

**ZN96J 6-Digit Digital Display Intelligent Counter**  
**ZN96FN 6-Digit Digital Display Intelligent Frequency Meter**  
**ZN96G 6-Digit Digital Display Intelligent Raster**



Beijing Symore Technology Development Co., Ltd.

# ZN96J 6-Digit Digital Display Intelligent Counter

ZN96FN numbers to show the intelligent 3 and 6 ZN96G numbers of frequency meter to show 6 intelligent grating table ZN96J numbers to show 6 intelligent counters.

ZN96J 6-Digit Digital Display Intelligent Counter is one of our ZN96 series control measurement and gauging products. This product applied widely machine tool, printing, textile, rubber, pharmacy, food, package machine industry etc...

## I. Technical Characteristics

1. 96 X48mm international standard face-plate.
2. 6-digit, 0.56 inches of LED digital display.
3. One add counting, one reduce counting input terminals.
4. Electrical level pulse and switching value input signals are compatible.
5. Set magnification, determine the proportion relation between counting and display value.
6. Set two control values, two-way relay output and control or alarm.
7. The present value and set value do not lose when power failure.
8. for outside connected sensor, can offer 5V (40 mA), 24V (30 mA) voltages (other voltages can be customized).
9. for outside-connected photoelectric geminate transistor, can offer 30 mA current approximately.
10. Outside connected sensor: hall sensor, photoelectric geminate transistor, sensor, proximity switch, contact switch.

## II. Technical Parameters:

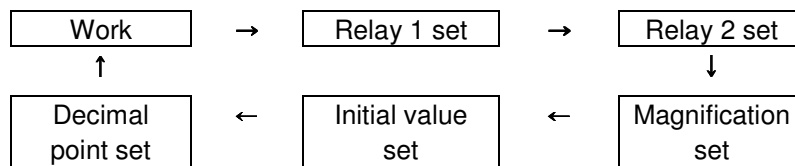
1. Power supply: AC220 V50Hz
2. Counting range: - 199999 - + 999999
3. Input resistance: 20K
4. Low impulse level: - 50 V-+0.5V
5. High impulse level: +4 V-+50V
6. Maximum counting frequency: 500,000
7. Minimum impulse level width: 2  $\mu$ S. When signal pulse rising edge and negative edge have trembles or have high frequency interference, can parallel connect capacitor properly at input end, but highest count frequency or input pulse minimum width will get influence (See the table and wire diagram).

	w/o capacitor	102pf	103pf	104pf	105pf
<b>Highest count frequency (times/sec.)</b>	500,000	10,000	1,000	100	10
<b>Level pulse minimum width</b>	2 $\mu$ S	100 $\mu$ S	1 mS	10 mS	100 mS

8. Relay contact capacity: AC220V 3A; DC24V 5A (hindrance load)
9. Overall dimension: 96 X48X112 mm
10. Opening size for installation:  $92^{+0.7} \times 44^{+0.5}$  mm
11. The ambient temperature:  $-10^{\circ}\text{C} - +50^{\circ}\text{C}$
12. Overall weight: 300g

### III. Operation Instruction:

1. **Function key (SET):** Press to choose item according to following order:



