DIGITAL COUNTER

SPS / KPS / NPS

■ Features of SPS

● **Setting lead value deals with a variety of machinery.**

It counts pulses from 2 ways encoder at an angle of 90. SPS is featured with two modes. Length measuring mode that measures from 1〜0.00001 and angle measuring mode that deals with 1 min/5 min/10 min/0.01°. Those two modes copes with all machinery.

● **Smaller area for a panel.**

Adapting compact box made it possible to miniaturize so that it's easier for you to use.

● **Set the lead value for a machine with parameter setting.**

It saves your time to match pluses number and the lead value for feed screws.

● **Non-volatile memory is able to store parameter set values and count values for a decade.**

● **Reset/Preset functions that catch signals from outside are equipped as standard.**

● **Free power supply is placed and it deals with AC 100〜240 V.**

■ Features of KPS

● **KPS is a digital counter that deals pulses number from rotary encoder with parameter setting.**

Digicollar has the following functions.
● Decimal setting from 1〜0.0001.
● Total count setting : possible to attach to a variety of machinery.
① Measuring mode
　Converts from a millimeter to an inch/a millimeter to a shaku.
② An angle mode
　Sexagesimal scale setting, 10 sec/30 sec/1 min/5 min/10 min.
　Decimal scale setting, an angle of 1°/0.1°/0.01°.
　Deals with speed reduction ratio as well.
It can attach to variety machinery.

● **Adjustable for many range of screw pitches.**

Parameter can send signal to set the lead value.
Pulse number of encoder and multiplication save your time to set up lead value.

● **Non-volatile memory is able to store parameter set values and count values for a decade.**

● **15 mm large LED is placed on the counter display.**

● **Digicollar with parallel output capability that operates reset/preset/latch hold/multiplier operator functions is also available.**

■ Specifications

**SPS
KPS**

Series	SPS	KPS
Display digits	±6 digits/Red 7 segments LED 10 mm in character height	±7 digits/Red 7 segments LED 15 mm in character height
Reset	It is possible to reset directly by external control input or to reset manually.	
Range of count	Length measurement : + 999999 〜− 99999 Angle : ±360.00°	Length measurement : ±9999999 Angle : ±360.00.00° Length measurement : Decimal・binary
Count mode	Angle 1・5・10 minutes・0.01・0.1・1 ° (Reading mode)	Angle 1・10・15・30 seconds・1・5・10 minutes・0.01・0.1・1 ° (Reading mode)
	Others : Rotation meter/Speedometer	
Decimal point position	Programmable setting by parameter.	
Lead value	Programmable setting by parameter.	
Memory	Nonvolatile memory backup. The encoder will not be counted when the power is off. Backup period : 10 year backup	
Switch functions	Clear・Digit・Up	Preset・Digit・Up・Down
Power source	AC100〜240 V ±10% 50/60 Hz 5 W	
Power supply for an encoder	DC 12 V 100 mA	DC 12 V 150 mA/DC 5 V 100 mA (Option)
Response frequency	5 kHz/50 kHz/500 kHz (Parameter setting)	
Rotation speed display function	The rotation speed of the encoder axis is displayed. (rpm display)	
Speed display	Velocity display by rotary encoder mm/min Peak holding : The maximum value of the counted value is displayed. Bottom holding : The minimum value of the counted value is displayed. Amplitude display : Displaying maximum to minimum of count rate	
External control input	Reset・Preset	Reset・Preset・Inhibits・mm ⇔ shaku・mm ⇔ inch
Operating temperature range	0〜45 ℃	
Operating humidity range	35〜90 % RH (no humidity)	
Storage temperature	−20〜80 ℃	
Weight	Approx. 200 g (incl. brackets)	Approx. 270 g (incl. brackets)
Vibration resistance	With 49 m/s², 30 minutes	
Impact resistance	With 294 m/s² X・Y・Z Three times each	
RoHS	Compliant	
Option	−	EX-2 or TC-1

※If KPS series are used as replacement for NKS counter series, please use fixing metal fitting(onerous).(KPS B installation metal fitting)

