ST48/ZN48/ZN72 SERIES
INTELIGENT DOUBLE DIGITAL DISPLAY
PRODUCTS MANUAL

Beijng Symore Technology Development Co., Ltd.

The Preface

ST48, ZN48(72)

Specifications for ST48, ZN48 (72) Series Intelligent Dual Digital Display CombiMeter

Rated supply voltage		220±10%ACV, 50/60Hz or 5/12/24±10%DCV (Non-standard voltage is also available as per request)
Power consumption		Max. 1.5VA
Contact capacity		AC220V 3A；DC24V 5A (Resistive load)
Life expectancy	Mechanical (180 Operations/Min.)	1×10^7 operations
	Electrical (20 operations/Min.)	1×10^5 operations
Overall Dimension (WxHxD)		DIN 48×48×82(85) mm/72×72×112 mm
Mounting Hole Dimension (WxH)		$45^{+0.5} \times 45^{+0.5}$ mm/$67^{+0.5} \times 67^{+0.5}$ mm
Mounting Method		Flush mounting and guide rail mounting compatible
Display		0.36"(0.56") LED 0.36"(0.56") LED nixie tubers dual 4-digit digital display PV: LED Top 4-digit LED； SV: LED Bottom 4-digit LED； **Totalizer & 8-digit counter: 8 digits (PV & SV)**
Timer ST48S① (SS②), ZN48(72)S(SS)	Time ranges	0.01 to 99.99 s, 1 to 9999 s, 1 s to 99 min 59 s, 1 to 9999 min, 1 min to 99 h 59 min (h-hour 时，min-分，s-second 秒)
	Timer modes	正计时 Elapsed time (Up)；Remaining time (Down)
Counter ST48J(8③)(R④), ZN48(72)J(8)(R)	Max. counting speed	10,000 cycles/sec.
	Counting range	0 to 9999, 0 to 9999.999, 0 to 99999999, 0 to 99999999.999
	magnification	0.001－9.999
Time totalizer ST48L, ZN48(72)L	Totaling ranges	0－99 h 59 min 59.99 s, 0－9999 h 59 min 59 s, 0－9999 d 23 h 59 s (d-day，h-hour，min-minute，s-second)
	Reset mode	Reset after 8 seconds; reset immediately
Frequency meter ST48F(R), ZN48(72)F(R)	Measure cycle	1 Second
	Measure range	1－9999 Hz; 0.1－999.9 Hz; 0－9999（Units customized）
	Magnification	Magnification=a/b (a, b can be set at will within display range)
Tachometer ST48, ZN48(72)N	Measure cycle	1秒 1 Second
	Display range	60－9999 rpm
	Measure input	1 pulse per revolution
Weight		120g 200g
Ambient temperature	Operating	0℃－+40℃ (-10℃－+55℃, for special order)
	Storage	-20℃－+60℃
Characteristics		All required parameters set at will by front panel keys, the set value of all meters and present value for the counter and totalizer does not lose even after power failure.
		High-precision, low power consumption
		Thirty two basic function matched with 6 individual relay output modes accommodate a wide variety of applications.

Note: ① Single set dual display, 4-digit timer; ② Double set (can set the ON/OFF time separately) dual display timer; ③ Single set 8-digit digital display reversible counter; ④ Counter and frequency meter with magnification.

ST48T, ZN48(72)T

### Specifications for ST48T, ZN48 (72) T Programmable Daily Cycle Time Controller

Display	0.36" (0.56) LED, 0.36"(0.56") LED nixie tube display, top 4-digit uses for hours and minutes; bottom 2-digit for seconds
Characteristics	Within 24 hours, can preset four group of ON/OFF timer, through the front panel keys, the set value does not lose and the clock is available even after power failure.

Note: For details refer to the table of "Specifications for ST48, ZN48 (72) Series Intelligent Dual Digital Display CombiMeter"
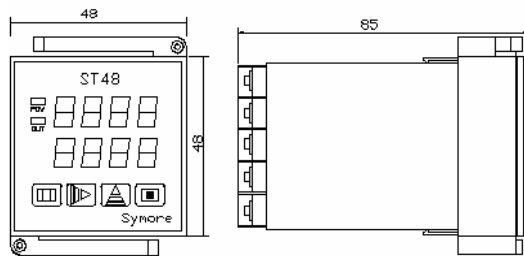
I. Products Terminal Illustration
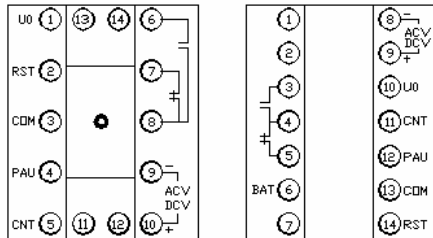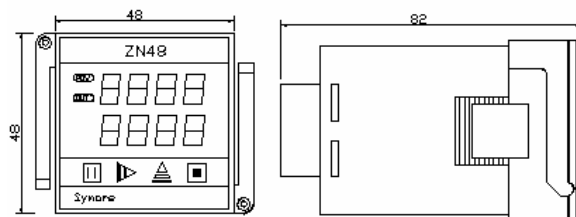

ST48/ ZN72 Square type
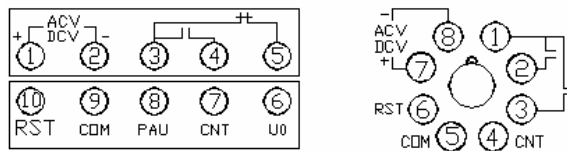
ZN48 Square type   **ZN48 Circle type**

II. Products Outline Drawing

ST48 Series product

ZN48 Series Product

III. Relay Operation Mode

   Operation Mode 1: Relay is ON after reaching or exceeding the set value during the electrified meter is working

