

# PULSE METER

## Features

- 13 kinds of various operation modes  
: Revolution/Speed/Frequency, Absolute rate, Passing time, Error rate, Cycle, Density, Passing speed, Error ratio, Time width, Time interval, Interval, Integration, Length measurement (Except MP5M having 11 models)
- Various output function  
: Relay output, NPN/PNP open collector output, Low speed Serial output, BCD output, 4-20mA output, RS485 communication output
- Various functions  
: Prescale function, Data monitoring function, Hysteresis width setting function, Max./Min. value monitoring function, Delay function, Auto zero time setting function, Lock setting function
- Max. display range : -19999 to 99999 (MP5M:0~99999)
- Various display units : rpm, rps, Hz, kHz, sec, min, m, mm, mm/s, m/s, m/min, m/h, l/s, l/min, l/h, %, counts, etc.
- Selectable voltage input (PNP) or No voltage input (NPN)
- 50kHz High speed response function



**⚠ Please read "Caution for your safety" in operation manual before using.**



## Ordering information

**MP 5 S - 4 N**

	Output	Sub output (Display value output)		
<b>S Type</b>	N	Indication type	X	
	<b>Y Type</b>	N	Indication type	X
		1	NPN open collector five-stage output	X
		2	PNP open collector five-stage output	X
		3	X	BCD Dynamic
<b>W Type</b>	4	X	PV transmission (4-20mADC)	
	5	X	RS485 communication output	
	N	Indication type	X	
	A	Relay five-stage (HH, H, GO, L, LL)	X	
	1	Relay three-stage (H, GO, L)	X	
	2	NPN open collector five-stage output	BCD Dynamic	
	3	PNP open collector five-stage output	BCD Dynamic	
	4	NPN open collector five-stage output	PV transmission (4-20mADC)	
	5	PNP open collector five-stage output	PV transmission (4-20mADC)	
<b>M Type</b>	6	NPN open collector five-stage output	Low speed serial output	
	7	PNP open collector five-stage output	Low speed serial output	
	8	NPN open collector five-stage output	RS485 communication output	
	9	PNP open collector five-stage output	RS485 communication output	
	N	Indication type	X	
<b>M Type</b>	1	Relay single (High-limit) output + NPN open collector output	X	
	2	Relay double (High/Low-limit) output + NPN open collector output	X	
	4	100-240VAC 50/60Hz		
Size	S	DIN Size W48×H48mm		
	Y	DIN Size W72×H36mm		
	W	DIN Size W96×H48mm		
	M	DIN Size W72×H72mm		
Digit	5	5digit (99999)		
Series	MP	Pulse meter		

