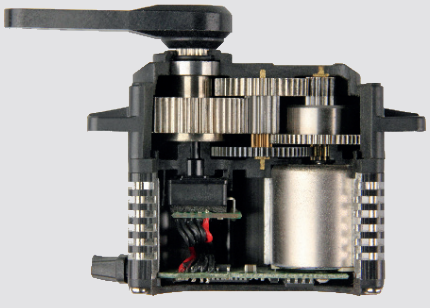
DE

MULTIPLEX®

COMMERCIAL
SOLUTIONS

Innovative Lösungen für
industrielle Anwendungen

Aktuatoren und Servos



INHALT

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SERVO ABTRIEBSARME

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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MULTIPLEX Modellsport 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 industrienahe 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 Aktuatortyp) 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*

CAN- und UAV/DroneCAN-Kommunikation

Der Industrie- und UAV-Bereich gewinnt zunehmend an Bedeutung. Dieser zukunftsträchtige, 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.

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 Zweiwegekommunikation (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*

Pin-Layout von Hitec RS485- Aktuatoren*

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 Umweltbedingungen 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 wiederspiegelt. 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 anspuchsvolle Anwendungen mit häufigen Korrekturmaßnahmen. Die meisten Hochlast-Aktuatoren sind deshalb mit BLDC-Motoren ausgestattet.

DMSZ
zertifiziert nach
DIN EN ISO 9001
22118

DMSZ

Z E R T I F I K A T

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-Werner Lortz
Leiter Zertifizierungsstelle

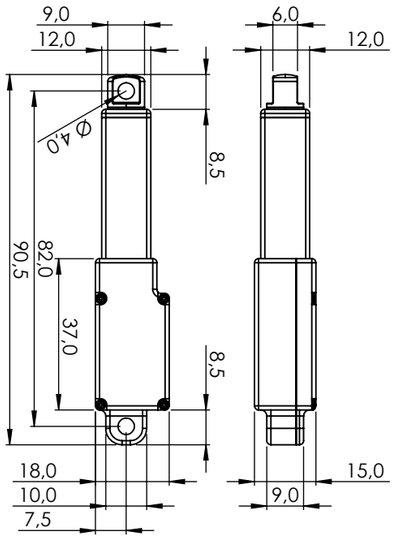
DAkkS Deutsche Akkreditierungsstelle D-ZM-16033-01-00

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

HLS Linear Actuators

HLS12-3050, -30100, -30210, -30380

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



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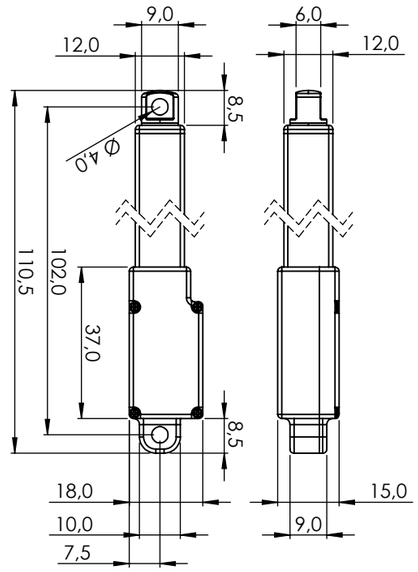
GENERAL SPECIFICATION

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)			22.2kg (217.8N)			
Stall Current	620mA												
Max Static Force	25.2kg (247N) (above)												
Max Side Load (Extended)	4.1kg (40N)												
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 Lengt	160mm												
Connector Wire Gauge	24AWG												
ConnectorWireStrandCount	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



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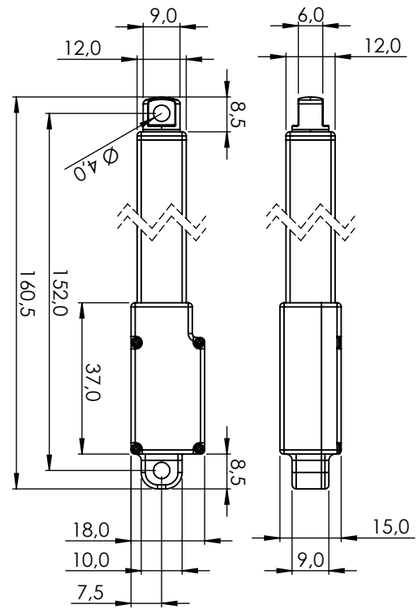
GENERAL SPECIFICATION

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



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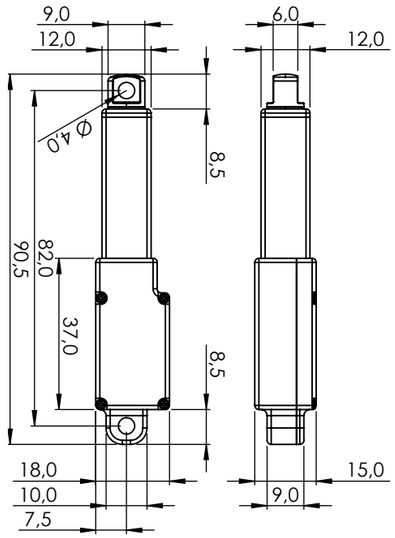
GENERAL SPECIFICATION

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)											
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	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

