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IST-TA SERIES
DYNAMIC TORQUE SENSOR
OPERATION MANUAL

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catalogue

The torque sensor series displays the torque and speed data on its own OLED display, and specific parameters such as zero and calibration can be adjusted by pressing the button. Simple calibration and zero clearance operation can be carried out without the user of instrument, which can be more easily applied to industrial production and torque testing. This sensor has strong stability and adaptability, supports the communication of transmission output with RS485, ASCII or HEX active transmission communication protocol, the speed frequency signal is transmitted to the torque instrument, all data without frequency pressure conversion, which improves the anti-interference performance to a large extent. It also ensures the stability and real-time performance of the transmitted data.

1. Main functions and characteristics

- Display the current measured torque and rotational speed values in real time at a refresh speed of 15 times per second.
- The current power value can be directly calculated and displayed.
- Support for RS485 communication, support for the active upload protocol, the fastest communication rate of up to 1,000 times per second.
- If the 120 line code disk is used, the acquisition speed above 12.5RPM is 25 times per second.
- The speed can directly output frequency signal, the maximum speed range is 15000 RPM.(The actual speed exceeds 8000 RPM, please contact customer service)
- This sensor supports the transformer current and transformer voltage output.

The ● sensor has an OLED display with a resolution of 128 * 64.

- Simple calibration, zero clearing, filtering and other operations.
- Allow the sensor to overload by 200%.
- Precision achieves more than 1 / 1000 accuracy, excellent zero-point stability.
- Non-contact type, no maintenance, no vulnerable devices, no service life limit.

2. qualification

- Measurement performance: 24-bit AD acquisition chip, acquisition speed of 1200 times / second.
- Torque value display range-99999-99999, speed value display range 0-99999.
- Communication: 485 communication port can execute Modbus-RTU protocol ASCII active upload HEX active upload protocol.
- Transfer: 4-20 mA, 0-5V, 0-10V, ± 5V, (± 10V customization), 14bit accuracy.
- Key: for three separate buttons operation.
- Power supply: DC is 24V (± 10%), 0.2A. Maximum voltage is 27.5V, and the minimum starting voltage is 12V.
- Speed output: shaft rotary ring output optional 2000 line (no frequency) encoder or 120,60 pulses.
- Working environment: ambient temperature: -20-70℃; relative humidity: 85% RH; avoid strong corrosive gas.

Output mode and its maximum output speed

	4-20MA	0-10V ±5V	MODBUS RTU (RS485)	HEXActive upload(RS4 85)	ASCIIActiv e upload (RS485)
Torque output	800t/s	800t/s	30t/s	1000t/s	1000t/s
Speed output	(External connection converter)	(External connection converter)	30t/s	1000t/s	nonsupport
power output	nonsupport	nonsupport	30t/s	nonsupport	nonsupport

(Note: no power output agreement for torque and speed calculation)

(Note: The above speed is the communication transmission speed)

3. parameter declaration

3.1. Speed output:

The current speed is sent by pulse mode, if the pulse output interface of 120,60 adopts OC output, if the 2000 pulse output interface is NPN, PNP, and the voltage output is optional.(Only 2000 pulse output is positive and negative)

3.2. Manual zero:

Press the K3 button to zero out the current data and establish a new zero point. All output data are benchmarked against the zero point.

3.3. digital filtering :

Using Gaussian filter and median filter, the digital filter level is 1-99. The higher the level, the better the disturbance resistance, but the data change lag is more obvious.

3.4. Transform output:

Customers can choose a voltage type or current type transmission output, essentially using the microcontroller to amplify the current sensor data to output a standard voltage and current for the customer to use.

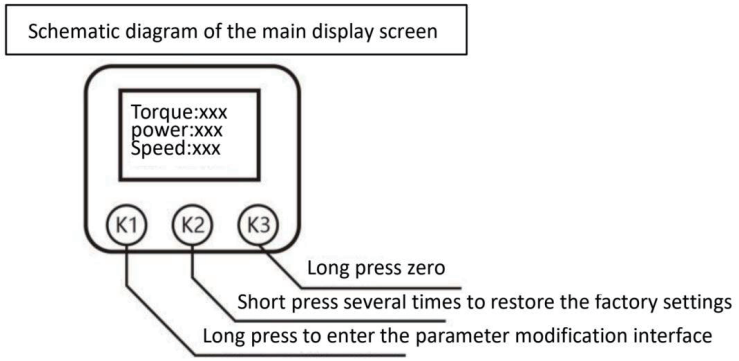
3.5. Power zero:

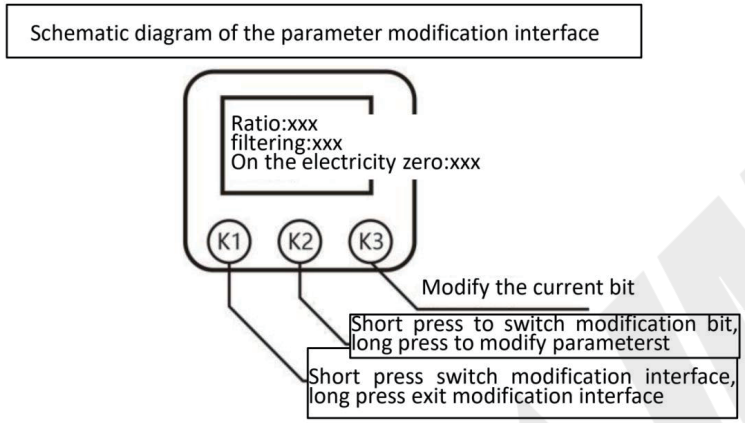
The customer can set the power zero enabled, then the boot will automatically set a zero. All output data are benchmarked against the zero point.