■ Specifications

NPS

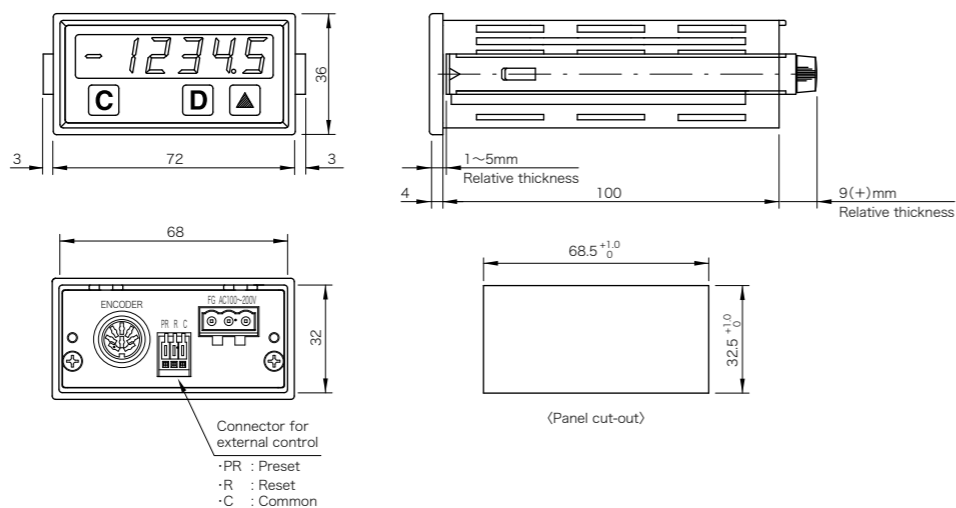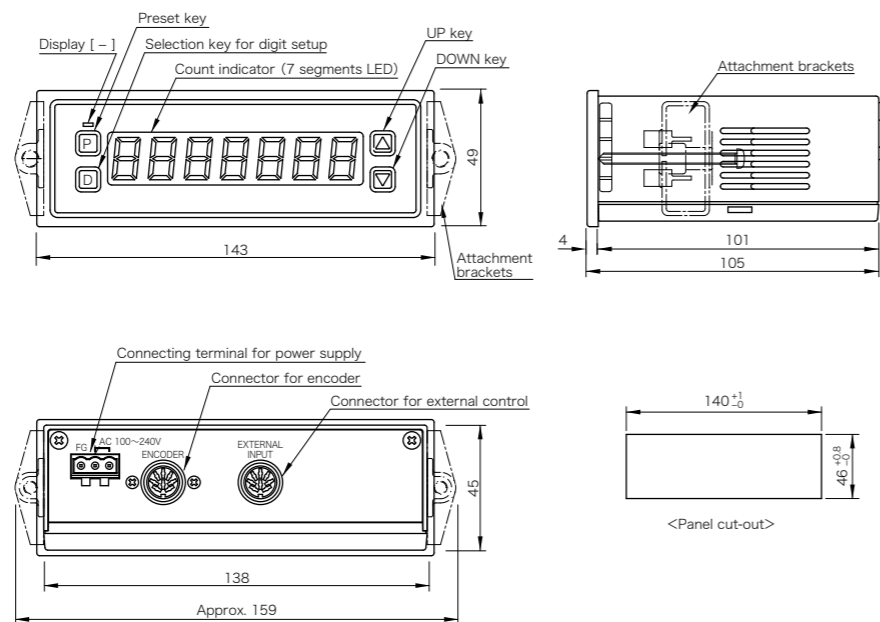| Series	NPS-□(Output option)
Output option	E : 0〜10 V/R : ±10 V/I : 4〜20 mA/P : Parallel option
Display digits	±7 digits/Red 7 segments LED 15 mm in character height
Range of count	±9999999　Angle : ±360.00.00°
Count mode	Length measurement : Decimal・binary Angle : 1・10・15・30 seconds・1・5・10 minutes・0.01・0.1・1° (reading mode) Others : Rotation meter/Speedometer
Reset/Preset	Press the [P] key for two seconds, to change the set-up value of Parameter-Function 08 to the present value. Set function 08 to "0" in order to "0" reset. It is possible to reset directly by external control input.
Decimal point position	Set function to 02.
Lead value	Set function to 03.
Memory	Nonvolatile memory backup.　Backup period : 10 year backup
Switch functions	[D] key : Selection of digit to be set up [P] key : Insertion [▲] key : UP [▼] key : DOWN
Power source	AC100〜240 V ±10%　50/60Hz　5W
Power supply for an encoder	DC12 V 150 mA/Optional DC5 V 100 mA
Encoder signal	A/B phases output Open collector/responds to the voltage output.
Response frequency	5 kHz(Low speed)/50 kHz(Standard)/500 kHz(High speed)(Function 25 switch setting)
External control input	Reset・Preset・Inhibits・Pass-Fail・Sequence reset・Transmission of present value Panel lock・Display hold・mm ⇔ shaku・mm ⇔ inch・Calculating input
Point output signal	Points output 1-10, Resisting pressure 30 V or less, Sink current 50 mA or less
Serial communication	RS-232C(one-to-one)・RS-485(max. of 32 axes)
Point output functions	Set in Function 17 ・Point passing ON setting　10 points setting ・Point passing OFF setting　10 points setting ・Bound pair limit setting　It is possible to set up to 5 systems, dividing 10 points by 2. ・Setting within the range　It is possible to set up to 5 systems, dividing 10 points by 2. ・±OK range setting　Admission decision, possible for 10 points. ・Front side output setting　Optimum for determining the basic position. (level output) ・Front side output setting　(One-shot output)
Rotation speed display function	The rotation speed of the encoder axis is displayed.(rpm display)
Speed display function	The speed is displayed based on the encoder pulse.(mm/minute) The speedometer using a wired type linear encoder etc. can be displayed.
Display holding function	・Peak holding　The maximum value of the counted value is displayed. ・Bottom holding　The minimum value of the counted value is displayed. ・Width of swinging is displayed 　(The maximum value of count value.)−(The width of swinging of minimum value is displayed.) ・Automatic reset　When the count value re aches the set value of function 20, it is reset to "0"
Parallel output	28 bit/SIGN/Strobe(When option is set)(P)
Parallel output update time	Approx. every 1ms
Analog output (Optional functions)	・0〜10 V (E) /±10 V (R) /4〜20 mA (I)　Appoint order time ・Output of update time　1 ms ・Resolution performance　10000 ・Load resistance　4.7 kΩ or more (Voltage output)　560 Ω or less (Electric current output) ・Output accuracy　within ±0.2 % F・S (Room temperature) ・Linearity　±0.1 % or less ・Temperature coefficient　±200 ppm/℃ or less
Operating temperature range	0〜45 ℃
Storage temperature range	−20〜80 ℃
Weight	350 g
Vibration resistance	With 49 m/s², 30 minutes
Impact resistance	With 294 m/s² X・Y・Z Three times each
RoHS	Compliant
Option	CK-5-2 : External control input-output　CK-4-2 : Parallel output ※Option CK-11-2(RS-232C Only)　Read-EXCEL(communication software)

