

OM-W2HE-V2.0

**RESISTANCE WELDING CONTROLLER
INSTRUCTION MANUAL
WELCOM – 020H**



CHOWEL CORPORATION

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1. GENERAL

CHOWEL WELCOM – 020H TIMER is welding controller, which achieve high welding data process, easy operation, and multifunction with microcomputer.

2. FUNCTION AND SPECIFICATION

2-1. Function

2-1-1. Welding condition and current control

- Weld schedule: 15
- Gun valve select : 2
- Current control: Voltage compensation mode or constant current mode through feedback control primary current.
- Weld operation: #1, Up slope, #2, #3 weld, Down slope

2-1-2. Inputs and Outputs

- Gun valve: AC100V
- Outputs circuit: Solid State Relay.

2-1-3. Counter

- Total weld counter: 1 (0 - 99)

2-1-4. Fault Detection

- Function: Self check trouble, start input trouble, over temperature, thyristor short, no current, etc. Total 11 faults detection
- Weld current fault detection level: Programmable high and low limits.

2-2. Specification

2-2-1. Welding power supply

- ♦ AC220V/380V/440V +10% ~ -25%

2-2-2. Control power supply

- ♦ AC100V \pm 10%.

2-2-3. Rated frequency

- ♦ 50/60Hz auto. Selection.

2-2-4. Current control

- ♦ Synchronous phase control by thyristor stack.

2-2-5. Current setting

- Current I, current II, current III is available.

2-2-6. Weld current control method

- Constant current control: Loop control by primary current feedback, or secondary current feedback.
- Voltage compensation control: Open-loop control by welding power supply voltage.

2-2-7. Current control range

- Constant current control: 0.5 ~ 40 KA. Current setting must be used in 30 ~ 100% of maximum current.
- Voltage compensation control: Maximum capacity of main transformer. Maximum fire angle is divided by 100 equal parts and controlled.
 - 99 current setting - 130° fire angle.
 - 00 current setting - 0° fire angle.

2-2-8. Time setting range

- Squeeze time: 0 ~ 99 cyc.
- #1 weld time: 0 ~ 99 cyc.
- #1 cool time: 0 ~ 9 cyc

- Up slop: 0~9 cyc.
- #2 weld time: 0 ~ 99 cyc.
- #2 cool time: 0 ~ 9 cyc.
- #3 weld time: 0 ~ 99 cyc
- Hold time: 0 ~ 99 cyc.
- Off time: 0 ~ 99 cyc

2-2-9. Control speed

- Secondary feedback constant current control: 1/2 cycle
- Primary feedback constant current control: 1 cycle
- Power source voltage fluctuation current control: 1 cycle

2-2-10. Accuracy

Secondary feedback constant current control

- Within $\pm 2\%$ against a $\pm 10\%$ welding source fluctuation.
- Within $\pm 2\%$ against a $\pm 10\%$ resistive load fluctuation.
- Within $\pm 2\%$ against a $\pm 10\%$ inductive load fluctuation.

Fluctuation compensation of power source voltage.

- Within $\pm 3\%$ against a $\pm 10\%$ welding source fluctuation.

2-2-11. Pressure schedule

- ♦ 2-solenoid valve schedule. (AC100V 1A, SSR)

2-2-12. Step Up

- ♦ Programmable signal schedule for five steps. (7 – segment display)

2-2-13. Step Up Counter

- ♦ 0~999×10 weld counts, 1 schedule. (7-segment display)

2-2-14. Step Up Rate

- ♦ 0~99%, 15 schedules.

2-2-15. Current monitor

- HIGH 0~99%, for 15 schedules. (7-segment display)
- LOW 0~99%, for 15 schedules. (7-segment display)

2-2-16. Weld count monitor

- ♦ 1~99, 4 schedules. (7-segment display)

2-2-17. Conduction degree monitor

- ♦ Setting 0~180°, for 15 schedules. (7-segment display)

2-2-18. Output signal (Constant capacity: AC110V, 0.5A)

- Interlock output: Closes the relay constant two cycles ahead of weld cycle and opens it immediately at the last weld. Used as weld counting contact.
- Held finish output: After HOLD time is over, the relay closes till activating signals discontinues.
- Step finish output: In stepper, the relay contact closes when the last step finished.
- Trouble output: The relay closes when the following happen, also LED corresponding to each trouble lights.
 - When OVER TEMPERATURE.
 - When S.C.R short.
 - When NO CURRENT.
 - When SELFCHECK TROUBLE.
 - When PILOT INPUT TROUBLE. (Parity check)
 - When CURRENT SET TROUBLE
 - When CURRENT UP RATE TROUBLE.
- Caution output: When the following happen, the relay closes and LED lights.
 - When the current monitor value goes beyond the set value HIGH, LOW range.
 - When conduction degree monitor value goes beyond conduction degree set value.
 - In power source voltage compensation mode, full wave detected.

2-2-19. Input signal (SCR BOX terminal S/W)

- WELD S/W: Welding, sequence selecting.
- GUN 1, 2, 4, and 8: Pilot signal becomes 4 bit binary input and 15 schedules.
- TROUBLE RESET
- INTERLOCK / WELD COUNT: Waiting for welds when the contact closing signal fed.
C.MONITOR count.
- STEP RESET
- PARITY CHECK: Parity check input signal.
- TEMP. SENSE: OVER TEMPERATURE check.

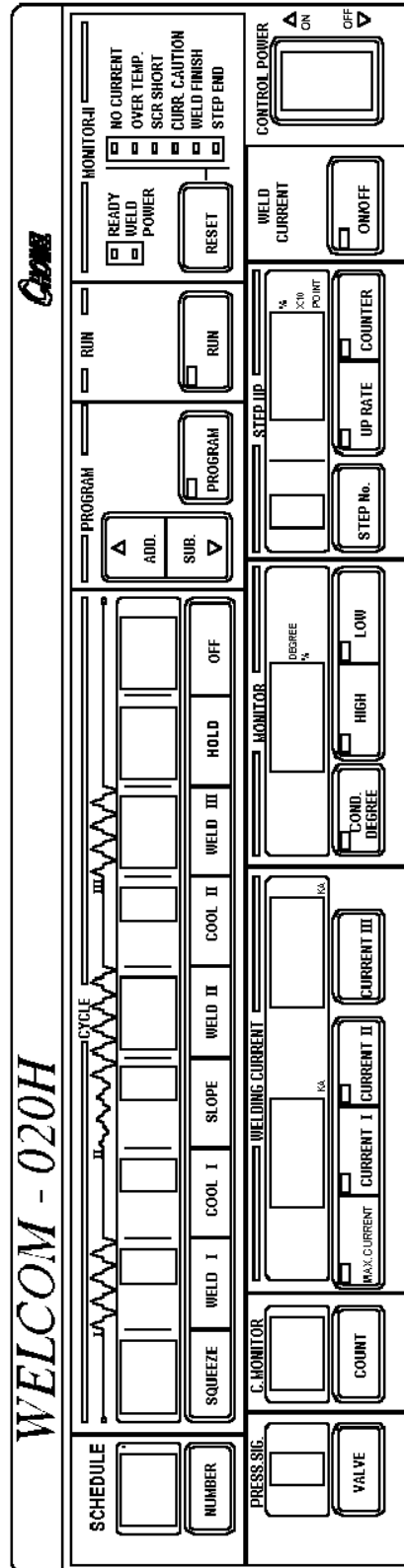
2-2-20. Dimension

- ♦ 350(W) × 345(D) × 103(H)

2-2-21. Weight

- ♦ 8kg (including troidal)

2-2-22. Front control panel



3. INSTALLATION

3-1. Cooling water

Securely connect cooling water hose to nipple of SCR box rear side and keep up cooling water flow 6 l /min at 30 ° C below.

3-2. Connection of operation cable

Refer to SCR box terminal panel disposition table and external circuit drawing.

3-3. Grounding

Ground the earth terminal on SCR box rear side for the sake of worker's safety.

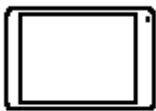
4. PROGRAMMING


4-1. FUNCTION OF FRONT PANEL




4-1-1. SCHEDULE

Indicate and program the number of the schedule that is operation.

SCHEDULE

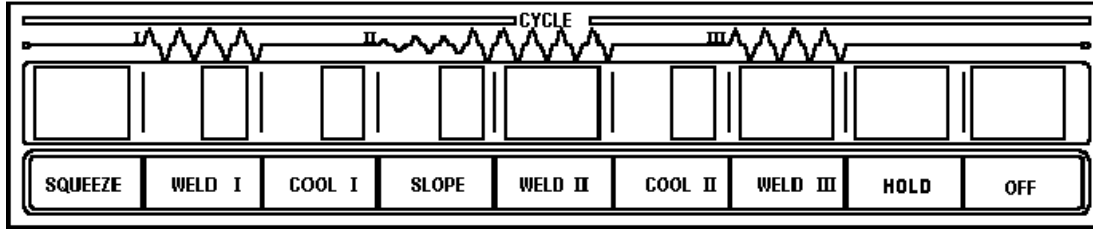


a) "RUN" mode: Whenever schedule input key  is pressed, the number increases and all the setting values of the schedule are displayed.

b) "PROGRAM" mode: The schedule display is flicker when schedule input key  is pressed. Setting the schedule number by increase  or decrease  key.



