Instruction Manual

for

Valve Control

Type LTKD-05,1,3 and 5

Type LTKD-05B,1B,3B and 5B

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CAUTION– FOR YOUR SAFETY

These safety instructions list the most important safety items, with paticular attention to operating this valve actuator.

Before using, first read these safety instructions carefuly, then operate the valve actuator correctly, as instructed.

Furthermore, the operation of this valve actuator should only be done by a trained specialist.

Receipt; Transportation; Storage

⚠ CAUTION ····· Preventing accidents caused by falling.

(1) When hooking up and lifting valve actuator, first check the weight, then take great care and attention, never standing beneath the load.

(2) With goods packed in cardbord boxes, if the cardbord packing gets wet, its strength can decrease, so take extra care when handling and/or storing.

If these cautions are neglected, it could result in serious injuly.

Instllation; Test running

⚠ CAUTION ····· Preventing accidents caused by dropping or falling.

(1) When hooking up and lifting valve actuator, first check the weight, then take great care and attention, never standing beneath the load.

(2) While working, maintain a sure and safe footing, and avoid working on unstable things, such as pipes.

If these cautions are neglected, it could result in serious injuly.

⚠ CAUTION ····· Preventing electic shock.

(1) When connecting uninsulated wires, ensure that water or moisture doesn't come into contact with those wires.

(2) Always make sure thre is a suitable earth connection.

If these cautions are neglected, it could result in electric shock

⚠ CAUTION ···· Preventing serious injuly(For electric actuator only)

(1) Always ensure interlocking switches are connected properly.

(2) When working, always keep in contact with the power switch operator.

If these cautions are neglected, it could result in electirc shock.

Keep this notice in a place where it can be clearly seen at any time, and when installing and test runs are complete, hand it to the maintenance manager.

Maintenance control; Maintenance checks

⚠ CAUTION ····· Preventing electric shock (For electric actutor only)

(1) When connecting uninsulated wires, ensure that water or moisture doesn't come into contact with those wires.

(2) Always make sure there is a suitable earth connection.

If these cautions are neglected, it could result in electric shock.

Keep this notice in a place where it can be clearly seen at any time, and when installing and test runs are complete, hand it to the maintenance manager.

In order to use the valve actuator properly and safety, maintenance, checking and care are of great importance.

MANUFACTURER

SEIBU ELECTRIC & MACHINERY CO., LTD.

CAUTIONS

(1) Prior to starting of wiring works for LTKD Valve Control, takecare the following items.

Instructions for Handling the Valve Control

1.1 Upon-closing the switch cover make sure that the packing is complete and clamp the fitting bolts surlly cleaning the joints.

In case of "Explosion type", when the liquied packing ----------

Tokyo three bond No.1 --- is stained by sand and dust, cleaning up with alcohol apply the liquid packing uniformly again and then clamp the bolts.

If it is forgotten to clamp the bolts or clamped insufficiently, it may result the fault of explosion-proof feature.

1.2 Cable entrance should be worked to prevent the entrance of rain water.

1.3 Don't hold open the switch cover and terminal cover.

1.4 Upon installing in the outdoor, wiring works in the rain weather should be avoided strictly.

1.5 Except the water proof type, don't keep the Valve Control in the earth and sand or puddles.

1.6 In case of "Explosion type", the outdoor cover should be fitted to be upside.

1.7 As the revolving direction of motor and the Valve Control is the same, connect the outdoor leads as follows (R–U, S–V, T–W).

(2) Refer to the following parts of this operation manual before attempting a trial operation.

1. TRIAL OPERATION
2. POWER–MANUAL CHANGE–OVER
7. POWER OPERATION
8. MANUAL OPERATION

(3) When reinstalling a Valve Control which has been once removed from the valve, check and adjust each section of the device once more in accordance with the instruction manual, prior to an power operation.

CONTENTS

1. TRIAL OPERATION

The trial operation should be performed exactly in accordance with the following instructions.

1.1 Preliminary Check

(1) Check electrical terminal connections referring to the terminal code label attached to the inside, of the switch cover of the Valve Control.

(2) Connecting the conduit tube or waterproof flexible conduit to the wiring entrance, and using the liquid packing agent or seal tape on the screw surface certify that rain water can not enter it.

(3) Make sure that the space heater for moisture prevention and electrical wiring do not contact each other.

(4) The space heater should be surely energized, especially it must be executed when the Valve Control is kept in wet place before mounting.

(5) Wash exposed parts of the valve stem and sleeve, and apply grease to them.

(6) Make sure that there will be nothing to impede movement of levers of the limit switch and that of the torque switch.

(7) Make sure that the switch cover has been closed tightly again after once removed for performing electrical wiring or adjustment.

Loose closing of the cover may result in trouble from entry of rainwater.

(8) Make sure that fuses at main power supply switc have not been blown out.

(9) Make sure that thermal relay is not been operated.

(10) When the Valve Control and valve are separately supplied, the trial operation must be performed in accordance with suggestions obtained from the manufacturer's representative at the work site.

1.2 Power Operation

Before adjustment of every part, if power operation is carried out, as the valve is in full opening or full closing, the valve may be damaged.

Therefore when power operation is carried out, the valve should be manually opened first at the intermediate position.

1.3 Check the Valve Operating Direction

(1) Manually open the valve to middle position.

(2) Confirm that the indication of the handwheel coincides with the direction of valve movement.

(3) Press push button in the order of OPEN→STOP→CLOSE→STOP to check the motor starts of stops surely.

(4) When terminals U, V, W are connected respectively to the power source R, S, T the valve can be operated to open. Therefore certify that when push button "OPEN" is pressed, the valve opens and when the push button "CLOSE" is pressed, the valve closes. If this movement is reverse, change two lead wires among three in the terminal box of the motor.

(5) In conjunction with the above step, confirm that the pointer of the position indicator also moves in the correct direction.

1.4 Check the Limit Switch Operation

After checking the direction of the valve movement as above, confirm the limit switch operates in the predetermined position, as follows:

(1) First pressing the CLOSE push button, stop the valve shortly before its fully closed position. Further close the valve manually.

(2) Certify whether the arrow mark of limit switch in closing side indicates mark A simultaneously with full opening.

(3) Similarly certify whether the arrow mark of the limit switch in opening side indicates mark A upon full opening.

(4) When the above (2), (3) conditions are not obtained, readjust the limit switch in accordance with paragraph 3.1 [Setting of Limit Switch].

(5) Notwithstanding the limit switch is correctly set, when the OPEN push button is pressed in case of the valve is in full close, the motor may stop shortly after starting, this is because of the operation of torque switch in the open side.

If the motor similarly behaves upon closing the valve in the fully opened position, the cause is operation of the torque switch on the close side.

In either case, readjust the torque switch in accordance with paragraph 4.1 [Setting of Torque Switch].

1.5 Check The Torque Switch Operation

The torque switch is normally set at the valve manufacturers' plant.

If the indication is within the red portion of the scale, that is, out of the permissible operating range, readjust the torque switch in accordance with paragraph 4.1 [Setting of Torque Switch].

2. DESCRIPTION OF MECHANISM (Refer to Fig. 1 —— page 8)

2.1 General

Our Valve Controls are designed for motorized actuation of valves of various types.

The major components of Valve Controls are a motor and a reduction gear system. Valve Controls are also provided with such auxiliary mechanism as (1) position indicator, (2) limit switches to permit automatic stop control in the fully-opened, fully-closed or any desired position, (3) torque switches to prevent the valve spindle from excessive torque, and (4) handwheel for manual operation.

Manual-to-power change over and vice-versa can be achieved by manually pushing or pulling out the handwheel.

In addition, in the manual operation, an interlocking switch is provided to prevent the motor from being energized even if the push button is depressed by mistake, thus eliminating danger in operation.

2.2 Power Operation Mechanism

In Fig. 1 when the handwheel (17) is pushed in the axial direction, catch (14) holds the handwheel in the position for power operation and at the same time interlocking switch (42) close to make electrical operation possible.

In this condition, the motor starts upon pressing the OPEN or CLOSE push button, and the rotation of the motor is reduced over gear A (2) and gear B (3), thence transmitted to worm shaft (8).

