303	1	-	
35	HEX. SOCKET BOLT M5X20L	CB	4	-	
34	HEX. SOCKET BOLT M5X8L	CB	4	-	
33	CROSSED TPG SCREW 3X10L	PTS	15	0.01	
32	PAIL CAN PACKING	E3021	1	0.70	KS-803819
31	PAIL COVER	E7401	1	3.60	820D1-SC1
30	HEX. SOCKET SET SCREW M5X16L	HSS	1	-	
29	HANDLE HSU-80.GTR-24-M8	E7300	1	0.10	KS-804653 ⚠
28	-	-			
27	SPRING WASHER M6	SW	2	-	SUS
26	SPRING WASHER M6	SW	8	0.01	
25	HEX. NUT M6	HN	6	-	
24	HEX. SOCKET SET SCREW M6X10L	HSS	2	0.01	
23	HEX. NUT M5	HN	2	-	
22	HEX. SOCKET BOLT M6X14L	HB	4	0.03	
21	HEX. SOCKET BOLT M6X16L	HB	2	0.01	SUS
20	-	-			
19	HEX. SOCKET BOLT M8X45L	HB	1	0.02	
18	STEEL BALL 5/32	Z2002	1	-	
17	E-SNAP RING E5	ER	2	-	SUS
16	E-SNAP RING E6	ER	2	-	
15	SPRING PIN ø8X35L	SP	1	-	
14	GUIDE ROLL SHAFT	E3040	1	0.02	KS-803813 ⚠
13	GUIDE ROLLER(LOWER SIDE)	E7313	1	0.02	KS-804767
12	GUIDE WHEEL PIN	E7305	1	0.01	S35C
11	GUIDE WHEEL	E3037	2	0.01	KS-803809 ⚠
10	-	-			
9	-	-			
8	GUIDE WHEEL	E7304	1	0.10	KS-804623
7	BEARING FOR PINION(PASSIVE SIDE)	E7036	1	0.11	KS-822046
6	BEARING FOR PINION(HANDLE SIDE)	E7302	1	0.11	KS-804624 ⚠
5	PINION SHAFT	E7301	1	0.21	KS-804622
4	RACK GEAR	E3030	1	2.21	KS-803815 ⚠
3	FLAME COVER	E7308	1	0.05	KS-804629
2	GUIDE FLAME FOR ELEVATOR	E3028	1	1.33	KS-803816 ⚠
1	FLAME FOR ELEVATOR	E7309	1	3.56	KS-804628 ⚠

CUSTOMER

SPECIFICATION

CHECKED BY	DRAWN BY
Mizuno 2012.12.27	KATSUTORI
2006.6.1	
SEC. CHIEF	DESIGNED BY
Kato 2012.12.27	MIYAZAKI
2006.6.1	

KSP820-D1
BASE & ELEVATOR

KOWA CORP.
OSAKA JAPAN

DWG. No. eSA-820-BASE&EV-D1 ⚠1
CFD. No.
CODE No.

3RD ANGLE PROJECTION

SCALE

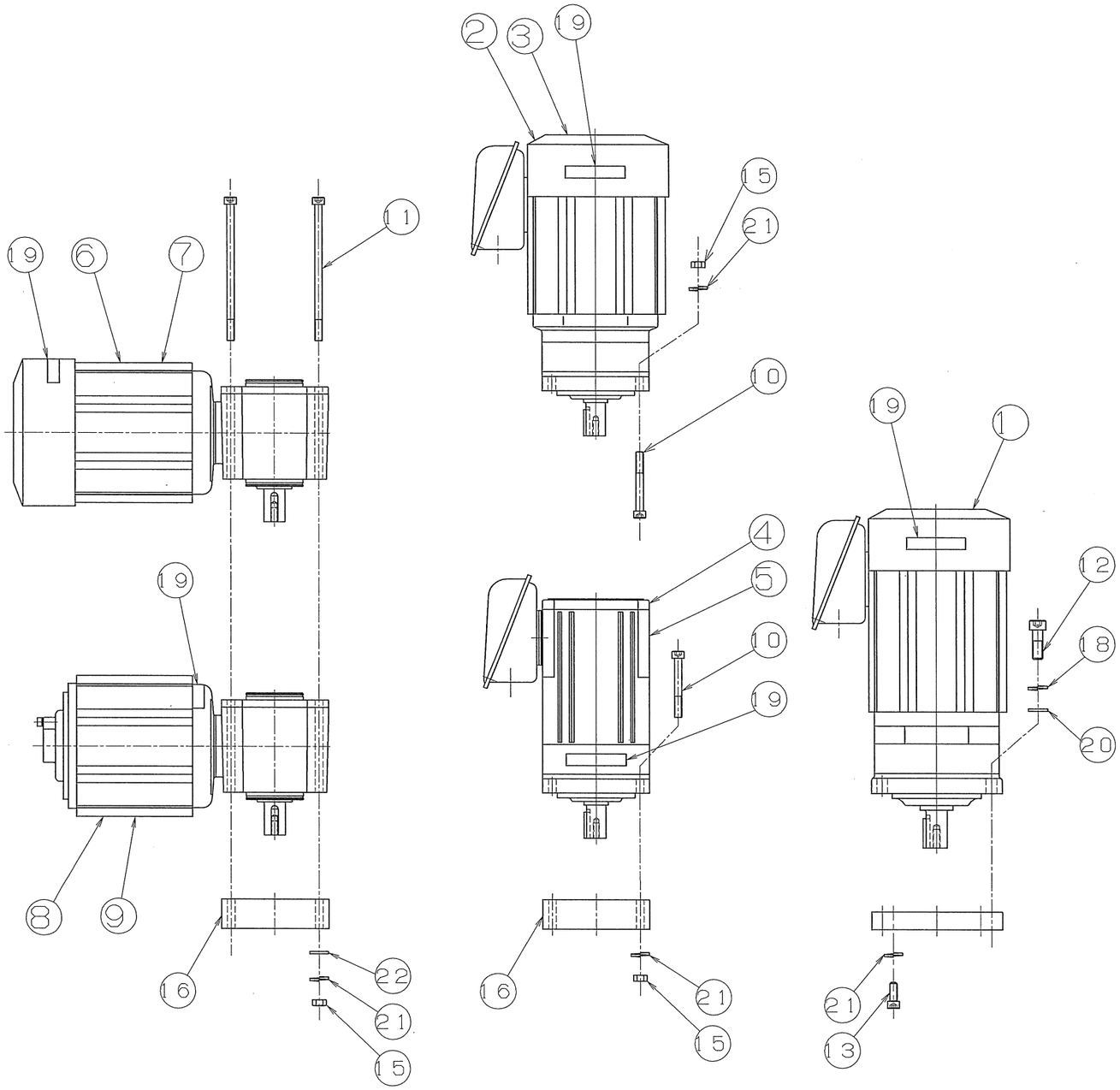
DATE OF ISSUE 2006.6.1

MFG. NO.

(A1)

協議印 / 出図先 / 購買 / 製造 / 客先 / 控 / 複写部数 A1 A3 / 出図日

改定REV	改定内容 DESCRIPTION	日付DATE	担当SIGN
1	Motor model is changed, The length of bolt is changed.	2009.9.1	H.K
2	Reduction ratio is corrected. (No.5)	2011.1.11	H.K



PUMP MODEL	No.	NAME	P. No.	Q'ty	MASS	NOTE
	22	PLANE WASHER	PW	4	0.01	M6
	21	SPRING WASHER	SW	4	0.01	M6
	20	PLANE WASHER	PW	4	0.02	M8
	19	NAME PLATE (ARROW)	V2019	1	-	KS-801334
	18	SPRING WASHER	SW	1	0.02	M8
	17	MOTOR FLANGE	E7407	1	0.21	820D1-SM2
	16	MOTOR FLANGE	E7406	1	0.26	820D1-SM1 ⚠1
	15	HEX. NUT	HN	4	0.02	M6
	14	HEX. NUT	HN	4	0.04	M8
	13	HEX. SOCKET BOLT	CB	4	0.04	M6X16L
	12	HEX. SOCKET BOLT	CB	4	0.06	M8X25L
	11	HEX. SOCKET BOLT	CB	4	0.19	M6X115L
	10	HEX. SOCKET BOLT	CB	4	0.06	M6X50L
KSP827_X	9	MOTOR (SUMITOMO) 0.1kW 1/40	-	1	5.30	RNFM01-190R-40
KSP826_X	8	MOTOR (SUMITOMO) 0.1kW 1/30	-	1	5.30	RNFM01-190R-30
KSP823,5_X	7	MOTOR (SUMITOMO) 0.2kW 1/20	-	1	6.50	RNFM02-190R-20
KSP822,4_X	6	MOTOR (SUMITOMO) 0.2kW 1/15	-	1	6.50	RNFM02-190R-15
KSP827_V	5	MOTOR (SUMITOMO) 0.1kW 1/43	-	1	4.00	CNVM01-5067-43
KSP826_V	4	MOTOR (SUMITOMO) 0.1kW 1/29	-	1	4.00	CNVM01-5067-29
KSP823,5_V	3	MOTOR (SUMITOMO) 0.2kW 1/21	-	1	6.50	CNVM02-506H-21
KSP822,4_V	2	MOTOR (SUMITOMO) 0.2kW 1/15	-	1	6.50	CNVM02-506H-15
KSP821_V	1	MOTOR (SUMITOMO) 0.4kW 1/11	-	1	8.00	CNVM05-5077-11

