

KWK LUBRICATION SYSTEM
KS-C,KW-C MEASURING VALVE
WITH CYCLE COUNTER

INSTRUCTION MANUAL

KWK KOWA CORPORATION

Foreword

Thank you for adopting KWK Centralized Lubrication System. This instruction manual describes how to handle and maintain the KS-C and KW-C type distribution valves.

This manual describes standard equipment, but if there are any differences from this manual, please refer to the final specification.

● Security

The warranty period of this device is one year after operation.

We will provide free repairs for any problems with this unit if it is clearly identified as responsible for design and manufacture during the warranty period.

Please note that even during the warranty period, we can not guarantee any accidents that may occur as a result of repair or replacement of parts due to normal wear or usage that is different from the explanation in this manual. .

● Inquiry

If you have any questions or concerns in this manual, please contact our distributor who has delivered this device.

● Parts order

Please order from our distributor who delivered this device.

Safety precautions

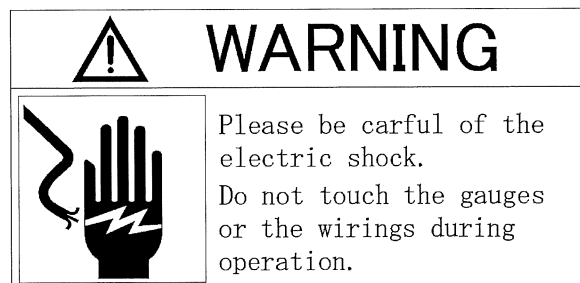
- Before installation, operation or maintenance, be sure to read this manual and all other attached documents carefully and use them properly.

Familiarize yourself with all the equipment knowledge, safety information and precautions.

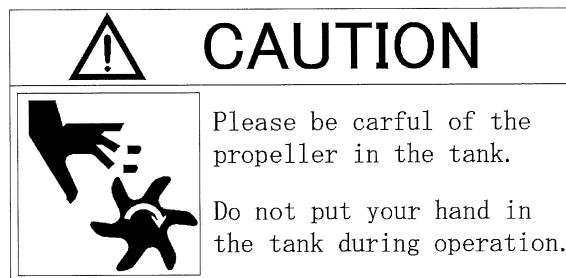
Safety signs are shown on each component of this centralized lubrication system to indicate safety precautions.

Be especially careful where these safety signs are located.

Safety signs are classified into "Warning" and "Caution".



If mishandled, dangerous situations may occur and death or serious injury may occur.



In case of mishandling, dangerous situations may occur and there may be a possibility of moderate injury or minor injury, or only physical injury may occur.

In addition, even the items described in "Caution" may lead to serious consequences depending on the situation. Be sure to protect them as they contain important information.

- This device has a maximum working pressure of 21MPa(210kg/cm²). When disassembling and checking each device, be sure to stop the operation of the pump, release the pressure, and work at 0MPa(0kg/cm²).

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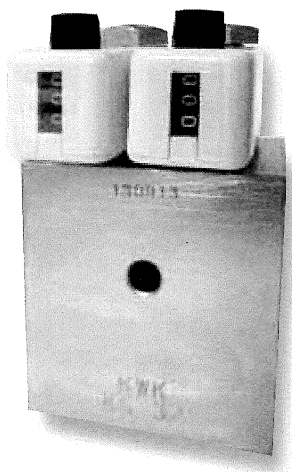
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KS-C形 (シングル吐出口)

KS-C

SERIES MEASURING VALVES
(Single Discharge Port Type)

概要 GENERAL DESCRIPTION



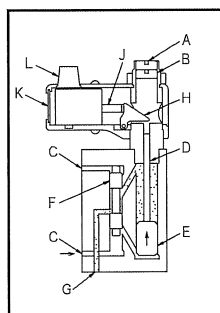
KS形分配弁は、デュアルラインに使用される可変容量形吐出弁で、ポンプから2本の主管に交互に圧送される潤滑剤の圧力により作動し、各給油ポイントへ計量吐出機構で給油します。分配弁の動作は、それぞれのメインピストンに設けたカウンタにより確認できます。又、このメインピストンのストロークを調整ネジを調整することによって吐出量を変更することができます。

シングル吐出口とは、メインピストンの往復吐出量を分配弁内部で、1つの吐出口に合流させたものです。仕様等に記載してある「吐出量 $\text{cm}^3/\text{ストローク}$ 」とはメインピストンの片側の動きに対する吐出量を表示しています。従って主管2本に交互に潤滑剤が圧送され、分配弁が作動したとしますとメインピストンは1往復したことになりますので、1個の吐出口からの量は $\text{cm}^3/\text{ストローク} \times 2$ となり倍量出したことになります。

The KS measuring valve is a variable delivery valve used in dualines. It is operated by the pressure of the lubricant pumped into the two main supply lines laterately from the pump, and feeds the lubricant to the lubricating points by way of the metering discharge mechanism. The action of measuring valves may be checked by the Cycle counter(s) provided on each main piston. The discharge capacity may be controlled by adjusting the stroke of main piston by turning the adjusting screw.

In the single discharge port type, the deliveries in the reciprocal stroke of the main piston are combined into one discharge port inside the valve. The discharge capacity ($\text{cm}^3/\text{stroke}$) mentioned in catalogue refers to the delivery by one side action of the main piston. Therefore, when lubricant is sent into two main supply lines alternately and the measuring valve is operated accordingly, the main piston makes one full reciprocal stroke, and the output from one discharge port is twice as large as the specified discharge capacity.

作動説明 PRINCIPLE OF OPERATION

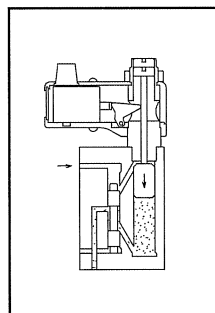


1.

下側の供給口に加圧された潤滑剤が作用し、パイロットピストンを押し上げ、メインピストン下部への油路を開く。メインピストンは矢印方向に押し上げられる。

Pressurized lubricant entering valve forces pilot piston up, allowing pressure to be applied to bottom of main piston. Main piston begins to move up.

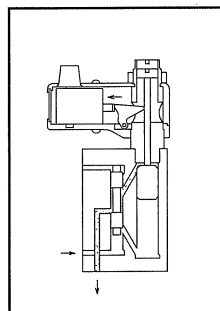
A, ロックネジ	Lock screw	G, 吐出口	Discharge line
B, 調整ネジ	Adjusting screw	H, ベルクランク	Bell crank
C, 供給口	Supply ports	J, 駆動板	Operating lever
D, 指示棒	Indicator stem	K, 目盛板	Dial
E, 主ピストン	Main piston	L, リセットノブ	Reset knob
F, パイロットピストン	Pilot piston		



3.

供給口からの加圧された潤滑剤により、パイロットピストンが押し下げられ、メインピストン上部への油路を開く。メインピストンは矢印方向に押し下げられる。

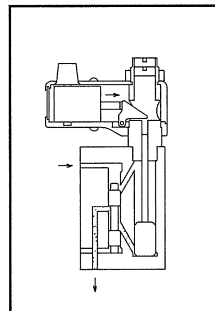
Pressurized lubricant entering valve forces pilot piston down, allowing pressure to be applied to top of main piston. Main piston begins to move down.



2.

メインピストン上昇に伴い上部側の潤滑剤は油路を通過してパイロットピストンに達し、吐出口へ押し出されます。この時、指示棒がベルクランクを回転させて、カウンタの駆動板を押し込み目盛板を1目盛押し上げます。

Main piston moving up under pressure forces lubricant from its chamber, past the upper land of the pilot piston and out the discharge line to the bearing. At this time, indicator stem revolves the bell crank. Bell crank push in operating lever of dial for cycle counter.



4.

メインピストンが押し下げられることにより、下部側の潤滑剤は油路を通過してパイロットピストンに達し、吐出口へ押し出されます。この時、指示棒との係合が解除されたベルクランクと駆動板は、スプリングにより元の状態に復帰します。以上1～4で1サイクルです。

Main piston moving down under pressure forces lubricant from its chamber, past the lower land of the pilot piston and out the discharge line to the bearing. At this time, bell crank and lever return to its rest position by spring. This (1~4) ends one cycle.

特長 FEATURES

1. 確実な計量分配給油: 給油ポイント毎に最適な量を給油します。
2. 堅牢な構造で確実な作動: 動作部分は、パイロットピストンとメインピストンからなるシンプルな構成ですから、故障がほとんどなく、その動作が確実です。
3. 給油ポイント毎に給油確認可能: 各々のカウンタの動きにより確認。
4. 20.6MPaの高压で使用できます。
圧力が高いと配管を細くする事も可能で、信頼性の高い給油が行えます。
5. 高精度の機械加工による優れた高性能分配弁。
分配弁はMC、ホーニング盤等により精密加工されているため、特に摺動部は高精度で、耐久性、機能性に優れています。

1. Accurate measuring --- an optimum amount of lubricant is supplied to each lubricating point.
2. Rigid structure, secure operation --- moving parts are built in a simple structure consisting only of pilot piston and main piston, so that the operation is secure and is almost free of troubles.
3. Checking of lubrication in every lubricating point --- the state can be checked by observing the Cycle counter(S).
4. Usable at a high 20.6MPa pressure.
At high pressure, the piping diameter can be reduced, and highly reliable lubrication may be realized.
5. Excellent performance by high precision machining.
Because of precision machining by MC, honing machine, etc., the precision of sliding parts is particularly high, and the durability and functions are excellent.

