

## Multi Counter PL1

## SPECIFICATIONS

SSF40752 19.06

## ■ Outline

This multi counter receives pulse signal from up to 2 flow meters, multiplies them by flow meter factor, and totalizes them or indicate flow rate and output pulse signal.

It also output control signals to external device by comparing with setting value. It has RS-485 communication as standard.

## ■ Features

- It has 4 kind of functions which can be changed by internal setting.
  - P type: Preset counter
  - T type: Scaling totalizer
  - B type: Simple type batch counter
  - R type: Digital flow rate indication
- P type: This function is indication of integrated volume by connecting with flow meter. It has 2 setting points and outputs contact signal comparing with total value.
- T type: This function is indication of integrated volume by receiving unitless signal.
- B type: This function is batch control by connecting flow meter. It has 1 setting point, and outputs 2 point control signal to pump or valve.
- R type: This function is indication of flow rate by connecting flow meter. Calculate system is time gating method. It can be added upper or lower limit alarm as option.
- 85 – 264V AC external power supply.
- Front dimension is 72W×72H as DIN standard.

## ■ Specifications

## Pulse input

Number of input	2 points (Input A/ Input B)	
Input signal	Voltage no-contact input. (Counting speed H)	
Input frequency	4 kHz or less (2 kHz or less when scaling pulse output)	
Signal width	0.13ms or more	
Signal level	H:6~30V L:2V or less.	
Input resistance	Approx. 7kΩ	
	Open collector input. (Counting speed H)	
Input frequency	4 kHz or less (2 kHz or less when scaling pulse output)	
Signal width	0.13ms or more	
Voltage & current	Approx. 12V,	Approx. 10mA
Signal level	L: 6V or less.	
	No-voltage contact input. (Counting speed L)	
Input frequency	30Hz or less	
Signal width	16ms or more	
Voltage & current	Approx. 12V,	Approx. 10mA
Signal level	L: 6V or less.	

## Counting system

Input A & input B: Initial setting is Addition & Addition type.  
Subtraction is also available. Counting system should be set by selecting from among Addition & Addition / Addition & Subtraction / Subtraction & Subtraction.

## Counting speed

Either counting speed H or L is set by means of a kind of input signal.  
Input A & input B: Counting speed is selected from among H&H / H&L / L&H / L&L.

## Decimal point

Decimal point is set by selecting from among 0. / 0.0 / 0.00



## Scaling

Flow meter factor and dividing can be set for input A and input B respectively.

Factor: 0.1000~0.9999 (factor=1.0000 is set as 0.0000)

Dividing: 1/1, 1/10, 1/100, 1/1000, 1/10000

## Calculation functions

It has 5 different kinds of calculation menu.

FUNC-1: No function	Indicate "-----"
FUNC-2: Addition	(FUNC) = (CB) + (CA)
FUNC-3: Proportion	(FUNC) = (CB) / (CA)
FUNC-4: Subtraction	(FUNC) = (CB) - (CA)
FUNC-5: Accuracy	(FUNC) = [(CB) - (CA)] / (CA)
FUNC-6: Concentration	(FUNC) = (CB) / [(CB) + (CA)] × 100%

(CA): value of input A (CB): value of input B

## Display

Counting value: Value of input A / value of input B / calculated value are switched by pressing switch key. It is fixed in input A by initial setting.

Decimal 6-digits counter, 7-segment red LED,  
7.5(W) × 10(H)

6 digits zero suppression

Indication range:

-199999~999999	(Total value)
-199999~999999	(Calculation of Addition and Subtraction)
-199.999~999.999	(Calculation of proportion and accuracy)
-199.99P~999.99P	(Calculation of concentration)
-1999~1999	(Standard flow rate)

Digit overflow: LED [IN.A], [IN.B] blinks.

Calculation error: LED [FUNC] blinks, and indicates "-----".

Setting value: Setting value 1 / setting value 2 / nothing are switched by pressing switch key. It is fixed in Setting Value 1 by initial setting.

Decimal 6-digits counter, 7-segment green LED,  
5.5(W) × 8(H)

## Initial value

Initial value at resetting can be set for each counter of input A and input B.

