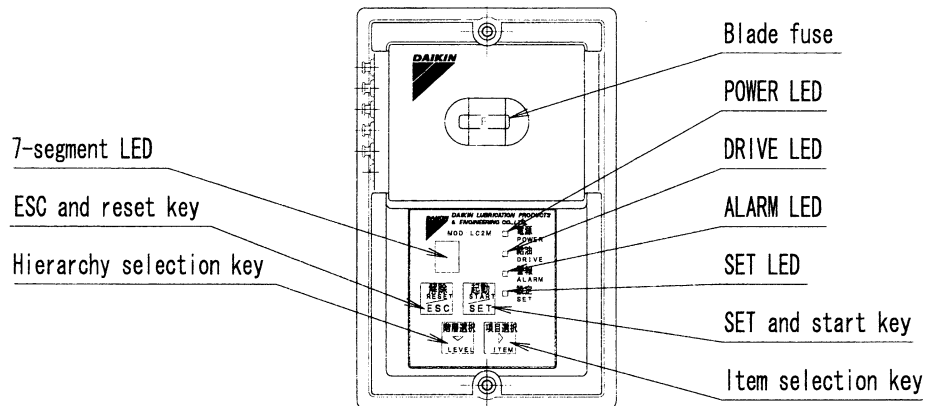


**CONTROLLER OF
CENTRAL LUBRICATING SYSTEM
LC2MP-40
INSTRUCTION MANUAL**


CONTENTS

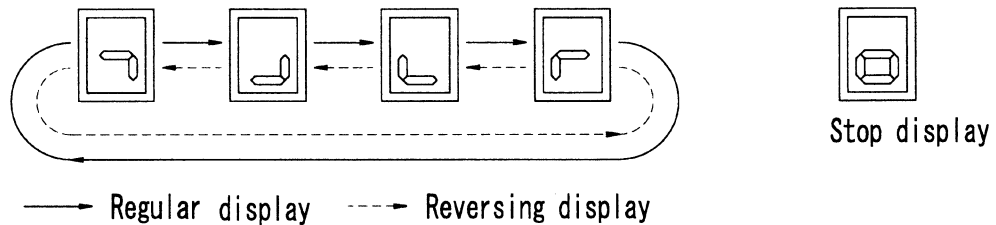
1. NAME OF PARTS
2. WAY OF CONNECTION
3. BASIC ACTION
4. OPERATION PROCEDURE
5. DISPLAY LIST
6. WARNING MANAGEMENT

1. NAME OF PARTS



Display unit

- ① 7-segment LED : Ordinary ... Only  part is flickering.
 - *1 When remaining lubrication cycles become 9 or less, count-down starts.
 - If select code No.0 on setting of lubrication cycles, count-down does not start.
 - : Lubricating ... Display driving condition of motor.