   Operation Mode 2: Relay is ON after reaching or exceeding the set value during the electrified meter is not working (can work through press the reset key and connect reset terminal's)
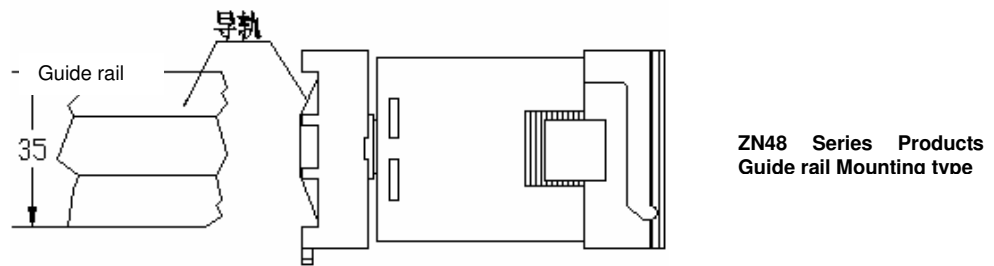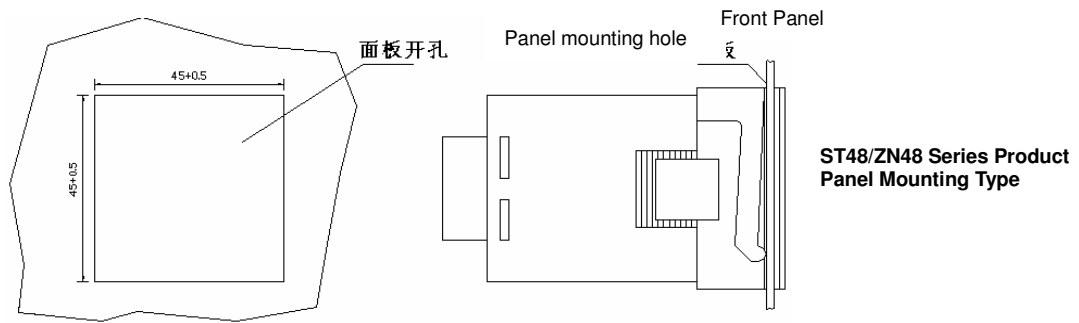
   Operation Mode 3: Relay is OFF after reaching or exceeding the set value during the electrified meter is working

   Operation Mode 4: Relay is OFF after reaching or exceeding the set value during the electrified meter is not working (can work through press the reset key and connect reset terminal's)

   Operation Mode 5: Relay is ON after reaching or exceeding the set value during the electrified meter is working; and reset after 5 seconds.
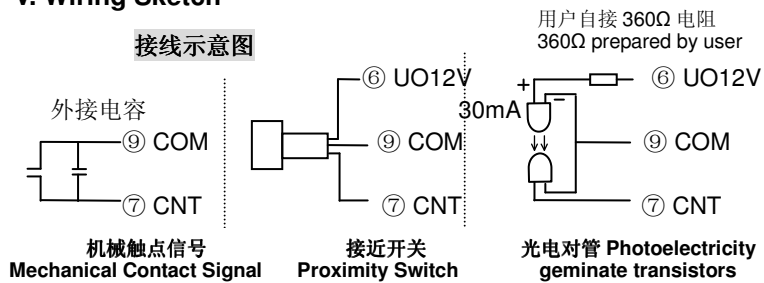
Operation Mode : Relay is ON after reaching or exceeding the set value during the electrified meter is not working (can work through press the reset key and connect reset terminal's), and reset after 5 seconds.

IV. Products Mounting Drawing

面板开孔

Panel mounting hole

Front Panel

45+0.5

45+0.5

ST48/ZN48 Series Product Panel Mounting Type

导轨

Guide rail

35

ZN48 Series Products Guide rail Mounting type

Note: More easy ZN72 series is not show.

V. Wiring Sketch

接线示意图

外接电容

⑨ COM

⑦ CNT

机械触点信号
Mechanical Contact Signal

⑥ UO12V

⑨ COM

⑦ CNT

接近开关
Proximity Switch

用户自接 360Ω 电阻
360Ω prepared by user

⑥ UO12V

30mA

⑨ COM

⑦ CNT

光电对管 Photoelectricity
geminate transistors

Model ST48S/ZN48S/ZN72S
Single Set Double Digital Display 4-Digit Delay Timer

I.   Product General Introduction

Model ST48S/ZN48S/ZN72S Single Set Double Digital Display 4-Digit Delay Timer is one of our series ST48/ZN48/ZN72 gauging products. Their characteristics are as follows:

1. Adopt press keys, set the value of delay time at will within its display range, the set value keeps remaining even after power failure.

2. The wide time delay range, high precision and low power consumption.

II. Technical Parameters

Please refer to the page 3 for detailed product general technical parameters.

III. Time Delay Range (ST48S-X, ZN48S-X, and ZN72S-X; X=1, 2 …)

Model	Time Delay Range	Remarks
48S－1/72S－1	0.01 Sec. – 99.99 Sec.	Remaining time (Down)
48S－2/72S－2	1 Sec. – 9999 Sec.	Remaining time (Down)
48S－3/72S－3	1 Sec. – 99 Min.59 Sec.	Remaining time (Down)
48S－4/72S－4	1 Min. – 99 Hr.59 Min.	Remaining time (Down)
48S－5/72S－5	1 Min. – 9999 Min.	Remaining time (Down)
48S－6/72S－6	0.01 Sec. – 99 Min. 59 Sec.	Elapsed time (UP)
48S－7/72S－7	1 Sec. – 9999 Sec.	Elapsed time (UP)
48S－8/72S－8	1 Sec. – 99 Min. 59 Sec.	Elapsed time (UP)
48S－9/72S－9	1 Min. – 99 Hr. 59 Min.	Elapsed time (UP)
48S－10/72S－10	1 Min. – 9999 Min.	Elapsed time (UP)

IV. Product outline drawing

Refer to page 4 for details.

V. Operation Instruction

1. Display: During normal working condition, top four LED nixie tubes display the value of delay time; bottom four LED nixie tubes display set value.

2. Mode Key (►): When make setting, select certain digit(s) position; the selected digit(s) will flash.

3. UP Key (▲): When make setting, press this key after pressed the Mode Key (►), can change the value of flashed digit(s), make value unidirectional increment.

4. Reset Key (▣): During normal working condition, after press reset key, delay timer resumes to initial state; Lift reset key, delay timer begins time delay again.

5. Pause Key (▥): During normal working condition, after press pause key, time delay stops, lifting to continue. This function can be use as a time totalizer.

6. The Value Setting of Time Delay: Use UP key and Mode key to set the delayed time value of relay. When press Mode key (►) at the first time, POW indicator light lights , the first nixie tube flashes , press UP key(▲), set the first digit value; press Mode key (►) again, the second

digit nixie tube flashes , press UP key(▲), set second digit value; And the like for 3rd and 4th digit values, right now, nixie tubes are still flashing, after 8 seconds, flashes stopped, the set values are stored.

