KCX series

Category			Model number	Number of digits	Memry backup at power failure	Operation speed	Sensor power	Source voltage
Preset Counter	Single preset	Addition with I/O indicators	**KCX-1**	1		10cps/ 200cps	DC12V 50mA	AC90～132V AC180 ～264V 50/60Hz
			KCX-2	2				
			KCX-3	3		10cps/ 1kcps		
			KCX-4	4				
		Addition with numerical display	**KCX-1D**	1		10cps/ 200cps		
			KCX-2D	2				
			KCX-2DM	2	●			
			KCX-3D	3		10cps/ 1kcps		
			KCX-3DM	3	●			
			KCX-4D	4				
			KCX-4DM	4	●			
			KCX-5D	5		10cps/ 5kcps		
			KCX-5DM	5	●			
			KCX-6D	6				
			KCX-6DM	6	●			
		Addition and Subtraction	**KCX-B4**	4		10cps/ 20kcps	DC24V 80mA	AC90～132V AC180～264V 50/60Hz
			KCX-B4M	4	●			
			KCX-B6	6				
			KCX-B6M	6	●			
	Dual preset (with numerical display)	Addition	**KCX-3W**	3		10cps/ 2kcps	DC12V 50mA	AC90～132V AC180～264V 50/60Hz
			KCX-4W	4				
			KCX-4WM	4	●			
			KCX-5W	5		10cps/ 5kcps		
			KCX-6W	6				
			KCX-6WM	6	●			
		Addition and Subtraction	**KCX-B4W**	4		10cps/ 20kcps	DC24V 80mA	AC90～132V AC180～264V 50/60Hz
			KCX-B4WM	4	●			
			KCX-B6W	6				
			KCX-B6WM	6	●			
Total counter	—	Addition	**KCX-4T**	4	●	10cps/ 1Kcps	DC12V 50mA	AC90～132V AC180～264V 50/60Hz
			KCX-6T	6	●	10cps/ 5Kcps		
			KCX-8T	8	●	10cps/ 10Kcps		
		Addition and Subtraction	**KCX-B6T**	6	●	10cps/ 20kcps	DC24V 80mA	

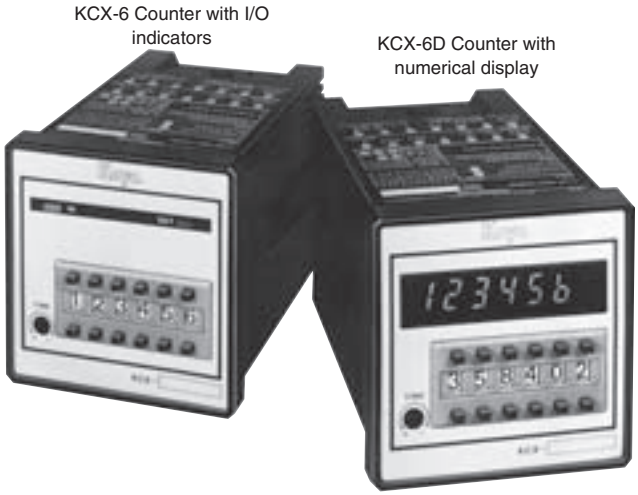
Accessory: Metal fitting(bracket)

KCX-□,□M,□D,□DM

Single Preset Green Counters for Addition

Maximum Counting speed	**1- or 2-digit: 10cps or 200cps 3- or 4-digit: 10cps or 1Kcps 5- or 6-digit: 10cps or 5Kcps**

These counters feature an easy to read green LED screen to display one- to six-digit values, and operation modes and status. Advanced functions are also integrated, including dust insulation and power backup.



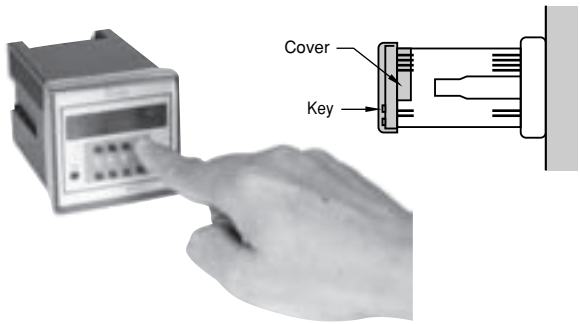
Merits

●Green LED for easy reading

Each model features a green LED display to facilitate reading. Numerical values are displayed with the height of 8 mm.

●Dust prevention cover

On all models, a protective cover is attached to the front panel. The keys and buttons can be operated through this cover.



●Minimum space requirement

In compliance with the DIN standard, all models are sized 72 mm (height)～72 mm (width)～103.5 mm (depth).

●Memory backup at power shutdown

Nickel cadmium battery is supported for minimum maintenance work. During power shutdown, current consumption is kept as low as several microamperes allowing memory backup for up to 2,000 hours. Power failure is detected by an integrated circuit to activate emergency I/O gates. Input status before shutdown is stored so the counter can resume operation upon recovery. Any pulse input is ignored during power shutdown.

●Built-in sensor power

A DC12V, 50 mA power source is included in all counters to allow direct connection to a proximity switch, photoelectric sensor or rotary encoder.

●Variable output duration

On the front panel, you can control the duration of One shot (Type A) output. Using a dial, the output time can be adjusted between 50 ms and 1,000 ms. You can extend it to 10 seconds by adding a capacitor.

●Type A and Type B output options

With a small change to the connection, the output mode can be switched between One shot and Hold.

●Six counter modes

Any of the six combinations can be selected as described on page 78.

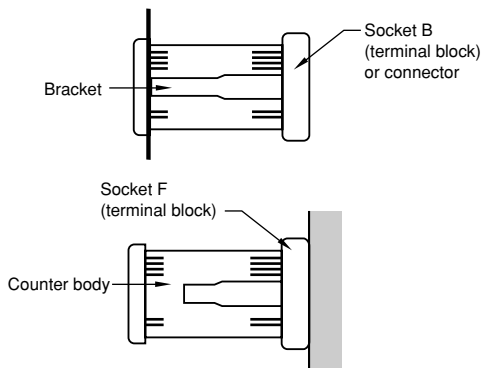
●Wide range of source voltage

You can choose source voltage of either AC90 to 132V, or AC180 to 264V.

●Option to disable count input

●Mounting

The counter can be mounted onto the wall surface in either way, wall surface mounting or flush mounting. Use mounting bracket for the flush mounting and use terminal block (socket F) for wall surface mounting.



Specifications

Model number	I/O indicators	Standard	KCX-1	KCX-2	KCX-3	KCX-4	—	—
	Numerical display	Standard	KCX-1D	KCX-2D	KCX-3D	KCX-4D	KCX-5D	KCX-6D
		backup memory	—	KCX-2DM	KCX-3DM	KCX-4DM	KCX-5DM	KCX-6DM
Number of digits			1-digit	2-digit	3-digit	4-digit	5-digit	6-digit
Operation	Type A: One shop output with auto reset Type B: Hold output							
Count input			Contact input	Static input	Contact input	Static input	Contact input	Static input
	Maximum count speed		10cps	200cps	10cps	1kcps	10cps	5kcps
	Minimum pulse width		50ms	2.5ms	50ms	0.5ms	50ms	0.1ms
	Input resistance		6kΩ	12kΩ	6kΩ	12kΩ	6kΩ	12kΩ
	Input voltage		"L"0～2V／"H"6～30V					
External reset	Response time		On delay: 20ms Off delay: 4ms		On delay: 10ms Off delay: 2ms		On delay: 5ms Off delay: 1ms	
	Input resistance		6kΩ					
	Input voltage		"L"0～2V／"H"6～30V					
Auto reset	Response time		Max. 5ms		Max. 1ms		Max. 0.2ms	
Power-on reset*1	Power shutdown		Min. 0.2s					
	Reset duration		Min. 0.2s					
DC output*2	Output resistance		1.2kΩ (at no load voltage of 12V)					
	Output current		Source: 2.5mA Sink:8.0mA					
	Withstand voltage		45V					
	Output duration		Type A: Variable Type B: Held					
Relay output	Capacity		AC250V 2A					
	Circuit		One transfer circuit					
	Output duration		Type A: Variable Type B: Held					
	Electrical durability		Min. 1,000,000 contacts at AC250V resistance load)					
	Mechanical durability		Min. 10,000,000 contacts					
I/O response*3			10cps	200cps	10cps	1kcps	10cps	5kcps
	Voltage output		Approx. 10ms	Approx. 4ms	Approx. 10ms	Approx. 0.8ms	Approx. 10ms	Approx. 0.15ms
	Contact output		Approx. 20ms	Approx. 14ms	Approx. 20ms	Approx. 10ms	Approx. 20ms	Approx. 10ms
Memory backup at power shutdown (Only models with battery)	Time for charging*4		50hours					
	Backup duration		Approx. 2,000 hours at 25℃ or 800 hours at 45℃					
	Response of emergency input gate*5		20～200ms (70ms typ)					
	Response of input gete upon recovery*6		50～500ms (120ms typ)					
Sensor power	DC＋12V±2V 50mA Max. 10% (rms) ripple							
Withstand voltage	AC 2kV for one minute (For each of AC power, pin E and relay contact interconnections)							
Insulation resistance	DC 500V Min. 20MΩ							
Vibration resistance	(In compliance with JIC C0911)		Durable for one hour along three axes at 10 to 55 Hz with 0.5mm amplitude No error for one hour along three axes at 10 to 55 Hz with 0.35mm amplitude					
Source voltage	AC 90～132V, or AC 180～264V (50/60Hz)							
Power consumption	With numerical display: Approx. 5VA With I/O indicators: Approx. 3VA							
Ambient temperature (during operation)	During power supply: 0～＋40℃ (－10～＋50℃ with no risk of destroyed battery) During memory backup: －10～＋50℃							

Storage temperature	With memory backup (included battery): −20～+50℃(−20～+70℃ during transportation of less than one week) Without memory backup: −20～+55℃
Ambient/Storage humidity	35～85%RH (with no dewing)
Noise resistance*7	1kV (square wave pulse with 1 μs width)
Weight	Approx. 0.5kg

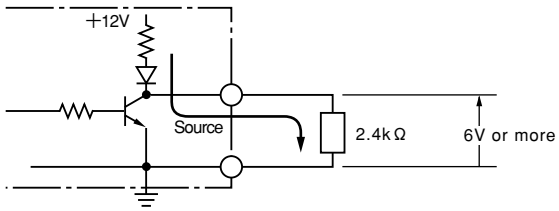
Notes:

*1. Power-on reset is available on the KCX-1 to 6 and KCX-1D to 6D, the models without the memory backup option (battery). "Reset time" is the time required for the counter to restart counting after the power is turned on.

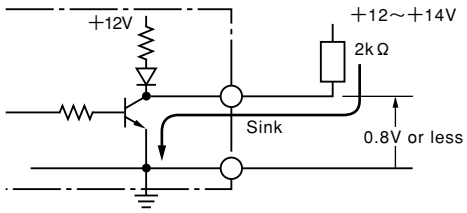
*2. DC output

When connected to 12V

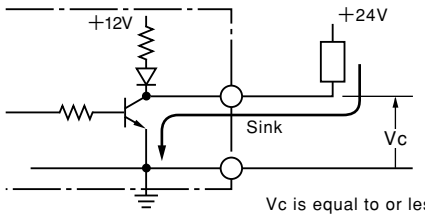
●Positive load



●Negative load

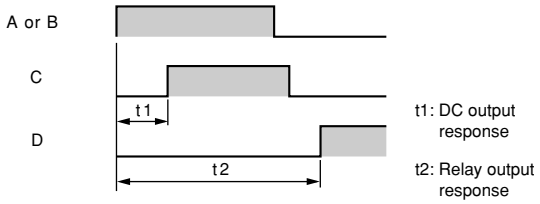


When connected to 24V



Vc is equal to or less than 3V at sink current of 20 mA.

*3. Time required for the counter to generate signal after the last pulse is counted at the rising edge.



*4. Time required for the included battery to be fully charged.

*5. Time for an internal circuit to disable pulse input and reset input after it detects power failure. Until this time, these signal inputs remain active.

*6. Time for an internal circuit to enable pulse input and reset input after it detects power recovery.

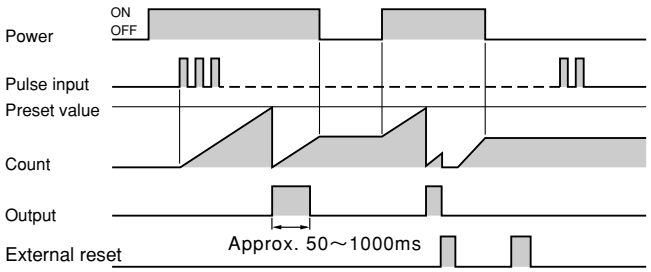
*7. Noise tests also include static discharge, induced load switching, electromagnetic switch oscillation and other tests defined by KOYO.

Output modes

Type A (One shot) output

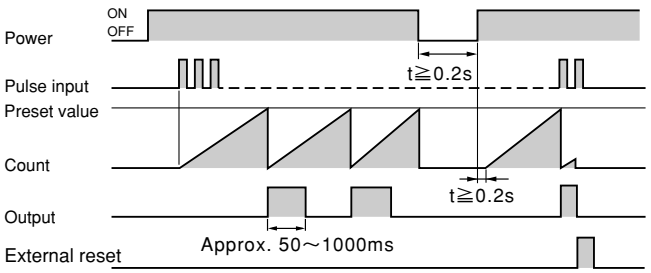
- The counter generates a signal upon countup, or when the number of input pulses has reached the preset value.
- Using a dial, the output duration can be adjusted between 50ms and 1,000ms.
- Upon countup, both the count and signal output are automatically reset.
- Count is reset to zero when the external reset terminal is activated.

With memory backup



●Count is reset by external reset.

Standard models



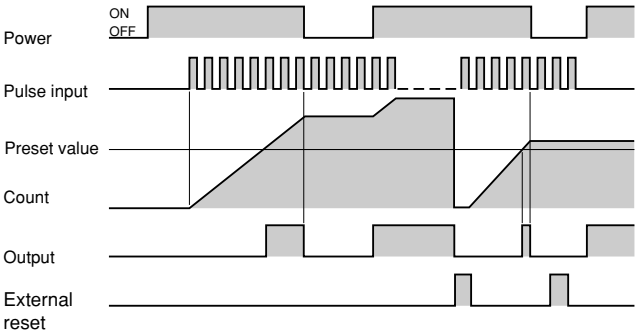
●Count is reset by external reset, or power shoutdown for 0.2 second or more.

Type B (Hold) output

- The counter generates and holds a signal upon countup, or when the number of input pulses has reached the preset value.
- On the counters with numerical displays, the terminals ④, ⑤ and ⑥ can be connected. In this case, the count is not reset upon countup, but continues to be incremented for each pulse input.

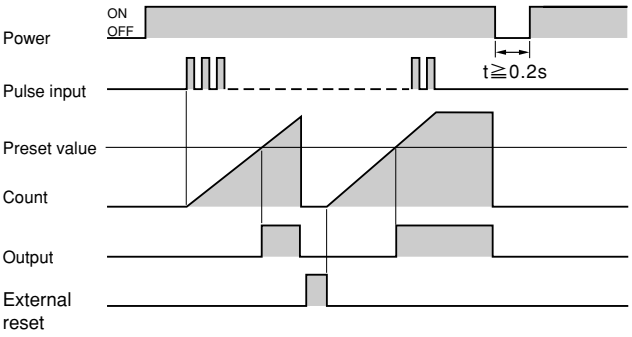
  When the terminal ④ and ⑤ are connected, the count is upon countup. (See "Switching between Type A and Type B" below.)

With memory backup



●Count is reset by external reset.

Standard models

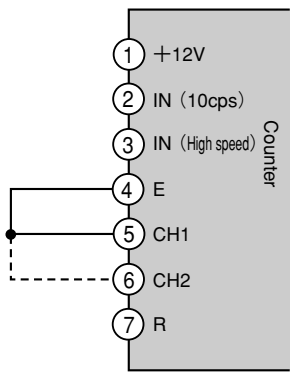


●Count is reset by external reset, or power shoutdown for 0.2 second or more.

■Switching between Type A and Type B

Connect terminals ④ and ⑤ to select the Type B operation. The count is reset upon countup.

If the terminals ④, ⑤ and ⑥ are connected, the count is not reset upon countup. It continues to be incremented for each pulse input.



Type B operation

Terminal Assignment

●With I/O indicators

Teminal number	Name	Description
1	+12V	Sensor power output
2	IN(10cps)	Count input
3	IN	High speed count input*1
4	E	Grounding *2(capacitor ⊖)
5	CH	One shot output/Hold switch (capacitor ⊕)
6	—	Not connected
7	R	External reset input
8	OUT	DC output
9	COM.	Relay output
10	N.O.	
11	N.C.	
12	AC180～264V	AC power input
13	AC90～132V	
14	AC0V	

●With numerical display

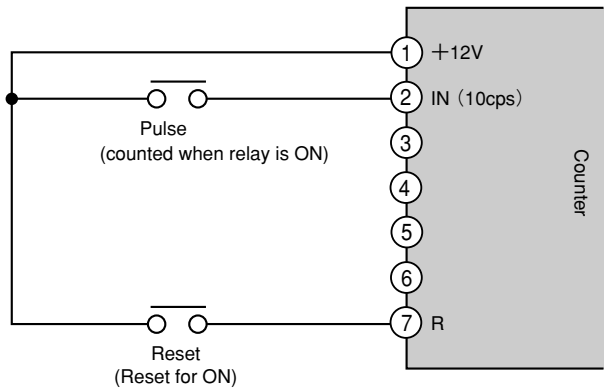
Teminal number	Name	Description
1	+12V	Sensor power output
2	IN(10cps)	Count input
3	IN	High speed count input＊1
4	E	Grounding ＊2(capacitor ⊖)
5	CH1	One shot output/Hold switch (capacitor ⊕)
6	CH2	Auto reset/Not auto reset switch
7	R	External reset input
8	OUT	DC output
9	COM.	Relay output
10	N.O.	
11	N.C.	
12	AC180～264V	AC power input
13	AC90～132V	
14	AC0V	

*1. See Specifications.
*2. Capacitor for output time extension

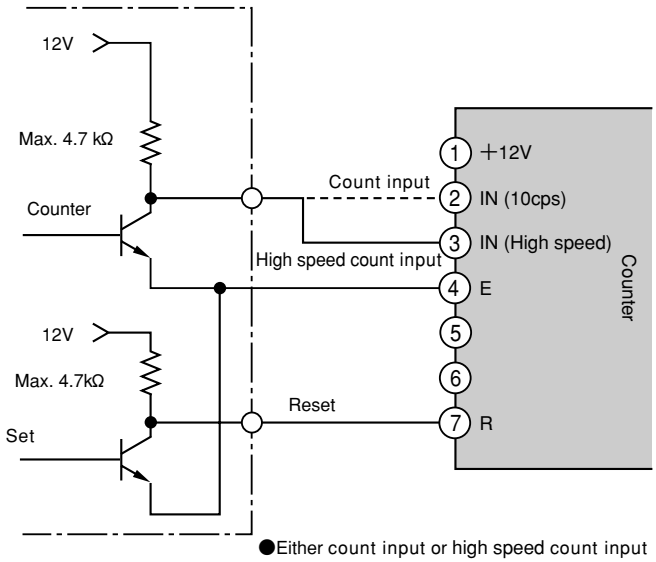
Wiring Diagrams

■Pulse input

1. Relay input

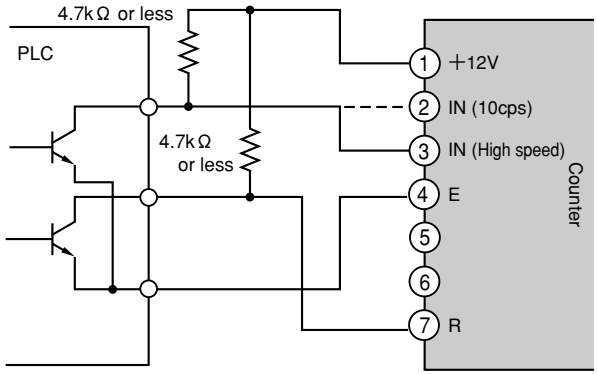


2. DC input



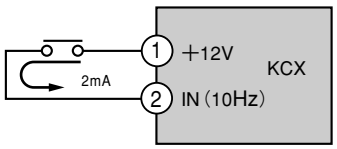
●Either count input or high speed count input can be selected as count rate.