Setting range: -199999~999999

## Setting value

Number of setting: 2 points (setting value 1, setting value 2)

Setting contents: Comparison value against indication value A, Indication value B, or calculation value.

Setting range: Same as indication range

Setting method: Manual setting      Entry by setting key for individual digits [1<sub>D</sub>] ~ [6<sub>D</sub>]

Communication setting      RS-485 communication

**Indication of operation**

Indicating input A	[IN.A]	Yellow LED	5(W) × 2(H)
Indicating input B	[IN.B]	Yellow LED	5(W) × 2(H)
Indicating calculated value	[FUNC]	Yellow LED	5(W) × 2(H)
Output contact signal 1	[OUT1]	Red LED	5(W) × 2(H)
Output contact signal 2	[OUT2]	Red LED	5(W) × 2(H)
Indicating setting value 1	[SET1]	Green LED	5(W) × 2(H)
Indicating setting value 2	[SET2]	Green LED	5(W) × 2(H)

**Operation**

**To switch indication**  
 Counting value: Press indication change key [DISP].  
 Setting value: Press indication change key for setting value [SET].  
 Indication is fixed depending on the setting.

**To entry setting value**  
 Method: Select from manual or communication  
 Manual: Entry by setting key for individual digits [1<sub>D</sub>] ~ [6<sub>D</sub>], activate setting by [SET] key.  
 Communication: Entry by RS-485 communication.

**To reset**  
 Select from among Manual / Remote / Communication  
 Manual: Reset indicating total value to initial value by pressing [RESET]. While indicating calculated value, both of total value A and B are reset to initial value.

**To start and stop batching (B type function only)**  
 Select from among Manual / Remote / Communication  
 Manual: Start batching by [START] key  
 Stop batching by [STOP] key.

**Control signal input**

Reset signal	To reset total value of input A: RESET.A To reset total value of input B: RESET.B
Start signal	To start batching: START (For B type function only)
Stop signal	To stop batching: STOP (For B type function only)
Inhibited signal	To stop counting the volume of input A: INHIBIT.A To stop counting the volume of input B: INHIBIT.B
Kind of signal	No-voltage contact / Open-collector Signal width 5ms or more Voltage / Current Approx. 12V, Approx. 10mA

**Control signal output**

Number of output	2 points Contact output 1: Comparative output of setting value 1, Contact output 2: Comparative output of setting value 2
Contents of signal	Contents is selected from among upper limit alarm / lower limit alarm / instantaneous output/ counting output / no output
Output time	50ms (When flow rate output) (Available for changing to 100ms, 500ms, or 1000ms)
Kind of signal	No-voltage contact Contact capacity 250V AC 3A, 30V DC 3A (resistance load)

**Pulse output**

Number of output	2 points (Pulse output A / Pulse output B)
Kind of signal	Open collector output Voltage / Current 30V, 30mA ON level 0.5V or less
Electronic logic	Negative logic (Available for changing to positive logic)
Contents of signal	Dividing pulse (Available for changing to scaling pulse)
Signal width	0.5ms (When scaling pulse output) (Available for changing to 1ms, 5ms, 10ms, 50ms, 100ms, 500ms, 1000ms, and 0.1ms)

**Communication**

Communication method	Half-duplex, asynchronous method (RS-485)
Format	ASCII code (Bit: Start = 1, Data = 7, Stop = 1)
Baud rate	9600 (Available for changing to 2400, 4800)
Parity	Without (Available for changing to odd or even)
Communication delay	100ms (Available for changing to 2ms)
Contents of communication	(1) Output Total value of input A, total value of input B, and calculated value. (2) Entry setting value 1 and setting value 2. (3) Reset total value of input A and total value of input B (4) Start and Stop batching while B type function. (5) Set and release of inhibited signal of input A and input B

**Power failure storage**

Memory	EEPROM
Contents of storage	Total value, setting value, Condition of internal setting, contact output in batching of B type function

**Power for generator**

12V DC ±10%, 100mA

**Insulation resistance**

500V DC 100MΩ or more (Between power supply terminal and contact output terminal)

**Withstand voltage**

1500V AC, 1 minute (test point is same as that of insulation resistance)