4-1-2. CYCLE



Indicate and program the cycle numbers of each stage. SLOPE cycle is included in WELD II time.



a) "RUN" mode: Key operation is disabled.

b) "PROGRAM" mode: When these keys are depressed, the depressed key display is flicker. Setting the

data for the keys that are flickering, using increase  or decrease  keys. After data are set, the data


are put into memory when other key except increase  or decrease  key are depressed.



4-1-3. PRESS SIG.

Indicate and program the number of pressure solenoid valve.



a) "RUN" mode:  key operation is disabled.

b) "PROGRAM" mode: When  key is depressed, display is flicker. Setting the


pressure No. by increase  or decrease  keys. Pressure No. corresponds with


schedule No.



4-1-4. C.MONITOR

Indicate and program the number of welds corresponding with pressure number when the count number of the weld monitor is set more than 1 and the signal during weld monitor (interlock input) is ON.



a) "RUN" mode:  key operation disabled.

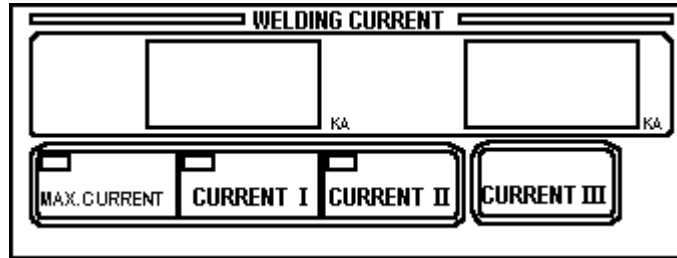
b) "PROGRAM" mode: When  key is depressed, display is flicker. Setting the

numbers of welds by increase  or decrease  keys. Count monitor display

corresponds with pressure number.

4-1-5. WELD CURRENT

Indicate and program the monitor value of maximum current I, current II, current III.



1) MAX.CURR. (Maximum current) key and key LED

- a) “RUN” mode: When key is depressed, key LED is light, and current display show maximum current setting value.
- b) “PROGRAM” mode: When key is depressed, key LED light, and current display is flicker.

Setting the maximum current value of the welder by increase or decrease keys.

Setting method of maximum current is as follow:

- In case of weld current 50.0 ~ 10.0 KA set 10.0 KA.
- In case of weld current 10.0 ~ 20.0 KA set 20.0 KA.
- In case of weld current 20.0 ~ 40.0 KA set 40.0 KA.

2) CURR I, CURR II. (Current I, II) key and key LED

- a) “RUN” mode: When or key is depressed, the key LED lights, and current display shows WELD I or WELD II current setting values.
- b) “PROGRAM” mode: When or key is depressed, the key LED lights, and current display is flicker.

Setting WELD I or WELD II current values by increase or decrease keys.

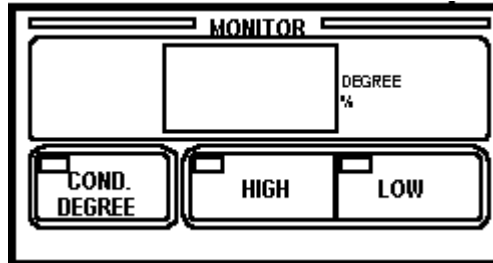
3) CURR III (Current III) key

- a) “RUN” mode: When key is depressed, display is WELD III current setting values.
- b) “PROGRAM” mode: When key is depressed, display is flicker. Setting WELD III current value





by increase or decrease keys.

4-1-6. MONITOR I







Indicate and program the monitor values of maximum conduction degree, current high and low limits.



1) COND. DEGREE (conduction degree) key and key LED

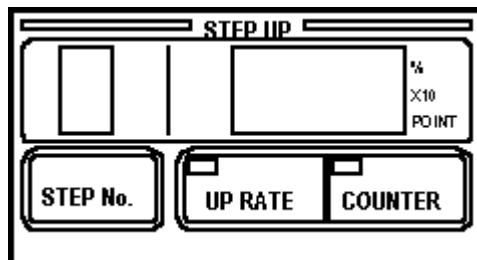
- a) "RUN" mode: When  key is depressed, the key LED is lights and monitor I display shows setting values of maximum conduction degree.
- b) "PROGRAM" mode: When  key is depressed, the key LED lights and monitor I display is flicker. Setting maximum conduction degrees to monitoring by increase  or decrease  keys.

2) HIGH, LOW key and key LED





- a) "RUN" mode: When  or  key is depressed, the key LED is lights and monitor I display shows HIGH or LOW values of current monitor.
- b) "PROGRAM" mode: When  or  key is depressed, the key LED is lights and monitor I display is flicker. Setting the HIGH or LOW limit of the current in percentage against the setting value of WELD I, II, III by increase  or decrease  keys.

4-1-7. STEP UP





Indicate and program the step up current, up-rate, step up count number or present count number.







1) STEP No. key

- a) "RUN" mode:  key operation is disabled.
- b) "PROGRAM" mode: When  key is depressed, STEP display is flicker. Set step number using increase  or decrease  keys.

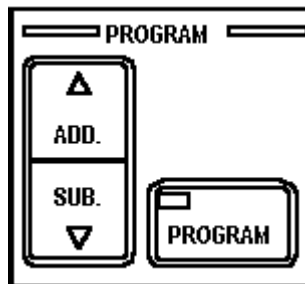
2) UP RATE key and key LED

- a) "RUN" mode:  key operation disabled.
- b) "PROGRAM" mode: When  key is depressed, the key LED lights, and up-rate or weld number display is flicker. Setting up-rate of current by increase  or decrease  keys. Up-rate corresponds to schedule number and step number. If step number is 0 or 1, setting of up-rate is impossible.

3) COUNTER key and key LED

- a) "RUN" mode:  key operation is disabled.
 - b) "PROGRAM" mode: When  key depressed, the key LED lights, and the display is flicker.
- Setting the counter of step up corresponds with step number by increase  or decrease  keys. If step number is 0 or 1, input of up-rate is impossible.

4-1-8. PROGRAM key



1) PROGRAM key and key LED

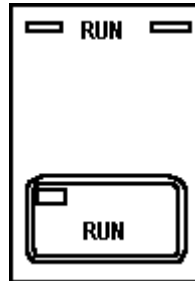
When  key is depressed, the key LED lights and the control becomes PROGRAM mode.

2) Increase and decrease key

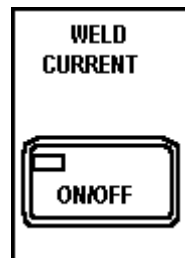
When increase  or decrease  key is in PROGRAM mode, these keys add or reduce 1 as to the data flashing on the panel.

4-1-9. RUN key and key LED

When key is depressed, the key LED lights and the control becomes RUN mode.

**4-1-10. WELD CURRENT ON/OFF**



When key is depressed, the key LED on or off. While the key LED is lighting, weld current is running.

**4-2. HOW TO OPERATE**



4-2-1. Control power S/W ON.


4-2-2. Press  key.

4-2-3. Press schedule input  key.

4-2-4. Input desired schedule number by increase  or decrease  keys.