CUSTOMER

SPECIFICATION

CHECKED BY	DRAWN BY
Shimono 2011.1.11	KATSUTORI 2006.6.13
SEC. CHIEF	DESIGNED BY
Kuno 2011.1.11	SHIMONO 2006.6.13

KSP820-D1
GEARD MOTOR & MOTOR FLANGE

KOWA CORP.
OSAKA JAPAN

DWG. No. eSA-820-MOTOR-D1 ⚠2

CFD. No.

CODENo.

3RD ANGLE PROJECTION

SCALE

DATE OF ISSUE | MFG. NO.

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KOWA SINGLE LINE LUBRICATING SYSTEMS

MOTOR-DRIVEN LUBRICATING PUMP

MODEL : KSP820SV SERIES

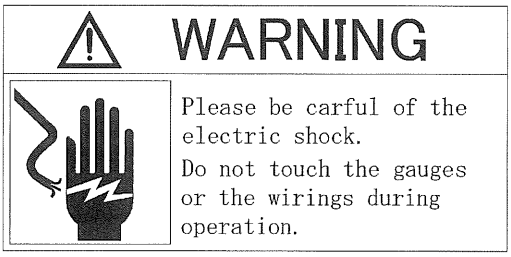
INSTRUCTION MANUAL

KWK KOWA CORPORATION

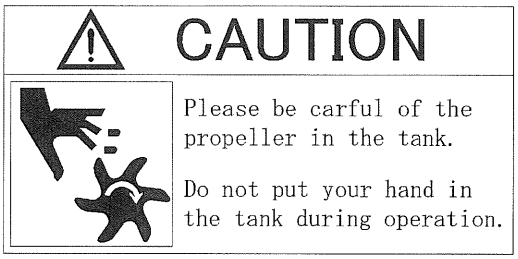
改定発行：2015年7月6日

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 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 obeys it without fail.

○ This system provides the max. Working pressure 21MPa (210kg/cm^2).
When each equipment is disassembled and inspected, stop the operation of pump, and release the pressure to perform the operation as 0MPa (0kg/cm^2).

CONTENTS

Introduction

Thank you very much for purchasing the KOWA SINGLE LINE LUBRICATING SYSTEM.
This Instruction Manual has been compiled as a practical guide for the operation and maintenance of lubricating system which incorporates the model KSP820SV motor driven lubricating pump.
All descriptions contained here in are based on the standard system, which may, therefore, be different from those of the purchased system. Such a problem can be solved by referring to the final specifications. However, it is required to understand that some changes caused by the modification of equipment may not be described in the final specifications.

Guarantee

The guaranteed period for this system will be one year from the commencement of operation.
Any defect or failure occurring during the guaranteed period, for which KWK is liable in design and manufacturing, shall be corrected and / or eliminated by KWK without compensation.
However, any defect or failure caused by improper operation which is not described in this Instruction Manual shall not be guaranteed, even though the defect or failure occurs witch the guaranteed period.

1. GENERAL DESCRIPTION OF KWK SINGLE LINE LUBRICATING SYSTEM

(1) Composition of the system

The system comprises the motor-driven lubricating pump, which will supply grease under a high pressure, external piping, measuring valves and the control panel, which is used to operate the system.

The outline of the system is as given to Fig.1. All the following descriptions are for the type used for greasing.

The motor-driven lubricating pump being employed for the system includes lubricating pump body, electric motor with reduction gear and pail for grease is provided below the pump body.

A pressure gauge is attached to show the discharge pressure of the pump.

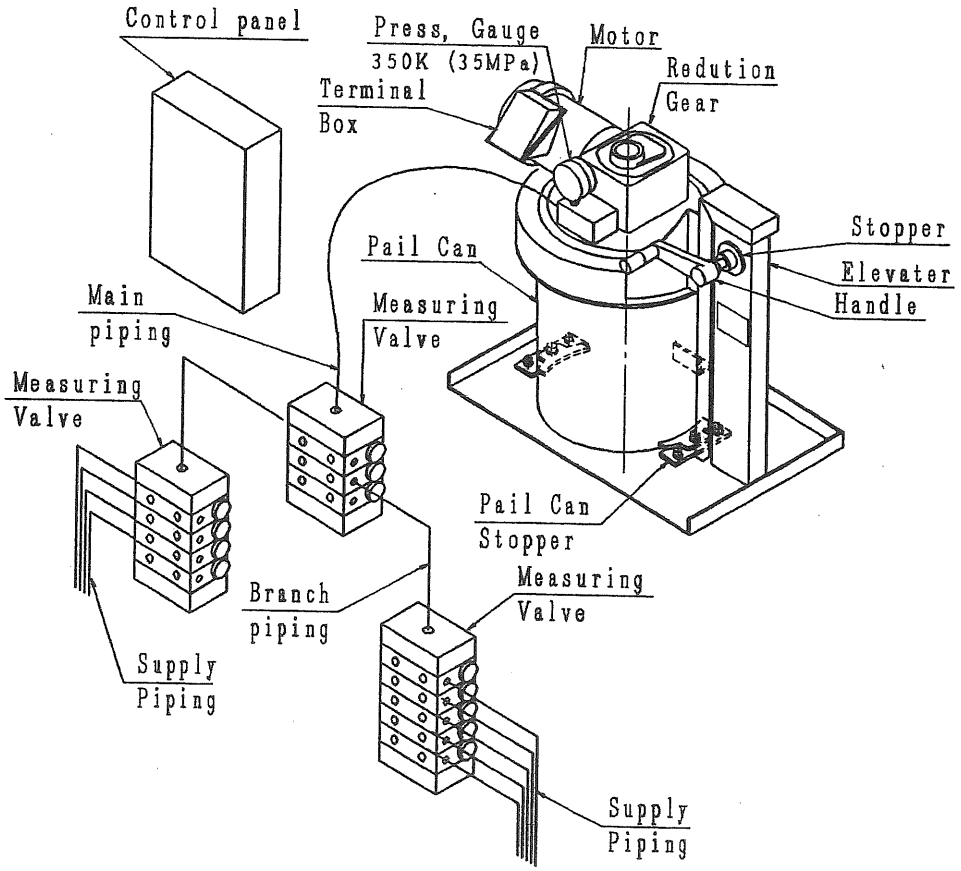


Fig.1

2. FEATURES OF KSP820 TYPE MOTOR-DRIVEN LUBRICATING PUMP

The pail (16kg or 18kg) is set to this motor-driven lubricating pump to feed the grease. This type of pump has been conventionally limited to the low pressure in specification and for filling in applications.

However, this pump has made it possible to discharge under a high pressure and is provided with the following features:

(1) Saving in weight and smaller in size results in easy handling and space saving.

(2) Suction efficiency has been improved by means of stirring blade, and grease level has been reduced evenly. In case of loading and unloading which are defective in a follower plate, its troublesome working has been released.

(3) A low level switch not being loaded in this of pump has become feasible through the compact method.

(4) Double plunger method (no-check valve consisting of plunger for discharge and plunger for opening & closing) has been adopted.
Consequently, the effect of dust is lessened and is forcibly discharged in case of air entrapment.
(In the check valve, the function of pump is lost when dust adheres to the check valve.)

(5) By considering the simplicity in case of replacement of pail, the pump body and manual handle rotary-lift has been developed.

(6) This pump applies to either single line or dual line system.

