

# BLA21-06U-A01 Technical Specification



Model	Features
BLA21-06U-A01	Supports DroneCAN v1

## ■Caution

- This product **SHOULD NOT** be used for the devices that is directly related to human life.
- The application of this product as a weapon of mass destruction is banned, and for military use, it is confined to defense purposes in regions with no security risks.
- Keep the servo away from an object which produces a strong magnetic field.  
There is a possibility of malfunction if the servo is affected by a strong magnetic field.
- Specifications and appearance of hardware/software and accessories are subject to change without notice for improvement.
- When disposing of this product, please comply with the relevant laws and regulations of each country and dispose of it as industrial waste.
- Do not insert or remove connectors while the power is on. Always turn off the power before connecting or disconnecting any connector.
- If you use this product in a vibrating environment, please check the connectors regularly to ensure they have not become loose.

## Basic specifications

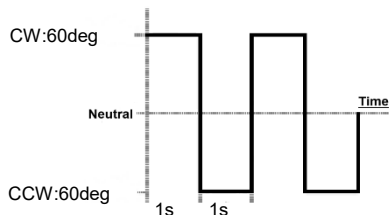
Item		Specification				Remarks			
Rated Voltage	typical	7.4			V	DC power supply.			
	range	6.0	~	7.4	V	DC power supply.			
Operating Voltage		5.0	~	8.4	V	DC power supply.			
Standby Current		≤ 70			mA	at 7.4V			
Starting Current <sup>*1</sup>	Design value	≤ 20			A	at 7.4V			
		12			A	100% of torque control. See each signal specification.			
Consumption Current <sup>*1,*2</sup>		270			mA	at 7.4V , No-load			
Max Torque <sup>*1,*2</sup>		4.71			N·m	at 7.4V	Applying this torque value for more than 1 second may cause damage.		
		48.0			kgf·cm				
		667.0			ozf·in				
		4.12			N·m	at 6.0V			
		4.90				at 8.4V			
Rated Torque <sup>*1,*2</sup>		1.18			N·m	at 7.4V	Please use at or below this torque.		
		12.0			kgf·cm				
		167.1			ozf·in				
		0.95			N·m	at 6.0V			
		1.18				at 8.4V			
Rotation Time <sup>*1</sup>		0.07			s/60°	at 7.4V	This unit is commonly used as the speed unit for RC servos.		
		0.08				at 6.0V			
		0.06				at 8.4V			
Speed with no load <sup>*1,*2</sup> (Angle control mode)		857			°/s	at 7.4V			
		143			min <sup>-1</sup>				
Speed with no load <sup>*1,*2</sup> (Speed control mode)		143			min <sup>-1</sup>	at 7.4V			
Rotation Angle <sup>*1</sup>	Range	Mechanical	179.9 ~ -180.0			°	Absolute		
		Software	-	36,000,000 ~			°	Pseudo absolute *Incremental above mechanical range.	
	Accuracy		+	36,000,000					
		±3.0			°	Standard value	at 7.4V, No- Load, Position:±60°		
±1.5			Measured value						
Direction <sup>*1</sup>		CW : Rotation Angle > 0 (+) CCW : Rotation Angle < 0 (-)				Based on the top surface of the servo (the side with the nameplate).			
BackLash <sup>*1</sup>		≤ 0.50			°				
Temperature Range	Operating	-40	~	70	°C	-40 °F ~ 158 °F			
	Storage	-40	~	80	°C	-40 °F ~ 176 °F			
Over heat protection		80			°C	The default temperature to activate the self-protection function “Torque OFF” in order to prevent overheat.			
		176			°F	The temperature can be set from 20° C to 80°C on the Signal line <sup>*3</sup> and on the program tool additionally provided by Futaba.			

\*1 At 23±5°C (Initial Performance Data)

\*2 Each value is typical.

\*3 The signal used for configuration varies depending on the model.