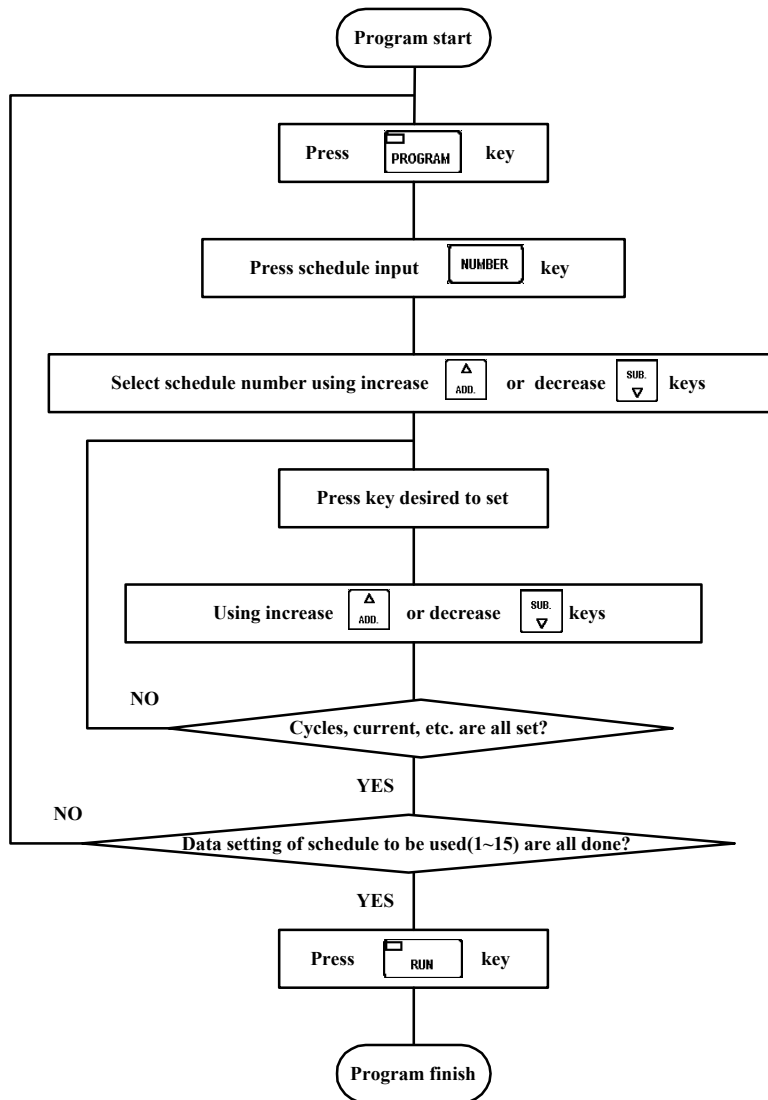
4-2-5. Press the keys of squeeze, each kind of sequence time and current which you want to set,

and then input desired data by increase  or decrease  keys.

4-2-6. Press  key after completing data input.

4-2-7. Press WELD  key.

4-2-8. Program procedure



5. FUNCTION & OPERATION OF DIP SWITCH

When the control is shipped from the factory on standard specifications, all the switches are in OFF position.

5-1. DIP switch 1

5-1-1. "NP"

- ◆ "ON"

Change of program in the front panel is not available.

- ◆ "OFF"

Can change program in the front panel.

5-1-2. "RW"

- ◆ "ON"

When the detected current becomes insufficient to current of setting values, this mode does not release pressure but increase the current 5% and re-weld. Weld complete signal is given out after re-weld.

- ◆ "OFF"

Re-weld is not done.

5-1-3. "PC"

- ◆ "ON"

When pilot signal inputted by 4-bit binary, parity check of pilot signal is done. (Parity must be in odd number)

- ◆ "OFF"

Parity check of pilot signal is not done.

5-1-4. "4"

- ◆ "ON"

Pilot signal becomes single input 4 schedules. (1, 2, 4, 8 schedules)

- ◆ "OFF"

Pilot signal becomes 4-bit binary input.(15 schedules)

5-1-5. "CV"

- ◆ "ON"

The mode becomes power voltage fluctuation compensation control.

- ◆ "OFF"

Becomes constant current control.

5-1-6. "I"

- ◆ "ON"

Becomes primary feedback constant current control. (current detection is done by CT)

- ◆ "OFF"

Becomes secondary feedback constant current control. (current detection is done by troidal coil)

5-1-7. "SH"

- ◆ "ON"

Start signal becomes self-hold from squeeze time.

- ◆ "OFF"

Start signal becomes self-hold from weld time.

5-1-8. "1"

- ◆ "ON"

Secondary feedback constant current control becomes 1 cycle control.

- ◆ "OFF"

Secondary feedback constant current control becomes 1/2 cycle control.

5-2. DIP switch 2**5-2-1. "TS"**

- ◆ "ON"

When control power is reentrance, preset data is initializing.

- ◆ "OFF"

When control power is reentrance, preset data is not initializing.

5-2-2. “EM”

- ◆ “ON”

Weld complete signal is outputted for 0.2 seconds after welding completed.

- ◆ “OFF”

Weld complete signal is outputted until pilot signal stopped.

5-2-3. “MR”

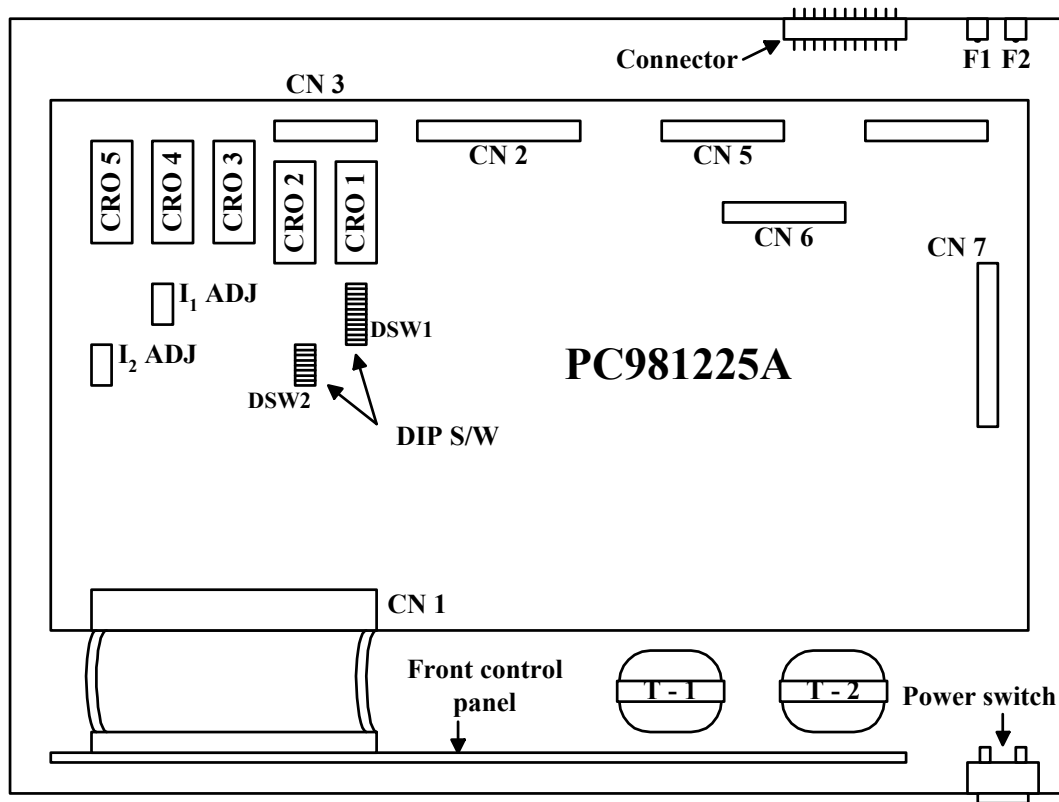
- ◆ “NO”

When the current monitor values are out of set ranges, weld complete signal output is not given (this is TROUBLE OUTPUT) and also does not accept the next pilot signal. Release of trouble is done by the reset signal.

- ◆ “OFF”

When the current monitor values are out of set ranges, weld complete signal output is given (as CAUTION OUTPUT) and accepts the next pilot signal. Release is done by the next pilot signal or reset signal.