3. Connection to open collector output

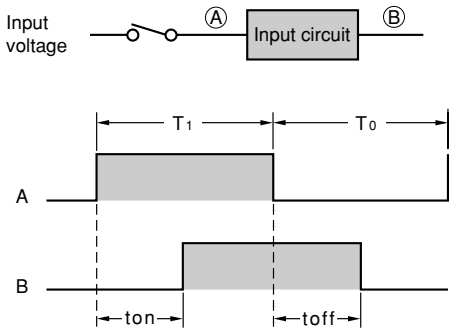


Notes on relay input

(1)On the circuit shown on the right, the input current to the relay is less than 2mA. Use a reliable relay that responds to such small current. Do not use an electromagnetic switch contact designed for large current and voltage.



(2)The following table lists the standard responses of Terminal ② at the pulse rate of 10 cps:

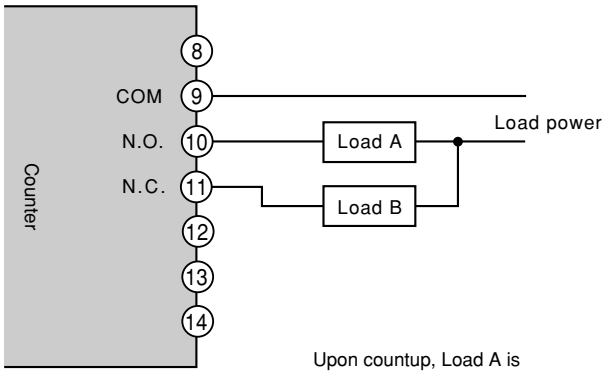


Input voltage	On delay (ton)	Off delay (toff)
6V	16ms	4ms
12V	8ms	8ms
30V	3ms	23ms

These are the standard values. T1 and T0 should be at least three times longer than ton and toff. For example, when using the DC12V sensor power, T1 and T0 should be 24ms or more.

■Output Connection

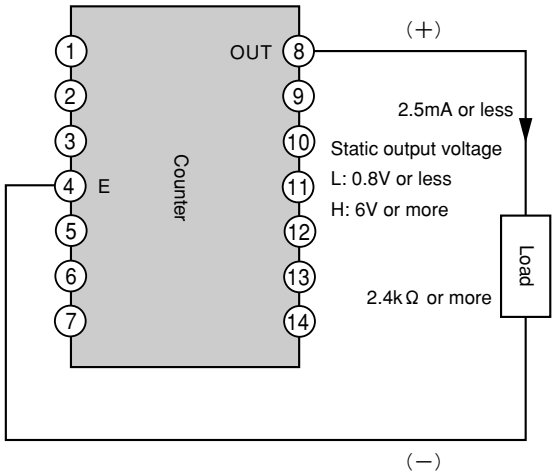
1. Relay output



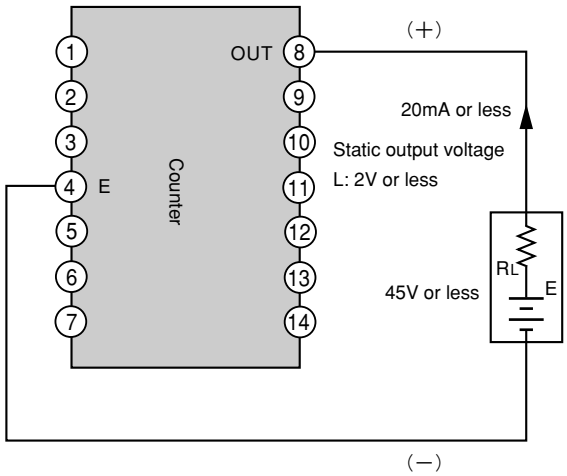
Upon countup, Load A is activated and Load B is deactivated.

2. DC output

●Source load



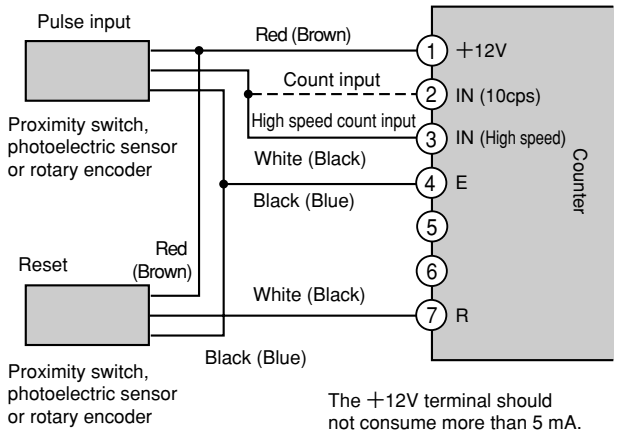
●Sink load



Electric current flows into the circuit when the output voltage falls to "L" level. Contrary to the open collector, the output rises to "H" level upon countup.

Connection Examples

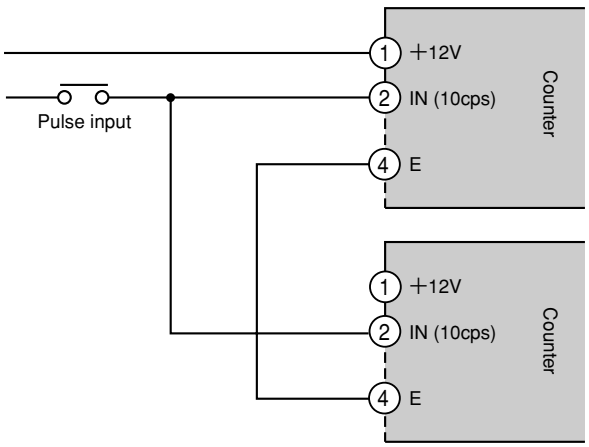
■Direct connection to a sensor



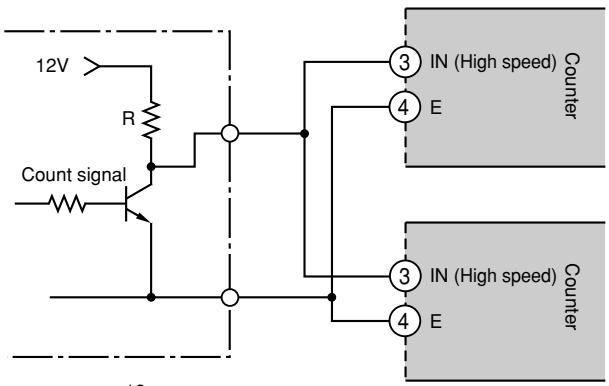
The +12V terminal should not consume more than 5 mA.

■Parallel Counters

1. Relay input

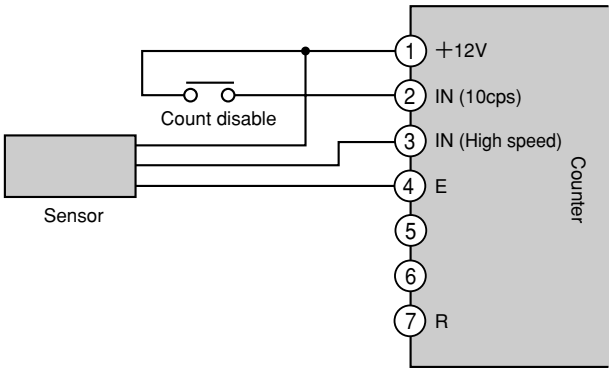


2. DC input



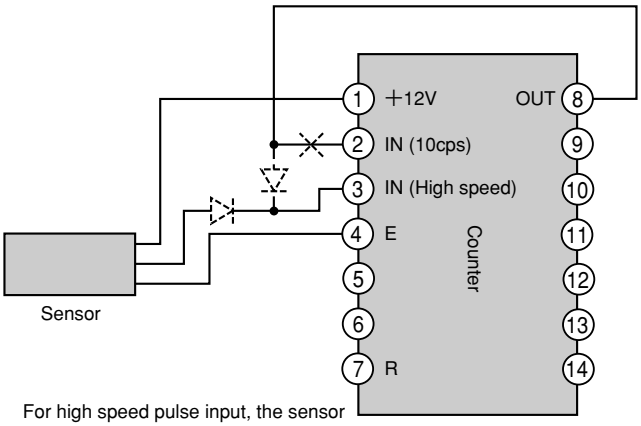
$R \leqq \frac{12}{N}(k\Omega)$ N: Numbers of counter that can be connected in parallel.

■Count disable using a free terminal



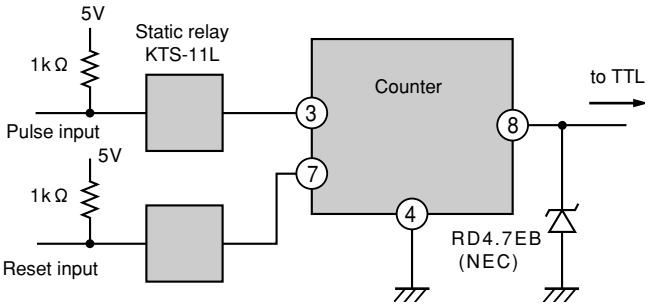
Pulse count is disabled when the contact is closed to force input to the terminal ②. However, the count increments by 1 when the contact is closed while the sensor (terminal ③) output is at "L" level.

■Count disable during signal output



For high speed pulse input, the sensor should be connected as shown by the dashed lines. Use Hitachi diodes IS2076 or equivalent.

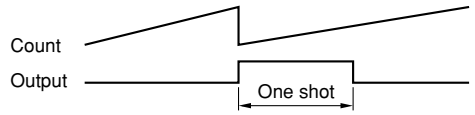
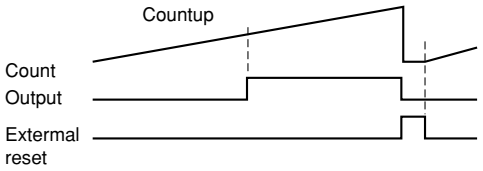
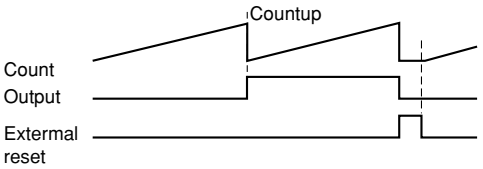
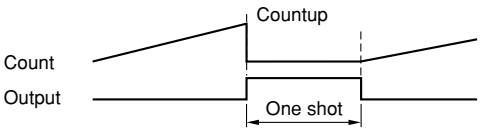
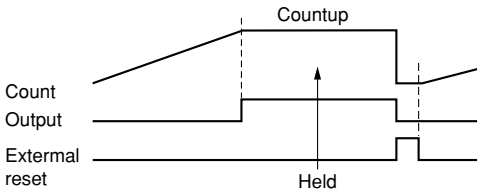
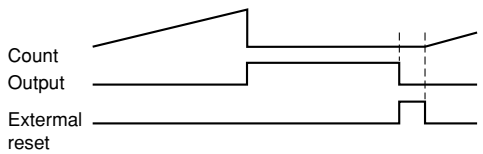
■Connection to TTL logic gate



Pull-in current is 4mA on the KCX counter side (0.4V residual voltage).

List of Counter Modes

One of the following six combinations can be selected for the numerical display counters.

Output		Upon countup		Count disable	Timing chart	Connection
Held	One shot	Reset	Not reset			
	●	●			Type A operation 	
●			●		Type B Operation 	④-⑤-⑥
●		●				④-⑤
	●	●		●		②-⑧* or ③-⑧
●			●	●		②-⑧* or ③-⑧ ④-⑤-⑥
●		●		●		②-⑧* or ③-⑧ ④-⑤

*When Terminal ⑧ is connected to Terminal ②, the time for the count disable to be activated is the same as the response time of Terminal ②.

KCX-□W,□WM

Dual Preset Green Counters for Addition

Maximum count speed 3- or 4-digit: 10cps or 2kcps
5- or 6-digit: 10cps or 5kcps

These counters feature an easy to see green LED screen to display three to six digit counts and dual preset values. Other features include dust insulation and power backup.

Merits

●Green LED for easy reading

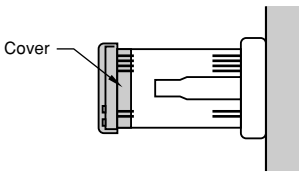
Each model features a green LED display to facilitate reading. Numerical values are displayed with the height of 8mm.

●Minimum space requirement

In compliance with the DIN standard, all models are sized 72mm (height)〜72mm (width)〜103.5mm (depth).

●Dust prevention cover

On all models, a protective cover is attached to the front panel. The keys and buttons can be operated through this cover.



●Option to disable count input

Pulse input and count can be disabled by signal input to the count disable terminal.

●Memory backup at power shutdown

The integrated nickel cadmium battery allows memory backup for up to 5,000 hours.

●Wide range of source voltage

The counter accepts voltage of DC 4.5V to 30V from a source ranging from 5V to 24V. You can choose source of either AC 90 to 132V, or AC 180 to 264V.

●Variable output duration

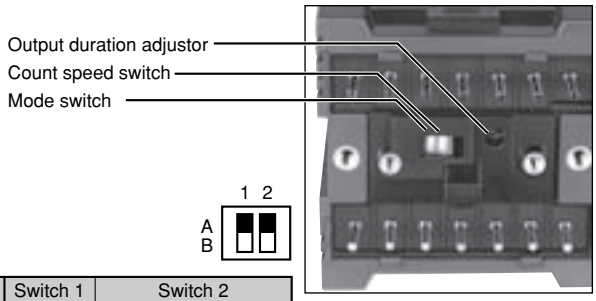
On the rear panel, you can control the duration of One shot (Type A) output. Using a dial, the output time can be adjusted between 50 ms and 1,000ms.

●One shot output and Hold output options

Using the selector on the rear panel, output type can be selected between One shot (Type A) output and hold (Type B) output.

●Slow Count and Fast Count options

Using the selector on the rear panel, count speed can be switched between 10cps and 2kcps (5kcps for 5- or 6-digit counter).



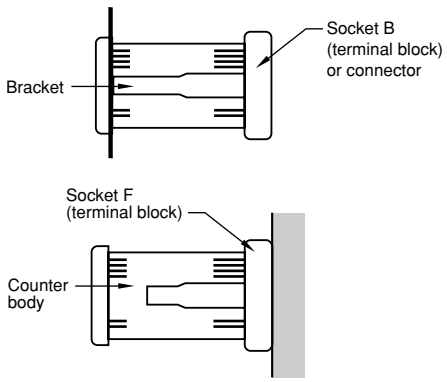
	Switch 1	Switch 2	
	Mode	Count speed	
A	Type A operation	2kcps (3・4W, 4WM)	5kcps (5・6W, 6WM)
B	Type B operation	10cps	

●Integrated sensor power

DC12V, 50 mA power source is included in all counters to allow direct connection to a proximity switch, photoelectric sensor or rotary encoder.

●Mounting

The counter can be mounted onto the wall surface in either way, wall surface mounting or flush mounting. Use mounting bracket for the flush mounting and use terminal block (socket F) for wall surface mounting.



Specifications

Model number	Standard models	KCX-3W	KCX-4W	KCX-5W	KCX-6W
	With backup memory	—	KCX-4WM	—	KCX-6WM
Number of digits		3 digits	4 digits	5 digits	6 digits
Operation	First preset: Type B (Hold output) only Second preset: Type A (One shot output) or Type B (Hold output) selected by switch on rear panel				
Count input	Maximum count speed	10cps 2kcps (selected by switch)		10cps 5kcps (selected by switch)	
	Minimum pulse width	10cps：50ms 2kcps：0.25ms		10cps：50ms 5kcps：0.1ms	
	Input resistance	6kΩ			
	Input voltage	"L"0～2V、"H"4.5～30V			
Count disable input	Response time	On delay ： Max. 0.25ms Off delay ： Max. 0.25ms		On delay ： Max. 0.1ms Off delay ： Max. 0.1ms	
	Input resistance	6kΩ			
	Input voltage	"L"0～2V、"H"4.5～30V			
External reset	Response time	On delay ： Max. 10ms Off delay ： Max. 2ms		On delay ： Max. 4ms Off delay ： Max. 0.8ms	
	Input resistance	6kΩ			
	Input voltage	"L"0～2V、"H"4.5～30V			
Auto reset	Response time	Max. 0.5ms		Max. 0.2ms	
Power-on reset (KCX-3～6W)	Power shutdown	Min. 200ms			
	Reset duration	Max. 200ms			
DC output	Output resistance	1.2kΩ (at no load voltage of 12V)			
	Output current	Source: 2.5mA Sink: 8mA			
	Withstand voltage	45V			
	Output duration	50ms～1s			
Relay output	Capacity	AC250V 2A			
	Circuit	One make contact			
	Output duration	50ms～1s			
	Electrical durability	Min. 10,000,000 contacts			
	Mechanical durability	Min. 1,000,000 contacts (resistance load)			
I/O response	Voltage output	10cps：10ms 2kcps：0.4ms		10cps：10ms 5kcps：0.15ms	
	Contact output	10cps：20ms 2kcps：10ms		10cps：20ms 5kcps：10ms	
Memory backup at power shutdown (KCX-3～6WM)	Time for charging	50h			
	Backup duration	5000h(25℃)、2000h(40℃)			
	Response of emergency input gate	Max. 200ms			
	Response of input gate upon recovery	Max. 200ms			
Sensor power	DC+12V 50mA				
Source voltage	AC 90～132V, or AC 180～264V (50/60Hz) approx. 5.5VA				
Ambient temperature	During power supply: 0～+40℃ (−10～+50℃ with no risk of destroyed battery) During memory backup: −10～+50℃				
Storage temperature	KCX-3～6W: −20～+55℃ KCX-3～6WM: −20～+50℃ (−20～+70℃ during transportation of less than one week)				
Ambient/Storage humidity	35～85%RH (with no dewing)				
Weight	0.5kg				

Note:
See pages B-34 and B-35 for withstand voltage, insulation resistance, vibration resistance, noise resistance and other related specifications.

Operation

■Type A (One shot) output
Type B (Hold) output

Selecting A or B

Only Type B output is available for the first preset value.

For the second preset value, either Type A or B can be selected by the switch on the rear panel.

■Variable Type A output

For the second preset value, the duration of Type A output can be changed. Use the dial on the rear panel to select the desired time from 50ms to 1,000ms.

■Changing count speed

The input speed of Terminal ② can be changed. Use the selector on the rear panel to select 10cps or 2kcps (or 5kcps for 5- or 6-digit counter).