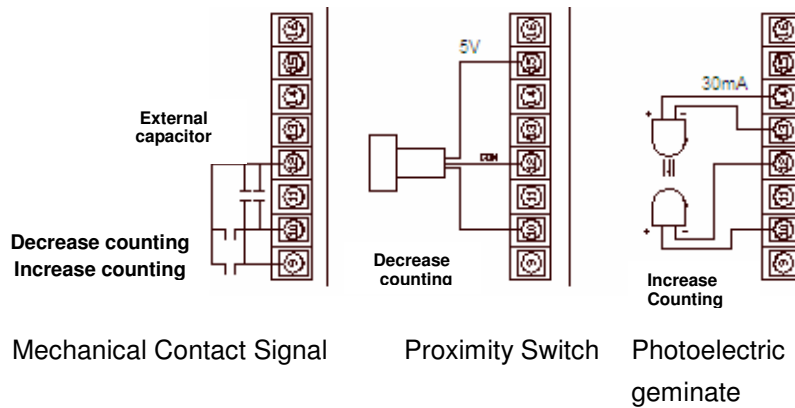
- ① During normal working condition, function key (SET) indicator does not light, press function key right now, function indicator light lights, enters into programming state. At the same time, relay 1 indicator light ( J 1) lights , can set the operation value of relay 1 through press Mode key (▶) and Up key (▲) (when display value is bigger than or is equal to this value, the relay 1 operate, otherwise release).
- ② Press function key again, indicator light J1 goes out, relay 2 indicator light (J2) lights , can set the operation value of relay 2 (when display value is bigger than or is equal to this value, the relay 2 operate, otherwise release).
- ③ Press function key continuously, indicator lights J1 and J2 light simultaneously, can set the magnification (counting value times magnification is equal to display value, magnification range: 0,001 to 65.535)
- ④ Press function key again, indicator lights J1 and J2 go out simultaneously,. Can set the count initial value (every time the display will return to initial value for each digit)
- ⑤ Press function key continuously, can set the decimal point through the Mode key.
- ⑥ Presses function key finally, function key indicator light goes out, and the counter enters into normal working condition. When relay 1 operates, the indicator light J1 lights, otherwise goes out; when relay 2 operates, indicator light J2 lights, otherwise goes out.

**2. Mode Key (▶):** During in programming state, select certain digit(s) position; the selected digit(s) will flash.

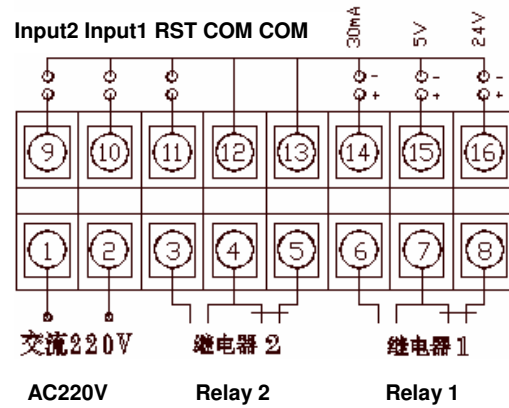
**3. UP or Reset Key (▲):** During in programming state, press this key can change the value of flashed digit(s), make value unidirectional increment. During normal working condition, press this key to reset the display to initial value.

**4. Reset Outlet Terminal:** The same as the reset key, short connect this terminal can reset the display value to initial value.

**5. The Counting Value Input Terminal:** Input 1 terminal as step-up one digit counting, input 2 terminal as step-down one digit counting. Can be connected electrical level pulse or switching value. (See the sketch diagram)



#### IV. Wiring Diagram



## ZN96FN 6-Digit Digital Display Intelligent frequency meter

ZN96FN 6-Digit Digital Display Intelligent frequency meter is one of our ZN96 series control measurement and gauging products. This product mainly use in measuring the frequency, rotation speed, productivity, flow capacity etc.

### I. Technical Characteristics

1. 96 X48mm international standard faceplate.
2. 6-digit, 0.56 inches of LED digital display.
3. Electrical level pulse and switching value input signals are compatible.
4. Set magnification; determine the proportion relation between sample frequency and display value.
5. Set two control values, two-way relay output and control or alarm.
6. for outside connected sensor, can offer 5V (40 mA), 24V (30 mA) voltages (other voltages can be customized).

7. for outside-connected photoelectric geminate transistor, can offer 30 mA current approximately.
8. Outside connected sensor: angle raster sensor, hall sensor, photoelectric geminate transistor, proximity switch, contact switch etc.

