BLA34-12U-AB1 Technical Specification

Date:250602

Model	Features
BLA34-12U-AB1	Supports DroneCAN v1 and PWM signals. Case shielded line and Battery line(-) are common.

■Caution

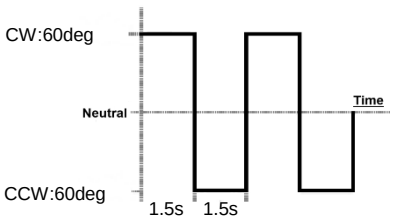
- **This product SHOULD NOT been used for the devices that is directly related to human life.**
- **The application of this product as a weapon of mass destruction is banned, and for military use, it is confined to defense purposes in regions with no security risks.**
- **Keep the servo away from an 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.**

Basic specifications

Item		Specification				Remarks	
Rated Voltage	typical	12.0			V	DC power supply.	
	range	11.1	～	14.8	V	DC power supply.	
Operating Voltage		9.0	～	16.8	V	DC power supply.	
Standby Current		≦		40.0	mA	at 12.0V	
Starting Current *1	Design value	≦		10	A	at 12.0V	
		6.3			A	100% of torque control. See each signal specification.	
Consumption Current *1,*2		170			mA	at 12.0V , No-load	
Max Torque *1,*2		16.5			N·m	at 12.0V	Applying this torque value for more than 1 second may cause damage.
		168.3			kgf·cm		
		2,336.6			ozf·in		
		16.3			N·m	at 11.1V	
		17.5				at 14.8V	
Rated Torque *1,*2		4.4			N·m	at 12.0V	Please use at or below this torque.
		44.9			kgf·cm		
		623.1			ozf·in		
		4.1			N·m	at 11.1V	
		4.4				at 14.8V	
Rotation Time *1		0.25			s/60°	at 12.0V	This unit is commonly used as the speed unit for RC servos.
		0.27				at 11.1V	
		0.20				at 14.8V	
Speed with no load *1,*2 (Angle control mode)		240.0			°/s	at 12.0V	
		40.0			min^{-1}		
Speed with no load *1,*2 (Speed control mode)		40.0			min^{-1}	at 12.0V	
Rotation Angle *1	Range	Mechanical	179.9	～ -180.0	°	Absolute	
		Software	- 36,000,000	～	°	Pseudo absolute *Incremental above mechanical range.	
			+ 36,000,000				
	Accuracy	3.0			°	Standard value	at 12.0V, No- Load, Position:±60°
		0.2				Measured value	
Direction *1		CW ：Rotation Angle ＞ 0 (+) CCW ：Rotation Angle ＜ 0 (-)				Based on the top surface of the servo (the side with the nameplate).	
BackLash *1		≦		0.50	°		
Temperature Range	Operating	-40	～	70	℃	-40 ℉ ～ 158 ℉	
	Storage	-40	～	80	℃	-40 ℉ ～ 176 ℉	
Over heat protection		80			℃	The default temperature to activate the self-protection function “Torque OFF” in order to prevent overheat. The temperature can be set from 20° C to 80°C on the Signal line※3 and on the program tool additionally provided by Futaba.	
		176			℉		

*1 At 23±5°C (Initial Performance Data)
*2 Each value is typical.
*3 The signal used for configuration varies depending on the model.