仕様 SPECIFICATION

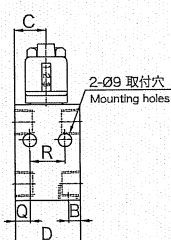
形 式 Model	吐出口数 Number of dis. ports	吐出量 (cm³/stroke) Dis. capacity		調整ネジ 1回転当り の吐出量 (cm³/rev) Adjustment	カウンタ目盛 Cycle counters	最高使用圧力 Working Pressure (MAX)	取付ボルト (付属) Mounting bolts (Attachment)	質量 (kg) MASS	パイロットピストン 操作油量(cm³) Operative Vol. for pilot piston
		MAX.	MIN.						
KS-31C	1	1.2	0.8	0.06	0～999 From 0～999 Counts	20.6 MPa	M8 × 65L	1.35	0.6
KS-32C	2							2.15	1.2
KS-33C	3							2.95	1.8
KS-34C	4							3.85	2.4
KS-41C	1	2.5	1.25	0.10	手動 リセット 方式			1.55	0.63
KS-42C	2							2.45	1.26
KS-43C	3							3.35	1.89
KS-44C	4							4.15	2.52
KS-51C	1	5.0	2.5	0.15				1.65	0.63
KS-52C	2							2.65	1.26
KS-53C	3							3.65	1.89
KS-54C	4							4.75	2.52

寸法表 DIMENSIONS

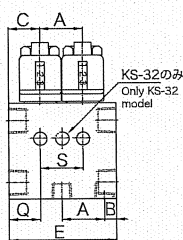
Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	R	S	T	U
KS-31C	—	8	21.5	44	—	—	—	10.5	26	—	18	42	—	118	46	10	24	—	—	—
KS-32C,33C,34C	29	8	21.5	—	73	102	131	10.5	26	—	18	42	—	118	48	36.5	—	—	29	58
KS-40C	32	9	24	49	81	113	145	9	28.5	—	12.5	54	—	129	49.5	10.5	28	60	91	123
KS-50C	37	9.5	25.5	53	90	127	164	13	33	—	11	57	—	131	51	10	33	70	107	144

KS-30C・KS-40C・KS-50Cカウンタ付分配弁

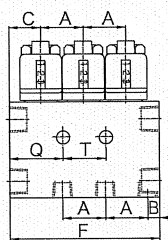
1口(1Dis. port)



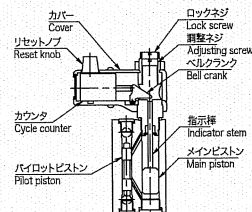
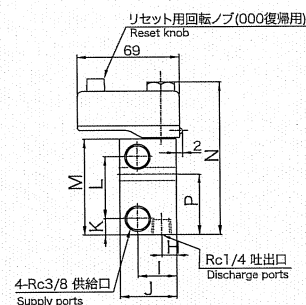
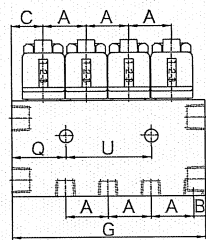
2口(2Dis. ports)



3口(3Dis. ports)



4口(4Dis. ports)



Sectional view of A-A



目盛板詳細
Detail of dial
View of B-B

取扱上の注意 CAUTION AT OPERATION

1. オイル用は9.8MPa以下でご使用下さい。
2. 作動圧力は1MPa以下です。
3. 使用温度範囲は-20~+80℃です。
4. 使用しない吐出口にはプラグ(R1/4)をして下さい。
5. 吐出量調整は指示棒ケース内の調整ネジで行ないます。
調整後はロック用ネジで十分固定して下さい。
6. 屋外、塵埃、輻射熱などに対しては保護カバーを取付けて下さい。

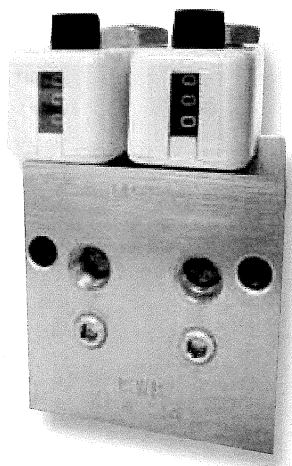
1. The maximum working pressure of measuring valve using oil should be 9.8MPa.
2. The working pressure is 1MPa or lower.
3. Range of working temperature is -20~+80°C.
4. Plug(R1/4) discharge ports unused.
5. Discharge capacity can be adjusted by a adjusting screw in indicator stem case. After adjustment, securely fix the screw with lock screw.
6. Install protection cover against outdoor use, dirt, radiation heat etc.

KW-C形 (ダブル吐出口)

KW-C

SERIES MEASURING VALVES
(Double Discharge Port Type)

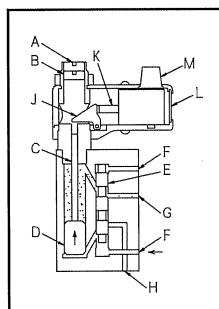
概要 GENERAL DESCRIPTION



KW形分配弁は、KS形分配弁と基本的には同じですが、吐出口が2個、すなわちダブル吐出口を持つ点が異なります。ダブル吐出口とは、メインピストンの往動時の吐出量と、復動時の吐出量をそれぞれ単独に取り出すようにしたものです。仕様等に記載してあります「吐出量 $\text{cm}^3/\text{ストローク}$ 」の値が、メインピストンの往・復動のいずれかの動きによって吐出される1つの吐出口の量を示します。

The KW measuring valve is similar to the KS measuring valve in structure and function except that it has two discharge ports. That is, in the double discharge port type, the delivery by "going" main piston and that by "returning" main piston are picked up independently. The discharge capacity ($\text{cm}^3/\text{stroke}$) mentioned in catalogue refers to the delivery by either way of action of the main piston.

作動説明 PRINCIPLE OF OPERATION

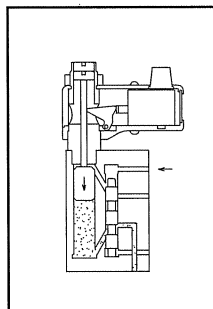


1.

下側の供給口に加圧された潤滑剤が作用し、パイロットピストンを押し上げ、メインピストン下部への油路を開く。メインピストンは矢印方向に押し上げられる。

Pressurized lubricant entering valve forces pilot piston up, allowing pressure to be applied to bottom of main piston. Main piston begins to move up.

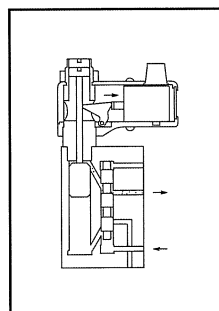
A. ロックネジ	Lock screw	G. 吐出口(A)	Discharge line(A)
B. 調整ネジ	Adjusting screw	H. 吐出口(B)	Discharge line(B)
C. 指示棒	Indicator stem	J. ベルクランク	Bell crank
D. 主ピストン	Main piston	K. 駆動板	Operating lever
E. パイロットピストン	Pilot piston	L. 目盛板	Dial
F. 供給口	Supply ports	M. リセットノブ	Reset knob



3.

供給口からの加圧された潤滑剤により、パイロットピストンが押し下げられ、メインピストン上部への油路を開く。メインピストンは矢印方向に押し下げられる。

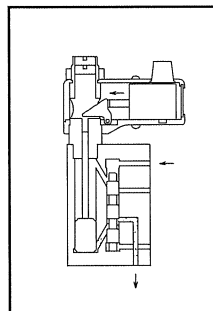
Pressurized lubricant entering valve forces pilot piston down, allowing pressure to be applied to top of main piston. Main piston begins to move down.



2.

メインピストン上昇に伴い、上部側の潤滑剤は油路を通してパイロットピストンに達し、吐出口(A)へ押し出されます。この時、指示棒がベルクランクを回転させて、カウンタの駆動板を押し込み目盛板を1目盛押し上げます。

Main piston moving up under pressure forces lubricant from its chamber, past the upper land of the pilot piston and out the discharge line to the bearing. At this time, Indicator stem revolves the bell crank. Bell crank push in operating lever of dial for cycle counter.



4.

メインピストンが押し下げられることにより下部側の潤滑剤は油路を通してパイロットピストンに達し、吐出口(B)へ押し出されます。この時、指示棒との係合が解除されたベルクランクと駆動板は、スプリングにより元の状態に復帰します。以上1～4で1サイクルです。

Main piston moving down under pressure forces lubricant from its chamber, past the lower land of the pilot piston and out the discharge line to the bearing. At this time, bell crank and lever return to its rest position by spring. This (1~4) ends one cycle.