3.6. Communication output:

RS485 The communication output port outputs the current sensor data value, which is sent to the torque instrument or PLC by Modbus-RTU protocol and active transmission protocol. The higher the baud rate setting, the more the amount of data sent in a fixed time.

4. operation declaration





4.1. Parameter modification:

In the case of display on the main interface, long press K1 for more than two seconds without releasing the release, the system enters the parameter modification interface and displays the parameter modification interface 1, and switches the interface K1 in the four interfaces of parameter modification. If you need to return to the main interface, press K1 again for more than two seconds to exit.

4.2. Modify zero:

In the case of the main interface display, long press the K3 button to clear up the current parameters. Set the current zero point.

4.3. Physical approach calibration:

Apply a known torque (set to X), stabilize, record the instrument display value (set to Y), find the "coefficient" in interface 1, and modify the parameter value to (Z * Y / X) by short pressing the K2 key: divide the display torque by the actual torque and multiply by the "coefficient". Press K1 directly to exit the parameter modification interface to save.

4.4. Modify the filter:

In the main interface, press K1 to enter parameter modification interface 1. In parameter setting interface 1, press K2, select the filter coefficient, press K2 to move the currently selected data position back, and press K3 to modify the value of the current position.

4.5. Modify the baud rate with the machine code:

Press K1 long on the main interface, enter parameter setting interface 1, press K1 twice under the parameter setting interface, enter parameter setting interface 3, press key K2 on the parameter setting interface 3, select the communication rate or communication machine code, and press K2 and K3 to modify the current parameters.

4.6. factory data reset

Under the main display interface, continuously press the K2 button and quickly press more than five times to restore the current parameters to the factory setting.

5. parameter list

symbol	Mame	default value	Span	explain
01	Current coefficient	/	100 ～ 32700	Results of physical calibration (not recommended)
02	digital filtering	20	1 ～ 99	The larger the filter value is, the more stable the data is, but it changes more slowly.
03	Torque decimal point	/	0 ～ 4	Displays the decimal point
04	Boot zero	1	0 ～ 1	0: no zero 1: zero
05	Send zero	/	0 ～ 16384	The torque is zero, and the transmission output value is changed.
06	Change to full	/	0 ～ 16384	Torque is the quantitative range, change the output value.
07	Change the	/	100 ～ 30000	Sensor range input (modification is not recommended)

	amount of delivery			
08	Communication rate	19200	0～ 115200	RS485 Communications Baud rate selection
09	Communication mode	1	0 ～ 3	0: Active upload for HEX 6 bytes 1: MODBUS RTU 2: ASCII active upload 3: Active upload for HEX 8 bytes
10	Communication machine code	1	0 ～ 120	MODBUS-RTU slave protocol, sensor address code
11	Communication format	N81	N81,N82,091 092,E91,E92	Support parity, support 8 or 9 bit data bits, support 1 or 2 bit stop bits.8-bit data bits are not available with parity.
12	Torque direction	0	0 ～ 1	0: Default torque direction 1: opposite torque direction
13	Speed filter	/	0 ～ 99	The larger the filter value, the more delayed the data changes
14	Speed decimal	0	0 ～ 3	The speed data is displayed with the number of decimal transmitted.
15	power unit	0	0 ～ 1	Power display unit.0 indicates W and 1 KW.
16	Power decimal point	0	0 ～ 3	Power shows the decimal point.

6. The RS485 communication instructions

This torque sensor supports RS-485 communication, MODBUS-RTU and active upload protocol. There are four communication modes, namely, communication mode 0, communication mode 1, communication mode 2, and communication mode 3. Communication mode 0 is a protocol for communication with the software and instrumentation supporting the Company. Communication mode 1 is the standard MODBUS-RTU protocol. Communication mode 2 is the ASCII active upload protocol. The specific communication formats of the four protocols are described below. (Note that the calibration method used in this machine is all CRC 16)

6.1. HEX 6 Bytes Active Upload protocol (Communication Mode 0)

Baud rate and transmission velocity relation

	9600bps	14400bps	19200bps	38400bps	57600bps	115200bps
Send speed	50t/s	50t/s	100t/s	200t/s	500t/s	1000t/s
Frame interval time	20ms	20ms	10ms	5ms	2ms	1ms

(Change the port rate, and the data transmission speed changes automatically, without modifying other parameters)

If you are equipped with the torque display instrument of this torque sensor or the upper machine designed by our company. Change the communication mode to 0 or 3 and send torque data and speed data. DYN200 When the torque sensor communication mode is 0, the actively uploaded data is six bytes, and each string of data sent must be checked by CRC 16. This transmission mode uses the timing transmission.

Send instances

D1 D2 D3 D4 D5 D6
0X**,0X**,0X**,0X**,0X**,0X**

The data format is as follows: D1, D2 data is the current torque value, the maximum value is 65535, D3, D4 is the current rotational speed value, the maximum is 32767. D5, D6 is the CRC calibration bit, where the highest D3 indicates the plus or minus sign of the torque value, and the highest bit is 1, and the highest torque value is negative. The calibration mode is CRC 16.

6.2. HEX 8-Byte Active Upload protocol (Communication Mode 3)

This communication protocol is a supplement to the HEX 6-byte active upload protocol and can be used for HEX communication when the speed data exceeds 32767 or the torque data exceeds 65535. This transmission mode uses the timing transmission.

Send instances

D1 D2 D3 D4 D5 D6 D7 D8
0X**,0X**,0X**,0X**,0X**,0X**,0X**,0X**

The data format is as follows: The data of D1, D2 and D3 are the current torque value, the maximum value is 0X7FFFFF, and the highest position of D1 is 1. For example, the torque data is 0XFF 0XFF 0XFE, which means the torque data is-2. D4, D5, and D6 are the current rotational speed values, and the maximum value is 0XFFFFFF. D7, D8 is the CRC check bit. The calibration mode is CRC 16.