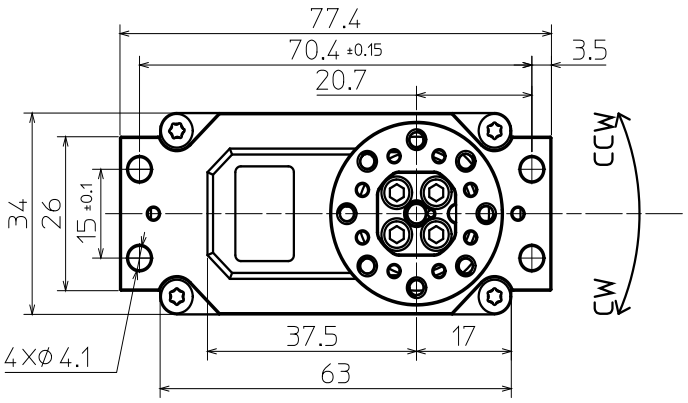
Mechanical specifications

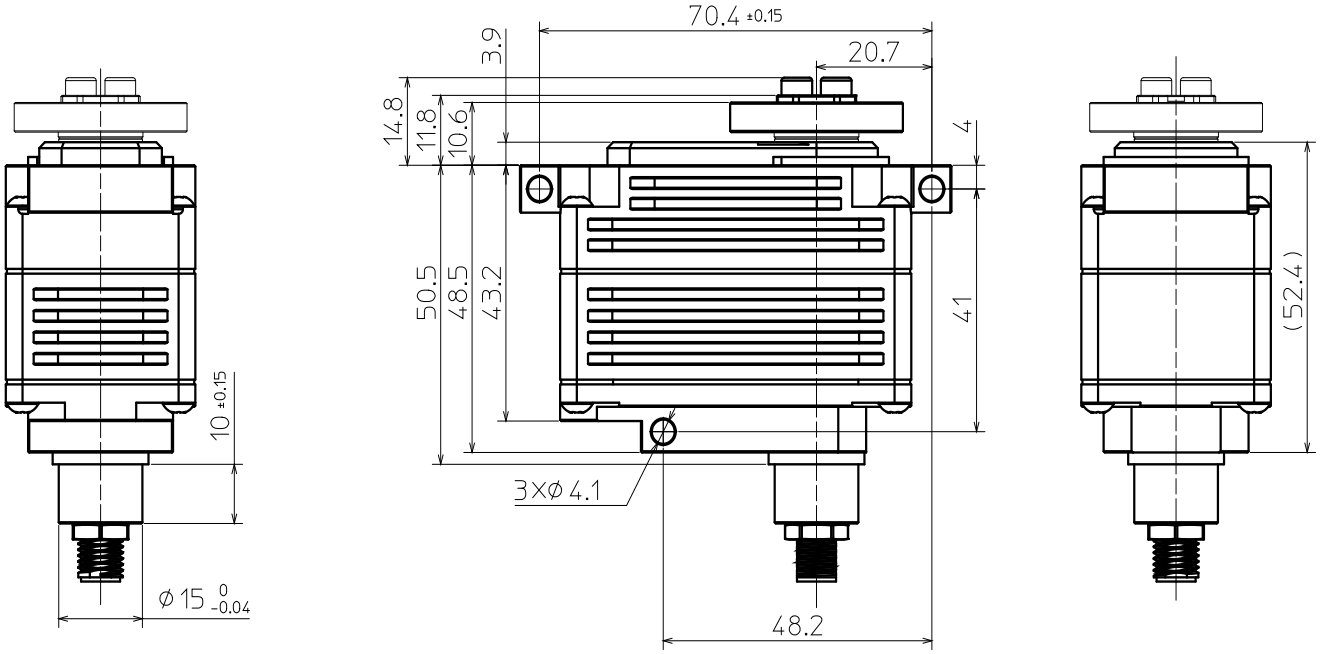
Item	Specification						Remarks
Outer Dimension	63.0	×	34.0	×	52.4	mm	See below Outer Dimension
	2.48	×	1.34	×	2.06	inch	
Weight	275					g	with Horn and screws without cables
	10					oz	
IP Code	IP67						Waterproof and Dustproof
Case Material	Upper		Aluminium				Surface：Anodizing , EMI Case Shielding
	Middle		Aluminium				Surface：Anodizing , EMI Case Shielding
	Bottom		Aluminium				Surface：Anodizing , EMI Case Shielding
Gear Set Material	Steel						Surface：Hardening treatment
Gear bearing	8					ball bearing	Assembled to the final gear
Output Shaft	BC10						P.C.D.10mm, 4×M3 screw
Radial load	-					N	TBD
Position Sensor	Magnetic Encoder						
Motor Type	Brushless DC Motor						
MTTF *1	Operating time (Inquire for the test report)			TBD		h	Operating Condition ・ at 12.0V ・ ±60°, 0.33Hz sweep Test Condition ・ Load : Rated Torque (Powder Brake)
						cycle	Angle Command Value 
Vibration Resistance *1	Operating time (Inquire for the test report)	≧		TBD		h	Operating Condition ・ at 12.0V ・ ±60°, 0.33Hz sweep ・ No-Load Test Condition(sine wave) ・Frequency：10 to 500Hz (sweep 1oct/min, amplitude limit 2mm) ・Acceleration : 300m/s^2 ・Vibration axis : X,Y,Z
	Equivalent to MIL-STD-810H Method 514.8 (Annex E,Minimum Integrity)		Operating Condition ・ at 12.0V ・ ±60°, 0.5Hz sweep ・ No-Load				Test Condition (Random wave) ・Refer to MIL-STD-810H Method 514.8 ・Company internal test

