N9ZX Multifunction Tachometer (DIN 48 × 96)

- Can display speed, wire speed, pulse frequency and flow,but also can output alarm.
- The measuring range is broad, low speed, high speed can be high precision measurement, identification.
- Operation in any of the four following modes is possible with the same Unit: Upper and lower limit, upper limit, lower limit, and area.
- Equipped with auto-zero time, average processing, and startup time functions.
- RS485 digital communication function, uses the international general Modbus communication protocol.

■ Ratings

*When □ is N, there is no 4-20mA output, and when □ is X, there is a 4-20mA output

Model	N9ZX-NN□	N9ZX-1PN□	N9ZX-2PN□
communication	N9ZX-NS□	N9ZX-1PS□	N9ZX-2PS□
Category	Only measurements show	A group of alarm output	Two groups of alarm output
supply voltage	1:AC100～240V 50/60HZ 2:AC/DC12～24V		
voltage range	85～110%		
Power consumption	Approx. 5 VA at 264 VAC, Approx. 3.2 W at 12 VDC		
Display	7-segment, LED digital display Display range: 0~999999		
Mounting method	Flush mounting		
Max. counting speed	30 Hz or 10 kHz (selectable, ON/OFF ratio 1:1)		
Measuring range	30Hz:0.0001HZ～30.00Hz、10KHz:0.0001HZ～10KHz		
RPM range	0. 06～600000rpm (1 pulses / rotation)		
Measuring accuracy	±0.1% FS ±1 digit max. (at 23 ±5°C)		
Pulse measurement method	Periodic measurement (Sampling period: 200 ms)		
Output modes	——	HI-LO, AREA, HI, LO	
Prescaling function	0. 0001～99. 9999		
Decimal point adjustment	Rightmost 4 digits		
External power supply	12VDC ±10% 100mA Max		
Input signals	Count, hold		
Input method	No-voltage input/voltage input (switchable) No-voltage input. ON impedance: 1 kΩ max. (Leakage current: 5 to 20 mA at 0 Ω) ON residual voltage: 3 V max.OFF impedance: 100 kΩ min. Voltage input无 High (logic) level: 4.5 to 30 VDC Low (logic) level: 0 to 2 VDC (Input resistance: approx. 4.7 kΩ)		
Control output	——	3 A at 250 VAC/30 VDC, resistive load (cosφ=1)	

Memory backup	EEPROM (overwrites: 100,000 times min.) that can store data for 10 years min.
Dielectric strength	AC2000V 50/60Hz 1min
Ambient temperature	Operating: −10 to 55°C (with no icing or condensation) Storage: −25 to 65°C (with no icing or condensation)

■ The panel and the size
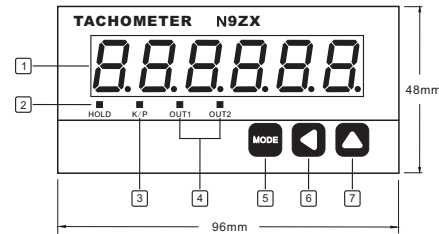
1. Monitor(Present Value)
2. Hold Indicator (Lit when the hold input)
3. Key Protection Indicator
4. Control Output Indicator
5. Mode Key(Used to switch mode and setting items.)
6. Data shift key
7. Up Keys

Flush Mounting Adapter

Panel Cutouts(mm) :

Min. 116
Min. 52
45. 5 +0.6 −0
91.5 +0.6 −0
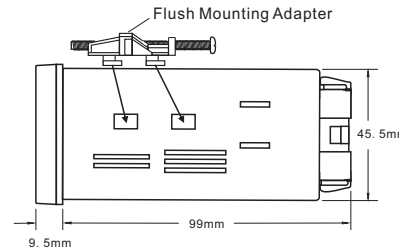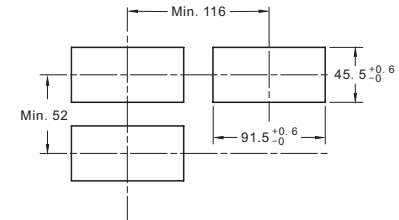
■ Comparison value set（T9ZX-N doesn't have this set）