特長 FEATURES

KS形分配弁の特長に加えて

1. KS形に比べて給油ポイントを倍数受け持つことができます。
2. 奇数の給油ポイントに対しては、左端のダブル吐出口をシングル吐出口に変更することができ、簡単に対応できます。(但し、左端の1個以外は不可)
3. 取付寸法が同じで接続が容易
KW-30・50形は取付寸法が同じですので、弁と弁の接続、弁と弁の交換が簡単にでき、シンプルな配管が行えます。

In addition at the features of KS series measuring valves:

1. A multiple of measuring points may be lubricated as compared with the number of lubricating points in KS.
2. For odd-number lubricating points, the double discharge ports at the left end may be modified to single type (but modification is impossible in other positions).
3. Mounting dimensions are identical, connection is easy. Since the mounting dimensions of KW 30, 50 are identical, the valves can be connected or replaced easily, and the piping may be simplified.

仕様 SPECIFICATION

形 式 Model	吐出口数 Number of dis. ports	吐出量 (cm ³ /stroke) Dis. capacity		調整ネジ 1回転当り の吐出量 (cm ³ /rev) Adjustment	カウンタ目盛 Cycle counters	最高使用圧力 Working Pressure (MAX)	取付ボルト (付属) Mounting bolts (Attachment)	質量 (kg) MASS	パイロットピストン 操作油量 (cm ³) Operative Vol. for pilot piston		
		MAX.	MIN.								
KW-32C	2	1.2	0.8	0.06	0～999	20.6 MPa	M8 × 75L	1.65	0.4		
KW-34C	4				From 0～999 Counts			2.65	0.8		
KW-36C	6							3.65	1.2		
KW-38C	8							4.65	1.6		
KW-310C	10	5.0	2.5	0.15	手動 リセット 方式			5.65	2.0		
KW-52C	2							1.65	0.4		
KW-54C	4							2.65	1.8		
KW-56C	6							3.65	1.2		
KW-58C	8							4.65	1.6		

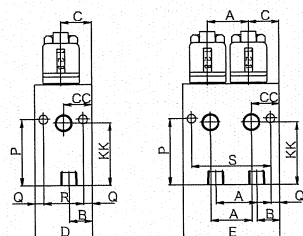
寸法表 DIMENSIONS

Model	A	B	C	CC	D	E	F	G	GG	H	I	J	K	KK	L	M	N
KW-30C	32	18	24	22	45	76	108	140	72	12	27	54	44	49	57	79	116
KW-50C									—								131

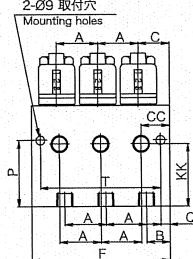
Model	P	Q	R	S	T	U	W	X	Y
KW-30C	52	7	31	62	94	126	158	1/4	3/8
KW-50C									

KW-30C・KW-50Cカウンタ付分配弁

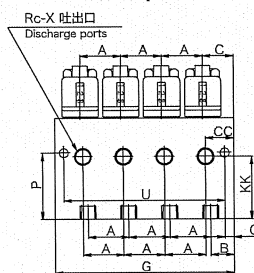
2口(2Dis. port) 4口(4Dis. ports)



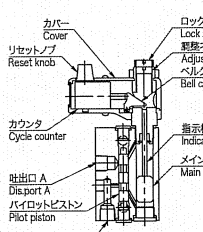
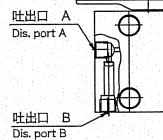
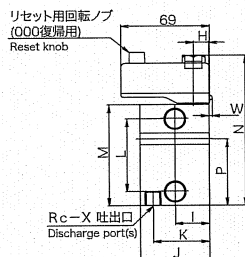
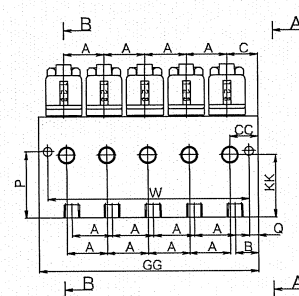
6口(6Dis. ports)



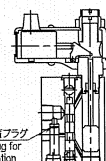
8口(8Dis. ports)



10口(10Dis. ports)



Sectional view of A-A



Sectional view of B-B



目盛板詳細
Detail of dial
View of C-C

取扱上の注意 CAUTION AT OPERATION

1. オイル用は9.8MPa以下でご使用下さい。
2. 作動圧力は1MPa以下です。
3. 使用温度範囲は-20~+80℃です。
4. 吐出量調整は指示棒ケース内の調整ネジで行います。
調整後はロック用ネジで十分固定して下さい。
5. 屋外、塵埃、輻射熱などに対しては保護カバーを取付けて下さい。
6. 左端1ヶ所のみ吐出口B内のプラグを外せばAB吐出口が合流します。
(B-B断面図参照)
この場合、この部分の吐出量は倍量となります。

1. The maximum working pressure of measuring valve using oil should be 9.8MPa.
2. The working pressure is 1MPa or lower.
3. Range of working temperature is -20~+80°C.
4. Discharge capacity can be adjusted by an adjusting screw in indicator stem case.
After adjustment, securely fix the screw with lock screw.
5. Install protection cover against outdoor use, dirt, radiation heat and etc.
6. To combine the output of the two discharge ports of only left side valve, remove the blind plug in the Dis. port B. (see sectional view of B-B)
In this case the quantity of lubricant will be doubled.

4. MEASURING VALVE TYPE LIST

Measuring valve size	Model	Number of discharge ports	Discharge capacity (cm ^³)		Adjustment cm ^³ /1rev	Mounting bolts	Mass (kg)	Piping connection port	
			MAX.	MIN.				In	Out
KS-30C	KS-31C	1	1.2	0.8	0.06	M8×65L	1.35	Rc3/8	Rc1/4
	KS-32C	2					2.15		
	KS-33C	3					2.95		
	KS-34C	4					3.85		
KS-40C	KS-41C	1	2.5	1.25	0.10		1.55		
	KS-42C	2					2.45		
	KS-43C	3					3.35		
	KS-44C	4					4.15		
KS-50C	KS-51C	1	5.0	2.5	0.15		1.65		
	KS-52C	2					2.65		
	KS-53C	3					3.65		
	KS-54C	4					4.75		
KW-30C	KW-32C	2	1.2	0.8	0.06	M8×75L	1.65		
	KW-34C	4					2.65		
	KW-36C	6					3.65		
	KW-38C	8					4.65		
	KW-310C	10					5.65		
KW-50C	KW-52C	2	5.0	2.5	0.15		1.65		
	KW-54C	4					2.65		
	KW-56C	6					3.65		
	KW-58C	8					4.65		

Minimum operating pressure 0.98MPa

Maximum working pressure 20.6MPa

Applicable grease NLGI No.00~No.1

5. MOUNTING OF MEASURING VALVE

1) MOUNTING OF MEASURING VALVE

- (a) It is not a good idea to mount the measuring valve directly on the mains. If it is necessary to remove the measuring valve in the future when it is mounted directly to the main pipe due to remodeling of the piping line or a defect etc. in the future, it will be difficult to continue the operation of the device unlike in the case of mounting to the branch pipe. Air is mixed in and causes the entire system to malfunction.
- (b) When piping the measuring valve in series, in general, stop the number to about 3 in general, and when it is more than that, branch the branch from the main pipe separately and connect the piping.
- (c) Make and mount a dedicated support for the measuring valve or an appropriate mount instead. Select the measuring valve as close as possible to the greasing point, where the indicator rod is easy to see and the amount of greasing can be easily adjusted.
- (d) For the measuring valve, consider the connection with the branch pipe so that all the measuring valve indicator rod operate in the same direction in order to facilitate confirmation of the lubrication operation.

That is, it is sufficient to connect the No. 1 line of the branch pipe to the pipe connection port on the indicator rod side of the measuring valve.

(You may unify and connect in the reverse direction above.)