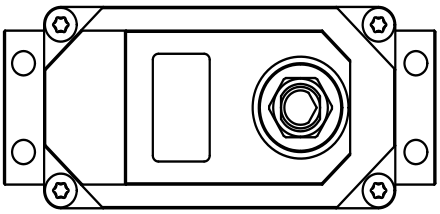
*1 At 23±5℃ (Initial Performance Data)

Outer Dimension

(unit : mm)

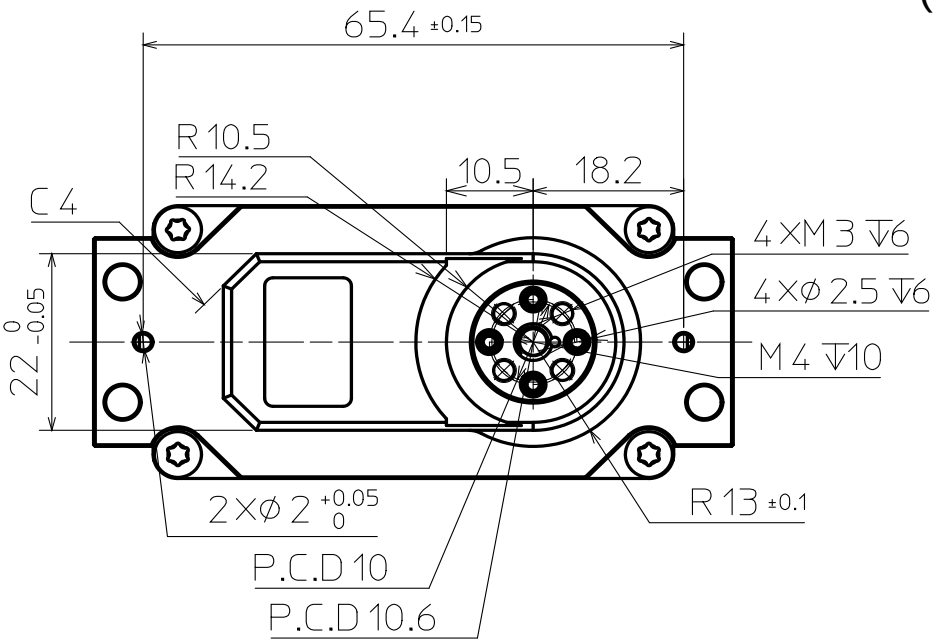


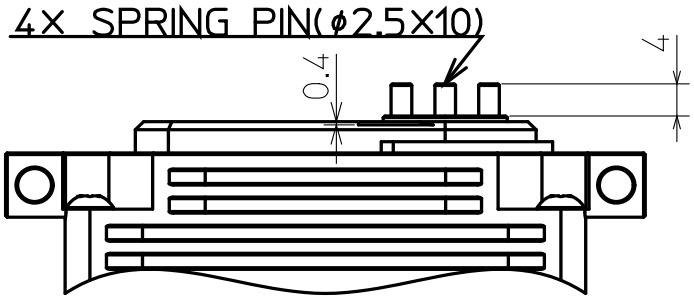




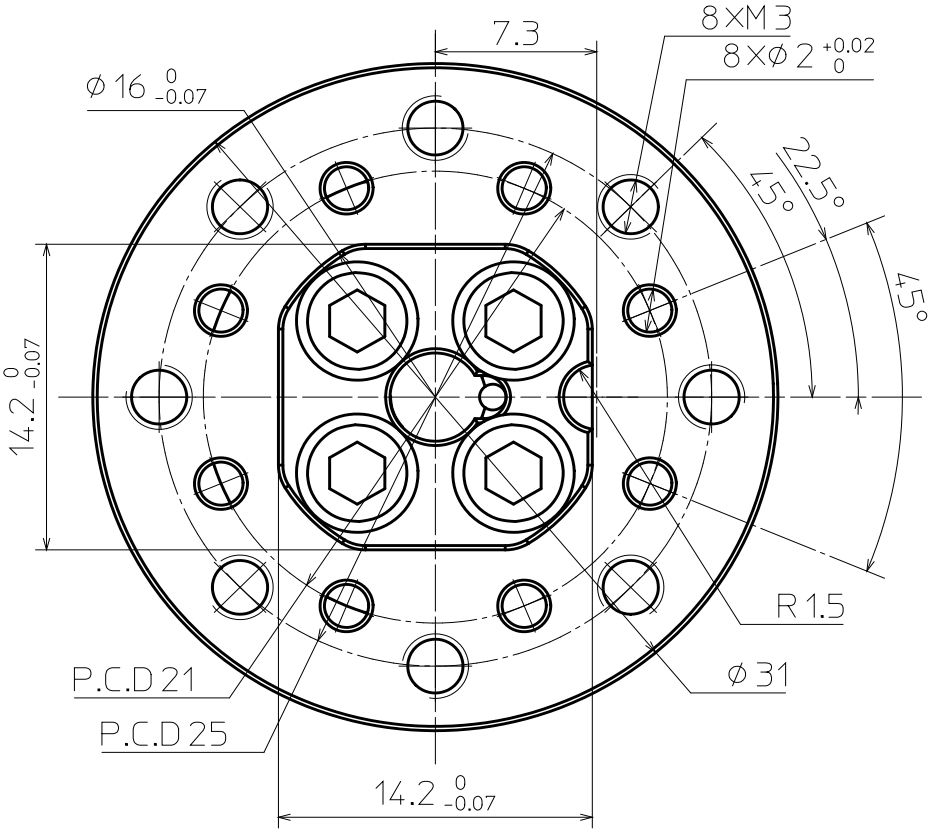
Outer Dimension

(unit : mm)