## 2. Technical Parameters:

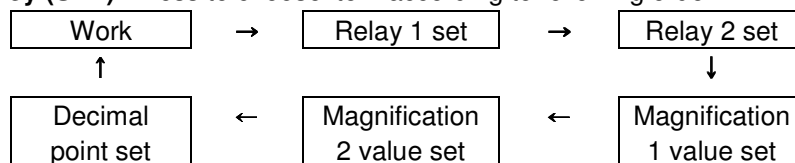
1. Power supply: AC220 V50Hz
2. Input resistance: 20K
3. Sampling period: 1 Sec.
4. The pulse low level: - 50 V-+0.5V
5. The pulse high level: +4 V-+50V
6. Maximum pulse frequency: 500,000
7. Level pulse minimum width: 100 $\mu$ S. When signal pulse rising edge and negative edge have trembles or have high frequency interference, can parallel connect capacitor properly at input end, but highest measuring frequency or input pulse minimum width will get influence (See the table and wire diagram).

	w/o capacitor	103pf	104pf	105pf
<b>Highest count frequency (times/sec.)</b>	10,000	1,000	100	10
<b>Level pulse minimum width</b>	100 $\mu$ S	1 $\mu$ S	10 mS	100 mS

8. Relay contact capacity: AC220V 3A; DC24V 5A (hindrance load)
9. Overall dimension: 96 X48X112 mm
10. Opening size for installation: 92<sup>+0.7</sup>X44<sup>+0.5</sup> mm
11. The ambient temperature: -10 $^{\circ}$ C - +50 $^{\circ}$ C
12. Overall weight: 300g

## III. Operation Instruction:

1. **Function key (SET):** Press to choose item according to following order:



- ① During normal working condition, function key (SET) indicator light does not light, press function key right now, function indicator light lights, enters into programming state. At the same time, relay 1 indicator light (J1) lights , can set the operation value of relay 1 through press Mode key (▶) and Up key (▲) (when display value is bigger than or is equal to this value, the relay 1 operate, otherwise release).
- ② Press function key again, indicator light J1 goes out, relay 2 indicator light (J2) lights , can set the operation value of relay 2 (when display value is bigger than or is equal to this value, the relay 2 operate, otherwise release).

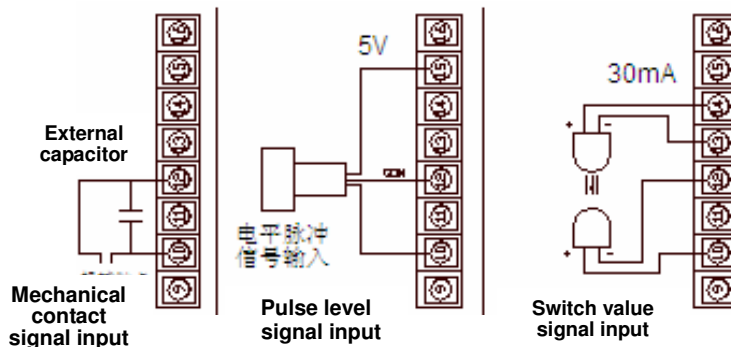
- ③ Press function key continuously, indicator lights J1 and J2 light simultaneously, can set the magnification 1 (set value range: 000,001- 001.000)
- ④ Press function key again, indicator lights J1 and J2 go out simultaneously,. can set the magnification 2 (set value range: 000001- 999999)
- ⑤ Press function key continuously, can set the decimal point through the Mode key.
- ⑥ Presses function key finally, function key indicator light goes out, and the meter enters into normal working condition. When relay 1 operates, the indicator light J1 lights, otherwise goes out; when relay 2 operates, indicator light J2 lights, otherwise goes out.

**2. Mode Key (▶):** During in programming state, select certain digit(s) position; the selected digit(s) will flash.

**3. UP Key (▲):** During in programming state, press this key can change the value of flashed digit(s), make value unidirectional increment.

**4. Reset Outlet Terminal:** Not available.

**5. The Signal Input Terminal:** Can be connected electrical level pulse or switching value between Input terminal 1 and public terminal. (See the sketch diagram)



Photoelectric Geminant Transistor    Mechanical Contact Signal    Proximity Switch or Angle Raster

#### IV. Wiring Diagram

It's same as the ZN96J wiring diagram.