3. SPECIFICATION

(1) Pump

Type	KSP821～7SV
Driving System of Pump	Motor-driven
Discharge Pressure	Max. 20.6MPa
Discharge Capacity cm^3/min	1=113/136　2=82/100　3=59/71　4=41/50 5=29/36　6=20/25　7=14/16
Reduction Ratio	1=1/11　2=1/15　3=1/21　4=1/15　5=1/21 6=1/29　7=1/43
Pump Method	Double plunger method
Service Grease	Pail (18kg or 16kg) NLGI #1 or less
Motor	3 ϕ　AC200/220V　400/440V　50/60Hz 1=0.4kW　2～5=0.2kW　6～7=0.1kW
Low Level Switch	50VA AC max.300V Max. switching current 0.5A NO contact Dry contat, it turns ON at low level position.
Mass	821=43kg　822～825=41kg　826,827=39kg (without pail)

4. CONSTRUCTION AND FUNCTION OF PUMP UNIT

(1) Pump Body

This motor-driven grease pump is constructed as given below: Turning force is converted into reciprocating motion by means of the rotating shaft of pump being directly connected with reduction gear and the cam being fixed to the rotating shaft, and the suction and discharge of grease is accomplished by the use of plunger which reciprocates in pump cylinder and stirring blade being fixed to the rotating shaft.

This pump is not provided with check valve, and it is double plunger type of pump which is sucked and/or discharged by main plunger (for discharge) and valve plunger (for opening and closing).

(2) Operation of pump

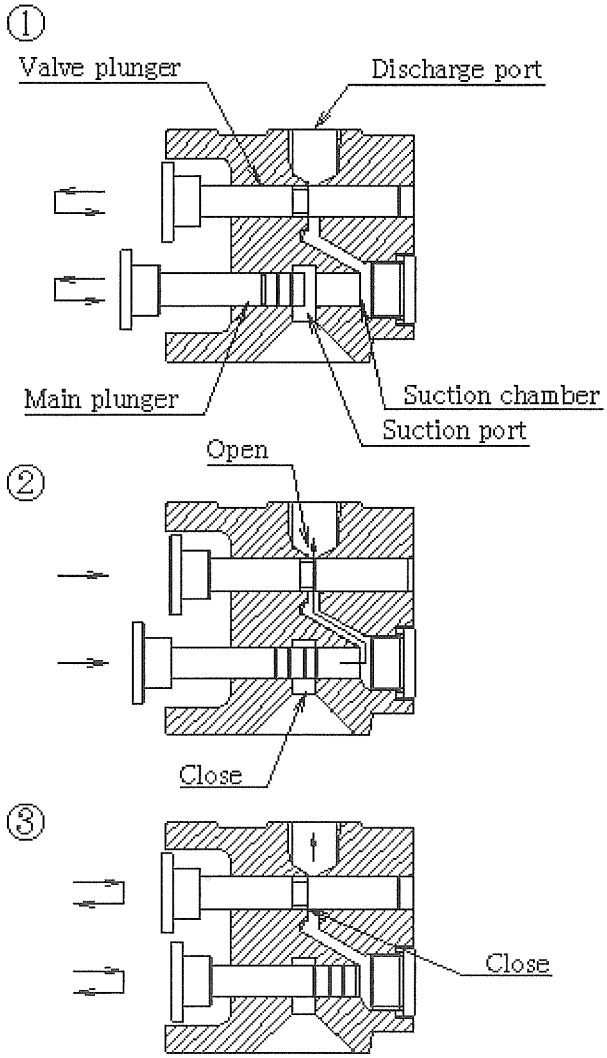


Fig.2

① Main plunger retracts, suction port is opened, and grease enters the suction chamber.
Then, the discharge port is closed by the valve plunger.

② Main plunger advances, simultaneously the valve plunger advances, the port opens, and grease is pushed out of the discharge chamber to the discharge port.

③ Valve plunger retreats, discharge port and main plunger's port are closed. Simultaneously main plunger begins to retract suction chamber provides negative pressure to prepare suction.

(3) Relief Valve

1) Relief valve

Relief valve is installed to the pump body.

This relief valve is provided for emergency pressure release when the pipe clogged for some reason. If such should happen, the pressurized grease, released from the pipe, is admitted into the pail to protect the lubricating system from being damaged.

The set pressure of relief valve provides 25MPa±0.5MPa.

Type of grease pump	Max. discharge pressure	Set pressure of relief valve
KSP820SV	20.6MPa	25MPa±0.5MPa

2) If the pump reverses

At a test run or when the electric wiring is changed, the pump (motor) sometimes reverses.

If the pump reverses, grease is not discharged, but released into the pail through the function of relief valve.

When the pump reverses, unlike the condition of forward turn of the double plunger timing, the reverse safety valve causes abnormal high pressure in the cylinder, resulting in broken plunger. Therefore, to prevent the breakage, the abnormal high pressure is released to protect the pump.

The reverse of motor adversely affects the pump, and finds it as soon as possible, and care should be exercised to avoid the reverse for a long time.

The correct direction of rotation of pump is shown on arrow name-plate.

(4) Low Level Switch

The low level switch is provided so that pump operation stops and the alarm is given when grease is consumed to a definite limit. The switch turns ON at a low level.

Rating	50VA AC max.300V,Current 0.5A

5. CAUTIONARY INTRUCTIONS OF MAINTENANCE AND HANDLING

(1) Replacement of Grease

In case KSP820SV is used ;

① Lift the pump so that the pail can be taken out by turning the handle for moving up and down. If it reaches the top position, fix the handle by using handle stopper. The stopper is provided with set-screw, and fixes the stopper with the set-screw. Then, careful attention is required whether the handle is fixed sufficiently. This is because it is highly dangerous when the pail moves down during the replacement of pail. Pull out horizontally the emptied grease pail to this side as it is. The pail stopper comes off to take out.

② Push horizontally a new pail from this side to the inner part with the pail stopper opened, and the pail is able to be automatically fixed. If the pail is pushed fully to the inner part, remove handle stopper, and move down the pump. Make sure that it moves down to the bottom position.

6. TEST OPERATION

(1) Confirmation Before Operation

1) Prior to test operation, check that no problem exists in installation, piping, and wiring :

   (a) Are unions and flanges of main supply pipe and branch pipe connected surely ?

   (b) Are sub-supply pipes connected to all bearings to be lubricated ?

   (c) Are the electric wiring works completed on the primary and secondary sides ?

2) Direction of Pump's Rotation

   (a) Turn the power supply switch and control supply switch to ON. Depress the push-button switch for manual starting, and confirm the direction of lubricating pump's rotation. As to the direction of rotation, follow the arrow mark on the coupling cover.

   The correct rotation is anti-clockwise from the motor fan side.

   (b) In case of a reverse rotation, no grease will be discharged. If the pump is rotated reversely, stop it immediately avoid the operation for a long time.

   (c) When the reverse rotation is corrected to the forward rotation, the motor should be rewired by interchanging 2 lines of 3 power lines.

(2) Selection of Grease

There are many kinds of grease in different quality and characteristics.
Select suitable grease to the operating conditions from the recommended kinds of grease as given below.
Generally, any grease is applicable with the range of NLGI Standard No.00～No.1 (Consistely : 430～310).

Note:

1. Molybdenum or graphite-filled grease

   Solid lubricant is on will affect the life of the pump (wear).

   If the particle size is 1μm or less, it can be used almost without problems.

   If the particle size is about 1~3μm, it can be used . But wear becomes violently.

   It can not be used if the particle size is greater than 3μm. (Pump life will be extremely short.)

2. Grease containing metals in powder form such as copper and zinc can not be used.

(3) Flushing

Foreign matter such as spatter & dust in the piping cause the malfunction in the measuring valve as will as the failure of bearing. Hence perform fully cleaning in the piping.

7. MAINTENANCE AND INSPECTION

(1) Cautionary Instructions in case of Replacement of Grease

1) When grease is mixed with other brand, grease may be deteriorated. It is recommended to obtain the adequate instructions from a grease manufacturer when using a different brand of grease.

2) When grease being left in the pail is admitted into a new pail in case of replacement of pail, it causes overflow with setting of pump, and avoid it. Be careful to prevent dust from mixing into grease of the new pail.

(2) Preparation for Spare Parts

It is recommended that the following spare parts should be provided to minimize the shut-down period of the system in case of emergency.

