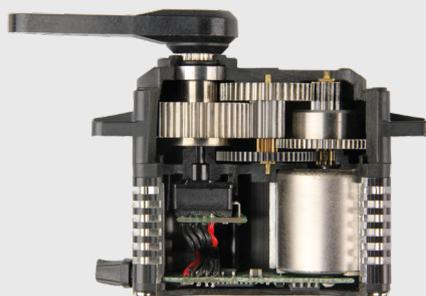


INNOVATIVE LÖSUNGEN FÜR  
INDUSTRIELLE ANWENDUNGEN

AKTUATOREN UND SERVOS

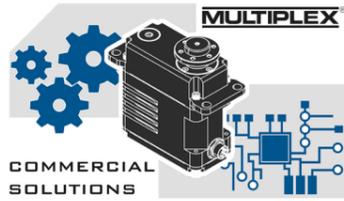


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## MULTIPLEX / HITEC

Seit 2002 gehört die MULTIPLEX Modellsport GmbH & Co.KG mit Standort in Bretten, Deutschland zur südkoreanischen HITEC-Gruppe.

Die Produkte der Hitec RCD Korea, Inc. werden weltweit eingesetzt und eignen sich aufgrund ihrer Diversität für die unterschiedlichsten Einsatzgebiete. So finden sie beispielsweise Anwendung als Servo im UAV-Bereich, als Aktuator für Automatisierungs- und Handhabungsaufgaben in der Industrie, oder auch als Stellgeber für die aktive Aerodynamik eines Rennwagens.

Detaillierte Spezifikationen, sowie zusätzliche Informationen lassen wir Ihnen gerne auf Anfrage zukommen.

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GmbH & Co.KG



Hitec RCD Korea, Inc.



Hitec Group USA, Inc.



Hitec-MULTIPLEX Japan, Inc.



Hitec RCD Philippines, Inc.

## PRODUKTÜBERSICHT

### Servos und Linear Aktuatoren

HLS-Serie Linear Aktuatoren

SG-Serie Servos

HSB/HSR-Serie Servos

D/DB/MD/MDB-Serie Servos

Sonstige Servos für industriennahe Anwendungen

### Servo Zubehör

a. Programmiergeräte

b. Servo Abtriebsarme



# ANALOG-AKTUATOREN

Analog-Aktuatoren sind in der Nieder- bis Mittelpreisregion angesiedelt und mit zumeist preiswerten Komponenten versehen. Der Antriebsmotor ist immer ein Gleichstrom-Bürstenmotor. Die Aktuatoren bieten keine Programmieroptionen seitens des Nutzers. Die Kommunikation erfolgt immer über ein PWM-Signal mit einer Frequenz von 50Hz. Die Motor-PWM ist analog zu Ansteuerfrequenz und beträgt somit ebenfalls 50Hz, somit ergibt sich lediglich alle 20ms die Möglichkeit für eine Kontrollaktivität (Motor-An oder Motor-Aus). Langsame Bewegungen oder kleine Korrekturen führen zu langen Motor-Aus-Perioden im Verhältnis zu Motor-An-Perioden. Die Motorspannung entspricht immer der Versorgungsspannung.

## Vorteile:

- Günstig
- Angenehme Geräuschentwicklung durch niedrige Motor-Ansteuerfrequenz
- Geringe Leistungsaufnahme

## Nachteile:

- Geringeres Haltemoment
- Langsames Ansprechverhalten
- Geringe Auflösung durch niedrige Ansteuerfrequenz
- Große Totzone (20ms)
- Langsame Bewegungen können unstetig werden

# DIGITAL-AKTUATOREN

Digital-Aktuatoren sind in der gehobenen Nieder- bis Hochpreisregion angesiedelt. Es können sehr hochwertige Komponenten wie beispielsweise Hall-Sensoren zur Positionserfassung, aber auch Bürstenlose-Gleichstrommotoren verwendet werden. Die Kommunikation erfolgt über ein PWM-Signal mit Frequenzen von bis zu 330Hz (je nach Aktuator-typ) oder andere Schnittstellen wie CAN, UAV/DroneCAN, RS-485 oder TTL. Die Motoransteuerfrequenz ist unabhängig von der Ansteuerfrequenz der Steuerung und beträgt zumeist 300-500Hz. Hieraus ergeben sich sehr kleine mögliche Totzonen von bis zu 1ms. Digitalaktuatoren bieten zudem vielseitige Programmier- und Schutzfunktionen und erlauben je nach Typ auch eine Zwei-Wege-Kommunikation (Feedback).

## Vorteile:

- Schnelles Ansprechverhalten
- Schnelle Korrekturaktivitäten
- Hohe Haltekraft
- Variabel Einstellbare Totzone
- Hohe Genauigkeit
- Zwei-Wege-Kommunikation
- Programmierbarkeit
- Sicherheitsfunktionen
- Hohe Auflösung

## Nachteile:

- Zumeist teurer
- Stellenweise unangenehme Geräuschentwicklung durch hohe Motor-Ansteuerfrequenz
- Höhere Leistungsaufnahme



# SCHNITTSTELLEN

## PWM-Kommunikation

Der klassische Weg der Ansteuerung von Hitec Aktuatoren mit vielen Vorteilen für einfache Aufgaben. Hitec PWM-Aktuatoren können mit einer Pulsweite von 900 bis 2100µs angesteuert werden. Die übliche Ansteuerfrequenz beträgt dabei 50Hz (20ms). Für spezielle Anwendungen sind je nach Aktuatortyp auch Frequenzen bis 330Hz möglich.

Aktuatoren mit PWM-Kommunikation lassen sich unkompliziert und preiswert ansteuern und sind für viele Anwendungen ohne benötigtes Feedback ausreichend.

Die Schnittstelle ist weit verbreitet und viele Steuerungen/Controller bieten passende Presets und Libraries.

Pin-Layout von Hitec PWM-Aktuatoren\*



## RS485- und TTL-Kommunikation

Es finden sich etliche Anwendungen in unterschiedlichen Bereichen bei denen eine Rückmeldung zur tatsächlichen Position des Servos notwendig, oder zumindest wünschenswert ist. Verschiedene Hitec Aktuatoren sind auch mit RS485- und TTL-Schnittstellen erhältlich und bieten somit die Möglichkeit für eine Zweizeigekommunikation (Feedback).

Hitec RS485- und TTL-Aktuatoren kommunizieren mit externen Geräten über das Halbduplex-Verfahren. TTL-Aktuatoren verfügen dabei neben der Spannungs- und Masseleitung über nur eine, RS485-Aktuatoren über zwei Signalleitungen.

Pin-Layout von Hitec TTL-Aktuatoren\*



## CAN- und UAV/DroneCAN-Kommunikation

Der Industrie- und UAV-Bereich gewinnt zunehmend an Bedeutung. Dieser zukunftssträchtige, schnelle und technisch hoch komplexe Markt verlangt nach Innovation und Zuverlässigkeit. Viele Anwendungen benötigen intelligente Lösungen und ein echtes Feedback von Position, Drehmoment und anderen Parametern zur Diagnose der Anwendung oder um Aussagen über den Zustand der Komponenten treffen zu können.

Folgende Protokolle sind verfügbar: CAN 2.0A, CAN 2.0B, UAV/DroneCAN

Pin-Layout von Hitec CAN-Aktuatoren (SG-Serie abweichend)



\* Ausführung auf Kundenwunsch auch mit kundenspezifischen Steckverbindern möglich.

# FEATUREÜBERSICHT

## Einstellung der Mittel- und Endlagen (EPA / Neutral Settings)

Erlaubt die Programmierung von Mittel- und Endpositionen des Servos.

## Einstellung der Drehrichtung

Clockwise (CW) = Aus der Draufsicht dreht das Servo bei Impulslängenvergrößerung im Uhrzeigersinn.

Counter-Clockwise (CCW) = Aus der Draufsicht dreht das Servo bei Impulslängenvergrößerung im Gegenuhrzeigersinn.

## Dead Band (DB-Width)

Je niedriger das Dead Band, desto eher finden Korrekturaktivitäten bei Winkeländerungen statt. Ein für die Applikation zu niedriges Dead Band führt zu erhöhtem Verschleiß. Eine Erhöhung des Dead Bands führt zu einem Präzisionsverlust.

## Travel Speed

Stellgeschwindigkeit des Servos: 100% entspricht der maximal möglichen Stellgeschwindigkeit.

## ID-Read / Node-ID

Zuweisung einer Aktuator-ID in TTL bzw. CAN-Netzwerken.

## Fail Safe

Bei einem Signalverlust fährt das Servo auf eine voreingestellte Position.

## Fail Safe Limp Modus

Das Servo geht in einen Schlafmodus, der Motor wird deaktiviert und die Position wird nicht gehalten. Das Servo lässt sich von Hand bewegen.

## Soft Start Einstellung

Bei Inbetriebnahme fährt das Servo verlangsamt auf die Sollposition um das Getriebe und die Peripherie zu schonen. Bei einer Einstellung von 100% fährt das Servo beim Einschalten mit maximaler Stellgeschwindigkeit auf die Sollposition.

## Overload Protection

Schutzmechanismus der das Servo vor Beschädigung bei Überlast/Blockieren schützt. Eine Einstellung von 20% entspricht einer Reduzierung des maximalen Drehmoments um 80%.

## Smart Sense

Ein intelligenter Regelkreis passt während des Betriebs Regelparameter an, um Schwingungen zu reduzieren. Diese werden durch variierende Trägheiten der unterschiedlichen Applikationen provoziert.

Eine manuelle Beeinflussung des Regelkreises ist ebenfalls möglich (Sensitivity Ratio Settings). Ein hoher Wert kann schnelle Schwingungen am Servo erzeugen. Ein niedriger Wert kann ein stark gedämpftes Ansprechverhalten erzeugen.



## SERIENÜBERSICHT

### HLS-Serie (Linear Aktuatoren)

Elektrische Linearaktuatoren erzeugen geradlinige Hubbewegungen und können somit viele Anwendungen von Pneumatik- und Hydraulikzylindern ersetzen.

### SG-Serie (Industrie Servos)

Die premium Industrieservo Linie konsequent für Anforderungen der Bereiche Automatisierung, unbemannte Luftfahrt und Robotik entwickelt. Zur Grundausstattung gehört ein leistungsstarker BLDC-Motor, ein Hall-Sensor zur berührungslosen und verschleißfreien Positionserfassung, sowie eine wasserdichte Ausführung. Alle SG-Serie Servos verfügen zudem über eine Multi-Turn\* und Continuous-Rotation\*\* Funktion.

### HSB-Serie (Brushless Servos)

Servomotoren der Mittelpreisregion mit leistungsstarken BLDC Motoren.

### HSR-Serie (Servos mit Multi-Turn)

Servomotoren der Mittelpreisregion mit Multi-Turn\* und teilweise Continuous-Rotation\*\* Funktion. Zumeist ausgestattet mit einem BLDC-Motor.

### D-Serie (Digitale Servos)

Digitale Servomotoren der Mittelpreisregion mit Glockenanker- oder Bürstenmotor. Die Positionserfassung erfolgt mit Hilfe eines hochwertigen Potentiometers.

### MD-Serie (Digitale Servos mit Hall-Sensor)

Digitale Servomotoren der Mittelpreisregion mit Glockenanker- oder Bürstenmotor. Die Positionserfassung erfolgt mit Hilfe eines Hall-Sensors.

### DB-Serie (Brushless Servos)

Digitale Servomotoren der Mittelpreisregion mit leistungsstarken BLDC-Motoren. Die Positionserfassung erfolgt mit Hilfe eines hochwertigen Potentiometers.

### MDB-Serie (Brushless Servos mit Hall-Sensor)

Digitale Servomotoren der Mittelpreisregion mit leistungsstarken BLDC-Motoren. Die Positionserfassung erfolgt mit Hilfe eines Hall-Sensors.

### MDR-Serie (Digitale Servos mit Hall-Sensor und Multi-Turn)

Digitale Servomotoren der Mittelpreisregion mit Multi-Turn\* und teilweise Continuous-Rotation\*\* Funktion. Ausgestattet mit einem Glockenanker- oder Bürstenmotor. Die Positionserfassung erfolgt mit Hilfe eines Hall-Sensors.

### HS-Serie (Analoge Servos)

Analoge Servomotoren der Niederpreisregion, ausgestattet mit Bürstenmotoren und einem Potentiometer zur Positionserfassung.

### HS-1XXX, HS-5XXX, HS-7XXX Serie (Digitale Servos)

Digitale Servomotoren der Mittelpreisregion, ausgestattet mit Glockenanker- und Bürstenmotoren und einem Potentiometer zur Positionserfassung.

\* Als maximaler Drehwinkel sind mehrere Umdrehungen möglich.

\*\* Das Servo ist in der Lage endlos zu drehen. DroneCAN nicht!

# ZWEI-WEGE-KOMMUNIKATION(FEEDBACK)

## Absolute Position

Eine Steuerung muss sich nicht länger darauf verlassen, dass ein Aktuator auch wirklich die gewünschte Position eingenommen hat, sie kann die aktuelle Position mit einer Auflösung von 4096 Schritten ablesen.

## Drehmoment

Das Drehmoment ist ein besonders wichtiges Feature. Hier können Aussagen über die tatsächlichen Belastungen im Betrieb sowie über den Zustand der Komponenten getroffen werden. Schwergängige Mechaniken können erfasst und somit rechtzeitig gewartet werden, bevor es zu einer Überlastung des Aktuators kommt. Das Drehmoment wird aus der Motor PWM abgeleitet und ist somit keine tatsächliche Messung, aber für die meisten Anwendungen hinreichend genau.

## Geschwindigkeit

Wie schnell ist der verwendete Aktuator in der Anwendung wirklich? Die Antwort liefert der Aktuator und ermöglicht somit wichtige Rückschlüsse für so manche Steuerungsaufgabe.

## Versorgungsspannung

Der Aktuator übermittelt stets die aktuelle Versorgungsspannung. Das Entwickler- oder das Wartungsteam sieht somit eventuelle Schwachpunkte im Kabelbaum und kann zum Beispiel hochohmige Verbinder rechtzeitig ersetzen.

## Stromaufnahme

Der Strom ist das wichtigste Feedback bei der Schadensprophylaxe. Ein ansteigender Strom über eine bestimmte Laufzeit bei gleichbleibender Belastung deutet immer auf einen anstehenden Defekt hin. Dieser kann am Motor, dem Getriebe oder der zu bewegenden Mechanik zu finden sein. Die Erfassung der Stromaufnahme eröffnet neue Möglichkeiten in der Programmierung. Durch gezieltes Optimieren der internen Regelung (PID) sowie anderer Parameter wie Softstart (Ramp) oder Deadbands, lässt sich die Lebenszeit erhöhen. Weniger Stromspitzen = mehr Lebenszeit.

## Mikrocontroller-Temperatur

Die Temperatur des Mikrocontrollers ist mehr als nur eine nette Information. Thermisch stark wechselnde Umgebungsbedingungen können einem Aktuator viel abverlangen. Das Entwicklerteam lernt hier die thermischen Grenzen des Produkts kennen und kann entsprechende Maßnahmen einleiten, ehe es zum Versagen kommt.

## Motor-Temperatur

Verlange ich dem verwendeten Aktuator zu viel ab? Die Temperatur des Motors gibt zuverlässig Auskunft darüber, ob ein Aktuator am Limit betrieben wird. Gerade bei stark schwankenden thermischen Bedingungen ist dieses Feedback von größter Bedeutung.

## Zyklenzähler

Wie viele Zyklen macht hat der verwendete Aktuator während eines Einsatzes? Wie viele Teile wurden positioniert? Wann muss der Aktuator getauscht werden, weil die maximale Zyklenzahl erreicht wurde. Einige unserer Aktuatoren liefern dieses Feedback bequem im Protokoll.

# MOTORTYPEN-ÜBERSICHT

## Bürstenmotoren

Bürstenbehaftete Gleichstrommotoren (Bürstenmotoren) zeichnen sich primär durch den günstigen Preis, aber auch ihre hohe Überlastfähigkeit aus (gute Wärmeableitung). Diese Motoren werden vorwiegend in Analogservos verwendet. Sie sind für Applikationen mit eher geringen Leistungsanforderungen, bzw. einer verhältnismäßig niedrigen Anzahl von Zyklen (z. B. Schließmechanismen) eine gute Wahl. Die Nachteile sind, neben dem Verschleiß der Schleifer, ein erhöhtes Rastmoment und eine geringere Effizienz. Die Motorhochlaufzeit (Beschleunigung) liegt -je nach Typ- zwischen 22 und 40ms.

## Glockenanker- / kernloser Motor (Coreless)

Diese äußerst effizienten Motoren (keine Ummagnetisierungsverluste) glänzen durch sehr schnelle Motorhochlaufzeiten (Beschleunigung) von nur 7 bis 11ms und eine gute Kraftentfaltung. Eisenkernlose Motoren haben bauartbedingt kein Rastmoment, was sich in einem besonders ruhigen Motorlauf widerspiegelt. Der Verschleiß ist gering und bezieht sich lediglich auf den Konduktor, der der Kommutierung dient, und die Lagerung. Ein Nachteil der kernlosen Bauform ist die geringe Überlastfähigkeit, bedingt durch die schlechte Wärmeableitung. Der Einsatz empfiehlt sich daher in anspruchsvolleren Applikationen, bei denen zwischen den Zyklen auch gelegentliche Ruhephasen vorhanden sind, um ein Abkühlen zu ermöglichen oder aber auch Steuerungs- und Regelungsaufgaben im niedrigen Lastbereich.

## Bürstenloser Gleichstrommotor (Brushless)

Leistungsstarke BLDC-Motoren vereinen viele Vorteile moderner Antriebstechnik und gelten als nahezu verschleißfrei (keine Schleifer). Neben der hohen Effizienz und ruhigen Laufkultur bieten sensorgesteuerte bürstenlose Motoren ebenso eine schnelle Motorhochlaufzeit (Beschleunigung) von nur 11 bis 14ms und bereits aus dem Stand heraus ein hohes Drehmoment. Im Gegensatz zu Glockenanker-Motoren erfolgt eine gute Wärmeableitung über das Blechpaket, wodurch thermische Probleme im Dauerbetrieb minimiert werden können. Diese Motoren sind deswegen besonders empfehlenswert für anspruchsvolle Anwendungen mit häufigen Korrekturmaßnahmen. Die meisten Hochlast-Aktuatoren sind deshalb mit BLDC-Motoren ausgestattet.



# DMSZ ZERTIFIKAT

Die  
DMSZ Deutsche Managementsystem Zertifizierungsgesellschaft mbH

bescheinigt hiermit, dass das Unternehmen



**Multiplex Modellsport GmbH & Co. KG**

Westliche Gewerbestr.1  
75015 Bretten  
Deutschland

für den Geltungsbereich  
**Produktion, Entwicklung und Handel von Fernsteuersystemen, Aktuatoren sowie Lade-, Antriebs- und Regeltechnologie im Modellsport und Industriebereich.**

ein

**Qualitätsmanagementsystem**

eingeführt hat und anwendet.

Durch ein Audit, dokumentiert in einem Bericht, wurde der Nachweis erbracht, dass dieses Managementsystem die Forderungen der folgenden Norm erfüllt:

**DIN EN ISO 9001:2015**

Dieses Zertifikat ist gültig von 05.12.2025 bis 04.12.2028  
Zertifikat-Registrier-Nr.: QM 22118-Z04731  
Griesheim, den 15.10.2025



*Hans-W. Lörtz*  
Hans-Werner Lörtz  
Leiter Zertifizierungsstelle



DMSZ Deutsche Managementsystem Zertifizierungsgesellschaft mbH  
Rübgrund 21 · 64347 · Griesheim · Deutschland



**HLS** LINEAR  
ACTUATORS



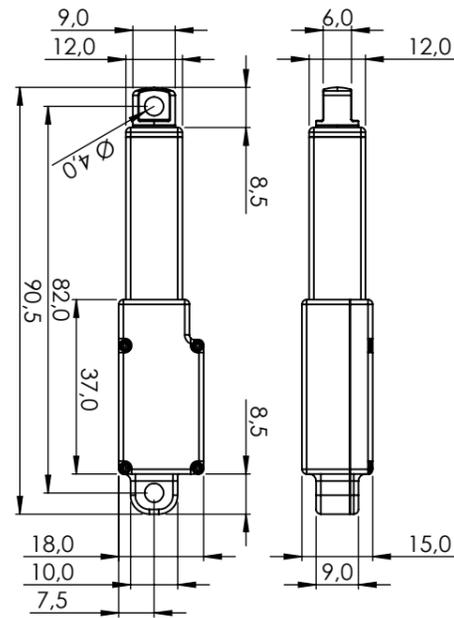
HLS12-30

HLS12-50

HLS12-100

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#1-02453, #1-03232, #1-02454, #1-02455



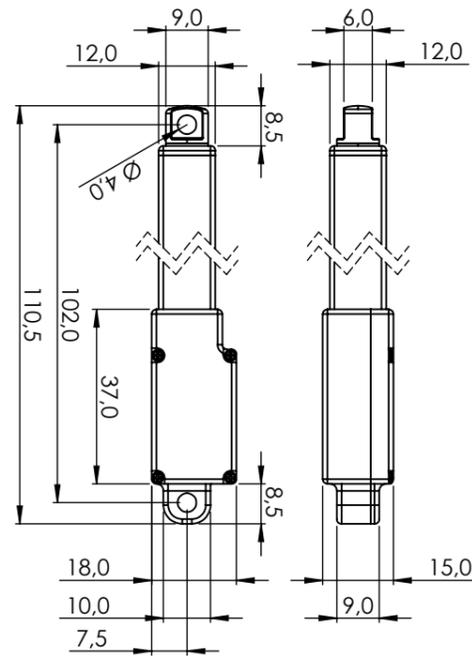
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## GENERAL SPECIFICATION

HLS12-30XXX												
Control System	PWM 1000usec ~ 2000usec											
Position Sensor Type	-											
Operating Voltage Range	4.0 ~ 8.4V											
Motor Type	Cored Metal Brush											
Amplifier / MCU	32bits programmable Digital											
Lead Screw	Lead 5mm											
Stroke Option	30mm											
Repeatability	±0.2mm											
Gear Ratio	50:1			100:1			210:1			380:1		
Voltage	At 7.4V			At 7.4V			At 7.4V			At 7.4V		
Speed at no Load	30.9mm/s			16.1mm/s			7.5mm/s			4.1mm/s		
Running Current at no Load	130mA			130mA			130mA			130mA		
Load Spec	Load	Speed	Current	Load	Speed	Current	Load	Speed	Current	Load	Speed	Current
Maximum Efficiency Point	1.2kg (11.8N)	23.5mm/s	250mA	2.1kg (20.6N)	12.7mm/s	250mA	4.4kg (43.2N)	5.6mm/s	250mA	8.0kg (78.5N)	3.1mm/s	250mA
Peak Power Point	2.1kg (20.6N)	17.3mm/s	370mA	3.8kg (37.3N)	8.6mm/s	370mA	7.7kg (75.5N)	4.0mm/s	370mA	12.4kg (121.6N)	2.3mm/s	370mA
Max Force (Lifted)	2.7kg (26.5N)	8.2mm/s	490mA	5.2kg (51.0N)	4.0mm/s	490mA	9.9kg (97.1N)	2.8mm/s	490mA	14.8kg (145.2N)	1.5mm/s	490mA
Stall Torque	3.1kg (30.4N)			6.2kg (60.8N)			12.4kg (121.6N)					
Stall Current	620mA											
Max Static Force	25.2kg (247N) (above)											
Max Side Load (Extended)	4.1kg (40N)											
Operating Temperature Range	-10°C ~ +50°C (14°F ~ +122°F)											
Storage Temperature Range	-30°C ~ +80°C (-31°F ~ +176°F)											
Vibrations at no Load	-											
Connector Wire Length	160mm											
Connector Wire Gauge	24AWG											
Connector Wire Strand Count	40/0.08											
External Dimensions	82.0 x 15.0 x 18.0mm											
Weight	34.0g											
Ball Bearing	Flange Bearing											
Case Material	Engineering Plastic & Aluminum Pipe											
Gear Material	4 Metal Gears											
IP-Rating	IP4X											
Revision	Rev. 1.1 / 02.01.2024											
Changelog	-											

# HLS12-5050, -50100, -50210, -50380

#1-02456, #03233, #1-02457, #1-02458



1:1

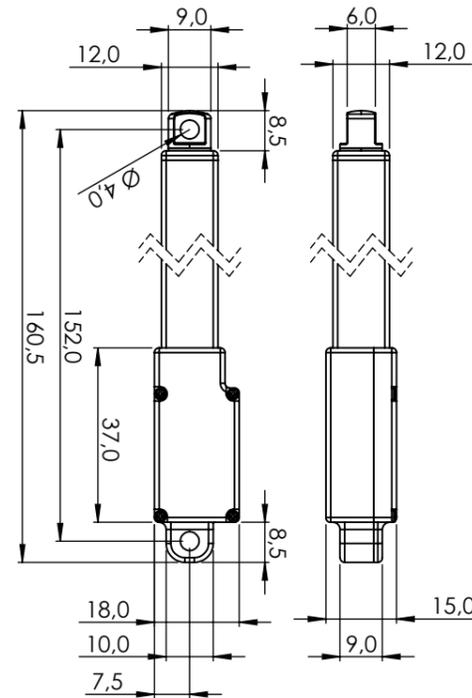
## GENERAL SPECIFICATION

HLS12-50XXX												
Control System	PWM 1000usec ~ 2000usec											
Position Sensor Type	-											
Operating Voltage Range	4.0 ~ 8.4V											
Motor Type	Cored Metal Brush											
Amplifier / MCU	32bits programmable Digital											
Lead Screw	Lead 5mm											
Stroke Option	50mm											
Repeatability	±0.3mm											
Gear Ratio	50:1			100:1			210:1			380:1		
Voltage	At 7.4V			At 7.4V			At 7.4V			At 7.4V		
Speed at no Load	30.9mm/s			16.1mm/s			7.5mm/s			4.1mm/s		
Running Current at no Load	130mA			130mA			130mA			130mA		
Load Spec	Load	Speed	Current	Load	Speed	Current	Load	Speed	Current	Load	Speed	Current
Maximum Efficiency Point	1.2kg (11.8N)	23.5mm/s	250mA	2.1kg (20.6N)	12.7mm/s	250mA	4.4kg (43.2N)	5.6mm/s	250mA	8.0kg (78.5N)	3.1mm/s	250mA
Peak Power Point	2.1kg (20.6N)	17.3mm/s	370mA	3.8kg (37.3N)	8.6mm/s	370mA	7.7kg (75.5N)	4.0mm/s	370mA	12.4kg (121.6N)	2.3mm/s	370mA
Max Force (Lifted)	2.7kg (26.5N)	8.2mm/s	490mA	5.2kg (51.0N)	4.0mm/s	490mA	9.9kg (97.1N)	2.8mm/s	490mA	14.8kg (145.2N)	1.5mm/s	490mA
Stall Torque	3.1kg (30.4N)			6.2kg (60.8N)			12.4kg (121.6N)			22.2kg (217.8N)		
Stall Current	620mA											
Max Static Force	25.2kg (247N) (above)											
Max Side Load (Extended)	3.1kg (30N)											
OperatingTemperatureRange	-10°C ~ +50°C (14°F ~ +122°F)											
Storage Temperature Range	-30°C ~ +80°C (-31°F ~ +176°F)											
Vibrations at no Load	-											
Connector Wire Length	160mm											
Connector Wire Gauge	24AWG											
ConnectorWireStrandCount	40/0.08											
External Dimensions	102.0 x 15.0 x 18.0mm											
Weight	40.0g											
Ball Bearing	Flange Bearing											
Case Material	Engineering Plastic & Aluminum Pipe											
Gear Material	4 Metal Gears											
IP-Rating	IP4X											
Revision	Rev. 1.1 / 02.01.2024											
Changelog	-											

# HLS12-10050, -100100, -100210, -100380

#1-02496, #1-03234, #1-02460, #1-02461

## GENERAL SPECIFICATION

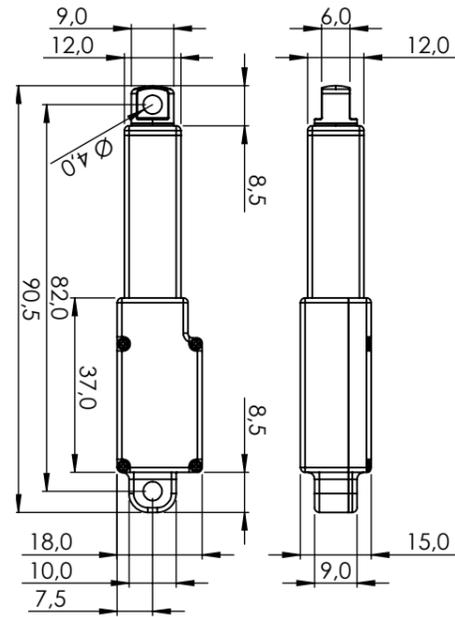


1:1

HLS12-100XX												
Control System	PWM 1000usec ~ 2000usec											
Position Sensor Type	-											
Operating Voltage Range	4.0 ~ 8.4V											
Motor Type	Cored Metal Brush											
Amplifier / MCU	32bits programmable Digital											
Lead Screw	Lead 5mm											
Stroke Option	100mm											
Repeatability	±0.5mm											
Gear Ratio	50:1			100:1			210:1			380:1		
Voltage	At 7.4V			At 7.4V			At 7.4V			At 7.4V		
Speed at no Load	30.9mm/s			16.1mm/s			7.5mm/s			4.1mm/s		
Running Current at no Load	130mA			130mA			130mA			130mA		
Load Spec	Load	Speed	Current	Load	Speed	Current	Load	Speed	Current	Load	Speed	Current
Maximum Efficiency Point	1.2kg (11.8N)	23.5mm/s	250mA	2.1kg (20.6N)	12.7mm/s	250mA	4.4kg (43.2N)	5.6mm/s	250mA	8.0kg (78.5N)	3.1mm/s	250mA
Peak Power Point	2.1kg (20.6N)	17.3mm/s	370mA	3.8kg (37.3N)	8.6mm/s	370mA	7.7kg (75.5N)	4.0mm/s	370mA	12.4kg (121.6N)	2.3mm/s	370mA
Max Force (Lifted)	2.7kg (26.5N)	8.2mm/s	490mA	5.2kg (51.0N)	4.0mm/s	490mA	9.9kg (97.1N)	2.8mm/s	490mA	14.8kg (145.2N)	1.5mm/s	490mA
Stall Torque	3.1kg (30.4N)			6.2kg (60.8N)			12.4kg (121.6N)			22.2kg (217.8N)		
Stall Current	620mA											
Max Static Force	25.2kg (247N) (above)											
Max Side Load (Extended)	1.5kg (15N)											
Operating Temperature Range	-10°C ~ +50°C (14°F ~ +122°F)											
Storage Temperature Range	-30°C ~ +80°C (-31°F ~ +176°F)											
Vibrations at no Load	-											
Connector Wire Length	160mm											
Connector Wire Gauge	24AWG											
Connector Wire Strand Count	40/0.08											
External Dimensions	152.0 x 15.0 x 18.0mm											
Weight	56.0g											
Ball Bearing	Flange Bearing											
Case Material	Engineering Plastic & Aluminum Pipe											
Gear Material	4 Metal Gears											
IP-Rating	IP4X											
Revision	Rev. 1.1 / 02.01.2024											
Changelog	-											

# HLS12-CAN-3050

#1-03288

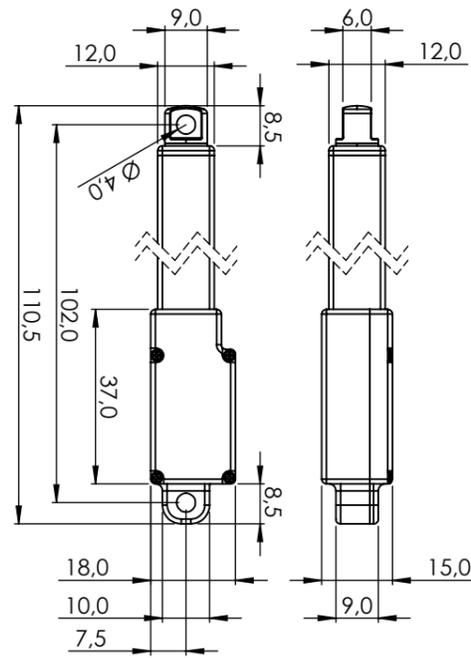


## GENERAL SPECIFICATION

HLS12-CAN-3050			
Control System	CAN2.0A, B		
Position Sensor Type	-		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	30mm		
Repeatability	±0.2mm		
Gear Ratio	50:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	20.0mm/s	25.0mm/s	30.9mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	2.0kgf (19.61N)	2.5kgf (24.52N)	3.1kgf (30.40N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	0.8kgf (7.85N)	1.0kgf (9.81N)	1.2kgf (11.77N)
Maximum Efficiency Point   Speed	15.2mm/s	19.0mm/s	23.5mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	1.4kgf (13.73N)	1.7kgf (16.67N)	2.1kgf (20.59N)
Peak Power Point   Speed	11.2mm/s	14.0mm/s	17.3mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	1.8kgf (17.65N)	2.2kgf (21.57N)	2.7kgf (26.48N)
Max Force (Lifted)   Speed	5.3mm/s	6.7mm/s	8.2mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	4.08kgf (40N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	82.0mm x 15.0mm x 18.0mm (3.228inch x 0.591inch x 0.709inch)		
Weight	34g (1.199oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

# HLS12-CAN-5050

#1-03289

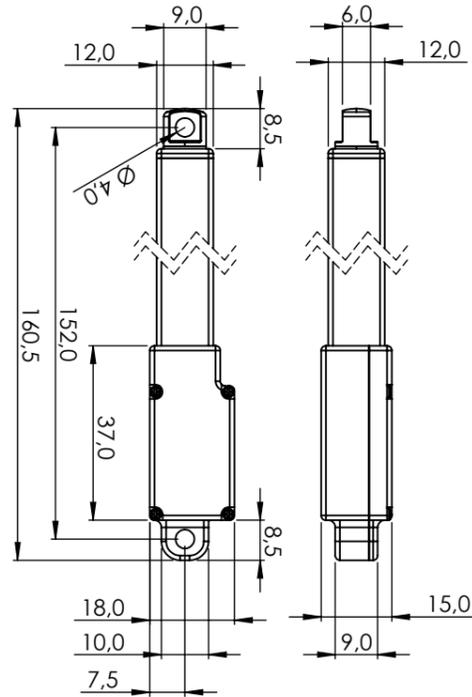


## GENERAL SPECIFICATION

HLS12-CAN-5050			
Control System	CAN2.0A, B		
Position Sensor Type	-		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	50mm		
Repeatability	±0.3mm		
Gear Ratio	50:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	20.0mm/s	25.0mm/s	30.9mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	2.0kgf (19.61N)	2.5kgf (24.52N)	3.1kgf (30.40N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	0.8kgf (7.85N)	1.0kgf (9.81N)	1.2kgf (11.77N)
Maximum Efficiency Point   Speed	15.2mm/s	19.0mm/s	23.5mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	1.4kgf (13.73N)	1.7kgf (16.67N)	2.1kgf (20.59N)
Peak Power Point   Speed	11.2mm/s	14.0mm/s	17.3mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	1.8kgf (17.65N)	2.2kgf (21.57N)	2.7kgf (26.48N)
Max Force (Lifted)   Speed	5.3mm/s	6.7mm/s	8.2mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	3.06kgf (30N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	102.0mm x 15.0mm x 18.0mm (4.016inch x 0.591inch x 0.709inch)		
Weight	40g (1.411oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

# HLS12-CAN-10050

#1-03290

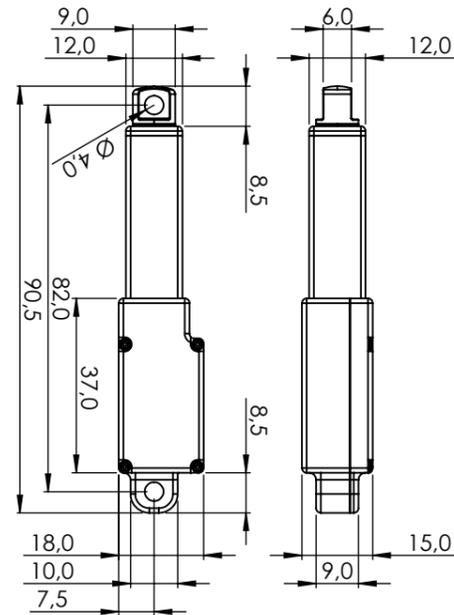


## GENERAL SPECIFICATION

HLS12-CAN-10050			
Control System	CAN2.0A, B		
Position Sensor Type	-		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	100mm		
Repeatability	±0.5mm		
Gear Ratio	50:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	20.0mm/s	25.0mm/s	30.9mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	2.0kgf (19.61N)	2.5kgf (24.52N)	3.1kgf (30.40N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	0.8kgf (7.85N)	1.0kgf (9.81N)	1.2kgf (11.77N)
Maximum Efficiency Point   Speed	15.2mm/s	19.0mm/s	23.5mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	1.4kgf (13.73N)	1.7kgf (16.67N)	2.1kgf (20.59N)
Peak Power Point   Speed	11.2mm/s	14.0mm/s	17.3mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	1.8kgf (17.65N)	2.2kgf (21.57N)	2.7kgf (26.48N)
Max Force (Lifted)   Speed	5.3mm/s	6.7mm/s	8.2mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	1.53kgf (15N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	152.0mm x 15.0mm x 18.0mm (5.984inch x 0.591inch x 0.709inch)		
Weight	56g (1.975oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

# HLS12-CAN-30100

#1-03291

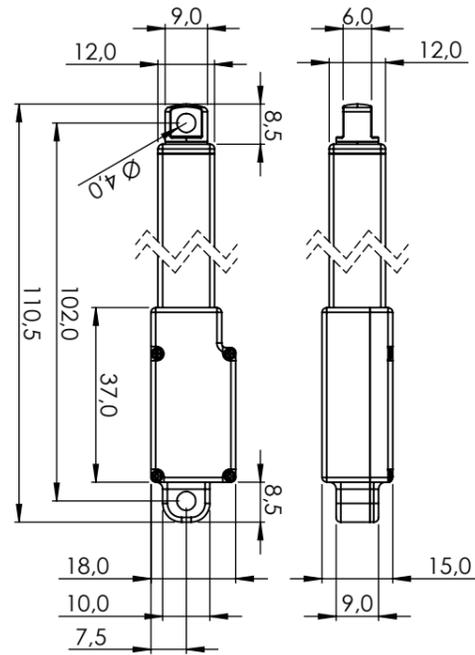


## GENERAL SPECIFICATION

HLS12-CAN-30100			
Control System	CAN2.0A, B		
Position Sensor Type	-		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	30mm		
Repeatability	±0.2mm		
Gear Ratio	100:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	10.4mm/s	13.0mm/s	16.1mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	4.0kgf (39.23N)	5.0kgf (49.03N)	6.2kgf (60.80N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	1.4kgf (13.73N)	1.7kgf (16.67N)	2.1kgf (20.59N)
Maximum Efficiency Point   Speed	8.2mm/s	10.3mm/s	12.7mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	2.5kgf (24.52N)	3.1kgf (30.40N)	3.8kgf (37.27N)
Peak Power Point   Speed	5.6mm/s	7.0mm/s	8.6mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	3.2kgf (31.38N)	4.2kgf (41.19N)	5.2kgf (50.99N)
Max Force (Lifted)   Speed	2.6mm/s	3.2mm/s	4.0mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	4.08kgf (40N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	82.0mm x 15.0mm x 18.0mm (3.228inch x 0.591inch x 0.709inch)		
Weight	34g (1.199oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

## HLS12-CAN-50100

#1-03292

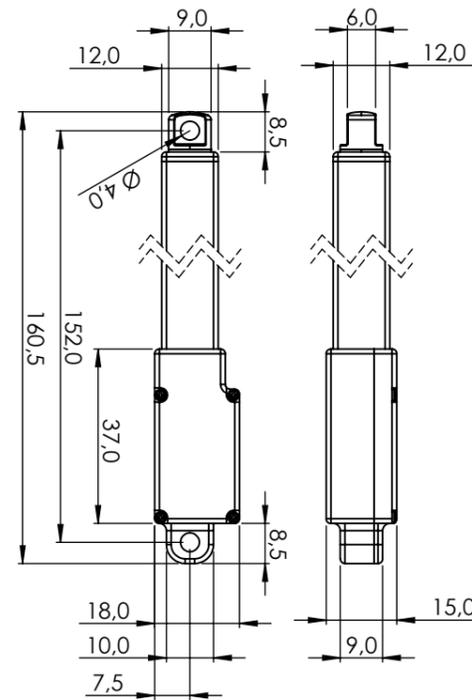


## GENERAL SPECIFICATION

HLS12-CAN-50100			
Control System	CAN2.0A, B		
Position Sensor Type	-		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	50mm		
Repeatability	±0.3mm		
Gear Ratio	100:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	10.4mm/s	13.0mm/s	16.1mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	4.0kgf (39.23N)	5.0kgf (49.03N)	6.2kgf (60.80N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	1.4kgf (13.73N)	1.7kgf (16.67N)	2.1kgf (20.59N)
Maximum Efficiency Point   Speed	8.2mm/s	10.3mm/s	12.7mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	2.5kgf (24.52N)	3.1kgf (30.40N)	3.8kgf (37.27N)
Peak Power Point   Speed	5.6mm/s	7.0mm/s	8.6mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	3.2kgf (31.38N)	4.2kgf (41.19N)	5.2kgf (50.99N)
Max Force (Lifted)   Speed	2.6mm/s	3.2mm/s	4.0mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	3.06kgf (30N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	102.0mm x 15.0mm x 18.0mm (4.016inch x 0.591inch x 0.709inch)		
Weight	40g (1.411oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

# HLS12-CAN-100100

#1-03293

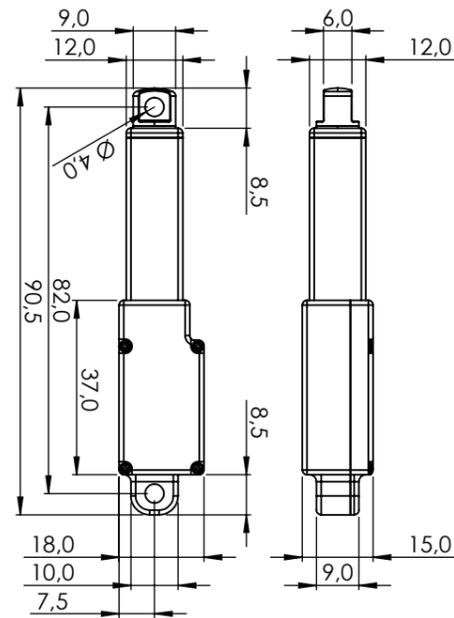


## GENERAL SPECIFICATION

HLS12-CAN-100100			
Control System	CAN2.0A, B		
Position Sensor Type	-		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	100mm		
Repeatability	±0.5mm		
Gear Ratio	100:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	10.4mm/s	13.0mm/s	16.1mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	4.0kgf (39.23N)	5.0kgf (49.03N)	6.2kgf (60.80N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	1.4kgf (13.73N)	1.7kgf (16.67N)	2.1kgf (20.59N)
Maximum Efficiency Point   Speed	8.2mm/s	10.3mm/s	12.7mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	2.5kgf (24.52N)	3.1kgf (30.40N)	3.8kgf (37.27N)
Peak Power Point   Speed	5.6mm/s	7.0mm/s	8.6mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	3.2kgf (31.38N)	4.2kgf (41.19N)	5.2kgf (50.99N)
Max Force (Lifted)   Speed	2.6mm/s	3.2mm/s	4.0mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	1.53kgf (15N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	152.0mm x 15.0mm x 18.0mm (5.984inch x 0.591inch x 0.709inch)		
Weight	56g (1.975oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

# HLS12-CAN-30210

#1-03294

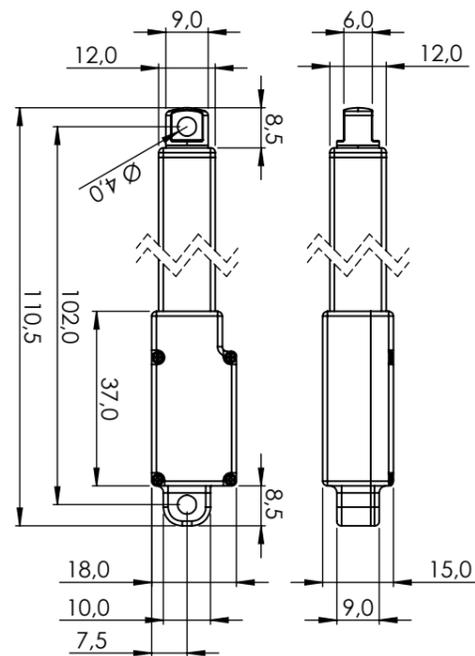


## GENERAL SPECIFICATION

HLS12-CAN-30210			
Control System	CAN2.0A, B		
Position Sensor Type	-		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	30mm		
Repeatability	±0.2mm		
Gear Ratio	210:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	4.9mm/s	6.1mm/s	7.5mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	8.0kgf (78.45N)	10.0kgf (98.07N)	12.4kgf (121.60N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	2.9kgf (28.44N)	3.6kgf (35.30N)	4.4kgf (43.15N)
Maximum Efficiency Point   Speed	3.6mm/s	4.5mm/s	5.6mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	5.6kgf (54.92N)	7.0kgf (68.65N)	8.6kgf (84.34N)
Peak Power Point   Speed	2.6mm/s	3.2mm/s	4.0mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	6.4kgf (62.76N)	8.0kgf (78.45N)	9.9kgf (97.09N)
Max Force (Lifted)   Speed	1.8mm/s	2.3mm/s	2.8mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	4.08kgf (40N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	82.0mm x 15.0mm x 18.0mm (3.228inch x 0.591inch x 0.709inch)		
Weight	34g (1.199oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

## HLS12-CAN-50210

#1-03295

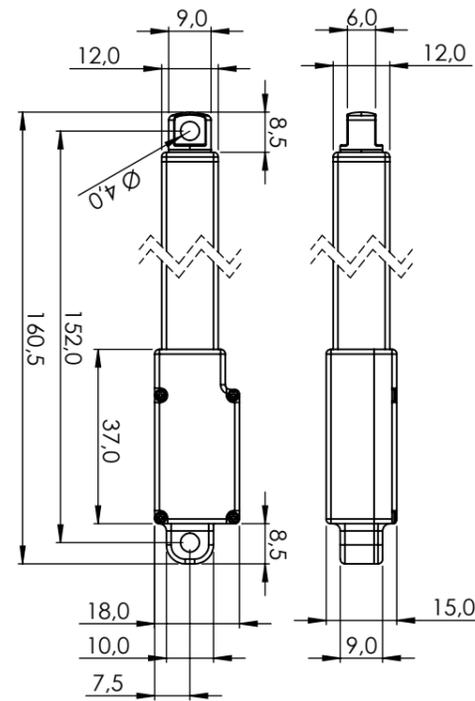


## GENERAL SPECIFICATION

HLS12-CAN-50210			
Control System	CAN2.0A, B		
Position Sensor Type	-		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	50mm		
Repeatability	±0.3mm		
Gear Ratio	210:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	4.9mm/s	6.1mm/s	7.5mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	8.0kgf (78.45N)	10.0kgf (98.07N)	12.4kgf (121.60N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	2.9kgf (28.44N)	3.6kgf (35.30N)	4.4kgf (43.15N)
Maximum Efficiency Point   Speed	3.6mm/s	4.5mm/s	5.6mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	5.6kgf (54.92N)	7.0kgf (68.65N)	8.6kgf (84.34N)
Peak Power Point   Speed	2.6mm/s	3.2mm/s	4.0mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	6.4kgf (62.76N)	8.0kgf (78.45N)	9.9kgf (97.09N)
Max Force (Lifted)   Speed	1.8mm/s	2.3mm/s	2.8mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	3.06kgf (30N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	102.0mm x 15.0mm x 18.0mm (4.016inch x 0.591inch x 0.709inch)		
Weight	40g (1.411oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

## HLS12-CAN-100210

#1-03296

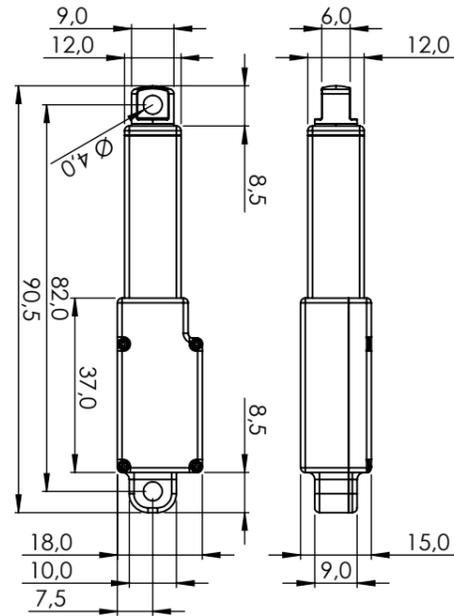


## GENERAL SPECIFICATION

HLS12-CAN-100210			
Control System	CAN2.0A, B		
Position Sensor Type	-		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	100mm		
Repeatability	±0.5mm		
Gear Ratio	210:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	4.9mm/s	6.1mm/s	7.5mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	8.0kgf (78.45N)	10.0kgf (98.07N)	12.4kgf (121.60N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	2.9kgf (28.44N)	3.6kgf (35.30N)	4.4kgf (43.15N)
Maximum Efficiency Point   Speed	3.6mm/s	4.5mm/s	5.6mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	5.6kgf (54.92N)	7.0kgf (68.65N)	8.6kgf (84.34N)
Peak Power Point   Speed	2.6mm/s	3.2mm/s	4.0mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	6.4kgf (62.76N)	8.0kgf (78.45N)	9.9kgf (97.09N)
Max Force (Lifted)   Speed	1.8mm/s	2.3mm/s	2.8mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	1.53kgf (15N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	152.0mm x 15.0mm x 18.0mm (5.984inch x 0.591inch x 0.709inch)		
Weight	56g (1.975oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

# HLS12-CAN-30380

#1-03297

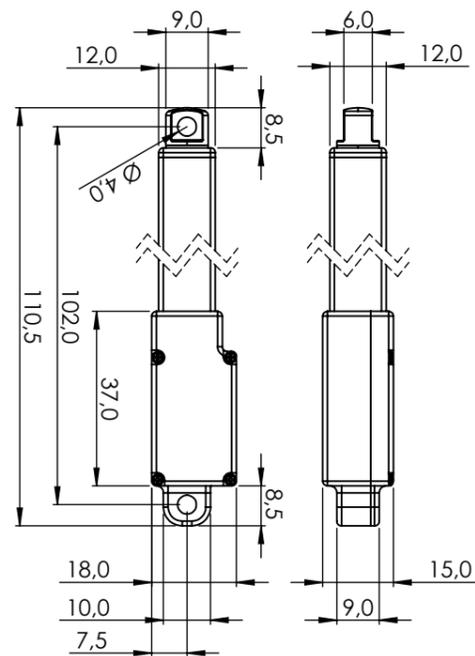


## GENERAL SPECIFICATION

HLS12-CAN-30380			
Control System	CAN2.0A, B		
Position Sensor Type	-		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	30mm		
Repeatability	±0.2mm		
Gear Ratio	380:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	2.6mm/s	3.3mm/s	4.1mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	14.4kgf (141.22N)	18.0kgf (176.52N)	22.2kgf (217.71N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	5.2kgf (50.99N)	6.5kgf (63.74N)	8.0kgf (78.45N)
Maximum Efficiency Point   Speed	2.0mm/s	2.5mm/s	3.1mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	8.0kgf (78.45N)	10.0kgf (98.07N)	12.4kgf (121.60N)
Peak Power Point   Speed	1.5mm/s	1.9mm/s	2.3mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	9.6kgf (94.14N)	12.0kgf (117.68N)	14.8kgf (145.14N)
Max Force (Lifted)   Speed	1.0mm/s	1.2mm/s	1.5mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	4.08kgf (40N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	82.0mm x 15.0mm x 18.0mm (3.228inch x 0.591inch x 0.709inch)		
Weight	34g (1.199oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

## HLS12-CAN-50380

#1-03298

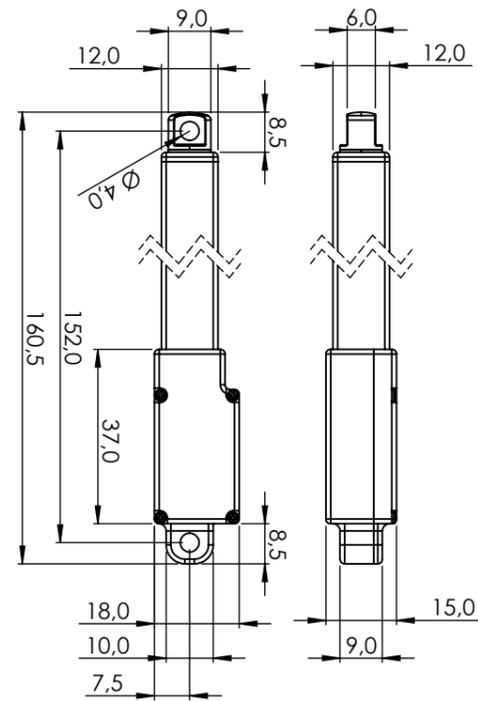


## GENERAL SPECIFICATION

HLS12-CAN-50380			
Control System	CAN2.0A, B		
Position Sensor Type	-		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	50mm		
Repeatability	±0.3mm		
Gear Ratio	380:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	2.6mm/s	3.3mm/s	4.1mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	14.4kgf (141.22N)	18.0kgf (176.52N)	22.2kgf (217.71N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	5.2kgf (50.99N)	6.5kgf (63.74N)	8.0kgf (78.45N)
Maximum Efficiency Point   Speed	2.0mm/s	2.5mm/s	3.1mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	8.0kgf (78.45N)	10.0kgf (98.07N)	12.4kgf (121.60N)
Peak Power Point   Speed	1.5mm/s	1.9mm/s	2.3mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	9.6kgf (94.14N)	12.0kgf (117.68N)	14.8kgf (145.14N)
Max Force (Lifted)   Speed	1.0mm/s	1.2mm/s	1.5mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	3.06kgf (30N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	102.0mm x 15.0mm x 18.0mm (4.016inch x 0.591inch x 0.709inch)		
Weight	40g (1.411oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

## HLS12-CAN-100380

#1-03299

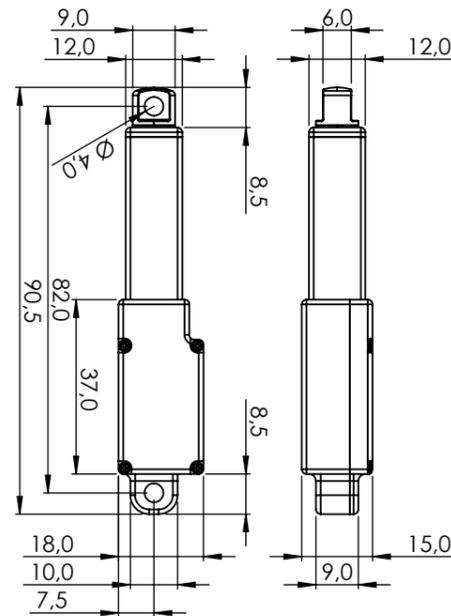


## GENERAL SPECIFICATION

HLS12-CAN-100380			
Control System	CAN2.0A, B		
Position Sensor Type	-		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	100mm		
Repeatability	±0.5mm		
Gear Ratio	380:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	2.6mm/s	3.3mm/s	4.1mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	14.4kgf (141.22N)	18.0kgf (176.52N)	22.2kgf (217.71N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	5.2kgf (50.99N)	6.5kgf (63.74N)	8.0kgf (78.45N)
Maximum Efficiency Point   Speed	2.0mm/s	2.5mm/s	3.1mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	8.0kgf (78.45N)	10.0kgf (98.07N)	12.4kgf (121.60N)
Peak Power Point   Speed	1.5mm/s	1.9mm/s	2.3mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	9.6kgf (94.14N)	12.0kgf (117.68N)	14.8kgf (145.14N)
Max Force (Lifted)   Speed	1.0mm/s	1.2mm/s	1.5mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	1.53kgf (15N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	152.0mm x 15.0mm x 18.0mm (5.984inch x 0.591inch x 0.709inch)		
Weight	56g (1.975oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

# HLS12-RS485-3050

#1-03301

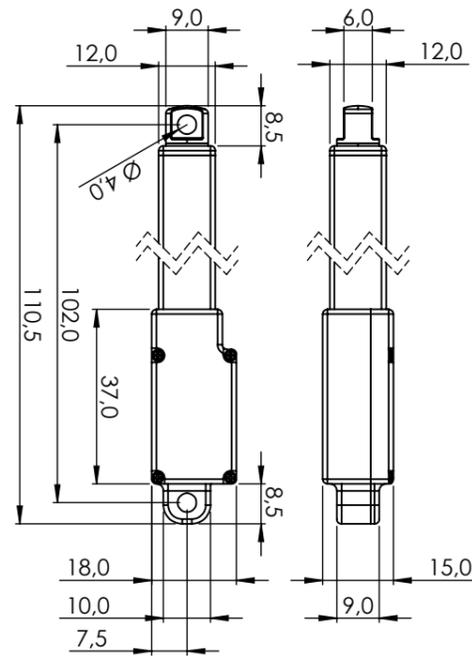


## GENERAL SPECIFICATION

HLS12-RS485-3050			
Control System	RS485		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	30mm		
Repeatability	±0.2mm		
Gear Ratio	50:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	20.0mm/s	25.0mm/s	30.9mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	2.0kgf (19.61N)	2.5kgf (24.52N)	3.1kgf (30.40N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	0.8kgf (7.85N)	1.0kgf (9.81N)	1.2kgf (11.77N)
Maximum Efficiency Point   Speed	15.2mm/s	19.0mm/s	23.5mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	1.4kgf (13.73N)	1.7kgf (16.67N)	2.1kgf (20.59N)
Peak Power Point   Speed	11.2mm/s	14.0mm/s	17.3mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	1.8kgf (17.65N)	2.2kgf (21.57N)	2.7kgf (26.48N)
Max Force (Lifted)   Speed	5.3mm/s	6.7mm/s	8.2mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	4.08kgf (40N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	82.0mm x 15.0mm x 18.0mm (3.228inch x 0.591inch x 0.709inch)		
Weight	34g (1.199oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

## HLS12-RS485-5050

#1-03302

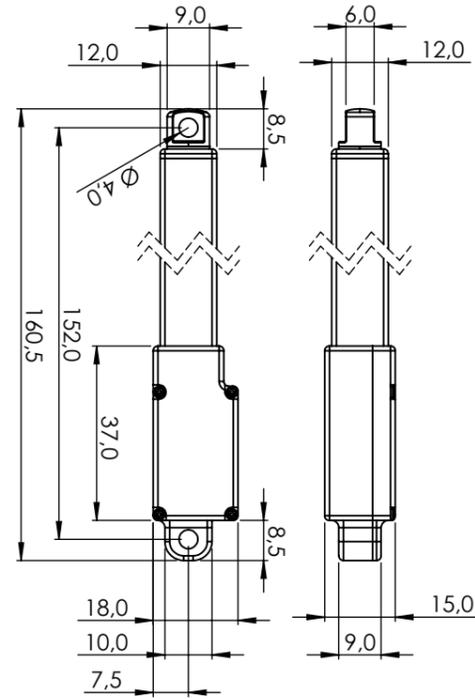


## GENERAL SPECIFICATION

HLS12-RS485-5050			
Control System	RS485		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	50mm		
Repeatability	±0.3mm		
Gear Ratio	50:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	20.0mm/s	25.0mm/s	30.9mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	2.0kgf (19.61N)	2.5kgf (24.52N)	3.1kgf (30.40N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	0.8kgf (7.85N)	1.0kgf (9.81N)	1.2kgf (11.77N)
Maximum Efficiency Point   Speed	15.2mm/s	19.0mm/s	23.5mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	1.4kgf (13.73N)	1.7kgf (16.67N)	2.1kgf (20.59N)
Peak Power Point   Speed	11.2mm/s	14.0mm/s	17.3mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	1.8kgf (17.65N)	2.2kgf (21.57N)	2.7kgf (26.48N)
Max Force (Lifted)   Speed	5.3mm/s	6.7mm/s	8.2mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	3.06kgf (30N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	102.0mm x 15.0mm x 18.0mm (4.016inch x 0.591inch x 0.709inch)		
Weight	40g (1.411oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

## HLS12-RS485-10050

#1-03303

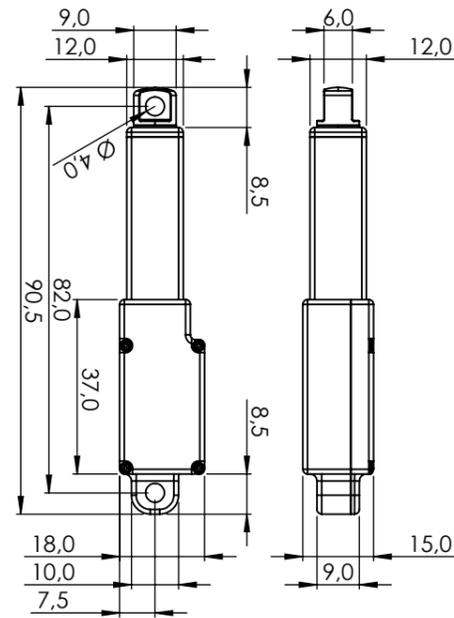


## GENERAL SPECIFICATION

HLS12-RS485-10050			
Control System	RS485		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	100mm		
Repeatability	±0.5mm		
Gear Ratio	50:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	20.0mm/s	25.0mm/s	30.9mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	2.0kgf (19.61N)	2.5kgf (24.52N)	3.1kgf (30.40N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	0.8kgf (7.85N)	1.0kgf (9.81N)	1.2kgf (11.77N)
Maximum Efficiency Point   Speed	15.2mm/s	19.0mm/s	23.5mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	1.4kgf (13.73N)	1.7kgf (16.67N)	2.1kgf (20.59N)
Peak Power Point   Speed	11.2mm/s	14.0mm/s	17.3mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	1.8kgf (17.65N)	2.2kgf (21.57N)	2.7kgf (26.48N)
Max Force (Lifted)   Speed	5.3mm/s	6.7mm/s	8.2mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	1.53kgf (15N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	152.0mm x 15.0mm x 18.0mm (5.984inch x 0.591inch x 0.709inch)		
Weight	56g (1.975oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

# HLS12-RS485-30100

#1-03304

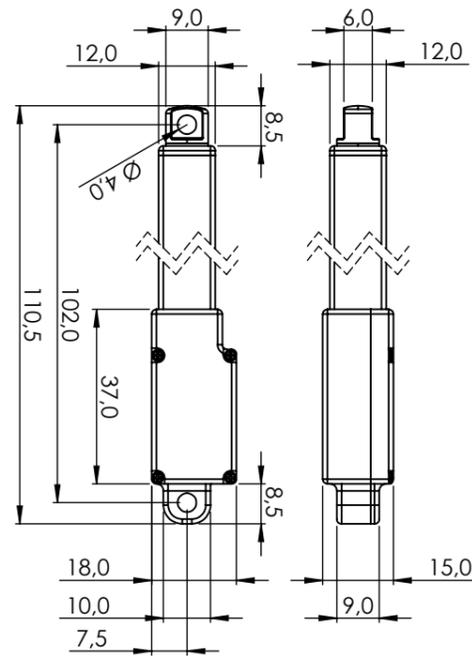


## GENERAL SPECIFICATION

HLS12-RS485-30100			
Control System	RS485		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	30mm		
Repeatability	±0.2mm		
Gear Ratio	100:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	10.4mm/s	13.0mm/s	16.1mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	4.0kgf (39.23N)	5.0kgf (49.03N)	6.2kgf (60.80N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	1.4kgf (13.73N)	1.7kgf (16.67N)	2.1kgf (20.59N)
Maximum Efficiency Point   Speed	8.2mm/s	10.3mm/s	12.7mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	2.5kgf (24.52N)	3.1kgf (30.40N)	3.8kgf (37.27N)
Peak Power Point   Speed	5.6mm/s	7.0mm/s	8.6mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	3.2kgf (31.38N)	4.2kgf (41.19N)	5.2kgf (50.99N)
Max Force (Lifted)   Speed	2.6mm/s	3.2mm/s	4.0mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	4.08kgf (40N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	82.0mm x 15.0mm x 18.0mm (3.228inch x 0.591inch x 0.709inch)		
Weight	34g (1.199oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

# HLS12-RS485-50100

#1-03305

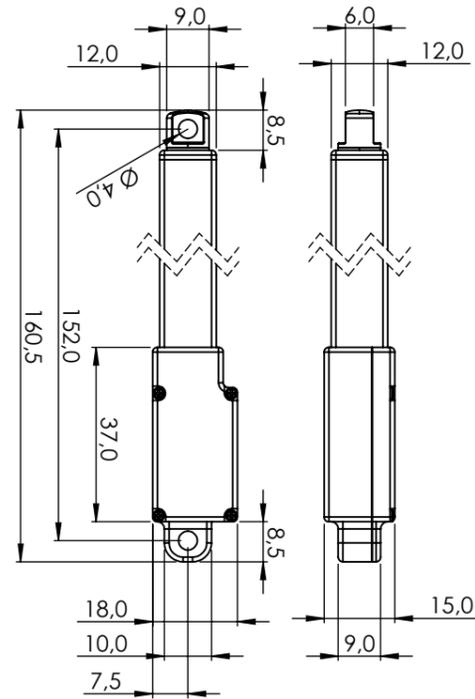


## GENERAL SPECIFICATION

HLS12-RS485-50100			
Control System	RS485		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	50mm		
Repeatability	±0.3mm		
Gear Ratio	100:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	10.4mm/s	13.0mm/s	16.1mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	4.0kgf (39.23N)	5.0kgf (49.03N)	6.2kgf (60.80N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	1.4kgf (13.73N)	1.7kgf (16.67N)	2.1kgf (20.59N)
Maximum Efficiency Point   Speed	8.2mm/s	10.3mm/s	12.7mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	2.5kgf (24.52N)	3.1kgf (30.40N)	3.8kgf (37.27N)
Peak Power Point   Speed	5.6mm/s	7.0mm/s	8.6mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	3.2kgf (31.38N)	4.2kgf (41.19N)	5.2kgf (50.99N)
Max Force (Lifted)   Speed	2.6mm/s	3.2mm/s	4.0mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	3.06kgf (30N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	102.0mm x 15.0mm x 18.0mm (4.016inch x 0.591inch x 0.709inch)		
Weight	40g (1.411oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

# HLS12-RS485-100100

#1-03306

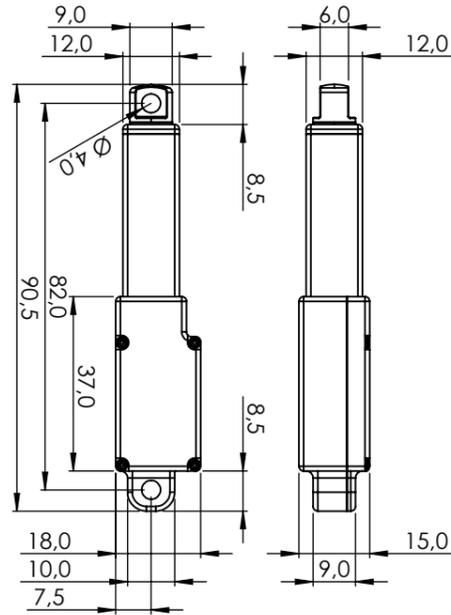


## GENERAL SPECIFICATION

HLS12-RS485-100100			
Control System	RS485		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	100mm		
Repeatability	±0.5mm		
Gear Ratio	100:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	10.4mm/s	13.0mm/s	16.1mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	4.0kgf (39.23N)	5.0kgf (49.03N)	6.2kgf (60.80N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	1.4kgf (13.73N)	1.7kgf (16.67N)	2.1kgf (20.59N)
Maximum Efficiency Point   Speed	8.2mm/s	10.3mm/s	12.7mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	2.5kgf (24.52N)	3.1kgf (30.40N)	3.8kgf (37.27N)
Peak Power Point   Speed	5.6mm/s	7.0mm/s	8.6mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	3.2kgf (31.38N)	4.2kgf (41.19N)	5.2kgf (50.99N)
Max Force (Lifted)   Speed	2.6mm/s	3.2mm/s	4.0mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	1.53kgf (15N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	152.0mm x 15.0mm x 18.0mm (5.984inch x 0.591inch x 0.709inch)		
Weight	56g (1.975oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

# HLS12-RS485-30210

#1-03307

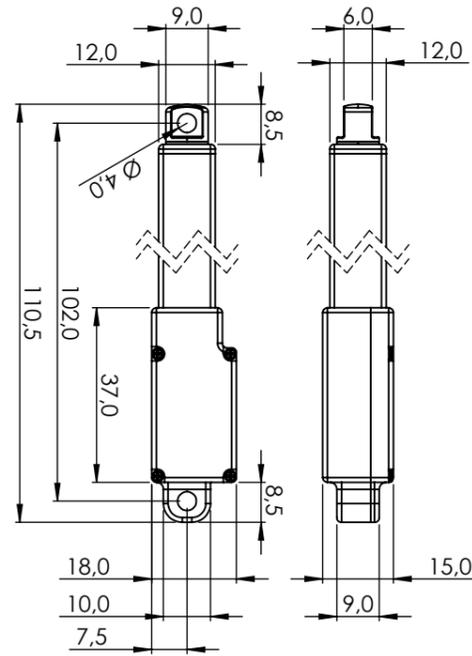


## GENERAL SPECIFICATION

HLS12-RS485-30210			
Control System	RS485		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	30mm		
Repeatability	±0.2mm		
Gear Ratio	210:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	4.9mm/s	6.1mm/s	7.5mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	8.0kgf (78.45N)	10.0kgf (98.07N)	12.4kgf (121.60N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	2.9kgf (28.44N)	3.6kgf (35.30N)	4.4kgf (43.15N)
Maximum Efficiency Point   Speed	3.6mm/s	4.5mm/s	5.6mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	5.6kgf (54.92N)	7.0kgf (68.65N)	8.6kgf (84.34N)
Peak Power Point   Speed	2.6mm/s	3.2mm/s	4.0mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	6.4kgf (62.76N)	8.0kgf (78.45N)	9.9kgf (97.09N)
Max Force (Lifted)   Speed	1.8mm/s	2.3mm/s	2.8mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	4.08kgf (40N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	82.0mm x 15.0mm x 18.0mm (3.228inch x 0.591inch x 0.709inch)		
Weight	34g (1.199oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

# HLS12-RS485-50210

#1-03308

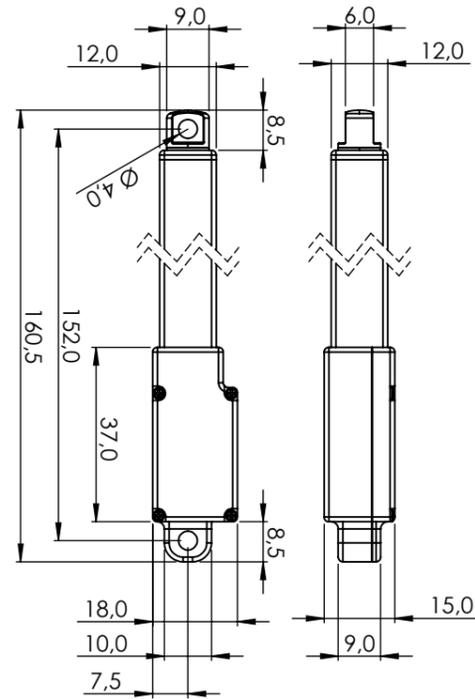


## GENERAL SPECIFICATION

HLS12-RS485-50210			
Control System	RS485		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	50mm		
Repeatability	±0.3mm		
Gear Ratio	210:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	4.9mm/s	6.1mm/s	7.5mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	8.0kgf (78.45N)	10.0kgf (98.07N)	12.4kgf (121.60N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	2.9kgf (28.44N)	3.6kgf (35.30N)	4.4kgf (43.15N)
Maximum Efficiency Point   Speed	3.6mm/s	4.5mm/s	5.6mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	5.6kgf (54.92N)	7.0kgf (68.65N)	8.6kgf (84.34N)
Peak Power Point   Speed	2.6mm/s	3.2mm/s	4.0mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	6.4kgf (62.76N)	8.0kgf (78.45N)	9.9kgf (97.09N)
Max Force (Lifted)   Speed	1.8mm/s	2.3mm/s	2.8mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	3.06kgf (30N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	102.0mm x 15.0mm x 18.0mm (4.016inch x 0.591inch x 0.709inch)		
Weight	40g (1.411oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

# HLS12-RS485-100210

#1-03309

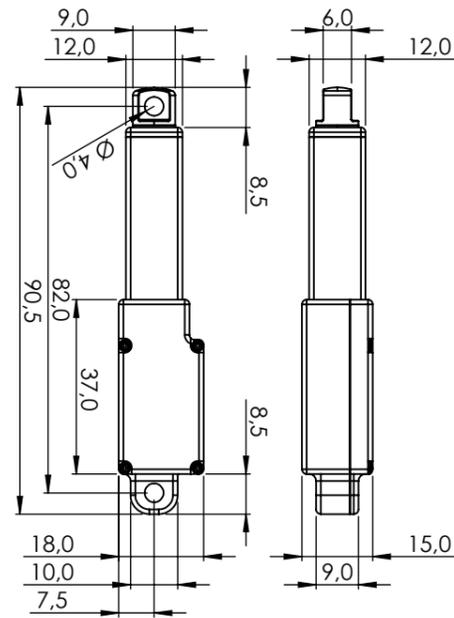


## GENERAL SPECIFICATION

HLS12-RS485-100210			
Control System	RS485		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	100mm		
Repeatability	±0.5mm		
Gear Ratio	210:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	4.9mm/s	6.1mm/s	7.5mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	8.0kgf (78.45N)	10.0kgf (98.07N)	12.4kgf (121.60N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	2.9kgf (28.44N)	3.6kgf (35.30N)	4.4kgf (43.15N)
Maximum Efficiency Point   Speed	3.6mm/s	4.5mm/s	5.6mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	5.6kgf (54.92N)	7.0kgf (68.65N)	8.6kgf (84.34N)
Peak Power Point   Speed	2.6mm/s	3.2mm/s	4.0mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	6.4kgf (62.76N)	8.0kgf (78.45N)	9.9kgf (97.09N)
Max Force (Lifted)   Speed	1.8mm/s	2.3mm/s	2.8mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	1.53kgf (15N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	152.0mm x 15.0mm x 18.0mm (5.984inch x 0.591inch x 0.709inch)		
Weight	56g (1.975oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

# HLS12-RS485-30380

#1-03310

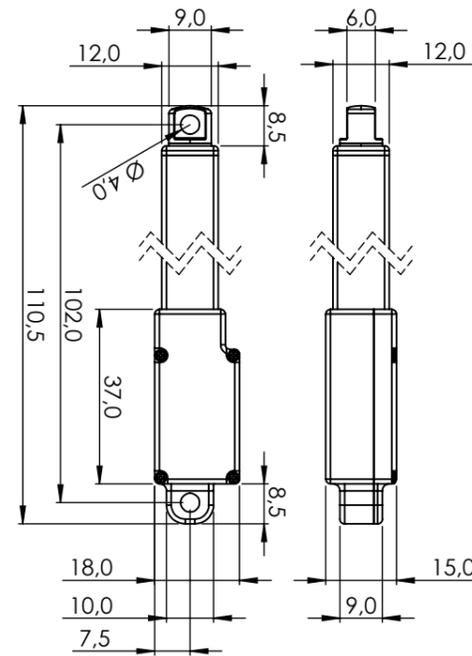


## GENERAL SPECIFICATION

HLS12-RS485-30380			
Control System	RS485		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	30mm		
Repeatability	±0.2mm		
Gear Ratio	380:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	2.6mm/s	3.3mm/s	4.1mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	14.4kgf (141.22N)	18.0kgf (176.52N)	22.2kgf (217.71N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	5.2kgf (50.99N)	6.5kgf (63.74N)	8.0kgf (78.45N)
Maximum Efficiency Point   Speed	2.0mm/s	2.5mm/s	3.1mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	8.0kgf (78.45N)	10.0kgf (98.07N)	12.4kgf (121.60N)
Peak Power Point   Speed	1.5mm/s	1.9mm/s	2.3mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	9.6kgf (94.14N)	12.0kgf (117.68N)	14.8kgf (145.14N)
Max Force (Lifted)   Speed	1.0mm/s	1.2mm/s	1.5mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	4.08kgf (40N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	82.0mm x 15.0mm x 18.0mm (3.228inch x 0.591inch x 0.709inch)		
Weight	34g (1.199oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

# HLS12-RS485-50380

#1-03311

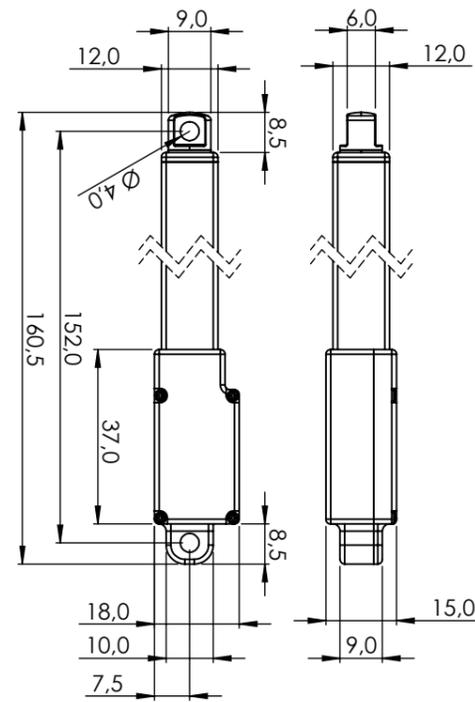


## GENERAL SPECIFICATION

HLS12-RS485-50380			
Control System	RS485		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	50mm		
Repeatability	±0.3mm		
Gear Ratio	380:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	2.6mm/s	3.3mm/s	4.1mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	14.4kgf (141.22N)	18.0kgf (176.52N)	22.2kgf (217.71N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	5.2kgf (50.99N)	6.5kgf (63.74N)	8.0kgf (78.45N)
Maximum Efficiency Point   Speed	2.0mm/s	2.5mm/s	3.1mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	8.0kgf (78.45N)	10.0kgf (98.07N)	12.4kgf (121.60N)
Peak Power Point   Speed	1.5mm/s	1.9mm/s	2.3mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	9.6kgf (94.14N)	12.0kgf (117.68N)	14.8kgf (145.14N)
Max Force (Lifted)   Speed	1.0mm/s	1.2mm/s	1.5mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	3.06kgf (30N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	102.0mm x 15.0mm x 18.0mm (4.016inch x 0.591inch x 0.709inch)		
Weight	40g (1.411oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

## HLS12-RS485-100380

#1-03312

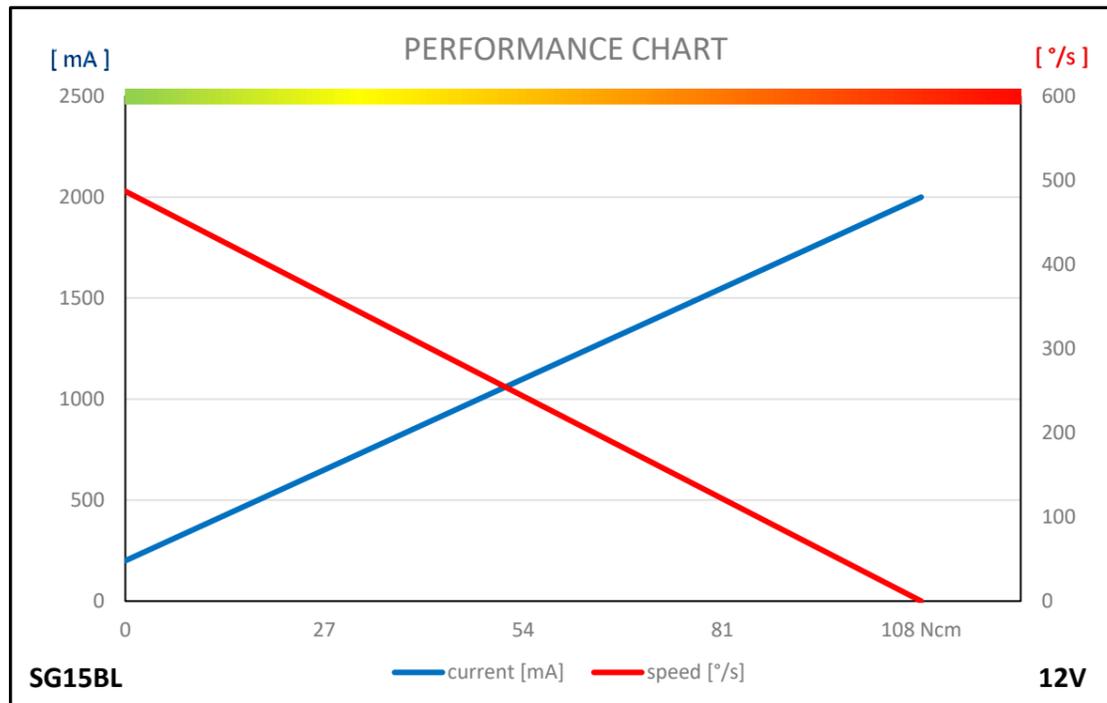
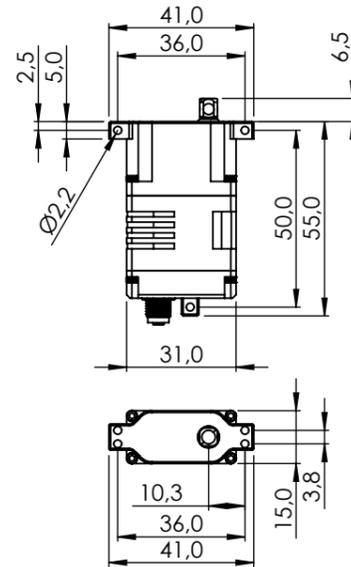