#### V. Measurement of Rotating Speed

The relation between each turn sampling pulse and the lowest measure rotational speed and highest measure rotational speed:

Minimum measure rotational speed = 60 / each turn sampling pulse

Maximum measure rotational speed = Maximum measure frequency / each turn sampling pulse several X 60

(This product highest measure frequency is ten thousands times/second, when need display the digits of the back of decimal point, highest measure rotational speed will be limited by 6-digit LED display).

For sampling input and display precision, the three parameters of decimal point setting,

magnification 2 and the magnification 1 configured on this product, have offered multiple choices for user. The data in the table list for reference only.

Explanation:

The parameter 1 (magnification 1) usually sets for 001.000 during the measure of rotational speed. The parameter 2 (magnification 2) matched with the decimal setting is mainly used to get the expected display value. For most popular, most easy to realize scheme: each turn to take a pulse as input (adopt photoelectric geminate transistor or proximity switch), the typical applications have given five kinds of parameter combination schemes. Need to install a 2, 30 and 60 ...teeth plate or holes plate in the place of shaft for measure the lower rotational speed; Need to install angle raster sensor in the place of shaft for the more low rotational speed measure. In the following table list, each turn to take 600 pulses is as input, four kinds of parameter combination schemes have been given, user can select most suitable one.

Sampling pulse/turn	Magnification 2	Magnification 1	Decimal point	Min. measure speed(rpm)	Max. measure speed(rpm)
1	000060	001.000	-----	60	600000
	000600	001.000	-----,-	60.0	99999.9
	006000	001.000	-----,-	60.00	9999.99
	060000	001.000	-----,-	60.000	999.999
	600000	001.000	-----,-	60.0000	99.9999
2	000030	001.000	-----	30	300000
10	000010	001.000	-----	6	60000
	000100	001.000	-----,-	6.0	60000.0
15	000004	001.000	-----	4	40000
	000040	001.000	-----,-	4.0	40000.0
30	000002	001.000	-----	2	20000
	000020	001.000	-----,-	2.0	20000.0
60	000001	001.000	-----	1	10000
	000010	001.000	-----,-	1.0	10000.0
	000100	001.000	-----,-	1.00	9999.99
	001000	001.000	-----,-	1.000	999.999
120	000005	001.000	-----,-	0.5	5000.0
	000050	001.000	-----,-	0.50	5000.00
	000500	001.000	-----,-	0.500	500.000
600	000001	001.000	-----,-	0.1	1000.9
	000010	001.000	-----,-	0.10	1000.99
	000100	001.000	-----,-	0.100	999.999
	001000	001.000	-----,-	0.1000	99.9999

## VI. Measurement of Frequency

This product-sampling period is one second, lowest measure frequency is 1 cycle/second, and highest measure frequency is 10,000 cycles /second. When need display the digits of the back of decimal point, highest measure frequency will be limited by 6-digit LED display).

For display precision, the three parameters of decimal point setting, magnification 2 and the

magnification 1 configured on this product, have offered multiple choices for user. (See the table)

Magnification 2	Magnification 1	Decimal point	Min. measure frequency (cycle/Min.)	Max. measure frequency (cycle/Min.)
000001	001.000	-----	1	100000
000010	001.000	-----.	1.0	99999.9
000100	001.000	-----.	1.00	9999.99
001000	001.000	-----.	1.000	999.999
010000	001.000	-----.	1.0000	99.9999
100000	001.000	-----.	1.00000	9.99999

Explanation:

The parameter 1 (magnification 1) usually sets for 001.000 during the measure of rotational speed. The parameter 2 (magnification 2) matched with the decimal setting is mainly used to get the expected display value.

### VII. Measure Product

In practical applications, the amount per hour is regular needs to known, for example, the productivity as each hour of workpiece, the printing speed of the book sheet etc.