Using reset key or outlet reset terminals or power-on again, can make delay timer start to work, after time delay is completed, the relay will act according to its operation mode.

Notice: In the entire setting progress, the setting should go on continuously, should not exceed 8 seconds between two steps.

VI. Product Terminals Wiring Diagram and Explanations

1. Product Terminals Wiring Diagram:

Please refer to the page 4 for details.

2. Terminals Explanations:

(1) Relay contact outlet terminals: ⌐⊥⌐ as normal close, ⌐⌐ as normal open.

(2) COM is for public terminal; PAU is for pause, RST is for reset.

(3) In normal working situation, should connect pause (PAU) and public (COM) terminals, then time delay stops; disconnect them, time delay continues. This function can be use as a time totalizer.

(4) In normal working situation, put through reset (RST) and public (COM) terminals, the delay timer recovers to its initial state; Disconnect reset (RST) and public (COM) terminals, delay timer starts to work again.

(5) CNT terminal, U_o terminal is not available.

VII. Relay Operation Mode:

It has six types; please refer to the page 5 for details.

VIII. Product Installation Diagram:

Please refer to the page 5 for details.

Model ST48SS/ZN48SS/ZN72SS
Double Set Double Digital Display 4-Digit Delay Timer
(Intelligent Twin Delay Timer)

I. Product General Introduction

Model ST48SS/ZN48SS/ZN72SS Double Set Double Digital Display 4-Digit Delay Timer (Intelligent Twin Delay Timer) is one of our series ST48/ZN48/ZN72 gauging products. Their characteristics are as follows:

1. Adopt press keys, set the value for the relay operation and release time at will within its display range, the set value keeps remaining even after power failure.

2. The wide time delay range, high precision and low power consumption.

II. General Technical Parameters

Please refer to the page 3 for details.

III. Time Delay Range (ST48SS-X, ZN48SS-X, and ZN72SS-X; X=1, 2 …)

Model	Time Delay Range	Remarks
48SS－1/72SS－1	1 Sec. – 9999 Sec.	Remaining time (Down)
48SS－2/72SS－2	1 Sec. – 99 Min.59 Sec.	Remaining time (Down)
48SS－3/72SS－3	1 Min. – 9999 Min.	Remaining time (Down)
48SS－4/72SS－4	1 Min. –99 Hr.59 Min.	Remaining time (Down)
48SS－5/72SS－5	1 Sec. – 9999 Sec.	Elapsed time (UP)
48SS－6/72SS－6	1 Sec. – 99 Min.59 Sec.	Elapsed time (UP)
48SS－7/72SS－7	1 Min. – 9999 Min.	Elapsed time (UP)
48SS－8/72SS－8	1 Min. – 99 Hr.59 Min.	Elapsed time (UP)

IV. Product outline drawing

Please refer to page 4 for details.

V. Operation Instruction

1. Display: During normal working condition, top four LED nixie tubes display the present values of the relay operation and release time; bottom four LED nixie tubes display the set value.

When make setting, top four LED nixie tubes display the set value of release time; bottom four LED nixie tubes display the set value of operation time.

2. Mode Key (▶): When make setting, select certain digit(s) position; the selected digit(s) will flash.

3. UP Key (▲): When make setting, press this key after pressed the Mode Key (▶), can change the value of flashed digit(s), make value unidirectional increment. During normal working condition, press this key to display the set value of the relay operation and release time.

4. Reset Key (▣): During normal working condition, after press reset key, delay timer resumes to initial value of the release time (i.e. top four LED nixie tubes display the initial value of the release time, bottom four LED nixie tubes display the set value of release time), lift reset key, and delay timer begins time delay again from the initial release time.

5. Pause Key (▥): During normal working condition, after press pause key, time delay stops, lifting to continue.

6. The Relay Operation and Release Time Value Set: Use UP key and mode key to set the operation and release delayed time value of relay at will within the display range. Press mode key (▶) first, the top first nixie tube flashes , press UP key(▲), set the first digit value; press mode key (▶) again, the top second digit nixie tube flashes , press UP key(▲), set second digit value, and the like for 3rd and 4th digit values, then complete the setting of the relay release time value; Press mode key (▶) again, the bottom first nixie tube flashes , press UP key(▲), set the first digit value; press mode key (▶) again, the bottom second digit nixie tube flashes , press UP key(▲), set second digit value, and the like for 3rd and 4th digit values, then complete the setting of the relay operation time value; Right now, nixie tubes are still flashing, after 8 seconds, flashes stopped, the set operation and release time values are stored.

Using reset key or outlet reset terminals or power on again, can make delay timer start to work from the relay initial release time (the POW indicator flashes). After time delay is completed,

the relay releases; Delay timer start to work from the relay initial operation time (the POW indicator still flashes and OUT indicator lights), after time delay is completed, the relay will operate. Then the delay timer will cycle work according to above set Operation Mode.

Notice: In the entire setting progress, the setting should go on continuously, should not exceed 8 seconds between two steps.

VI. Product Terminal Wiring Diagram and Explanations

1. Product Terminals Wiring Diagram:

Please refer to the page 4 for details.

2. Terminals Explanations:

(1) Relay contact outlet terminals:⌐⊥⌐ as normal close,⌐⌐ as normal open.

(2) COM is for public terminal; PAU is for pause, RST is for reset.

(3) In normal working situation, should connect pause (PAU) and public (COM) terminals, then time delay stops; disconnect them, time delay continues.

(4) In normal working situation, put through reset (RST) and public (COM) terminals, the delay timer recovers to its initial release time (i.e. top four LED nixie tubes display the initial value of the release time, bottom four LED nixie tubes display the set value of release time). Disconnect reset (RST) and public (COM) terminals, delay timer starts to work from the initial release time.

(5) CNT terminal, U_o terminal is not available.

VII. Operation Mode:

There are mode 1 and mode 2; please refer to the page 5 for details.

VIII. Product Installation Diagram:

Please refer to the page 5 for details.

Model ST48L/ZN48L/ZN72L
Single Set 8-Digit Digital Display Time Totalizer

I. Product General Introduction

Model ST48L/ZN48L/ZN72L Single Set 8-Digit Digital Display Time totalizer is one of our series ST48/ZN48/ZN72 gauging products. Their characteristics are as follows:

1. Adopt press keys, set the total count value at will within 8-digit display range,

2. The set value keeps remaining even after power failure.

II. Technical Parameters

Please refer to the page 3 for detailed product general technical parameters.