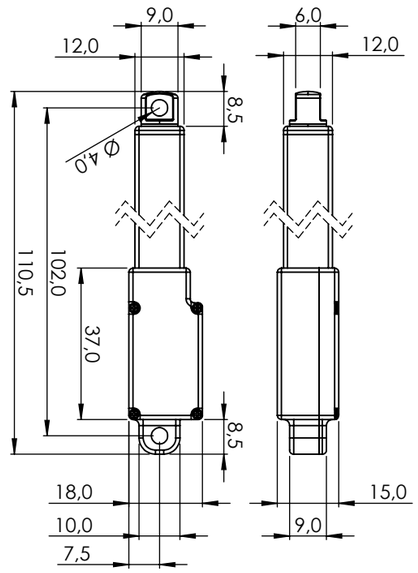


GENERAL SPECIFICATION

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

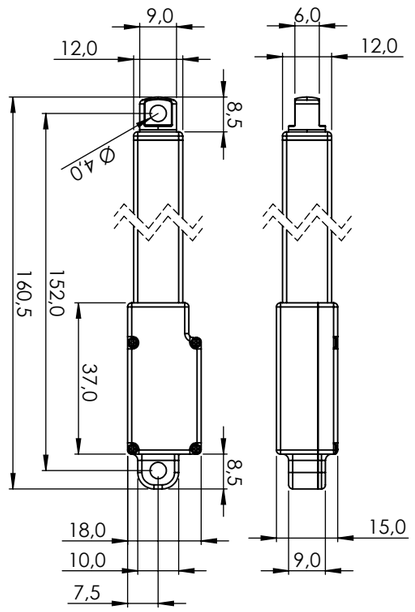


GENERAL SPECIFICATION

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

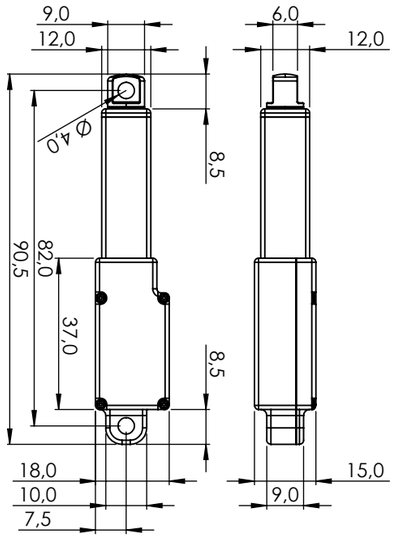


GENERAL SPECIFICATION

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

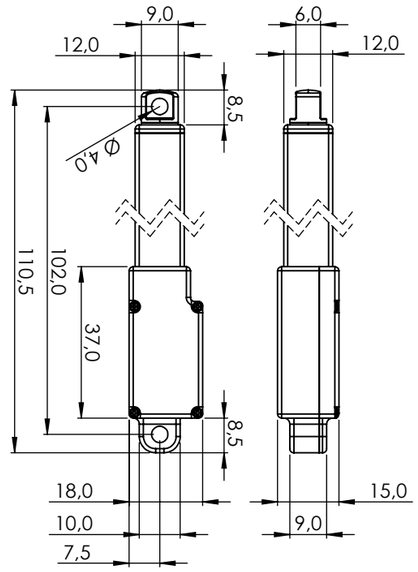


GENERAL SPECIFICATION

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

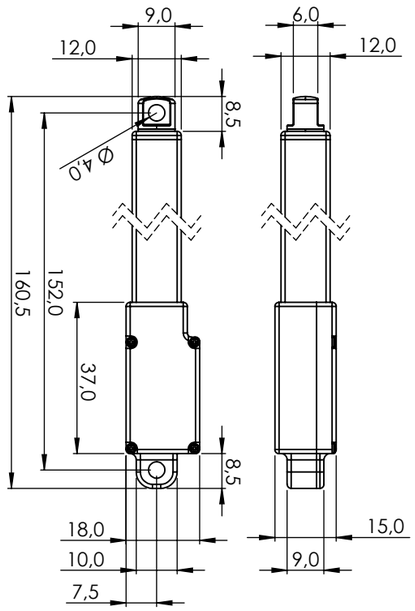


GENERAL SPECIFICATION

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

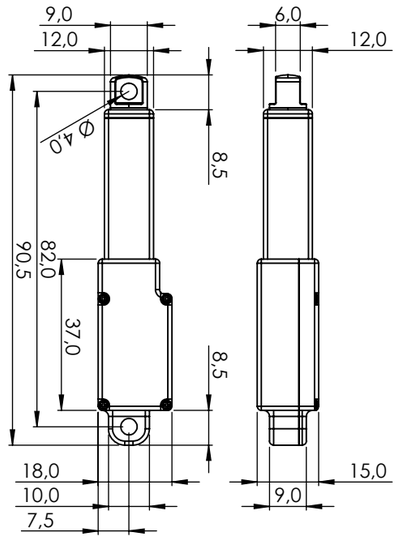


GENERAL SPECIFICATION

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

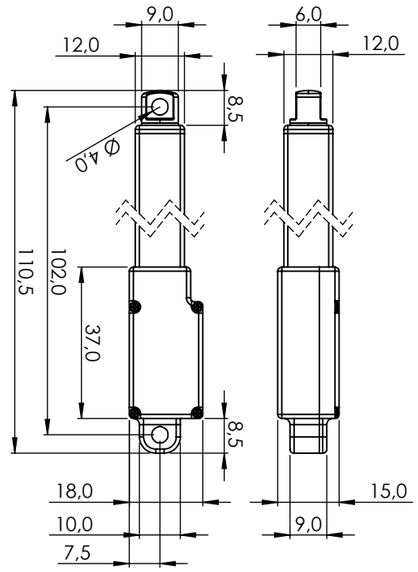


GENERAL SPECIFICATION

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

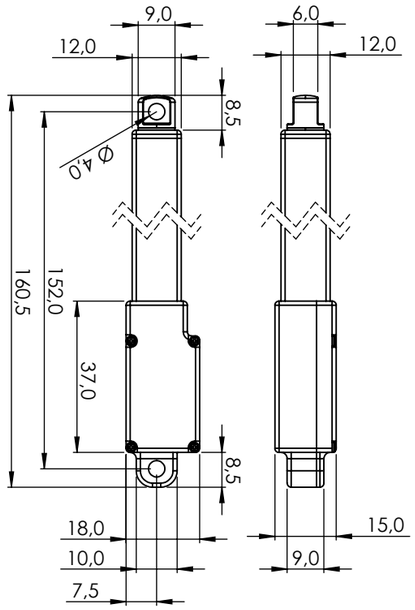


GENERAL SPECIFICATION

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

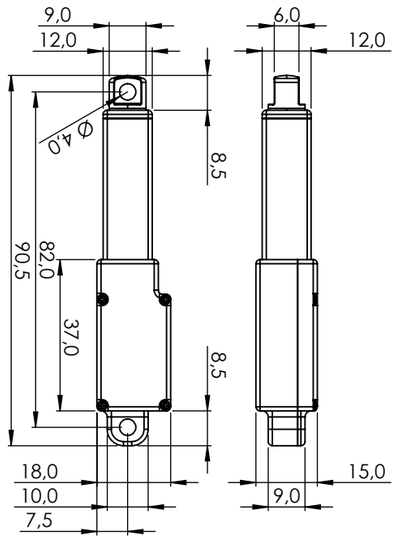


GENERAL SPECIFICATION

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

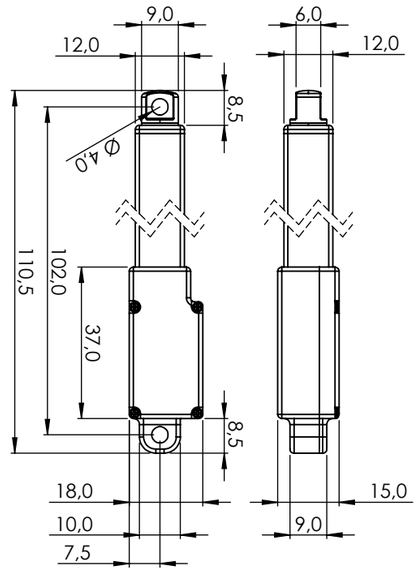


GENERAL SPECIFICATION

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

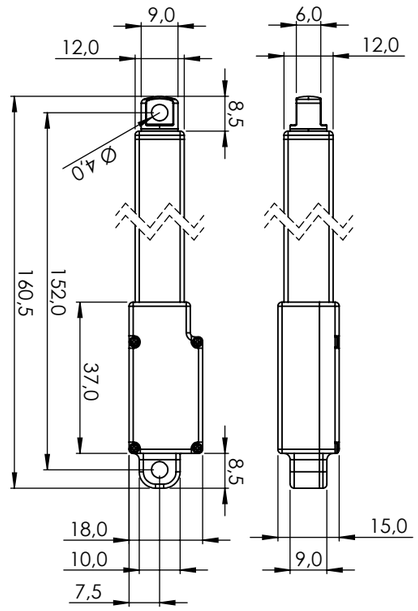


GENERAL SPECIFICATION

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

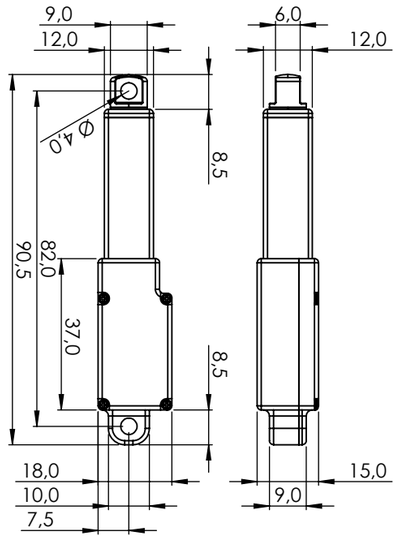


GENERAL SPECIFICATION

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

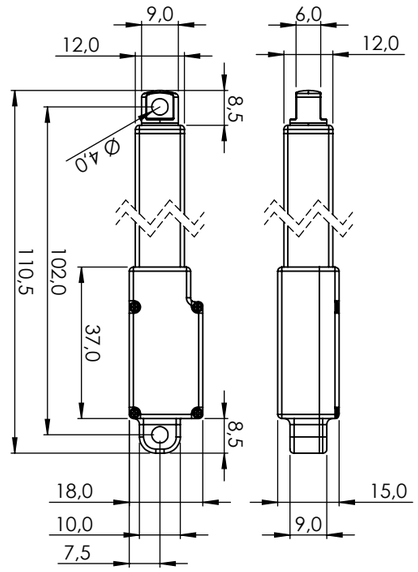


GENERAL SPECIFICATION

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

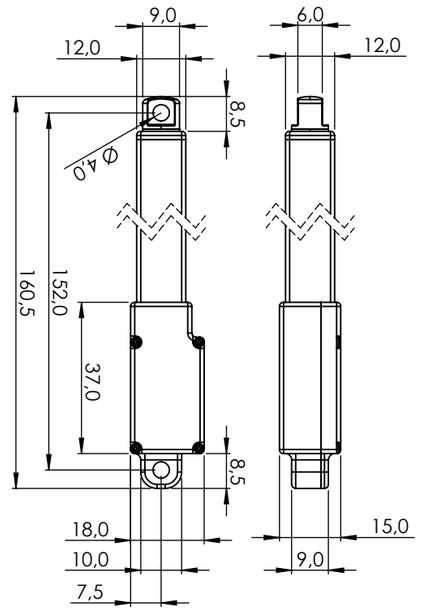


GENERAL SPECIFICATION

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

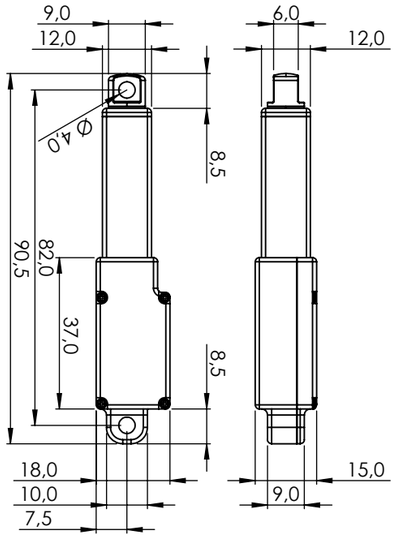


GENERAL SPECIFICATION

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

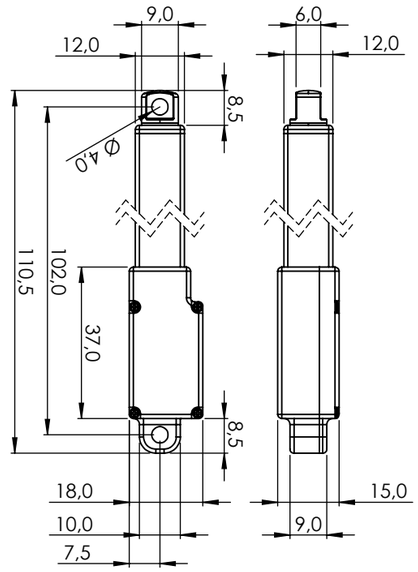


GENERAL SPECIFICATION

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

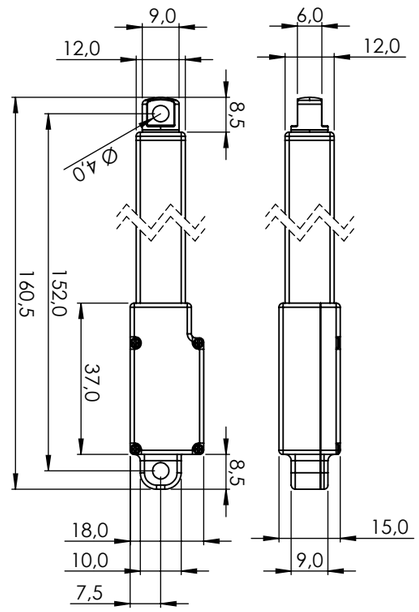


GENERAL SPECIFICATION

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

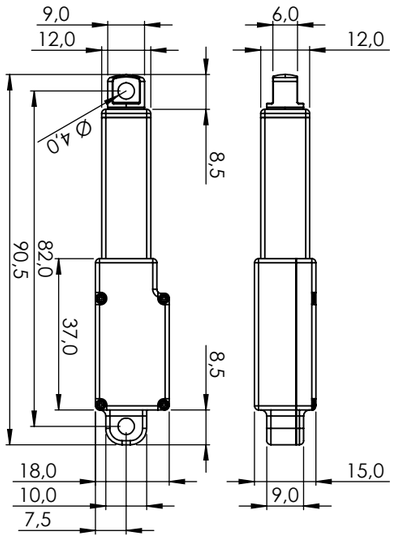


GENERAL SPECIFICATION

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