6.3. ASCII Active upload protocol (communication mode 2)

Baud rate and transmission velocity relation

	9600bps	14400bps	19200bps	38400bps	57600bps	115200bps
Send speed	50t/s	50t/s	100t/s	200t/s	500t/s	1000t/s
Frame interval time	20ms	20ms	10ms	5ms	2ms	1ms

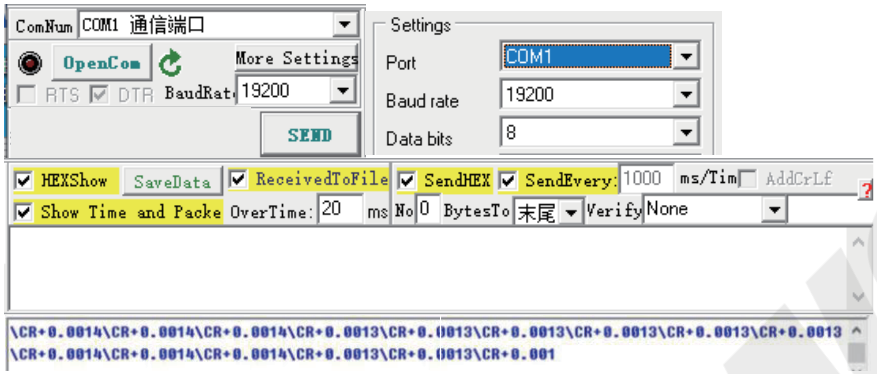
(Change the port rate, and the data transmission speed changes automatically, without modifying other parameters)

If ASCII active upload, set the communication mode to 2. If you need to change the transmission rate, just change the port rate. In order to ensure speed and stability, it only sends real-time torque data.

A section of the data format such as: 2B 30 2E 30 30 30 31 0D

The ASCII data is converted through the code table:+ 0 . 0 0 0 1\CR

The data received using the upper computer computer is as follows:



6.4. MODBUS _ RTU protocol (communication mode 1)

(Note: XXH refers to 16, and 10H to 10 to 16)

Sensor code: sensor is slave mode, default code is 01H.

Baud rate: when using MODBUS _ RTU communication, using the baud rate below 19200, a higher baud rate will cause a high error rate.

Stop: Stop one and two bits, default two bits.

03H command: can read the current speed value, torque value and power value, etc.

05H command: It can complete the reset and restore the factory operation.

10H command: you can modify the coefficient, filter, decimal point, etc.

Communication example: 01 is the machine code, crc 0 is the low level of CRC calibration, and crc 1 is the high level of CRC calibration. The verification code can be automatically calculated using Commix software, and most of the PLC has a data verification function.

03H function code instance

Send: 01 03 00 00 00 02 C4 0B read torque measurement (long)

Return: 01 03 04 d1 d2 d3 d4 crc0 crc1 (d1-d4 torque measurement data, d1 highest, d4 lowest)

Note: Each register is 16 bintes of data, each four registers is a complete data, the high data is in front, the low data is in back, the data format is integer format, stored in the form of supplementary code, is a positive and

negative integer. For example: 00000000H, 0; 00000001H, 1; FFFFFFFFH, -1; FFFFFFFEH. -2..

05H function code instance

Send: 01 05 00 00 ff 00 8C 3A (reset operation)

Return: 01 05 00 00 ff 00 8C 3A

The 10H function code instance

Send: 01 10 00 06 00 02 04 d1 d2 d3 d4 crc0 crc1 (modified filter) d1-d4 is the filter value, the high level is before

Return: 01 10 00 06 00 02 A1 C9

(10H command, clear and restore the factory, d1-d4 write 00 00 00 01)

communicational parameter

address	The parameter name	read-write	Support instructions	A brief description
06H	digital filtering	Read / write	03H, 10H	The larger the filter value, the more stable the data is, but the change is more slowly
08H	Torque decimal point	Read / write	03H, 10H	Torque shows the decimal point position
0AH	Boot zero	Read / write	03H, 10H	0: no zero 1: zero
0CH	Send zero	Read / write	03H, 10H	Transfer the hardware to the zero-point output
0EH	Change to full	Read / write	03H, 10H	Change the full send partial hardware output value
10H	Change the amount of delivery	Read / write	03H, 10H	Sensor range input
12H	Torque direction	Read / write	03H, 10H	Change of the torque direction
14H	traffic rate	Read / write	03H, 10H	1--9600bps, 2--14400bps, 3--19200bps, 4--38400bps, 5--57600bps, 6--115200bps
16H	Communication machine code	Read / write	03H, 10H	The initial value is 1, as modified according to the requirements

18H	stop bit	Read / write	03H,10H	0:2 stop 1:1 stop
1AH	coefficient	Read / write	03H,10H	It is not recommended to modify the result of the physical approaching calibration
1CH	Communication mode	Read / write	03H,10H	0: Active upload for HEX 6 bytes 1: MODBUS RTU 2: ASCII active upload 3: HEX 8 bytes active upload Note that the factory default is MODBUS RTU mode, and the other mode cannot be changed to MODBUS RTU mode through communication
1EH	Speed filter	Read / write	03H,10H	The larger the filter value, the more delayed the data changes
20H	Speed decimal	Read / write	03H,10H	Speed data decimal point, affect the speed range.
00H	zero clearing	write	05H,10H	Establish a new zero point
02H	factory data reset	write	05H,10H	Clears up the data as modified by the user
00H	Torque value	a slight pause in reading	03H	Current output torque, measured in NM
02H	speed	a slight pause in reading	03H	Current rotational speed, measured in the RPM
04H	power	a slight pause in reading	03H	Current output power

(If the current register address cannot be used, add a multiple of 44000 or 4000 to the correspondence address)

(10H command, clear and restore the factory, d1-d4 write 00 00 00 01)

(All parameters are int type variables, and occupy 4 bytes)

7. Transform output

7.1. Parameter introduction

Analog output: resolution 1 / 16383, output current 4-20 mA, 4-12-20 mA. The output voltage is-5-0 ~ 5 V, 0~10V or 0~5~10V for customers to choose (note before ordering), the sensor internal analog output only output the torque signal.