\*PNP open collector output : Option

(A) Counter

(B) Timer

(C) Temp. controller

(D) Power controller

(E) Panel meter

(F) Tacho/Speed/Pulse meter

(G) Display unit

(H) Sensor controller

(I) Proximity sensor

(J) Photo electric sensor

(K) Pressure sensor

(L) Rotary encoder

(M) 5-Phase stepping motor & Driver & Controller

# MP5S/ MP5Y/ MP5W/ MP5M SERIES

## ■ Specifications (MP5S/ MP5Y/ MP5W Series)

Series	MP5S	MP5Y	MP5W
Display method	7 Segment LED(Zero blanking)		
Character size	W4 × H8mm	W6.8 × H13.8mm	
Max. indication	5digits(-19999 ~ 99999)		
Power supply	100-240VAC 50/60Hz		
Allowable operation voltage	Allowable operation voltage: 90 ~ 110%		
Power consumption	Approx. Min. 7.5VA(240VAC)	Approx. Min. 3.5VA(240VAC)	Approx. Min. 6VA
Power for external sensor	12VDC ±10%, 80mA		
Input frequency	<ul style="list-style-type: none"> <li>• Non-contact input : Max. 50kHz(Pulse width:Each over 10<math>\mu</math>s)</li> <li>• Contact input : Max. 45Hz( Pulse width:Over 11ms)</li> </ul>		
Input level	[Voltage input] High : 4.5-24VDC, Low : 0-1.0VDC, Input impedance : 4.5k $\Omega$ [No-voltage input] Impedance at short-circuit : Max. 200 $\Omega$ , Residual voltage : Max. 1V Impedance at open-circuit : Min. 100k $\Omega$		
Measuring range	<ul style="list-style-type: none"> <li>• Mode F1, F4, F7, F8, F9, F10 : 0.0005Hz ~ 50kHz</li> <li>• Mode F3 : 0.02s ~ 3,200s</li> <li>• Mode F2, F5, F6 : 0.01s ~ 3,200s</li> <li>• Mode F11, F12, F13 : 0 to 4 × 10<sup>9</sup> Count</li> </ul>		
Measuring accuracy (23 ±5 $^{\circ}$ C)	<ul style="list-style-type: none"> <li>• Mode F1, F4, F7, F8, F9, F10 : F.S. ±0.05% rdg ±1Digit</li> <li>• Mode F2, F3, F5, F6 : F.S. ±0.01% rdg ±1Digit</li> </ul>		
Display accuracy	0.05 / 0.5 / 1 / 2 / 4 / 8sec.(The same as update output cycle)		
Operation mode	Number of revolution/Speed/Frequency (F1), Passing time (F2), Cycle (F3), Passing speed (F4), Time width (F5), Time interval (F6), Absolute rate (F7), Error ratio (F8), Density (F9), Error rate (F10), Length measurement (F11), Interval (F12), Integration (F13) <b>※Please see the operating mode(F-18~21 page).</b>		
Prescale function	Direct input method(0.0001 × 10 <sup>-9</sup> to 9.9999 × 10 <sup>9</sup> )		
Hysteresis	<b>(Note1)</b>	0 to 9999	
Other function	<ul style="list-style-type: none"> <li>• Lock setting function</li> <li>• Auto-Zero time setting function</li> <li>• Time unit selection function</li> <li>• Monitoring function : Memorize max. value</li> <li>• Memory retention function (Mode F13 applied only)</li> </ul>	<ul style="list-style-type: none"> <li>• Lock setting function</li> <li>• Monitoring delay function</li> <li>• Auto-Zero time setting function</li> <li>• Current output range selection(Current output type only)</li> <li>• Comparative output function(HH, H, GO, L, LL)</li> <li>• Time unit selection function</li> <li>• Deviation memory function(F output mode applied only)</li> <li>• Monitoring function : Memorize max. value or min. value</li> <li>• Remote/Local switching function(Communication output type only)</li> <li>• Data Bank switching function <b>(Note2)</b></li> <li>• Memory retention function (Mode F13 applied only)</li> </ul>	
Main output	Relay three-stage	—	250VAC 3A resistive load 3a
	Relay five-stage	—	250VAC 3A resistive load 5a
	NPN Open collector five-stage	—	12-24VDC 20mA Max.
	PNP Open collector five-stage	12-24VDC 30mA Max.	
Sub output	BCD Dynamic		NPN Open collector 12-24VDC 20mA Max.
	Low speed serial output		NPN Open collector 12-24VDC 20mA Max.
	PV transmission		4-20mADC Load 600 $\Omega$ Max.
	RS485 communication		4-20mADC Load 600 $\Omega$ Max.
Memory	Non-volatile memory(Input times : Min. 100,000 times)		
Insulation resistance	Min. 100M $\Omega$ (at 500VDC) Between charge part and non-charge part		
Dielectric strength	2000VAC 60Hz 1minute (Between terminals of AC power and case, Between terminals of AC power and measuring terminals)		
Impulse noise strength	±2000V the square wave noise(pulse width:1 $\mu$ s)by the noise simulator, Repeat frequency 60Hz		
Vibration	Mechanical	0.75mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 2 hour	
	Malfunction	0.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s <sup>2</sup> (30G) in X, Y, Z directions for 3 times	
	Malfunction	100m/s <sup>2</sup> (10G) in X, Y, Z directions for 3 times	
Relay life cycle	Malfunction	—	Min. 20,000,000 times
	Mechanical	—	Min. 100,000 times(250VAC 3A Load current)
Ambient temperature	-10 ~ +50 $^{\circ}$ C (at non-freezing status)		
Storage temperature	-20 ~ +60 $^{\circ}$ C (at non-freezing status)		
Ambient humidity	35 ~ 85%RH		
Weight	Approx. 130g	Approx. 135g	Approx. 230g

※ **(Note1)** The hysteresis setting range is different by the place of decimal point set.

※ **(Note2)** Data Bank switching function MP5W series only.

# PULSE METER

## ■ Specifications (MP5M Series)

Model	MP5M	MP5M-41	MP5M-42
	Indication type	High-limit setting type	High/Low-limit setting type
Display method	7 Segment LED(Zero Blanking), Letter size : W4 X H8mm		
Max. indication	5digits(0.0001 to 99999)		
Power supply	100-240VAC 50/60Hz		
Allowable operation voltage	Allowable operation voltage: 90 ~ 110%		
Power consumption	Approx. min. 7.5VA(240VAC)	Approx. min. 8VA(240VAC)	
Power for external sensor	12VDC ±10%, 80mA		
Input frequency	<ul style="list-style-type: none"> <li>Non-contact input : Max. 50kHz(pulse width:over 10<math>\mu</math>s)</li> <li>Contact input : Max. 45Hz(pulse width:over 11ms)</li> </ul>		
Input level	[Voltage input] High : 4.5-24VDC, Low : 0-1.0VDC, Input impedance : 4.5k $\Omega$ [No-voltage input] Impedance at short-circuit : Max. 300 $\Omega$ , Residual voltage : Max. 1V Impedance at open-circuit : Min. 100k $\Omega$		
Measuring range	<ul style="list-style-type: none"> <li>Mode F1, F4, F7, F8 : 0.0005Hz ~ 50kHz</li> <li>Mode F3 : 0.02s ~ 3,200s</li> <li>Mode F2, F5, F6 : 0.01s ~ 3,200s</li> <li>Mode F9, F10, F11 : 0 to 4 <math>\times 10^9</math> Count</li> </ul>		
Measuring accuracy (23 $\pm$ 5 $^{\circ}$ C)	<ul style="list-style-type: none"> <li>Mode F1, F4, F7, F8 : F.S. <math>\pm</math>0.05% rdg <math>\pm</math>1Digit</li> <li>Mode F2, F3, F5, F6 : F.S. <math>\pm</math>0.01% rdg <math>\pm</math>1Digit</li> </ul>		
Display accuracy	0.05 / 0.5 / 1 / 2 / 4 / 8sec.(The same as update output cycle)		
Operation mode	Number of revolution/Speed/Frequency(F1), Passing time(F2), Cycle(F3), Passing speed(F4), Time width(F5), Time interval(F6), Absolute rate(F7), Density(F8), Length measurement(F9), Interval(F10), Integration(F11) <b>*Please see the operating mode(F-18~21page).</b>		
Prescale function	Direct input method(0.0001 $\times 10^{-9}$ ~ 9.9999 $\times 10^9$ )		
Hysterisis	—————	(Note1)	0 ~ 9999
Other function	<ul style="list-style-type: none"> <li>Lock setting function</li> <li>Auto-Zero time setting function</li> <li>Time unit selection function</li> <li>Display value monitoring function</li> <li>Memory retention function (Mode F11 applied only)</li> </ul>	<ul style="list-style-type: none"> <li>Lock setting function</li> <li>Monitoring delay function</li> <li>Auto-Zero time setting function</li> <li>Time unit selection function</li> <li>Display value monitoring function</li> <li>Memory retention function (Mode F11 applied only)</li> <li>High-limit output function(H)</li> </ul>	<ul style="list-style-type: none"> <li>Lock setting function</li> <li>Monitoring delay function</li> <li>Auto-Zero time setting function</li> <li>Time unit selection function</li> <li>Display value monitoring function</li> <li>Memory retention function (Mode F11 applied only)</li> <li>Comparative output function(H, L) (S, H, L, B, I, F)</li> <li>Deviation memory function (F output mode applied only)</li> </ul>
Main output	Relay output	—————	250VAC 3A resistive load 1a 1b
	NPN Open Collector	—————	30VDC 100mA Max. $\times 2$
Memory retention	Non-volatile memory (Input times : Min. 100,000 times)		
Weight	Approx. 275g	Approx. 310g	Approx. 330g