DIGITAL COUNTER

■Outline drawing ▶

SPS

3　72　3

1～5mm
Relative thickness
4　100

9(+)mm
Relative thickness

36

68

68.5 +1.0 0

32

32.5 +1.0 0

〈Panel cut-out〉

ENCODER　TG AC100～200V
PR R C

Connector for
external control
・PR ： Preset
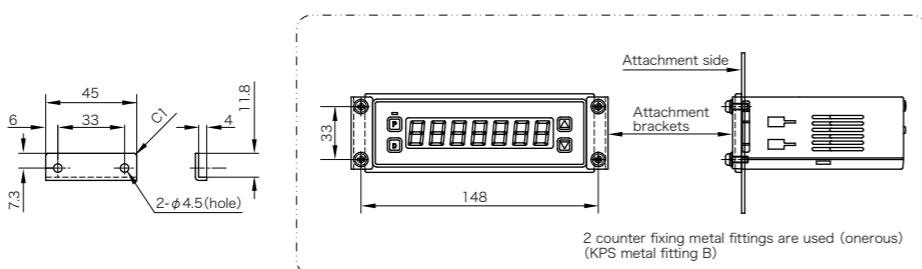・R ： Reset
・C ： Common

■Outline drawing ▶

KPS

If it is used as a replacement for NKS counter series, please use counter fixing metal fitting (onerous)
(KPS installation metal fitting B.)

Display [−]
Preset key
Selection key for digit setup
Count indicator（7 segments LED）
UP key
DOWN key
Attachment brackets

143
Attachment brackets

49

4　101
105

Connecting terminal for power supply
Connector for encoder
Connector for external control

FG AC 100～240V
ENCODER
EXTERNAL
INPUT

138
Approx. 159

45

140 +1 0
46 +0.8 0

<Panel cut-out>

■Outline drawing ▶

Counter fixing metal fitting. （KPS installation metal fitting B. ）

45
6　33
C1　4　11.8
7.3
2-φ4.5（hole）

33
148

Attachment side
Attachment brackets

2 counter fixing metal fittings are used （onerous）
(KPS metal fitting B)

■Parameter ▶

KPS

Default value

	No.	Item	8th	7th	6th	5th	4th	3rd	2nd	1st
Basic setting	01	Basic parameter setting							0	0
	02	Decimal point position setting							1	1
	03	Lead value setting	0	0	0	2	0	0	0	
	04	Pulse number setting of encoder one rotation	0	0	0	1	0	0	0	
	05	Count mode setting							0	0
	06	Count polarity switch								0
	07	Angle count mode switch								0
	08	Preset value setting	(−)	0	0	0	0	0	0	0
	09	Arbitrary multiplier operation setting (Mantissa)	0	0	0	0	0	0	0	1
	10	Arbitrary multiplier operation setting (Index)								0
Parallel output setting	18	Parallel output code setting								0
Display holding setting	19	Display holding mode setting								0
Setting at display update time	21	Setting of display update time						0	0	0
Moving average measurement frequency setting	22	Moving average measurement frequency setting						9	1	0
A／B phase input response change	25	Encoder input response frequency change setting								1

【FUN1】：Basic parameter setting

8th	7th	6th	5th	4th	3rd	2nd	1st	
						0	0	Default value

Basic parameter setting sets the function data to an already decided default value in order to simplify the initial setting.

FUN1	FUN2	FUN3	FUN4	FUN5	
Set value	Decimal point position	Lead value	Number of pulses	Count mode	Adjustment model
00	11	200.0	1000	00	D-1000Z／DE-04／DL-07
01	11	400.0	1000	00	D-540／SIS（MAKOME）／DL-20A／DL-30i／DES-01
02	22	40.00	1000	00	D-5400／DX-025／Linear scale EMIX2／DEX-01
03	11	100.0	1000	00	DS-025
11	Automatic	360.0	2160	10	A-2160　10 minutes reading mode
12	Automatic	360.0	2160	11	A-2160　5 minutes reading mode
13	Automatic	360.0	5400	12	A-5400　1 minute reading mode
14	Automatic	360.00.00	10800	16	NH-10800　30 seconds reading mode
15	Automatic	360	100	13	100P／R　1° Reading mode
16	Automatic	360.0	1000	14	1000P／R　0.1° Reading mode
17	Automatic	360.00	9000	15	9000P／R　0.01° Reading mode
20	33	4.000	1000	00	Linear scale EMIX23
50	00	60	100	50	Rotation meter mode（100P／R）
51	33	12.000	1000	50	Speedometer（D-1000Z／DE-04）Linear encoder

※ When setting other than the basic parameter, after setting the count mode first, rewrite the setting for the number of pulses and lead value.
※ The position of the decimal point of the angle mode is set on automatic setting and will skip the display for function 02.

【FUN2】：Decimal point position setting

8th	7th	6th	5th	4th	3rd	2nd	1st	
						1	1	Default value

・The first digit
　When the multiplier calculator of the external control signal is ON, the decimal position is set.（Used for unit change setting）
・The second digit
　Set the decimal point position for the usual setting.

0	Not displayed after the decimal point.
1	□□□□□□.□
2	□□□□□.□□
3	□□□□.□□□
4	□□□.□□□□
5	□□.□□□□□

※ Decimal point position when angle mode is selected is automatically set depending on each count mode.

【FUN3】：Lead value setting

8th	7th	6th	5th	4th	3rd	2nd	1st	
	0	0	0	2	0	0.	0	Default value

・The encoder installed in the machine sets the distance that the machine moves when one rotation is made.
・The decimal point position is the set value of the second digit for function 02.
・The given value is set when, as in the case of angle mode also, it is not in function 01 in the basic setting.
・When set to rotation meter mode, the value which is displayed when the pulse set for function 04 is input is set.

【FUN4】：Pulse number setting of encoder

8th	7th	6th	5th	4th	3rd	2nd	1st
	0	0	0	1	0	0	0

・The number of pulses generated when the encoder installed in the machine makes one rotation is set.
・The same for the rotation meter mode is done, the number of pulses of the encoder when it makes one rotation is set.

※Calculate necessary minimum number of encoder pulses from the following calculation formula.
Number of encoder pulses＝＞（Lead value÷minimum reading value）÷4

If the number of pulses of the encoder are more than that of the formula above, then it is usable.

