

ATO-TQS-D01 series rotary torque sensors can be used to measure the torque and rotational speed. The output signal is frequency square wave signal or analog signal (4-20mA / 1-5V), so rotary torque sensor has good anti-interference ability. ATO-TQS-D01 series torque sensors use transformer induction power supply, it can work for a long time. Torque sensor with capacity range 0.05-300000 Nm is widely used in the measurement of torque, speed and power of motors, generators, speed reducers and diesel engines.

1. Measuring Principle:

1.1 Torque measurement

Rotary torque sensor uses strain gauge electrical measurement technology. The strain bridge is formed on the elastic shaft. When the strain bridge is power on, the electrical signal of the elastic shaft torsion can be measured. After amplifying the strain voltage signal and voltage/frequency converting, it becomes a frequency signal proportional to the torsional strain.

1.2 Speed measurement

Through optical coupling and the corresponding processing circuit, the speed signal is converted into a pulse signal output, and the rotating device outputs 60 pulses per rotation.



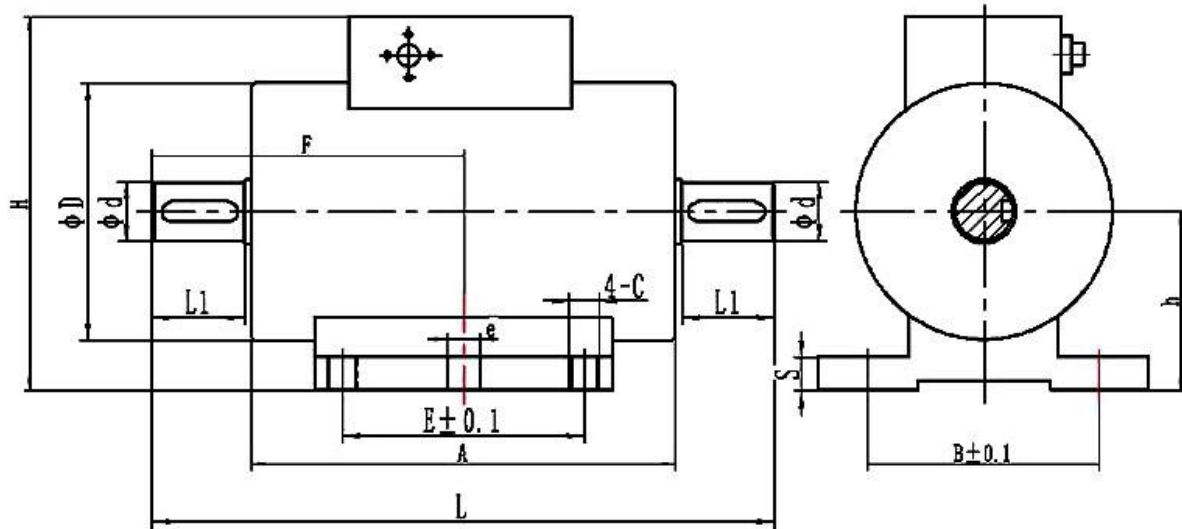
2. Specification:

Model	ATO-TQS-DYN-201
Shipping weight	5~1000kg
Capacity range	0-0.05 Nm ~ 0-300000 Nm
Accuracy	±0.1%FS, ±0.2%FS, ±0.5%F.S
Power supply	±15V DC (≥50mA), 24V DC
Output signal	10kHz±5kHz, 4-20mA (add external F/I transmitter), 1-5V (add external F/V transmitter)
Speed range	0-3000rpm, 0-6000rpm, 0-8000rpm, maximum speed 10000rpm
Speed signal	60 pulse/turn (measuring range > 10000 Nm, it will reach 180 pulse/turn)
Temperature drift on zero	<0.2%F.S/10℃
Operating temperature	-30℃~+90℃
Humidity	0~90%RH
Insulation resistance	>500MΩ
Stability	0.3%FS/year
Safety overload	150%F.S
Breaking load	200%F.S
Bridge voltage	DC 10V
Material	Alloy steel
Protection class	IP65
Electrical connection	circular connector
Wiring	Red: V+, Blue: V-, Green: Torque signal, Yellow: Speed signal, Black: GND
Cable length	2m (Φ5mm), or other customizable lengths