III. Totalizing Range (ST48L-X, ZN48L-X, and ZN72L-X; X=1, 2 …)

Model	Time Delay Range	Remarks
48L－1/72L－1	0－99 Hr. 59 Min. 59.99Sec.	Reset after 8 seconds

48L－2/72L－2	0－9999 Hr. 59 Min. 59 Sec.	Reset after 8 seconds
48L－3/72L－3	0－9999 Day 23 Hr. 59 Min.	Reset after 8 seconds
48L－4/72L－4	0－99 Hr. 59 Min.59.99 Sec.	Reset immediately
48L－5/72L－5	0－9999 Hr. 59 Min. 59 Sec.	Reset immediately
48L－6/72L－6	0－9999 Day 23 Hr. 59 Min.	Reset immediately

IV. Product outline drawing

Please refer to page 4 for details.

V. Operation Instruction

1. Display: During normal working condition, eight LED nixie tubes display the present total count time value. When make setting, eight LED nixie tubes display the set total count time value.

2. Mode Key (►): When make setting, select certain digit(s) position; the selected digit(s) will flash.

3. UP Key (▲): When make setting, press this key after pressed the Mode Key (►), can change the value of flashed digit(s), make value unidirectional increment. During normal working condition, press this key to display the set value of the totalizer.

4. Reset Key (▣): During normal working condition, after pressed reset key (for the 8 seconds reset type, should press the key continuously for 8 seconds) , the totalizer resumes to initial state; Lift reset key, the totalizer will count from the value zero (0).

5. Pause Key (▥): During normal working condition, after press pause key, the totalizer stops, lifting to continue.

6. The Total Count Value Setting of Totalizer: Use UP key and Mode key to set the total count value of the totalizer. Press Mode key (►) at the first, the top first nixie tube flashes , press UP key(▲), set the first digit value; press Mode key (►) again, the second digit nixie tube flashes , press UP key(▲), set second digit value, and the like for top 3rd, 4th digit and bottom 1st, 2nd, 3rd, 4th digit values, complete the set total count value. Right now, nixie tubes are still flashing, after 8 seconds, flashes stopped, the set values are stored.

Using reset key or outlet reset terminals or power-on again, can make totalizer start to work (the POW indicator flashes), after totalizer reached its set value, the relay will act to stop the totalizing.(now the POW indicator stopped flashing, when OUT indicator lights, relay will operate; when OUT indicator off, the relay will release).

Notice: In the entire setting progress, the setting should go on continuously, should not exceed 8 seconds between two steps.

7. Keep the Present Total Count Value after Power Failure: If power failure, the present value will be stored automatically, when power on, the totalizer will resume working continuously.

VI. Product Terminals Wiring Diagram and Explanations

   1.   Product Terminals Wiring Diagram:

   Please refer to the page 4 for details.

2. Terminals Explanations:

(1) Relay contact outlet terminals: ⊓ as normal close, ⊔ as normal open.

(2) COM is for public terminal; PAU is for pause, During normal working condition, should connect pause (PAU) and public (COM) terminals, then totalizing stops; disconnect them, totalizing continues.

(3) RST is for reset. In normal working situation, put through reset (RST) and public (COM) terminals (for 8 seconds reset type, should connect the terminals continuously for 8 seconds), the totalizer recovers to its initial state; Disconnect them, the totalizer will resume totalizing from the beginning (same as the reset key function).

(4) CNT terminal, U_o terminal is not available.

VII. Relay Operation Mode:
It has six types; please refer to the page 5 for details.

VIII. Product Installation Diagram:
Please refer to the page 5 for details.

Model ST48J/ZN48J/ZN72J
Single Set Reversible Digital Display Counter

I.   Product General Introduction
This series of product has four models: ST48J/ZN48J/ZN72J single set, double digital display 4-digit reversible counter; ST48JR/ZN48JR/ZN72JR single set, double digital display 4-digit with magnification reversible counter; ST48J8/ZN48J8/ZN72J8 single set, digital display 8-digit reversible counter; ST48J8R/ZN48J8R/ZN72J8R single set, digital display 8-digit with magnification reversible counter. Their characteristics are as follows:

1. Adopt press keys, set the count value at will within its display range,

2. The set value keeps remaining even after power failure.

II. Technical Parameters
Please refer to the page 3 for detailed product general technical parameters.

III. Counting Range

Model	Counting Range
ST48J/ZN48J/ZN72J	0－9999
ST48JR/ZN48JR/ZN72JR	0－9999.999
ST48J8/ZN48J8/ZN72J8	0－99999999
ST48J8R/ZN48J8R/ZN72J8R	0－99999999.999

IV. Product outline drawing
Please refer to page 4 for details.

V. Operation Instruction

1. Display: During normal working condition, for Model 48J/72J and 48JR/72JR, the top four digits LED nixie tubes display the present count value. The bottom four digits LED nixie tubes display the set count value；For Model 48J8/72J8 and 48J8R/72J8R, the eight digits LED nixie tubes display the present count value.

2. Mode Key (►): When make setting, select certain digit(s) position; the selected digit(s) will flash.

3. UP Key (▲): When make setting, press this key after pressed the Mode Key (►), can change the value of flashed digit(s), make value unidirectional increment. During normal working condition, press this key to display the set value and magnification value of the counter.

4. Reset Key (▣): During normal working condition, after pressed reset key, the counter resumes to initial state; Lift reset key, the counter will start to work.

5. Pause Key (▥): Not available.

6. The Counting Value Setting: Use UP key and Mode key to set the total count value of the counter at will within its display range.

(1) 48J/72J Single Set, Double Digital Display 4-digit Reversible Counter:

Press Mode key (►) at the first, the POW indicator lights, the bottom first nixie tube flashes , press UP key(▲), set the first digit value; press Mode key (►) again, the second digit nixie tube flashes, press UP key(▲), set second digit value, and the like for bottom 3rd, 4th digits, right now, nixie tubes are still flashing, after 8 seconds, flashes stopped, the set values are stored.