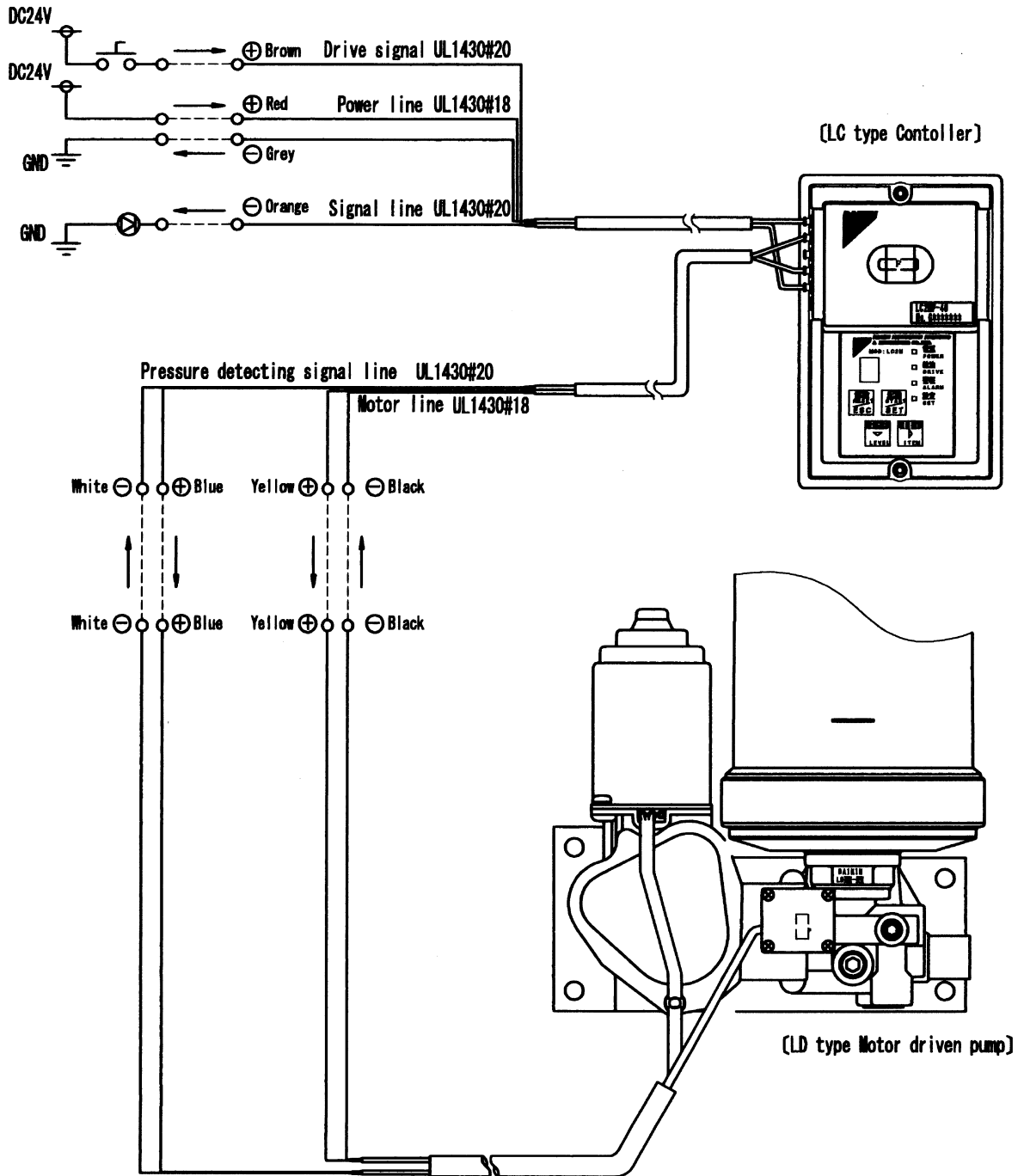
- ② POWER LED : Alarm ... Display error indication (E) and error code. [*1 Remaining lubrication cycles=Setting cycles-Real cycles]
- ③ DRIVE LED : Lighting up when energized (Pilot lamp)
- ④ ALARM LED : When pump is running ... Lighting up
- ⑤ SET LED : When dwelling ... Flickering (slow)
- ⑥ ALARM LED : When pressure-releasing (reverse run) ... Flickering (quick)
- ⑦ ALARM LED : In case of abnormalities ... Flickering
- ⑧ SET LED : When setting various items ... Flickering

(Lighting up of all LED and 7-segment LED when the power source is ON, but this is not an accident.)