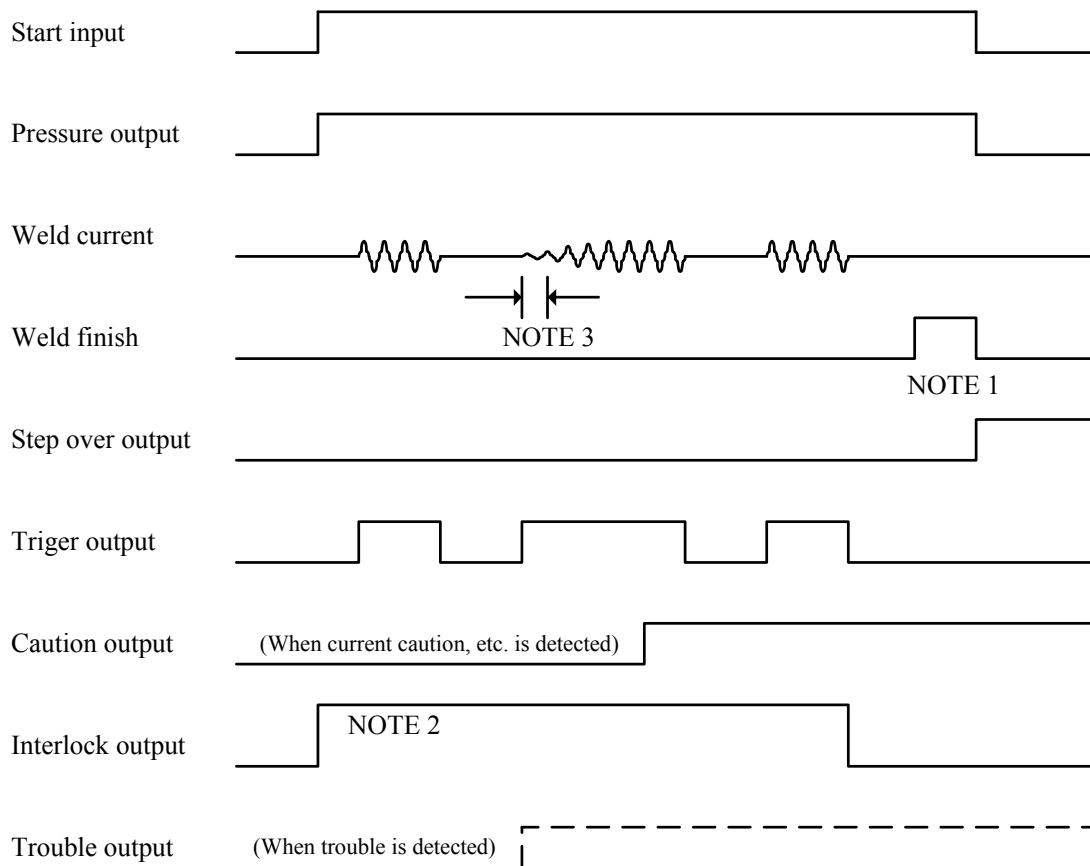
6. INSIDE THE CONTROLLER



- ♦ CRO1: Finish signal
- ♦ CRO2: Trouble output
- ♦ CRO3: Caution output
- ♦ CRO4: Current increase
- ♦ CRO5: Insufficient weld (Interlock output)
- ♦ Relay 1 – 5 standards: DC24V (contact capacity: AC100V, 0.5A)
- ♦ F1: Control power protecting fuse (1A)
- ♦ F2: Welding power protecting fuse (1A)
- ♦ I₁ ADJ: Variable resistor for current calibration in primary constant-current control mode.
- ♦ I₂ ADJ: Variable resistor for current calibration in secondary constant-current control mode.

7. TIME CHART

7-1. Basic operation time chart

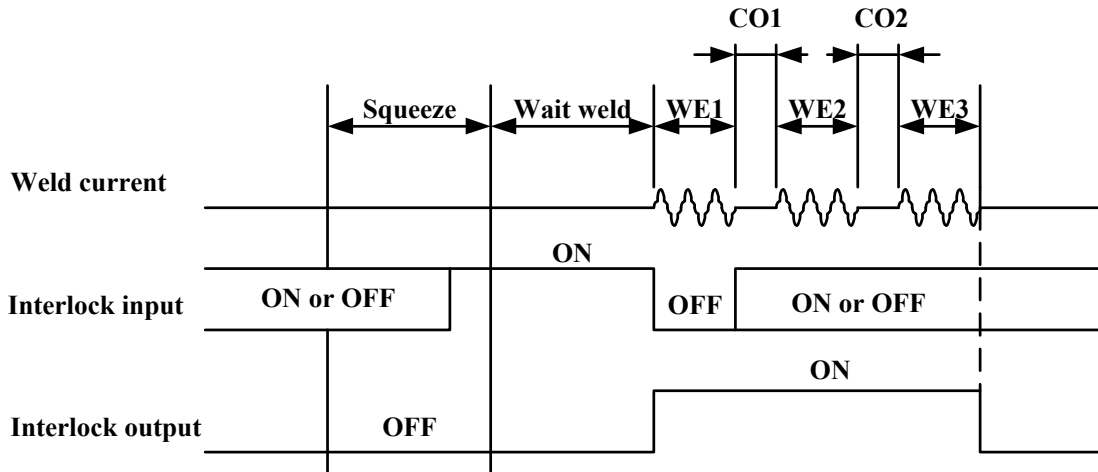


* NOTE 1 Weld output: When start input becomes OFF before hold, and when it becomes OFF before 0.2 second after hold, this signal is given out for 0.2 second.

* NOTE 2 Interlock input: When interlock input is not fed, interlock output comes out 2 cycles before weld starts and when interlock input is fed, interlock output comes out as weld starts

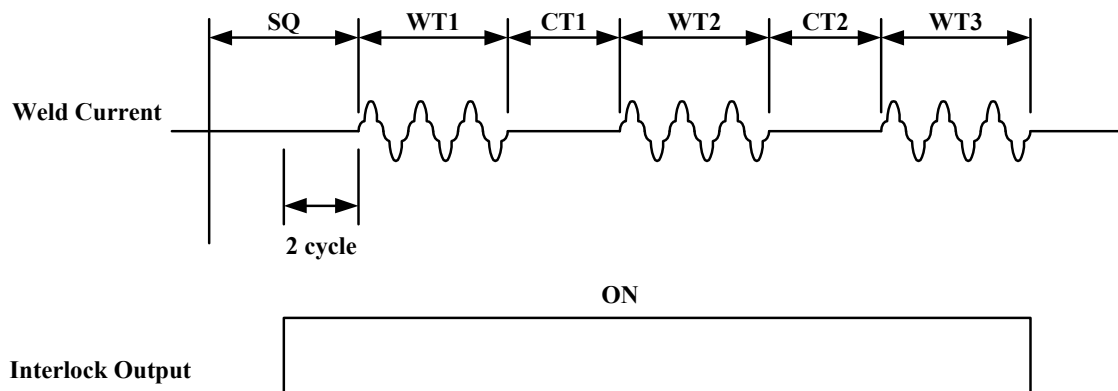
* NOTE 3 Slope: Slope time is included to weld II.

7-2. Interlock operation time chart when interlock input is fed.



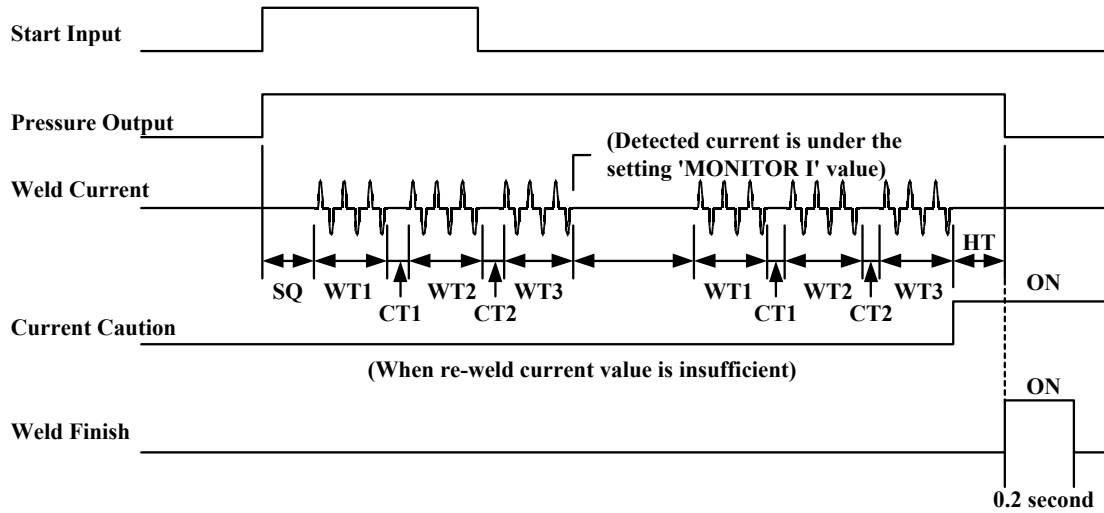
When interlock input becomes OFF while waiting for weld, interlock output becomes ON and weld starts

7-3. Interlock operation time chart when interlock input is not fed.

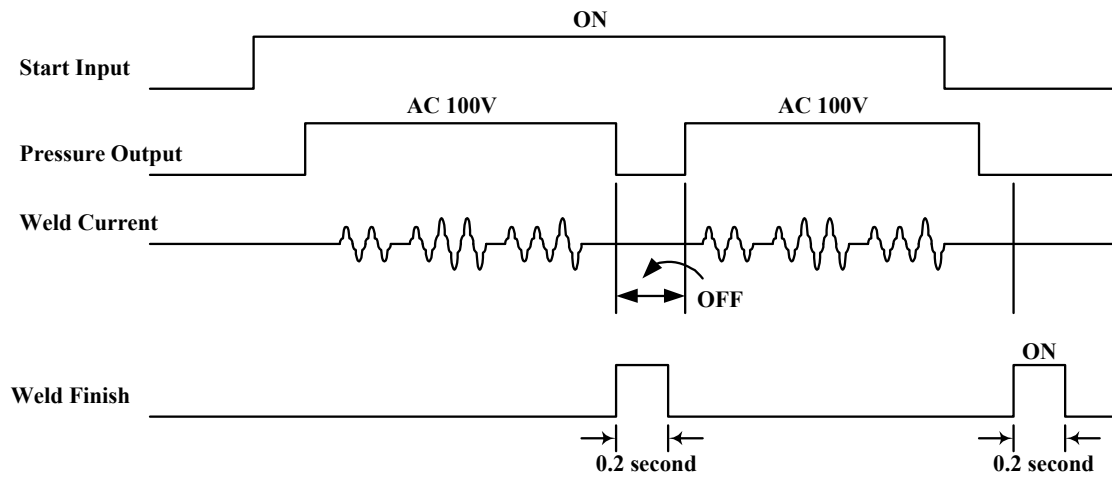


- ♦ Interlock output comes out 2 cycles before weld starts
- ♦ When squeeze is "0" cycle, interlock output flows out as weld starts