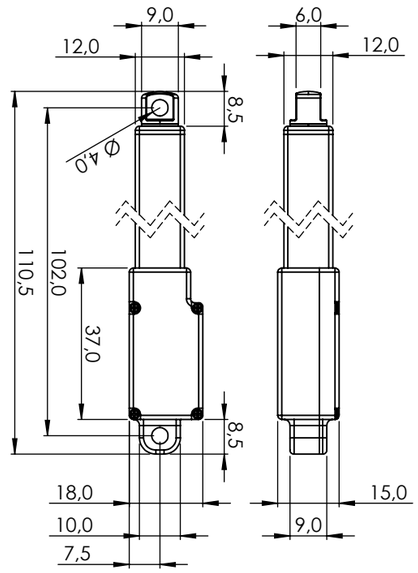


GENERAL SPECIFICATION

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

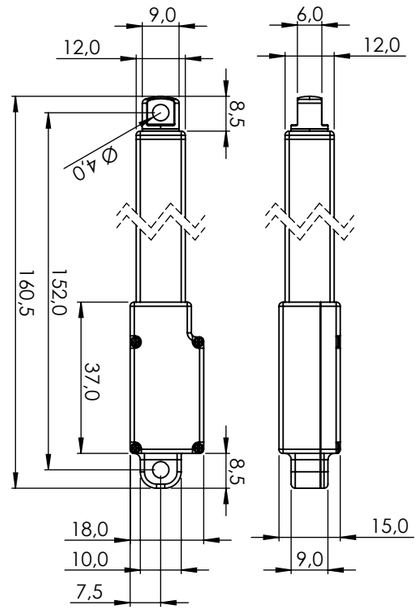


GENERAL SPECIFICATION

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

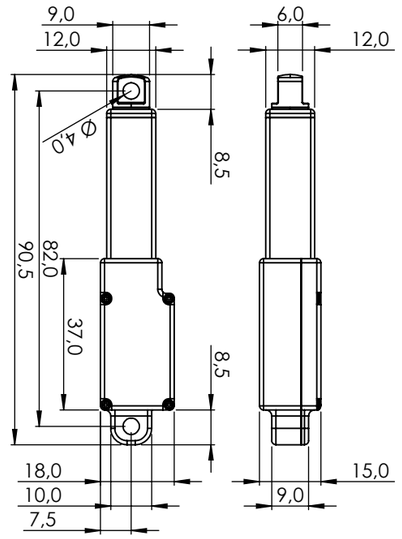


GENERAL SPECIFICATION

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

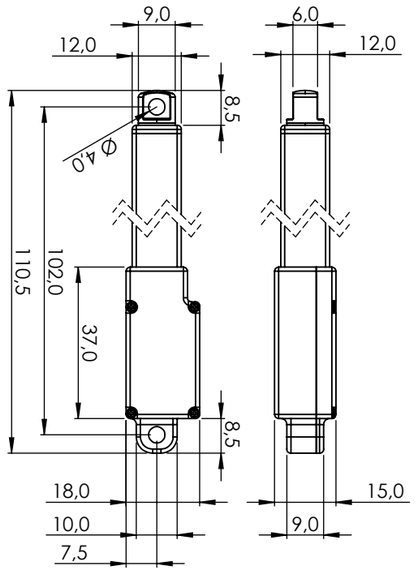


GENERAL SPECIFICATION

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

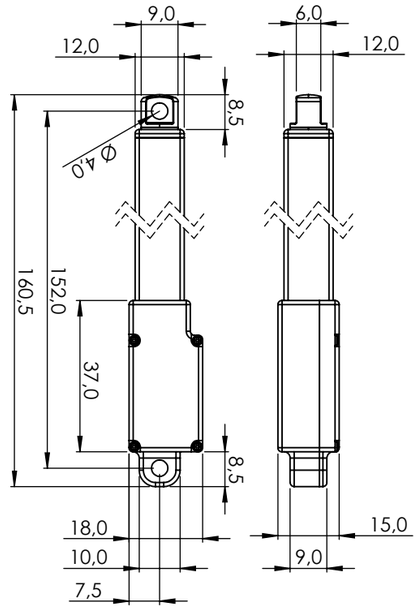


GENERAL SPECIFICATION

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

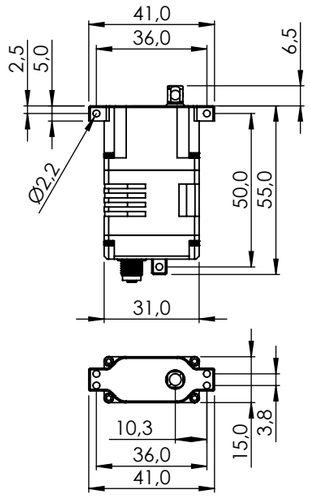


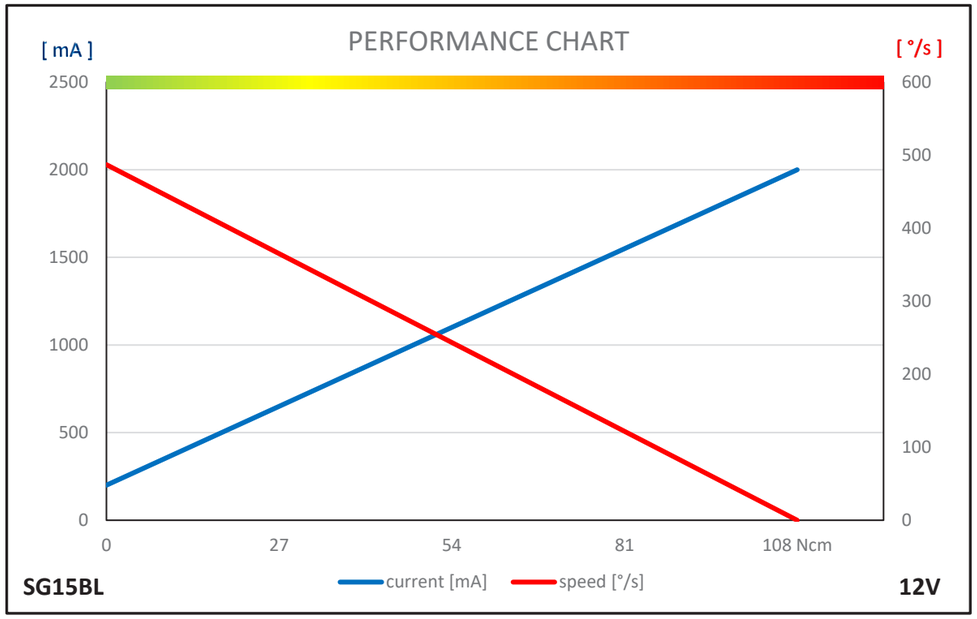
GENERAL SPECIFICATION

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



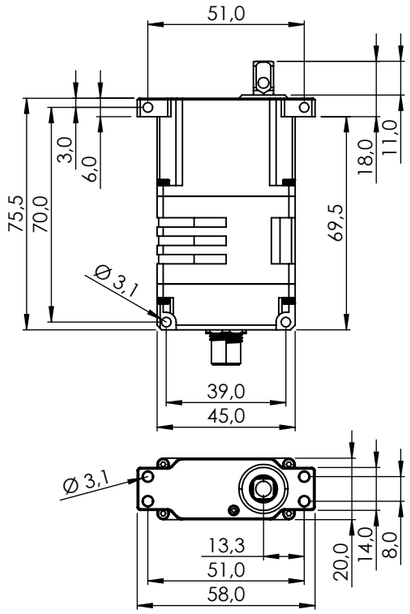


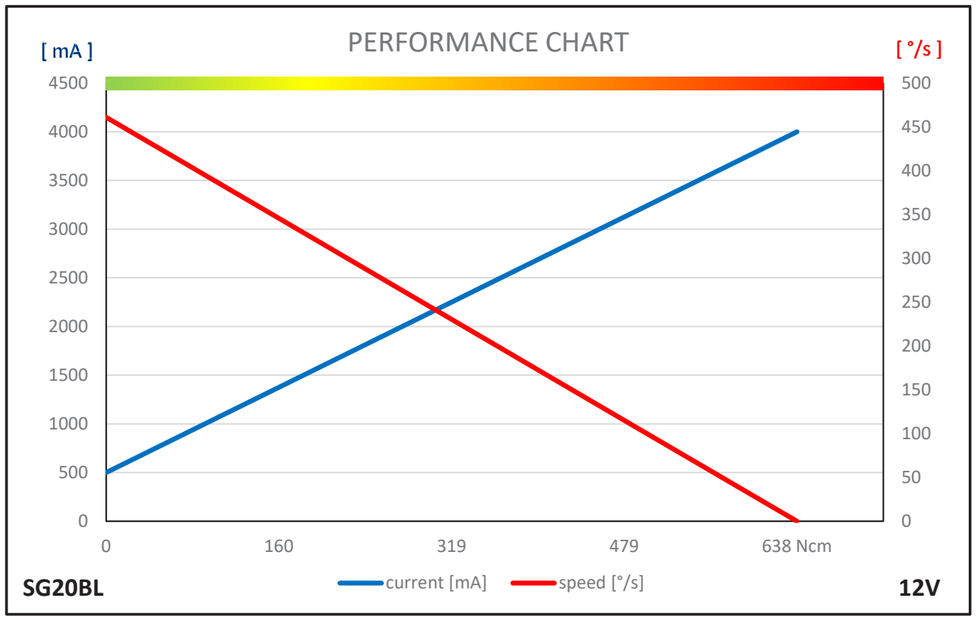
GENERAL SPECIFICATION

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 : ±60º(Default), ±150º(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



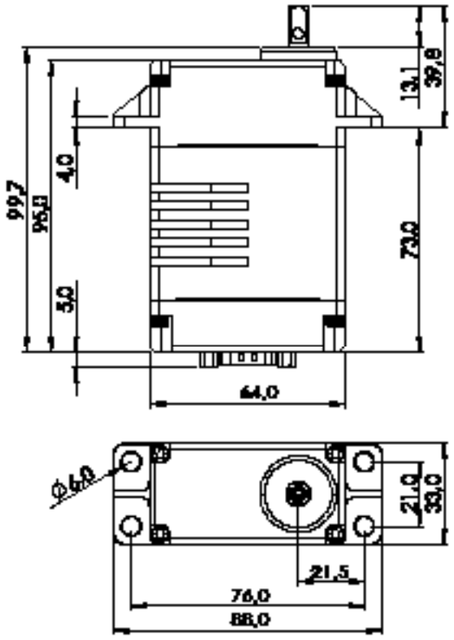


GENERAL SPECIFICATION

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 : ±60º(Default), ±150º(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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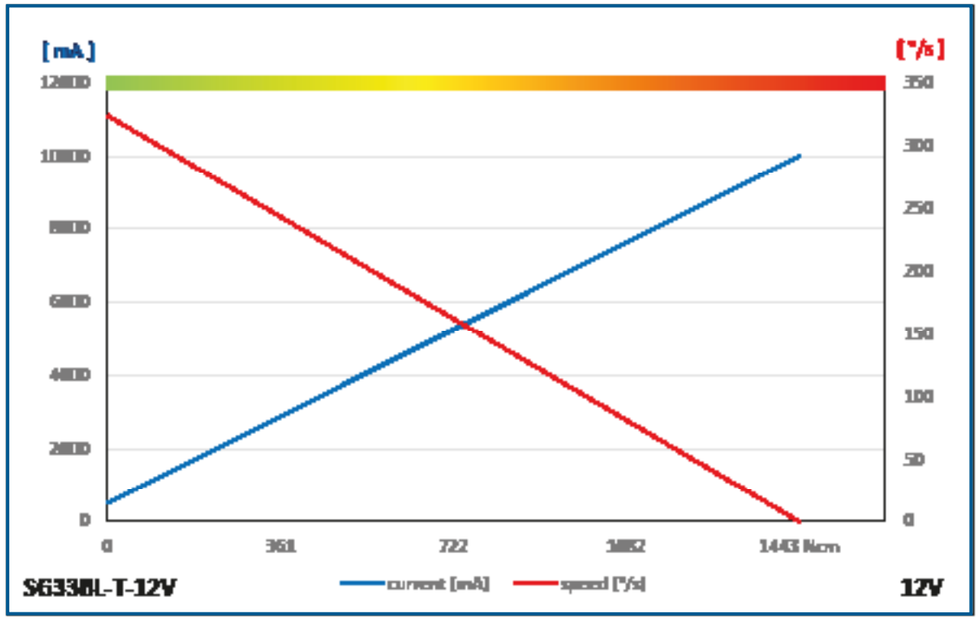
PERFORMANCE CHART

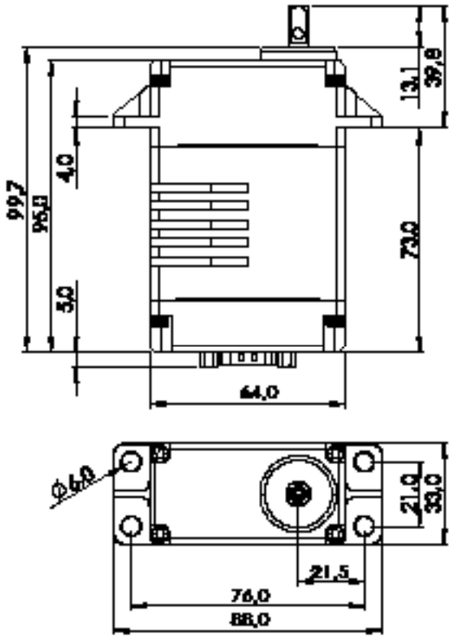


GENERAL SPECIFICATION

	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 Harware, 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-24V (DSUB)

#1-02462



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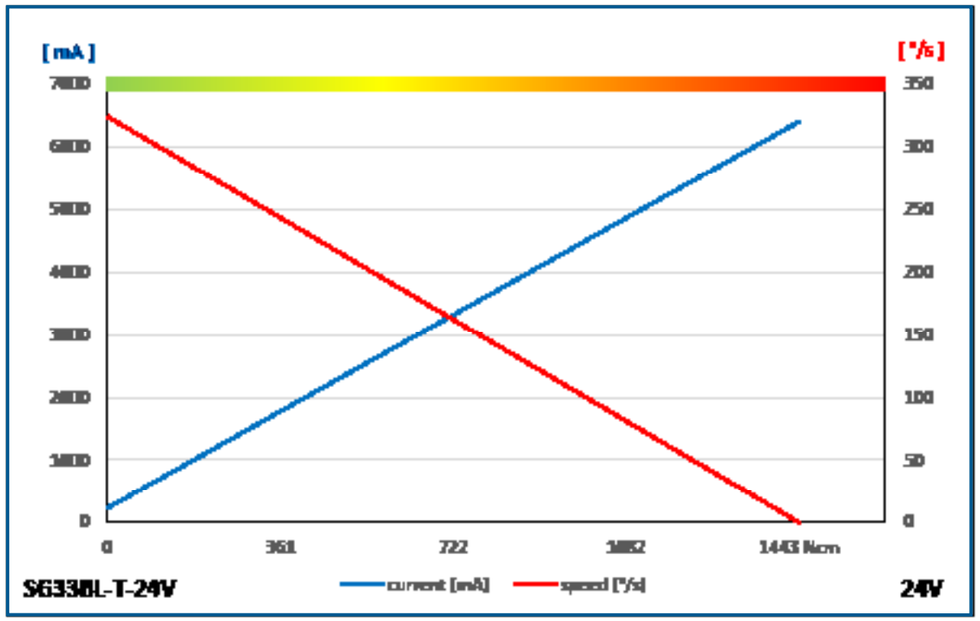
PERFORMANCE CHART

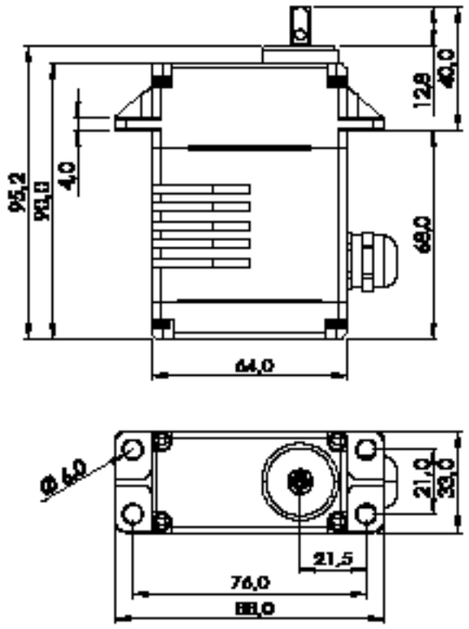


GENERAL SPECIFICATION

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		

SG33BL-T-CAN-12V(GLANDCABLE)

#1-02345



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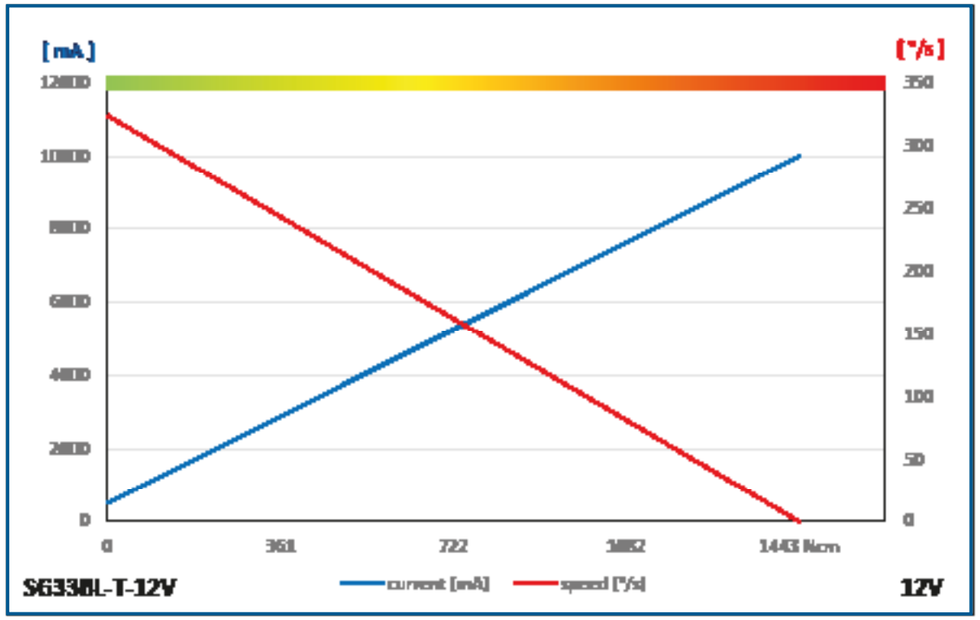
PERFORMANCE CHART

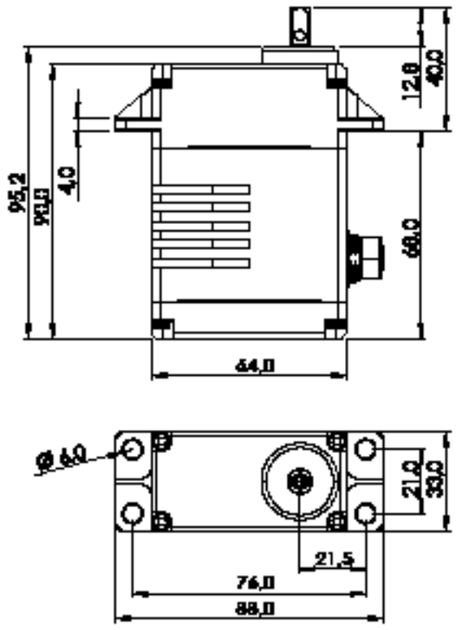


GENERAL SPECIFICATION

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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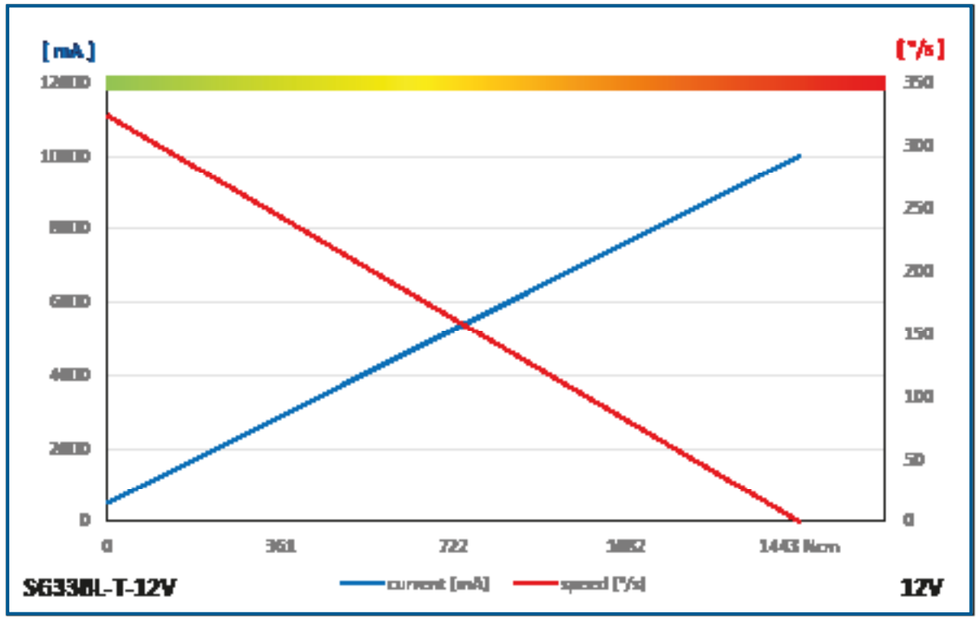
PERFORMANCE CHART

