NITTOSEIKO
Taking new steps forward together

Digital Flow Rate Indicator & Totalizer MC75

Specification

SSF21351 21.12

■ Outline

This equipment indicates momentary flow rate which is periodic calculation by multiplying meter factor to pulse signal.
It calculates from unitless pulse to unit pulse and indicate integrated total volume.

■ Features

- ●Press the [S] key or input a switch signal and indication content switches momentary flow rate and integrated total volume.
- ●As an option, it can output analog signal and comparative signal as well it has communication function.
- ●RS-485 communication as an option can read-out integrated total volume, momentary flow rate, indicating value, comparative signal value, indication state, and comparative output state, as well can write-in comparative output value.
- ●Communication protocol is unique method or Modbus-RTU.
- ●It can show integrated total volume, momentary flow rate, or indicating value onto our large indicator without programing.

■ Specifications

Pulse input

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

●Voltage no-contact
- Frequency: 10k Hz or less (ON: OFF ratio 1:1)
  1k Hz or less at 1 periodic calculation
- Signal level: H : 4～30 V
  L : 0～1.5 V
- Input resistance: Approx. 10kΩ

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

●No-voltage contact
- Frequency: 50 Hz or less (ON: OFF ratio 1:1)
- Voltage & current: Approx. 12 V Approx. 8mA

Momentary flow rate measurement
- Method: Periodical measurement and calculation system
- Sampling frequency: 10 msec
- Number of pulses per cycle: 1~20
- Forecasting calculation: Detect speed reduction.
- Low cut: 0.001-10.000% of full scale

Flow indication
- Display: 7-segments Red LED 7.9W X 14.2H 6-digits, Zero suppression
- Decimal point: Available for setting decimal point
- Change of indication: Press the [S] key or input a switch signal and indication content switches momentary flow rate and integrated total volume.
- 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. 1s 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 volume indication
- Initial value: Available for setting initial value when reset
- Over flow: Stop and blink at 999999 or totalize from 0

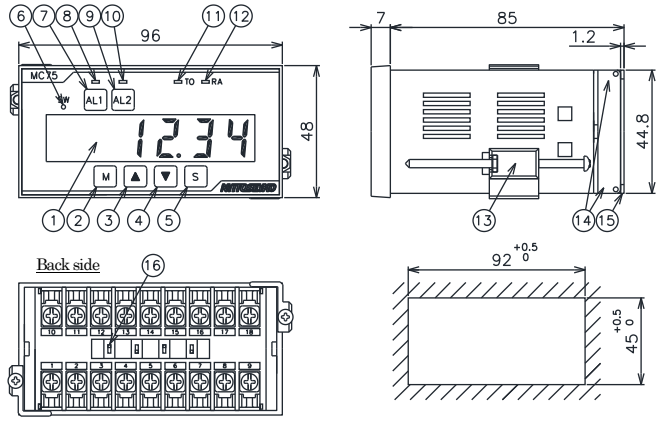
Reset
- Operation: One-shot reset
- Manual reset: Press the [M] key and the [S] key at same time when indicating integrated total volume.
- Reset signal: Input a reset signal and total volume is reset whichever indicating integrated total volume or momentary flow rate.
- Kind of signal: No-voltage contact signal or open collector signal
- Signal width: 20 msec or longer
- Voltage & current: Approx. 12 V Approx. 8m A

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

Analog output (Option)
- Content: Select momentary flow rate or integrated total volume
- Output signal: Select voltage or current output
  Voltage: 1～5V,0～5V,0～10V DC
  Current: 4～20mA DC
- Allowable road resistance
  1～5V,0～5V: 1kΩ or more
  0～10V: 2kΩ or more
  4～20mA: 500Ω or less