(2) **48JR/48JR/72JR Single Set, Double Digital Display 4-digit With Magnification Reversible Counter:**

Press Mode key (►) at the first, the top first nixie tube flashes , press UP key(▲), set the first digit value; press Mode key (►) again, the second digit nixie tube flashes , press UP key(▲), set second digit value, and the like for top 3rd, 4th , complete the value setting of the counter; At this time, press Mode key (►) again, the bottom first nixie tube flashes , press UP key(▲), set the first digit value, press Mode key (►) again, the second digit nixie tube flashes, press UP key(▲), set second digit value, and the like for bottom 3rd, 4th digits, then complete the setting for the counter magnification value (the display value equals to counting pulse figure times to magnification value, magnification value range is from 0,001 to 9,999), right now, nixie tubes are still flashing, after 8 seconds, flashes stopped, the set values are stored.

(3) 48J8/72J8 Single Set, Digital Display 8-digit Reversible Counter:

Press Mode key (►) at the first, the top first nixie tube flashes , press UP key(▲), set the first digit value; press Mode key (►) again, the second digit nixie tube flashes, press UP key(▲), set second digit value, and the like for bottom 3rd, 4th digits and the bottom four digits, complete the value setting of the counter; Right now, nixie tubes are still flashing, after 8 seconds, flashes stopped, the set values are stored.

(4) 48J8R/72J8R Single Set, Digital Display 8-digit With Magnification Reversible Counter:

Press Mode key (►) at the first, the top first nixie tube flashes , press UP key(▲), set the first digit value; press Mode key (►) again, the second digit nixie tube flashes , press UP key(▲), set second digit value, and the like for top 3rd, 4th digits and the bottom four digits,, complete

the value setting of the counter; At this time, press Mode key (►) again, the top four nixie tubes light, and the first nixie tube flashes, press UP key(▲), set the first digit value, press Mode key (►) again, the second digit nixie tube flashes, press UP key(▲), set second digit value, and the like for bottom 3rd, 4th digits, then complete the setting for the counter magnification value (the display value equals to counting pulse figure times to magnification value, magnification value range is from 0,001 to 9,999), right now, nixie tubes are still flashing, after 8 seconds, flashes stopped, the set values are stored.

Notice: In the entire setting progress, the setting should go on continuously, should not exceed 8 seconds between two steps.

7. Keep the Present Count Value after Power Failure: If power failure, the present value will be stored automatically, when power on, the counter will resume working continuously.

VI. Product Terminals Wiring Diagram and Explanations

  1. **Product Terminals Wiring Diagram:**

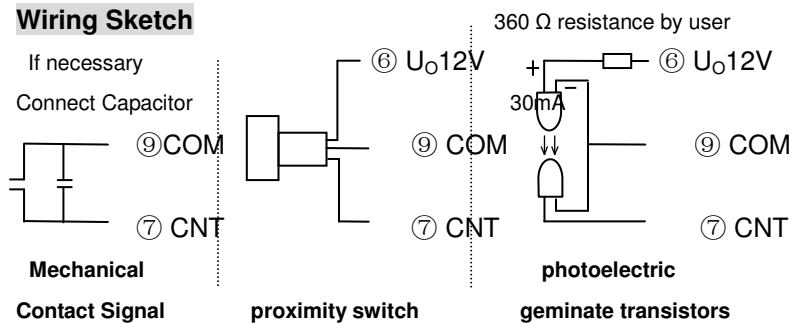Please refer to the page 4 for details.

  2. **Terminals Explanations:**

(1) Relay contact outlet terminals: ⊓╨⌐ as normal close, ⌐╵⌐ as normal open.

(2) COM is for public terminal; PAU is for counter mode selection, should connect pause (PAU) and public (COM) terminals, the counter is in reverse mode, the vice versa.

(3) RST is for reset. Put through reset (RST) and public (COM) terminals, the counter recovers to its initial state; Disconnect them, the counter will resume working from the beginning.

(4) CNT is for counting input terminal. Switching value and electrical level pulse input signals are compatible.

The Switching Value is that the input signals produced by relay contacts, photoelectric geminate transistors etc.

Electric level pulse: Low level: -30V—+0.6V; High Level: +4V—+30V

Input pulse maximum low level: 0.6V; Input pulse minimum high level: 4V (see wiring sketch)

Wiring Sketch

Mechanical Contact Signal   proximity switch   photoelectric geminate transistors

VII. Relay Operation Mode:

It has three types, Mode 1, Mode 3 and Mode 5; please refer to the page 5 for details.

VIII. Product Installation Diagram:

Please refer to the page 5 for details.

Model ST48F/ZN48F/ZN72F
Single Set, Double Digital Display 4-digit Frequency Meter

I.   Product General Introduction

The model ST48F/ZN48F/ZN72F single set, double digital display 4-digit frequency meter has characteristics as following:

1. Adopt press keys, set the frequency control value at will within its display range, the set control value keeps remaining even after power failure.

2. High metering precision; low fuel consumption.

II. Technical Parameters

Periodic metering cycle: 1 Seconds.

All others please refer to the page 3 for detailed product ZN48 general technical parameters.

III. Counting Range

Model	Metering Range
ST48F-1/ZN48F-1/ZN72F-1	1－9999 Hz
ST48F-2/ZN48F-2/ZN72F-2	0.1－999.9 Hz

IV. Product outline drawing

Please refer to page 4 for details.

V. Operation Instruction

1. Display: During normal working condition, the top four digits LED nixie tubes display the present frequency value. The bottom four digits LED nixie tubes display the set control value of frequency.

2. Mode Key (►): When make setting, select certain digit(s) position; the selected digit(s) will flash.

3. UP Key (▲): When make setting, press this key after pressed the Mode Key (►), can change the value of flashed digit(s), make value unidirectional increment.

4. Reset Key (▣), Pause Key (▥) are not available.

5. The Frequency Control Value Setting: Use UP key and Mode key to set the control value of the frequency meter at will within its display range.

Press Mode key (►) at the first time, the POW indicator lights, the bottom first nixie tube flashes , press UP key(▲), set the first digit value; press Mode key (►) again, the second digit nixie tube flashes, press UP key(▲), set second digit value, and the like for bottom 3rd, 4th digits, right now, nixie tubes are still flashing, after 8 seconds, flashes stopped, the set control values of frequency meter are stored.

Connect the pulse to be metered directly to CNT input terminal; the metered result is frequency (Cycle/Sec.). When the display value reaches or exceeds to the control value, the relay starts to operate, the return difference of control value is four numbers.