DIGITAL COUNTER

■ Parameter
KPS

【FUN5】：Count mode setting

8th	7th	6th	5th	4th	3rd	2nd	1st	
						0	0	Default value

Set value	Count mode	Content of display
00	Decimal	±9999999
01	Binary	±9999995
10	10 minutes	±359.50
11	5 minutes	±359.55
12	1 minutes	±359.59
13	1°	±359
14	0.1°	±359.9
15	0.01°	±359.99
16	30 seconds	±359.59.30
17	15 seconds	±359.59.45
18	10 seconds	±359.59.50
19	1 seconds	±359.59.59
50	Rotation meter	9999999

【FUN6】：Count polarity switch

8th	7th	6th	5th	4th	3rd	2nd	1st	
							0	Default value

Change to either of "0" or "1" when changing the count polarity.

【FUN7】：Angle count mode switch

8th	7th	6th	5th	4th	3rd	2nd	1st	
							0	Default value

0 : ± is counted on the boundary of "0°".
　(−360°～−2°・−1°・0°・1°・2°～360°)
1 : It is shown within the range of "0 to 360°", and "−(Minus)" is not displayed.
　Example : "−" is not displayed as
　359.58⇔359.59⇔0.00⇔0.01⇔0.02.(At one-minute mode)

【FUN8】：Preset value setting

8th	7th	6th	5th	4th	3rd	2nd	1st	
(−)	0	0	0	0	0	0.	0	Default value

・After setting the given value to function 08, when returned to ordinary mode, the set value will be corrected to this given value.
・When the [PRESET] of the external control signal is input, the value will be corrected to the set value of function 08.
・The value is corrected to this value when the [P] key of the panel is pressed.

【FUN9】：Arbitrary multiplier operation setting(Mantissa)

8th	7th	6th	5th	4th	3rd	2nd	1st	
	0	0	0	0	0	0	1	Default value

(0000001～9999999)

【FUN10】：Positional specification of arbitrary multiplier operation value setting(index)[decimal point]

8th	7th	6th	5th	4th	3rd	2nd	1st	
							0	Default value

(0 ～ 9)　$10^0 \sim 10^{-9}$
When the arbitrary multiplier operation signal is ON, the above-mentioned value is operated and displayed for the display.

Example	FUN 9 setting	FUN 10 setting	FUN 2 setting
Current value mm	Arithmetic ON	(Mantissa portion)(Exponent portion)	(Decimal point setting)
254.00 mm→	10.000 inches	Arithmetic value 39370	5	23
303.3 mm →	1.00 shaku	Arithmetic value 33003	5	12

※ Constant operation does not function when angle mode is being used.

【FUN11～17】：Unused

Do not change the set value.

【FUN18】：Parallel output code setting (Only KPS-P is effective)

8th	7th	6th	5th	4th	3rd	2nd	1st	
							0	Default value

0 : BCD code output
1 : Binary code output
2 : Gray code output
The form of the parallel output signal switches from BCD code output, binary code output and the gray code.

【FUN19】：Display holding setting

8th	7th	6th	5th	4th	3rd	2nd	1st	
							0	Default value

0 : The count value is displayed.
1 : Peak holding(maximum value)display
　When the maximum value of the count value is updated, the value is displayed.
2 : Bottom holding(minimum value)display
　When the minimum value of the count value is updated, the value is displayed.
3 : Peak holding(maximum value)display―Bottom holding(minimum value)display : Width of swinging
　The difference between the maximum value and the minimum value of the count value is displayed.
4 : Unused

【FUN20】：Unused

Do not change the set value.

【FUN21】：Setting of display update time

8th	7th	6th	5th	4th	3rd	2nd	1st	
					0	0.	1	Default value

・Set when setting the rotational speed mode and the speed display mode or to suppress "Flicker" of the LED display.
・When set to "0", this becomes the usual display, and the maximum set value is 99.9 seconds.

【FUN22】：Moving average measurement frequency setting

8th	7th	6th	5th	4th	3rd	2nd	1st	
					9	1	0	Default value

● The first digit　　　Moving average frequency
0/1 : Direct display
2 ~ 9 : Moving average frequency specification
・It becomes effective at rotation meter mode and the speedometer mode and when the initial value is "0", the measurement values are displayed directly.
・If the value is set at "3", the mean value of the past three times will be calculated and displayed.
・By using this moving average function the difference of the display can be suppressed.

● The second digit　　Sampling duration
0 : 100 ms
1 : 1 sec(Default Value)
2 : 10 sec
・It becomes effective at rotation meter mode and the speedometer mode when the initial value is "1", the sampling duration is one second.
・If the rotational speed is quick, set to 100 ms, if it is extremely slow, set it at ten seconds.

● The third digit　　Do not use
※Do not change the set value.

【FUN23～24】：Unused

Do not change the set value.

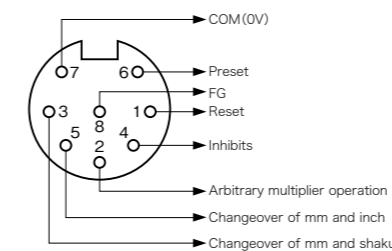### 【FUN25】：Encoder input response frequency change setting

8th	7th	6th	5th	4th	3rd	2nd	1st	
							1	Default value

・The maximum response frequency of the encoder input is switched.
0 : 5 kHz Response
1 : 50 kHz Response
2 : 500 kHz Response
・When it is set to high-speed response, the encoder signal line is easily influenced by noise so make sure to ensure noise measures.

【FUN26】：Unused

Do not change the set value.

■ External Control Input
KPS

COM(0V)
7　6　Preset
3　8　1　FG
5　4　Reset
2　Inhibits
Arbitrary multiplier operation
Changeover of mm and inch
Changeover of mm and shaku

Enter Contact- A between the desired signal line and COM.
When using an open collector, the signal line should be connected with the collector, while the emitter side should be connected with the COM (0V) side.