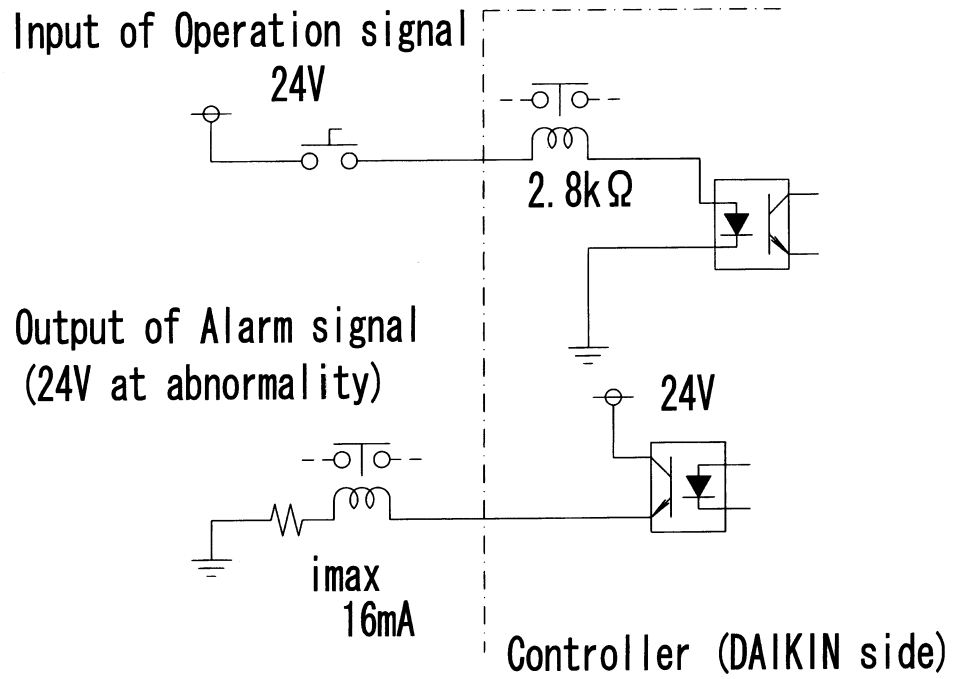
Keyswitch unit

- ① Reset (RESET) / ESC key : Ordinary ... Alarm reset and cycle reset key
 On setting ... Rising hierarchy key
 (Code No. selection → Item selection → Timer counting condition)
- ② Start (START) / SET key : Ordinary ... Optional operation key
 On setting ... Code No. decision key
- ③ Hierarchy selection (LEVEL) ▼ key : On setting ... Descending hierarchy key
 (Item selection → Code No. selection)
- ④ Item selection (ITEM) ► key : On setting ... Item and code No. selection key

2. WAY OF CONNECTION



Signal example of input and output



3. BASIC ACTION

This controller controls the motor for the pump and manages the whole of lubricating system by following action procedure.

1) Put power source on

When putting power source on, after initial setting, controller is in state of waiting for input of driving signal.

2) Calculation of lubrication interval time (timer frequency)

When driving signal is input, relay inside of controller is moved and lubrication interval timer is started to move.

Moreover, as the lubrication interval timer is frequent action, if driving signal is cut off during timer counting, timer does not be reset, at the next time, when driving signal is input, timer is accumulatively counted from the time cut off on the last time.

3) Lubrication

When lubrication interval calculation time reaches to setting time, lubrication is started.

- ① Pressurizing ... Make the pump motor regularly run to send grease into the lubrication system.
- ② Pressure holding...Repeat ON and OFF of motor to maintain maximum pressure in the system by using pressure detecting switch which is inside of the pump.
- ③ Pressure releasing ... Release the pressure within the system and complete lubrication by reversing the motor, and operating the pressure release piston which is inside the pump.

4) Automatic driving

Above mentioned 2) to 3) are automatically repeated, automatic driving by timer is performed.

5) Optional driving

Lubrication which is not timer timing can be performed.

In this case, frequency value of timer is reset and re-start from the time when lubrication is finished.

6) Driving signal OFF

When the driving signal of main equipment is cut off, controller stops whether it is interval time or counting then, cut power supply to itself is off, after releasing pressure.

Moreover, even after power source is cut off, frequency value of interval time and setting value is kept.

And if the driving signal is cut during lubrication, as soon as the next driving signal is on, the lubrication is started.

Note) Refer to "2. Way of connection" about the way of input of various input signal. Refer to "4. Operation procedure" about automatic driving and optional driving.

4. OPERATION PROCEDURE

There are two methods as given below, which can be used for operating the central lubrication system.

- a. Automatic (Timer) operation : Automatic starting and automatic stopping operation by built in timer of the controller.
- b. Optional operation : Manual starting and automatic stopping operation by "START" switch of control panel (or input "Optional operation" from outside (only in case of LC2MP-K1A and KM1A type)) .