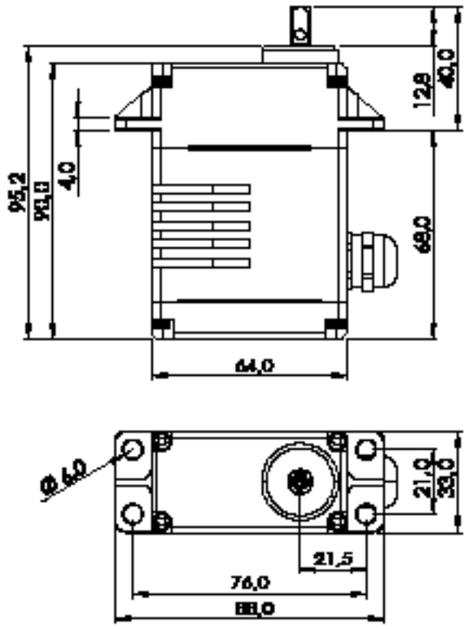


GENERAL SPECIFICATION

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	Rigt
	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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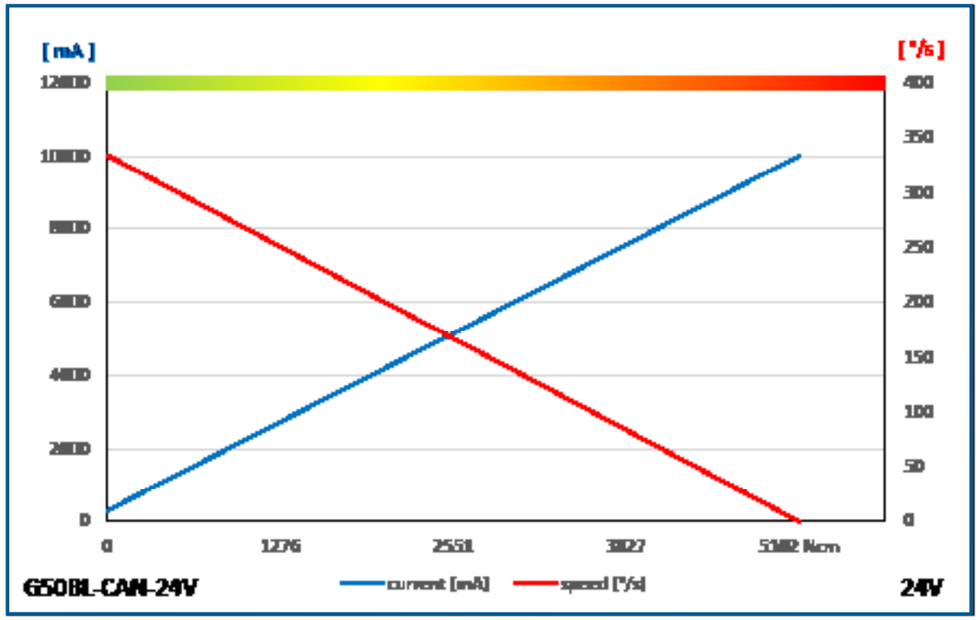
PERFORMANCE CHART

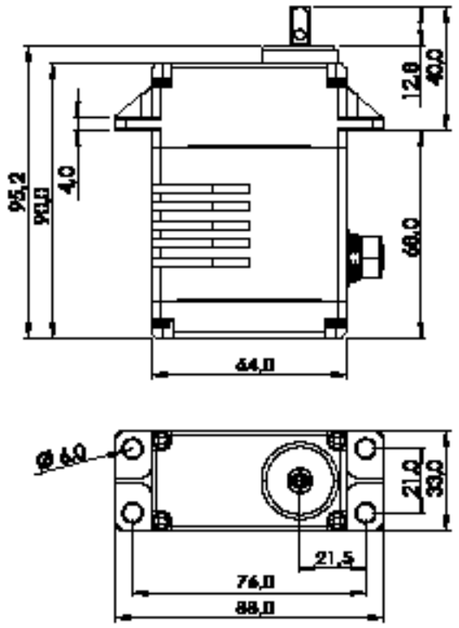


GENERAL SPECIFICATION

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	Rigt
	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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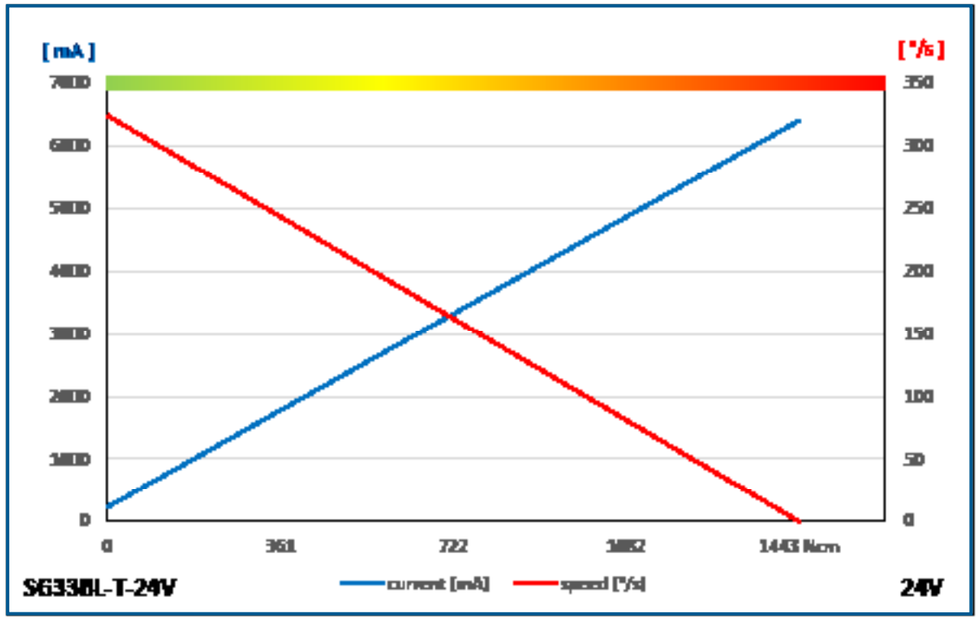
PERFORMANCE CHART

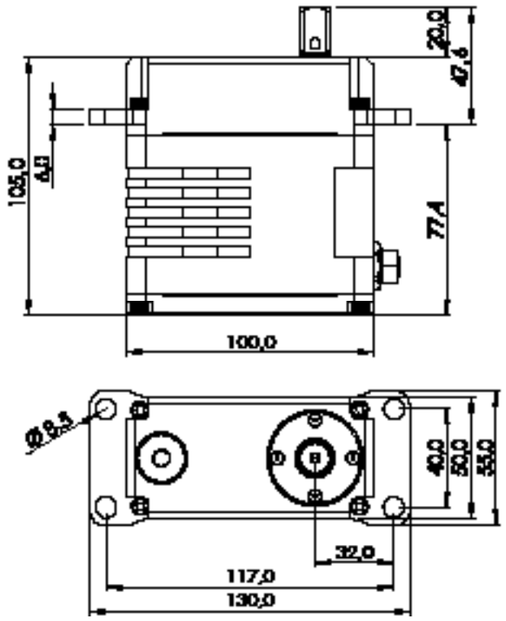


GENERAL SPECIFICATION

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	Rigt
	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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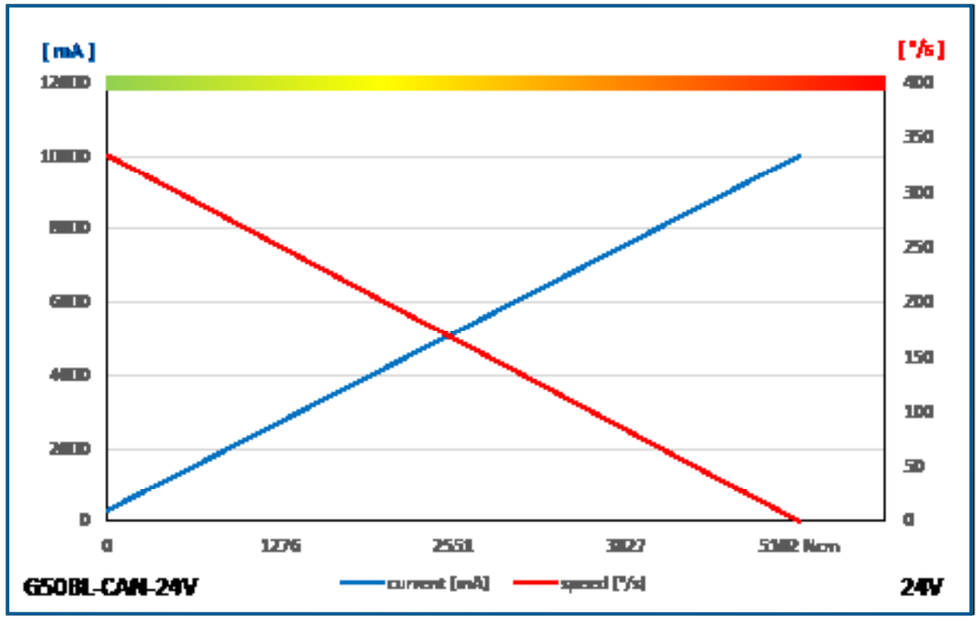
PERFORMANCE CHART



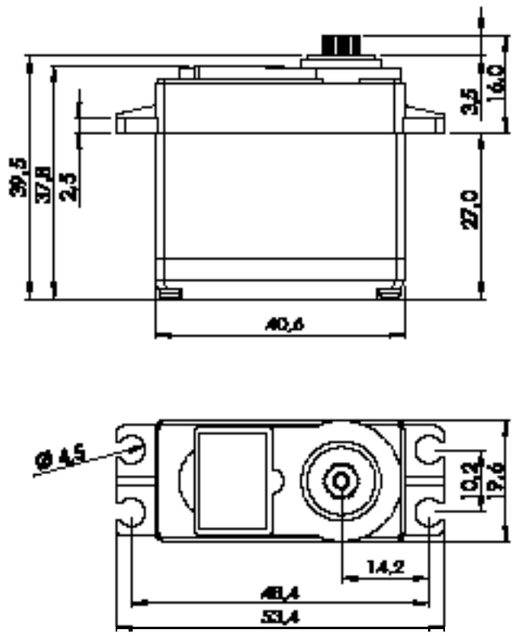
GENERAL SPECIFICATION

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	Rigt
	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-2645CRH

#138645

#1-02360 GP 24 Stück



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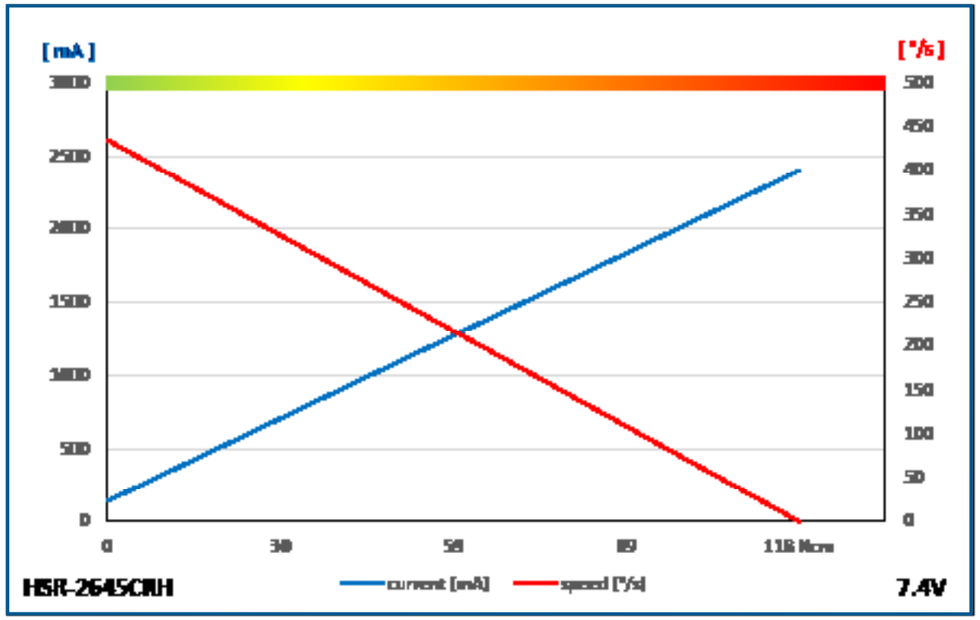
GENERAL SPECIFICATION