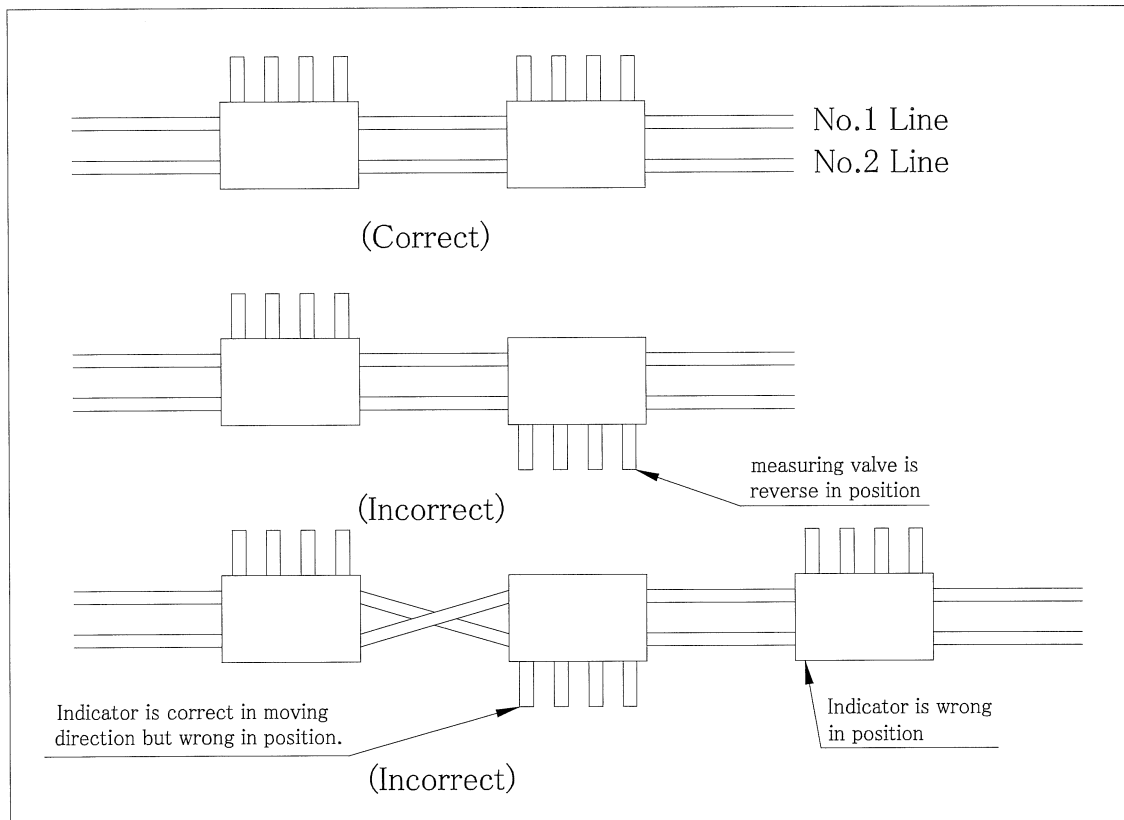


Figure 4 Measuring valve connection

- (e) In particular, attach the protective cover made of steel plate when installing the product outdoors where it is exposed to dust, where it gets splashed with water, or where it receives high radiant heat.
 - (f) Close the end of the measuring valve mounted on the branch pipe and main pipe with a high pressure plug.
- 2) INSTALLATION CONDITIONS OF MEASURING VALVE WITH COUNTER
- (a) Install a protective cover when installing the counter valve with the outside, dust, water, radiant heat, etc.
 - (b) Due to the structure of the counter, installation in a place with a lot of vibration is not recommended. It may not work correctly.
- 3) PLUMBING PIPING
- (a) For piping from the measuring valve to the lubrication point, use a material that can withstand the pressure of 3MPa, which is the maximum pressure required for lubrication by overcoming the back pressure of the bearing and the resistance of the oil supply pipe. This piping uses 8A(1/4B) steel pipe or 6φ 8φ copper pipe.
 - (b) If the bearing has a high back pressure, use a check valve or reverse check valve to prevent backflow of grease and malfunction of the measuring valve. (At this time, the pressure resistance of the oil supply pipe also changes, so select piping materials with due consideration.
 - (c) The bearings must be structured to always discharge old grease. In the case of a sealed bearing, it is necessary to install a relief valve on the bearing to release the filled grease.
 - (d) About flexible hose
Use flexible hoses if there are moving parts that slide in the lubrication area of the machine.

6. OPERATION CHECK OF MEASURING VALVE

- 1) Check the measuring valve one by one and check whether the counter is counting up.
- 2) When there is a measuring valve not counting
 - ① If the bearing has a special back pressure, it may not move unless the switching pressure is increased.

Switching pressure = back pressure + around 4MPa

The pressure of the above equation is necessary.

- ② Remove the greasing pipe at the non-moving indicator rod (piston).
- ③ Operate the grease pump and wait for it to stop automatically to check for operation.

(a) When activated

There is a problem with the oil supply pipe and the bearing side.

- a) Check if the oil supply pipe is crushed.
- b) Set a pressure gauge at the end of the grease gun, lubricate the grease supply pipe directly to the bearing, and check the back pressure. Possible causes are as follows.
 - b)-1 It was originally a bearing with high back pressure.
 - b)-2 The piston of the measuring valve can not operate because the bearing is filled with grease and there is no space for the grease. In this case, attach a relief valve to the bearing.
 - b)-3 Bearing design and processing problems

(b) If it does not work

- a) In most cases, foreign matter enters the piping and the piston of the measuring valve sticks.

(Normal measuring valves operate at less than 1 MPa.)

- b) Take the following action.

- b)-1 Every time the grease pump is operated, the switching pressure until the indicator rod moves moves little by little. When the indicator rod moves, add 1 to 2 MPa to the switching pressure at that time, and set the pressure adjustment screw.

Set within the adjustment range of switching pressure 4 to 18 MPa.

- b)-2 If the pressure does not work even if the pressure is raised, clean the measuring valve.

7. MAINTENANCE AND INSPECTION

Please check the following items regularly.

- 1) Measuring valve indicator rod operation
- 2) Piping leaks
- 3) Whether or not each device is damaged

8. FAILURE DETECTION AND TREATMENT

It is better to investigate failure detection as easy as possible, and to do time-consuming work later.

No.	Status	Cause	Measures and measures
(1)	The measuring valve indicator rod does not work. (The counter does not work.)	a. The bearing is closed.	a.Examine and improve bearings.
		b. The oil supply pipe is crushed.	Inspection and repair of oil supply pipes
		c. The switching pressure of the hydraulic switching valve is too low.	c. Adjust the switching pressure.
		d. The measuring valve sticks with dust.	d. Disassembly, cleaning or replacement of the measuring valve.
		e. The branch is too long.	e. Make branch pipes thicker and lower flow resistance.
		f. The counter is broken.	f. Counter exchange
(2)	All measuring valves do not work.	In this case, an alarm will be issued, so please refer to (3).	
(3)	An alarm signal is output If the operation power switch is turned off and then on again, the pump will operate, but soon an alarm will be issued and the pump will stop.	Grease congestion is happening.	
		a. Plunger of the plunger or broken of the plunger. (Contamination of foreign matter)	a. Replace cylinder and plunger.
		b. Insufficient discharge amount or discharge pressure due to abrasion of cylinder / plunger.	b. Replace cylinder and plunger.
		c. There is air in the pump.	c. Loosen the switching valve's air release and operate the pump until the air disappears.
		d. Suction does not occur because the grease used is hard.	d. Swap with soft ones.
		e. Incorrect connection of piping system.	e. Inspection and repair of piping
		f. Grease leak from main pipe.	f. Inspection and repair of piping
		g. There is a lot of air in the main pipe.	g. Disconnect the piping and operate the pump to bleed air.

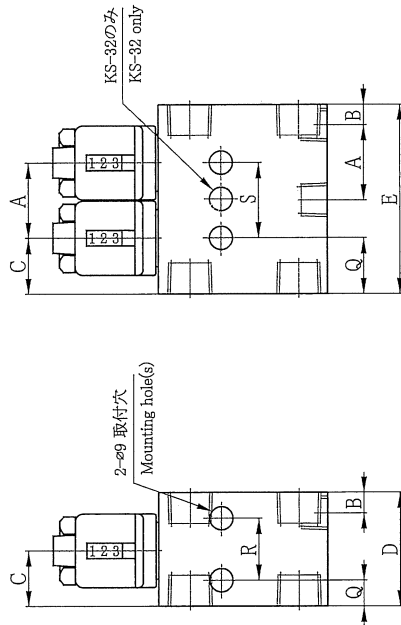
		h. There is dirt on the relief valve.	h. Disassembly and cleaning (Set at 25 MPa.)
		i. Hydraulic switching valve malfunction, piston stick, rattling due to wear.	i. Disassembly or replacement.
		j. The switching pressure of the hydraulic pressure switching valve is improperly adjusted, resulting in high pressure.	j. Turn the adjustment screw to the right and reset.
		k. Bad setting of protection timer.	k. Set the oil supply time + 5 minutes.
		l. Limit switch malfunction or wiring error.	l. Check limit switch (press by hand) or repair.