Transmission zero: the change of transmission zero will lead to the change of zero output voltage and output current, which has been adjusted to the appropriate value before delivery.

Full: changing the "full" will result in the change of the maximum output voltage and maximum current maximum is 16383, and the factory default is 16383.

Transfer range: the default is the current sensor range, and modifying the transmission range can change the change rate of the transmission output. Take the 50 NM sensor as an example, when the transmission range is adjusted to 10 NM, when the sensor applies more than 10 NM torque, the output voltage is full output, but the excess range is not recommended.

7.2. Parameter introduction

Five modes of changing the delivery of the output

4-20 mA: the resolution is 1 / 16383, the default zero point current is 4 mA, the forward torque and reverse torque reach the quantitative range, the transformer output current is 20 mA, without distinguishing the torque direction value.

4-12-20 mA: the resolution is 1 / 16383, the default zero current is 12 mA, when the forward torque value reaches the cycle, the output current is 20 mA, and when the reverse torque value reaches the cycle, the output current is 4 mA.

-5~0~5V: the resolution is 1 / 16383, the default zero voltage is 0V, the forward torque value reaches the range, the output voltage is 5V, and the reverse torque value reaches the range, the output voltage is-5V.

0~10V: the resolution is 1 / 16383, and the default zero voltage is 0V. When the forward torque and reverse torque reach the quantitative range, the transmission output voltage is 10V, and the direction of torque value is not distinguished.

0~5~10V: the resolution is 1 / 16383, and the default zero voltage is 5V. When the forward torque value reaches the range, the output voltage is 10V, and when the reverse torque value reaches the range, the output voltage is 0V.

7.3. Calibrate the current transformer feed output

(Take 0-5-10V as an example below) Connect the multimeter to the transmission output voltage port and enter the parameter modification interface 2. Switch to the transformer full degree modification, observe whether the multimeter voltage number is 10V, if there is a deviation to adjust the current

transformer output full degree, and when the output voltage is exactly 10V, the calibration of the transformer full degree is completed, calibrate the current transformer zero point again, and adjust the voltage output by 5V.

8. Speed output

8.1. Rated performance of the speed sensor (Electrical performance)

	60pulse	120pulse	2000pulse
maximum speed	20000RPM	10000RPM	3000RPM
Output	monopulse	monopulse	A.B.Z
Distinguish positive reversals	No	No	yes
Output rise time (5V)	12us	12us	1us
output form	Open collector circuit (OC)	Open collector circuit (OC)	The NPN collector has an open circuit The PNP collector has an open circuit NPN voltage output (default)
OC pull-up voltage	5-30V	5-30V	/

8.2. Speed collection method

The speed collection ensures the accuracy and real-time of speed data. However, it leads in a partial positive correlation between the speed acquisition speed and the speed value. When you use the 120 line code disk, the speed is higher than 12.5PRM, the speed acquisition speed is 25 times per second. When the speed is lower than 12.5RPM, the speed acquisition speed is the speed value multiplied by two.

8.3. Speed decimal

When the speed is between 1 and 100 RPM, the minimum speed resolution is 0.001 RPM and the decimal point speed is set to 3.

When the speed is in the 1-1000 RPM range, the minimum speed resolution is 0.01 RPM and the decimal point is set to 2.

When the speed is in the 1-10000 RPM range, the minimum speed resolution is 0.1 RPM, and the decimal point of the speed is set to 1.

The above speed interval needs to be noted before purchase. When you need to modify the speed interval, you can modify the first data on the left of the parameter "Speed mode", which represents the speed decimal number.

8.4. Speed filter

Acquisition speed pulse width mode

When the motor speed beating volume is large, the parameter "speed mode" can be modified, and the last two parameters are the speed filter coefficient. (The second bit data from the left cannot be modified, and this data is related to the speed hardware) The value range is 1-98. Because the speed acquisition speed is affected by the speed, when the speed is lower than 2% of the total range, the filter coefficient is automatically reduced to 1 to ensure the real-time performance of the speed sampling.

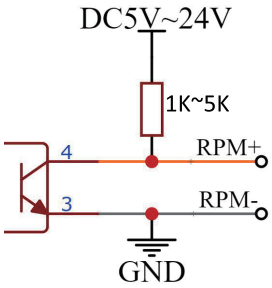
For example, the speed range is 1-1000 RPM, and the speed filter coefficient is 5. When the speed is lower than 20 RPM, the speed filter coefficient is reduced to 1, and when the speed returns to more than 20 RPM, the filter coefficient is automatically modified to 5.

Collect the rotation speed pulse quantity mode

This method is a fixed time acquisition frequency pulse, suitable for high speed or slow speed acquisition occasions. After the speed filter coefficient is changed to 99, the sensor is powered on to change the speed acquisition mode to "collect speed pulse quantity mode". The speed acquisition speed is 2 times per second (120 HZ speed code plate).

8.5. Standard rotation speed standard output mode

The torque sensor speed default output is 60Hz per lap, the maximum measurement limit speed is 20000 RPM（custom made）, or the maximum measurement limit speed is 10000 RPM. These three methods all use the OC output mode, that is, the collector open circuit output mode. When the output is used, you need to add the collector resistance between 1K-5K. Generally, 2K resistance is selected as the pull resistance. The resistance should not be too large or too small, otherwise it will deform the output frequency and narrow the output frequency range.