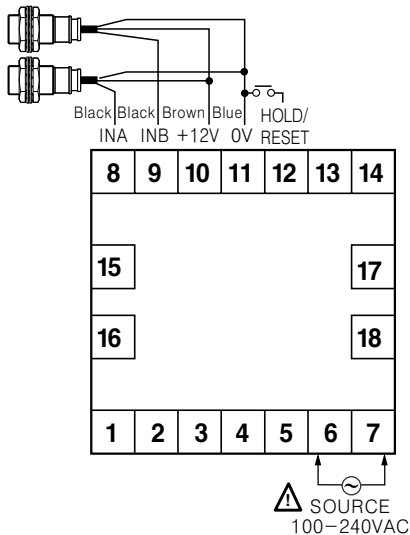
\*Function part is same as MP5S, MP5Y, MP5W series.

\* (Note1) The hysteresis setting range is different by the place of decimal point set. (See F-24 Page, hysteresis function.)

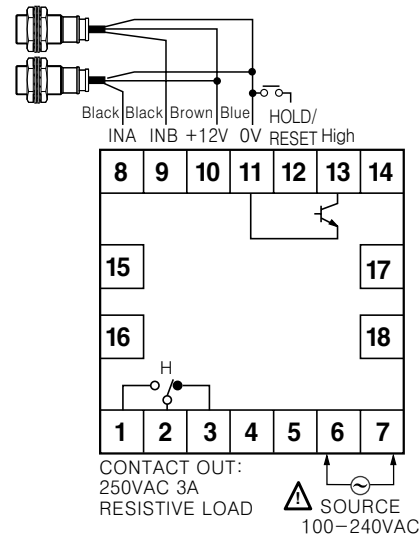
## ■ Connections

### ○ MP5M Series

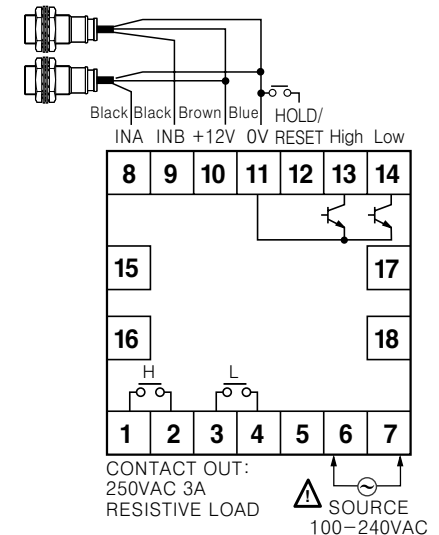
#### ● MP5M-4N (Indication type)



#### ● MP5M-41 (High-limit setting type)



#### ● MP5M-42 (High/Low-limit setting type)



(A) Counter

(B) Timer

(C) Temp. controller

(D) Power controller

(E) Panel meter

(F) Tacho/Speed/Pulse meter

(G) Display unit

(H) Sensor controller

(I) Proximity sensor

(J) Photo electric sensor

(K) Pressure sensor

(L) Rotary encoder

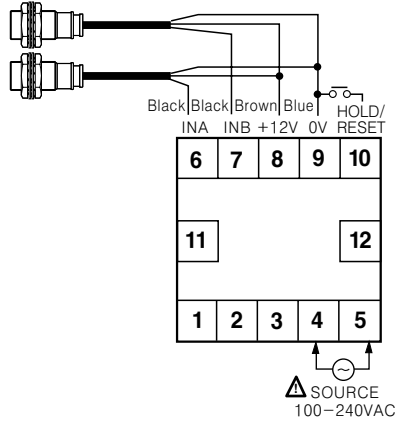
(M) 5-Phase stepping motor & Driver & Controller

