



# GV24 Modular Sequential Control System User Guide



## Precautions

**WARNING**

Use of this equipment in a manner not specified by the manufacturer may impair protection provided by the equipment.

In addition to presenting a potential fire hazard, high voltage and high temperature can damage equipment and cause severe injury or death. When installing or using this instrument, follow all instructions carefully and use approved safety controls.



Hazardous potentials exist on components inside the controller. Always disconnect AC power to the mainframe when servicing the controller.

Because these controllers or associated equipment may not always fail safe, an approved safety control should be used for safe operation.

Turn off power to the controller before cleaning the exterior of the controller.

Failure to observe these precautions can result in exposure to a potentially lethal shock hazard.

All wiring should be done by an experienced technician. The controller and wiring should be installed in accordance with national and local electrical codes. To avoid serious personal injury and damage to equipment, follow all warnings and cautions provided in the hardware setup instructions.

**CAUTION**

If a controller shows signs of having been damaged during shipping, do not power up or install the controller. Save all packing materials and report any damage to the carrier immediately.

Do not locate this instrument where it may be subjected to excessive shock, vibration, dirt, moisture, oil, or other liquids.

This is a Class A product. In domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.



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## 1.1 Uses

The Sequential Controller GV24 provides a means of controlling the mould filling sequence when using Valve Gate Hot Runner Systems.

GV24 enables the Valve Gates of a Hot Runner System to be individually controlled to provide the following benefits.

### 1.1.1 Removal or Positioning of Weld Lines

Quality of the moulded part can be improved by removing or repositioning weld lines or visual surfaces or sections where a weld line would cause a weakness.

### 1.1.2 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.

### 1.1.3 Reduction of Clamping Force

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

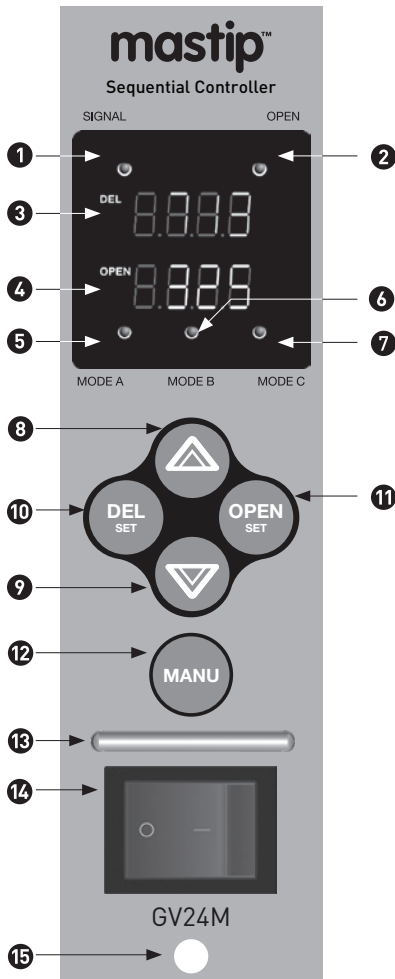
### 1.1.4 Reduction of Flow Marks

Flow marks are minimised by being able to raise the injection rate of the gate.

## 2.0 Power Supply

Mains Power Supply (Timer case)		Single phase AC 220V (50/60 Hz)
Injection Signal Input Power Supply		24VDC, 110VAC, 220VAC
Solenoid Valve Voltage		24VDC, 110VAC, 220VAC
Operating Temperature Range		-10 °C - 50 °C
PCB Structure	POWER PCB	Timer power
	Main PCB	MPU out signal input/out injection
	Display	Switch signal input, condition display