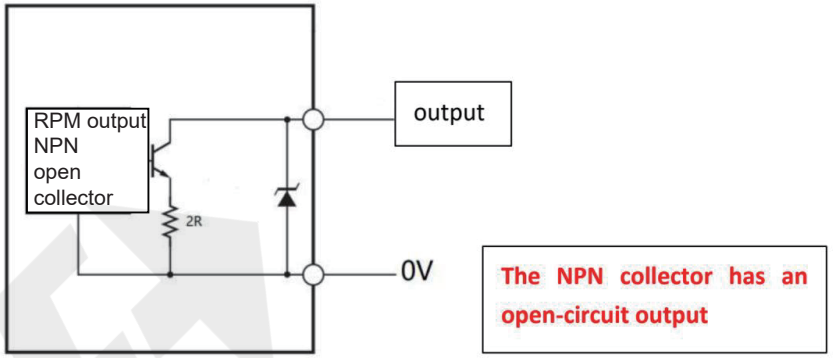
Example: Speed RPM + connected to 2K pull resistance to 24V, speed RPM-connected to common ground, output signal connected to RPM +. At this time, the output signal end is the square wave speed frequency with an amplitude of 24V.

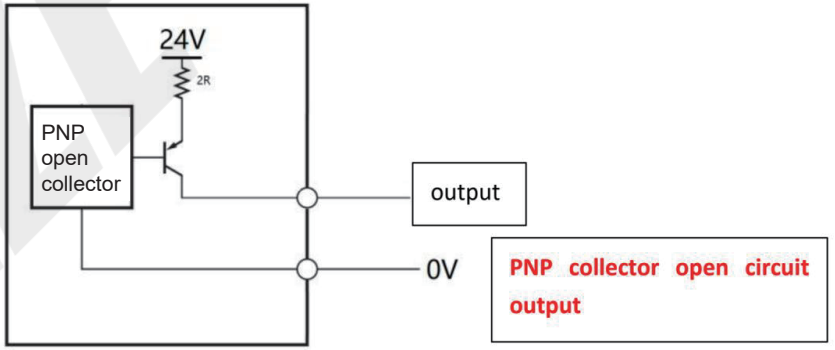
8.6. Analog quantity output mode

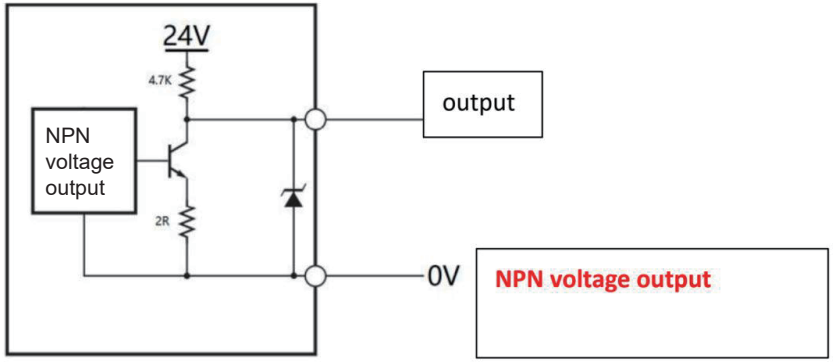
If you are not convenient to collect OC output, or only equipped with analog module, need the speed output analog, you can choose the company's frequency to analog converter, need to provide the required speed range before purchasing.

8.7. Encoder output mode

If you have a higher demand for speed sampling speed and accuracy, you can choose the 2000-line encoder output mode, which is placed inside the sensor. The appearance and size of the sensor are unchanged, and it is more adaptable. The encoder power supply is directly using the sensor 24V power supply, no external power supply, the default output is ABZ item output. The external frequency can be 4 times, the output resolution can reach 8000 HZ, and the differential signal output needs to be customized. There are three ways to choose from the output. Here are these three ways of internal circuit and wiring definitions.







1. Performance parameter table

code	IST-TA	No-linear	0.1%FS
rated capacity	±20000Nm	repetitiveness	0.03%FS
power input	DC24V	lag	0.03%
Consumption of current	< 150mA	Temperature effect of the zero point	0.01%FS/℃
Torque output	4-20mA、0-20mA、0-5V、0-10V、14bit precision	Temperature influence of the output	0.01%FS/℃
Speed output	120 / 60 Pulse / rpm	rated speed	8000rpm
reactivity worth	1kHz	The fastest rotation speed	15000rpm（custom made）
load resistance	≥ 2kΩ	Maximum torsion angle	2.60x10rad(0.149°)
Signal delay	2.6ms	inertia moment	0.38kg.cm
Allow overload	200%FS	Vibration natural frequency (Rotor part)	19.4kHz
Operating temperature range	-10~+ 50℃	torsional constant	3.85x10Nm/rad

2. Product maximum speed and torque range relationship

Sensor range (N.m)	diameter of axle (mm)	Weight (KG)	Default rated speed (RPM)
0.1-5	10	1.3	8000
0.1-100	18	1.5	8000
200-300	28	1.9	7000
500-800	38	3.5	6000
1000-5000	60	8.0	4000
10000-20000	98	38	3000

3. Use precautions

prohibit Proprohibited during operation and operation(Prohibited items)

Do not dismantle the product.
Please do not let the product fall, and exert a strong impact on the product.
No use of this product for purposes other than torque measurement.

