

BLA34-28U-AB1 Technical Specification

This product is a compact servo motor featuring high torque, IP67-rated, and a long-life.



Model	Features
BLA34-28U-AB1	Supports DroneCAN v1 and PWM signals. Case shielded line and Battery line(-) are common.

■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.
- We assume no liability for any problems, damages, or losses arising from the use of products other than the servo horns we provide.
Before use, please ensure that the operating environment is appropriate and that there are no factors that could interfere with normal operation.

Basic specifications

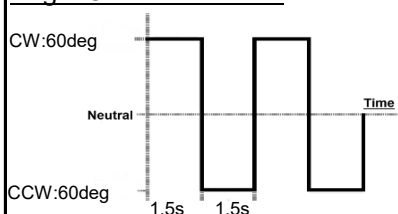
Item		Specification			Remarks		
Rated Voltage	typical	28.0		V	DC power supply.		
	range	24.0	~ 28.0	V	DC power supply.		
Operating Voltage		20.0	~ 32.0	V	DC power supply.		
Standby Current		≤	30.0	mA	at 28.0V		
Starting Current *1	Design value	≤	5	A	at 28.0V		
		2.4		A	100% of torque control. See each signal specification.		
Consumption Current *1,*2		105		mA	at 28.0V , No-load		
Max Torque *1,*2		15.4		N·m	at 28.0V	Applying this torque value for more than 1 second may cause damage.	
		157.0		kgf·cm			
		2,180.8		ozf·in			
		14.7		N·m	at 24.0V		
Rated Torque *1,*2		4.5		N·m	at 28.0V	Please use at or below this torque.	
		45.9		kgf·cm			
		637.2		ozf·in			
		3.8		N·m	at 24.0V		
Rotation Time *1		0.19		s/60°	at 28.0V	This unit is commonly used as the speed unit for RC servos.	
		0.22			at 24.0V		
Speed with no load *1,*2 (Angle control mode)		316		°/s	at 28.0V		
		52.6		min ⁻¹			
Speed with no load *1,*2 (Speed control mode)		52.6		min ⁻¹	at 28.0V		
Rotation Angle *1	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 28.0V, 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	°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※3 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