● N9ZX-1P Output Mode: HIHI or LOLO
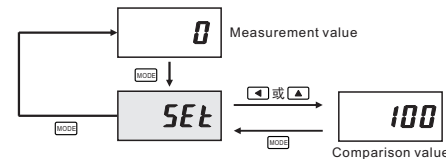
Comparison Value
Set comparison value. The measurement value is compared to comparison value and output is made according to the selected output mode.

● N9ZX-1P/N9ZX-2P Output Mode: HI-LO or AREA
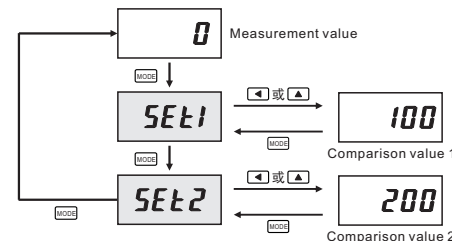
Comparison Value 1/Comparison Value 2
Set comparison value 1 and comparison value 2. The measurement value is compared to comparis-on value 1 and comparison value 2 and output is made according to the selected output mode.

■ Settings for Advanced Functions

```
┌─────────┐
│    0    │  Run mode
└─────────┘
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[MODE] 3s min. ↓ ↑ [MODE] 3s min.

Set each setting item using the ◄ and ▲ keys.

ōUtn
◄ or ▲
Tachometer output mode   *N9ZX-N Without this parameter
HiLō ↔ ArEA ↔ HiHi ↔ LōLō
(HI-LO)   (AREA)   (HI-HI)   (LO-LO)
[MODE]

CPS
◄ or ▲
Counting speed
30 ↔ 10P
(30Hz)   (10KHz)
[MODE]

dP
◄ or ▲
Decimal point position
------ ↔ ----.- ↔ ---.-- ↔ --.--- ↔ -.----
(No decimal   (One digit after   (Two digits after   (Three digits after   (Four digits after
point)   decimal point)   decimal point)   decimal point)   decimal point)
[MODE]

PSCL
◄ or ▲
Prescale value
0.0001 ~ 999999
(0.0001~99.9999)
[MODE]

HY
◄ or ▲
Control Output hysteresis   *dP determines the location of the
0 ~ 99999   decimal point
(0~99999)
[MODE]

AuG
◄ or ▲
Average processing
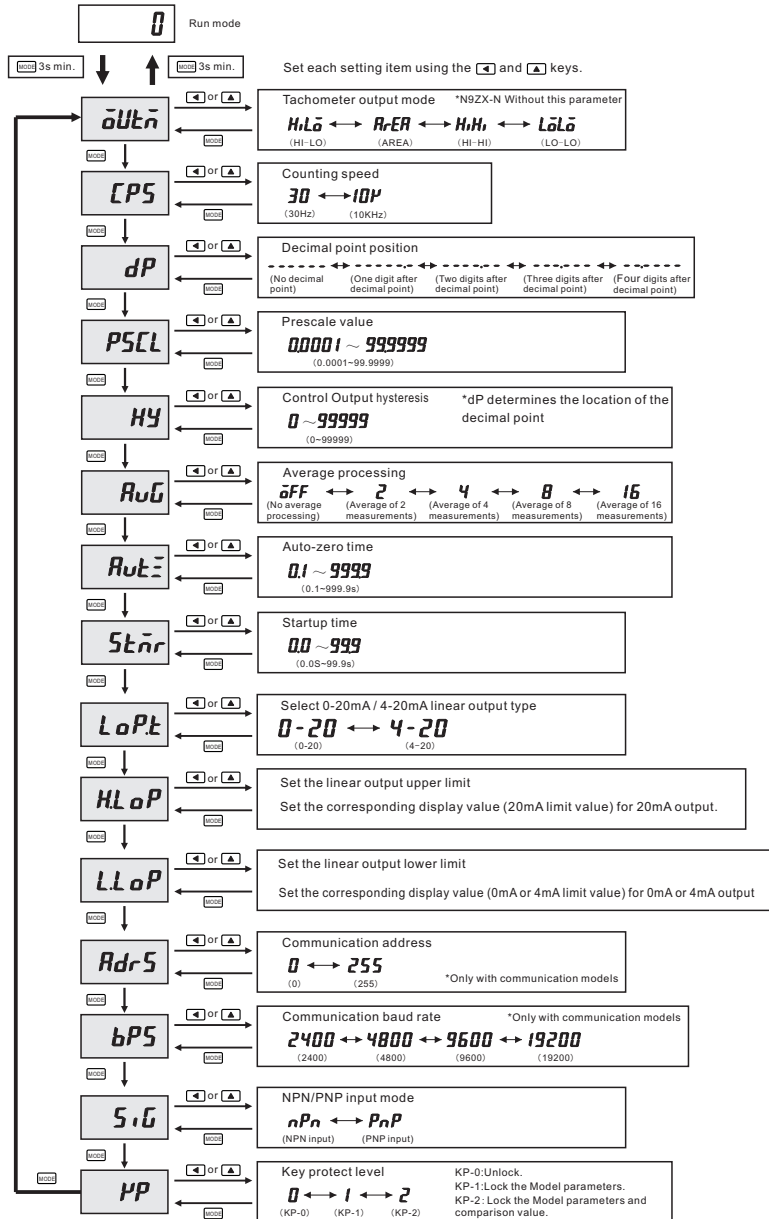ōFF ↔ 2 ↔ 4 ↔ 8 ↔ 16
(No average   (Average of 2   (Average of 4   (Average of 8   (Average of 16
processing)   measurements)   measurements)   measurements)   measurements)
[MODE]

AutE
◄ or ▲
Auto-zero time
0.1 ~ 9999
(0.1~999.9s)
[MODE]

Stnr
◄ or ▲
Startup time
0.0 ~ 999
(0.0S~99.9s)
[MODE]

LoP.t
◄ or ▲
Select 0-20mA / 4-20mA linear output type
0-20 ↔ 4-20
(0-20)   (4-20)
[MODE]