7-4. Re-weld operation time chart

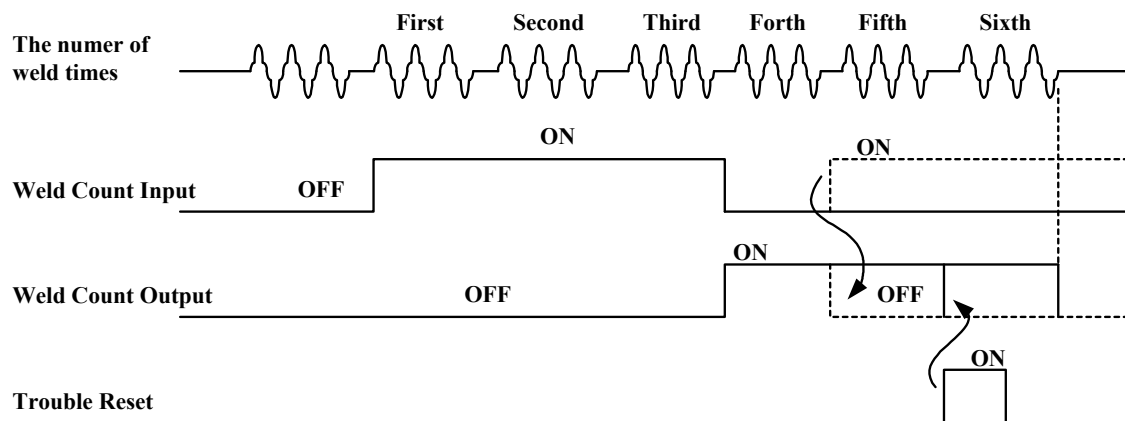


7-5. Repeat operation time chart



7-6. Count monitor time chart

Ex) In case of setting as 6 times



7-6-1. It counts number of weld while weld count input is "ON".







When weld output is OFF, and if the numbers of weld counts is less than the one set previously, the weld count output is given out.

7-6-2. Weld count output is released when the following happen.

- When the new weld schedule are given.
- When weld count input becomes ON again.
- When trouble reset is ON.
- When the reset key on the front control panel is ON.

8. SPECIAL OPERATION

8-1. Setting of transformer turns ratio

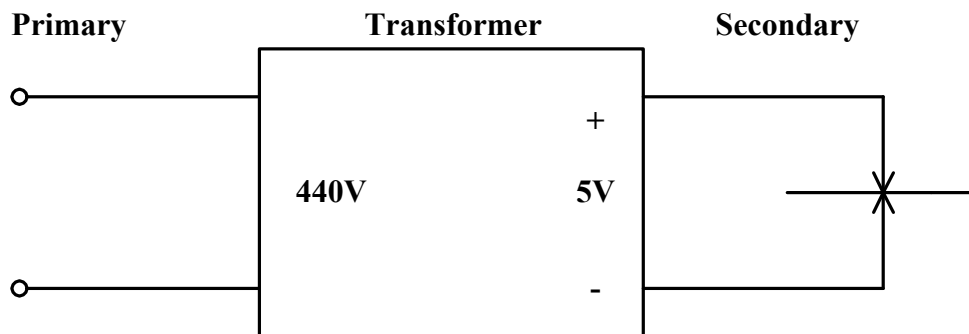
Current I key  and current II key  are pressed at the same time, both LED light and current display is flicker. This is the transformer turns ratio-setting mode. Using increase  or decrease  keys set the winding ratio of the transformer. To release from this mode, press other data selecting key except current I  key and current II  key.

- Following equations are transformer turns ratio:

$$\text{transformer turns ratio} = \frac{\text{Primary winding number}}{\text{Secondary winding number}} = \frac{\text{Primary input voltage}}{\text{Secondary output voltage}}$$

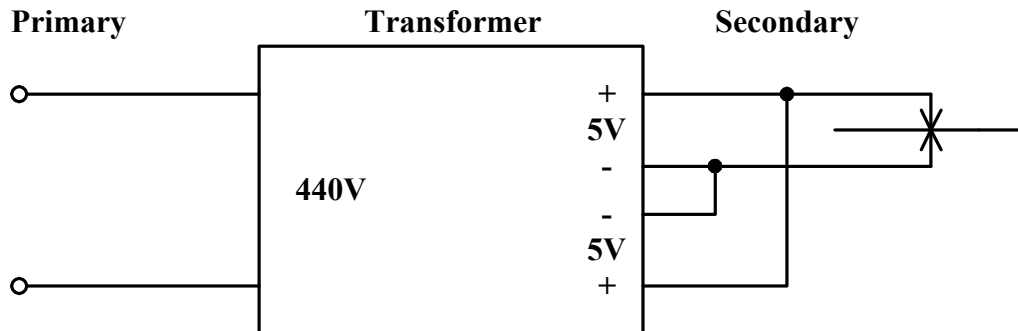
(EXAMPLE) transformer winding ratio

1) Secondary output is one



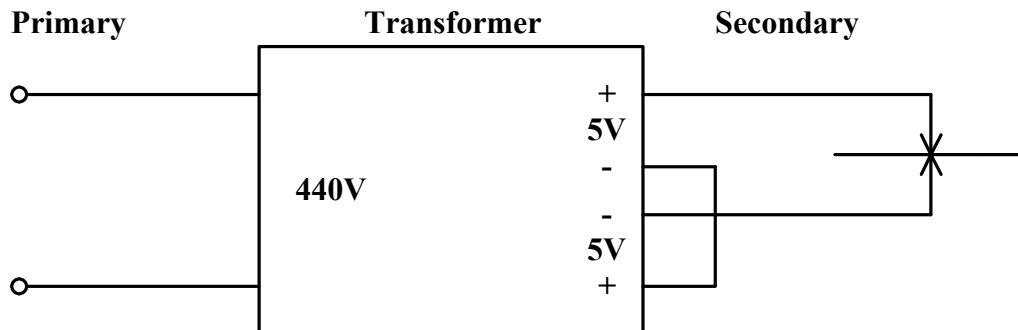
$$\text{transformer turns ratio} = \frac{\text{primary input voltage}}{\text{secondary output voltage}} = \frac{440}{5} = 88$$

2) Secondary outputs are connected in parallel



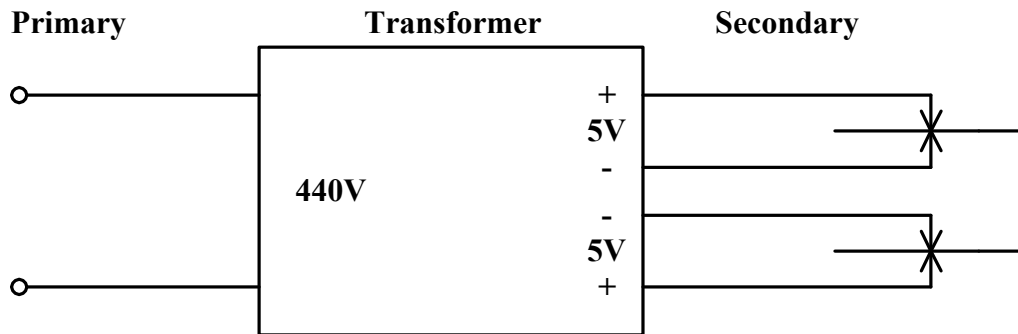
$$\text{transformer turns ratio} = \frac{\text{primary input voltage}}{\text{secondary output voltage}} = \frac{440}{5} = 88$$

3) Secondary outputs are connected in serial



$$\text{transformer turns ratio} = \frac{\text{primary input voltage}}{\text{secondary output voltage}} = \frac{440}{10} = 44$$

4) Secondary outputs are two



$$\text{transformer turns ratio} = \frac{\text{primary input voltage}}{\text{secondary output voltage}} \times \frac{1}{\text{secondary circuit number}}$$

When two points are welded in the same time

$$\text{transformer turns ratio} = \frac{440}{5} \times \frac{1}{2} = 44$$

When one point is welded

$$\text{transformer turns ratio} = \frac{440}{5} \times \frac{1}{1} = 88$$

8-2. Current Calibration

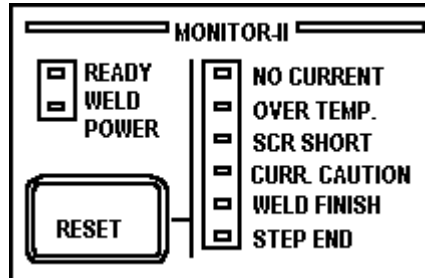
8-2-1. Primary constant current control

When actual secondary current is smaller than the setting current values in the front control panel, adjust variable resistor "I₁ ADJ". If there is more than 10% difference, adjust the winding ratio setting so that the setting current values and actual current become equal.

