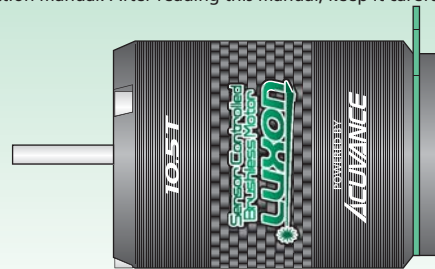


Thank you for purchasing the KEYENCE Sensor-Controlled Brushless Motor. This motor provides the best performance when used in combination with the KEYENCE brushless ESC "TACHYON". To obtain 100% performance of this product, be sure to read this instruction manual. After reading this manual, keep it carefully.



### FEATURES OF LUXON

#### [Well-balanced KV value]

KV value is motor rotation speed per volt under no load. A motor with a larger KV value is a "Rotation type", and a motor with a smaller KV value is a "Torque type". To obtain the feeling suitable for various categories depending on gear ratio and ESC settings, LUXON uses the KV value that places emphasis on the balance of torque feeling and the highest speed.

#### [Rotor with excellent heat resistance]

A permanent magnet is remarkably affected by temperature change. When a certain temperature is exceeded, a magnet will lose magnetic force, and magnetic force cannot be recovered even if the magnet is restored to the original temperature.

To prevent loss of magnetic force due to a temperature rise, LUXON uses a sintered rotor equipped with a neodymium magnet that provides excellent heat resistance.

#### [Cogging torque reduction]

Cogging torque is the magnetic attraction force generated when a rotor rotates in motor power OFF status. In actual use, cogging torque causes irregular torque and vibration. It is a disturbance factor in sensor control. Therefore, higher-precision motor control is enabled by minimizing cogging torque. Through cogging torque reduction, LUXON enables direct and smooth acceleration, from a low speed to a high speed.

\* LUXON is a motor dedicated to sensor-controlled brushless ESC. It is not applicable to sensorless ESC.

### SPECIFICATIONS

The specifications are subject to change without prior notice.

	17.5T	13.5T	11.5T	10.5T	8.5T	7.5T	6.5T	5.5T	4.5T	8.5T-D	7.5T-D	6.5T-D	4.5T-D
Allowable voltage (V)*1	4.8~11.1												
KV (rpm/V)	1,900	2,440	2,800	3,000	4,080	4,600	5,100	6,240	7,600	3,800	4,400	5,000	7,500
Power (W)*2	200	210	220	240	270	340	380	450	500	270	340	380	500
Efficiency (%)**2	93	93	92	92	92	91	91	90	90	93	93	92	91
Rotor type	Sintered rotor, $\phi$ 12.3 mm (Neodymium magnet)												Sintered $\phi$ 12.5mm (Neodymium magnet)
Coil winding method	Star-winding												

\*1: Allowable voltage of the motor. Pay attention to the ESC's allowable voltage.  
 \*\*2: With 7.2V under no load

### REFERENCE GEAR RATIO

Select an appropriate gear ratio based on the reference values listed below. The following values are only for your reference. The optimum gear ratio varies depending on the ESC performance, machine settings and characteristics of the traveling course. Determine the optimum gear ratio by observing heating-up condition of the ESC and the motor.

\* The 4.5T type should be used at 6.0 V or lower voltage.

	17.5T	13.5T	11.5T	10.5T	8.5T	7.5T	6.5T	5.5T	4.5T	8.5T-D	7.5T-D	6.5T-D	4.5T-D
On-road technical course [7.2~7.4V]	3.8:1	4.6:1	5.4:1	5.4:1	7.0:1	7.0:1	7.5:1	8.5:1	9.5:1	7.0:1	6.6:1	7.3:1	8.4:1
On-road technical course [6.0 V]	---	---	---	---	5.8:1	5.8:1	6.6:1	7.0:1	8.4:1	5.8:1	5.8:1	6.6:1	7.6:1
Off-road 2WD	6.0:1	7.2:1	8.2:1	8.3:1	9.6:1	9.5:1	10.0:1	11.0:1	11.5:1	9.3:1	9.3:1	10.8:1	12.5:1
Off-road 4WD	6.3:1	7.4:1	8.2:1	8.2:1	9.3:1	9.5:1	10.0:1	11.0:1	12.0:1	9.3:1	8.2:1	10.4:1	13.7:1
Off-road truck	7.6:1	8.8:1	9.5:1	9.8:1	10.7:1	11.0:1	11.5:1	12.5:1	13.0:1	10.0:1	10.7:1	11.7:1	13.2:1



After use, the product must be disposed of with an appropriate method in consideration of environment.

## PRECAUTION FOR USE

- Before using this product, carefully read the important warnings described in this instruction manual to understand the instructions thoroughly.