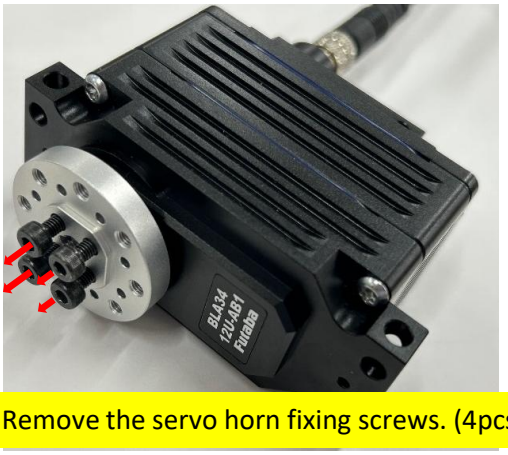


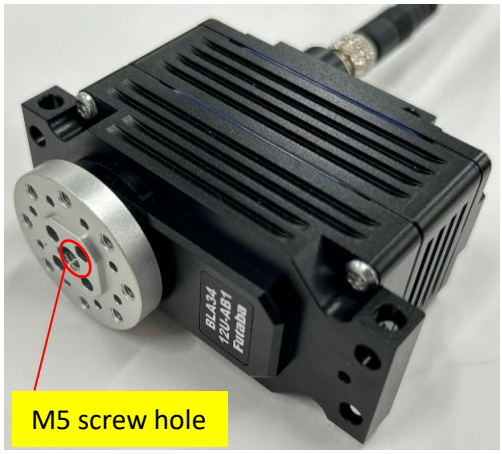


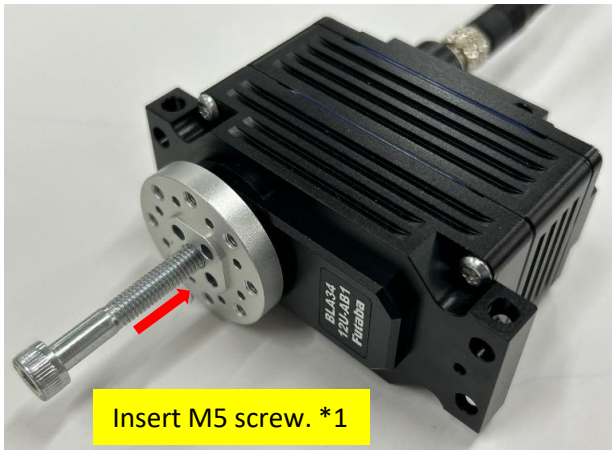
Without Servo Horn



How to remove the servo horn

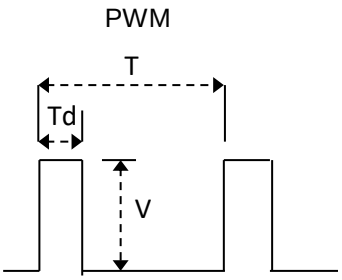






*1 M5 screw is not included. Please prepare it by yourself.