# MP5S/ MP5Y/ MP5W/ MP5M SERIES

## Connections

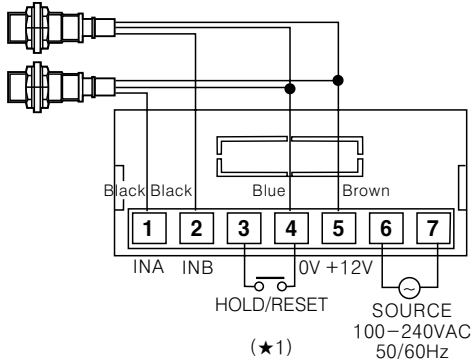
### MP5S Series

#### MP5S-4N (Indication type)



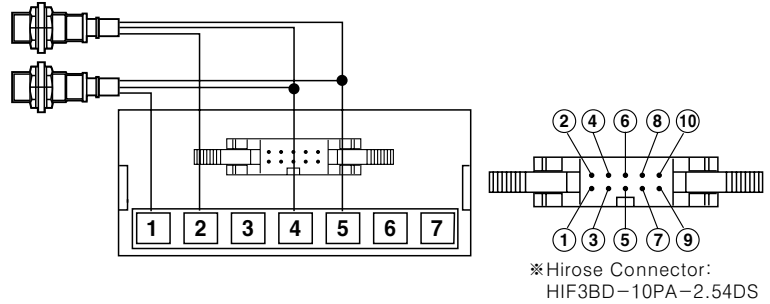
### MP5Y Series

#### MP5Y-4N (Indication type)



※ (★1) It is used for RESET terminal when an operation mode is F13.  
(See the "Operating mode" F-21 page)

#### MAIN Output / SUB Output

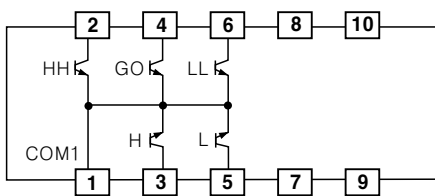


※ Hirose Connector:  
HIF3BD-10PA-2.54DS

### Main output (Connector)

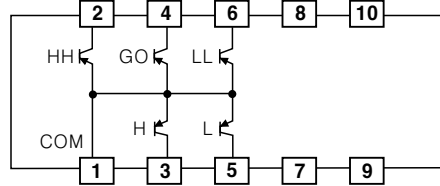
#### MP5Y-41 (NPN Open Collector output)

**MAIN OUT**  
(NPN OPEN COLLECTOR)  
12-24VDC Max. 30mA



#### MP5Y-42 (PNP Open Collector output)

**MAIN OUT**  
(PNP OPEN COLLECTOR)  
12-24VDC Max. 30mA

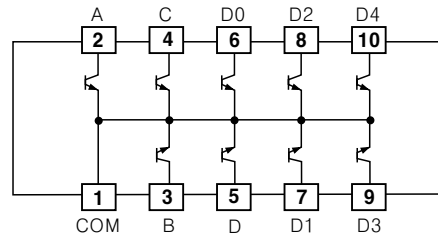


※ Main output type & sub output type : option

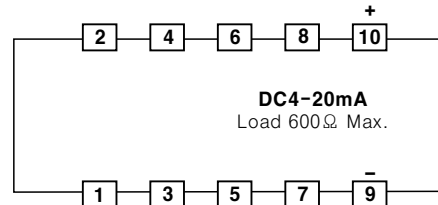
### Sub output (Connector)

#### MP5Y-43 (BCD Dynamic output)

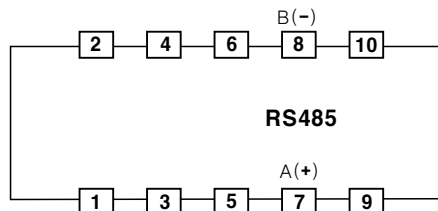
**BCD OUT**  
(NPN OPEN COLLECTOR)  
12-24VDC Max. 30mA



#### MP5Y-44 (PV transmission output)



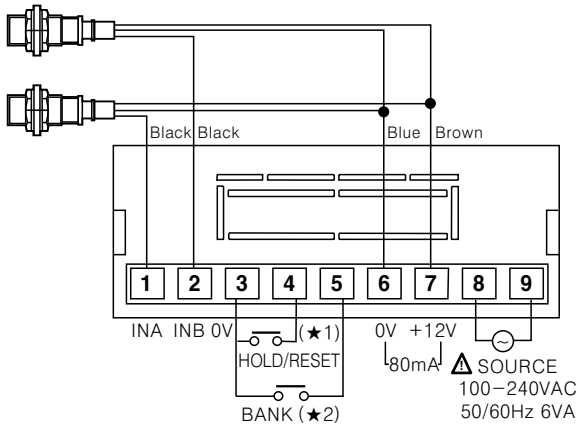
#### MP5Y-45 (RS485 communication output)