Warn If improperly properly, it may lead to death Or seriously injured content

1.Design warning

- In order to ensure that the whole system can operate safely, please assemble the safety circuit on the outside of the product.
- If this product is used in the following purposes, be sure to consult our sales staff before use.
  - When used in environments not mentioned in the instruction manual
  - In the use of medical equipment, transportation equipment, weapons, entertainment equipment, installation devices and other uses that have a great impact on personal safety and property
- During operation, do not touch the product with hand or fingers, otherwise injury or clothing may be involved in the product.To prevent danger, be sure to install a safety cover, or other safety guards, so that the device will stop automatically when you may touch the rotating part.
- In case the product is damaged, the drive part and the load part may be completely separated to prevent danger, please install safety guards such as safety brake

2. Installation warnings

●Do not install it in the following environment.
- In a corrosive or combustible gas environment
- Places where water, oil, and medicine splash

●When installing the square head shaft, concave head connection, if the shaft is biased or bent, not only can not meet the performance of the product, but also will cause damage to the product due to the rotating vibration, in the worst case, the product will fly out, very dangerous. When performing the centering operation of the shaft, the low-speed rotation must be used to confirm that the shaft runs smoothly and without vibration before starting running the product. When installing the product on the device, ensure that the installation error is within the allowable range. If the product is used beyond the installation range, it may damage the product itself or affect the device that install the product.

●Please do not energize the shaft or frame of this product. In addition, please implement protective measures outside the product to avoid leakage current from entering the shaft.

3.Warning on wiring

●Please do not connect this product directly to the commercial power supply.

●Please confirm that the product is not connected first.
- Pull off the plug
- Cable wiring and connection

●Please insulated the terminals of unused cables to avoid contact with other metal or live parts.

●Before turning on the power supply, please carefully confirm the wiring first.

4.Warning on wiring

●Please do not repair, inspect the internal product, and modify the product without permission. Otherwise, it may lead to a fire and an electric shock. When needing to repair it, please entrust our company to repair it.

●Make sure that the fixing part is fastened before starting.

5.Warning on start-up maintenance

●Please do not repair, inspect the internal product, and modify the product without permission. Otherwise, it may lead to a fire and an electric shock. When needing to repair it, please entrust our company to repair it.

●Make sure that the fixing part is fastened before starting.

6.Warning on operation

●When used, ensure that the supply voltage and load are within the range of specifications and ratings. If used in the rated state, it will not only damage the product, but also may affect the installation of the product.

●If the outer cover of the main body is opened, it may be electrocuted inside the product or involved in the rotating part

●If smoke, combustion, abnormal odor occurs, please cut off the power supply immediately.

●Do not touch the rotating parts and non-rotating parts of the product during rotation. Please be careful not to involve your fingers or clothing in this product.

●If running above the fastest rotation speed, it will lead to increased vibration, serious will make the product damage, parts fall out, very dangerous. Be sure not to exceed the fastest speed limit. In addition, even if the maximum speed limit will not exceed to avoid the vibration due to the size error on the installation.

●If running in the state of loose connection fixation, it may cause skid, abnormal heat, damage, and affect the device to install the product. Be sure to use this product when the fixed part is fully fastened. Be sure to install safety guards such as safety brakes.

pay attention to | If improperly properly, it may lead to death Or seriously injured content

7.Warning on installation

●Do not install it in the following environment.
- Places where the temperature and humidity exceed the specification range
- Places where the temperature changes sharply or may freeze or dew
- The place where the temperature difference between the driving part and the load part
- outdoor
- A place of direct sunlight
- Places with more dust
- poorly ventilated places
- Places with more salt and metal debris
- The place where the impact is being directly communicated to the subject

●Take adequate shielding measures, including the cables.
- Near the wire
- Places where strong electric fields and strong magnetic fields are generated
- Places where static electricity and relays are generated

●When installation, please try to stay away from the equipment that will produce high frequency, high voltage, high current, surge, etc.Also, please separate from these power lines.Do not arrange the wiring and the same pipe wiring in parallel.

●When connecting the motor as the drive source, please follow the instructions of the frequency converter and servo amplifier used, and the motor casing should be grounded.

●Do not use it until the fault is cleared.

●Do not use screw classes that are not specified by the company.

8.Warning on wiring

●In use, the cable generates static electricity. The static electricity may damage the semiconductors in the device

●Use a stable DC 24V power supply.

●Please use the shielded cable.

●When extending cables, use cables with line diameter above AWG26 (0.13mm²) and length not more than 10m.

●To prevent static failure, ground with threaded holes in the housing.

9.Warning on startup maintenance

●The protection performance of the product may be impaired if not used in the specified method.

●cleaning
- Unplug the power when cleaning.
- Please do not use a wet rag.When dirt is serious, please soak the cloth in low concentration neutral cleaning agent and wring dry and wipe, and then dry with dry soft cloth.

10.Warning on Disposal

●When discarding this product, please treat it as per the industrial waste.

10. Torque conversion relationship (to prevent sensor overload)

10.1 Calculate the relation type

After installation, please rotate the product at a low speed to confirm its output.

Rotate start, stop conditions and torque: During design and operation, make sure that the torque applied on this product may exceed the rated value when starting or stopping the rotation.

temperature gradient : Be careful not to generate shaft temperature gradient when installation. Heat from other devices should be avoided from passing on directly to the shaft. Turn the shaft at a high speed, which can cause the bearing to heat up. Please implement cooling measures such as ventilation as required.

5. debugging

Q. No output torque signal is available.

A. 1) Please confirm the power supply voltage. Ensure that the power supply voltage is DC24V.

2) After adjusting the wiring other than the power supply to the open state, apply the torque, and then measure the voltage between SIG, OUT and SIG and GND.

• If there is no output voltage in this state, it can be inferred as this product fault.

• If the voltage is output in this state, it can be inferred as a problem on the connection method.