The rotation is further transmitted over worm (7), which is spline mounted on the worm shaft, to worm wheel (32), thence to sleeve (31) through a hammer blow clutch (10) having 90° play.

The rotation of the sleeve causes the valve to open or close which is connected with the stem bush (35) inserted inside the sleeve.

Worm (7) is spline mounted on the worm shaft (8) so that torque is transmitted through them but the former can axially slide on the latter.

This worm is normally held in the normal position by Torque spring (13) but when the valve requires an extraordinarily high operating power, the worm moves in the axial direction compressing the Torque spring. This movement is used to actuate torque switch (23) .

Revolution of worm shaft (8) is transmitted over switch actuating worm (6) to counter mechanism (25) , for actuating limit switch (24) .

Operation of this limit switch controls automatic stopping of the valve actuating motor at fully opening, fully closing or any predetermined position. The motor stops instantly regardless of the valve position upon pressing of the STOP push button.

Worm wheel (32) is fitted loosely on the sleeve (31) , and is engaged with the sleeve through pawls on each of them.

And stem bushing (35) is engaged with the sleeve through spline.

Since there is an approximately 90° play between pawls of the clutch and worm wheel, the actuation of valve is made easy by the hammer blow action utilizing inertia of the rotor of the motor.

2.3 Manual Operation Mechanism

To operate Type LTKD–05, –1, and –3 Valve Controls manually, press one end of catch (14) in Fig. 1.

The holding mechanism for the power operation is now released, and hand-wheel (17) is moved axially by the spring tension to be engaged with clutch (46).

Rotation of the handwheel drives the sleeve through the handle clutch, worm shaft (8) , worm (7) and worm wheel (32) in turn, and then opens and closes the valve.

In case of the Type LTKD–5, rotation is reduced through manual gear A (45) and manual gear B (44) before being transmitted to the worm shaft to actuate the valve.

2.4 Power-Manual Change Over

2.4.1 Power-to-Manual Change Over

In Fig. 1, press one end of catch (14) and pull the handwheel (17) toward you to engage it with handle clutch (46) .

The device is now ready for manual operation.

The valve can be opened and closed by turning the handwheel.

In the manual operation condition the motor can not be started even when the START push button is pressed because the circuit is kept open by the interlocking switch.

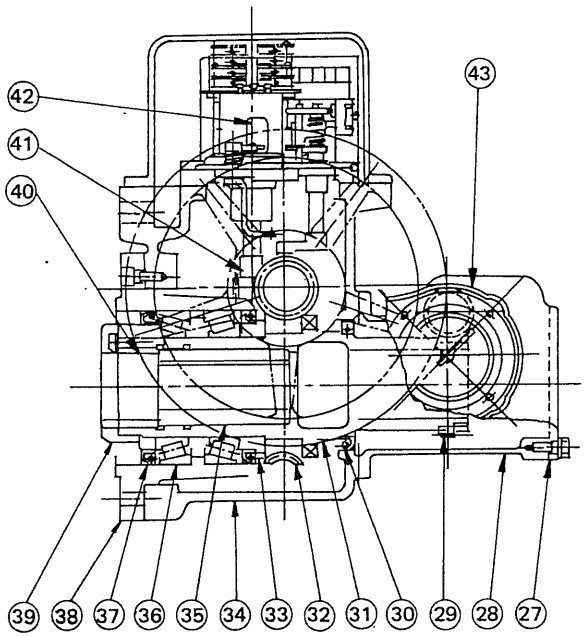
2.4.2 Manual-to-Power Change Over

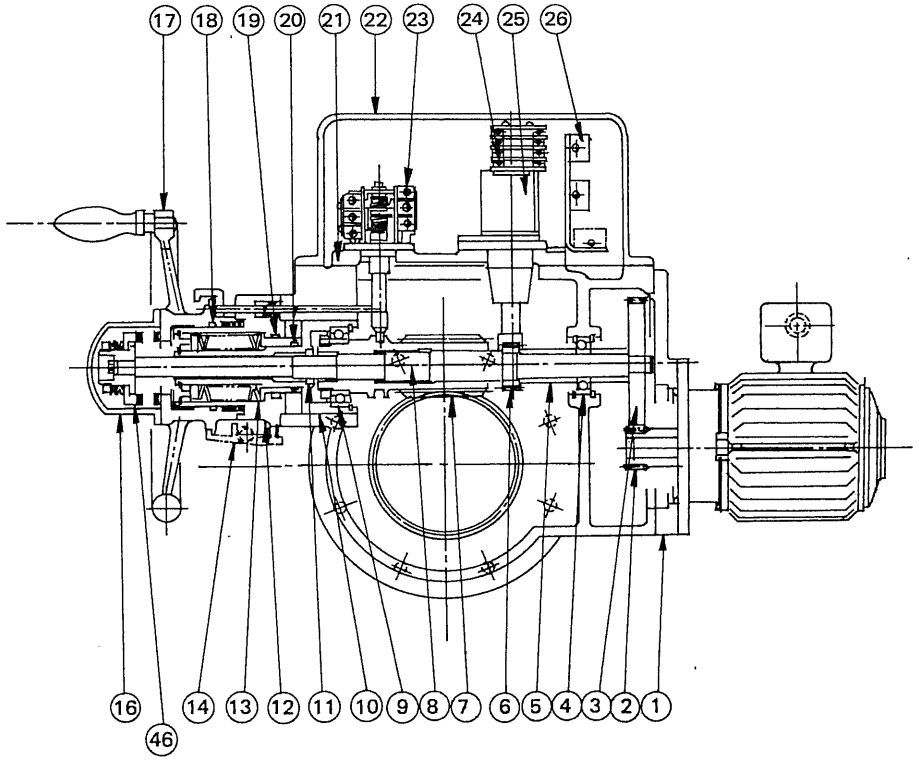
Upon pressing the handwheel (17) , catch (14) snaps and holds it that position, thus providing the power operation.

2.4.3 Safety Device for Manual Operation

The Valve Control is provided with the safety device to prevent the danger with the slip mechanism to the handwheel for avoiding the abnormal power upon manual operation.

