1. Uses

YUDO have produced the Sequence Injection Timer - SIT500 Series to provide a means of controlling the mould filling sequence when using Valve Gate Hot-Runner Systems.

The Sequence Injection Timer enables the Valve Gates of a Hot-Runner System to be individually controlled to provide the following benefits.

1) Removal or Positioning of Weld Lines

Quality of the moulded part can be improved by removing or re-positioning of weld lines on visual surfaces, or sections where a weld line would cause a weakness.

2) Regulation of the Injection Quantity by Gate Operation

Flash occurrence or short moulding is improved by the regulation of the Injection Quantity from each individual gate.

3) Reduction of Clamping Force

Injection is performed with minimum clamping force because all of the gates are not opened simultaneously.

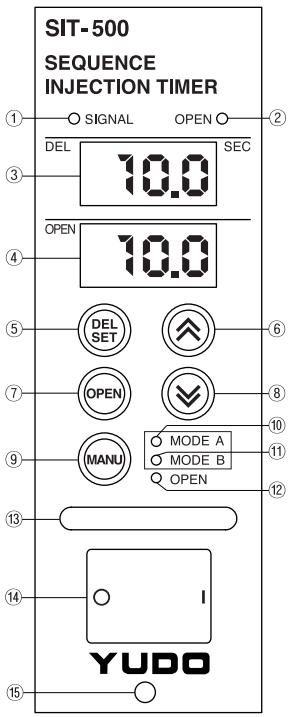
4) Reduction of Flow Marks

Flow marks are minimized by being able to raise the injection rate at the gate.

2. Power Supply

▶ Mains Power Supply (Timer case)	Single phase AC 220V (50/60 Hz)
▶ Injection Signal Input Power Supply	DC 24V, AC 110V, AC 220V (Free Voltage)
▶ Solenoid Valve Voltage	DC 24V, AC 110V, AC 220V
▶ Operating Temperature Range	-10°C ~ +50°C
▶ PCB Structure 1. Power PCB	Timer power
2. MAIN PCB	MPU out signal input.out injection
3. DISPLAY	Switch signal input, condition display

3. Control Panel Layout Sequence Injection Timer SIT-500



1. SIGNAL LED	If injection signal is entered, lamp is turned on.
2. OPEN LED	If gate is opened, lamp is turned on. When it is manually operated in ⑨, lamp is also turned on.
3. DEL	The time until gate is started to be opened after receiving injection signal. Mode A and mode B operate in the same way.(Basic setting value : 3 seconds)
4. OPEN	The time when gate is being opened. Counting continues in mode A until injection signal ends. Gate opens only during setting time in mode B. (Basic setting value : 3 seconds)
5. DEL SET Key	A key to set gate opening time after injection signal. This is used by being pressed simultaneously with key ⑥ or key ⑧. ("SAVE" is displayed 5 seconds after setting, and then setting value is saved. If signal is turned on before "SAVE" display, it operates with the changed value, and if AC input power is turned off and then turned on, setting value is not saved.)
6. UP KEY	A key to set up time by pressing DEL or OPEN SET Key simultaneously.
7. OPEN SET Key	A key to set the time when gate is being opened. This is used by pressing key ⑥ or key ⑧ simultaneously. (Save function is the same as DEL SET key.)
8. DOWN KEY	A key to turn down time setting by pressing DEL or OPEN SET key simultaneously.
9. MANU Key	A key to be operated when opening gate manually. Gate is opened only when key is being pressed.
10. MODE A LED	Lamp is turned on when it is set as A type. (Refer to mode setting method)
11. MODE B LED	Lamp is turned on when it is being set as B type. (Refer to mode setting method)
12. Lamp is turned on when gate is opened manually.	
13. Module Handle	
14. Power switch (On / Off)	
15. Module Securing Screw.	

4. Function

1) Operation after power is connected

1) When the power is initially connected, the system conducts self-diagnosis and the segment number starts count from 1 to 9 at an interval of 0.3 seconds.
2) LED blinks from LE1 to LE5 in sequence.
3) After the 1st self-diagnosis, the memory status is indicated.

2) Mode and time unit setting

1) Press MANU & OPEN SET switches simultaneously and connect power to convert to mode setting.
   ① "Set" starts blinking in the delay time display segment 'SET.
   ② Time set time unit saved in the open time display segment starts blinking (1, 0.1, 0.01 aligned to the right side)
2) Press MANU and the MODE display LED indicates the selected mode by blinking (MODE A, B)
3) Press >>(UP) and the open time display segment moves UP (0.01=>0.1, 0.1=>1)
4) Press <<(DOWN) and the OPEN TIME display SEGMENT moves DOWN (1=>0.1, 0.1=>0.01)
5) Setting is completed if there is no more input for 5 seconds.
6) All input/output function is suspended during the time of setting.
7) TIME setting not executed

3) Time setting(No blinking)

1) DELAY time adjustment
   ① Setting Delay time through the use of the DEL SET & >>(UP) , DEL SET & <<(DOWN) switches.
   ② All MODE A, B can be set
   ③ Setting range
   ④ If there is no adjustment key-in for 5 seconds "Save" is displayed and setting is completed
   ⑤ Display time functions first when the injection signal is entered during the set time. (The system functions even during adjustment)
   ⑥ If MANU is pressed during the period of setting, system operates manually. (Will not function during the period of adjustment)
   ⑦ If the adjustment key remains pressed, data can be entered continuously.
   ⑧ When data are saved from 1 Sec setting to the 999 Sec, 0.1 Sec setting is displayed as 99.9 Sec and 0.01 Sec setting as 9.99 Sec. (Even the saved time is changed according to the multiple of the time setting.)