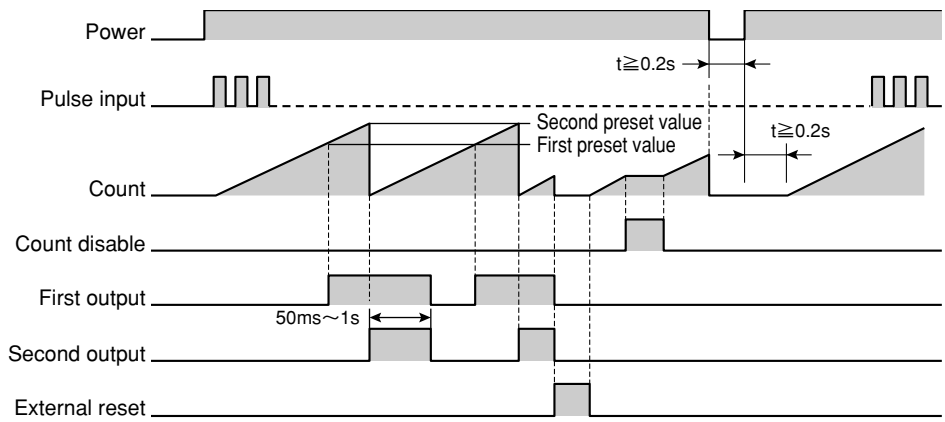
■Terminal Assignment

Terminal number	Name	Description
1	+12V	Sensor power output
2	IN	Count input
3	INH	Count disable input
4	E	Grounding
5	OUT1	DC output
6	OUT2	DC output
7	R	External reset input
8	OUT1	Relay output (1a contact)
9		
10	OUT2	Relay output (1a contact)
11		
12	AC180～264V	AC power input
13	AC90～132V	
14	AC0V	

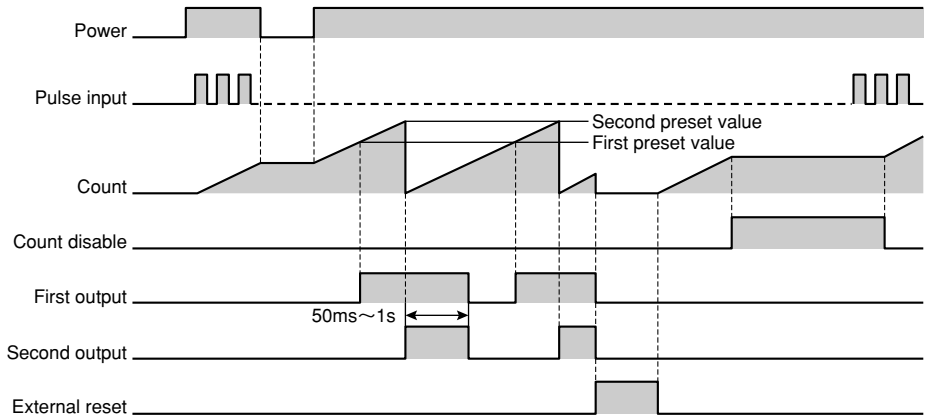
Type A (One shot) output

(1) Count starts 0.2 second after the power is on.
(2) Count is interrupted when the count disable terminal ③ is activated by additional voltage of 4.5V to 30V. Count is restarted when the terminal is deactivated.
(3) The counter generates a signal upon countup, or when the number of input pulses has reached the first preset value. For the first preset, signal output is held (Type B output).
(4) The counter generates another signal when the pulse count has reached the second preset value. Upon countup, both the count and signal output are automatically reset.
(5) The first signal drops to zero at the same time as the second signal.
(6) Count is reset to zero when the external reset terminal ⑦ is activated by additional voltage of 4.5V to 30V. Signal output is also reset if the count has previously reached the first and/or second value.
(7) The KCX-3 to 6WM models integrates a backup memory for power shutdown. When the power is shut down, both the count and the output status are stored in this memory.
(8) These models also have a power-on reset function. Count and signal output are reset when the power is off for 0.2 second then turned on.

Standard models: KCX-3 to 6W



With memory backup: KCX-3 to 6WM



Type B (Hold) output

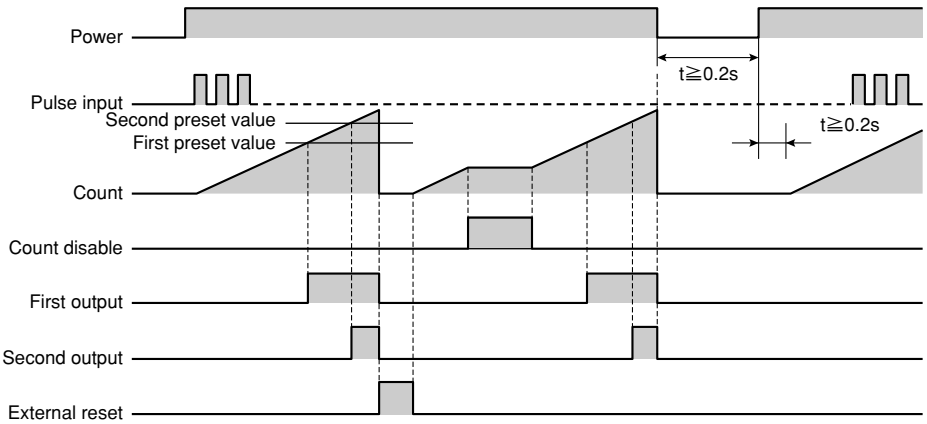
(1)
(2) } Same as the Type A output.
(3)

(4)The counter generates and holds a signal when the pulse count has reached the second preset value.

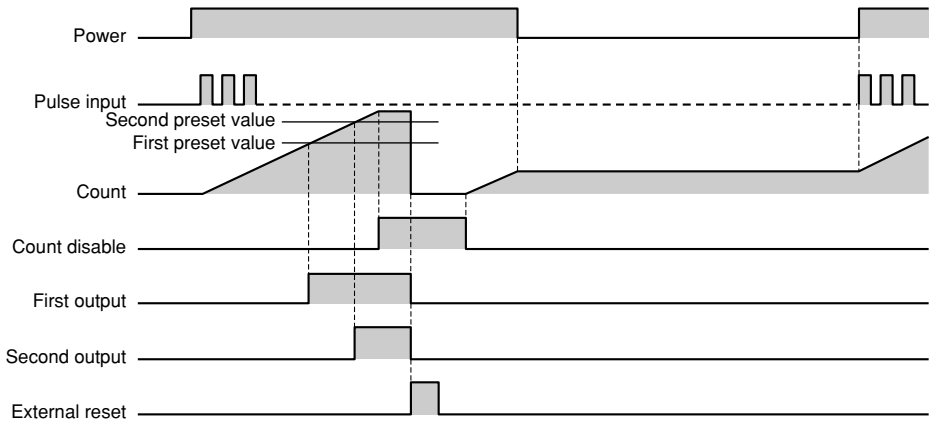
(5)Count and signal output are reset when the external reset terminal ⑦ is activated by additional voltage of 4.5V to 30V.

(6)
(7) } Same as the steps 7 and 8 of the Type A output

Standard models: KCX-3 to 6W



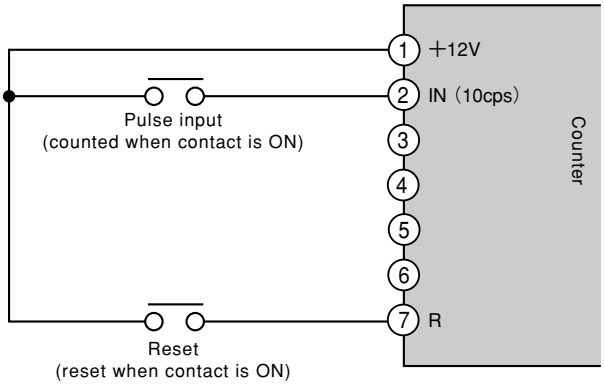
With memory backup: KCX-3 to 6WM



Wiring Diagrams

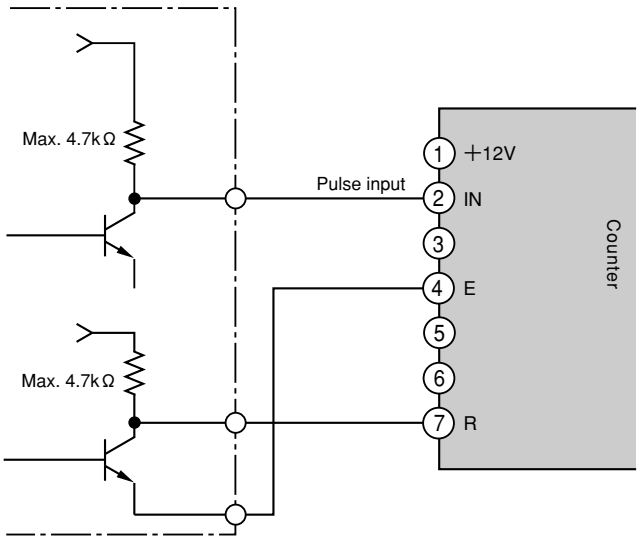
■Pulse input

1. Relay input



On the rear panel, set the speed switch to Low (10 cps).

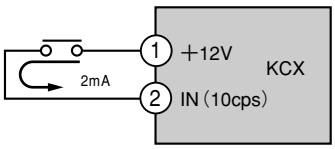
2. DC input



Either pulse input or high speed pulse input can be selected as count rate.

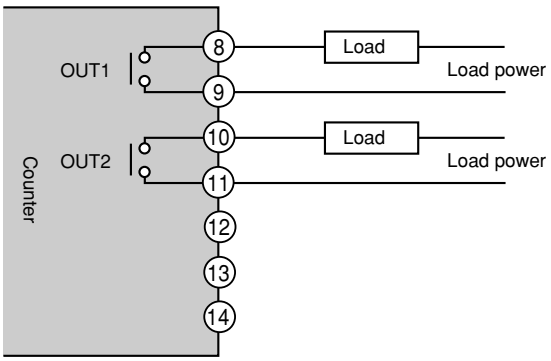
Note on relay input

On the circuit shown on the right, the input current to the relay is less than 2mA. Use a reliable relay that responds to such small current. Do not use an electromagnetic switch contact designed for large current and voltage.



■Output Connection

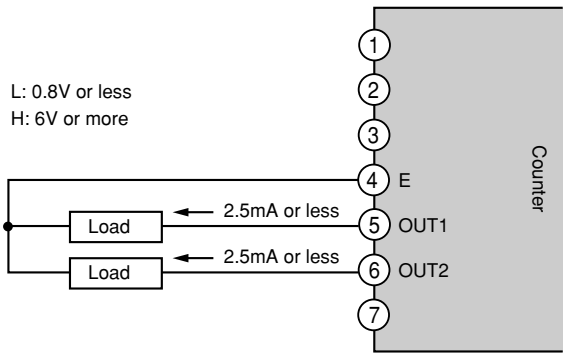
1. Relay output



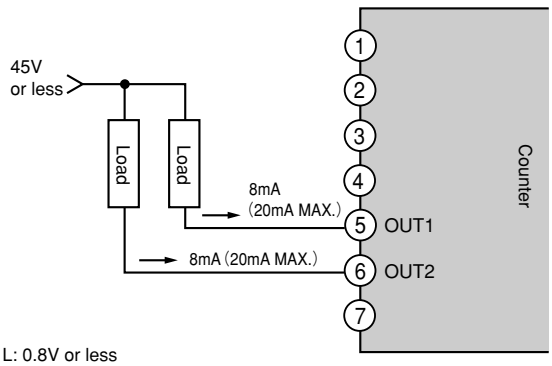
Only the relay contact a is used for the first and second outputs.

2. DC output

●Source load



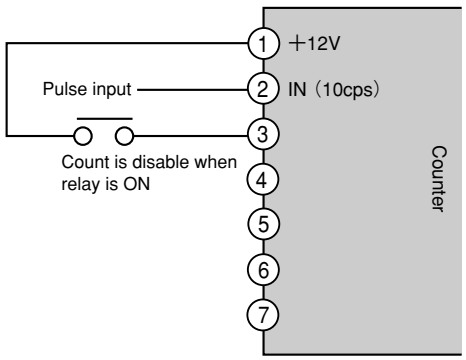
●Sink load



L: 0.8V or less
3V or less at sink current of 20mA.

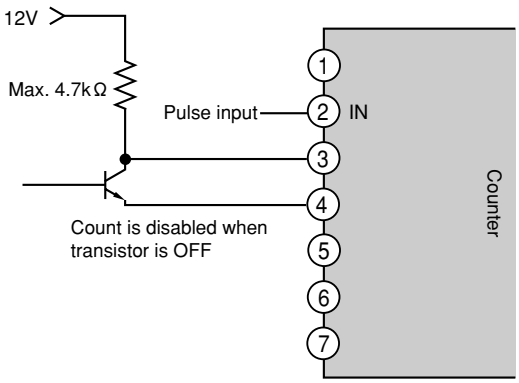
■Count Disable Input Connections

1. Relay input



When count is disabled, only slow input is available.

2. DC input



KCX-□T

Total Counters with Green LED

Maximum counting speed
KCX-4T: 10cps or 1kcps
KCX-6T: 10cps or 5kcps
KCX-8T: 10cps or 10kcps

The counters feature an easy to see green LED screen. Other features include variable voltage and power backup of 5,000 hours.

Merits

●Green LED for easy reading

Each model features a green LED display to facilitate reading. Numerical values are displayed with the height of 8 mm.

●Option to disable count input

Pulse input and count can be disable by voltage input to the disable terminal.

●Memory backup at power shutdown

The integrated nickel cadmium battery allows memory backup for up to 5,000 hours.

●Wide range of source voltage

The counter accepts voltage of DC 4.5V to 30V from a source ranging from TTL level to 24V. You can choose source of either AC 90 to 132V, or AC 180 to 264V.

●Latch option

Count can be latched and displayed by signal input to the latch terminal. When the terminal is deactivated, the counter restarts from the current count.

●Option to disable manual reset

You can disable the Reset key on the front panel to prevent accidental reset.

●Zero suppression

The counter suppresses non-significant zeroes on the left to the count value.

●Built-in sensor power

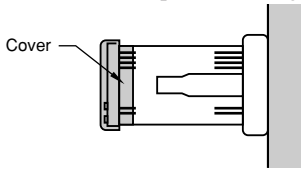
A DC 12V, 50mA power source is included in all counters to allow direct connection to a proximity sensor, photoelectric sensor or rotary encoder.

●Minimum space requirement

In compliance with the DIN standard, all models are sized 72mm (height)〜72mm (width).

●Dust prevention cover

On all models, a protective cover is attached to the front panel. The keys and buttons can be operated through this cover.



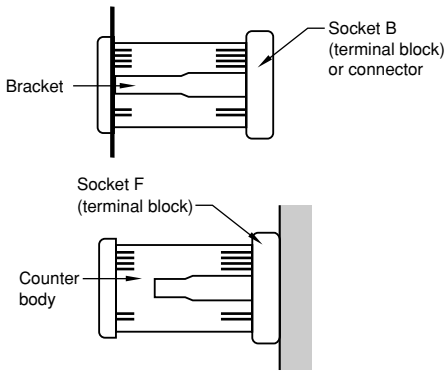
KCX-4T

KCX-6T

KCX-8T

●Mounting

The counter can be mounted onto the wall surface in either way, wall surface mounting or flush mounting. Use mounting bracket for the flush mounting and use terminal block (socket F) for wall surface mounting.



Specifications

Model number		KCX-4T	KCX-6T	KCX-8T
Number of digits		4 digits	6 digits	8 digits
Count input	Maximum count speed	10cps or 1kcps	10cps or 5kcps	10cps or 10kcps
	Minimum pulse width	10cps：50ms 1kcps：0.5ms	10cps：50ms 5kcps：0.1ms	10cps：50ms 10kcps：50 μs
	Input resistance	10cps：6kΩ 1kcps：12kΩ	10cps：6kΩ 5kcps：12kΩ	10cps：6kΩ 10kcps：12kΩ
	Input voltage	"L"0～2V、"H"4.5～30V		
Count disable input	Response time	On delay：Max. 1ms Off delay：Max. 1ms	On delay：Max. 0.2ms Off delay：Max. 0.2ms	On delay：Max. 0.1ms Off delay：Max. 0.1ms
	Input resistance	6kΩ		
	Input voltage	"L"0～2V、"H"4.5～30V		
Manual reset	Disabled by switch on the front panel (by short circuiting Terminals ④ and ⑥)			
External reset	Response time	On delay：Max. 0.5ms Off delay：Max. 0.5ms	On delay：Max. 0.1ms Off delay：Max. 0.1ms	On delay：Max. 50 μs Off delay：Max. 50 μs
	Input resistance	6kΩ		
	Input voltage	"L"0～2V、"H"4.5～30V		
Memory backup at power shutdown	Time for charging	50h		
	Backup duration	5000h(25℃)、2000h(40℃)		
	Response of emergency input gate	Max. 200ms		
	Response of input gate upon recovery	Max. 200ms		
Latch input	Response time	Max. 0.5ms	Max.0.1ms	Max.0.1ms
	Input resistance	6kΩ		
	Input voltage	"L"0～2V、"H"4.5～30V		
Sensor power	DC＋12V±2V 50mA (Max. 5% rms ripple)			
Source voltage	AC 90～132V, or AC 180～264V (50/60Hz, 5.5VA)			
Ambient temperature	During power supply: 0～＋40℃ (－10～＋50℃ with no risk of destroyed battery) During memory backup: －10～＋50℃			
Storage temperature	－20～＋50℃ (－20～＋70℃ during transportation of less than one week)			
Ambient/Storage humidity	35～85%RH (with no dewing)			
Weight	Approx. 0.5kg			

Note:

See pages B-34 and B-35 for withstand voltage, insulation resistance, vibration resistance, noise resistance and other related specifications.

■Terminal Assignment

Terminal number	Name	Description	Terminal number	Name	Description
1	＋12V	Sensor power output	8	—	Not connected
2	IN (10cps)	Count input	9	—	Not connected
3	IN(1kcps/5kcps/10kcps)	High speed count input	10	L	Latch input
4	E	Grounding	11	—	Not connected
5	INH	Count disable	12	AC180～264V	AC power input
6	RD	Manual reset prevention	13	AC90～132V	
7	R	External reset input	14	AC0V	

Operation

(1)Count starts 0.2 second after the power is on.

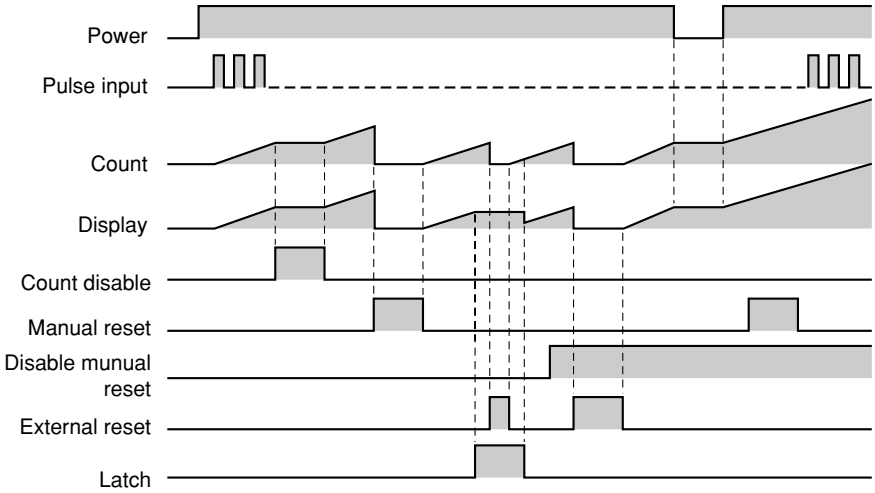
(2)Count is reset to zero when the Reset key is pressed, or when the external reset terminal ⑦ is activated by additional voltage of 4.5V to 30V. Only one zero is displayed on the first digit.

(3)The minimum pulse width should be as follows:
50ms for all counters operating at 10cps
0.5ms for KCX-4T at 1k cps
0.1ms for KCX-6T at 5k cps
50 μ s for KCX-8T at 10k cps
The counter total individual counts and displays the current total.
The terminal ② should be used for 10 cps, and the terminal ③ for 1k cps, 5k cps and 10k cps.

(4)Count is interrupted when the count disable terminal ⑤ is activated by additional voltage of 4.5V to 30V. Count is restarted when the terminal is deactivated.

(5)Count is latched when the terminal ⑩ is activated by input voltage of 4.5V to 30V. When the terminal is deactivated, the counter restarts from the current count.