## GENERAL SPECIFICATION

HLS12-RS485-100380			
Control System	RS485		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.0 ~ 8.4V		
Servo Amplifier Type	32bit programmable Digital		
Stroke Option	100mm		
Repeatability	±0.5mm		
Gear Ratio	380:1		
Voltage	4.8V	6.0V	7.4V
Speed at no Load	2.6mm/s	3.3mm/s	4.1mm/s
Running Current at no Load	80mA	100mA	130mA
Stall Force	14.4kgf (141.22N)	18.0kgf (176.52N)	22.2kgf (217.71N)
Stall Current	400mA	500mA	620mA
Maximum Efficiency Point   Load	5.2kgf (50.99N)	6.5kgf (63.74N)	8.0kgf (78.45N)
Maximum Efficiency Point   Speed	2.0mm/s	2.5mm/s	3.1mm/s
Maximum Efficiency Point   Current	160mA	200mA	250mA
Peak Power Point   Load	8.0kgf (78.45N)	10.0kgf (98.07N)	12.4kgf (121.60N)
Peak Power Point   Speed	1.5mm/s	1.9mm/s	2.3mm/s
Peak Power Point   Current	240mA	300mA	370mA
Max Force (Lifted)   Load	9.6kgf (94.14N)	12.0kgf (117.68N)	14.8kgf (145.14N)
Max Force (Lifted)   Speed	1.0mm/s	1.2mm/s	1.5mm/s
Max Force (Lifted)   Current	320mA	400mA	490mA
Max Side Load (Extended)	1.53kgf (15N)		
Operating Temperature Range	-10°C ~ +50°C		
Storage Temperature Range	-30°C ~ +80°C		
Connector Wire Length	160mm(6.294inch)		
Connector Wire Gauge	24AWG		
Outline Dimensions	152.0mm x 15.0mm x 18.0mm (5.984inch x 0.591inch x 0.709inch)		
Weight	56g (1.975oz)		
Bearing Type	Flange bearing		
Case Material	Engineering Plastic & Aluminum Pipe		
Gear Material	4 Metal Gears		
IP-Rating	IP4X		

# SG15BL-CAN (M5 CIRCULAR)

#1-03282

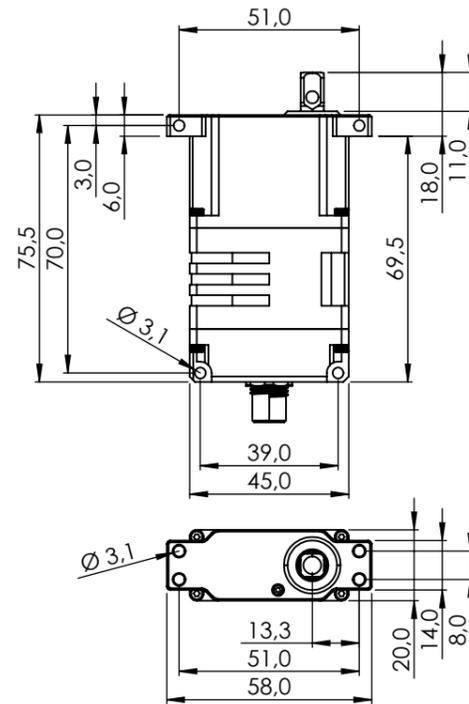


## GENERAL SPECIFICATION

SG15BL-CAN (M5 Circular)	
Control System	CAN 2.0A,B / DroneCAN (UAVCAN v0)
Position Sensor Type	Contactless Magnetic Encoder
Motor Type	BLDC
Operating Voltage Range	9.0V ~ 15.0V
Voltage	At 12.0V
No Load Speed	487.8 °/sec      0.123 sec/60°      81.3 RPM
Rated Torque (At 20% Load)	0.216 N-m (2.2 kgf-cm)
Peak Torque	1.08 N-m (11.0 kgf-cm)
Idle Current (At Stopped)	35mA
Running Current (At No Load)	200mA
Peak Current	2,000mA
Operating Travel	Servo Mode : ±60°(Default), ±150°(Programmable)
Multi-Turn	Turn Mode : ±32760 turns (DroneCAN: n/a)
Servo Amplifier Type	32bit Programmable Digital
Dimensions	31.0 x 15.0 x 50.0mm (±0.2mm) / (1.220 x 0.590 x 1.969 inch)
Weight	62.5g (±10%)
Housing	Rugged Aluminum Alloy With Hardcoat Anodizing
Gear Reduction	5 Hardened Steel Gears
Bearing	8 Ball Bearing & 3 Needle Bearing & 1Thrust Bearing
Horn Gear Spline	Square 5.0 x 5.0
Gear Train Backlash	< 0.5°
Operation Temperature	-30°C (-22°F) bis +70°C (+158°F)
MTTF	>1,000h
Radial Load On Output Shaft	< 129.55N (13.21kgf)
Push Load On Output Shaft	< 1,025N (104.52kgf)
Connector Type	Circular
Connector	M5 4 Pins Female Panel Mount (M5*0.75 Front Fastened DIP)
IP-Rating	IP68

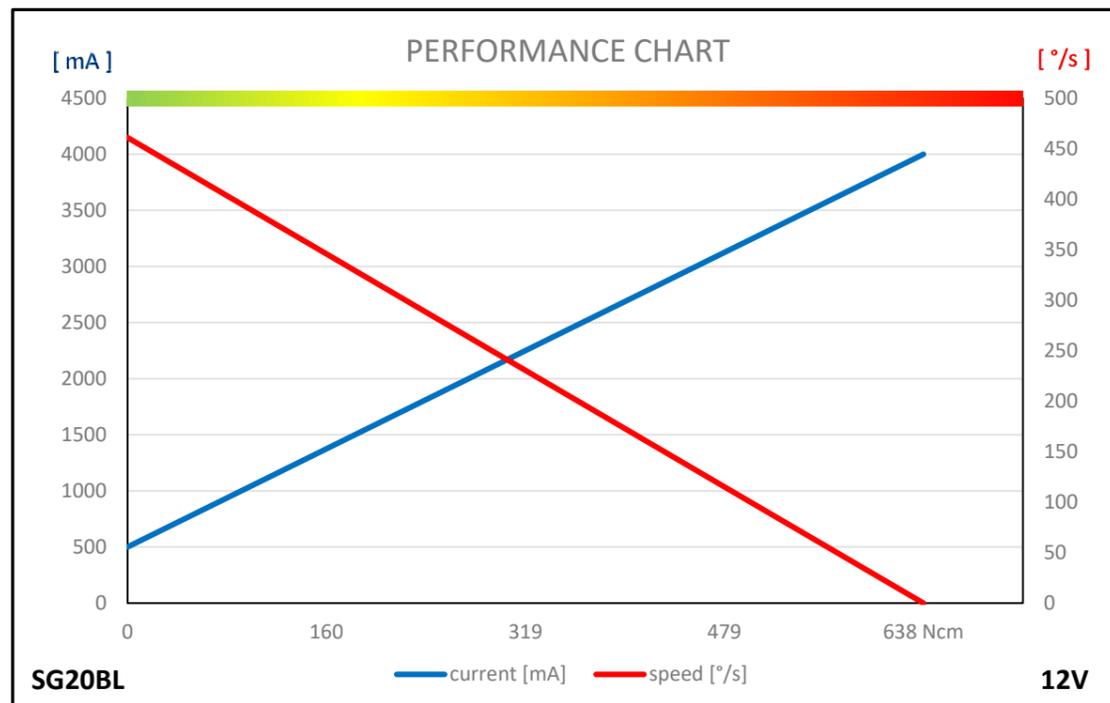
# SG20BL-CAN-12V (M8 CIRCULAR)

#1-03169



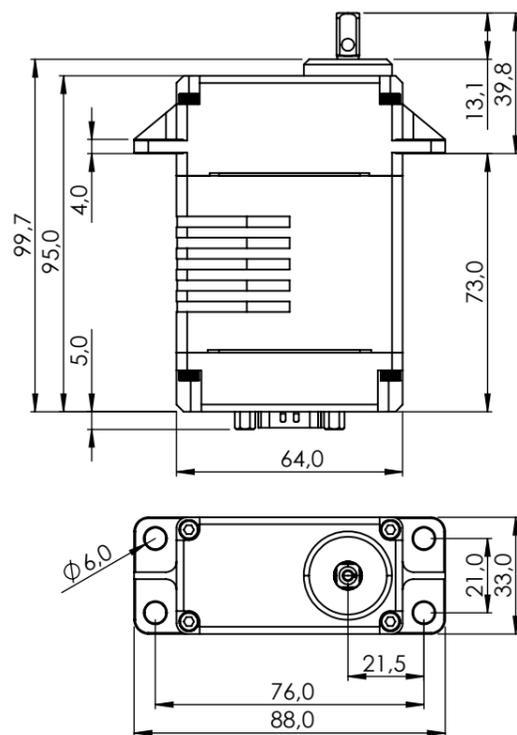
## GENERAL SPECIFICATION

SG20BL-CAN-12V (M8 Circular)			
Control System	CAN 2.0A,B / DroneCAN (UAVCAN v0)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	BLDC Motor		
Operating Voltage Range	9.0V ~ 15.0V		
Voltage	At 12.0V		
No Load Speed	463.0 °/sec	0.13 sec/60°	77.17 RPM
Rated Torque (At 20% Load)	1.27 N-m (13.0 kgf-cm)		
Peak Torque	6.37 N-m (65.0 kgf-cm)		
Idle Current (At Stopped)	30mA		
Running Current (At No Load)	500mA		
Peak Current	4,000mA		
Operating Travel	Servo Mode : ±60°(Default), ±150°(Programmable)		
Multi-Turn	Turn Mode : ±32760 turns (DroneCAN: n/a)		
Servo Amplifier Type	32bit Programmable Digital		
Dimensions	45.0 x 20.0 x 75.0mm (±0.2mm) / (1.772 x 0.787 x 2.953 inch)		
Weight	Non-Clutch Type : 170g (±10%)		
Housing	Rugged Aluminum Alloy With Hardcoat Anodizing		
Gear Reduction	5 Hardened Steel Gears		
Bearing	3 Ball Bearing & 6 Needle Bearing & 1 Thrust Bearing		
Horn Gear Spline	Square 6.5 x 6.5		
Gear Train Backlash	< 0.5°		
Operation Temperature	-30°C (-22°F) bis +70°C (+158°F)		
MTTF	>1,000h		
Radial Load On Output Shaft	<764.92N (78.0kgf)		
Push Load On Output Shaft	<1,570N (160kgf)		
Connector Type	Circular		
Connector	M8 B-coding 5 Pins Female Panel Mount With Wires(Front fastened)		
IP-Rating	IP68		



# SG33BL-T-12V (DSUB)

#1-00932

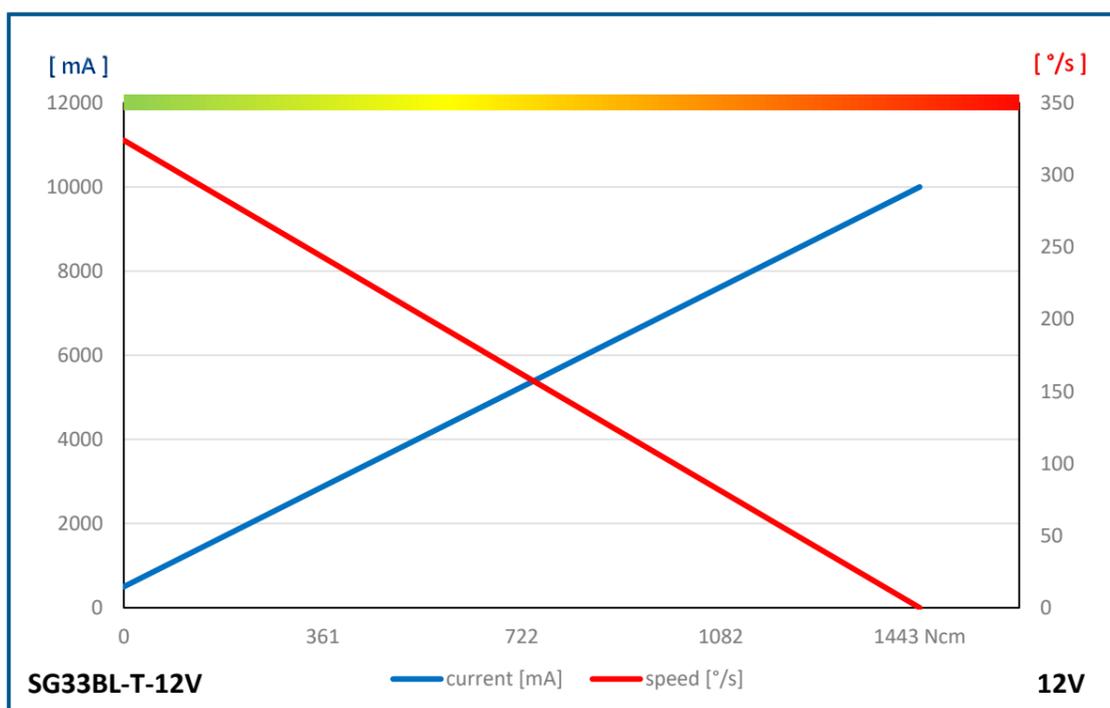


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## GENERAL SPECIFICATION

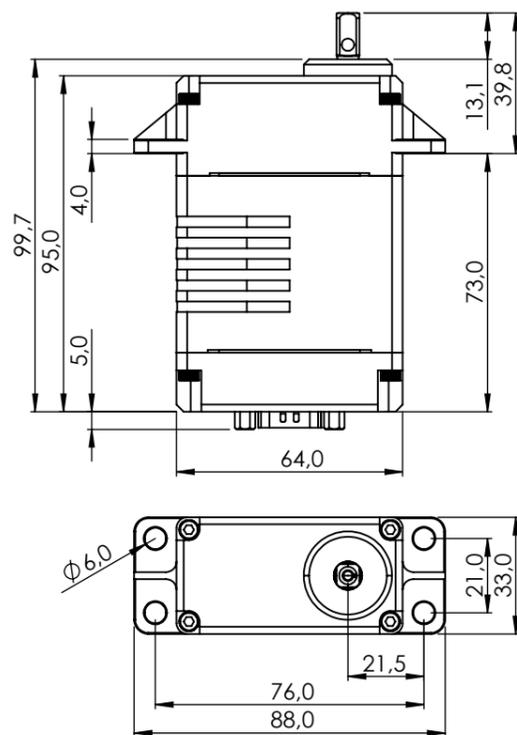
SG33BL-T-12V (DSUB)		
Control System	PWM / RS485 / TTL (Half Duplex) Pulse Width 900µs 1500µs (Center) 2100µs	
Connector Type	D-Sub 9	
Position Sensor Type	Contactless Magnetic Encoder	
Motor Type	BLDC	
Amplifier / MCU	32bit programmable Digital	
Operating Voltage Range	9.0V ~ 15.0V	
Operating Voltage	At 12.0V	
Operating Speed at no Load	324°/s (54RPM)	
Stall Torque	147.0kgcm (1442.1Ncm)	
Rest Current	30mA	
Running Current at no Load	500mA	
Stall Current	10000mA	
Deadband Width	2µs	
Operating Travel	Default	±60°
	Programmable	±160°
	Multi Turn	±2880° (Max ±8 Turns)
	Continuous Rotation	n/a
Operating Temperature Range	-30°C ~ +70°C (-22°F ~ +158°F)	
Storage Temperature Range	-40°C ~ +80°C (-40°F ~ +176°F)	
Vibrations at no Load	MIL-STD-810G 514.6C-VII / EN60068-2-6	
Connector Wire Length	-	
Connector Wire Gauge	-	
Connector Wire Strand Count	-	
External Dimensions	64.0 x 33.0 x 95.0mm	
Weight*	480.0g	
Ball Bearing	6 Ball Bearings & 2 Needle Bearings	
Case Material	Rugged Aluminum Alloy With Hardcoat Anodizing	
Gear Material	4 Hardened Steel Gears	
Gear Train Backlash	Max. 0.5°	
Horn Gear Spline	Square 6.5 x 6.5	
Accessories	Mounting Hardware, Servo Horn (I-MOS)	
IP-Rating	IP68	
MTTF	>1000h	
Revision & Stand	Rev. 1.2 / 01.02.2024	
Changelog	-	
*of the servo only w/o horns and accessories		

## PERFORMANCE CHART



# SG33BL-T-24V (DSUB)

#1-02462

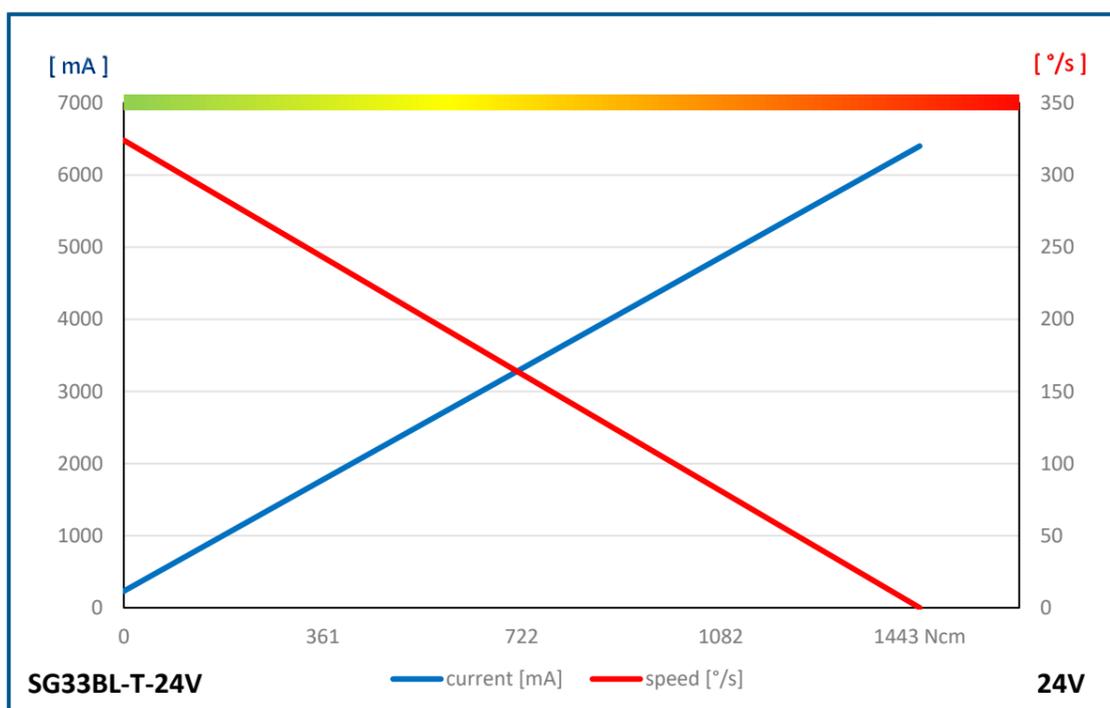


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## GENERAL SPECIFICATION

SG33BL-T-24V (DSUB)		
Control System	PWM / RS485 / TTL (Half Duplex) Pulse Width 900µs 1500µs (Center) 2100µs	
Connector Type	D-Sub 9	
Position Sensor Type	Contactless Magnetic Encoder	
Motor Type	BLDC	
Amplifier / MCU	32bit programmable Digital	
Operating Voltage Range	22.0V ~ 26.0V	
Operating Voltage	At 24.0V	
Operating Speed at no Load	324°/s (54RPM)	
Stall Torque	147.00kgcm (1442.1Ncm)	
Idle Current	20mA	
No Load Running Current	230mA	
Stall Current	6400mA	
Deadband Width	2µs	
Operating Travel	Default	±60°
	Programmable	±160°
	Multi Turn	±2880° (Max ±8 Turns)
	Continuous Rotation	n/a
Operating Temperature Range	-30°C ~ +70°C (-22°F ~ +158°F)	
Storage Temperature Range	-40°C ~ +80°C (-40°F ~ +176°F)	
Vibrations at no Load	MIL-STD-810G 514.6C-VII / EN60068-2-6	
Connector Wire Length	-	
Connector Wire Gauge	-	
Connector Wire Strand Count	-	
External Dimensions	64.0 x 33.0 x 95.0mm	
Weight*	480.0g	
Ball Bearing	6 Ball Bearings & 2 Needle Bearings	
Case Material	Rugged Aluminum Alloy With Hardcoat Anodizing	
Gear Material	4 Hardened Steel Gears	
Gear Train Backlash	Max. 0.5°	
Horn Gear Spline	Square 6.5 x 6.5	
Accessories	Mounting Hardware, Servo Horn (I-MOS)	
IP-Rating	IP68	
MTTF	>1000h	
Revision & Stand	Rev. 1.2 / 01.02.2024	
Changelog	-	
*of the servo only w/o horns and accessories		

## PERFORMANCE CHART



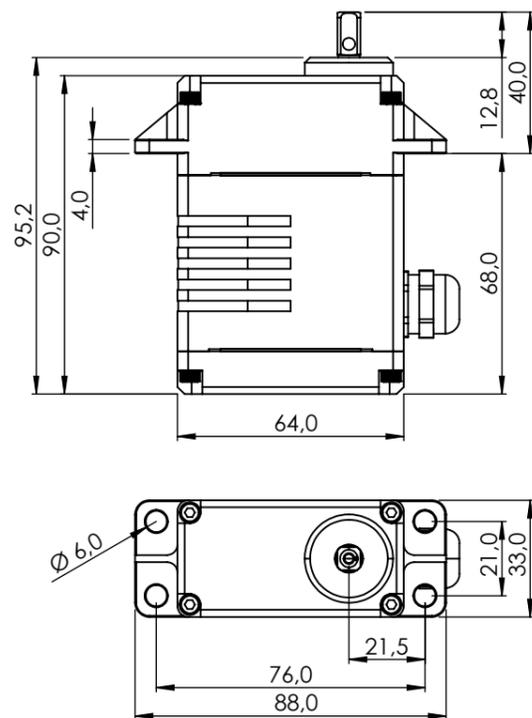
SG33BL-T-24V

— current [mA] — speed [°/s]

24V

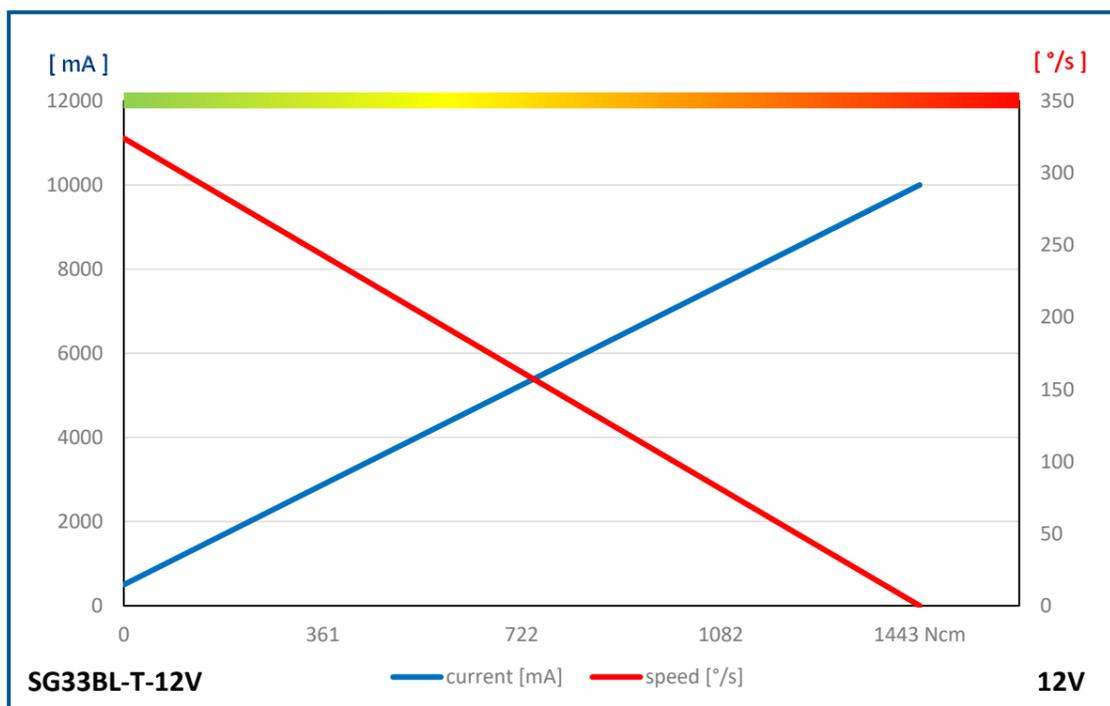
# SG33BL-T-CAN-12V(GLANDCABLE)

#1-02345



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## PERFORMANCE CHART



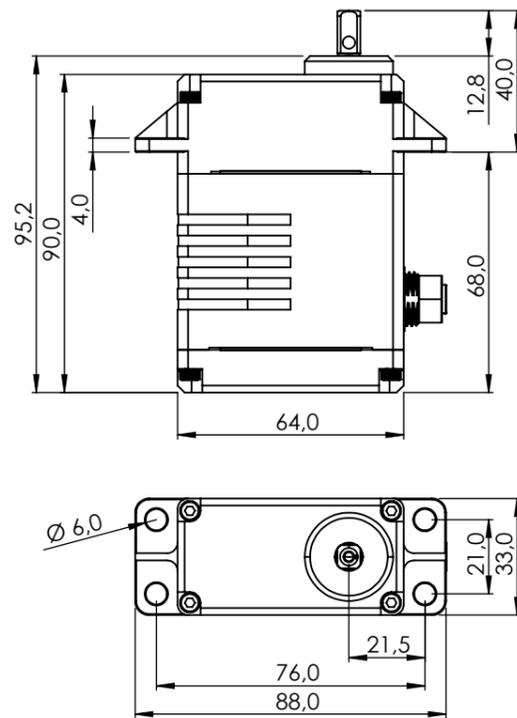
## GENERAL SPECIFICATION

SG33BL-T-CAN-12V (Gland Cable)				
Control System	CAN 2.0A,B / DroneCAN (UAVCAN v0)			
	Protocol (Mode)	Standard 2.0A	Extended 2.0B	DroneCAN
	Baud-Rate	10kbps ~ 1Mbps		
	Sample-Point	50% or 87.5%		
	Available SERVO ID	1 ~ 254		1 ~ 127
	Available Node ID	1 ~ 2047	1 ~ 536870911	1 ~ 127
Input Signal Range	0 ~ 5V			
Connector Type	-			
Position Sensor Type	Contactless Magnetic Encoder			
Motor Type	BLDC			
Amplifier / MCU	32bit programmable Digital			
Operating Voltage Range	9.0 ~ 15.0V			
Operating Voltage	At 12.0V			
Operating Speed at no Load	324°/s (54RPM)			
Stall Torque	147.0kgcm (1442.1Ncm)			
Rest Current	30mA			
Running Current at no Load	500mA			
Stall Current	10000mA			
Deadband Width	-			
Travel	Travel / Command	90° / 4096		
	Servo mode	Left	Center	Right
	Pos Command	+1366	+8192	+15018
	Pos [°]	-150	0	+150
	Turn Mode	Left	Power On	Right
	Pos Command	-16383	0	+16383
	Pos [°]	-359	0	+359
	Turn Range	-32760 ~ +32760 (CAN only)		
Operating Temperature Range	-30°C ~ +70°C (-22°F ~ +158°F)			
Storage Temperature Range	-40°C ~ +80°C (-40°F ~ +176°F)			
Vibrations at no Load	MIL-STD-810G 514.6C-VII / EN 60068-2-6			
Connector Wire Length	400mm			
Connector Wire Gauge	20AWG			
Connector Wire Strand Count	80/0.08			
External Dimensions	64.0 x 33.0 x 90.0mm			
Weight*	500.0g			
Ball Bearing	6 Ball Bearings & 2 Needle Bearings			
Case Material	Rugged Aluminum Alloy With Hardcoat Anodizing			
Gear Material	4 Hardened Steel Gears			
Gear Train Backlash	Max. 0.5°			
Horn Gear Spline	Square 6.5 x 6.5			
Accessories	Mounting Hardware, Servo Horn (I-MOS)			
IP-Rating	IP68			
MTTF	>1000h			
Revision & Stand	Rev. 1.2 / 01.02.2024			
Changelog	-			

\*of the servo only w/o horns and accessories

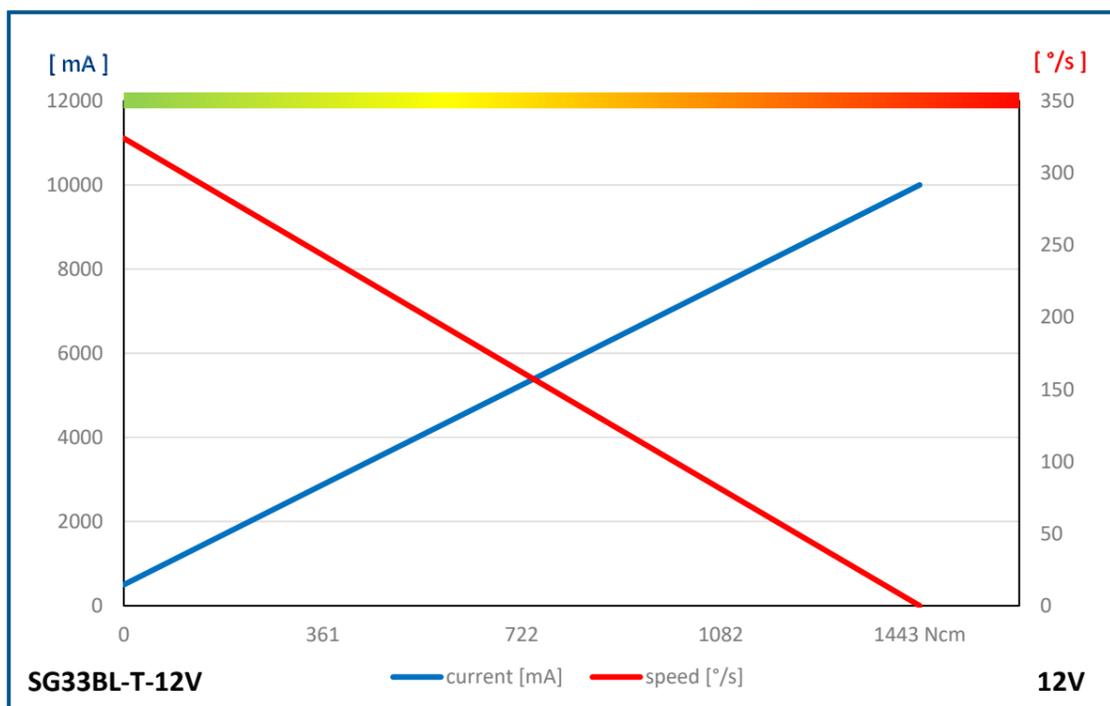
# SG33BL-T-CAN-12V (CIRCULAR)

#1-02346



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## PERFORMANCE CHART



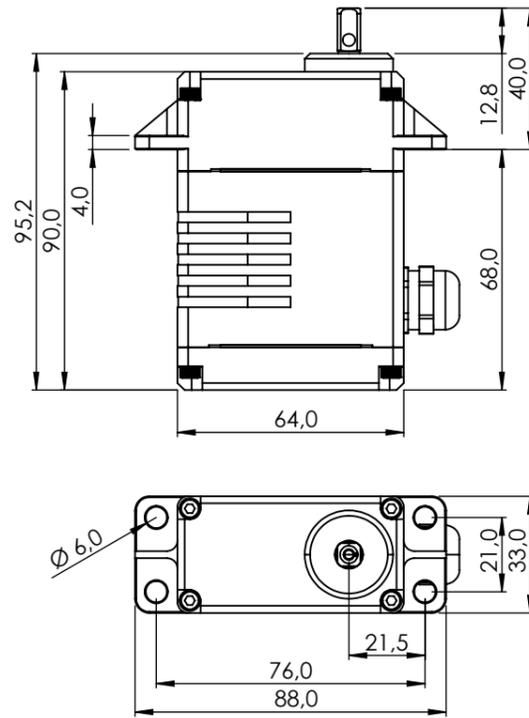
## GENERAL SPECIFICATION

SG33BL-T-CAN-12V (Circular)				
Control System	CAN 2.0A,B / DroneCAN (UAVCAN v0)			
	Protocol (Mode)	Standard 2.0A	Extended 2.0B	DroneCan
	Baud-Rate	10kbps ~ 1Mbps		
	Sample-Point	50% or 87.5%		
	Available SERVO ID	1 ~ 254		1 ~ 127
	Available Node ID	1 ~ 2047	1 ~ 536870911	1 ~ 127
Input Signal Range	0 ~ 5V			
Connector Type	Circular			
Position Sensor Type	Contactless Magnetic Encoder			
Motor Type	BLDC			
Amplifier / MCU	32bit programmable Digital			
Operating Voltage Range	9.0 ~ 15.0V			
Operating Voltage	At 12.0V			
Operating Speed at no Load	324°/s (54RPM)			
Stall Torque	147.0kgcm (1442.1Ncm)			
Rest Current	30mA			
Running Current at no Load	500mA			
Stall Current	10000mA			
Deadband Width	-			
Travel	Travel / Command	90° / 4096		
	Servo mode	Left	Center	Right
	Pos Command	+1366	+8192	+15018
	Pos [°]	-150	0	+150
	Turn Mode	Left	Power On	Right
	Pos Command	-16383	0	+16383
	Pos [°]	-359	0	+359
	Turn Range	-32760 ~ +32760 (CAN only)		
Operating Temperature Range	-30°C ~ +70°C (-22°F ~ +158°F)			
Storage Temperature Range	-40°C ~ +80°C (-40°F ~ +176°F)			
Vibrations at no Load	MIL-STD-810G 514.6C-VII / EN 60068-2-6			
Connector Wire Length	-			
Connector Wire Gauge	-			
Connector Wire Strand Count	-			
External Dimensions	64.0 x 33.0 x 90.0mm			
Weight*	480.0g			
Ball Bearing	6 Ball Bearings & 2 Needle Bearings			
Case Material	Rugged Aluminum Alloy With Hardcoat Anodizing			
Gear Material	4 Hardened Steel Gears			
Gear Train Backlash	Max. 0.5°			
Horn Gear Spline	Square 6.5 x 6.5			
Accessories	Mounting Hardware, Servo Horn (I-MOS)			
IP-Rating	IP68			
MTTF	>1000h			
Revision & Stand	Rev. 1.2 / 01.02.2024			
Changelog	-			

\*of the servo only w/o horns and accessories

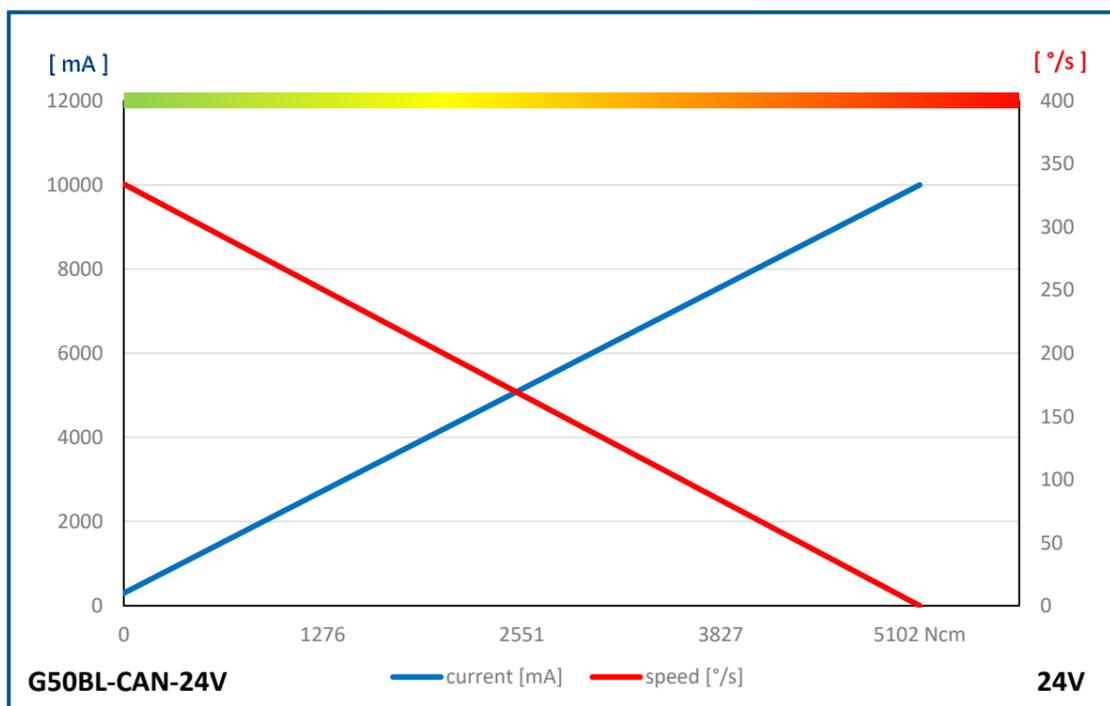
# SG33BL-T-CAN-24V (GLAND CABLE)

#1-02464



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## PERFORMANCE CHART



G50BL-CAN-24V

— current [mA] — speed [°/s]

24V

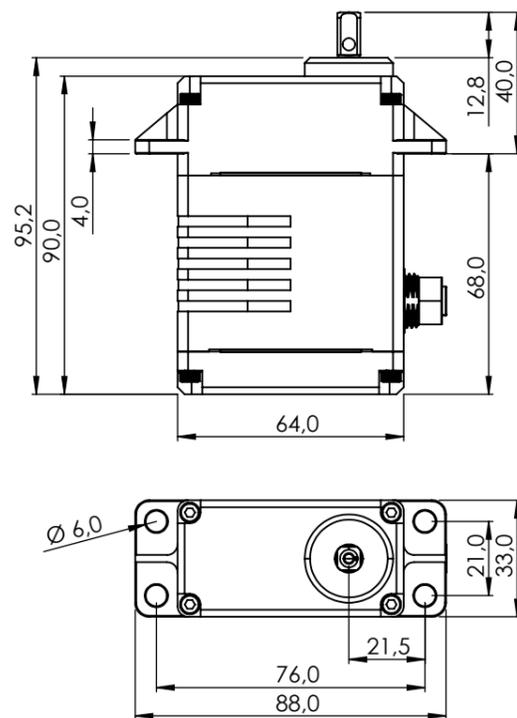
## GENERAL SPECIFICATION

SG33BL-T-CAN-24V (Gland Cable)				
Control System	CAN2.0A,B / DroneCAN (UAVCAN v0)			
	Protocol (Mode)	Standard 2.0A	Extended 2.0B	DroneCAN
	Baud-Rate	10kbps ~ 1Mbps		
	Sample-Point	50% or 87.5%		
	Available SERVO ID	1 ~ 254		1 ~ 127
	Available Node ID	1 ~ 2047	1 ~ 536870911	1 ~ 127
Input Signal Range	0 ~ 5V			
Connector Type	-			
Position Sensor Type	Contactless Magnetic Encoder			
Motor Type	BLDC			
Amplifier / MCU	32Bit programmable Digital			
Operating Voltage Range	18.0 ~ 32.0V			
Operating Voltage	At 24.0V			
Operating Speed at no Load	324°/s (54RPM)			
Stall Torque	147.0kgcm (1442.1Ncm)			
Rest Current	20mA			
Running Current at no Load	230mA			
Stall Current	6400mA			
Deadband Width	-			
Travel	Travel / Command	90° / 4096		
	Servo mode	Left	Center	Right
	Pos Command	+1366	+8192	+15018
	Pos [°]	-150	0	+150
	Turn Mode	Left	Power On	Right
	Pos Command	-16383	0	+16383
	Pos [°]	-359	0	+359
	Turn Range	-32760 ~ +32760 (CAN only)		
Operating Temperature Range	-30°C ~ +70°C (-22°F ~ +158°F)			
Storage Temperature Range	-40°C ~ +80°C (-40°F ~ +176°F)			
Vibrations at no Load	MIL-STD-810G 514.6C-VII / EN 60068-2-6			
Connector Wire Length	400mm			
Connector Wire Gauge	20AWG			
Connector Wire Strand Count	80/0.08			
External Dimensions	64.0 x 33.0 x 90.0mm			
Weight*	500.0g			
Ball Bearing	6 Ball Bearings & 2 Needle Bearings			
Case Material	Rugged Aluminum Alloy With Hardcoat Anodizing			
Gear Material	4 Hardened Steel Gears			
Gear Train Backlash	Max. 0.5°			
Horn Gear Spline	Square 6.5 x 6.5			
Accessories	Mounting Hardware, Servo Horn (I-MOS)			
IP-Rating	IP68			
MTTF	>1000h			
Revision & Stand	Rev. 1.2 / 01.02.2024			
Changelog	-			

\*of the servo only w/o horns and accessories

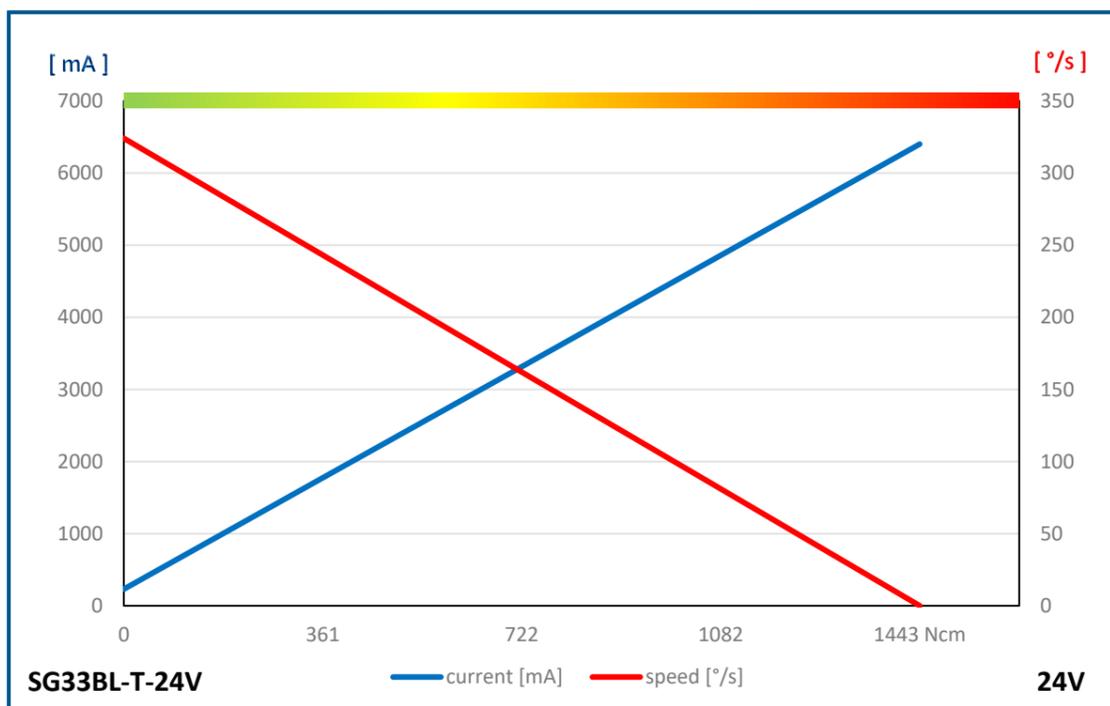
# SG33BL-T-CAN-24V (CIRCULAR)

#1-02465



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## PERFORMANCE CHART



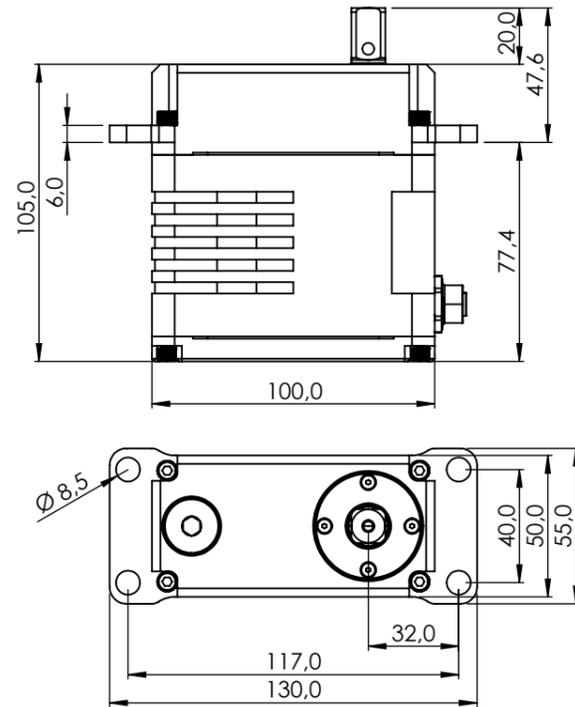
## GENERAL SPECIFICATION

SG33BL-T-CAN-24V (Circular)				
Control System	CAN 2.0A,B / DroneCAN (UAVCAN v0)			
	Protocol (Mode)	Standard 2.0A	Extended 2.0B	DroneCAN
	Baud-Rate	10kbps ~ 1Mbps		
	Sample-Point	50% or 87.5%		
	Available SERVO ID	1 ~ 254		1 ~ 127
	Available Node ID	1 ~ 2047	1 ~ 536870911	1 ~ 127
Input Signal Range	0 ~ 5V			
Connector Type	Circular			
Position Sensor Type	Contactless Magnetic Encoder			
Motor Type	BLDC			
Amplifier / MCU	32bit programmable Digital			
Operating Voltage Range	18.0 ~ 32.0V			
Operating Voltage	At 24.0V			
Operating Speed at no Load	324°/s (54RPM)			
Stall Torque	147.0kgcm (1442.1Ncm)			
Rest Current	20mA			
Running Current at no Load	230mA			
Stall Current	6400mA			
Deadband Width	-			
Travel	Travel / Command	90° / 4096		
	Servo mode	Left	Center	Right
	Pos Command	+1366	+8192	+15018
	Pos [°]	-150	0	+150
	Turn Mode	Left	Power On	Right
	Pos Command	-16383	0	+16383
	Pos [°]	-359	0	+359
	Turn Range	-32760 ~ +32760 (CAN only)		
Operating Temperature Range	-30°C ~ +70°C (-22°F ~ +158°F)			
Storage Temperature Range	-40°C ~ +80°C (-40°F ~ +176°F)			
Vibrations at no Load	MIL-STD-810G 514.6C-VII / EN 60068-2-6			
Connector Wire Length	-			
Connector Wire Gauge	-			
Connector Wire Strand Count	-			
External Dimensions	64.0 x 33.0 x 90.0mm			
Weight*	480.0g			
Ball Bearing	6 Ball Bearings & 2 Needle Bearings			
Case Material	Rugged Aluminum Alloy With Hardcoat Anodizing			
Gear Material	4 Hardened Steel Gears			
Gear Train Backlash	Max. 0.5°			
Horn Gear Spline	Square 6.5 x 6.5			
Accessories	Mounting Hardware, Servo Horn (I-MOS)			
IP-Rating	IP68			
MTTF	>1000h			
Revision & Stand	Rev. 1.2 / 01.02.2024			
Changelog	-			

\*of the servo only w/o horns and accessories

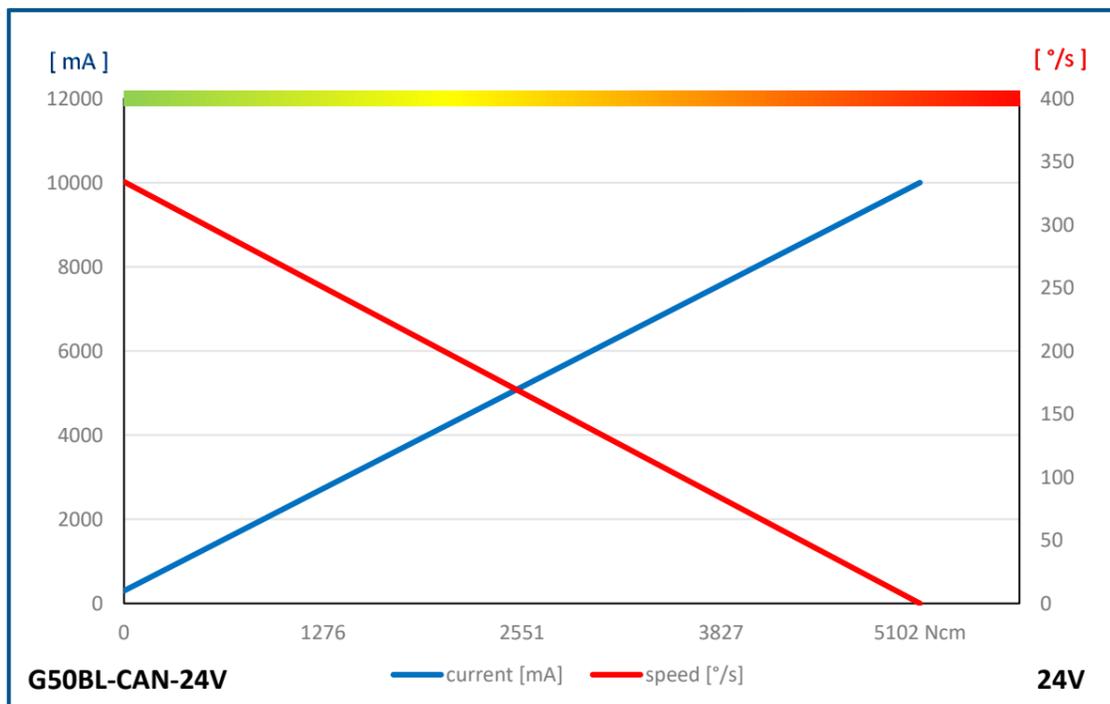
# SG50BL-CAN-24V(CIRCULAR)

#1-02412



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## PERFORMANCE CHART



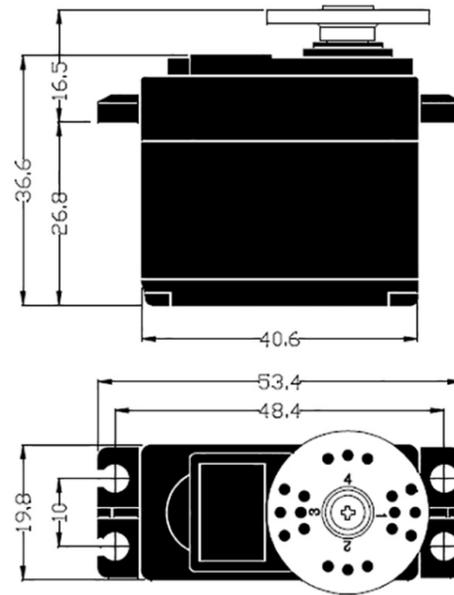
## GENERAL SPECIFICATION

SG50BL-CAN-24V (Circular)				
Control System	CAN 2.0A,B / DroneCAN (UAVCAN v0)			
	Protocol (Mode)	Standard 2.0A	Extended 2.0B	DroneCAN
	Baud-Rate	10kbps ~ 1Mbps		
	Sample-Point	50% or 87.5%		
	Available SERVO ID	1 ~ 254		1 ~ 127
	Available Node ID	1 ~ 2047	1 ~ 536870911	1 ~ 127
Input Signal Range	0 ~ 5V			
Connector Type	Circular			
Position Sensor Type	Contactless Magnetic Encoder			
Motor Type	BLDC			
Amplifier / MCU	32bit programmable Digital			
Operating Voltage Range	18.0 ~ 32.0V			
Operating Voltage	At 24.0V			
Operating Speed at no Load	120°/s (20RPM)			
Stall Torque	520.0kgcm (5101.2Ncm)			
Rest Current	45mA			
Running Current at no Load	300mA			
Stall Current	10000mA			
Deadband Width	-			
Travel	Travel / Command	90° / 4096		
	Servo mode	Left	Center	Right
	Pos Command	+1366	+8192	+15018
	Pos [°]	-150	0	+150
	Turn Mode	Left	Power On	Right
	Pos Command	-16383	0	+16383
	Pos [°]	-359	0	+359
	Turn Range	-32760 ~ +32760 (CAN only)		
Operating Temperature Range	-30°C ~ +70°C (-22°F ~ +158°F)			
Storage Temperature Range	-40°C ~ +80°C (-40°F ~ +176°F)			
Vibrations at no Load	MIL-STD 810G 514.6C VII / EN 60068-2-6			
Connector Wire Length	-			
Connector Wire Gauge	-			
Connector Wire Strand Count	-			
External Dimensions	100.0 x 50.0 x 105.0mm			
Weight*	1450g			
Ball Bearing	4 Angular Ball Bearings & 9 Needle Bearings			
Case Material	Rugged Aluminum Alloy With Hardcoat Anodizing			
Gear Material	5 Hardened Steel Gears			
Gear Train Backlash	Max. 0.5°			
Horn Gear Spline	Square 12.0 x 12.0			
Accessories	Mounting Hardware, Servo Horn (I-MOS12)			
IP-Rating	IP68			
MTTF	>1000h			
Revision & Stand	Rev. 1.2 / 01.02.2024			
Changelog	-			

\*of the servo only w/o horns and accessories

# HSR-1425CR

#138114



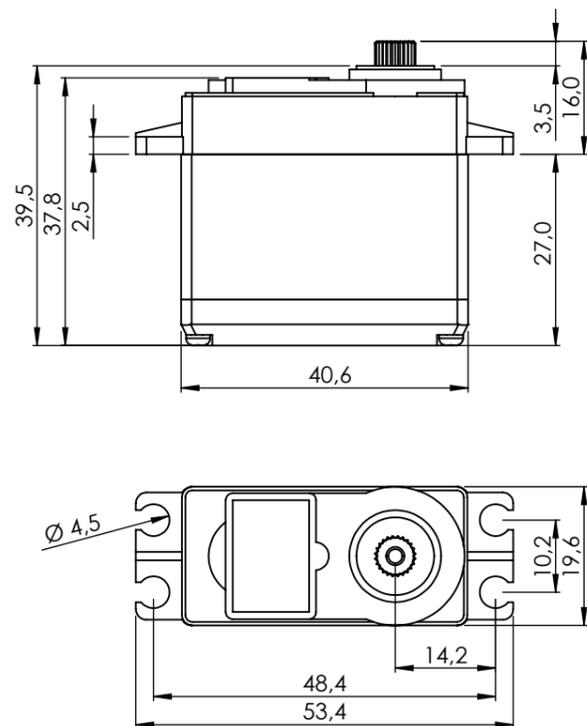
## GENERAL SPECIFICATION

HSR-1425CR			
Control System	PWM		
Position Sensor Type	-		
Motor Type	Cored Metal Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	-	-
No Load Speed	43.4RPM	-	-
Stall Torque	2.8kgf·cm (38.9 oz·in)	-	-
Peak Efficiency Torque	0.6kgf·cm ( 8.3 oz·in)	-	-
Standing Current	8mA	-	-
No Load Running Current	150mA	-	-
Stall Current	640mA	-	-
Deadband	-	-	-
Operating Travel	Default: Continuous Rotation / Pulse Width: 900~2100µs(Center:1500µs)		
Continuous Rotation	Able		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	26AWG		
Dimensions	40.6mm x 19.8mm x 36.6mm (1.598inch x 0.780inch x 1.441inch)		
Weight	41.7g (1.471oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	4 Resin Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	Analog Contorller		

# HSR-2645CRH

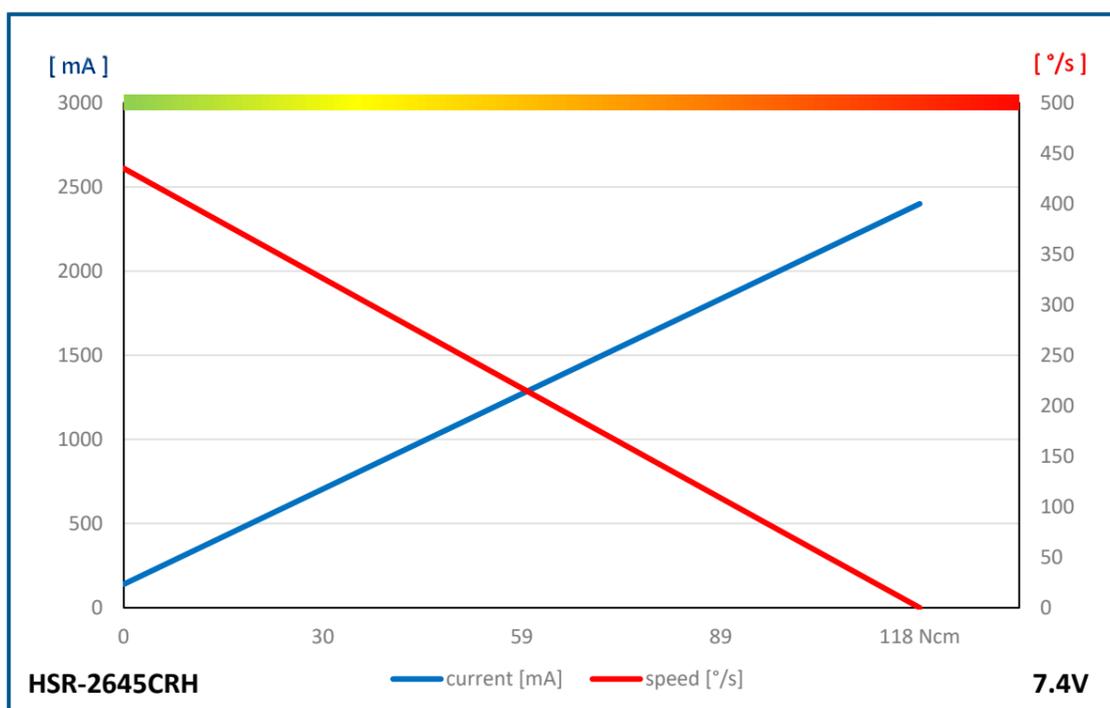
#138645

#1-02360 GP 24 Stück



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## PERFORMANCE CHART

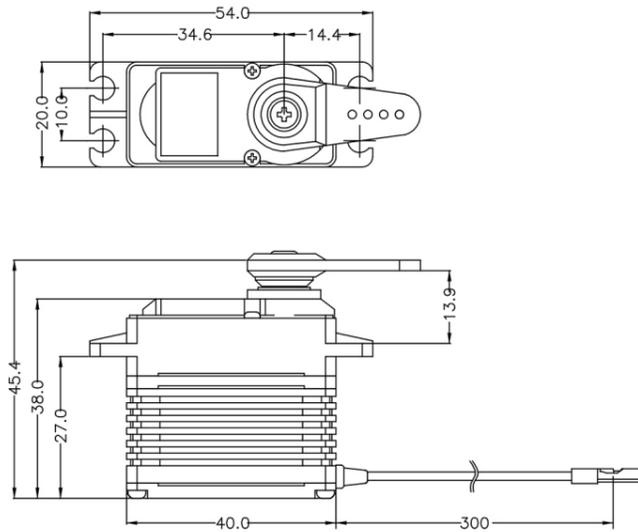


## GENERAL SPECIFICATION

HSR-2645CRH		
Control System	PWM	
	Pulse Width 900µs 1500µs (Center) 2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	-	
Motor Type	Cored Carbon Brush	
Amplifier / MCU	8bit programmable Digital Amplifier with Mosfet Drive	
Operating Voltage Range	3.5V ~ 8.4V	
Operating Voltage	At 6.0V	At 7.4V
Operating Speed at no Load	347°/s (58RPM)	435°/s (72RPM)
Stall Torque	10.0kgcm (98.1Ncm)	12.0kgcm (117.7Ncm)
Peak Efficiency Torque	2.0kgcm (19.6Ncm)	2.4kgcm (23.5Ncm)
Rest Current	3mA	3mA
Running Current at no Load	120mA	140mA
Stall Current	2000mA	2400mA
Deadband Width	-	-
Operating Travel	Default	Continuous Rotation
	Programmable	Yes
	Multi Turn/Continuous Rotation	Yes / Yes
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)	
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)	
Connector Wire Length	300mm	
Connector Wire Gauge	22AWG	
Connector Wire Strand Count	60/0.08	
External Dimensions	40.6 x 19.6 x 37.8mm	
Weight*	53.0g	
Ball Bearing	Dual Ball Bearing	
Case Material	Engineering Plastic	
Gear Material	1 Metal-Plastic & 3 Metal Gears	
Gear Train Backlash	Max 0.5°	
Horn Gear Spline	H24T Ø6.0	
Accessories	Mounting Hardware, Servo Horn (R-O)	
IP-Rating	IP4X	
Revision	Rev. 1.0 / 02.01.2024	
Changelog	-	
* of the servo only w/o horns and accessories		

# HSB-9360TH

#116360

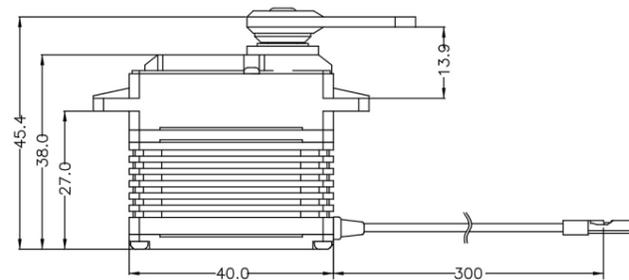
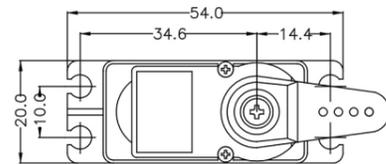


## GENERAL SPECIFICATION

HSB-9360TH			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	BLDC		
Operating Voltage Range	4.0 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.08sec/60°	0.06sec/60°
Stall Torque	-	17.0kgf·cm (236.1 oz-in)	17.0kgf·cm (236.1 oz-in)
Peak Efficiency Torque	-	3.4kgf·cm (47.2 oz-in)	3.4kgf·cm (47.2 oz-in)
Standing Current	-	27mA	27mA
No Load Running Current	-	250mA	250mA
Stall Current	-	2,700mA	2,100mA
Deadband	-	1μs	1μs
Operating Travel	Default: ±60°, Programmable: Max 160° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81 inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 38.5mm (1.575inch x 0.787inch x 1.516inch)		
Weight	68.0g (2.399oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic & Aluminum Heat Sink		
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	16bit Programmable Digital		

# HSB-9370TH

#116370

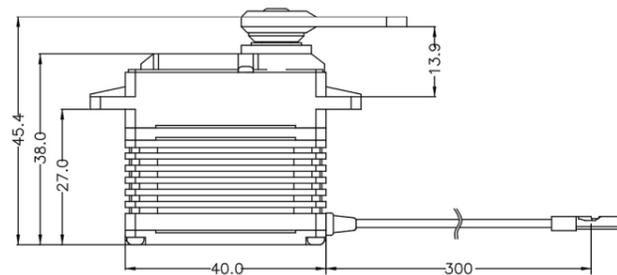
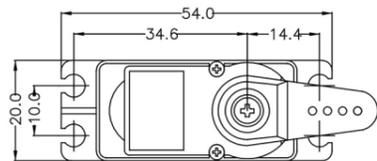


## GENERAL SPECIFICATION

HSB-9370TH			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	BLDC		
Operating Voltage Range	4.0 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.12sec/60°	0.10sec/60°
Stall Torque	-	25.0kgf-cm (347.2 oz-in)	25.0kgf-cm (347.2 oz-in)
Peak Efficiency Torque	-	5.0kgf-cm (69.4 oz-in)	5.0kgf-cm (69.4 oz-in)
Standing Current	-	27mA	27mA
No Load Running Current	-	250mA	250mA
Stall Current	-	2,700mA	2,100mA
Deadband	-	1μs	1μs
Operating Travel	Default: ±60°, Programmable: Max 160° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81 inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 38.5mm (1.575inch x 0.787inch x 1.516inch)		
Weight	68.0g (2.399oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic & Aluminum Heat Sink		
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	16bit Programmable Digital		

# HSB-9380TH

#116380



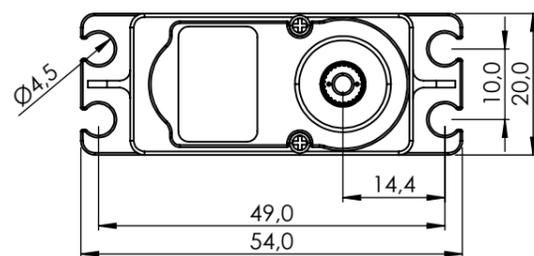
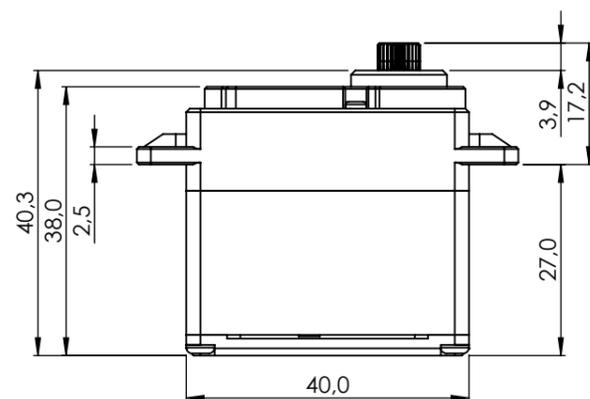
## GENERAL SPECIFICATION

HSB-9380TH			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	BLDC		
Operating Voltage Range	4.0 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.18sec/60°	0.14sec/60°
Stall Torque	-	34.0kgf·cm (472.2 oz-in)	34.0kgf·cm (472.2 oz-in)
Peak Efficiency Torque	-	6.8kgf·cm (94.4 oz-in)	6.8kgf·cm (94.4 oz-in)
Standing Current	-	27mA	27mA
No Load Running Current	-	250mA	250mA
Stall Current	-	2,700mA	2,100mA
Deadband	-	1μs	1μs
Operating Travel	Default: ±60°, Programmable: Max 160° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81 inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 38.5mm (1.575inch x 0.787inch x 1.516inch)		
Weight	68.0g (2.399oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic & Aluminum Heat Sink		
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	16bit Programmable Digital		

# HSB-9381TH

#1-00074

#1-02357 GP 24 Stück

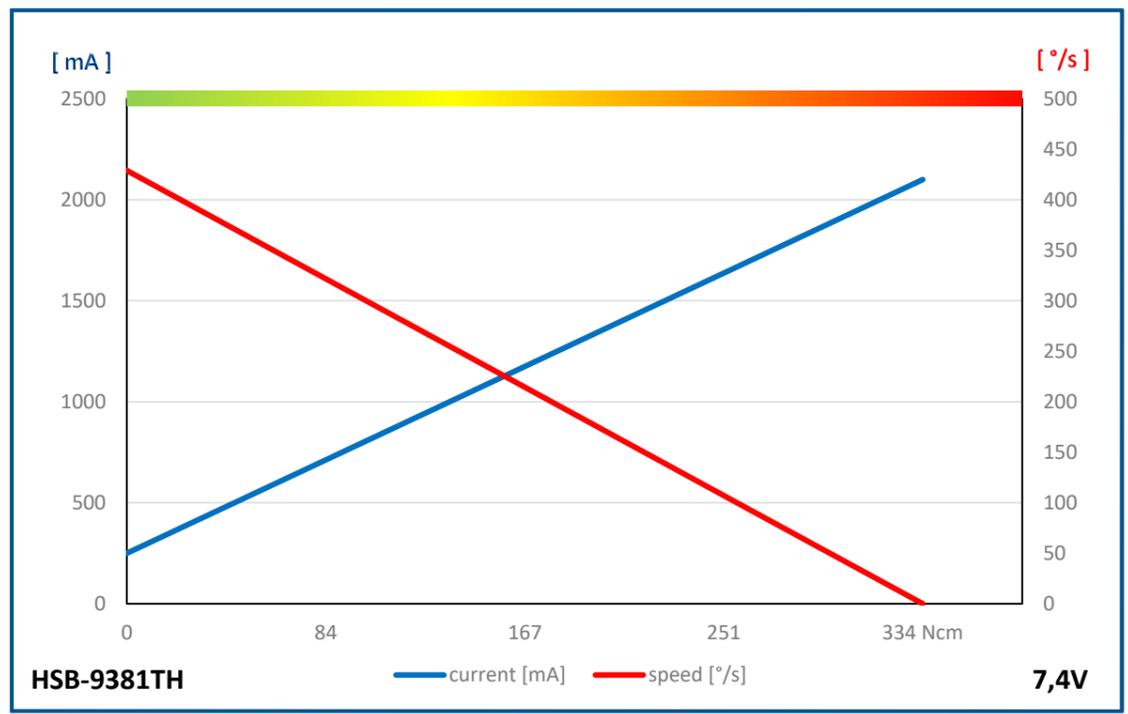


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## GENERAL SPECIFICATION

HSB-9381TH		
Control System	PWM	
	Pulse Width 900µs 1500µs (Center) 2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Indirect Drive / 4 Slider / 1M Cycle Long Life	
Motor Type	BLDC	
Amplifier / MCU	16bit programmable Digital	
Operating Voltage Range	4.0V ~ 8.4V	
Operating Voltage	At 6.0V	At 7.4V
Operating Speed at no Load	353°/s (59RPM)	429°/s (71RPM)
Stall Torque	34.0kgcm (333.5Ncm)	34.0kgcm (333.5Ncm)
Peak Efficiency Torque	6.8kgcm (66.7Ncm)	6.8kgcm (66.7Ncm)
Rest Current	27mA	27mA
Running Current at no Load	250mA	250mA
Stall Current	2700mA	2100mA
Deadband Width	1µs	1µs
Operating Travel	Default	±60°
	Programmable	Max. 160°
	Multi Turn/Continuous Rotation	n/a / n/a
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)	
Storage Temperature Range	-30°C ~ +80°C (-31°F ~ +176°F)	
Connector Wire Length	300mm	
Connector Wire Gauge	20AWG	
Connector Wire Strand Count	80/0.08	
External Dimensions	40.0 x 20.0 x 38.0mm	
Weight*	79.0g	
Ball Bearing	Dual Ball Bearing	
Case Material	Aluminum Alloy	
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears	
Gear Train Backlash	Max 0.5°	
Horn Gear Spline	H25T Ø6.0	
Accessories	Mounting Hardware, Servo Horns (HD-IM25, HD-LS25, HD-OS25, HD-X25)	
IP-Rating	IP54	
Revision	Rev. 1.1 / 03.01.2024	
Changelog	-	
*of the servo w/o horns and accessories		

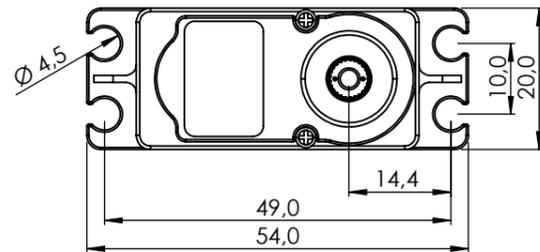
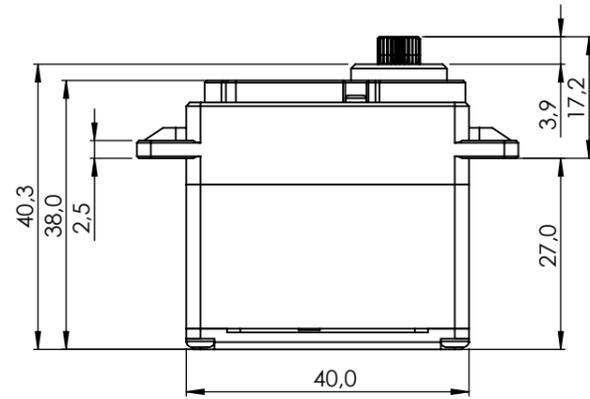
## PERFORMANCE CHART



# HSB-M9381TH

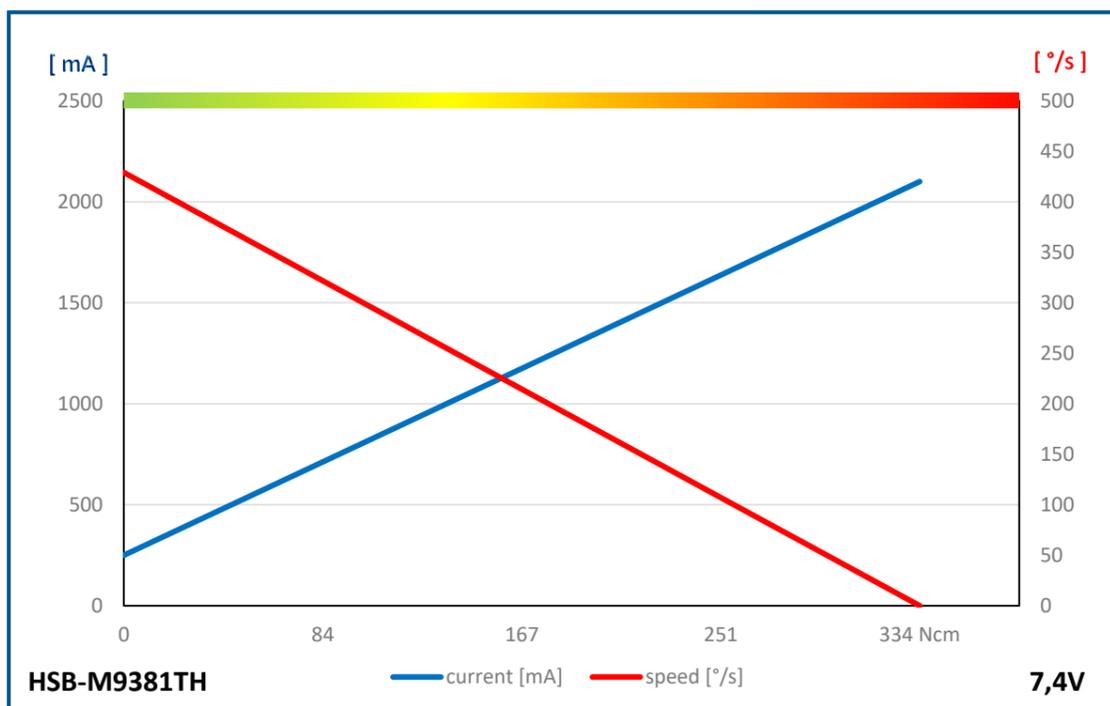
#1-01191

#1-02353 GP 24 Stück



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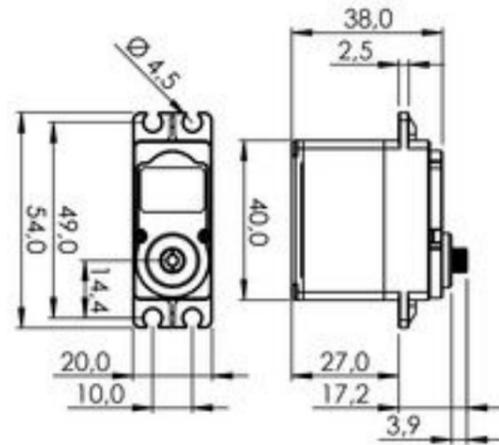


## GENERAL SPECIFICATION

HSB-M9381TH		
Control System	PWM	
	Pulse Width 900µs 1500µs (Center) 2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Contactless Magnetic Encoder	
Motor Type	BLDC	
Amplifier / MCU	16bit programmable Digital Amplifier with Mosfet Drive	
Operating Voltage Range	4.0V ~ 8.4V	
Operating Voltage	At 6.0V	At 7.4V
Operating Speed at no Load	353°/s (59RPM)	429°/s (71RPM)
Stall Torque	34.0kgcm (333.5Ncm)	34.0kgcm (333.5Ncm)
Peak Efficiency Torque	6.8kgcm (66.7Ncm)	6.8kgcm (66.7Ncm)
Rest Current	27mA	27mA
Running Current at no Load	250mA	250mA
Stall Current	2700mA	2100mA
Deadband Width	1µs	1µs
Operating Travel	Default	±60°
	Programmable	Max. 300°
	Multi Turn/Continuous Rotation	n/a / n/a
Operating Temperature Range	-20°C ~ +70°C (-4°F ~ +158°F)	
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)	
Connector Wire Length	300mm	
Connector Wire Gauge	20AWG	
Connector Wire Strand Count	80/0.08	
External Dimensions	40.0 x 20.0 x 38.0mm	
Weight*	78.0g	
Ball Bearing	Dual Ball Bearing	
Case Material	Aluminum Alloy	
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears	
Gear Train Backlash	Max 0.5°	
Horn Gear Spline	H25T Ø6.0	
Accessories	Mounting Hardware, Servo Horns (HD-IM25, HD-LS25, HD-OS25, HD-X25)	
IP-Rating	IP54	
Revision	Rev. 1.1 / 03.01.2024	
Changelog	-	
*of the servo w/o horns and accessories		

# HSR-M9382TH

#1-01251



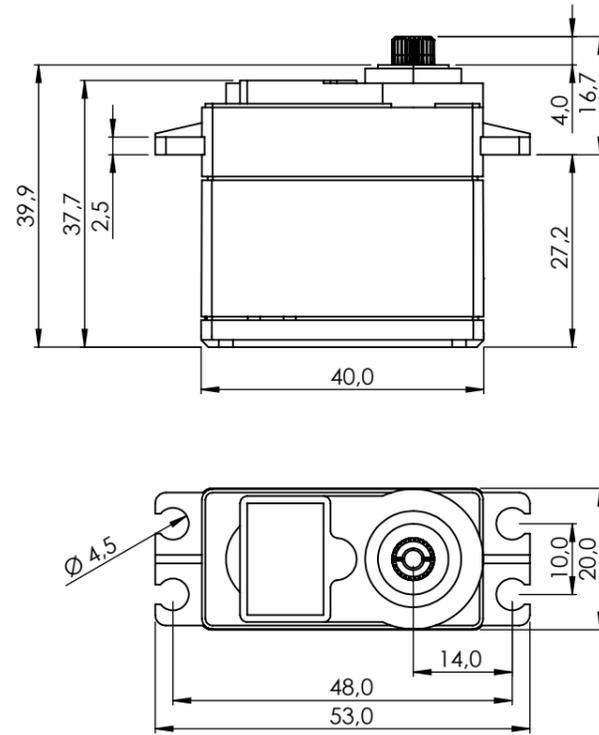
## GENERAL SPECIFICATION

M9382TH			
Control System	PWM		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	BLDC		
Operating Voltage Range	4.0 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.17sec/60°	0.14sec/60°
Stall Torque	-	34.0kgf-cm (472.2 oz-in)	34.0kgf-cm (472.2 oz-in)
Peak Efficiency Torque	-	6.8kgf-cm (94.4 oz-in)	6.8kgf-cm (94.4 oz-in)
Standing Current	-	27mA	27mA
No Load Running Current	-	250mA	250mA
Stall Current	-	2,700mA	2,100mA
Deadband	-	1μs	1μs
Operating Travel	Default: ±180°, Multi Turn : Max ±3.5 Turn / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	able		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 38.0mm (1.575inch x 0.787inch x 1.496inch)		
Weight	72.0g (2.540oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic & Aluminum Heat Sink		
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	16bit Programmable Digital		

# HSB-9465SH

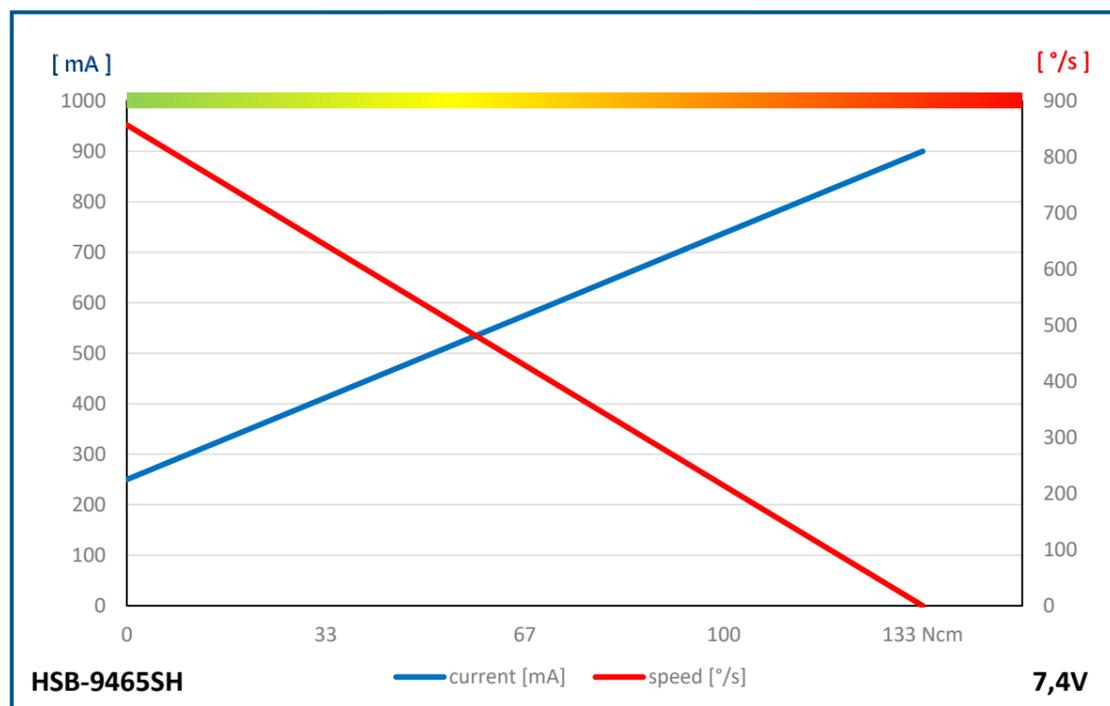
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#1-02355 GP 24 STÜCK



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## PERFORMANCE CHART



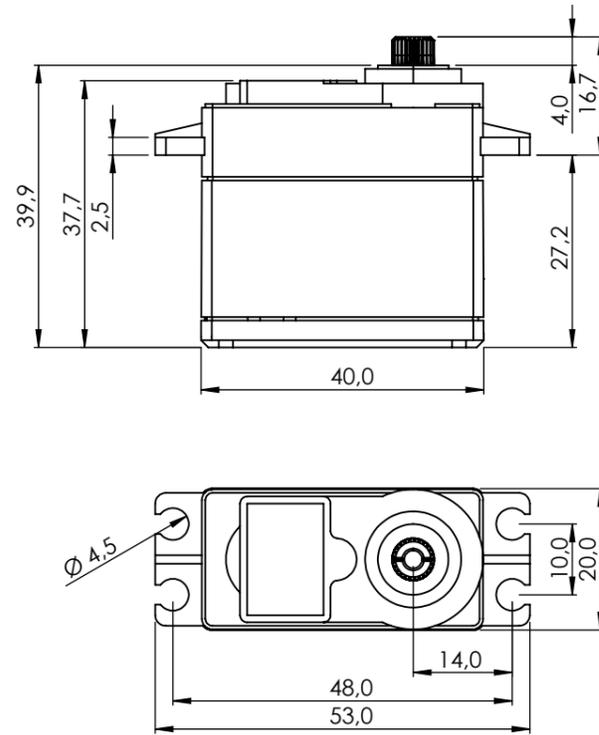
## GENERAL SPECIFICATION

HSB-9465SH		
Control System	PWM	
	Pulse Width 900µs 1500µs (Center) 2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Indirect Drive / 4 Slider / 1M Cycle Long Life	
Motor Type	BLDC	
Amplifier / MCU	16bit programmable Digital Amplifier with Mosfet Drive	
Operating Voltage Range	4.0V ~ 8.4V	
Operating Voltage	At 6.0V	At 7.4V
Operating Speed at no Load	667°/s (111RPM)	857°/s (143RPM)
Stall Torque	13.5kgcm (132.4Ncm)	13.5kgcm (132.4Ncm)
Peak Efficiency Torque	2.7kgcm (26.5Ncm)	2.7kgcm (26.5Ncm)
Rest Current	30mA	30mA
Running Current at no Load	250mA	250mA
Stall Current	1100mA	900mA
Deadband Width	1µs	1µs
Operating Travel	Default	±60°
	Programmable	Max. 160°
	Multi Turn/Continuous Rotation	n/a / n/a
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)	
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)	
Connector Wire Length	300mm	
Connector Wire Gauge	20AWG	
Connector Wire Strand Count	80/0.08	
External Dimensions	40.0 x 20.0 x 37.7mm	
Weight*	62.0g	
Ball Bearing	Dual Ball Bearing	
Case Material	Engineering Plastic	
Gear Material	1 Metal-Plastic & 3 Steel Gears	
Gear Train Backlash	Max. 0.5°	
Horn Gear Spline	H25T Ø6.0	
Accessories	Mounting Hardware, HD-IM25, HD-LS25, HD-OS25, HD-X25, HD-IL25, HD-LL25	
IP-Rating	IP54	
Revision	Rev. 1.1 / 03.01.2024	
Changelog	-	
*of the servo w/o horns and accessories		