Usually, after finishing of controller setting, lubrication can be operated by "a. Automatic driving"

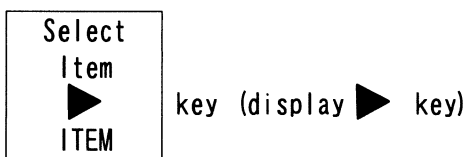
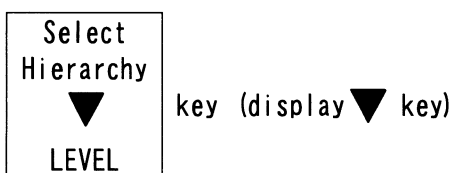
4-1. Description of set item

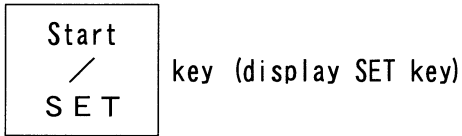
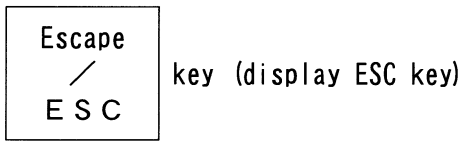
Proper lubrication can be performed by setting each of the following items depending upon the condition of main equipment or difference of lubrication system construction.

Item	Description
a. Lubrication interval	Lubrication interval in automatic (timer) operation. Time from completion of lubrication to the next lubrication.
b. Lubrication time	Pump running time requires for 1-cycle lubrication.
c. Limited number of lubrication cycles	Setting at the number of lubrication cycles until tank empty (= Tank capacity per 1-cycle lubricating volume) to give a standard of grease replenishment period (cartridge replacement, tank filling period). Moreover, selection of code No. 0 can stop the output and display of alarm by Limited number of lubrication cycles.

4-2. How to set

Following is the way of setting of above items.
Setting of items use following key switches.





Setting of each item should be done by selection of code No. instead of input numeral value directly.

Set item \ Code No.	0	1	2	3	4	5	6	7	8	9
a. Lubrication interval (hour)	/	1	1.5	2	3	4	5	6	8	/
b. Lubrication time (min)	/	2	3	5	7	10	15	20	25	/
c. Limited number of lubrication (cycles)	※	25	50	75	100	150	200	250	/	/

Note : Code No. column with diagonal line should not be used.

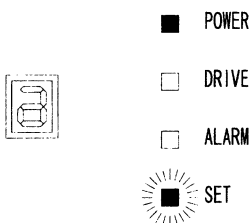
Code No. setting can be made for each item.

Setting code No. on delivery time : a=1, b=1, c=1

※If set c as 0, limited number of lubrication(cycles) becomes invalid.

4-3. Setting procedure

[Display unit]



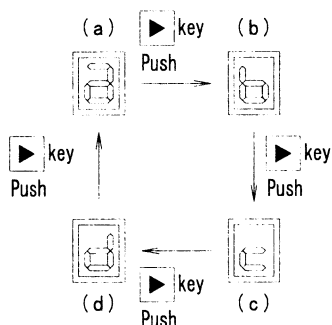
I) Selection of setting mode

1. Setting mode is started by pushing ▼ key and ► key at the same time.

(At following setting mode, SET LED is continuously flickering.)

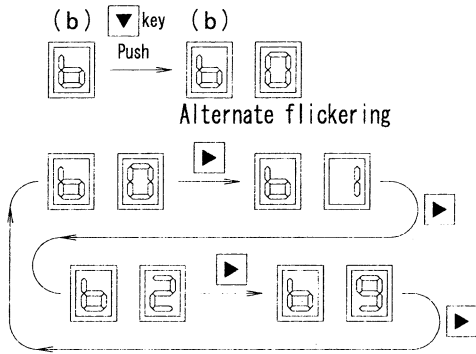
(7-segment LED and SET LED flickering)

II) Selection and settlement of set item

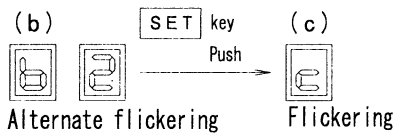


1. Every time pushing ► key, set item (a. Lubrication interval, b. Lubrication time, c. Limited number of lubrication time, *d : Mode set) is replaced.
 Setting code No. of mode set must be "0".

Example) (b) : On time of selecting lubrication time



Example) (2) : On time of selecting (3 min.)



2. Push ▼ key where the selected set item flickers.
(Settlement of set item)

III) Selection and settlement of code No.