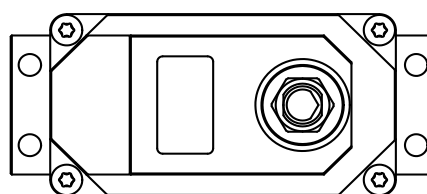
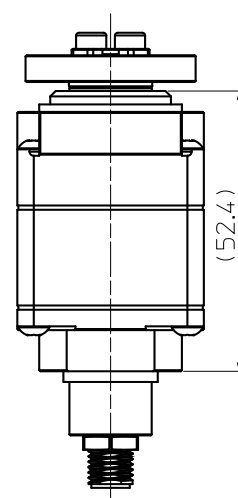
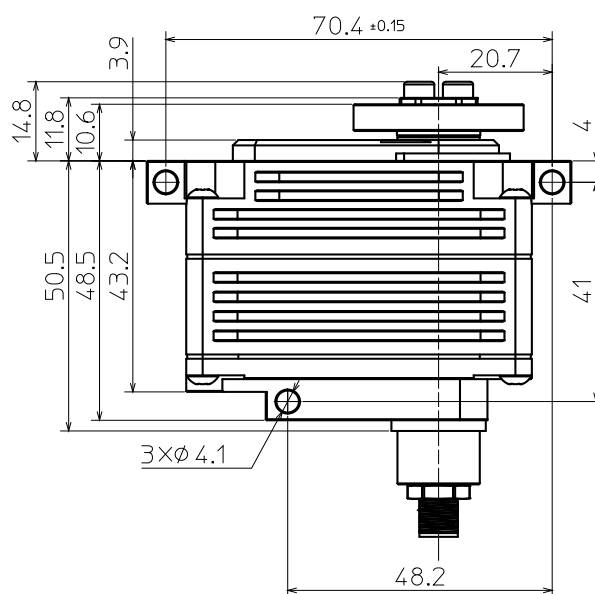
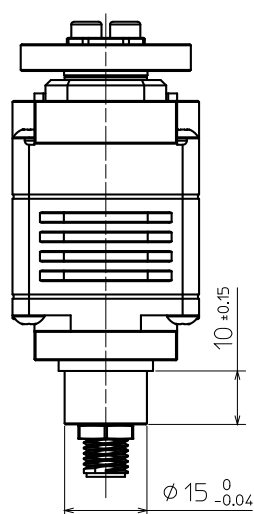
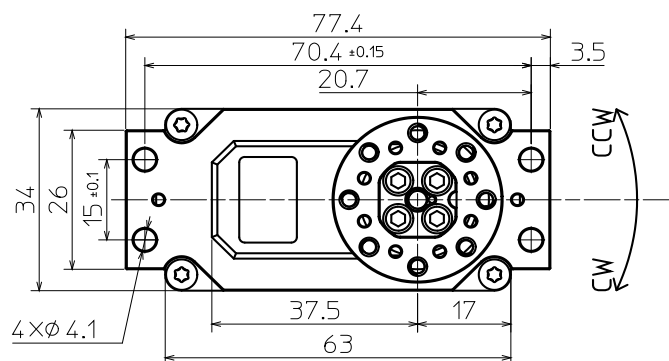
Item	Specification						Remarks
Outer Dimension	63.0	×	34.0	×	52.4	mm	See below Outer Dimension
	2.48	×	1.34	×	2.06	inch	
Weight	275					g	with Horn and screws
	9.70					oz	without cables
IP Code	IP67					Waterproof and Dustproof	
Case Material	Upper		Aluminium			Surface : Anodizing , EMI Case Shielding	
	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	300				N	Load position : Refer to Outer Dimension	
Position Sensor	Magnetic Encoder						
Motor Type	Brushless DC Motor						
MTTF *1	Operating time *2 (Inquire for the test report)		1,000 (Ongoing)	h	Operating Condition ▪ at 28.0V ▪ ±60°, 0.33Hz sweep Test Condition ▪ Load : Rated Torque (Powder Brake)		
			1,200,000	cycle	<u>Angle Command Value</u> 		
Vibration Resistance *1	Operating time *2 (Inquire for the test report)		100	h	Operating Condition ▪ at 28.0V ▪ ±60°, 0.33Hz sweep ▪ No-Load		
					<u>Test Condition(sine wave)</u> ▪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 28.0V ▪ ±60°, 0.5Hz sweep ▪ No-Load		<u>Test Condition (Random wave)</u> ▪Refer to MIL-STD-810H Method 514.8 ▪Company internal test		

*1 At 23±5°C (Initial Performance Data) Each values are measured values and are not guaranteed values.

*2 This test is currently undergoing continuous measurement.

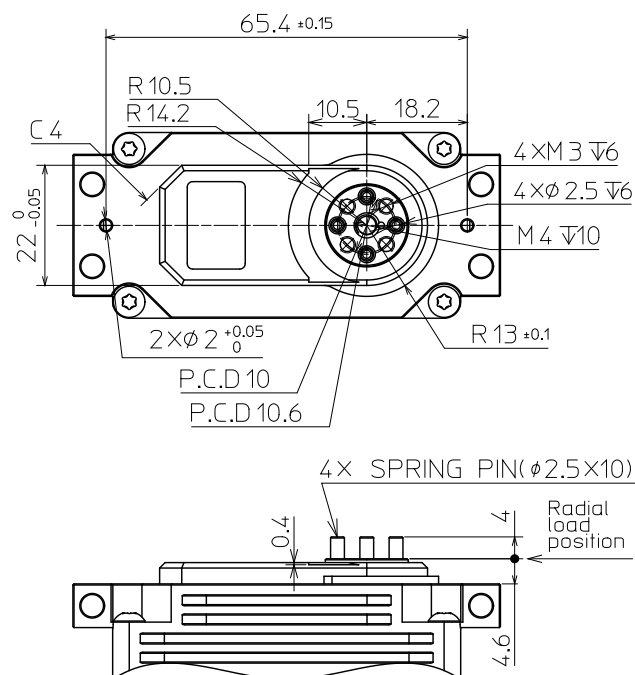
Outer Dimension

(unit : mm)