# HSB-9485SH

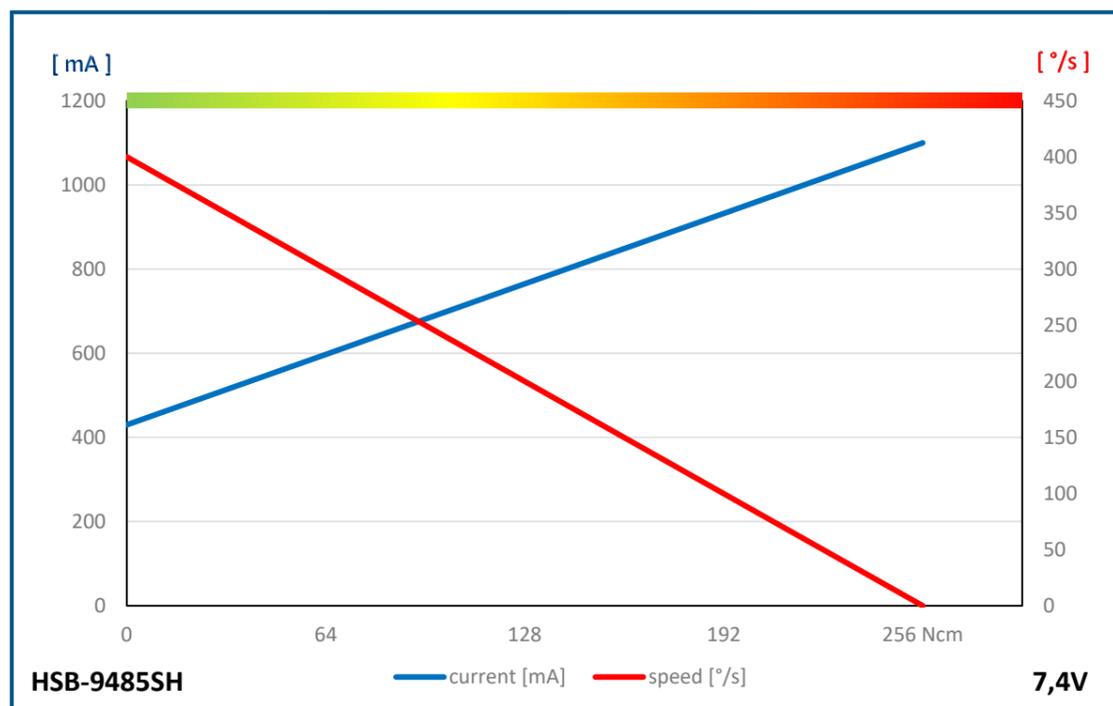
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#1-02356 GP 24 STÜCK



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## PERFORMANCE CHART

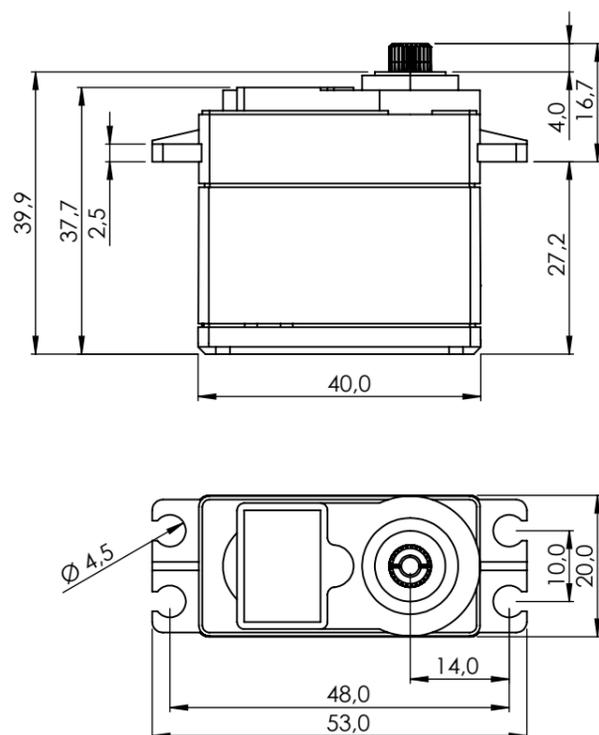


## GENERAL SPECIFICATION

HSB-9485SH		
Control System	PWM	
	Pulse Width 900µs 1500µs (Center) 2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Indirect Drive / 4 Slider / 1M Cycle Long Life	
Motor Type	BLDC	
Amplifier / MCU	16bit programmable Digital Amplifier with Mosfet Drive	
Operating Voltage Range	4.0V ~ 8.4V	
Operating Voltage	At 6.0V	At 7.4V
Operating Speed at no Load	333°/s (56RPM)	400°/s (67RPM)
Stall Torque	26.0kgcm (255.1Ncm)	26.0kgcm (255.1Ncm)
Peak Efficiency Torque	5.2kgcm (51.0Ncm)	5.2kgcm (51.0Ncm)
Rest Current	30mA	30mA
Running Current at no Load	360mA	430mA
Stall Current	1300mA	1100mA
Deadband Width	1µs	1µs
Operating Travel	Default	±60°
	Programmable	Max. 160°**
	Multi Turn/Continuous Rotation	n/a / n/a
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)	
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)	
Connector Wire Length	300mm	
Connector Wire Gauge	20AWG	
Connector Wire Strand Count	80/0.08	
External Dimensions	40.0 x 20.0 x 37.7mm	
Weight*	62.0g	
Ball Bearing	Dual Ball Bearing	
Case Material	Engineering Plastic	
Gear Material	1 Metal-Plastic & 3 Steel Gears	
Gear Train Backlash	Max. 0.5°	
Horn Gear Spline	H25T $\varnothing 6.0$	
Accessories	Mounting Hardware, Servo Horns (HD-IM25, HD-LS25, HD-OS25, HD-X25, HD-IL25, HD-LL25)	
IP-Rating	IP54	
Revision	Rev. 1.1 / 03.01.2024	
Changelog	-	
*of the servo w/o horns and accessories		
** also available with 270°		

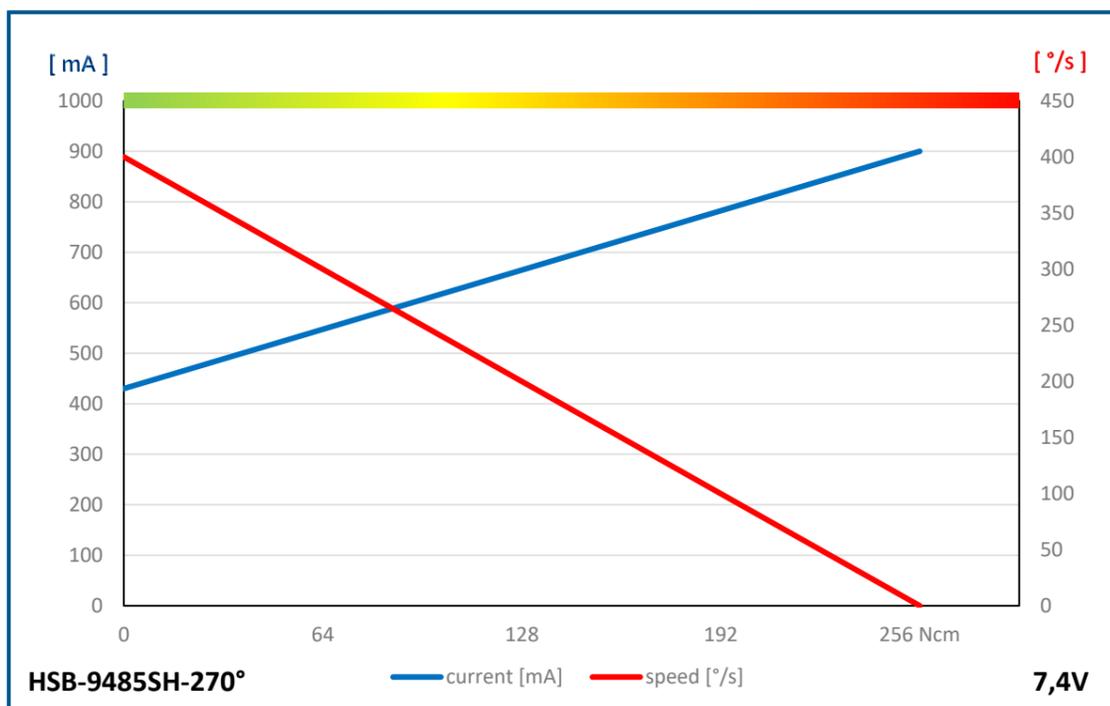
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#1-00409



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## PERFORMANCE CHART

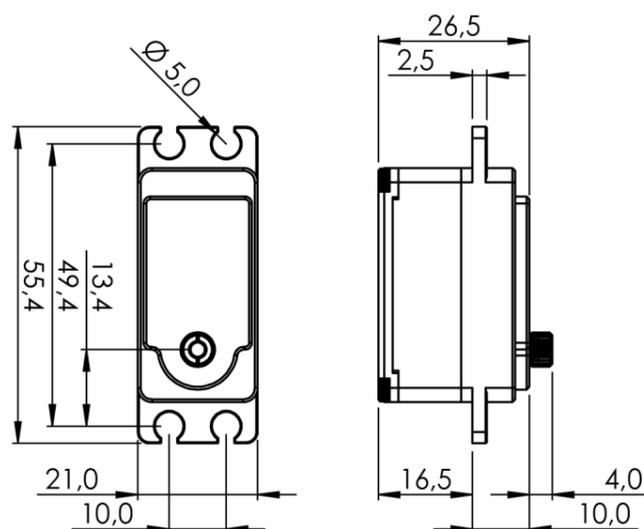


## GENERAL SPECIFICATION

HSB-9485SH-270°		
Control System	PWM	
	Pulse Width 900µs 1500µs (Center) 2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Indirect Drive / 4 Slider / 1M Cycle Long Life	
Motor Type	BLDC	
Amplifier / MCU	16bit programmable Digital Amplifier with Mosfet Drive	
Operating Voltage Range	4.0V ~ 8.4V	
Operating Voltage	At 6.0V	At 7.4V
Operating Speed at no Load	333°/s (56RPM)	400°/s (67RPM)
Stall Torque	26.0kgcm (255.1Ncm)	26.0kgcm (255.1Ncm)
Peak Efficiency Torque	5.2kgcm (51.0Ncm)	5.2kgcm (51.0Ncm)
Rest Current	30mA	30mA
Running Current at no Load	360mA	430mA
Stall Current	1100mA	900mA
Deadband Width	1µs	1µs
Operating Travel	Default	±60°
	Programmable	Max. 270°
	Multi Turn/Continuous Rotation	n/a / n/a
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)	
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)	
Connector Wire Length	300mm	
Connector Wire Gauge	20AWG	
Connector Wire Strand Count	80/0.08	
External Dimensions	40.0 x 20.0 x 37.7mm	
Weight*	62.0g	
Ball Bearing	Dual Ball Bearing	
Case Material	Engineering Plastic	
Gear Material	1 Metal-Plastic & 3 Steel Gears	
Gear Train Backlash	Max. 0.5°	
Horn Gear Spline	H25T Ø6.0	
Accessories	Servo Horn (HD-LS25)	
IP-Rating	IP54	
Revision	Rev. 1.0 / 09.01.2024	
Changelog	-	
*of the servo w/o horns and accessories		

## DB777WP

#1-01538

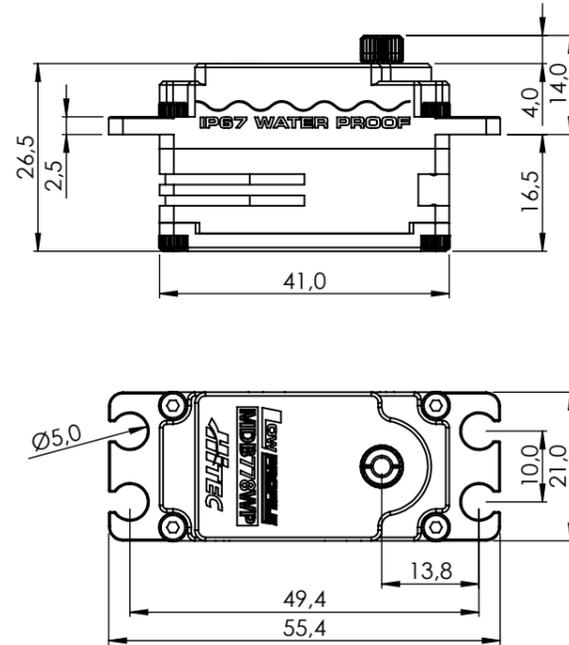


## GENERAL SPECIFICATION

DB777WP			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	BLDC		
Operating Voltage Range	4.0 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.08sec/60°	0.06sec/60°
Stall Torque	-	8.0kgf-cm (111.1 oz-in)	11.0kgf-cm (152.76oz-in)
Peak Efficiency Torque	-	1.6kgf-cm (22.22oz-in)	2.2kgf-cm (30.55oz-in)
Standing Current	-	35mA	35mA
No Load Running Current	-	250mA	350mA
Stall Current	-	3,500mA	4,500mA
Deadband	-	1μs	1μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +70°C (-4°F ~+158°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	200mm (7.874inch)		
Connector Wire Gauge	20AWG		
Dimensions	41.0mm x 21.0mm x 26.5mm (1.614inch x 0.827inch x 1.043inch)		
Weight	68.0g (2.399oz)		
Bearing Type	2 Ball Bearing		
Case Material	Rugged Aluminum Alloy		
Gear Material	5 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP67		
Servo Amplifier Type	32bit Programmable Digital		

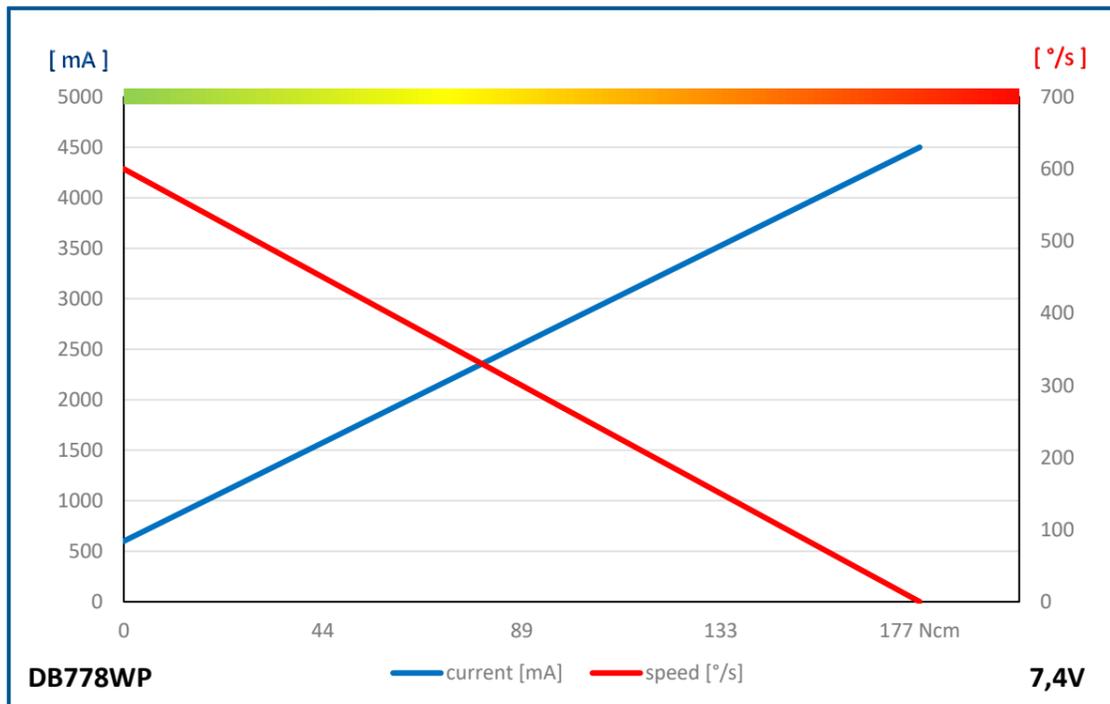
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#1-02853



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## PERFORMANCE CHART

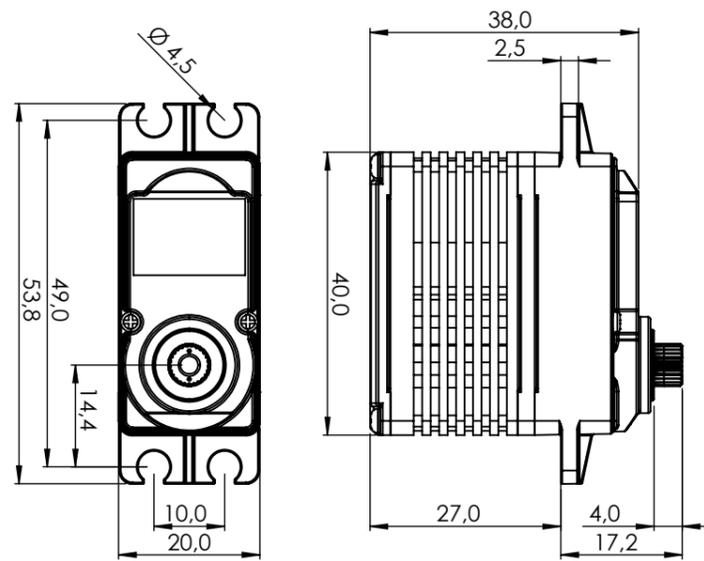


## GENERAL SPECIFICATION

DB778WP		
Control System	PWM / TTL (Half Duplex)	
	Pulse Width 900µs 1500µs (Center) 2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Contact Analog Potentiometer	
Motor Type	BLDC	
Amplifier / MCU	32bit programmable Digital	
Operating Voltage Range	4.0V ~ 8.4V	
Operating Voltage	At 6.0V	At 7.4V
Operating Speed at no Load	500°/s (83RPM)	600°/s (100RPM)
Stall Torque	15.0kgcm (147.2Ncm)	18.0kgcm (175.6Ncm)
Peak Efficiency Torque	3.0kgcm (29.4Ncm)	3.6kgcm (35.3Ncm)
Rest Current	28mA	28mA
Running Current at no Load	500mA	600mA
Stall Current	3500mA	4500mA
Deadband Width	1µs	1µs
Operating Travel	Default	±60°
	Programmable	Max. 175°
	Multi Turn/Continuous Rotation	n/a / n/a
Operating Temperature Range	-20°C ~ +70°C (-4°F ~ +158°F)	
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)	
Vibrations at no Load	-	
Connector Wire Length	200mm	
Connector Wire Gauge	20AWG	
Connector Wire Strand Count	80/0.08	
External Dimensions	41.0 x 21.0 x 26.5mm	
Weight*	66.0g	
Ball Bearing	Dual Ball Bearing	
Case Material	Rugged Aluminum Alloy	
Gear Material	5 Hardened Steel Gears	
Gear Train Backlash	Max. 0.5°	
Horn Gear Spline	H25T Ø6.0	
Accessories	Hex Screw, Servo Horns (HD-IM25, HD-LS25, HD-OS25, HD-X25)	
IP-Rating	IP67	
Revision	Rev. 1.0 / 09.01.2024	
Changelog	-	
*of the servo only w/o horns and accessories		

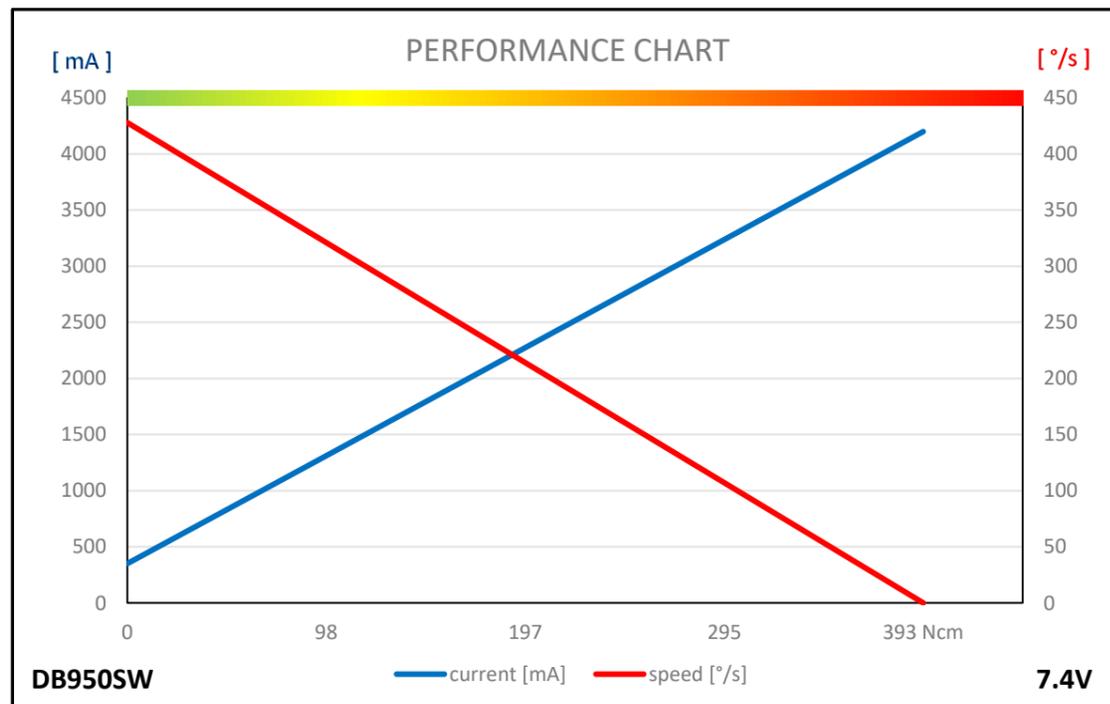
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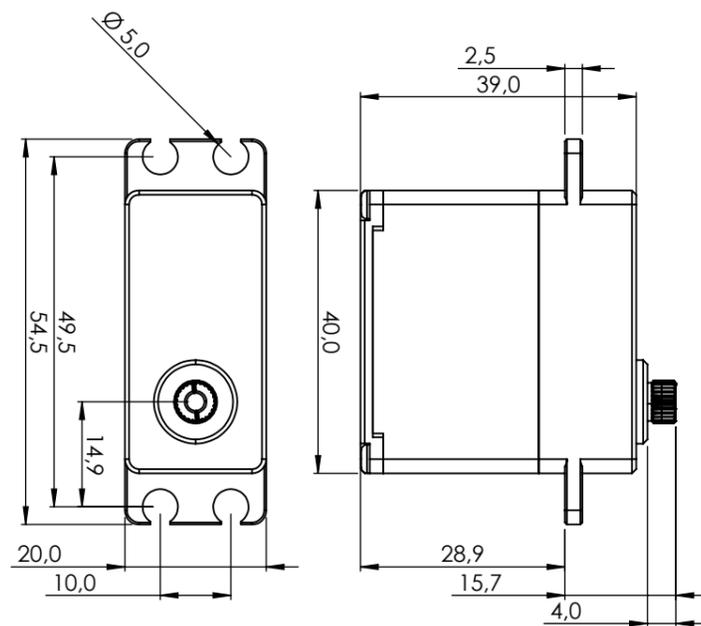
## GENERAL SPECIFICATION

DB950SW			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	BLDC		
Operating Voltage Range	4.0 ~ 8.4V		
Voltage	4.8V	6.0V	7.4V
No Load Speed	0.23sec/60°	0.18sec/60°	0.14sec/60°
Stall Torque	35.0kgf-cm (486.06oz-in)	40.0kgf-cm (555.5 oz-in)	40.0kgf-cm (555.5 oz-in)
Peak Efficiency Torque	7.0kgf-cm (97.21oz-in)	8.0kgf-cm (111.1 oz-in)	8.0kgf-cm (111.1 oz-in)
Standing Current	35mA	35mA	35mA
No Load Running Current	350mA	350mA	350mA
Stall Current	5,000mA	5,000mA	4,200mA
Deadband	1μs	1μs	1μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 38.5mm (1.575inch x 0.787inch x 1.516inch)		
Weight	68.0g (2.399oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic & Aluminum Heat Sink		
Gear Material	1 Metal-Plastic & 3 Hardened Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	32bit Programmable Digital		



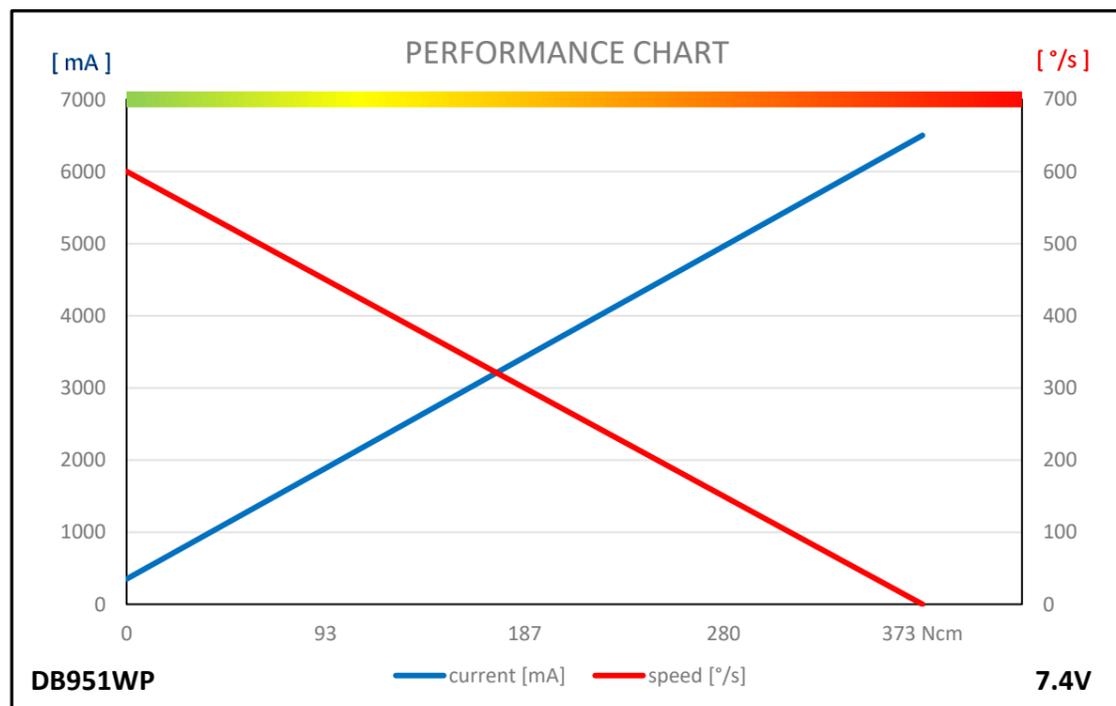
# DB951WP

#1-03088



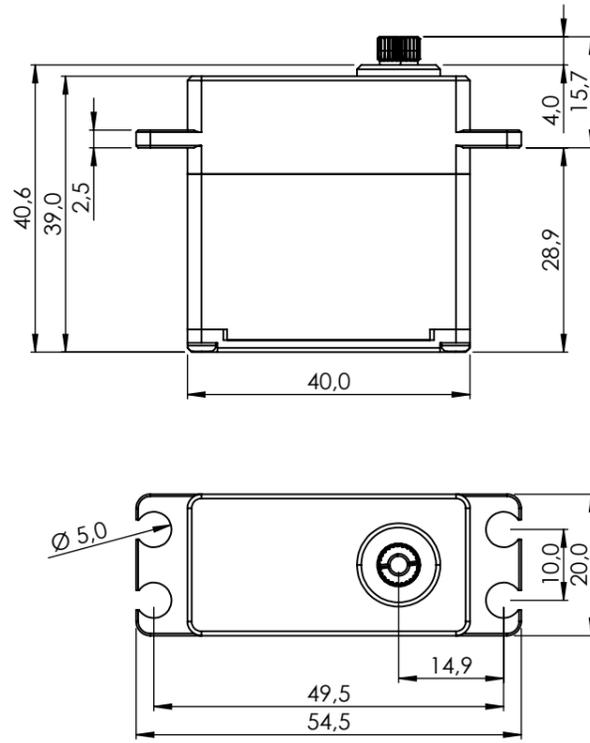
## GENERAL SPECIFICATION

DB951WP			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	BLDC		
Operating Voltage Range	4.0 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.12sec/60°	0.10sec/60°
Stall Torque	-	38.0kgf·cm (527.72oz-in)	38.0kgf·cm (527.72oz-in)
Peak Efficiency Torque	-	7.6kgf·cm (105.54oz-in)	7.6kgf·cm (105.54oz-in)
Standing Current	-	35mA	35mA
No Load Running Current	-	350mA	350mA
Stall Current	-	8,000mA	6,500mA
Deadband	-	1 $\mu$ s	1 $\mu$ s
Operating Travel	Default: $\pm 60^\circ$ , Programmable: Max 260° / Pulse Width: 900~2100 $\mu$ s(Center:1500 $\mu$ s)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 39.0mm (1.575inch x 0.787inch x 1.535inch)		
Weight	90.0g (3.175oz)		
Bearing Type	2 Ball Bearing		
Case Material	Aluminum Alloy		
Gear Material	5 Hardened Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T( $\varnothing 6$ )		
IP-Rating	IP67		
Servo Amplifier Type	16bit programmable Digital		



# DB961WP

#1-02571



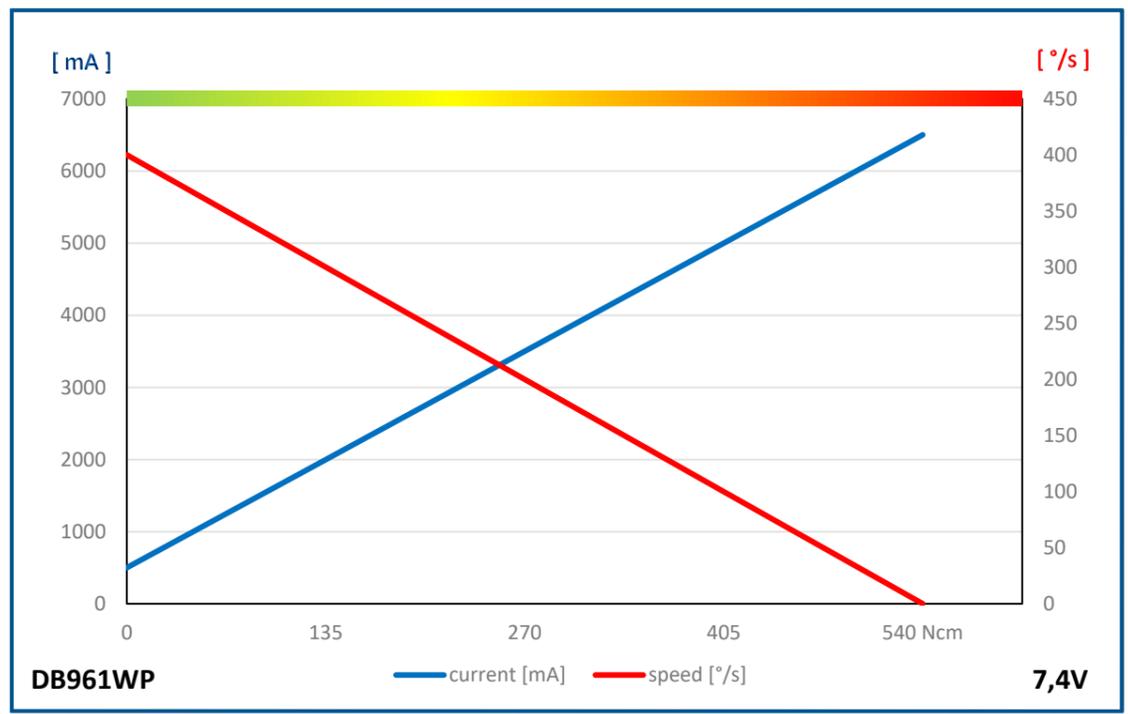
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## GENERAL SPECIFICATION

DB961WP		
Control System	PWM / TTL (Half Duplex)	
	Pulse Width 900µs 1500µs (Center) 2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Contact Analog Potentiometer	
Motor Type	BLDC	
Amplifier / MCU	16bit programmable Digital	
Operating Voltage Range	4.0 ~ 8.4V	
Operating Voltage	At 6.0V	At 7.4V
Operating Speed at no Load	333°/s (56RPM)	400°/s (67RPM)
Stall Torque	55.0kgcm (539.6Ncm)	55.0kgcm (539.6Ncm)
Peak Efficiency Torque	11.0kgcm (107.9Ncm)	11.0kgcm (107.9Ncm)
Rest Current	35mA	35mA
Running Current at no Load	500mA	500mA
Stall Current	8000mA	6500mA
Deadband Width	1µs	1µs
Operating Travel	Default	±60°
	Programmable	Max. 260°
	Multi Turn/Continuous Rotation	n/a / n/a
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)	
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)	
Vibrations at no Load	MIL-STD-810G 514.6C-VII	
Connector Wire Length	300mm	
Connector Wire Gauge	20AWG	
Connector Wire Strand Count	80/0.08	
External Dimensions	40.0 x 20.0 x 39.0mm	
Weight*	90.0g	
Ball Bearing	Dual Ball Bearing	
Case Material	Aluminum Alloy	
Gear Material	5 Hardened Steel Gears	
Gear Train Backlash	Max. 0.5°	
Horn Gear Spline	H25T Ø6.0	
Accessories	Mounting Hardware, HD-IM25, HD-LS25, HD-OS25, HD-X25	
IP-Rating	IP67	
Revision	Rev. 1.1 / 04.01.2024	
Changelog	-	

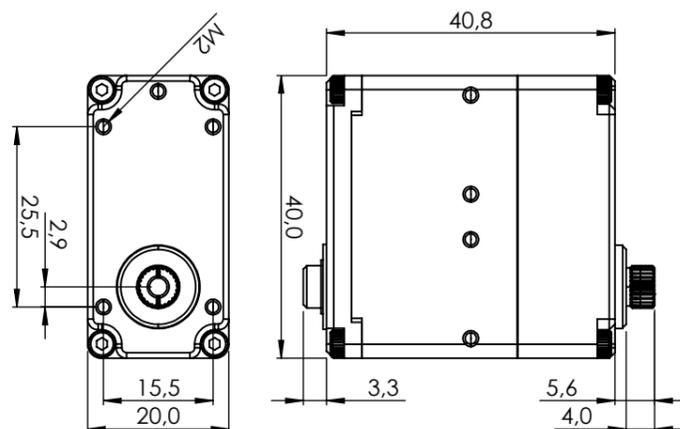
\*of the servo only w/o horns and accessories

## PERFORMANCE CHART



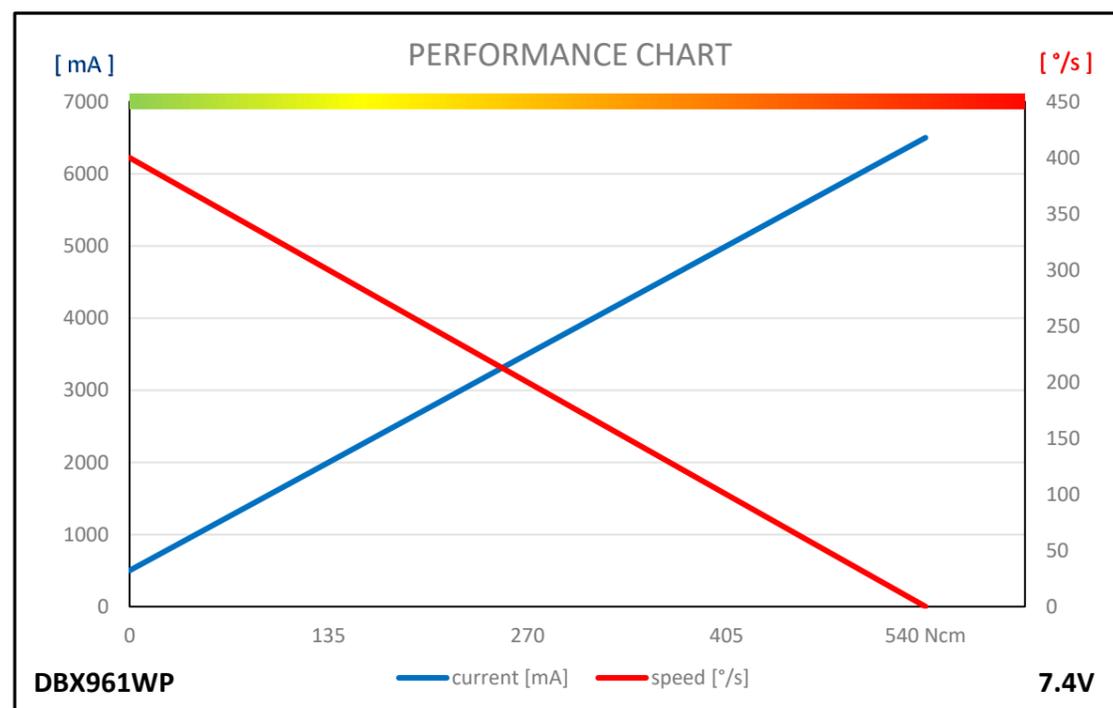
# DBX961WP

#1-03226



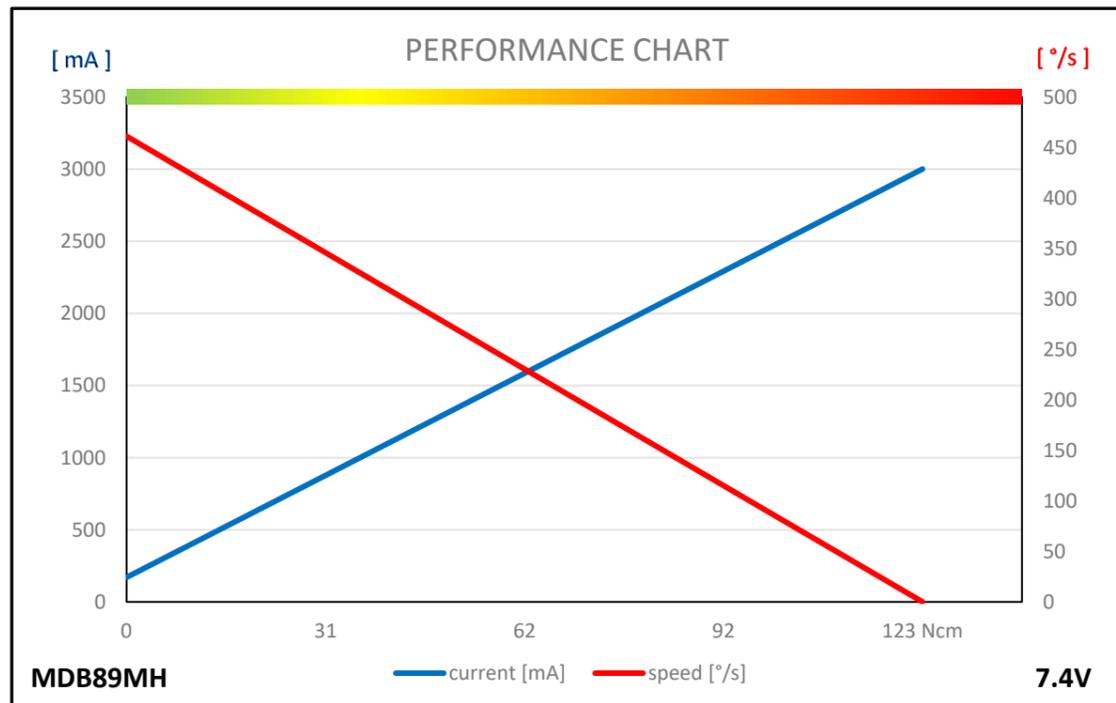
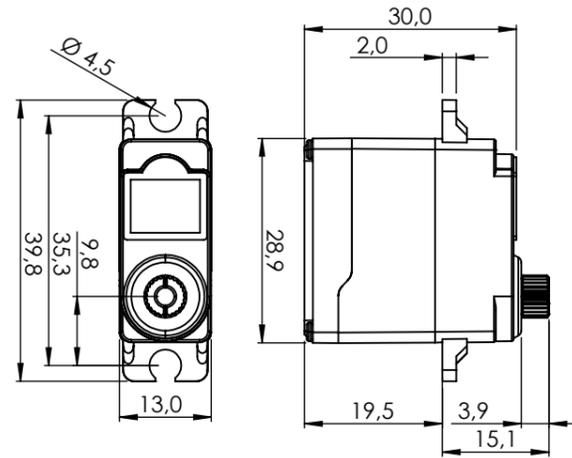
## GENERAL SPECIFICATION

DBX961WP			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	BLDC		
Operating Voltage Range	4.0 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.18sec/60°	0.15sec/60°
Stall Torque	-	55.0kgf-cm (763.81oz-in)	55.0kgf-cm (763.81oz-in)
Peak Efficiency Torque	-	11.0kgf-cm (152.76oz-in)	11.0kgf-cm (152.76oz-in)
Standing Current	-	35mA	35mA
No Load Running Current	-	500mA	500mA
Stall Current	-	8,000mA	6,500mA
Deadband	-	1μs	1μs
Operating Travel	Default: ±60°, Programmable: Max 260° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 40.8mm (1.575inch x 0.787inch x 1.606inch)		
Weight	106.7g (3.764oz)		
Bearing Type	2 Ball Bearing		
Case Material	Rugged Aluminum Alloy		
Gear Material	5 Hardened Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP67		
Servo Amplifier Type	16bit programmable Digital		



# MDB89MH

#1-03276

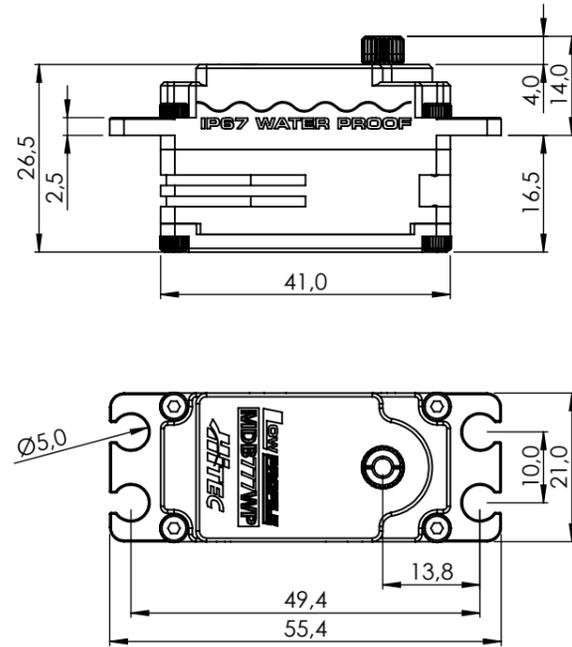


## GENERAL SPECIFICATION

MDB89MH			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	BLDC		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.17sec/60°	0.13sec/60°
Stall Torque	-	10.5kgf-cm (145.82oz-in)	12.5kgf-cm (173.59oz-in)
Peak Efficiency Torque	-	2.1kgf-cm (29.16oz-in)	2.5kgf-cm (34.72oz-in)
Standing Current	-	30mA	30mA
No Load Running Current	-	150mA	170mA
Stall Current	-	2,400mA	3,000mA
Deadband	-	2μs	2μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	240mm (9.449inch)		
Connector Wire Gauge	22AWG		
Dimensions	29.0mm x 13.0mm x 34.0mm (1.142inch x 0.512inch x 1.339inch)		
Weight	33.6g (1.185oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	5 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	32bit Programmable Digital		

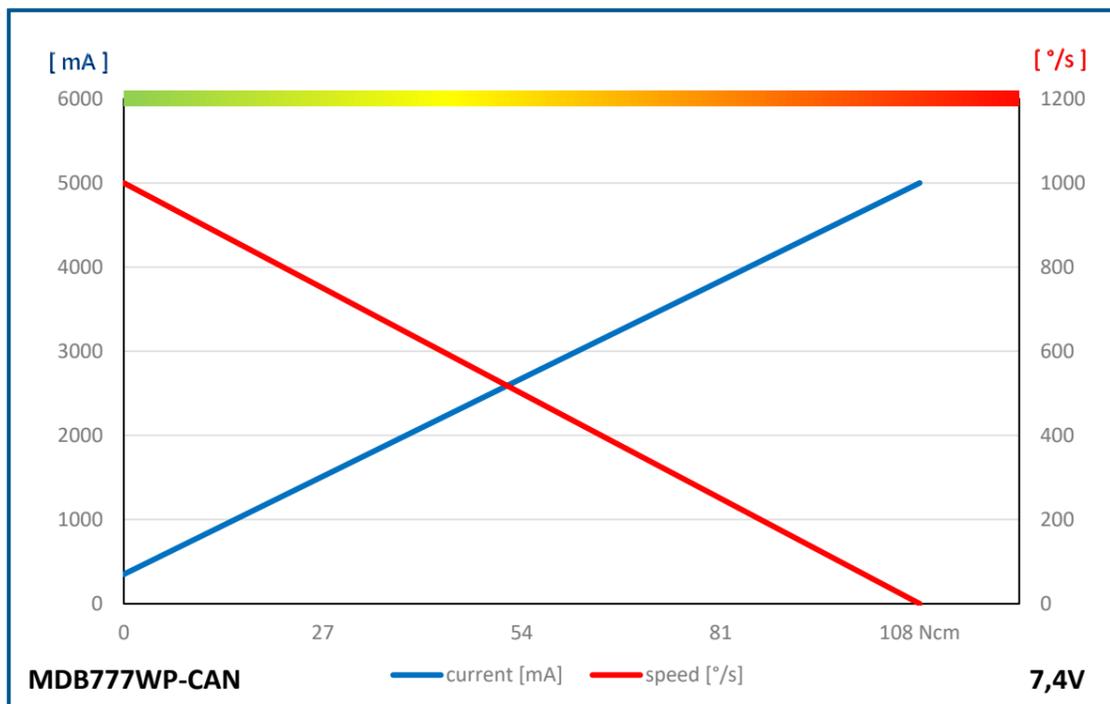
# MDB-777WP-CAN/DRONECAN

#1-03030, #1-03031



1:1

## PERFORMANCE CHART



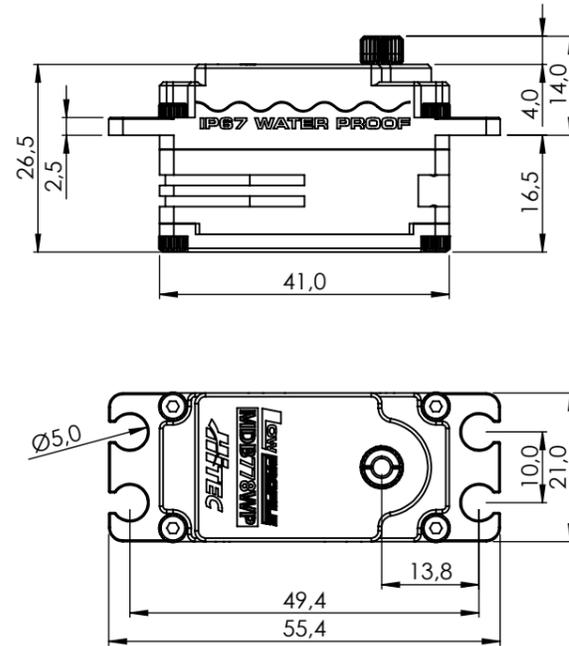
## GENERAL SPECIFICATION

MDB777WP-CAN/DroneCAN				
Control System	CAN BUS			
	Protocol (Mode)	Standard 2.0A	Extended 2.0B	DroneCAN
	Baud-Rate	10kbps ~ 1Mbps		
	Sample-Point	50% or 87.5%		
	Available SERVO ID	1 ~ 254		1 ~ 127
	Available Node ID	1 ~ 2047	1 ~ 536870911	1 ~ 127
Input Signal Range	0 ~ 5V			
Connector Type	Hitec 4P			
Position Sensor Type	Contactless Magnetic Encoder			
Motor Type	BLDC			
Amplifier / MCU	32bit programmable Digital			
Operating Voltage Range	4.0V ~ 8.4V			
Operating Voltage	At 6.0V		At 7.4V	
Operating Speed at no Load	750°/s (125RPM)		1000°/s (167RPM)	
Stall Torque	8.0kgcm (78.5Ncm)		11.0kgcm (107.9Ncm)	
Peak Efficiency Torque	1.6kgcm (15.7Ncm)		2.2kgcm (21.6Ncm)	
Rest Current	26mA		26mA	
Running Current at no Load	320mA		350mA	
Stall Current	4000mA		5000mA	
Deadband Width	n/a		n/a	
Travel	Travel / Command	90° / 4096		
	Servo mode	Left	Center	Right
	Pos Command	+1366	+8192	+15018
	Pos [°]	-150	0	+150
	Turn Mode	Left	Power On	Right
	Pos Command	-16383	0	+16383
	Pos [°]	-359	0	+359
Turn Range	-32760 ~ +32760 (CAN only)			
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)			
Storage Temperature Range	-30°C ~ +80°C (-31°F ~ +176°F)			
Vibrations at no Load	-			
Connector Wire Length	300mm			
Connector Wire Gauge	20AWG			
Connector Wire Strand Count	80/0.08			
External Dimensions	41.0 x 21.0 x 26.5mm			
Weight*	70.0g			
Ball Bearing	Dual Ball Bearing			
Case Material	Aluminum Alloy			
Gear Material	5 Hardened Steel Gears			
Gear Train Backlash	Max. 0.5°			
Horn Gear Spline	H25T Ø6.0			
Accessories	Mounting Hardware, Servo Horns (HD-IM25, HD-LS25, HD-OS25, HD-X25)			
IP-Rating	IP67			
Revision	Rev. 1.0 / 09.01.2024			
Changelog	-			

\*of the servo only w/o horns and accessories

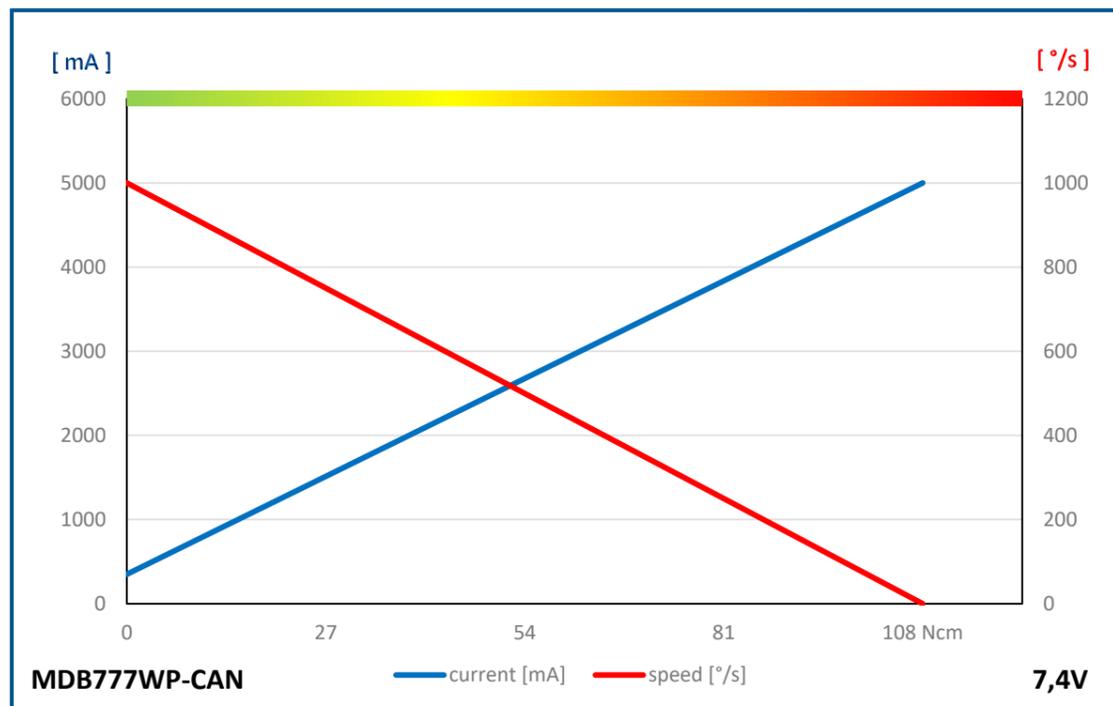
# MDB778WP-CAN/DRONECAN

#1-03032, #1-03033



1:2

## PERFORMANCE CHART



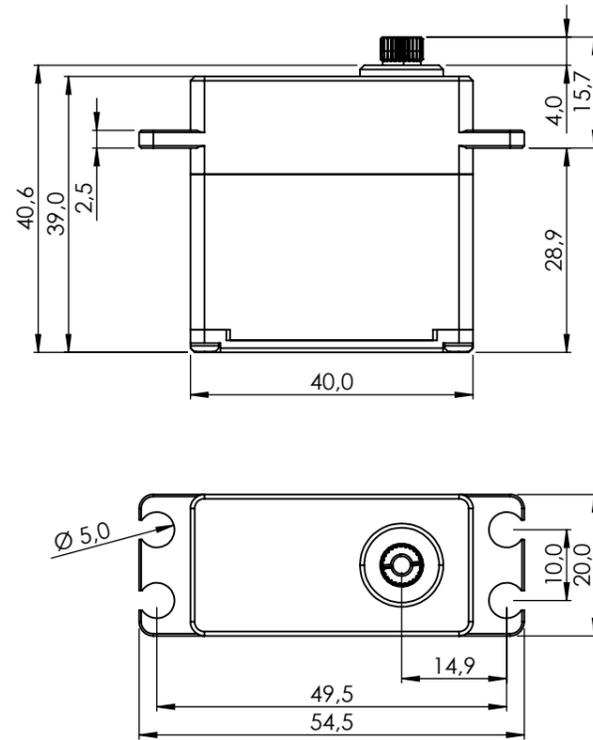
## GENERAL SPECIFICATION

MDB778WP-CAN/DroneCAN				
Control System	CAN BUS			
	Protocol (Mode)	Standard 2.0A	Extended 2.0B	DroneCAN
	Baud-Rate	10kbps ~ 1Mbps		
	Sample-Point	50% or 87.5%		
	Available SERVO ID	1 ~ 254		1 ~ 127
	Available Node ID	1 ~ 2047	1 ~ 536870911	1 ~ 127
Input Signal Range	0 ~ 5V			
Connector Type	Hitec 4P			
Position Sensor Type	Contactless Magnetic Encoder			
Motor Type	BLDC			
Amplifier / MCU	32bit programmable Digital			
Operating Voltage Range	4.0V ~ 8.4V			
Operating Voltage	At 6.0V		At 7.4V	
Operating Speed at no Load	462°/s (77RPM)		600°/s (100RPM)	
Stall Torque	14.0kgcm (137.3Ncm)		16.0kgcm (157.0Ncm)	
Peak Efficiency Torque	2.8kgcm (27.5Ncm)		3.3kgcm (32.4Ncm)	
Rest Current	50mA		50mA	
Running Current at no Load	400mA		500mA	
Stall Current	4000mA		5000mA	
Deadband Width	n/a		n/a	
Travel	Travel / Command	90° / 4096		
	Servo mode	Left	Center	Right
	Pos Command	+1366	+8192	+15018
	Pos [°]	-150	0	+150
	Turn Mode	Left	Power On	Right
	Pos Command	-16383	0	+16383
	Pos [°]	-359	0	+359
Turn Range	-32760 ~ +32760 (CAN only)			
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)			
Storage Temperature Range	-30°C ~ +80°C (-31°F ~ +176°F)			
Vibrations at no Load	-			
Connector Wire Length	300mm			
Connector Wire Gauge	20AWG			
Connector Wire Strand Count	80/0.08			
External Dimensions	41.0 x 21.0 x 26.5mm			
Weight*	70.0g			
Ball Bearing	Dual Ball Bearing			
Case Material	Aluminum Alloy			
Gear Material	5 Hardened Steel Gears			
Gear Train Backlash	Max. 0.5°			
Horn Gear Spline	H25T Ø6.0			
Accessories	Mounting Hardware, Servo Horns (HD-IM25, HD-LS25, HD-OS25, HD-X25)			
IP-Rating	IP67			
Revision	Rev. 1.0 / 09.01.2024			
Changelog	-			

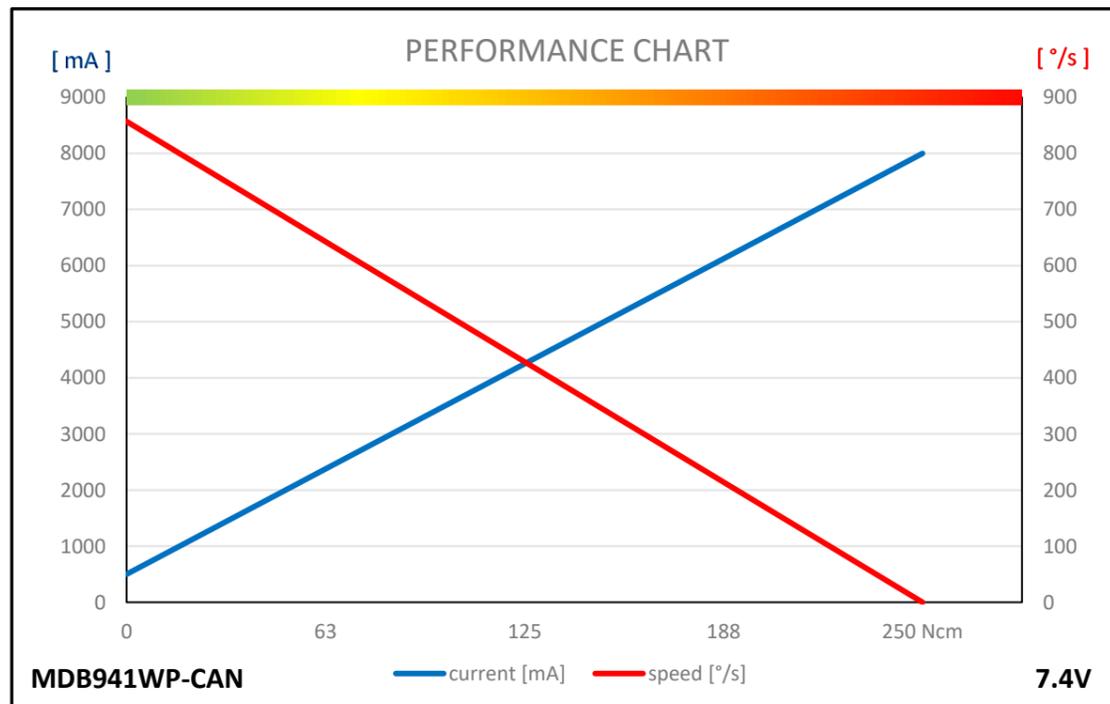
\*of the servo only w/o horns and accessories

# MDB941WP-CAN

#1-03191



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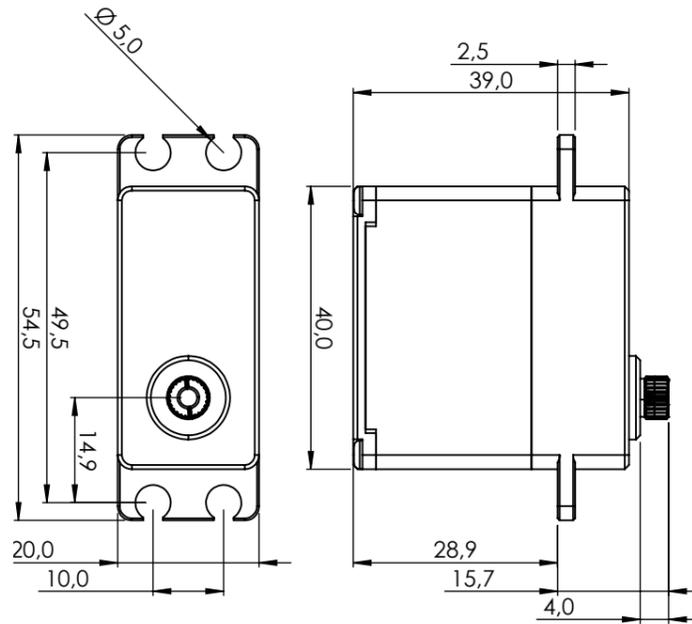


## GENERAL SPECIFICATION

MDB941WP-CAN			
Control System	CAN 2.0A,B		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	BLDC		
Operating Voltage Range	4.0 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.085sec/60°	0.07sec/60°
Stall Torque	-	20.6kgf-cm (286.08oz-in)	25.4kgf-cm (352.74oz-in)
Peak Efficiency Torque	-	4.1kgf-cm (56.94oz-in)	5.1kgf-cm (70.83oz-in)
Standing Current	-	30mA	30mA
No Load Running Current	-	500mA	500mA
Stall Current	-	8,000mA	8,000mA
Deadband	-	n/a	n/a
Operating Travel	Servo Mode : $\pm 60^\circ$ (Default), $\pm 150^\circ$ (Programmable) / Turn Mode : $\pm 32760$ Turns		
Continuous Rotation	n/a		
Operating Temperature Range	$-20^\circ\text{C} \sim +60^\circ\text{C}$ ( $-4^\circ\text{F} \sim +140^\circ\text{F}$ )		
Storage Temperature Range	$-30^\circ\text{C} \sim +80^\circ\text{C}$ ( $-22^\circ\text{F} \sim +176^\circ\text{F}$ )		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 39.0mm (1.575inch x 0.787inch x 1.535inch)		
Weight	91.7g (3.235oz)		
Bearing Type	2 Ball Bearing		
Case Material	Aluminum Alloy		
Gear Material	5 Hardened Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T( $\varnothing 6$ )		
IP-Rating	IP67		
Servo Amplifier Type	32bit programmable Digital		

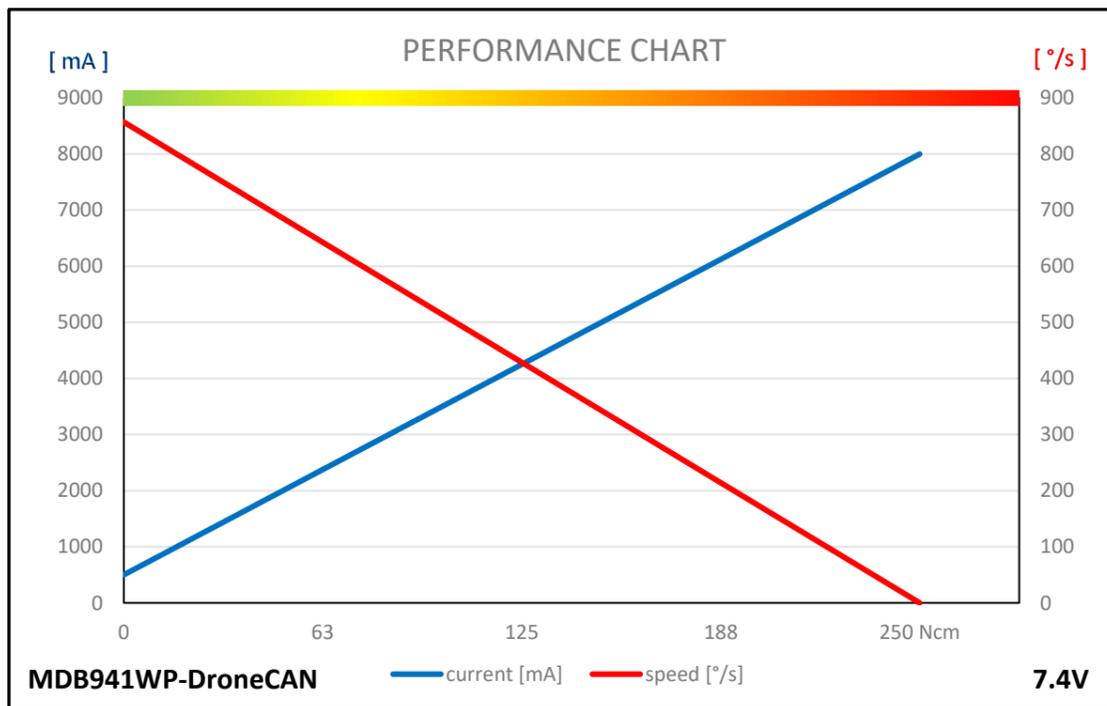
# MDB941WP-DRONECAN

#1-03314



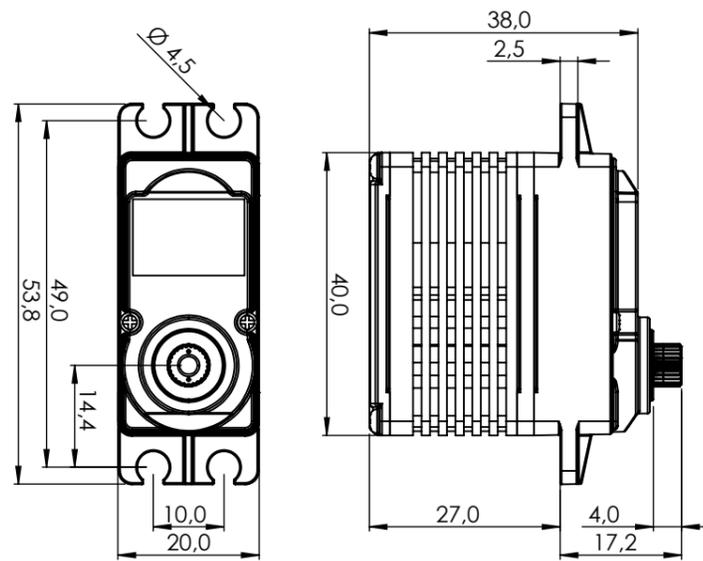
## GENERAL SPECIFICATION

MDB941WP-DroneCAN			
Control System	DroneCAN (UAVCAN v0)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	BLDC		
Operating Voltage Range	4.0 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.085sec/60°	0.07sec/60°
Stall Torque	-	20.6kgf-cm (286.08oz-in)	25.4kgf-cm (352.74oz-in)
Peak Efficiency Torque	-	4.1kgf-cm (56.94oz-in)	5.1kgf-cm (70.83oz-in)
Standing Current	-	30mA	30mA
No Load Running Current	-	500mA	500mA
Stall Current	-	8,000mA	8,000mA
Deadband	-	n/a	n/a
Operating Travel	Servo Mode : ±60°(Default), ±150°(Programmable)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 39.0mm (1.575inch x 0.787inch x 1.535inch)		
Weight	91.7g (3.235oz)		
Bearing Type	2 Ball Bearing		
Case Material	Aluminum Alloy		
Gear Material	5 Hardened Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP67		
Servo Amplifier Type	32bit programmable Digital		



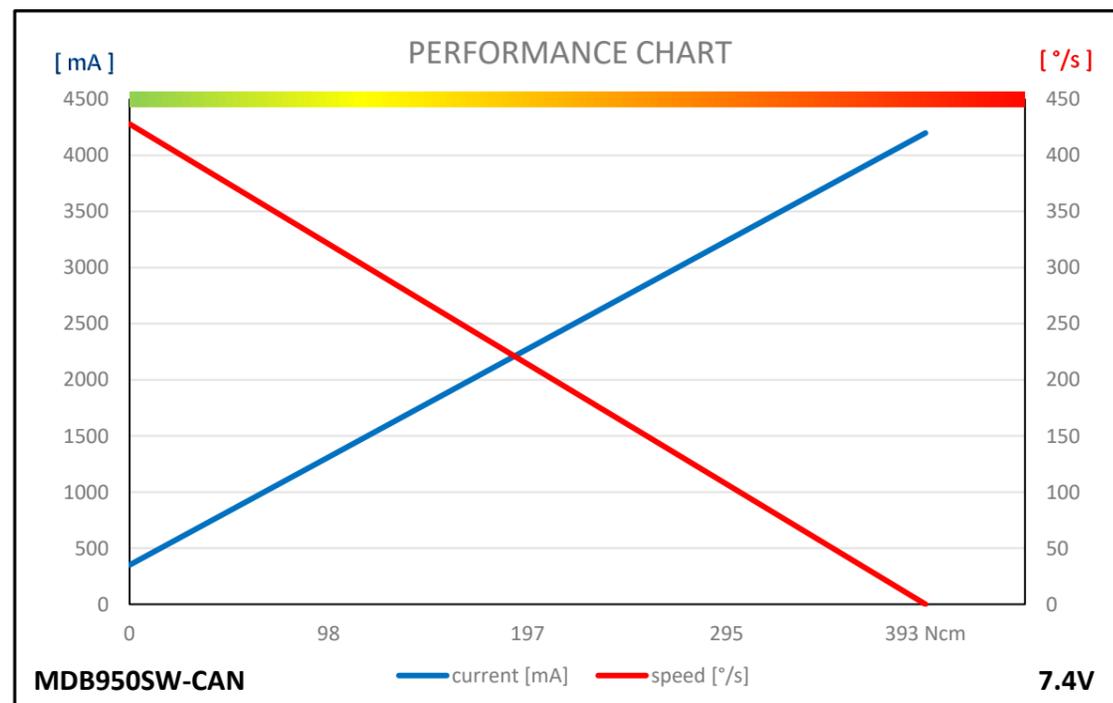
# MDB950SW-CAN

#1-03093



## GENERAL SPECIFICATION

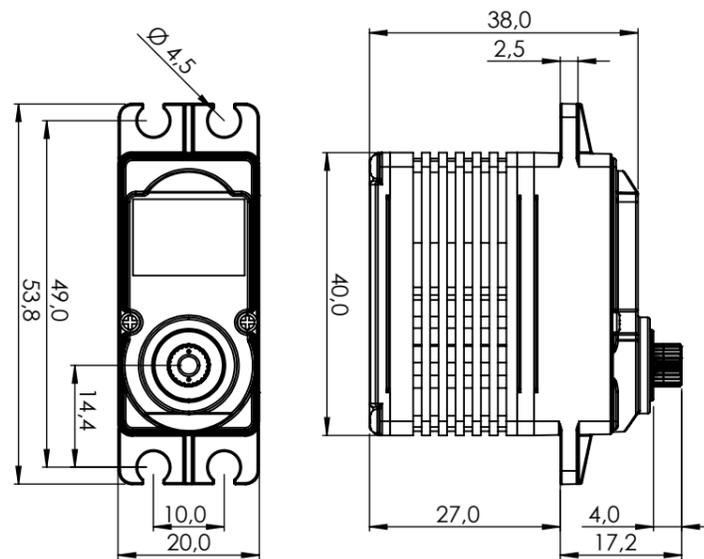
MDB950SW-CAN			
Control System	CAN 2.0A,B		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	BLDC		
Operating Voltage Range	4.0 ~ 8.4V		
Voltage	4.8V	6.0V	7.4V
No Load Speed	0.23sec/60°	0.18sec/60°	0.14sec/60°
Stall Torque	35.0kgf·cm (486.06oz-in)	40.0kgf·cm (555.5 oz-in)	40.0kgf·cm (555.5 oz-in)
Peak Efficiency Torque	7.0kgf·cm (97.21oz-in)	8.0kgf·cm (111.1 oz-in)	8.0kgf·cm (111.1 oz-in)
Standing Current	30mA	30mA	30mA
No Load Running Current	350mA	350mA	350mA
Stall Current	5,000mA	5,000mA	4,200mA
Deadband	n/a	n/a	n/a
Operating Travel	Servo Mode : $\pm 60^\circ$ (Default), $\pm 150^\circ$ (Programmable) / Turn Mode : $\pm 32760$ Turns		
Continuous Rotation	n/a		
Operating Temperature Range	$-20^\circ\text{C} \sim +60^\circ\text{C}$ ( $-4^\circ\text{F} \sim +140^\circ\text{F}$ )		
Storage Temperature Range	$-30^\circ\text{C} \sim +80^\circ\text{C}$ ( $-22^\circ\text{F} \sim +176^\circ\text{F}$ )		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 38.5mm (1.575inch x 0.787inch x 1.516inch)		
Weight	70.7g (2.494oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic & Aluminum Heat Sink		
Gear Material	1 Metal-Plastic & 3 Hardened Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T( $\varnothing 6$ )		
IP-Rating	IP54		
Servo Amplifier Type	32bit programmable Digital		



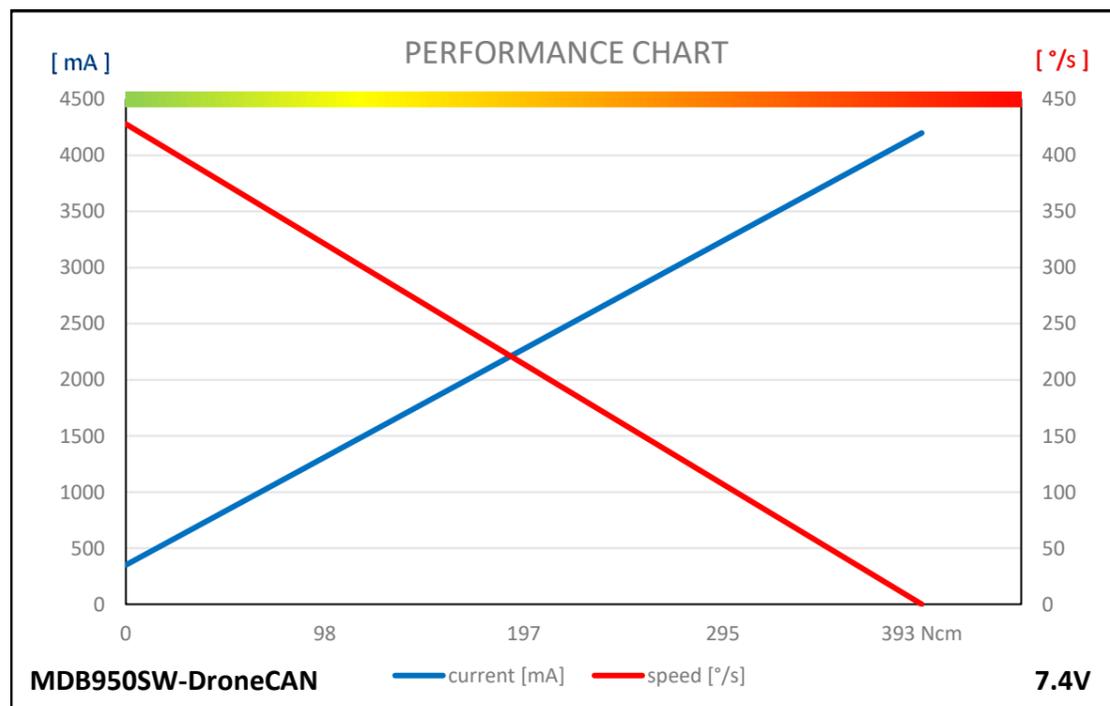
# MDB950SW-DRONECAN

#1-03313

## GENERAL SPECIFICATION

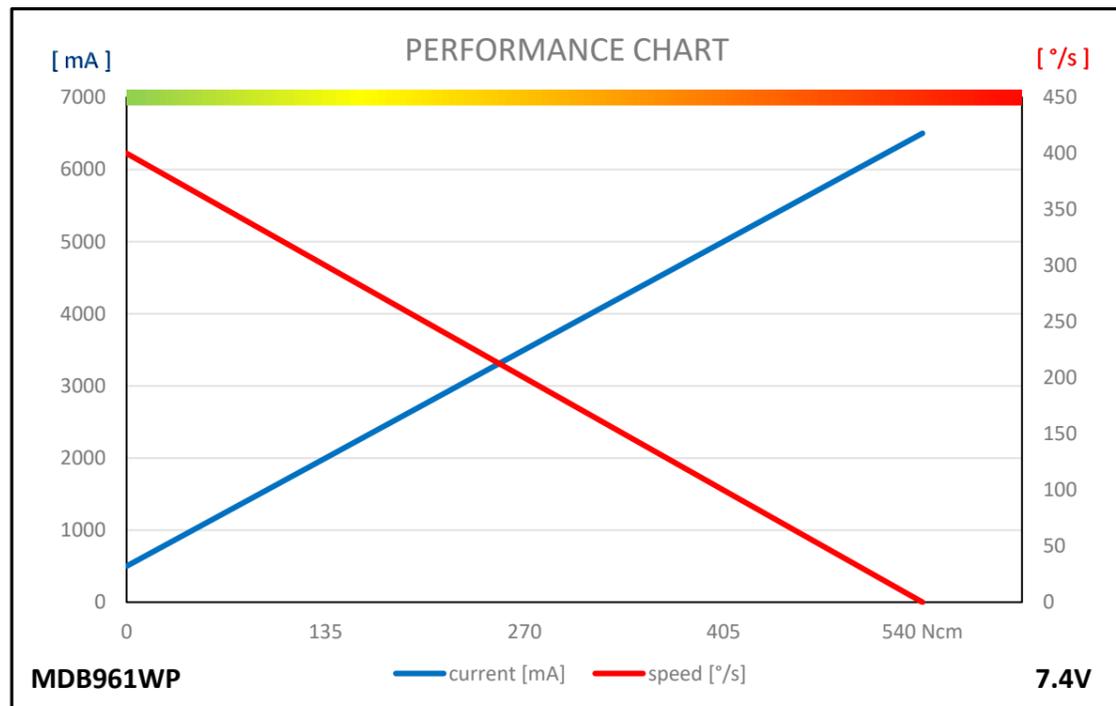
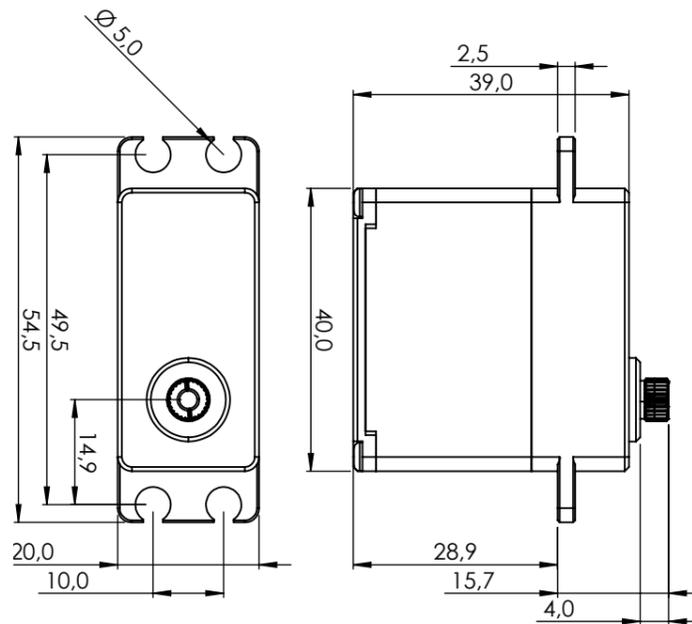


MDB950SW-DroneCAN			
Control System	DroneCAN (UAVCAN v0)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	BLDC		
Operating Voltage Range	4.0 ~ 8.4V		
Voltage	4.8V	6.0V	7.4V
No Load Speed	0.23sec/60°	0.18sec/60°	0.14sec/60°
Stall Torque	35.0kgf-cm (486.06oz-in)	40.0kgf-cm (555.5 oz-in)	40.0kgf-cm (555.5 oz-in)
Peak Efficiency Torque	7.0kgf-cm (97.21oz-in)	8.0kgf-cm (111.1 oz-in)	8.0kgf-cm (111.1 oz-in)
Standing Current	30mA	30mA	30mA
No Load Running Current	350mA	350mA	350mA
Stall Current	5,000mA	5,000mA	4,200mA
Deadband	n/a	n/a	n/a
Operating Travel	Servo Mode : ±60°(Default), ±150°(Programmable)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 38.5mm (1.575inch x 0.787inch x 1.516inch)		
Weight	70.7g (2.494oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic & Aluminum Heat Sink		
Gear Material	1 Metal-Plastic & 3 Hardened Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	32bit programmable Digital		



# MDB961WP

#1-03225

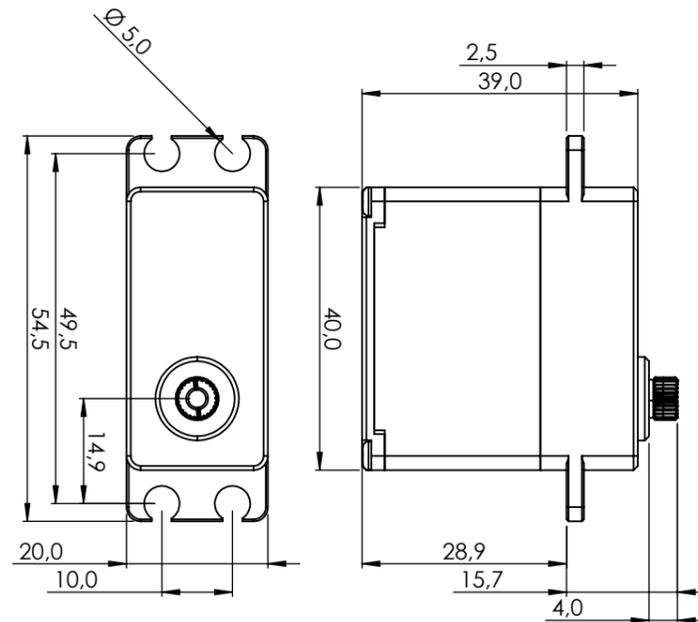


## GENERAL SPECIFICATION

MDB961WP			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	BLDC		
Operating Voltage Range	4.0 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.18sec/60°	0.15sec/60°
Stall Torque	-	55.0kgf-cm (763.81oz-in)	55.0kgf-cm (763.81oz-in)
Peak Efficiency Torque	-	11.0kgf-cm (152.76oz-in)	11.0kgf-cm (152.76oz-in)
Standing Current	-	35mA	35mA
No Load Running Current	-	500mA	500mA
Stall Current	-	8,000mA	6,500mA
Deadband	-	1µs	1µs
Operating Travel	Default: ±60°, Programmable: Max 320° / Pulse Width: 900~2100µs(Center:1500µs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 39.0mm (1.575inch x 0.787inch x 1.535inch)		
Weight	90.0g (3.175oz)		
Bearing Type	2 Ball Bearing		
Case Material	Aluminum Alloy		
Gear Material	5 Hardened Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP67		
Servo Amplifier Type	16bit programmable Digital		