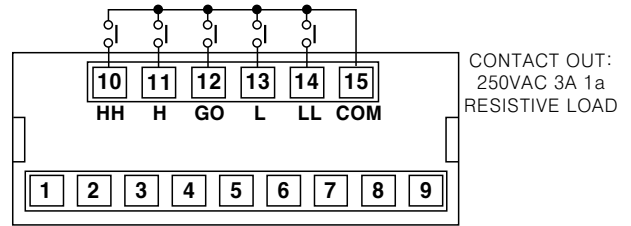
# PULSE METER

## ◎MP5W Series

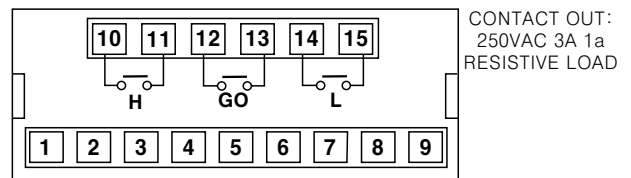
### ●MP5W-4N (Indication type)



### ●MP5W-4A (RELAY Five-stage output)



### ●MP5W-41 (Three-stage output)



(A) Counter

(B) Timer

(C) Temp. controller

(D) Power controller

(E) Panel meter

(F) Tacho/Speed/Pulse meter

(G) Display unit

(H) Sensor controller

(I) Proximity sensor

(J) Photo electric sensor

(K) Pressure sensor

(L) Rotary encoder

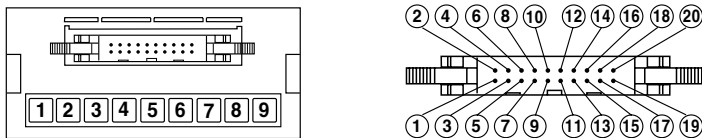
(M) 5-Phase stepping motor & Driver & Controller

※(★1) It is used for RESET terminal when an operation mode is F13. (See the "Operating mode" F-21 page)

※(★2) Please see F-24 page for BANK function.

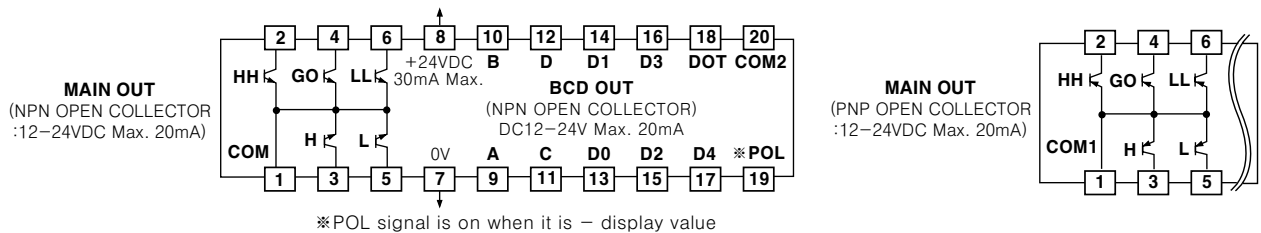
※Main output type & sub output type : option

