

MFC-ST3N Controller

一、 Environmental conditions

Setting place : Interior 、 Ambient temperature : 0°C ~ 40°C 、 Humidity : 10 ~ 90%RH

二、 Specification (Applicable for software version v6.01 and hardware version 12-041F2-1):

	Item	Description
Output	Maximum output current	3A(Ampere) / Fuse 3A
	Output Voltage Setting Range	1.0% ~125.0%
	Output Cycle Number Range	45.0Hz ~ 400.0Hz
	Sensor Power	DC 24V, 80mA
	Control	PWM Control
Input	Input Voltage	AC110V/220V±10% Single-phase
	Frequency	50~60Hz
Display	Input Voltage	Display input voltage when turn on
	Setting Parameter	Set value is displayed on the seven-segment display
	Parameter on Setting	Parameter Selection LED flash
	Error Display	Refer to 三-6. Protection function (Error message)
	Run	“RUN”LED light

三、 MFC-ST3N Panel operation descriptions

1. KEY

V/F : Voltage/Frequency switching. When pressing the corresponding LED

and start to flash, accept the setting, setting time is around 8 sec.

V : 1.0%~125% (Over voltage must be set to Maximum 125),
minimum increase or decrease 0.1%.

F : 45.0~400.0Hz, minimum increase or decrease 0.1Hz.

Fn : Other parameter adjustment. Press Fn KEY Will display the current
parameter settings in turn and can be set.

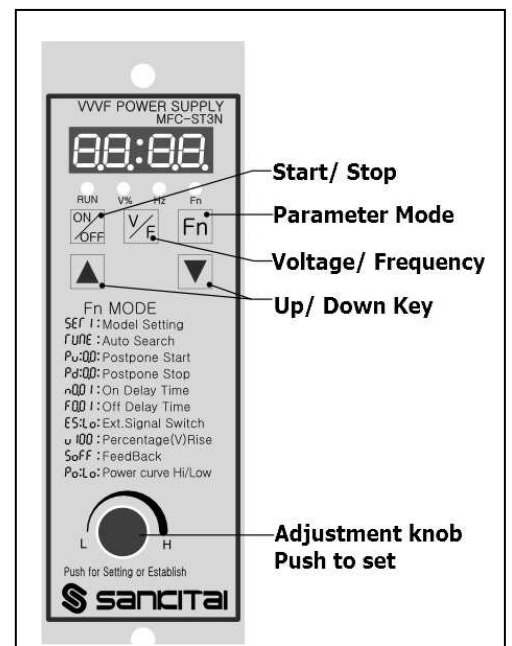
ON/ OFF : Forced start/ Forced stop.

▲ : Increase parameter value : Long press KEY to increase quickly.

▼ : Decrease parameter value : Long press KEY to decrease quickly.

Adjustment knob- Right rotation : In the settable state, the value is increased
by one unit by one turn. If you turn right quickly, will be quickly increased.

Adjustment knob- Left rotation : In the settable state, the value is increased
by one unit by one turn. If you turn left quickly, will be quickly increased.



Adjustment knob-Press : Can start or end the setting.

After the parameter is set, it will automatically return to the display voltage value.

2. Fn- Parameter setting

- A. Change the working group by panel change or external hardware, and display the frequency value after the change.

(External selection connection terminal -J12, refer to 4. Group switching)

Indicated Value	SEF1	SEF2	SEF3	SEF4
Description	Memory parameter -1	Memory parameter -2	Memory parameter -3	Memory parameter -4

