9 DIAGNOSIS

9.1 POWER INDICATION ("DC ON" LED)

(1) In case that the "DC ON" LED of the power unit is not turned ON when the PC power is supplied correctly, turn the power OFF for more than 10 seconds and then try to turn the power ON again.

(2) If the "DC ON" LED is not turned ON again, remove the power unit and open the left plastic cover, and renew the fuse with one attached to the unit. Since the wrong voltage supply or abnormalities in the PC unit such as conductive wastes may cause the fuse OFF, renew the fuse (2A) after remove the cause.

(3) The power unit might be damaged by the over voltage supply, replace the power unit in this case.

(4) The power unit may not generate the output when the power supply is turned ON and OFF repeatedly in haste or chattering failure of the power supply switch is caused. In this case, turn the power OFF for more than 10 seconds and then turn the power ON again.

9.2 BATTERY VOLTAGE ("BATT" LED)

(1) If the battery voltage is dropped, the "BATT" LED on the CPU unit is turned ON and the special function auxiliary relay, M375, is turned ON when the power is turned ON.

(2) The battery is still serviceable for approx. one month after the LED comes ON, however, it is recommended to replace the battery immediately, as the discovery may be delayed. (It is advised to replace the battery every 5 years periodically.)

(3) If the battery is not serviceable, a program in the RAM and memories backed by the battery are erased.

9.3 MEMORY ERROR ("MEM" LED)

(1) If the battery voltage drops or a program memory is changed by noise interference or conductive wastes, the "MEM" LED is turned ON checking the parity error and all outputs are turned OFF. In this case, the "RUN" output contact on the power unit is also turned OFF.

(2) If the parity error is caused during the operation, the LED is turned ON, but the LED flickers if the PC power is turned ON after the parity error is caused.

(3) When the "MEM" LED is turned ON or flickers, ensure that there is no large noise or surge source near the PC, that earth is connected correctly, that the battery voltage is normal, that there is no misconnection of the output wiring, and that no conductive trash or waste has fallen into the PC unit.

(4) Check all step program to recover and correct the error program if it is found.

(5) The "MEM" LED flickers if timer or counter constant value is not programmed. In this case, write the constant value in the program.

(6) The "MEM" LED flickers if the input/output unit locations are changed after the PC power is turned OFF and then the power is turned ON again. In this case, turn the key switch to PROGRAM mode.

9.4 CPU ERROR ("CPU" LED)

(1) The "CPU" LED is turned ON checking the watch-dog timer error if the CPU causes error by the noise interference or conductive trashes or wastes. In this case, turned the key switch to the RESET and then try the RUN operation again. If the PC is recovered by above operations, check the noise source or conductive trashes or wastes.

(2) If the "MEM" LED is also turned ON, check all step programs, as the CPU error may cause the memory error. (Check the items mentioned in the section of memory error.)

(3) If the "CPU" LED remains ON after above operation, the CPU unit may be failure. Replace the unit in this case.

9.5 INPUT INDICATION LEDs

(1) If the input contact is turned ON (or OFF) at monitoring by the programmer whether the "input indication" LED on the input unit is not turned ON (or OFF), ensure that the input switch is turned ON (or OFF) correctly, as the ON/OFF levels of the LED and program data are different.

(2) The contact error of input device may be caused by contamination of the oil etc. Over current to the input switch may also cause the contact error.

(3) In case that a resistor for the LED indication is provided in parallel to the input device, the input signal may be turned ON by current leakage through the parallel circuit whether the input device is turned OFF.

(4) Input signal shorter than the CPU execution time may not be accepted.

9.6 OUTPUT INDICATION LEDs

If the output load is not turned ON (or OFF) whether the output indication LED is turned ON (or OFF), check following points;

(1) When using small current output device less than specified, the output load may be turned ON incorrectly because of the leakage current through the absorber circuit in parallel to the PC output device such as relay or SSR. In this case, provide additional surge absorber $(0.1 \mu F + 50 \Omega)$ in parallel to the load.

(2) The short circuit of output circuit or over load may cause damages of the PC output device such as agglutination of relay contact or short-circuit of SSR or transistor, which may lead incorrect operation of the output contact.