

Digital Flow Rate Indicator & Totalizer MC81

NITTOSEIKO

Taking new steps forward together

SPECIFICATIONS

SSF10451 19.06

Outline

This equipment converts from voltage to frequency (V/F) and indicates momentary flow rate and integrated total flow. And also, it outputs pulse signal synchronized with indicated integrated total flow.

Features

- Available for changing indication of momentary flow rate and integrated total flow by pressing the **[S]** key or by input switch signal.
- Available for output analogue signal, comparative output and also communication function as option.

Specifications

Analogue input Kind	Select from current input or voltage input
● Direct current input	
Input signal	4~20mADC, 0~20mADC
Input resistance	10Ω
● Direct voltage input	
Input signal	1~5VDC, 0~5VDC, 0~10VDC
Input resistance	1MΩ
Flow measurement	
Method	Voltage to Frequency conversion
Sampling Freq.	20ms
Low cut	OFF at 0.01~50.00% of full scale. 0 flow judgment time at OFF setting: Approx. 1sec
Accuracy	±0.2% of full scale ±1 digit (In case of 23°C±5°C Temp. factor: ±150ppm/°C)
Warm-up period	10 min
Flow rate indication	
Display	7 segment red LED 7.9W×14.2H 6 digits Zero suppression
Decimal point	Available for setting the point
Display switch	Switch indication instantaneous flow rate or integrated total flow by pressing [S] key or input switch signal.
Flow rate/ Total volume lump	Red LED 2.8W×1H
Flow rate indication	
Indication up-date cycle	0.1, 0.2, 0.5, 1~10s (STD. Approx. 0.5sec)
Moving average	1~20 times
Fixed indication	OFF, 5, 10, 100
Significant figure	4 digits
Indication unit	/h, /min, /s
Total volume indication	
Initial value	Available for setting the value at reset
Over flow	Stop at 999999 and blink, or start from 0



Reset	Action	One-shot reset
	Manual reset	Reset total value by pressing [M] and [S] button simultaneously while indicating total value
	Remote reset	(resettable indicating both flow rate and total value)
	Kind of signal	no-voltage contact signal or open collector signal
	Signal width	20ms and over
	Voltage/Current	Approx. 12V Approx. 8mA
Input switch signal	Action	Select the action from "Indication switch", "Prohibition" or "Hold"
	Kind of signal	no-voltage contact signal or open collector signal
	Delay time	Approx. 20ms
	Voltage/Current	Approx. 12V / Approx 8mA
	Switch signal input lump	Red LED 1.5φ
Analog output (OPTION)		
	Signal contents	Select from flow rate or total volume
	Output signal	Select from Voltage output or Current output Voltage : 1~5V, 0~5V, 0~10VDC Current : 4~20mADC
	Allowable load resistance	Voltage output : 5kΩ and more Current output : 500Ω or less
	Warm-up period	15min
	Conversion method	select from PWM or DA method
	● PWM method (standard)	
	Resolution	Approx. 1/40000
	Conversion speed	Approx. 500ms (at 0~90%)
	Conversion accuracy	±0.5% of full scale (at 23°C±5°C Temp. factor : ±300ppm/°C)
	● DA method	
	Resolution	Approx. 1/10000 (1/8000 for 1~5VDC and 4~20mADC)
	Conversion speed	Approx. 1ms
	Conversion accuracy	±0.3% of full scale (at 23°C±5°C Temp. factor : ±300ppm/°C)