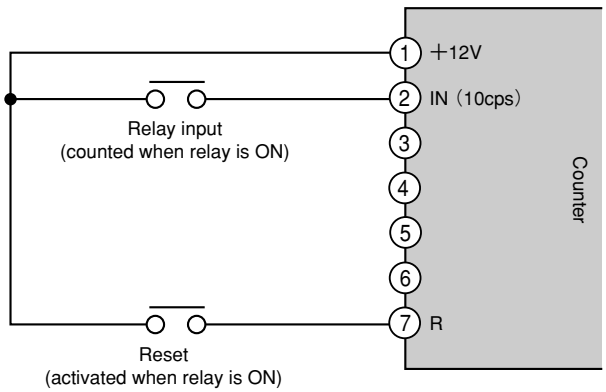
Timing Charts



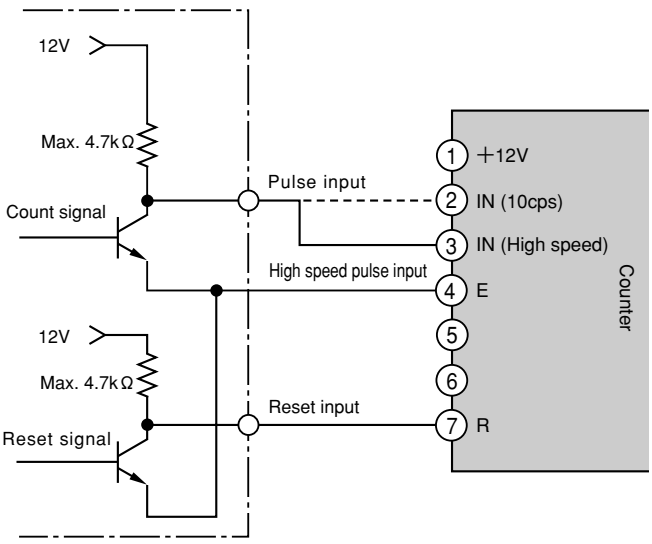
Wiring Diagrams

■Pulse input

1. Relay input



2. DC input

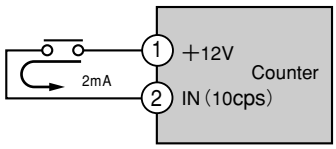


Either pulse input or high speed pulse input can be selected as count rate.

Note on relay input

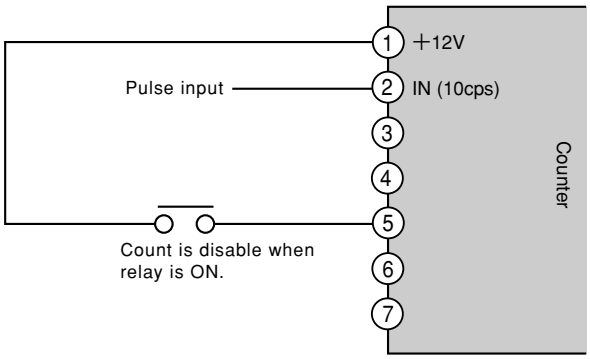
On the circuit shown on the right, the input current to the relay is less than 2mA.

Use a reliable relay that responds to such small current. Do not use an electromagnetic switch contact designed for large current and voltage.

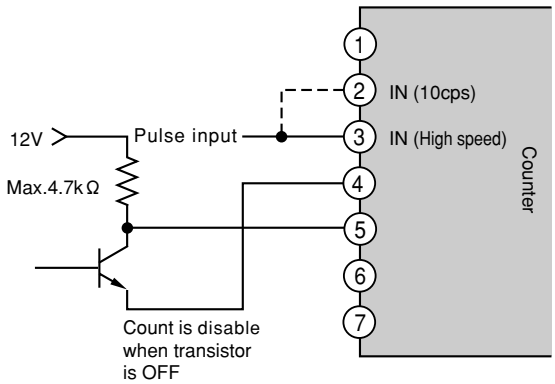


■Count Disable Input Connections

1. Relay input



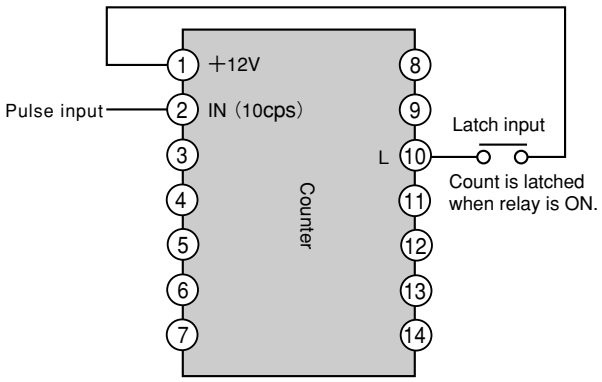
2. DC input



Either pulse input or high speed pulse input can be selected as count rate.

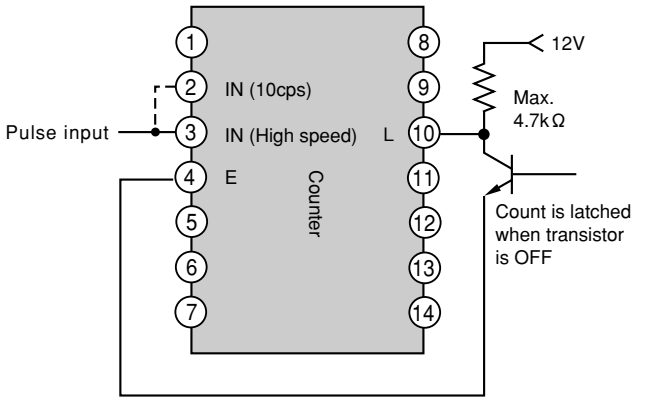
■Latch Input Connections

1 Relay input



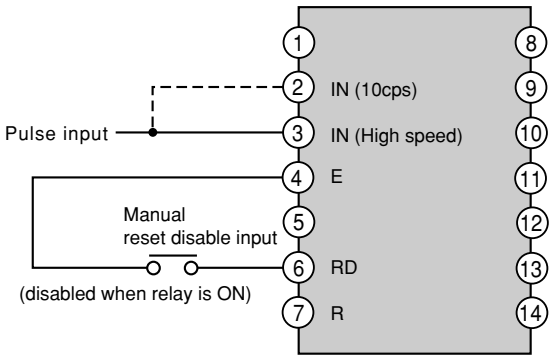
For relay input, only the pulse input can be used.

2. DC input



Either pulse input or high speed pulse input can be selected as count rate.

■Disabling manual reset



KCX-B

Single or Dual Preset Counters for Fast Addition and Subtraction

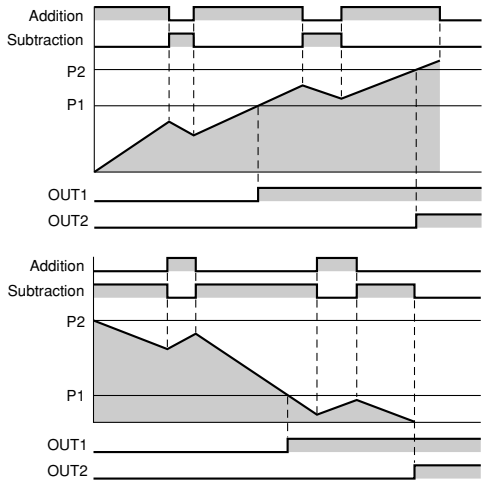
Maximum counting speed: 10cps or 20kcps

The counter integrates 6-digit green LED display, and provides Add, Subtract and Compare options. I/O logic can be switched between positive logic and negative. The counter can be connected to either a source or sink I/O device.

Merits

●Addition and Subtraction

With the ability to count in the two directions, the counter can be used for precise control of a cutter or winder.



●Fast count at 20kcps

The 72mm high and 72mm wide the counter operates as fast as at 20kcps. The speed can be switched to 10cps for slower relay input.

●Two-phase input and separate input

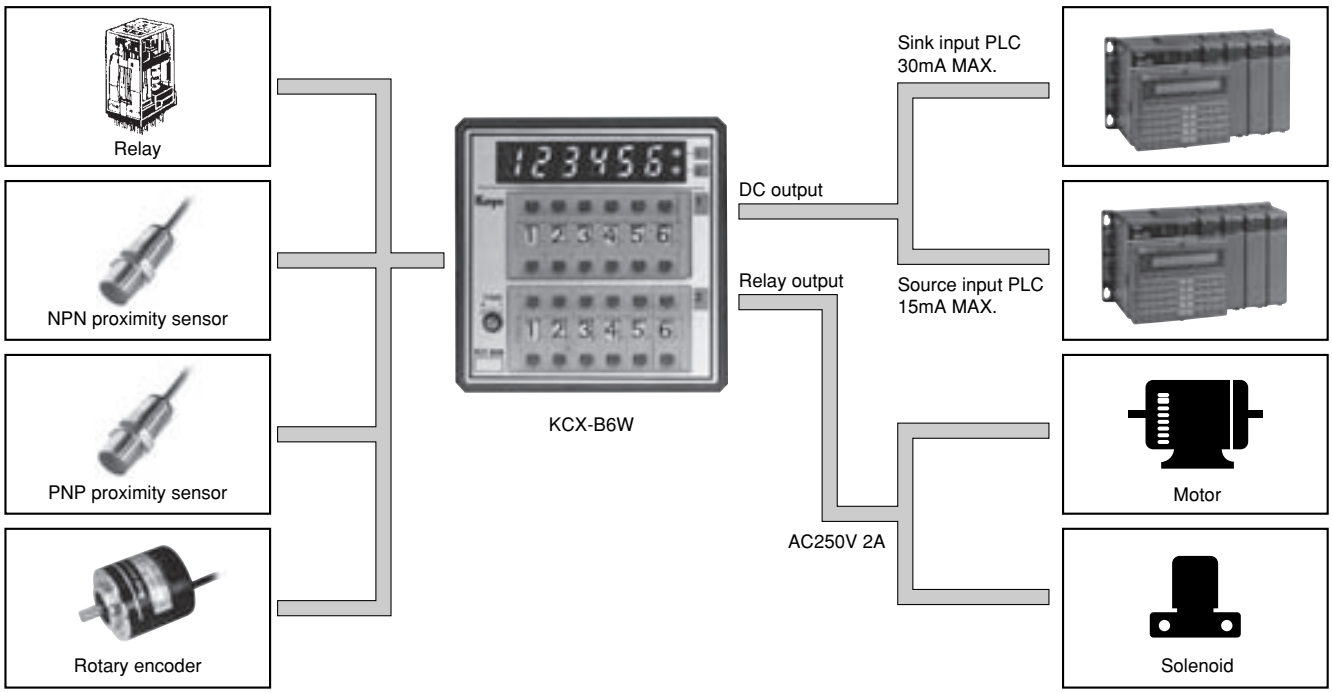
With these options, the counter widens choices of input devices to rotary encoders, proximity sensors and relay contacts. It accepts simultaneous inputs for addition and subtraction. This is ideal for keeping track of variable quantities such as workpieces on a conveyor and cars in a parking lot.

●Output options

Different modes are available including Countup and Compare. Using the switch on the rear panel, you can select any of the six modes for single preset counters, and ten modes for dual preset counters.

●Positive and negative I/O logics

Choices of I/O devices are also expanded. The counter supports both positive and negative I/O logics.



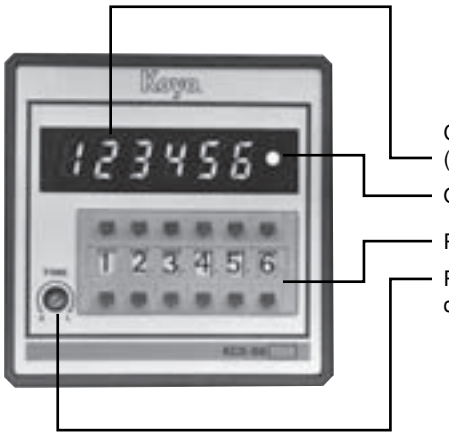
Specifications

Model number	Standard	KCX-B6	KCX-B6W
	With backup memory	KCX-B6M	KCX-B6WM
Setting	—	Single preset	Dual preset
Number of digits	—	6 digits	
Pulse input	Maximum count speed	10cps 20kcps (selected by switch)	
	Input resistance	Positive: 2.2kΩ Negative: 4.7kΩ	
	Input voltage	"L"0～6V、"H"12～30V	
Count disable input	Response time	On delay: Max. 25 μs Off delay: Max. 25 μs	
	Input resistance	Positive: 2.2kΩ Negative: 4.7kΩ	
	Input voltage	"L"0～6V、"H"12～30V	
External reset input	Response time	On delay: Max. 5ms Off delay: Max. 5ms	
	Input resistance	Positive: 2.2kΩ Negative: 4.7kΩ	
	Input voltage	"L"0～6V、"H"12～30V	
Auto reset	Reset time	Max. 50 μs	
DC output	Number of circuits	1 circuit	2 circuits
	Positive output	Voltage: 16～28V (at no load vltage of 28V) Current: Max. 15mA	
	Negative output	Load voltage: Max. 35V Load current: Max. 30mA Residual voltage: Max. 1.5V	
Relay output	Number of circuits	One transfer circuit	Two N.O. contacts
	Capacity	AC220V 2A (resistance load)	
	Electrical durability	Min. 200,000 contacts (resistance load)	
	Mechanical durability	Min. 20,000,000 contacts	
I/O response	DC output	10cps: Approx. 30ms 20kcps: Approx. 30 μs	
	Relay output	10cps: Approx. 40ms 20kcps: Approx. 10ms	
Power-on reset (KCX-B4、6 KCX-B4W、6W)	Power shutdown	Max. 500ms	
	Reset time*	Max. 500ms	
Memory backup at power shutdown (KCX-B4M、6M KCX-B4WM、6WM)	Time for charging	50h	
	Backup duration	2000h(25℃)	
	Response of emergency input gate	20～500ms	
	Response of input gate upon recovery	50～500ms	
Sensor power	DC＋24V (20～28V) 80mA		
Withstand voltage	AC 2kV for one minute (For each of AC power, Terminal E and relay contact interconnections)		
Vibration resistance	(In compliance with JIS C 0911)	Durable for one hour along three axes at 10 to 55Hz with 0.5mm amplitude No error for one hour along three axes at 10 to 55Hz with 0.35mm amplitude	
Noise resistance	1kV (square wave pulse with 1 μs width)		
Source voltage	AC90～132V,or AC180～264V 14VA		
Ambient temperature	－10～＋50℃		
Storage temperature	－20～＋50℃ (－20～＋70℃ during transportation of less than one week)		
Ambient/Storage humidity	35～85%RH (with no dewing)		
Weight	Approx. 0.5kg		

*Time required for the counter to restart counting after the power is turned on.

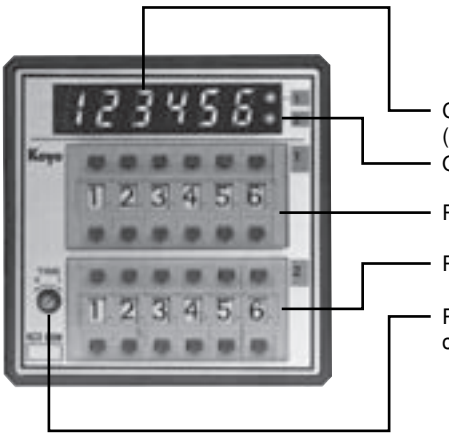
Front Panel and Terminal Assignment

KCX-B6(M)

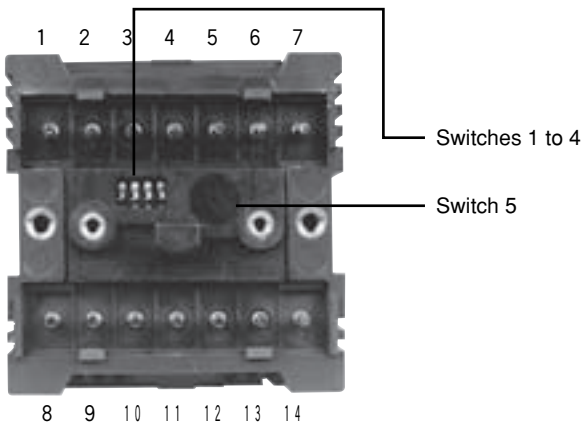


T/N	Name	Description
1	+24V 80mA	Sensor power
2	IN A	Pulse count input A
3	IN B	Pulse count input B
4	E	Negative common I/O
5	IN H	Count disable
6	—	Not connected
7	R	External reset input
8	OUT	DC output
9	COM	Common Relay output
10	N.O.	N.O. Relay output
11	N.C.	N.C. Relay output
12	AC180～264V	Power input
13	AC90～132V	
14	AC0V	

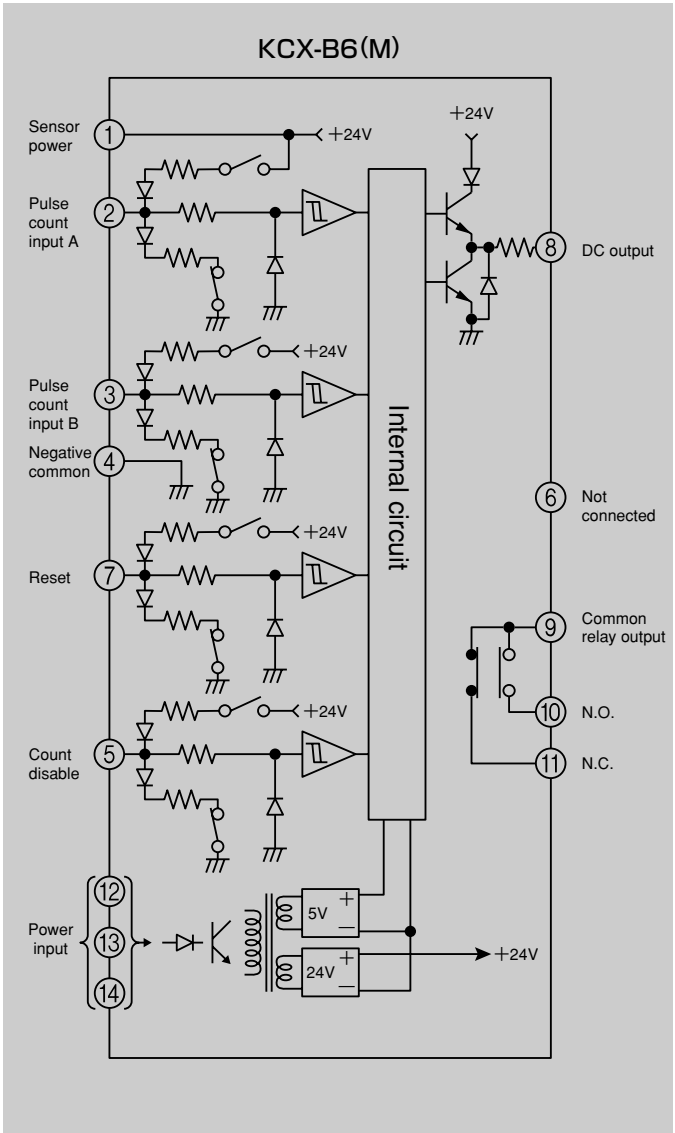
KCX-B6W(M)

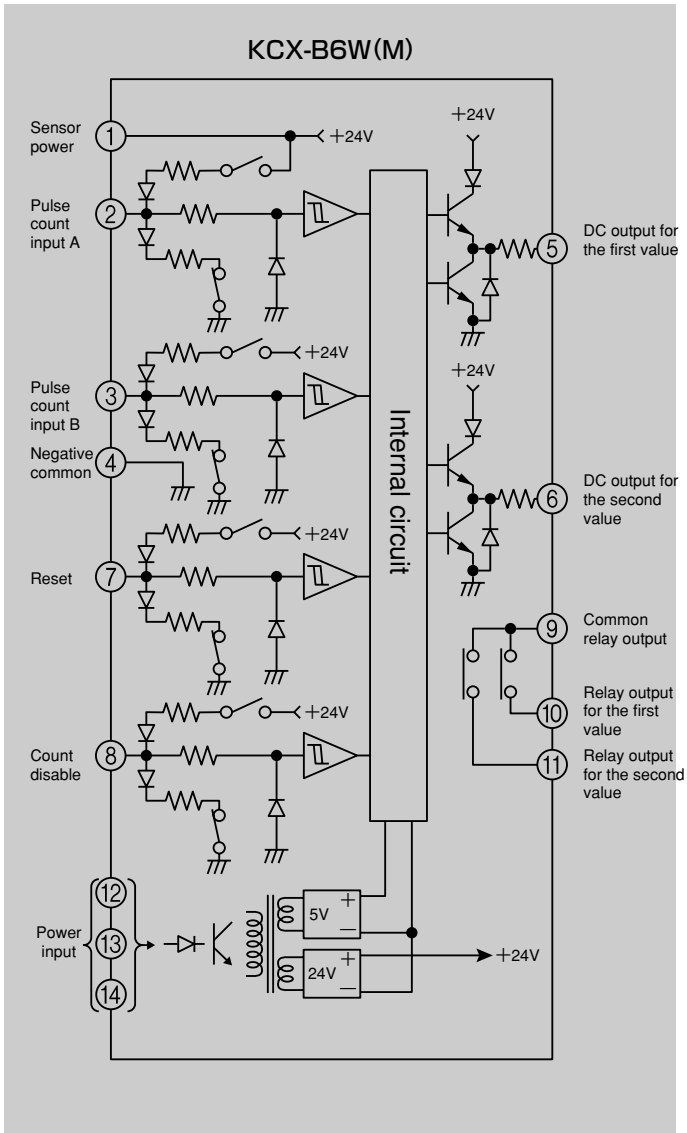


T/N	Name	Description
1	+24V 80mA	Sensor power
2	IN A	Pulse count input A
3	IN B	Pulse count input B
4	E	Negative common I/O
5	OUT 1	DC output for the first value
6	OUT 2	DC output for the second value
7	R	External reset input
8	IN H	Count disable
9	COM	Connected relay output
10	N.O.1	Relay output for the first value
11	N.O.2	Relay output for the second value
12	AC180～264V	Power input
13	AC90～132V	
14	AC0V	



I/O Circuits

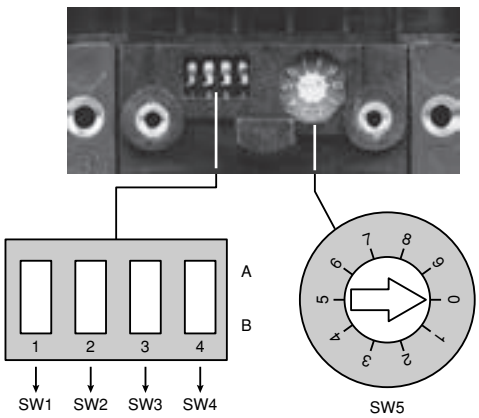




Operating procedures

1. Mode selection

To select the counter modes, use the four switches located on the rear side of the counter, and ten positions of the rotary switch.