1) Pump parts
   (a) Pressure gauge
2) Various measuring valves
3) Control panel
   (a) Indicator lamp
   (b) Fuse
   (c) Various relays
   (d) Timers
4) Miscellaneous
   (a) Flexible hose
   (b) Pipes and joints

(3) Inspection

Periodically inspect the following items :

1) Lubricating time, discharge pressure
2) Operation of indicating rod of measuring valve
3) Possible leakage from piping
4) Possible breakage of equipment
5) Residue in grease can

8. TROUBLE SHOOTING AND REMEDIES

No.	Fault	Possible Cause	Remedies
1	Even if the starting button is depressed, the pump does not start.	Power is not turned to ON.	Turn the power switch operation switch to ON. Check to see if the power is turned ON to the primary side.
		Fuse or breaker drops.	Turn the Molded Case Breaker to ON. Replace the fuse.
		Disconnection of motor circuit.	Repair and check of wiring.
2	Alarm lamp goes on. Even if the clear button is depressed, the alarm button goes on, and pump is not capable being operated.	Pail is emptied.	Change the pail.
		Overload of motor. Galling of reduction gear.	Check & repair. Replacement of reduction gear.
		Disconnection of motor circuit. (Voltage is exerted upon two-phase only of three-phase.)	Repair of wiring or replacement of motor.
		Pressure switch goes ON.	Decrease the pressure in the piping.
3	The needle's movement of pressure gauge for pump is large.	Mixing of the air in the piping.	Release the air in the piping.
4	Alarm lamp goes on. The clear lamp is depressed. (Or the operating power supply is once turned off.) When the operation is conducted, the pump runs. The alarm lamp soon goes on, and the pump stops.	(1) Lubrication is delayed.	
		Galling of plunger or its breakage.	Replacement of pump ass'y.
		Shortage of discharge capacity or discharge pressure caused by wear of cylinder plunger.	Replacement of pump ass'y.
		Air is included in the pump.	Loosen the air vent of pump block, and operate the pump until the air is eliminated.

4		Since the service grease is hard, the suction is not made.	Replace it with soft grease.
		Leakage disengagement.	Repair of piping.
		Improper setting of protective timer.	Reset.
		Improper function of pressure switch.	Check or repair of pressure switch.
		(2) Abnormal high pressure occurs.	
		Measuring valve is choked.	Disassembly and cleaning
		Piping is choked.	Repair of piping.
		Bearing is choked.	Examination and correction of bearing.
		The discharge port of measuring valve is plugged.	Make the correction as per the plan.
		Erroneous setting of pressure switch.	Reset.
5	High operating sound or abnormal noise of pump.	Wear.	Check and repair of reduction gear & lubricating pump body.
6	Water collects in the pail.	Improper properties of the supplied grease.	Check the grease, and make inquiries to the grease makers about it.
		Pump is sprinkled with water.	Fit up the cover.

9. Specifications of measuring valve

Model	Kind of piston	Discharge capacity (cm^3/Stroke)	Number of discharg ports per block
KJ	5T	0.082	2
	5S	0.164	1
	10T	0.164	2
	10S	0.328	1
	15T	0.246	2
	15S	0.492	1
KM	10T	0.164	2
	10S	0.328	1
	15T	0.246	2
	15S	0.492	1
	20T	0.328	2
	20S	0.656	1
	25T	0.41	2
	25S	0.82	1
	30T	0.492	2
	30S	0.984	1
	35T	0.574	2
	35S	1.148	1
KL	25T	0.41	2
	25S	0.82	1
	50T	0.82	2
	50S	1.64	1
	75T	1.23	2
	75S	2.46	1
	100T	1.64	2
	100S	3.28	1
	125T	2.05	2
	125S	4.1	1
	150T	2.46	2
	150S	4.92	1

Operation Record of KWK SINGLE LINE LUBRICATING SYSTEMS

Specifications	
Type of pump	Grease filling method : Concentrated filling, Exclusive pump, etc.
Pump No.	Type of filling pump
Motor voltage _____V	Name of grease used
Type of control panel	Type of measuring valve used
Control system Auto/Manual start	Number of measuring valve used : Approx.
Details of test operation	
Lubricating pump	Control panel
Lubricating pump & Reduction gear oil volume : good / bad	Voltage motor : _____V , control : _____V
Motor rotating direction : normal / reverse	Pilot lamp (power supply) : good / bad
Lubricating pump operation noise : normal / reverse	Pilot lamp (operation) : good / bad
	Pilot lamp (alarm) : good / bad
Lubricating time : min._____sec.	Auto start of pump : good / bad
	Auto stop of pump : good / bad
Lubricating time : min._____sec.	Alarm buzzer (low level switch) : good / bad
	Alarm buzzer (over time) : good / bad
Discharge pressure : _____kg/cm^2	Overload of alarm buzzer motor : good / bad
	Timer setting (for start) : hrs.
Discharge pressure : _____kg/cm^2	Timer setting (for protection) : min.
	Measuring valve
	All operations : good / bad

Others	Grease leakage from piping : yes / no	Damage of piping : yes / no

Special notes

REV	改定内容 DESCRIPTION	日付 DATE	DESIGN
△	Drawing No. change.(Pump body)	2007.9.5	KATO
△			
△			
△			