Pulse output	Signal contents	Unit pulse	Communication contents
	Kind of signal	select from 12V no-contact or open collector	Read-in
	Signal logic	Select from positive or negative	Indication value, Setting value of comparative, Setting value of upper and lower limit for analogue signal, Initial value of integrated total value, Condition of indication, Condition of comparative output, Momentary flow rate, Integrated total flow value.
	Signal width	0.01~2s by parameter setting	Read-out
	Frequency	25Hz or less	Setting value of comparative, setting value of upper and lower limit for analogue signal, Initial value of integrated total value
	●12V no-contact signal output		
	Signal level	H : Approx. 10V (at no load) L : 0.5V or less (at no load)	
	Output resistance	Approx. 1.5kΩ	
	●open collector output		
	Voltage / Current	30V DC / 20mA	
Comparative output (Option)			
Output point	2 points		
Target	Select from flow rate or total volume		
Setting	Setting value is indicated by switching on the 6 digits flow rate indicator		
Output configuration	Select from upper limit or lower limit		
Output performance	Select from one of comparative output, hold output or one-shot output		
Hysteresis	2~9999digit		
Prohibition at power ON	Prohibit output lower limit or output for a while (0.1~99.9) at power ON.		
Response time	Approx. 40ms		
Kind of signal	No-voltage contact		
Contact capacity	250V AC 0.5A / 30V DC 1A (Load resistance)		
Comparative output lamp Red LED 2.8W×1H			
Communication function (Option) (Unavailable for 24DC power for generator)			
Communication STD.	EIA RS-485		
Communication method	2 wire half-duplex		
Synchronization	Asynchronous		
Number of connection	32 equipment include upper computer (host computer)		
Unit No.	00~99		
Communication delay time	Select from 10~500ms (Error 10ms or less)		
Communication speed	1200/ 2400/ 4800/ 9600/ 19.2k/ 38.4kbps		
Transmission code	ASCII code		
Data length	7b bit / 8 bit		
Parity	Odd number / Even number		
Stop bit	1bit / 2 bit		
Transmission control	Reply type / Continuous transmission		
Error check	BCC check sum		

Power failure storage

Type of storage EEPROM

Power source for generator

24V DC ±10% 80mA (STD)
(24V DC power is unavailable in case of communicative function type)

12V DC ±10% 100mA (OPTION)

Insurance resistance

500V DC 100MΩ or more
Between respective terminal block of Input, comparative output, analogue output, communication, and power source.

Withstand voltage

0 V and 2nd 3rd 14th terminal block is common
2,000V AC 1 minute
Test point: Power source terminal 7th and 8th collectively, input terminal 1st 2nd 3rd 4th 5th 6th 14th 15th collectively, and comparative output terminal 9th 16th 17th 18th collectively.

Noise resistance

Square wave noise by noise simulator 1,500 V(Noise width 1μs, Polarity ±, Synchronous application of power source, Phase 0~360°)

Power source

85~264 V AC 50/60Hz (AC power type)

11~48 V DC (Ripple 5% or less) (DC power type)

Power consumption

Approx. 10VA (AC power type)

Approx. 6W (DC power type)

Ambient temperature

0~50°C (Without freezing)

Ambient humidity

45~85% RH (Without dew condensation)

Weight

Approx. 0.3kg

Casing

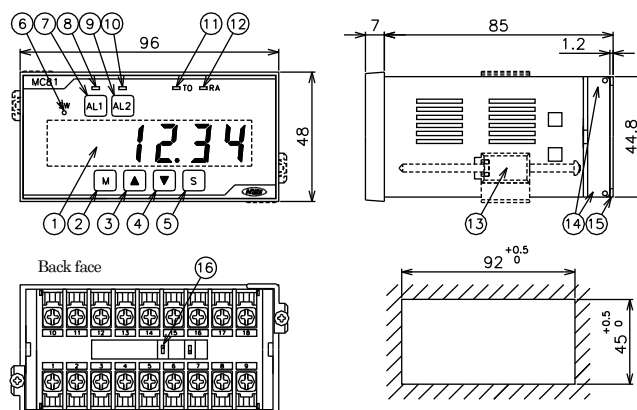
Body: ABS Plastic

Front: ABS Plastic, Acrylic Plastic

Protection structure

IP65 (Front panel)

■ Configuration and panel cut dimension



No.	Name
1	Flow rate display
2	[M] (Mode) key
3	[▲] (Up) key
4	[▼] (Down) key
5	[S] (Set) key
6	Switch input light
7	[AL1] key (For comparative output only)
8	AL1 light (For comparative output only)
9	[AL2] key (For comparative output only)
10	AL2 light (For comparative output only)
11	Integrated total flow light
12	Momentary flow rate light
13	Mounting fixture
14	Terminal block
15	Terminal cover
16	Setting switch (SSW)

■ Operation

■ Power activation

- When power is activated, momentary flow rate or integrated total flow is shown depending on the setting of parameter. In case of integrated total flow, integrated total value which is total value before turning off of power appears.