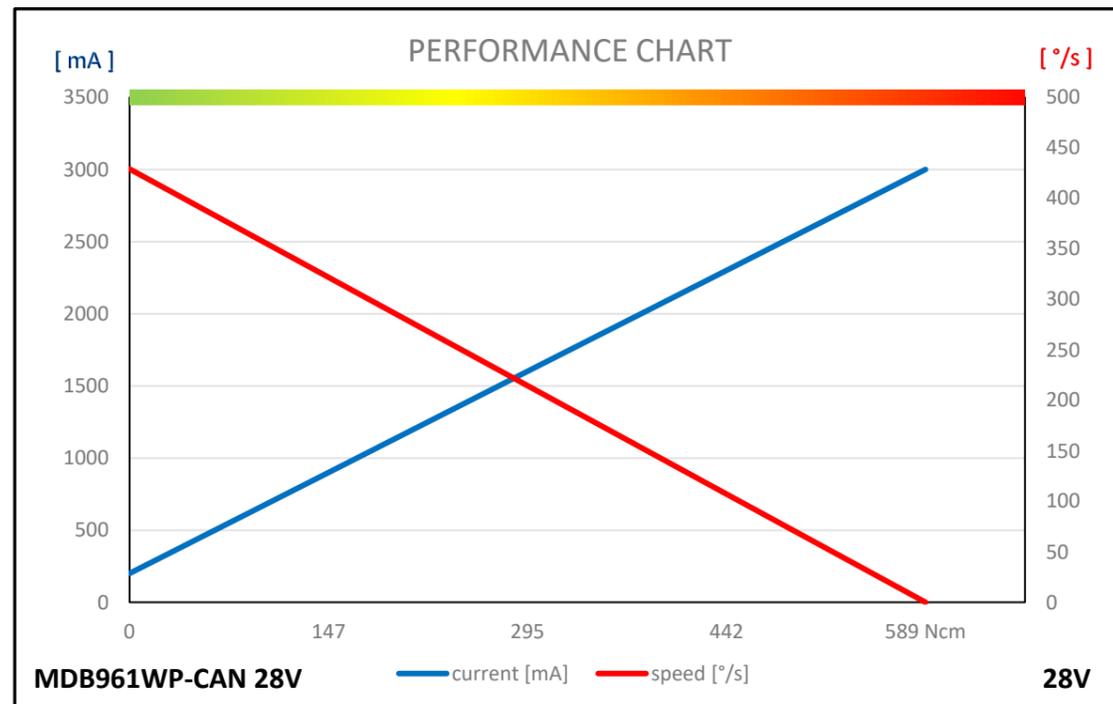
# MDB961WP-CAN

#1-03004



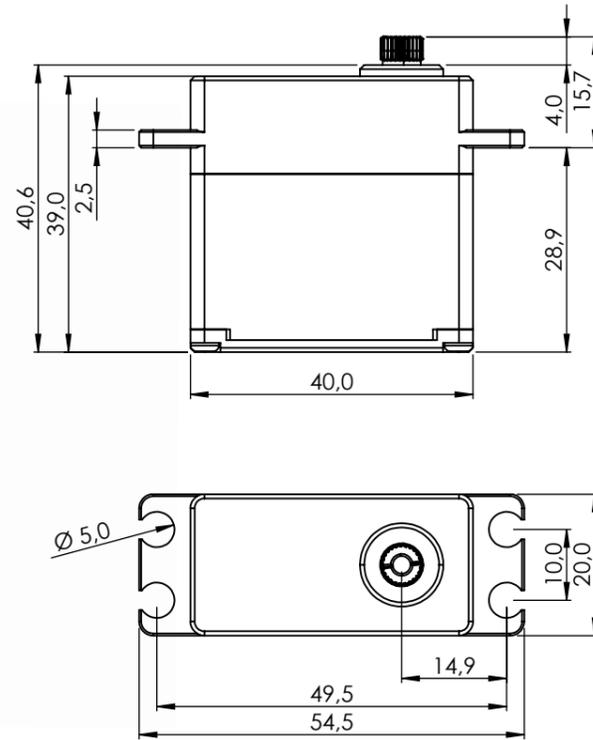
## GENERAL SPECIFICATION

MDB961WP-CAN			
Control System	CAN 2.0A,B		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	BLDC		
Operating Voltage Range	4.0 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.18sec/60°	0.15sec/60°
Stall Torque	-	55.0kgf-cm (763.81oz-in)	55.0kgf-cm (763.81oz-in)
Peak Efficiency Torque	-	11.0kgf-cm (152.76oz-in)	11.0kgf-cm (152.76oz-in)
Standing Current	-	30mA	30mA
No Load Running Current	-	500mA	500mA
Stall Current	-	8,000mA	6,500mA
Deadband	-	n/a	n/a
Operating Travel	Servo Mode : ±60°(Default), ±150°(Programmable) / Turn Mode : ±32760 Turns		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 39.0mm (1.575inch x 0.787inch x 1.535inch)		
Weight	90.0g (3.175oz)		
Bearing Type	2 Ball Bearing		
Case Material	Aluminum Alloy		
Gear Material	5 Hardened Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP67		
Servo Amplifier Type	32bit programmable Digital		



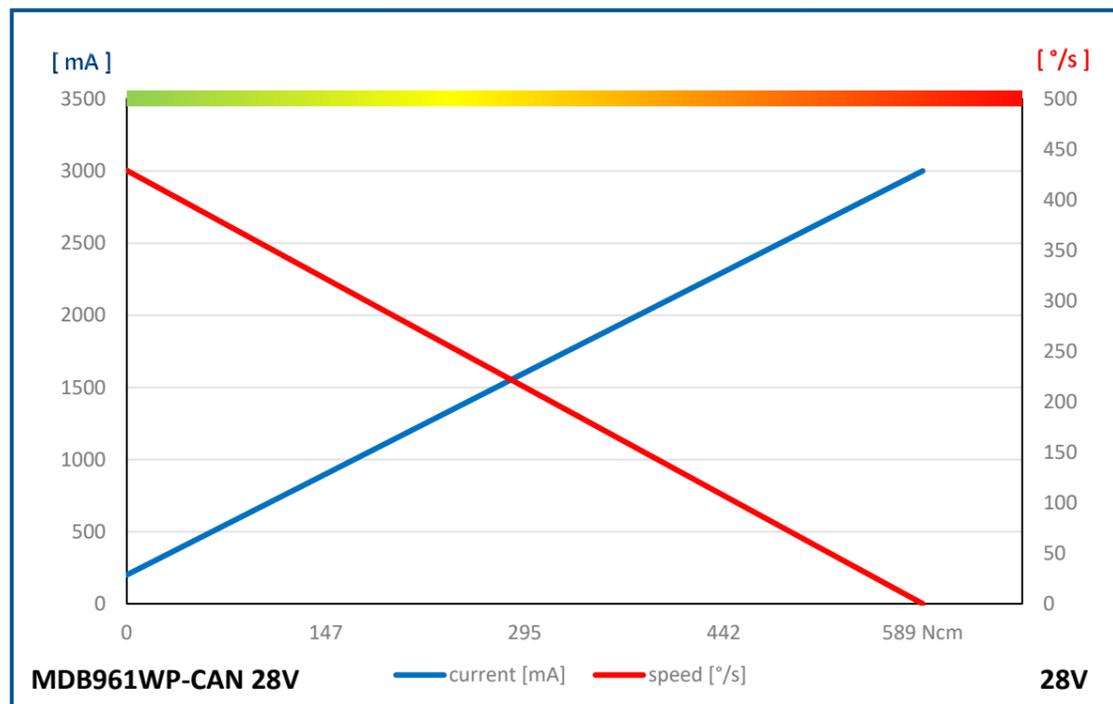
# MDB961WP-CAN 28V

#1-03003



1:1

## PERFORMANCE CHART



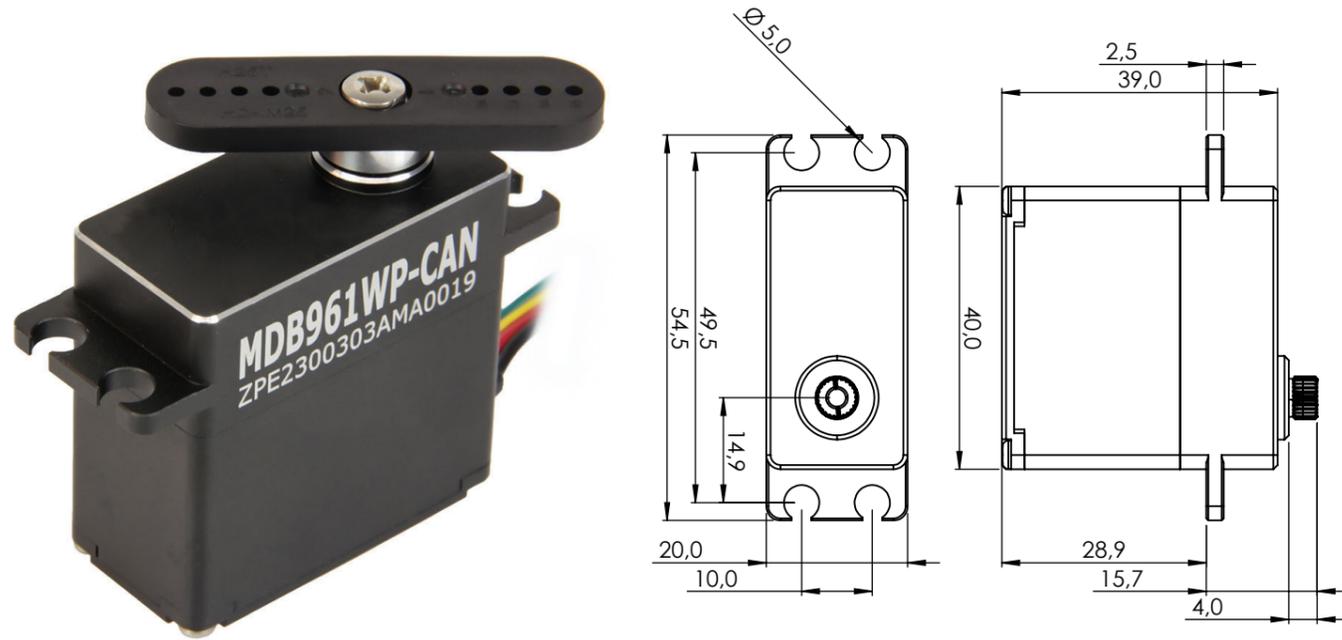
## GENERAL SPECIFICATION

MDB961WP-CAN 28V				
Control System	CAN BUS			
	Protocol (Mode)	Standard 2.0A	Extended 2.0B	
	Baud-Rate	10kbps ~ 1Mbps		
	Sample-Point	50% or 87.5%		
	Available SERVO ID	1 ~ 254	1 ~ 127	
	Available Node ID	1 ~ 2047	1 ~ 536870911	1 ~ 127
Input Signal Range	0 ~ 5V			
Connector Type	Hitec 4P			
Position Sensor Type	Contactless Magnetic Encoder			
Motor Type	BLDC			
Amplifier / MCU	32bit programmable Digital			
Operating Voltage Range	8.0V ~ 32.0V			
Operating Voltage	At 12.0V	At 24.0V	At 28.0V	
Operating Speed at no Load	429°/s (71RPM)	429°/s (71RPM)	429°/s (71RPM)	
Stall Torque	60.0kgcm (588.6Ncm)	60.0kgcm (588.6Ncm)	60.0kgcm (588.6Ncm)	
Peak Efficiency Torque	12.0kgcm (117.7Ncm)	12.0kgcm (117.7Ncm)	12.0kgcm (117.7Ncm)	
Rest Current	18mA	10mA	9mA	
Running Current at no Load	500mA	300mA	200mA	
Stall Current	6700mA	3400mA	3000mA	
Deadband Width	n/a	n/a	n/a	
Travel	Travel / Command	90° / 4096		
	Servo mode	Left	Center	Right
	Pos Command	+1366	+8192	+15018
	Pos [°]	-150	0	+150
	Turn Mode	Left	Power On	Right
	Pos Command	-16383	0	+16383
	Pos [°]	-359	0	+359
	Turn Range	-32760 ~ +32760		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)			
Storage Temperature Range	-30°C ~ +80°C (-31°F ~ +176°F)			
Vibrations at no Load	-			
Connector Wire Length	300mm			
Connector Wire Gauge	20AWG			
Connector Wire Strand Count	80/0.08			
External Dimensions	40.0 x 20.0 x 39.0mm			
Weight*	90.0g			
Ball Bearing	Dual Ball Bearing			
Case Material	Aluminum Alloy			
Gear Material	5 Hardened Steel Gears			
Gear Train Backlash	Max. 0.5°			
Horn Gear Spline	H25T Ø6.0			
Accessories	Mounting Hardware, Servo Horns (HD-IM25, HD-OS25, HD-X25)			
IP-Rating	IP67			
Revision	Rev. 1.0 / 09.01.2024			
Changelog	-			

\*of the servo only w/o horns and accessories

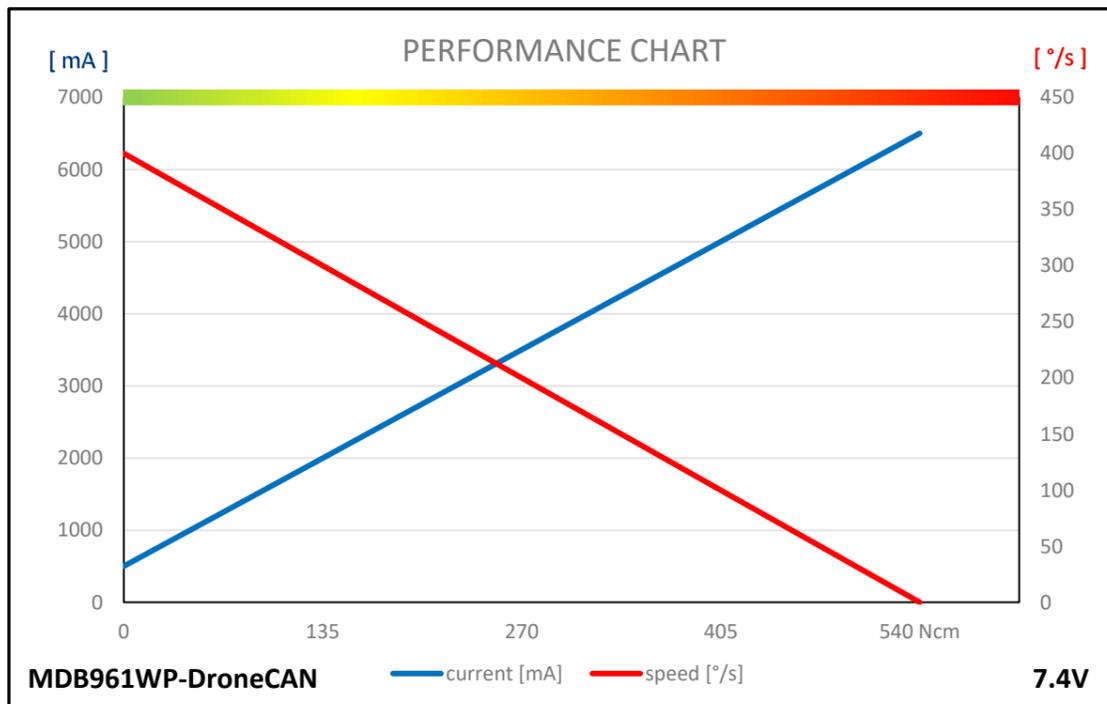
# MDB961WP-UAVCAN / DRONECAN

#1-03228



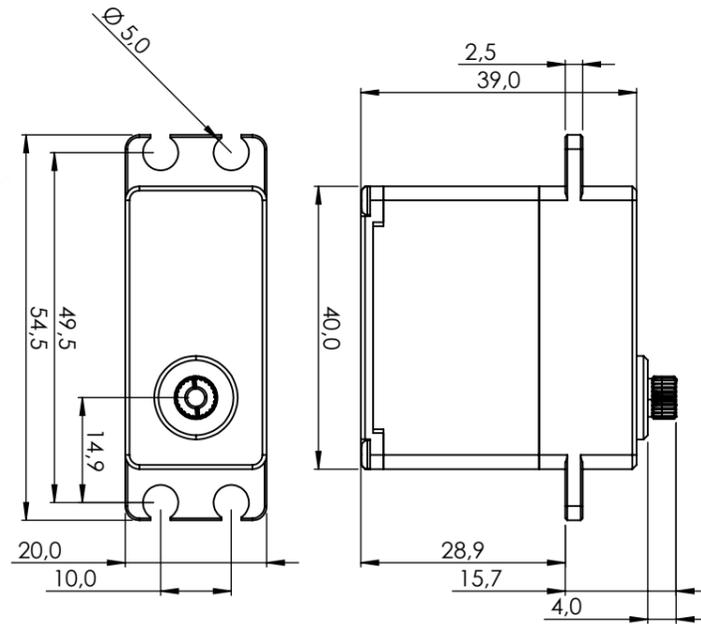
## GENERAL SPECIFICATION

MDB961WP-UAVCAN / DroneCAN			
Control System	DroneCAN (UAVCAN v0)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	BLDC		
Operating Voltage Range	4.0 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.18sec/60°	0.15sec/60°
Stall Torque	-	55.0kgf-cm (763.81oz-in)	55.0kgf-cm (763.81oz-in)
Peak Efficiency Torque	-	11.0kgf-cm (152.76oz-in)	11.0kgf-cm (152.76oz-in)
Standing Current	-	30mA	30mA
No Load Running Current	-	500mA	500mA
Stall Current	-	8,000mA	6,500mA
Deadband	-	n/a	n/a
Operating Travel	Servo Mode : ±60°(Default), ±150°(Programmable)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 39.0mm (1.575inch x 0.787inch x 1.535inch)		
Weight	90.0g (3.175oz)		
Bearing Type	2 Ball Bearing		
Case Material	Aluminum Alloy		
Gear Material	5 Hardened Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP67		
Servo Amplifier Type	32bit programmable Digital		



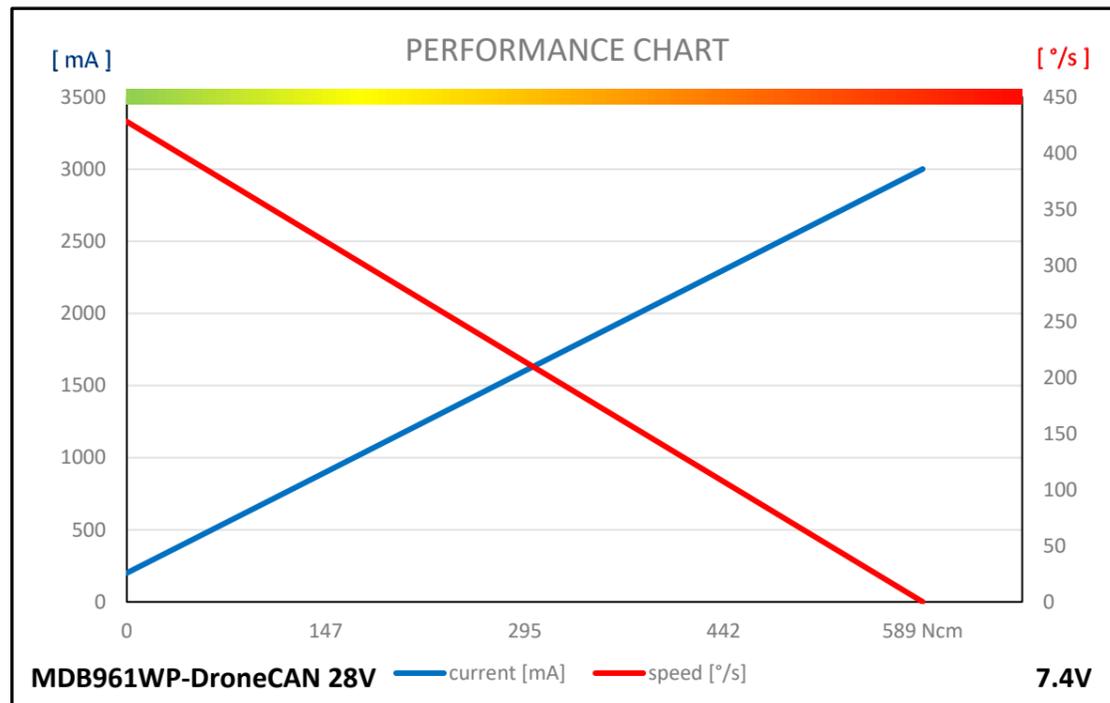
# MDB961WP-UAVCAN/DRONECAN-28V

#1-03229



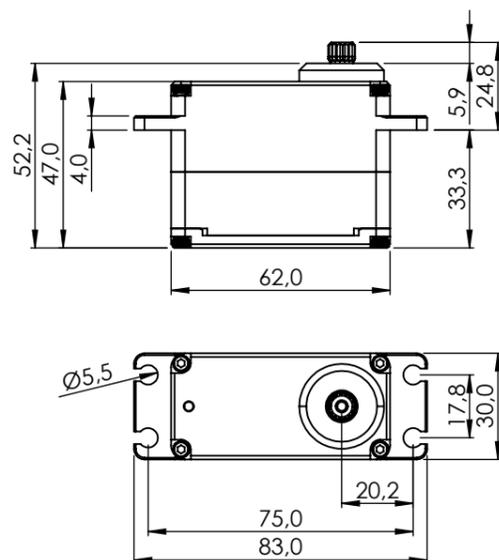
## GENERAL SPECIFICATION

MDB961WP-UAVCAN/DroneCAN-28V			
Control System	DroneCAN (UAVCAN v0)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	BLDC		
Operating Voltage Range	8.0 ~ 32.0V		
Voltage	12.0V	24.0V	28.0V
No Load Speed	0.14sec/60°	0.14sec/60°	0.14sec/60°
Stall Torque	60.0kgf-cm (833.24oz-in)	60.0kgf-cm (833.24oz-in)	60.0kgf-cm (833.24oz-in)
Peak Efficiency Torque	12.0kgf-cm (166.65oz-in)	12.0kgf-cm (166.65oz-in)	12.0kgf-cm (166.65oz-in)
Standing Current	20mA	12mA	11mA
No Load Running Current	500mA	300mA	200mA
Stall Current	6,700mA	3,400mA	3,000mA
Deadband	n/a	n/a	n/a
Operating Travel	Servo Mode : ±60°(Default), ±150°(Programmable)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 39.0mm (1.575inch x 0.787inch x 1.535inch)		
Weight	90.0g (3.175oz)		
Bearing Type	2 Ball Bearing		
Case Material	Aluminum Alloy		
Gear Material	5 Hardened Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP67		
Servo Amplifier Type	32bit programmable Digital		



# MDB1200WP

#1-03109

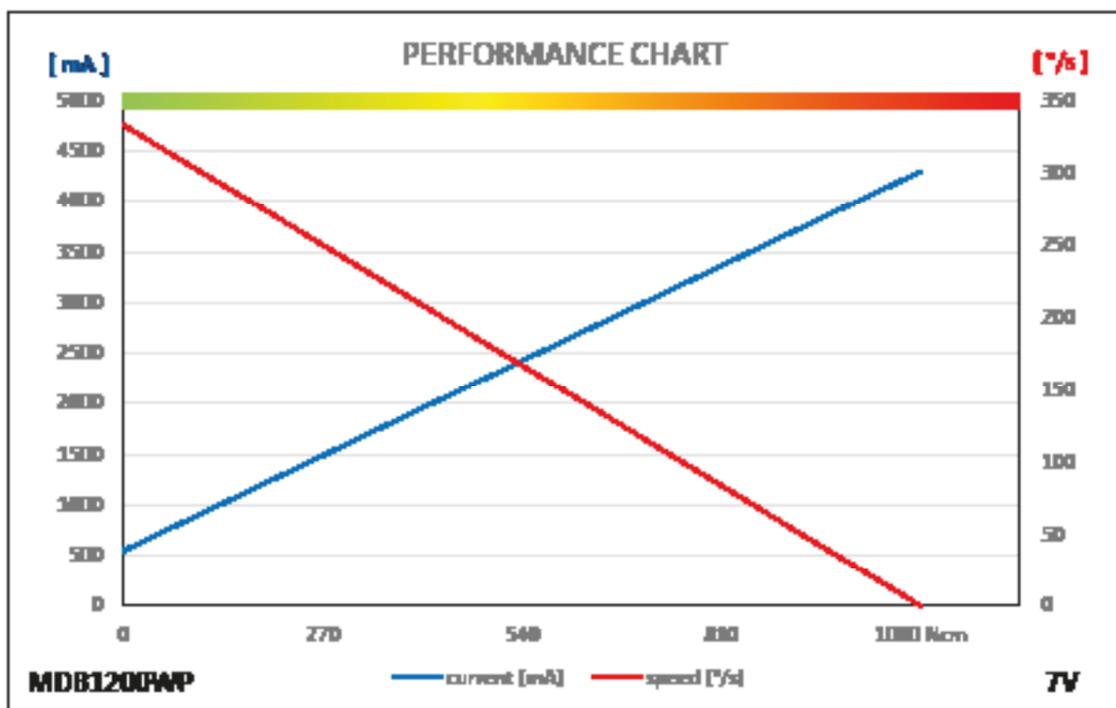


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## GENERAL SPECIFICATION

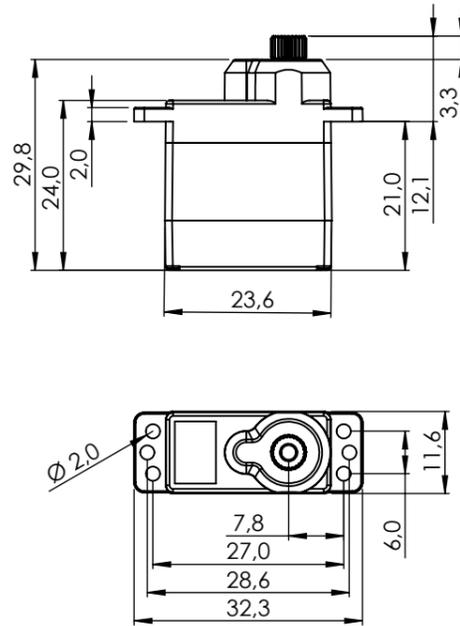
MDB1200WP		
Control System	PWM / TTL (Half Duplex) Pulse Width 900µs 1500µs (Center) 2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Contactless Magnetic Encoder	
Motor Type	BLDC	
Amplifier / MCU	32bit programmable Digital	
Operating Voltage Range	4.0V ~ 8.4V	
Operating Voltage	At 6.0V	At 7.0V
Operating Speed at no Load	273°/s (46RPM)	333°/s (56RPM)
Stall Torque	100.0kgcm (981.0Ncm)	110.0kgcm (1079.1Ncm)
Peak Efficiency Torque	20.0kgcm (196.2Ncm)	22.0kgcm (215.8Ncm)
Rest Current	20mA	20mA
Running Current at no Load	500mA	550mA
Stall Current	5000mA	4300mA
Deadband Width	2µs	2µs
Operating Travel	Default	±60°
	Programmable	Max. 320°
	Multi Turn/Continuous Rotation	n/a / n/a
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)	
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)	
Vibrations at no Load	-	
Connector Wire Length	300mm	
Connector Wire Gauge	20AWG	
Connector Wire Strand Count	80/0.08	
External Dimensions	62.0 x 30.0 x 47.0mm	
Weight*	260.0g	
Ball Bearing	2 Ball Bearing & 2 Needle Bearing	
Case Material	Aluminum Alloy	
Gear Material	5 Hardened Steel Gears	
Gear Train Backlash	Max. 0.5°	
Horn Gear Spline	H15T Ø8.0	
Accessories	Mounting Hardware, Servo Horns (Q-OA15, Q-XA15)	
IP-Rating	IP67	
Revision	Rev. 1.0 / 09.01.2024	
Changelog	-	

\*of the servo only w/o horns and accessories



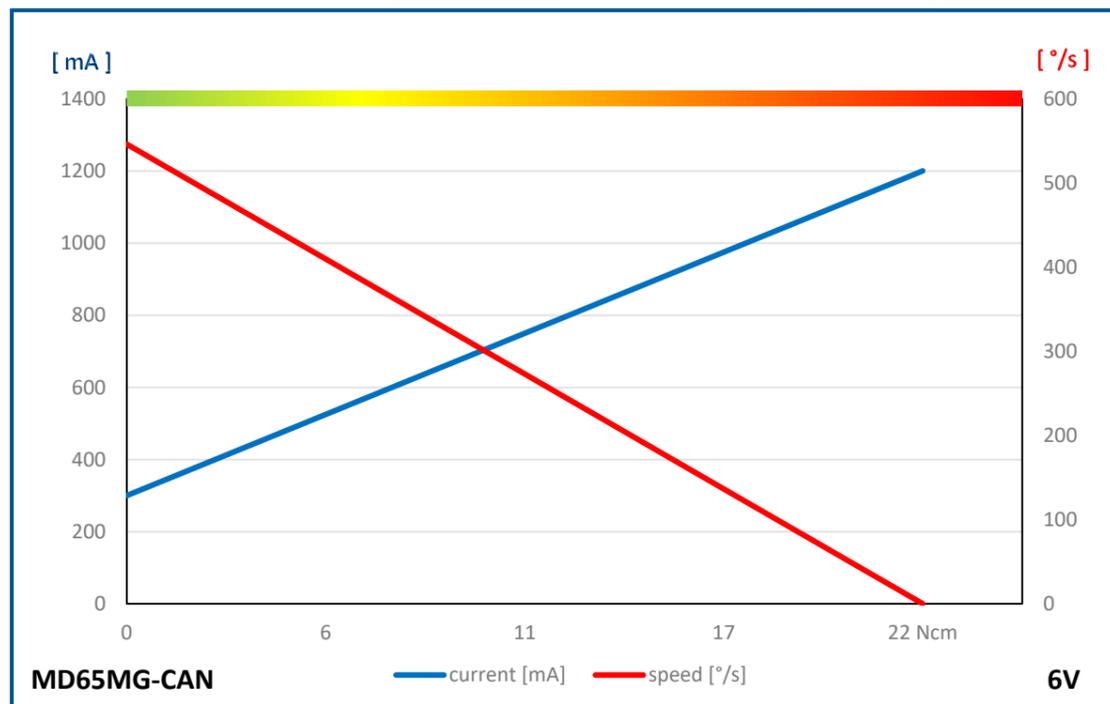
# MD65MG-/CAN/UAV/DRONECAN

#1-01600, #1-01707, #1-01643



1:1

## PERFORMANCE CHART



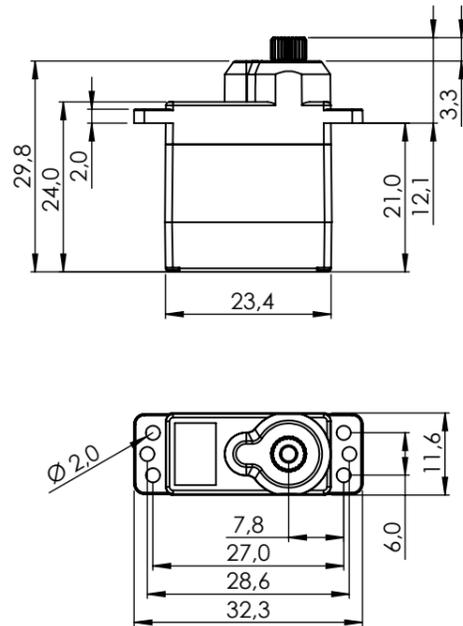
## GENERAL SPECIFICATION

MD65MG-CAN/UAVCAN/DroneCAN				
Control System	CAN BUS			
	Protocol (Mode)	Standard 2.0A	Extended 2.0B	UAVCAN/DroneCAN
	Baud-Rate	10kbps ~ 1Mbps		
	Sample-Point	50% or 87.5%		
	Available SERVO ID	1 ~ 254		1 ~ 127
	Available Node ID	1 ~ 2047	1 ~ 536870911	1 ~ 127
Input Signal Range	0 ~ 5V			
Connector Type	Hitec 4P			
Position Sensor Type	Contactless Magnetic Encoder			
Motor Type	Cored Metal Brush			
Amplifier / MCU	32bit programmable Digital			
Operating Voltage Range	3.5V ~ 8.4V			
Operating Voltage	At 4.8V	At 6.0V		
Operating Speed at no Load	429°/s (71RPM)	546°/s (91RPM)		
Stall Torque	1.8kgcm (17.7Ncm)	2.2kgcm (21.6Ncm)		
Peak Efficiency Torque	0.4kgcm (3.9Ncm)	0.4kgcm (3.9Ncm)		
Rest Current	30mA	30mA		
Running Current at no Load	180mA	220mA		
Stall Current	960mA	1200mA		
Deadband Width	4Step	4Step		
Travel	Travel / Command	90° / 4096		
	Servo mode	Left	Center	Right
	Pos Command	+1366	+8192	+15018
	Pos [°]	-150	0	+150
	Turn Mode	Left	Power On	Right
	Pos Command	-16383	0	+16383
	Pos [°]	-359	0	+359
	Turn Range	-32760 ~ +32760 (CAN only)		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)			
Storage Temperature Range	-30°C ~ +80°C (-31°F ~ +176°F)			
Vibrations at no Load	MIL-STD-810G 514.6C-VII			
Connector Wire Length	300mm			
Connector Wire Gauge	28AWG			
Connector Wire Strand Count	20/0.08			
External Dimensions	23.6 x 11.6 x 24.0mm			
Weight*	12.8g			
Ball Bearing	Single Ball Bearing			
Case Material	Engineering Plastic			
Gear Material	1 Heavy Duty Resin & 4 Metal Gears			
Gear Train Backlash	Max. 0.5°			
Horn Gear Spline	25T Ø5.0			
Accessories	Tapping Screw, Servo Horns (MS-I25, MS-L25, MS-X25)			
IP-Rating	IP4X			
Revision	Rev. 1.1 / 03.01.2024			
Changelog	-			

\*of the servo only w/o horns and accessories

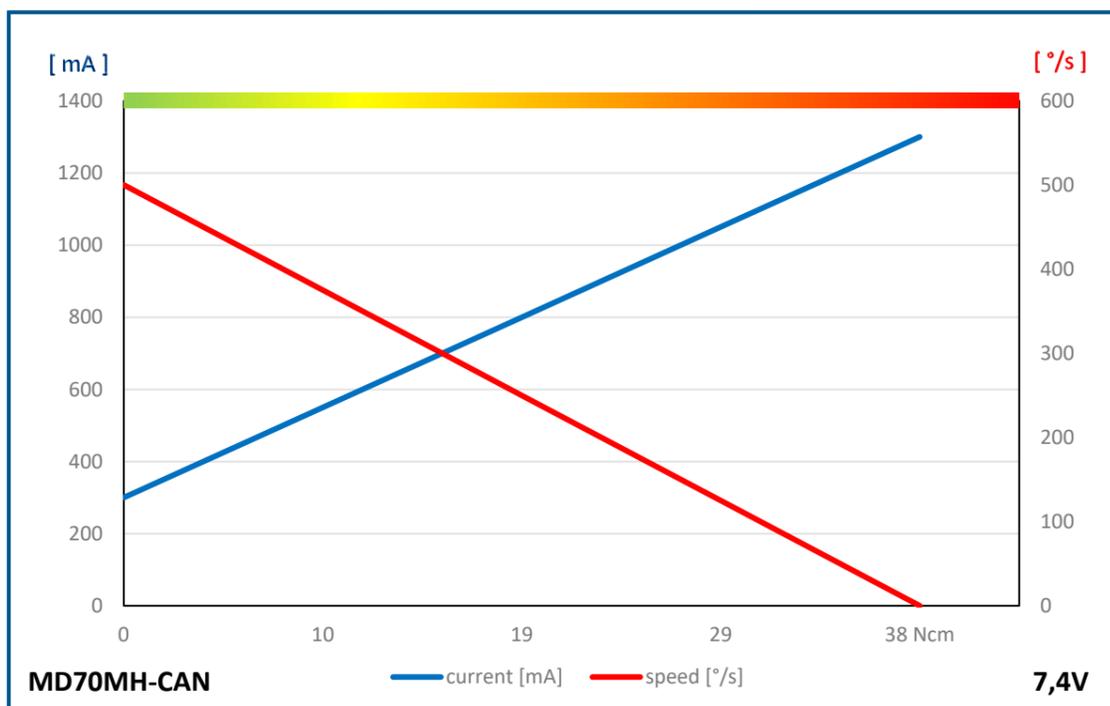
# MD70MH-/CAN/UAVCAN/DRONECAN

#1-03277, #1-01201, #1-01644



1:1

## PERFORMANCE CHART



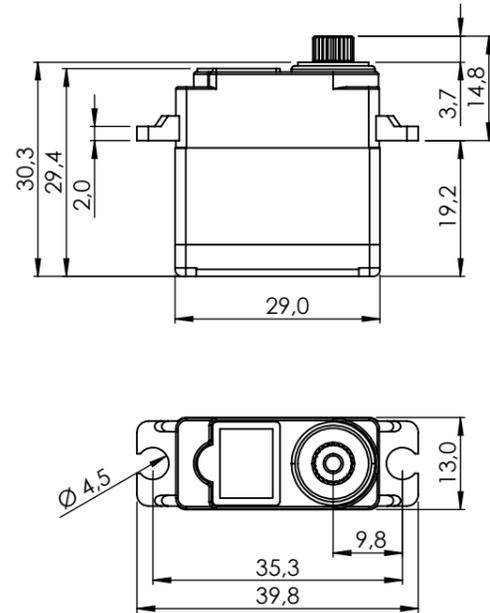
## GENERAL SPECIFICATION

MD70MH-/CAN/UAVCAN/DroneCAN				
Control System	CAN BUS			
	Protocol (Mode)	Standard 2.0A	Extended 2.0B	UAVCAN/DroneCAN
	Baud-Rate	10kbps ~ 1Mbps		
	Sample-Point	50% or 87.5%		
	Available SERVO ID	1 ~ 254		1 ~ 127
	Available Node ID	1 ~ 2047	1 ~ 536870911	1 ~ 127
Input Signal Range	0 ~ 5V			
Connector Type	Hitec 4P			
Position Sensor Type	Contactless Magnetic Encoder			
Motor Type	Cored Metal Brush			
Amplifier / MCU	32bit programmable Digital			
Operating Voltage Range	3.5V ~ 8.4V			
Operating Voltage	At 6.0V	At 7.4V		
Operating Speed at no Load	400°/s (67RPM)	500°/s (83RPM)		
Stall Torque	3.1kgcm (30.4Ncm)	3.8kgcm (37.3Ncm)		
Peak Efficiency Torque	0.6kgcm (5.9Ncm)	0.8kgcm (7.9Ncm)		
Rest Current	30mA	30mA		
Running Current at no Load	200mA	240mA		
Stall Current	1000mA	1300mA		
Deadband Width	n/a	n/a		
Travel	Travel / Command	90° / 4096		
	Servo mode	Left	Center	Right
	Pos Command	+1366	+8192	+15018
	Pos [°]	-150	0	+150
	Turn Mode	Left	Power On	Right
	Pos Command	-16383	0	+16383
	Pos [°]	-359	0	+359
	Turn Range	-32760 ~ +32760 (CAN only)		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)			
Storage Temperature Range	-30°C ~ +80°C (-31°F ~ +176°F)			
Vibrations at no Load	-			
Connector Wire Length	300mm			
Connector Wire Gauge	28AWG			
Connector Wire Strand Count	20/0.08			
External Dimensions	23.4 x 11.4 x 24.0mm			
Weight*	14.1g			
Ball Bearing	Single Ball Bearing			
Case Material	Engineering Plastic			
Gear Material	1 Heavy Duty Resin & 4 Metal Gears			
Gear Train Backlash	Max. 0.5°			
Horn Gear Spline	25T Ø5.0			
Accessories	Tapping Screw, Servo Horns (MS-I25, MS-L25, MS-X25)			
Dust & Water Protection class	IP4X			
Revision	Rev. 1.1 / 03.01.2024			
Changelog	-			

\*of the servo only w/o horns and accessories

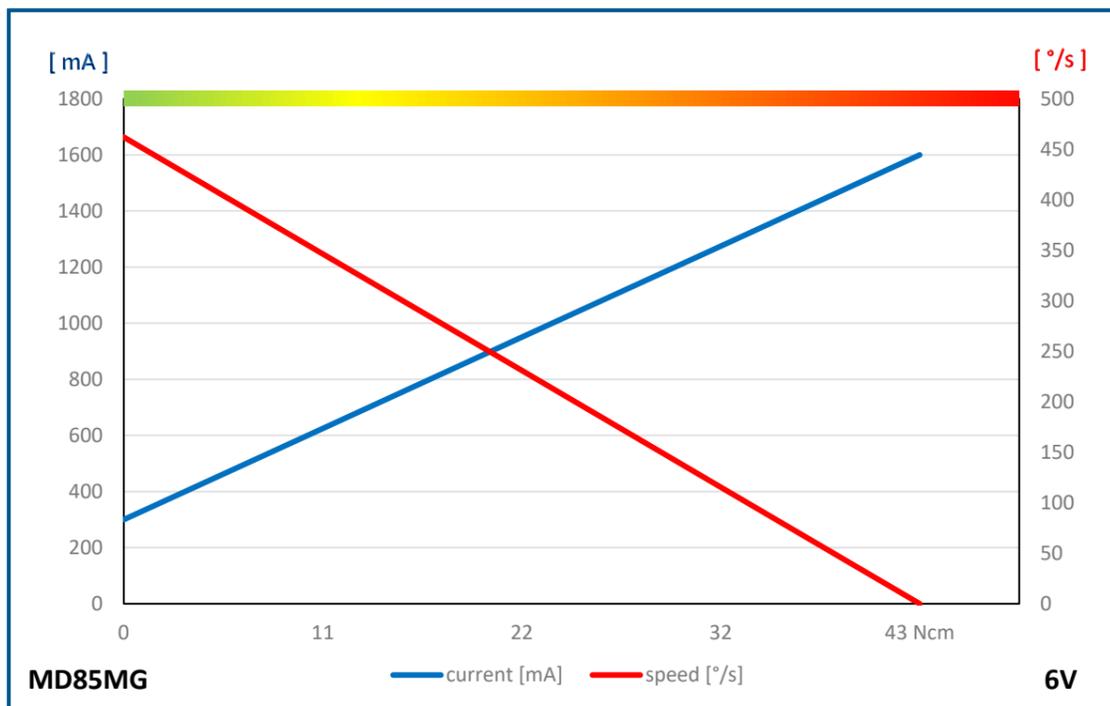
# MD85MG

#1-01656



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## PERFORMANCE CHART

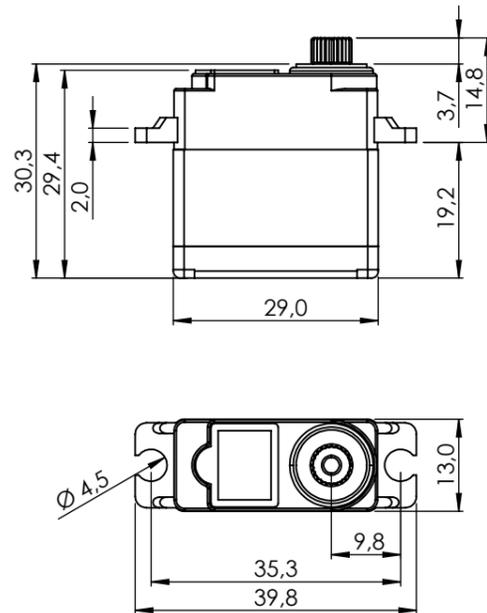


## GENERAL SPECIFICATION

MD85MG	
Control System	PWM / TTL (Half Duplex)
	Pulse Width 900µs 1500µs (Center) 2100µs
Connector Type	Hitec 3P (JR 3P compatible)
Position Sensor Type	Contactless Magnetic Encoder
Motor Type	Cored Carbon Brush
Amplifier / MCU	32bit programmable Digital Amplifier with Mosfet Drive
Operating Voltage Range	3.5V ~ 8.4V
Operating Voltage	At 4.8V <span style="float:right">At 6.0V</span>
Operating Speed at no Load	353°/s (59RPM) <span style="float:right">462°/s (77RPM)</span>
Stall Torque	3.6kgcm (35.3Ncm) <span style="float:right">4.3kgcm (42.2Ncm)</span>
Peak Efficiency Torque	0.7kgcm (6.9Ncm) <span style="float:right">0.9kgcm (8.8Ncm)</span>
Rest Current	30mA <span style="float:right">30mA</span>
Running Current at no Load	260mA <span style="float:right">300mA</span>
Stall Current	1300mA <span style="float:right">1600mA</span>
Deadband Width	2µs <span style="float:right">2µs</span>
Operating Travel	Default <span style="float:right">±60°</span>
	Programmable <span style="float:right">Max. 320°</span>
	Multi Turn/Continuous Rotation <span style="float:right">n/a / n/a</span>
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)
Vibrations at no Load	-
Connector Wire Length	250mm
Connector Wire Gauge	28AWG
Connector Wire Strand Count	20/0.08
External Dimensions	29.0 x 13.0 x 29.4mm
Weight*	21.5g
Ball Bearing	Single Ball Bearing
Case Material	Engineering Plastic
Gear Material	5 Metal Gears
Gear Train Backlash	Max. 0.5°
Horn Gear Spline	24T Ø6.0
Accessories	Mounting Hardware, Servo Horns (M-I, M-X, M-O)
IP-Rating	IP4X
Revision	Rev. 1.1 / 03.01.2024
Changelog	-
*of the servo only w/o horns and accessories	

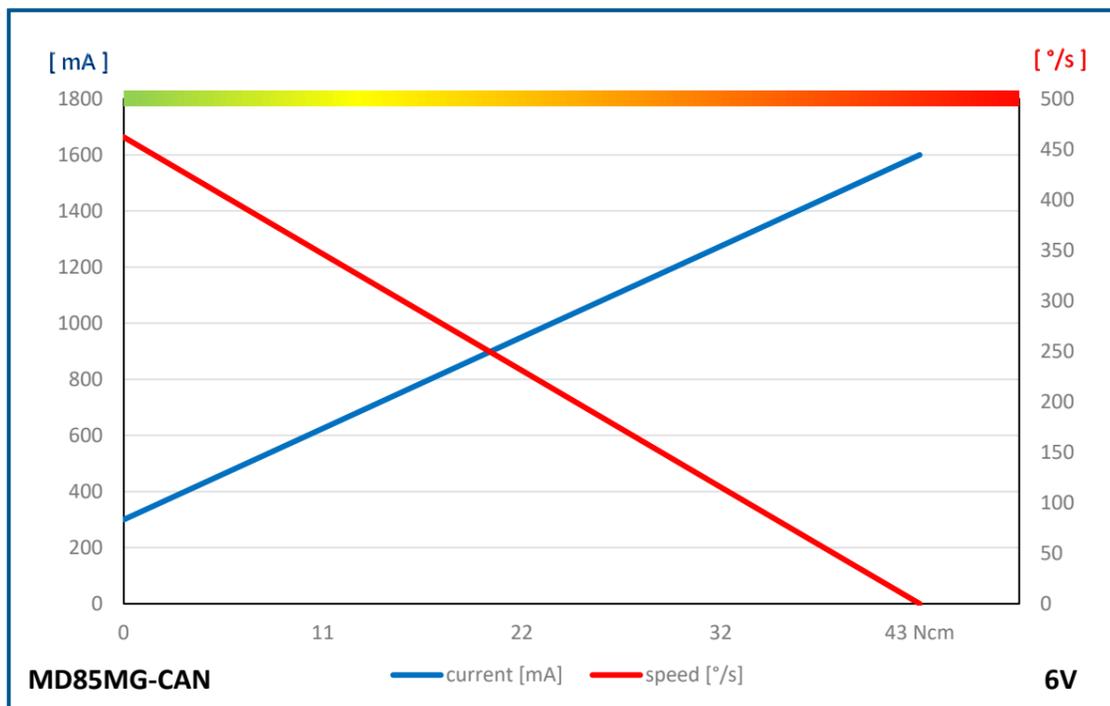
# MD85MG-CAN/UAVCAN/DRONECAN

#1-01573, #1-01645



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## PERFORMANCE CHART



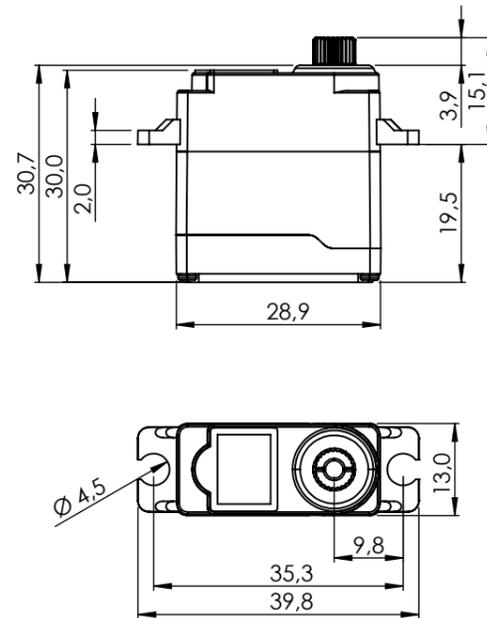
## GENERAL SPECIFICATION

MD85MG-CAN/UAVCAN/DroneCAN				
Control System	CAN BUS			
	Protocol (Mode)	Standard 2.0A	Extended 2.0B	UAVCAN/DroneCAN
	Baud-Rate	10kbps ~ 1Mbps		
	Sample-Point	50% or 87.5%		
	Available SERVO ID	1 ~ 254		1 ~ 127
	Available Node ID	1 ~ 2047	1 ~ 536870911	1 ~ 127
Input Signal Range	0 ~ 5V			
Connector Type	Hitec 4P			
Position Sensor Type	Contactless Magnetic Encoder			
Motor Type	Cored Carbon Brush			
Amplifier / MCU	32bit programmable Digital with Mosfet Drive			
Operating Voltage Range	4.0V ~ 8.4V			
Operating Voltage	At 4.8V	At 6.0V		
Operating Speed at no Load	353°/s (59RPM)	462°/s (77RPM)		
Stall Torque	3.6kgcm (35.3Ncm)	4.3kgcm (42.2Ncm)		
Peak Efficiency Torque	0.7kgcm (6.9Ncm)	0.9kgcm (8.8Ncm)		
Rest Current	30mA	30mA		
Running Current at no Load	260mA	300mA		
Stall Current	1300mA	1600mA		
Deadband Width	4Step	4Step		
Travel	Travel / Command	90° / 4096		
	Servo mode	Left	Center	Right
	Pos Command	+1366	+8192	+15018
	Pos [°]	-150	0	+150
	Turn Mode	Left	Power On	Right
	Pos Command	-16383	0	+16383
	Pos [°]	-359	0	+359
	Turn Range	-32760 ~ +32760 (CAN only)		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)			
Storage Temperature Range	-30°C ~ +80°C (-31°F ~ +176°F)			
Vibrations at no Load	MIL-STD-810G 514.6C-VII			
Connector Wire Length	300mm			
Connector Wire Gauge	28AWG			
Connector Wire Strand Count	20/0.08			
External Dimensions	29.0 x 13.0 x 29.4mm			
Weight*	22.7g			
Ball Bearing	Single Ball Bearing			
Case Material	Engineering Plastic			
Gear Material	5 Metal Gears			
Gear Train Backlash	Max. 0.5°			
Horn Gear Spline	24T $\varnothing 6.0$			
Accessories	Mounting Hardware, Servo Horns (M-I, M-X, M-O)			
IP-Rating	IP4X			
Revision	Rev. 1.1 / 03.01.2024			
Changelog	-			

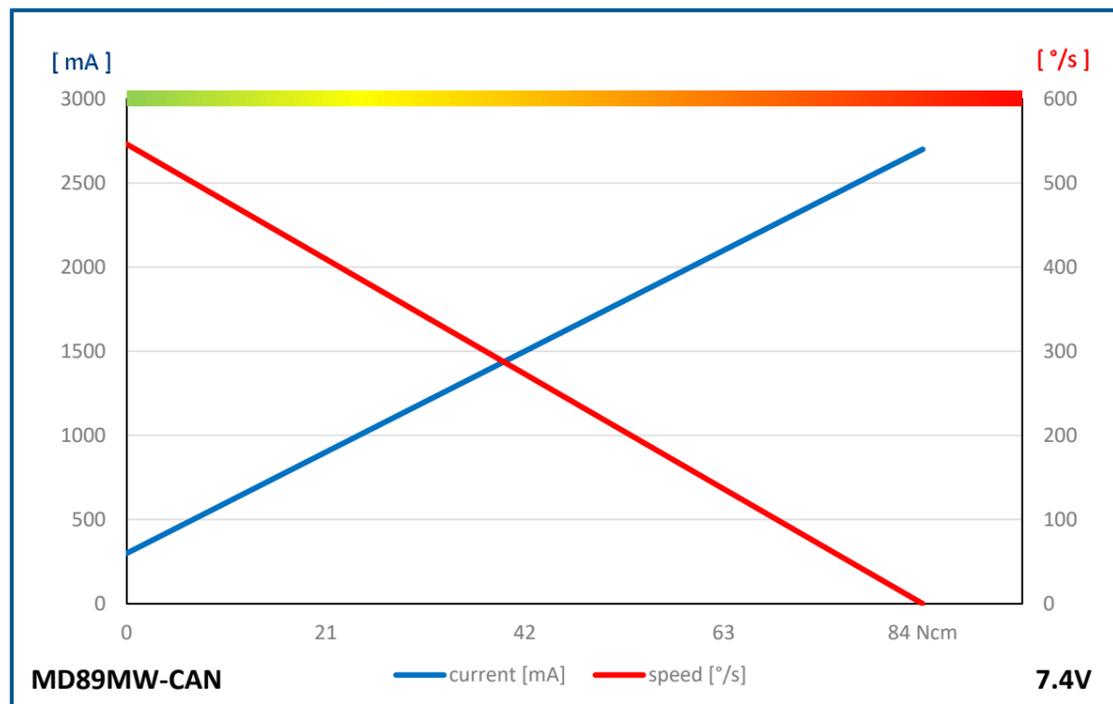
\*of the servo only w/o horns and accessories

# MD89MW-/CAN/UAVCAN/DRONECAN

#1-01237, #1-01972, #1-01973



## PERFORMANCE CHART



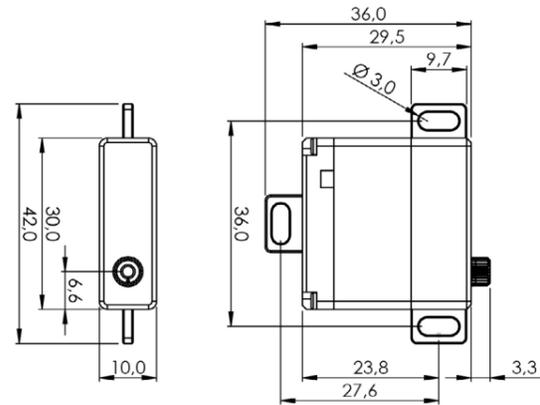
## GENERAL SPECIFICATION

MD89MW-CAN/UAVCAN/DroneCAN				
Control System	CAN BUS			
	Protocol (Mode)	Standard 2.0A	Extended 2.0B	UAVCAN/DroneCAN
	Baud-Rate	10kbps ~ 1Mbps		
	Sample-Point	50% or 87.5%		
	Available SERVO ID	1 ~ 254		1 ~ 127
	Available Node ID	1 ~ 2047	1 ~ 536870911	1 ~ 127
Input Signal Range	0 ~ 5V			
Connector Type	Hitec 4P			
Position Sensor Type	Contactless Magnetic Encoder			
Motor Type	Coreless			
Amplifier / MCU	32bit programmable Digital			
Operating Voltage Range	3.5 ~ 8.4V			
Operating Voltage	At 4.8V	At 6.0V	At 7.4V	
Operating Speed at no Load	353°/s (59RPM)	462°/s (77RPM)	546°/s (91RPM)	
Stall Torque	5.3kgcm (52.0Ncm)	6.4kgcm (62.8Ncm)	8.5kgcm (83.4Ncm)	
Peak Efficiency Torque	1.1kgcm (10.8Ncm)	1.3kgcm (12.8Ncm)	1.7kgcm (16.7Ncm)	
Rest Current	30mA	30mA	30mA	
Running Current at no Load	200mA	250mA	300mA	
Stall Current	1800mA	2200mA	2700mA	
Deadband Width	n/a	n/a	n/a	
Travel	Travel / Command	90° / 4096		
	Servo mode	Left	Center	Right
	Pos Command	+1366	+8192	+15018
	Pos [°]	-150	0	+150
	Turn Mode	Left	Power On	Right
	Pos Command	-16383	0	+16383
	Pos [°]	-359	0	+359
	Turn Range	-32760 ~ +32760 (CAN only)		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)			
Storage Temperature Range	-30°C ~ +80°C (-31°F ~ +176°F)			
Vibrations at no Load	-			
Connector Wire Length	300mm			
Connector Wire Gauge	22AWG			
Connector Wire Strand Count	60/0.08			
External Dimensions	28.9 x 13.0 x 30.0mm			
Weight*	28.0g			
Ball Bearing	Dual Ball Bearing			
Case Material	Engineering Plastic			
Gear Material	5 Metal Gears			
Gear Train Backlash	Max. 0.5°			
Horn Gear Spline	25T Ø6.0			
Accessories	Mounting Hardware, Servo Horns (M-I, M-X, M-O)			
IP-Rating	IP4X			
Revision	Rev. 1.1 / 03.01.2024			
Changelog	-			

\*of the servo only w/o horns and accessories

## MD141SH

#1-02852

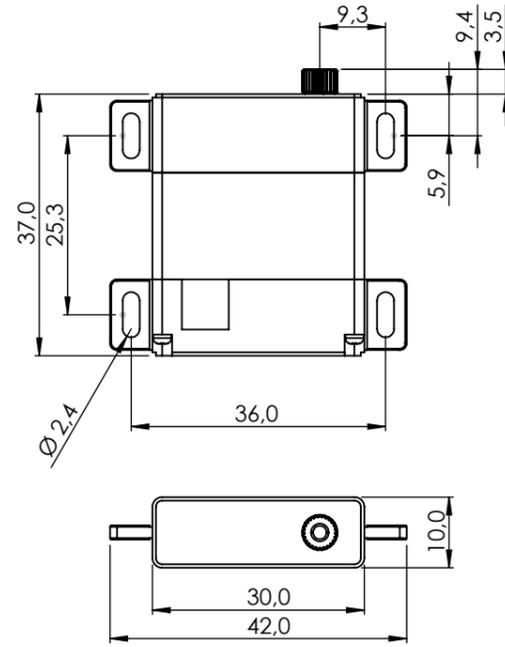


## GENERAL SPECIFICATION

Servo MD141SH			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	Coreless		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.13sec/60°	0.10sec/60°
Stall Torque	-	5.7kgf·cm (79.16oz-in)	7.0kgf·cm (97.21oz-in)
Peak Efficiency Torque	-	1.1kgf·cm (15.83oz-in)	1.4kgf·cm (19.44oz-in)
Standing Current	-	30mA	30mA
No Load Running Current	-	130mA	160mA
Stall Current	-	2,000mA	2,500mA
Deadband	-	2μs	2μs
Operating Travel	Default: ±60°, Programmable: Max 320° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	24AWG		
Dimensions	30.0mm x 10.0mm x 29.5mm (1.181inch x 0.394inch x 1.161inch)		
Weight	26.7g (0.942oz)		
Bearing Type	2 Ball Bearing		
Case Material	Aluminum Alloy		
Gear Material	1 Metal-Plastic & 4 Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	M25T(Ø5)		
IP-Rating	IP4X		

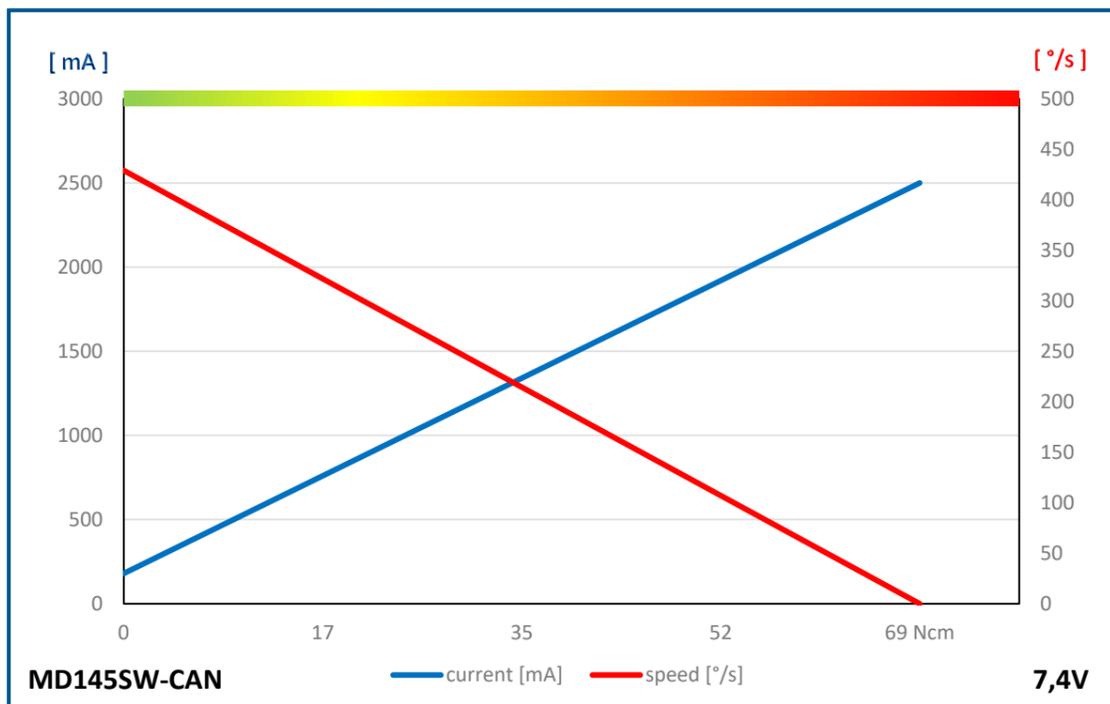
# MD145SW/CAN/UAVCAN/DRONECAN

#1-01598, #1-01787, #1-01641



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## PERFORMANCE CHART



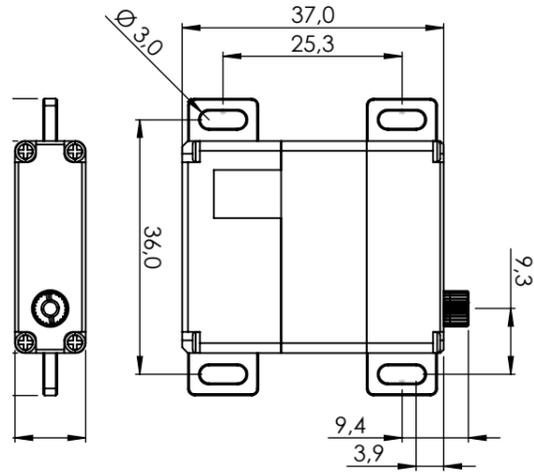
## GENERAL SPECIFICATION

MD145SW-CAN/UAVCAN/DroneCAN				
Control System	CAN BUS			
	Protocol (Mode)	Standard 2.0A	Extended 2.0B	UAVCAN/DroneCAN
	Baud-Rate	10kbps ~ 1Mbps		
	Sample-Point	50% or 87.5%		
	Available SERVO ID	1 ~ 254		1 ~ 127
	Available Node ID	1 ~ 2047	1 ~ 536870911	1 ~ 127
Input Signal Range	0 ~ 5V			
Connector Type	Hitec 4P			
Position Sensor Type	Contactless Magnetic Encoder			
Motor Type	Cored Carbon Brush			
Amplifier / MCU	32bit programmable Digital			
Operating Voltage Range	3.5V ~ 8.4V			
Operating Voltage	At 4.8V	At 6.0V	At 7.4V	
Operating Speed at no Load	286°/s (48RPM)	353°/s (59RPM)	429°/s (71RPM)	
Stall Torque	4.9kgcm (16.7Ncm)	5.9kgcm (57.9Ncm)	7.0kgcm (68.7Ncm)	
Peak Efficiency Torque	1.0kgcm (9.8Ncm)	1.2kgcm (11.8Ncm)	1.4kgcm (13.7Ncm)	
Rest Current	30mA	30mA	30mA	
Running Current at no Load	120mA	180mA	180mA	
Stall Current	1,600mA	2,500mA	2,500mA	
Deadband Width	4Step	4Step	4Step	
Travel	Travel / Command	90° / 4096		
	Servo mode	Left	Center	Right
	Pos Command	+1366	+8192	+15018
	Pos [°]	-150	0	+150
	Turn Mode	Left	Power On	Right
	Pos Command	-16383	0	+16383
	Pos [°]	-359	0	+359
Turn Range	-32760 ~ +32760 (CAN only)			
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)			
Storage Temperature Range	-30°C ~ +80°C (-31°F ~ +176°F)			
Vibrations at no Load	MIL-STD-810G 514.6C-VII			
Connector Wire Length	300mm			
Connector Wire Gauge	24AWG			
Connector Wire Strand Count	40/0.08			
External Dimensions	30.0 x 10.0 x 37.0mm			
Weight*	27.6g			
Ball Bearing	Dual Ball Bearing			
Case Material	Engineering Plastic			
Gear Material	1 Metal-Plastic & 4 Steel Gears			
Gear Train Backlash	Max. 0.5°			
Horn Gear Spline	25T Ø5.0			
Accessories	Mounting Hardware, Servo Horns (MS-L25, MS-ML25)			
IP-Rating	IP4X			
Revision	Rev. 1.1 / 03.01.2024			
Changelog	-			

\*of the servo only w/o horns and accessories

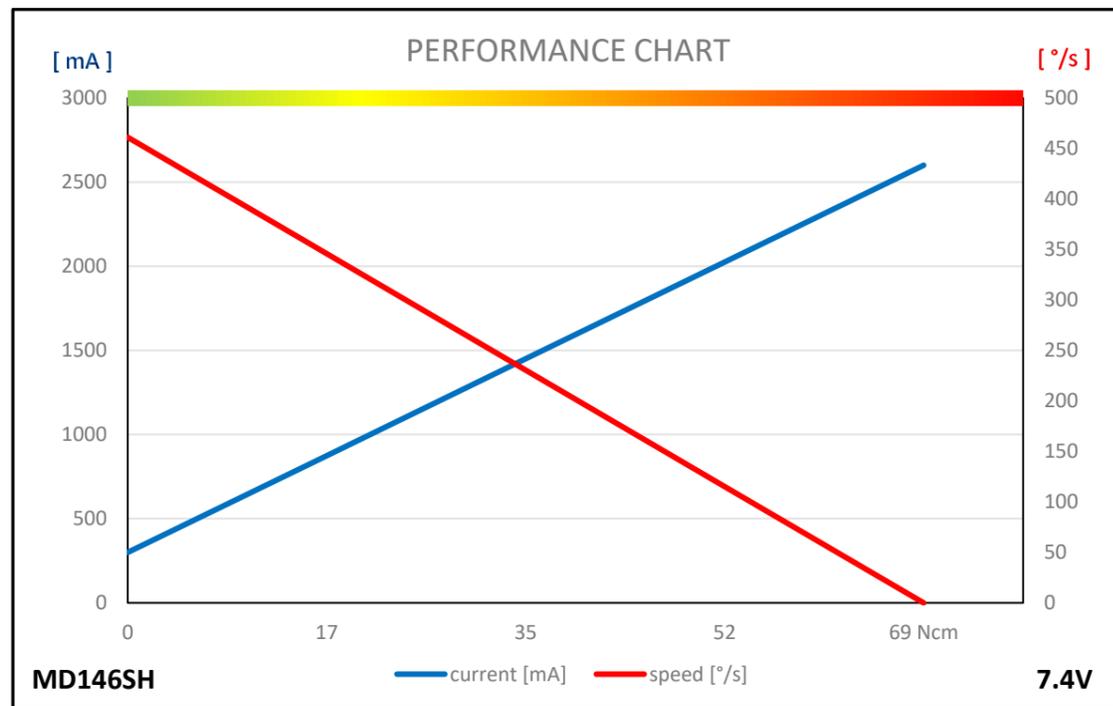
# MD146SH

#1-03090



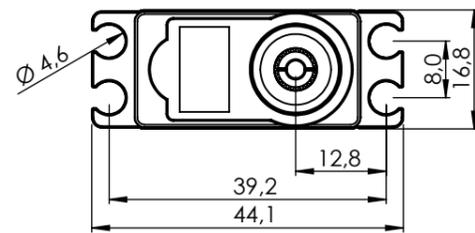
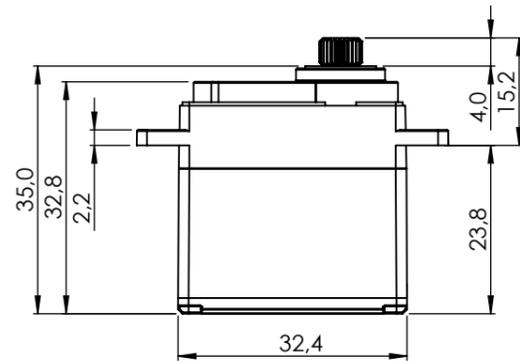
## GENERAL SPECIFICATION

MD146SH			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	Cored Carbon Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.15sec/60°	0.13sec/60°
Stall Torque	-	5.9kgf-cm (81.94oz-in)	7.0kgf-cm (97.21oz-in)
Peak Efficiency Torque	-	1.2kgf-cm (16.39oz-in)	1.4kgf-cm (19.44oz-in)
Standing Current	-	30mA	30mA
No Load Running Current	-	250mA	300mA
Stall Current	-	2,100mA	2,600mA
Deadband	-	2μs	2μs
Operating Travel	Default: ±60°, Programmable: Max 320° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	24AWG		
Dimensions	30.0mm x 10.0mm x 37.0mm (1.181inch x 0.394inch x 1.457inch)		
Weight	31.0g (1.093oz)		
Bearing Type	2 Ball Bearing		
Case Material	Aluminum Alloy		
Gear Material	1 Metal-Plastic & 4 Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	M25T(Ø5)		
IP-Rating	IP4X		
Servo Amplifier Type	32bit Programmable Digital		



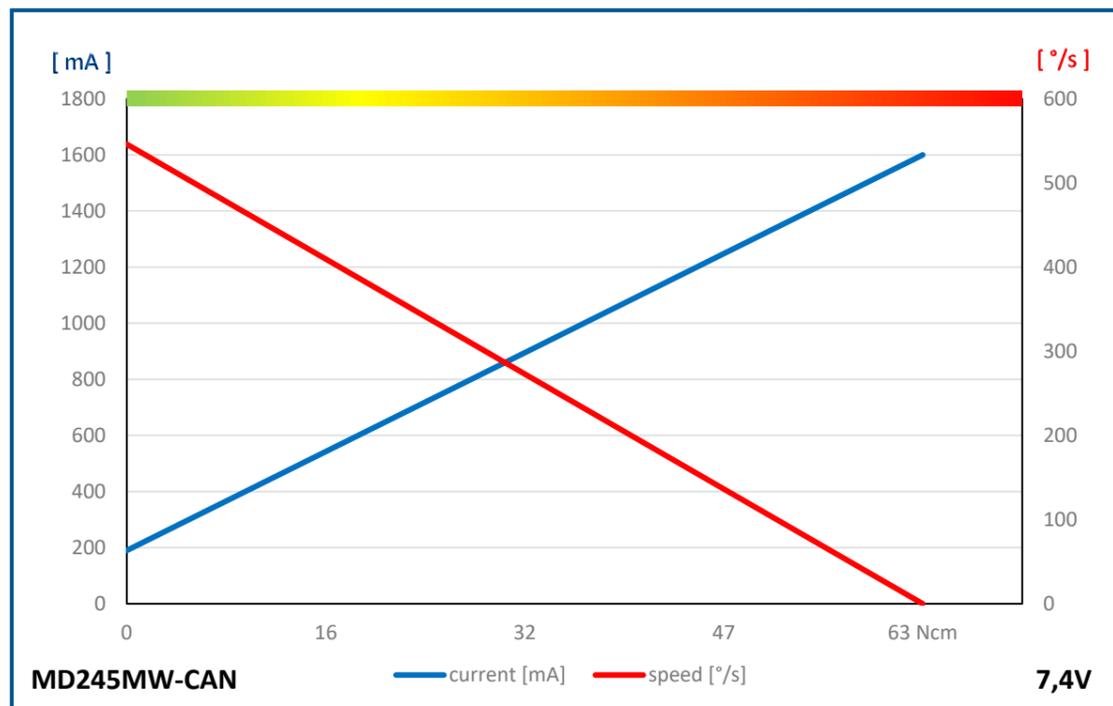
# MD245MW-/CAN/UAVCAN/DRONECAN

#1-01247, #1-01574, #1-01642



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## PERFORMANCE CHART



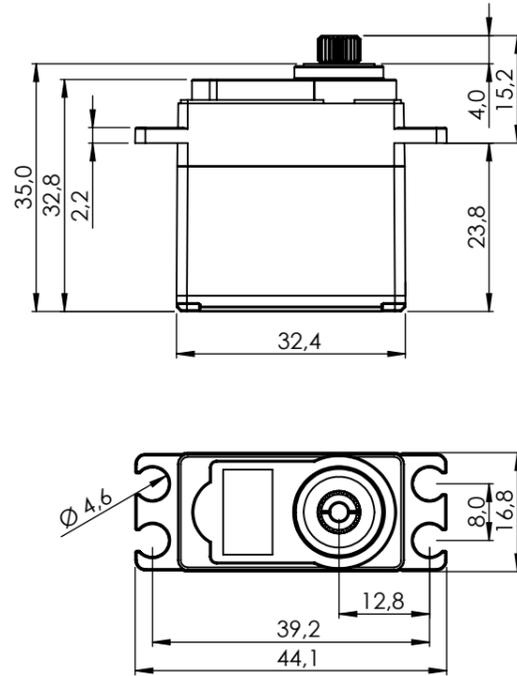
## GENERAL SPECIFICATION

MD245MW-CAN/UAVCAN/DroneCAN				
Control System	CAN BUS			
	Protocol (Mode)	Standard 2.0A	Extended 2.0B	UAVCAN/DroneCAN
	Baud-Rate	10kbps ~ 1Mbps		
	Sample-Point	50% or 87.5%		
	Available SERVO ID	1 ~ 254		1 ~ 127
	Available Node ID	1 ~ 2047	1 ~ 536870911	1 ~ 127
Input Signal Range	0 ~ 5V			
Connector Type	Hitec 4P			
Position Sensor Type	Contactless Magnetic Encoder			
Motor Type	Coreless Metal Brush			
Amplifier / MCU	32bit programmable Digital			
Operating Voltage Range	3.5V ~ 8.4V			
Operating Voltage	At 4.8V	At 6.0V	At 7.4V	
Operating Speed at no Load	353°/s (59RPM)	462°/s (77RPM)	546°/s (91RPM)	
Stall Torque	4.2kgcm (41.2Ncm)	5.2kgcm (51.0Ncm)	6.4kgcm (62.8Ncm)	
Peak Efficiency Torque	0.8kgcm (7.9Ncm)	1.0kgcm (9.8Ncm)	1.3kgcm (12.8Ncm)	
Rest Current	30mA	30mA	30mA	
Running Current at no Load	110mA	150mA	190mA	
Stall Current	1000mA	1300mA	1600mA	
Deadband Width	n/a	n/a	n/a	
Travel	Travel / Command	90° / 4096		
	Servo mode	Left	Center	Right
	Pos Command	+1366	+8192	+15018
	Pos [°]	-150	0	+150
	Turn Mode	Left	Power On	Right
	Pos Command	-16383	0	+16383
	Pos [°]	-359	0	+359
	Turn Range	-32760 ~ +32760 (CAN only)		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)			
Storage Temperature Range	-30°C ~ +80°C (-31°F ~ +176°F)			
Vibrations at no Load	MIL-STD-810G 514.6C-VII			
Connector Wire Length	300mm			
Connector Wire Gauge	22AWG			
Connector Wire Strand Count	60/0.08			
External Dimensions	32.4 x 16.8 x 32.8mm			
Weight*	35.5g			
Ball Bearing	Dual Ball Bearing			
Case Material	Engineering Plastic			
Gear Material	1 Metal-Plastic & 3 Metal Gears			
Gear Train Backlash	Max. 0.5°			
Horn Gear Spline	H25T Ø6.0			
Accessories	Mounting Hardware, Servo Horn (M-025)			
IP-Rating	IP4X			
Revision	Rev. 1.1 / 03.01.2024			
Changelog	-			

\*of the servo only w/o horns and accessories

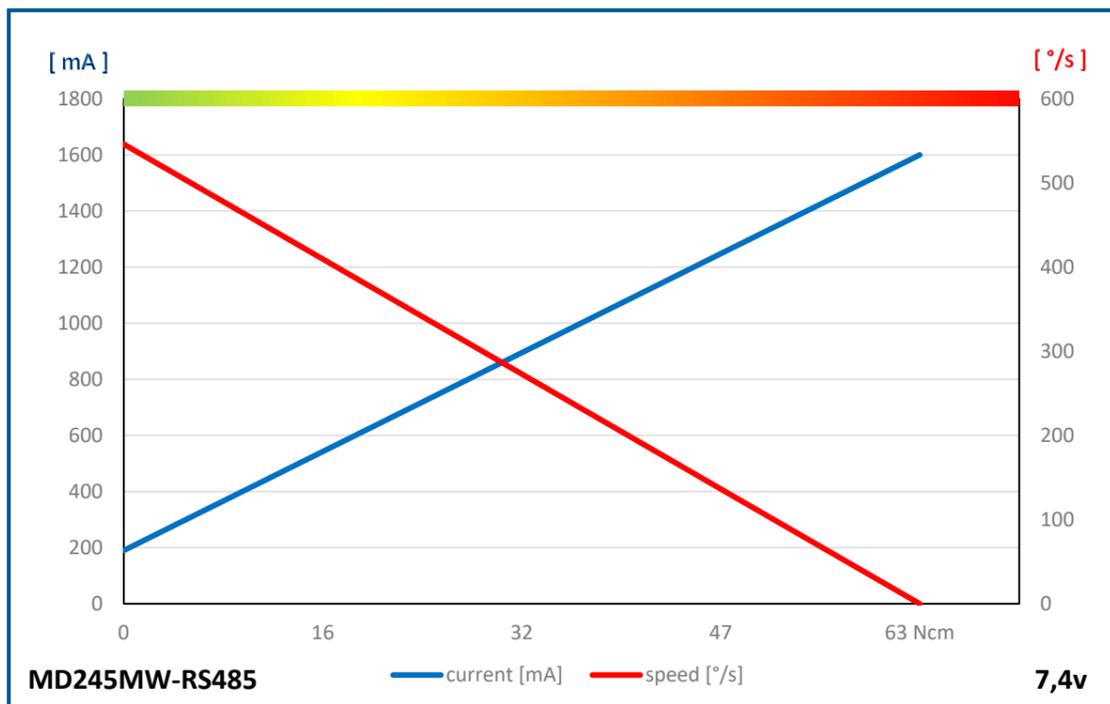
# MD245MW-RS485

#1-01677



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## PERFORMANCE CHART

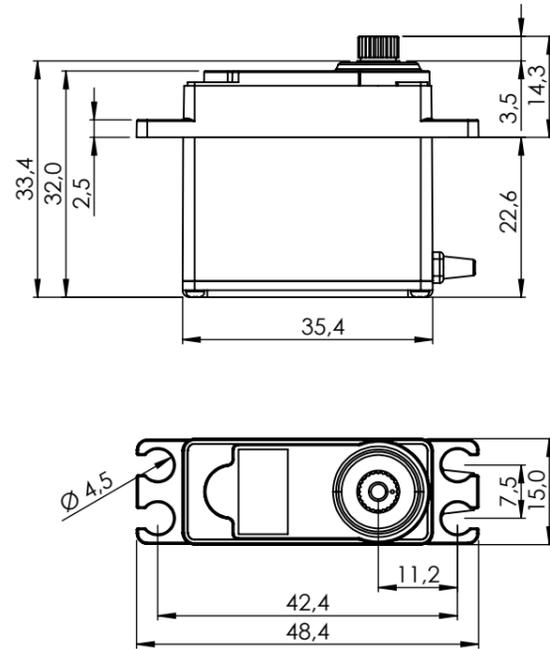


## GENERAL SPECIFICATION

MD245MW-RS485			
Control System	RS485		
	Pulse Width -		
Connector Type	Hitec 4P		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	Coreless		
Amplifier / MCU	32bit programmable Digital		
Operating Voltage Range	4.0V ~ 8.4V		
Operating Voltage	At 4.8V	At 6.0V	At 7.4V
Operating Speed at no Load	353°/s (59RPM)	462°/s (77RPM)	546°/s (91RPM)
Stall Torque	4.2kgcm (41.2Ncm)	5.2kgcm (51.0Ncm)	6.4kgcm (62.8Ncm)
Peak Efficiency Torque	0.9kgcm (8.8Ncm)	1.0kgcm (9.8Ncm)	1.3kgcm (12.8Ncm)
Rest Current	30mA	30mA	30mA
Running Current at no Load	110mA	150mA	190mA
Stall Current	1000mA	1300mA	1600mA
Deadband Width	n/a	n/a	n/a
Operating Travel	Default	±60°	
	Programmable	Max. 320°	
	Multi Turn/Continuous Rotation	n/a / n/a	
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)		
Vibrations at no Load	-		
Connector Wire Length	300mm		
Connector Wire Gauge	22AWG		
Connector Wire Strand Count	60/0.08		
External Dimensions	32.4 x 16.8 x 32.8mm		
Weight*	35.2g		
Ball Bearing	Dual Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal-Plastic & 3 Metal Gears		
Gear Train Backlash	Max. 0.5°		
Horn Gear Spline	H25T Ø6.0		
Accessories	Mounting Hardware, Servo Horn (M-O25)		
IP-Rating	IP4X		
Revision	Rev. 1.0 / 05.01.2024		
Changelog	-		
*of the servo only w/o horns and accessories			