H.LoP
◄ or ▲
Set the linear output upper limit
Set the corresponding display value (20mA limit value) for 20mA output.
[MODE]

L.LoP
◄ or ▲
Set the linear output lower limit
Set the corresponding display value (0mA or 4mA limit value) for 0mA or 4mA output
[MODE]

AdrS
◄ or ▲
Communication address
0 ↔ 255
(0)   (255)   *Only with communication models
[MODE]

bPS
◄ or ▲
Communication baud rate   *Only with communication models
2400 ↔ 4800 ↔ 9600 ↔ 19200
(2400)   (4800)   (9600)   (19200)
[MODE]

S.iG
◄ or ▲
NPN/PNP input mode
nPn ↔ PnP
(NPN input)   (PNP input)
[MODE]

HP
◄ or ▲
Key protect level   KP-0:Unlock.
0 ↔ 1 ↔ 2   KP-1:Lock the Model parameters.
(KP-0) (KP-1) (KP-2)   KP-2: Lock the Model parameters and
                          comparison value.

(3)

■ Explanation of Functions

● Counting Speed（CPS）

Set the maximum counting speed (30 Hz/10 kHz) for CP1 input. If contacts are used for input signals, set the counting speed to 30 Hz.Processing to eliminate chattering is performed for this setting.

● Decimal Point Position（dP）

Decide the decimal point position for the measurement value, OUT1 set value, and OUT2 set value.

● Prescale Value（PSCL）

It is possible to display the rate of rotation or the speed of a device or machine to which the N9ZX is mounted by converting input pulses to a desired unit. If this prescaling function is not used, the input frequency(Hz) will be displayed.

The relationship between display and input is determined by the following equation. Set the prescale value according to the unit to be displayed.

$$\text{Displayed value} = f \times a$$

f: Input pulse frequency (number of pulses in 1 second)

a: Prescale value

1. Displaying Rotation Rate

Display unit	Prescale value (a)
rpm	1/NX60
rps	1/N

N: Number of pulses per revolution