	Worm-up period	15 minutes
	Conversion method	DA method
	Resolution	Approx. 1/40,000
	Conversion speed	Approx. 22 msec
	Conversion accuracy	±0.15% full scale at 23℃ ±5℃ Temp. factor: ±150ppm/℃
Pulse output	Signal contents	Select distribution output or unit pulse output
	Kind of signal	Select 12 V no-contact signal or open collector signal.
	Signal logic	Select high active or low active
	Signal width	0.001～2s by parameter setting In case of distribution 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 signal (Option)		
	Number of output	2 points
	Signal contents	Select momentary flow rate or integrated total volume
	Setting	Switch the indication and show setting value on the 6 digits display.
	Output configuration	Select upper limit or lower limit
	Output performance	Select one of comparative output, output holding or one-shot output
	Hysteresis	2～9999 digit
	Prohibition at power ON	Prohibit output lower limit or output for a certain period (0.1~99.9s) when turn on a power.
	Response time	Approx. 32ms
	Kind of signal	No-voltage contact
	Contact capacity	250V AC 0.5A / 30V DC 1A (Load resistance)
	Comparative output light	2.8W X 1H Red LED
Communication function (Option)		
	Standard	EIA RS-485
	Method	2 wire half-duplex
	Synchronization	Asynchronous
	No. of connection	32 equipment include upper computer (host computer)
	Unit No.	00～99
	Delay time	Select from 10～500 msec (Error 10 msec or less)
	Speed	1200/ 2400/ 4800/ 9600/ 19.2k/ 38.4 kbps
	Transmission code	ASCII code
	Data length	7b bit／ 8 bit
	Parity	Without / Odd number / Even number
	Stop bit	1bit / 2 bit
	Transmission control	Reply type / Continuous transmission
	Error check	BCC check sum
	Communication Contents	
	Read-out	Indication value, comparative signal setting value, setting value of upper and lower limit for analog signal, initial value of integrated total volume, indication state, comparative output state, momentary flow rate, integrated total volume.
	Write-in	Comparative signal setting value, setting value of upper and lower limit for analog signal, and initial value of integrated total volume
Power failure storage		
	Type of storage	EEPROM
Power source for generator		12V DC ±10% 100mA (STD) 24V DC ±10% 80mA (OPTION)
Insulation resistance		500V DC 100MΩ or more Between respective terminal block of input, comparative output, analog output, communication, and power source. 0 V and 2nd 3rd 14th terminal block is common
Withstand voltage		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℃ (Without freezing)
Ambient humidity		45～85% RH (Without dew condensation)
Weight		Approx. 0.3kg
Casing		Body: ABS Plastic Front: ABS / Acrylic Plastic
Protection structure		IP65 (Front panel)

■ External dimension 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, it shows momentary flow rate or integrated total volume. This initial indication can be set by parameter. In case of integrated total volume, indication volume is same as volume before previous turning off of power.

■ Momentary flow rate

・It calculates frequency of pulse signal and multiplies to meter factor.

・It can decrease momentary flow rate value by forecasting calculation when flow rate becomes low.

・It shows zero when flow rate becomes lower than the low cut value which is set in advance.

■ Integrated total volume

・Integrated total volume is calculated by a pulse signal multiplying to the meter factor.

■ Flow rate display

・Flow rate display can show momentary flow rate or integrated total volume. Indication can be set by parameter from one of "Switch indication momentary flow rate or integrated total volume", "Momentary flow rate only", or "Integrated total volume only".

・In case of setting as switch indication mode, press the S key or input a switch signal and indication content switches momentary flow rate and integrated total volume.

・Momentary flow rate indication is up-dated each indication frequency time. This indication frequency can be set by parameter.

・Response will be delay if number of moving average per indication frequency is set by parameter, however flow rate indication becomes stable.

・Fixed indication parameter setting as 5, 10, or 100 can fix the right-hand digits to 5, 0, or 00.

・Press the M key and the S key at same time, and it can reset integrated total volume during indicating integrated total volume. Input a reset signal and reset integrated total volume whichever indicating momentary flow rate or integrated total volume.