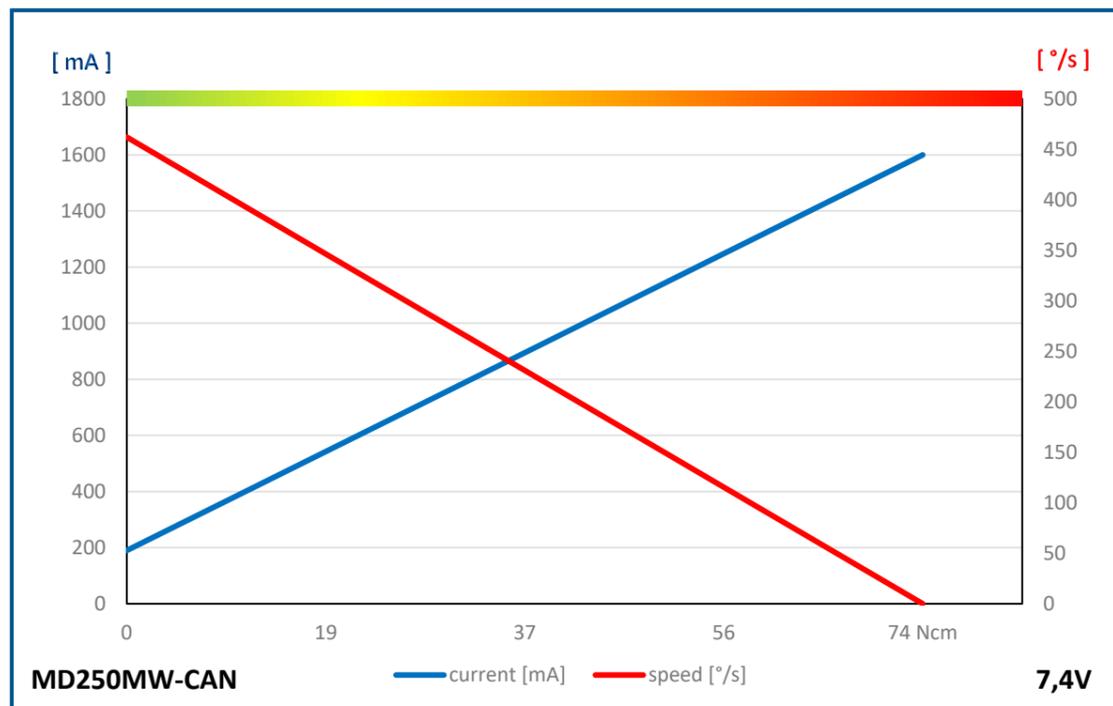
# MD250MW

#1-00707



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## PERFORMANCE CHART

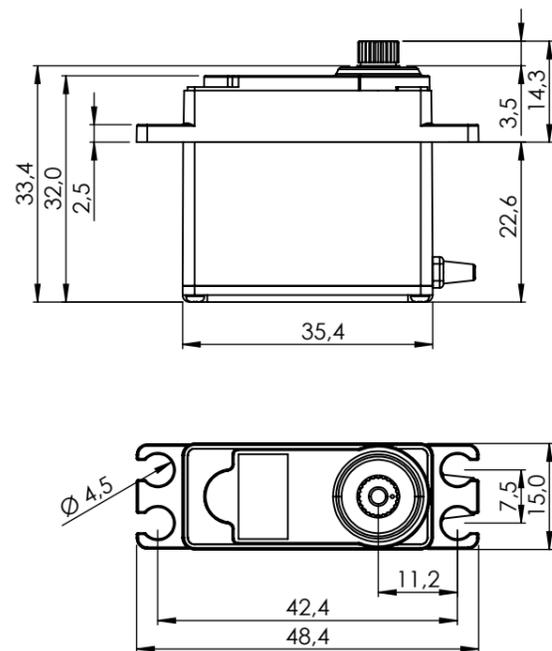


## GENERAL SPECIFICATION

MD250MW			
Control System	PWM / TTL (Half Duplex)		
	Pulse Width 900µs 1500µs (Center) 2100µs		
Connector Type	Hitec 3P (JR 3P compatible)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	Cored Carbon Brush		
Amplifier / MCU	32Bit programmable Digital with Mosfet Drive		
Operating Voltage Range	3.5V ~ 8.4V		
Operating Voltage	At 4.8V	At 6.0V	At 7.4V
Operating Speed at no Load	300°/s (50RPM)	375°/s (63RPM)	462°/s (77RPM)
Stall Torque	4.9kgcm (48.1Ncm)	6.1kgcm (59.8Ncm)	7.5kgcm (73.6Ncm)
Peak Efficiency Torque	1.0kgcm (9.8Ncm)	1.2kgcm (11.8Ncm)	1.5kgcm (14.7Ncm)
Rest Current	40mA	40mA	40mA
Running Current at no Load	110mA	150mA	190mA
Stall Current	1000mA	1300mA	1600mA
Deadband Width	2µs	2µs	2µs
Operating Travel	Default	±60°	
	Programmable	Max. 320°	
	Multi Turn/Continuous Rotation	n/a / n/a	
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)		
Vibrations at no Load	-		
Connector Wire Length	300mm		
Connector Wire Gauge	22AWG		
Connector Wire Strand Count	60/0.08		
External Dimensions	35.4 x 15.0 x 32.0mm		
Weight*	38.3g		
Ball Bearing	Dual Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal-Plastic & 4 Steel Gears		
Gear Train Backlash	Max. 0.5°		
Horn Gear Spline	H25T Ø6.0		
Accessories	Mounting Hardware, Servo Horns (M-I25, R-ML25)		
IP-Rating	IP4X		
Revision	Rev. 1.1 / 03.01.2024		
Changelog	-		
*of the servo only w/o horns and accessories			

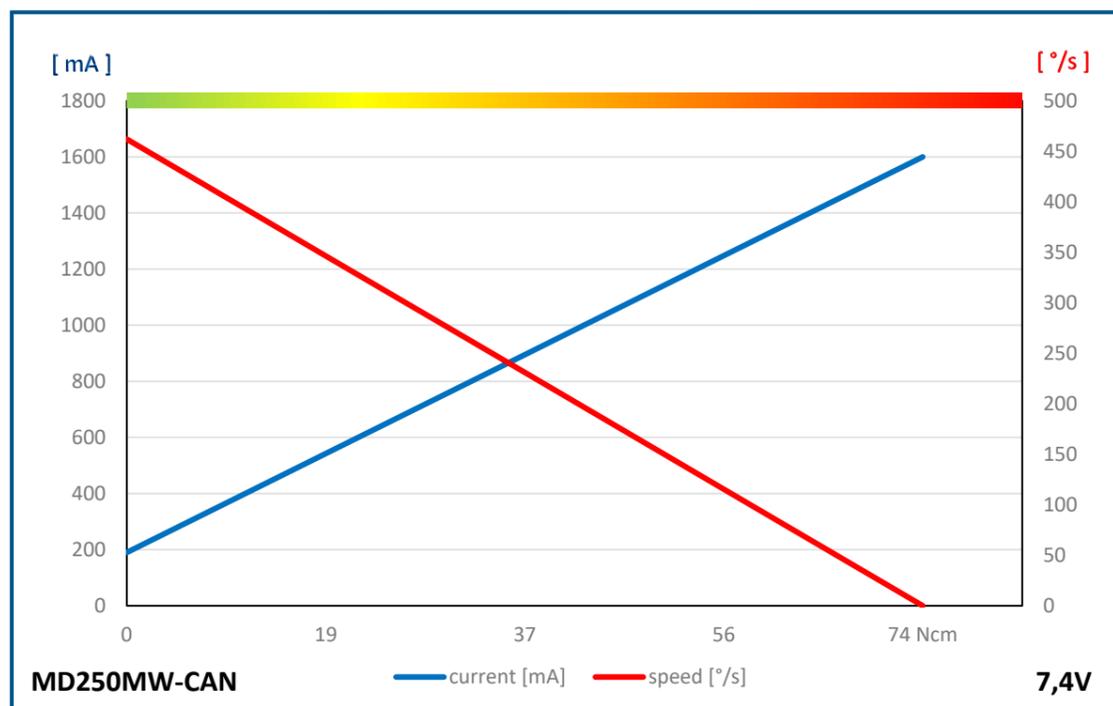
# MD250MW-CAN/UAVCAN/DRONECAN

#1-01666, #1-01572



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## PERFORMANCE CHART

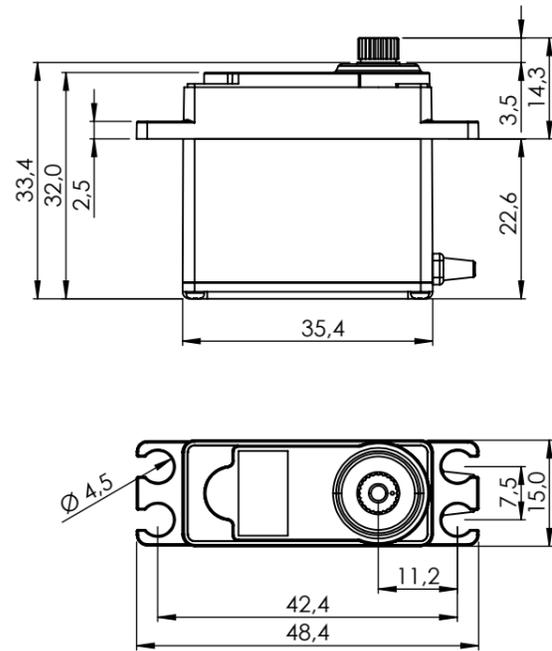


## GENERAL SPECIFICATION

MD250MW-CAN/UAVCAN/DroneCAN				
Control System	CAN BUS			
	Protocol (Mode)	Standard 2.0A	Extended 2.0B	UAVCAN/DroneCAN
	Baud-Rate	10kbps ~ 1Mbps		
	Sample-Point	50% or 87.5%		
	Available SERVO ID	1 ~ 254		1 ~ 127
	Available Node ID	1 ~ 2047	1 ~ 536870911	1 ~ 127
Input Signal Range	0 ~ 5V			
Connector Type	Hitec 4P			
Position Sensor Type	Contactless Magnetic Encoder			
Motor Type	Cored Carbon Brush			
Amplifier / MCU	32bit programmable Digital			
Operating Voltage Range	4.0V ~ 8.4V			
Operating Voltage	At 4.8V	At 6.0V	At 7.4V	
Operating Speed at no Load	300°/s (50RPM)	375°/s (63RPM)	462°/s (77RPM)	
Stall Torque	4.9kgcm (48.1Ncm)	6.1kgcm (59.8Ncm)	7.5kgcm (73.6Ncm)	
Peak Efficiency Torque	1.0kgcm (9.8Ncm)	1.2kgcm (11.8Ncm)	1.5kgcm (14.7Ncm)	
Rest Current	40mA	40mA	40mA	
Running Current at no Load	110mA	150mA	190mA	
Stall Current	1000mA	1300mA	1600mA	
Travel	Travel / Command	90° / 4096		
	Servo mode	Left	Center	Right
	Pos Command	+1366	+8192	+15018
	Pos [°]	-150	0	+150
	Turn Mode	Left	Power On	Right
	Pos Command	-16383	0	+16383
	Pos [°]	-359	0	+359
Turn Range	-32760 ~ +32760 (CAN only)			
Operating Temperature Range	-20°C ~ +60°C (-22°F ~ +140°F)			
Storage Temperature Range	-30°C ~ +60°C (-80°F ~ +176°F)			
Vibrations at no Load	MIL-STD-810G 514.6C-VII			
Connector Wire Length	300mm			
Connector Wire Gauge	22AWG			
Connector Wire Strand Count	60/0.08			
External Dimensions	35.4 x 15.0 x 32.0mm			
Weight*	38.8g			
Ball Bearing	Dual Ball Bearing			
Case Material	Engineering Plastic			
Gear Material	1 Metal-Plastic & 4 Steel Gears			
Gear Train Backlash	Max. 0.5°			
Horn Gear Spline	H25T Ø6.0			
Accessories	Mounting Hardware, Servo Horn (M-125)			
IP-Rating	IP4X			
Revision	Rev. 1.1 / 03.01.2024			
Changelog	-			
*of the servo only w/o horns and accessories				

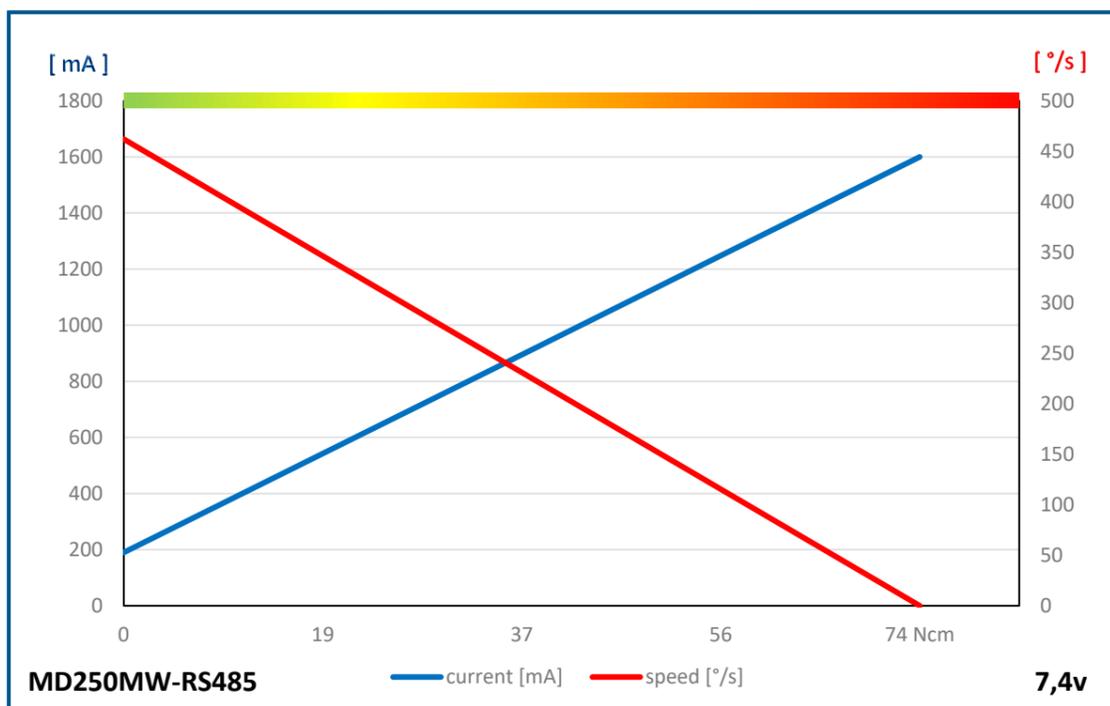
# MD250MW-RS485

#1-01676



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## PERFORMANCE CHART

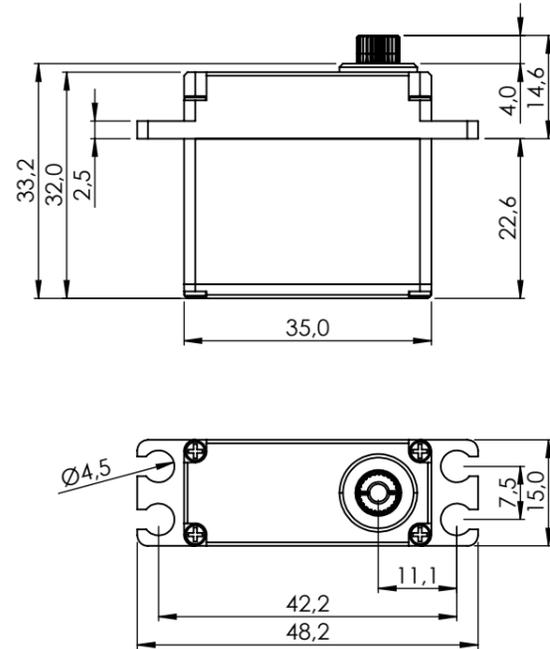


## GENERAL SPECIFICATION

MD250MW-RS485			
Control System	RS485		
	Pulse Width -		
Connector Type	Hitec 4P		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	Cored Carbon Brush		
Amplifier / MCU	32bit programmable Digital		
Operating Voltage Range	4.0V ~ 8.4V		
Operating Voltage	At 4.8V	At 6.0V	At 7.4V
Operating Speed at no Load	300°/s (50RPM)	375°/s (63RPM)	462°/s (77RPM)
Stall Torque	4.9kgcm (48.1Ncm)	6.1kgcm (59.8Ncm)	7.5kgcm (73.6Ncm)
Peak Efficiency Torque	1.0kgcm (9.8Ncm)	1.2kgcm (11.8Ncm)	1.5kgcm (14.7Ncm)
Rest Current	40mA	40mA	40mA
Running Current at no Load	110mA	150mA	190mA
Stall Current	1000mA	1300mA	1600mA
Deadband Width	n/a	n/a	n/a
Operating Travel	Default	±60°	
	Programmable	Max. 320°	
	Multi Turn/Continuous Rotation	n/a / n/a	
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)		
Vibrations at no Load	-		
Connector Wire Length	300mm		
Connector Wire Gauge	22AWG		
Connector Wire Strand Count	60/0.08		
External Dimensions	35.4 x 15.0 x 32.0mm		
Weight*	40.0g		
Ball Bearing	Dual Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal-Plastic & 4 Steel Gears		
Gear Train Backlash	Max. 0.5°		
Horn Gear Spline	H25T Ø6.0		
Accessories	Mounting Hardware, Servo Horn (M-I25)		
IP-Rating	IP4X		
Revision	Rev. 1.0 / 05.01.2024		
Changelog	-		
*of the servo only w/o horns and accessories			

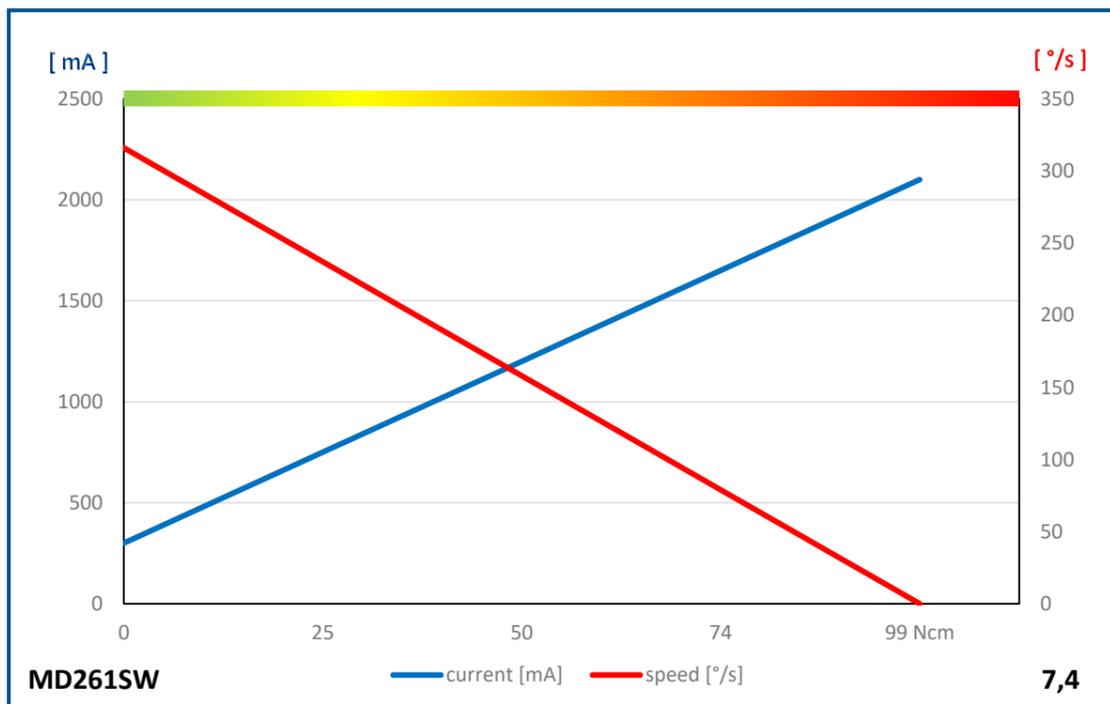
# MD261SW

#1-03052



1:1

## PERFORMANCE CHART



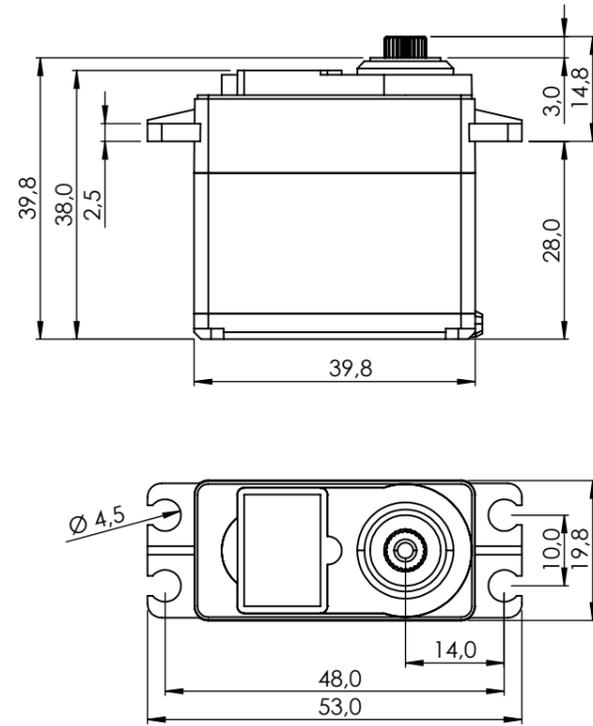
## GENERAL SPECIFICATION

MD261SW			
Control System	PWM / TTL (Half Duplex)		
	Pulse Width 900µs 1500µs (Center) 2100µs		
Connector Type	Hitec 3P (JR 3P compatible)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	Cored Carbon Brush		
Amplifier / MCU	32bit programmable Digital		
Operating Voltage Range	3.5V ~ 8.4V		
Operating Voltage	At 4.8V	At 6.0V	At 7.4V
Operating Speed at no Load	200°/s (33RPM)	261°/s (44RPM)	316°/s (53RPM)
Stall Torque	6.5kgcm (63.7Ncm)	8.1kgcm (79.5Ncm)	10.0kgcm (98.1Ncm)
Peak Efficiency Torque	1.3kgcm (12.8Ncm)	1.6kgcm (15.7Ncm)	2.0kgcm (19.6Ncm)
Rest Current	30mA	30mA	30mA
Running Current at no Load	220mA	260mA	300mA
Stall Current	1400mA	1700mA	2100mA
Deadband Width	2µs	2µs	2µs
Operating Travel	Default	±60°	
	Programmable	Max. 320°	
	Multi Turn/Continuous Rotation	n/a / n/a	
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)		
Vibrations at no Load	-		
Connector Wire Length	300mm		
Connector Wire Gauge	22AWG		
Connector Wire Strand Count	60/0.08		
External Dimensions	35.0 x 15.0 x 32.0mm		
Weight*	50.6g		
Ball Bearing	Dual Ball Bearing		
Case Material	Aluminum Alloy		
Gear Material	5 Steel Gears		
Gear Train Backlash	Max. 0.5°		
Horn Gear Spline	H25T Ø6.0		
Accessories	Mounting Hardware, Servo Horn (M-I25)		
IP-Rating	IP4X		
Revision	Rev. 1.0 / 05.01.2024		
Changelog	-		
*of the servo only w/o horns and accessories			

# MD485HW

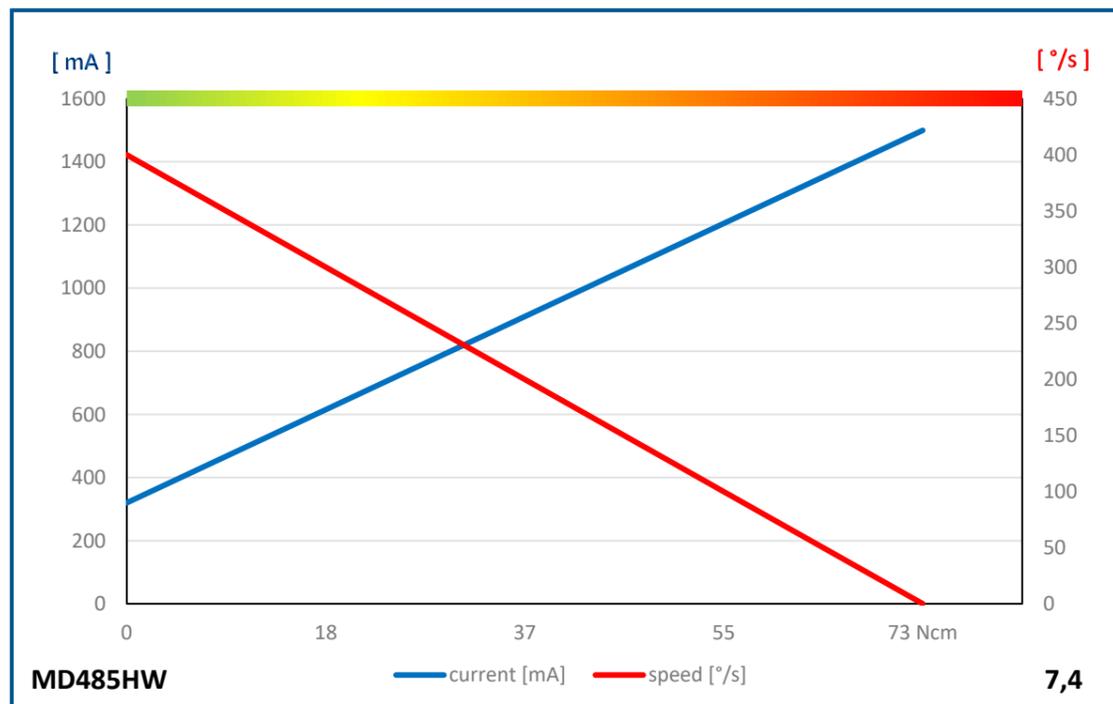
#1-01924

#1-02363 GP 30 Stück



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## PERFORMANCE CHART

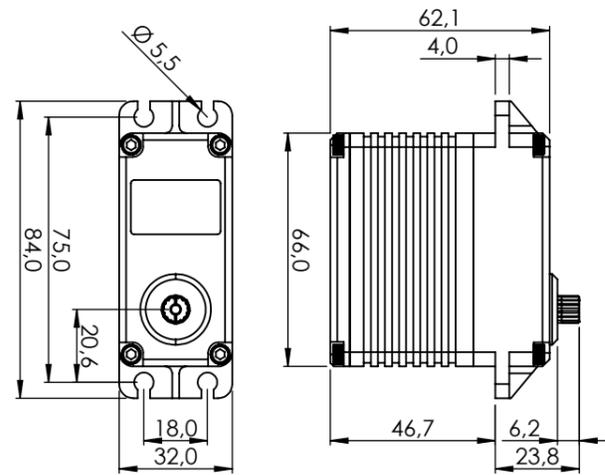


## GENERAL SPECIFICATION

MD485HW			
Control System	PWM / TTL (Half Duplex)		
	Pulse Width 900µs 1500µs (Center) 2100µs		
Connector Type	Hitec 3P (JR 3P compatible)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	Cored Carbon Brush		
Amplifier / MCU	32bit Programmable Digital Mosfet Drive		
Operating Voltage Range	3.5V ~ 8.4V		
Operating Voltage	At 4.8V	At 6.0V	At 7.4V
Operating Speed at no Load	300°/s (50RPM)	353°/s (59RPM)	400°/s (67RPM)
Stall Torque	4.8kgcm (47.1Ncm)	6.0kgcm (58.8Ncm)	7.4kgcm (72.6Ncm)
Peak Efficiency Torque	1.0kgcm (9.8Ncm)	1.2kgcm (11.8Ncm)	1.5kgcm (14.7Ncm)
Rest Current	30mA	30mA	30mA
Running Current at no Load	250mA	280mA	320mA
Stall Current	1000mA	1200mA	1500mA
Deadband Width	2µs	2µs	2µs
Operating Travel	Default	±60°	
	Programmable	Max. 320°	
	Multi Turn/Continuous Rotation	n/a / n/a	
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)		
Vibrations at no Load	-		
Connector Wire Length	300mm		
Connector Wire Gauge	24AWG		
Connector Wire Strand Count	40/0.08		
External Dimensions	39.8 x 19.8 x 38.0mm		
Weight*	43.3g		
Ball Bearing	Dual Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	4 Heavy Duty Resin Gears		
Gear Train Backlash	Max. 0.5°		
Horn Gear Spline	H25T Ø6.0		
Accessories	Mounting Hardware, Servo Horns (HD-IM25, HD-LS25, HD-OS25, HD-X25)		
IP-Rating	IP4X		
Revision	Rev. 1.1 / 03.01.2024		
Changelog	-		
*of the servo only w/o horns and accessories			

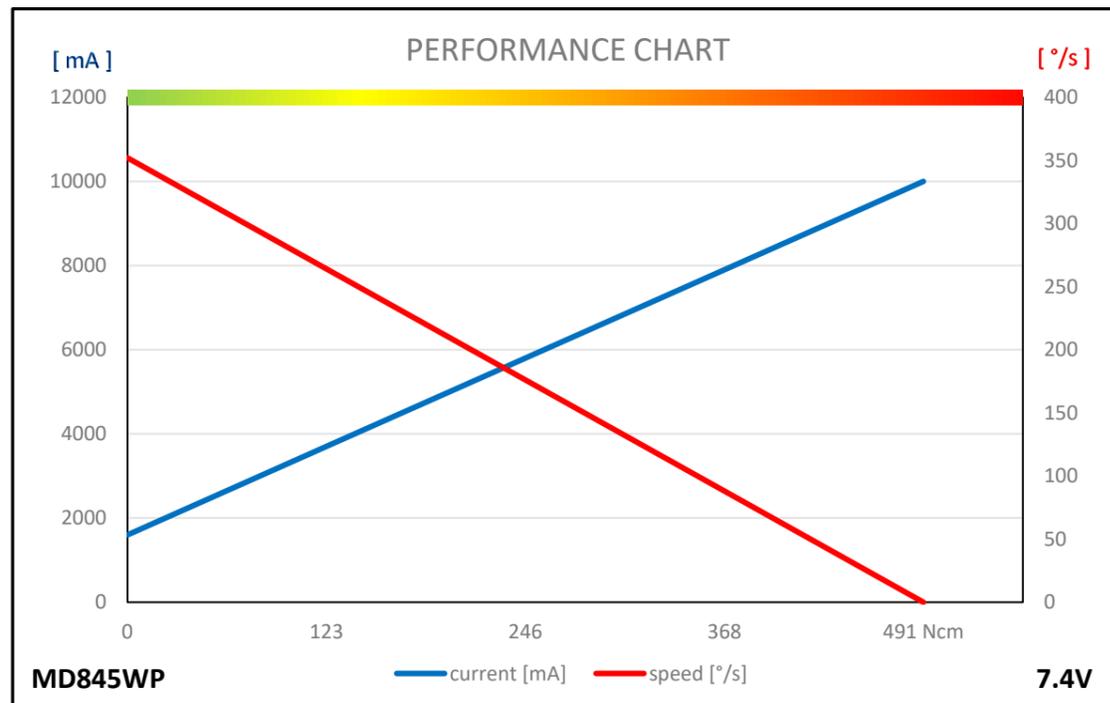
# MD845WP

#1-03227



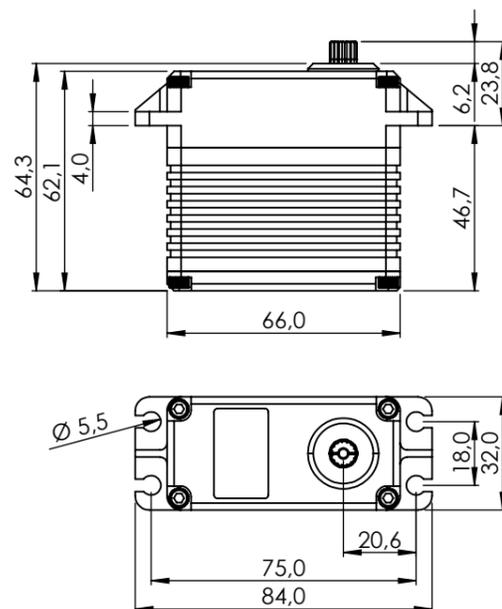
## GENERAL SPECIFICATION

MD845WP			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	Cored Carbon Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	7.4V
No Load Speed	0.26sec/60°	0.21sec/60°	0.17sec/60°
Stall Torque	32.5kgf-cm (451.34oz-in)	40.5kgf-cm (562.44oz-in)	50.0kgf-cm (694.37oz-in)
Peak Efficiency Torque	6.5kgf-cm (90.27oz-in)	8.1kgf-cm (112.49oz-in)	10.0kgf-cm (138.87oz-in)
Standing Current	30mA	30mA	30mA
No Load Running Current	1,100mA	1,250mA	1,600mA
Stall Current	6,000mA	7,000mA	10,000mA
Deadband	2 $\mu$ s	2 $\mu$ s	2 $\mu$ s
Operating Travel	Default: $\pm 60^\circ$ , Programmable: Max 320° / Pulse Width: 900~2100 $\mu$ s(Center:1500 $\mu$ s)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	20AWG		
Dimensions	66.0mm x 32.0mm x 62.1mm (2.598inch x 1.260inch x 2.445inch)		
Weight	228.9g (8.074oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic & Aluminum Heat Sink		
Gear Material	1 Metal-Plastic & 4 Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	15T( $\varnothing 8$ )		
IP-Rating	IP67		
Servo Amplifier Type	32bit programmable Digital		



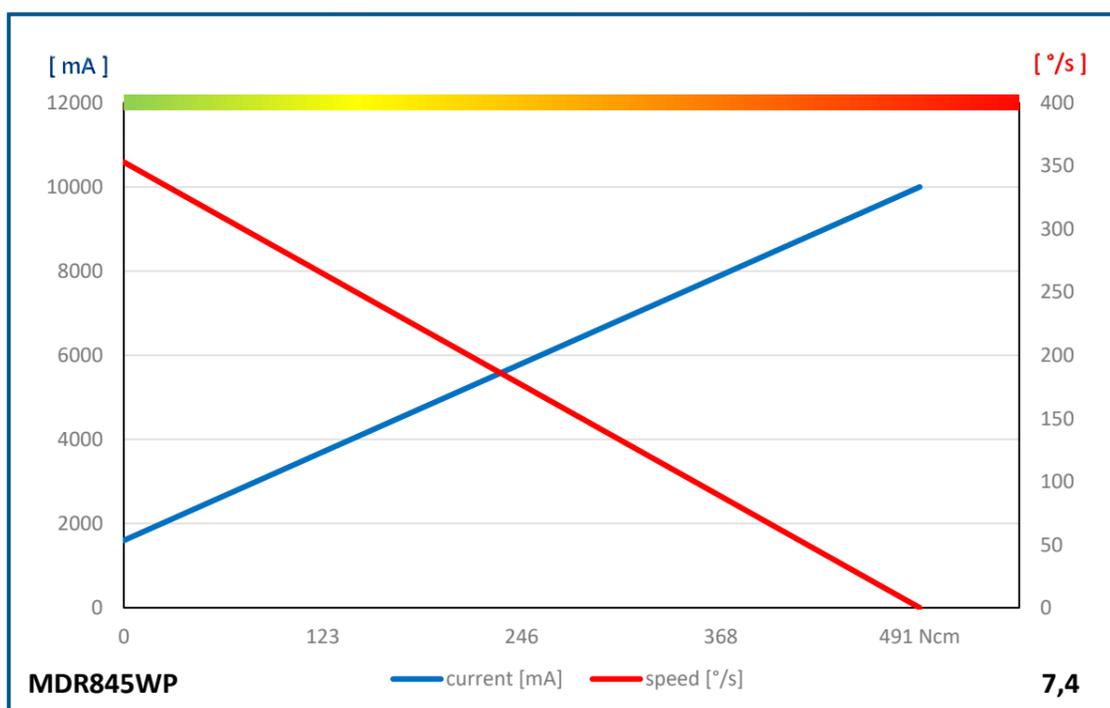
# MDR845WP

#1-01329



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## PERFORMANCE CHART



MDR845WP

— current [mA] — speed [°/s]

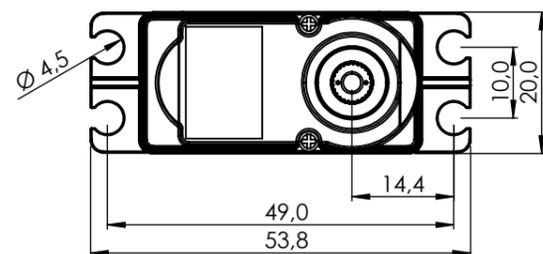
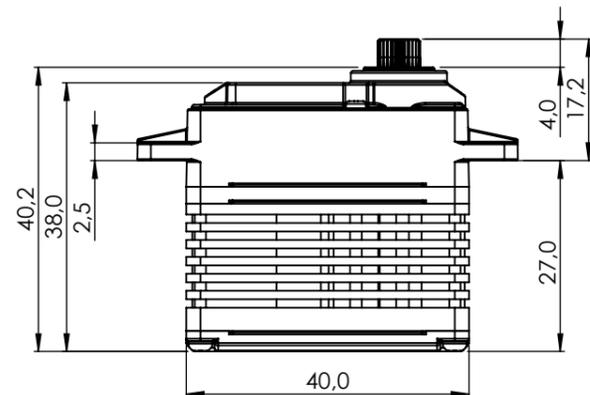
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## GENERAL SPECIFICATION

MDR845WP			
Control System	PWM / TTL (Half Duplex)		
	Pulse Width 900µs 1500µs (Center) 2100µs		
Connector Type	Hitec 3P (JR 3P compatible)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	Cored Carbon Brush		
Amplifier / MCU	32bit programmable Digital		
Operating Voltage Range	4.0V ~ 8.4V		
Operating Voltage	At 4.8V	At 6.0V	At 7.4V
Operating Speed at no Load	231°/s (38RPM)	286°/s (48RPM)	353°/s (59RPM)
Stall Torque	32.5kgcm (318.8Ncm)	40.5kgcm (397.3Ncm)	50.0kgcm (490.5Ncm)
Peak Efficiency Torque	6.5kgcm (63.8Ncm)	8.1kgcm (79.5Ncm)	10.0kgcm (98.1Ncm)
Rest Current	30mA	30mA	30mA
Running Current at no Load	1100mA	1250mA	1600mA
Stall Current	6000mA	7000mA	10000mA
Deadband Width	2µs	2µs	2µs
Operating Travel	Default	±1800°	
	Programmable	Max. ±8 Turns	
	Multi Turn/Continuous Rotation	Yes / Yes	
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-31°F ~ +176°F)		
Vibrations at no Load	-		
Connector Wire Length	300mm		
Connector Wire Gauge	20AWG		
Connector Wire Strand Count	80/0.08		
External Dimensions	66.0 x 32.0 x 62.1mm		
Weight*	229.4g		
Ball Bearing	Dual Ball Bearing		
Case Material	Engineering Plastic & Aluminum Heatsink		
Gear Material	1 Metal-Plastic & 4 Steel Gears		
Gear Train Backlash	Max. 0.5°		
Horn Gear Spline	15T Ø8.0		
Accessories	Mounting Hardware, Servo Horns (Q-MIA, Q-XA, Q-MIA)		
IP-Rating	IP67		
Revision	Rev. 1.1 / 04.01.2024		
Changelog	-		
*of the servo only w/o horns and accessories			

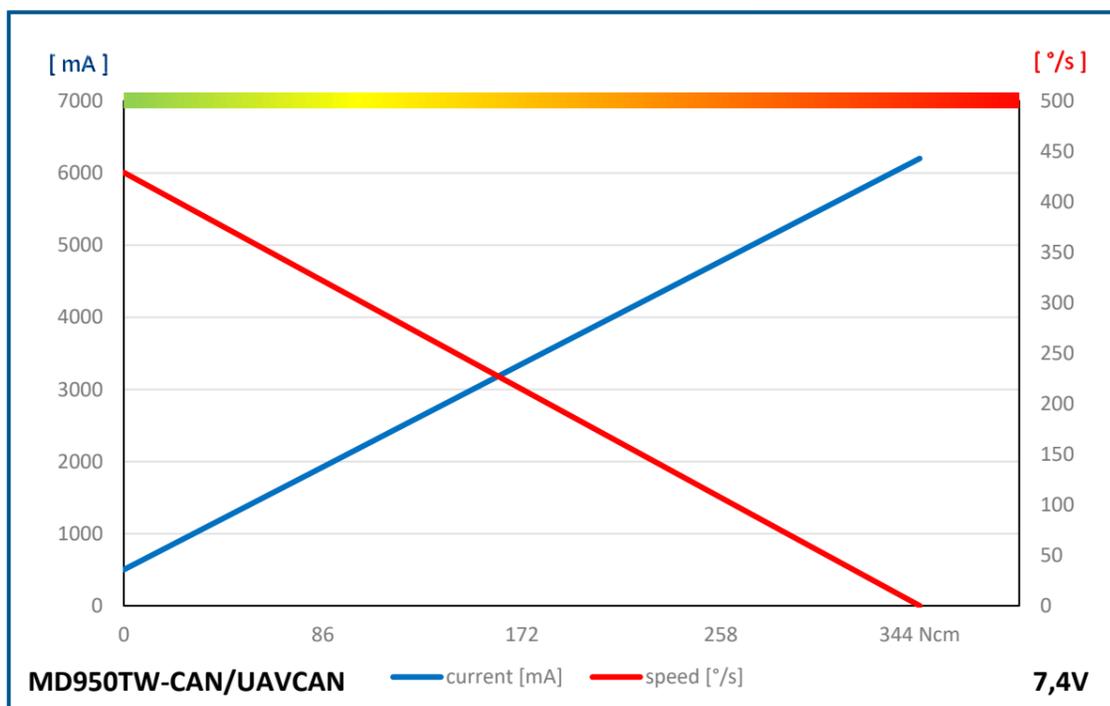
# MD950TW-CAN/UAVCAN/DRONECAN

#1-01646, #1-01647



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## PERFORMANCE CHART



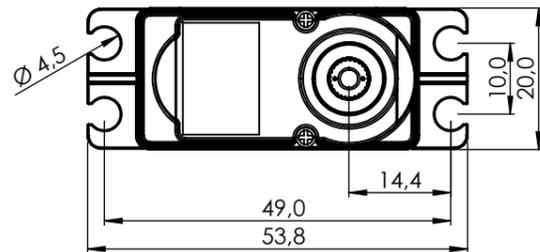
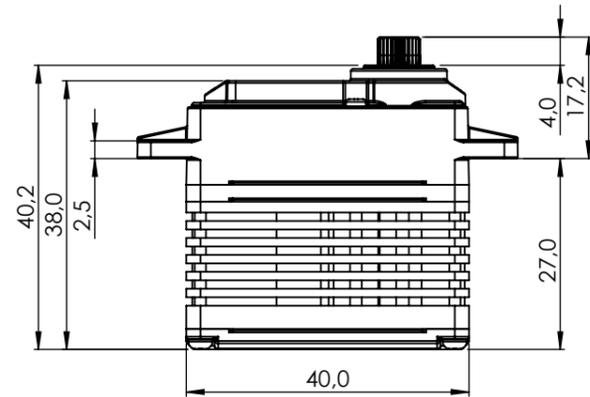
## GENERAL SPECIFICATION

MD950TW-CAN/UAVCAN				
Control System	CAN BUS			
	Protocol (Mode)	Standard 2.0A	Extended 2.0B	UAVCAN/DroneCAN
	Baud-Rate	10kbps ~ 1Mbps		
	Sample-Point	50% or 87.5%		
	Available SERVO ID	1 ~ 254		1 ~ 127
	Available Node ID	1 ~ 2047	1 ~ 536870911	1 ~ 127
Input Signal Range	0 ~ 5V			
Connector Type	Hitec 4P			
Position Sensor Type	Contactless Magnetic Encoder			
Motor Type	Coreless			
Amplifier / MCU	32bit programmable Digital			
Operating Voltage Range	4.0V ~ 8.4V			
Operating Voltage	At 4.8V	At 6.0V	At 7.4V	
Operating Speed at no Load	261°/s (44RPM)	353°/s (59RPM)	429°/s (72RPM)	
Stall Torque	21.0kgcm (206.0Ncm)	29.0kgcm (284.5Ncm)	35.0kgcm (343.4Ncm)	
Peak Efficiency Torque	4.2kgcm (41.2Ncm)	5.8kgcm (56.9Ncm)	7.0kgcm (68.7Ncm)	
Rest Current	30mA	30mA	30mA	
Running Current at no Load	300mA	390mA	500mA	
Stall Current	3700mA	4800mA	6200mA	
Deadband Width	4Step	4Step	4Step	
Travel	Travel / Command	90° / 4096		
	Servo mode	Left	Center	Right
	Pos Command	+1366	+8192	+15018
	Pos [°]	-150	0	+150
	Turn Mode	Left	Power On	Right
	Pos Command	-16383	0	+16383
	Pos [°]	-359	0	+359
	Turn Range	-32760 ~ +32760 (CAN only)		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)			
Storage Temperature Range	-30°C ~ +80°C (-31°F ~ +176°F)			
Vibrations at no Load	MIL-STD-810G 514.6C-VII			
Connector Wire Length	300mm			
Connector Wire Gauge	20AWG			
Connector Wire Strand Count	80/0.08			
Extrenal Dimensions	40.0 x 20.0 x 38.0mm			
Weight*	66.4g			
Ball Bearing	Dual Ball Bearing			
Case Material	Engineering Plastic & Aluminum Heatsink			
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears			
Gear Train Backlash	Max. 0.5°			
Horn Gear Spline	H25T Ø6.0			
Accessories	Mounting Hardware, Servo Horns (HD-IM25, HD-LS25, HD-OS25, HD-X25)			
IP-Rating	IP54			
Revision	Rev. 1.1 / 03.01.2024			
Changelog	-			

\*of the servo w/o horns and accessories

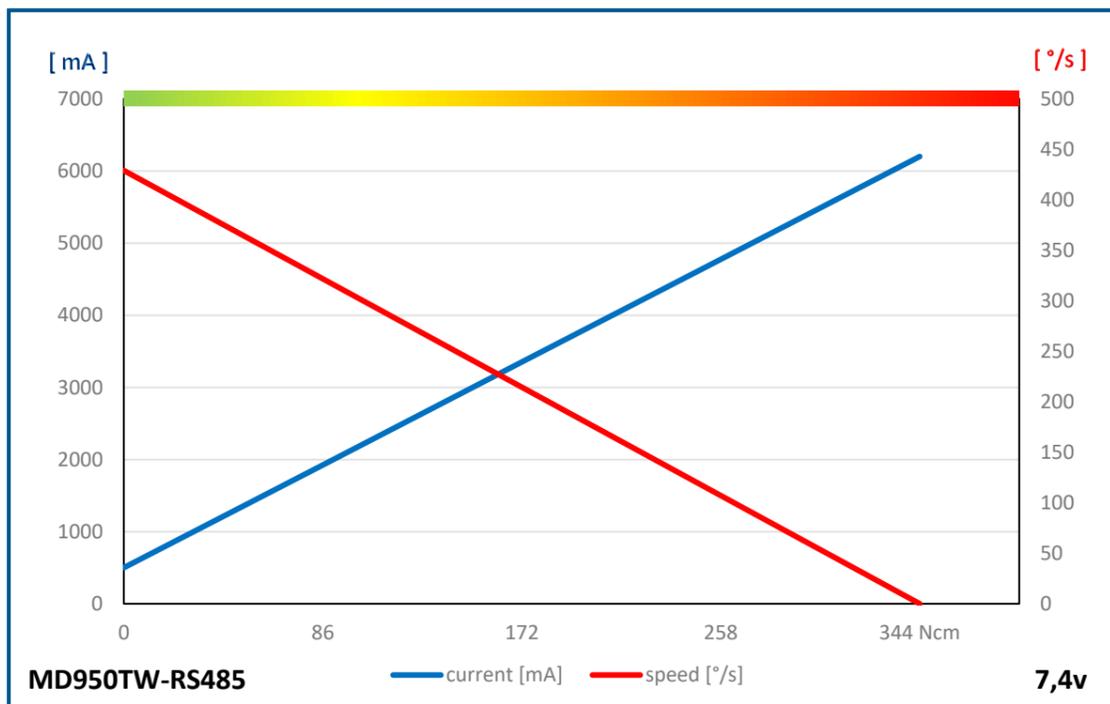
# MD950TW-RS485

#1-01675



1:1

## PERFORMANCE CHART

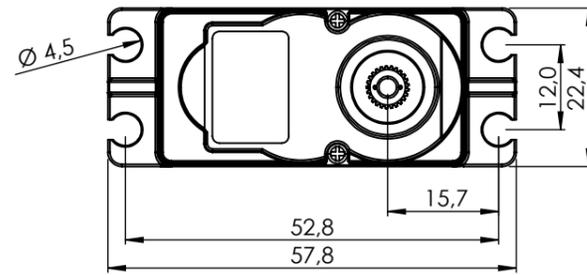
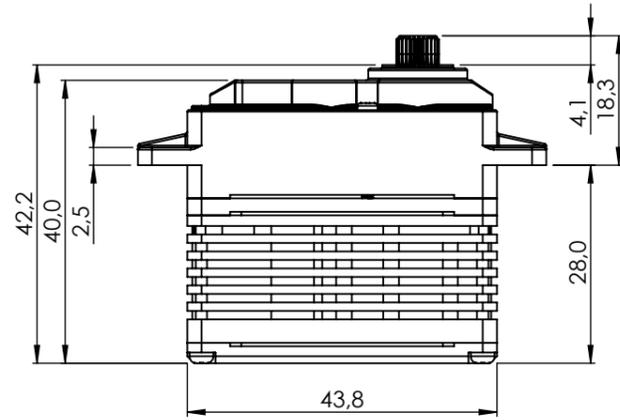


## GENERAL SPECIFICATION

MD950TW-RS485			
Control System	RS485		
	Pulse Width -		
Connector Type	Hitec 4P		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	Coreless		
Amplifier / MCU	32bit programmable Digital		
Operating Voltage Range	4.0V ~ 8.4V		
Operating Voltage	At 4.8V	At 6.0V	At 7.4V
Operating Speed at no Load	261°/s (44RPM)	353°/s (59RPM)	429°/s (71RPM)
Stall Torque	21.0kgcm (206.0Ncm)	29.0kgcm (284.5Ncm)	35.0kgcm (343.4Ncm)
Peak Efficiency Torque	4.2kgcm (41.2Ncm)	5.8kgcm (56.9Ncm)	7.0kgcm (68.7Ncm)
Rest Current	30mA	30mA	30mA
Running Current at no Load	300mA	390mA	500mA
Stall Current	3700mA	4800mA	6200mA
Deadband Width	n/a	n/a	n/a
Operating Travel	Default	±60°	
	Programmable	Max. 320°	
	Multi Turn/Continuous Rotation	n/a / n/a	
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)		
Vibrations at no Load	-		
Connector Wire Length	300mm		
Connector Wire Gauge	20AWG		
Connector Wire Strand Count	80/0.08		
External Dimensions	40.0 x 20.0 x 38.0mm		
Weight*	66.3g		
Ball Bearing	Dual Ball Bearing		
Case Material	Engineering plastic & Aluminum Heatsink		
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears		
Gear Train Backlash	Max. 0.5°		
Horn Gear Spline	H25T Ø6.0		
Accessories	Mounting Hardware, Servo Horns (HD-IM25, HD-LS25, HD-OS25, HD-X25)		
IP-Rating	IP54		
Revision	Rev. 1.0 / 05.01.2024		
Changelog	-		
*of the servo only w/o horns and accessories			

# MD980TW

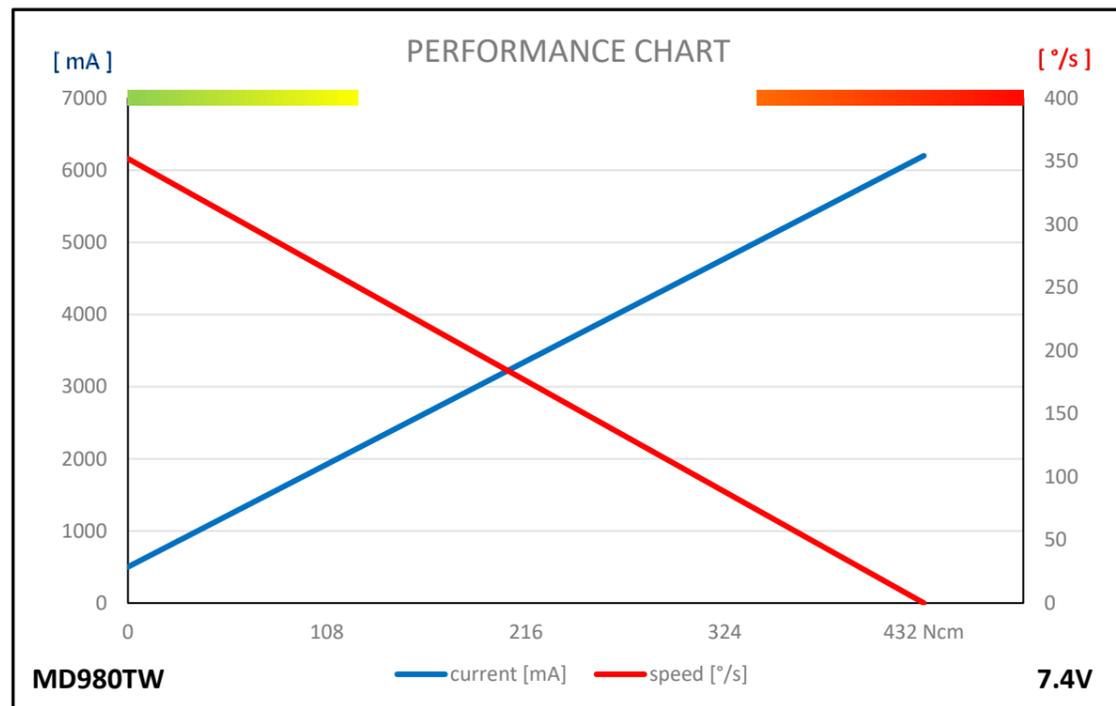
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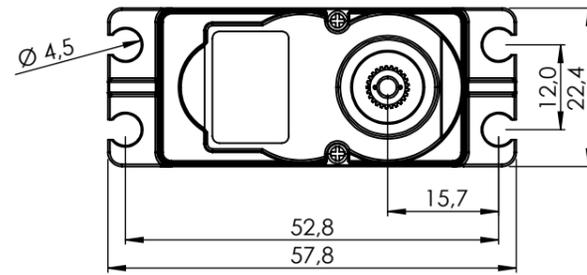
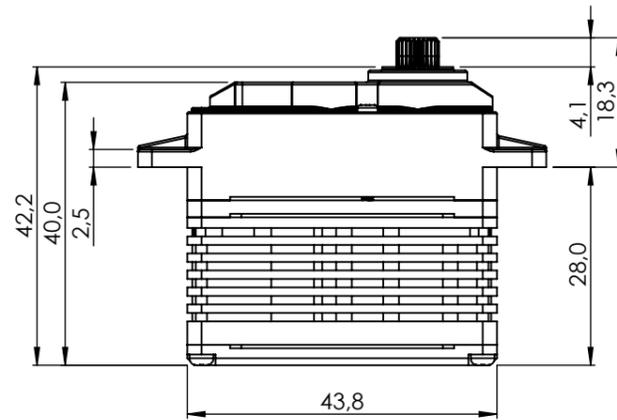
## GENERAL SPECIFICATION

MD980TW			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	Coreless		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	7.4V
No Load Speed	0.28sec/60°	0.21sec/60°	0.17sec/60°
Stall Torque	26.0kgf-cm (361.07oz-in)	36.0kgf-cm (499.95oz-in)	44.0kgf-cm (611.05oz-in)
Peak Efficiency Torque	5.2kgf-cm (72.21oz-in)	7.2kgf-cm (99.99oz-in)	8.8kgf-cm (122.21oz-in)
Standing Current	30mA	30mA	30mA
No Load Running Current	300mA	390mA	500mA
Stall Current	4,200mA	4,800mA	6,200mA
Deadband	1μs	1μs	1μs
Operating Travel	Default: ±60°, Programmable: Max 320° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	20AWG		
Dimensions	43.8mm x 22.4mm x 40.0mm (1.724inch x 0.882inch x 1.575inch)		
Weight	75.8g (2.674oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	32bit programmable Digital		



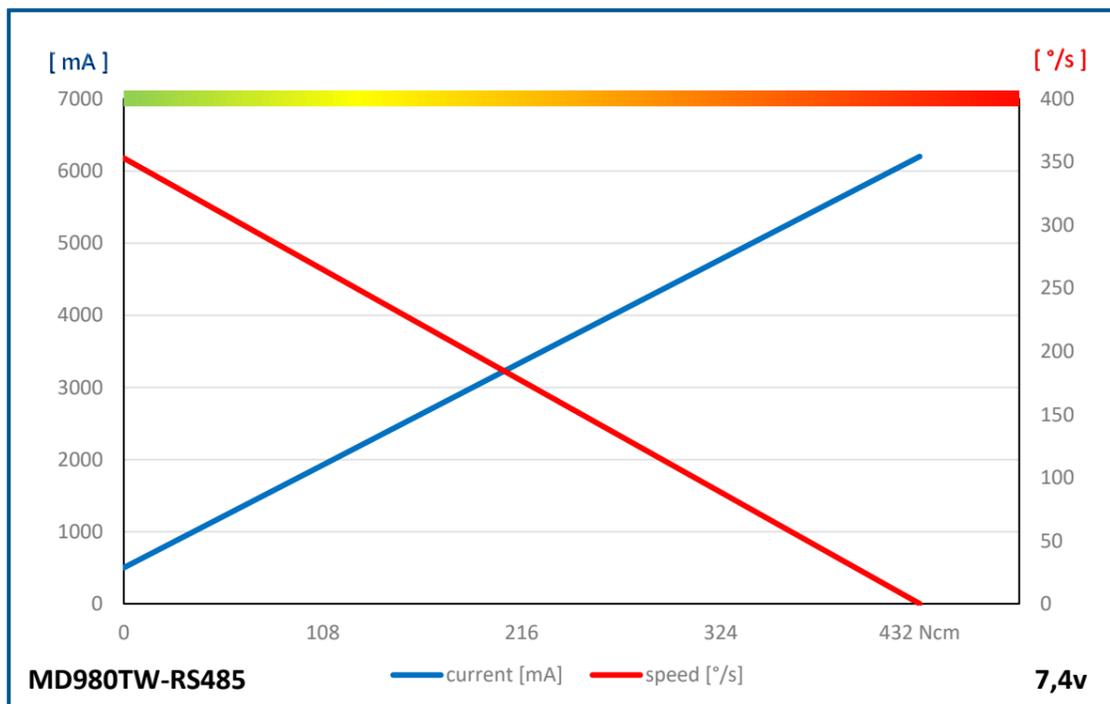
# MD980TW-RS485

#1-03230



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## PERFORMANCE CHART

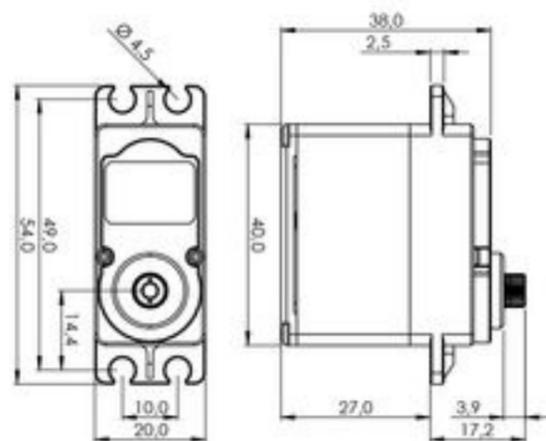


## GENERAL SPECIFICATION

MD980TW-RS485			
Control System	RS485		
	Pulse Width -		
Connector Type	Hitec 4P		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	Coreless		
Amplifier / MCU	32bit programmable Digital		
Operating Voltage Range	4.0V ~ 8.4V		
Operating Voltage	At 4.8V	At 6.0V	At 7.4V
Operating Speed at no Load	214°/s (36RPM)	286°/s (48RPM)	353°/s (59RPM)
Stall Torque	26.0kgcm (255.1Ncm)	36.0kgcm (353.2Ncm)	44.0kgcm (431.6Ncm)
Peak Efficiency Torque	5.2kgcm (51.0Ncm)	7.2kgcm (70.6Ncm)	8.8kgcm (86.3Ncm)
Rest Current	30mA	30mA	30mA
Running Current at no Load	300mA	390mA	500mA
Stall Current	4200mA	4800mA	6200mA
Deadband Width	n/a	n/a	n/a
Operating Travel	Default	±60°	
	Programmable	Max. 320°	
	Multi Turn/Continuous Rotation	n/a / n/a	
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)		
Vibrations at no Load	-		
Connector Wire Length	300mm		
Connector Wire Gauge	20AWG		
Connector Wire Strand Count	80/0.08		
External Dimensions	43.8 x 22.4 x 40.0mm		
Weight*	76.7g		
Ball Bearing	Dual Ball Bearing		
Case Material	Engineering plastic		
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears		
Gear Train Backlash	Max. 0.5°		
Horn Gear Spline	H25T Ø6.0		
Accessories	Mounting Hardware, Servo Horns (HD-IM25, HD-LS25, HD-OS25, HD-X25, HD-IL25, HD-LL25, HD-IG25, HD-LG25)		
IP-Rating	IP54		
Revision	Rev. 1.0 / 08.01.2024		
Changelog	-		
*of the servo only w/o horns and accessories			

## MD981TW

#1-01640



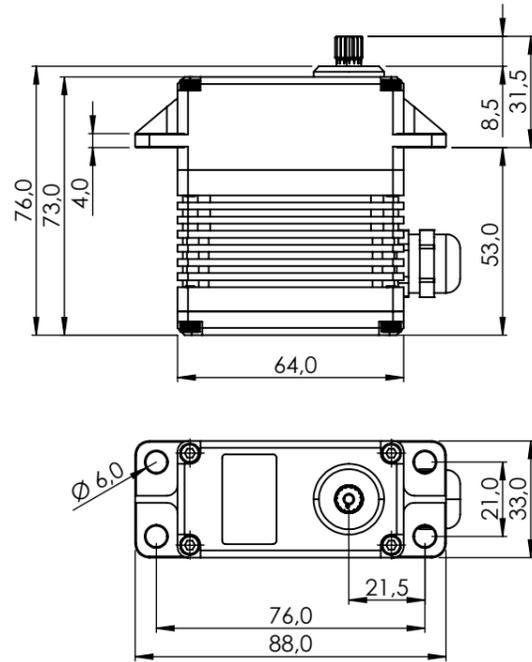
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## GENERAL SPECIFICATION

MD981TW			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	Coreless		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	7.4V
No Load Speed	0.28sec/60°	0.21sec/60°	0.17sec/60°
Stall Torque	26.0kgf·cm (361.07oz-in)	36.0kgf·cm (499.95oz-in)	44.0kgf·cm (611.05oz-in)
Peak Efficiency Torque	5.2kgf·cm (72.21oz-in)	7.2kgf·cm (99.99oz-in)	8.8kgf·cm (122.21oz-in)
Standing Current	30mA	30mA	30mA
No Load Running Current	300mA	390mA	500mA
Stall Current	4,200mA	4,800mA	6,200mA
Deadband	1μs	1μs	1μs
Operating Travel	Default: ±60°, Programmable: Max 320° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	20AWG		
Dimensions	43.8mm x 22.4mm x 40.0mm (1.724inch x 0.882inch x 1.575inch)		
Weight	94.2g (3.323oz)		
Bearing Type	2 Ball Bearing		
Case Material	Aluminum Alloy		
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	32bit programmable Digital		

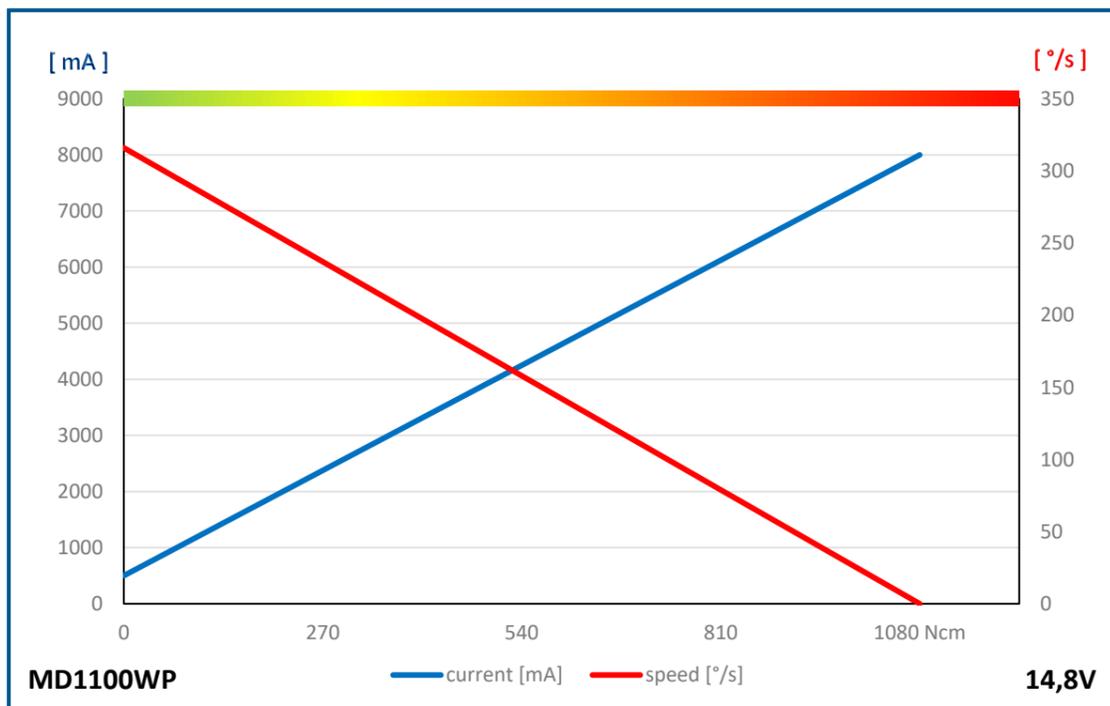
# MD1100WP

#1-01638



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## PERFORMANCE CHART



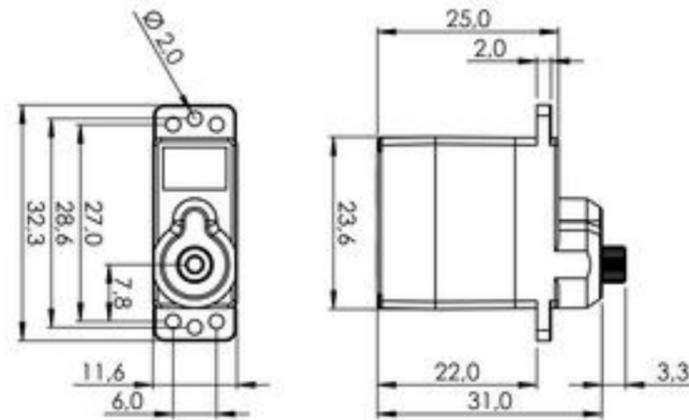
## GENERAL SPECIFICATION

MD1100WP	
Control System	PWM / TTL (Half Duplex)
	Pulse Width 900µs 1500µs (Center) 2100µs
Connector Type	Hitec 3P (JR 3P compatible)
Position Sensor Type	Contactless Magnetic Encoder
Motor Type	5 Poles DC Cored Carbon Brush
Amplifier / MCU	32bit programmable Digital with Mosfet Drive
Operating Voltage Range	9.0V ~ 16.8V
Operating Voltage	At 11.1V <span style="float:right">At 14.8V</span>
Operating Speed at no Load	231°/s (38RPM) <span style="float:right">316°/s (53RPM)</span>
Stall Torque	84.0kgcm (824.0Ncm) <span style="float:right">110.0kgcm (1079.1Ncm)</span>
Peak Efficiency Torque	16.8kgcm (164.8Ncm) <span style="float:right">22.0kgcm (215.8Ncm)</span>
Rest Current	90mA <span style="float:right">90mA</span>
Running Current at no Load	550mA <span style="float:right">500mA</span>
Stall Current	6500mA <span style="float:right">8000mA</span>
Deadband Width	2µs <span style="float:right">2µs</span>
Operating Travel	Default <span style="float:right">±60°</span>
	Programmable <span style="float:right">Max. 320°</span>
	Multi Turn/Continuous Rotation <span style="float:right">n/a / n/a</span>
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)
Vibrations at no Load	IEC-60068-2-64
Connector Wire Length	270mm
Connector Wire Gauge	18AWG (Signal: 20AWG)
Connector Wire Strand Count	120/0.08 (80/0.08)
External Dimensions	64.0 x 33.0 x 73.0mm
Weight*	324.3g
Ball Bearing	Dual Ball Bearing & Dual Needle Bearing
Case Material	Rugged Aluminum Alloy
Gear Material	1 Metal-Plastic & 3 Hardened Steel Gears
Gear Train Backlash	Max. 0.5°
Horn Gear Spline	15T Ø8.0
Accessories	Mounting Hardware, Servo Horn (I-MO)
IP-Rating	IP67
Revision	Rev. 1.1 / 03.01.2024
Changelog	-

\*of the servo w/o only horns and accessories

## D71MH

#1-02660

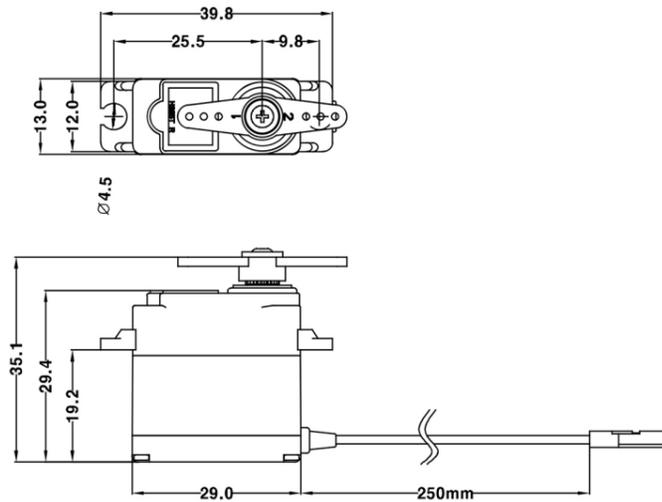


## GENERAL SPECIFICATION

D71MH			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.16sec/60°	0.13sec/60°
Stall Torque	-	3.9kgf·cm (54.16oz·in)	4.5kgf·cm (62.49oz·in)
Peak Efficiency Torque	-	0.8kgf·cm (11.11oz·in)	0.9kgf·cm (12.5 oz·in)
Standing Current	-	30mA	30mA
No Load Running Current	-	200mA	220mA
Stall Current	-	1,300mA	1,500mA
Deadband	-	2μs	2μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	160mm (6.299inch)		
Connector Wire Gauge	28AWG		
Dimensions	23.6mm x 11.6mm x 31.0mm (0.929inch x 0.457inch x 1.220inch)		
Weight	12.5g (0.441oz)		
Bearing Type	1 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Resin & 4 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	M25T(Ø5)		
IP-Rating	IP4X		
Servo Amplifier Type	32bit Programmable Digital		

## D85MG

#1-00068

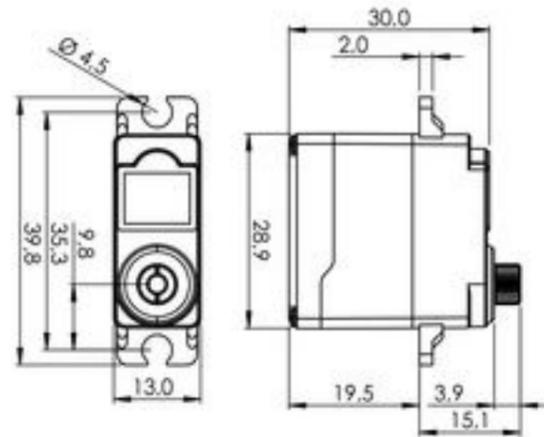


## GENERAL SPECIFICATION

D85MG			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	-
No Load Speed	0.17sec/60°	0.13sec/60°	-
Stall Torque	3.6kgf·cm (49.99oz-in)	4.3kgf·cm (59.72oz-in)	-
Peak Efficiency Torque	0.7kgf·cm ( 9.72oz-in)	0.9kgf·cm (12.5 oz-in)	-
Standing Current	30mA	30mA	-
No Load Running Current	260mA	290mA	-
Stall Current	1,200mA	1,400mA	-
Deadband	2μs	2μs	-
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	250mm (9.843inch)		
Connector Wire Gauge	28AWG		
Dimensions	29.0mm x 13.0mm x 30.0mm (1.142inch x 0.512inch x 1.181inch)		
Weight	24.0g (0.847oz)		
Bearing Type	1 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	5 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	32bit programmable Digital		

## D89MW

#1-00077

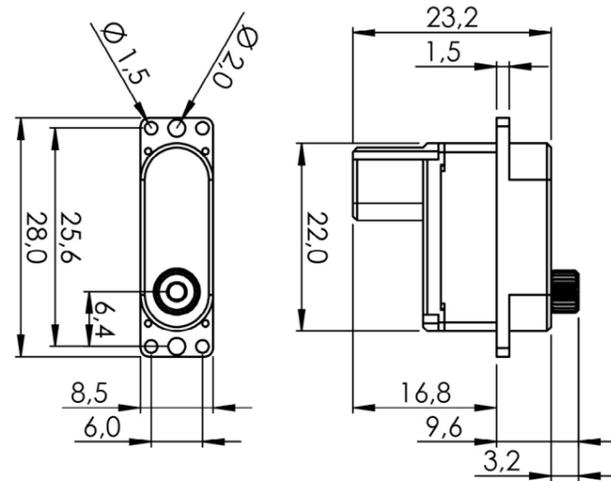


## GENERAL SPECIFICATION

D89MW			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Coreless		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	7.4V
No Load Speed	0.17sec/60°	0.13sec/60°	0.11sec/60°
Stall Torque	5.3kgf·cm (73.6 oz-in)	6.4kgf·cm (88.88oz-in)	8.5kgf·cm (118.04oz-in)
Peak Efficiency Torque	1.1kgf·cm (15.28oz-in)	1.3kgf·cm (18.05oz-in)	1.7kgf·cm (23.61oz-in)
Standing Current	30mA	30mA	30mA
No Load Running Current	200mA	250mA	300mA
Stall Current	1,800mA	2,200mA	2,700mA
Deadband	1μs	1μs	1μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	240mm (9.449inch)		
Connector Wire Gauge	22AWG		
Dimensions	29.0mm x 13.0mm x 30.0mm (1.142inch x 0.512inch x 1.181inch)		
Weight	25.0g (0.882oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	5 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	32bit programmable Digital		

## D131MW

#1-01494

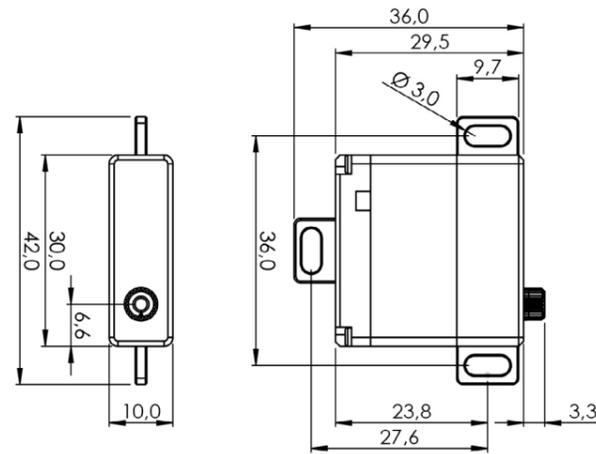


## GENERAL SPECIFICATION

Servo D131MW			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Coreless		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	7.4V
No Load Speed	0.16sec/60°	0.13sec/60°	0.11sec/60°
Stall Torque	1.9kgf-cm (26.39oz-in)	2.4kgf-cm (33.33oz-in)	2.9kgf-cm (40.27oz-in)
Peak Efficiency Torque	0.40kgf-cm ( 5.55oz-in)	0.50kgf-cm ( 6.94oz-in)	0.60kgf-cm ( 8.33oz-in)
Standing Current	30mA	30mA	30mA
No Load Running Current	75mA	90mA	110mA
Stall Current	700mA	800mA	900mA
Deadband	2 $\mu$ s	2 $\mu$ s	2 $\mu$ s
Operating Travel	Default: $\pm 60^\circ$ , Programmable: Max 175° / Pulse Width: 900~2100 $\mu$ s(Center:1500 $\mu$ s)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	160mm (6.299inch)		
Connector Wire Gauge	28AWG		
Dimensions	22.0mm x 8.5mm x 23.2mm (0.866inch x 0.335inch x 0.913inch)		
Weight	9.8g (0.346oz)		
Bearing Type	2 Ball Bearing		
Case Material	Aluminum Alloy		
Gear Material	5 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	M25T( $\varnothing$ 5)		
IP-Rating	IP4X		

## D141SH

#1-01496

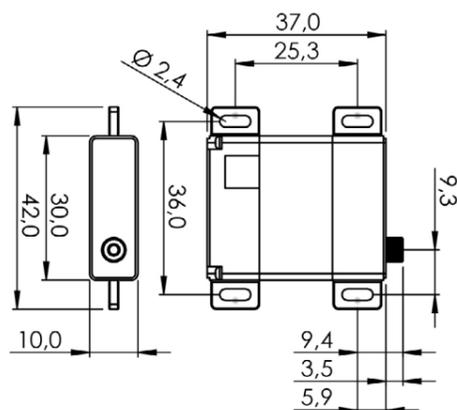


## GENERAL SPECIFICATION

Servo D141SH			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Coreless		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.13sec/60°	0.10sec/60°
Stall Torque	-	5.7kgf·cm (79.16oz-in)	7.0kgf·cm (97.21oz-in)
Peak Efficiency Torque	-	1.1kgf·cm (15.28oz-in)	1.4kgf·cm (19.44oz-in)
Standing Current	-	30mA	30mA
No Load Running Current	-	130mA	160mA
Stall Current	-	2,000mA	2,500mA
Deadband	-	2μs	2μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	24AWG		
Dimensions	30.0mm x 10.0mm x 29.5mm (1.181inch x 0.394inch x 1.161inch)		
Weight	26.0g (0.917oz)		
Bearing Type	2 Ball Bearing		
Case Material	Aluminum Alloy		
Gear Material	1 Metal-Plastic & 4 Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	M25T(Ø5)		
IP-Rating	IP4X		
Servo Amplifier Type	32bit Programmable Digital		

## D145SW

#1-00064



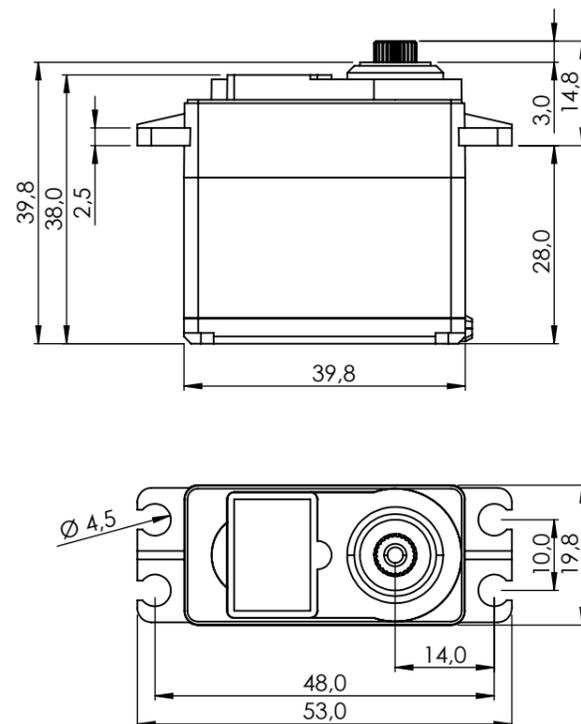
## GENERAL SPECIFICATION

Servo D145SW			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Carbon Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	7.4V
No Load Speed	0.21sec/60°	0.17sec/60°	0.14sec/60°
Stall Torque	4.9kgf·cm (68.05oz-in)	5.9kgf·cm (81.94oz-in)	7.0kgf·cm (97.21oz-in)
Peak Efficiency Torque	1.0kgf·cm (13.61oz-in)	1.2kgf·cm (16.39oz-in)	1.4kgf·cm (19.44oz-in)
Standing Current	30mA	30mA	30mA
No Load Running Current	200mA	230mA	260mA
Stall Current	1,600mA	2,000mA	2,500mA
Deadband	2μs	2μs	2μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	24AWG		
Dimensions	30.0mm x 10.0mm x 37.0mm (1.181inch x 0.394inch x 1.457inch)		
Weight	24.0g (0.847oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal-Plastic & 4 Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	M25T(Ø5)		
IP-Rating	IP4X		
Servo Amplifier Type	32bit programmable Digital		

# D485HW

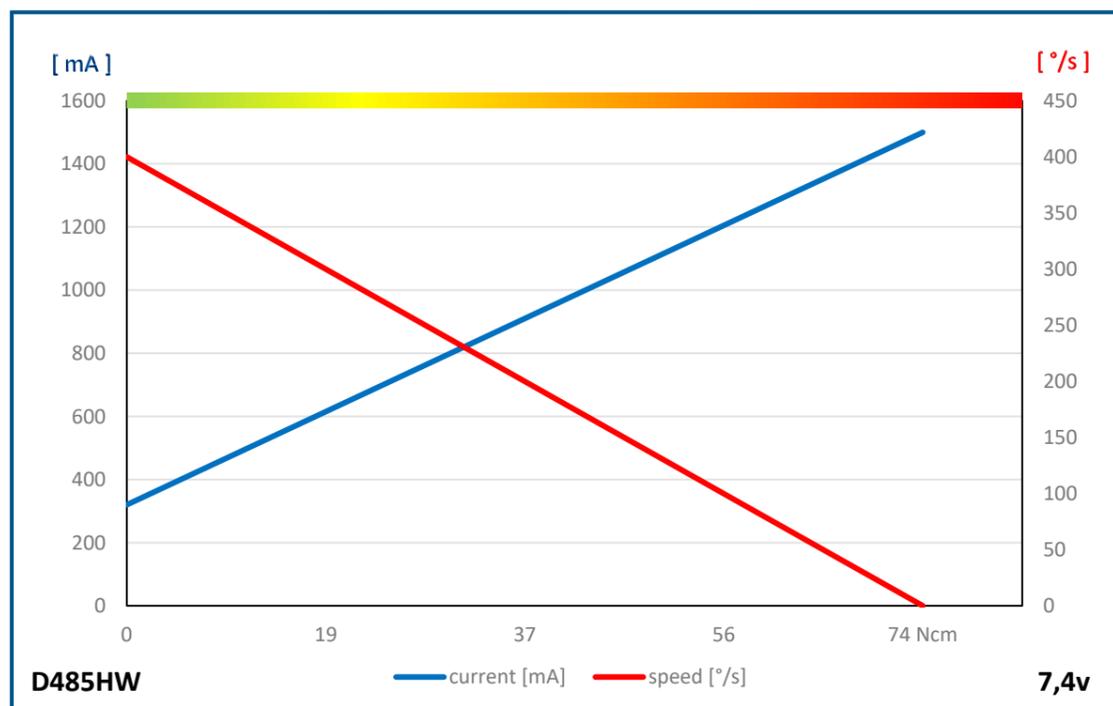
#1-00066

#1-02362 GP 30 Stück



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## PERFORMANCE CHART



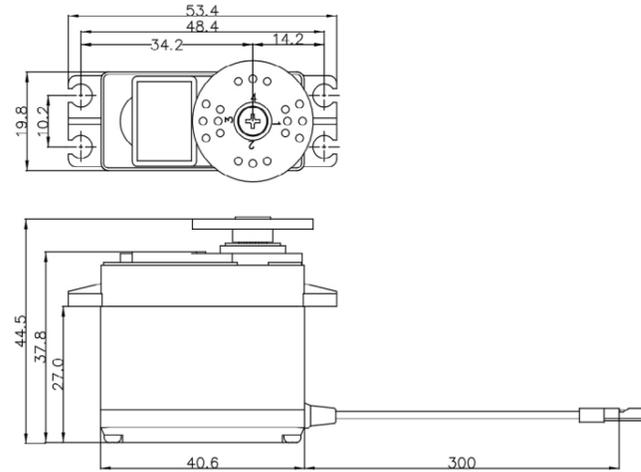
## GENERAL SPECIFICATION

D485HW			
Control System	PWM / TTL (Half Duplex)		
	Pulse Width 900µs 1500µs (Center) 2100µs		
Connector Type	Hitec 3P (JR 3P compatible)		
Position Sensor Type	Indirect Drive / 1M Cycle Long Life		
Motor Type	Cored Metal Brush		
Amplifier / MCU	32bit programmable Digital with Mosfet Drive		
Operating Voltage Range	3.5V ~ 8.4V		
Operating Voltage	At 4.8V	At 6.0V	At 7.4V
Operating Speed at no Load	300°/s (50RPM)	353°/s (59RPM)	400°/s (67RPM)
Stall Torque	5.2kgcm (51.0Ncm)	6.4kgcm (62.8Ncm)	7.5kgcm (73.6Ncm)
Peak Efficiency Torque	1.0kgcm (9.8Ncm)	1.3kgcm (12.8Ncm)	1.5kgcm (14.7Ncm)
Rest Current	30mA	30mA	30mA
Running Current at no Load	250mA	280mA	320mA
Stall Current	1000mA	1200mA	1500mA
Deadband Width	2µs	2µs	2µs
Operating Travel	Default	±60°	
	Programmable	Max. 175°	
	Multi Turn/Continuous Rotation	n/a / n/a	
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)		
Vibrations at no Load	-		
Connector Wire Length	300mm		
Connector Wire Gauge	24AWG		
Connector Wire Strand Count	40/0.08		
External Dimensions	39.8 x 19.8 x 38.0mm		
Weight*	45.0g		
Ball Bearing	Dual Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	4 Heavy Duty Resin Gears		
Gear Train Backlash	Max. 0.5°		
Horn Gear Spline	H25T Ø6.0		
Accessories	Mounting Hardware, Servo Horns (HD-IM25, HD-LS25, HD-OS25, HD-X25)		
IP-Rating	IP54		
Revision	Rev. 1.1 / 04.01.2024		
Changelog	-		