Example:In order to display the rate of rotation for a machine that outputs 5 pulses per revolution in he form □□.□ rpm:
    1. Set the decimal point position to 1 decimal place.
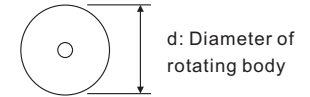   2. Using the formula, set the prescale value to 1/N × 60 =60/5 = 12.

2. Displaying Speed

Display unit	Prescale value (a)
m/min	πdX1/NX60
m/s	πdX1/N

N: Number of pulses per revolution

d: Diameter of rotating body (m)

πd: Circumference (m)

d: Diameter of rotating body

● Average Processing（AuG）

Flickering display and output chattering can be prevented using average processing (simple averaging). Average processing can be set to one of four levels: no average processing, 2 times (i.e., the avera-ge of 2 measurement values), 4 times, or 8 times. The measurement cycle will be equal to the sampling cycle (200 ms) multiplied by the average processing setting (i.e., the number of times). Average proc-ssing enables fluctuating input signals to be displayed stably. Set the optimum number of times for the application.

● Auto-zero Time（AutE）

It is possible to set the N9ZX so that if there is no pulse for a certain time the display is force-set to 0. This time is called the auto-zero time.

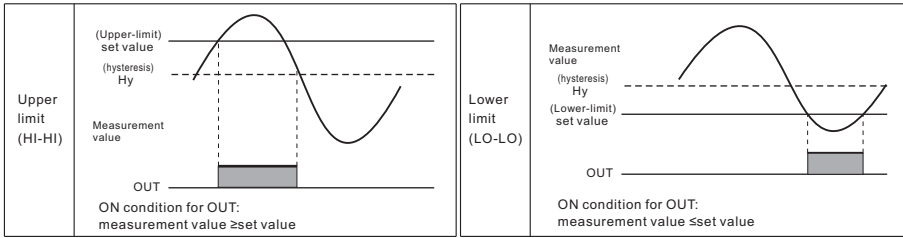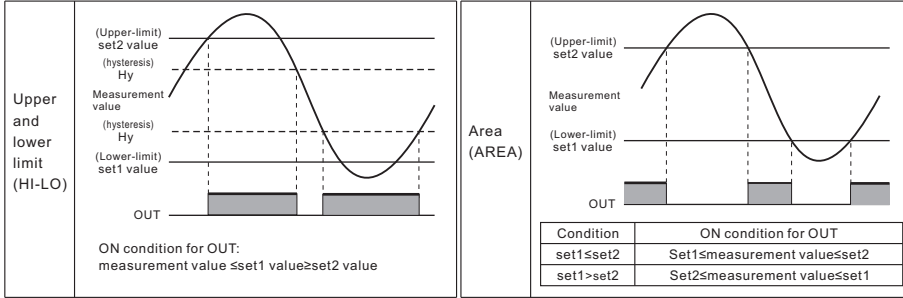Note: Set the auto-zero time to a time slightly longer than the estimated interval between input pulses and within the setting range(0.1 to 999.9 s). It will not be possible to make accurate measurements if the auto-zero time is set to a time shorter than the input pulse cycle. Setting a time that is too long may also result in problems, such as a time-lag between rotation stopping and the alarm turning ON.
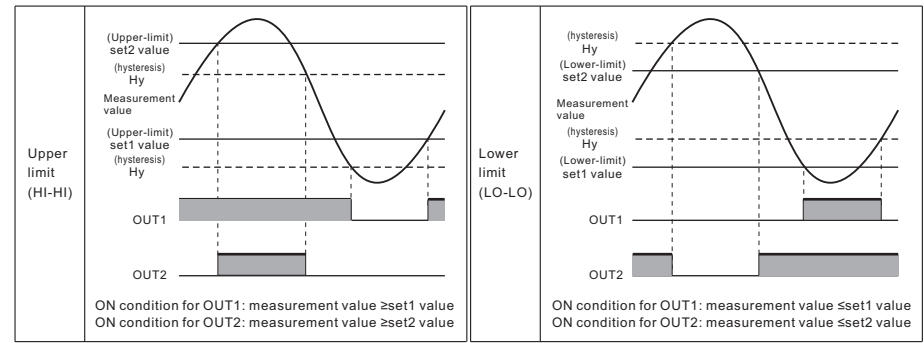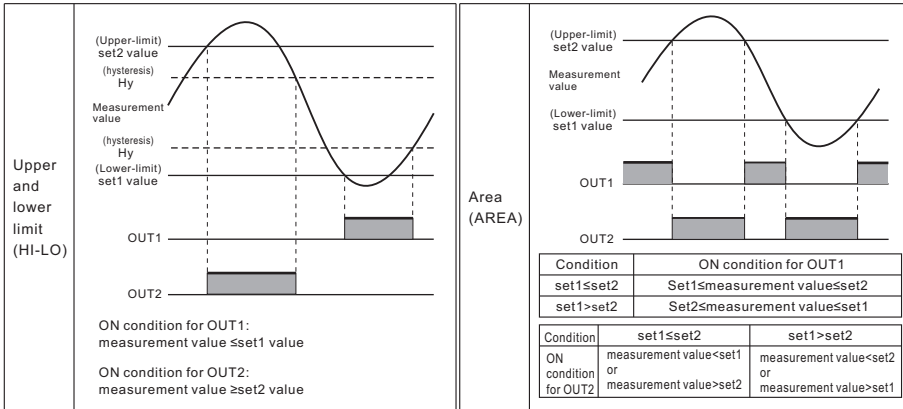
（4）

●Startup Time（**Stār**）