< NOTE >
It is convenient to use the option extension cable (EX-2) .
In addition, it is convenient to use the (AX-2) in order to use multiplier calculator.

■ Usage
KPS

Panel description
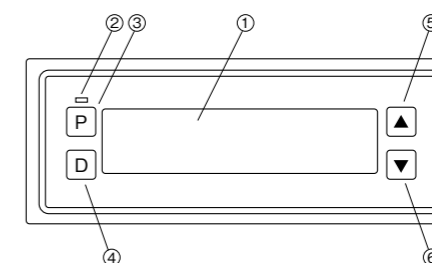
① 7 segments LED
Here displays count value, and value when each parameter setting is selected.

② Display [−]
Light is put when the eighth digit of count value or parameter setting value are "−".

③ [P] key
It is used to decide the parameter data. When it is pushed during operation, current value is collected to the value set in FUN08.

④ [D] key
Setting digit shifts to right every time the button is pushed during parameter is set. If the button is pushed more than two seconds, presetting mode will activate.

⑤ [▲] key
If the button is pushed more than two seconds during ordinal displaying, the function input mode will activate. Setting value will be higher every time the button is pushed while the parameter setting is in use.

⑥ [▼] key
Setting value will be lower every time the button is pushed when the parameter is set.

■ Function mode
KPS

Set each parameter(function) in order to set the function of the counter.

Step 1
It becomes function mode when the [▲] key is pressed for two seconds. In that case, "F-01" is displayed immediately after the first usage but after the second time onwards, the last function number selected will be displayed when it is switched ON again. At this time, the data set as the function number and the function number which has been selected will be displayed alternately.

Step 2 : Selection of function number
At an alternate display, the function number advances whenever the [▲] key is pressed. Whenever the [▼] key is pressed, the function number reverses. If the [▲] key or [▼] key is pressed for a long time, the function number will fast-forward.

Step 3 : Change or confirmation of set value
When the function number that needs to be changed or confirmed is displayed, the function number and set value will be alternately displayed so the set value can be confirmed. When [D] key is pressed in this state, it shifts to the set value change mode.

Step 4 : Change of set value
From step 3, the digit that can be entered starts blinking, and whenever [D] key is pressed, the set digit moves to the right. After the set digit moves to the very end and the [D] key is continually pressed, the set digit returns to the very top.
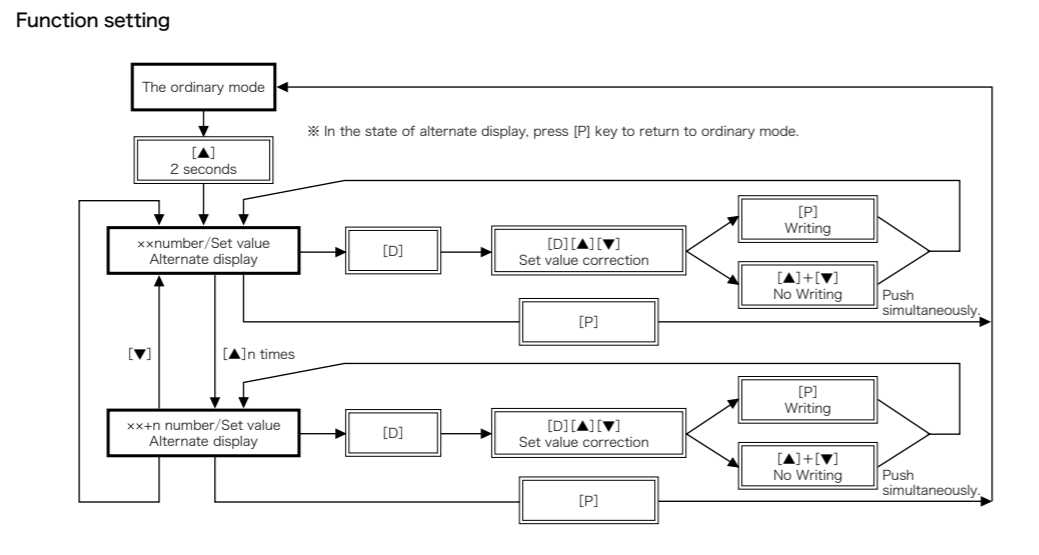
Step 5 : Setting and change in data
If the [▲] key is pressed where the blinking digit is, the set value will increase. The set value will decrease when the [▼] key is pressed. Moreover, "−(Minus)" is displayed in data in which "Minus" data can be set.
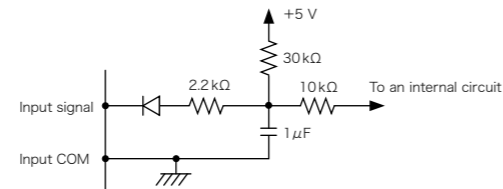
Step 6 : Set value change fixation and confirmation
When the setting of the data is finished, press the [P] key to set the registration data, and the set value and function number will be displayed alternately. When the [P] key is pressed in this state, it will return to ordinary mode.
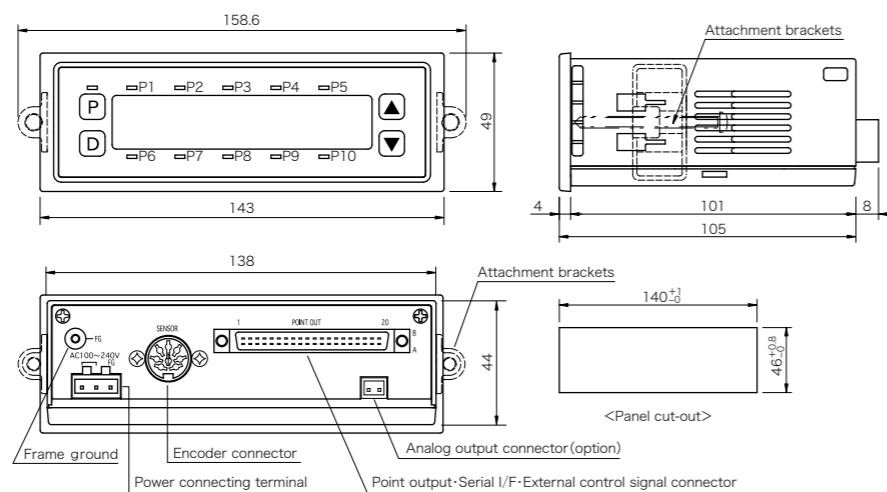
DIGITAL COUNTER

■ Flow of operation
KPS

Function setting

※ In the state of alternate display, press [P] key to return to ordinary mode.