Q. The no-load state produces a torque signal.

A. Remove the product from the installation device no load. If the output exceeds the sensor specification range in this state, the product failure can be inferred. Probably a zero-point offset due to a sharp temperature change or overload. Verify any problem with the specifications and operating method.

Q. This product has an unusually high temperature.

A. Without rotating shaft after power on, the temperature rise should be about peripheral temperature + 10℃. The temperature rise shall be about + 15℃ (r p m) at 15000) even when no gauge charge is applied to the axis. If the temperature of the product is obviously abnormal compared with the above situation, it can be inferred as the following reasons.

1) Please confirm that additional heat sources are transferred to the shaft.

2) Please confirm that the power supply voltage is DC24V ± 10%.

3) If the temperature of the product is still high, it can be inferred as a fault.

4) If the temperature rises abnormally when the power supply is normal and the shaft rotates, it can be inferred that an extra-gauge load (radial, thrust load) is applied on the shaft, or that the bearing wear has reached the service life.

Q. With the rotation, the output fluctuates.

A. Please confirm the output fluctuation when running the product independently. If the shaft is stuck in the rotation, or when the rotation is not smooth, it can be inferred to be a bearing wear, to reach the service life. If the product is fluctuating in the assembled state, confirm the installation allowable error. It can be inferred as fluctuations caused to the deformation of the measured object axis.

Q. The output is unstable under a state where a certain load is applied.

A. • Please confirm that the measurement object, the product and the unit are not vibration。

• Check if there is a strong alternating magnetic field nearby, or if the temperature varies frequently.

• Verify that the shaft is charged or has a leakage current in the shaft.

If the above situation is not present, it can be inferred that the product fails.

6. Common use problems and solutions

1. What if the data setting is wrong or the torque value is not accurate?

Answer: restoring the factory setting can basically solve the problem of parameter setting error. When the main interface displays, the K2 button presses the screen five times within four seconds to flash once, which means that the factory has been restored.

2. There is a beating phenomenon, is it a sensor problem?

Answer: The speed accuracy of the torque sensor is within 0.3%, and the servo motor is controlled by PID algorithm, there will be fluctuations. If high precision detection of speed is required, please add hall encoder or photoelectric encoder.

3. What if the sensor cannot communicate with the MODBUS?

Answer: Change the communication mode to 2 to test whether the communication line is normal and whether the correct data can be received. After determining that the communication line is normal, then send 010300000002C40B to check whether the torque value is returned.

4. How to read the speed by using the active transmission mode?

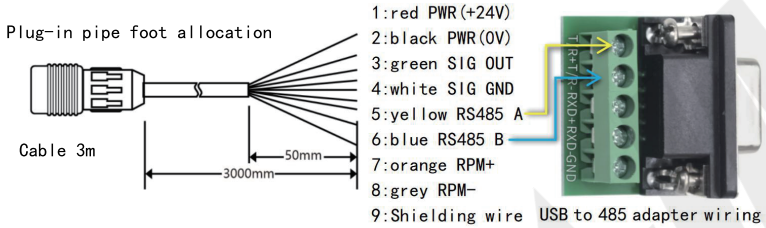
Answer: In order to ensure the speed, only send the torque, the speed can

be detected by the frequency, the specific detection way to check the seventh section of the manual.

7. Wiring mode (no special requirements, default mode)

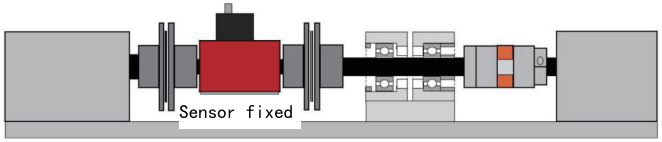
	Pipe foot number	Cable color	Signal name
pin configuration 	1	red	PWR (+24V)
	2	black	PWR (0V)
	3	hispid arthraxon	SIG OUT(±5V/0-10V/4-20mA)
	4	white	SIG GND
	5	yellow	RS485 A
	6	blue	RS485 B
	7	Citrus sinensis	RPM+
	8	ash	RPM-
	shield line	litzendraht wire	*The shield line is not connected to the sensor frame