In order to prevent undesired output resulting from unstable input immediately after the power supply is turned ON, it is possible to prohibit measurement for a set time (0.0 to 99.9 s), the startup time. It can also be used to stop measurement and disable output until the rotating body reaches the normal rate of rotation, after the power supply to the N9ZX and rotating body are turned ON at the same time.
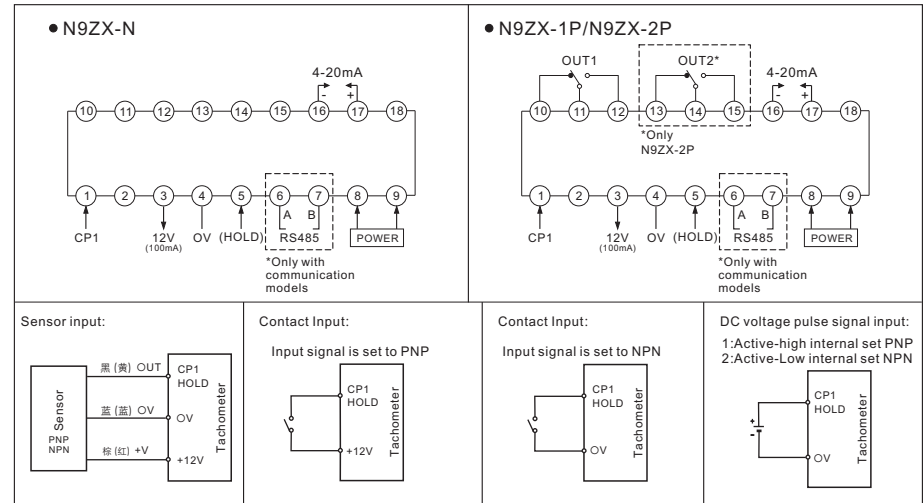
■ Output Mode Settings

● N9ZX-1P(A group of alarm output)

Upper and lower limit (HI-LO)

(Upper-limit) set2 value
(hysteresis) Hy
Measurement value
(hysteresis) Hy
(Lower-limit) set1 value
OUT

ON condition for OUT:
measurement value ≤set1 value≥set2 value

Area (AREA)

(Upper-limit) set2 value
Measurement value
(Lower-limit) set1 value
OUT

Condition	ON condition for OUT
set1≤set2	Set1≤measurement value≤set2
set1>set2	Set2≤measurement value≤set1

Upper limit (HI-HI)

(Upper-limit) set value
(hysteresis) Hy
Measurement value
OUT

ON condition for OUT:
measurement value ≥set value

Lower limit (LO-LO)

Measurement value
(hysteresis) Hy
(Lower-limit) set value
OUT

ON condition for OUT:
measurement value ≤set value

● N9ZX-2P(Two groups of alarm output)

Upper and lower limit (HI-LO)

(Upper-limit) set2 value
(hysteresis) Hy
Measurement value
(hysteresis) Hy
(Lower-limit) set1 value
OUT1
OUT2

ON condition for OUT1:
measurement value ≤set1 value

ON condition for OUT2:
measurement value ≥set2 value

Area (AREA)

(Upper-limit) set2 value
Measurement value
(Lower-limit) set1 value
OUT1
OUT2

Condition	ON condition for OUT1
set1≤set2	Set1≤measurement value≤set2
set1>set2	Set2≤measurement value≤set1

Condition	set1≤set2	set1>set2
ON condition for OUT2	measurement value<set1 or measurement value>set2	measurement value<set2 or measurement value>set1

Upper limit (HI-HI)

(Upper-limit) set2 value
(hysteresis) Hy
Measurement value
(Upper-limit) set1 value
(hysteresis) Hy