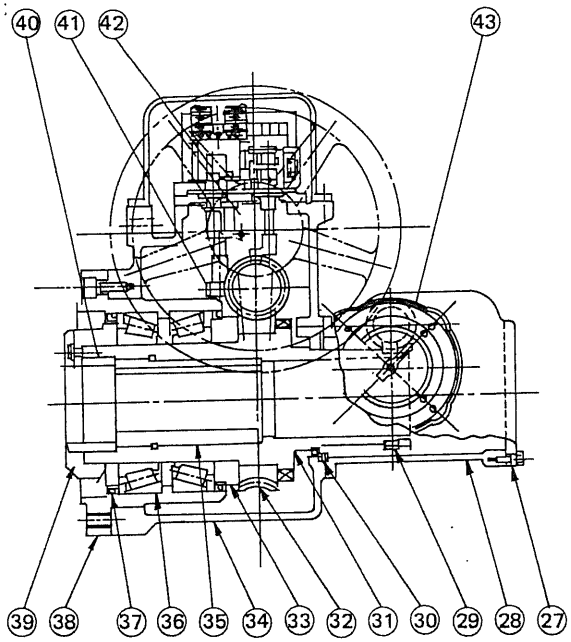
Fig.1-1 CONSTRUCTION LTKD–05, –1, –3

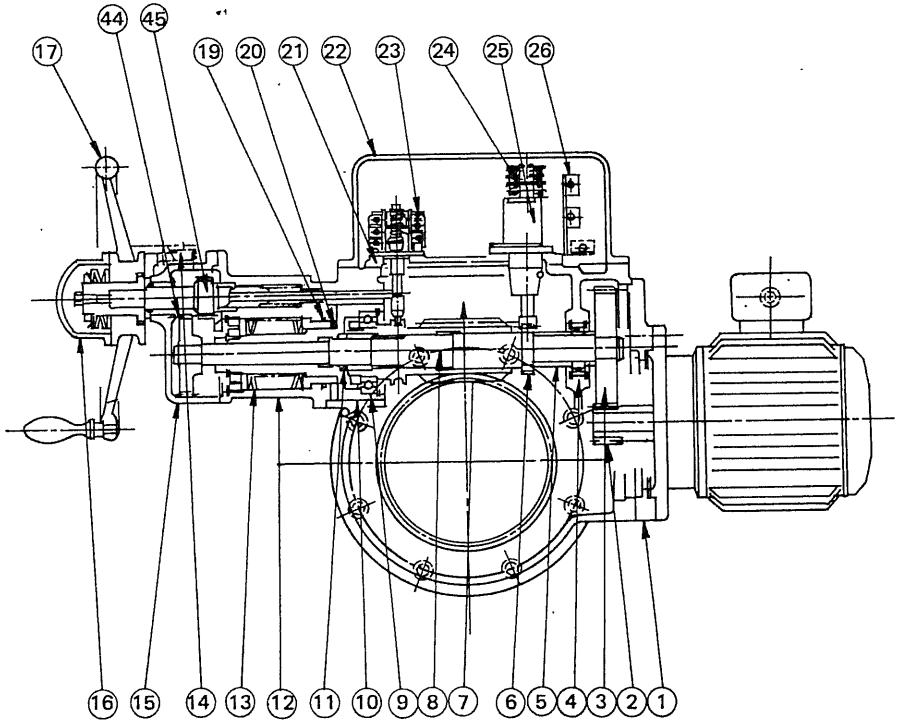




Item	Parts name	Item	Parts name	Item	Parts name
1	Spacer	17	Manual handwheel	32	Worm wheel
2	Gear A	18	O ring	33	Collar
3	Gear B	19	O ring	34	Gear case
4	Bearing	20	O ring	35	Stem bush
5	Collar	21	Switch base	36	Bearing
6	Worm for switch	22	Switch cover	37	Oil seal
7	Worm	23	Torque switch	38	Bearing housing
8	Worm shaft	24	Limit switch	39	Lock nut
9	Bearing	25	Counter mechanism	40	Collar
10	Cartridge	26	Terminal	41	Worm wheel for switch
11	Oil seal	27	Cover	42	Interlock switch
12	Spring case	28	Position indicator case	43	Position indicator
13	Torque spring	29	Worm for position indicator	46	Handle clutch
14	Handle catch	30	Oil seal		
16	Clutch cover	31	Sleeve		

Fig.1-2 CONSTRUCTION LTKD-5





Item	Parts name	Item	Parts name	Item	Parts name
1	Spacer	16	Clatch cover	32	Warm wheel
2	Gear A	17	Manual Handwheel	33	Collar
3	Gear B	19	O ring	34	Gear case
4	Bearing	20	O ring	35	Stem bush
5	Collar	21	Switch base	36	Bearing
6	Worm for switch	22	Switch cover	37	Oil seal
7	Worm	23	Torque switch	38	Bearing housing
8	Worm shaft	24	Limit switch	39	Lock nut
9	Bearing	25	Counter mechanism	40	Collar
10	Cartridge	26	Terminal	41	Worm wheel for switch
11	Oil seal	27	Cover	42	Interlock switch
12	Spring case	28	Position indicator case	43	Position indicator
13	Torque spring	29	Worm for position indicator	44	Manual gear B
14	Handle catch	30	Oil seal	45	Manual gear A
15	Manual gear case	31	Sleeve		

3. LIMIT SWITCH

As the standard, limit switch is provided with cam switches.
The setting of limit switch is completed at the valve manufacturer's plant.
If field setting is required, take the following procedure.

3.1 Setting of Limit Switch

Set the limit switch for the close side first, and later for the open side.

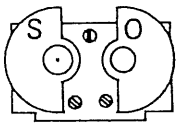
3.1.1 Setting procedure

START

Close fully the valve by manual.
If power operation is utilized, be sure to stop the motor before the valve reaches it's end, and operate it further manually.

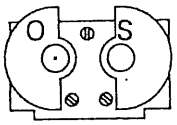
Distinguish the limit switch variation in the open and close indication as shown in next column, and choose the proper course of limit switch setting.

Facing the limit switch, if the simbol "S" is on the left side as shown the figure, take the following steps.



Adjust the limit switch according to Chart 1.

Facing the limit switch, if the simbol "S" is on the right side as shown the figure, take the following steps.



Adjust the limit switch according to Chart 2.

Confirm the switch actuation at the valve fully closed position by manual operation for several times. Then confirm it by power operation too.

Open fully the valve by manual.
If power operation is utilized, be sure to stop the motor before the valve reaches it's end, and operate it further manually.

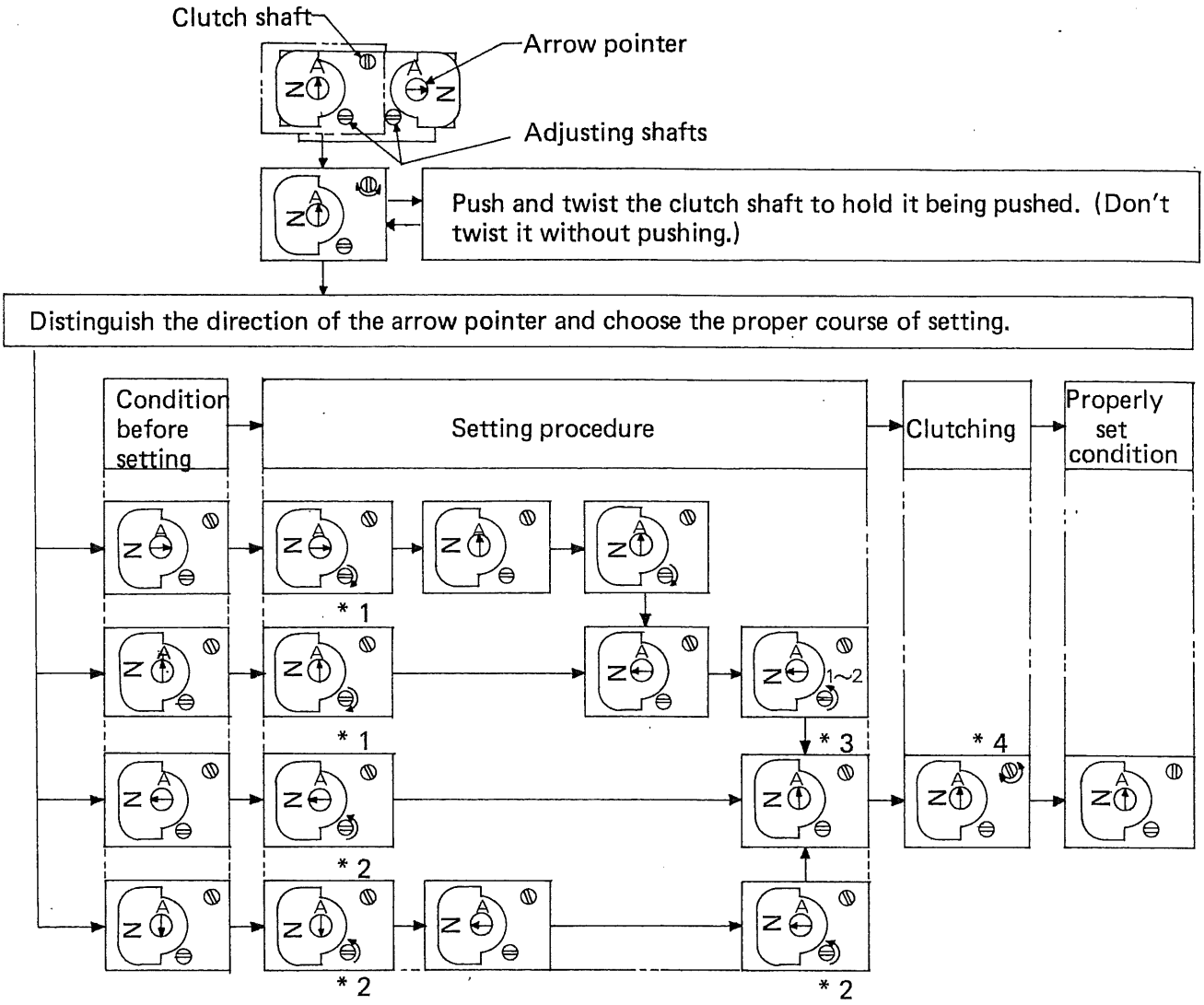
Adjust the limit switch according to Chart 2.