- B. "FURE" (Automatic frequency search) : Need to use G-Sensor to perform resonance point search. (G-Sensor is optional) When the "Fn-LED" is flashing, press the adjustment knob and start it in the no-operation state, the search frequency will be counted from 400 to 45Hz. If you want to stop searching during the search, you can directly press the "ON/OFF" key to stop. Note: If no optimal resonance point is found, the frequency will display the frequency value of the maximum current during the search process. (When there is no G-Sensor, you can observe the bowl running and manually find the resonance frequency, which is analyzed by 1Hz.)
- C. "Pu:0.1" (Slow start) : 0 ~ 3.0s, increase or decrease resolution is 0.1 sec.
- D. "Pd:0.1" (Slow stop) : 0 ~ 3.0s, increase or decrease resolution is 0.1 sec.
- E. "n0.01" (on dly) (will go slow stop) : 0.01~9.99s. Shortly press increase or decrease 0.01sec, long press increase or decrease 0.01sec.
- F. "F0.01" (off dly) (will go slow start) : 0.01~9.99s. Shortly press increase or decrease 0.01sec, long press increase or decrease 0.01sec.
- G. "ES:H" or "ES:L" (Select START signal to activate polarity.)
- H. "u125" (Over Voltage) : From 50 to 125, the unit for each increase or decrease is 5, limit the voltage output maximum or increase the voltage output maximum.
- I. Son1~4 : Start the feedback function, reaction time Son1 > Son2 > Son3 > Son4. (Operate with J8 GSen)

Indicated Value	SoFF	Son1	Son2	Son3	Son4
Description	No compensation function	Compensation speed -maximum	Compensation speed - fast	Compensation speed -medium	Compensation speed - slow

Note: If the "Hd" function is "on", this function cannot be started. In order to enable this function, the "Hd" function must be set to "oFF" status and the setting can be made.

- J. "Gd:on" or "Gd:oF" : G-Sensor amplitude reference value.(Operate with J8 GSen)

Note: 1. When the Feedback function is set to "SoFF", the G-Sensor amplitude reference value is fixedly displayed as "L xxx", for example: "L 104".

Note: 2. When the Feedback function is set to not-"SoFF", the G-Sensor amplitude reference value will be displayed as "H xxx" or "L xxx" according to the current program compensation level, for example: "H 171" or "L 104".

(The display H represents large-scale compensation, and the display L represents small-scale compensation.)

K. "Po:Hi" or "Po:Lo" : Voltage output high / low selection.

L. "Hd:on" or "Hd:off" : Intermittent start function.

When set to "on", "Hd" option of "on:0.3", "off:0.3" is made sense for on/off time setting.

Note: If the "Feedback" option is not "SoFF", this function cannot be started. In order to enable this function, the "Feedback" option must be set to "SoFF" and the setting can be made.

3. External voltage control (J4):

A. If the external voltage control connector (J4) detects a voltage over than 0.7V, activate external voltage control. At this point, the output voltage can only be controlled by an external voltage and changes with voltage.

B. The voltage value will not be written into the memory during external control.

C. If the external voltage control is activated, the feedback cannot be controlled.

D. " ° XXX " is displayed during external voltage control, for example: " 125 " it represents the current voltage output is 125%.

E. Calculation formula : $V_{out}=306V_i-230$, $0.8v < V_i < 5.0v$ or $V_{out}=1\%(\text{Minimum})$, $0.7v < V_i \leq 0.8v$

For example: When the external voltage control connector (J4) is input 2.0V, the voltage control is around 38.2%.

For example: When the external voltage control connector (J4) inputs 4.8V, the voltage control is around 123.8%, but whether it is output to 123.8% is regarded as the current over voltage setting value.

F. External variable resistance regulation : 5K~15K ohms. (10K ohm is recommended)

Variable resistor three-terminal insert to J4 (+5, S, RG).

G. If controlled by DC voltage, input power to J4-S (pin2), G (pin4) both ends (+0.7 ~ +5.0V).

H. When the external resistor is removed or the external input voltage is less than 0.7V, it will return to the panel button control mode.

4. Group switching

A. Panel setting

When pressing Fn key to **SEFn** (n:1~4), you can select the group (1~4). You can switch the working group and load new parameters by pressing the adjustment knob or waiting for the setting time to end. °

B. Hardware setting(J12)

Pin1 (+5) and pin2 (1) short circuit (> 150ms) is set. First group (SET1) - preset value.

Pin1 (+5) and pin3 (2) short circuit (> 150ms) is set. Second group (SET2).

Pin1 (+5) and pin4 (3) short circuit (> 150ms) is set. Third group (SET3).

