Flow Rate Indicator with Totalizer MC74 Specification

SSF21251 11.02

■Out line

Periodically operates pulse signals from the flow meter, multiplies that value with the flow meter factor, and numerically indicates momentary flow rate. It outputs unit pulse by scaling unitless pulse, and also it indicates 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 by option.

■Specifications

Pulse input

Kind of signal: Select from among Voltage no-contact signal, Open collector signal, or No-voltage contact signal

●Voltage no-contact input

Frequency	10k Hz or less (ON: OFF ratio 1:1) 1k Hz or less at 1 periodic operation
Signal level	H : 4～30 V L : 0～1.5 V
Input resistance	Approx. 10kΩ

●Open collector input

Frequency	10k Hz or less (ON: OFF ratio 1:1) 1k Hz or less at 1 periodic operation
Voltage & current	Approx. 12 V Approx. 8mA

●No-voltage contact input

Frequency	50 Hz or less (ON: OFF ratio 1:1)
Voltage & current	Approx. 12 V Approx. 8mA

Momentary flow rate measurement

Measuring system	Periodical measurement & operation system
Sampling frequency	10 ms
Number of pulse at 1 cycle	1–20
Forecasting calculation	By detecting speed reduction.
Low cut	0.001-10.000% of full scale

Flow rate indication

Display	7-segments Red LED 7.9W X 14.2H 6-digits, Zero suppresion
Decimal point	Available for changing decimal point
Change of indication	Indication can be changed to momentary flow rate and integrated total flow by pressing [S] key or input switch signal

Momentary flow rate and integrated total flow light.
2.8W X 1H Red LED

Momentary flow rate indication

Indication frequency	0.1, 0.2, 0.5, 1~10 s (Approx. 0.5s is standard)
Moving average	1~20 times
Fixed indication	OFF, 5, 10, 100
Significant digits	4 digits
Indication accuracy	±0.003%±1digit (at 23℃ ±5℃)
Indication unit	/h, /min, /s

Integrated total flow indication

Initial value	Available for setting initial value at reset
Over flow	Stop and blink at 999999 or totalize from 0

Reset

Operation	One-shot reset
Manual reset	Total value will be reset by pressing [M] key and [S] key when indicating integrated total value.

Remote controlled reset:
Total value will be reset when indicating both integrated total value and momentary flow rate.

Kind of signal	No-voltage contact signal or open collector signal
Signal width	20ms or more
Voltage & current	Approx. 12 V Approx. 8m A

Switch input

Operation	Select from among indication change, prohibit or hold operation.
Kind of signal	No-voltage contact signal or open collector signal.
Delay time	Approx. 20ms
Voltage & current	Approx. 12 V Approx. 8m A
Switch input light	Red LED 1.5 ϕ

Analogue output (Option)

Output subject	Select from momentary flow rate or integrated value
Output signal	Select from voltage or current output Voltage: 1～5V,0～5V,0～10V DC Current: 4～20mA DC
Allowable road resistance	Voltage output: 5kΩ or more Current output: 500Ω or less
Worm-up period	15 minutes
Conversion method	Select from PWM or DA method

●PWM method (Standard)

Resolution	Approx. 1/40,000
Conversion speed	Approx. 500ms at 0% to 90%
Conversion accuracy	±0.5% full scale at 23℃ ±5℃ Temp. factor: ±300ppm/℃

●DA method

Resolution	Approx. 1/10,000 In case of 1～5V DC or 4～20mA DC, 1/8,000
Conversion speed	Approx. 1ms
Conversion accuracy	±0.3% full scale at 23℃ ±5℃ Temp. factor: ±150ppm/℃。

Pulse output

Signal contents	Select from divided output or unit pulse output
Kind of signal	Select from 12 V no-contact signal or open collector signal.
Signal logic	Select from high active or low active
Signal width	0.001～2s parameter setting In case of divided pulse output, it is synchronized with input pulse.
Frequency	400 Hz or less at unit pulse output

●12Vno-contact output

Signal level	H: Approx. 10 V at no load L: 0.5 V or less at no load
Output resistance	Approx. 1.5kΩ

●Open collector output

Voltage & current	30 V DC 20mA
Voltage at ON	0.5 V or less

Comparative output (Option)

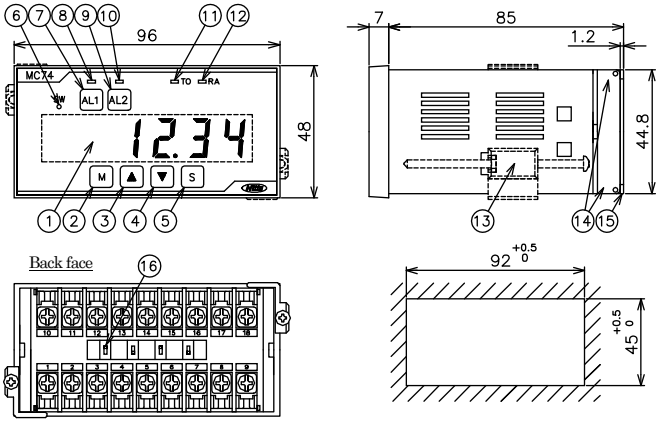
Number of output	2 points
Subject of compare	Select from momentary flow rate or integrated total flow
Setting	Setting value is indicated on 6 digits flow rate display by changing indication
Output configuration	Select from upper limit output or lower limit output
Output operation	Select from among comparative output, output hold, or one-shot output.
Hysteresis	2～9999 digit
Power ON prohibition	Prohibit output of "lower limit" or "during set amount of time (0.1~99.9s)" at power ON
Output response time	Approx. 20ms
Kind of signal	No-voltage contact signal
Contact capacity	250 V AC 0.5A, 30 V DC 1A (Load resistance)
Comparative output light	Red LED 2.8W×1H