Switch	Mode selected	Position	Value selected
1	Count speed	A	10cps
		B	20kcps
2	Pulse count	A	Separate
		B	Two-phase
3	Direction	A	Subtraction
		B	Addition
4	I/O logic	A	Negative
		B	Positive
5	Signal output	—	

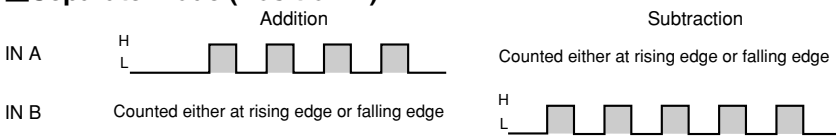
Switch 1 Count speed

This switch used to set or change the maximum count rate. Turn the switch to Position A to select 10cps, and Position B to select 20kcps. Position A is used for relay input such as a switch or relay. Use Position B for DC input such s a rotary encoder or proximity switch.

Switch 2 Count mode

This switch selects the Two-Phase or Separate count mode. For a proximity switch or relay, set the switch to Position A to select the Separate mode. For a rotary encoder, set it to Position B to select the Two-Phase mode.

■Separate mode (Position A)



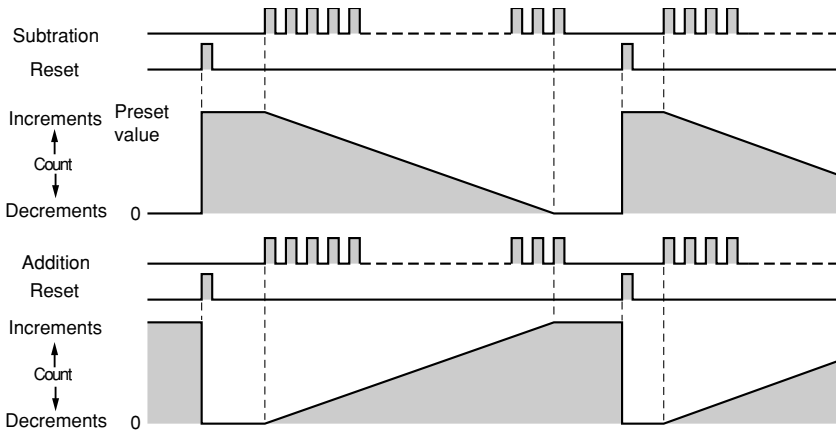
■Two-Phase mode (Position B)

Switch 3 Direction

This switch changes the count direction to Addition or Subtraction. Set the switch to Position A to select Subtraction, and set it to Position B to select Addition. When a reset signal is entered, the counter is reset as follows:

In the Subtraction mode, the single preset counter is reset to the first preset value, and the dual preset counter is reset to the second preset value.

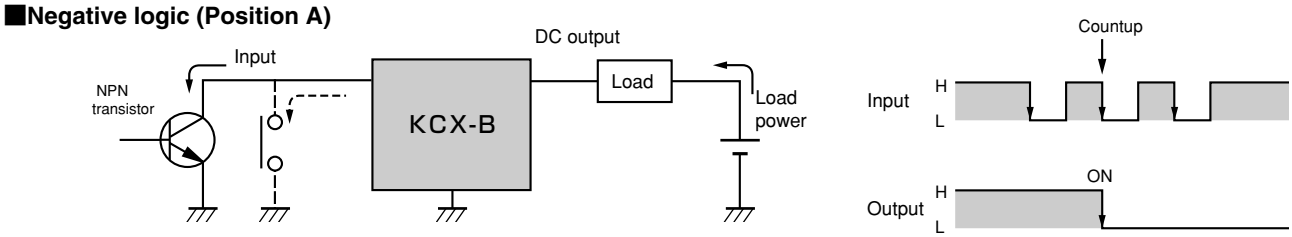
In the Addition mode, both counters are reset to zero.



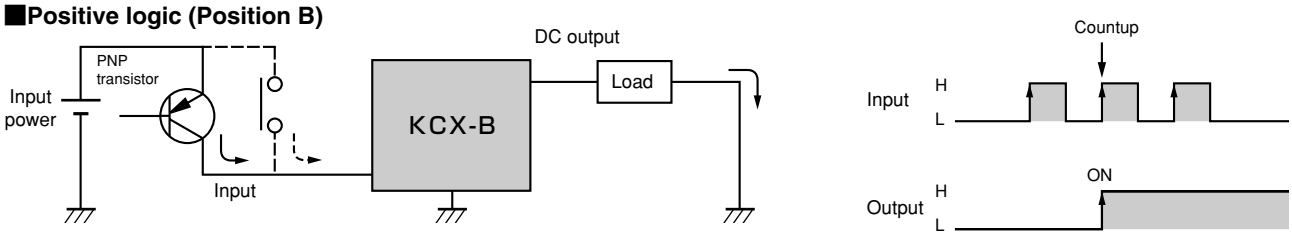
Switch 4 I/O logic

Use this switch to select either positive or negative I/O logic. To select the negative logic (active at "L" level), set the switch to Position A. To select the positive logic (active at "H"), set it to Position B.

■Negative logic (Position A)



■Positive logic (Position B)



Switch 5 Signal output

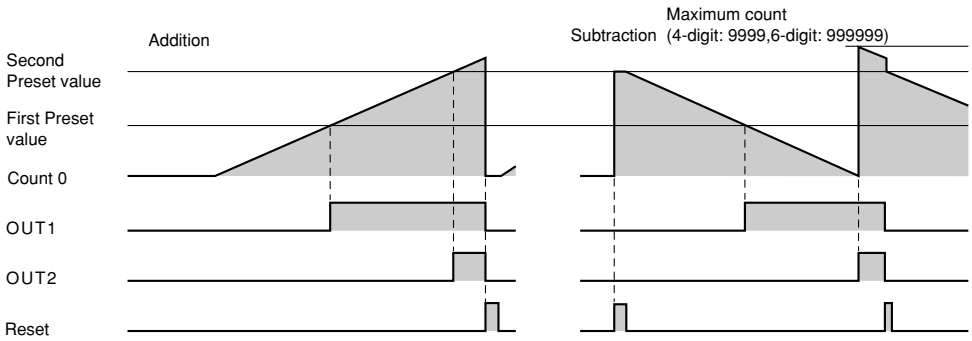
Use this rotary switch to select the output mode of the counter. Six modes are available for single preset counters, and ten modes for dual preset counters.

- "OUT 2" applies to single preset counters. P2 is reset to the preset value, and P1 is reset to zero.
- Positions 0 to 5 are used to select the Countup mode. Positions 6 to 9 select the Compare mode.

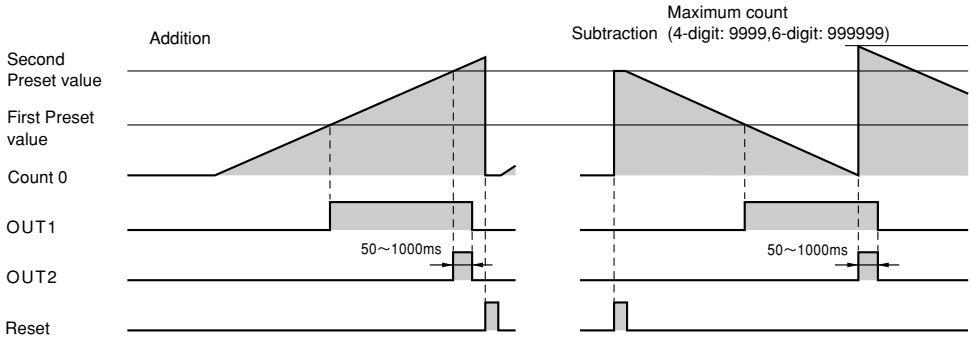
C: Count
P1: First preset value
P2: Second preset value

Position	OUT 1		OUT 2	
	Count	Signal output	Count	Signal output
0	Continued	Held	Continued	Held
1				50～1000ms
2			Reset	
3		100ms	Continued	Held
4				50～1000ms
5			Reset	
6	C≦P1		C≧P2	
7			P1≦C≦P2	
8	C≧P2		C＜0	
9	P1≦C≦P2		C≧P2	

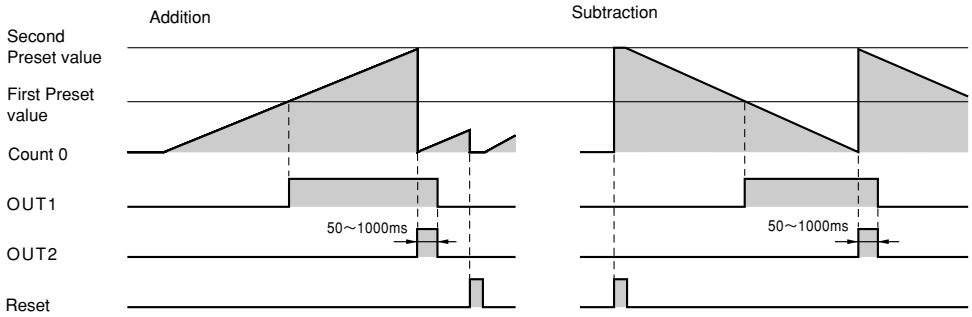
■Position 0



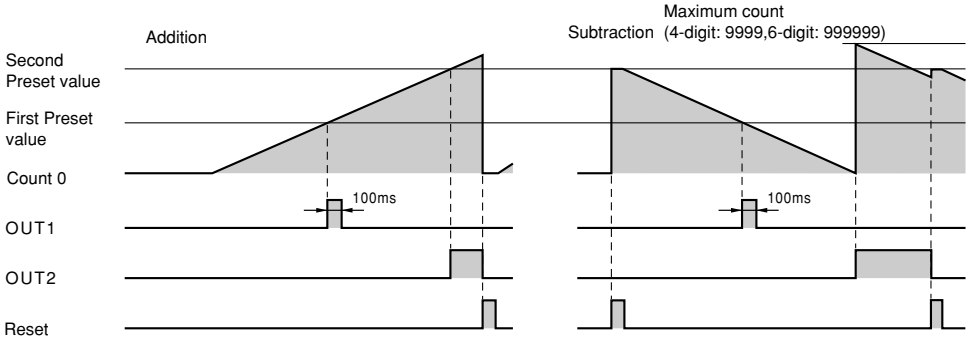
■Position 1



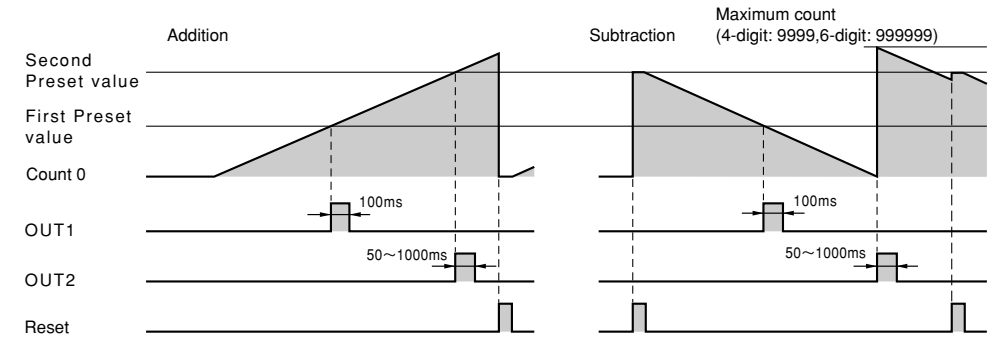
■Position 2



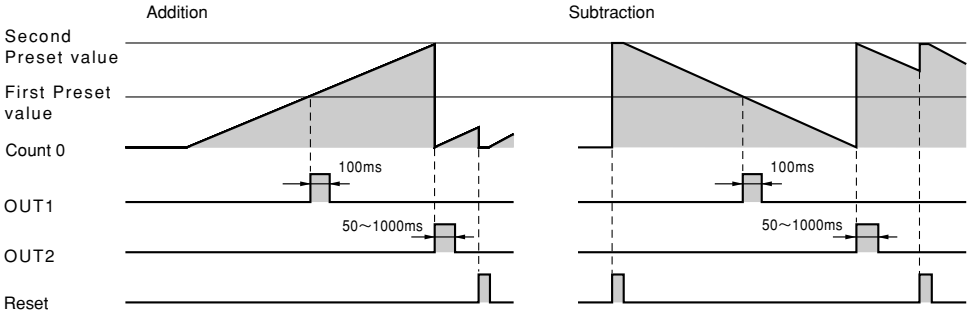
■Position 3



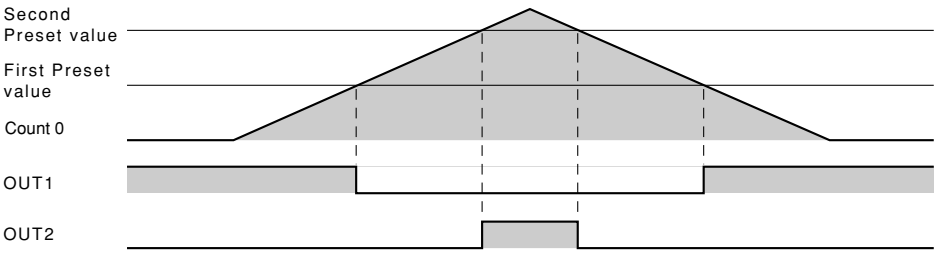
■**Position 4**



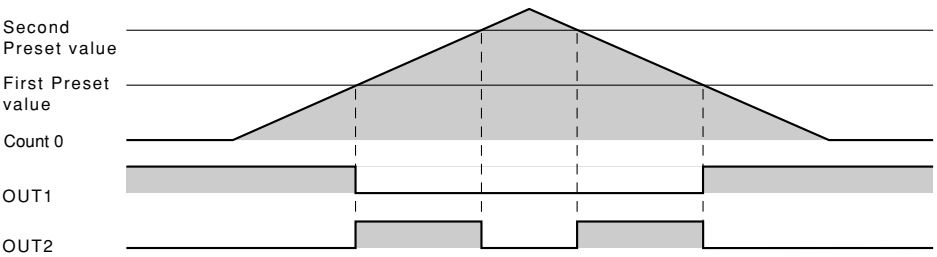
■**Position 5**



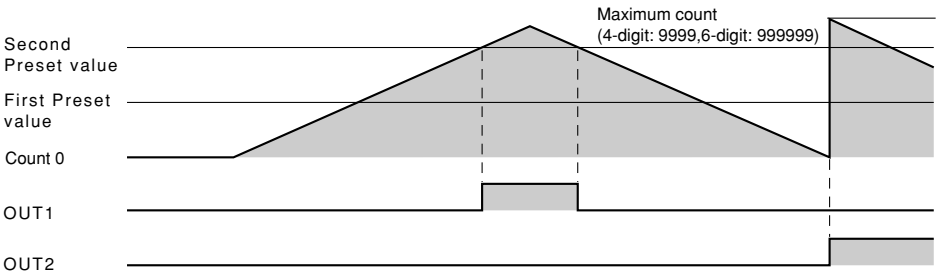
■**Position 6**



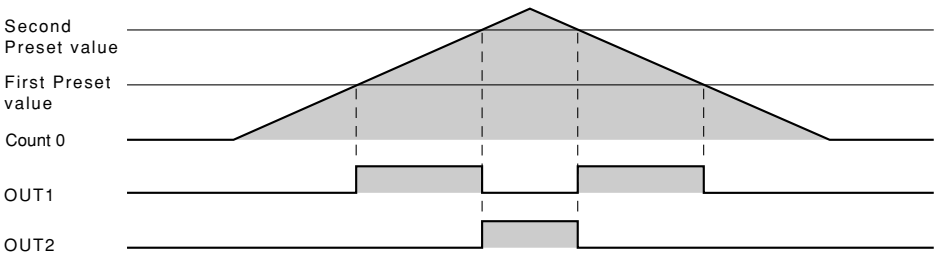
■**Position 7**



■**Position 8**

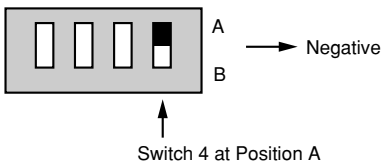


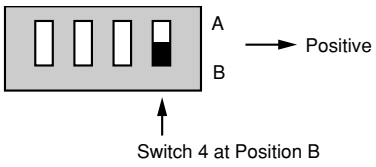
■**Position 9**



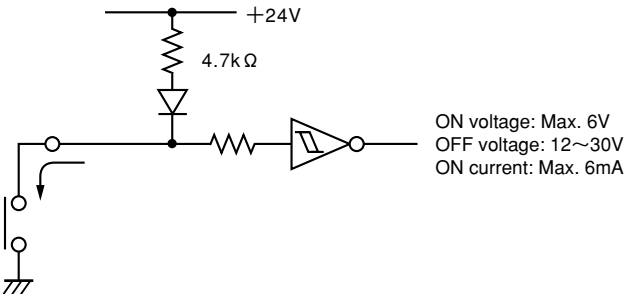
2. Input Circuit

The KCX-B Series counters can use either positive or negative input.
To change the input mode, use Dip switch 4 on the rear panel.