寸法表 (DIMENSIONS)

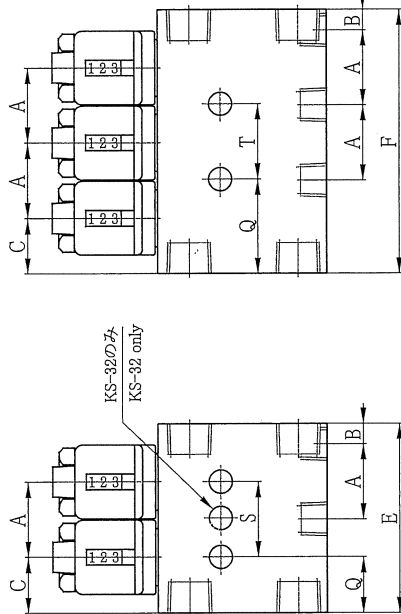
Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	R	S	T	U	V
KS-31C	-	8	21.5	44	-	-	-	10.5	26	-	18	42	-	118	46	10	24	-	-	-	4.5
KS-32C,33C,34C	29	8	21.5	-	73	102	131	10.5	26	45	18	42	79	118	48	36.5	-	-	29	58	4.5
KS-40C	32	9	24	49	81	113	145	9	28.5	-	12.5	54	-	129	49.5	10.5	28	60	91	123	4
KS-50C	37	9.5	25.5	53	90	127	164	13	33	-	11	57	-	131	51	10	33	70	107	144	1.5

注) KS-32は取付穴が1ヶ所です。(NOTE: KS-32, Measuring valve has one mounting hole)

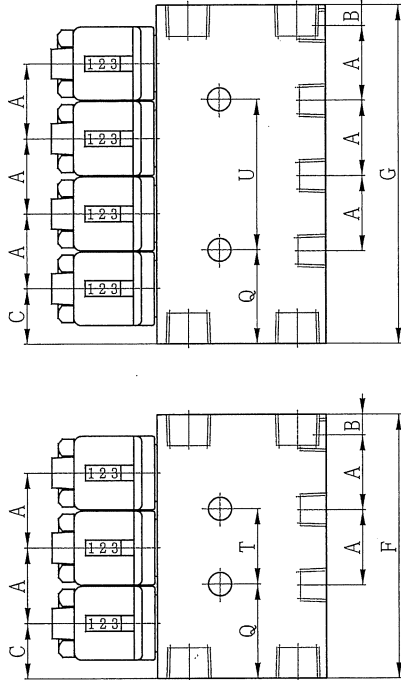
1口 (1Dis.ports)



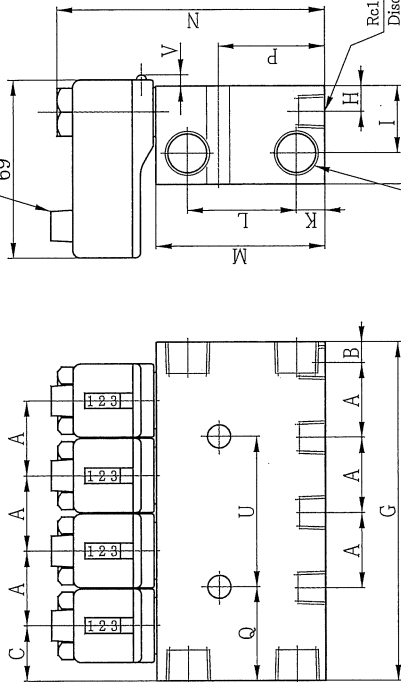
2口 (2Dis.ports)



3口 (3Dis.ports)



4口 (4Dis.ports)



仕様 (SPECIFICATION)

形 式 Model	吐出口数 Number of dis.ports	吐出量 (cm ³ /stroke) Dis. capacity		調整ネジ1回転 当りの吐出量 (cm ³ /rev) Adjustment	カウンタ目盛り Count tick	最高使用圧力 (MPa) Working Pressure (MAX.)	取付ボルト (付属) Mounting bolts (Attachment)	重 量 (kg) Mass	パイロットピストン 操作圧油量 (cm ³) Operative Vol. for pilot piston
		MAX.	MIN.						
KS-31C	1							1.35	0.6
KS-32C	2	1.2	0.8	0.06	0~999			2.15	1.2
KS-33C	3							2.95	1.8
KS-34C	4							3.85	2.4
KS-41C	1					20.6MPa	M8×65	1.55	0.63
KS-42C	2	2.5	1.25	0.10	手動リセット			2.45	1.26
KS-43C	3							3.35	1.89
KS-44C	4							4.15	2.52
KS-51C	1							1.65	0.63
KS-52C	2	5.0	2.5	0.15				2.65	1.26
KS-53C	3							3.65	1.89
KS-54C	4							4.75	2.52

注 記

- オイル用は9.8MPa以下でご利用下さい。
The maximum working pressure of measuring valve using oil should be 9.8 MPa.
- 作動圧力は1MPa以下です。
The working pressure is 1MPa or lower.
- 使用温度範囲は-20~+80℃です。
Range of working temperature is -20 to +80 °C.
- 使用しない吐出口にはプラグ (PT1/4) をして下さい。
Plug (PT1/4) discharge ports unused.
- 吐出量調整は指示棒ケース内の調整ネジで行います。
調整後はロック用ネジで十分固定して下さい。
Discharge capacity can be adjusted by a adjusting screw in indicator rod case.
After adjustment, securely fix the screw with lock screw.
- 屋外、塵埃、輻射熱などに対しては保護カバーを取付けて下さい。
Install protection cover against outdoor use, dirt, radiation heat etc.

CHECKED BY
小西
DESIGNED BY
加藤

DRAWN BY
小西
H20.9.02

カウンター付分配弁 KS-C形 組立図
Measuring valve with cycle counter
KS-C assembly drawing

DWG. No.
FA-0591

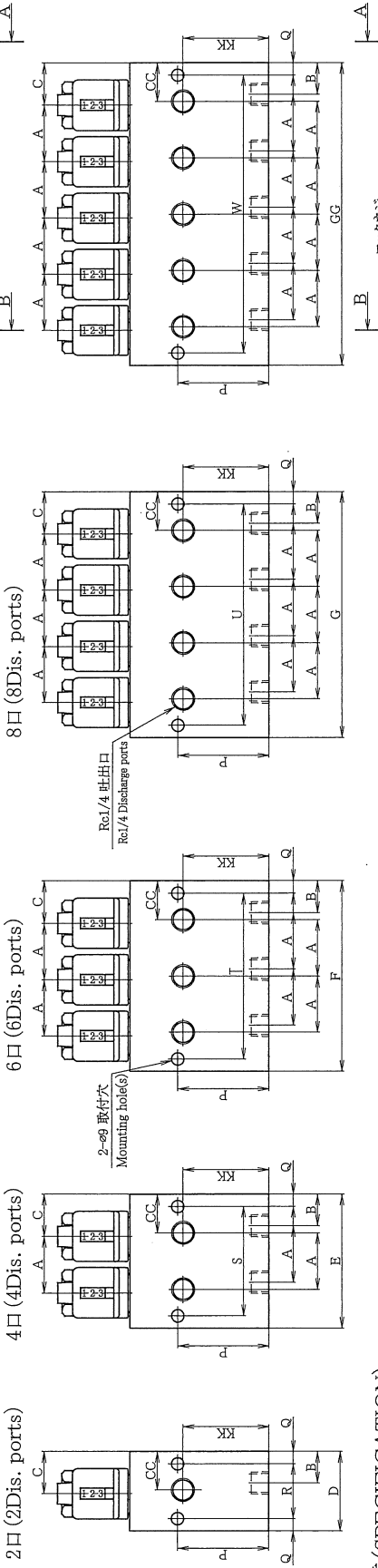
CFD. No.
OSAKA JAPAN

CODE No.
1/2

寸法表(DIMENSIONS)

Model	A	B	C	CC	D	E	F	G	GG	H	I	J	K	KK	L	M	N	P	Q	R	S	T	U	V	W
KW-30C	32	18	24	22	45	76	108	140	172	12	27	54	44	49	57	79	118	52	7	31	62	94	126	158	2.5
KW-50C																	131								

10口(10Dis. ports)



仕様(SPECIFICATION)

形 式 Model	吐出口数 Number of dis.ports	吐出量 (cm ³ /stroke) Dis. capacity		調整ネジ1回転 当りの吐出量 (cm ³ /rev) Adjustment	カウント目盛り Count tick	最高使用圧力 (MPa) Working Pressure (MAX.)	取付ボルト (付属) Mounting bolts (Attachment)	重 量 (kg) Mass	パイロットピストン 操作油量 (cm ³) Operative Vol. for pilot piston
		MAX.	MIN.						
KW-32C	2							1.65	0.4
KW-34C	4							2.65	0.8
KW-36C	6	1.2	0.8	0.06				3.65	1.2
KW-38C	8							4.65	1.6
KW-310C	10							5.65	2.0
KW-52C	2				0~999 手動リセット	20.6MPa	M8×75L	1.65	0.4
KW-54C	4							2.65	0.8
KW-56C	6	5.0	2.5	0.15				3.65	1.2
KW-58C	8							4.65	1.6

注 記.