8-2-2. Secondary constant current control

Adjust variable resistor "I₂ ADJ" so that the setting current values in the front panel and the actual secondary current of the welder become equal.

9. MONITOR II



9-1. "READY" LED

When all of the followings are met, this LED lights and welding is ready to do.

- Control power is fed.
- Welding power is fed.
- "WELD CURRENT" key is pressed "ON"
- External WELD switch is ON. (I/O Signal)

9-2. "WELD POWER" LED

Lights when the welding power source is supplied.

9-3. "NO CURRENT" LED

Lights when no current or breaking of troidal coil occurred. (In constant current control only)

9-4. "OVER TEMP." LED

Lights when thyristor thermo is opened.

9-5. "SCR SHORT" LED

Lights when thyristor is shorted. (Only when CT or troidal coil is used)

9-6. “CURR. CAUTION” LED

In constant current control, the LED lights when the current which is greater than HIGH or lower than LOW runs and also when the current goes beyond the set limit of conduction degree. In power source fluctuation compensation control, the LED lights when the troidal coil or CT is connected and full-wave is detected.

9-7. “WELD FINISH” LED

Lights when weld count is reached the setting value of counter monitor.

9-8. “STEP END” LED

Lights when the last step is over in current step up.

9-9. “RESET” key

When the key is depressed, troubles mentioned 10-3 through 10-8 are released and each LED is off.

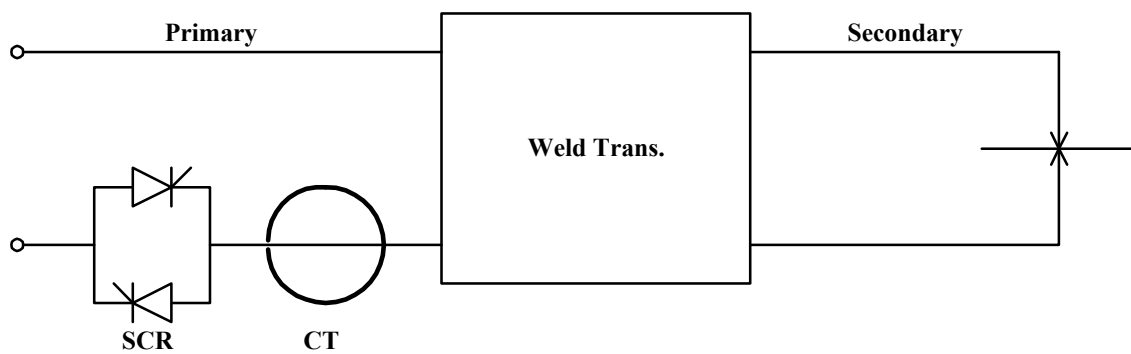
TROUBLE DETECTION TABLE

TROUBLE CODE	CONTENT	DETECTIO N PERIOD	OPERATIO N	RESET	FINISH OUTPUT	WARNING OUTPUT	REMARKS
1	SELF CHECK TROUBLE	When power is put on	Does not start	Trouble reset	Not given	Trouble	
2	START INPUT TROUBLE	When start input is given	"	"	"	"	Parity check in ON
3	OVER TEMPERA TURE	On occasion	"	"	"	"	
4	S.C.R SHORT	In pressure except weld	Pressure, weld OFF	"	"	"	
5	NO CURRENT OR TROIDAL COIL SHORT	While welding current run	"	"	"	"	
6	CURRENT CAUTION	After weld is over	No start	"	"	"	
7	CONDUCT ION DEGREE TROUBLE	"	"	"	"	Caution	
8	WELD FINISH	Weld monitor detect signal OFF	Ready for start	"	Given	Weld count output	
9	STEP FINISH	When weld is over	"	Step reset	"	Step finish	
10	CURRENT SET TROUBLE	When start input is given	Not ready for start	Trouble reset	Not given	Trouble	
11	CURRENT UP RATE TROUBLE	"	"	"	"	"	

10. CONNECTION OF TROIDAL COIL & CT

10-1. How to connect CT

CT is to connect to the primary side of weld transformer.

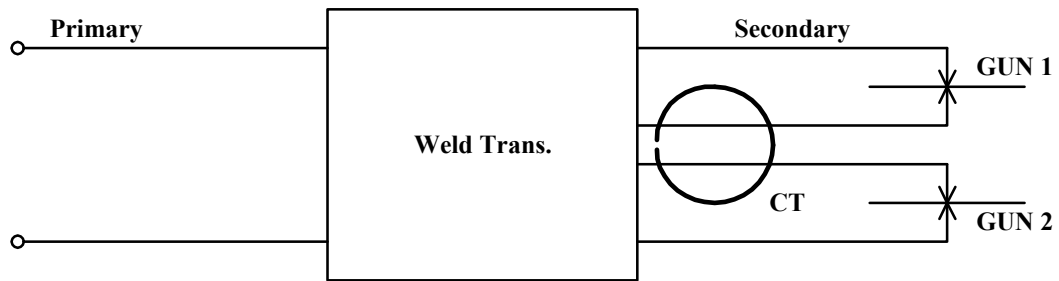
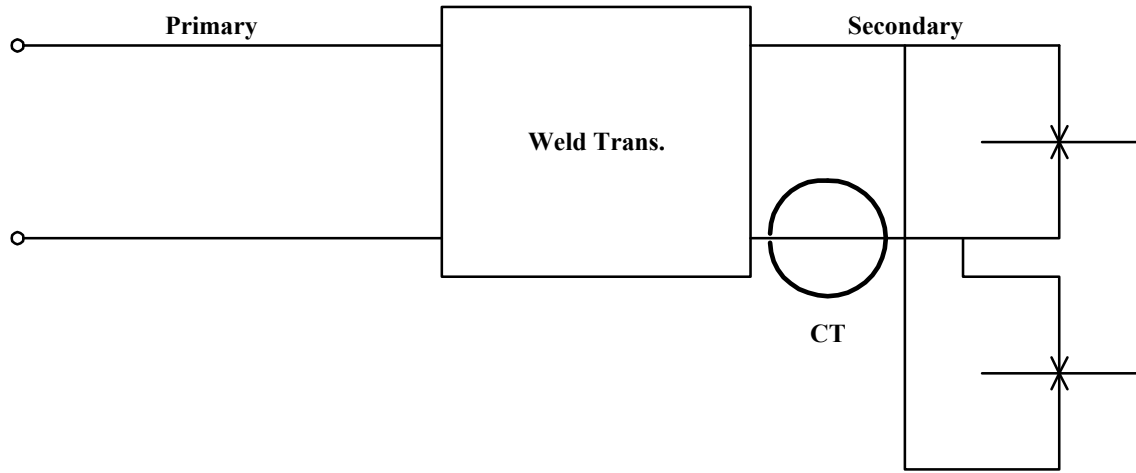


- ♦ CT Specifications
 - Primary current: 600A
 - Secondary current: 5A
 - Secondary load resistance: $0.2\ \Omega$ (5W)

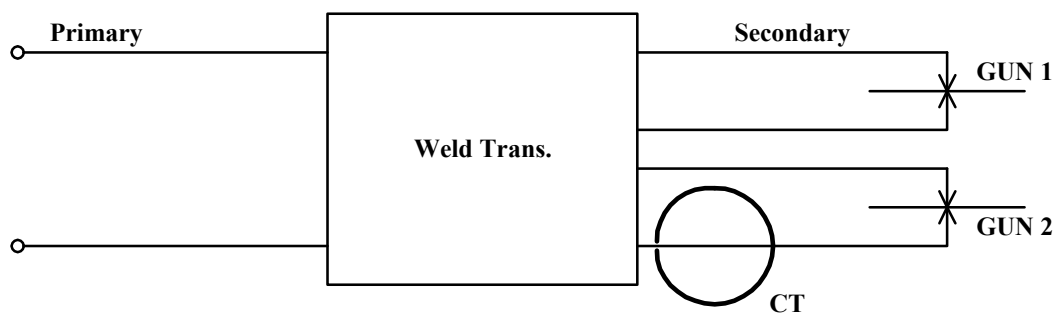
10-2. Connection of troidal coil

The troidal coil should be connected to the secondary of the welding transformer. In the case of welding guns are plural, connect the coil as shown below.

10-2-1. When the weld current does not run to plural guns simultaneously.