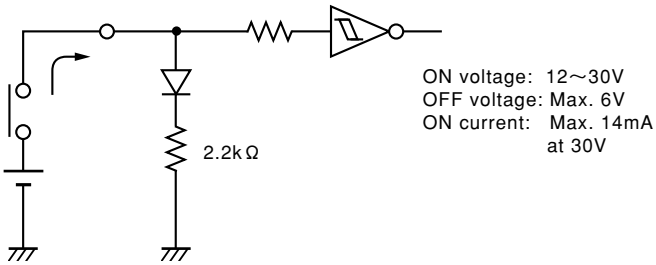




Negative input equivalent circuit



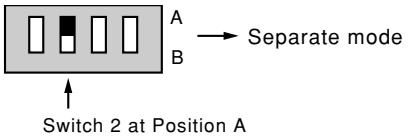
Positive input equivalent circuit



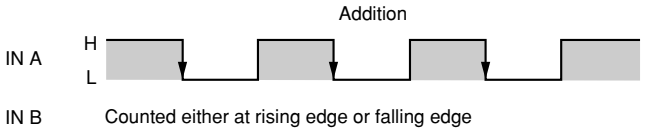
(1) Pulse count mode

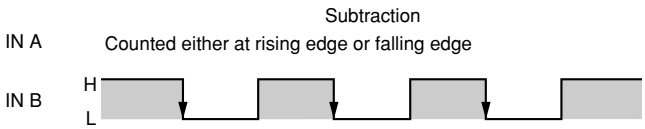
Use Dip switch 4 to change the pulse count mode between Two-Phase (90˚ dephased) or Separate.

■Input waveforms

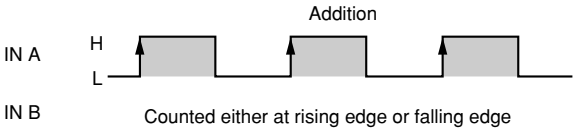


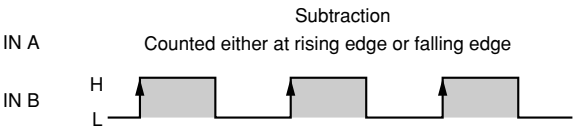
■Negative mode

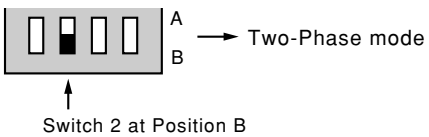




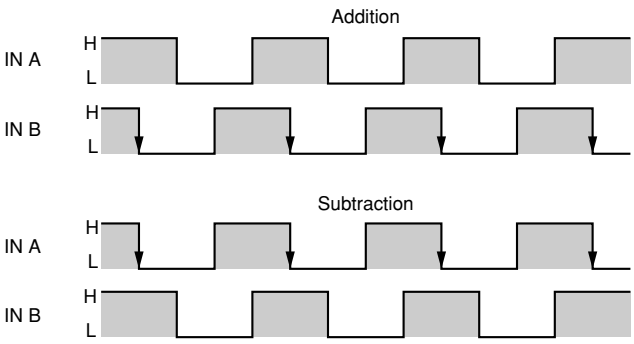
■Positive mode



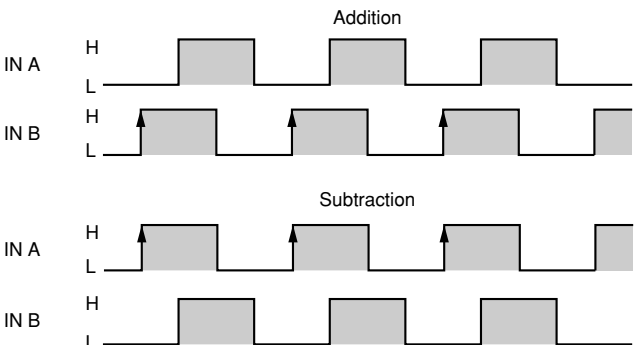




■Negative mode

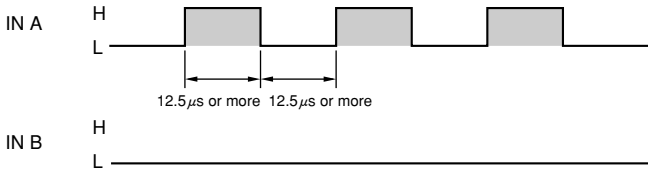


■Positive mode

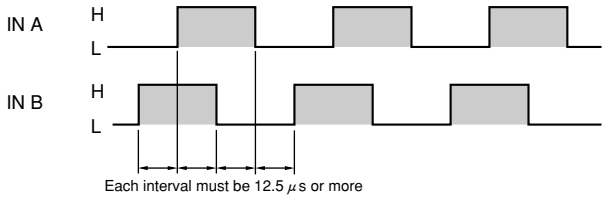


■Pulse count requirements

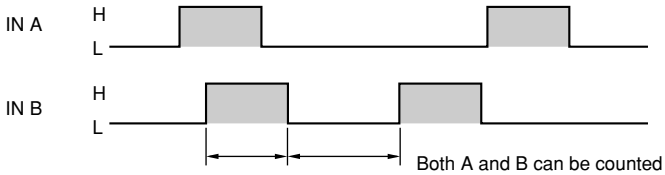
■Separate mode



■Two-Phase mode



■Repeated additions or subtractions



Both A and B can be counted at the same time if the pulse width and interval are equal to or longer than 12.5μs.

(2) External reset

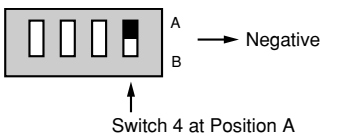
In the addition mode, this signal resets the count to zero. In the subtraction mode, the count is reset to the first preset value on the single preset counters, and to the second value on the dual preset models. The reset input overrides the pulse input and the count disable input.

(3) Count disable

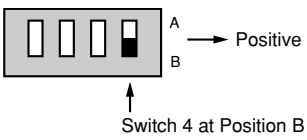
The disable signal suspends the pulse count. When it turns off, count restarts from the value at the time of suspension.

3. Output Circuit

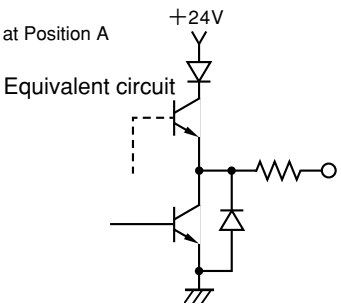
The KCX-B Series counters can use DC output or relay output. Either positive or negative logic can be selected. The 1c relay contact is used for the single preset models, and 2a relay contact for the dual preset models.



Switch 4 at Position A



Switch 4 at Position B



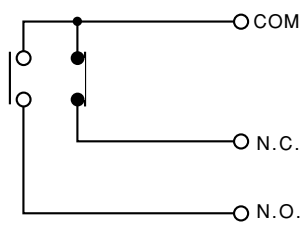
Negative Switching current:	Max. 30mA
Negative Applied voltage:	Max. 35V
Negative Residual voltage:	Max. 1.5V
Positive Output voltage:	16~28V
Positive Output current:	Max. 15mA

※In the negative mode, the output terminal generates a voltage of 20V to 28V when signal output turns off. For the load input terminal, use a reverse current blocking diode that withstands 40V backward voltage and 40mA forward current.

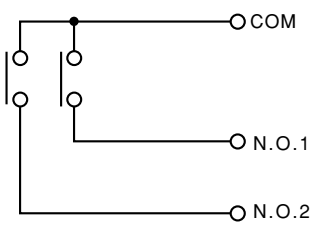
※Use a totem-pole structure for the DC output. Do not connect the circuit in parallel with other DC output.

Relay output AC220V 2A (resistance load)

Single preset



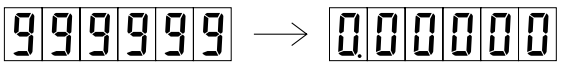
Dual preset



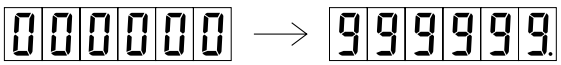
4. Count overrange

The KCX-B models can count from 0 to 999999 (6 digits).

When Switch 5 is between Position 0 to Position 5, the counter is set to the Hold mode or One shot mode. In the Hold mode, signal output is retained after countup. In the One shot mode, signal is generated for a short period upon countup.
When Switch 5 is anywhere between Position 6 to Position 9, the counter operates in the Compare mode. When the count exceeds the above range, the counter retains the lower or upper limit.
In the Addition mode, the count changes as follows when it has reached the upper limit:



In the Subtraction mode, the count changes as follows when it has reached the lower limit:

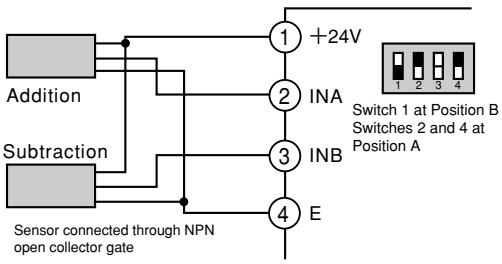


Wiring Examples

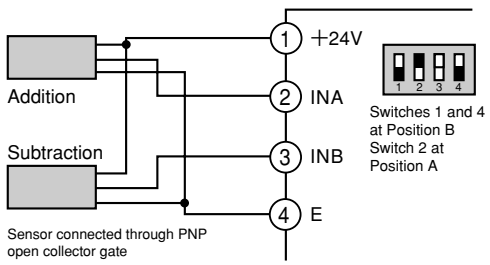
Pulse input

Proximity switch or Photoelectric sensor

■Negative logic

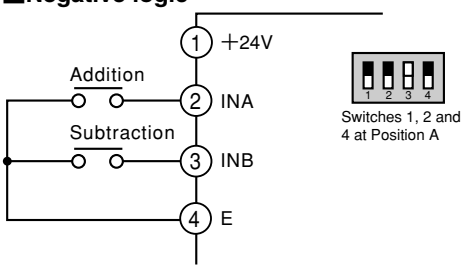


■Positive logic

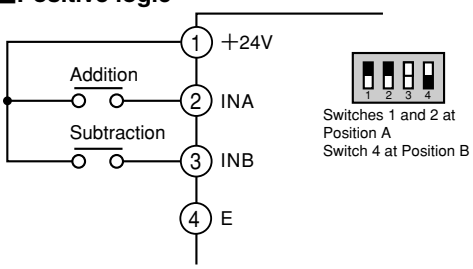


Switch or relay

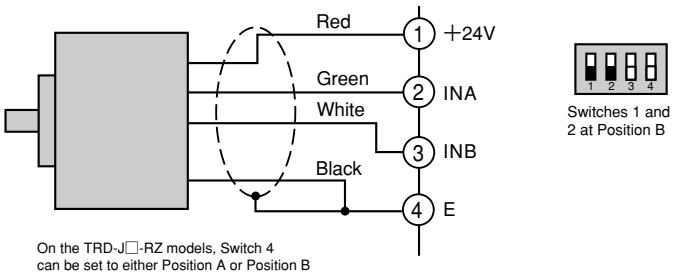
■Negative logic



■Positive logic

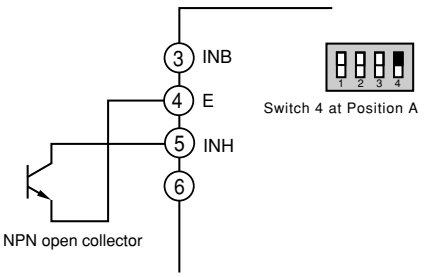


Rotary encoder

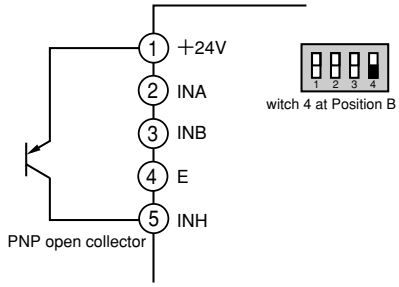


Count disable input

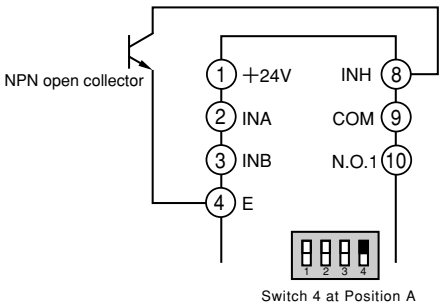
■Single preset in negative logic



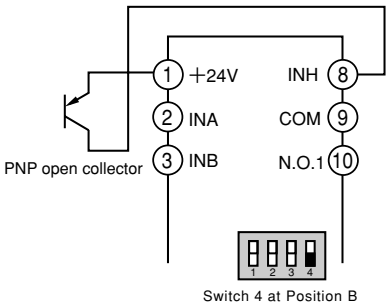
■Single preset in positive logic



■Dual preset in negative logic

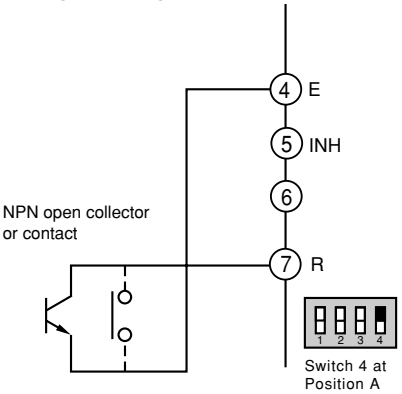


■Dual preset in positive logic

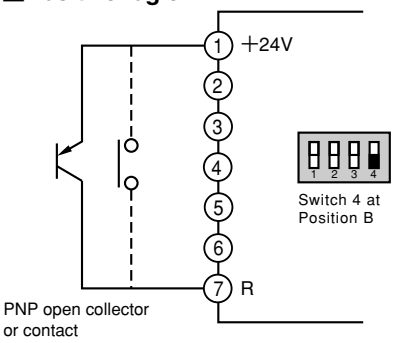


Reset input

■Negative logic

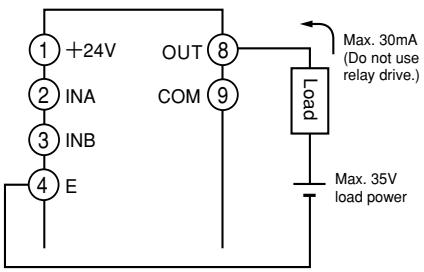


■Positive logic

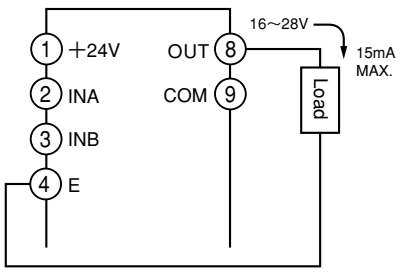


DC output

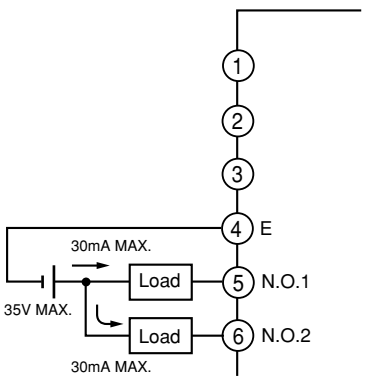
■Single preset in negative logic



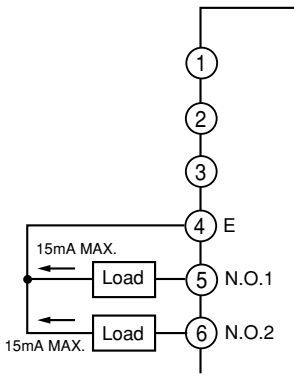
■Single preset in positive logic



■Dual preset in negative logic

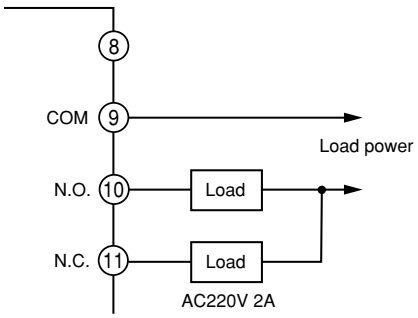


■Dual preset in positive logic

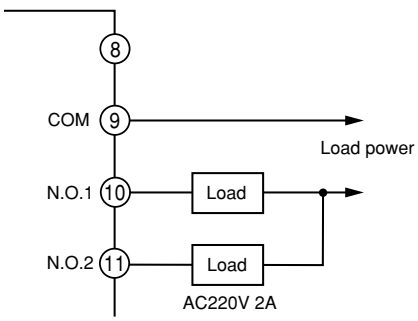


Relay output

■Single preset

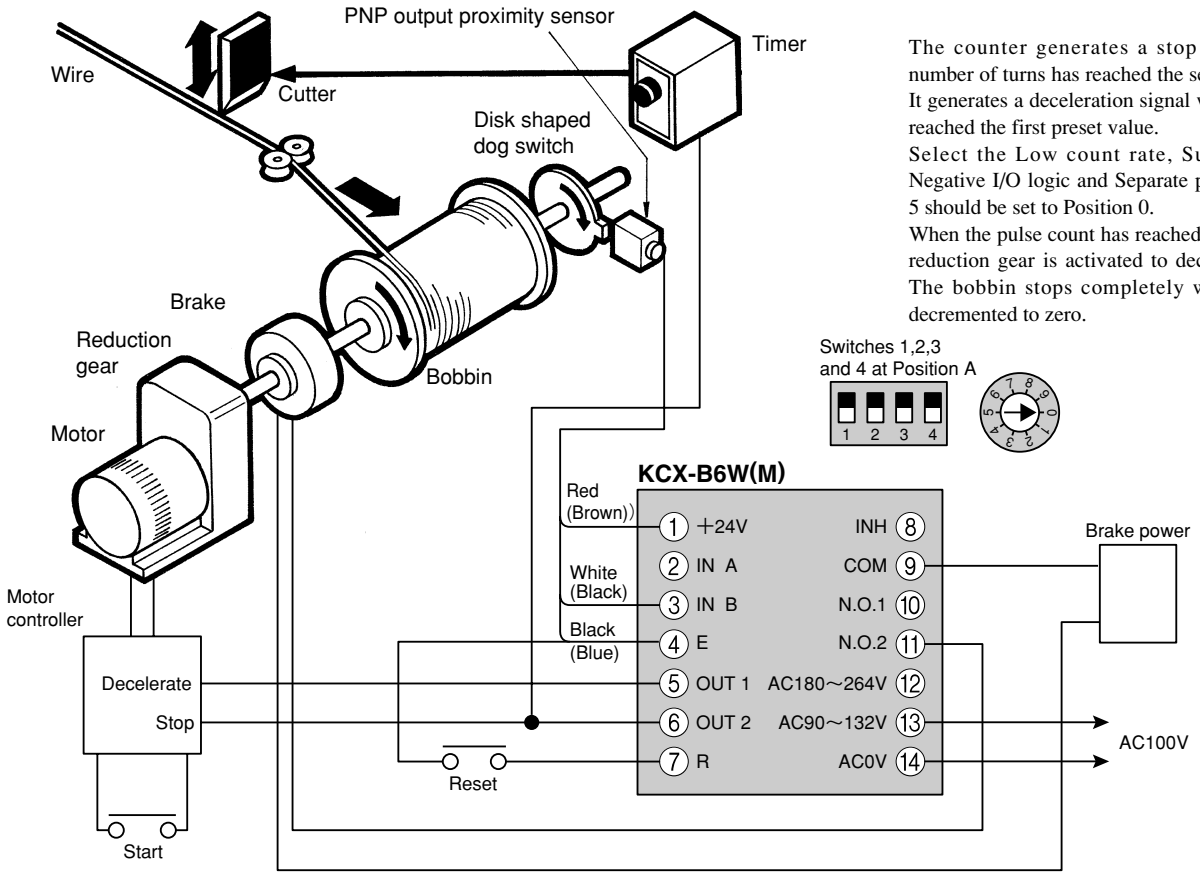


■Dual preset



Recommended applications

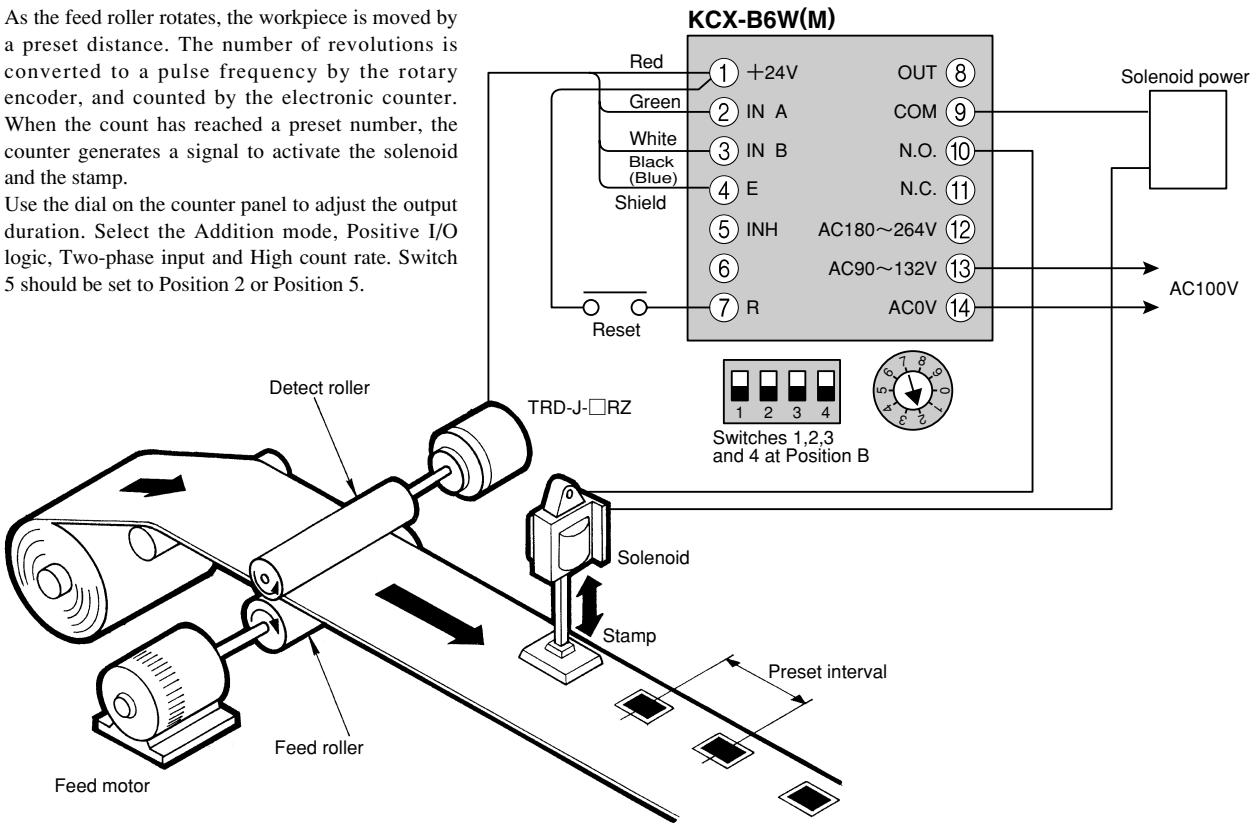
Winder with one-step reduction gear



The counter generates a stop signal when the number of turns has reached the second preset value. It generates a deceleration signal when the count has reached the first preset value.
Select the Low count rate, Subtraction mode, Negative I/O logic and Separate pulse input. Switch 5 should be set to Position 0.
When the pulse count has reached the first value, the reduction gear is activated to decelerate the motor. The bobbin stops completely when the count is decremented to zero.

Stamper

As the feed roller rotates, the workpiece is moved by a preset distance. The number of revolutions is converted to a pulse frequency by the rotary encoder, and counted by the electronic counter. When the count has reached a preset number, the counter generates a signal to activate the solenoid and the stamp.
Use the dial on the counter panel to adjust the output duration. Select the Addition mode, Positive I/O logic, Two-phase input and High count rate. Switch 5 should be set to Position 2 or Position 5.



KCX-B6T

Fast Total Counters for Addition and Subtraction

Maximum count speed: 10cps or 20kcps

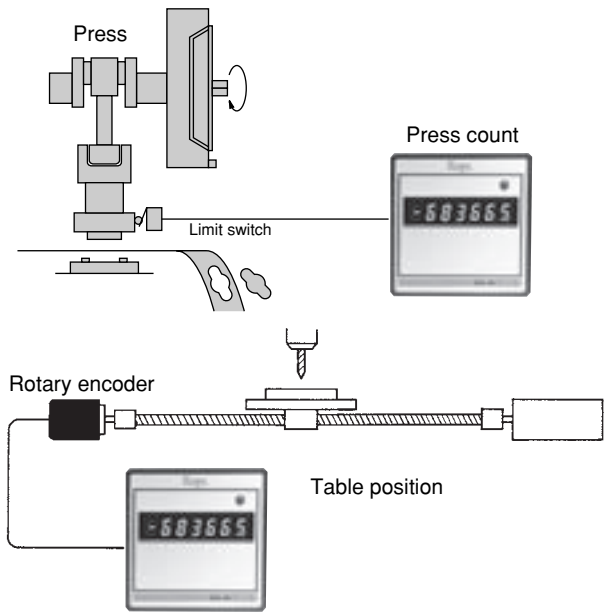
In addition to counting in two directions, these counters can use negative values. They are displayed on the easy to see green LED screen. Available options include count disable, reset prevention and negative or positive input logic. The counter can be used for positioning a moving object as shown below.

KCX-B6T

Merits

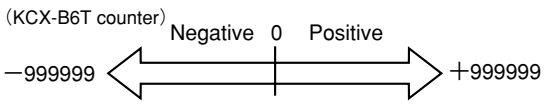
●Total counter as fast as 20kcps

Using both addition and subtraction, the counter totals individual counts much more quickly than other similar products. With the option of 10cps, the counter can be used for many purposes.



●Ability to count negative numbers

The count range is doubled by the ability to operate both in positive and negative numbers.

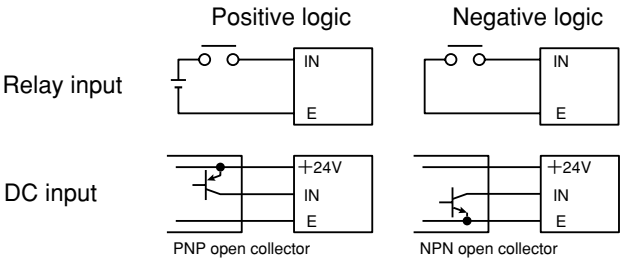


●Two-phase input and separate input

With these options, the counter widens choices of input devices to rotary encoder, proximity sensors and relay contacts. It accepts simultaneous inputs for addition and subtraction. This is ideal for keeping track of variable quantities such as workpieces on a conveyor and cars in a parking lot.

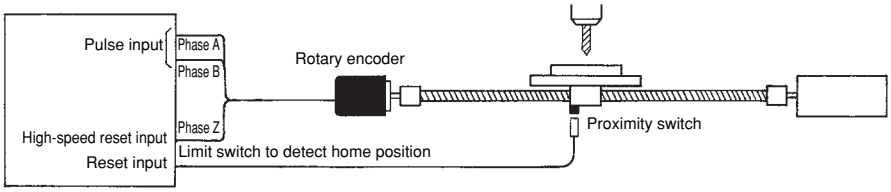
●Positive and negative input logics

The choices of input devices are also expanded. Except for slow reset, positive or negative can be selected to allow the use of PNP or NPN open collector.



●Fast reset and slow reset

The two reset signals work as AND elements. They can be used to combine two different operations. For example, the counter can be reset only when the rotary encoder and the drilling machine are at their respective home positions. No additional circuit is required.



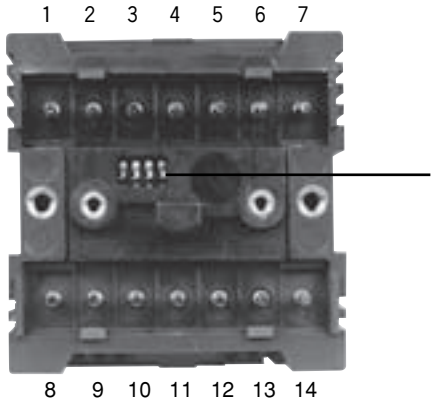
Specifications

Model number	KCX-B6T	
Number of digits	6 digits	
Count range	−999999～+999999	
Pulse input	Maximum count speed	10cps 20kcps or (selected by switch)
	Input resistance	Positive: 2.2kΩ Negative: 3.3kΩ
	Input voltage	"L"0～6V、"H"16～30V
Count disable input	Response time	On delay: Max. 25μs Off delay: Max. 25μs
	Input resistance	Positive: 2.2kΩ Negative: 3.3kΩ
	Input voltage	"L"0～6V、"H"16～30V
High speed reset input	Response time	On delay: Max. 25μs Off delay: Max. 25μs
	Input resistance	Positive: 2.2kΩ Negative: 3.3kΩ
	Input voltage	"L"0～6V、"H"16～30V
Reset input	Response time	On delay: Max. 50ms Off delay: Max. 50ms
	Input resistance	Positive: 3.3kΩ
	Input voltage	"L"0～6V、"H"16～30V
Manual reset	Manual reset is disabled by switch on front panel (by short circuiting terminals ④ and ⑥)	
Memory backup at power shutdown	Time for charging	50h
	Backup duration	2000h(25℃)
	Response of emergency input gate	20～500ms
	Response of input gate upon recovery	50～500ms
Sensor power	DC+24V(20～28V) 80mA	
Withstand voltage	AC 2kV for one minute (between AC power and Terminal E)	
Vibration resistance	(In compliance to JIS C 0911)	Durable for one hour along three axes at 10 to 55Hz with 0.5mm amplitude No error for one hour along three axes at 10 to 55Hz with 0.35mm amplitude
Noise resistance	1kV (square wave pulse with 1μs width)	
Source voltage	AC90～132V, or AC180～264V 14VA	
Ambient temperature	−10～+50℃	
Storage temperature	−20～+50℃ (−20～+70℃ during transportation of less than one week)	
Ambient/Storage humidity	35～85%RH (with no dewing)	
Weight	Approx. 350g	

Character height on display: 8mm

Terminal Assignment

T/N	Name	Description
1	+24V 80mA	Sensor power
2	IN A	Pulse count input A
3	IN B	Pulse count input B
4	E	Common input
5	IN H	Count disable
6	RD	Manual reset prevention
7	RH	High speed reset input
8	RL	Reset input
9	—	Not connected
10	—	Not connected
11	—	Not connected
12	AC180～264V	Power input
13	AC90～132V	
14	AC0V	

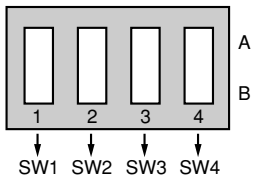


Operating procedures

1. Mode selection

To select the counter modes, use the four switches located on the rear side of the counter.

Switch	Mode selected	Position	Value selected
1	IN A Count speed	A	10cps
		B	20kcps
2	IN B Count speed	A	10cps
		B	20kcps
3	Pulse count	A	Separate
		B	Two-phase
4	Input logic	A	Negative
		B	Positive



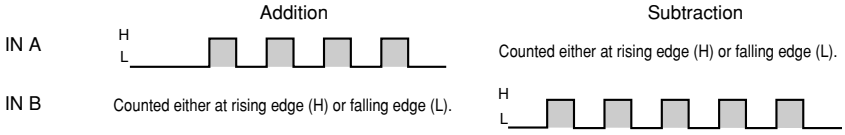
Switches 1 and 2 **Count speed**

These switches are used to set or change the maximum count speed. Turn the either switch to Position A to select 10cps, and Position B to select 20kcps. Position A is used for relay input such as a switch or relay. Use Position B for DC input such s a rotary encoder or proximity switch.

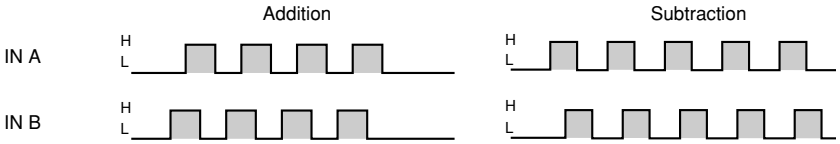
Switch 3 **Pulse speed**

This switch changes the pulse count mode between Two-Phase and Separate. For a Proximity switch or relay, set the switch to Position A to select the Separate mode. For a rotary encoder, set it to Position B to select the Two-Phase mode.

■Separate mode (Position A)



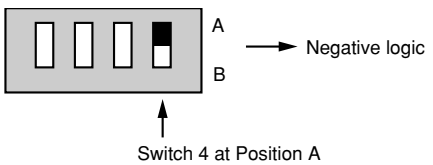
■Two-Phase mode (Position B)

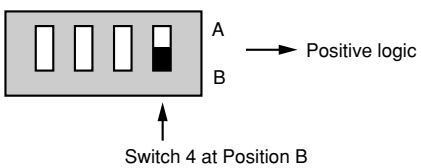


Switch 4 **Input logic**

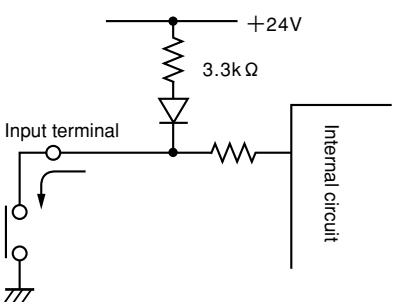
Use this switch to select the input logic either Positive or Negative. To select the negative logic (active at "L" level), set the switch to Position A. To select the positive logic (active at "H"), set it to Position B.

2. Input logic selection



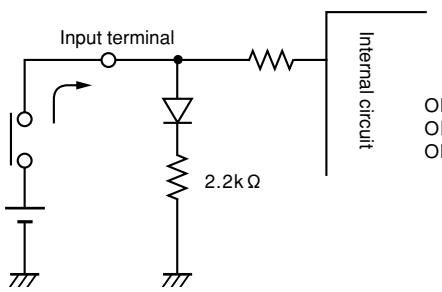


Negative logic input equivalent circuit



ON voltage: Max. 6V
OFF voltage: 16 to 30V
ON current: Max. 9mA

Positive input equivalent circuit

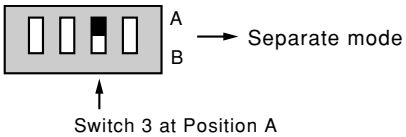


ON voltage: 16 to 30V
OFF voltage: Max. 6V
ON current: Max. 14mA
at 30V

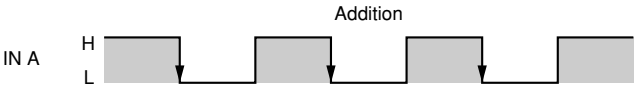
3. Pulse count input

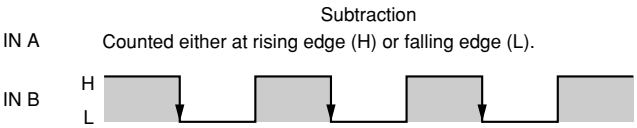
Use Dip switch 3 to change the pulse count mode between Two-Phase (90° dephased) or Separate.

■Input waveforms

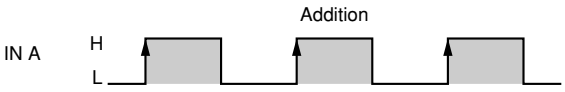


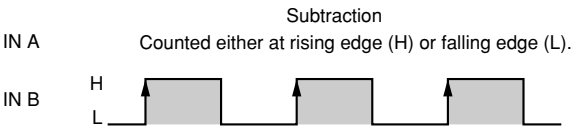
■Negative mode

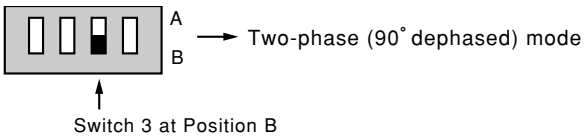




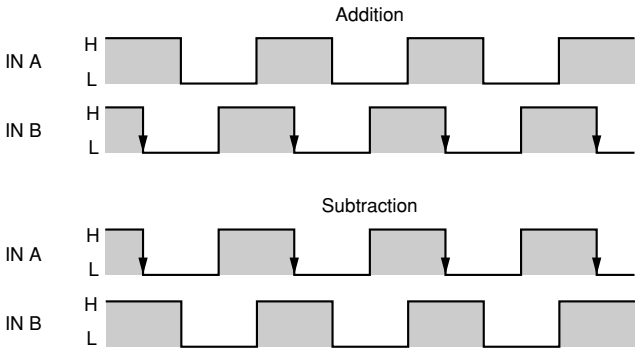
■Positive mode



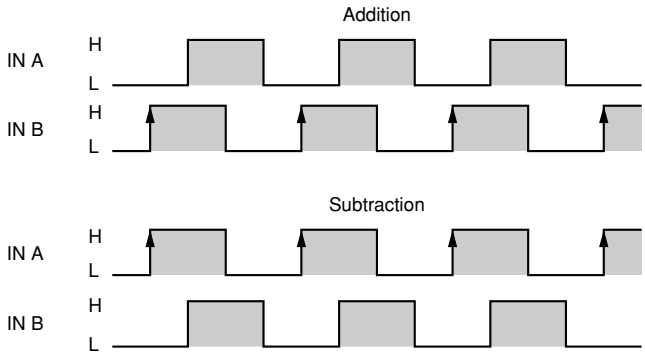




■Negative mode

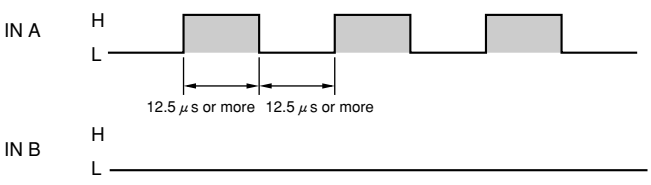


■Positive mode

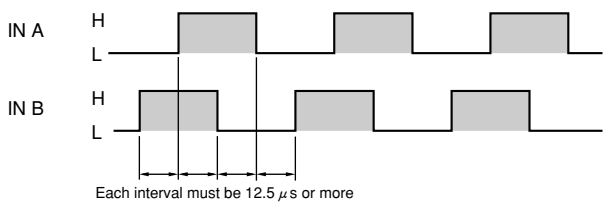


■Pulse count requirements

■Separate mode

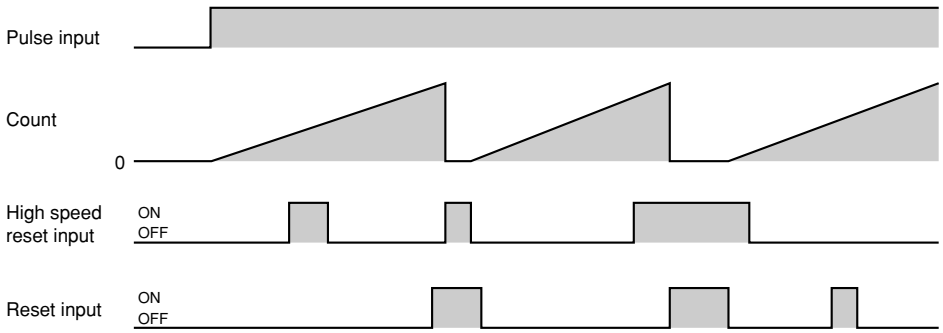


■Two-Phase mode



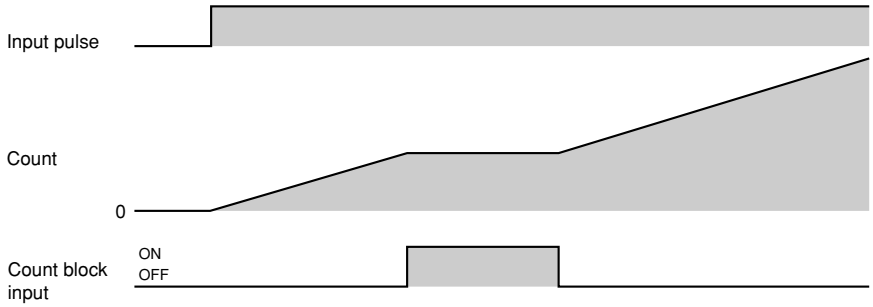
4. External reset input

On the KCX-B6T Series counters, reset and high speed reset are used as an AND gate.
If you do not use both of them, keep the unused input at ON level.