■ Momentary flow rate

- Converts from voltage to frequency (V/F) and indicates momentary flow rate and integrated total flow.
- It shows flow rate as 0 when the flow rate is lower than the setting value of low cut. It does not add integrated total flow, and does not output pulse signal. In case of setting OFF of low cut function, 0 flow judgment time is approx 1sec.

■ Flow rate indication

- Flow rate display shows momentary flow rate or integrated total flow value. "Switching indication of momentary flow rate and integrated total flow value", "Momentary flow rate only", or "Integrated total flow value only" can be set by parameter setting.
- [S] key or Switch input (required indication change setting) makes display switched momentary flow rate indication and integrated total flow value.
- Momentary flow rate indication is update in each indication frequency. Indication frequency can be set by parameter setting.
- By setting parameter for number of moving average at each indication frequency, response speed will be slow, but flow rate indication will be stabilized.
- Parameter setting as multiply number of 5, 10, or 100 indication makes subordinate digits fixed 5, 0 or 00.
- Pressing [M] key and [S] key at same time reset integrated total value when indicating integrated total value. Remote reset signal input can reset integrated total flow value when indicating both momentary flow rate and integrated total flow value.
- When integrated total value is overflow, available for select by parameter setting from "blinking indication 999999" or "counting from 0 again".

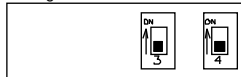
■ Switch input

- By parameter setting, Indication change, Prohibition, or hold operation is selected.
- In case of using as indication switch, ON indicates integrated total flow value, and OFF indicates momentary flow rate.
- In case of using as prohibition, ON makes same operation as without analog signal.
- In case of using hold operation, ON makes indication holding.

■ Pulse output

- Output unit pulse signal synchronized with indicated integrated total value.
- It can select from which digits unit pulse output by parameter setting.
- Kind of signal and signal logic are selected by switch setting.
- Signal width is set by parameter setting
- Switch setting

Setting Switch SSW



SSW	3	4
ON/OFF	Kind	Logic
ON (UP)	12V No-contact	Negative
OFF(DOWN)	Open collector	Positive

■ Analog output (Option)

- Analog signal output can be select from among 4~20mA DC, 1~5V DC, 0~5V DC, or 0~10V DC.
- Output momentary flow rate or output integrated total flow value is set by parameter setting.
- Update momentary flow rate at each sampling period or update synchronized with momentary flow rate is selected by parameter setting.
- PWM method equipment or DA method equipment should be selected. DA method can respond with high-speed.

■ Comparative output (Option)

- Comparison target is selected by parameter setting from momentary or integrated total flow.
- Upper limit operation or lower limit operation is selected by parameter setting.
- Continuous comparative operation, hold operation (for momentary flow rate only), or one-shot operation is selected by parameter setting.
- Hysteresis of momentary flow rate, prohibition of lower limit operation of momentary flow rate at power ON, and output delay are available.
- Hold operation awakes by reset.