Pin1(+5) and pin5 (4) short circuit (>150ms) is set. Fourth group (SET4).

C. When powering on, it will give priority to determine whether there is external group setting. If there is, it will have higher priority with external control (that is, when the external hardware has group setting, the software cannot change the working group).

D. The current working group can press Fn key to **SEFn** (n:1~4) to display °

5. Feedback function (J8 terminal)

- A. Start the feedback control after starting and performing the slow start 10 sec.
- B. The compensation parameters are Son1 (fast compensation speed) ~ Son4 (slow compensation speed).
- C. The maximum compensation value is 87% of the current working voltage setting and does not exceed the over voltage value. The minimum will drop to 1%.
- D. The voltage, frequency, and feedback parameters will be changed, and the status will be re-determined. After 10 sec, the feedback control will be executed.
- E. After the Feedback function starts successfully, if it stops running and restarts, it will enter the compensation control.
- F. In Power ON, if the feedback function is executed before the shutdown, the previous compensation speed will be executed after the power is turned on.
- G. Feedback control cannot be performed during external voltage control.
- H. Feedback function display (the decimal point display status on the far right of the seven-segment display)
<Light off> : No feedback function <Flash> : Record status (10 sec) <Light> : Feedback operating

6. Protection function (Error message)

- A. Replaceable 3A - FUSE on the PCB.
- B. Input voltage selection setting (J10 - Jumper), set 110V or 220V input voltage.
When set to 110V system, if the input voltage is 220V, turn on will display the error message “**R C : H I**”, at this time, the panel 4 LEDs flash and all functions cannot be operated.
- C. When the temperature detection line is disconnected, the error code “**R F C . B**” is displayed, at this time, the panel 4 LEDs flash and all functions cannot be operated.
- D. When the temperature is over temperature (85 °C), the error code “**R F C . H**” is displayed, at this time, the panel 4 LEDs flash and all functions cannot be operated.
- E. Overcurrent protection - When overcurrent, error code “**L d : H I**” is displayed, at this time, the panel 4 LEDs flash and all functions cannot be operated.

※When the protection function is activated, you need to turn off the power to troubleshoot and then restart the power.

7. Simple mode or full function mode

Press” ▲ “ up key for **5** sec when display ” **F n** ” and simultaneously press ” Fn ” key to switch operation mode.

When switching to full function mode, the display shows “**F S E F**” for around 1 sec and all parameters can be set.

When switching to simple mode, the display shows “**E S E F**” for around 1 sec and **only the output voltage parameter can be set.**

8. External output/ input signal

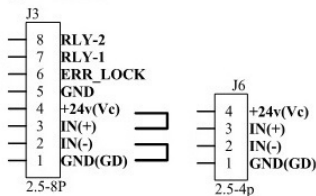
- A. Output voltage (Vc) : DC+24V, maximum current **80mA**.
- B. External control : Operating < Inter lock > Short circuit · Stop < Inter lock > Open circuit, panel display " STOP ".
- C. When the protection function is activated, the “ERROR-OUT” pin will output logic Low (normal is open-collector).

- D. For external voltage control, please refer to wiring diagram, control mode (1) variable resistance regulation.
(2) DC+0.7 ~ +5V voltage regulation.
- E. For the external working group switching, please refer to the wiring diagram.

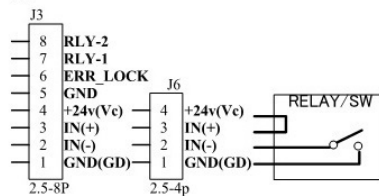
9. External wiring

《 MFC-ST3N Input interface wiring 》

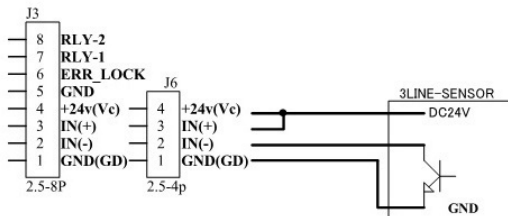
(1) Turn on



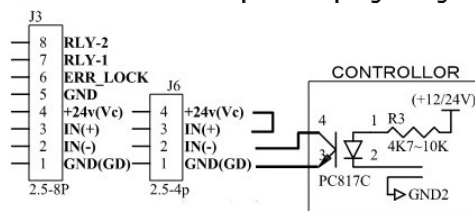
(5) Ground isolation-Dry contact wiring diagram