・When integrated total volume over-flow, blinking "999999" or integrate from zero is selected by parameter.

■ Switch input

・Indication switch, prohibition, or hold is applied to the function by parameter.

・In case of indication switch function, ON: Integrated total volume, and OFF: momentary flow rate.

・In case of prohibition function, ON: same state as no pulse input. However, distribution pulse keep output.

・In case of hold function, ON: indication keeps showing the same value.

■ Pulse output

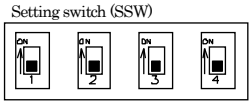
・It can output pulse signal synchronized to the input pulse or scaled pulse synchronized to the integrated total volume. Pulse synchronization is selected by switch.

・Kind of pulse signal and logic are selected by switch.

・Pulse width of scaled pulse is set by parameter.

・Setting switch

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

■ Analog output (Option)

・Select one of 4～20mADC, 1～5VDC, 0～5VDC, or 0～10VDC.

・Momentary flow rate or integrated total volume as output content is selected by parameter.

・Momentary flow rate is selected by parameter either updating each sampling frequency or updating synchronized to flow rate indication.

■ Comparative output (Option)

・Comparing against momentary flow rate or integrated total volume is selected by parameter.

・Working against upper limit or against lower limit is selected by parameter.

・One of the permanent comparative, the hold for momentary flow rate, or the one-shot is selected by parameter.

・Hysteresis of momentary flow rate, prohibition of lower limit function at power ON, or output delay is available.

・Release from hold performance is by reset operation.

■ Communication (option)

(For the detail, please refer the instruction manual)

・Following contents are communicated by RS-485.

(1) Read-out the momentary flow rate, integrated total volume, and indicating value.

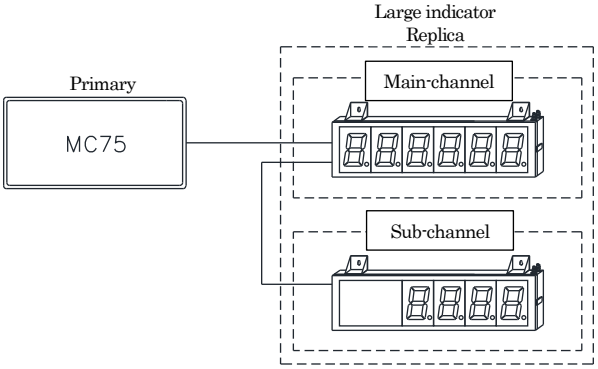
(2) Read-out the comparative output setting value, indication state, and state of comparative output.

(3) Write-in the comparative output setting.

・Momentary flow rate, integrated total value, and indicating value can be shown largely on the remote place by connecting to our large indicator DH1 or DS1. MC75 becomes primary and large indicator becomes replica.

It can connect up to 4 equipment as replicas.

When connect 2 large indicators, integrated total volume and momentary flow rate are shown respectively. One of the replicas is main-channel, and the other is sub-channel. Communication between primary and replica is by our unique method. Showing contents is set by parameter of large indicator.

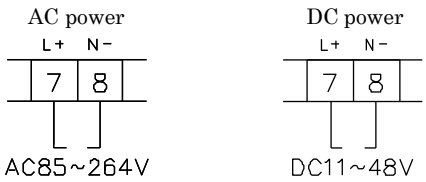


■Terminal arrangement

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	85~264V AC
8	N−		11~48V DC
9	AL2-O		
10	A−	Analog 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	AAL2−C		

■Connection

■ Power source



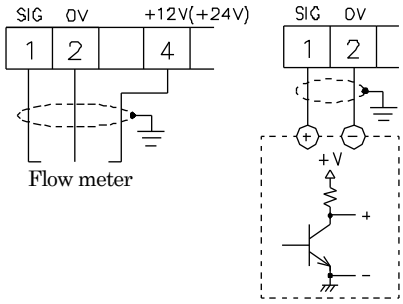
■ Pulse input

(Use shielded cable)