Adjust the limit switch according to Chart 1.

Confirm the switch actuation at the valve fully opened position by manual operation for several times. Then confirm it by power operation too.

FINISH

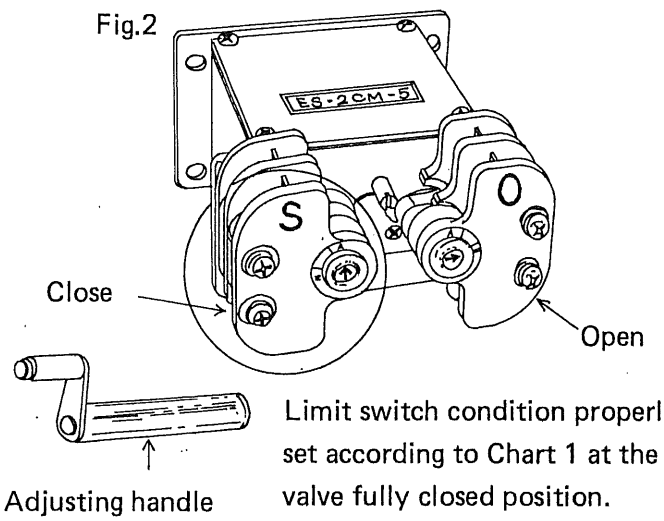
Chart 1



Explanation of figures

* 1 : Turn the adjusting shaft clockwise until arrow pointer change the direction.
* 2 : Turn the adjusting shaft counterclockwise until arrow pointer changes the direction.
* 3 (1~2) : Turn the adjusting shaft counterclockwise once or twice until arrow pointer changes the direction.
* 4 : Twist the clutch shaft to stick out. (If the valve is operated without sticking out of the clutch shaft to the original position, the adjustment will come to nothing.)

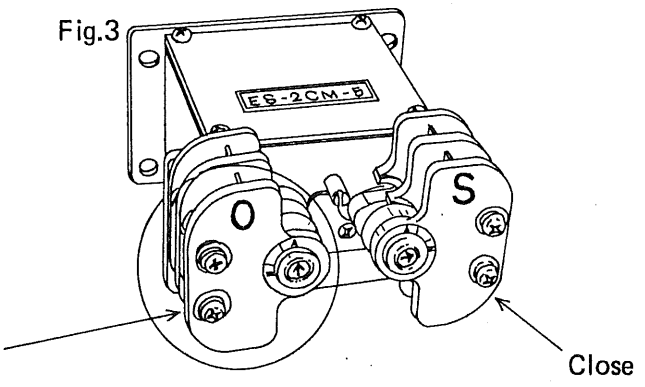
Fig.2



Adjusting handle

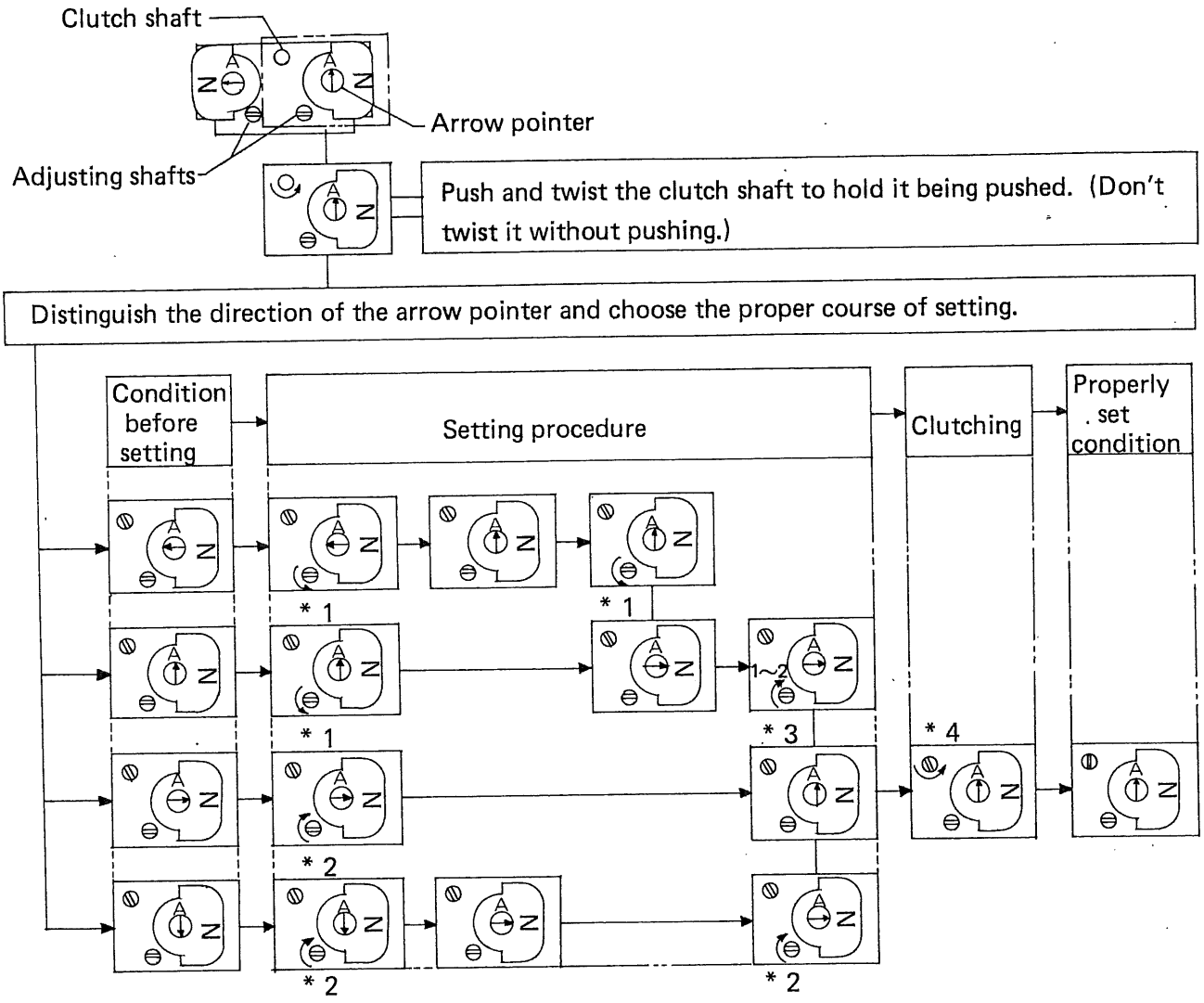
Limit switch condition properly set according to Chart 1 at the valve fully closed position.

Fig.3



Limit switch condition properly set according to Chart 1 at the valve fully opened position.

Chart 2



Explanation of figures

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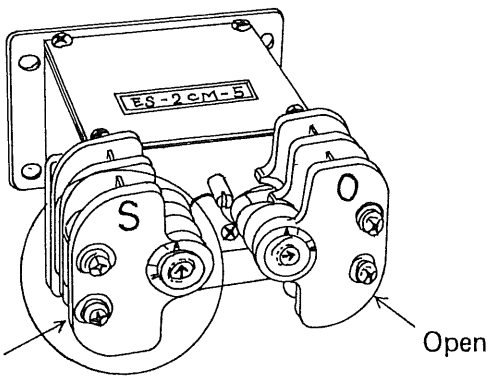
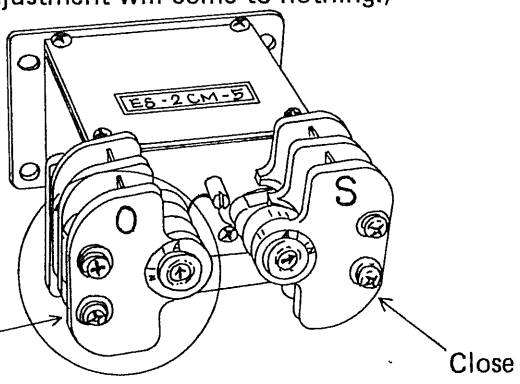
Fig.4
Fig.