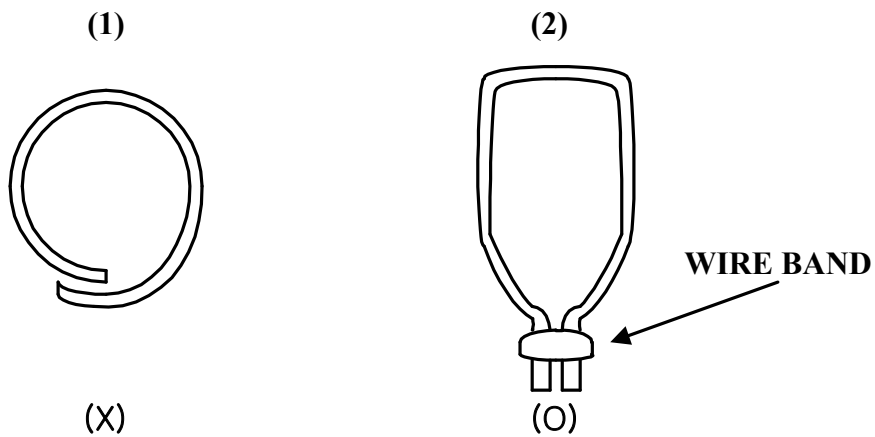
10-2-2. When the weld current runs to plural guns at the same time.



In this case, use one coil for one side.

10-3. Some remarks when you connect the troidal coil

During the constant current control, if the troidal coil is broken, the unit gives the trouble warning signal and stop operation. Therefore, it is important to pay attention to the connecting position of the coil so that it may not be broken by certain reasons such as excessive heat up of the conductor, mechanical actions, contact with the work, etc. Clip the coil firmly to the conductor using the plastic band. When you clip the coil to the conductor, if you do as shown in the chart (1), error will occur, so be sure to do it as shown (2).



11. DATA SETTING RANGE

ITEM	SETTING RANGE
Schedule input	1 ~ 15
Squeeze	0 ~ 99
Weld I	0 ~ 9
Cool I	0 ~ 9
Slope	0 ~ 9
Weld II	0 ~ 99
Cool II	0 ~ 9
Weld III	0 ~ 99
Hold	0 ~ 99
Off	0 ~ 99
Valve	1 ~ 4
Count monitor	0 ~ 99 (0 count monitor Off)
Maximum current	5.0 ~ 40.0 KA
Current I	Set in 20 ~ 100% of maximum current in compensation mode, the last digit LED goes off. Range is 00 ~ 99.
Current II	
Current III	
Transformer turns ratio	1.0 ~ 99.9
HIGH	0 ~ 99 (0 is Monitor off)
LOW	0 ~ 99 (0 is Monitor off)
Step No.	0 ~ 5 (0 is Step up off)
Up rate	0 ~ 99
Weld number	0 ~ 999 (X10)

12. PILOT SIGNAL INPUT PROCEDURE

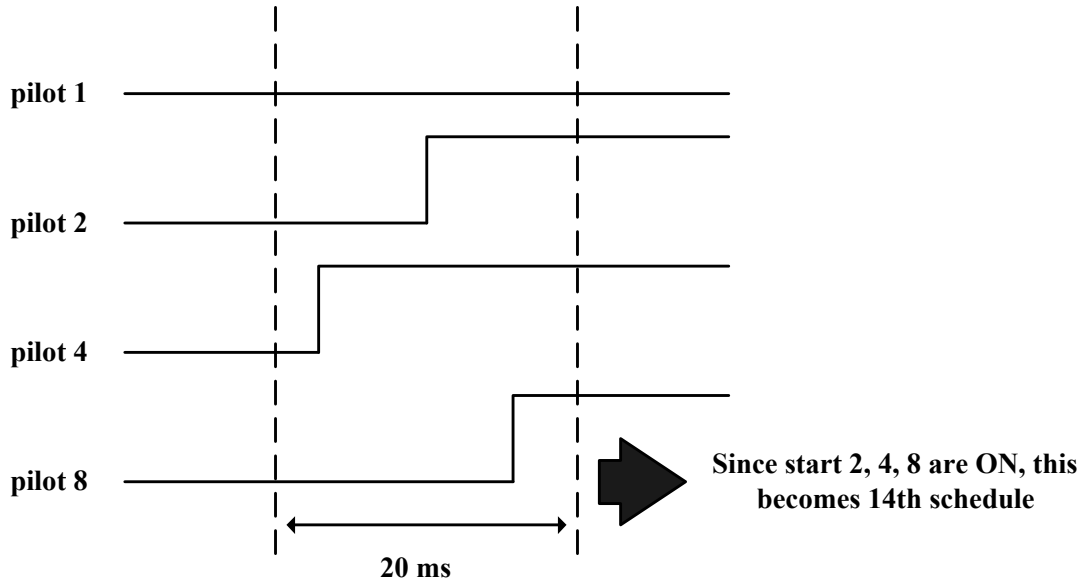
Pilot signal includes pilot 1, pilot 2, pilot 4, pilot 8 and Parity signal.

1) In case of 15 schedules pilot, and parity check of pilot signal is not done. Pilot signals can be selected out of 15 schedules using 4 inputs binary code match of pilot 1, pilot 2, pilot 4, and pilot 8.

Pilot schedule	Pilot 1	Pilot 2	Pilot 3	Pilot 4
1	●			
2		●		
3	●	●		
4			●	
5	●		●	
6		●	●	
7	●	●	●	
8				●
9	●			●
10		●		●
11	●	●		●
12		●		●
13	●		●	●
14		●	●	●
15	●	●	●	●

●: ON blank : OFF

- Pilot input time chart (In case 14th schedule is selected)



Pilot schedule becomes ready 20ms after first start input.

2) In case of 15 schedules and parity check is done. Pilot signal is selected out of 15 schedules using 4 inputs (pilot 1, 2, 4, 8) binary code match and (parity signal)

Pilot schedule	Pilot 1	Pilot 2	Pilot 3	Pilot 4	Parity
1	●				
2		●			
3	●	●			●
4			●		
5	●		●		●
6		●	●		●
7	●	●	●		
8				●	
9	●			●	●
10		●		●	●
11	●	●		●	
12			●	●	●
13	●		●	●	
14		●	●	●	
15	●	●	●	●	●

●: ON blank : OFF (Make become odd number including parity)

Parity check is done in odd number parity. For pilot, the number of input signals must be in odd numbers combining parity signal with pilot 1, 2, 4, and 8. If the number of the combined input signals is even number, it causes start input trouble and "MONITOR I" LED displays "02". It also gives out trouble output "CR02".

3) In case of 4 schedules pilot

When the mode switch inside the unit "4" is ON, the pilot signal becomes single input 4 schedules. The smaller pilot number of pilot signal has a priority. After the pilot signal is ON for the first time, the smaller pilot signal number that is ON 20ms after the pilot start has a priority.

13. OTHERS

13-1. Setting of maximum current

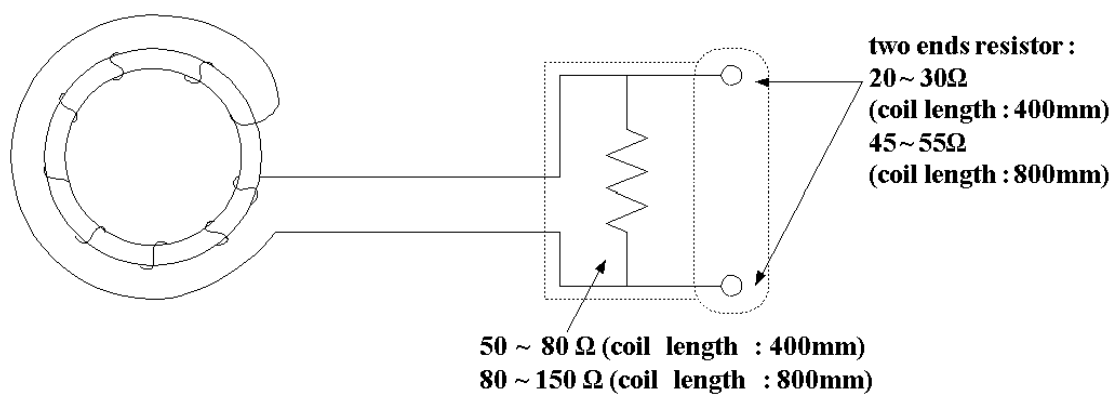
Maximum current determines maximum current of the welder. If the maximum current is not certain, follow the procedure given below.

- ◆ Maximum current ----- 10.0KA
- ◆ WELD I, II ----- 0
- ◆ WELD III ----- 1
- ◆ CURRENT III ----- desiring current value (but less than 10.0KA)

If the monitor value of CURRENT III after weld current runs is smaller than the desired current values, make the setting of maximum current smaller, and if it is greater, make it greater. Repeat this procedure and try to set the maximum current so that the monitor value of CURRENT III becomes a little lower than the set value.