**⚠ DANGER** Instructions that the user must observe to prevent serious injury.

**⚠ CAUTION** Useful information for handling this product.

**⚠ WARNING** Instructions that the user must observe to prevent accidents.

### •About installation

**⚠ DANGER** **To prevent accident and fault:**  
Conduct wiring work carefully. If a connecting part comes off under vibration during travel, motor control may be disabled.

**⚠ WARNING** **To prevent accident and fault:**  
The soldering of each part must be conducted within 5 seconds.  
Applying heat for a long period causes damage to the electronic components.

### •About cable connections

**⚠ CAUTION** **To prevent accident and fault:**  
Make sure that the cables are properly connected. Do not connect the power supply with reverse polarities. Be sure to insulate cable connection terminals. If the connection terminals are short-circuited, it may result in damage to this product.

### •About modification

**⚠ DANGER** **To prevent smoke, fire and burns:**  
Never attempt to solder the circuit board and electronic components in the motor.

### •Handling precautions

**⚠ DANGER** **To prevent smoke, fire and burns:**  
During use of this product (when a power supply is connected to the motor, or when the power switch is ON), keep watching the motor. If an abnormal condition occurs, it may result in fire or other accident.

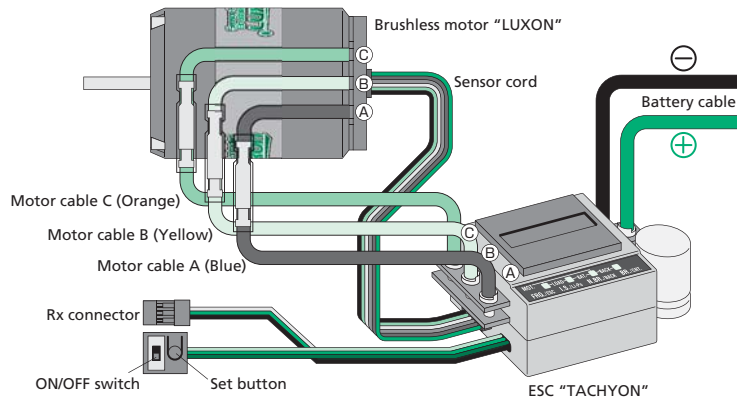
**⚠ CAUTION** **To prevent accident and fault:**  
Do not install this product in a place where water, oil, fuel or other conductive liquids are present. Electronic components are vulnerable to minerals contained in such liquids. If the product becomes wet with such liquids, immediately stop operation, and dry it.

**⚠ CAUTION** **To prevent accident and fault:**  
Be sure not to use the motor in fully-throttled condition, if the motor is not incorporated in a chassis drive unit. Running the motor at a high speed under no load causes damage to the motor.

**⚠ CAUTION** **To prevent accident and fault:**  
If an improper gear ratio is selected, it results in motor overload, causing the motor to be damaged by abnormal heating. Select an appropriate gear ratio carefully.

## CONNECTIONS

Connect the motor as shown below:



### •Sensor cord

The sensor cord transmits a position signal of Hall element to a speed controller (hereinafter, referred to as ESC). Since the ESC and the motor use the same type of connector, there is no limitation in cord inserting direction. However, when inserting the cord, match the cord with the connector shape. If the sensor cord is not connected, the ESC initial setup cannot be performed. (During travel, keep the sensor cord connected to the ESC.)

Connect the sensor cord securely, because a contact failure causes malfunction and damage to equipment. Modification of the sensor cord causes a failure of the motor. Never attempt to modify the sensor cord.

### •Motor cables (A, B, C)

The motor cables are used to apply a voltage to the motor coil at appropriate timing, according to the signal transmitted to the ESC via the sensor cord.

To connect the LUXON to the KEYENCE ESC "TACHYON", soldering work is not required. A cable with a connector plug is attached to the LUXON in advance.

**⚠ WARNING** To connect the LUXON to the ESC, be sure to connect the cables with the "A", "B" and "C" symbols matched with each other. If a cable with a different symbol is connected, motor rotation control is disabled. Furthermore, a large current may flow through the ESC and the motor, resulting in damage and burnout of the equipment. Unlike the sensorless type brushless motor, the LUXON cannot change the rotating direction even if the cable connections are exchanged. Change the rotating direction\* with the ESC, as required.

\* To change the motor rotating direction, a rotating direction change function is required for the ESC. (TACHYON provides this function).

**⚠ WARNING** To replace the motor cable, use a soldering iron which provides a large soldering tip area and high output (approx. 70 W), and quickly conduct the soldering work. If a soldering iron's output is low, solder is hard to melt, disabling secure connections of the cables. This may result in cable disconnection or contact failure when vibration is applied to the cable. If heat application time is excessively long, it causes damage to the internal parts. (Use thorough caution so that the terminals will not be short-circuited by solder.)

**⚠ WARNING** To fasten the motor to the motor mount, be sure to use screws with up to 8 mm length.