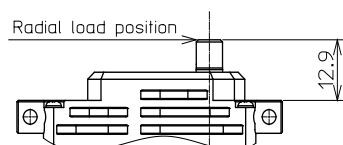
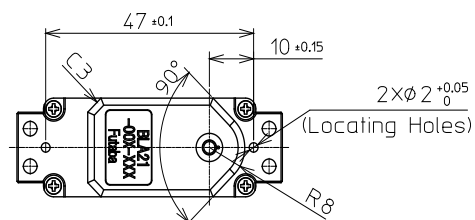
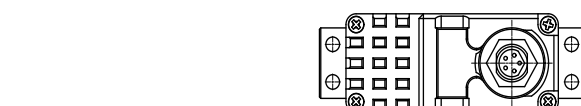
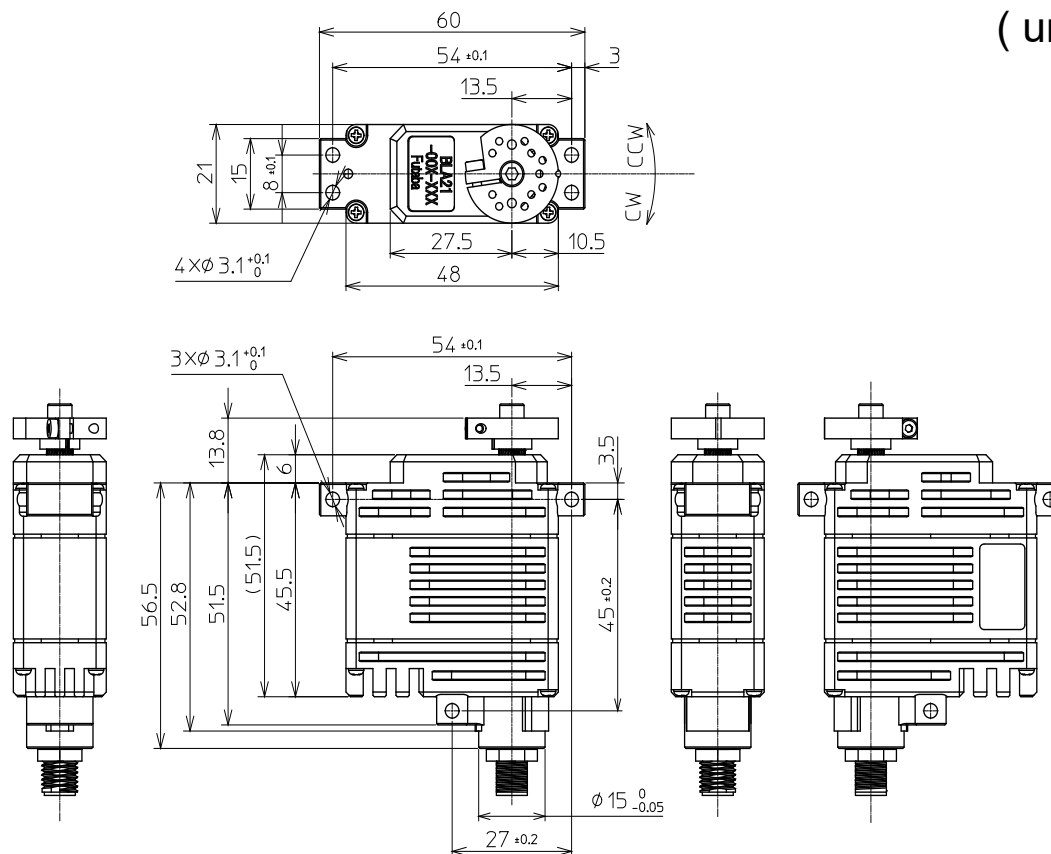
# Mechanical specifications

Item	Specification						Remarks
Outer Dimension	48.0	×	21.0	×	51.5	mm	See below Outer Dimension
	1.89	×	0.83	×	2.03	inch	
Weight	130					g	with Horn and screws
	4.59					oz	without cables
IP Code	IP67						Waterproof and Dustproof
Case Material	Upper		Aluminium			Surface : Anodizing	
	Middle		Aluminium			Surface : Anodizing	
	Bottom		Aluminium			Surface : Anodizing	
Gear Set Material	Steel						Surface : Hardening treatment
Gear bearing	8					ball bearing	Assembled to the final gear
Output Shaft	Serration S6L						Size: φ6mm, 25 teeth
Radial load	100					N	Load position : Refer to Outer Dimension
Position Sensor	Magnetic Encoder						
Motor Type	Brushless DC Motor						
MTTF *1	Operating time (Inquire for the test report)			1,000	h	Operating Condition ▪ at 7.4V ▪ ±60°, 0.5Hz sweep Test Condition ▪ Load : Rated Torque (Powder Brake)	
				7,200,000	cycle	<u>Angle Command Value</u> 	
Vibration Resistance *1	Operating time (Inquire for the test report)		≧	1,000	h	Operating Condition ▪ at 7.4V ▪ ±60°, 0.5Hz sweep ▪ No-Load	
						<u>Test Condition(sine wave)</u> •Frequency: 10 to 500Hz (sweep 1oct/min, amplitude limit 2mm) •Acceleration : 300m/s <sup>2</sup> •Vibration axis : X,Y,Z	