- オイル用は9.8MPa以下でご使用下さい。
- 作動圧力は1MPa以下です。
- 使用温度範囲は-20~+80℃です。
- 吐出量調整は指示棒ケース内の調整ネジで行います。
調整後はロック用ネジで十分固定して下さい。
- 屋外、塵埃、輻射熱などに対しては保護カバーを取付けて下さい。
- 左端1ヶ所のみ吐出口B内のプラグを外せばAB吐出口が合流します。この場合、この部分の吐出量は倍量となります。

CAUTION AT OPERATION

- The maximum working pressure of measuring valve using oil should be 9.8 MPa .
- The working pressure is 1MPa or lower.
- Range of working temperature is -20 to +80 ℃.
- Discharge capacity can be adjusted by a adjusting screw in indicator rod case.
After adjustment, securely fix the screw with lock screw.
- Install protection cover against outdoor use, dirt, radiation heat etc.
- To combine the output of the two discharge ports of the left side valve, remove the blind plug in the Dis. port B. (See sectional view of B-B) In this case the quantity of lubricant will be doubled.

断面 B-B 左端1箇所のみ
Cross section B-B only one left end

矢視 A-A
View A-A

CHECKED BY
Shimizu 小西
2015.3.8 H20.3.02
SEC. CHIEF
Kato 加藤
2015.3.9 H20.3.02

DRAWN BY
小西
DESIGNED BY
加藤

カウンタ付分配弁 KW-C形 組立図
Measuring valve with counter
KW-C assembly drawing

DWG. No. FA-0592

KOWA CORP.
OSAKA JAPAN

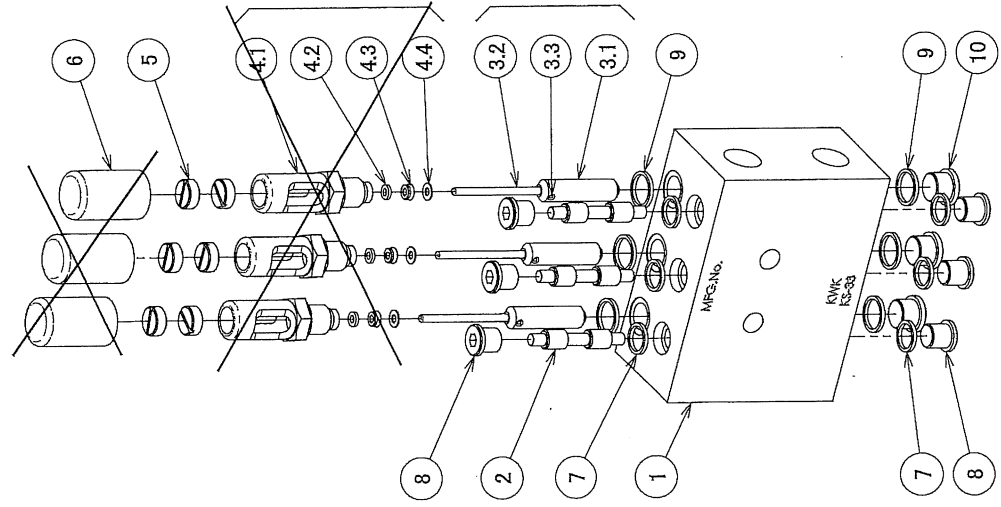
CFD. No.
CODE No.

SCALE

A

4 Assembly parts

3 Assembly parts



4 KS.KW-30C indicator rod guide ASSY

No.	Name	Part number	Quantity	Mass	Note
10	Sealed plug	X2007	3	8.77	M12×10L
9	Copper packing	X2008	6	0.72	φ15×φ12.5×1.5t
8	Sealed plug	X2006	6	0.51	M10×11L
7	Copper packing	X2006	6	0.62	φ13×φ10.5×1.5t
6	KS, KW-30 indicator rod cap	G8840	3	5.15	KS-800218
5	Adjusting screw	G8807	6	4.51	KS-800478
4.4	Pin-washer	PW-M3	1	0.120	M3
4.3	SK seal	SKSEAL-P3	1	0.07	P3 Endless
4.2	Backup ring T3	BRK-P3-E	1	0.06	KS-800462
4.1	KS, KW-30 indicator rod guide	G8802	3	40.38	KS-800462
3.3	Parallel pin	-	1	0.111	1.5×8L
3.2	KS, KW-30 measuring valve indicator rod	-	1	2.59	KS-800516
3.1	KS, KW-30 piston	G2020	3	17.03	KS-800516
3	KS, KW-30 main piston ASSY	G1120	3	19.73	KS-800516
2	KS-30 pilot piston	G1103	3	11.56	KS-800461
1	KS-33 body	G1103	1	2367.51	KS-800442

CUSTOMER

SPECIFICATION

CHECKED BY
DRAWN BY
oosumi
2018.5.8
2018.5.7
DESIGNED BY
kato
2018.5.8
2018.5.7

KS-30 Measuring valve
Disassembly

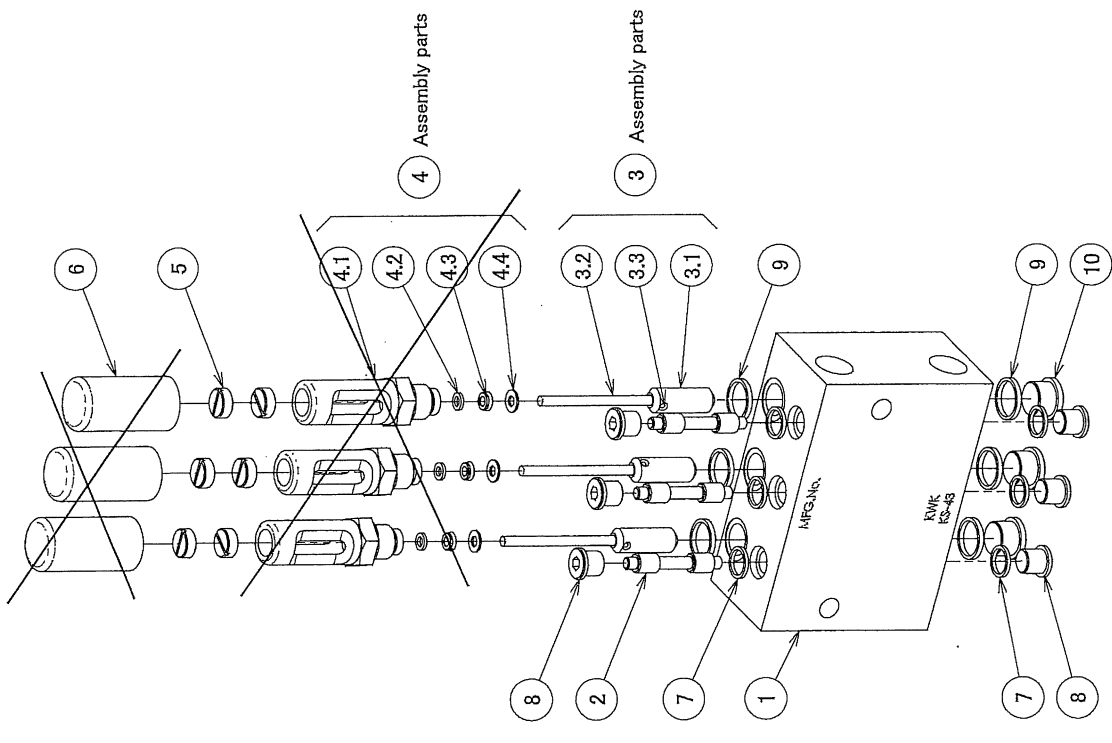
KOWA CORP.
OSAKA JAPAN

DWG.No.
eSA-KS-30
CFD.No.
CODE No.

DATE OF ISSUE
SCALE
12

MFG.No.

5
(A3)



4 KS-KW-40C G3012 3 RP-1127
Indicator rod guide ASSY

10	Sealed plug	X2009	3	12.76	M14×11L
9	Copper packing	X3010	6	1.10	φ17×φ14.5×2t
8	Sealed plug	X2008	6	0.31	M10×11L
7	Copper packing	X3006	6	0.62	φ13×φ10.5×1.5t
6	KS-40 indicator rod cap	G8011	3	7.67	KS-80021B
5	Adjusting screw	G8007	6	4.51	KS-800478
4.3	Pin-washer	PW-M4	1	0.309	M4
4.2	SK seal	SKSEAL-P4	1	0.08	P4
4.1	Backup ring T3	BUFT-P4	1	0.08	P4
3.2	KS-40 indicator rod guide	G8003	3	70.54	KS-800465
3.1	KS-40 measuring valve indicator rod	G8003	1	0.198	2×8L
2	KS-40 main piston ASSY	G2021	3	15.83	KS-800517
1	KS-40 body	G1107	3	11.70	KS-800464