- The ordinary mode
- [▲] 2 seconds
- ××number/Set value Alternate display
- [D]
- [D] [▲] [▼] Set value correction
- [P] Writing
- [▲]+[▼] No Writing
- [P]
- Push simultaneously
- [▼]
- [▲]n times
- ××+n number/Set value Alternate display
- [D]
- [D] [▲] [▼] Set value correction
- [P] Writing
- [▲]+[▼] No Writing
- [P]
- Push simultaneously

■ Input circuit
KPS

- +5 V
- 30 kΩ
- 2.2 kΩ
- 10 kΩ
- To an internal circuit
- Input signal
- 1 μF
- Input COM

■ Outline drawing
NPS

158.6

49

143

138

44

Attachment brackets

SENSOR   POINT OUT

AC100~240V

P1 P2 P3 P4 P5
P6 P7 P8 P9 P10

101
105
4   8

140 +1 −0
46 +0.8 −0
<Panel cut-out>

Frame ground

Encoder connector

Power connecting terminal

Analog output connector (option)

Point output・Serial I/F・External control signal connector

■ Encoder signal input connector
SPS
KPS
NPS
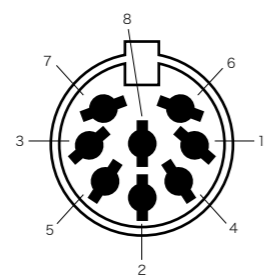
Figure seen from the cable side (TC-1/TC-5)

Pin No.	Signal name
1	B phase
2	NC
3	NC
4	NC
5	A phase
6※	+ 12 V (150 mA)
7	0 V
8	Shield

※ + 5 V (100 mA) for option

■ I/O circuit
NPS

Input circuit

+12 V
680 Ω
820 Ω
D1 Input signal
Input COM (A01, B01)
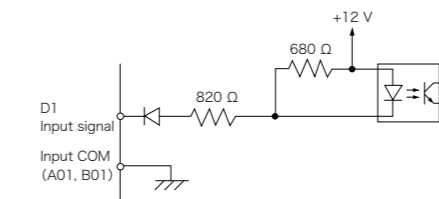
※ Short-circuit between the input signal COM terminal and terminal of each input signal.

Point output circuit

OUT (A15~19/B15~19)
COM (A20, B20)
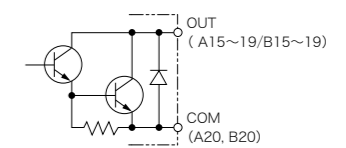
Output capacity
Resisting pressure : 30 V or less
Sink current : 50 mA or less
Residual voltage : 1.2 V or less

※ Input COM and output COM are independent.

■ External control signal
NPS

External control input/output signal pin array

| Pin No.	Signal name	Dot mark and line color of option cable CK-5-2	Pin No.	Signal name	Dot mark and line color of option cable CK-5-2
A01	COM for control input signal	OR RE −	B01	COM for control input signal	OR BK −
A02	RESET input signal	GR RE −	B02	PRESET input signal	GR BK −
A03	Inhibit input signal	WH RE −	B03	Admission determination input signal	WH BK −
A04	Present value transmission input signal	YE RE −	B04	Sequence reset input signal	YE BK −
A05	Panel lock input signal	PI RE −	B05	Display holding input signal	PI BK −
A06	mm/shaku switch-over input signal	OR RE −−	B06	mm/inch switch-over input signal	OR BK −−
A07	Multiplier operation input signal	GR RE −−	B07		GR BK −−
A08		WH RE −−	B08		WH BK −−
A09	RS-485 (TXD +)	YE RE −−	B09	RS-485 (TXD −)	YE BK −−
A10	RS-485 (RXD +)	PI RE −−	B10	RS-485 (RXD −)	PI BK −−
A11	RS-485 (Termination resistance)	OR RE −−−	B11	RS-485 (Termination resistance)	OR BK −−−
A12	RS-232C (TXD)	GR RE −−−	B12	RS-232C (RXD)	GR BK −−−
A13	RS-232C (SG)	WH RE −−−	B13		WH BK −−−
A14		YE RE −−−	B14		YE BK −−−
A15	Point 1 output signal	PI RE −−−	B15	Point 2 output signal	PI BK −−−
A16	Point 3 output signal	OR RE −−−−	B16	Point 4 output signal	OR BK −−−−
A17	Point 5 output signal	GR RE −−−−	B17	Point 6 output signal	GR BK −−−−
A18	Point 7 output signal	WH RE −−−−	B18	Point 8 output signal	WH BK −−−−
A19	Point 9 output signal	YE RE −−−−	B19	Point 10 output signal	YE BK −−−−
A20	Output signal COM	PI RE −−−−	B20	Output signal COM	PI BK −−−−

OR : Orange, GR : Gray, WH : White, YE : Yellow, PI : Pink, RE : Red, BK : Black   ※ Use option CK-5-2 to connect.