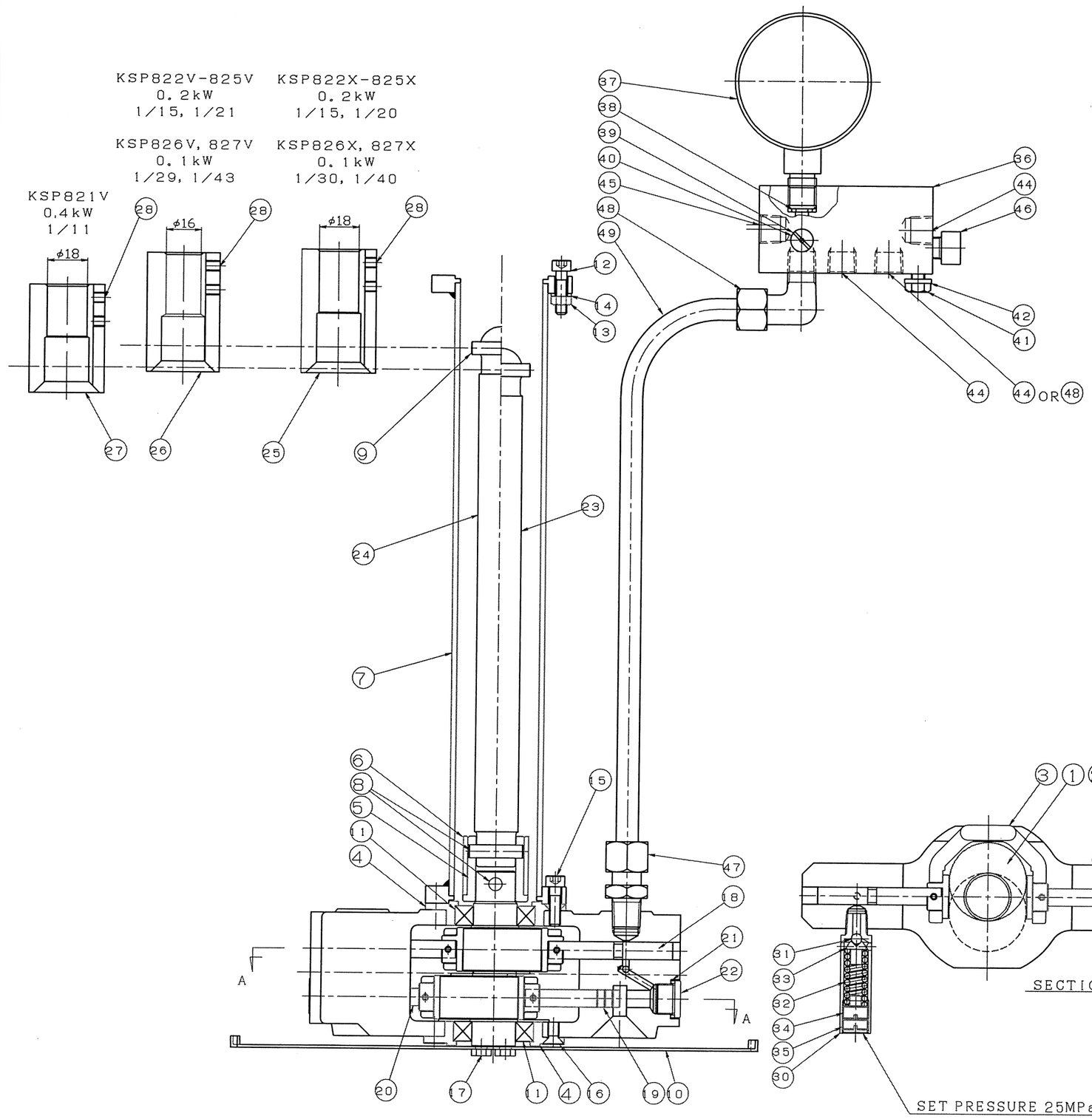
KSP822V-825V
0.2kW
1/15, 1/21

KSP822X-825X
0.2kW
1/15, 1/20

KSP826V, 827V
0.1kW
1/29, 1/43

KSP826X, 827X
0.1kW
1/30, 1/40

KSP821V
0.4kW
1/11



6.42kg	6.49kg	6.20kg	6.50kg	6.21kg	No.	NAME	P. No.	MASS	NOTE
2	2	1	2	1	49	PUMP LINE PIPE φ10X350L	Z9317	0.08	KS-822034
2	2	1	2	1	48	COPPER TUBE ELBOWφ10xRc1/4	OSTF	0.05	
2	2	1	2	1	47	COPPER TUBE JOINTφ10XRc1/4	OSTF	0.05	
1	1	1	1	1	46	FLOW FITTING	T3004	0.02	KS-800136
1	1	1	1	1	45	HEX. SOCKET PLUG Rc3/8	HS-PG	0.02	
2	2	3	2	3	44	HEX. SOCKET PLUG Rc1/4	HS-PG	0.01	
-	-	-	-	-	43	-	-	-	
2	2	2	2	2	42	SPRING WASHER M6	SW	-	
2	2	2	2	2	41	HEX. BOLT M6X12L	HB	-	
1	1	1	1	1	40	AIR VENT VALVE	X1005	0.01	KS-800124
1	1	1	1	1	39	STEEL BALL 1/8	Z2001	-	
1	1	1	1	1	38	COPPER WASHER	X3004	-	φ9Xφ5.5X1.5t
1	1	1	1	1	37	PRESSURE GAUGE 35MPa	W1001	0.30	
1	1	1	1	1	36	DISCHARGE PORT BLOCK	E7405	1.51	820D1-SM6△
2	2	1	2	1	35	AJUST SCREW M12	G8007	0.01	KS-800478△
2	2	1	2	1	34	AJUST SCREW	A8003	0.01	KS-800245
2	2	1	2	1	33	SPRING RETAINER	A8001	0.01	KS-800243
2	2	1	2	1	32	COIL SPRING	A8002	0.01	KS-800244
2	2	1	2	1	31	STEEL BALL 3/16	Z2003	-	
2	2	1	2	1	30	RELIEF VALVE BODY	E3010	0.04	KS-803862△
-	-	-	-	-	29	-	-	-	
2	2	2	2	2	28	HEX. SOCKET SET SCREW M5x5L	HSS	-	
1	-	-	-	-	27	821V-D1 MOTOR COUPLING φ18	E7403	0.21	820D1-SM3
-	1	1	-	-	26	820V-D1 MOTOR COUPLING φ16	E7402	0.25	820D1-SM4
-	-	-	1	1	25	820X-D1 MOTOR COUPLING φ18	E7404	0.26	820D1-SM5
-	1	1	1	1	24	MOTOR SHAFT 232L	E7032	0.60	KS-822109△
1	-	-	-	-	23	MOTOR SHAFT 222L	E7031	0.57	KS-822109△
2	2	1	2	1	22	HEX. PLUG M14	X2009	0.01	
2	2	1	2	1	21	COPPER WASHER	X3010	0.01	φ17Xφ14.5X2.0t
-	-	2	-	2	20	GUIDE PISTON ASSY	E7005	0.02	KS-822103△
2	2	1	2	1	19	MAIN PISTON ASSY	E7003	0.03	KS-822103△
2	2	1	2	1	18	VALVE PISTON ASSY	E7004	0.03	KS-822103△
2	2	2	2	2	17	HEX. BOLT M5X12L	E7012	-	
4	4	4	4	4	16	CROSSED FLAT SCREW M5X10L	PSS	-	
4	4	4	4	4	15	HEX. SOCKET BOLT M5X18L	HB	-	
4	4	4	4	4	14	SPRING WASHER M5	SW	-	
4	4	4	4	4	13	HEX. NUT	HN	-	
4	4	4	4	4	12	HEX. SOCKET BOLT M5X20L	CB	-	
2	2	2	2	2	11	D.G BALL BEARING 6904	Z3021	0.04	
1	1	1	1	1	10	AGITATER	E7011	0.06	KS-822216△
1	1	1	1	1	9	CONNECTING PIN φ5.95	E3008	0.01	KS-803830
2	2	2	2	2	8	CONNECTING PIN φ6.0	E3009	0.01	KS-803831△
1	1	1	1	1	7	SUPPORT PIPE	E7010	0.84	KS-822108
1	1	1	1	1	6	COUPLING COVER	E7009	0.04	KS-822007
1	1	1	1	1	5	CAM SHAFT COUPLING	E7008	0.06	KS-822006
2	2	2	2	2	4	BEARING COVER	E7007	0.08	KS-822105
2	2	2	2	2	3	PLUNGER GUIDE	E7006	0.09	KS-822004△
1	1	1	1	1	2	PUMP BODY	E7002	1.22	KS-822102△
1	1	1	1	1	1	CAM SHAFT	E7001	0.41	KS-822201

KSP 821 -V	KSP 822 ~ 823 -V	KSP 824 ~ 827 -V	KSP 822 ~ 823 -X	KSP 824 ~ 827 -X
Q'ty				

CUSTOMER

SPECIFICATION

CHECKED BY	DRAWN BY
Kato 2006.5.9	KATSUTORI
SEC. CHIEF	DESIGNED BY
Miyazaki 2006.4.25	MIYAZAKI

KSP820S-D1 PUMP ASSY

KOWA CORP.
OSAKA JAPAN

DWG. No. eSA-820S-D1 △1

GPD. No.

CODE No.