## 3.0 Control Panel Layout







- 1 **SIGNAL LED** – If injection signal is entered, LED is turned on.
- 2 **OPEN LED** – If gate is opened, LED is turned on. When it is manually operated in 12, LED is also turned on.
- 3 **DEL** – The time from when the gate is opened after receiving injection signal. Mode A, Mode B and Mode C operate in the same way. (Default: 3 seconds)
- 4 **OPEN** – The time when the gate is being opened. Counting continues in Mode A until the injection signal ends. Gate opens only during setting time in Mode B. (Default: 3 seconds)
- 5 **MODE A LED** – LED is turned on when it is set as A type. (Refer to mode setting method)
- 6 **MODE B LED** – LED is turned on when it is set as B type. (Refer to mode setting method)
- 7 **MODE C LED** – LED is turned on when it is set as C type. (Refer to mode setting method)
- 8 **UP** – Set up time by pressing DEL SET key or OPEN SET key.
- 9 **DOWN** – Turn down time setting by pressing OPEN SET key or OPEN SET key.
- 10 **DEL SET** – Set gate closed time after injection signal. Setting Delay Time by pressing UP key or DOWN key . (Setting value will be saved 3 seconds after setting. If signal is turned on before saving setting value, it operates with the previous value not changed value. If you turn off and on AC input power during setting, the setting value is not saved).
- 11 **OPEN SET** – Set the time when gate is being opened by pressing UP key or DOWN key . (Save function is the same as DEL SET key).
- 12 **MANU** – Operate when opening gate manually. Gate is opened only when key is being pressed.
- 13 **Unit Handle**
- 14 **Power Switch**
- 15 **Module Securing Screw**

## 4.1 Functions

### 4.1.1 Operations after power is selected




- 1) When the power is initially connected, the system conducts self-diagnosis.
- 2) After the first self-diagnosis, the memory status is indicated.

## 4.2 Mode and Time Unit Setting


- 1) Convert the MODE setting, if you input power supply by pressing  MANU +  UP key simultaneously.
  - a) "SET" is displayed in the DELAY time screen.
  - b) Saved unit of the setting time starts blinking in the OPEN time screen. (999, 99.9, 9.99)
- 2) Press  UP key and MODE display LED indicates the selected mode by blinking. (MODE A, B, C)
- 3) Press  DOWN key and the OPEN time screen moves DOWN.
- 4) Setting is completed when there are no more adjustments to the key-in process for 3 seconds.

## 4.3 Time Setting (No blinking)

### 4.3.1 Adjusting DELAY time:




- 1) You can set DELAY time by pressing  UP key or  DOWN key within 3 seconds after pressing  DEL SET key.
- 2) All MODE A, B, C can be set.
- 3) Setting range (DELAY time)

	1 second setting	0.1 seconds setting	0.01 seconds setting
Setting range	0 - 999 seconds	0 - 99.9 seconds	0 - 9.99 seconds


- 4) If there are no adjustments to the key-in process for 3 seconds, the setting is completed.
- 5) If INJECTION SIGNAL is input during setting time, it operates with values before the setting. (The system functions even during adjustment)
- 6) If  MANU is pressed during the period of setting, system operates manually. (It will not function during the period of adjustment)
- 7) If the adjustment key remains pressed, data can be entered continuously.
- 8) When data is saved from 1 second setting to the 999 seconds, 0.1 seconds setting is displayed as 99.9 seconds and 0.01 seconds setting as 9.99 seconds. (Even the saved time is changed according to the multiple of the time setting).



## 4.3.2 Adjusting OPEN time:

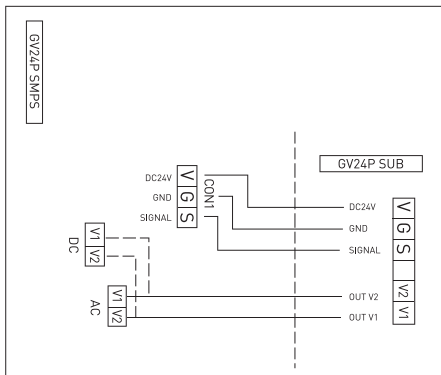
- 1) You can set OPEN time by pressing  UP key or  DOWN key within 3 seconds after pressing  OPEN SET key.
- 2) Only MODE B, C can be set.
- 3) Setting range (OPEN time)