\*of the servo only w/o horns and accessories

## D625MW

#116625

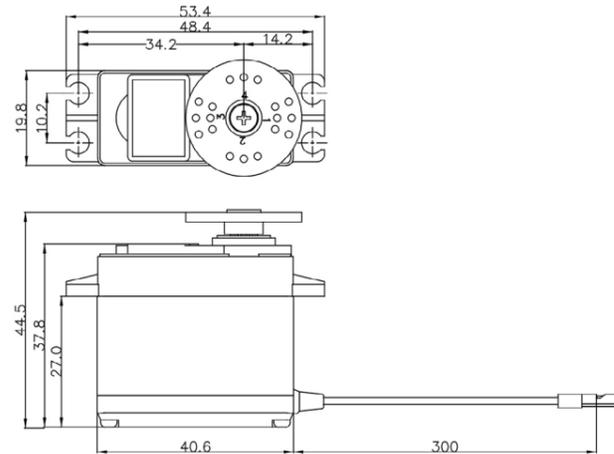


## GENERAL SPECIFICATION

D625MW			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	7.4V
No Load Speed	0.20sec/60°	0.15sec/60°	0.13sec/60°
Stall Torque	6.3kgf·cm (87.49oz-in)	8.8kgf·cm (122.21oz-in)	10.0kgf·cm (138.87oz-in)
Peak Efficiency Torque	1.3kgf·cm (17.5 oz-in)	1.8kgf·cm (24.44oz-in)	2.0kgf·cm (27.77oz-in)
Standing Current	30mA	30mA	30mA
No Load Running Current	300mA	400mA	500mA
Stall Current	1,700mA	2,150mA	2,650mA
Deadband	2μs	2μs	2μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81 inch)		
Connector Wire Gauge	22AWG		
Dimensions	40.8mm x 20.0mm x 37.8mm (1.606inch x 0.787inch x 1.488inch)		
Weight	60.0g (2.116oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal-Plastic & 3 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	32bit programmable Digital		

## D645MW

#116645



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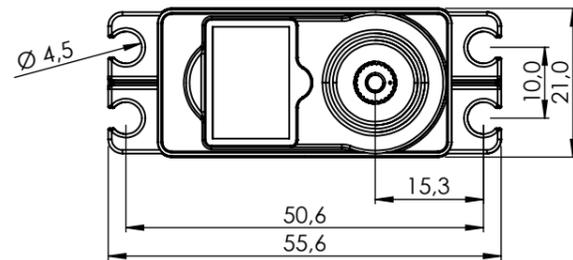
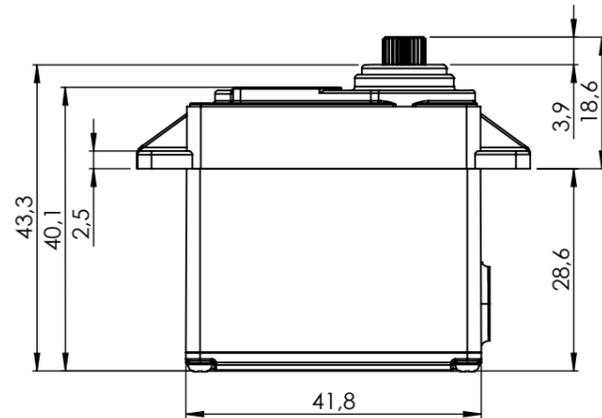
## GENERAL SPECIFICATION

D645MW			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	7.4V
No Load Speed	0.28sec/60°	0.20sec/60°	0.17sec/60°
Stall Torque	8.3kgf-cm (115.27oz-in)	11.3kgf-cm (156.93oz-in)	12.9kgf-cm (179.15oz-in)
Peak Efficiency Torque	1.7kgf-cm (23.05oz-in)	2.3kgf-cm (31.39oz-in)	2.6kgf-cm (35.83oz-in)
Standing Current	30mA	30mA	30mA
No Load Running Current	300mA	400mA	500mA
Stall Current	1,700mA	2,150mA	2,650mA
Deadband	2μs	2μs	2μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	22AWG		
Dimensions	40.8mm x 20.0mm x 37.8mm (1.606inch x 0.787inch x 1.488inch)		
Weight	60.0g (2.116oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal-Plastic & 3 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	32bit programmable Digital		

# D646WP

#1-00072

#1-02354 GP 24 Stück



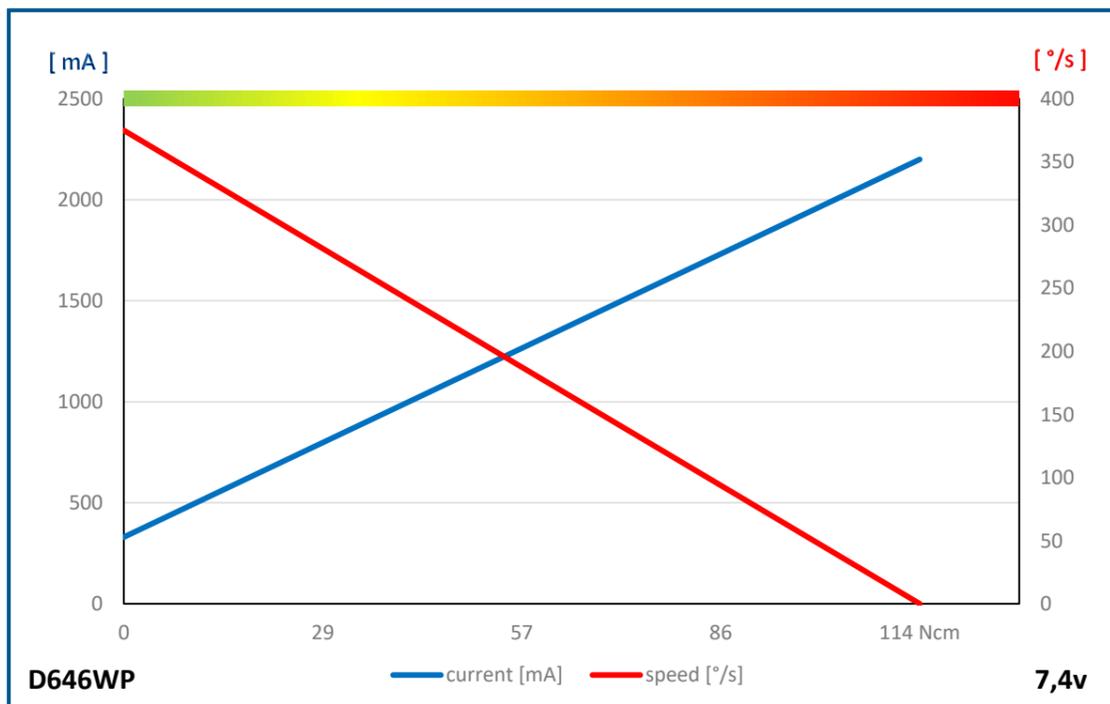
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## GENERAL SPECIFICATION

D646WP			
Control System	PWM / TTL (Half Duplex)		
	Pulse Width 900µs 1500µs (Center) 2100µs		
Connector Type	Hitec 3P (JR 3P compatible)		
Position Sensor Type	Contact Analog / 4 Slider / 1M Cycle Long Life		
Motor Type	Cored Carbon Brush		
Amplifier / MCU	32bit programmable Digital with Mosfet Drive		
Operating Voltage Range	3.5V ~ 8.4V		
Operating Voltage	At 4.8V	At 6.0V	At 7.4V
Operating Speed at no Load	250°/s (42RPM)	316°/s (33RPM)	375°/s (63RPM)
Stall Torque	7.5kgcm (73.6Ncm)	9.6kgcm (94.2Ncm)	11.6kgcm (113.8Ncm)
Peak Efficiency Torque	1.5kgcm (14.7Ncm)	1.9kgcm (18.6Ncm)	2.3kgcm (22.6Ncm)
Rest Current	30mA	30mA	30mA
Running Current at no Load	270mA	300mA	330mA
Stall Current	1500mA	1800mA	2200mA
Deadband Width	2µs	2µs	2µs
Operating Travel	Default	±60°	
	Programmable	Max. 170°	
	Multi Turn/Continuous Rotation	n/a / n/a	
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)		
Vibrations at no Load	-		
Connector Wire Length	300mm		
Connector Wire Gauge	22AWG		
Connector Wire Strand Count	60/0.08		
External Dimensions	41.8 x 21.0 x 40.1mm		
Weight*	61.0g		
Ball Bearing	Dual Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal-Plastic & 3 Metal Gears		
Gear Train Backlash	Max. 0.5°		
Horn Gear Spline	H25T Ø6.0		
Accessories	Mounting Hardware, Servo Horns (HD-IM25, HD-LS25, HD-OS25, HD-X25)		
IP-Rating	IP67		
Revision	Rev. 1.1 / 04.01.2024		
Changelog	-		

\*of the servo only w/o horns and accessories

## PERFORMANCE CHART



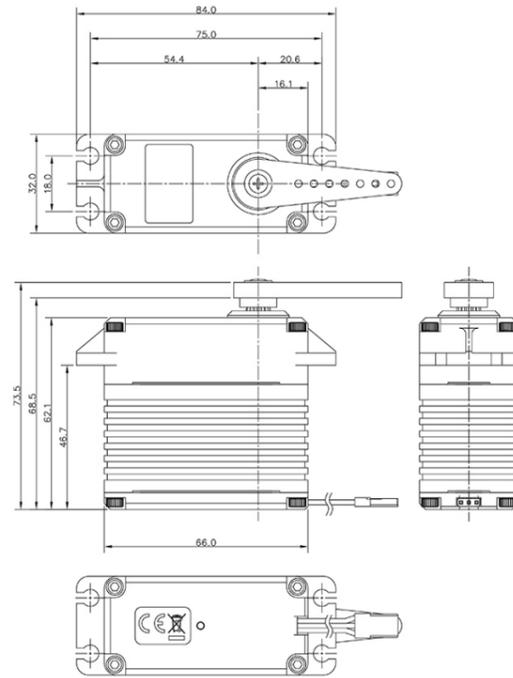
D646WP

— current [mA] — speed [°/s]

7,4v

## D840WP

#116840

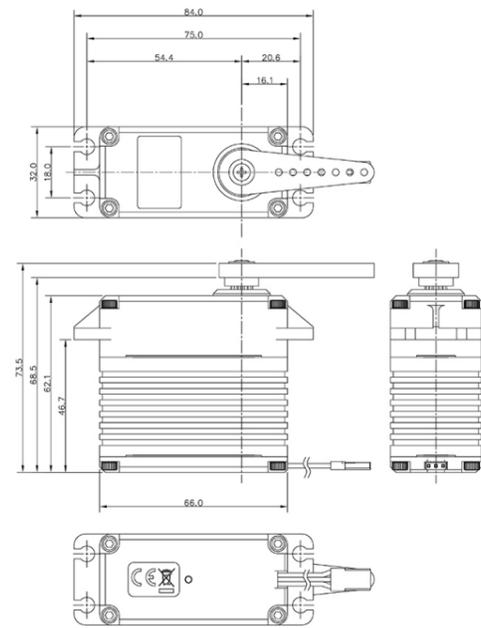


## GENERAL SPECIFICATION

D840WP			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Carbon Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	7.4V
No Load Speed	0.17sec/60°	0.14sec/60°	0.11sec/60°
Stall Torque	19.0kgf·cm (263.86oz·in)	24.0kgf·cm (333.3 oz·in)	30.0kgf·cm (416.62oz·in)
Peak Efficiency Torque	3.8kgf·cm (52.77oz·in)	4.8kgf·cm (66.66oz·in)	6.0kgf·cm (83.32oz·in)
Standing Current	30mA	30mA	30mA
No Load Running Current	1,100mA	1,250mA	1,600mA
Stall Current	5,000mA	6,000mA	9,000mA
Deadband	2μs	2μs	2μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.811inch)		
Connector Wire Gauge	20AWG		
Dimensions	66.0mm x 32.0mm x 62.1mm (2.598inch x 1.260inch x 2.445inch)		
Weight	227.0g (8.007oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic & Aluminum Heat Sink		
Gear Material	1 Metal-Plastic & 4 Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	15T(Ø8)		
IP-Rating	IP67		
Servo Amplifier Type	32bit programmable Digital		

## D845WP

#116845

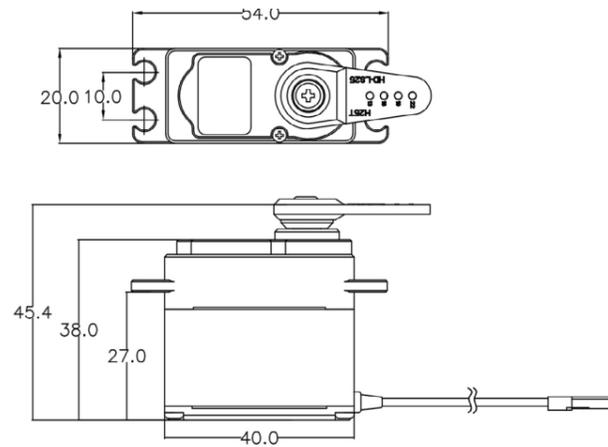


## GENERAL SPECIFICATION

D845WP			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Carbon Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	7.4V
No Load Speed	0.26sec/60°	0.21sec/60°	0.17sec/60°
Stall Torque	32.5kgf·cm (451.34oz-in)	40.5kgf·cm (562.44oz-in)	50.0kgf·cm (694.37oz-in)
Peak Efficiency Torque	6.5kgf·cm (90.27oz-in)	8.1kgf·cm (112.49oz-in)	10.0kgf·cm (138.87oz-in)
Standing Current	30mA	30mA	30mA
No Load Running Current	1,100mA	1,250mA	1,600mA
Stall Current	6,000mA	7,000mA	10,000mA
Deadband	2μs	2μs	2μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	20AWG		
Dimensions	66.0mm x 32.0mm x 62.1mm (2.598inch x 1.260inch x 2.445inch)		
Weight	227.0g (8.007oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic & Aluminum Heat Sink		
Gear Material	1 Metal-Plastic & 4 Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	15T(Ø8)		
IP-Rating	IP67		
Servo Amplifier Type	32bit programmable Digital		

## D941TW

#116941

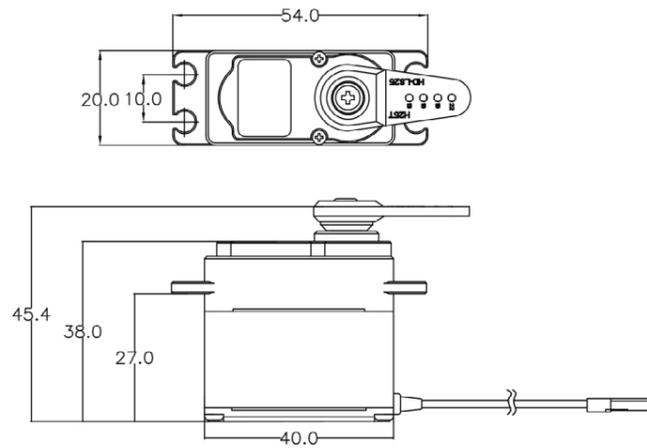


## GENERAL SPECIFICATION

D941TW			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	Coreless		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	7.4V
No Load Speed	0.11sec/60°	0.08sec/60°	0.07sec/60°
Stall Torque	10.0kgf·cm (138.87oz-in)	13.5kgf·cm (187.48oz-in)	16.5kgf·cm (229.14oz-in)
Peak Efficiency Torque	2.0kgf·cm (27.77oz-in)	2.7kgf·cm (37.5 oz-in)	3.3kgf·cm (45.83oz-in)
Standing Current	30mA	30mA	30mA
No Load Running Current	300mA	390mA	500mA
Stall Current	3,700mA	4,800mA	6,200mA
Deadband	1μs	1μs	1μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 38.0mm (1.575inch x 0.787inch x 1.496inch)		
Weight	80.0g (2.822oz)		
Bearing Type	2 Ball Bearing		
Case Material	Aluminum Alloy		
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	32bit programmable Digital		

## D946TW

#116946

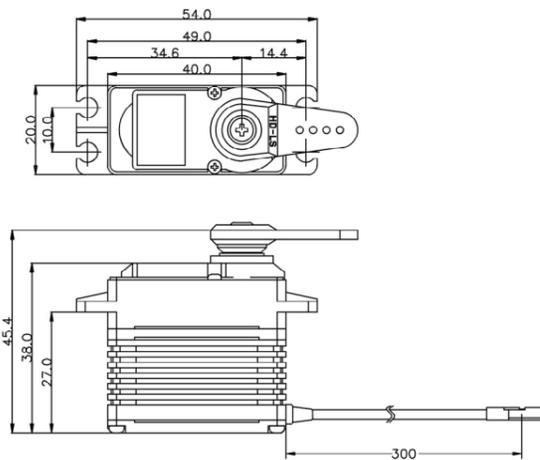


## GENERAL SPECIFICATION

D946TW			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	Coreless		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	7.4V
No Load Speed	0.16sec/60°	0.12sec/60°	0.10sec/60°
Stall Torque	14.0kgf·cm (194.42oz-in)	18.0kgf·cm (249.97oz-in)	23.0kgf·cm (319.41oz-in)
Peak Efficiency Torque	2.8kgf·cm (38.88oz-in)	3.6kgf·cm (49.99oz-in)	4.6kgf·cm (63.88oz-in)
Standing Current	30mA	30mA	30mA
No Load Running Current	300mA	390mA	500mA
Stall Current	3,700mA	4,800mA	6,200mA
Deadband	1μs	1μs	1μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 38.0mm (1.575inch x 0.787inch x 1.496inch)		
Weight	80.0g (2.822oz)		
Bearing Type	2 Ball Bearing		
Case Material	Aluminum Alloy		
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	32bit programmable Digital		

## D950TW

#116950



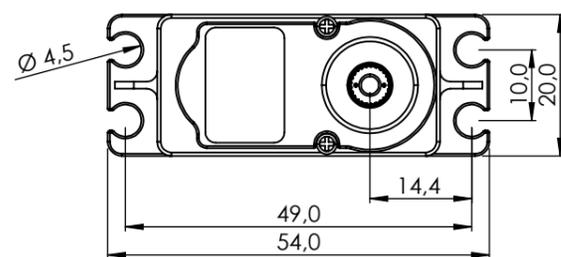
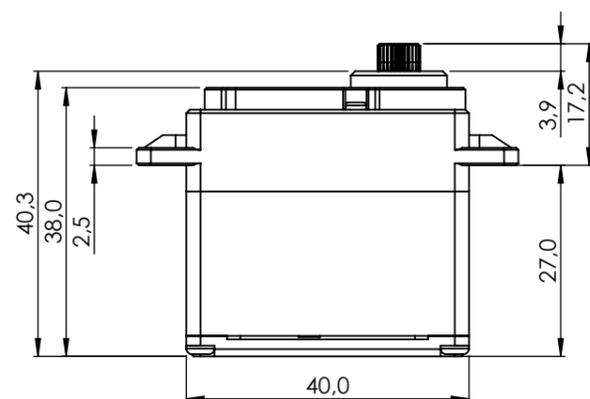
## GENERAL SPECIFICATION

D950TW			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Coreless		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	7.4V
No Load Speed	0.23sec/60°	0.17sec/60°	0.14sec/60°
Stall Torque	21.0kgf·cm (291.64oz-in)	29.0kgf·cm (402.73oz-in)	35.0kgf·cm (486.06oz-in)
Peak Efficiency Torque	4.2kgf·cm (58.33oz-in)	5.8kgf·cm (80.55oz-in)	7.0kgf·cm (97.21oz-in)
Standing Current	30mA	30mA	30mA
No Load Running Current	300mA	390mA	500mA
Stall Current	3,700mA	4,800mA	6,200mA
Deadband	1μs	1μs	1μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.811inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 38.0mm (1.575inch x 0.787inch x 1.496inch)		
Weight	68.0g (2.399oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	32bit programmable Digital		

# D951TW

#116951

#1-02359 GP 24 Stück

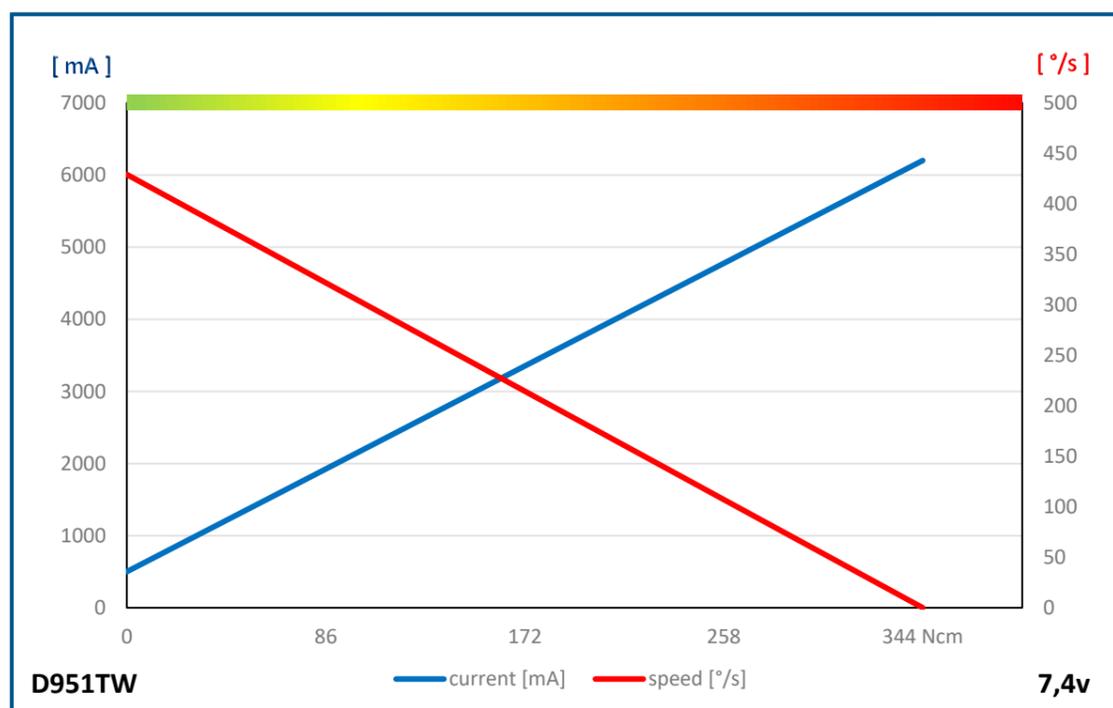


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## GENERAL SPECIFICATION

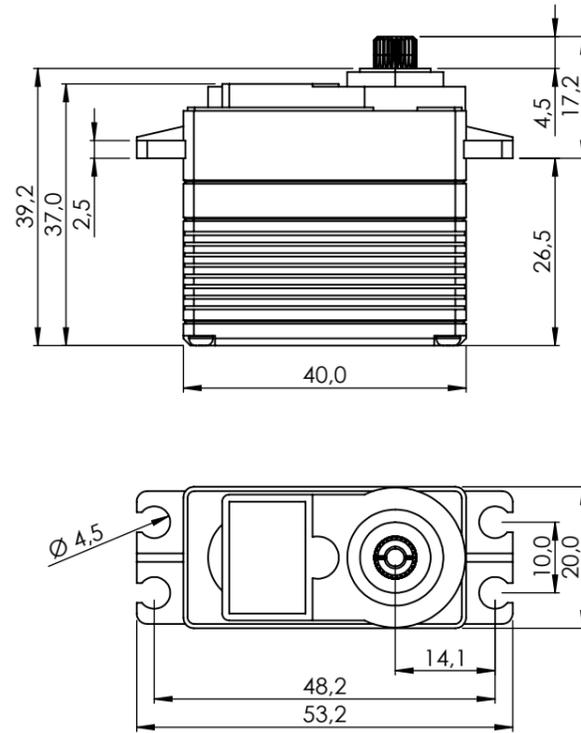
D951TW			
Control System	PWM / TTL (Half Duplex)		
	PWM Range 900µs   1500µs   2100µs		
Connector Type	Hitec 3P (JR 3P compatible)		
Position Sensor Type	Indirect Drive / 1M Cycle Long Life		
Motor Type	Coreless		
Amplifier / MCU	32bit programmable Digital with Mosfet Drive		
Operating Voltage Range	3.5V ~ 8.4V		
Operating Voltage	At 4.8V	At 6.0V	At 7.4V
Operating Speed at no Load	261°/s (44RPM)	353°/s (59RPM)	429°/s (71RPM)
Stall Torque	21.0kgcm (206.0Ncm)	29.0kgcm (284.5Ncm)	35.0kgcm (343.4Ncm)
Peak Efficiency Torque	4.2kgcm (41.2Ncm)	5.8kgcm (56.9Ncm)	7.0kgcm (68.7Ncm)
Rest Current	30mA	30mA	30mA
Running Current at no Load	300mA	390mA	500mA
Stall Current	3700mA	4800mA	6200mA
Deadband Width	1µs	1µs	1µs
Operating Travel	Default	±60°	
	Programmable	Max. 175°	
	Multi Turn/Continuous Rotation	n/a / n/a	
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)		
Vibrations at no Load	-		
Connector Wire Length	300mm		
Connector Wire Gauge	20AWG		
Connector Wire Strand Count	80/0.08		
External Dimensions	40.0 x 20.0 x 38.0mm		
Weight*	80.0g		
Ball Bearing	Dual Ball Bearing		
Case Material	Aluminum Alloy		
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears		
Gear Train Backlash	Max. 0.5°		
Horn Gear Spline	H25T Ø6.0		
Accessories	Mounting Hardware, HD-IM25, HD-LS25, HD-OS25, HD-X25		
IP-Rating	IP54		
Revision	Rev. 1.1 / 04.01.2024		
Changelog	-		
*of the servo only w/o horns and accessories			

## PERFORMANCE CHART



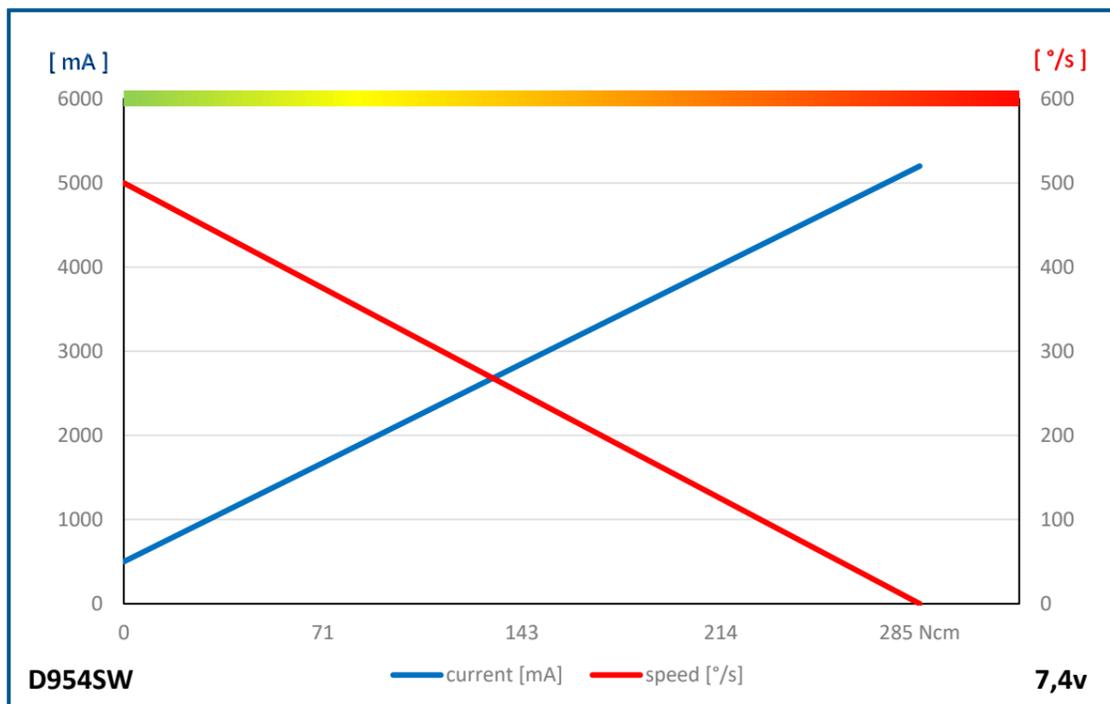
# D954SW

#116954



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## PERFORMANCE CHART

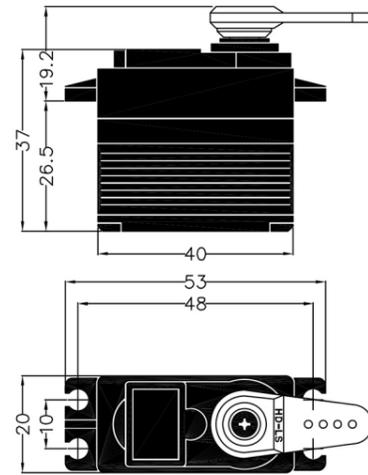


## GENERAL SPECIFICATION

D954SW			
Control System	PWM / TTL (Half Duplex)		
	Pulse Width 900µs 1500µs (Center) 2100µs		
Connector Type	Hitec 3P (JR 3P compatible)		
Position Sensor Type	Indirect Drive / 1M Cycle Long Life		
Motor Type	Coreless		
Amplifier / MCU	32bit programmable Digital with Mosfet Drive		
Operating Voltage Range	3.5V ~ 8.4V		
Operating Voltage	At 4.8V	At 6.0V	At 7.4V
Operating Speed at no Load	316°/s (53RPM)	400°/s (67RPM)	500°/s (83RPM)
Stall Torque	16.0kgcm (157.0Ncm)	24.0kgcm (235.4Ncm)	29.0kgcm (284.5Ncm)
Peak Efficiency Torque	3.6kgcm (35.3Ncm)	4.8kgcm (47.1Ncm)	5.8kgcm (56.9Ncm)
Rest Current	30mA	30mA	30mA
Running Current at no Load	300mA	400mA	500mA
Stall Current	3200mA	4200mA	5200mA
Deadband Width	1µs	1µs	1µs
Operating Travel	Default	±60° **	
	Programmable	Max. 175°	
	Multi Turn/Continuous Rotation	n/a / n/a	
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)		
Vibrations at no Load	-		
Connector Wire Length	300mm		
Connector Wire Gauge	20AWG		
Connector Wire Strand Count	80/0.08		
External Dimensions	40.0 x 20.0 x 37.0mm		
Weight*	66.0g		
Ball Bearing	Dual Ball Bearing		
Case Material	Engineering Plastic & Aluminum Heatsink		
Gear Material	1 Metal-Plastic & 3 Steel Gears		
Gear Train Backlash	Max. 0.5°		
Horn Gear Spline	H25T Ø6.0		
Accessories	Mounting Hardware, Servo Horns (HD-IM25, HD-LS25, HD-OS25, HD-X25)		
IP-Rating	IP54		
Revision	Rev. 1.1 / 04.01.2024		
Changelog	-		
*of the servo only w/o horns and accessories			
** also available with 270°			

## D955TW

#116955

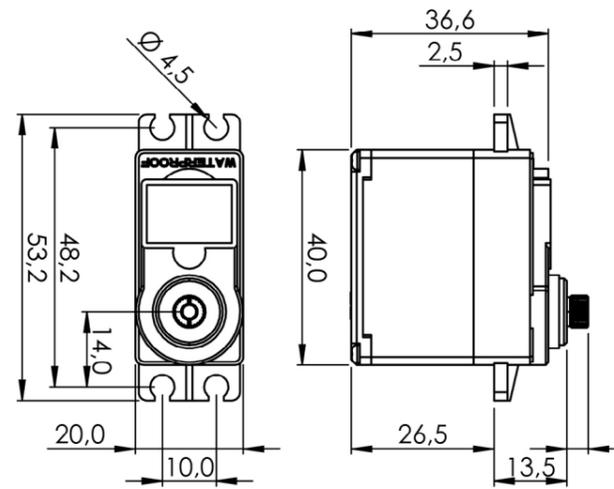


## GENERAL SPECIFICATION

D955TW			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Coreless		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	7.4V
No Load Speed	0.19sec/60°	0.15sec/60°	0.12sec/60°
Stall Torque	18.0kgf·cm (249.97oz-in)	24.0kgf·cm (333.3 oz-in)	29.0kgf·cm (402.73oz-in)
Peak Efficiency Torque	3.6kgf·cm (49.99oz-in)	4.8kgf·cm (66.66oz-in)	5.8kgf·cm (80.55oz-in)
Standing Current	30mA	30mA	30mA
No Load Running Current	300mA	400mA	500mA
Stall Current	3,200mA	4,200mA	5,200mA
Deadband	1μs	1μs	1μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81 inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 37.0mm (1.575inch x 0.787inch x 1.457inch)		
Weight	66.0g (2.328oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic & Aluminum Heat Sink		
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	32bit programmable Digital		

## D956WP

#1-01323

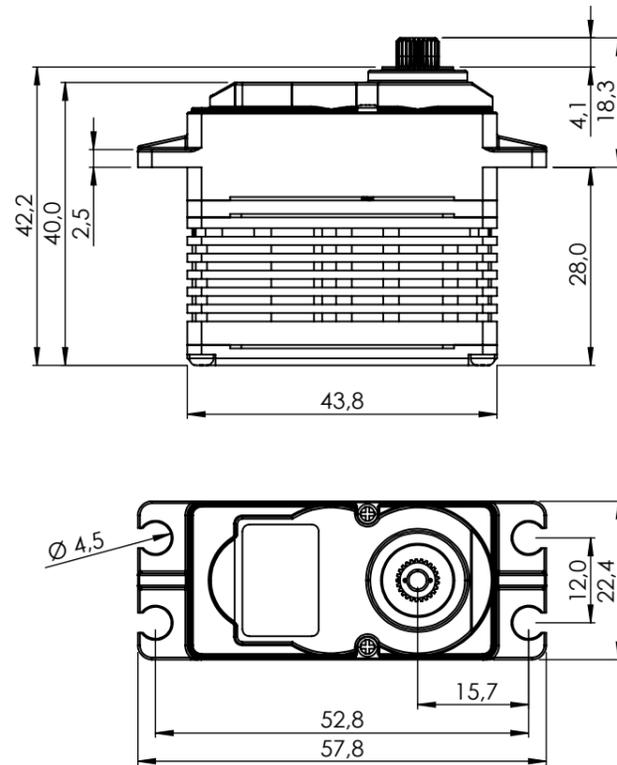


## GENERAL SPECIFICATION

D956WP			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Coreless		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	7.4V
No Load Speed	0.19sec/60°	0.15sec/60°	0.12sec/60°
Stall Torque	19.0kgf-cm (263.86oz-in)	24.0kgf-cm (333.3 oz-in)	29.0kgf-cm (402.73oz-in)
Peak Efficiency Torque	3.8kgf-cm (52.77oz-in)	4.8kgf-cm (66.66oz-in)	5.8kgf-cm (80.55oz-in)
Standing Current	30mA	30mA	30mA
No Load Running Current	300mA	400mA	500mA
Stall Current	3,000mA	3,700mA	4,400mA
Deadband	1μs	1μs	1μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.811inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 37.0mm (1.575inch x 0.787inch x 1.457inch)		
Weight	72.4g (2.554oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic & Aluminum Heat Sink		
Gear Material	1 Metal-Plastic & 3 Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	25T(Ø6)		
IP-Rating	IP67		
Servo Amplifier Type	32bit programmable Digital		

# D980TW

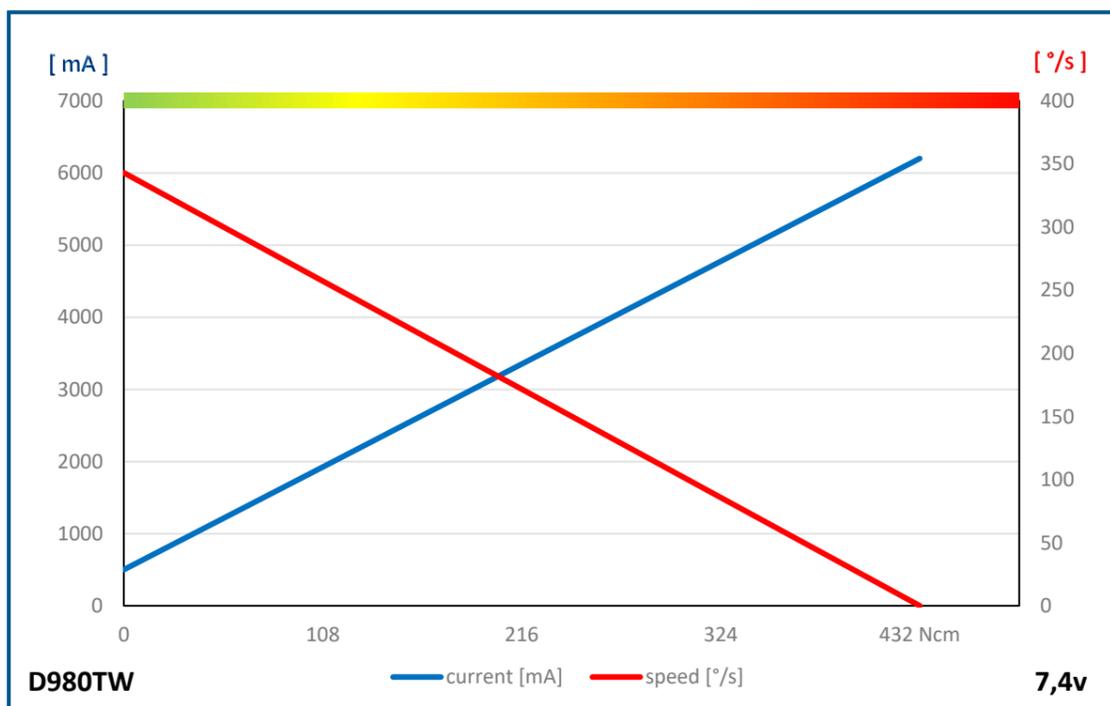
#1-02982



## GENERAL SPECIFICATION

D980TW			
Control System	PWM / TTL (Half Duplex)		
	Pulse Width 900µs 1500µs (Center) 2100µs		
Connector Type	Hitec 3P (JR 3P compatible)		
Position Sensor Type	Indirect Drive / 4 Slider / 1M Cycle Long Life		
Motor Type	Coreless		
Amplifier / MCU	32bit programmable Digital with Mosfet Drive		
Operating Voltage Range	3.5V ~ 8.4V		
Operating Voltage	At 4.8V	At 6.0V	At 7.4V
Operating Speed at no Load	214°/s (36RPM)	286°/s (48RPM)	343°/s (59RPM)
Stall Torque	26.0kgcm (255.1Ncm)	36.0kgcm (353.2Ncm)	44.0kgcm (431.6Ncm)
Peak Efficiency Torque	5.5kgcm (54.0Ncm)	7.2kgcm (70.6Ncm)	8.8kgcm (86.3Ncm)
Rest Current	30mA	30mA	30mA
Running Current at no Load	300mA	390mA	500mA
Stall Current	4200mA	4800mA	6200mA
Deadband Width	1µs	1µs	1µs
Operating Travel	Default	±60°	
	Programmable	Max. 175°	
	Multi Turn/Continuous Rotation	n/a / n/a	
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)		
Vibrations at no Load	-		
Connector Wire Length	300mm		
Connector Wire Gauge	20AWG		
Connector Wire Strand Count	80/0.08		
External Dimensions	43.8 x 22.4 x 40.0mm		
Weight*	78.2g		
Ball Bearing	Dual Ball Bearing		
Case Material	Engineering Plastic & Aluminum Heatsink		
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears		
Gear Train Backlash	Max. 0.5°		
Horn Gear Spline	H25T Ø6.0		
Accessories	Mounting Hardware, Servo Horns (HD-IM25, HD-LS25, HD-OS25, HD-X25, HD-IL25, HD-LL25, HD-IG25, HD-LG25)		
IP-Rating	IP54		
Revision	Rev. 1.1 / 04.01.2024		
Changelog	-		

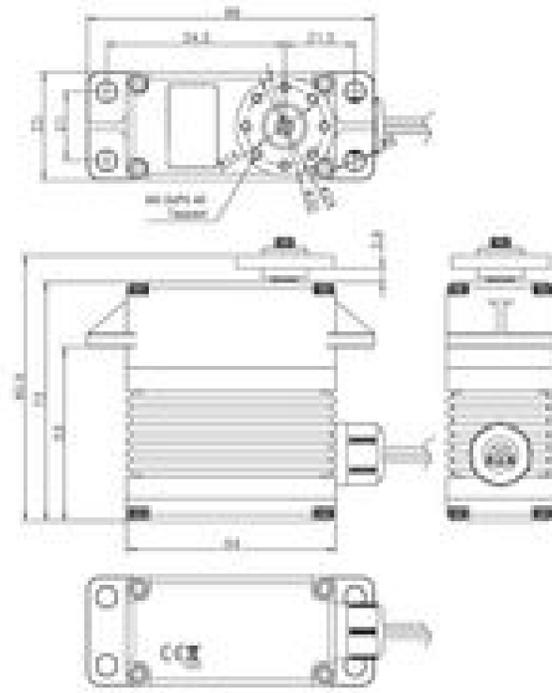
## PERFORMANCE CHART



\*of the servo only w/o horns and accessories

## D1005SGT

#1-02857

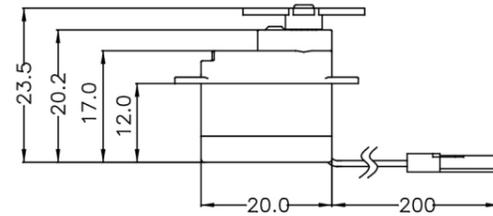
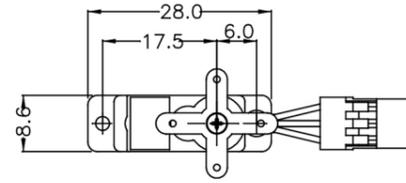


## GENERAL SPECIFICATION

D1005SGT			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Carbon Brush		
Operating Voltage Range	Motor : 9.0 ~ 16.8V, Signal : 3.5 ~ 8.4V		
Voltage	-	11.1V	14.8V
No Load Speed	-	0.26sec/60°	0.19sec/60°
Stall Torque	-	84.0kgf·cm (1,166.54oz-in)	110.0kgf·cm (1,527.61oz-in)
Peak Efficiency Torque	-	16.8kgf·cm (233.31oz-in)	22.0kgf·cm (305.52oz-in)
Standing Current	-	30mA	30mA
No Load Running Current	-	750mA	950mA
Stall Current	-	5,500mA	6,500mA
Deadband	-	2μs	2μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	250mm (9.843inch)		
Connector Wire Gauge	Motor : 18AWG, Signal : 20AWG		
Dimensions	64.0mm x 33.0mm x 73.0mm (2.520inch x 1.299inch x 2.874inch)		
Weight	310.0g (10.935oz)		
Bearing Type	2 Ball Bearing		
Case Material	Aluminum Alloy		
Gear Material	1 Metal-Plastic & 3 Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	15T(Ø8.0)		
IP-Rating	IP54		
Servo Amplifier Type	32bit programmable Digital		

# HS-40

#112040

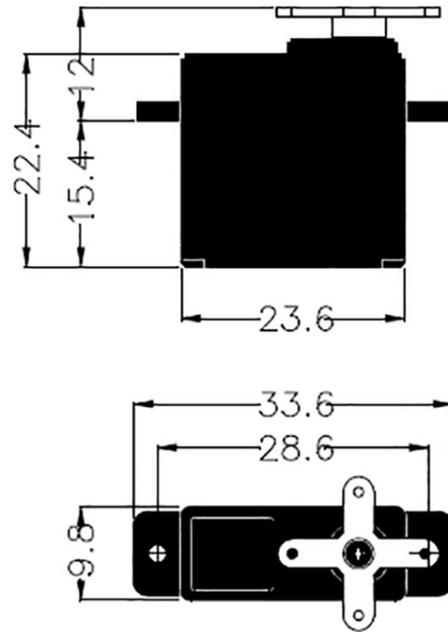
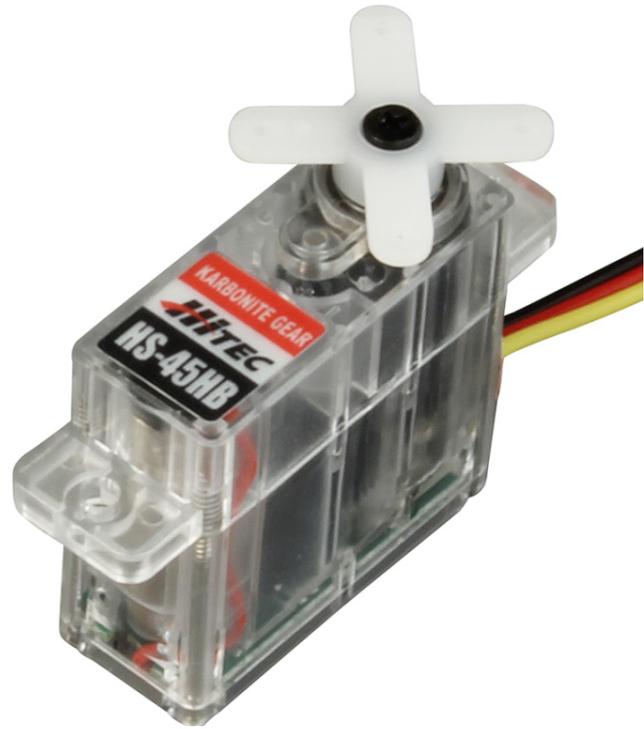


## GENERAL SPECIFICATION

HS-40			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Coreless		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	-	-
No Load Speed	0.09sec/60°	-	-
Stall Torque	0.6kgf·cm ( 8.33oz-in)	-	-
Peak Efficiency Torque	0.1kgf·cm ( 1.4 oz-in)	-	-
Standing Current	8mA	-	-
No Load Running Current	60mA	-	-
Stall Current	460mA	-	-
Deadband	5μs	-	-
Operating Travel	Default: ±60°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	180mm (7.087inch)		
Connector Wire Gauge	28AWG		
Dimensions	20.0mm x 8.6mm x 17.0mm (0.787inch x 0.339inch x 0.669inch)		
Weight	4.8g (0.169oz)		
Bearing Type	N/A		
Case Material	Engineering Plastic		
Gear Material	5 Resin Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	15T(Ø4.0)		
IP-Rating	IP4X		
Servo Amplifier Type	Analog Contorller		

# HS-45HB

#112045



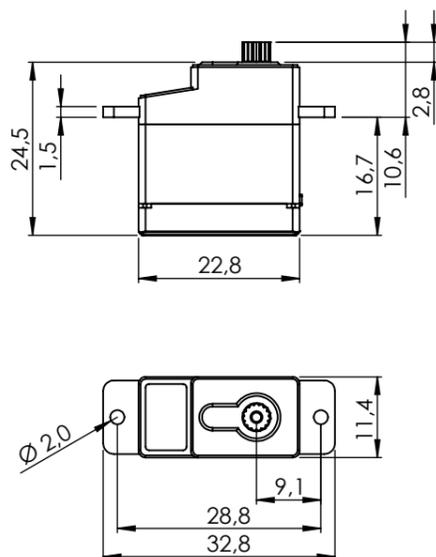
## GENERAL SPECIFICATION

HS-45HB			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Coreless		
Operating Voltage Range	4.8V		
Voltage	4.8V	-	-
No Load Speed	0.14sec/60°	-	-
Stall Torque	1.0kgf·cm (13.89oz-in)	-	-
Peak Efficiency Torque	0.2kgf·cm ( 2.8 oz-in)	-	-
Standing Current	8mA	-	-
No Load Running Current	100mA	-	-
Stall Current	440mA	-	-
Deadband	5μs	-	-
Operating Travel	Default: ±60°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	250mm (9.843inch)		
Connector Wire Gauge	28AWG		
Dimensions	23.7mm x 9.8mm x 22.4mm (0.933inch x 0.386inch x 0.882inch)		
Weight	8.0g (0.282oz)		
Bearing Type	1 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	5 Heavy Duty Resin Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	15T(Ø4.0)		
IP-Rating	IP4X		
Servo Amplifier Type	Analog Contorller		

# HS-53

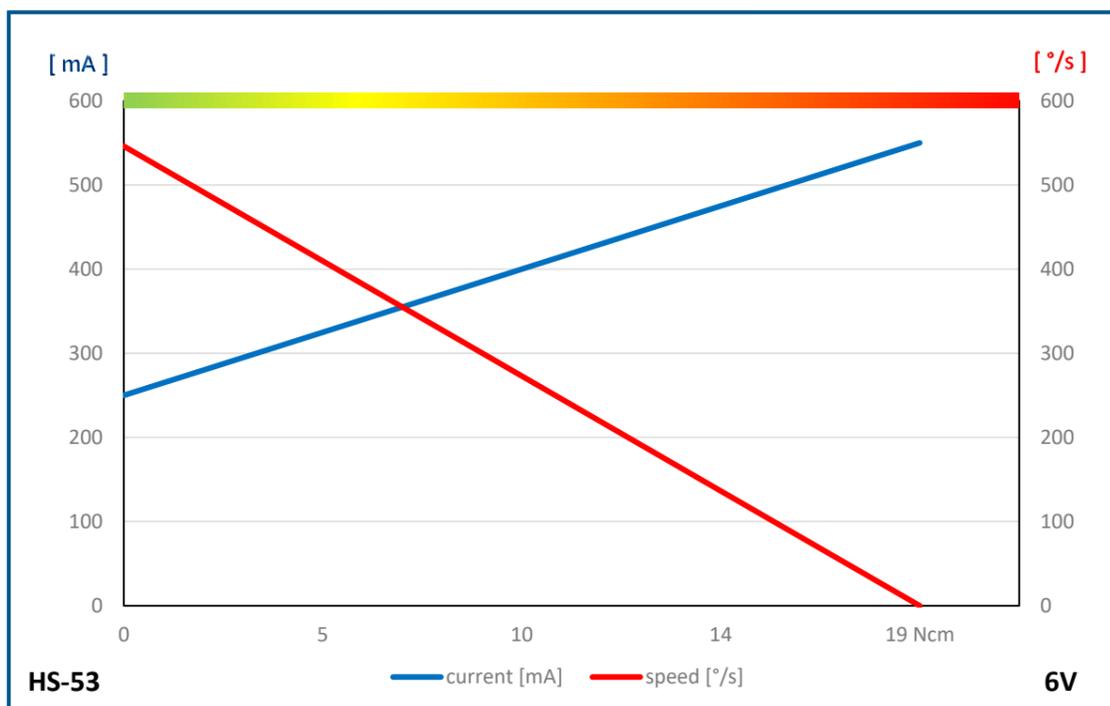
#112053

#112054 GP 20 Stück



1:1

## PERFORMANCE CHART



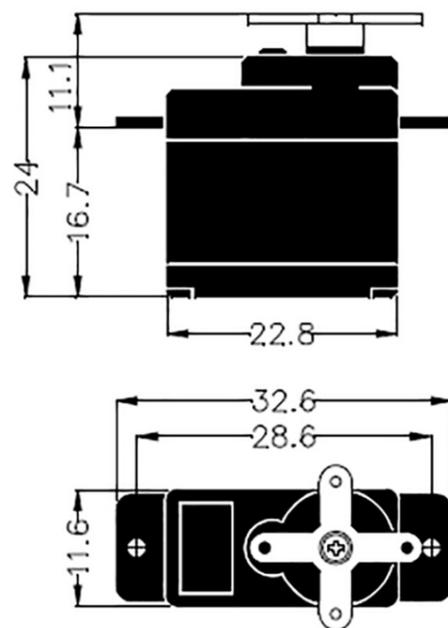
## GENERAL SPECIFICATION

HS-53	
Control System	PWM
	Pulse Width 900µs 1500µs (Center) 2100µs
Connector Type	Hitec 3P (JR 3P compatible)
Position Sensor Type	Direct Drive / 2 Slider
Motor Type	Cored Metal Brush
Amplifier / MCU	Analog
Operating Voltage Range	4.8V ~ 6.0V
Operating Voltage	At 4.8V
	At 6.0V
Operating Speed at no Load	429°/s (71RPM)
	546°/s (91RPM)
Stall Torque	1.5kgcm (14.7Ncm)
	1.9kgcm (18.6Ncm)
Peak Efficiency Torque	0.3kgcm (2.9Ncm)
	0.4kgcm (3.9Ncm)
Rest Current	8mA
	10mA
Running Current at no Load	200mA
	250mA
Stall Current	440mA
	550mA
Deadband Width	5µs
	5µs
Operating Travel	Default
	Programmable
	Multi Turn/Continuous Rotation
	±60°
	n/a
	n/a / n/a
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)
Vibrations at no Load	-
Connector Wire Length	250mm
Connector Wire Gauge	28AWG
Connector Wire Strand Count	20/0.08
External Dimensions	22.8 x 11.4 x 24.5mm
Weight*	8.0g
Ball Bearing	n/a
Case Material	Engineering Plastic
Gear Material	5 Resin Gears
Gear Train Backlash	Max. 0.5°
Horn Gear Spline	15T $\varnothing 4.0$
Accessories	Tapping Screw, Servo Horns (FS-IL, FS-X)
IP-Rating	IP4X
Revision	Rev. 1.1 / 04.01.2024
Changelog	-

\*of the servo only w/o horns and accessories

# HS-55

#112055

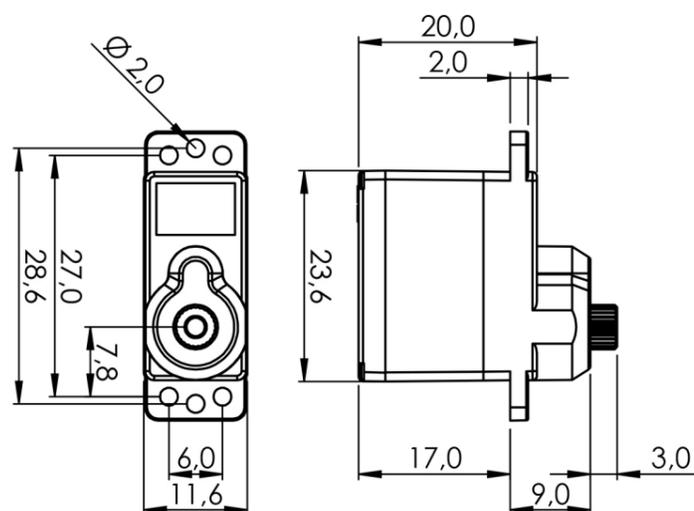


## GENERAL SPECIFICATION

HS-55			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Coreless		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	6.0V	-
No Load Speed	0.18sec/60°	0.14sec/60°	-
Stall Torque	1.2kgf·cm (16.66oz-in)	1.5kgf·cm (20.83oz-in)	-
Peak Efficiency Torque	0.2kgf·cm ( 2.8 oz-in)	0.3kgf·cm ( 4.2 oz-in)	-
Standing Current	5mA	6mA	-
No Load Running Current	150mA	180mA	-
Stall Current	-	-	-
Deadband	5μs	5μs	-
Operating Travel	Default: ±60°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	250mm (9.843inch)		
Connector Wire Gauge	28AWG		
Dimensions	22.8mm x 11.6mm x 24.0mm (0.898inch x 0.457inch x 0.945inch)		
Weight	8.0g (0.282oz)		
Bearing Type	N/A		
Case Material	Engineering Plastic		
Gear Material	5 Resin Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	15T(Ø4.0)		
IP-Rating	IP4X		
Servo Amplifier Type	Analog Contorller		

# HS-65HB/HS-65HBM

#112065, #1-02232

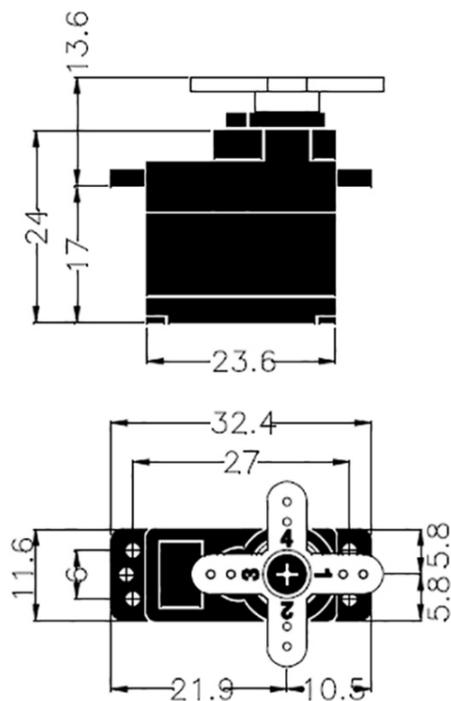


## GENERAL SPECIFICATION

HS-65HB			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	6.0V	-
No Load Speed	0.14sec/60°	0.11sec/60°	-
Stall Torque	1.8kgf-cm (25.0 oz-in)	2.2kgf-cm (30.55oz-in)	-
Peak Efficiency Torque	0.4kgf-cm ( 5.6 oz-in)	0.4kgf-cm ( 5.6 oz-in)	-
Standing Current	8mA	8mA	-
No Load Running Current	180mA	220mA	-
Stall Current	960mA	1,200mA	-
Deadband	5 $\mu$ s	5 $\mu$ s	-
Operating Travel	Default: $\pm 60^\circ$ , Non-programmable / Pulse Width: 900~2100 $\mu$ s(Center:1500 $\mu$ s)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	160mm (6.299inch)		
Connector Wire Gauge	28AWG		
Dimensions	23.6mm x 11.6mm x 24.0mm (0.929inch x 0.457inch x 0.945inch)		
Weight	11.2g (0.395oz)		
Bearing Type	1 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Resin & 4 Heavy Duty Resin Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	M25T( $\varnothing 5$ )		
IP-Rating	IP4X		
Servo Amplifier Type	Analog Contorller		

# HS-65MG

#112066

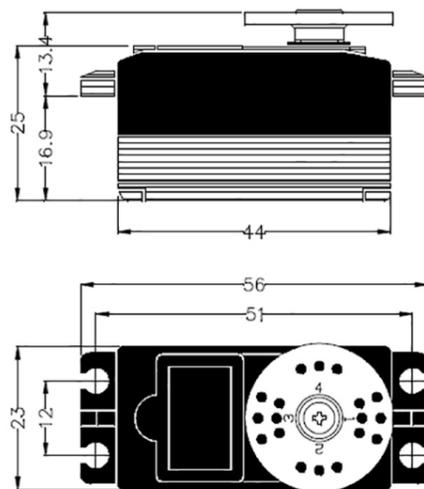


## GENERAL SPECIFICATION

HS-65MG			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	6.0V	-
No Load Speed	0.14sec/60°	0.11sec/60°	-
Stall Torque	1.8kgf-cm (25.0 oz-in)	2.2kgf-cm (30.55oz-in)	-
Peak Efficiency Torque	0.4kgf-cm ( 5.6 oz-in)	0.4kgf-cm ( 5.6 oz-in)	-
Standing Current	8mA	8mA	-
No Load Running Current	180mA	220mA	-
Stall Current	960mA	1,200mA	-
Deadband	5μs	5μs	-
Operating Travel	Default: ±60°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	160mm (6.299inch)		
Connector Wire Gauge	28AWG		
Dimensions	23.6mm x 11.6mm x 24.0mm (0.929inch x 0.457inch x 0.945inch)		
Weight	12.5g (0.441oz)		
Bearing Type	1 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Resin & 4 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	M25T(Ø5)		
IP-Rating	IP4X		
Servo Amplifier Type	Analog Contorller		

# HS-75BB

#112075

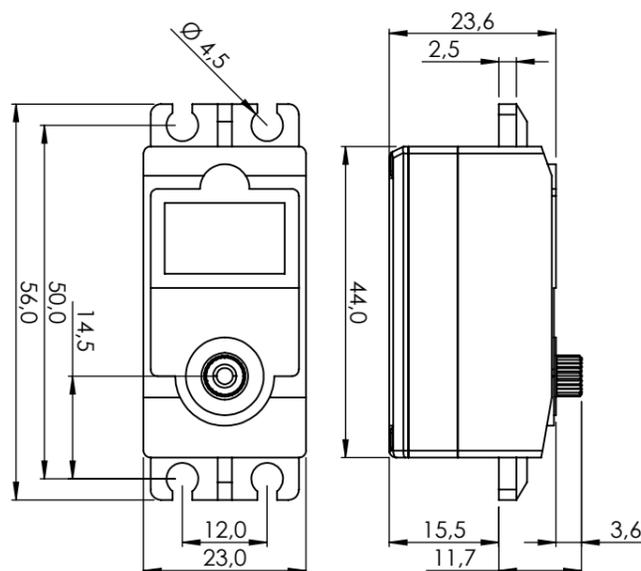


## GENERAL SPECIFICATION

HS-75BB			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	6.0V	-
No Load Speed	0.45sec/60°	0.34sec/60°	-
Stall Torque	6.6kgf·cm (91.66oz-in)	8.2kgf·cm (113.88oz-in)	-
Peak Efficiency Torque	1.3kgf·cm (18.1 oz-in)	1.6kgf·cm (22.2 oz-in)	-
Standing Current	1mA	1mA	-
No Load Running Current	150mA	150mA	-
Stall Current	-	-	-
Deadband	20μs	20μs	-
Operating Travel	Default: 0°/+170° Above, Non-programmable, Pulse Width: 1400μs Less / 1600μs More		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)		
Connector Wire Length	300mm (11.811inch)		
Connector Wire Gauge	24AWG		
Dimensions	44.1mm x 23.0mm x 24.8mm (1.736inch x 0.906inch x 0.976inch)		
Weight	35.0g (1.235oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal & 4 Resin Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	Analog Controller		

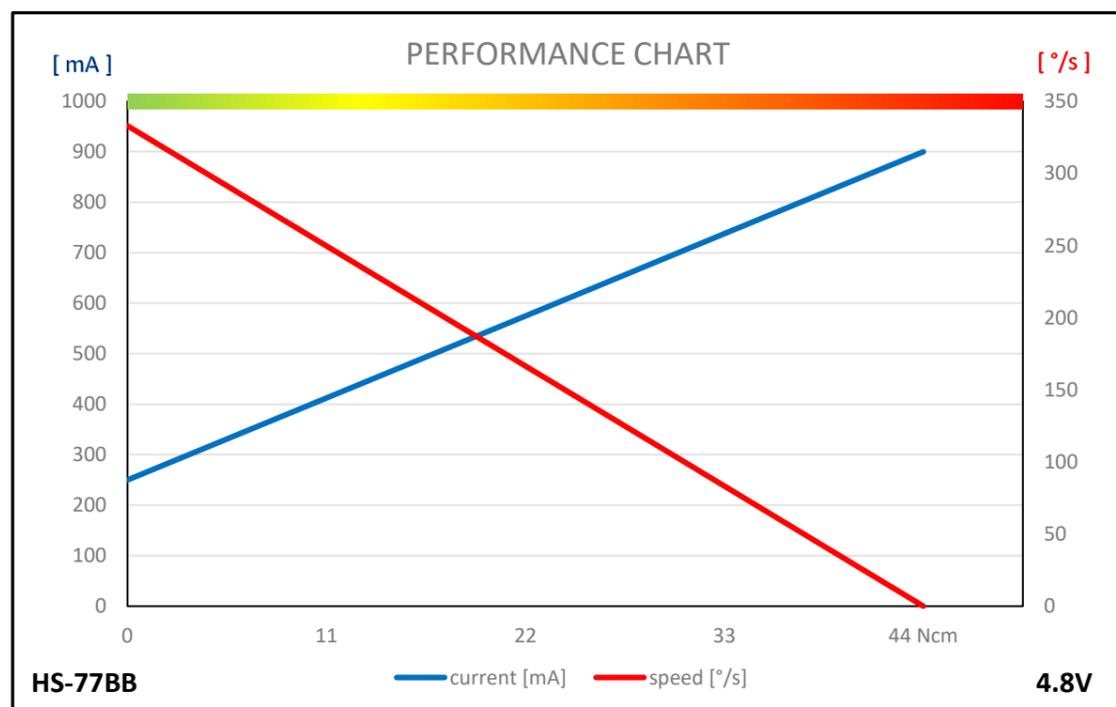
# HS-77BB

#1-03236



## GENERAL SPECIFICATION

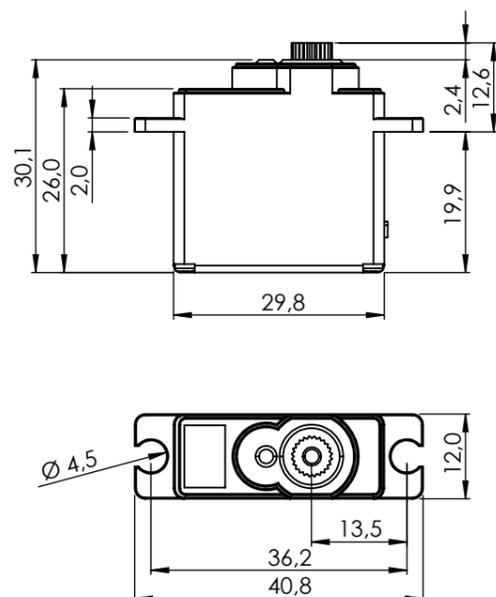
HS-77BB			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.8V		
Voltage	4.8V	-	-
No Load Speed	0.18sec/60°	-	-
Stall Torque	4.4kgf-cm (61.1 oz-in)	-	-
Peak Efficiency Torque	0.9kgf-cm (12.5 oz-in)	-	-
Standing Current	8mA	-	-
No Load Running Current	250mA	-	-
Stall Current	-	-	-
Deadband	8μs	-	-
Operating Travel	Default: ±67.5°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	24AWG		
Dimensions	44.1mm x 23.0mm x 24.8mm (1.736inch x 0.906inch x 0.976inch)		
Weight	35.0g (1.235oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	5 Resin Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(∅6)		
IP-Rating	IP54		
Servo Amplifier Type	Analog Contorller		



# HS-81

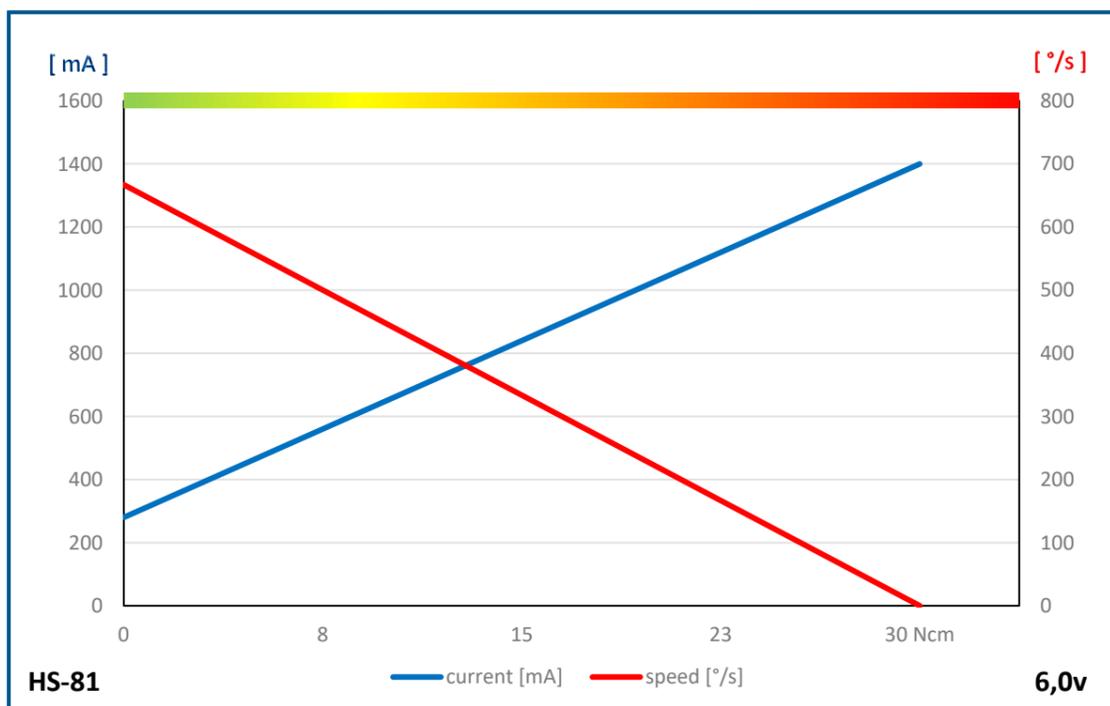
#112081

#112084 GP 20 Stück



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## PERFORMANCE CHART



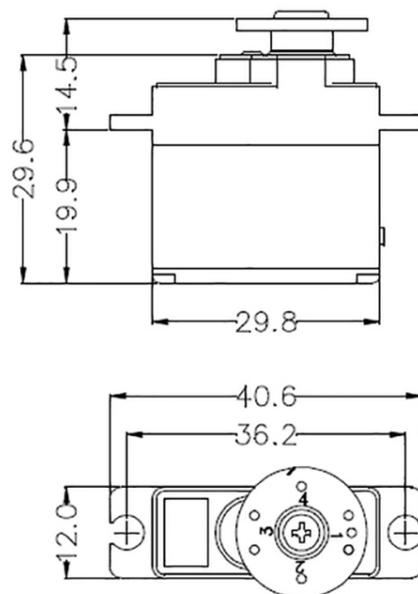
## GENERAL SPECIFICATION

HS-81		
Control System	Pulse Width Modulation (PWM)	
	PWM Range '900µs   1500µs   2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Direct Drive	
Motor Type	Cored / 3 poles Ferrite Motor	
Amplifier / MCU	Analog	
Operating Voltage Range	4.8V ~ 6.0V	
Operating Voltage	At 4.8V	At 6.0V
Operating Speed at no Load	546°/s (91RPM)	667°/s (111RPM)
Stall Torque	2.6kgcm (25.5Ncm)	3.0kgcm (29.4Ncm)
Peak Efficiency Torque	0.5kgcm (4.9Ncm)	0.6kgcm (5.9Ncm)
Rest Current	9mA	9mA
Running Current at no Load	220mA	280mA
Stall Current	-	-
Deadband Width	5µs	5µs
Operating Travel	Default	±60°
	Programmable	n/a
	Multi Turn/Continuous Rotation	n/a / n/a
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)	
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)	
Vibrations at no Load	-	
Connector Wire Length	250mm	
Connector Wire Gauge	28AWG	
Connector Wire Strand Count	20/0.08	
External Dimensions	29.8 x 12.0 x 26.0mm	
Weight*	16.6g	
Ball Bearing	n/a	
Case Material	Engineering Plastic	
Gear Material	3 resin & 1 Heavy Duty Resin Gears	
Gear Train Backlash	n/a	
Horn Gear Spline	24T Ø5.76	
Accessories	Mounting Hardware, Servo Horns (M-I, M-X, M-O)	
IP-Rating	IP4X	
Revision	Rev. 1.1 / 04.01.2024	
Changelog	-	

\*of the servo only w/o horns and accessories

# HS-82MG

#112088

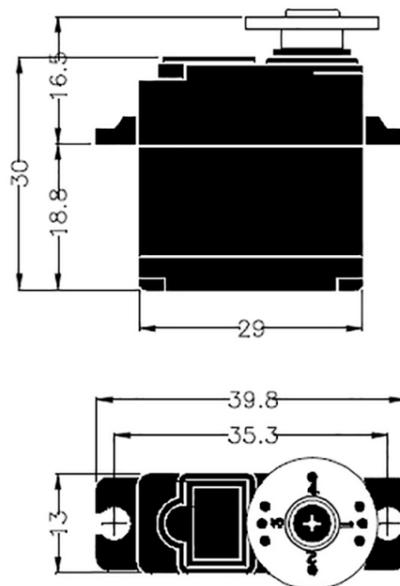


## GENERAL SPECIFICATION

HS-82MG			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	6.0V	-
No Load Speed	0.12sec/60°	0.10sec/60°	-
Stall Torque	2.8kgf·cm (38.88oz-in)	3.4kgf·cm (47.22oz-in)	-
Peak Efficiency Torque	0.6kgf·cm ( 8.3 oz-in)	0.7kgf·cm ( 9.7 oz-in)	-
Standing Current	10mA	10mA	-
No Load Running Current	220mA	280mA	-
Stall Current	1,450mA	1,800mA	-
Deadband	5μs	5μs	-
Operating Travel	Default: ±60°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	250mm (9.843inch)		
Connector Wire Gauge	28AWG		
Dimensions	30.0mm x 12.0mm x 29.6mm (1.181inch x 0.472inch x 1.165inch)		
Weight	19.0g (0.670oz)		
Bearing Type	N/A		
Case Material	Engineering Plastic		
Gear Material	4 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	Analog Contorller		

# HS-85BB

#112085



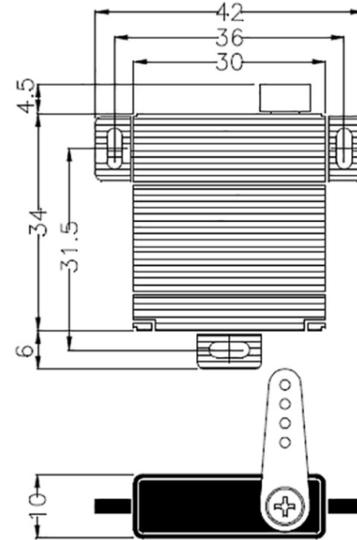
## GENERAL SPECIFICATION

HS-85BB			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	6.0V	-
No Load Speed	0.16sec/60°	0.14sec/60°	-
Stall Torque	3.0kgf·cm (41.66oz-in)	3.5kgf·cm (48.61oz-in)	-
Peak Efficiency Torque	0.6kgf·cm ( 8.3 oz-in)	0.7kgf·cm ( 9.7 oz-in)	-
Standing Current	8mA	8mA	-
No Load Running Current	280mA	280mA	-
Stall Current	-	-	-
Deadband	5μs	5μs	-
Operating Travel	Default: ±60°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	250mm (9.843inch)		
Connector Wire Gauge	28AWG		
Dimensions	29.0mm x 13.0mm x 29.4mm (1.142inch x 0.512inch x 1.157inch)		
Weight	19.2g (0.677oz)		
Bearing Type	1 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	5 Resin Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	Analog Contorller		



# HS-125MG

#112125

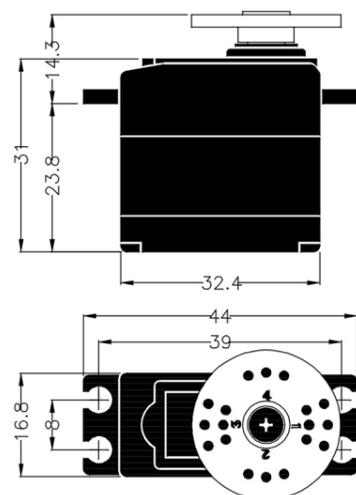


## GENERAL SPECIFICATION

HS-125MG			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	6.0V	-
No Load Speed	0.17sec/60°	0.13sec/60°	-
Stall Torque	3.0kgf·cm (41.66oz-in)	3.5kgf·cm (48.61oz-in)	-
Peak Efficiency Torque	0.6kgf·cm ( 8.3 oz-in)	0.7kgf·cm ( 9.7 oz-in)	-
Standing Current	7mA	8mA	-
No Load Running Current	250mA	330mA	-
Stall Current	-	-	-
Deadband	5μs	5μs	-
Operating Travel	Default: ±60°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	24AWG		
Dimensions	30.0mm x 10.0mm x 34.0mm (1.181inch x 0.394inch x 1.339inch)		
Weight	24.0g (0.847oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal + Plastic & 4 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	M25T(Ø5)		
IP-Rating	IP4X		
Servo Amplifier Type	Analog Contorller		

# HS-225BB

#112225

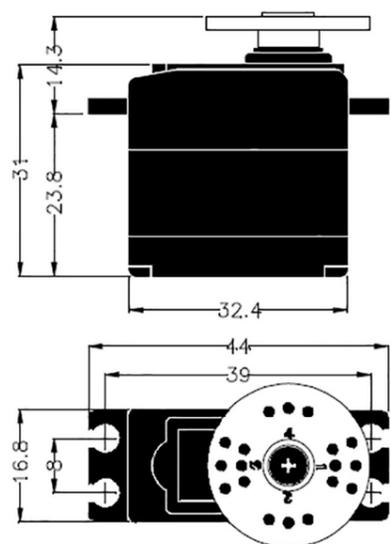


## GENERAL SPECIFICATION

HS-225BB			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	6.0V	-
No Load Speed	0.15sec/60°	0.13sec/60°	-
Stall Torque	3.7kgf·cm (51.38oz·in)	4.4kgf·cm (61.1 oz·in)	-
Peak Efficiency Torque	0.7kgf·cm (9.7 oz·in)	0.9kgf·cm (12.5 oz·in)	-
Standing Current	7mA	8mA	-
No Load Running Current	260mA	360mA	-
Stall Current	1,600mA	2,000mA	-
Deadband	5μs	5μs	-
Operating Travel	Default: ±60°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.811inch)		
Connector Wire Gauge	24AWG		
Dimensions	32.2mm x 16.8mm x 31.0mm (1.268inch x 0.661inch x 1.220inch)		
Weight	27.7g (0.977oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	4 Resin Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	Analog Controller		

# HS-225MG

#112226



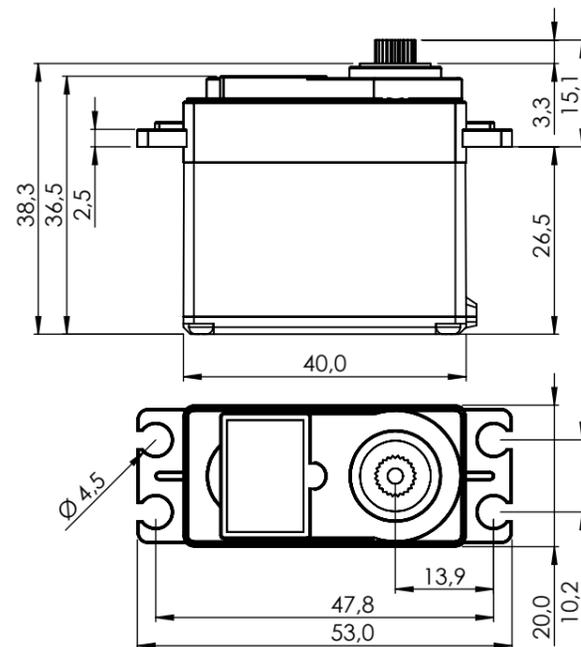
## GENERAL SPECIFICATION

HS-225MG			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	6.0V	-
No Load Speed	0.15sec/60°	0.13sec/60°	-
Stall Torque	3.7kgf·cm (51.38oz·in)	4.4kgf·cm (61.1 oz·in)	-
Peak Efficiency Torque	0.7kgf·cm (9.7 oz·in)	0.9kgf·cm (12.5 oz·in)	-
Standing Current	7mA	8mA	-
No Load Running Current	260mA	360mA	-
Stall Current	1,600mA	2,000mA	-
Deadband	5μs	5μs	-
Operating Travel	Default: ±60°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.811inch)		
Connector Wire Gauge	24AWG		
Dimensions	32.2mm x 16.8mm x 31.0mm (1.268inch x 0.661inch x 1.220inch)		
Weight	31.0g (1.093oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal + Plastic & 3 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	Analog Contorller		

# HS-311

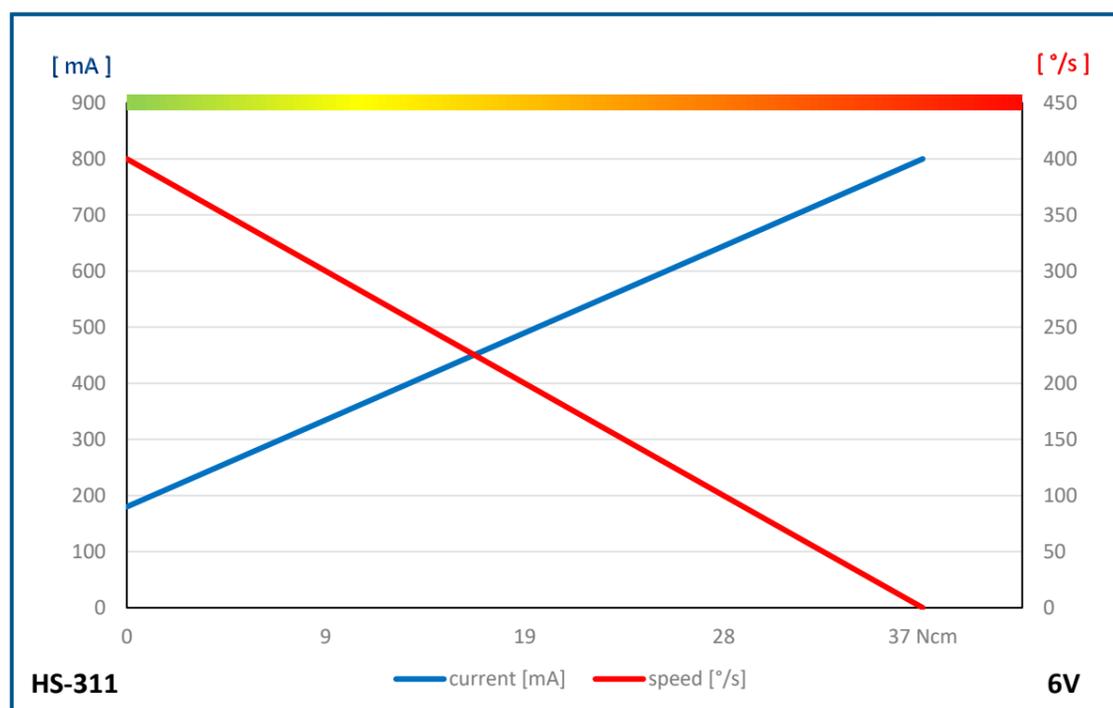
#112311

#IND-112314 GP 30 Stück



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## PERFORMANCE CHART



## GENERAL SPECIFICATION

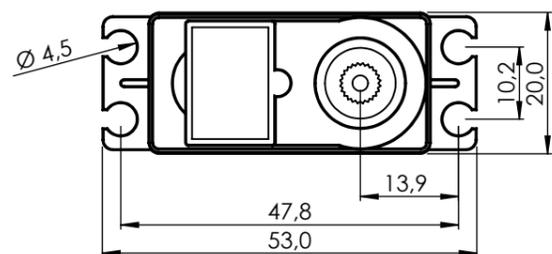
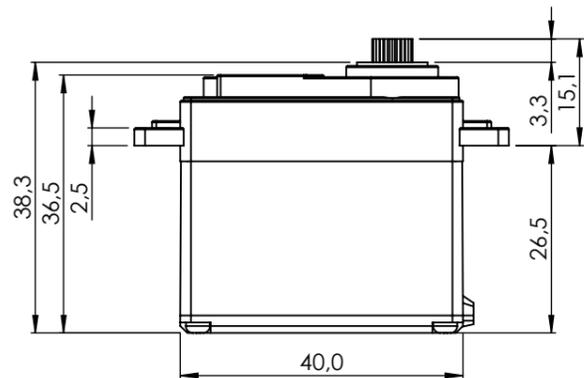
HS-311		
Control System	PWM	
	Pulse Width 900µs 1500µs (Center) 2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Direct Drive / 4 Slider	
Motor Type	Cored Metal Brush	
Amplifier / MCU	Analog	
Operating Voltage Range	4.8V ~ 6.0V	
Operating Voltage	At 4.8V	At 6.0V
Operating Speed at no Load	316°/s (53RPM)	400°/s (67RPM)
Stall Torque	3.0kgcm (29.4Ncm)	3.7kgcm (36.3Ncm)
Peak Efficiency Torque	0.6kgcm (5.9Ncm)	0.7kgcm (6.9Ncm)
Rest Current	7mA	8mA
Running Current at no Load	160mA	180mA
Stall Current	700mA	800mA
Deadband Width	5µs	5µs
Operating Travel	Default	±60°
	Programmable	n/a
	Multi Turn/Continuous Rotation	n/a / n/a
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)	
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)	
Vibrations at no Load	-	
Connector Wire Length	300mm	
Connector Wire Gauge	24AWG	
Connector Wire Strand Count	40/0.08	
External Dimensions	40.0 x 20.0 x 36.5mm	
Weight*	43.0g	
Ball Bearing	Single Resin Bushing	
Case Material	Engineering Plastic	
Gear Material	4 Resin Gears	
Gear Train Backlash	Max. 0.5°	
Horn Gear Spline	24T Ø6.0	
Accessories	Mounting Hardware, Servo Horns (R-O, R-X, R-I, R-D, R-C, R-XA)	
IP-Rating	IP4X	
Revision	Rev. 1.1 / 04.01.2024	
Changelog	-	