13-2. Troidal coil inspection

There is a resistor inside the connector of coil for adjusting the sensitivity. Test the resistor as follow.

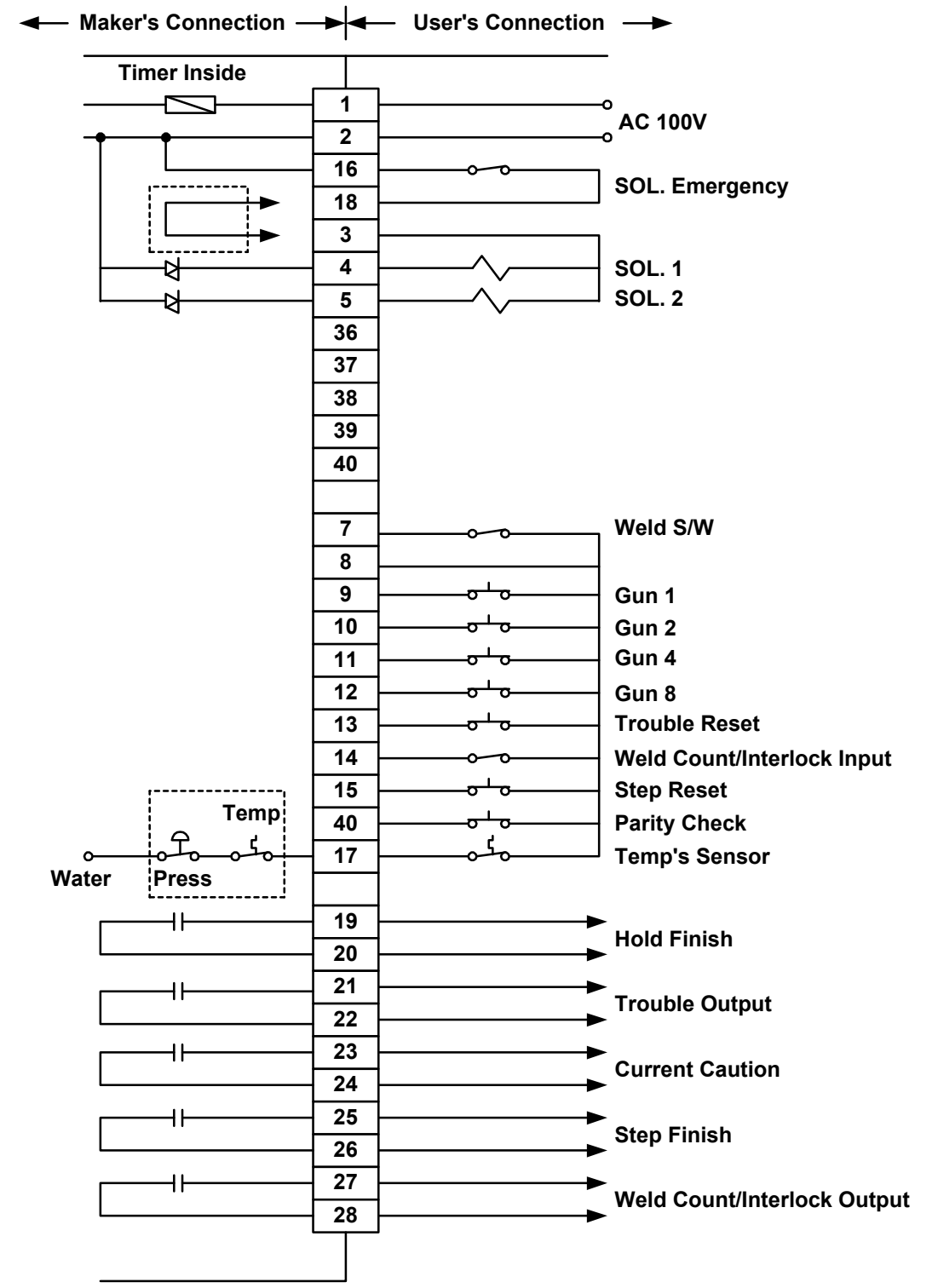


SCHEDULE TABLE

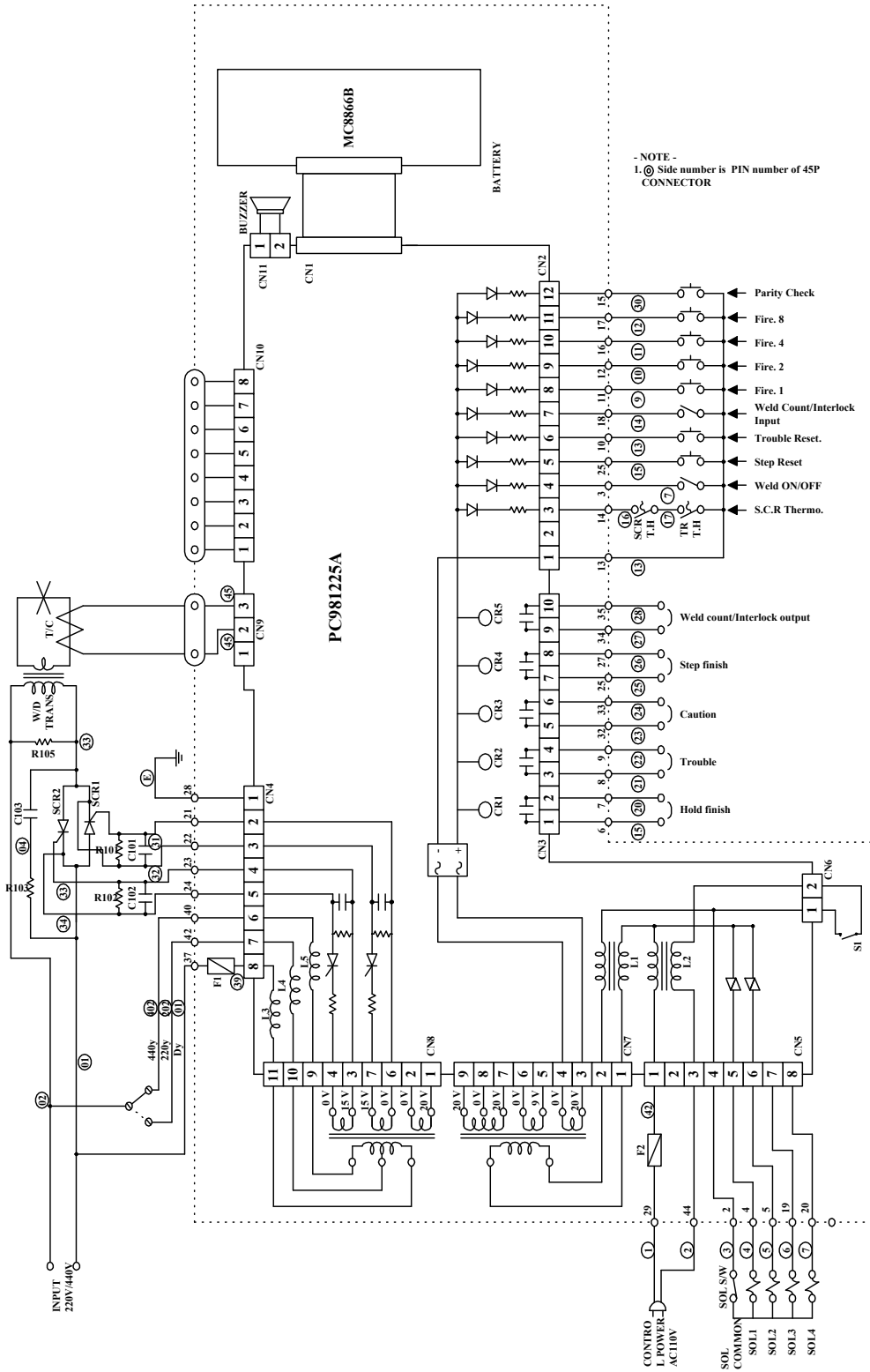
Item \ schedule	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
SQUEEZE															
WELD															
COOL															
SLOPE															
WELD															
COOL															
WELD															
HOLD															
OFF															
CURRENT I															
CURRENT II															
CURRENT III															
VALVE No.															
STEP 1 COUNT															
STEP 2 COUNT															
STEP 3 COUNT															
STEP 4 COUNT															
STEP 5 COUNT															
UP RATE II															
UP RATE III															
UP RATE IV															
UP RATE V															
COND. DEGREE															
HIGH															
LOW															
MAX. CURRENT															
TRANS. Turns ratio															

NOTE: Though schedule number is different input value of count may be equal according to valve number.

SCR BOX TERMINAL PANEL DISPOSITION TABLE



INTERNAL CONNECTION DIAGRAM



- NOTE -
1. @ Side number is PIN number of 45P CONNECTOR