	1 second setting	0.1 second setting	0.01 second setting
MODE B	0 - 999 seconds	0 - 99.9 seconds	0 - 9.99 seconds
MODE C	0 - 999 seconds	0 - 99.9 seconds	0 - 99.9 seconds

- 4) If there are no adjustments to the key-in process for 3 seconds, the setting is completed.
- 5) If INJECTION SIGNAL is input during setting time, it operates with values before the setting. (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 is saved from 1 second setting to the 999 seconds, 0.1 seconds setting is displayed as 99.9 seconds and 0.01 seconds setting as 9.99 seconds.
- 9) To set DELAY time is available in MODE C (Delay Sequence)

## 4.4 Setting Output Voltage

- 1) Remove the power module.
- 2) Insert the OUT\_V1, OUT\_V2 cables of the PCB into desired voltage DC 24V. (Refer to the following figure).
- 3) Match the selected voltage with the Solenoid Valve voltage specifications. (Default setting : DC 24V)





### 5.4 Mode C (Delay Sequence)

Selecting Mode C - After the injection signal has been received, the nozzle gate remains closed for the duration of the delay time. Opening of the nozzle gate can then be initiated and held beyond the end of the injection signal.

#### Timer Programming

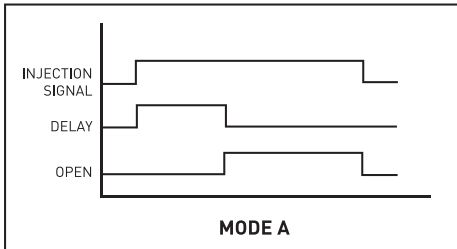
- Increment 0.1 seconds
- Range 0 seconds to 99.9 seconds

MODE C	
S1	ON OFF
T1	DEL OPEN
T2	DEL OPEN
T3	DEL -OPEN

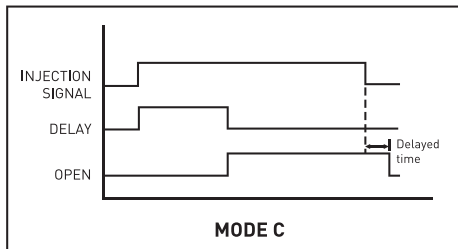
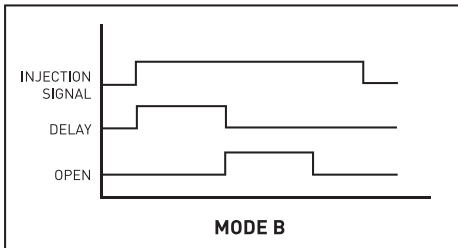
Signal ON                      Signal OFF

S1 : Signal Injection  
 T1 : Timer 1  
 T2 : Timer 2  
 T3 : Timer 3  
 DEL : Delay time  
 OPEN : Injection time  
       (Gate open time)

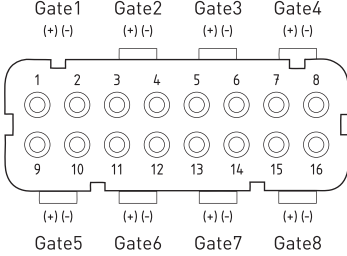
### 5.5 Gate Opening by Mode Type Selection



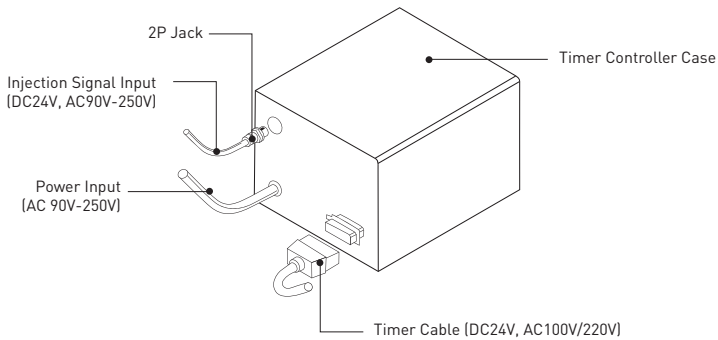
It is possible to set various conditions by selecting the DEL and OPEN timer setting as below.