### ◆Main output+Sub output(Connector)



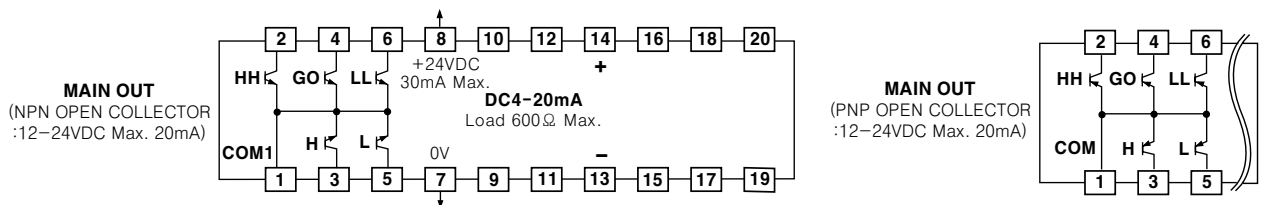
※Hirose Connector:HIF3BA-20PA-2.54DS

### ●MP5W-42/ MP5W-43 (NPN/PNP Open Collector output + BCD output)

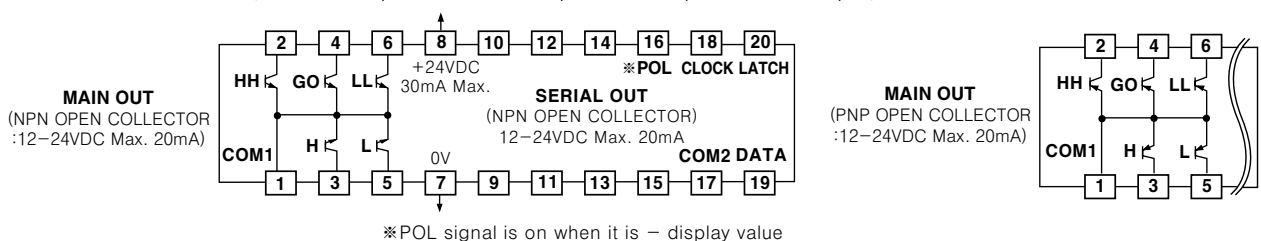


※POL signal is on when it is - display value

### ●MP5W-44/ MP5W-45 (NPN/PNP Open Collector output + PV transmission output(4-20mAADC) output)

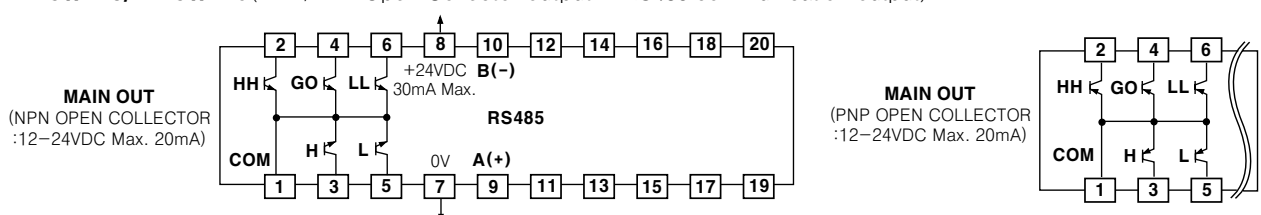


### ●MP5W-46/ MP5W-47 (NPN/PNP Open Collector output + Low speed serial output)



※POL signal is on when it is - display value

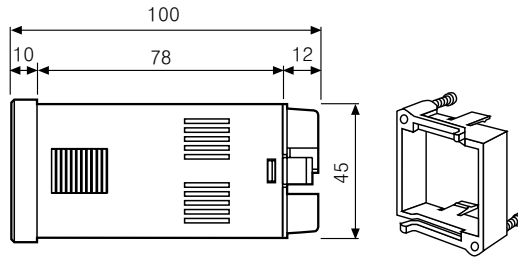
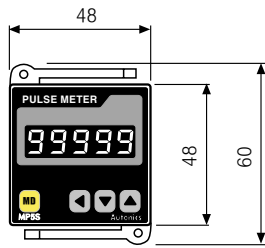
### ●MP5W-48/ MP5W-49 (NPN/PNP Open Collector output + RS485 communication output)



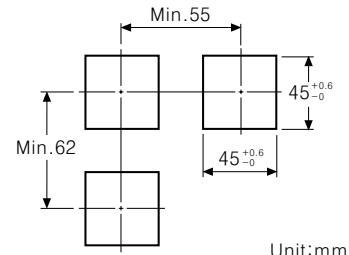
# MP5S/ MP5Y/ MP5W/ MP5M SERIES

## Dimensions

### ●MP5S Series

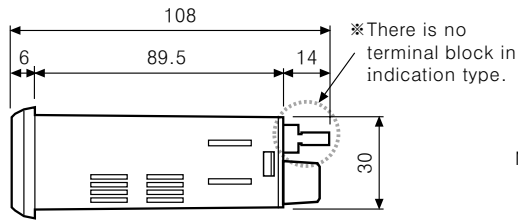
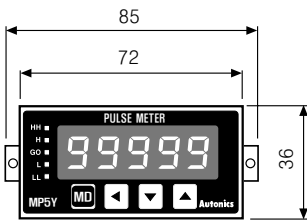


### ●Panel cut-out

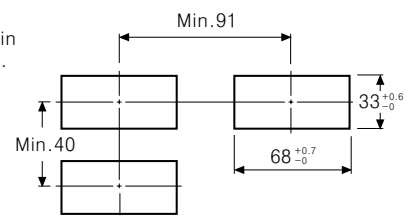


Unit:mm

### ●MP5Y Series



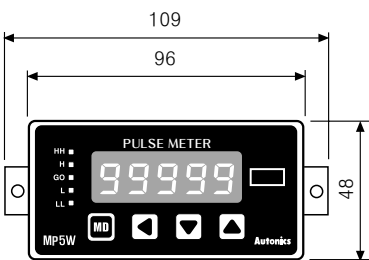
### ●Panel cut-out



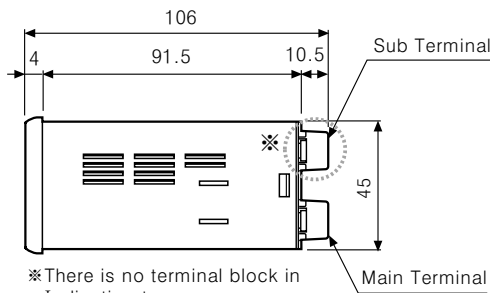
Unit:mm

※Hirose Connector :HIF3BD-10PA-2.54DS

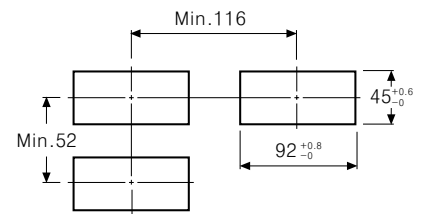
### ●MP5W Series



### [Terminal type]

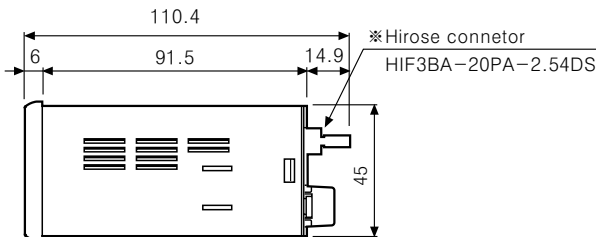


### ●Panel cut-out

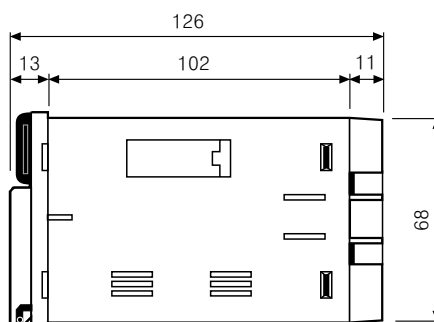
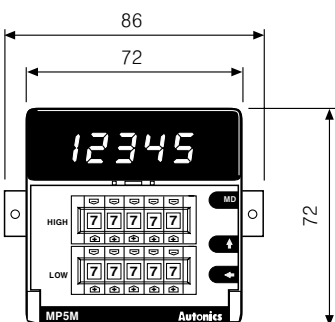