3RD ANGLE PROJECTION

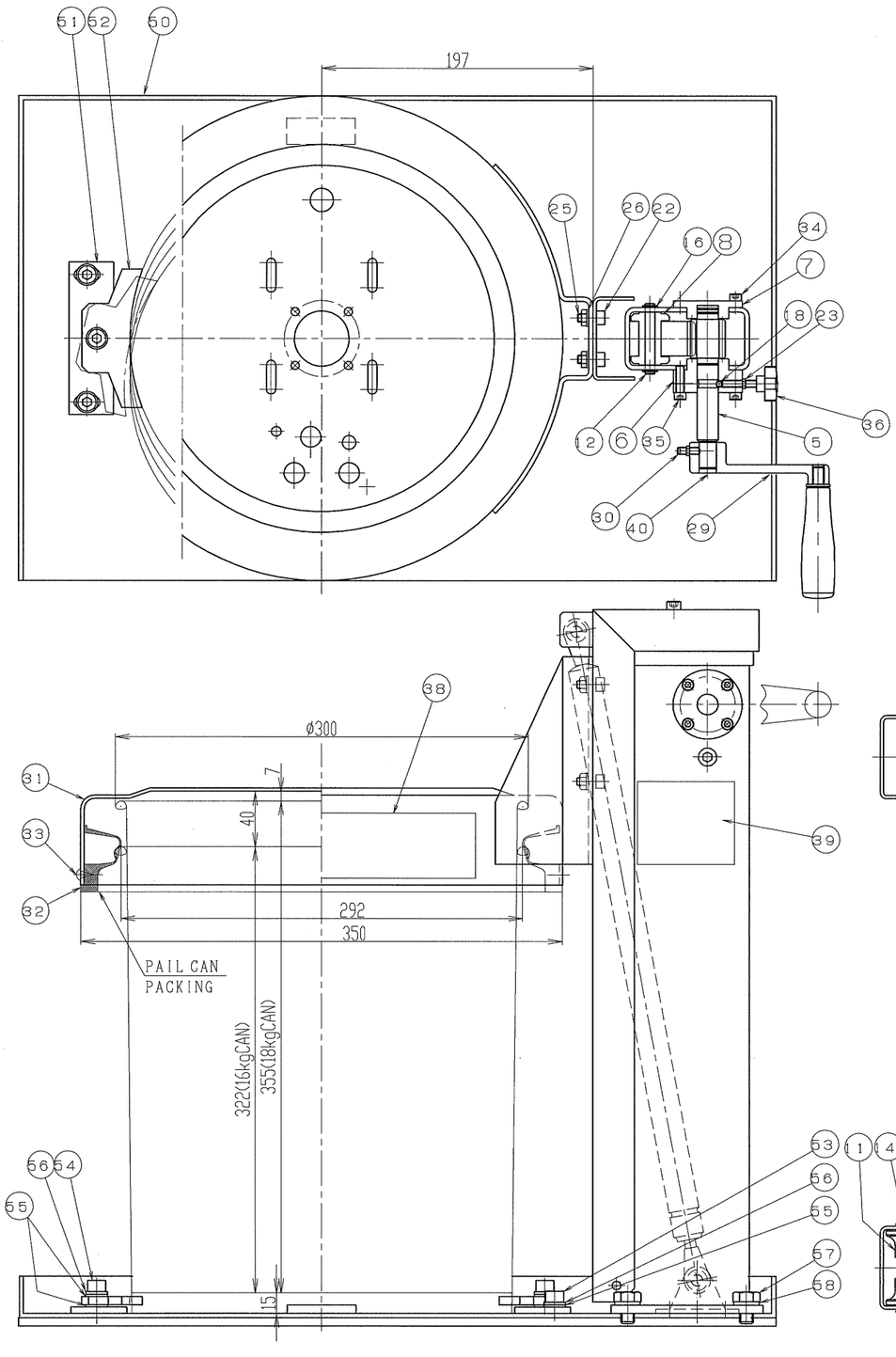
SCALE

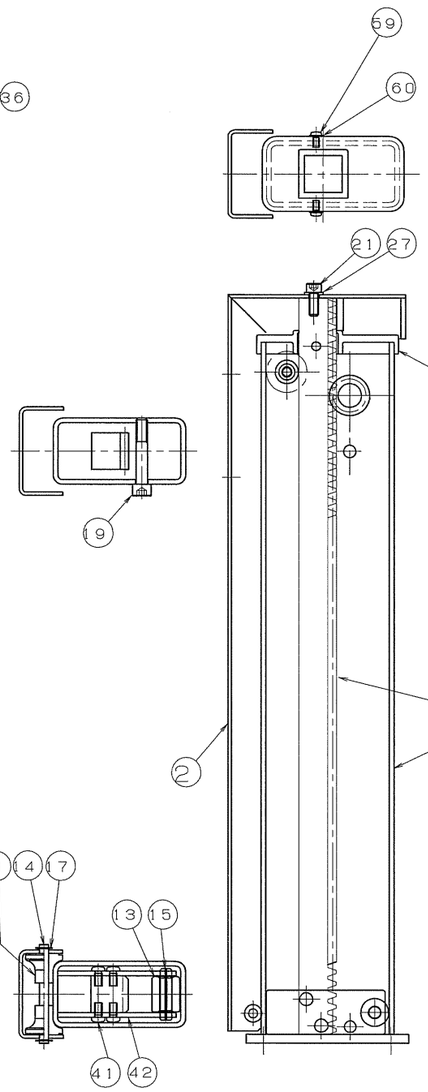
DATE OF ISSUE 2006.6.1

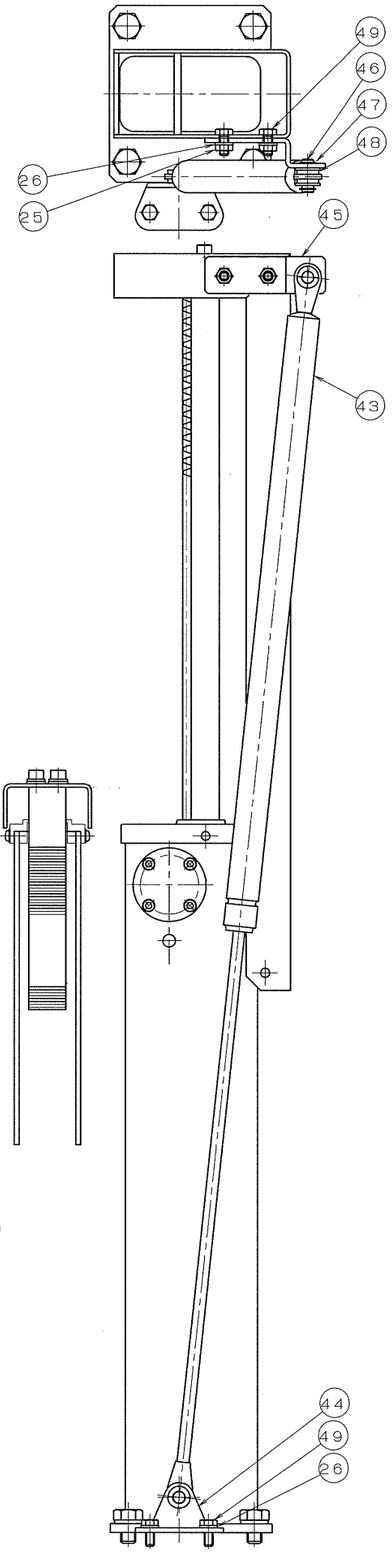
MFG. NO.

(A1)

協議印 出図先 購買 製造 客先 他 複写部数 A1 A3 出図日







改定REV	改定内容DESCRIPTION	日付DATE	承認SIGN
1	エレベータ用フレーム取付ピス修正・エレベータ側面図修正	2012.12.27	水野
2			
3			
4			

Total 20.26kg

No.	NAME	P. No.	Q'ty	MASS	NOTE
60	PLANE WASHER M4	PW	2	0.01	
59	CROSSED PAN SCREW M4X12L	PNS	2	0.06	
58	SPRING WASHER M10	SW	4	0.01	
57	HEX. BOLT M10X16L	HB	4	0.08	
56	SPRING WASHER M8	SW	6	0.01	
55	PLANE WASHER M8	PW	8	0.01	
54	HEX. SOCKET BOLT M8X16L	CB	2	0.02	
53	HEX. SOCKET BOLT M8X18L	CB	4	0.05	
52	PAIL CAN STOPPER	E7042	2	0.23	KS-822063 ⚠2
51	PAIL CAN STOPPER	E7041	2	0.23	KS-822063 ⚠1
50	PUMP BASE	E7040	1	4.33	KS-822061 ⚠
49	HEX. BOLT M6X14L	HB	4	0.02	
48	PLANE WASHER M8	PW	3	-	
47	E-SNAP RING E5	ER	2	-	S60CM
46	PIN	E9003	1	0.01	KS-822056
45	BLACKET	E9002	1	0.01	KS-822155
44	BLACKET KIT G13	E9001	1	0.05	
43	AIR SPRING Y2114	E9001	1	0.53	GS066-3059F
42	GUIDE ROLLER PLATE(LOWER SIDE)	E7312	2	0.06	KS-804766 ⚠
41	CROSSED PAN SCREW M5X10L	PNS	4	0.06	KS-804627
40	HANDLE CAP	E7310	1	-	KS-804704
39	NAME PLATE	V1107	1	-	KS-822072
38	NAME PLATE	V2022	1	-	KS-822086
37	HEX. BOLT M4X22L	HB	2	0.01	
36	KT-B1 M5-25L	E7303	1	-	
35	HEX. SOCKET BOLT M5X20L	CB	4	-	
34	HEX. SOCKET BOLT M5X8L	CB	4	-	
33	CROSSED TPG SCREW 3X10L	PTS	15	0.01	
32	PAIL CAN PACKING	E3021	1	0.70	KS-803819
31	PAIL COVER	E7401	1	3.60	820D1-SC1
30	HEX. SOCKET SET SCREW M5X16L	HSS	1	-	
29	HANDLE HSU-80.GTR-24-M8	E7300	1	0.10	KS-804653 ⚠
28	-	-			
27	SPRING WASHER M6	SW	2	-	SUS
26	SPRING WASHER M6	SW	8	0.01	
25	HEX. NUT M6	HN	6	-	
24	HEX. SOCKET SET SCREW M6X10L	HSS	2	0.01	
23	HEX. NUT M5	HN	2	-	
22	HEX. SOCKET BOLT M6X14L	HB	4	0.03	
21	HEX. SOCKET BOLT M6X16L	HB	2	0.01	SUS
20	-	-			
19	HEX. SOCKET BOLT M8X45L	HB	1	0.02	
18	STEEL BALL 5/32	Z2002	1	-	
17	E-SNAP RING E5	ER	2	-	SUS
16	E-SNAP RING E6	ER	2	-	
15	SPRING PIN ø8X35L	SP	1	-	
14	GUIDE ROLL SHAFT	E3040	1	0.02	KS-803813 ⚠
13	GUIDE ROLLER(LOWER SIDE)	E7313	1	0.02	KS-804767
12	GUIDE WHEEL PIN	E7305	1	0.01	S35C
11	GUIDE WHEEL	E3037	2	0.01	KS-803809 ⚠
10	-	-			
9	-	-			
8	GUIDE WHEEL	E7304	1	0.10	KS-804623
7	BEARING FOR PINION(PASSIVE SIDE)	E7036	1	0.11	KS-822046
6	BEARING FOR PINION(HANDLE SIDE)	E7302	1	0.11	KS-804624 ⚠
5	PINION SHAFT	E7301	1	0.21	KS-804622
4	RACK GEAR	E3030	1	2.21	KS-803815 ⚠
3	FLAME COVER	E7308	1	0.05	KS-804629
2	GUIDE FLAME FOR ELEVATOR	E3028	1	1.33	KS-803816 ⚠
1	FLAME FOR ELEVATOR	E7309	1	3.56	KS-804628 ⚠

CUSTOMER

SPECIFICATION

CHECKED BY	DRAWN BY
Mizuno 2012.12.27	KATSUTORI
2006.6.1	
SEC. CHIEF	DESIGNED BY
Kato 2012.12.27	MIYAZAKI
2006.6.1	

KSP820-D1
BASE & ELEVATOR

KOWA CORP.
OSAKA JAPAN

DWG. No. eSA-820-BASE&EV-D1 ⚠1
CFD. No.
CODE No.