## ■ External control input/output signal
NPS

Signal name	Function explanation
Control input signal COM	[Input signal COM line] COM for each input signal
Reset(One-shot)	[Signal for resetting present value to "0"] Resets present value shown in LED to "0".
Preset(One-shot)	[Preset signal] Corrects present value, shown in function 08(preset value setting), to the preset value.
Inhibit(level)	[Inhibit signal]Would not count, even if the encoder signal is inputted, when the inhibit signal is on.
Admission decision(level)	[Admission decision signal] For admission decision function, set "4" to function 17. When the admission decision signal is on, the ±OK ranges of function 15 and function 16 and the present value are compared. If it is within the OK range, each point output signal will turn ON.
Present value transmission (One-shot)	[Present value transmission signal] Output format based on "P2" instruction of the present value shown in LED, is delivered by serial communication.
Sequence reset	When the sequence reset function 17 is set to 5, it becomes front side output setting function. After the sequence output is ON, the output signal turns off by present value transmission signal.
Panel lock(level)	[Panel lock signal]When the panel lock signal is ON, the switches on the navigational panel is inoperative.
Display hold(level)	[Display hold signal] While the display hold signal is OFF, it displays what is set to function 19. When the display hold signal is on, it displays the present value.
【mm/shaku switch-over】(level)	[mm/shaku switch-over signal] Converts and displays the present value in shaku. The decimal point position is displayed accordingly to the first digit in function 02.
【mm/inch switch-over】(level)	[mm/inch switch-over signal] Converts and displays the present value in inches. The decimal point position is displayed accordingly to the first digit in function 02.
Multiplier operation(level)	[Arbitrary multiplier operation signal]When the arbitrary multiplier operation signal is ON, it calculates the arbitrary multiplier value and the present value and displays the result as the present value.
RS-485	Use to use counters and serial communications of multiple units. Can connect up to 32 axes.
RS-485 (termination resistance)	To connect multiple axes, short circuit the pin of the termination (termination resistance)resistance, of the hindmost counter from the PC(A11 and B11).
RS-232C	For a one-to-one serial communication
POINT1~10	[Point output signal] Output signal for each point data.
Output signal COM	[Output signal COM] Output COM for points 1~10

DIGITAL COUNTER

■ Setting of point output configuration
NPS

0 : Compared output
（ON when value set < displayed value）
Turns ON as the count moves farther away from 0 and passes the set point value.（P1～10）
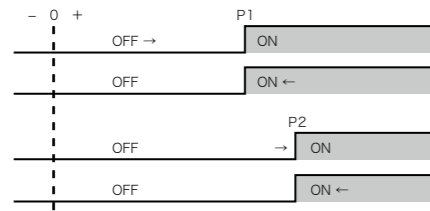
1 : Compared output
（OFF when value set < displayed value）
A reverse action of point output configuration 0. Turns OFF as the count moves farther away from 0 and passes the set point value.（P1～10）
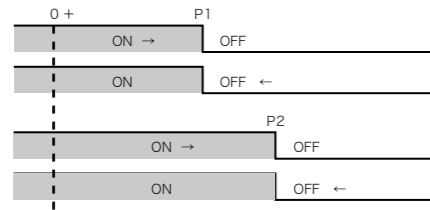

2 : Compared output
（P1～P5 ON when value set < displayed value,
　P6～P10 OFF when value set < displayed value）
Separate point output signal into 2 blocks, P1～P5 and P6～P10. Turns ON when the output of P1～P5 exceeds the set point. As for P6～P10, turns ON when it falls below the set value.
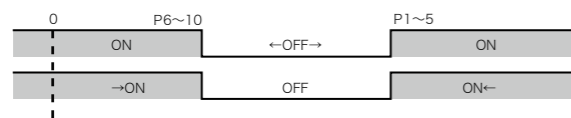

・Use P1～P5 for output signal. P6～P10 are not used.
・As shown in the figure above, limit signal can be applied to turn ON when the count exce eds the set range.

3 : Compared output
（P1～P5 OFF when set value < displayed value,
　P6～P10 ON when set value < displayed value）
A reverse action of point output configuration 2.
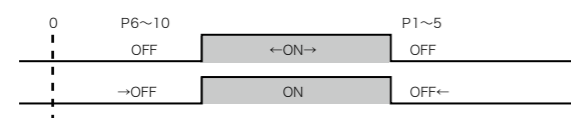
・Use P1～P5 for output signal. P6～P10 are not used.
・As shown in the figure above, can set to turn OFF when the count goes out of the set range by applying are a detection.

4 : Admission decision function
・Point settings can be set to P1～P10.
・Compares the count value and point set value accordingly to point output OK range settings of FUN15 and FUN16, when the pass-fail signal is ON.
・The point output signal turns to OK if it is in the OK range.
・If the result is OK, output of P1～P10 corresponding to each point number turns ON. Furthermore, when the admission decision signal is on, and the corresponding point output signal does not appear, the count is out of the OK range.
・When the admission decision signal is ON, results of all point values（P1～P10）will be read out.
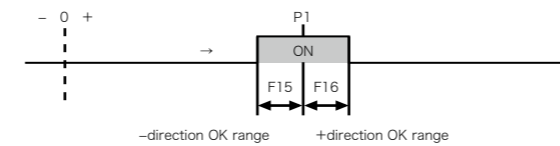
5 : Front side output setting（level output）
・Set points to P1～P5. For P6～P10, set range for each cor-responding front side output（decelerating domain）.
・Consistently determines the points regardless to the admission decision signal.
・Sequence output of P1～P5 turn ON when the counts pass the set value. Turns OFF when the sequence output reset signal is ON.
・The groupings of point numbers are as below.