Communicative function (Option) *Unavailable in case of 24 V DC power for pulse generator

Communication standard	EIA RS-485 compliant
Communication method	Semi double 2 wire type
Synchronization	Asynchronous
Number of connection	32 equipments include upper computer (host computer)
Unit No.	00~99
Communication delay time	select from among 10~500ms (Error 10ms or less)
Communication speed	1,200/ 2,400/ 4,800/ 9,600/ 19.2k/ 38.4kbps
Transmission code	ASCII code
Data length	7 bit / 8 bit
Parity	Odd number / Even number
Stop bit	1 bit / 2 bit
Transmission control	Reply type/ Continuous transmission
Error check	BCC check sum
Communicative contents	
Read-in	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.
Read-out	Setting value of comparative, setting value of upper and lower limit for analogue signal, Initial value of integrated total value

Power failure storage	Type of storage EEPROM
Power source for generator	12 V DC ±10% 100mA (Standard) 24 V DC ±10% 80mA (Option)
	*24 V DC power is unavailable in case of communicative function type
Insurance resistance	500 V DC 100MΩ or more Between respective terminal block of Input, comparative output, analogue output, communication, and power source. 0 V and 2nd 3rd 14th terminal block is common
Withstand voltage	2,000 V 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 1 μs, 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℃ (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

- Periodically calculate pulse signal from flow meter, multiply flow meter factor to its value, and operate momentary flow rate.
- It is available to reduce momentary flow rate by forecasting calculation at reducing flow rate.
- It shows flow rate as 0 when the flow rate is lower than the setting value of low cut

■ Integrated total flow

- It multiplies flow meter factor to pulse signal from flow meter, and calculates integrated total flow value.

■ 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".

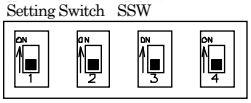
■ Switch input

- 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 pulse signal. However, if divided pulse output is selected, divided pulse output is not prohibited.
- In case of using hold operation, ON makes indication holding.

■ Pulse output

- Divided pulse output which is synchronized with input pulse or unit pulse output which is synchronized with integrated total flow rate value is selected by switch setting.
- Kind of signal and signal logic are selected by switch setting.
- Signal width of unit pulse output is set by parameter setting.
- Switch setting

Setting Switch SSW



SSW	1	2	3	4
ON/OFF	Input pulse	Output pulse		
	Kind of signal	Contents of signal	Kind of signal	Signal logic
ON (Upper)	Voltage no-contact signal	Divided pulse	12 V no-contact signal	Low active
OFF (Lower)	Open collector signal / No-voltage contact signal	Unit pulse	Open collector	High active

■ Analogue signal output (Option)

- Analogue 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.

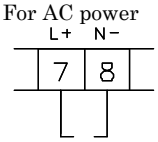
■Terminal arrangement

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

■Connection

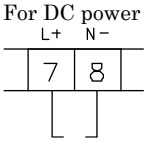
■ Connection of power source

For AC power



85~264 V AC

For DC power

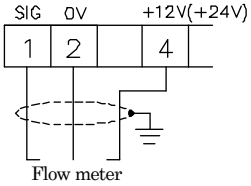


11~48 V DC

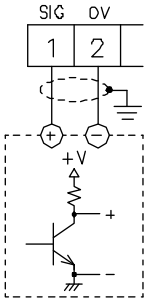
■ Connection of pulse signal input (Use shielded cable)

● Voltage no-contact input
Setting switch SSW1: ON

For voltage no-contact pulse output flow meter

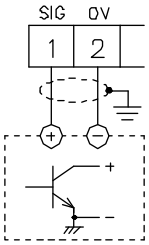


For voltage no-contact signal

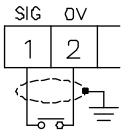


● Open collector input
Setting switch SSW1: OFF

For open collector signal

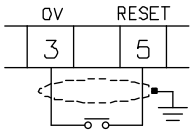


For no-voltage contact signal
Parameter 02: LL

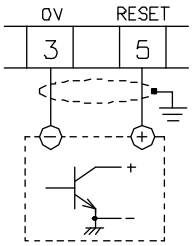


■ Connection of reset signal (Use shielded cable)

For no-voltage contact signal

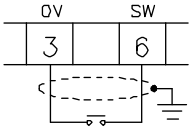


For open collector signal

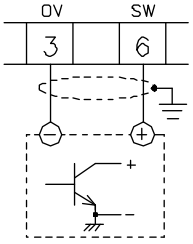


■ Connection of switch signal (Use shielded cable)

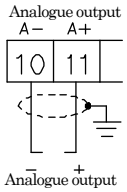
For no-voltage contact signal



For open collector signal

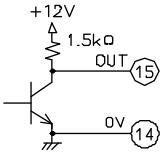


■ Connection of analogue signal (Option) (Use shielded cable)

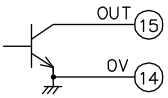


■ Pulse output

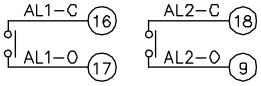
For 12 V no-contact signal
Setting switch SSW3: ON



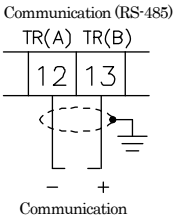
For open collector signal
Setting switch SSW3: OFF



■ Comparative output



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



■ Model

MC74□ −□□□ −□ P□ −□□ −□□

● Input pulse

1	Voltage no-contact input
2	Open collector or contact 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 (Communication function is unavailable)
2	12V DC (Standard)

● Power

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

▼ The contents and description are subject to change without notice.

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