3RD ANGLE PROJECTION

SCALE

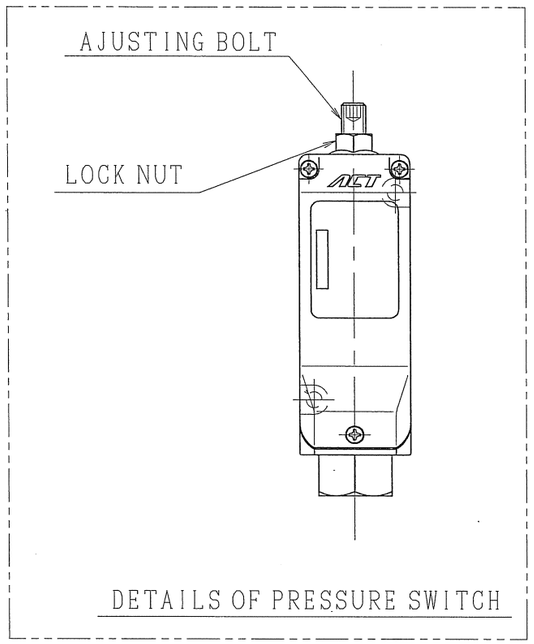
DATE OF ISSUE 2006.6.1

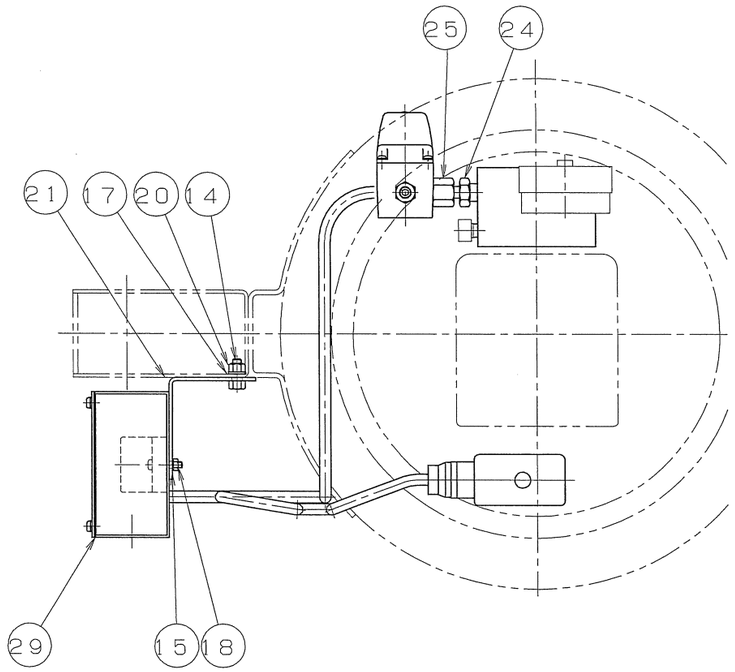
MFG. NO.

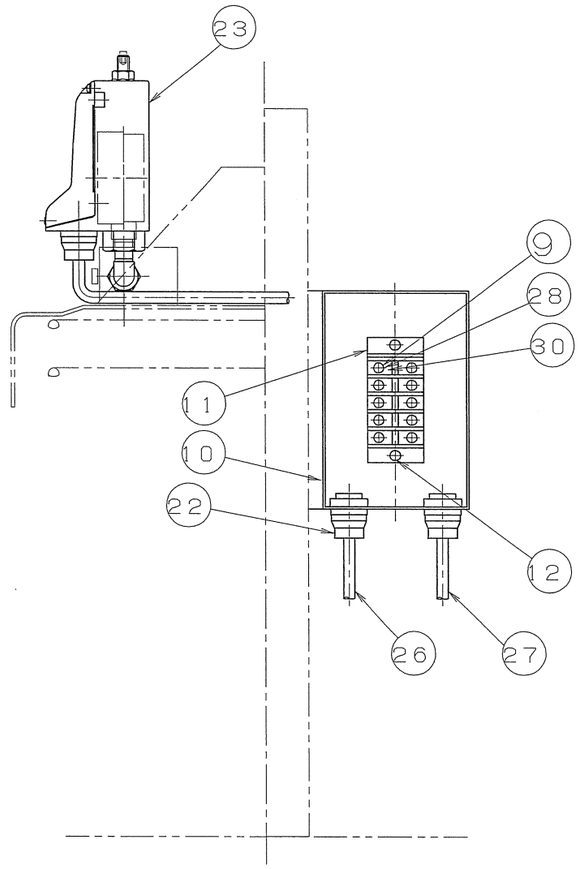
(A1)

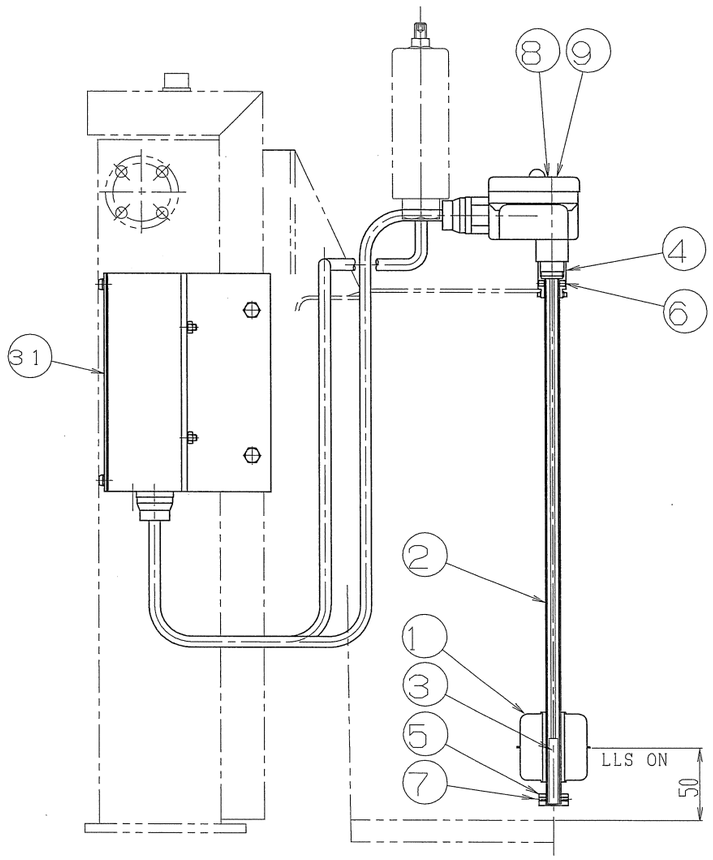
協議印 / 出図先 / 購買 / 製造 / 客先 / 控 / 複写部数 A1 A3 / 出図日

改定REV	改定内容 DESCRIPTION	日付DATE	担当SIGN
1	Model of terminal box is changed.	2011.6.21	H.K









Total 2.5kg

31	NAME PLATE (PL)	V6001	1		
30	TERMINAL	CT	6	-	R1.25-4
29	WATERPLOOF PACKING	E2101	1	0.02	KS-804350
28	MARK TUBE	MT	6	-	1.25
27	CABLE(VCTF1.25mm²2C)	CC	1	0.10	
26	CABLE(VCTF0.75mm²2C)	CC	1	0.10	
25	ELBOW NIPPLE Ø8X1/4	OSTF	1	0.04	
24	BITE TYPE STAD Ø8X1/8	OSTF	1	0.05	
23	PRESSURE SWITCH	CE25	1	0.60	CE25
22	CONNECTOR	CC	3	0.03	OA-1
21	BASE	E3051	1	0.51	KS-803871 4
20	HEX. NUT	HN	2	-	M6
19	HEX. NUT	HN	4	-	M5
18	HEX. NUT	HN	2	-	M4
17	SPRING WASHER	SW	2	-	M6
16	SPRING WASHER	SW	4	-	M5
15	SPRING WASHER	SW	2	-	M4
14	HEX. BOLT	HB	2	0.01	M6X14L
13	CROSSED PAN SCREW	PNS	4	-	M5X35L
12	CROSSED PAN SCREW	PNS	2	-	M4X20L
11	TERMINAL BLOCK	E3046	1	0.05	BTBH30C5
10	TERMINAL BOX	E7043	1	0.50	KS-804500
9	TERMINAL	CT	2	-	R1.25-3
8	TERMINAL BOX(WITH PACKING)	E3044	1	0.20	TERMINAL-BOX-M-M16
7	HEX. SOCKET SET SCREW	HSS	2	-	M3X4L
6	HEX. SOCKET SET SCREW	HSS	2	-	M4X5L
5	LOW LEVEL STOPPER	E7016	1	0.02	KS-822027
4	LOCK SCREW	E3042	1	0.06	KS-803867
3	LEAD SWITCH	W3010	1	0.03	FA-0202
2	GUIDE PIPE Ø10XØ8X361L	E7015	1	0.08	KS-822126 2
1	FLOAT	E3041	1	0.03	SUS304
No.	NAME	P.No.	Q'ty	MASS	NOTE