Use this product can convert the number(s) per second to one-hour continuous amount (See the table).

Number/Sec.	Magnification 2	Magnification 1	Decimal point	Amount/Hr.
1-177	003600	001.000	-----	3600-999999
1-27	036000	001.000	-----.	3600.0-99999.9
1-2.7	360000	001.000	-----.	3600.00-9999.99

### VIII. Applications Brief

The above-mentioned measurement of frequency, rotational speed and productivity output, is to complete through sampling numbers per second combined with parameters configuration. Also, can deploy proper parameter through the number of each second sampling; get the more extensive application of other aspects such as the measure of rate of flow.

## ZN96G 6-Digit Digital Display Intelligent Raster

ZN96G 6-Digit Digital Display Intelligent Raster is one of our ZN96 series control measurement and gauging products. This product applied to measure the displacement, length, liquid level and etc.

### I. Technical Characteristics

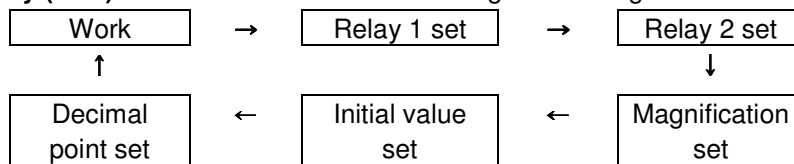
1. 96 X48mm international standard face-plate.
2. 6-digit, 0.56 inches of LED digital display.
3. Input 1 and input 2 double input terminals, can identify the 90 degree pulse coder signal.
4. Electrical level pulse and switching value input signals are compatible.
5. Set magnification; determine the proportion relation between pulse numbers and display value.
6. Set two control values, two-way relay output and control or alarm.
7. The present value and set value do not lose when power failure.
8. Outside connected sensor: angle and linear raster sensor and etc.

## II. Technical Parameters:

1. Power supply: AC220 V50Hz (other voltages are customized)
2. Display range: -199999 - +999999
3. Input resistance: 20K
4. The pulse low level: - 50 V-+0.5V
5. The pulse high level: +4 V-+50V
6. Maximum pulse frequency: 500,000 Cycles/sec.
7. Level pulse minimum width: 2 μS.
8. Relay contact capacity: AC220V 3A; DC24V 5A (hindrance load)
9. Overall dimension: 96 X48X112 mm
10. Opening size for installation:  $92^{+0.7} \times 44^{+0.5}$  mm
11. The ambient temperature: -10°C - +50°C
12. Overall weight: 300g

## III. Operation Instruction:

**1. Function key (SET):** Press to choose item according to following order:



- ① During normal working condition, function key (SET) indicator does not light, press function key right now, function indicator light lights, enters into programming state. At the same time, relay 1 indicator light ( J 1) lights , can set the operation value of relay 1 through press Mode key (▶) and Up key (▲) (when display value is bigger than or is equal to this value, the relay 1 operate, otherwise release).
- ② Press function key again, indicator light J1 goes out, relay 2 indicator light (J2) lights , can set the operation value of relay 2 (when display value is bigger than or is equal to this value, the relay 2 operate, otherwise release).
- ③ Press function key continuously, indicator lights J1 and J2 light simultaneously, can set the magnification (counting value times magnification is equal to display value, magnification range: 0,001 to 65.535)

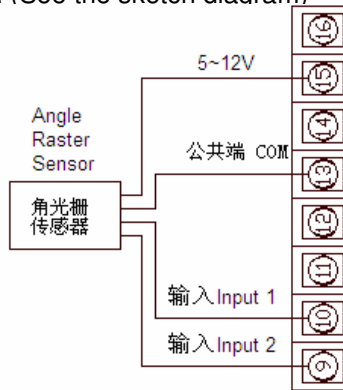
- ④ Press function key again, indicator lights J1 and J2 go out simultaneously,. Can set the count initial value (every time the display will return to initial value for each digit)
- ⑤ Press function key continuously, can set the decimal point through the Mode key.
- ⑥ Presses function key finally, function key indicator light goes out, and the meter enters into normal working condition. When relay 1 operates, the indicator light J1 lights, otherwise goes out; when relay 2 operates, indicator light J2 lights, otherwise goes out.