7.1. Plug-in pipe foot allocation



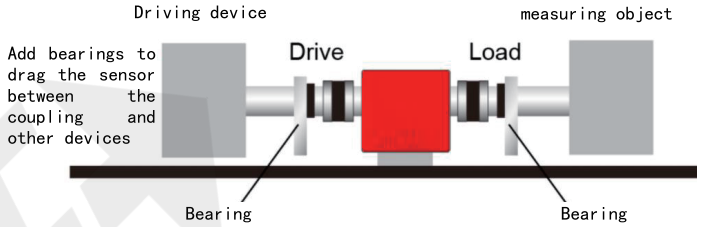
8. Installation and use

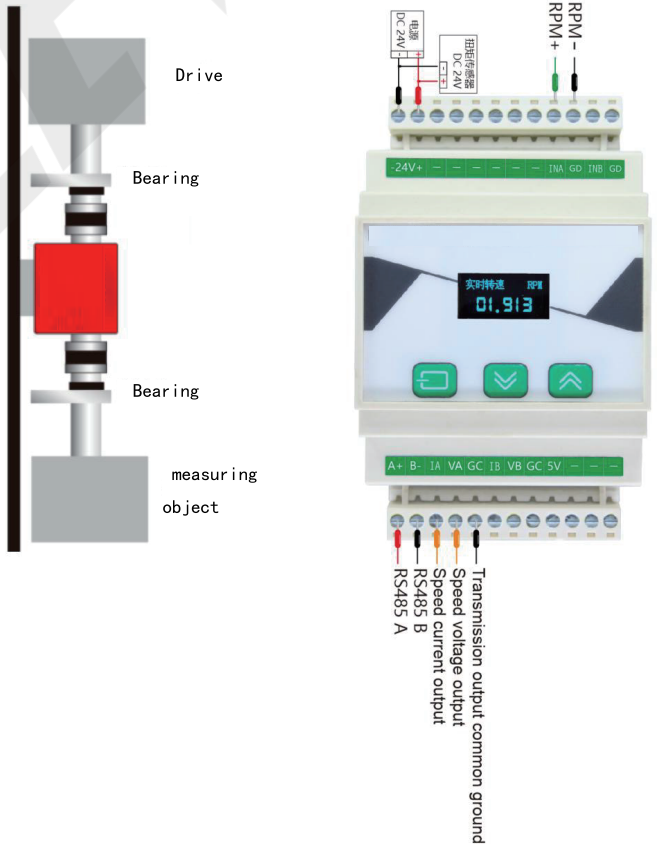
Torque sensor, key slot connection if dropped, can cause damage and personnel injury, please install pins to prevent loss. Verify that the keyslot is free of damage and firmly fitted into the torque sensor.



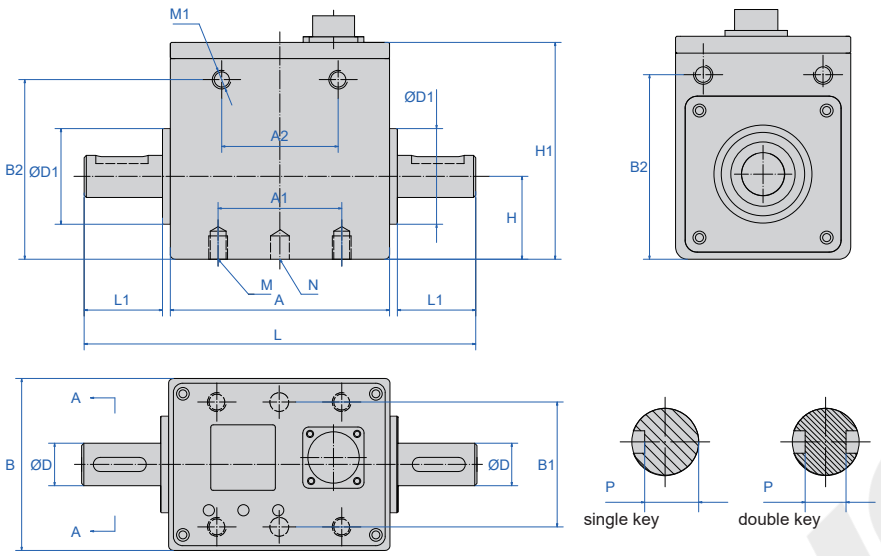
This product can be used either horizontally or vertically. Also, there is

no limit on the direction of the cable. When installing the product to other devices, ask for the frame of the product to prevent it from rotating.





9. product size



(mm)

Code	Rated RPM	D	B	L	L1	H	H1	A1	A2	B1	B2	D1	M	M1	N	Key size (L × W)	P
IST-TA1S	8000rpm	10	51	108	18	25.5	68	58	/	43	/	12	4-M3 depth 6	/	/	single key 15×3	8.2
IST-TA2S																	
IST-TA3S																	
IST-TA5S																	
IST-TA1L	8000rpm	10	73	148	23.6	35.5	93	53	50	53	77	41	4-M8 depth 10	8-M8 depth 6	2-Ø8 depth 10	single key 10×3	8.2
IST-TA2L																	
IST-TA3L																	
IST-TA5L																	
IST-TA10	8000rpm	18	73	168	33.6	35.5	93	53	50	53	77	41	4-M8 depth 10	8-M8 depth 6	2-Ø8 depth 10	single key 22×6	14.5
IST-TA20																	
IST-TA30																	
IST-TA50																	
IST-TA100																	
IST-TA200	7000rpm	28	73	208	53.5	35.5	93	53	50	53	77	51	4-M8 depth 10	8-M8 depth 6	2-Ø8 depth 10	single key 28×8	24
IST-TA300																	
IST-TA500	6000rpm	38	90	238	65.5	44	107.5	60	60	60	91	61	4-M8 depth 12	8-M8 depth 12	2-Ø8 depth 10	double key 45×10	28
IST-TA800																	
IST-TA1000	4000rpm	60	120	258	75.5	60	138.5	60	70	75	122.5	93	4-M10 depth 15	8-M10 depth 15	2-Ø10 depth 15	double key 60×18	46
IST-TA2000																	
IST-TA3000																	
IST-TA5000																	
IST-TA10000	3000rpm	98	160	356	100.5	80	191.6	80	80	120	157	129	4-M12 depth 25	4-M12 depth 25	/	double key 90×28	78
IST-TA20000																	

10. state

exceeding the environmental conditions will affect the measurement index and life of the sensor, which will cause permanent damage to the sensor!
The installation, commissioning and maintenance of this product shall be carried out by qualified engineering and technical personnel.
The Company is not liable for any direct or indirect loss except for the product itself.
The Company reserves the right to change the product specification without notice.

11. Warranty description

Product from the date of sale, the whole machine warranty for one year, lifelong service.
During the warranty period, if the product fault is found, contact our company in time and shall not remove it by itself, otherwise the company has the right to refuse the warranty.
Charging for repair shall be performed under any of the following circumstances:

1 Products with of warranty.
2 Damaged due to poor transportation, storage, or failure to operate as required by the instructions.
3 Self-disassembled products or not repaired by our warranty point.
4 Products with no product number or no warranty product number that do not match or alter the product number sent for repair.
5 For the damage not caused by product quality during the warranty period, the repair cost shall be borne by the user.