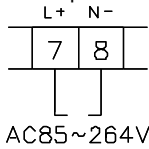
■ Terminal arrangement

No.	Signal name	
1	A. IN Analog input	
2	0V	
3	0V	
4	+24V (+12V)	
5	RESET Reset input	
6	SW Switch input	
7	L+	Power 85~264 V AC 11~48 V DC
8	N-	
9	AL2-O	
10	A-	Analogue signal output (Option)
11	A+	
12	T/R (A) (-)	Communication RS-485 (Option)
13	T/R (B) (+)	
14	0V	Pulse output
15	P.OUT	
16	AL1-C	
17	AL1-O	
18	AL2-C	

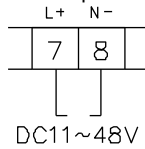
■ Connection

■ Connection of power source

For AC power



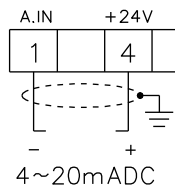
For DC power



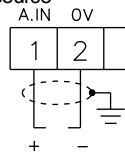
■ Connection of analog signal input
(Use shielded cable)

- Connect with 2 wire type generator

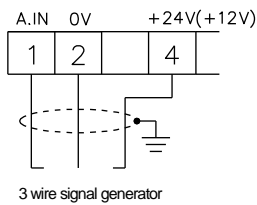
Generator need power source



Generator does not need power source



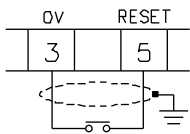
- Connect with 3 wire type generator



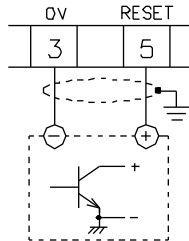
3 wire signal generator

■ Connection of reset signal
(Use shielded cable)

For no-voltage contact signal

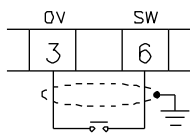


For open collector signal

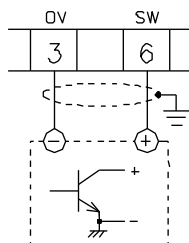


■ Connection of switch signal
(Use shielded cable)

For no-voltage contact signal

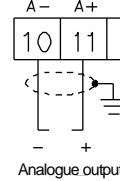


For open collector signal



■ Connection of analogue signal (Option)
(Use shielded cable)

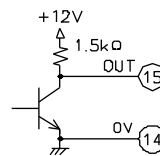
Analogue output



■ Pulse output

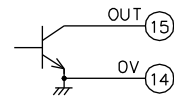
For 12 V no-contact signal

Setting switch SSW3: ON

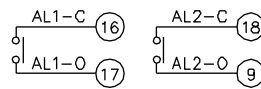


For open collector signal

Setting switch SSW3: OFF

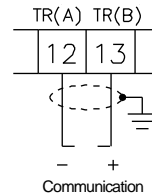


■ Comparative output



■ Connection of communication (Option)
(Use shielded cable)

Communication (RS-485)



Model

MC81 □ - □ □ □ - □ P □ - □ □ □ - □ □ □

Input pulse

1	Direct current signal input
2	Direct voltage signal input

Decimal point of momentary flow rate

1	0.001
2	0.01
3	0.1
4	1

Indication unit of momentary flow rate

1	L/min
2	L/h
3	mL/min
4	m ³ /h

Indication unit of integrated total flow

1	1mL
2	0.01L
3	0.1L
4	1L
5	0.01m ³
6	0.1m ³
7	1m ³

Analogue output (Option)

0	Without
1	4~20 mA DC (PWM type)
2	1~5 V DC (PWM type)
3	0~5 V DC (PWM type)
4	0~10 V DC (PWM type)
5	4~20 mA DC (DA type)
6	1~5 V DC (DA type)
7	0~5 V DC (DA type)
8	0~10 V DC (DA type)

Output pulse unit

0	Divided pulse output
1	1mL
2	0.01L
3	0.1L
4	1L
5	0.01m ³
6	0.1m ³
7	1m ³

Comparative output (Option)

0	Without
1	Comparative output

Communication function (Option)

0	Without
1	RS-485 (24 VDC for pulse generator is unavailable)

Power for pulse generator

1	24V DC (STD) (Communication function is unavailable)
2	12V DC

Power

A	AC power 85~264 V AC
D	DC power 11~48 V DC

▼ The contents given here are subject to change without notice.

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