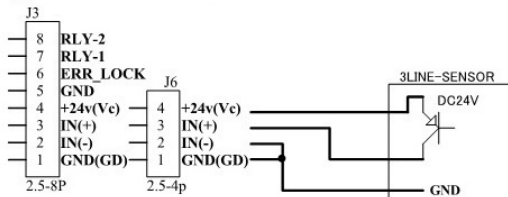
(2) Sensor-NPN type wiring diagram



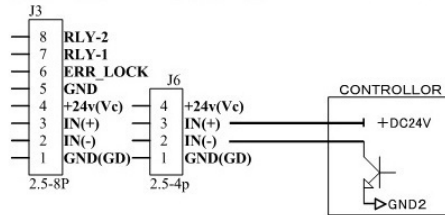
(6) Ground isolation- Optical coupling wiring diagram



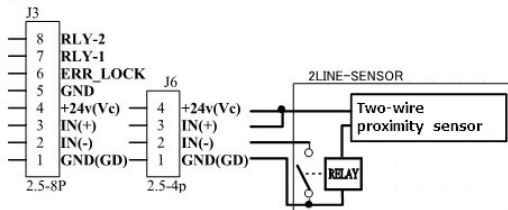
(3) Sensor-PNP type wiring diagram



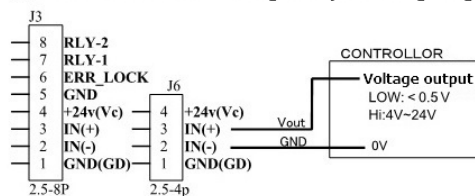
(7) Ground isolation-NPN type wiring diagram



(4) Two-wire proximity sensor wiring diagram

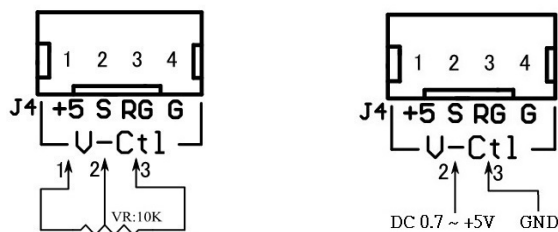


(8) Ground isolation-Voltage output wiring diagram



Remark : J6 +24v (Pin4) and GND (Pin1) are the power supply to the client, and the external power supply must not be connected.