Specifications for PWM signals

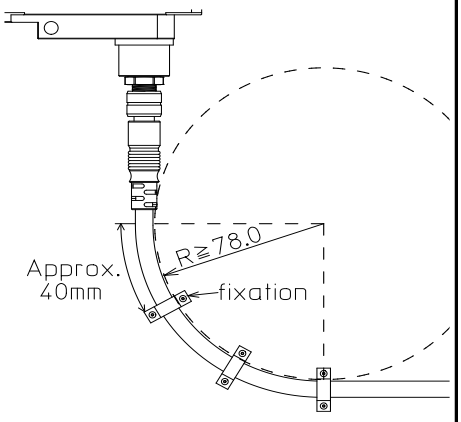
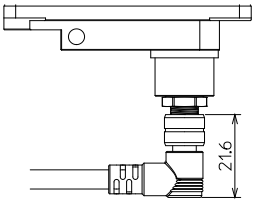
<table>
<tr><th colspan="3">Item</th><th colspan="4">Specification</th><th>Remarks</th></tr>
<tr><td colspan="3">Communication Interface</td><td colspan="4"> 
</td><td>
<table>
<tr><td rowspan="2">Signal Voltage HIGH:V</td><td>max</td><td>5.0</td><td>V</td></tr>
<tr><td>min</td><td>2.0</td><td>V</td></tr>
<tr><td rowspan="2">Signal Voltage LOW:V</td><td>max</td><td>0.5</td><td>V</td></tr>
<tr><td>min</td><td>0.0</td><td>V</td></tr>
<tr><td>Frame Rate:T</td><td colspan="2">14.25</td><td>ms</td></tr>
<tr><td rowspan="3">Pulse Wide:Td</td><td>CW</td><td>2,620</td><td rowspan="3">µs</td></tr>
<tr><td>Center</td><td>1,520</td></tr>
<tr><td>CCW</td><td>420</td></tr>
</table>
If the high level voltage exceeds 5.0V, the servo may be damaged.
If you use an RC device as a signal source, please pay attention to the voltage level of the PWM signal.</td></tr>
<tr><td rowspan="8">Operating Mode (PWM)
+ :CW
- :CCW
(Turn direction reversible)*1</td><td rowspan="4">Angle control (Absolute)</td><td rowspan="4">Rotation Angle</td><td>Default</td><td>Max</td><td></td><td rowspan="4">The travel ends are ±110° (default) with a pulse of 1,520 ± 1,100µs, where the input width is 1,100µs centered at a neutral of 1,520µs. The travel ends can be adjusted from ± 110° to ±360° using the CANBUS line and the Futaba program tool. Both the neutral (1,520µs) and input width (1,100µs) can be set within ranges of 100 to 10,000µs and 10 to 10,000µs, respectively.</td></tr>
<tr><td>+110.0°</td><td>+360.0°</td><td>2,620µs</td></tr>
<tr><td colspan="2">Neutral 0°</td><td>1,520µs</td></tr>
<tr><td>-110.0°</td><td>-360.0°</td><td>420µs</td></tr>