Unit:mm

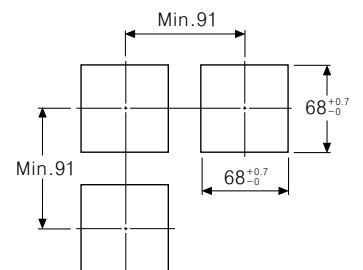
### [Connector type]



### ●MP5M Series



### ●Panel cut-out



Unit:mm

## Input specification

### Input signal

#### Non-contact input

- Input frequency: **50kHz Max.**

Standard duty rate of input signal is 1:1, ON/OFF pulse width should be over 10 $\mu$ s.

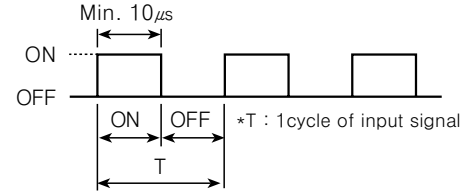
- Input voltage Level : ON voltage  $\rightarrow$  4.5–24V, OFF voltage  $\rightarrow$  0–1.0V

#### Relay contact input

- Input frequency : **45Hz Max.**

ON/OFF pulse width should be over 11ms.

- Relay contact specification : Please use a relay contact that can carry the load current (min. 12VDC 2mA).

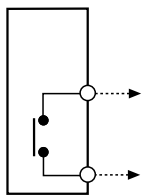


### Input type

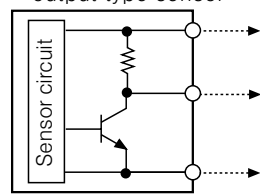
MP5W has NPN input and PNP input and you are able to select in Parameter 1 group.

#### 1) When it is NPN input type

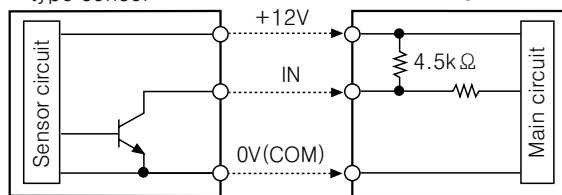
##### ① Contact



##### ② NPN voltage output type sensor

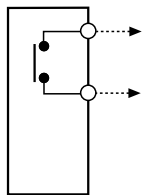


##### ③ NPN O·C output type sensor

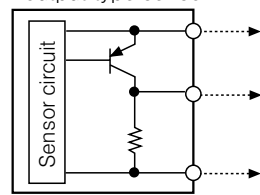


#### 2) When it is PNP input type

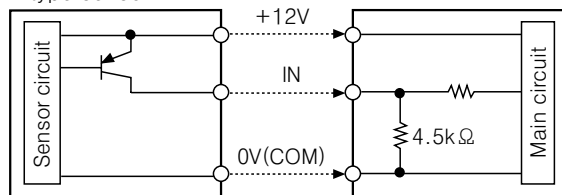
##### ① Contact



##### ② PNP voltage output type sensor



##### ③ PNP O·C output type sensor



※ O·C is Open collector output.

## Output specification (MP5Y/ MP5W Series)

### BCD Dynamic output

- Output : Display value

- Output signal

BCD Data (A, B, C, D, DOT)  $\leftarrow$  A : Lowest bit

Dot : Highest bit

Digit Data (D0, D1, D2, D3, D4)  $\leftarrow$  D0 : Lowest digit

D4 : Highest digit

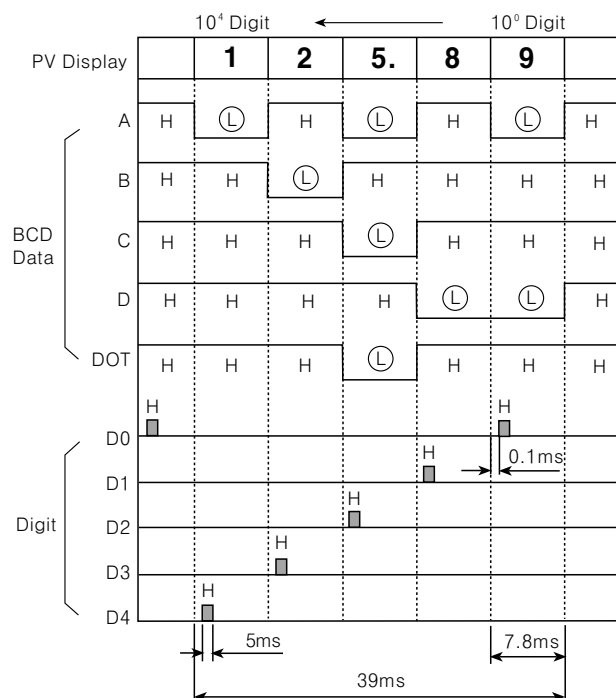
※ There is no Dot data output in MP5Y-43, therefore decimal point should be mark in first display plate.