CUSTOMER

SPECIFICATION

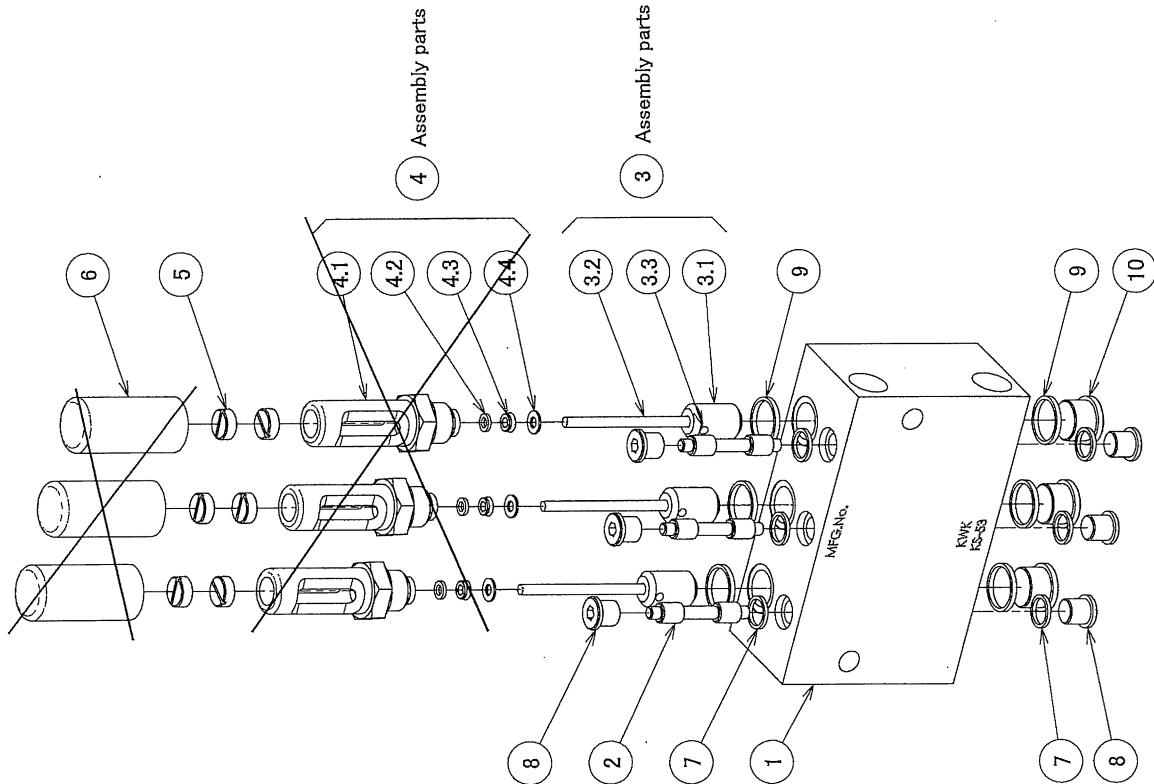
CHECKED BY: *oosumi*
DRAWN BY: *2019.5.7*
APPROVED BY: *Kato*
DESIGNED BY: *2019.5.7*

KS-40 Measuring valve
Disassembly

DWG.No. *eSA-KS-40*
CFD.No. *A3*
CODE.No. *1/2*
DATE OF ISSUE *1/2*
MFG.No. *1/2*

KOWA CORP.
OSAKA JAPAN

出図先
出図日



4 Assembly parts

3 Assembly parts

4 KS-KW-50C indicator rod guide ASSY

G3013

3

PP-1128

10	Sealed plug	X2010	3	18.18	M16×12L
9	Copper packing	X3011	6	1.24	φ18×φ16.5×2t
8	Sealed plug	X2008	6	6.51	M10×11L
7	Copper packing	X3006	6	0.82	φ13×φ10.5×1.5t
6	KS-KW-50 indicator rod cap	G8012	3	8.16	KS-800220
5	Adjusting screw	G8007	6	4.51	KS-800478
4.4	Pin-washer	PW-M4	1	0.309	M4
4.3	SK seal	SKSEAL-P4	1	0.08	P4
4.2	Backup ring T3	BR-T4LE	1	0.08	P4 Endless
4.1	KS-KW-50 indicator rod guide	-	1	64.38	KS-800468
4	KS-KW-50 indicator rod guide ASSY	G8004	3	84.85	KS-800468
3.3	Parallel pin	-	1	0.188	2×8L
3.2	KS-KW-50 measuring valve indicator rod	-	1	6.18	KS-800518
3.1	KS-KW-50 piston	G2031	1	23.88	KS-800518
3	KS-KW-50 main piston ASSY	G2031	3	30.26	KS-800518
2	KS-4050 pilot piston	G1021	3	11.70	KS-800464
1	KS-53 body	G1111	1	2882.63	KS-800462
No.	Name	Part number	Quantity	Mass	Note

CUSTOMER

SPECIFICATION

CHECKED BY
DRAWN BY
oosumi
2018.5.7
2018.5.7
APPROVED BY
DESIGNED BY
kato
2018.5.7

KS-50 Measuring valve
Disassembly

KOWA CORP.
OSAKA JAPAN

DWG.No.
eSA-KS-50
CFD.No.
CODE No.

購買
製造
客先
投
検印部数
A3
出図日

3RD ANGLE PROJECTION SCALE 1/2

DATE OF ISSUE

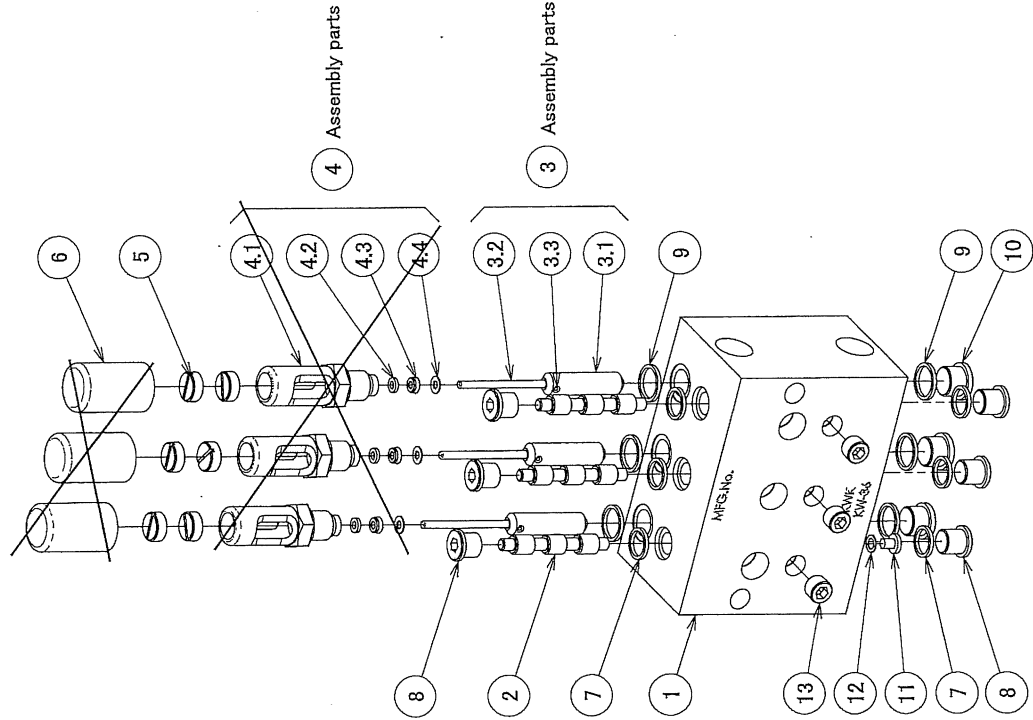
MFG.No.

5

(A3)

2

1



4 KS KW-30C 3 RP-1126

13	Hexagon socket plug	HS-PG-1/8U	3	3.21	RT/8
12	Copper packing	X3002	1	0.10	$\phi 7 \times \phi 4.5 \times 0.5t$
11	Cross Recessed Machine Screw	PNS-M4×5L	1	1.361	M4×5L
10	Sealed plug	X2007	3	8.77	M12×10L
9	Copper packing	X3008	6	0.72	$\phi 15 \times \phi 12.5 \times 1.5t$
8	Copper packing	X2008	6	6.51	M10×11L
7	Copper packing	X3006	6	0.82	$\phi 13 \times \phi 10.5 \times 1.5t$
6	KS KW-30 indicator rod cap	G8019	3	5.12	KS-800218
5	Adjusting screw	G8007	6	4.51	KS-800478
4.3	SK seal	PW-M3	1	0.120	M3
4.2	Backup ring T3	SKSEAL-P3	1	0.07	P3
4.1	KS KW-30 indicator rod guide	BHR-P3-E	1	40.11	KS-800462
4	KS KW-30 indicator rod guide ASSY	G8002	3	40.36	KS-800462
3.2	Parallel pin	—	1	0.111	1.5×6L
3.1	KS KW-30 type measuring valve indicator rod	—	1	2.58	KS-800516
3	KS KW-30 main piston ASSY	G2020	3	17.03	KS-800516
2	KS KW-30, 50 pilot piston	G2024	3	14.27	KS-800520
1	KS KW-30 body	G2107	1	3086.08	KS-800555

Part number

Quantity

Mass

Note

CUSTOMER

SPECIFICATION

CHECKED BY

DRAWN BY

DESIGNED BY

APPROVED BY

Shimada

oosumi

Yoshida

Kato

2019.5.9

2019.5.7

KW-30 Measuring valve

Disassembly

DWG.No.

eSA-KW-30

CFD.No.