Limit switch condition properly set according to Chart 2 at the valve fully opened position.

Fig.5



Limit switch condition properly set according to Chart 2 at the valve fully closed position.

4. TORQUE SWITCH

As prescribed in paragraph 2.1, the torque switch functions automatically to stop the motor when an excessive torque is applied to the valve spindle. Directions of movement of the sleeve and worm for open and close operations are opposite to each other, therefore, two separate switches are actuated, each corresponding to open or close operation.

4.1 Setting of Torque Switch

The supplied Valve Controls have been adjusted at our works so that it will operate at proper torque. If the torque switch is to be readjusted to a different torque or for any other reason, take the following steps.

The operating torque will increase in proportion to the scale indication on the switch dial. When the adjusting screw is loosened, as shown in Fig.6, the pointer can be freely moved.

First, set the pointer to position 1 on the scale and operate the valve by power. Now, as the torque switch operates prior to the limit switch, gradually move the pointer toward greater indication on the scale. An ideal setting is such that the torque switch will operate immediately after tripping of the limit switch.

Operation of the limit switch can be identified by watching the signal lamp or by the movement of the cam of the limit switch.

Adjust the torque switch for opening direction and closing direction separately.

After campletion of the setting, positively tighten the lock nut.

Note: 1) Don't touch the zero pointer adjusting screw.

2) When setting of torque switch is changed for the device provided with motor slip, setting valve of torque for motor slip should be changed at the same time.

5. POSITION INDICATOR

The local position indicator is provided on the Valve Control.

In the case of remote indication, a transmitter is mounted on the Valve Control (local indication) and a receiver with dial is mounted on the remote control board.

5.1 Setting of Local Position Indicator (Refer to Fig.7)

Fully closeing the valve, remove acylite cover, and loosen the nut for fastening the pointer and then set the pointer to zero position. Tighten the nut again.

5.2 Setting of Position Indicator for Remote Indication

(1) In case of synchro system (selsyn), the adjustment of transmitter is unnecessary. Setting of indicator (receiver) should be set to-the dial of transmitter after the rated voltage is applied.

If the opening pointer of the indicator turn reversely to transmitter, change two lead wires among three which are connected to terminels S1, S2 and S3 and as the pointer is the press type, when it should be removed, pull out holding its base part.

(2) Potentio meter

Adjustment of transmitter is performed simultaneously with the setting of pointer of the local position indicator. As the connecting gears of the potentiometer is disengaged, find the zero point turning the shaft and reading the resistance of the potentiometer with the tester. When the resistance just reached 0 Ohm, loosening the set screw of connection gear t to set engagement again, and set finally the pointer of the position indicator. Adjustment of indicator is carried out opening the valve fully by adjusting the span of R/I converter or constant voltage device, and then adjust the zero point fully closing the valve. Thus repeating this procedure, adjust minutely.

Repeating this procedure two or three times, perform the slight adjustment.

6. MOTOR

As a standard, a specially designed, outdoor-use, damp-proof, totally-enclosed, flange-mounted, high resistance squirrel-cage type brakeless 3-phase induction motor with insultation class E is used.

This motor features 250% or higher starting torque, drooping torque characteristic and very small moment of enertia of the rotor.

A brake motor or a DC motor is also available upon request.

7. POWER OPERATION

Standard operation the LTKD Valve Control is normally operated by pressing the OPEN, CLOSE and STOP push buttons.

When the OPEN or CLOSE push button for power operation is depressed, the motor starts to actuate the valve in the intended direction and the valve stops immediately upon depressing of the STOP push button.

In the fully opened or fully closed position the limit switch actuates, and stops the motor instantly.

In the case of an automatic control or linked control, the motor can be controlled automatically from extraneous electrical control signals.

8. MANUAL OPERATION

In Fig.1, push one end of handle catch (14) and pull handwheel (17) in the axial direction. When the handle clutch does not engage smoothly, pull the handwheel and at the same time turn it in left or right direction. When the handwheel is set for the manual operation, an interlocking switch opens the control circuit of the magnetic contactor for the motor simultaneously, so that the motor will not start even when the push button is pressed.

In the case of a brake motor; A brake loosening handle is provided on the motor.
On operating the valve manually, loosen the brake beforehand.

After the power-to-manual switching over, the valve can be actuated by turning the handwheel in the opening (marked "O") or closing (marked "S") direction. After completion of the manual operation, push the handwheel to set the Valve Control to electrical operation.

In the case of a brake motor; Reset the brake after completion of the manual operation.

9. MAINTENANCE

9.1 Lubrication

This Valve Control is lubricated by Lithium grease of long life, and is provided with a necessary amount of grease.

While it is operated normally, renewal of grease is unneccessary, but on the regular inspection or disassembling for repair, renew grease in accordance with the following table.

If the grease is the same quality of lithium grease, it can be mixed with each other, however another soap base grease should be avoid for mixing.

Model	Amount kg	Recommended Grease	
		Brand	Manufacturer
LTKD-05 / -05B	4.5	Nigtight LYW No.0-N	Nippon Grease
		General purpose grease No.0-S	Kyodo Yushi
LTKD-1 / -1B	10	Daphn-Grease MP No.0	Idemitsu Kosan
		Cosmo Grease Dynamax EP No.0	Cosmo Oil
LTKD-3 / -3B	15.5	Movilux EP0	ExxonMobil Japan G.K
		Albania EP Grease R0	Shell Lubricants Japan
LTKD-5 / -5B	20	Epinoc AP0	ENEOS Holdings, Inc.

*Nigtight LYW No.0-N, General purpose grease No.0-S are cold resistant grease and can be used up to -25°C.

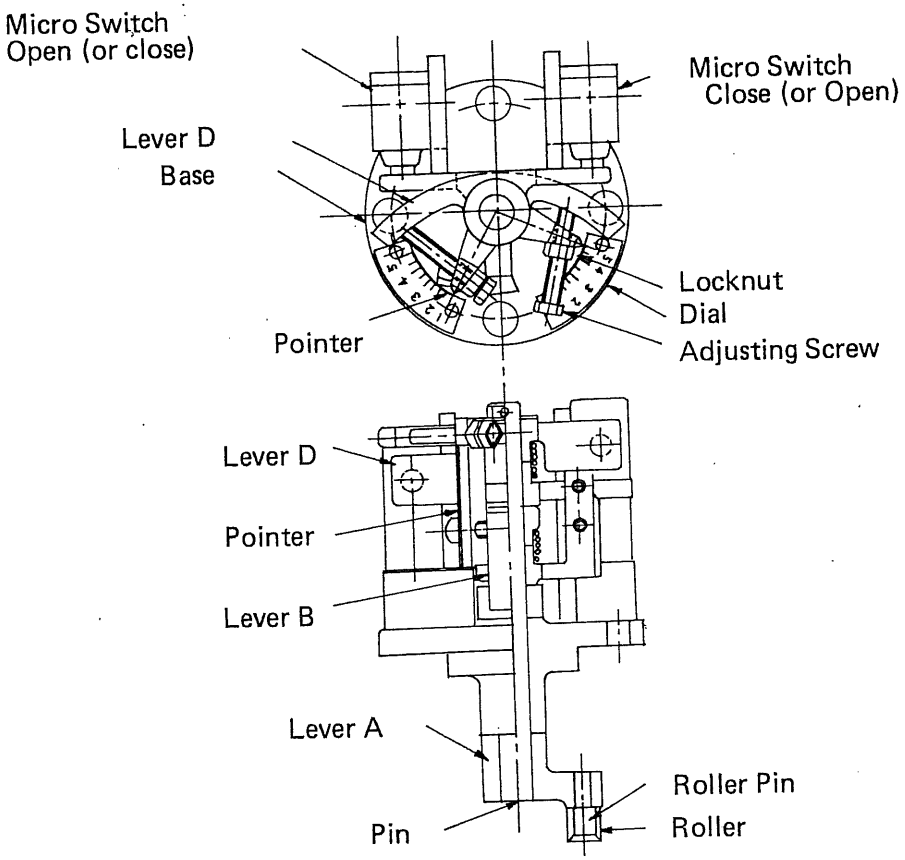
*Standard grease to be used for LTKD-05 to 5 is Nigtight LYW No.0-N.