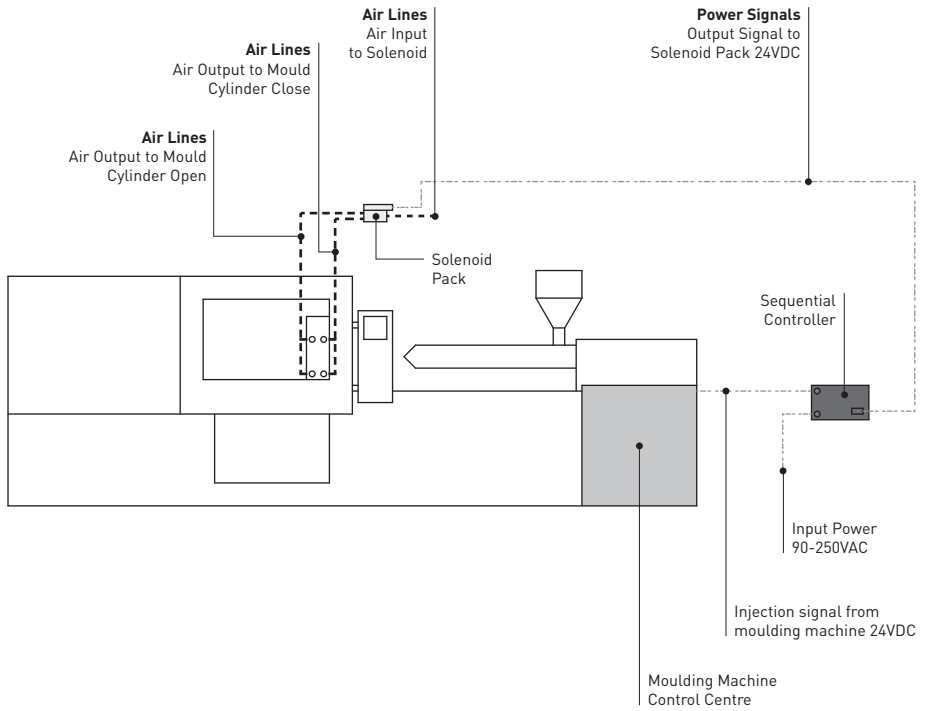
6.1 Wiring Connectors

Connector Pin No.		Solenoid Valve No.	Gate Output Connection
+	-		
1 (Black)	2 (Black+Stripe)	No. 1 Solenoid	HAN 16A (250V 16A) MALE P/N:09 20 016 2612 FEMALE P/N:09 20 016 2812  
3 (Brown)	4 (Brown+Stripe)	No. 2 Solenoid	
5 (Red)	6 (Red+Stripe)	No. 3 Solenoid	
7 (Orange)	8 (Orange+Stripe)	No. 4 Solenoid	
9 (Yellow)	10 (Yellow+Stripe)	No. 5 Solenoid	
11 (Green)	12 (Green+Stripe)	No. 6 Solenoid	
13 (Blue)	14 (Blue+Stripe)	No. 7 Solenoid	
15 (Purple)	16 (Purple+Stripe)	No. 8 Solenoid	

7.0 Composition



8.0 General Schematic









**Mastip Head Office New Zealand**

**Physical Address**

558 Rosebank Road, Avondale  
Auckland 1026, New Zealand

**Postal Address**

PO Box 90651, Victoria St West  
Auckland 1142, New Zealand

Phone: +64 9 970 2100

Email: [mastip@mastip.com](mailto:mastip@mastip.com)

Mastip Regional Office Europe

Phone: +33 0 809 400 076

Email: [europe@mastip.com](mailto:europe@mastip.com)

**Mastip Regional Office North America**

Phone: +1 262 644 9400

Email: [northamerica@mastip.com](mailto:northamerica@mastip.com)

**Mastip Regional Office China**

Email: [china@mastip.com](mailto:china@mastip.com)

For a full list of Distributors,  
please visit [www.mastip.com](http://www.mastip.com)