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		

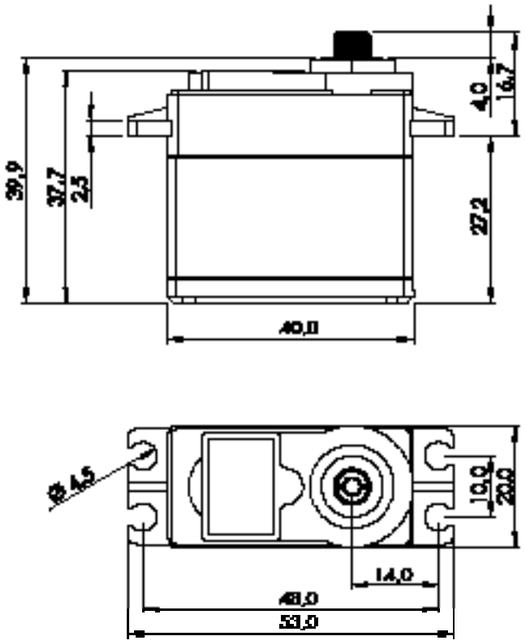
PERFORMANCE CHART



HSB-9465SH

#116465

#1-02355 GP 24 STÜCK



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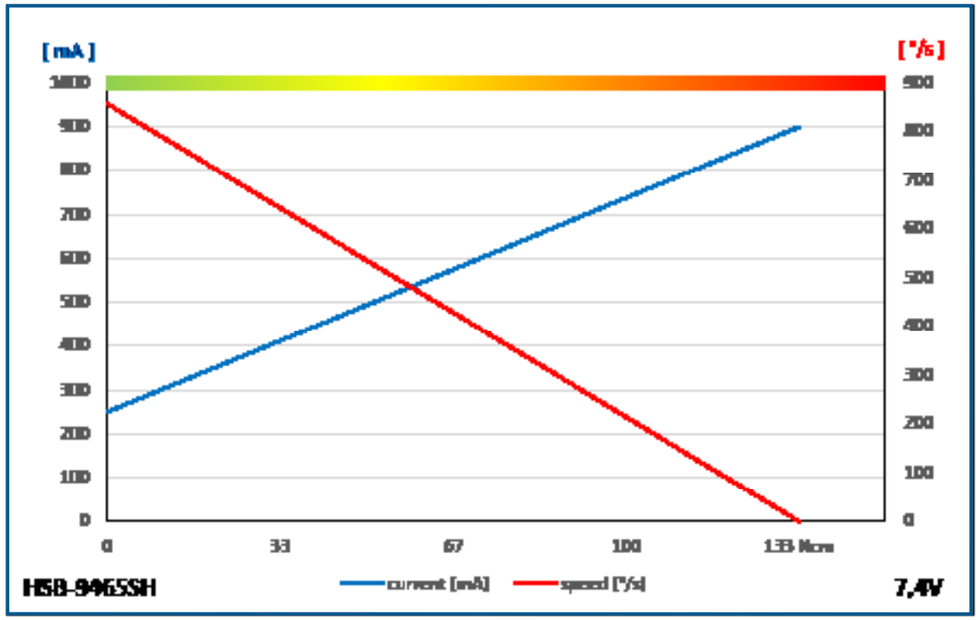
PERFORMANCE CHART



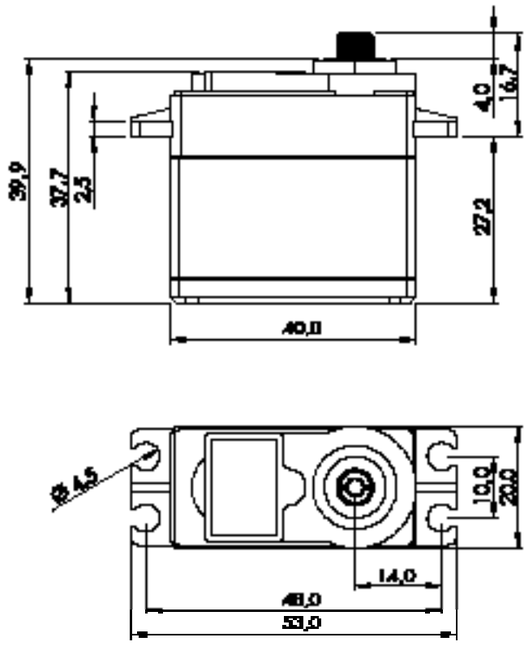
GENERAL SPECIFICATION

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 Cylce Long Life	
Motor Type	BLDC	
Ampflifier / 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

#116485

#1-02356 GP 24 STÜCK



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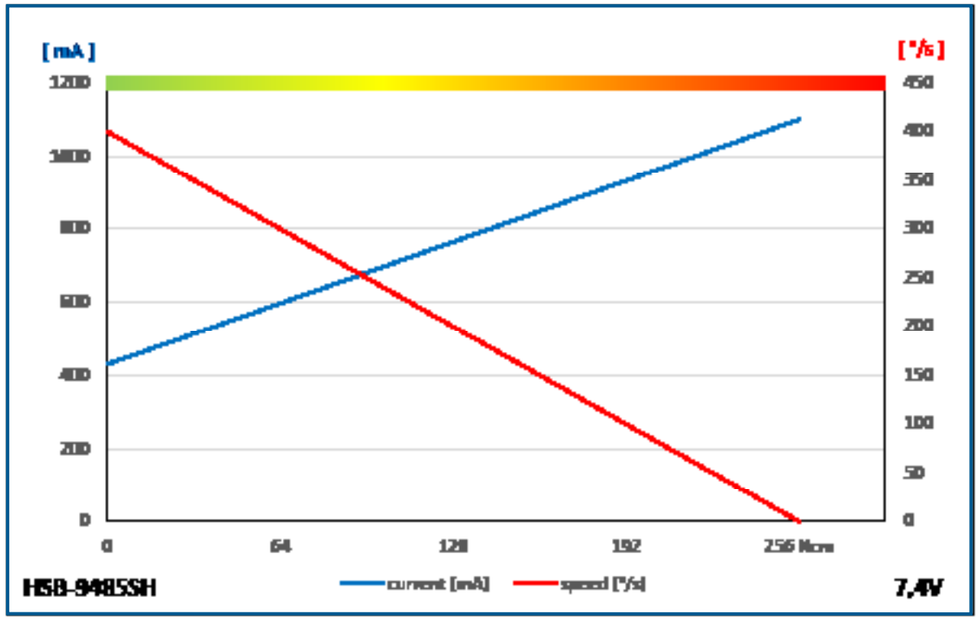
PERFORMANCE CHART



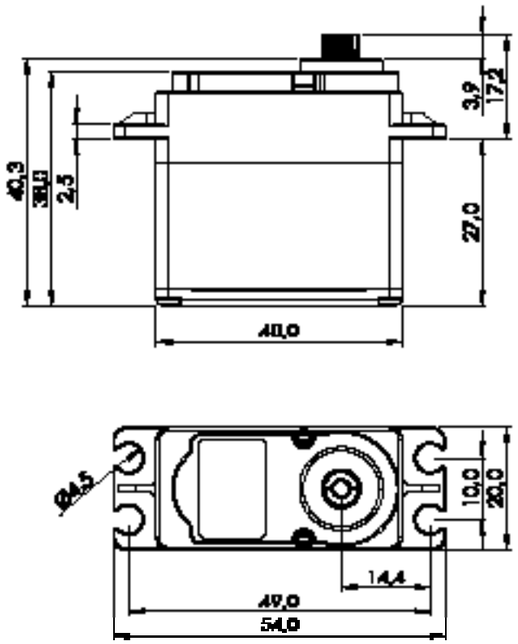
GENERAL SPECIFICATION

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 Cylce 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 Ø6.0	
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°		

HSB-9381TH

#1-00074

#1-02357 GP 24 Stück



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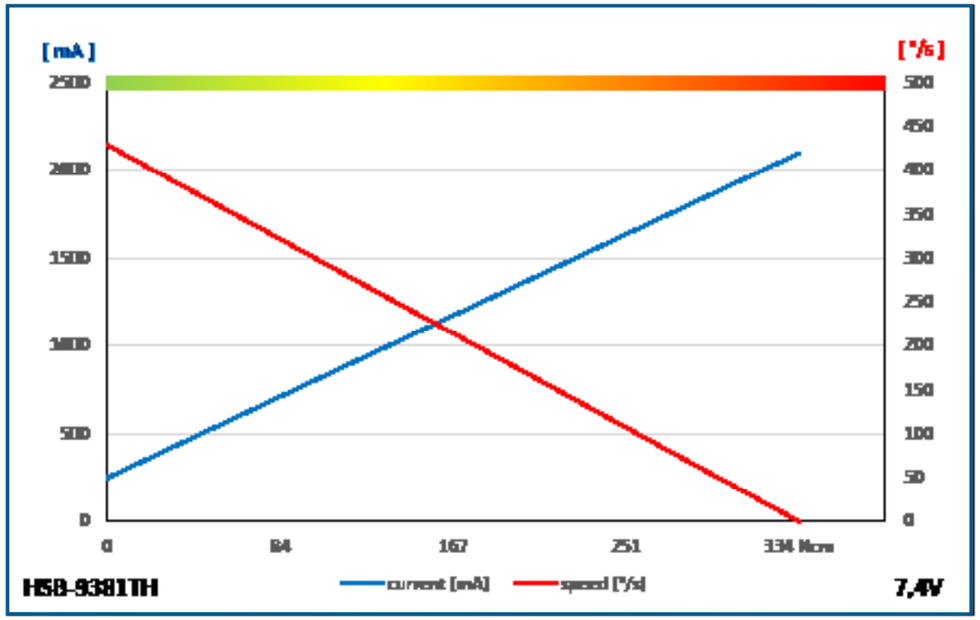
PERFORMANCE CHART



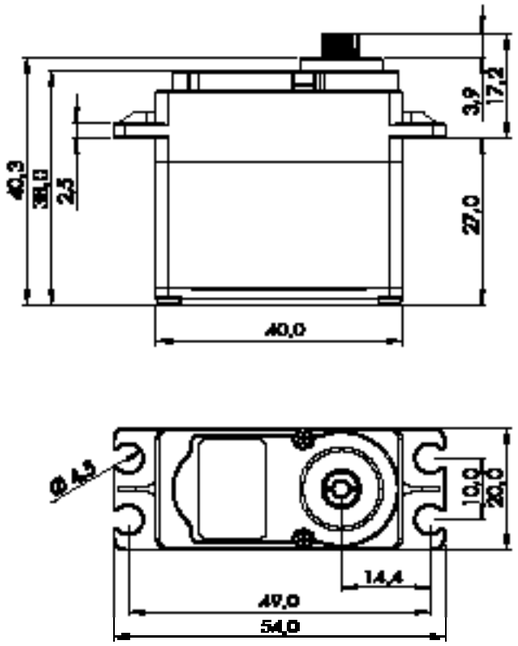
GENERAL SPECIFICATION

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		

HSB-M9381TH

#1-01191

#1-02353 GP 24 Stück



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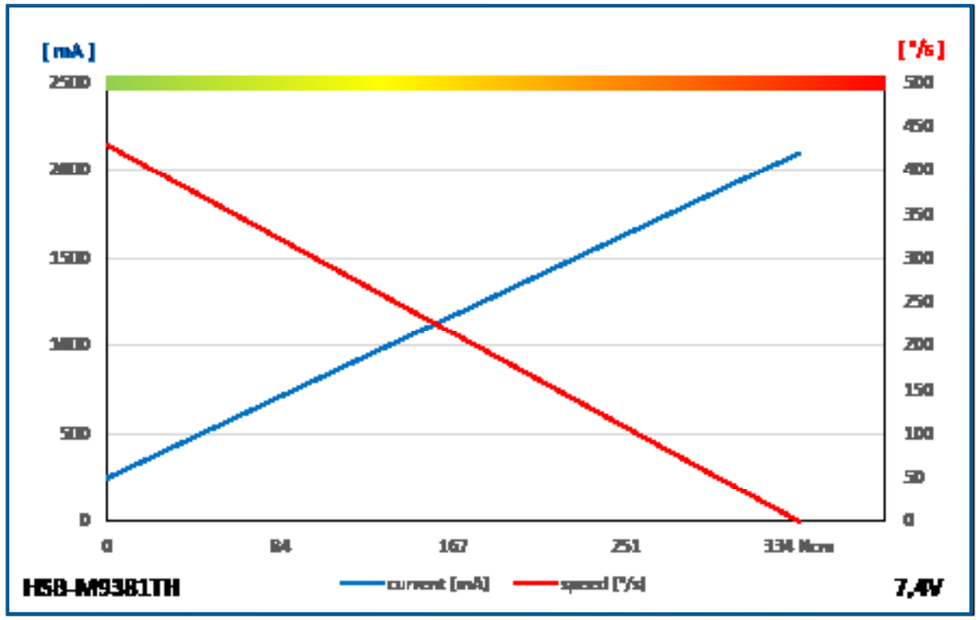
PERFORMANCE CHART