9.2 Others

(1) For the threaded part of the outthread type valve, grease mixed with molybdenum disuphide should be applied regularly to prevent wear of stem bush.

(2) In case the valve is seldom operated, establish a schedule for a periodical (for example, once a week) test run for the valve, to confirm operating condition.

Fig.6 Construction of Torque Switch



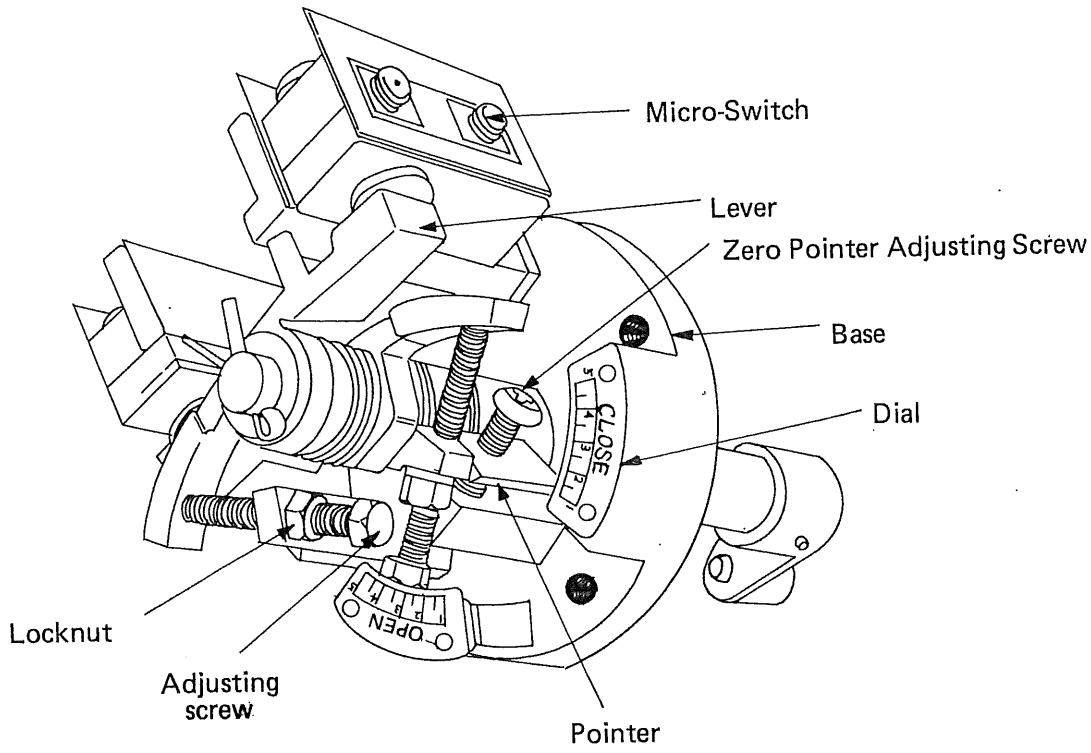
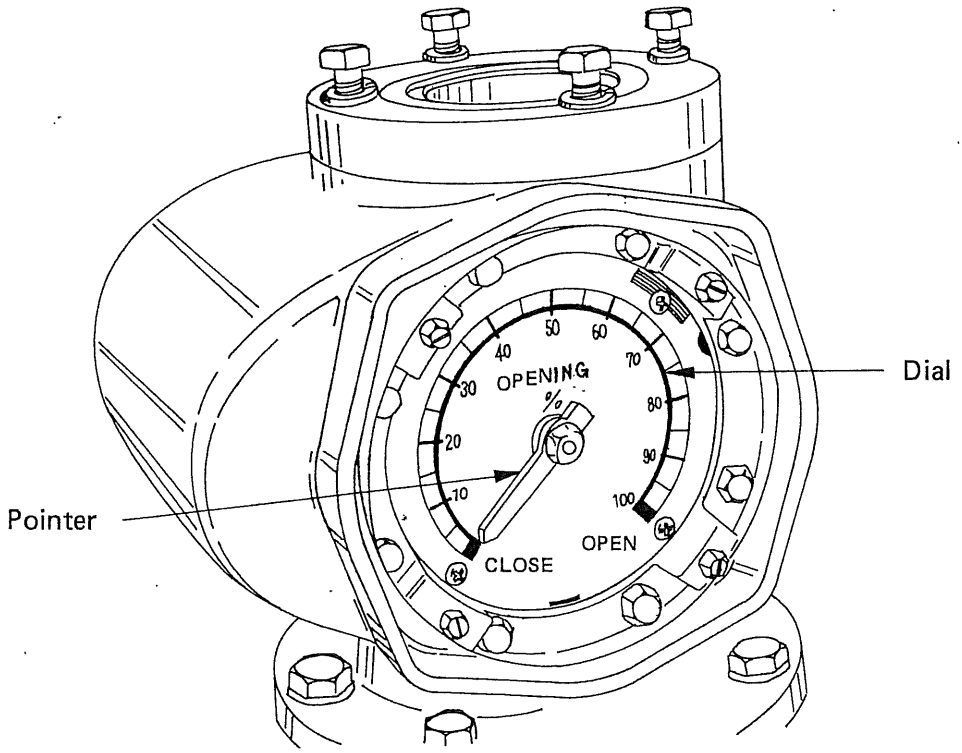
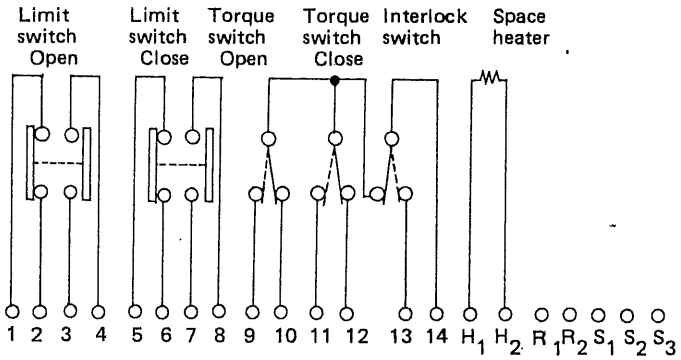


Fig.7 Position Indicator



10 STANDARD TERMINAL ARRANGEMENT AND SEQUENCE DIAGRAM

10.1 Standard Terminal Arrangement



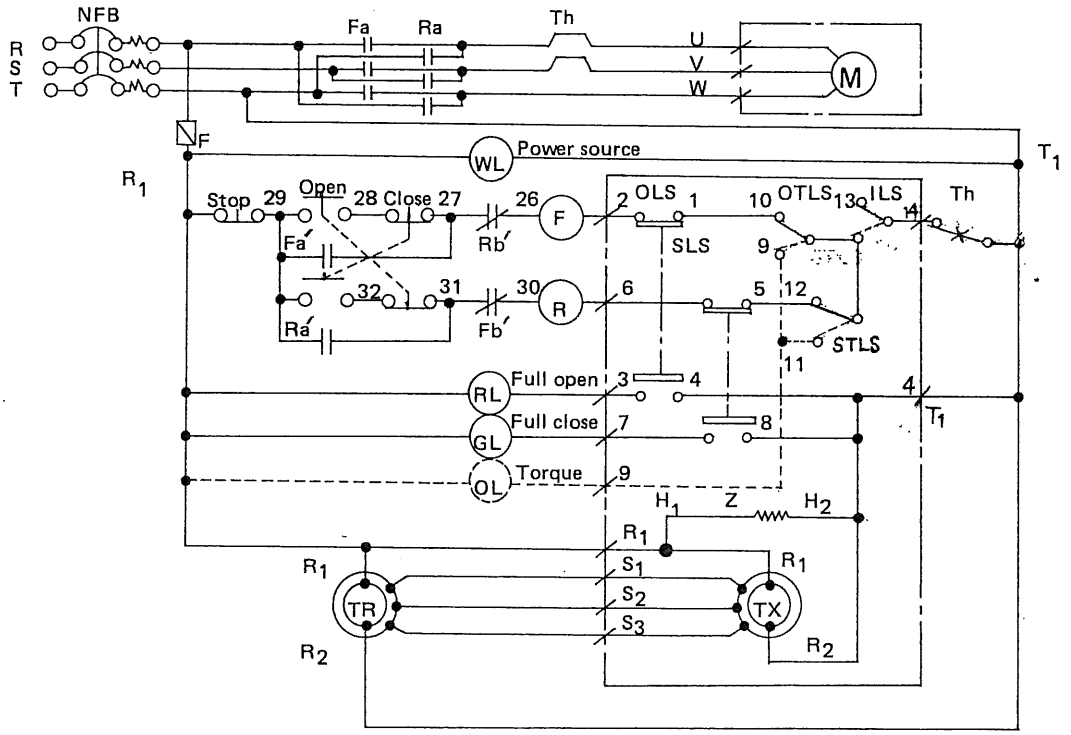
1~2 ... OFF at full opening
4~3 ... ON at full opening
5~6 ... OFF at full closing
8~7 ... ON at full closing
9~14 .. ON at opening over torque
10~14 .. OFF at opening over torque or by manual
11~14 .. ON at closing over torque
12~14 .. OFF at closing over torque or by manual
13~14 .. ON by manual
H_1~H_2.. Heater terminals
R_1, R_2, S_1, S_2, S_3 ... Terminals for Synchro