- Output type : NPN Open collector

- Rated load voltage : 12–24VDC

- Max. load current : 30mA (MP5Y)/20mA (MP5W)

Ex) When BCD Dynamic output is 125.89



(A) Counter

(B) Timer

(C) Temp. controller

(D) Power controller

(E) Panel meter

(F) Tacho/ Speed/ Pulse meter

(G) Display unit

(H) Sensor controller

(I) Proximity sensor

(J) Photo electric sensor

(K) Pressure sensor

(L) Rotary encoder

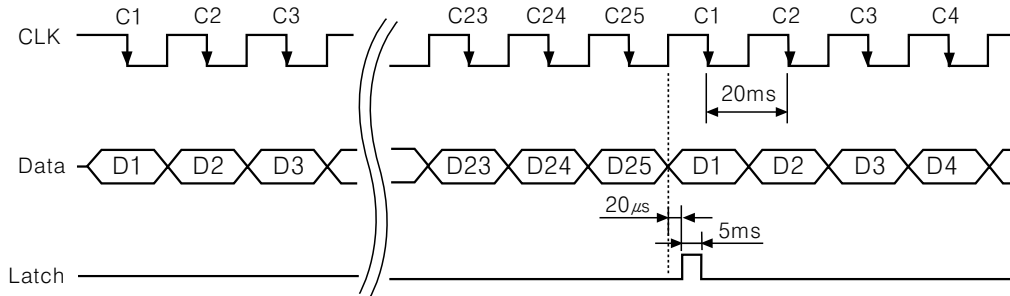
(M) 5-Phase stepping motor & Driver & Controller

# MP5S/ MP5Y/ MP5W/ MP5M SERIES

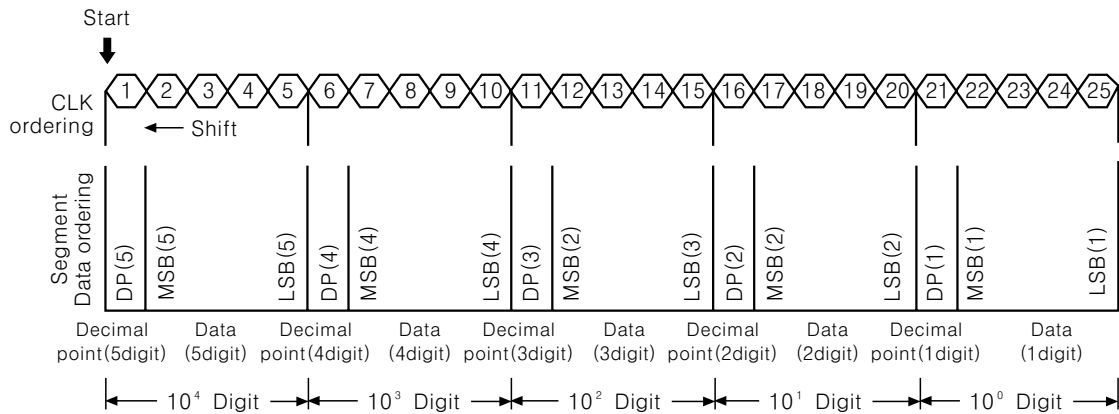
## ◎Low speed serial output

- Output : Display value
- Output signal : CLK, Data, Latch
- CLK cycle : 50Hz
- Output CLK bit : 25 bit
- Output Data bit : 25 bit
- Output form: NPN Open Collector
- Rated load voltag : 12–24VDC
- Max. load current : 30mA (MP5Y)/20mA (MP5W)

## ●Serial transmission time diagram

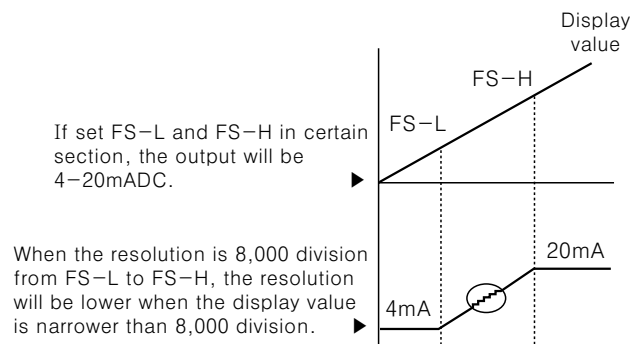


## ●Data output sequence when it is serial transmission



## ◎PV transmission output(4–20mADC)

- Application : Transmit the measured value
- Function : This function is to transmit 4–20mADC converted from measured display value between High limit output (FS-H) and Low limit (FS-L).
- Range of High/Low limit output setting
  - High limit setting range (FS-H) : From min. to max within range of measurement
  - Low limit setting range (FS-L) : From min. to max within range of measurement
- Resistive load : Max. 600Ω
- Resolution : 8000 division



## ◎RS485 communication output

- Address : 0 ~ 99 address (32 channels)
  - Transmission speed (Baud rate) : 2400/4800/9600 bps
  - Transmission code : ASCII
  - Parity Bit : No
  - Data Bit : 8 Bit
  - Stop Bit : 1 Bit
  - Communication items
    - MP5W ← PC : Comparative value of each bank data, Prescale value and Peak value, RESET control
    - MP5W → PC : Comparative value of each bank data, Prescale value and Peak value, Display value
- ※ See page F-26 for communication data.