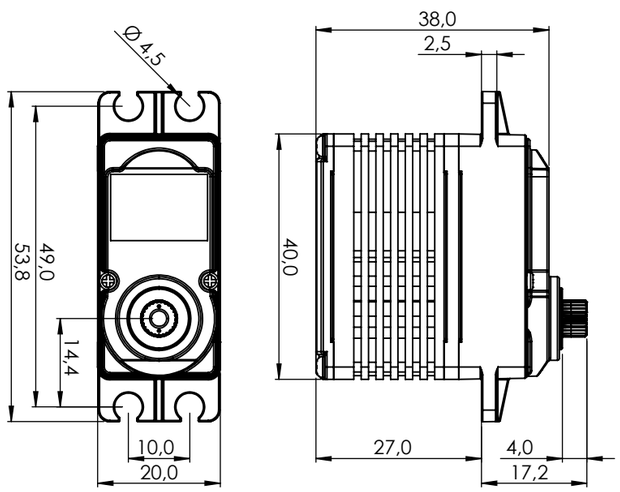


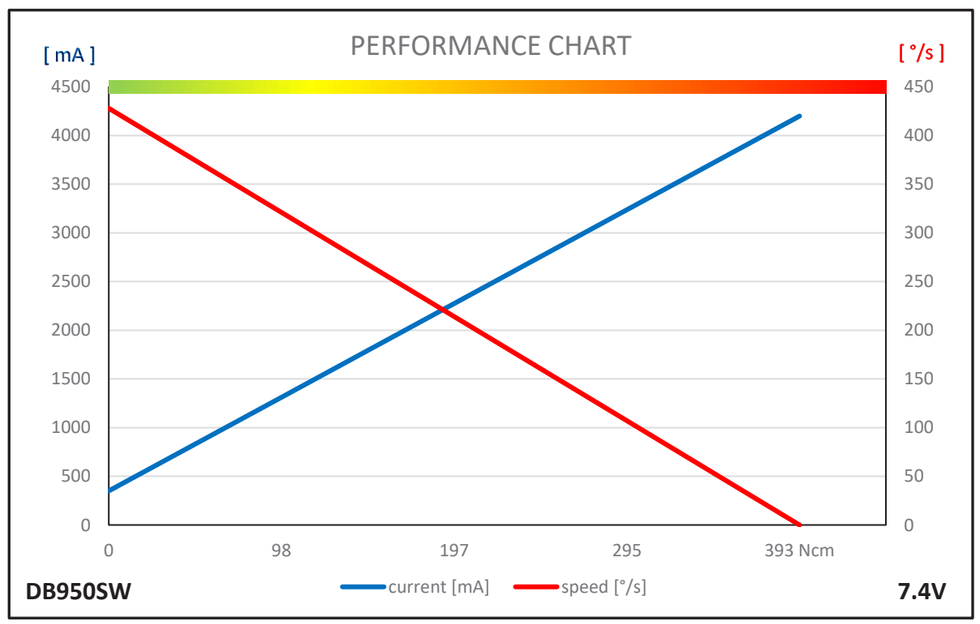
GENERAL SPECIFICATION

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		

DB950SW

1-03218



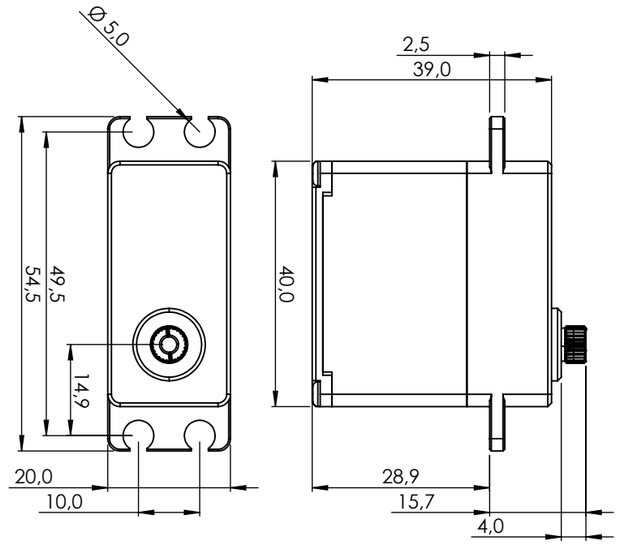


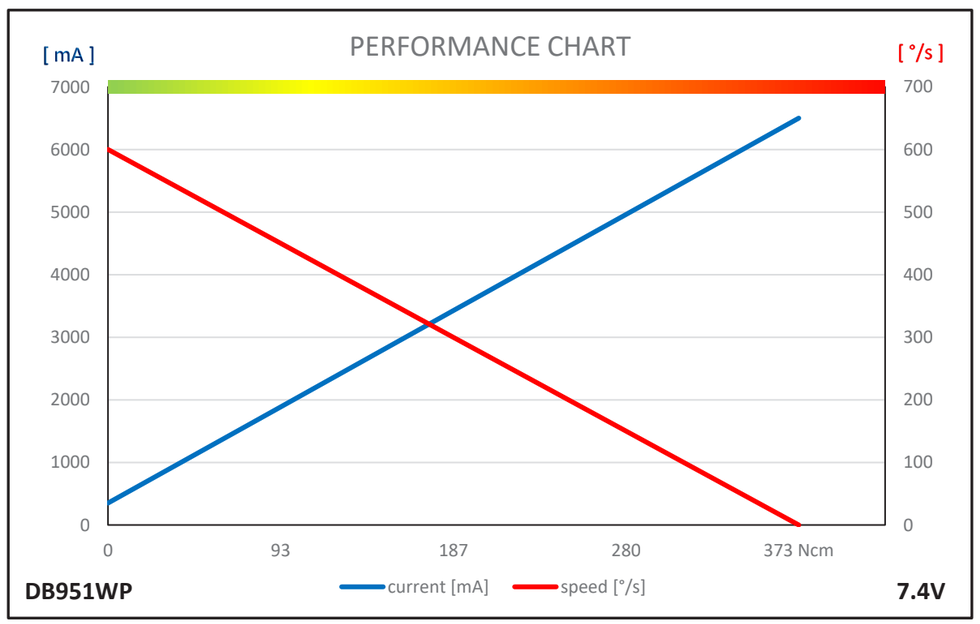
GENERAL SPECIFICATION

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: ±60º, Programmable: Max 175º / 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 38.5mm (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



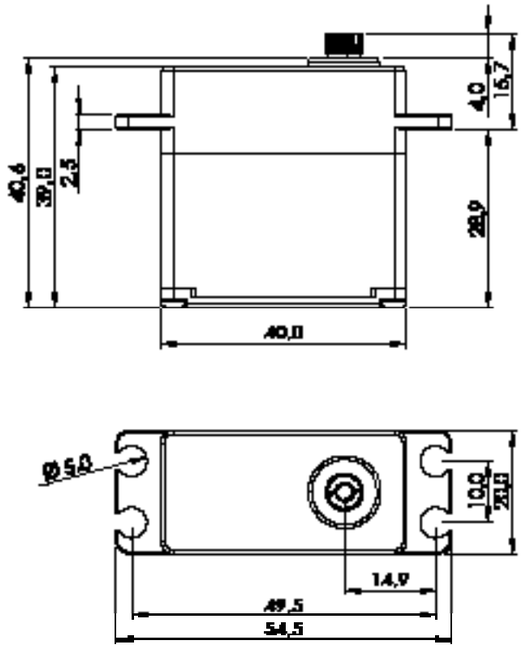


GENERAL SPECIFICATION

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	-	1µs	1µs
Operating Travel	Default: ±60º, Programmable: Max 260º / 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 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		

DB961WP

#1-02571



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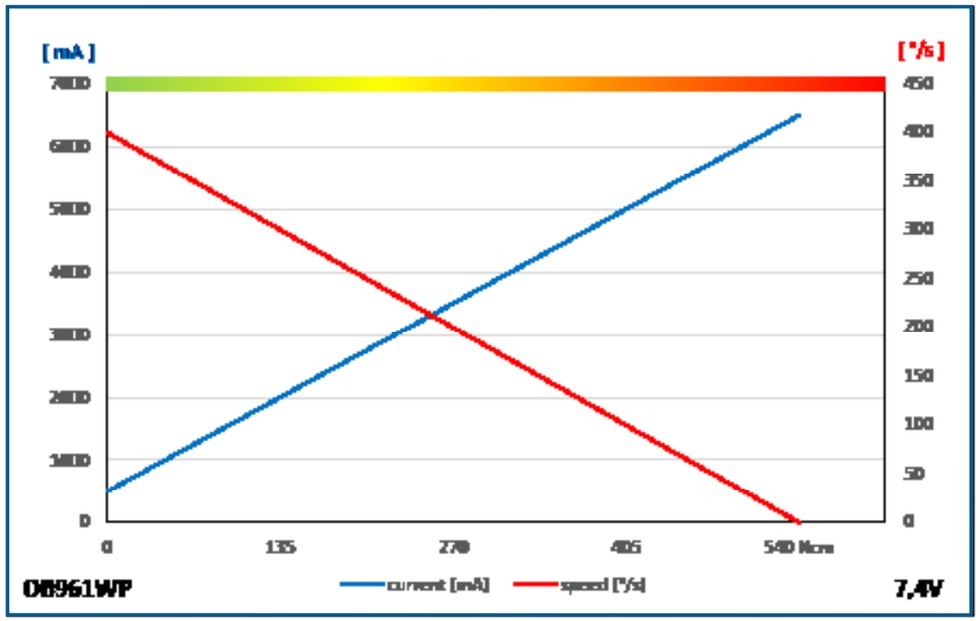
PERFORMANCE CHART



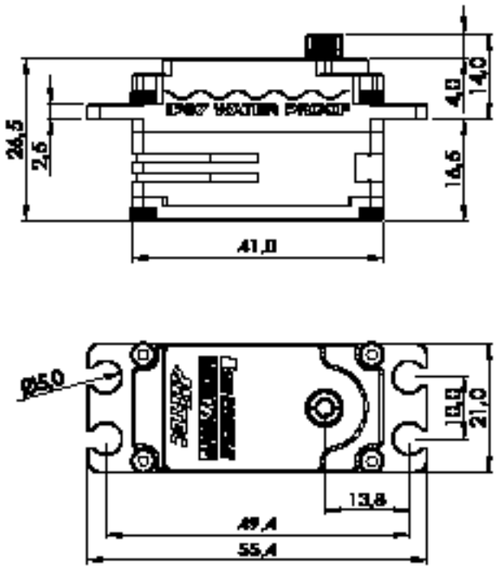
GENERAL SPECIFICATION

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

DB778WP

#1-02853



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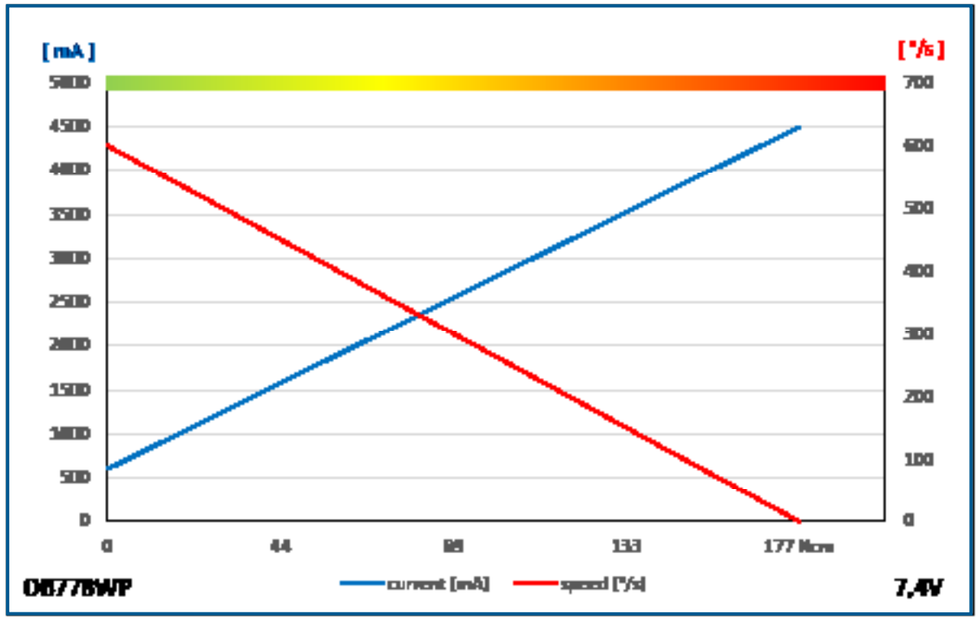
PERFORMANCE CHART



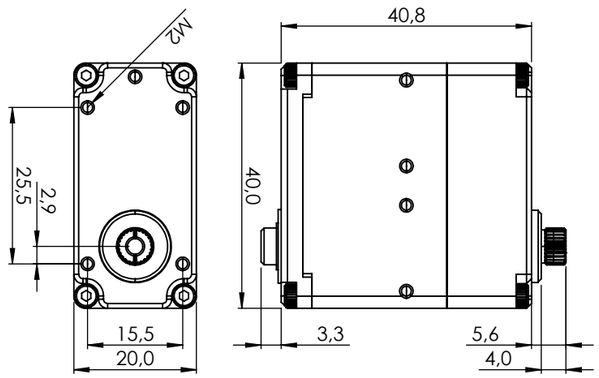
GENERAL SPECIFICATION

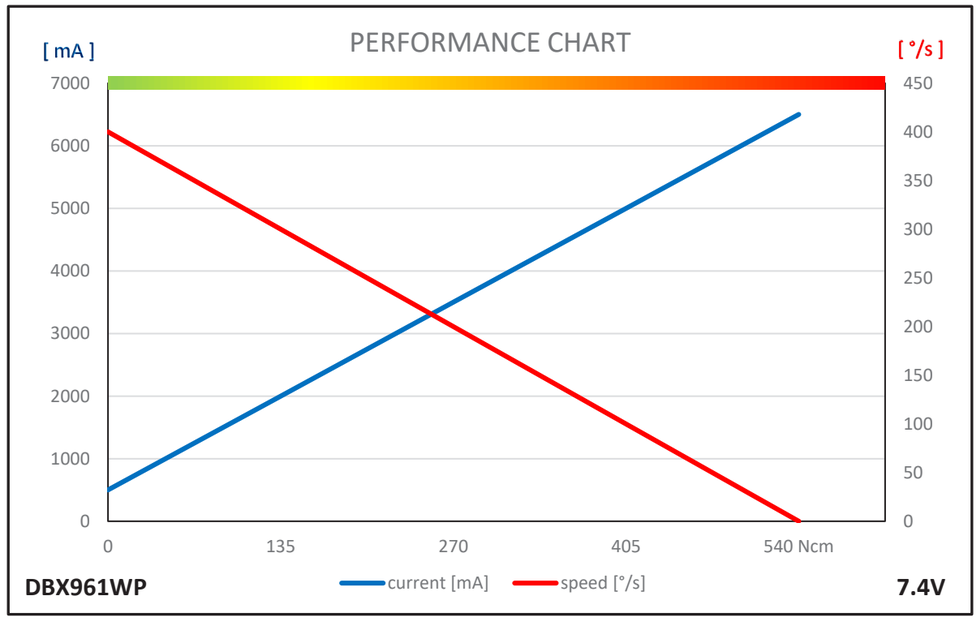
	DB778WP	
Control System	PWM / TTL (Half Duplex)	
	Pulse Width 900µs|1500µs (Center)|2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Contact Analog Potentiometer	
Motor Type	BLDC	
Amplifier / MCU	32bit programmable Digital	
Operating Voltage Range	4.0V ~ 8.4V	
Operating Voltage	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