《 External voltage control wiring 》

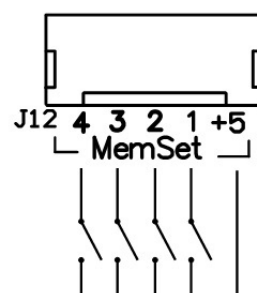


(1) Variable resistance regulation

(2) DC+0.7~+5V voltage regulation

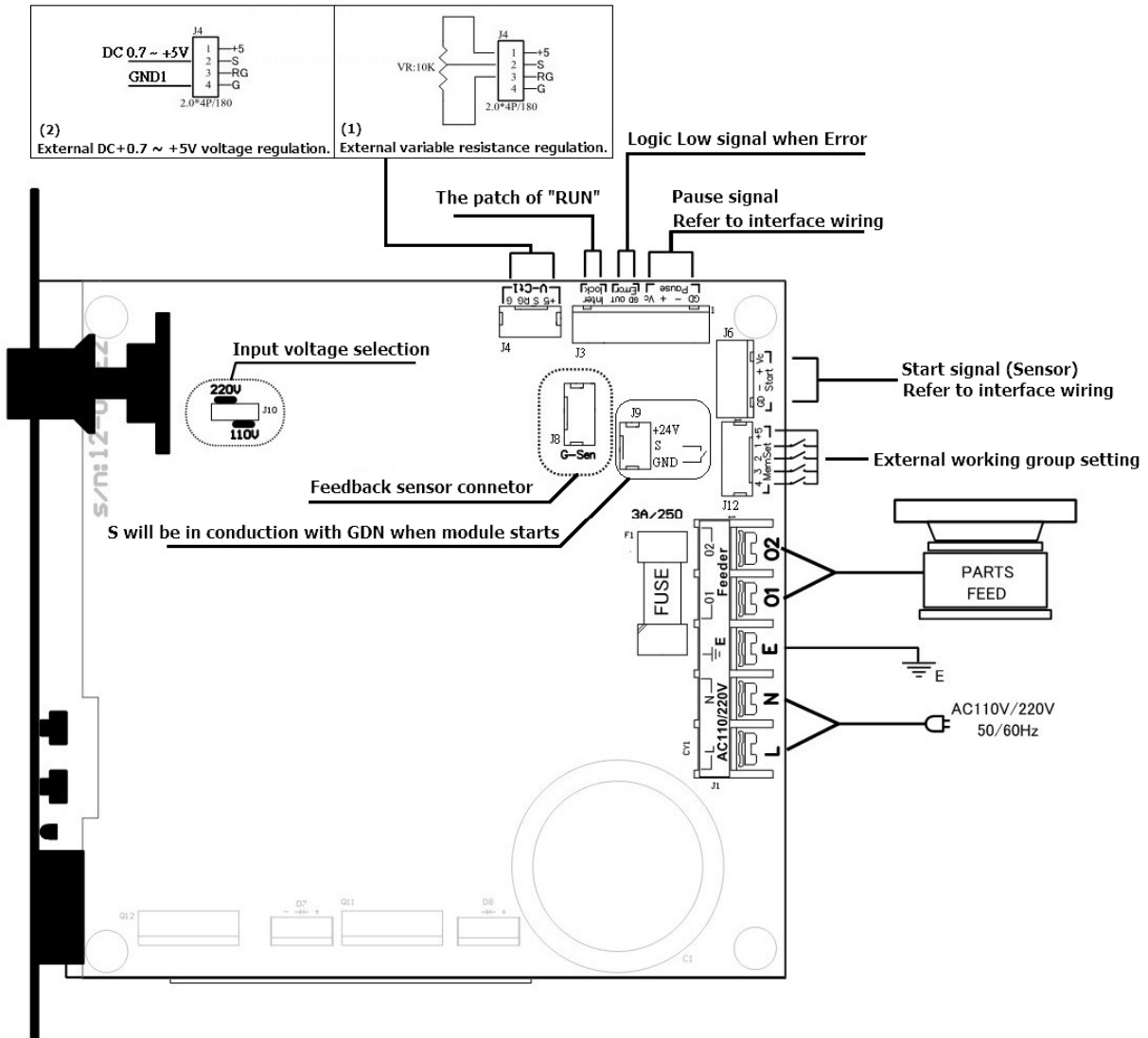
**RG, G internal circuit is short-circuited.
(Can be used for wire grounding)**

《 External working group setting 》

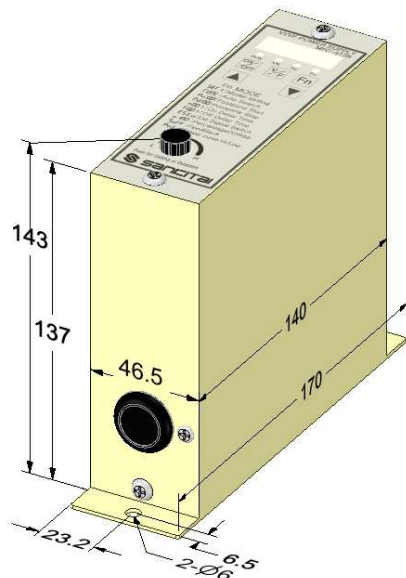


Cannot be in conduction simultaneously

10. MFC-ST3N wiring diagram and each connector location map



11. Dimension (unit: mm)



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