OUT1
OUT2

ON condition for OUT1: measurement value ≥set1 value
ON condition for OUT2: measurement value ≥set2 value

Lower limit (LO-LO)

(hysteresis) Hy
(Lower-limit) set2 value
Measurement value
(hysteresis) Hy
(Lower-limit) set1 value
OUT1
OUT2

ON condition for OUT1: measurement value ≤set1 value
ON condition for OUT2: measurement value ≤set2 value

■ Wiring diagram

● N9ZX-N

4-20mA

10 11 12 13 14 15 16 17 18

1 2 3 4 5 6 7 8 9

CP1   12V (100mA)   0V (HOLD) RS485 A B   POWER

*Only with communication models

● N9ZX-1P/N9ZX-2P

OUT1   OUT2*   4-20mA

10 11 12 13 14 15 16 17 18

*Only N9ZX-2P

1 2 3 4 5 6 7 8 9

CP1   12V (100mA)   0V (HOLD) RS485 A B   POWER

*Only with communication models

Sensor input:

Sensor PNP NPN
黑 (黄) OUT — CP1 HOLD
蓝 (蓝) 0V — 0V
棕 (红) +V — +12V
Tachometer

Contact Input:
Input signal is set to PNP
CP1 HOLD
+12V
Tachometer

Contact Input:
Input signal is set to NPN
CP1 HOLD
0V
Tachometer

DC voltage pulse signal input:
1:Active-high internal set PNP
2:Active-Low internal set NPN
CP1 HOLD
0V
Tachometer

■ Before the use of attention

1: before use, make sure that the voltage and connection, to avoid lead to instrument damage due to incorrect wiring.

2：Avoid the instrument used in high temperature, flammable, explosive, corrosive, dust, severe shock, humidity, static electricity, oil and other occasions.

3：Twist of the instrument signal lines and power lines may cause interference
Please try to stay away from these strong electric wires, to conduct an independent wiring, and signal lines as far as possible to shorten the wiring distance.

4：Output relay, please do not exceed the switching capacity, according to the rated load, otherwise it would contact burned, such as an external high current relay or contactor exceeds its capacity.

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