Notice: In the entire setting progress, the setting should go on continuously, should not exceed 8 seconds between two steps.

VI. Product Terminals Wiring Diagram and Explanations

1. Product Terminals Wiring Diagram:

Please refer to the page 4 for details.

2. Terminals Explanations:

(1) Relay contact outlet terminals: ⌐╨⌐ as normal close, ⌐╨⌐ as normal open.

(2) COM is for public terminal, CNT is for pulse input terminal. Switching value and electrical level pulse input signals are compatible.
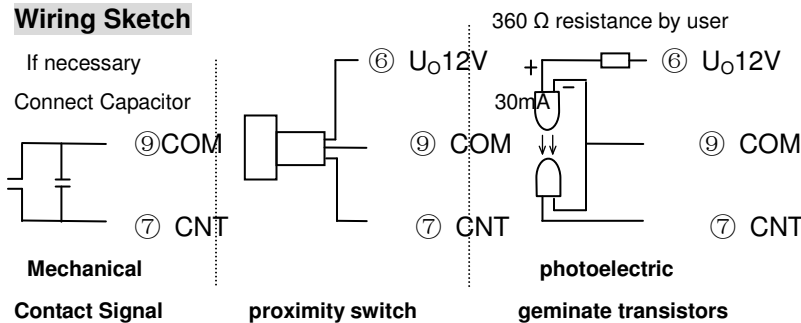
The Switching Value is that the input signals produced by relay contacts, photoelectric geminate transistors etc.

Electric level pulse: Low level: -30V—+0.6V; High Level: +4V—+30V

Input pulse maximum low level: 0.6V; Input pulse minimum high level: 4V (see wiring sketch)

Input Terminal Wiring Diagram for Frequency Meter:

(3) The terminals PAU and RST are not available.

VII. Relay Operation Mode:

It has two types, one for mode 1, another one for mode3; please refer to the page 5 for details.

VIII. Product Installation Diagram:

Please refer to the page 5 for details.

Model ST48FR/ZN48FR/ZN72FR
Single Set, Double Digital Display
4-digit with Magnification Frequency Meter

I. Product General Introduction

The model ST48FR/ZN48FR/ZN72FR single set, double digital display 4-digit with magnification frequency meter has characteristics as following:

1. Adopt press keys, set the frequency control value at will within its display range, the set control value keeps remaining even after power failure.

2. High metering precision; low fuel consumption.

II. Technical Parameters

1. Periodic metering cycle: 1 Seconds.

2. Display range: 0-9999 (Units can be assigned)

All others please refer to the page 3 for detailed products ST48/ZN48/AN72 general technical parameters.

III. Product outline drawing

Please refer to page 4 for details (Model ZN48).

IV. Operation Instruction

1. Display: During normal working condition, the top four digits LED nixie tubes display the present frequency value. The bottom four digits LED nixie tubes display the set control value of frequency.

Present Display Value (PV) = Metered Frequency Value (MV)*a/b

Parameters a, b are chosen by customers.

2. Mode Key (►): When make setting, select certain digit(s) position; the selected digit(s) will flash.

3. UP Key (▲): When make setting, press this key after pressed the Mode Key (►), can change the value of flashed digit(s), make value unidirectional increment.

4. Reset Key (▣), Pause Key (▥) are not available.

5. The a, b and Control Value Setting: Use UP key and Mode key to set the, a, b and control value of the frequency meter at will within its display range.

Press Mode key (►) at the first time, the top first nixie tube flashes , press UP key(▲), set the first digit value; press Mode key (►) again, the second digit nixie tube flashes, press UP key(▲), set second digit value, and the like for top 3rd, 4th digits, these four digits set are as for control value; At this moment, press Mode key (►), the bottom first nixie tube flashes, press UP key(▲), set the first digit value; and the like for bottom 2nd, 3rd, 4th digits, these four digits set are as for value a; Next, press Mode key (►) again, only the top row nixie tubes light, and the first one flashes, press UP key(▲), set the first digit value; And the like for top 2nd, 3rd, 4th digits, these four digits set are as for value b. Right now, nixie tubes are still flashing, after 8 seconds, flashes stopped, and the set a, b, and control values of frequency meter are stored. Connect the pulse to be metered directly to CNT input terminal; the frequency meter comes into operating mode. When the display value reaches or exceeds to the control value, the relay starts to operate, the return difference of control value is four numbers.

Notice: In the entire setting progress, the setting should go on continuously, should not exceed 8 seconds between two steps.

V. Product Terminals Wiring Diagram and Explanations

1. Product Terminals Wiring Diagram:

Please refer to the page 4 for details.

2. Terminals Explanations:

(1) Relay contact outlet terminals: ⊓⊤⊓ as normal close, ⊓⌐⊓ as normal open.

(2) COM is for public terminal, CNT is for pulse input terminal. Switching value and electrical level pulse input signals are compatible.

The Switching Value is that the input signals produced by relay contacts, photoelectric geminate transistors etc.

Electric level pulse: Low level: -30V—+0.6V; High Level: +4V—+30V

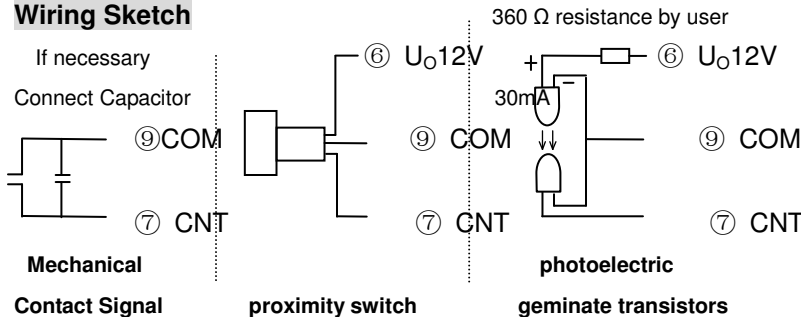Input pulse maximum low level: 0.6V; Input pulse minimum high level: 4V (see wiring sketch)

(3) Terminals PAU and RST are not supported.

Input Terminal Wiring Diagram for Frequency Meter:

360 Ω resistance by user

Wiring Sketch

If necessary

Connect Capacitor

⑨COM   ⑥ U$_O$12V   +   ⑥ U$_O$12V

         30mA

⑨ COM   ⑨ COM

⑦ CNT   ⑦ CNT   ⑦ CNT

Mechanical   **photoelectric**

Contact Signal   **proximity switch**   **geminate transistors**

(3) The terminals PAU and RST are not available.