**Noise resistance**

Square wave noise by noise simulator.  
1500V (Power supply terminals), 500V (Input terminals)  
(Noise width 1μs, Polarity±, Synchronous application of power supply, Phase 0~360°)

**Power source**

85~264V AC, 50/60Hz

**Power consumption**

7VA or less

**Ambient temperature**

-10 ~ +50°C (Without dew condensation)

**Weight**

Approx. 0.3kg

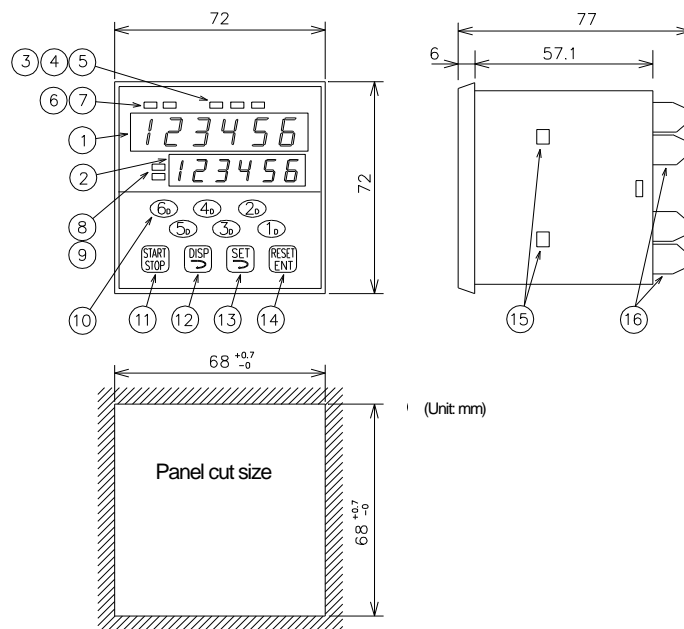
**Casing**

ABS plastic

**Protection class**

Equivalent of IP54 (Panel face only)

**External dimensions**

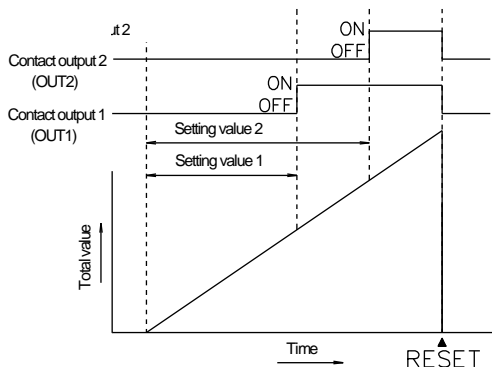


No.	Name	No.	Name
1	6 digits total indicator	9	LED indication of set value 2
2	6 digits set value indicator	10	Setting key (1D~6D)
3	LED indication of input A	11	Start / Stop key
4	LED indication of input B	12	Counting indication switch key
5	LED indication of calculation	13	Set value indication switch key
6	LED indication of output 1	14	Reset key
7	LED indication of output 2	15	Panel mounting hole
8	LED indication of set value 1	16	Terminal block (M3)

Function

● P type (Preset counter)

- It totalizes signals which are input to input A.
- It can be set 2 points of setting value. Setting value 1 is value for contact output 1 and setting value 2 is value for contact output 2.
- Under the condition of {Total value of input A  $\geq$  Setting value}, contact output is activate. (2 points of upper limit alarm)
- Total value is reset by reset signal, and contact output becomes OFF.

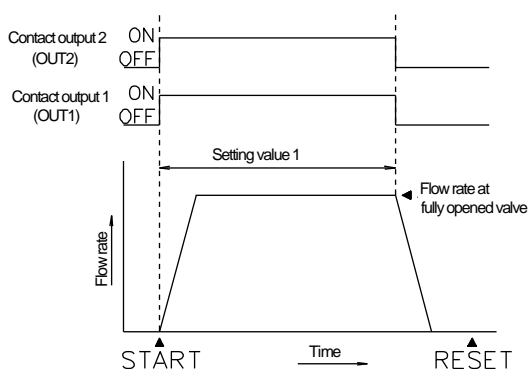


● T type (Scaling totalizer)