3. Dimension

3.1 Dimension of 5~500 Nm rotary torque sensor:

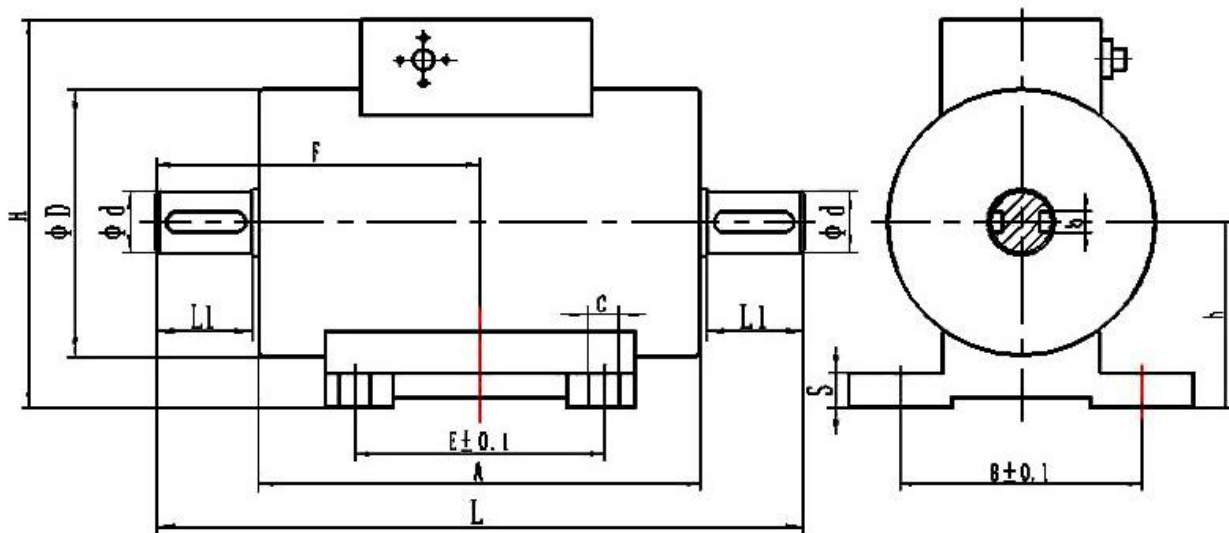
0-5 Nm ~ 0-500 Nm:



Capacity	Dimension (mm)														
	ΦD	Φd	L	L_1	E	e	C	A	H	h	B	F	s	Speed (rpm)	Key size (L*W*H)
5~100 Nm	78	18	188	28	72	11	M8	128	115	54	80	94	10	10000	single key 23*6*2
200 Nm	88	28	207	35	72	11	M8	133	124	60	80	103.5	10	8000	single key 29*8*7
500 Nm	98	38	240	45	72	11	M8	146	142	65	80	120	10	7000	double keys 38*10*8

3.2 Dimension of 1000~300000 Nm rotary torque sensor:

0-1000 Nm ~ 0-300000 Nm:



Capacity	Dimension (mm)													
	ΦD	Φd	L	L1	E	A	H	h	B	F	s	c	Speed (rpm)	Key size (L*W*H)
1000 Nm	108	48	275	60	69	149	152	70	90	137.5	15	11	6300	double keys 50*14*9
2000 Nm	118	55	298	70	69	152	164	77	124	149	15	11	5600	double keys 60*16*10
5000 Nm	143	75	356	100	68	150	188	90	146	178	15	13	4800	double keys 93*20*12
10000~20000 Nm	158	98	388	118	80	146	215	109	170	194	15	13	4000	double keys 109*28*16
50000 Nm	215	140	451	135	79	171	265	138	170	225.5	15	17	2800	double keys 123*36*20
100000 Nm	247	180	572	180	90	156	305	162	250	261	25	17	2200	double keys 166*45*25
150000 Nm	350	235	900	315	220	250	420	220	250	450	25	17	2000	double keys 315*56*32
200000 Nm	360	255	900	320	220	210	446	240	250	450	25	17	1800	double keys 320*56*32
300000 Nm	416	295	900	325	220	224	480	250	268	450	25	17	1800	double keys 325*70*36