Regarding the wiring on the terminal blocks, refer to the sequence diagram.

10.2 Terminal Arrangement in the Control Box

R	S	T	U	V	W	R_1	T_1	2	3	6	7	9	14	S_1	S_2	S_3

10.3 Sequence Diagram of Standard Type LTKD



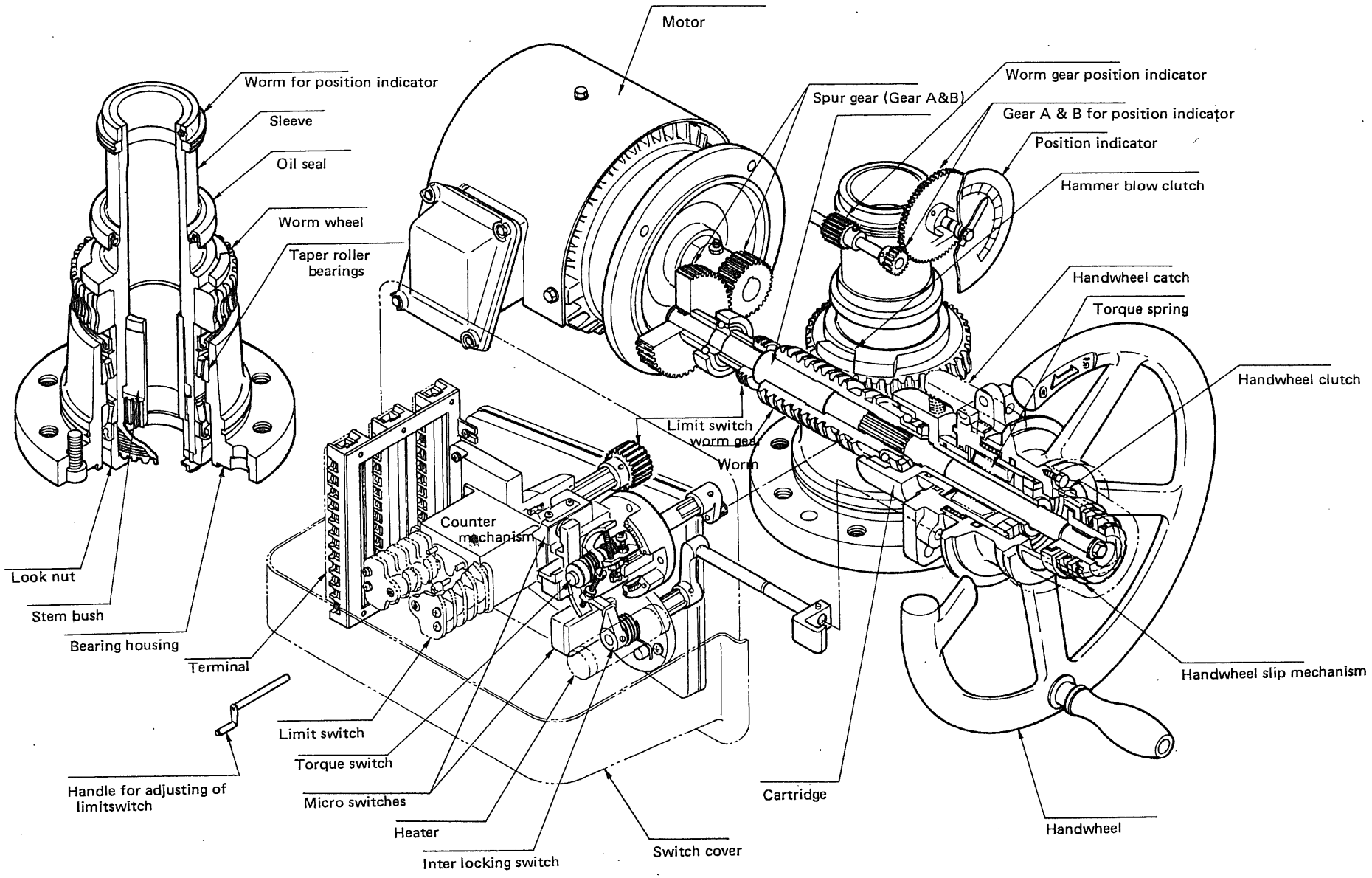
Internal wiring of switch box and motor terminal box.

This wiring shows the case of over torque indication.

NFB	No-Fuse Breaker	GL	Full close signal lamp (green)
Th	Thermal relay	OL	Torque signal lamp (orange)
F	magnetic switch open coil	OLS	Open limit switch (Ia, Ib)
Fa	magnetic switch open main contact	SLS	Close limit switch (Ia, Ib)
Fa' Fb'	magnetic switch open auxiliary contact	OTLS	Open torque switch (Ic)
R	magnetic switch close coil	STLS	Close torque switch (Ic)
Ra	magnetic switch close main contact	ILS	Interlock switch (Ic)
Ra' Rb'	magnetic switch close auxiliary contact	Z	Space heater
Open, Close, Stop	3 push button switches	F	Fuse
WL	Power source signal lamp (white)	TX	Synchro transmitter
RL	Full open signal lamp (red)	TR	Synchro receiver

Seibu VALVE CONTROL

Type LTKD-05, 1, 3



11. STEM BUSH INSTALLATION PROCEDURE

1) For LTKD-05,-1,-3, and -5

Take the following steps on disassembling and assembling the stem bushing from/into Valve Control.

Disassembling

1. Put the Valve Control with the switch cover upward.
2. Release the lock washer ①.
3. Take off the set bolt ② together with the lock washer.
4. Turn the lock nut ③ counterclockwise and take off it.

※ Caution : Take care not to remove the liner(s) ⑥.

: Don't strike the sleeve ⑧ in the axial direction without tightening the lock nut, or proper arrangement of the parts may be spoiled.

5. Take off the collar ④.
6. Draw out the stem bushing ⑦.

Assembling

1. Lubricate the interior surface of the sleeve ⑧.
2. Insert the stem bushing ⑦ into the sleeve taking care of adjusting splines of both parts.