- It totalizes signals which are input to input A.
- It indicates total value by multiplied flow meter factor set in advance.
- Total value is reset by reset signal.
- Select from output pulse synchronized with input pulse (dividing pulse output) or output synchronized with indicated value (scaling output)

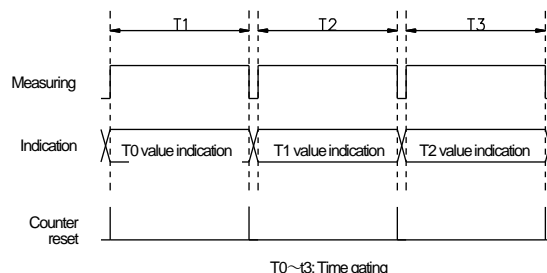
● B type (Simple type batch counter)

- It can control single stage type batch count. Batch method is manual reset and over flow count type.
- It totalizes signals which are input to input A.
- 1 point set value is available, and this is set value for contact output 1 and 2 (metering signal).
- Contact signal 1 and 2 are ON by start signal. Under the condition of {Total value of Input A = Setting value}, contact output is OFF. It can be changed contact output 2 to flow rate output (Batch-end signal)
- Stop the count is available by stop signal during measuring. At that time, contact output 1 and 2 (batching signal) become OFF. Restart by start signal.
- Reset total value by reset signal.



● R type (Digital flow rate indicator)

- It indicate flow rate of unit time by counting the input signal to input A per unit time, and memory that value.
- The value measured in time gating T1 Indicates on T2, and the value measured in time gating T2 indicates on T3. It repeats this action.
- Adding upper and lower limit alarm output is available.
- Under condition of {Flow rate value  $\leq$  set value 1}, contact output 1 is activate. (Lower limit alarm)
- Under condition of {Flow rate value  $\geq$  set value 2}, contact output 2 is activate. (Upper limit alarm)



● Change of counting indication (Manual)

- Indication is changed by pressing key [DISP]. Depending on the setting condition, indication is fixed.
- It indicates total value of input A, total value of input B, and calculated value by rotation.

● Change of set value (Manual)

- Indication of set value is changed by pressing key [SET]. Depending on the setting condition, indication is fixed.
- It indicates Set value 1, Set value 2, and blank (without indication) by rotation.
- Indication is changed to setting mode by pressing setting keys for individual digits. Respective digits are changed by pressing individual setting key [1<sub>D</sub>]~[6<sub>D</sub>], and value is registered by pressing [SET] key. LED indication of set value [SET1] or [SET2] blinks while setting mode.

● Pulse output

- It output dividing pulse or scaling pulse. (Factory setting: Dividing pulse)
- Dividing pulse is output by synchronized with input pulse.
- Scaling pulse is output by synchronized with the value scaled by flow meter factor. Pulse width is select from among 0.1ms, 0.5ms, 1ms, 5ms, 10ms, 50ms, 100ms, 500ms, 1000ms (Factory setting: 0.5ms).
- Output logic is selected from negative logic and positive logic (Factory setting: Negative logic)

● Function except for P / T / B / R type.

- Subtract count is available. It subtract from initial value, and output contact signal when the value reaches to setting value.
- By connecting 2 flow meters, it can calculate addition, subtraction, ratio and so on of both indication value, and output contact signals by comparing indication value and setting value.
- Indication and output of 2 kind of scaling is available because it can be set flow meter factor respectively.
- Please give inquiry about other function.

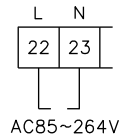
Terminal arrangement

Terminal block

Inhibit signal input A	INH. A	28	14 (-)	Pulse output B
Inhibit signal input B	INH. B	27	13 (+)	PULSE OUT. B
Stop signal input	STOP	26	12	RESET. A Reset signal input A
Communication	(-)	25	11	RESET. B Reset signal input B
RS485	(+)	24	10	START Start signal input
Power supply	N	23	9 (-)	Pulse output A
85-264V AC	L	22	8 (+)	PULSE OUT. A
	0V	21	7	COM Contact output 2
	0V	20	6	NO OUT2
	+12V	19	5	NC
Voltage pulse input A	SIG1. A	18	4	0V
Voltage pulse input B	SIG1. B	17	3	COM Contact output 1
No-voltage pulse input A	SIG2. 2	16	2	NO OUT1
No-voltage pulse input B	SIG2. B	15	1	NC