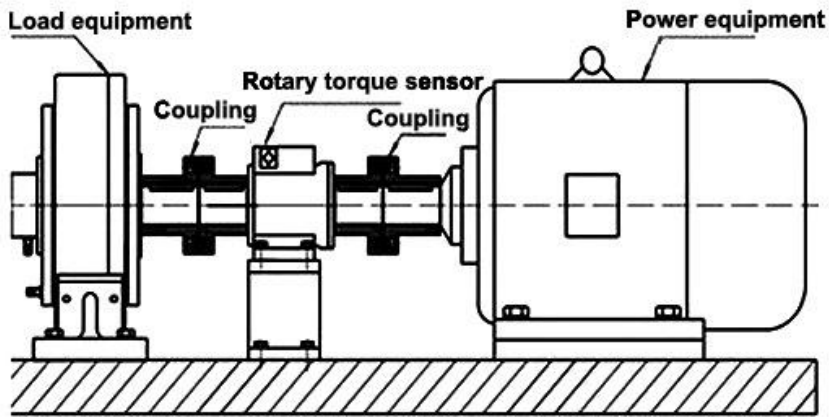
4. Installation Steps:

- According to the connection form of the shafts and the length of the torque sensor, determine the distance between the power equipment and the load equipment.
- Adjust the distance between the axis of the power equipment and the load equipment relative to the installation base.
- Measure the shaft diameter and center height of the torque sensor. Adjust the center height and coaxiality of the power equipment, load equipment and torque sensor separately. The difference should be less than 0.03mm. And then fix them and tighten the screws to prevent shaking.
- Use two sets of couplings to install the rotary torque sensor between the power equipment and the

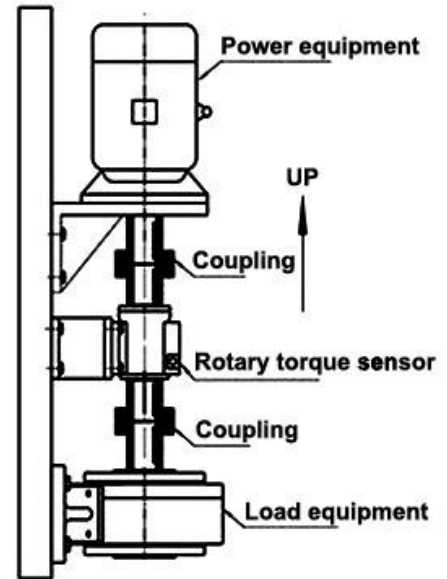
load equipment. Install the couplings on the respective shafts.

- e) Fasten the couplings and the installation is complete.

Horizontal Installation



Vertical Installation



5. Instructions and Attentions:

- When using a small range or high speed torque sensor, the center height and coaxiality of the connection must be strictly guaranteed. Otherwise it may cause measurement error and sensor damage.
- The dynamic torque sensor can be connected with rigid or elastic coupling. When the vibration is large and the coaxiality is less than 0.2mm and more than 0.5mm, it is recommended to choose elastic coupling.
- The installation base should have certain strength to ensure the stability of the installation and avoid excessive vibration. Otherwise it may cause measurement data instability and affect the measurement accuracy.
- The sensor could adopt horizontal installation or vertical installation. The torque sensor is not allowed to bear axial force and bending moment, otherwise it will affect the measurement accuracy reduced or even cause torque sensor damage.
- Do not installing torque sensor when power on. Do not directly knock or bump the sensor.
- The fastening bolts of the coupling should be tightened, and a protective cover should be added to the outside of the coupling to avoid personal injury.
- The signal output wire must not be short-circuited to the ground. The shielding layer of the shielded cable must be connected to the common terminal (power ground) of the + 24V power.
- It should not be installed in a strong electromagnetic interference environment.
- Grease the bearings at both ends of the torque sensor every year. When adding grease, only needs to open the bearing covers at both ends and then add the grease, finally close up the cover at both ends.
- Rotary torque sensor should be installed in an environment without flammable and explosive products. The temperature is $-20\text{ }^{\circ}\text{C} \sim 60\text{ }^{\circ}\text{C}$, and the relative humidity is less than 90%.