● Voltage no-contact (Setting switch SSW1: ON)

Voltage no-contact pulse from flow meter

Voltage no-contact pulse

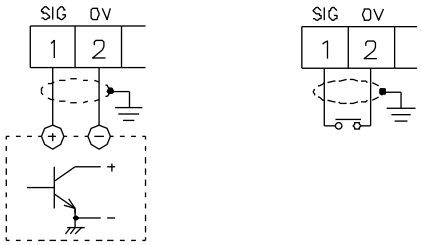


● Open collector (Setting switch SSW1: OFF)

Open collector

No-voltage contact signal

Parameter 02: LL

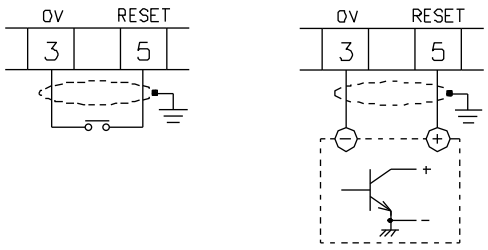


■ Reset signal input

(Use shielded cable)

No-voltage contact signal

Open collector

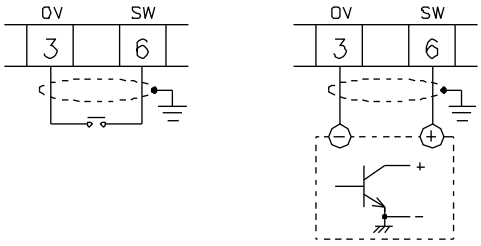


■ Switch signal input

(Use shielded cable)

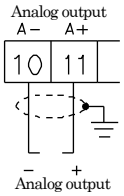
No-voltage contact signal

Open collector



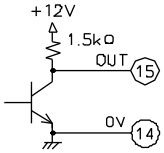
■ Analog signal output (Option)

(Use shielded cable)

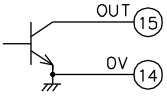


■ Pulse output

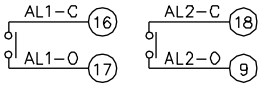
12V no-contact output (Setting switch SSW3: ON)



Open collector output (Setting switch SSW3: OFF)

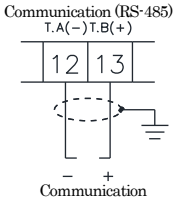


■ Comparative output (Option)



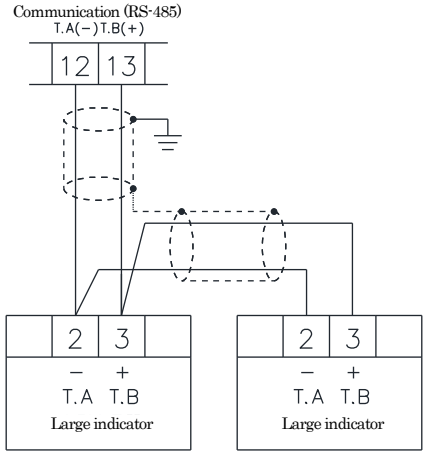
■ Communication (Option)

(Use shielded cable)



■ Communication with our large indicator (Option)

(Use shielded cable)



■ Model

MC75 – □ – □□□ – □P□ – □□ – □□

● Input pulse

1	Voltage no-contact pulse
2	Open collector / no-voltage contact signal

● Decimal point for momentary flow rate

1	0.001
2	0.01
3	0.1
4	1

● Unit for momentary flow rate

1	L/min
2	L/h
3	mL/min
4	m^3/h

● Unit for integrated total volume

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

● Analog output (Option)

0	Without
1	4~20mA DC
2	1~5V DC
3	0~5V DC
4	0~10V DC

● Output pulse unit

0	Distribution 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 (Option)

0	Without
1	RS-485

● Power for generator

1	24V DC
2	12V DC (Standard)

● Power

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

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

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