Wiring diagram

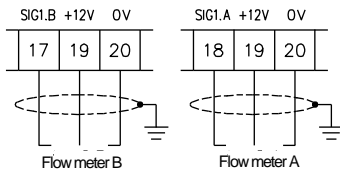
Connection of power supply



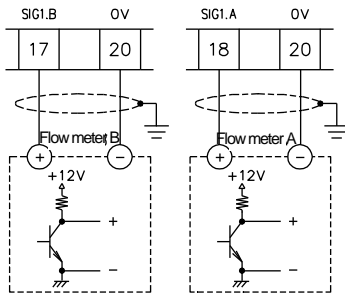
Connection of pulse input (Use shielded cable)

Voltage no-contact input

Flow meter with High frequency pulse generator

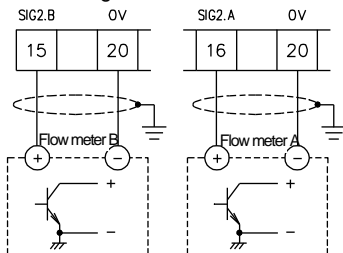


Voltage no-contact signal input

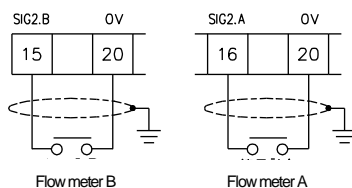


No-voltage input

Open collector signal

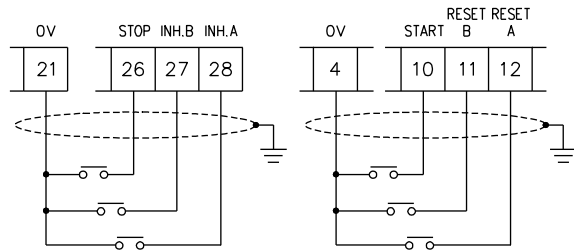


Contact signal (Counting speed shall be L)



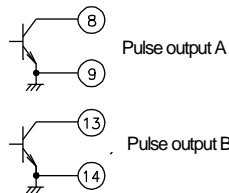
Connection of control signal input (Use shielded cable)

No-voltage contact signal  
(Open collector signal is available)

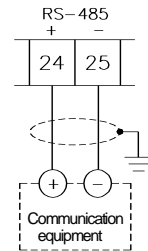


Pulse output

(use shielded cable)



Connection for communication (RS-485)



Model

Model	Specification code	Remark
PL1		Multi counter
Initial setting	-P	P type: Preset counter
	-T	T type: Scaling totalizer
	-B	B type: Simple type batch counter
	-R	R type: Digital flow rate indication
	-N	Another type (User request)
Indication unit	1	1 mL
	2	0.01 L
	3	0.1 L
	4	1 L
	5	0.01 m <sup>3</sup>
	6	0.1 m <sup>3</sup>
	7	1 m <sup>3</sup>
	9	Another
	Time unit	0
1		/min (minute) : For R-type only
2		/h (hour) : For R-type only
Power supply	A	85~264V AC
Additional setting	/SC	Scaling count (needs flow meter factor)
	/SP	Scaling pulse output (needs flow meter factor and pulse unit)
	/FN	Indicate function value (needs function-type)
	/ME	With batching output and batch-end output : For B-type only
	/HL	With upper limit alarm and lower limit alarm : For R-type only
	/Z	Another setting : User request

◆◆◆◆◆Matters to be specified at placing of order◆◆◆◆◆

1. Model, specification code.
2. Input pulse unit and indication unit, output pulse unit.

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

NITTOSEIKO CO., LTD.

30 Nogamibata, Nobu-Cho, Ayabe, Kyoto 623-0041, JAPAN  
 TEL : +81-773-43-1412  
 +81-6-6105-5086(Global Sales Section)  
 FAX : +81-773-43-1595  
 E-mail:sales@nittoseiko.co.jp  
 https://www.nittoseiko.co.jp/