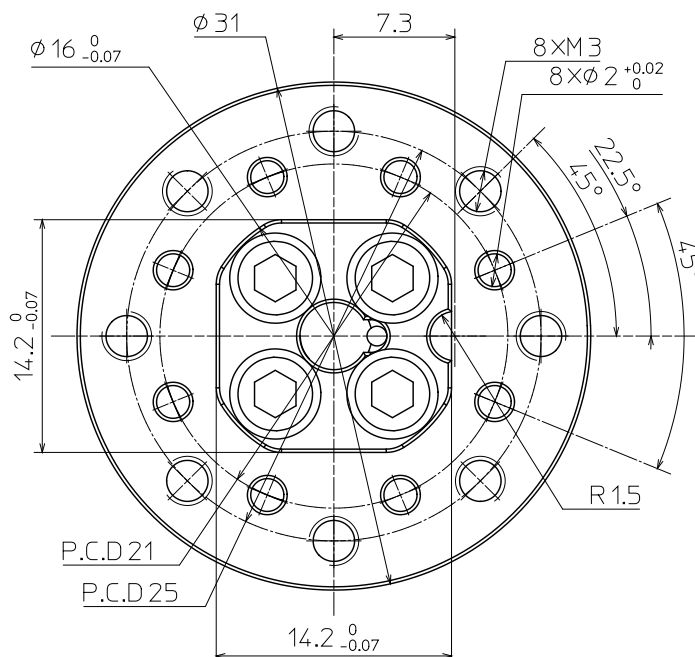


Outer Dimension

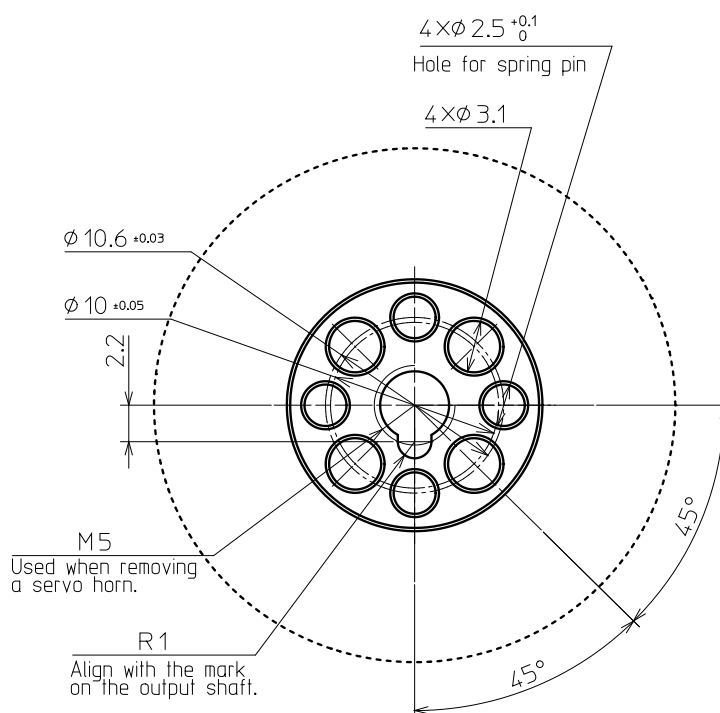
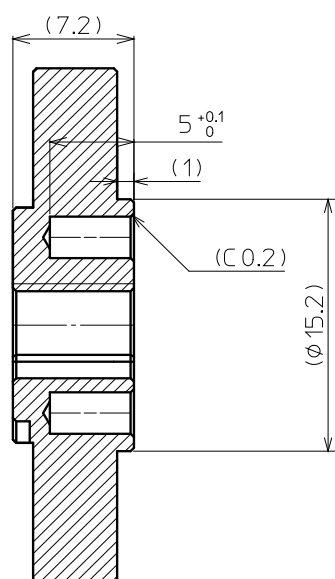
(unit : mm)