DBX961WP

1-03226



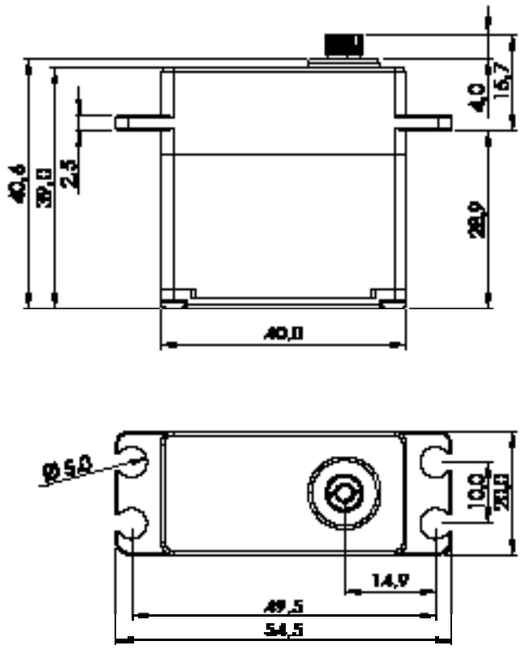


GENERAL SPECIFICATION

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: ±60º, Programmable: Max 260º / 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 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		

MDB941WP-CAN

1-03191



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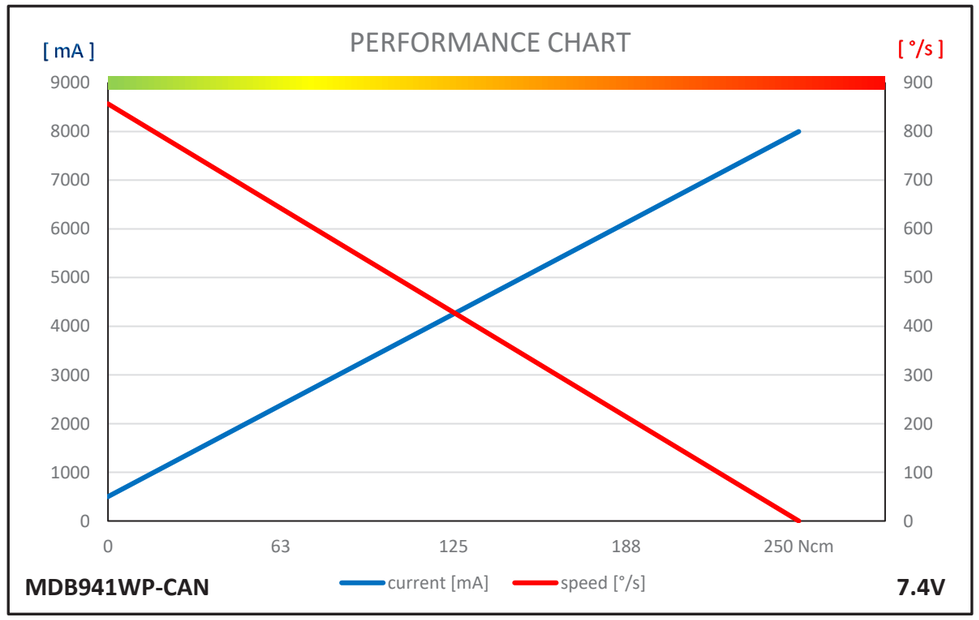
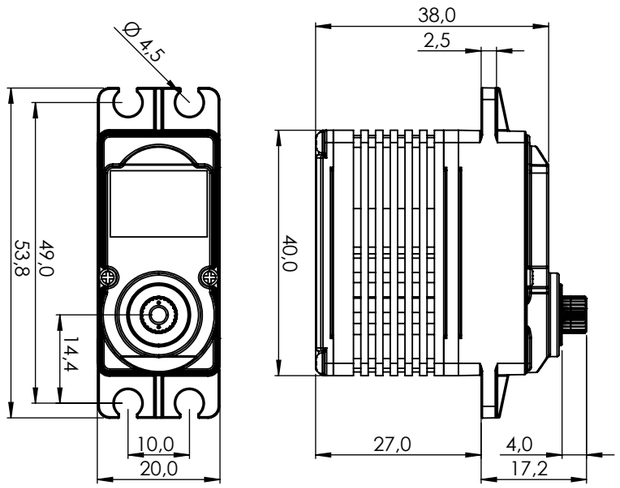


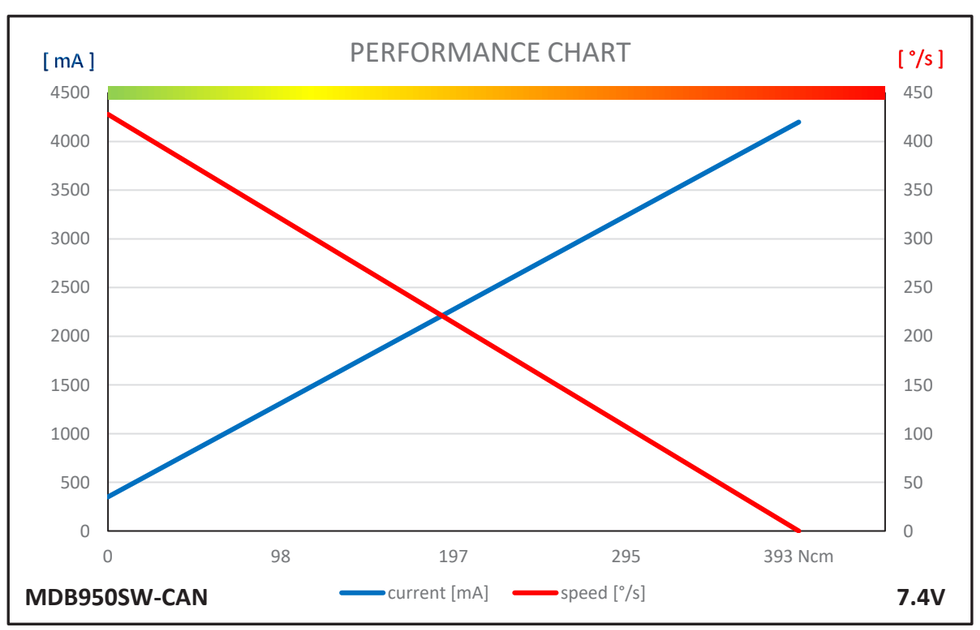
GENERAL SPECIFICATION

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 : ±60º(Default), ±150º(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 (11.811inch)		
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



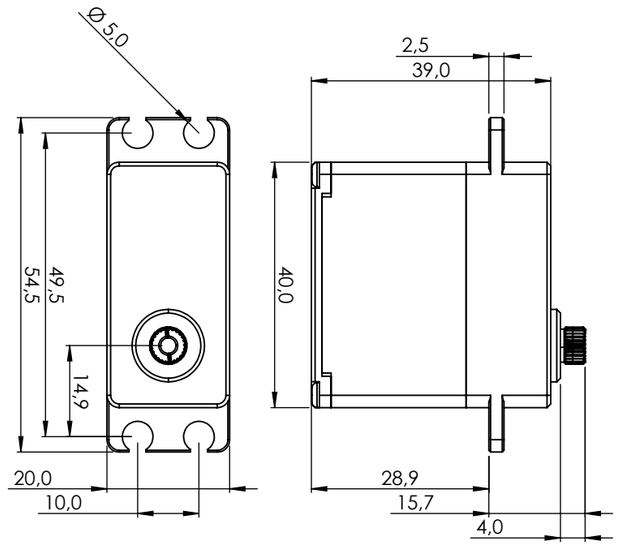


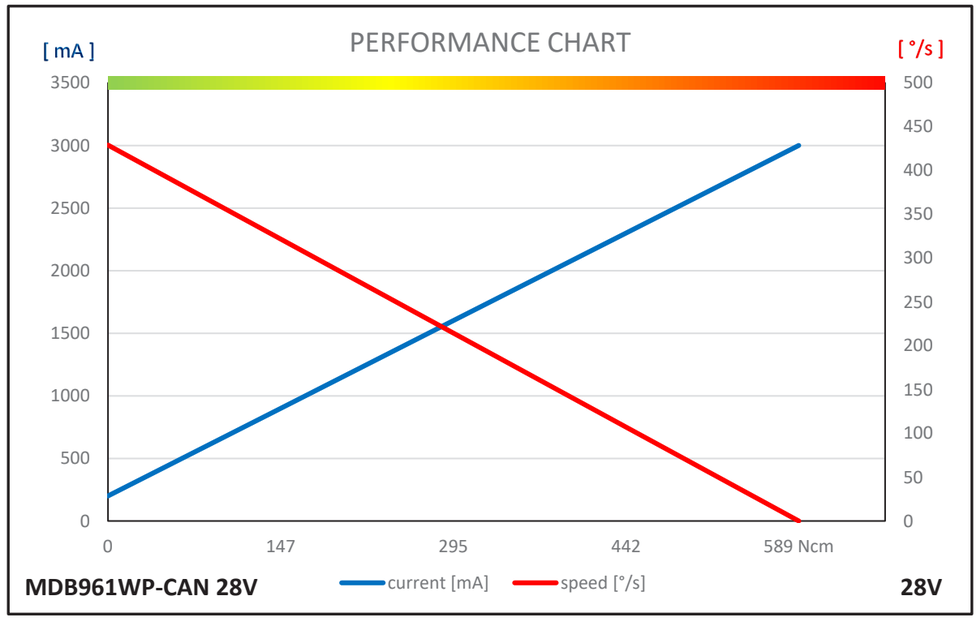
GENERAL SPECIFICATION

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 : ±60º(Default), ±150º(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 (11.811inch)		
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-CAN

1-03004



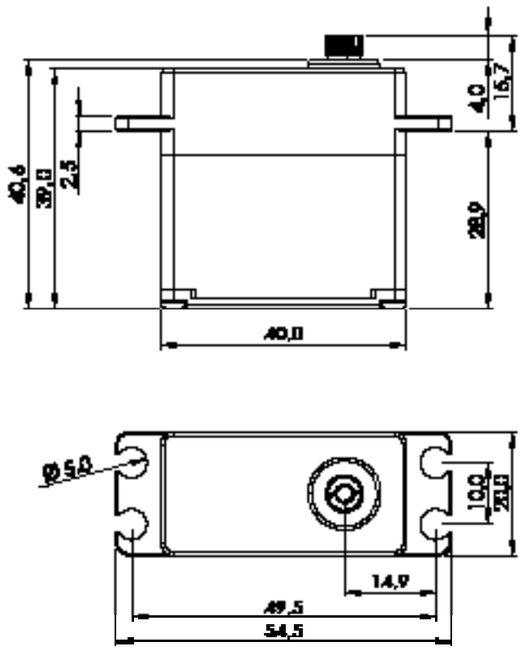


GENERAL SPECIFICATION

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 : ±60º(Default), ±150º(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 (11.811inch)		
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



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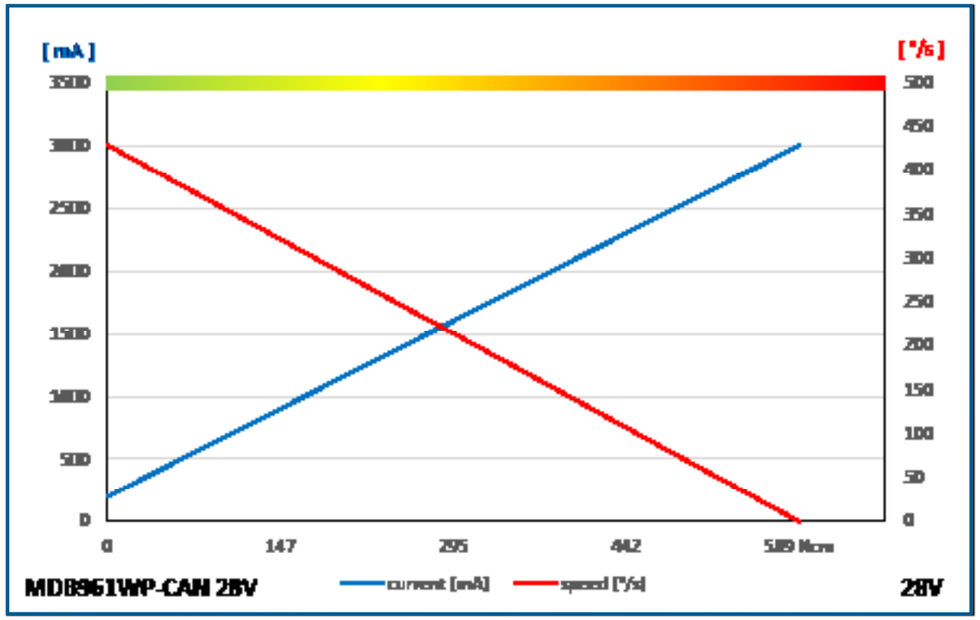
PERFORMANCE CHART