1. Every time pushing ► key, code No. (numeral part) is advanced.

(Notes) A numeral appears just after pushing ▼ key is the code No. that is currently memorized.

2. Push SET key where the selected code No. (numeral) flickers. (Settlement of code No.)

3. (b) (3min.) is set at (2) (lubrication time) , 7-segment LED returns to state of 1)-1 item.
However set item moves to next item.

(Example) Setting finish "a" → "b"
Setting finish "c" → "d")

IV) In case of continuing the setting
Repeat each item II) to III), input set code.


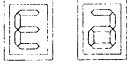
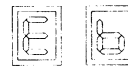


V) In case of finishing the setting
By pushing ESC key set mode moves to automatic operation (timer frequency condition).

(When alphabets flickers
... Mode moves by pushing ESC key once.

When alphabets and numeral flicker alternately.
... Mode moves pushing ESC key twice.)

5. DISPLAY LIST

The state of the lubrication system can be known by the 7-segment LED of controller panel and the description of LED display.

Sorts	Item	Phenomenon	LED display	7-segment display	Alarm output
Normal	Under counting	Ordinary	POWER LED lighting up	 flickering or numeral flickering	0V Output
	Under lubrication	I Pump running	DRIVE LED lighting up	Regular display	
		II Pressure holding III Pressure releasing	DRIVE LED flickering DRIVE LED flickering	Stop display Reversing display	
Under setting	SET mode	SET LED flickering	By each SETTING mode		
Abnormal	Pump pressurizing abnormal	Pressure does not rise within lubrication time	ALARM LED lighting up	(E) (a)  Alternate flickering	24V Output
	Pressure releasing abnormal	Pressure does not released even after releasing (reversing)		(E) (b)  Alternate flickering	
	Pressure detection abnormal	Pressure detection switch is working before starting of the system		(E) (c)  Alternate flickering	
	Tank empty	Actual lubrication cycles reaches to lubrication cycle limit		(E) (0)  Alternate flickering	

Notes) * When the remaining of lubrication cycles is less than 10 cycles, a numeral (0 to 9) is flickering.

6. WARNING MANAGEMENT

When abnormality occurs in the lubrication system, reset after remove causes of abnormality by referring to following items.

No.	Item	Cause	Management
1	Pressure releasing abnormal	<ul style="list-style-type: none"> • Mixture of air into the pump or main pipe • Leakage from main pipe part • Tank empty • Wear of check packing 	<ul style="list-style-type: none"> • Air venting • Check of main pipe connection and re-tightening • Charging lubricant to tank • Exchange of check packing
2	Pressure releasing abnormal	<ul style="list-style-type: none"> • Abnormality of releasing mechanism inside of the pump • Abnormality of pressure detector inside of the pump 	<ul style="list-style-type: none"> • Check of releasing part • Check of limit switch on pressure detecting part
3	Pressure detection abnormal	<ul style="list-style-type: none"> • Abnormality of releasing mechanism inside of the pump • Abnormality of pressure detector inside of the pump 	<ul style="list-style-type: none"> • Check of releasing part • Check of limit switch on pressure detecting part
4	Tank empty	<ul style="list-style-type: none"> • Reaching to lubrication cycle limit 	<ul style="list-style-type: none"> • Charging lubricant to tank • Frequency reset of actual lubrication cycles

Note) 1. For the above-mentioned No. 1 to 3, neither operation nor the timer count are restarted until pushing the reset button or cutting power off and canceling a warning.

(As for the empty tank warning, the warning is simply displayed, and operation and the timer count are continued.)

2. When it keeps pushing the reset button for five seconds or more, the integration value of the actual lubrication frequency is reset.
(After keep pushing the reset button for five seconds or more and release, "0" in 7 segment LED shows that the blinking display is done and the frequency was reset.)

3. Even if this display appears, lubrication can be continued because the empty tank warning is a simply indication of the grease replenishment. However, when other abnormalities occur while displaying E-9 to 0, other abnormalities are not displayed because E-9 to 0 is displaying. Therefore, please release warning E-9 to 0 at once according to Note) 2. when the cartridge grease is exchanged by E-9 to 0, or grease is replenished by the follower plate type.