	1 Sec Setting	0.1 Sec Setting	0.01 Sec Setting
Setting Range	0--999 Sec	0--99.9 Sec	0--9.99 Sec

2) Adjusting OPEN time
   ① Setting OPEN time through the use of the OPEN SET & >>(UP) , OPEN SET & <<(DOWN) switches.

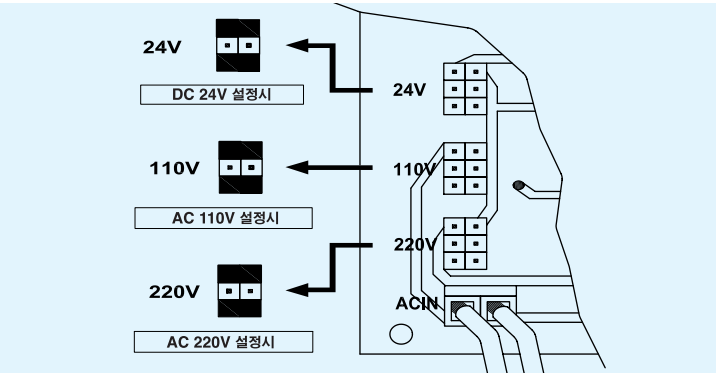
② Only MODE B can be set.

③ DELAY time adjustment item : ③--⑧same

3) Setting output voltage

Remove the rear side of the Timer Case (Remove M4 bolt).

Select the desired voltage from C 24V, AC 110V and AC220V, and insert the 2 jumpers into the top and bottom for the selected voltage on of the PCB attached to the rear side of the separate case. (Refer to the following figure). Match the selected voltage with the Solenoid Valve voltage specifications (Basic Setting AC 220V)

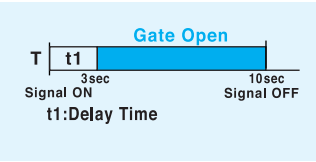


5. Mode Specification

YUDO Sequence Injection Timer (SIT-500) may be set in two modes.

The opening/closing operation of the gate differs according to the setting mode as illustrated below.

1) MODE A

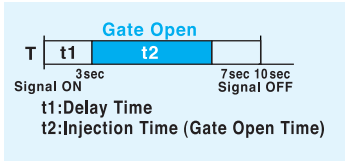


Selecting mode A - After the injection signal has been received, the gate remains Closed during the DEL time (t1). After the DEL time has elapsed, the gate Opens and remains open until the end of the injection signal.

Ex) Injection time:10 seconds DEL Time (t1):3 second setting

Operation:Gate opens 3 seconds after receiving the injection signal, and remains open for 7 seconds, and then closes.

2) MODE B



Selecting mode B - After the injection signal has been received, the gate remains Closed during the DEL time (t1). After the DEL time has elapsed, the gate Opens for the OPEN time setting (t2).

After the OPEN time has elapsed, the gate closes and remains closed.

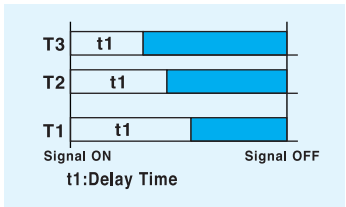
Ex) Injection time:10 seconds DEL Time:3 second setting

OPEN time:4 second setting

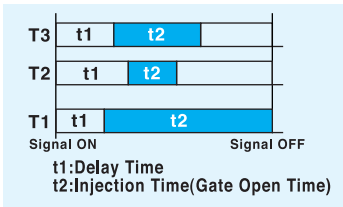
Operation:Gate opens 3 seconds after receiving the injection signal, and remains in the open condition for 4 seconds, and then closes.

3) Gate Opening by Mode Type Selection.

It is possible to set various conditions by selecting the DEL and OPEN timer settings as below.



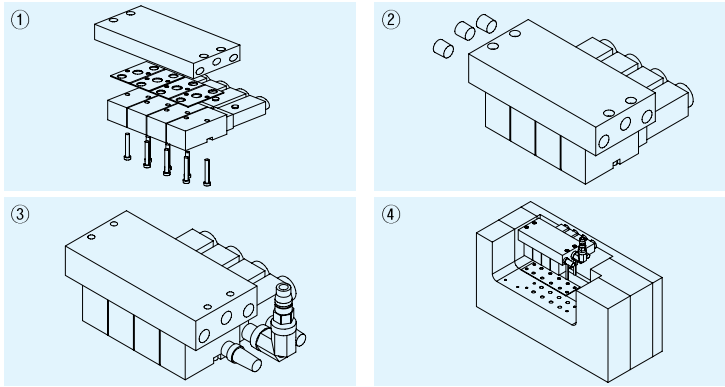
A MODE



B MODE

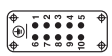
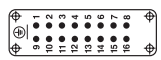
6. Assembly Sequence