5. Count disable input

The disable signal halts the pulse count. When it turns off, count restarts from the value at the time of halt.



Count overrange

The KCX-B6T models can count from-999999 to 999999.

In the Addition mode, the count is reset to 000000 when it has reached 999999.

In the Subtraction mode, the count is reset to 000000 when it has reached -999999.

Disabling manual reset

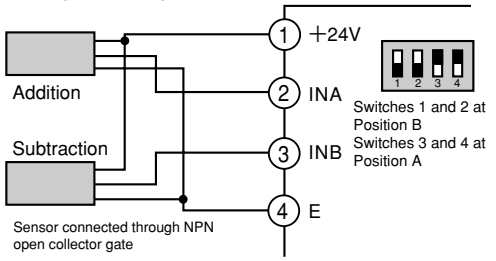
Connect Terminals 6 and 4 if you wish to disable the Reset button on the front panel.
It allows you to prevent erroneous preset.

Wiring Examples

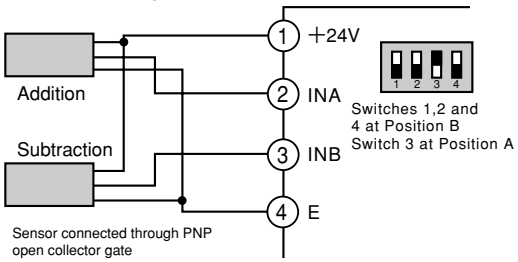
Pulse input

Proximity switch or photoelectric sensor

■Negative logic

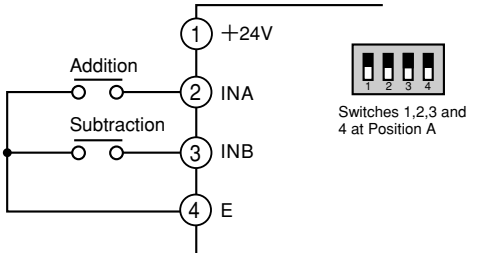


■Positive logic

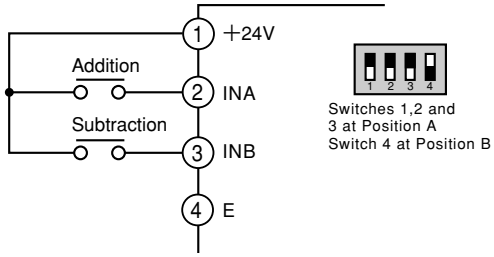


Switch or relay

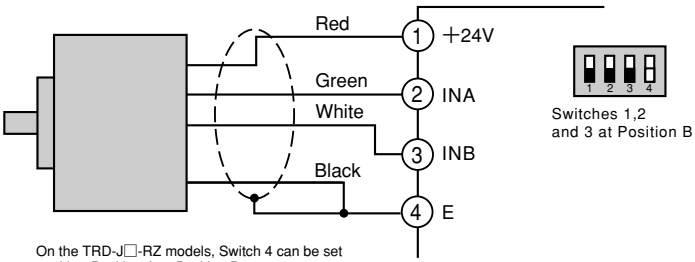
■Negative logic



■Positive logic

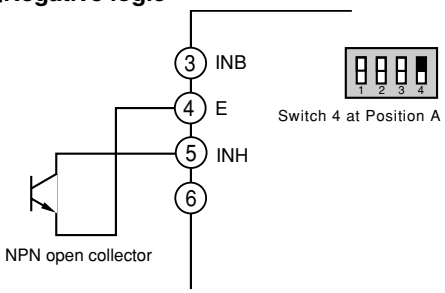


Rotary encoder

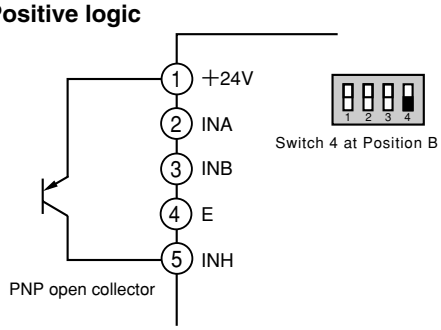


Count disable input

■Negative logic

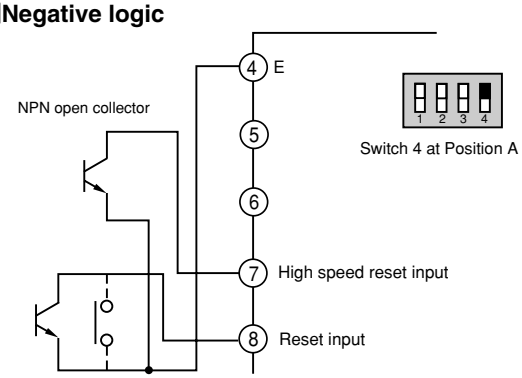


■Positive logic

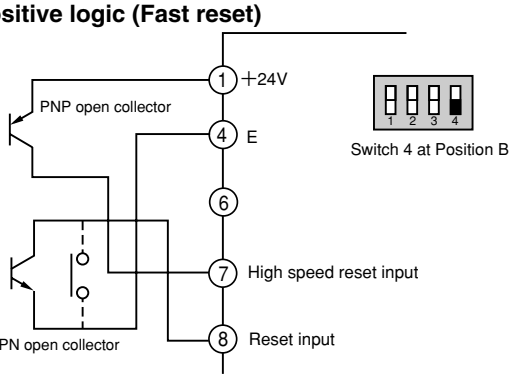


Reset input

■Negative logic



■Positive logic (Fast reset)

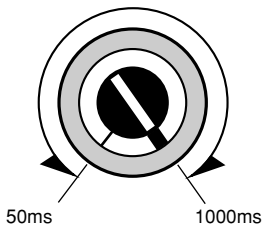


For optimum performance(KCX-□,□M,□D,□DM/□W,□WM/□T/B/B6T)

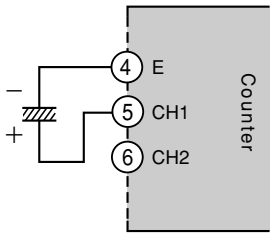
■Changing the duration of Type A output

In the One shot mode, output duration can be changed from 50ms to 1,000ms. For adjustment, use the dial on the front panel.
(On the KCX-□W and KCX-□WM counters, the dial is located on the rear panel.)

Turn the dial counterclockwise or clockwise to decrease or increase the duration. Turn it fully to either direction to select the minimum or maximum time.



On the KCX single preset counters, you can extend the output time by adding a capacitor between the terminals ④ and ⑤.



Electrolytic capacitor	Output duration		
	Minimum		Maximum
None	50ms	～	1s
2.2 μF 16V	100ms	～	2s
4.7 μF 16V	150ms	～	3s
10 μF 16V	250ms	～	5s
22 μF 16V	500ms	～	10s

■Memory backup at power shutdown

In some counters, a second battery is integrated to backup the count memory upon power shutdown. The battery can be fully charged in 50 hours. With only one hour charging, it can supply power for 40 hours, or 100 hours on the KCX-□WM and KCX-□T models.

Notes on memory backup

1. When power is shut down, the count display is cleared, and the sensor power drops to 0 V.

2. During Type B (Hold mode) operation, DC output also drops to 0V resulting in random signal. Upon the recovery of power, the signal output returns to the status before the power shutdown.

3. If the power is turned off during pulse input, the counter uses the battery to continue correct count.

4. You cannot reset the count by shutting power down.

5. During power shutdown, the count is not reset by any external reset signal.

6. In the following cases, 100 hours are required for charging the battery:

●When the counter is used for the first time

●When the battery is unused for a long time

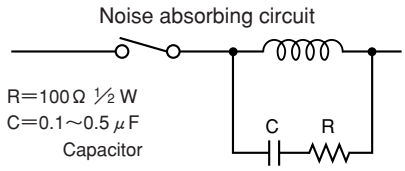
7. Service life of battery

When fully charged, the battery should be able to support memory for 2,000 hours (5,000 hours on the KCX-□WM and KCX-□T models). It should be replaced when this period is reduced to 50%. Normally, the battery can be used for five years. It can serve longer if the ambient temperature is kept at 5 to 30℃.

■Protection against noise

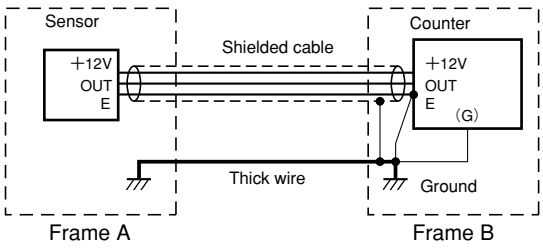
All of the KOYO electronic counters are tested for noise resistance. In addition to the standard tests, we perform special inspections to assure reliable performance. Use the following procedures for additional enhancement:

1. When you use a solenoid valve, clutch or brake near the counter, connect a surge absorbing circuit in parallel with its drive coil. This circuit should consist of a capacitor serially connected with a resistance of 100Ω (1/2W). Use an oil-impregnated capacitor or an MP capacitor of 0.1 to 0.5 μF.



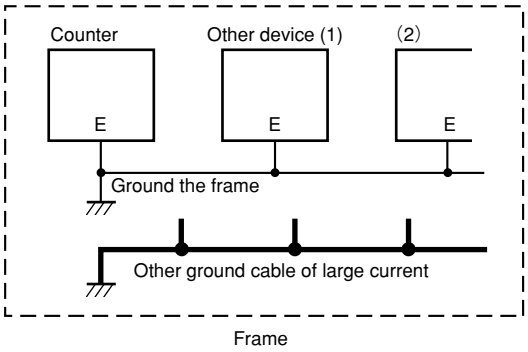
2. In a noisy area, do not share the power line with a device that uses large electric current. Always shield the I/O signal cables, and connect the shielded cables between the sensor and the counter.

   If they are installed on separate frames, use a thick wire of at least 0.5mm² to connect the frames.

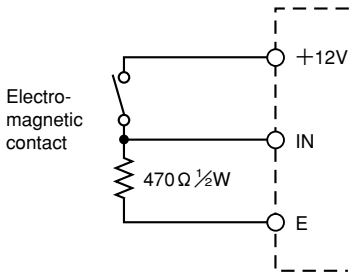


3. Keep the minimum distance between Terminal E and the frames.

   If you use a common ground for the counter and other devices, connect the ground cable to the counter frame. Use a thick and short ground cable, and isolate it from any other cable that grounds a large current.



4. Use a resistor of 470Ω (1/2W) if you add an electromagnetic relay to the slow pulse count terminal. Insert the resistor between the input terminal and the ground cable. This prevents incomplete contact, and helps improve reliability.



■Changing the preset value

During operation, a change to the preset value may cause the counter to generate a false signal. Before you make a change, always turn the power off, or reset the counter. Otherwise, the counter generates no signal upon countup, or erroneously generates a signal before or after the count has reached the new value.

Presetting to zero

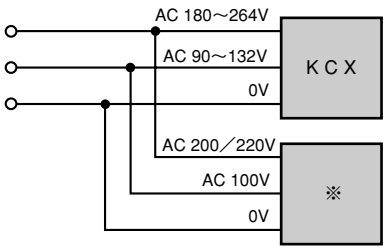
The counter may be preset to zero (for example, to "000" on a 3-digit counter). This may cause the counter to act as follows:

- It may generate a signal unless the input pulse is at "L" level and the reset signal is at "H" level.
- In the Type B mode, the counter may display 0,1,2,3 if a sequence of pulse signals are entered while the reset signal is at "L" level.

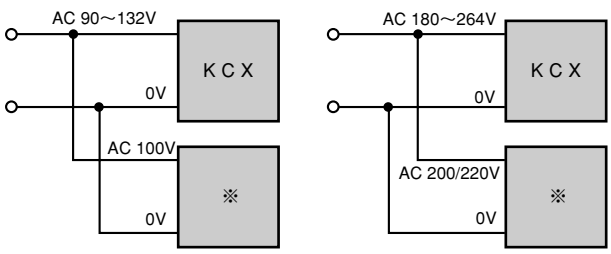
■Connecting the power

On the KCX Series counters, the power transformer is set to 110V or 220V. Avoid the following connection:

Wrong



Correct



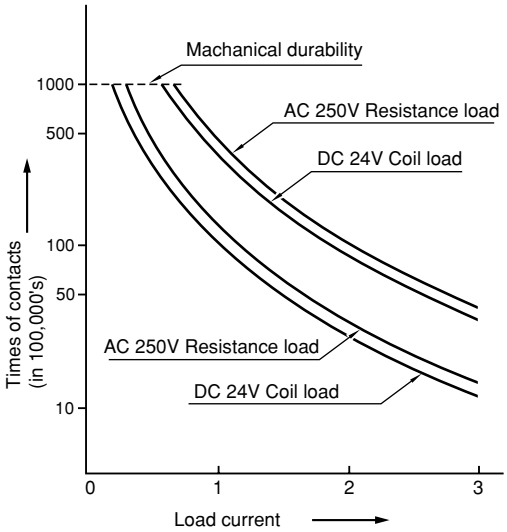
※Other counters

Cautions

●Output relay contact

The counter can be connected to an induced load. It may be an electromagnetic switch, control relay, AC solenoid or electromagnetic valve. The counter contains an output relay contact. Its service life is reduced if higher current or voltage flows to the contact. The following graph shows the relation between the durability of the contact and the magnitude of load:

Relay durability curve

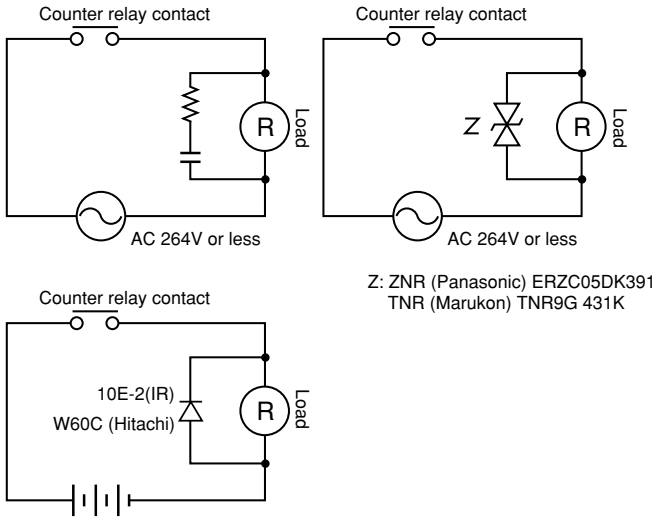


Under load conditions specified in JEM 1230 (1976)

On the contact surface, carbide is produced by glow discharge of induced load being switched. This increases the contact resistance. The carbide produced can be eliminated by arc discharge that occurs at higher current. It keeps the contact surface clean with minimum resistance. At lower current or voltage, the contact cannot be switched properly because of the carbide. It becomes unserviceable before the number of contacts reaches the normal limit. Its life can be reduced to as short as one tenth or one hundredth of the time estimated from the above curve. If you use small voltage or current, action should be taken to prevent glow discharge.

An effective means is to use a CR surge absorber or varistor. Connect such element in parallel with the load as shown below.

Surge absorbing circuit



●The induced load of the relay contact is 10% to 20% of the resistance load. The smaller the load is, the longer the contact can serve.

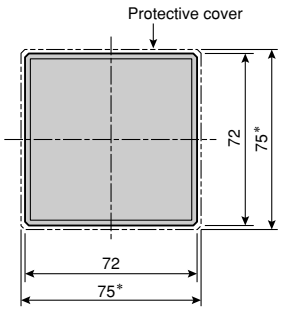
●With or without the memory backup, the status of DC output during power shutdown is undefined. That is, the output can randomly change between “1" and “0".

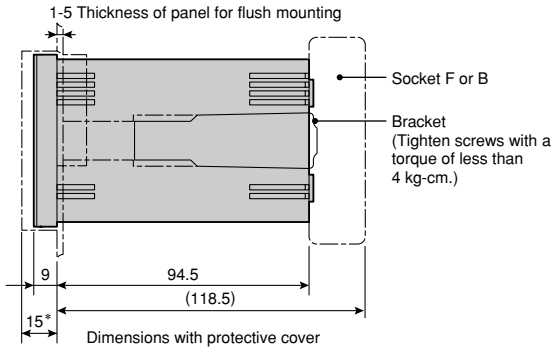
●On some models, certain numbers are displayed in different shapes as shown below. This is normal for such models.

KCX-1D/2D/3D/4D KCX-B/KCX-B6T	Other models
6	b
9	q

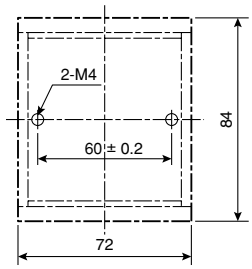
External Dimensions

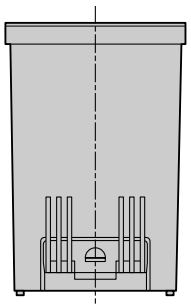
(in mm)



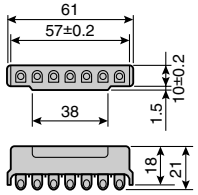


●Boring dimensions for wall surface mounting using Socket F

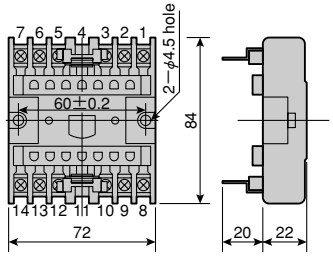




●Specified connector: KA-01



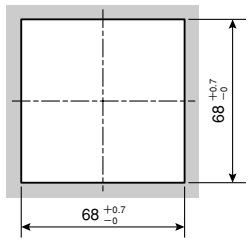
●Socket F (KF-03) for wall surface mounting



●External dimensions of Socket B (KB-03): Same as Socket F.

●KA-01, KF-03 and KB-03 are options.

●Boring dimensions for flush mounting

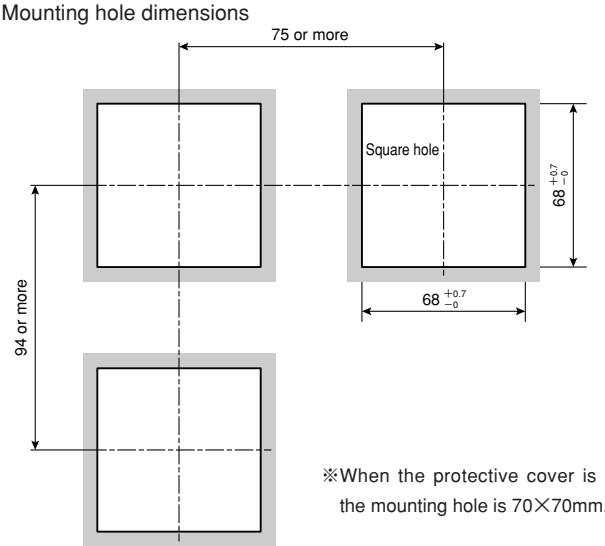


Notes:

- Use the screws provided to install the counter on Socket F (KF-03) or Socket B (KB-03).
- For the connector kit KA-01 and Socket B (KB-03), use screws sized as follows:
  For the connector kit (KA-01): 12mm or less
  For Socket B (KB-03): 30mm or less

Do not use longer screws, as they may break the internal elements.

Mounting hole dimensions



※When the protective cover is used, the mounting hole is 70×70mm.