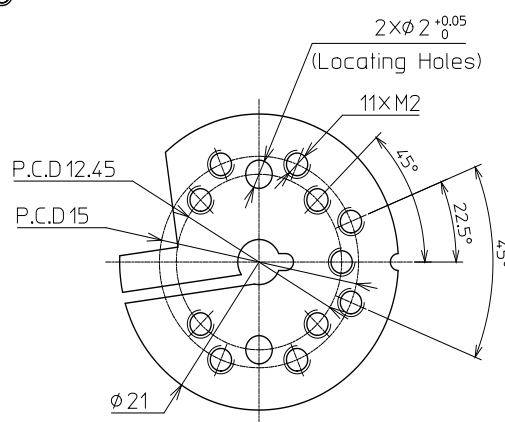
\*1 At  $23\pm 5^\circ\text{C}$  (Initial Performance Data)

# Outer Dimension

( unit : mm )

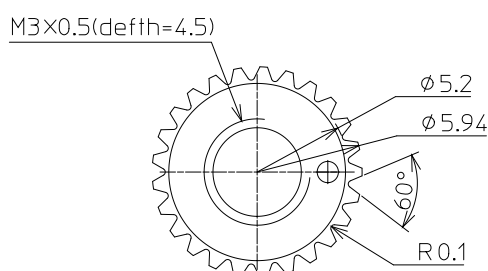
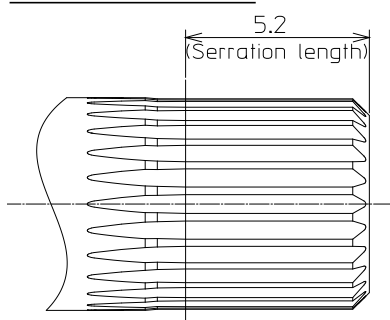


Without Servo Horn



Servo Horn

## OUTPUT SHAFT



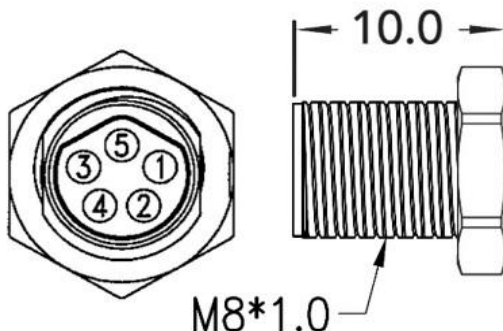
## Sarretion Size

Standard Diameter :  $\phi 6$   
 Angle : 60°  
 Tooth : 25

# Specifications for CAN BUS signals

Item		Specification				Remarks	
Communication Interface		CAN BUS				Protocol :	DroneCAN v1
						Baud Rate :	1 Mbps
						Sample Point:	87.5 %
						NodeID:	1 ~ 127
Operating mode (CAN BUS)	Angle control (Absolute)	-180.0	~	+179.9	°	The position within this range is absolute and can be recognized by the servo even after power-off. The position commands within this range are uniquely identified. For accuracy, see "Speed with no load (Speed control mode)". Resolution is 0.1°.	
	Angle control	-36,000,000.0	~	+36,000,000.0	°	The servo can accept position commands over 360°, but will lose multi-turn information when switched off, recognizing only the absolute position within 360°. Resolution is 0.1°.	
	Speed control	-300	~	+300	min <sup>-1</sup>	This mode is for continuous servo rotation, with speeds ranging within 300min <sup>-1</sup> . Speed settings can be adjusted via CANBUS and a Futaba program tool. Refer to "Speed with no load (Speed control mode)" for actual speed details.	
	Torque control	-100	~	+100	%	Maximum torque at 7.4V supply voltage is 100%. Refer to "Max Torque".	

## Connector specifications

Item		Specification		Remarks	
Cable		Shielded Cable(Detachable)		400	mm
				15.75	inch
Cable bending radius		78	mm		
Connector	Manufacture	ODS Electronics Co., Ltd.			
	Type	MMEPM05MCC-SHS7001			
	Matching	MAEAF05FCC-SRC7000 etc.			
Pin Assignment		Pin No.	Assignment	Cable Color	
		①	Battery(+)	Brown	
		②	Battery(-)	White	
		③	CAN-H	Blue	
		④	CAN-L	Black	
		⑤	Case Shield Line	Drain	
Pin Layout					

## Model name system

<u>BLA</u>	<u>21</u>	-	<u>06</u>	<u>U</u>	-	<u>A</u>	<u>0</u>	<u>1</u>
<u>Motor type</u>			<u>Power-supply voltage</u>			<u>Development code</u>	<u>Optional function 1</u>	
BLA : Brushless Motor			(Rated Voltage) 06 : 6.0~7.4V 12 : 11.1~14.8V 28 : 24.0~28.0V			0: Case shielded line and Battery(-) are separated. B: Supports PWM signals (Rotation direction: CW *) * Operation of PWM signal 1520 → 2120 μs.		
	<u>Servo width</u> 21 : 21mm *Gear box width			<u>Main signal type</u> U : DroneCAN v1			<u>Optional function 2</u>	
						1: Straight connector type. 2: Side connector type.		