A3

CODE No.

—

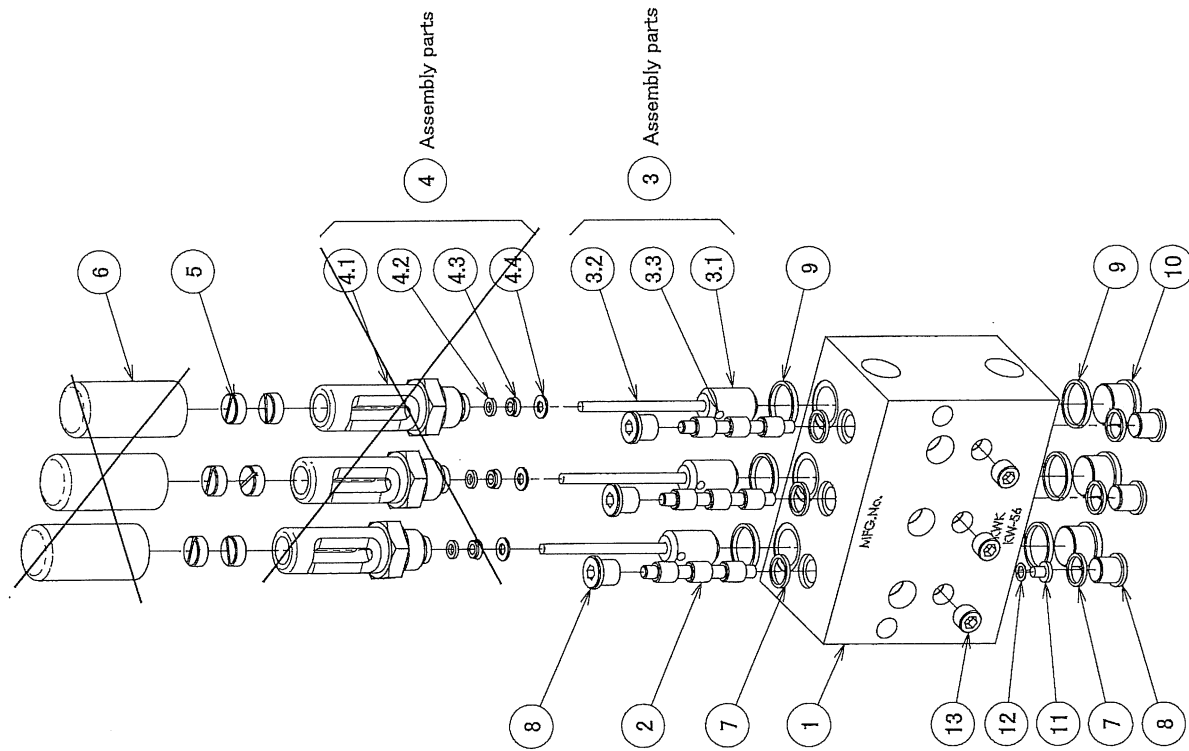
DATE OF ISSUE

SCALE

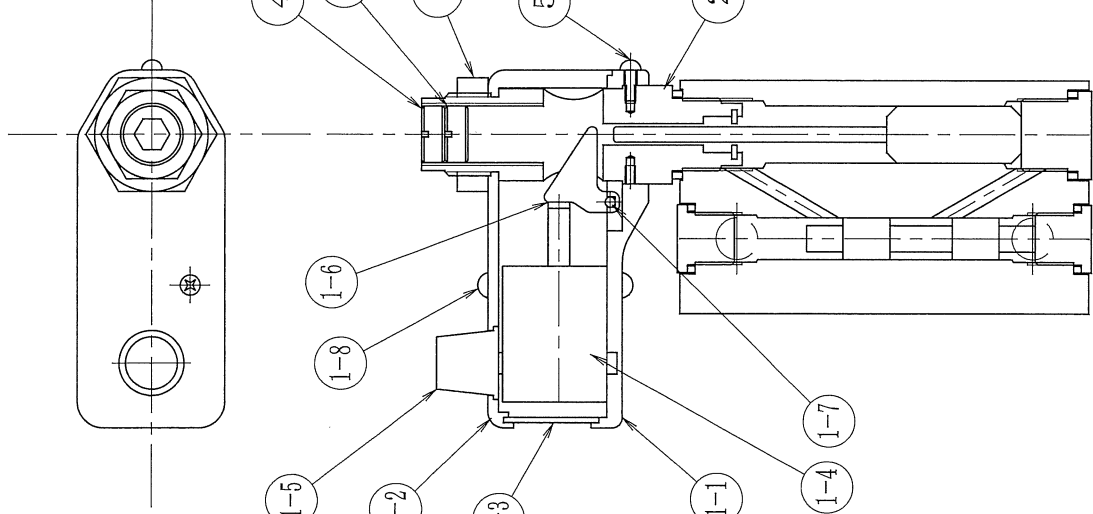
1/2

MFG.No.

—



4	K3,KW-50C	G3013	3	FP-1128
Indicator rod guide ASSY				
13	Hexagon socket plug	HS-PQ-7/8U	3	3.21 RT/8
12	Copper packing	X3002	1	0.10 $\phi 7 \times \phi 4.8 \times 0.9t$
11	Cross Reassembled Machine Screw	PNS-M4 x RL	1	1.361 M4 x RL
10	Sealed plug	X2010	3	1.818 $\phi 19 \times 12t$
9	Copper packing	X3011	8	1.24 $\phi 19 \times \phi 16.5 \times 2t$
8	Seated plug	X3008	8	0.91 M10 x 11L
7	Copper packing	X3008	8	0.62 $\phi 13 \times \phi 10.5 \times 1.9t$
6	K3, KW-50 Indicator rod cap	G8046	3	R.16 KS-800220
5	Adjusting screw	G8007	6	4.51 KS-800478
4.4	Pin-washer	PW-M4	1	0.303 M4
4.3	SK seal	SKSEAL-P4	1	0.08 P4
4.2	Backstop ring T3	BDNR-P4-E	1	0.08 P4 Endress
4.1	KS, KW-50 Indicator rod guide		1	R4.38 KS-500468
4	KS, KW-50 Indicator rod guide ASSY	G8004	3	R4.85 KS-500468
3.3	Parallel pin	-	1	0.198 2 x 9L
3.2	KS, KW-50 measuring valve indicator rod	-	1	6.18 KS-8000518
3.1	KS, KW-50 piston	-	1	23.88 KS-8000518
3	KS, KW-50 main piston ASSY	G2031	3	14.27 KS-8000518
2	KW-30, 50 pilot piston	G2024	3	30.26 KS-8000518
1	KW-56 body	G2117	1	2807.61 KS-8000053
No.	Name	Part number	Quantity	Mass
CUSTOMER				
SPECIFICATION				
CHECKED BY: DRAWN BY:				
S. Kawanishi				
DESIGNED BY:				
APPROVED BY:				
kato				
2019.5.7				
KOWA CORP.				
OSAKA JAPAN				
DWG.No. eSA-KW-50				
CFD.No.				
CODE No.				
SCALE 1/2				
DATE OF ISSUE				
MFG.No.				
5 (A3)				



1	6	カバー固定ナット Cover fixing nut	FP-1129
1	5	小ネジ Small screw	M2x6
1	4	ロックネジ Lock screw	
1	3	調整ネジ Adjusting screw	
1	2-c	指示棒ガイド (50) Indicator rod guide (50)	FP-1128 R2
1	2-b	指示棒ガイド (40) Indicator rod guide (40)	FP-1127 R2
1	2-a	指示棒ガイド (30) Indicator rod guide (30)	FP-1126 R2
(2)	8	小ネジ Small screw	
(1)	7	平行ピン Parallel pin	
(1)	6b	カム cam	
(1)	6a	カム cam	
(1)	5	リセット用ノブ Reset knob	
(1)	4	カウンター本体 Counter body	
(1)	3	窓用アクリル板 Acrylic board for windows	
(1)	2	カウンターカバー Counter cover	
(1)	1	カウンター台 Counter stand	
1	1	カウンター Counter	
数量	No.	名称 Name	備考 Note
KW-50	KS-30	CUSTOMER	
KS-40	KS-50	SPECIFICATION	
KS-30	KS-40	CHECKED BY 5/6/2019	カウンター付分配弁 組立図
KS-50	KS-30	DRAWN BY 5/6/2019	Measuring valve with counter
KS-40	KS-50	DATE 5/6/2019	
KS-30	KS-40	DESIGNED BY 5/6/2019	

カウンター付分配弁 組立図
Measuring valve with counter
assembly drawing

 KOWA CORP. OSAKA JAPAN	DWG. No.		FA-0593	
	CED. No.	DE11		
	CODE No.			
 3RD ANGLE PROJECTION	SCALE	1/1 (A3)		