VI. Relay Operation Mode:

It has two types, one for mode 1, another one for mode3; please refer to the page 5 for details.

VII. Product Installation Diagram:

Please refer to the page 5 for details.

Model ST48/ZN48N/ZN72N
Single Set, Dual Digital Display 4-digit Tachometer
I.   Product General Introduction

The model ST48N/ZN48N/ZN72N single set, double digital display 4-digit Tachometer has
 characteristics as following:

1. Adopt press keys, set the control value of revolution speed at will within its display range,

the set control value keeps remaining even after power failure.

2. High metering precision; low fuel consumption.

II. Technical Parameters

1. Metering Input: 1 pulse/revolution.

2. Periodic metering cycle: 1 Seconds.

3. Metering Range: 60－9999rpm.

All others please refer to the page 3 for detailed product ST48/ZN48/ZN72 general technical
parameters.

III. Product outline drawing

Please refer to page 4 for details.

IV. Operation Instruction

1. Display: During normal working condition, the top four digits LED nixie tubes display the
present revolution speed value. The bottom four digits LED nixie tubes display the set control
value of revolution speed.

2. Mode Key (►): When make setting, select certain digit(s) position; the selected digit(s) will flash.

3. UP Key (▲): When make setting, press this key after pressed the Mode Key (►), can change the value of flashed digit(s), make value unidirectional increment.

4. Reset Key (▣), Pause Key (Ⅲ) are not available.

5. The Revolution Speed Control Value Setting: Use UP key and Mode key to set the control value of the tachometer at will within its display range.

Press Mode key (►) at the first time, the POW indicator lights, the bottom first nixie tube flashes , press UP key(▲), set the first digit value; press Mode key (►) again, the second digit nixie tube flashes, press UP key(▲), set second digit value, and the like for bottom 3rd, 4th digits, right now, nixie tubes are still flashing, after 8 seconds, flashes stopped, the set control values of tachometer are stored.

Connect the pulse to be metered directly to CNT input terminal; the metered result is revolution speed (rpm). When the display value reaches or exceeds to the control value, the relay starts to operate, the return difference of control value is four numbers.

Notice: In the entire setting progress, the setting should go on continuously, should not exceed 8 seconds between two steps.

V. Product Terminals Wiring Diagram and Explanations

3. Product Terminals Wiring Diagram:

Please refer to the page 4 for details.

4. Terminals Explanations:

(1) Relay contact outlet terminals: ⌐⊥⌐ as normal close, ⌐⌐ as normal open.

(2) COM is for public terminal, CNT is for pulse input terminal: Switching value and electrical level pulse input signals are compatible.

The Switching Value is that the input signals produced by relay contacts, photoelectric geminate transistors etc.

Electric level pulse: Low level: -30V—+0.6V; High Level: +4V—+30V

Input pulse maximum low level: 0.6V; Input pulse minimum high level: 4V (see wiring sketch)

Input Terminal Wiring Diagram for Frequency Meter:

(3) The terminals PAU and RST are not available.

VI. Relay Operation Mode:

It has two types, one for mode 1, another one for mode3; please refer to the page 5 for details.

VII. Product Installation Diagram:

Please refer to the page 5 for details.

ST48T/ZN48T/ZN72T Programmable Daily Cycle Timer

ST48T/ZN48T/ZN72T Programmable Daily Cycle Timer is widely used in the industry area such as print, textile, pharmacy and food package machine etc. to carry out time control.

I. Product General Introduction

1. Adopt press keys, can preset four group of on-off timing within 24 hours.

2. When power failure, display will be eliminated, the inside clock is still working and preset timing value does not lose.
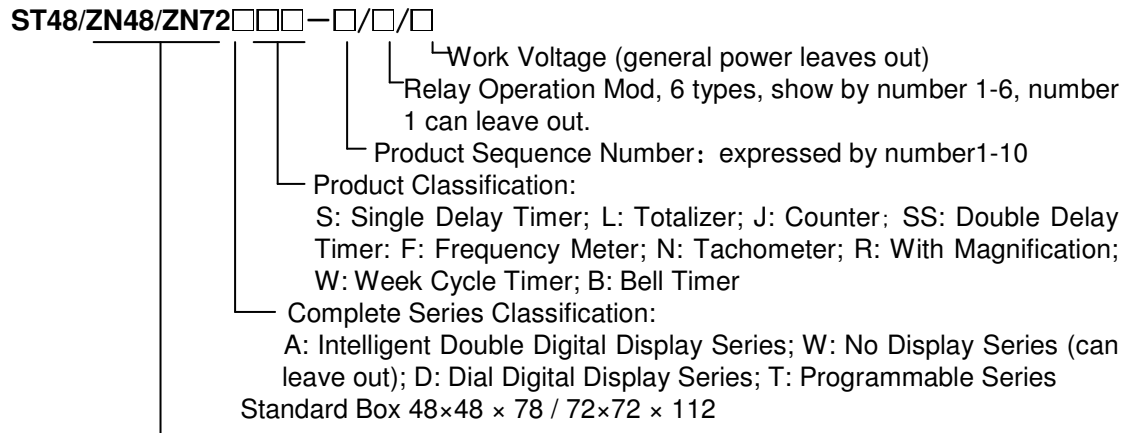

II. Technical Parameters

1. Power Supply: AC220V/50Hz (Non-standard voltage is available as per request).

2. Power Consumption: Less than 3A.

3. Contact Capacity: AC220V 3A; DC24V 5A (hindrance load)

4. Contact Life: 10^5

III. Operation Instruction

1. Display: Top four digits 0.36 inches of LED nixie tubes are for hours and minutes; the bottom two digits are for seconds.

2. Mode Key (►): Press this key, the top indicator light is off, the bottom two nixie tubes value change to 00, right now, timer enters into programming state. After setup, checkup, calibration, then press the mode key, now top indicator light is on, the timer resumes to normal working condition. The clock starts to work from XX hour XX minute 00 second.

3. UP Key (▲): Hold down to adjust hours; press to adjust minutes (right now minute position value does not carry to hour position).