\*of the servo only w/o horns and accessories

# HS-322HD

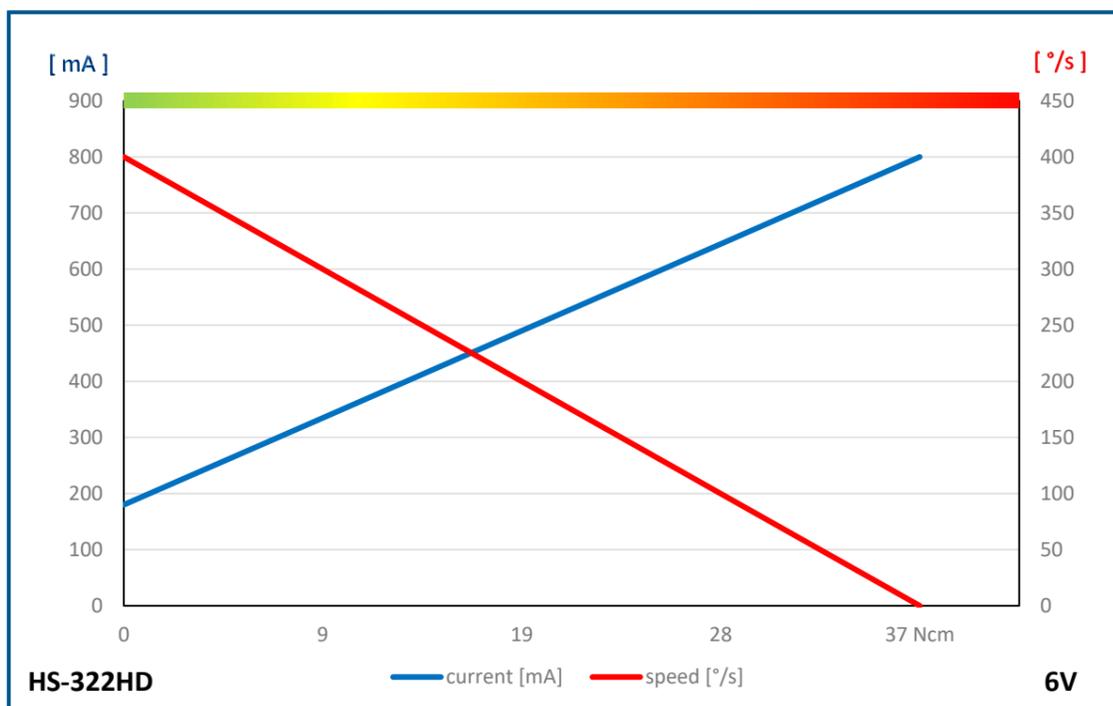
#112322

#112326 GP 30 Stück



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## PERFORMANCE CHART



## GENERAL SPECIFICATION

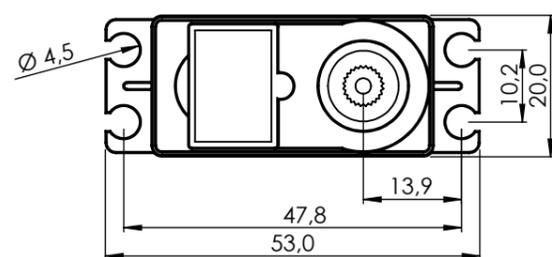
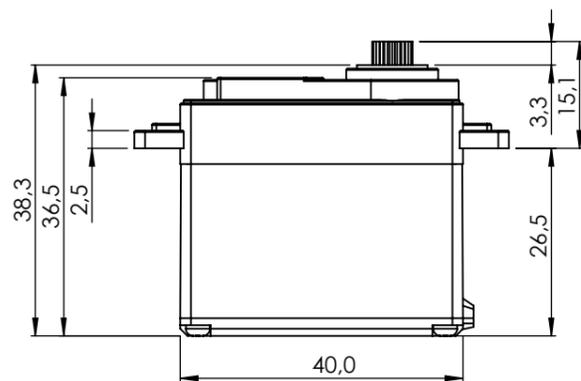
HS-322HD	
Control System	PWM
	Pulse Width 900µs 1500µs (Center) 2100µs
Connector Type	Hitec 3P (JR 3P compatible)
Position Sensor Type	Direct Drive / 4 Slider
Motor Type	Cored Metal Brush
Amplifier / MCU	Analog
Operating Voltage Range	4.8V ~ 6.0V
Operating Voltage	At 4.8V
Operating Speed at no Load	316°/s (53RPM)
Stall Torque	3.0kgcm (29.4Ncm)
Peak Efficiency Torque	0.6kgcm (5.9Ncm)
Rest Current	7mA
Running Current at no Load	160mA
Stall Current	700mA
Deadband Width	5µs
Operating Travel	Default ±60°
	Programmable n/a
	Multi Turn/Continuous Rotation n/a / n/a
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)
Vibrations at no Load	-
Connector Wire Length	300mm
Connector Wire Gauge	24AWG
Connector Wire Strand Count	40/0.08
External Dimensions	40.0 x 20.0 x 36.5mm
Weight*	43.0g
Ball Bearing	Dual Resin Bushing
Case Material	Engineering Plastic
Gear Material	2 Resin & 2 Heavy Duty Resin Gears
Gear Train Backlash	Max. 0.5°
Horn Gear Spline	24T Ø6.0
Accessories	Mounting Hardware, Servo Horns (R-O, R-X, R-I, R-D, R-C)
IP-Rating	IP4X
Revision	Rev. 1.1 / 04.01.2024
Changelog	-

\*of the servo only w/o horns and accessories

# HS-325HB

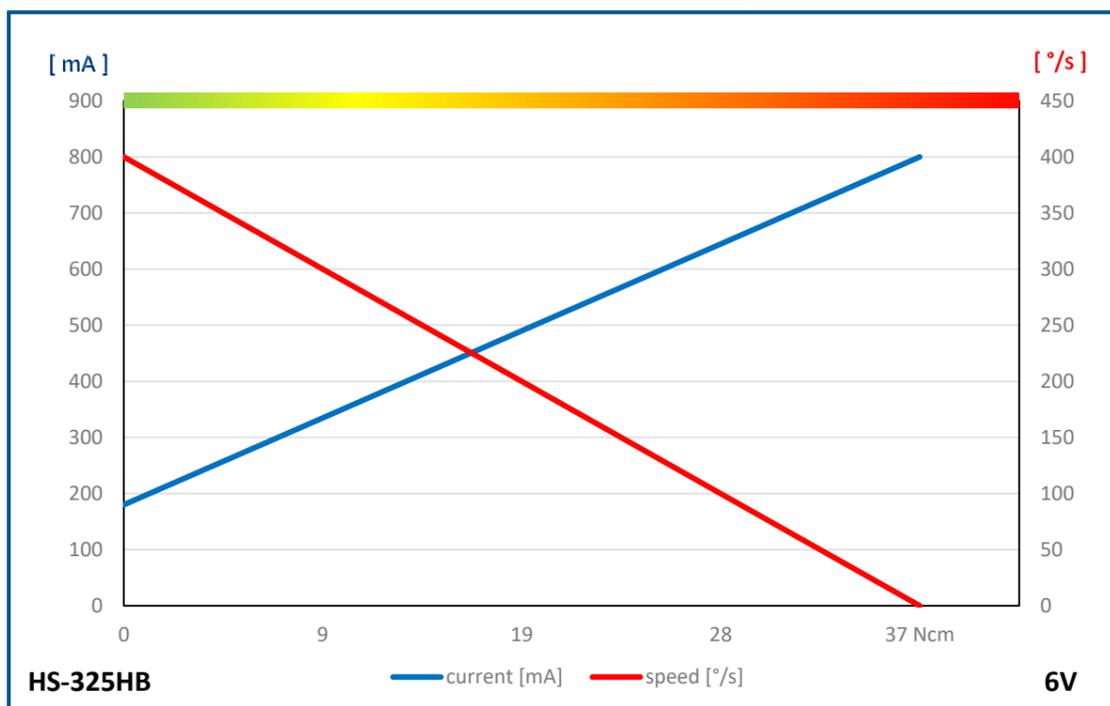
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#1-02361 GP 30 Stück



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## PERFORMANCE CHART



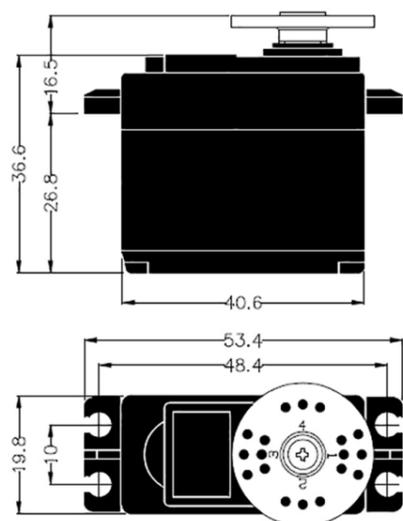
## GENERAL SPECIFICATION

HS-325HB	
Control System	PWM
	Pulse Width 900µs 1500µs (Center) 2100µs
Connector Type	Hitec 3P (JR 3P compatible)
Position Sensor Type	Direct Drive / 4 Slider
Motor Type	Cored Metal Brush
Amplifier / MCU	Analog
Operating Voltage Range	4.8V ~ 6.0V
Operating Voltage	At 4.8V
Operating Speed at no Load	316°/s (53RPM)
Stall Torque	3.0kgcm (29.4Ncm)
Peak Efficiency Torque	0.6kgcm (5.9Ncm)
Rest Current	7mA
Running Current at no Load	160mA
Stall Current	700mA
Deadband Width	5µs
Operating Travel	Default ±60°
	Programmable n/a
	Multi Turn/Continuous Rotation n/a / n/a
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)
Vibrations at no Load	-
Connector Wire Length	300mm
Connector Wire Gauge	24AWG
Connector Wire Strand Count	40/0.08
External Dimensions	40.0 x 20.0 x 36.5mm
Weight*	43.0g
Ball Bearing	Dual Resin Bushing
Case Material	Engineering Plastic
Gear Material	2 Resin & 2 Heavy Duty Resin Gears
Gear Train Backlash	Max. 0.5°
Horn Gear Spline	24T Ø6.0
Accessories	Mounting Hardware, Servo Horns (R-O, R-X, R-I, R-D, R-C)
IP-Rating	IP4X
Revision	Rev. 1.1 / 04.01.2024
Changelog	-

\*of the servo only w/o horns and accessories

# HS-422

#112422

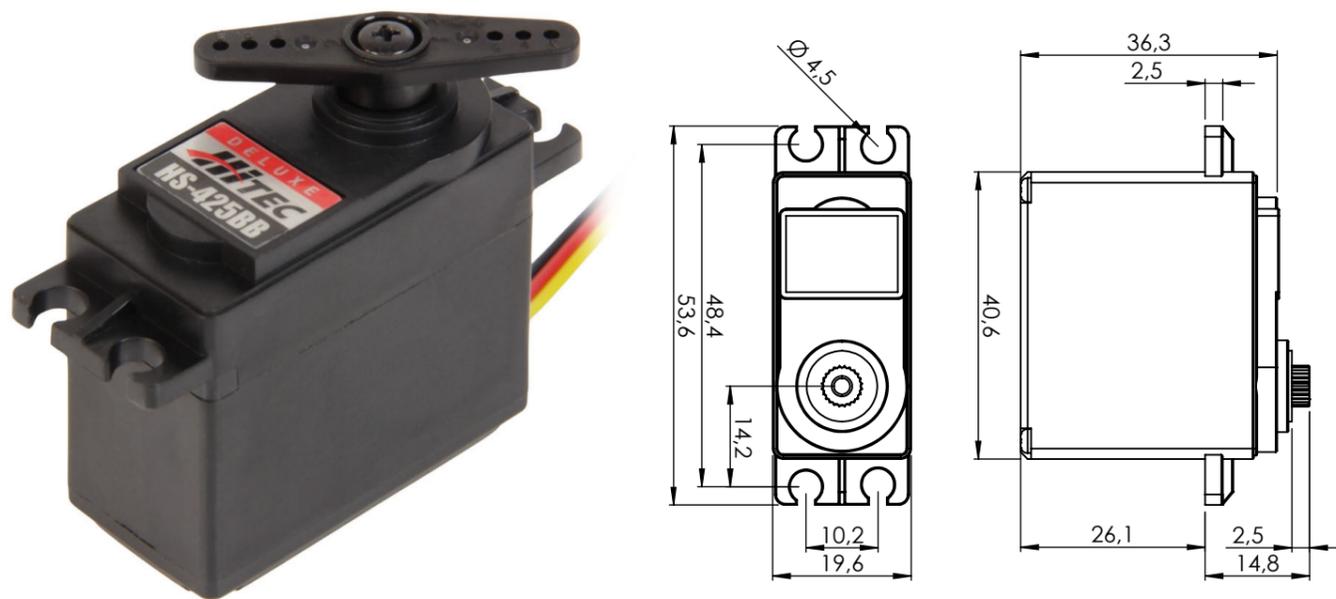


## GENERAL SPECIFICATION

HS-422			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	6.0V	-
No Load Speed	0.21sec/60°	0.16sec/60°	-
Stall Torque	3.1kgf·cm (43.05oz-in)	3.9kgf·cm (54.16oz-in)	-
Peak Efficiency Torque	0.6kgf·cm ( 8.3 oz-in)	0.8kgf·cm (11.1 oz-in)	-
Standing Current	8mA	8mA	-
No Load Running Current	150mA	180mA	-
Stall Current	600mA	750mA	-
Deadband	5μs	5μs	-
Operating Travel	Default: ±60°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	24WAG		
Dimensions	40.6mm x 19.8mm x 36.5mm (1.598inch x 0.780inch x 1.437inch)		
Weight	45.5g (1.605oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	4 Resin Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	Analog Contorller		

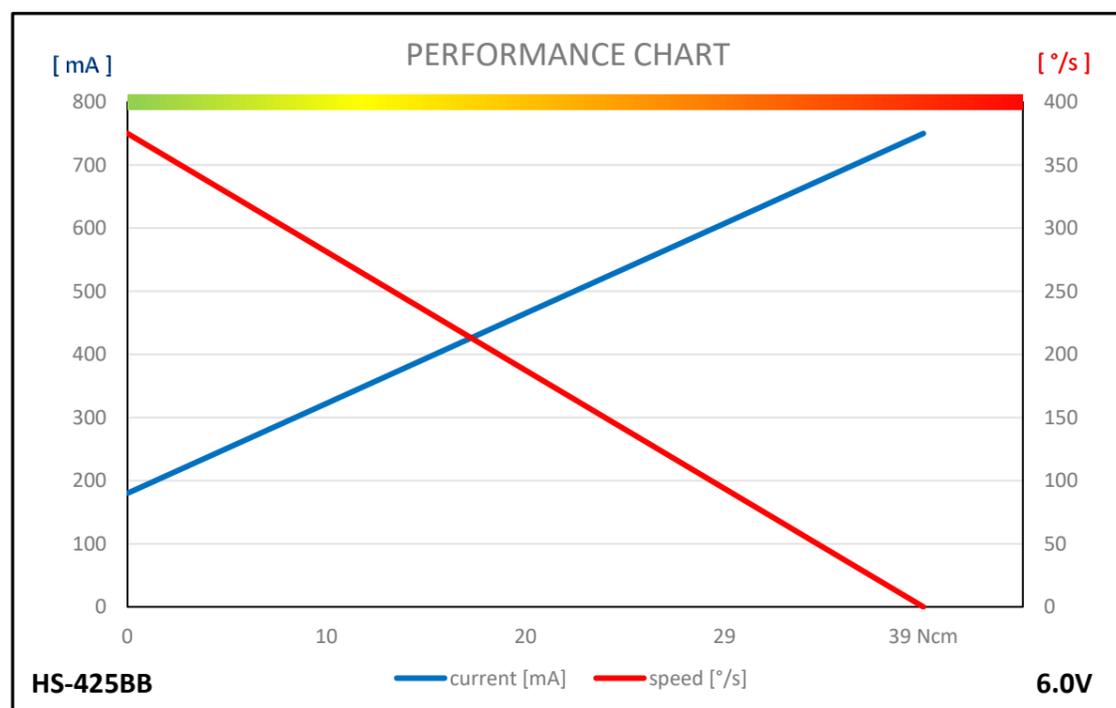
# HS-425BB

#1-03235



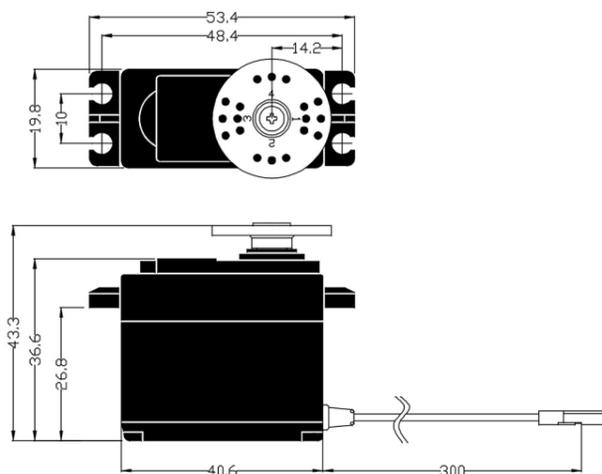
## GENERAL SPECIFICATION

HS-425BB			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	6.0V	-
No Load Speed	0.21sec/60°	0.16sec/60°	-
Stall Torque	3.1kgf·cm (43.05oz·in)	3.9kgf·cm (54.16oz·in)	-
Peak Efficiency Torque	0.6kgf·cm ( 8.3 oz·in)	0.8kgf·cm (11.1 oz·in)	-
Standing Current	8mA	8mA	-
No Load Running Current	150mA	180mA	-
Stall Current	600mA	750mA	-
Deadband	5μs	5μs	-
Operating Travel	Default: ±60°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	24WAG		
Dimensions	40.6mm x 19.8mm x 36.6mm (1.598inch x 0.780inch x 1.441inch)		
Weight	46.0g (1.623oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	4 Resin Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	Analog Contorller		



# HS-430BH

#114430

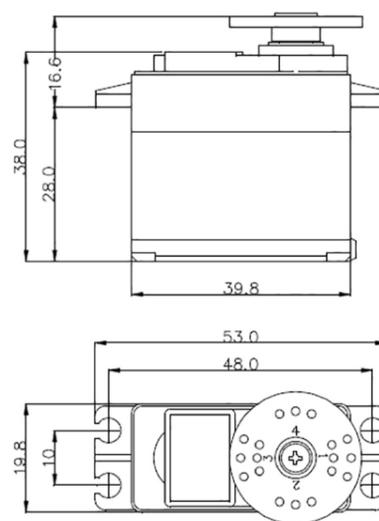


## GENERAL SPECIFICATION

HS-430BH			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	6.0 ~ 7.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.16sec/60°	0.14sec/60°
Stall Torque	-	4.1kgf·cm (56.94oz·in)	5.0kgf·cm (69.44oz·in)
Peak Efficiency Torque	-	0.8kgf·cm (11.1 oz·in)	1.0kgf·cm (13.9 oz·in)
Standing Current	-	8mA	10mA
No Load Running Current	-	150mA	190mA
Stall Current	-	750mA	930mA
Deadband	-	5μs	5μs
Operating Travel	Default: ±60°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	24WAG		
Dimensions	40.6mm x 19.8mm x 36.5mm (1.598inch x 0.780inch x 1.437inch)		
Weight	45.5g (1.605oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	4 Resin Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	Analog Controller		

# HS-485HB

#112485

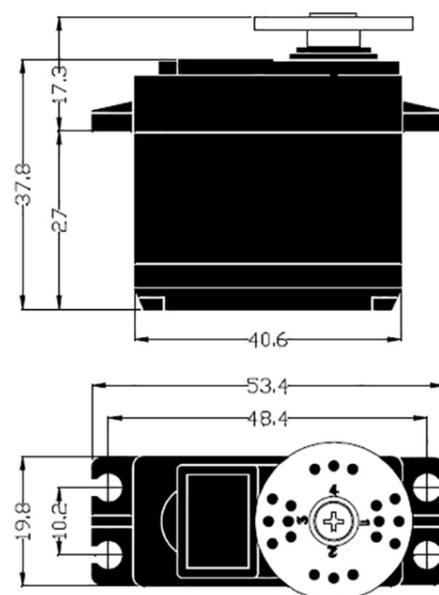


## GENERAL SPECIFICATION

HS-485HB			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	6.0V	-
No Load Speed	0.22sec/60°	0.18sec/60°	-
Stall Torque	4.8kgf·cm (66.66oz-in)	6.0kgf·cm (83.32oz-in)	-
Peak Efficiency Torque	1.0kgf·cm (13.9 oz-in)	1.2kgf·cm (16.7 oz-in)	-
Standing Current	8mA	10mA	-
No Load Running Current	180mA	200mA	-
Stall Current	1,000mA	1,200mA	-
Deadband	3μs	3μs	-
Operating Travel	Default: ±60°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	24AWG		
Dimensions	39.8mm x 19.8mm x 38.0mm (1.567inch x 0.780inch x 1.496inch)		
Weight	45.0g (1.587oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	4 Heavy Duty Resin Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	Analog Contorller		

# HS-625MG

#112625



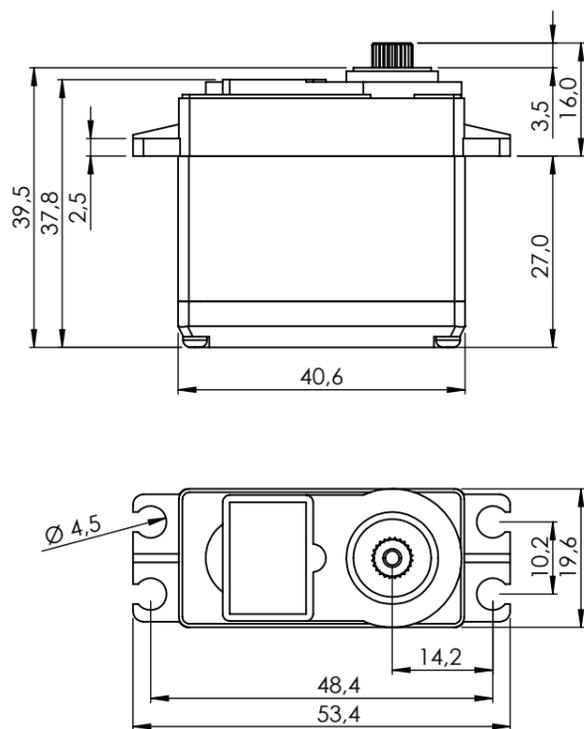
## GENERAL SPECIFICATION

HS-625MG			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	6.0V	-
No Load Speed	0.18sec/60°	0.15sec/60°	-
Stall Torque	5.5kgf·cm (76.38oz-in)	6.8kgf·cm (94.43oz-in)	-
Peak Efficiency Torque	1.1kgf·cm (15.3 oz-in)	1.4kgf·cm (19.4 oz-in)	-
Standing Current	9mA	9mA	-
No Load Running Current	400mA	500mA	-
Stall Current	-	-	-
Deadband	8μs	8μs	-
Operating Travel	Default: ±60°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.811inch)		
Connector Wire Gauge	22AWG		
Dimensions	40.6mm x 19.8mm x 37.8mm (1.598inch x 0.780inch x 1.488inch)		
Weight	55.2g (1.947oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal + Plastic & 3 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	Analog Controller		

# HS-645MG

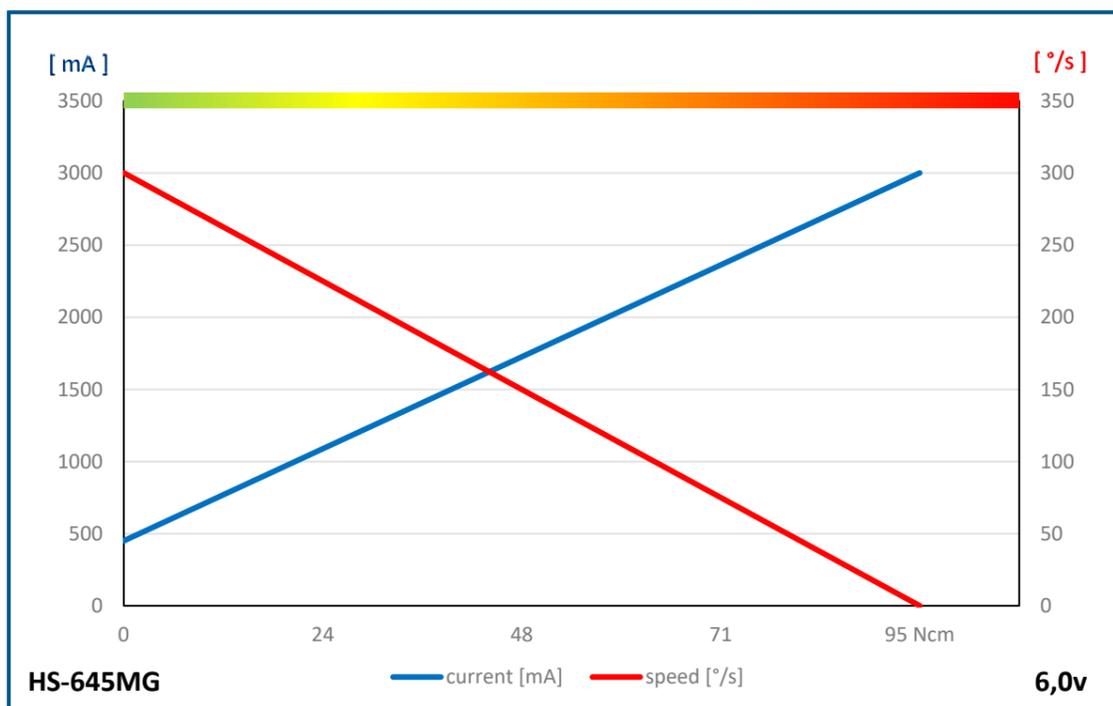
#112645

#112648 GP 30 Stück



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## PERFORMANCE CHART



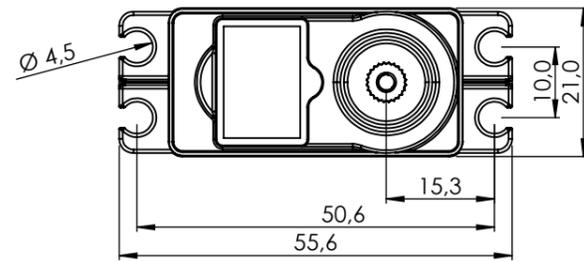
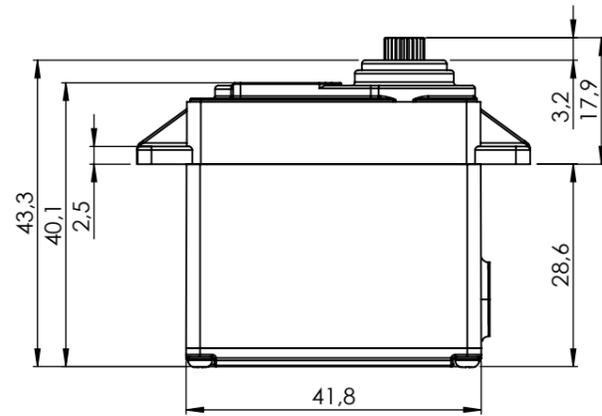
## GENERAL SPECIFICATION

HS-645MG		
Control System	PWM	
	Pulse Width 900µs 1500µs (Center) 2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Contact Analog Potentiometer	
Motor Type	Cored Metal Brush	
Amplifier / MCU	Analog	
Operating Voltage Range	4.8V ~ 6.0V	
Operating Voltage	At 4.8V	At 6.0V
Operating Speed at no Load	250°/s (42RPM)	300°/s (50RPM)
Stall Torque	7.7kgcm (75.5Ncm)	9.6kgcm (94.2Ncm)
Peak Efficiency Torque	1.5kgcm (14.7Ncm)	1.9kgcm (18.6Ncm)
Rest Current	9mA	9mA
Running Current at no Load	350mA	450mA
Stall Current	-	-
Deadband Width	8µs	8µs
Operating Travel	Default	±60°
	Programmable	n/a
	Multi Turn/Continuous Rotation	n/a / n/a
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)	
Storage Temperature Range	-30°C ~ +80°C (-31°F ~ +176°F)	
Vibrations at no Load	-	
Connector Wire Length	300mm	
Connector Wire Gauge	22AWG	
Connector Wire Strand Count	60/0.08	
External Dimensions	40.6 x 19.6 x 37.8mm	
Weight*	55.2g	
Ball Bearing	Dual Ball Bearing	
Case Material	Engineering Plastic	
Gear Material	1 Metal-Plastic Gear & 3 Metal Gears	
Gear Train Backlash	Max. 0.5°	
Horn Gear Spline	24T / $\varnothing 6.0$	
Accessories	Mounting Hardware, Servo Horns (R-O, R-XA, HD-IS, HD-LS, HD-OS)	
IP-Rating	IP4X	
Revision	Rev. 1.1 / 04.01.2024	
Changelog	-	
*of the servo only w/o horns and accessories		

# HS-646WP

#115646

#1-02352 GP 24 Stück



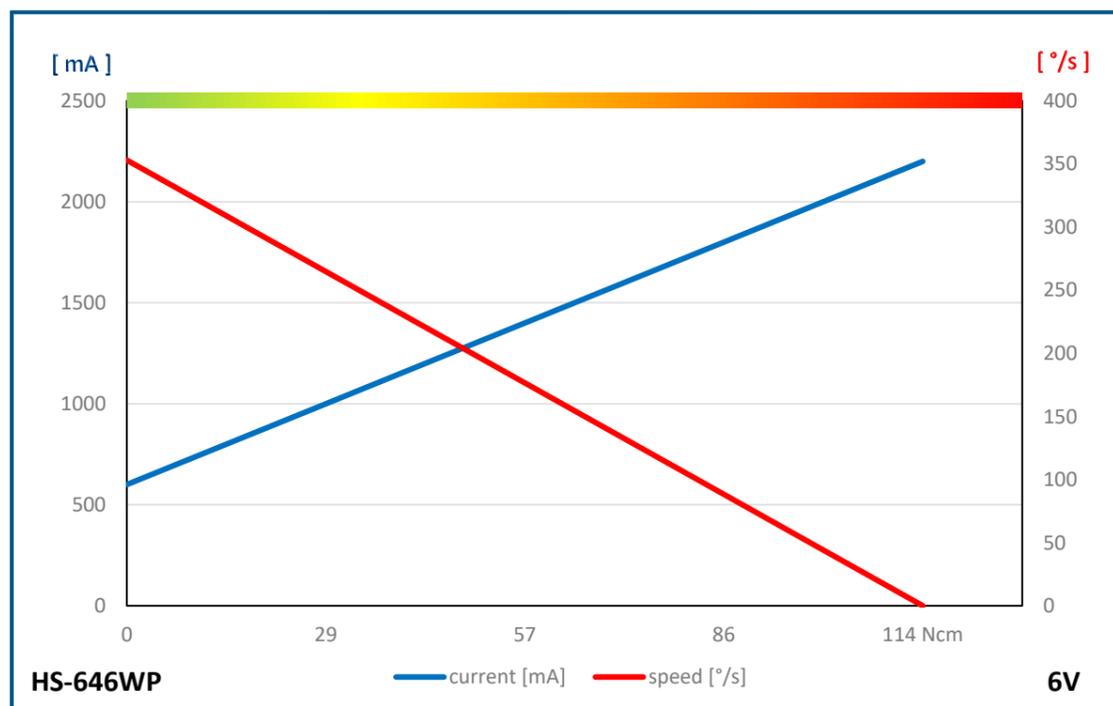
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## GENERAL SPECIFICATION

HS-646WP		
Control System	PWM	
	Pulse Width 900µs 1500µs (Center) 2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Indirect Drive / 4 Slider / 1M cycle Long Life	
Motor Type	Cored Carbon Brush / 3 Pole Ferrite Motor	
Amplifier / MCU	Analog	
Operating Voltage Range	6.0V ~ 7.4V	
Operating Voltage	At 6.0V	At 7.4V
Operating Speed at no Load	300°/s (50RPM)	353°/s (59RPM)
Stall Torque	9.6kgcm (94.2Ncm)	11.6kgcm (113.8Ncm)
Peak Efficiency Torque	1.9kgcm (18.6Ncm)	2.3kgcm (22.6Ncm)
Rest Current	8mA	8mA
Running Current at no Load	400mA	600mA
Stall Current	2000mA	2200mA
Deadband Width	4µs	4µs
Operating Travel	Default	±60°
	Programmable	n/a
	Multi Turn/Continuous Rotation	n/a / n/a
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)	
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)	
Vibrations at no Load	-	
Connector Wire Length	300mm	
Connector Wire Gauge	22AWG	
Connector Wire Strand Count	60/0.08	
External Dimensions	41.8 x 21.0 x 40.0mm	
Weight*	61.0g	
Ball Bearing	Dual Ball Bearing	
Case Material	Engineering Plastic	
Gear Material	1 Metal-Plastic & 3 Metal Gears	
Gear Train Backlash	Max. 0.5°	
Horn Gear Spline	24T Ø6.0	
Accessories	Mounting Hardware, Servo Horns (R-O, R-XA, HD-IS, HD-LS, HD-OS)	
IP-Rating	IP67	
Revision	Rev. 1.1 / 04.01.2024	
Changelog	-	

\*of the servo only w/o horns and accessories

## PERFORMANCE CHART



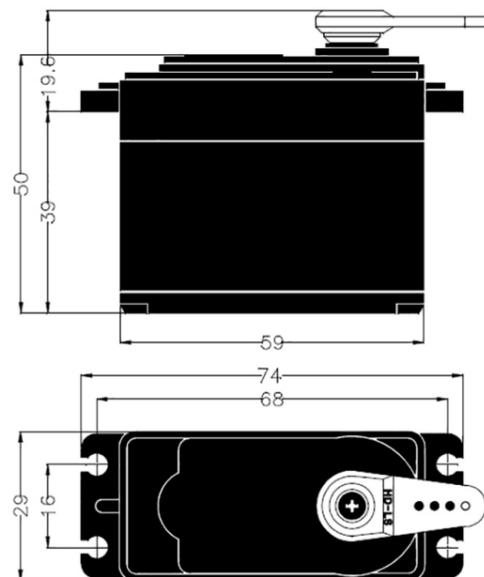
HS-646WP

— current [mA] — speed [°/s]

6V

# HS-755HB

#112755

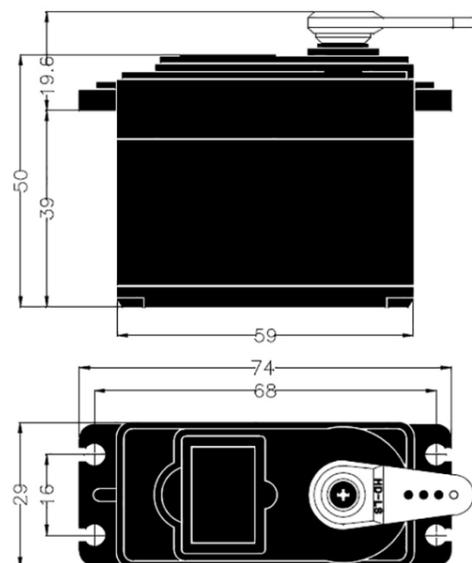


## GENERAL SPECIFICATION

HS-755HB			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	6.0V	-
No Load Speed	0.28sec/60°	0.23sec/60°	-
Stall Torque	11.0kgf·cm (152.76oz-in)	13.2kgf·cm (183.31oz-in)	-
Peak Efficiency Torque	2.2kgf·cm (30.6 oz-in)	2.6kgf·cm (36.1 oz-in)	-
Standing Current	8mA	8mA	-
No Load Running Current	230mA	250mA	-
Stall Current	1,500mA	1,800mA	-
Deadband	5μs	5μs	-
Operating Travel	Default: ±60°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	22AWG		
Dimensions	59.0mm x 29.0mm x 50.0mm (2.323inch x 1.142inch x 1.969inch)		
Weight	110.0g (3.880oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	4 Heavy Duty Resin Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	Analog Controller		

# HS-755MG

#112756

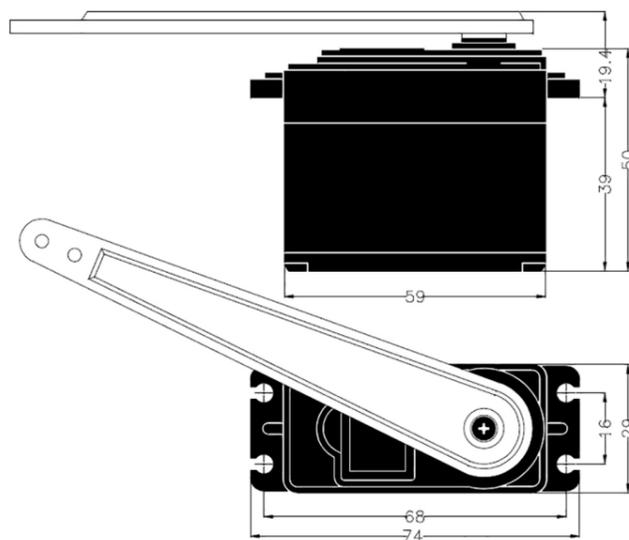


## GENERAL SPECIFICATION

HS-755MG			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	6.0V	-
No Load Speed	0.28sec/60°	0.23sec/60°	-
Stall Torque	12.0kgf·cm (166.65oz-in)	14.4kgf·cm (199.98oz-in)	-
Peak Efficiency Torque	2.4kgf·cm (33.3 oz-in)	2.9kgf·cm (40.3 oz-in)	-
Standing Current	8mA	8mA	-
No Load Running Current	230mA	250mA	-
Stall Current	1,500mA	1,800mA	-
Deadband	5μs	5μs	-
Operating Travel	Default: ±60°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.811inch)		
Connector Wire Gauge	22AWG		
Dimensions	59.0mm x 29.0mm x 50.0mm (2.323inch x 1.142inch x 1.969inch)		
Weight	117.0g (4.127oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Heavy Duty Resin & 3 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	Analog Controller		

# HS-765HB

#112765

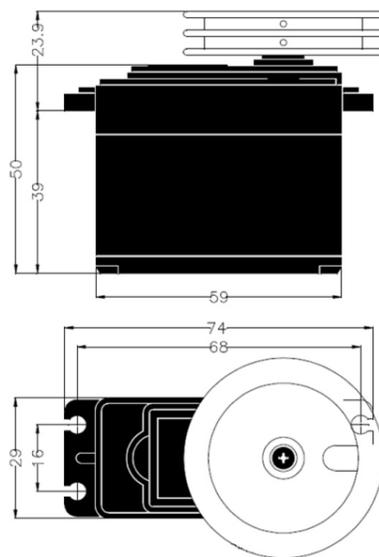


## GENERAL SPECIFICATION

HS-765HB			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	6.0V	-
No Load Speed	0.28sec/60°	0.23sec/60°	-
Stall Torque	11.0kgf·cm (152.76oz-in)	13.2kgf·cm (183.31oz-in)	-
Peak Efficiency Torque	2.2kgf·cm (30.6 oz-in)	2.6kgf·cm (36.1 oz-in)	-
Standing Current	8mA	8mA	-
No Load Running Current	230mA	250mA	-
Stall Current	1,500mA	1,800mA	-
Deadband	5μs	5μs	-
Operating Travel	Default: ±75°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	22AWG		
Dimensions	59.0mm x 29.0mm x 50.0mm (2.323inch x 1.142inch x 1.969inch)		
Weight	110.0g (3.880oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	4 Heavy Duty Resin Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	Analog Controller		

# HS-785HB

#112785

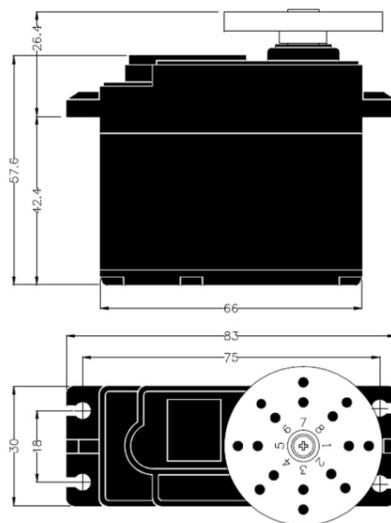


## GENERAL SPECIFICATION

HS-785HB			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	6.0V	-
No Load Speed	1.68sec/360°	1.38sec/360°	-
Stall Torque	11.0kgf·cm (152.76oz-in)	13.2kgf·cm (183.31oz-in)	-
Peak Efficiency Torque	2.2kgf·cm (30.6 oz-in)	2.6kgf·cm (36.1 oz-in)	-
Standing Current	8mA	8mA	-
No Load Running Current	230mA	250mA	-
Stall Current	1,500mA	1,800mA	-
Deadband	5μs	5μs	-
Operating Travel	Default: ±2.625 Turns, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.811inch)		
Connector Wire Gauge	22AWG		
Dimensions	59.0mm x 29.0mm x 50.0mm (2.323inch x 1.142inch x 1.969inch)		
Weight	110.0g (3.880oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	4 Heavy Duty Resin Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	Analog Contorller		

# HS-805BB

#112805

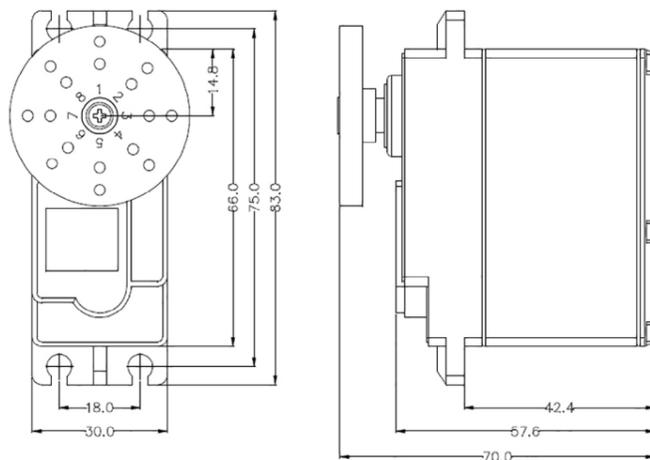


## GENERAL SPECIFICATION

HS-805BB			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Carbon brush		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	6.0V	-
No Load Speed	0.19sec/60°	0.14sec/60°	-
Stall Torque	19.8kgf·cm (274.97oz-in)	24.7kgf·cm (343.02oz-in)	-
Peak Efficiency Torque	4.0kgf·cm (55.5 oz-in)	4.9kgf·cm (68.0 oz-in)	-
Standing Current	8mA	8mA	-
No Load Running Current	700mA	700mA	-
Stall Current	-	-	-
Deadband	8μs	8μs	-
Operating Travel	Default: ±67.5°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	22AWG		
Dimensions	66.3mm x 30.3mm x 57.6mm (2.610inch x 1.193inch x 2.268inch)		
Weight	152.0g (5.362oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	5 Resin Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	15T(Ø8)		
IP-Rating	IP54		
Servo Amplifier Type	Analog Controller		

# HS-805MG

#112806

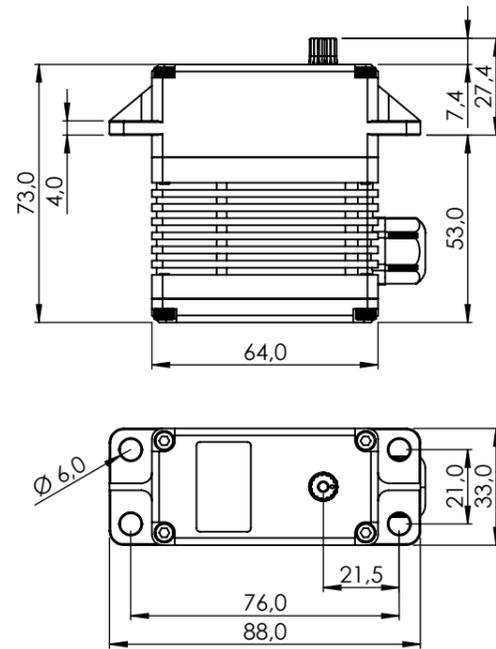


## GENERAL SPECIFICATION

HS-805MG			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Carbon brush		
Operating Voltage Range	4.8 ~ 6.0V		
Voltage	4.8V	6.0V	-
No Load Speed	0.19sec/60°	0.14sec/60°	-
Stall Torque	19.8kgf·cm (274.97oz-in)	24.7kgf·cm (343.02oz-in)	-
Peak Efficiency Torque	4.0kgf·cm (55.5 oz-in)	4.9kgf·cm (68.0 oz-in)	-
Standing Current	8mA	10mA	-
No Load Running Current	400mA	520mA	-
Stall Current	4,800mA	6,000mA	-
Deadband	5μs	5μs	-
Operating Travel	Default: ±60°, Non-programmable / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.811inch)		
Connector Wire Gauge	22AWG		
Dimensions	66.3mm x 30.3mm x 57.6mm (2.610inch x 1.193inch x 2.268inch)		
Weight	197.0g (6.949oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Resin & 4 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	15T(Ø8)		
IP-Rating	IP54		
Servo Amplifier Type	Analog Controller		

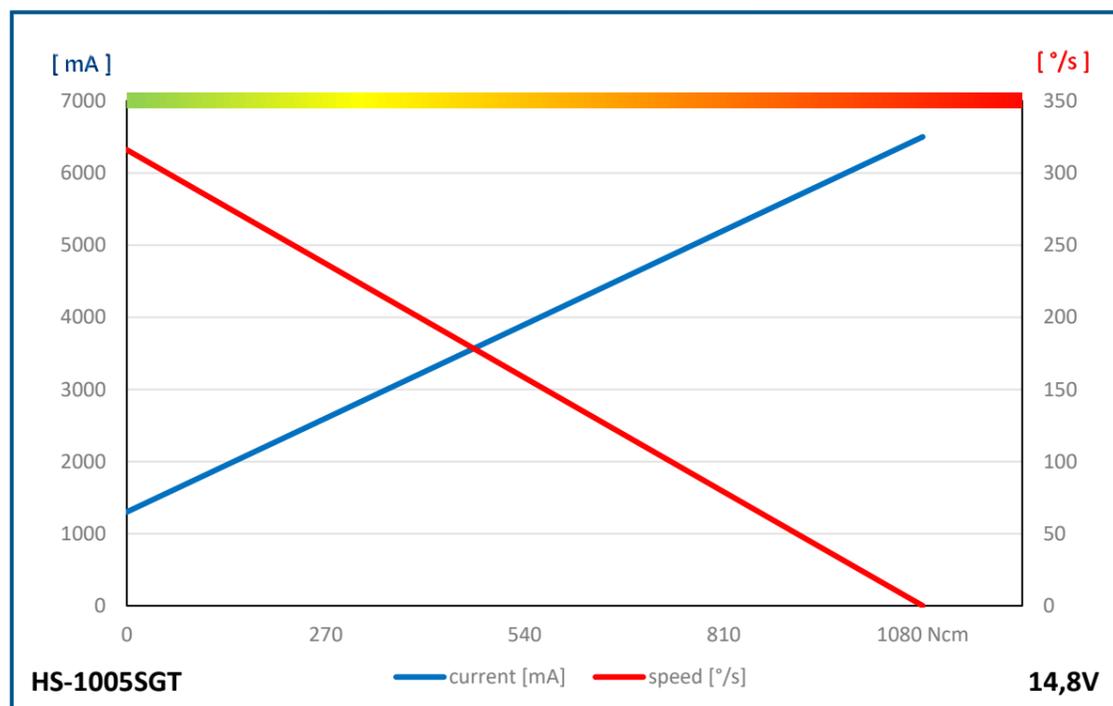
# HS-1005SGT

#138105



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## PERFORMANCE CHART



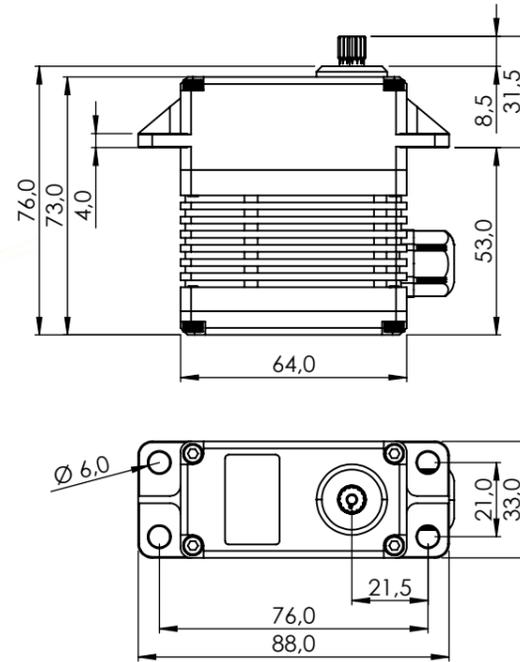
## GENERAL SPECIFICATION

HS-1005SGT		
Control System	PWM	
	Pulse Width 900µs 1500µs (Center) 2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Indirect Drive / 1M Cycle Long Life	
Motor Type	Cored Carbon Brush	
Amplifier / MCU	Digital with Mosfet Drive	
Operating Voltage Range	9.0V ~ 16.8V (Signal: 3.5V ~ 8.4V)	
Operating Voltage	At 11.1V	At 14.8V
Operating Speed at no Load	231°/s (38RPM)	316°/s (53RPM)
Stall Torque	84.0kgcm (824.0Ncm)	110.0kgcm (1079.1Ncm)
Peak Efficiency Torque	16.8kgcm (164.8Ncm)	22.0kgcm (215.8Ncm)
Rest Current	90mA	130mA
Running Current at no Load	1100mA	1300mA
Stall Current	5500mA	6500mA
Deadband Width	2µs	2µs
Operating Travel	Default	±60°
	Programmable	n/a
	Multi Turn/Continuous Rotation	n/a / n/a
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)	
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)	
Vibrations at no Load	IEC-60068-2-64	
Connector Wire Length	250mm	
Connector Wire Gauge	18AWG (Signal: 20AWG)	
Connector Wire Strand Count	120/0.08 (80/0.08)	
External Dimensions	64.0 x 33.0 x 73.0mm	
Weight*	310.0g	
Ball Bearing	Dual Ball Bearing	
Case Material	Aluminum Alloy	
Gear Material	1 Metal-Plastic & 3 Steel Gears	
Gear Train Backlash	Max. 0.5°	
Horn Gear Spline	15T Ø8.0	
Accessories	Mounting Hardware, Servo Horn (I-MO)	
IP-Rating	IP54	
Revision	Rev. 1.1 / 04.01.2024	
Changelog	-	

\*of the servo only w/o horns and accessories

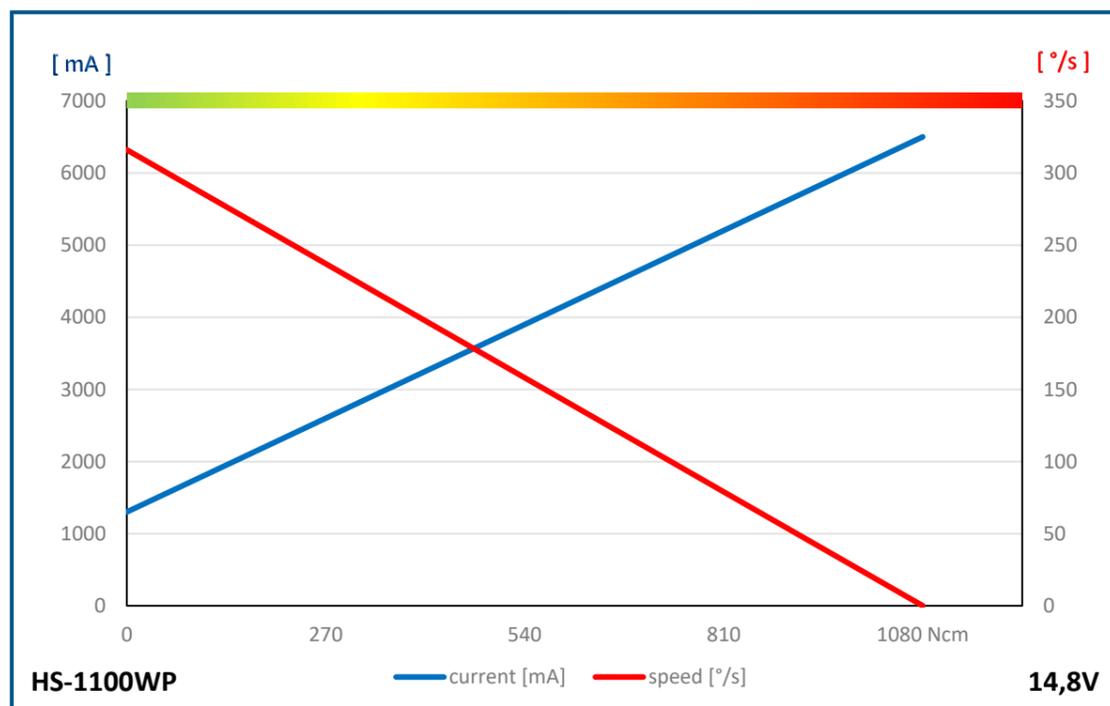
# HS-1100WP

#138100



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## PERFORMANCE CHART



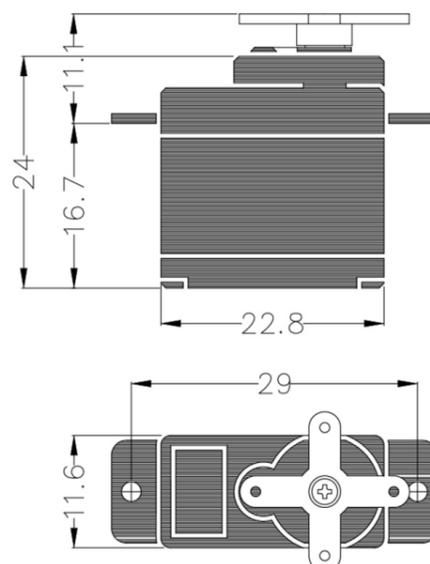
## GENERAL SPECIFICATION

General Specification		HS-1100WP	
Control System	PWM		
	Pulse Width 900µs 1500µs (Center) 2100µs		
Connector Type	Hitec 3P (JR 3P compatible)		
Position Sensor Type	Indirect Drive / 1M Cycle Long Life		
Motor Type	5 Poles DC Cored Carbon Brush		
Amplifier / MCU	Digital with Mosfet Drive		
Operating Voltage Range	9.0V ~ 16.8V (Signal: 3.5V ~ 8.4V)		
Operating Voltage	At 11.1V	At 14.8V	
Operating Speed at no Load	231°/s (38RPM)	316°/s (53RPM)	
Stall Torque	84.0kgcm (824.0Ncm)	110.0kgcm (1079.1Ncm)	
Peak Efficiency Torque	16.8kgcm (164.8Ncm)	22.0kgcm (215.8Ncm)	
Rest Current	90mA	130mA	
Running Current at no Load	1100mA	1300mA	
Stall Current	5500mA	6500mA	
Deadband Width	2µs		
Operating Travel	Default	±60°	
	Programmable	n/a	
	Multi Turn/Continuous Rotation	n/a / n/a	
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)		
Vibrations at no Load	-		
Connector Wire Length	250mm		
Connector Wire Gauge	18AWG (Signal: 20AWG)		
Connector Wire Strand Count	120/0.08 (80/0.08)		
External Dimensions	64.0 x 33.0 x 73.0mm		
Weight*	320.0g		
Ball Bearing	Dual Ball Bearing & Dual Needle Bearing		
Case Material	Aluminum Alloy		
Gear Material	1 Metal-Plastic & 3 Steel Gears		
Gear Train Backlash	Max. 0.5°		
Horn Gear Spline	15T Ø8.0		
Accessories	Mounting Hardware, Servo Horn (I-MO)		
IP-Rating	IP67		
Revision	Rev. 1.1 / 04.01.2024		
Changelog	-		

\*of the servo only w/o horns and accessories

# HS-5055MG

#113055

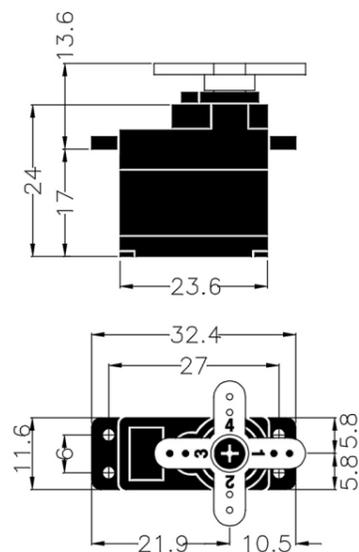


## GENERAL SPECIFICATION

HS-5055MG			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	-
No Load Speed	0.20sec/60°	0.17sec/60°	-
Stall Torque	1.3kgf-cm (18.1 oz-in)	1.6kgf-cm (22.2 oz-in)	-
Peak Efficiency Torque	0.3kgf-cm (4.2 oz-in)	0.3kgf-cm (4.2 oz-in)	-
Standing Current	8mA	8mA	-
No Load Running Current	120mA	150mA	-
Stall Current	560mA	700mA	-
Deadband	6μs	6μs	-
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	250mm (9.843inch)		
Connector Wire Gauge	28AWG		
Dimensions	22.8mm x 11.6mm x 24.0mm (0.898inch x 0.457inch x 0.945inch)		
Weight	9.5g (0.335oz)		
Bearing Type	n/a		
Case Material	Engineering Plastic		
Gear Material	1 Resin & 4 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	15T(Ø4.0)		
IP-Rating	IP4X		
Servo Amplifier Type	8bit Programmable Digital		

## HS-5065MG

#113065

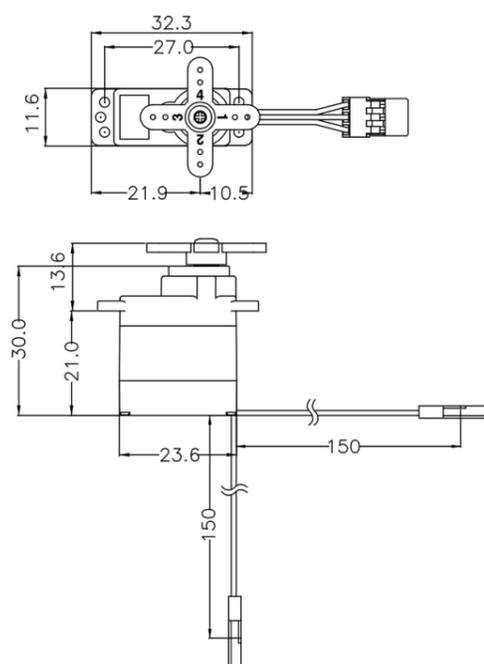


## GENERAL SPECIFICATION

HS-5065MG			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	-
No Load Speed	0.14sec/60°	0.11sec/60°	-
Stall Torque	1.8kgf-cm (25.0 oz-in)	2.2kgf-cm (30.6 oz-in)	-
Peak Efficiency Torque	0.4kgf-cm ( 5.6 oz-in)	0.4kgf-cm ( 5.6 oz-in)	-
Standing Current	3mA	3mA	-
No Load Running Current	180mA	220mA	-
Stall Current	960mA	1,200mA	-
Deadband	2μs	2μs	-
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	160mm (6.299inch)		
Connector Wire Gauge	28AWG		
Dimensions	23.6mm x 11.6mm x 26.0mm (0.929inch x 0.457inch x 1.024inch)		
Weight	11.9g (0.420oz)		
Bearing Type	1 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Heavy Duty Resin & 4 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	M25T(Ø5)		
IP-Rating	IP4X		
Servo Amplifier Type	8bit Programmable Digital		

# HS-5070MH

#113070

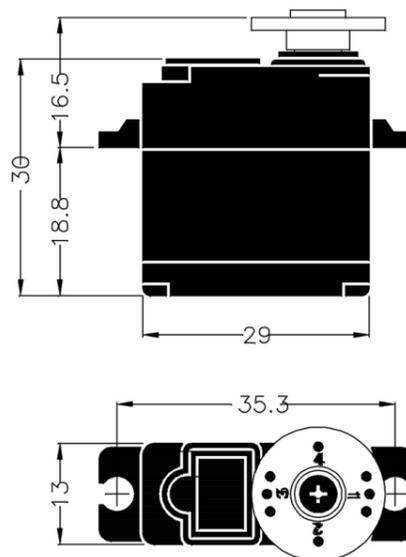


## GENERAL SPECIFICATION

HS-5070MH			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.15sec/60°	0.12sec/60°
Stall Torque	-	3.1kgf-cm (43.1 oz-in)	3.8kgf-cm (52.8 oz-in)
Peak Efficiency Torque	-	0.6kgf-cm ( 8.3 oz-in)	0.8kgf-cm (11.1 oz-in)
Standing Current	-	8mA	8mA
No Load Running Current	-	200mA	240mA
Stall Current	-	1,000mA	1,300mA
Deadband	-	2μs	2μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	160mm (6.299inch)		
Connector Wire Gauge	28AWG		
Dimensions	23.6mm x 11.6mm x 30.0mm (0.929inch x 0.457inch x 1.181inch)		
Weight	12.7g (0.448oz)		
Bearing Type	1 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Heavy Duty Resin & 4 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	M25T(Ø5)		
IP-Rating	IP4X		
Servo Amplifier Type	8bit Programmable Digital		

# HS-5085MG

#113085

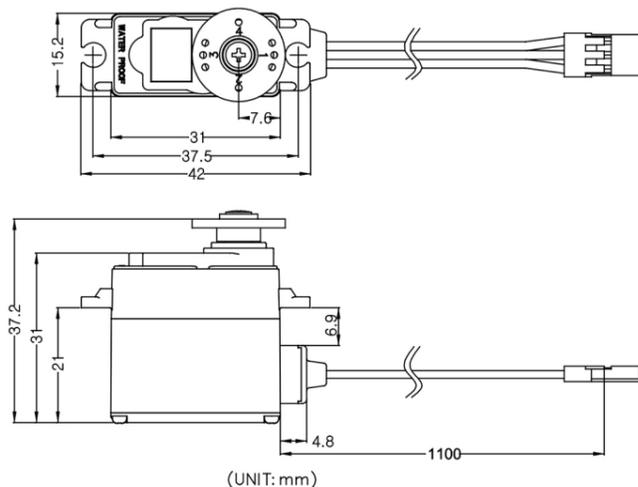


## GENERAL SPECIFICATION

HS-5085MG			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	-
No Load Speed	0.17sec/60°	0.13sec/60°	-
Stall Torque	3.6kgf·cm (50.0 oz·in)	4.3kgf·cm (59.7 oz·in)	-
Peak Efficiency Torque	0.7kgf·cm (9.7 oz·in)	0.9kgf·cm (12.5 oz·in)	-
Standing Current	3mA	3mA	-
No Load Running Current	220mA	280mA	-
Stall Current	1,450mA	1,800mA	-
Deadband	2μs	2μs	-
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	250mm (9.843inch)		
Connector Wire Gauge	28AWG		
Dimensions	29.0mm x 13.0mm x 29.4mm (1.142inch x 0.512inch x 1.157inch)		
Weight	21.9g (0.773oz)		
Bearing Type	1 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Resin & 4 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	8bit Programmable Digital		

# HS-5086WP

#115086

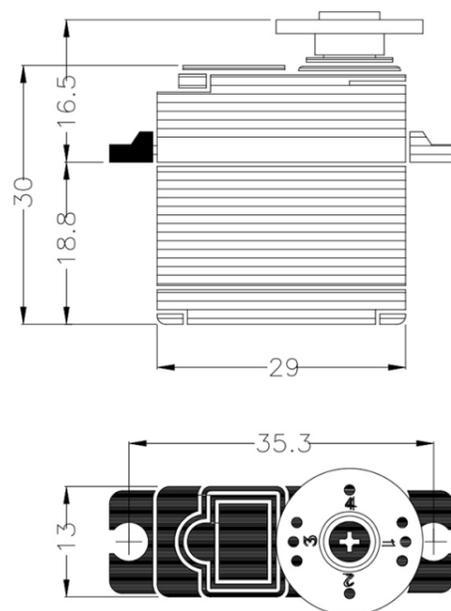


## GENERAL SPECIFICATION

HS-5086WP			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	-
No Load Speed	0.18sec/60°	0.15sec/60°	-
Stall Torque	3.0kgf·cm (41.7 oz·in)	3.6kgf·cm (50.0 oz·in)	-
Peak Efficiency Torque	0.6kgf·cm ( 8.3 oz·in)	0.7kgf·cm ( 9.7 oz·in)	-
Standing Current	3mA	3mA	-
No Load Running Current	160mA	180mA	-
Stall Current	1,100mA	1,400mA	-
Deadband	2μs	2μs	-
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	250mm (9.843inch)		
Connector Wire Gauge	24AWG		
Dimensions	31.0mm x 15.2mm x 31.0mm (1.220inch x 0.598inch x 1.220inch)		
Weight	28.5g (1.005oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	5 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP67		
Servo Amplifier Type	8bit Programmable Digital		

# HS-5087MH

#114087



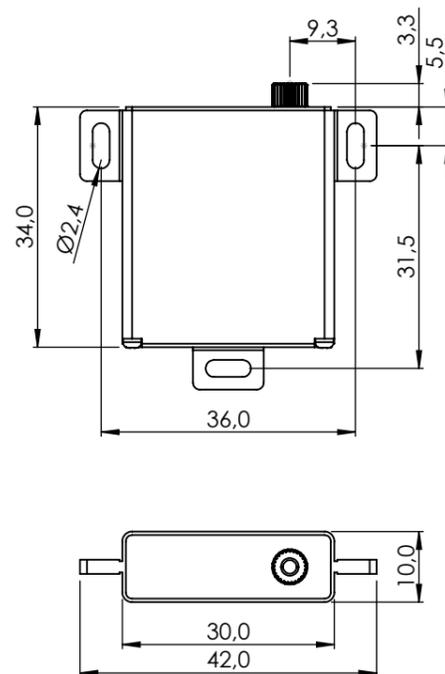
## GENERAL SPECIFICATION

HS-5087MH			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.17sec/60°	0.13sec/60°
Stall Torque	-	3.6kgf-cm (50.0 oz-in)	4.3kgf-cm (59.7 oz-in)
Peak Efficiency Torque	-	0.7kgf-cm (9.7 oz-in)	0.9kgf-cm (12.5 oz-in)
Standing Current	-	3mA	3mA
No Load Running Current	-	170mA	200mA
Stall Current	-	1,450mA	1,750mA
Deadband	-	2μs	2μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	250mm (9.843inch)		
Connector Wire Gauge	28AWG		
Dimensions	29.0mm x 13.0mm x 29.4mm (1.142inch x 0.512inch x 1.157inch)		
Weight	21.9g (0.773oz)		
Bearing Type	1 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Resin & 4 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	8bit Programmable Digital		

# HS-5125MG

#113125

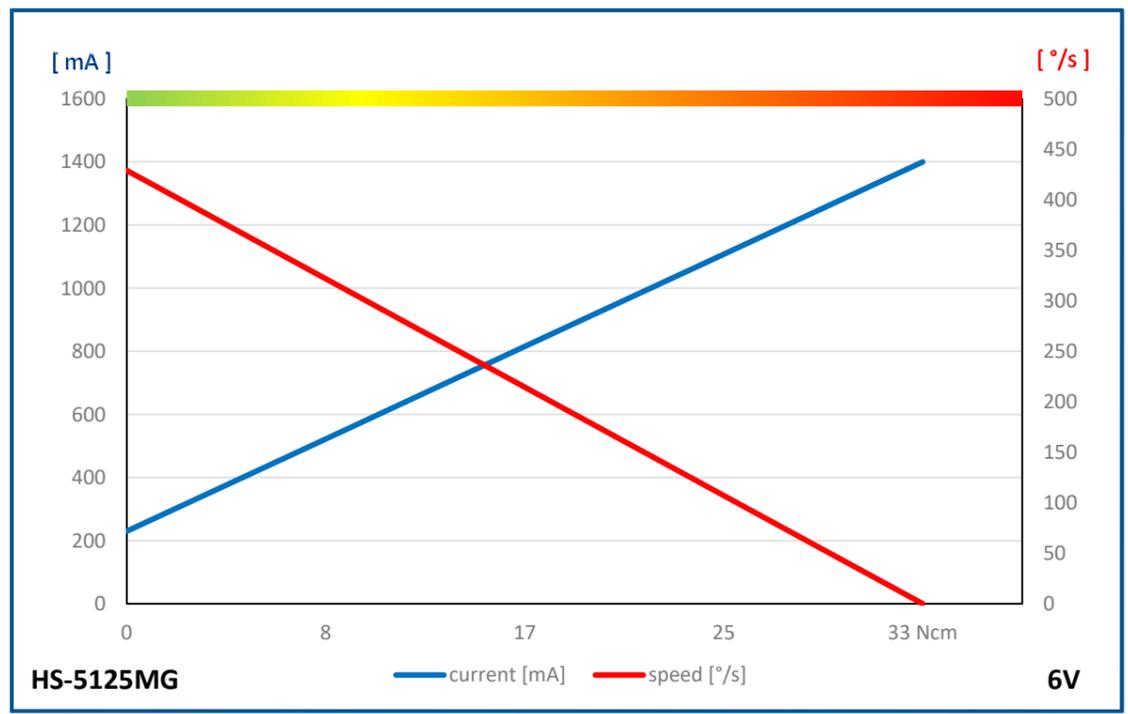
#1-03035 GP 15 Stück



## GENERAL SPECIFICATION

HS-5125MG	
Control System	PWM
	Pulse Width 900µs 1500µs (Center) 2100µs
Connector Type	Hitec 3P (JR 3P compatible)
Position Sensor Type	Contact Analog Potentiometer
Motor Type	Cored Metal Brush
Amplifier / MCU	8bit programmable Digital
Operating Voltage Range	3.5V ~ 8.4V
Operating Voltage	At 4.8V <span style="float:right">At 6.0V</span>
Operating Speed at no Load	333°/s (56RPM) <span style="float:right">429°/s (71RPM)</span>
Stall Torque	2.8kgcm (27.5Ncm) <span style="float:right">3.3kgcm (32.4Ncm)</span>
Peak Efficiency Torque	0.6kgcm (5.9Ncm) <span style="float:right">0.7kgcm (6.9Ncm)</span>
Rest Current	3mA <span style="float:right">3mA</span>
Running Current at no Load	180mA <span style="float:right">230mA</span>
Stall Current	1100mA <span style="float:right">1400mA</span>
Deadband Width	2µs <span style="float:right">2µs</span>
Operating Travel	Default <span style="float:right">±60°</span>
	Programmable <span style="float:right">Max. 175°</span>
	Multi Turn/Continuous Rotation <span style="float:right">n/a / n/a</span>
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)
Vibrations at no Load	-
Connector Wire Length	300mm
Connector Wire Gauge	22AWG
Connector Wire Strand Count	60/0.08
External Dimensions	30.0 x 10.0 x 34.0mm
Weight*	24.0g
Ball Bearing	Dual Ball Bearing
Case Material	Engineering Plastic
Gear Material	1 Metal-Plastic & 4 Metal Gears
Gear Train Backlash	Max. 0.5°
Horn Gear Spline	25T Ø5.0
Accessories	Mounting Hardware, Servo Horns (MS-L25, MS-ML25)
IP-Rating	IP4X
Revision	Rev. 1.0 / 08.01.2024
Changelog	-

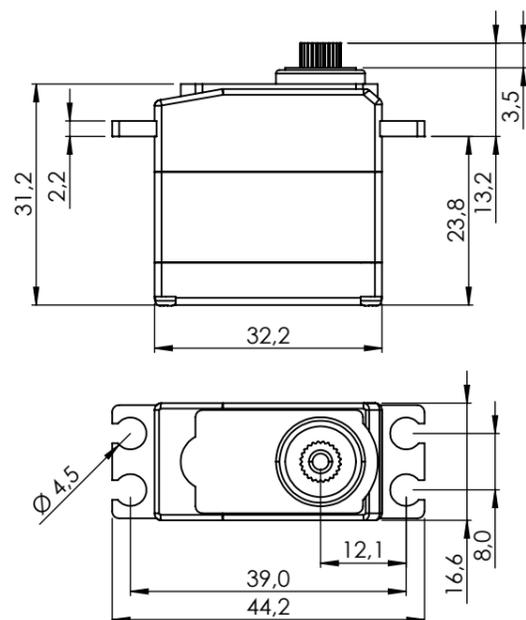
## PERFORMANCE CHART



\*of the servo only w/o horns and accessories

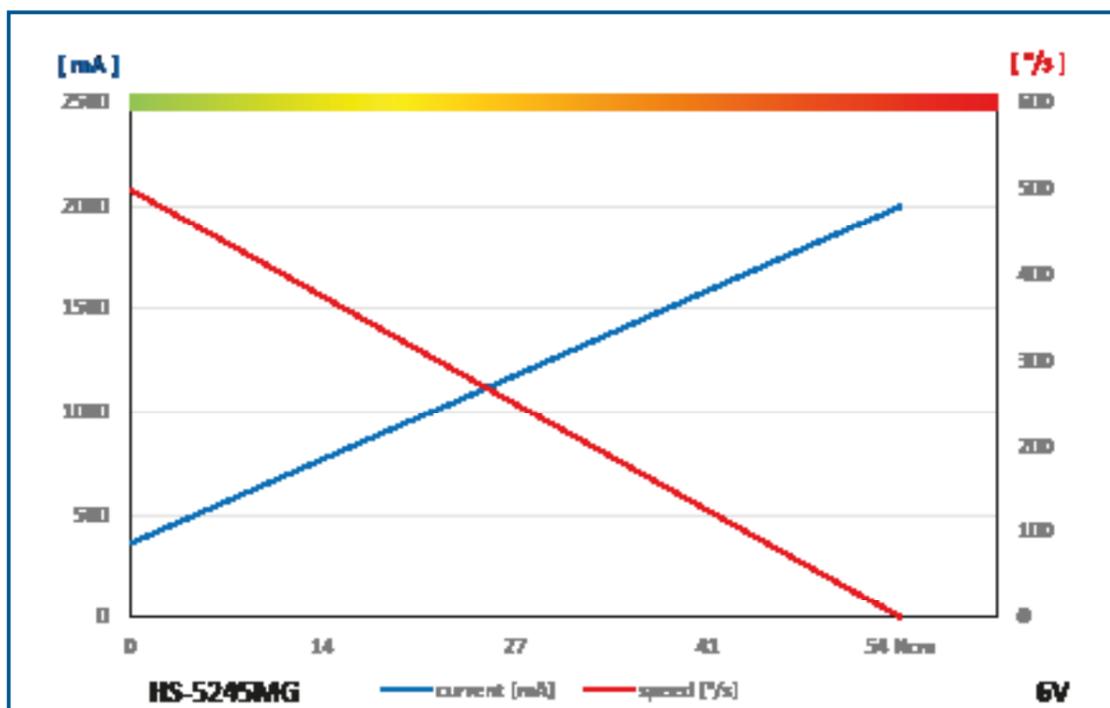
# HS-5245MG

#113245



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## PERFORMANCE CHART

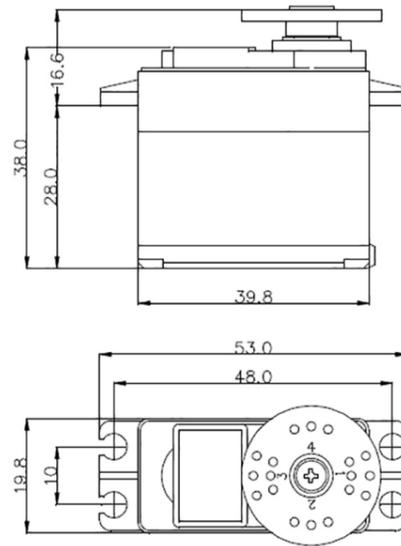


## GENERAL SPECIFICATION

HS-5245MG		
Control System	PWM	
	Pulse Width: 900~2100µs(Center:1500µs)	
Connector Type		
Position Sensor Type	Contact Analog Potentiometer	
Motor Type	Cored Metal Brush	
Amplifier / MCU	8bit programmable Digital	
Operating Voltage Range**	3.5V ~ 8.4V	
Operating Voltage	At 4.8V	At 6.0V
Operating Speed at no Load	0.15sec/60°	0.12sec/60°
Stall Torque	4.4kgf·cm (61.1 oz-in)	5.5kgf·cm (76.4 oz-in)
Peak Efficiency Torque	0.9kgf·cm (12.5 oz-in)	1.1kgf·cm (15.3 oz-in)
Rest Current	3mA	3mA
Running Current at no Load	260mA	360mA
Stall Current	1,600mA	2,000mA
Deadband Width	2µs	2µs
Operating Travel	Default	±60°
	Programmable	Max. 175°
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)	
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)	
Vibrations at no Load	-	
Connector Wire Length	300mm	
Connector Wire Gauge	22AWG	
Connector Wire Strand Count		
External Dimensions	32.2mm x 16.8mm x 31.0mm	
Weight*	32.0g	
Ball Bearing	2 Ball Bearing	
Case Material	Engineering Plastic	
Gear Material	1 Metal-Plastic & 3 Metal Gears	
Gear Train Backlash	Max. 0.5°	
Horn Gear Spline	24T Ø6.0	
Accessories		
IP-Rating	IP4X	
Revision		
Changelog	-	
*of the servo only w/o horns and accessories		
**At the Max voltage, it is recommended to be used only for a short time duration.		