<tr><td rowspan="3">Angle control (Extended)</td><td rowspan="3">Rotation Angle</td><td colspan="2">+360.0°</td><td>2,620µs</td><td rowspan="3">The travel ends can be extended to ± 360°, beyond the absolute range of ± 180°. After the servo is switched off, positions in the extended range (± 360° > position > ±180°) will be recognized within the absolute range. For example, an end position of CW 270° will be regarded as CCW 90°.</td></tr>
<tr><td colspan="2">Neutral 0°</td><td>1,520µs</td></tr>
<tr><td colspan="2">-360.0°</td><td>420µs</td></tr>
<tr><td rowspan="3">Speed control</td><td rowspan="3">Max Speed</td><td>+1,100</td><td rowspan="3">min^{-1}</td><td>2,620µs</td><td rowspan="3">This mode is for applications requiring continuous servo rotation. The speed can be set within ±1100min-1 using the CANBUS line and the Futaba program tool. Refer to “Speed with no load (Speed control mode)“ for speed variations.</td></tr>
<tr><td>0</td><td>1,520µs</td></tr>
<tr><td>-1,100</td><td>420µs</td></tr>
<tr><td>Torque control</td><td colspan="3">-　~　-</td><td>%</td><td>Not available for PWM signals.</td></tr>
</table>

*1 Based on the top surface of the servo(the side with the nameplate).

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^{-1}	This mode is for continuous servo rotation, with speeds ranging within ± 300min-1. 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 12.0V supply voltage is 100%. Refer to “Max Torque“.		

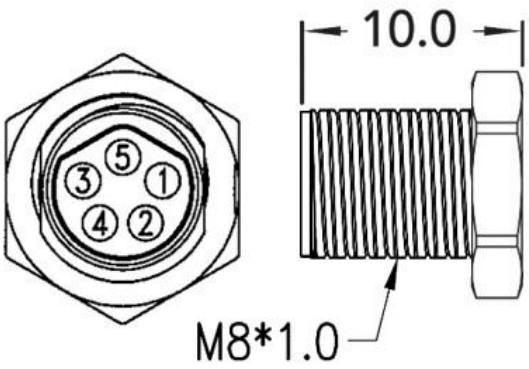
Connector specifications

Item		Specification		Remarks	
Cable		Shielded Cable(Detachable)		400	mm
				16	inch
Cable bending radius		78	mm		
Cable layout		 or			
Connector	Manufacture	ODS Electronics Co., Ltd.			
	Type	MMEPM05MCC-SHS7001			
	Matching	MAEAF05FCC-SRC7000 etc.			

Pin Assignment

Pin No.	Assignment	Cable Color
①	Battery (+)	Brown
②	PWM	White
③	CAN-H	Blue
④	CAN-L	Black
⑤	Battery (−) and Case Shield Line	Drain

Pin Layout *1



***1 If the connector is inserted in the wrong direction, it will malfunction.**

Check the orientation of the connector carefully before installation.

Model name system