4. On Key (▣): Press this key for setup an on-time value, the bottom indicator light lights.

5. Off Key (▥): Press this key for setup an off-time value, the bottom indicator light is off.

6. The Timing Setup: When power is on, use UP key to adjust the time to the on-time value after press Mode key, press On Key to set the on-time value, the bottom indicator light lights. Then adjust the time to off-time value, press Off Key to set the off-time value, the bottom indicator light is off. And the like for others, four groups of the timing setup can be completed. Then use Up Key to check the set time, when on-time start, the bottom light lights, when off-time works, the bottom indicator light is off.

If you setup is confirmed by checkup, calibrate the time to standard time, press Mode key, now the timer enters into normal working condition.

Notes: Whenever from working state, entering into programming state, once operates the Off Key or On Key, all timing value will clear away.

The Nomenclature of
Complete Series of Products ST48/ZN48/ZN72

ST48/ZN48/ZN72☐☐☐－☐/☐/☐

┗Work Voltage (general power leaves out)

┗Relay Operation Mod, 6 types, show by number 1-6, number 1 can leave out.

┗ Product Sequence Number：expressed by number1-10

Product Classification:
S: Single Delay Timer; L: Totalizer; J: Counter；SS: Double Delay Timer: F: Frequency Meter; N: Tachometer; R: With Magnification; W: Week Cycle Timer; B: Bell Timer

Complete Series Classification:
A: Intelligent Double Digital Display Series; W: No Display Series (can leave out); D: Dial Digital Display Series; T: Programmable Series

Standard Box 48×48 × 78 / 72×72 × 112

The Code Initial Setup Instruction
for ST48/ZN48/ZN72 Series Intelligent Dual Digital Display Meters

The meter product code setup can be carried out at any working state.

The method is to press Mode Key (►) continuously for 10 seconds; it will be ready for code setup when the top row nixie lights displayed XX-X. The first two digits nixie lights are for product code numbers, the last one is for relay working type. Choose first two digits nixie lights or last one by Mode Key, let them flash; Use the UP Key (▲) to change the code numbers (refer to the code number table).The setup code will be stored after 8 seconds completion of code setting. Now your designated product is initialized.

Before delivery of the ST48/ZN48/ZN72 Series products, their code numbers are set as 08－1, its related product model is as Single Set Dual Digital Display 4-digit Time Relay. Model Number: ZN48S-3 (1S－99M59S), the relay working mode is time delayed operate type.

Note: , the "X" in the following table is for relay working mode, its value is 1－6, and related specific meaning is as follows:

Mode 1. The power on meter working, the relay will operate after reach or exceed to the set value.
Mode 2. The power on meter not working, (use reset key or reset terminal to make meter working), the relay will operate after reach or exceed to set value.
Mode 3. The power on meter working, the relay will release after reach or exceed to set value.
Mode 4. The power on meter not working (use reset key or reset terminal to make meter working), the relay will release after reach or exceed to set value.
Mode 5. The power on meter working, the relay will operate after reach or exceed to setting value, after 5 seconds, the system will be automatic reset.

Mode 6. The power on meter not working (use reset key or reset terminal to make meter working), the relay will operate after reach or exceed to set value, after 5 seconds, the system will be automatic reset.

产 品 密 码 编 号 表
The Product Code Number Table

密码 Code	产品型号 Model	显示范围 Display Range	备　注 Remarks
01-X	ZN48S--6	0.01S--99.99S	正计时延时/ Elapsed time (Up) time delay
02-X	ZN48S--1	0.01S--99.99S	倒计时延时/Remaining time (Down) time delay
03-X	ZN48S-10	1M--9999M	正计时延时/ Elapsed time (Up) time delay
04-X	ZN48S--5	1M--9999M	倒计时延时/ Remaining time (Down) time delay
05-X	ZN48S--7	1S--9999S	正计时延时/ Elapsed time (Up) time delay
06-X	ZN48S--2	1S--9999S	倒计时延时/ Remaining time (Down) time delay
07-X	ZN48S--8	1S－99M59S	正计时延时/ Elapsed time (Up) time delay
08-X	ZN48S--3	1S－99M59S	倒计时延时/ Remaining time (Down) time delay
09-X	ZN48S--9	1M－99H59M	正计时延时/ Elapsed time (Up) time delay
10-X	ZN48S--4	1M－99H59M	倒计时延时/ Remaining time (Down) time delay
11-X	ZN48SS-8	1M－99H59M	正计时延时/ Elapsed time (Up) time delay
12-X	ZN48SS-4	1M－99H59M	倒计时延时/ Remaining time (Down) time delay
13-X	ZN48SS-6	1S－99M59S	正计时延时/ Elapsed time (Up) time delay
14-X	ZN48SS-2	1S－99M59S	倒计时延时/ Remaining time (Down) time delay
15-X	ZN48SS-5	1S--9999S	正计时延时/ Elapsed time (Up) time delay
16-X	ZN48SS-1	1S--9999S	倒计时延时/ Remaining time (Down) time delay
17-X	ZN48SS-7	1M--9999M	正计时延时/ Elapsed time (Up) time delay
18-X	ZN48SS-3	1M--9999M	倒计时延时/ Remaining time (Down) time delay
19-X	ZN48L-4	0--99H59M59.99S	立即复位/Immediately reset
20-X	ZN48L-1	0-- 99H59M59.99S	八秒复位/8 seconds reset
21-X	ZN48L-5	0--9999H59M59S	立即复位/Immediately reset
22-X	ZN48L-2	0--9999H59M59S	八秒复位/8 seconds reset
23-X	ZN48L-6	0--9999D23H59M	立即复位/Immediately reset
24-X	ZN48L-3	0--9999D23H59M	八秒复位/8 seconds reset
25-X	ZN48F-1	1Hz--9999Hz	
26-X	ZN48F-2	0.1Hz--999.9Hz	
27-X	ZN48N	60--9999RPM　每转取 1 个脉冲/One pulse per rpm	
28-X	ZN48FR	0--9999 频率、转速通用型/General purpose for frequency and rotation speed	
29-X	ZN48J	0-9999(9999-0 短接 COM 与 PAU/Short connection COM and PAU)	
30-X	ZN48JR	0-9999.999(9999.999-0 短接 COM 与 PAU/Short connection COM and PAU)	
31-X	ZN48J8	0-99999999(99999999--0 短接 COM 与 PAU/Short connection COM and PAU)	
32-X	ZN48J8R	0-99999999.999(99999999.999-0 短接 COM 与 PAU/Short connection COM and PAU)	