PRESS. SWITCH ASS'Y

LLS ASS'Y

CUSTOMER	
SPECIFICATION	

CHECKED BY	DRAWN BY
Shimomo 2011.6.22	KATSUTORI 2006.6.1
SEC.CHIEF	DESIGNED BY
Kato	SHIMONO 2006.6.1

KSP820-D1
PRESSURE SWITCH &
LOW LEVEL SWITCH ASSY

KOWA CORP.
OSAKA JAPAN

DWG. No.
eSA-820-LLS&PS-D1 1

CFD. No.
CODE No.

3RD ANGLE PROJECTION

SCALE

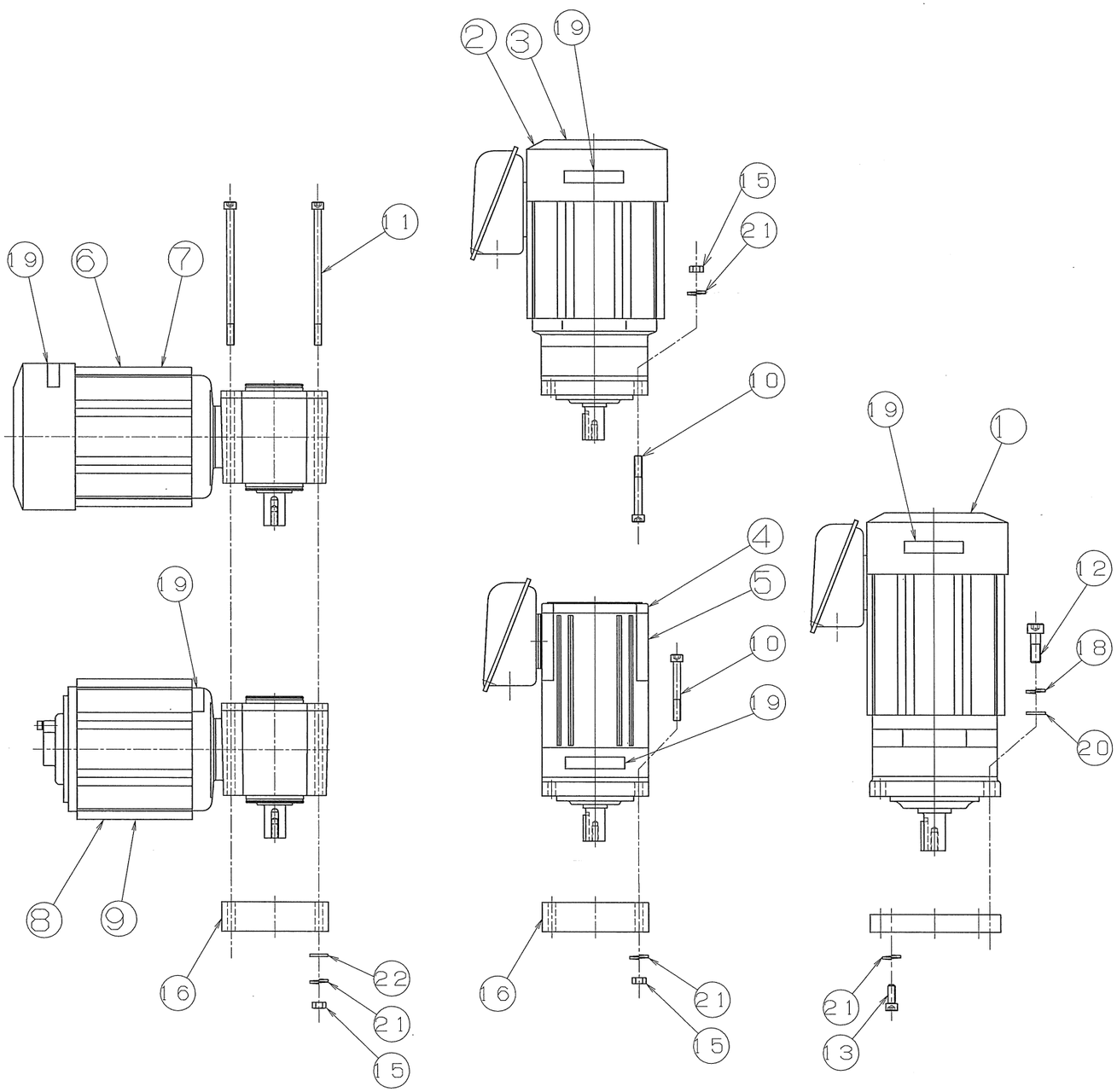
DATE OF ISSUE

MFG. NO.

協議印
出図先
購買
製造
客先
控
複写部数
A1
A3
出図日

(A2)

改定REV	改定内容 DESCRIPTION	日付DATE	担当SIGN
1	Motor model is changed, The length of bolt is changed,	2009.9.1	H.K
2	Reduction ratio is corrected, (No.5)	2011.1.11	H.K



22	PLANE WASHER	PW	4	0.01	M6
21	SPRING WASHER	SW	4	0.01	M6
20	PLANE WASHER	PW	4	0.02	M8
19	NAME PLATE(ARROW)	V2019	1	-	KS-801334
18	SPRING WASHER	SW	1	0.02	M8
17	MOTOR FLANGE	E7407	1	0.21	820D1-SM2
16	MOTOR FLANGE	E7406	1	0.26	820D1-SM1 ⚠1
15	HEX. NUT	HN	4	0.02	M6
14	HEX. NUT	HN	4	0.04	M8
13	HEX. SOCKET BOLT	CB	4	0.04	M6X16L
12	HEX. SOCKET BOLT	CB	4	0.06	M8X25L
11	HEX. SOCKET BOLT	CB	4	0.19	M6X115L
10	HEX. SOCKET BOLT	CB	4	0.06	M6X50L
KSP827_X	9	MOTOR(SUMITOMO)0.1kW 1/40	-	1	5.30	RNFM01-190R-40
KSP826_X	8	MOTOR(SUMITOMO)0.1kW 1/30	-	1	5.30	RNFM01-190R-30
KSP823,5_X	7	MOTOR(SUMITOMO)0.2kW 1/20	-	1	6.50	RNFM02-190R-20
KSP822,4_X	6	MOTOR(SUMITOMO)0.2kW 1/15	-	1	6.50	RNFM02-190R-15
KSP827_V	5	MOTOR(SUMITOMO)0.1kW 1/43	-	1	4.00	CNVM01-5067-43
KSP826_V	4	MOTOR(SUMITOMO)0.1kW 1/29	-	1	4.00	CNVM01-5067-29
KSP823,5_V	3	MOTOR(SUMITOMO)0.2kW 1/21	-	1	6.50	CNVM02-506H-21
KSP822,4_V	2	MOTOR(SUMITOMO)0.2kW 1/15	-	1	6.50	CNVM02-506H-15
KSP821_V	1	MOTOR(SUMITOMO)0.4kW 1/11	-	1	8.00	CNVM05-5077-11
PUMP MODEL	No.	NAME	P.No.	Q'ty	MASS	NOTE

CUSTOMER

SPECIFICATION

CHECKED BY	DRAWN BY
Shimono 2011.1.11	KATSUTORI 2006.6.13
SEC. CHIEF	DESIGNED BY
Kato 2006.6.13	SHIMONO 2006.6.13

KSP820-D1
GEARD MOTOR & MOTOR FLANGE

KOWA CORP.
OSAKA JAPAN

DWG. No. eSA-820-MOTOR-D1 ⚠2

CFD. No.

CODENo.

3RD ANGLE PROJECTION

SCALE

DATE OF ISSUE | MFG. NO.

協議印 | 出図先 | 購買 | 製造 | 客先 | 控 | 複写部数 A1 A3 | 出図日

(A2)