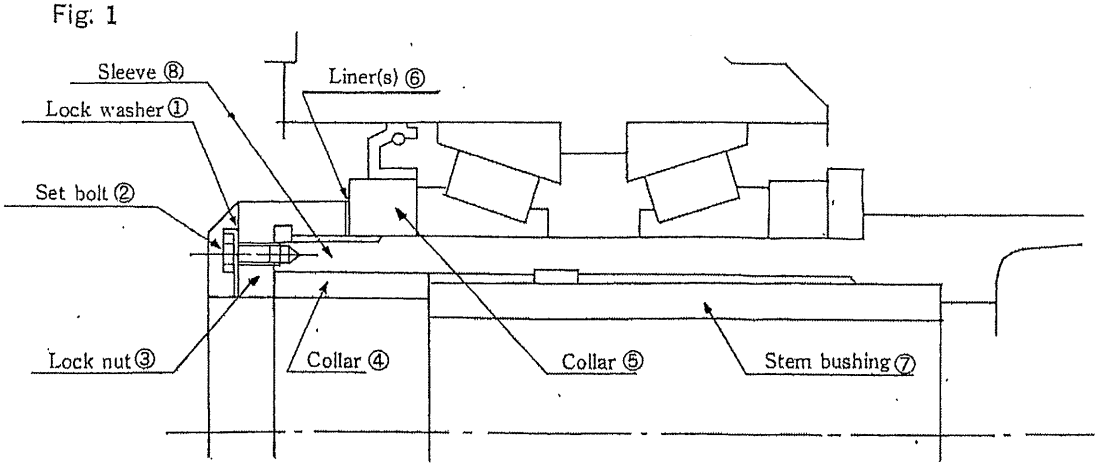
※ Caution : Don't strike the stem bushing into the sleeve, or proper arrangement of the parts is spoiled.

3. Insert the collar ④ into the sleeve.
4. Lubricate the threads of the lock nut ③.
5. Turning the lock nut clockwise and tighten it up to the sleeve so that one of the tapped holes of the lock nut fit to one of the slots on the end of the sleeve.

※ Caution : Confirm that the gap between sleeve and collar is maximum 0.5 mm when the lock nut is tightened up. Large gap may cause a trouble.

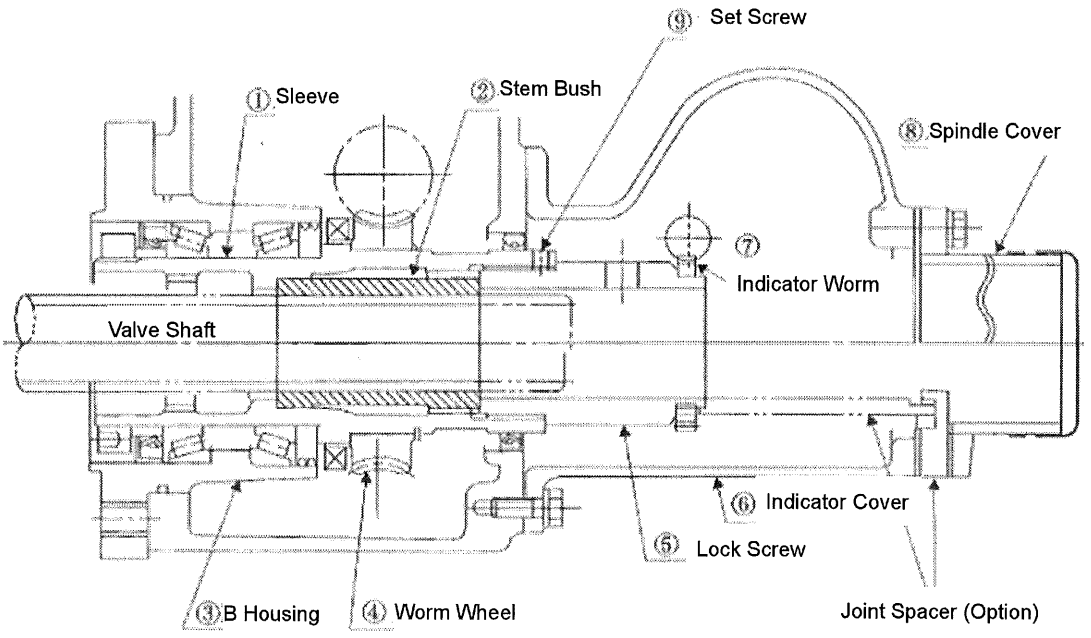
6. Screw firmly the set bolt ② with the lock washer ① into the tapped hole.
7. Fix the set bolt by bending the lock washer.

Fig. 1

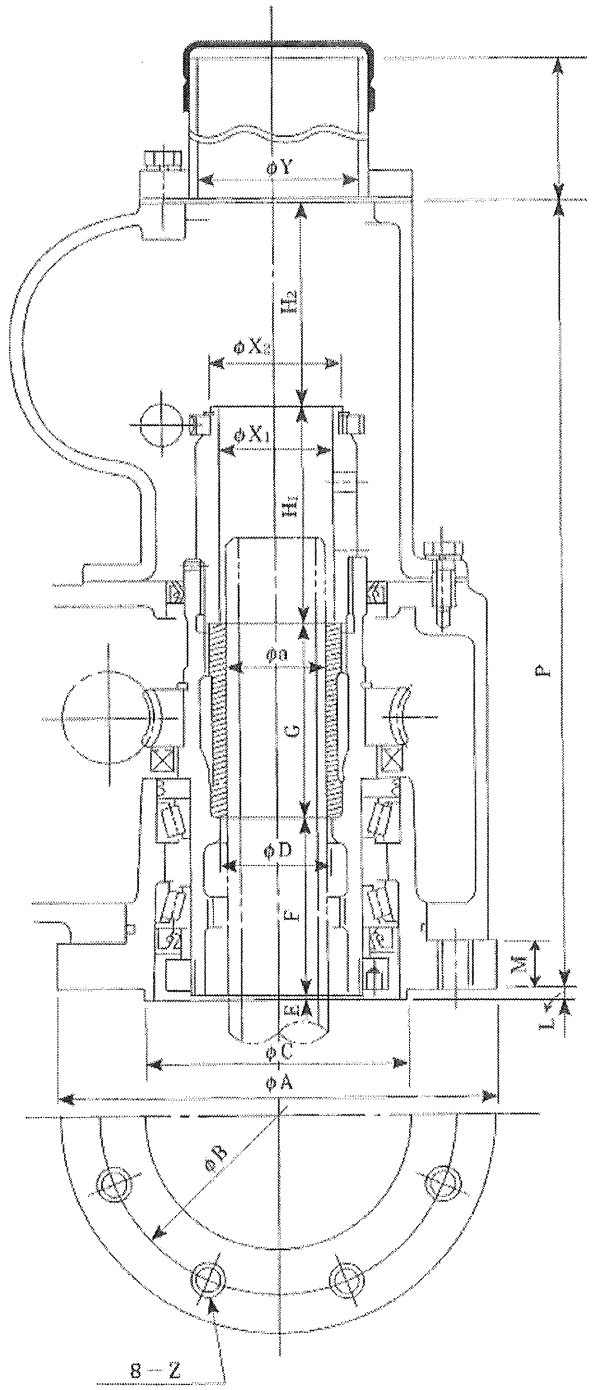


2) For LTKD-05B,-1B,-3B, and -5B

(1) Set the gate or valve to fully-closed position to lower the valve shaft.
(2) Remove Spindle cover ⑧ and Indicator case ⑥ from actuator.
(3) Loosen the Set screw ⑨ of Lock screw ⑤.
(4) Use pipe wrench or insert stick into any hole of Lock screw ⑤, then rotate and remove it from Sleeve.
(5) Set to the manual operation mode, and rotate the handwheel so that Stem bush ② will rise up to the edge of Sleeve ①.
(6) Insert bolt into extraction tap on the edge of Stem bush, and rotate and remove it from valve shaft.
(7) After Stem bush is installed, put Indicator case ⑥ on Gear case and check Indicator worm ⑦ is engaged properly, then tighten the bolt.



LTKD-05B,-1B,-3B, -5B : Dimensional data



Model / Size	LTKD -05B	-1B	-3B	-5B
Shaft Dia.	52	70	90	115
A	220	300	340	410
B	180	250	300	360
C h7	130	200	250	310
D	56	75	96	118
E	2	1	1	1
F	91	94	84	111.5
G	100	140	180	220
H_1	112	133	140	153
H_2	105	103	121	158
L	5	5	5	5
M	25	25	30	40
P	405	466	521	638.5
X_1	56	77	97	123
X_2	65	90	110	140
Y	80	105	105	130
Z	M16	M16	M20	M24

*Flange size is same as standard LTKD.
*Other dimensions not listed here is same as standard LTKD.