Without Servo Horn



Servo Horn



Mounting point for a servo horn

- If a custom servo horn is used instead of the supplied one, refer to the dimension diagram above.
- To secure the servo horn, use four M3 screws.
- To secure the servo horn, use four screws and four pins.
- The recommended tightening torque for the screw is $1.4 \text{ N}\cdot\text{m}$.

How to remove the servo horn



Remove the servo horn fixing screws. (4pcs)



M5 screw hole



Insert M5 screw. *1



The servo horn is pushed up.



Completed.

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

Specifications for PWM signals

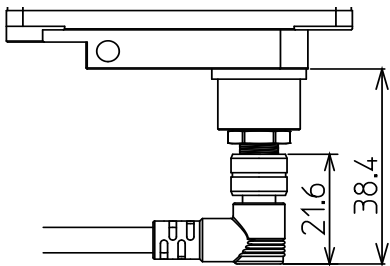
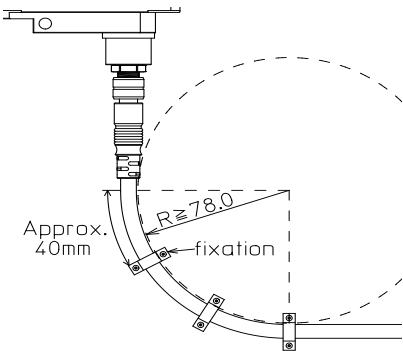
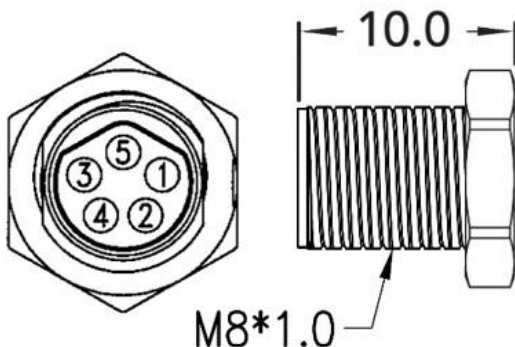
Item		Specification				Remarks				
Communication Interface		PWM				Signal Voltage HIGH:V	max	5.0	V	
						min	2.0	V		
						Signal Voltage LOW:V	max	0.45	V	
						min	0.0	V		
						Frame Rate:T	14.25			ms
						Pulse Wide:Td	CW	2,620	μs	
							Center	1,520		
CCW	420									
				If the high level voltage 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.						
Operating Mode (PWM) + :CW - :CCW (Turn direction reversible)*1	Angle control (Absolute)	Rotation Angle	Default	Max		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.				
			+110.0°	+360.0°	2,620μs					
			Neutral 0°		1,520μs					
			-110.0°	-360.0°	420μs					
	Angle control (Extended)	Rotation Angle	+360.0°		2,620μs	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°.				
			Neutral 0°		1,520μs					
			-360.0°		420μs					
	Speed control	Max Speed	+1,100	min ⁻¹	2,620μs	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.				
			0		1,520μs					
			-1,100		420μs					

*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	-80	~	+80	min ⁻¹	This mode is for continuous servo rotation, with speeds ranging within 80min ⁻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 28.0V 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		
Cable layout		 or  Please select either a straight cable or an L-shaped cable for purchase.			
Connector	Manufacture	ODS Electronics Co., Ltd.			
	Type	MMEPM05MCC-SHS7001			
	Matching	BE0010 or BE0011		Futaba Support Product Code	
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					

■ Caution

- If the connector is inserted in the wrong direction, it will malfunction.
Check the orientation of the connector carefully before installation.

Model name system