1) Assembling the Solenoid Valve Block

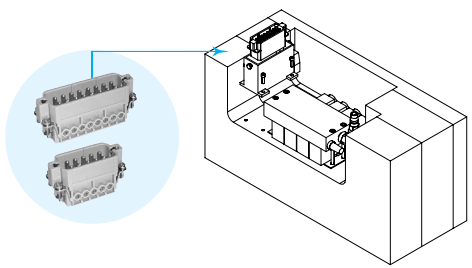


① **Assemble the solenoid valves, seal and air manifold using the M4*35 screws.**
② **Install the Blanking Plugs in the air manifold.**
③ **Assemble the Air Supply connector and silencer in air manifold.**
④ **Assemble the Solenoid Valve Block Assembly to the mould using the M5*70 flat head cap screws, Ensuring that the sealing gasket is correctly fitted. Connect the Solenoid Valve magnet power cable to a 10P or 16P rectangular connector as indicated below.**

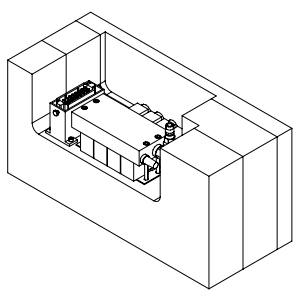
Connection sequence

Connector pin no	Sol Valve No	Connector specification	
		HAN 10A (250V 16A) MALE P/N:09 20 010 2612 FEMALE P/N:09 20 010 2812	HAN 16A (250V 16A) MALE P/N:09 20 016 2612 FEMALE P/N:09 20 016 2812
1, 2	No. 1 Sol		
3, 4	No. 2 Sol		
5, 6	No. 3 Sol		
7, 8	No. 4 Sol		
9, 10	No. 5 Sol		
11, 12	No. 6 Sol		
13, 14	No. 7 Sol		
15, 16	No. 8 Sol		

⑤ **Assemble the connected rectangular connector to mold using M4*12 bolt.**

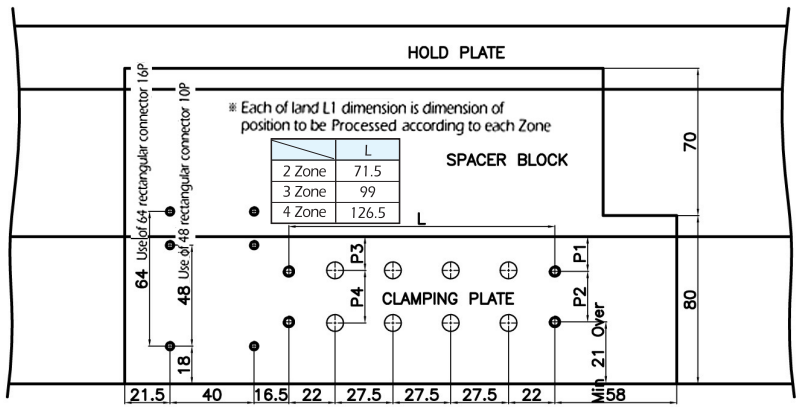


⑥ **The final assembled equipment is illustrated below.**

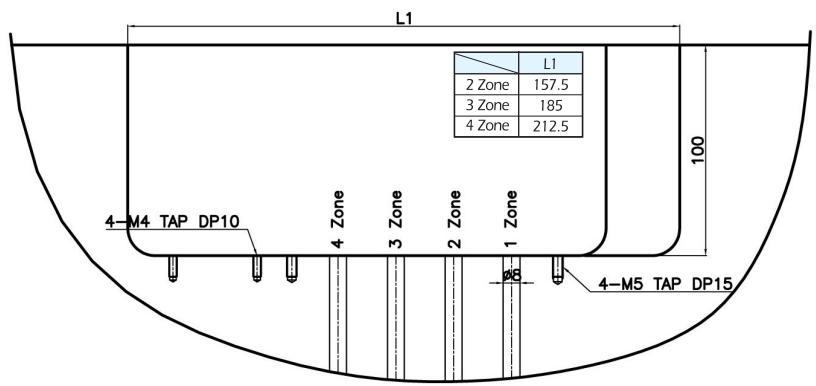


7. Mould Machining

Machine the mould by referring to the drawing issued for the YUDO Sequence Timer System.
It is recommended that the equipment is installed on the upper surface of mould, opposite the operator position.
Machine the clamping plate, spacer block, and hold plate at the selected solenoid valve position on the mould to the details illustrated below.



Cylinder Model	P1	P2	P3	P4	Cylinder Model	P1	P2	P3	P4
VC5504N	19	24	21	22	VC58G	19	24	21	22
VC6506N	20	24	21	24.5	VC68G	20	24	21	24.5
VC8510N	25.5	24	26	25	VC78G	25.5	24	26	25



8. Valve Sequence Timer and Equipment