# HS-5485HB

#113485

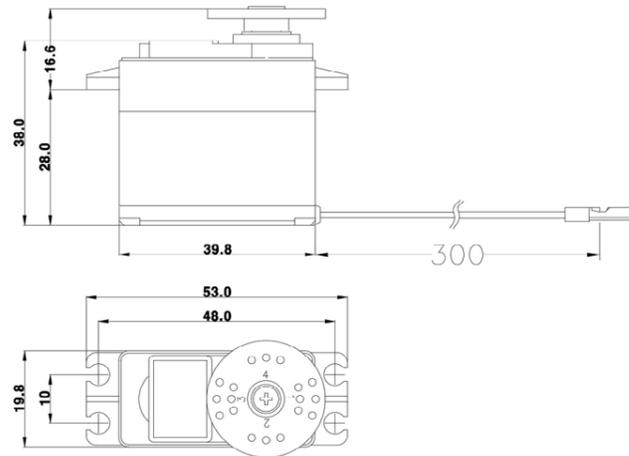


## GENERAL SPECIFICATION

HS-5485HB			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	-
No Load Speed	0.20sec/60°	0.17sec/60°	-
Stall Torque	5.2kgf·cm (72.2 oz·in)	6.4kgf·cm (88.9 oz·in)	-
Peak Efficiency Torque	1.0kgf·cm (13.9 oz·in)	1.3kgf·cm (18.1 oz·in)	-
Standing Current	8mA	10mA	-
No Load Running Current	150mA	170mA	-
Stall Current	1,000mA	1,200mA	-
Deadband	4μs	4μs	-
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.811inch)		
Connector Wire Gauge	24AWG		
Dimensions	40.0mm x 20.0mm x 38.0mm (1.575inch x 0.787inch x 1.496inch)		
Weight	45.0g (1.587oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	4 Heavy Duty Resin Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	8bit Programmable Digital		

# HS-5495BH

#114495



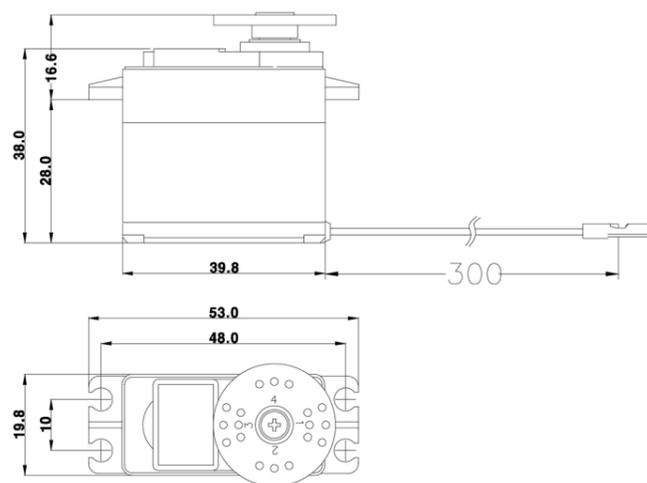
## GENERAL SPECIFICATION

HS-5495BH			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.17sec/60°	0.15sec/60°
Stall Torque	-	6.4kgf-cm (88.9 oz-in)	7.5kgf-cm (104.2 oz-in)
Peak Efficiency Torque	-	1.3kgf-cm (18.1 oz-in)	1.5kgf-cm (20.8 oz-in)
Standing Current	-	10mA	10mA
No Load Running Current	-	170mA	190mA
Stall Current	-	1,200mA	1,400mA
Deadband	-	4μs	4μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81 inch)		
Connector Wire Gauge	24AWG		
Dimensions	40.0mm x 20.0mm x 38.0mm (1.575inch x 0.787inch x 1.496inch)		
Weight	45.0g (1.587oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	4 Heavy Duty Resin Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	8bit Programmable Digital		

# HS-5496MH

#114496

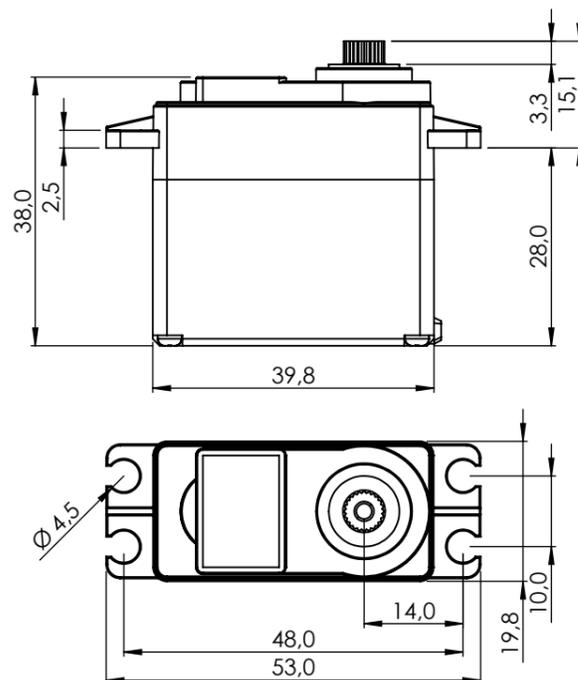
## GENERAL SPECIFICATION



HS-5496MH			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.18sec/60°	0.15sec/60°
Stall Torque	-	6.0kgf-cm (83.3 oz-in)	7.2kgf-cm (100.0 oz-in)
Peak Efficiency Torque	-	1.2kgf-cm (16.7 oz-in)	1.4kgf-cm (19.4 oz-in)
Standing Current	-	10mA	12mA
No Load Running Current	-	170mA	190mA
Stall Current	-	1,200mA	1,400mA
Deadband	-	4μs	4μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81 inch)		
Connector Wire Gauge	24AWG		
Dimensions	40.0mm x 20.0mm x 38.0mm (1.575inch x 0.787inch x 1.496inch)		
Weight	52.0g (1.834oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Heavy Duty Resin & 3 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	8bit Programmable Digital		

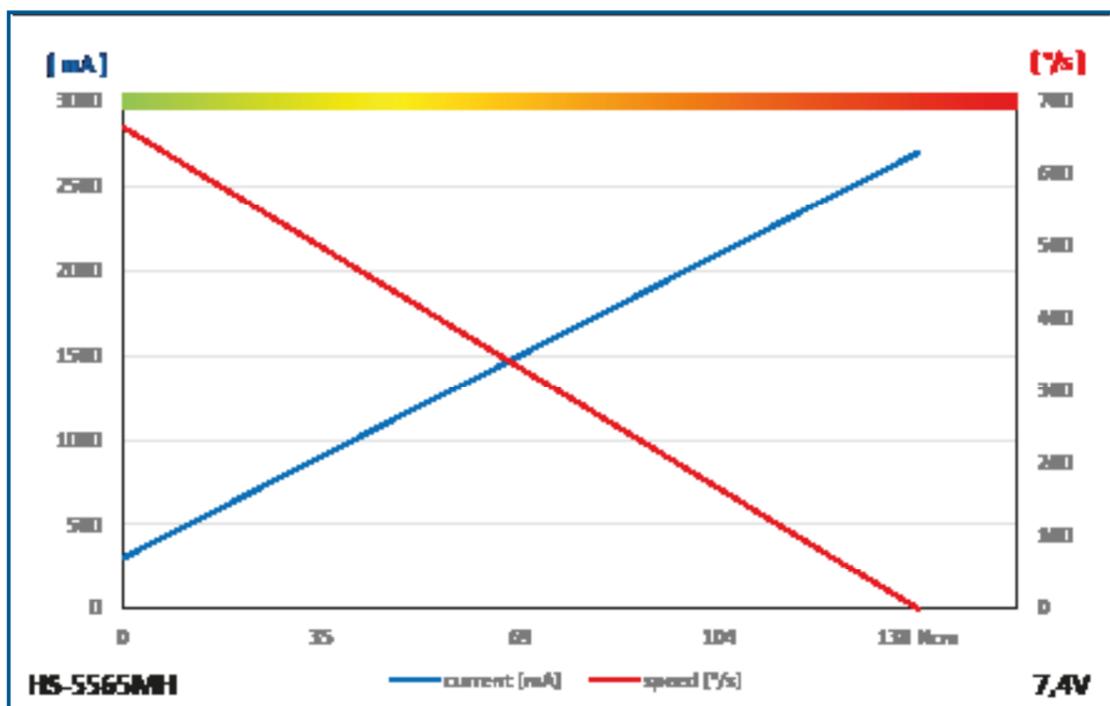
# HS-5565MG

#114565



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## PERFORMANCE CHART



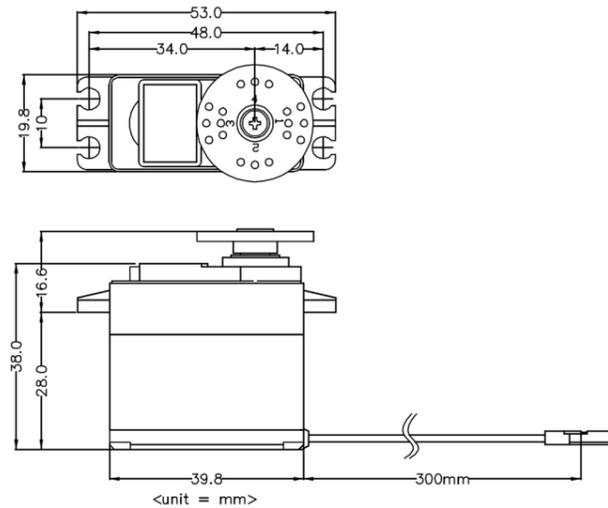
## GENERAL SPECIFICATION

HS-5565MG		
Control System	PWM	
	Pulse Width: 900~2100 $\mu s$ (Center:1500 $\mu s$ )	
Connector Type		
Position Sensor Type	Contact Analog Potentiometer	
Motor Type	Cored Metal Brush	
Amplifier / MCU	8bit programmable Digital	
Operating Voltage Range**	3.5V ~ 8.4V	
Operating Voltage	At 6.0V	At 7.4V
Operating Speed at no Load	0.11sec/60°	0.09sec/60°
Stall Torque	11.0kgf·cm (152.8 oz-in)	14.0kgf·cm (194.4 oz-in)
Peak Efficiency Torque	2.2kgf·cm (30.6 oz-in)	2.8kgf·cm (38.9 oz-in)
Rest Current	4mA	4mA
Running Current at no Load	260mA	300mA
Stall Current	2,100mA	2,700mA
Deadband Width	2 $\mu s$	2 $\mu s$
Operating Travel	Default	$\pm 60^\circ$
	Programmable	Max. 175°
	Continuous Rotation	n/a
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)	
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)	
Vibrations at no Load	-	
Connector Wire Length	300mm (11.811inch)	
Connector Wire Gauge	24AWG	
Connector Wire Strand Count		
External Dimensions	40.0mm x 20.0mm x 38.0mm	
Weight*	59.0g	
Ball Bearing	2 Ball Bearing	
Case Material	Engineering Plastic	
Gear Material	1 Metal-Plastic & 3 Metal Gears	
Gear Train Backlash	Max. 0.5°	
Horn Gear Spline	24T $\phi 6.0$	
Accessories		
IP-Rating	IP54	
Revision		
Changelog	-	

\*of the servo only w/o horns and accessories  
 \*\*At the Max voltage, it is recommended to be used only for a short time duration.

# HS-5585MH

#114585

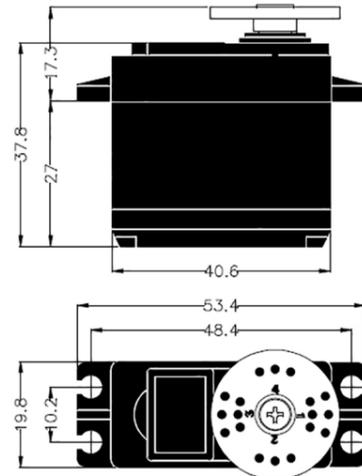


## GENERAL SPECIFICATION

HS-5585MH			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Coreless		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.17sec/60°	0.14sec/60°
Stall Torque	-	14.0kgf·cm (194.4 oz-in)	17.0kgf·cm (236.1 oz-in)
Peak Efficiency Torque	-	2.8kgf·cm (38.9 oz-in)	3.4kgf·cm (47.2 oz-in)
Standing Current	-	4mA	4mA
No Load Running Current	-	260mA	300mA
Stall Current	-	2,100mA	2,700mA
Deadband	-	2μs	2μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81 inch)		
Connector Wire Gauge	24AWG		
Dimensions	40.0mm x 20.0mm x 38.0mm (1.567inch x 0.780inch x 1.496inch)		
Weight	59.0g (2.081oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal-Plastic & 3 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	8bit Programmable Digital		

# HS-5625MG

#113625

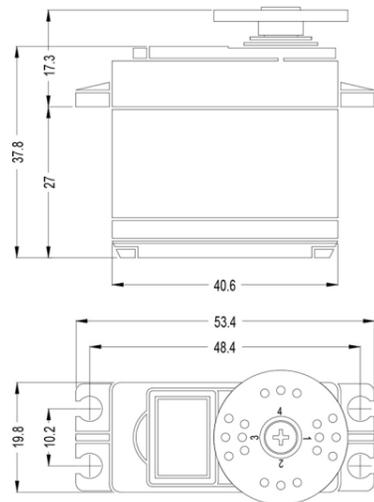


## GENERAL SPECIFICATION

HS-5625MG			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	-
No Load Speed	0.17sec/60°	0.14sec/60°	-
Stall Torque	7.9kgf-cm (109.7 oz-in)	9.4kgf-cm (130.5 oz-in)	-
Peak Efficiency Torque	1.6kgf-cm (22.2 oz-in)	1.9kgf-cm (26.4 oz-in)	-
Standing Current	3mA	3mA	-
No Load Running Current	250mA	300mA	-
Stall Current	1,700mA	2,100mA	-
Deadband	1μs	1μs	-
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.811inch)		
Connector Wire Gauge	22AWG		
Dimensions	40.8mm x 20.0mm x 37.8mm (1.598inch x 0.780inch x 1.488inch)		
Weight	60.0g (1.947oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal-Plastic & 3 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	8bit Programmable Digital		

# HS-5645MG

#113645

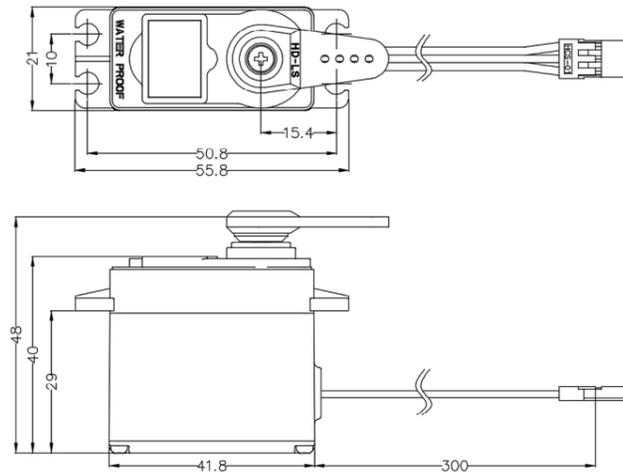


## GENERAL SPECIFICATION

HS-5645MG			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	-
No Load Speed	0.23sec/60°	0.18sec/60°	-
Stall Torque	10.3kgf-cm (143.0 oz-in)	12.1kgf-cm (168.0 oz-in)	-
Peak Efficiency Torque	2.1kgf-cm (29.2 oz-in)	2.4kgf-cm (33.3 oz-in)	-
Standing Current	3mA	3mA	-
No Load Running Current	240mA	300mA	-
Stall Current	1,700mA	2,000mA	-
Deadband	1μs	1μs	-
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.811inch)		
Connector Wire Gauge	22AWG		
Dimensions	40.8mm x 20.0mm x 37.8mm (1.606inch x 0.787inch x 1.488inch)		
Weight	60.0g (2.116oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal-Plastic & 3 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	8bit Programmable Digital		

# HS-5646WP

#115647

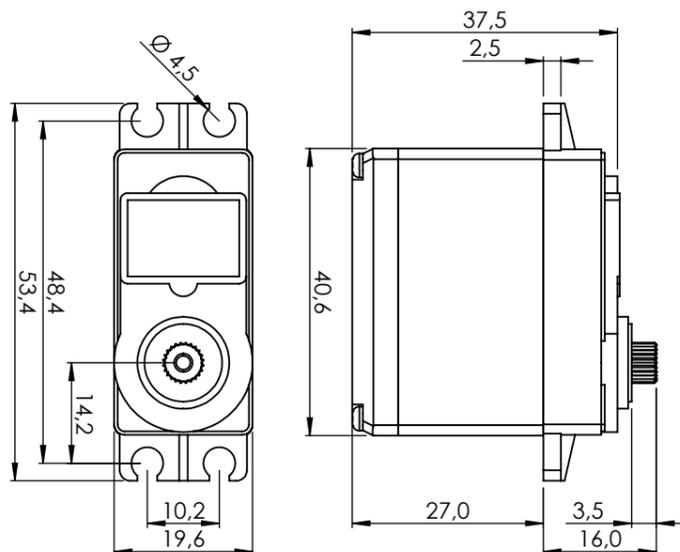


## GENERAL SPECIFICATION

HS-5646WP			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.20sec/60°	0.18sec/60°
Stall Torque	-	11.3kgf·cm (156.9 oz-in)	12.9kgf·cm (179.1 oz-in)
Peak Efficiency Torque	-	2.3kgf·cm (31.9 oz-in)	2.6kgf·cm (36.1 oz-in)
Standing Current	-	5mA	5mA
No Load Running Current	-	270mA	330mA
Stall Current	-	1,670mA	2,100mA
Deadband	-	4μs	4μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81 inch)		
Connector Wire Gauge	22AWG		
Dimensions	41.8mm x 21.0mm x 40.1mm (1.646inch x 0.827inch x 1.579inch)		
Weight	61.0g (2.152oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal-Plastic & 3 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP67		
Servo Amplifier Type	8bit Programmable Digital		

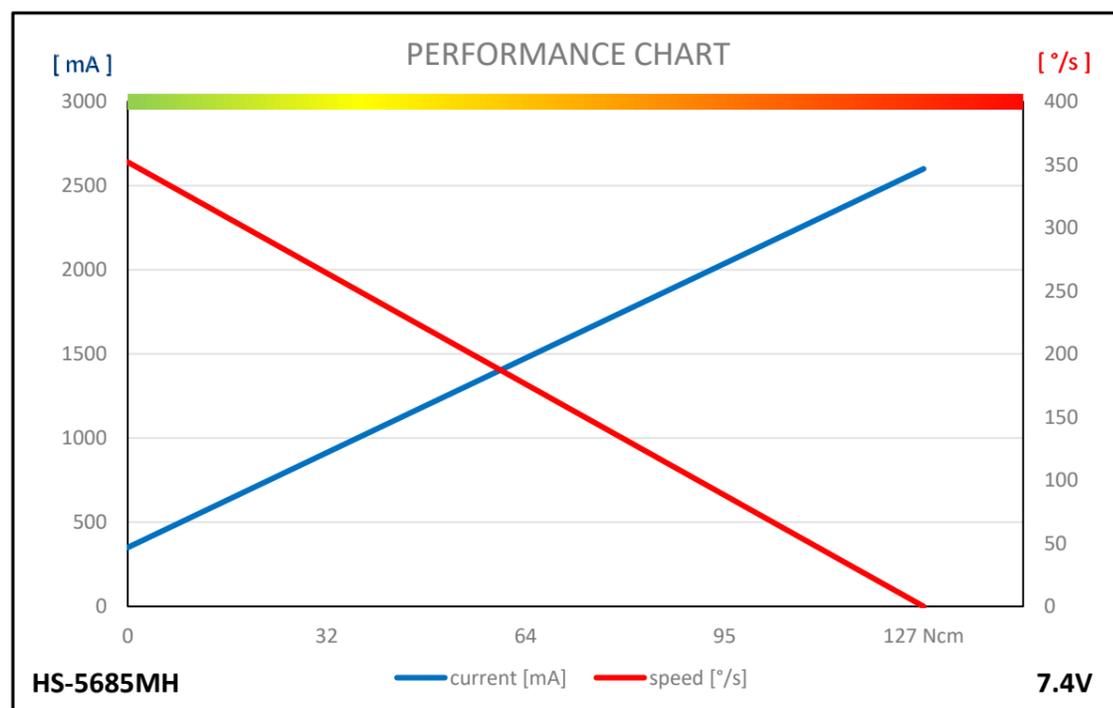
# HS-5685MH

#1-03237



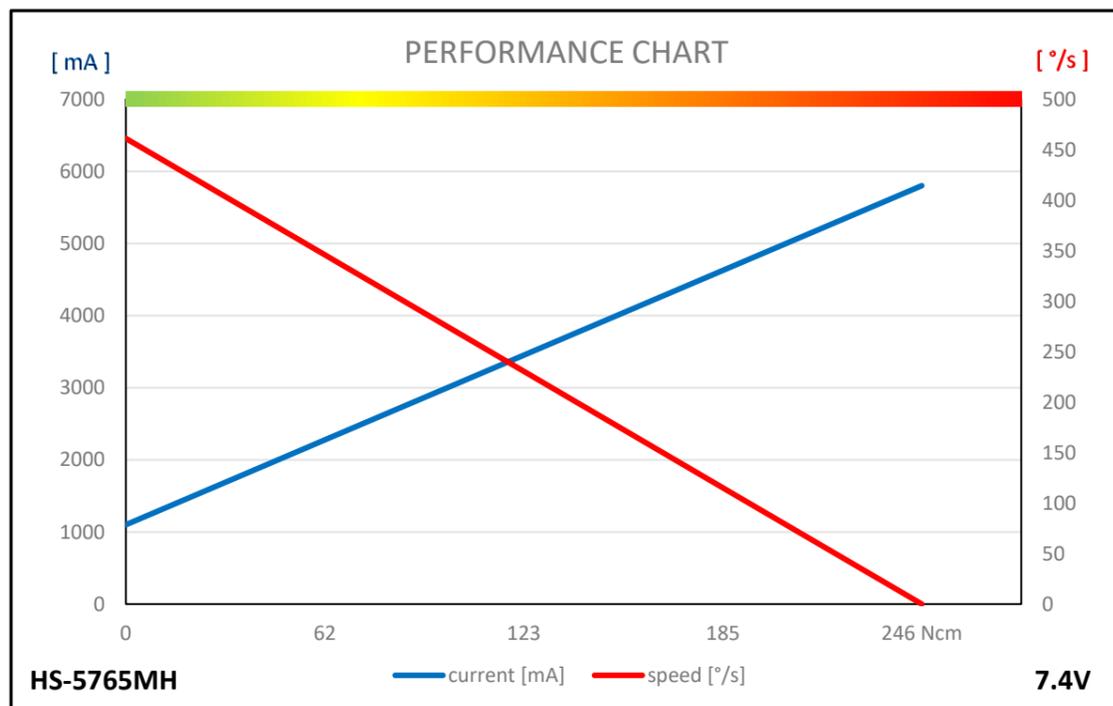
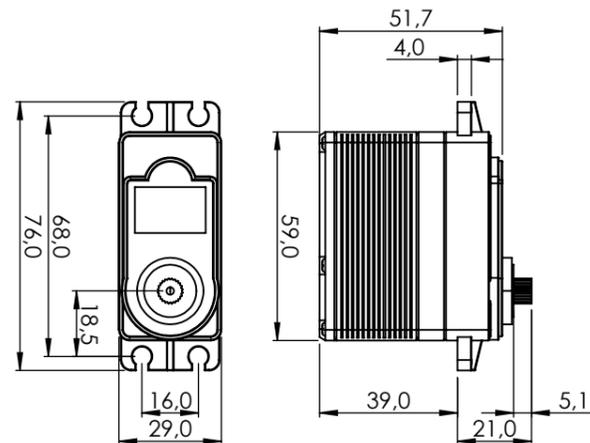
## GENERAL SPECIFICATION

HS-5685MH			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.20sec/60°	0.17sec/60°
Stall Torque	-	11.3kgf-cm (156.9 oz-in)	12.9kgf-cm (179.1 oz-in)
Peak Efficiency Torque	-	2.3kgf-cm (31.9 oz-in)	2.6kgf-cm (36.1 oz-in)
Standing Current	-	6mA	7mA
No Load Running Current	-	280mA	350mA
Stall Current	-	2,100mA	2,600mA
Deadband	-	4μs	4μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	22AWG		
Dimensions	40.8mm x 20.0mm x 37.8mm (1.606inch x 0.787inch x 1.488inch)		
Weight	60.0g (2.116oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal-Plastic & 3 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	8bit Programmable Digital		



# HS-5765MH

#1-03238



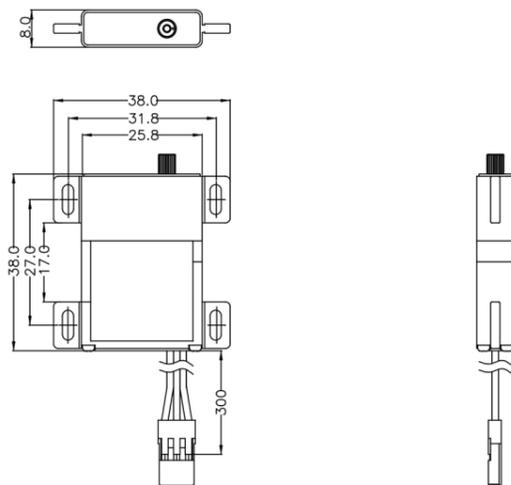
## GENERAL SPECIFICATION

HS-5765MH			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Carbon Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.16sec/60°	0.13sec/60°
Stall Torque	-	20.0kgf-cm (277.7 oz-in)	25.0kgf-cm (347.2 oz-in)
Peak Efficiency Torque	-	4.0kgf-cm (55.5 oz-in)	5.0kgf-cm (69.4 oz-in)
Standing Current	-	3mA	3mA
No Load Running Current	-	840mA	1,100mA
Stall Current	-	4,700mA	5,800mA
Deadband	-	5μs	5μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	22AWG		
Dimensions	59.0mm x 29.0mm x 52.0mm (2.323inch x 1.142inch x 2.047inch)		
Weight	172.3g (6.078oz)		
Bearing Type	3 Ball Bearing		
Case Material	Engineering plastic & Aluminum Heat Sink		
Gear Material	1 Metal-Plastic & 3 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	15T(Ø8.0)		
IP-Rating	IP54		
Servo Amplifier Type	8bit Programmable Digital		

# HS-7115TH

#114015

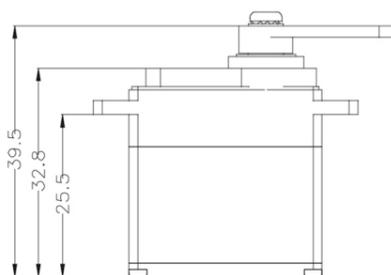
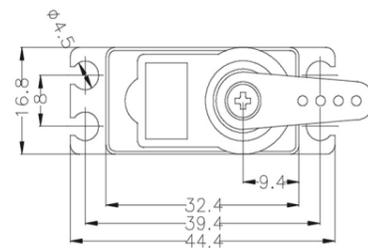
## GENERAL SPECIFICATION



HS-7115TH			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Cored Metal Brush		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.12sec/60°	0.10sec/60°
Stall Torque	-	3.2kgf-cm (44.4 oz-in)	3.9kgf-cm (54.2 oz-in)
Peak Efficiency Torque	-	0.6kgf-cm ( 8.3 oz-in)	0.8kgf-cm (11.1 oz-in)
Standing Current	-	10mA	10mA
No Load Running Current	-	110mA	130mA
Stall Current	-	1,250mA	1,500mA
Deadband	-	1μs	1μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	24AWG		
Dimensions	26.0mm x 8.0mm x 38.0mm (1.024inch x 0.315inch x 1.496inch)		
Weight	20.0g (0.705oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal-Plastic & 5 Titanium Alloy Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	15T(Ø4)		
IP-Rating	IP4X		
Servo Amplifier Type	8bit Programmable Digital		

# HS-7245MH

#114245

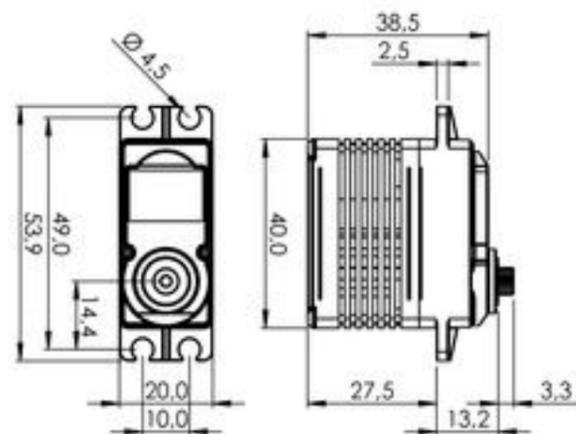


## GENERAL SPECIFICATION

HS-7245MH			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Coreless		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.13sec/60°	0.11sec/60°
Stall Torque	-	5.2kgf·cm (72.2 oz-in)	6.4kgf·cm (88.9 oz-in)
Peak Efficiency Torque	-	1.0kgf·cm (13.9 oz-in)	1.3kgf·cm (18.1 oz-in)
Standing Current	-	10mA	12mA
No Load Running Current	-	150mA	190mA
Stall Current	-	1,300mA	1,600mA
Deadband	-	2μs	2μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	240mm (9.449inch)		
Connector Wire Gauge	22AWG		
Dimensions	32.4mm x 16.8mm x 32.8mm (1.276inch x 0.661inch x 1.291inch)		
Weight	34.0g (1.199oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal-Plastic & 3 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP4X		
Servo Amplifier Type	8bit Programmable Digital		

# HS-7950TH

#1-02064

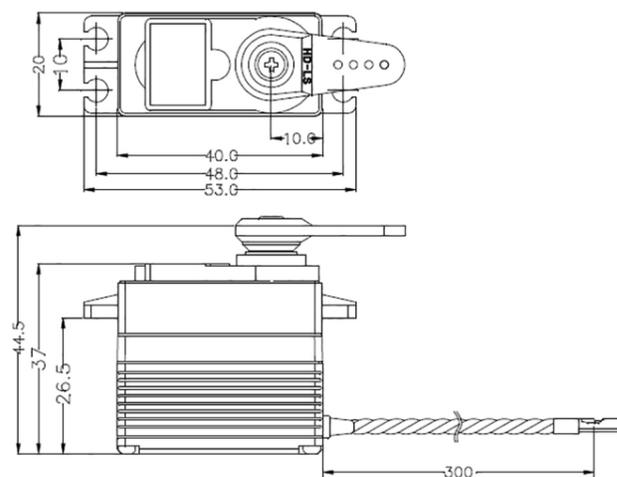


## GENERAL SPECIFICATION

HS-7950TH			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Coreless		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.15sec/60°	0.13sec/60°
Stall Torque	-	29.0kgf-cm (402.7 oz-in)	35.0kgf-cm (486.1 oz-in)
Peak Efficiency Torque	-	5.8kgf-cm (80.5 oz-in)	7.0kgf-cm (97.2 oz-in)
Standing Current	-	10mA	10mA
No Load Running Current	-	390mA	500mA
Stall Current	-	4,800mA	6,200mA
Deadband	-	1 $\mu$ s	1 $\mu$ s
Operating Travel	Default: $\pm 60^\circ$ , Programmable: Max 175° / Pulse Width: 900~2100 $\mu$ s(Center:1500 $\mu$ s)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 38.0mm (1.575inch x 0.787inch x 1.496inch)		
Weight	68.0g (2.399oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic & Aluminum Heat Sink		
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T( $\varnothing 6$ )		
IP-Rating	IP54		
Servo Amplifier Type	8bit Programmable Digital		

# HS-7954SH

#114954

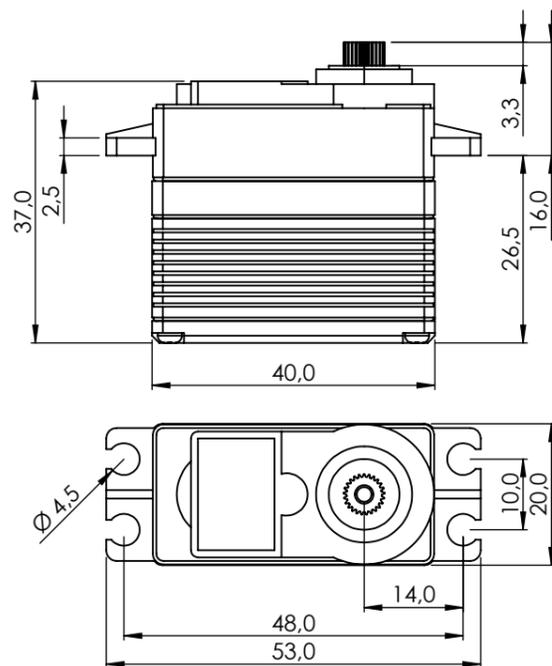


## GENERAL SPECIFICATION

HS-7954SH			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Coreless		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.15sec/60°	0.12sec/60°
Stall Torque	-	24.0kgf·cm (333.3 oz-in)	29.0kgf·cm (402.7 oz-in)
Peak Efficiency Torque	-	4.8kgf·cm (66.7 oz-in)	5.8kgf·cm (80.5 oz-in)
Standing Current	-	8mA	10mA
No Load Running Current	-	300mA	360mA
Stall Current	-	4,200mA	5,200mA
Deadband	-	2μs	2μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81 inch)		
Connector Wire Gauge	20AWG		
Dimensions	40.0mm x 20.0mm x 37.0mm (1.575inch x 0.787inch x 1.457inch)		
Weight	68.0g (2.399oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic & Aluminum Heat Sink		
Gear Material	1 Metal-Plastic & 3 Steel Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	8bit Programmable Digital		

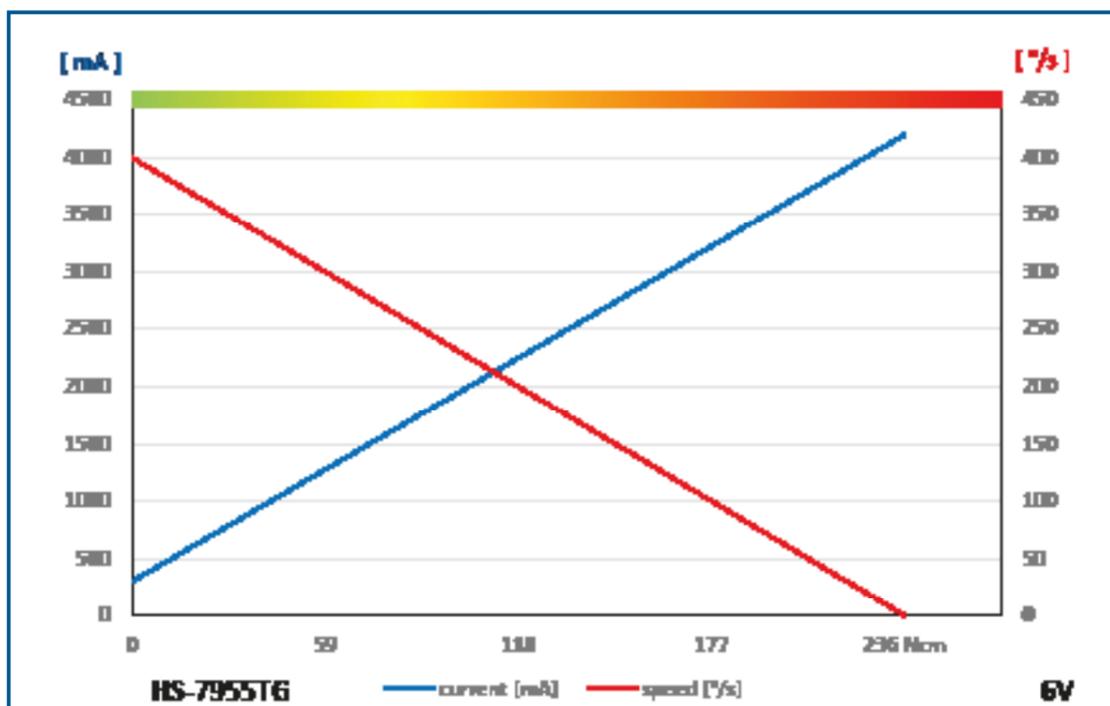
# HS-7955TG

#113957



1:1

## PERFORMANCE CHART



## GENERAL SPECIFICATION

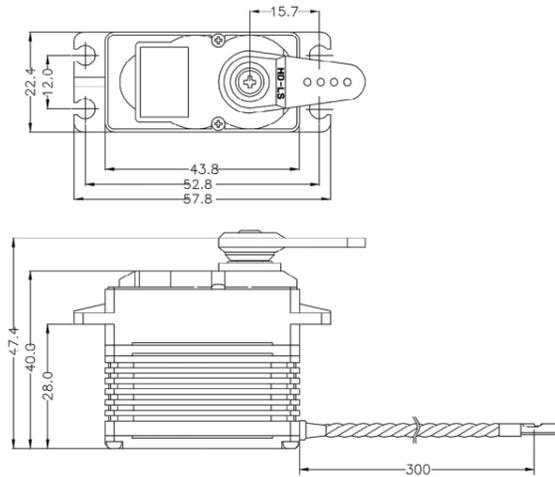
HS-7955TG		
Control System	PWM	
	Pulse Width: 900~2100µs(Center:1500µs)	
Connector Type		
Position Sensor Type	Contact Analog Potentiometer	
Motor Type	Coreless	
Amplifier / MCU	8bit programmable Digital	
Operating Voltage Range**	3.5V ~ 8.4V	
Operating Voltage	At 4.8V	At 6.0V
Operating Speed at no Load	0.19sec/60°	0.15sec/60°
Stall Torque	18.0kgf·cm (250.0 oz·in)	24.0kgf·cm (333.3 oz·in)
Peak Efficiency Torque	3.6kgf·cm (50.0 oz·in)	4.8kgf·cm (66.7 oz·in)
Rest Current	9mA	9mA
Running Current at no Load	220mA	300mA
Stall Current	3,400mA	4,200mA
Deadband Width	1µs	1µs
Operating Travel	Default	±60°
	Programmable	Max. 175°
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)	
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)	
Vibrations at no Load	-	
Connector Wire Length	300mm	
Connector Wire Gauge	22AWG	
Connector Wire Strand Count		
External Dimensions	40.0mm x 20.0mm x 37.0mm	
Weight*	65.0g	
Ball Bearing	2 Ball Bearing	
Case Material	Engineering Plastic & Aluminum Heat Sink	
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears	
Gear Train Backlash	Max. 0.5°	
Horn Gear Spline	24T Ø6.0	
Accessories		
IP-Rating		
Revision		
Changelog	-	

\*of the servo only w/o horns and accessories

\*\*At the Max voltage, it is recommended to be used only for a short time duration.

# HS-7980TH

#114980

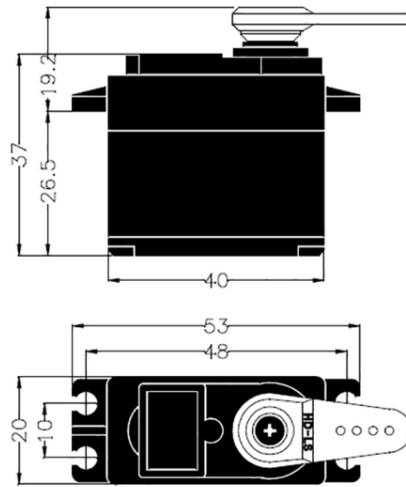


## GENERAL SPECIFICATION

HS-7980TH			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Coreless		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	-	6.0V	7.4V
No Load Speed	-	0.21sec/60°	0.17sec/60°
Stall Torque	-	36.0kgf-cm (499.9 oz-in)	44.0kgf-cm (611.0 oz-in)
Peak Efficiency Torque	-	7.2kgf-cm (100.0 oz-in)	8.8kgf-cm (122.2 oz-in)
Standing Current	-	8mA	10mA
No Load Running Current	-	400mA	480mA
Stall Current	-	8,100mA	9,900mA
Deadband	-	1μs	1μs
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.81 inch)		
Connector Wire Gauge	22AWG		
Dimensions	43.8mm x 22.4mm x 40.0mm (1.724inch x 0.882inch x 1.575inch)		
Weight	78.2g (2.758oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic & Aluminum Heat Sink		
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	8bit Programmable Digital		

# HS-7985MG

#113987

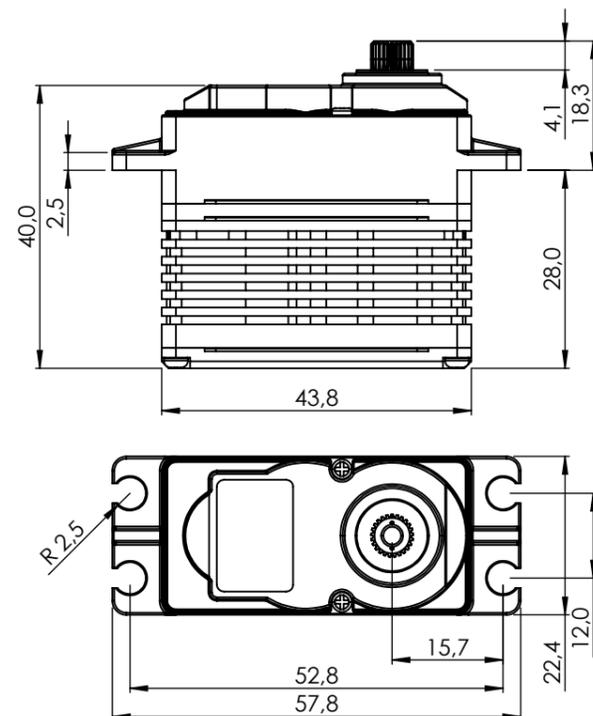


## GENERAL SPECIFICATION

HS-7985MG			
Control System	PWM		
Position Sensor Type	Contact Analog Potentiometer		
Motor Type	Coreless		
Operating Voltage Range	3.5 ~ 8.4V		
Voltage	4.8V	6.0V	-
No Load Speed	0.16sec/60°	0.13sec/60°	-
Stall Torque	10.4kgf-cm (144.4 oz-in)	12.4kgf-cm (172.2 oz-in)	-
Peak Efficiency Torque	2.1kgf-cm (29.2 oz-in)	2.5kgf-cm (34.7 oz-in)	-
Standing Current	9mA	9mA	-
No Load Running Current	200mA	240mA	-
Stall Current	2,400mA	3,000mA	-
Deadband	2μs	2μs	-
Operating Travel	Default: ±60°, Programmable: Max 175° / Pulse Width: 900~2100μs(Center:1500μs)		
Continuous Rotation	n/a		
Operating Temperature Range	-20°C ~ +60°C (-4°F ~+140°F)		
Storage Temperature Range	-30°C ~ +80°C (-22°F ~+176°F)		
Connector Wire Length	300mm (11.811inch)		
Connector Wire Gauge	22AWG		
Dimensions	40.0mm x 20.0mm x 37.0mm (1.575inch x 0.787inch x 1.457inch)		
Weight	62.0g (2.187oz)		
Bearing Type	2 Ball Bearing		
Case Material	Engineering Plastic		
Gear Material	1 Metal-Plastic & 3 Metal Gears		
Gear Train Backlash	Max 0.5°		
Horn Gear Spline	24T(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	8bit Programmable Digital		

# HS-M7990TH

#114990



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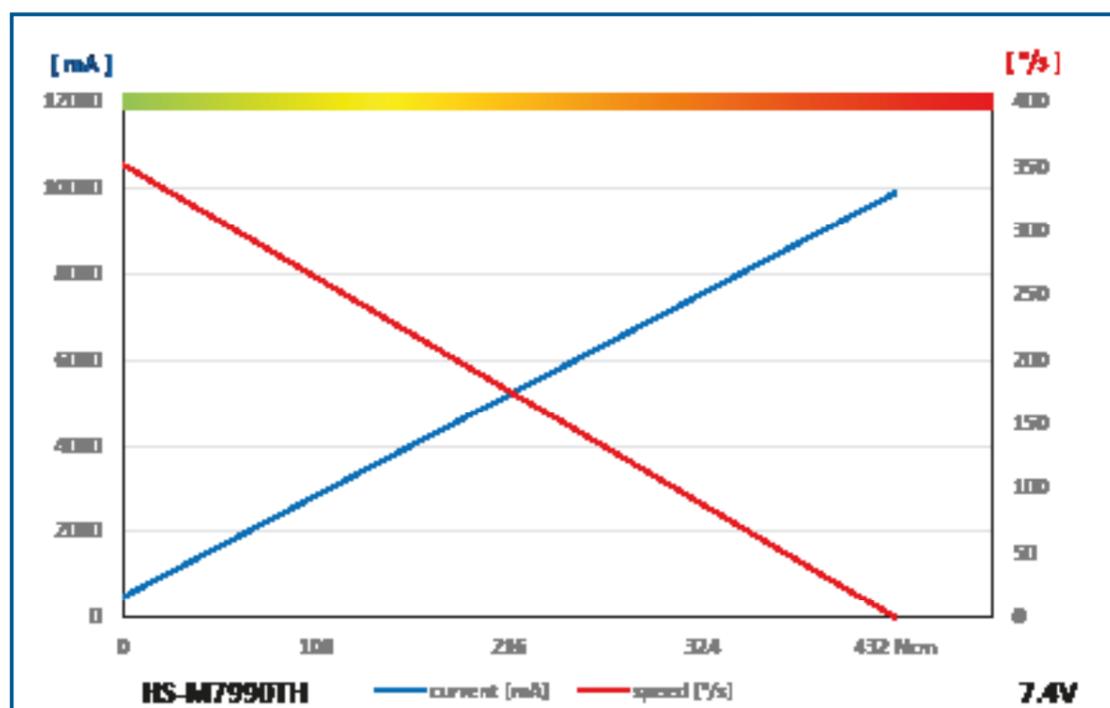
## GENERAL SPECIFICATION

HS-M7990TH		
Control System	PWM	
	Pulse Width: 900~2100µs(Center:1500µs)	
Connector Type		
Position Sensor Type	Contactless Magnetic Encoder	
Motor Type	Coreless	
Amplifier / MCU	8bit programmable Digital	
Operating Voltage Range**	3.5V ~ 8.4V	
Operating Voltage	At 6.V	At 7.4V
Operating Speed at no Load	0.21sec/60°	0.17sec/60°
Stall Torque	36.0kgf·cm (499.9 oz-in)	44.0kgf·cm (611.0 oz-in)
Peak Efficiency Torque	7.2kgf·cm (100.0 oz-in)	8.8kgf·cm (122.2 oz-in)
Rest Current	22mA	23mA
Running Current at no Load	400mA	480mA
Stall Current	8,100mA	9,900mA
Deadband Width	2µs	2µs
Operating Travel	Default	±60°
	Programmable	Max 300°
	Continuous Rotation	n/a
Operating Temperature Range	-20°C ~ +60°C (-4°F ~ +140°F)	
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)	
Vibrations at no Load	-	
Connector Wire Length	300mm	
Connector Wire Gauge	20AWG	
Connector Wire Strand Count		
External Dimensions	43.8mm x 22.4mm x 40.0mm	
Weight*	79.0g	
Ball Bearing	2 Ball Bearing	
Case Material	Engineering Plastic & Aluminum Heat Sink	
Gear Material	1 Metal-Plastic & 3 Titanium Alloy Gears	
Gear Train Backlash	Max. 0.5°	
Horn Gear Spline	25T Ø6.0	
Accessories		
IP-Rating	IP54	
Revision		
Changelog	-	

\*of the servo only w/o horns and accessories

\*\*At the Max voltage, it is recommended to be used only for a short time duration.

## PERFORMANCE CHART





Anwendungsbeispiel für HiTEC-Servos

Hier im Roboter-Arm

Typical application for HiTEC servos – here in a robot arm

# KUNDENINDIVIDUELLE ANPASSUNG

Als Schwesterunternehmen der Firma Hitec RCD Korea Inc. Sind wir in der Lage individuelle Kundenwünsche zu realisieren. Folgende Anpassungen/Modifikationen sind dabei möglich:

- Änderung von Kabeltyp und Kabellänge
- Änderung der Steckverbindung
- Anpassung des Zubehörs
- Anpassung der Verpackung (Umverpackung und Gebindegröße)
- Programmierservice
- Montageservice
- Erweiterte Warenausgangsprüfung (Teststand und Protokollierung)
- Änderung der Beschriftung (Name Plate, Serien-Nr., etc.)
- Anpassung des Produkts (z.B. Getriebeübersetzung)
- Erfüllung von besonderen Zertifizierungswünschen
- Tracing von Komponenten
- Spezielle Liefervereinbarung (Rahmenaufträge, garantierte Lieferfähigkeiten)



Foto:Robotzone,LLC



Anwendungsbeispiel für HiTEC-Servos

Hier in einem Robotergetriebe

Typical application for HiTEC servos – In this case in a robot gearbox

# PROGRAMMIERGERÄTE

Digitale Hitec Aktuatoren verfügen über die Möglichkeit unterschiedliche Einstellungen anzupassen beziehungsweise Sicherheitsfeatures zu aktivieren. Das Ändern dieser Parameter kann mit Hilfe von unterschiedlichen Programmiergeräten erfolgen.

## HFP-30

Das Hitec HFP-30 bietet umfangreiche Einstellungsmöglichkeiten und Testfunktionen. Aufgrund der kompakten Abmessungen eignet sich das HFP-30 ideal für den mobilen Einsatz, da kein Computer benötigt wird. Mit dem HFP-30 lassen sich alle digitalen Hitec PWM-Aktuatoren programmieren.



## DPC-11

Das Hitec DPC-11 ist ein kostengünstige Programmierschnittstelle, welche in Verbindung mit einem Computer mit Windows-Betriebssystem verwendet wird. Hierbei lassen sich alle Einstellungen bequem modifizieren und optional auch abspeichern. So können beispielsweise die gewählten Einstellungen mit geringem Aufwand archiviert, oder auf weitere Servos übertragen werden. Die Anbindung erfolgt über USB.



## DPC-CAN

Mit der Hitec DPC-CAN Schnittstelle lassen sich Hitec CAN- und UAVCAN-Servos konfigurieren, aktualisieren, oder testen. Hierfür stehen unterschiedliche Software-Applikationen bereit. Hierfür ist ein Computer mit Windows-Betriebssystem notwendig. Die Anbindung erfolgt über USB.

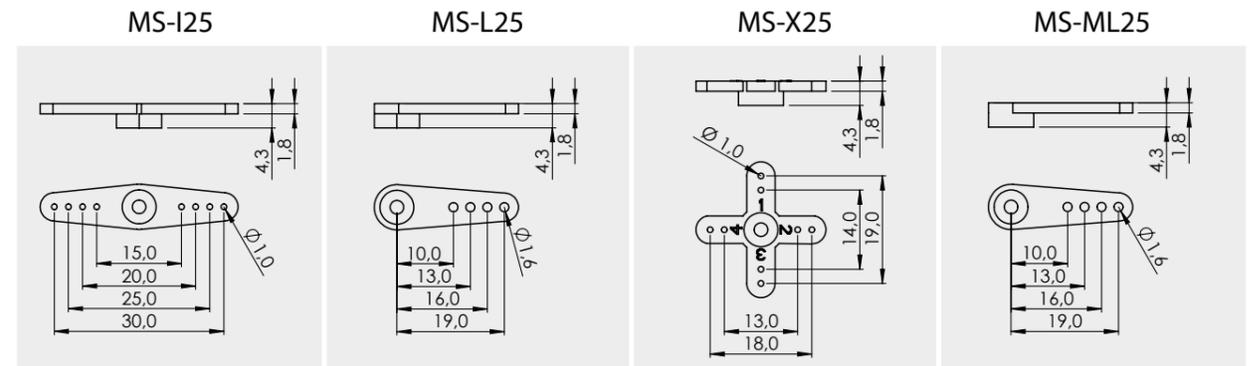


# SERVO ABTRIEBSARME

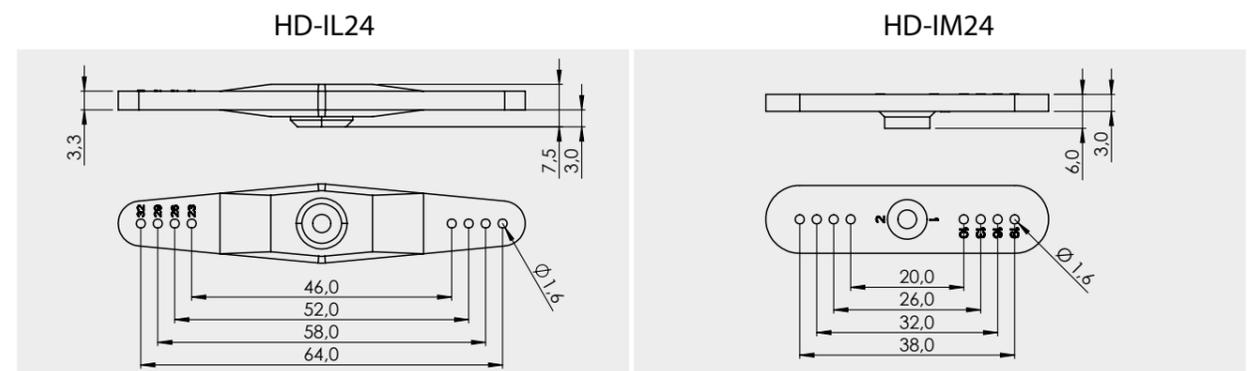
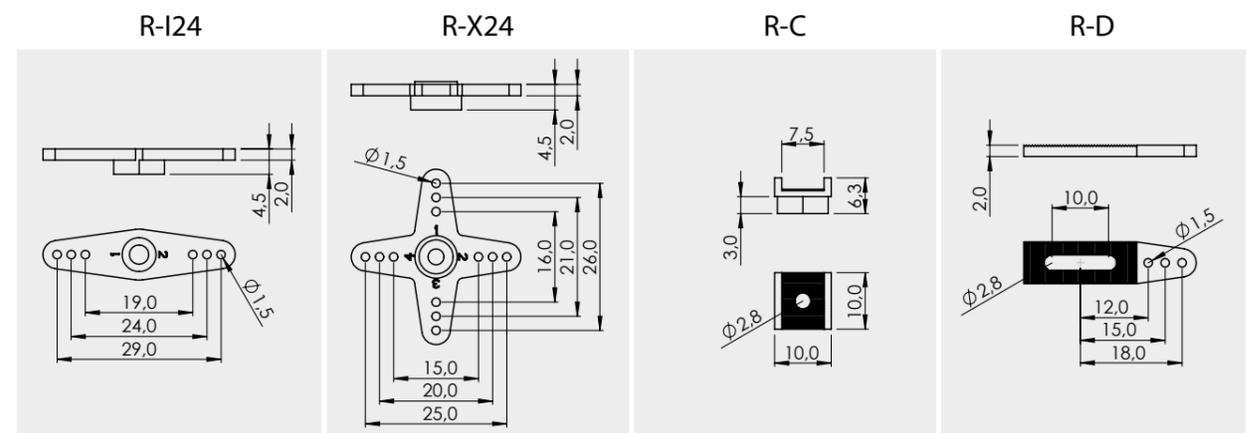
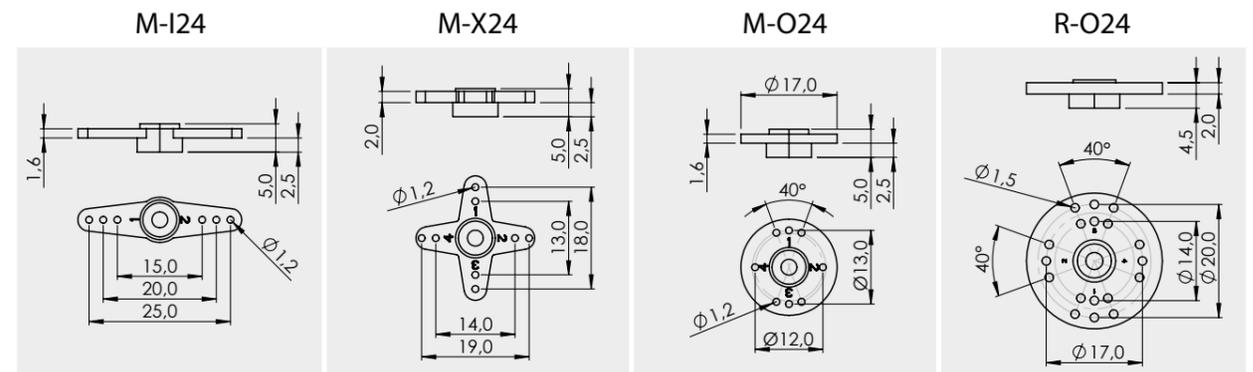
Für das gesamte Hitec Servo-Portfolio steht eine Vielzahl von Abtriebsarmen zur Verfügung. Im Lieferumfang der Servos ist zumeist eine Auswahl geeigneter Abtriebsarme enthalten.

Bei Sonderwünschen können Sie aus dem breiten Sortiment wählen, bitte nehmen Sie hierzu Kontakt zu uns auf.

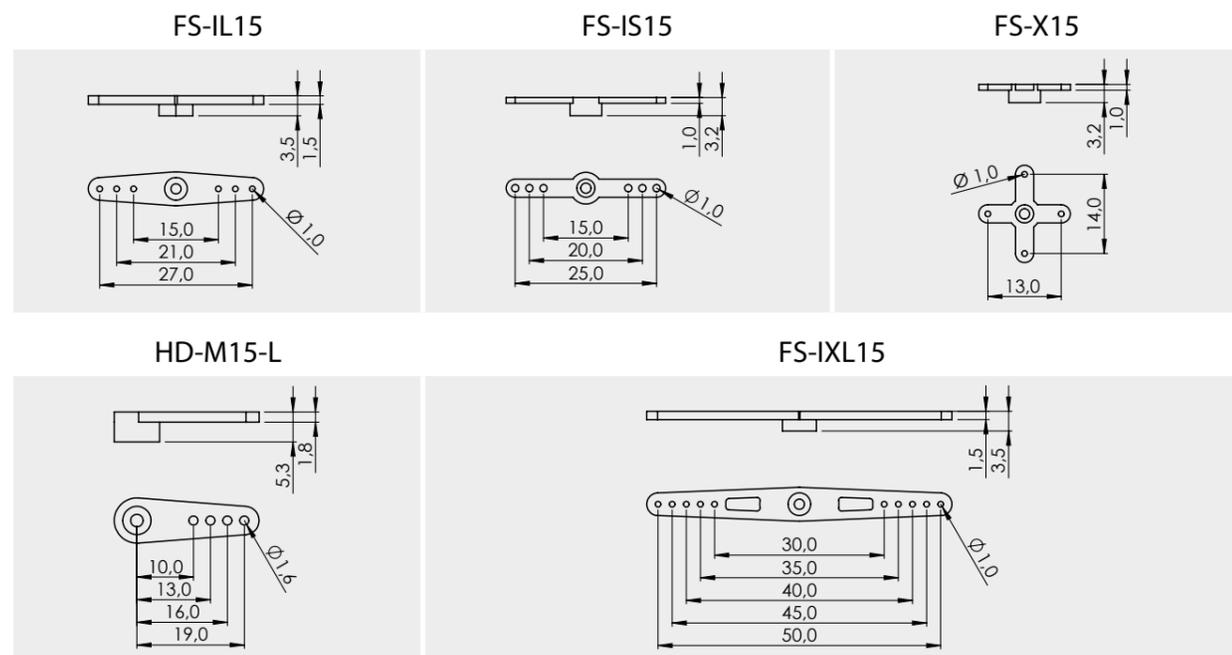
## 25T(Ø5,0)



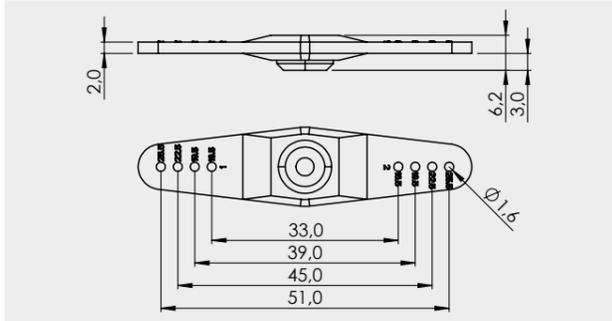
## 24T (Ø6,0)



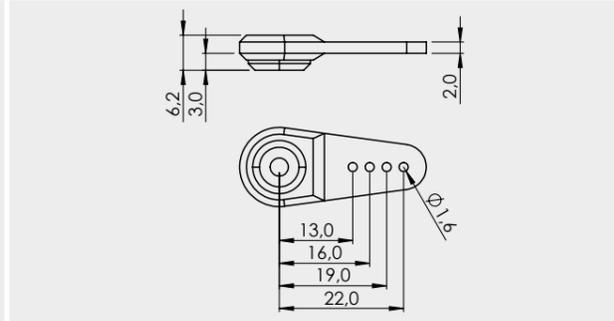
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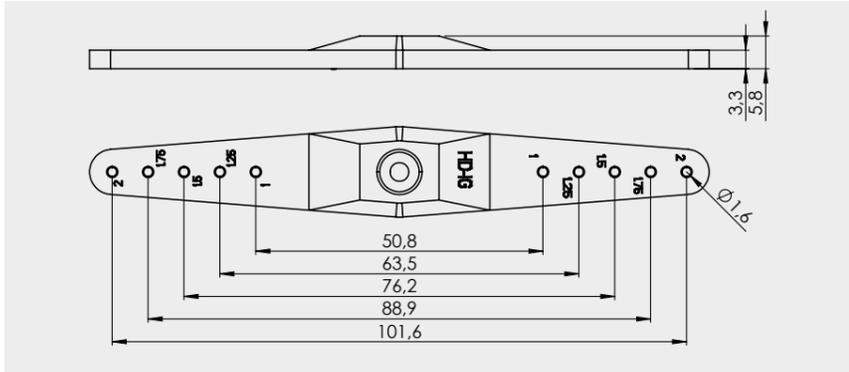
HD-IS24



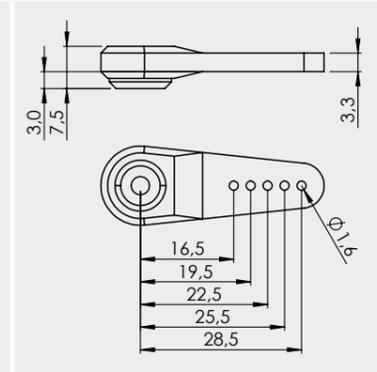
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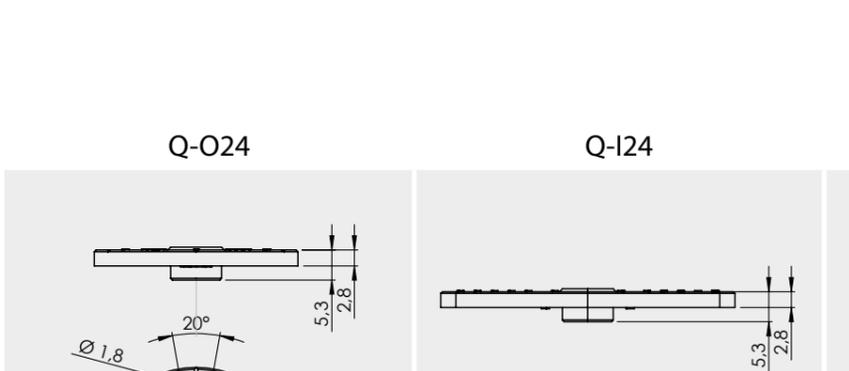
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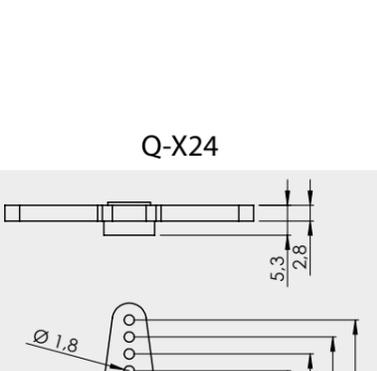
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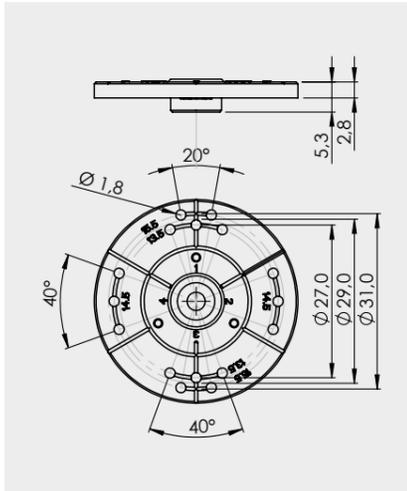
HD-LG24



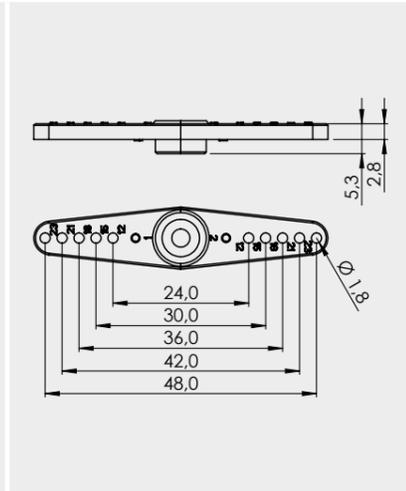
HD-OS24



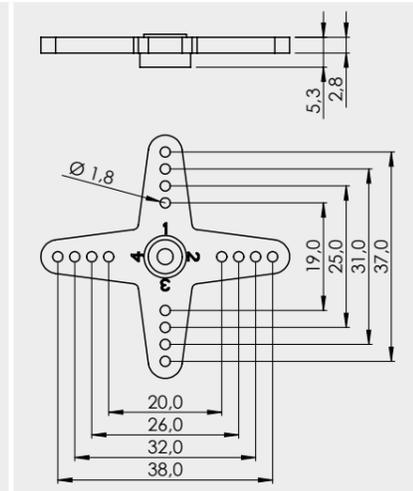
Q-O24



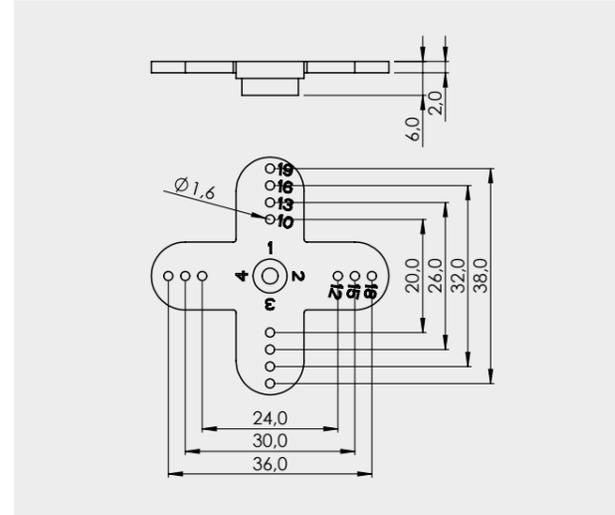
Q-I24



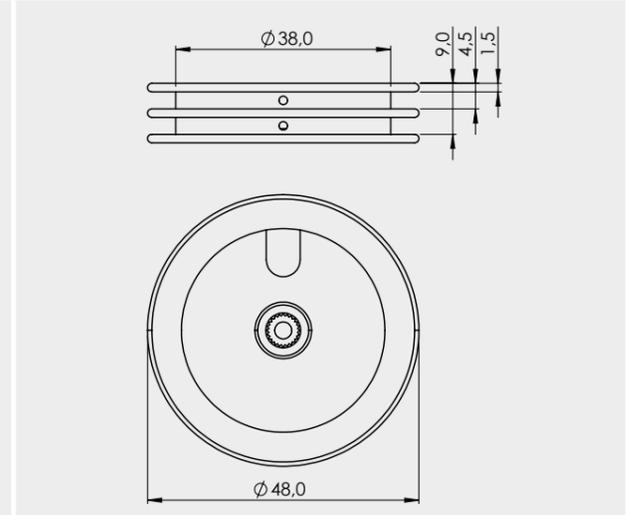
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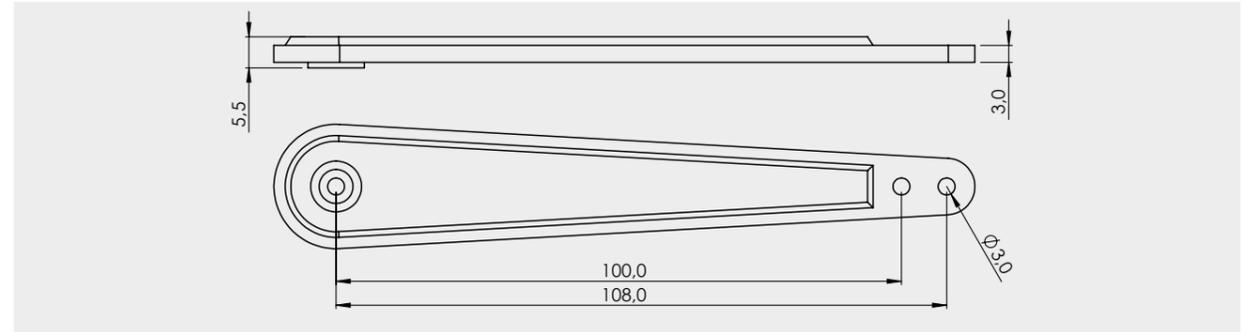
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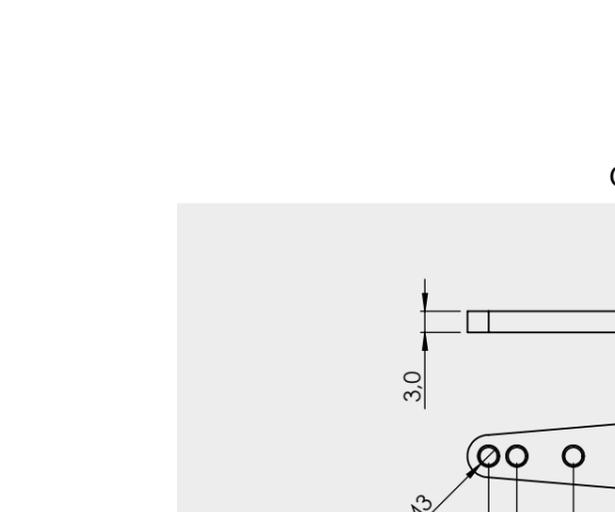
SP-24



715SA-24

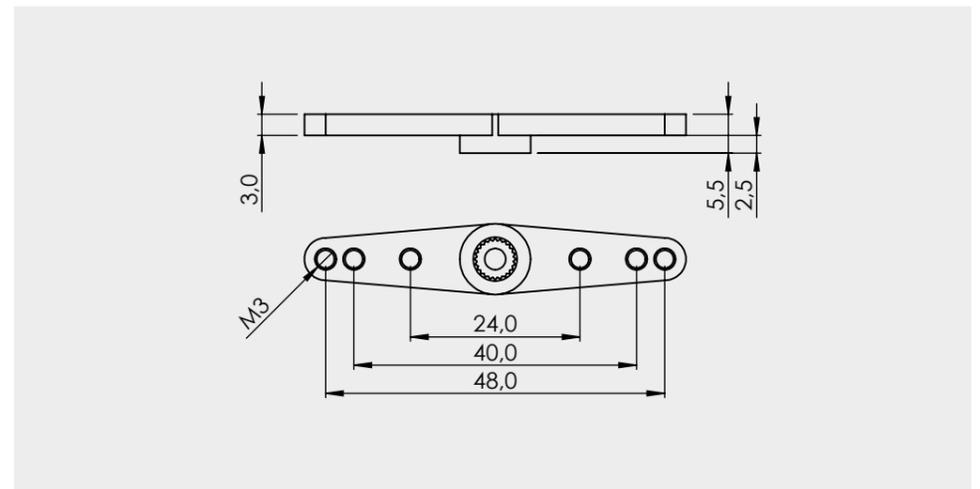


R-ML24



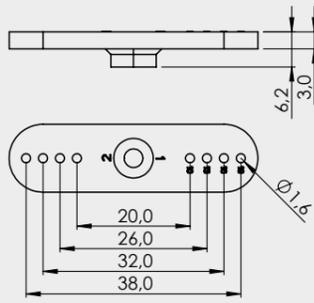
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Q-MI24

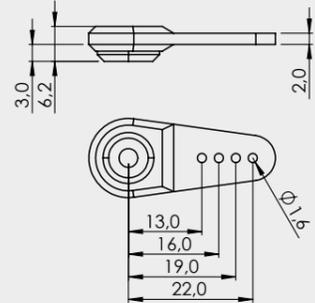


# H25T(Ø6,0)

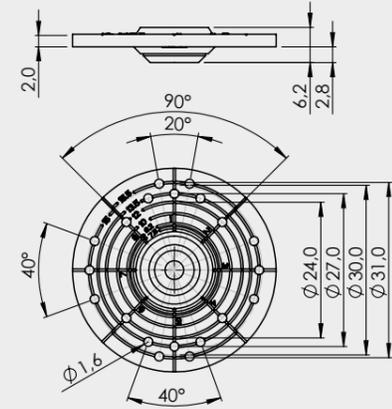
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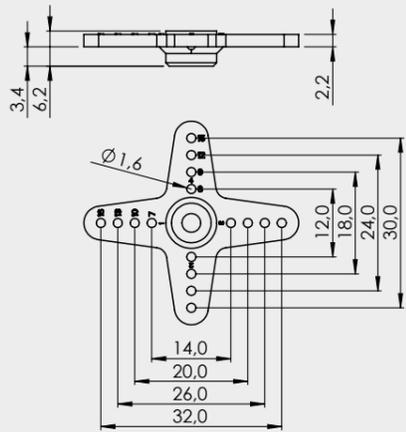
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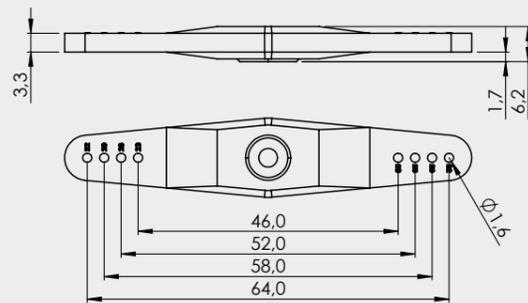
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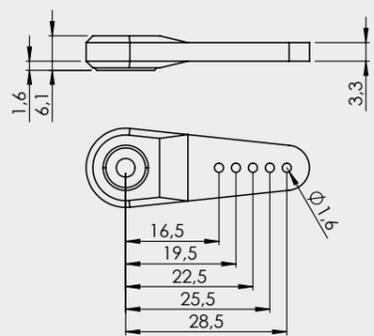
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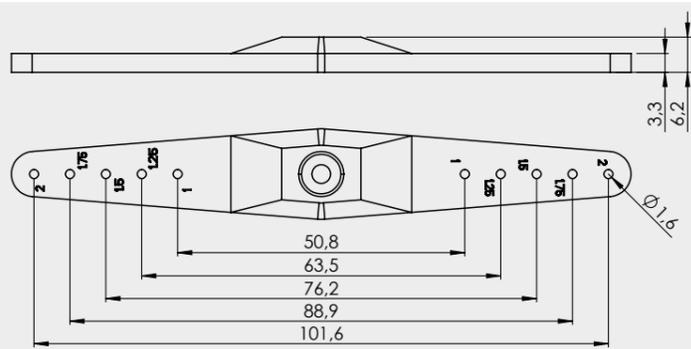
HD-IL25



HD-LL25



HD-IG25

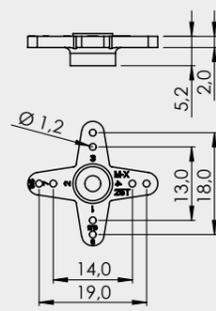


HD-LG25

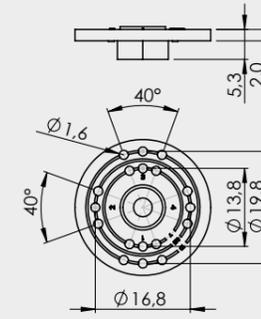
M-O25

M-I25

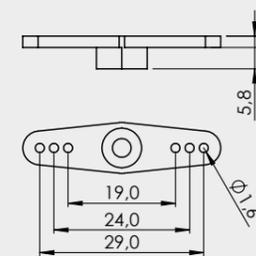
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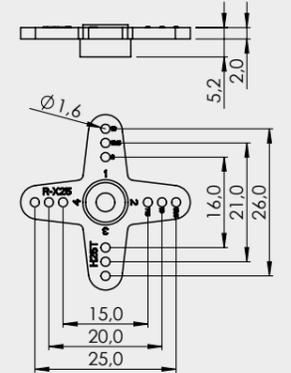
R-O25



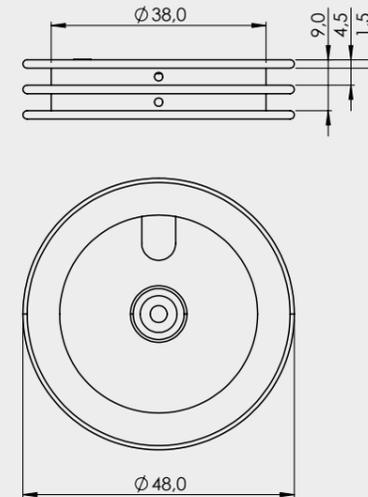
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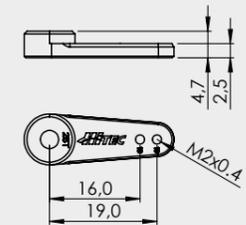
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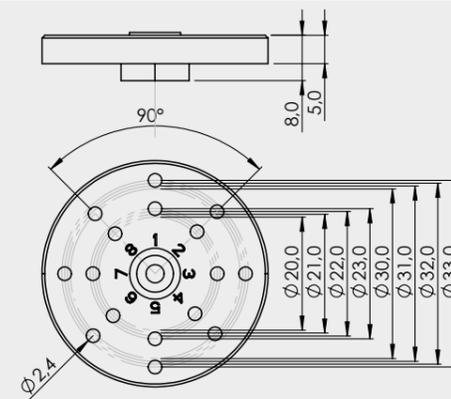
SP-25



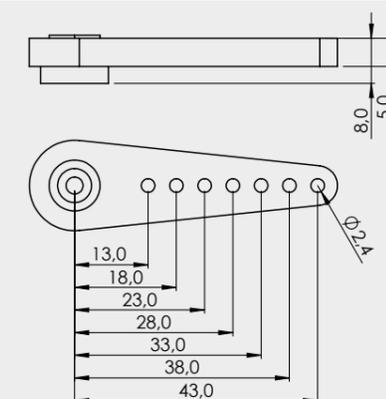
R-ML25



Q-OA15

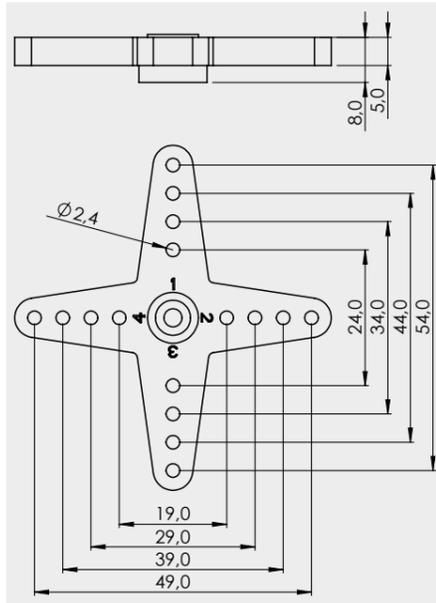


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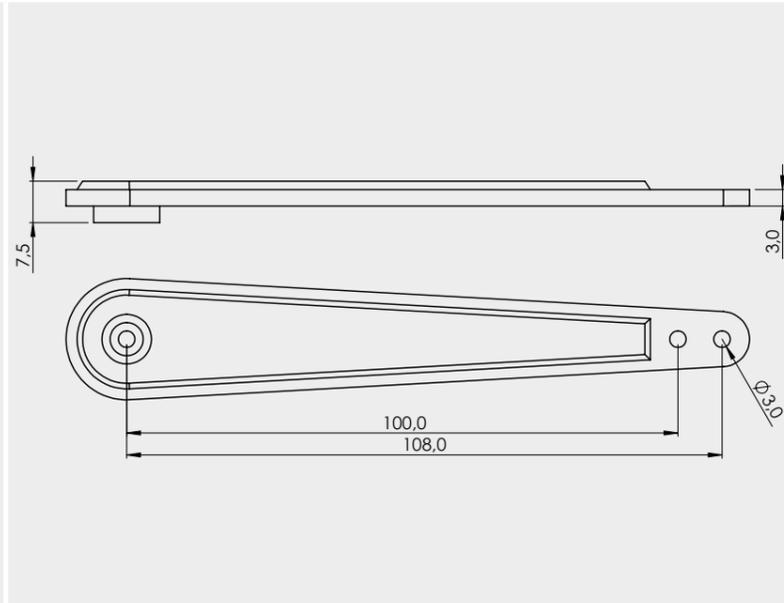


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Q-XA15

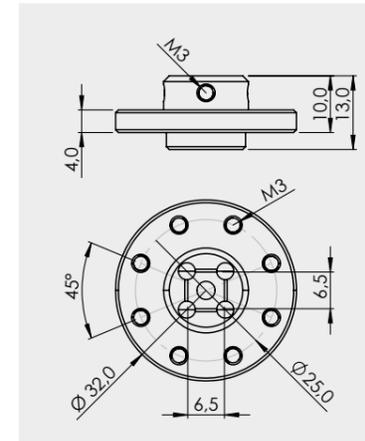


825SA-15

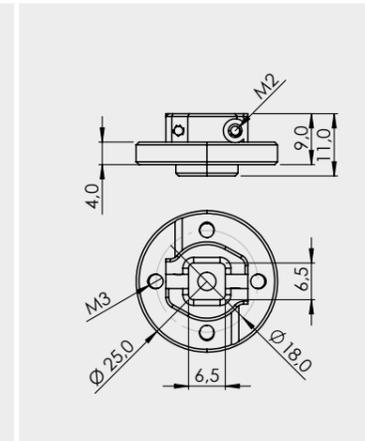


SQUARE6.5

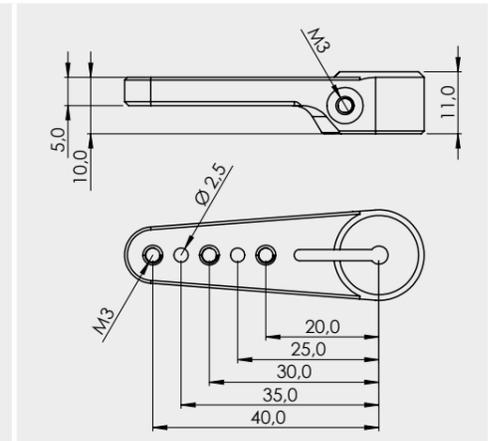
MOS6.5-S



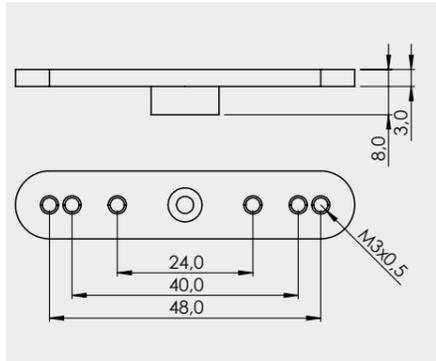
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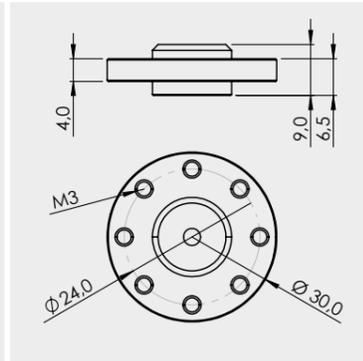
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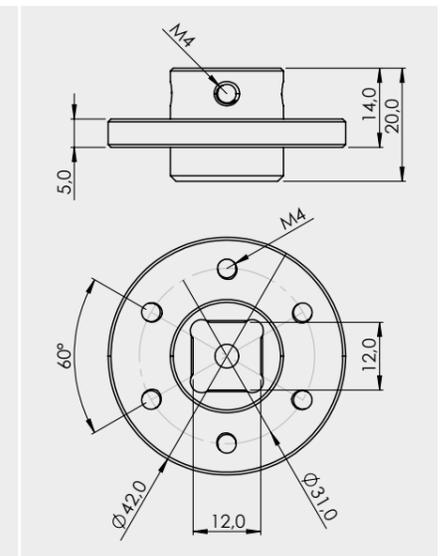
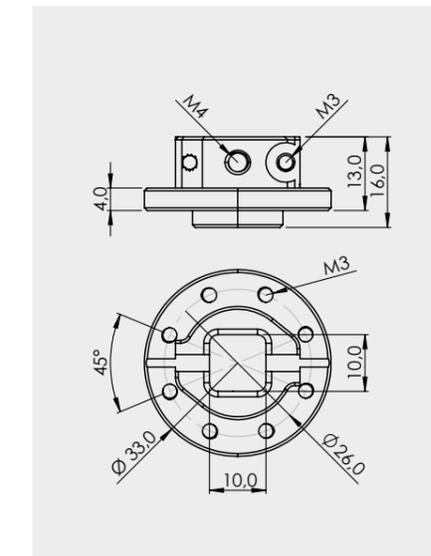


I-MO15



SQUARE10

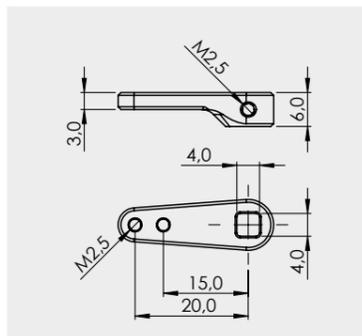
SQUARE12



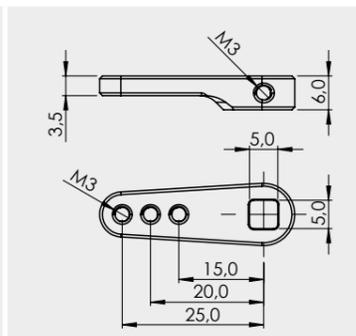
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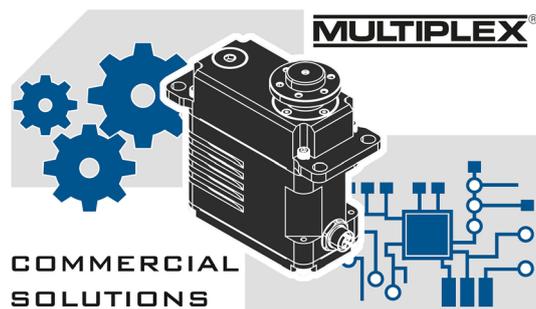
SQUARE5

MIS4-A



MIS5-A





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