**2. Mode Key (▶):** During in programming state, select certain digit(s) position; the selected digit(s) will flash.

**3. UP or Reset Key (▲):** During in programming state, press this key can change the value of flashed digit(s), make value unidirectional increment. During normal working condition, press this key to reset the display value to initial value.

**4. Reset Outlet Terminal:** The same as the reset key, short connect this terminal can reset the display value to initial value.

**5. The Measure Input Terminal:** The distance between the sensor and digital display meter should be less than 100 meters. (See the sketch diagram)



#### IV. Samples Applications

When being used in measure displacement, should select sensor according to actual precision requirement. From actual application, convert sensor unit reticle to the actual length (this length is for basic discrepancy), use the magnification and decimal point setting, get the display value. When there is a big discrepancy between display value and measured value, should adjust the magnification properly to reduce the discrepancy to minimum. The combination in the table for reference only

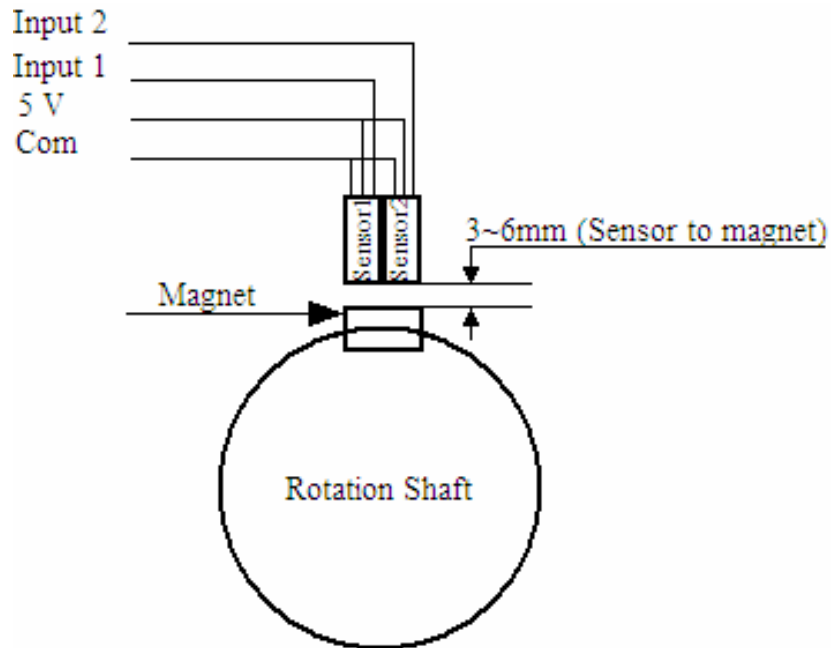
Sensor Pulses/turn	Length of Unit Pulse (mm)	Magnification	Decimal point	Display Range
1	12.3	012.300	---,---	-199.998-999.990
10	12	012.000	---,---	-199.992-999.996
100	0.5	000.500	--,---	-19.9995-99.9995
600	1	001.000	---,---	-199.999-999.999
1500	0.168	000.168	---,---	-199.920-999.936

For example:

Adopt two Hall sensors, each turn to take one pulse, apply to add and reduce counting (distinguish direction automatically) or measure displacement.

Mount the Magnet piece on the surface of shaft, with a distance of sensor probe 3-6 millimeter.

When shaft co rotation, magnet passes the sensor order is 1 and 2. Shaft reverse turning, magnet passes sensor order is 2 and 1. Magnet has polarity, makes a magnet certain end surface pass through sensor, if the meter figure has change, means that polarity is correct.



**Install Wiring Sketch**

### **V. Wiring Diagram**

It's same as the ZN96J wiring diagram.