Sequence output	P1	P2	P3	P4	P5	Sequence output line / Sequence point setting
Front side output	P6	P7	P8	P9	P10	Front side output line / Front side output area setting
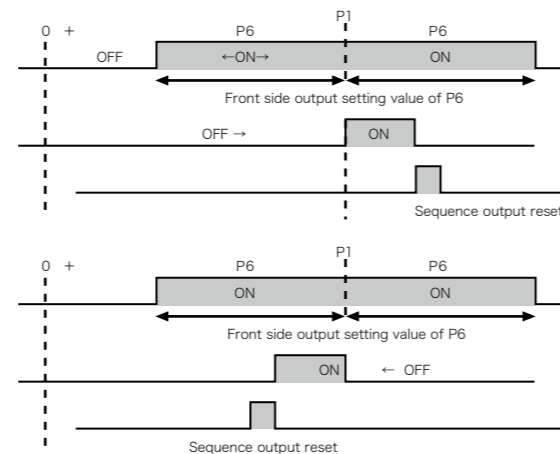
6 : Front side output setting（One-shot output）
・Operation of point output is the same as setting of 5, but, the sequence output will be one-shot output.（0.5 sec.）
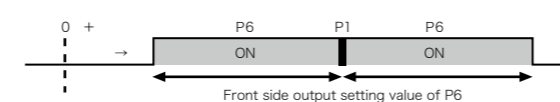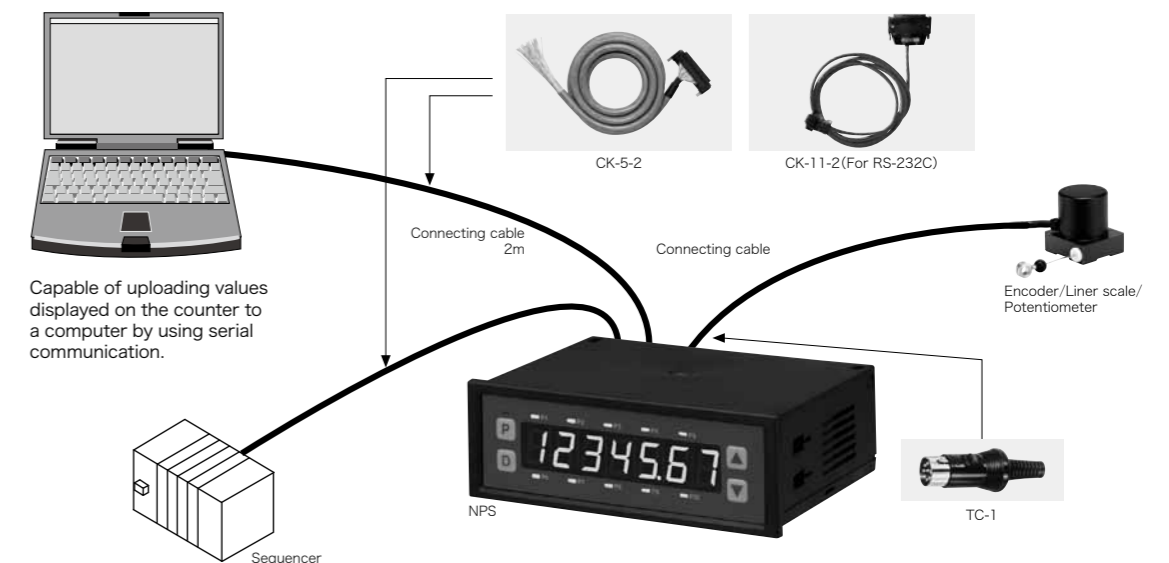

■ Communication control
NPS

Outline of serial communication
Data communication is operated through computer/sequencer and RS-232C or I/F standardized by RS-485 with serial communication.

Communication system	Half-duplex communications ; however, RS-422/485 is double connection
Synchro system	Asynchronous communication
Transmission code	ASCII 7bit
Error detection	Lateral parity is even
Stop bit	1 bit
Transfer speed	2400/4800/9600/19200/38400 bps
Unit number	00 ～ 32 (00 : When only one axis is used.)

【Example】P2 : Reply of present value counter

STX	X	X	P	2	X	X	X	X	X	X	X	X	ETX
	Unit No.		Instruction code					Data					
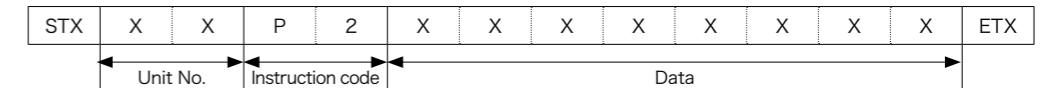
Uploading values measured by Encoder/Linear scale/Potentiometer to computers（RS-232C/485 in use）

Capable of uploading values displayed on the counter to a computer by using serial communication.

CK-5-2　　CK-11-2（For RS-232C）

Connecting cable 2m　　Connecting cable

Encoder/Liner scale/Potentiometer

NPS　　TC-1

Sequencer

■ Display holding setting
NPS

0 : The count value is displayed.
1 : Peak holding（maximum value）display
　　When the maximum value of the count value is updated, the value is displayed.
2 : Bottom holding（minimum value）display
　　When the minimum value of the count value is updated, the value is displayed.
3 : Peak holding（maximum value）display – Bottom holding（minimum value）display: Width of swinging
　　The difference between the maximum value and the minimum value of the count value is displayed.
4 : Automatic reset
　　Resets the count value to 0 and continues to count immediately, when the count value corresponds the value set to function 20.

■ Serial communication : instruction
NPS

1.	［F0］	= Writing of function data	→Counter side
2.	［F1］	= Transmission request of function data	→Counter side
3.	［F2］	= Transmission of function data	←Counter side
4.	［P0］	= Correction of present value counter	→Counter side
5.	［P1］	= Transmission request of present value counter	→Counter side
6.	［P2］	= Transmission of present value counter	←Counter side
7.	［T0］	= Writing point data	→Counter side
8.	［T1］	= Transmission request of point data sent	→Counter side
9.	［T2］	= Transmission of point data	←Counter side
10.	［A0］	= Transmission of data confirming OK from the PC	←Counter side

DIGITAL COUNTER