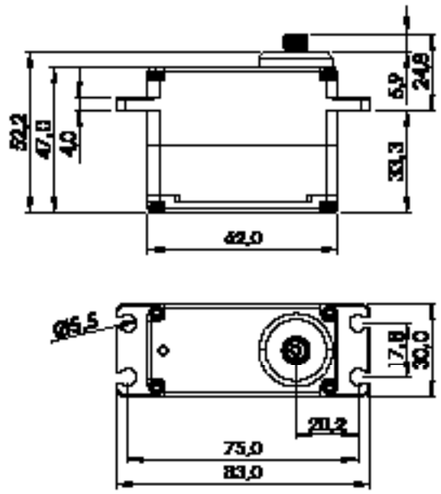


GENERAL SPECIFICATION

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	Rigt
	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				

MDB1200WP

#1-03109



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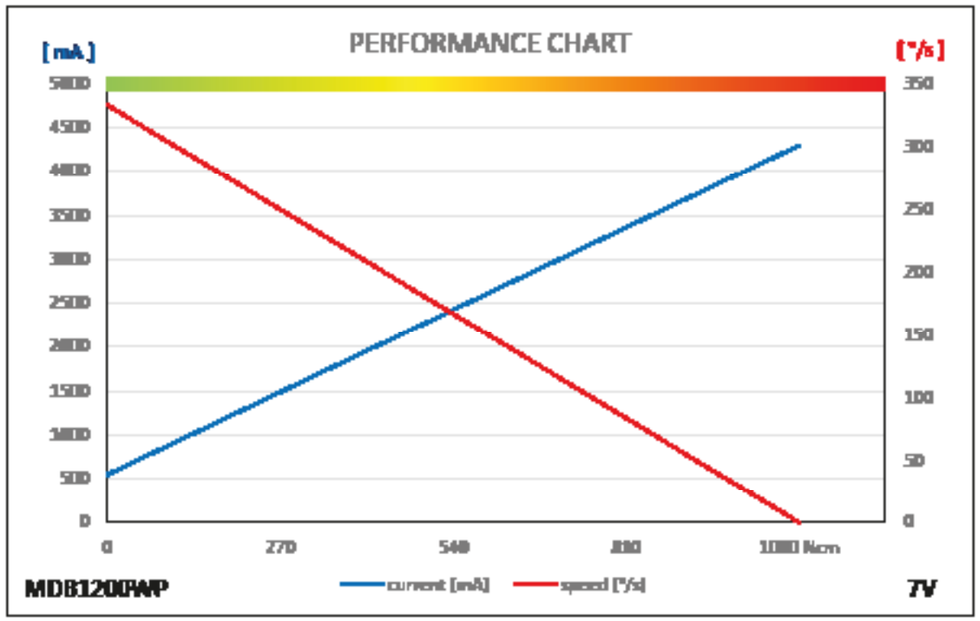
PERFORMANCE CHART



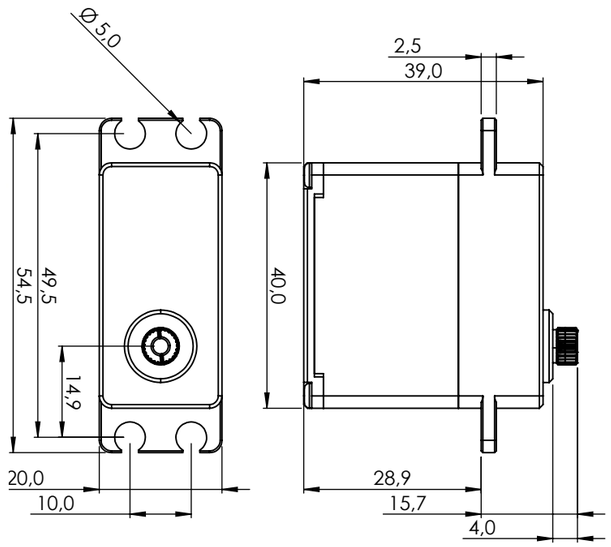
GENERAL SPECIFICATION

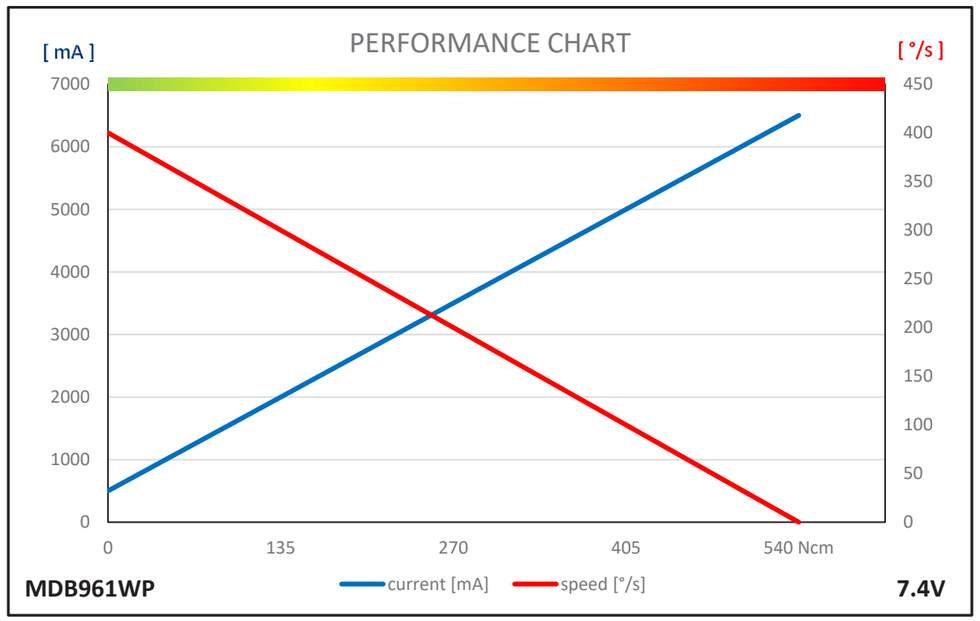
	MDB1200WP	
Control System	PWM / TTL (Half Duplex)	
	Pulse Width 900µs|1500µs (Center)|2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Contactless Magnetic Encoder	
Motor Type	BLDC	
Amplifier / MCU	32bit programmable Digital	
Operating Voltage Range	4.0V ~ 8.4V	
Operating Voltage	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

MDB961WP

1-03225



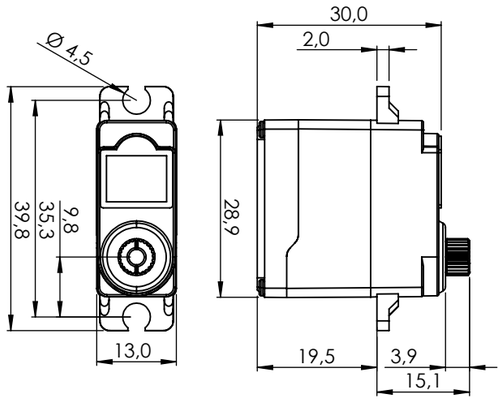


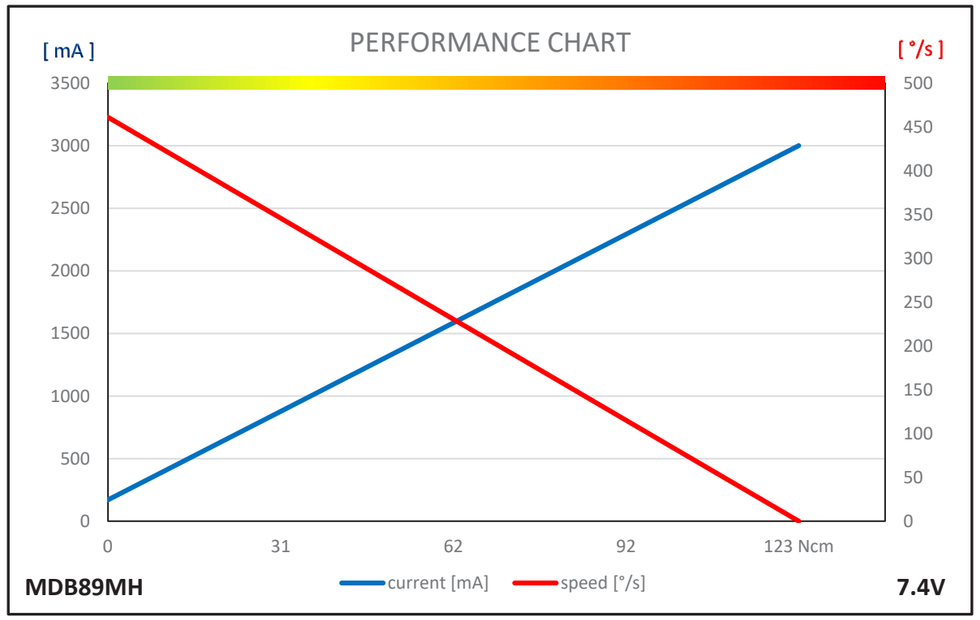
GENERAL SPECIFICATION

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: ±60º, Programmable: Max 320º / 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 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		

MDB89MH

1-03276



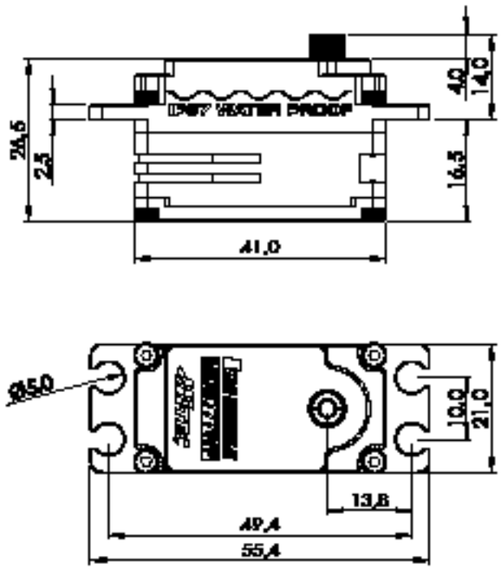


GENERAL SPECIFICATION

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: ±60º, Programmable: Max 175º / 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



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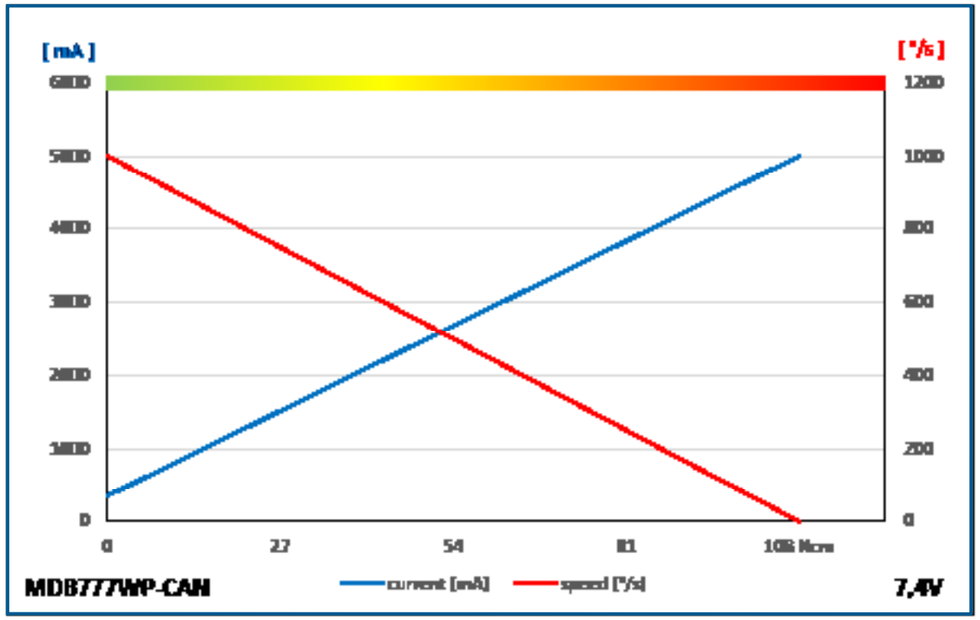
PERFORMANCE CHART

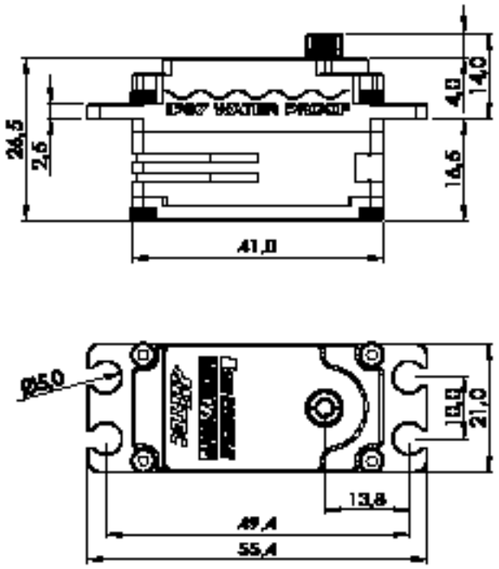


GENERAL SPECIFICATION

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	Rigt
	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



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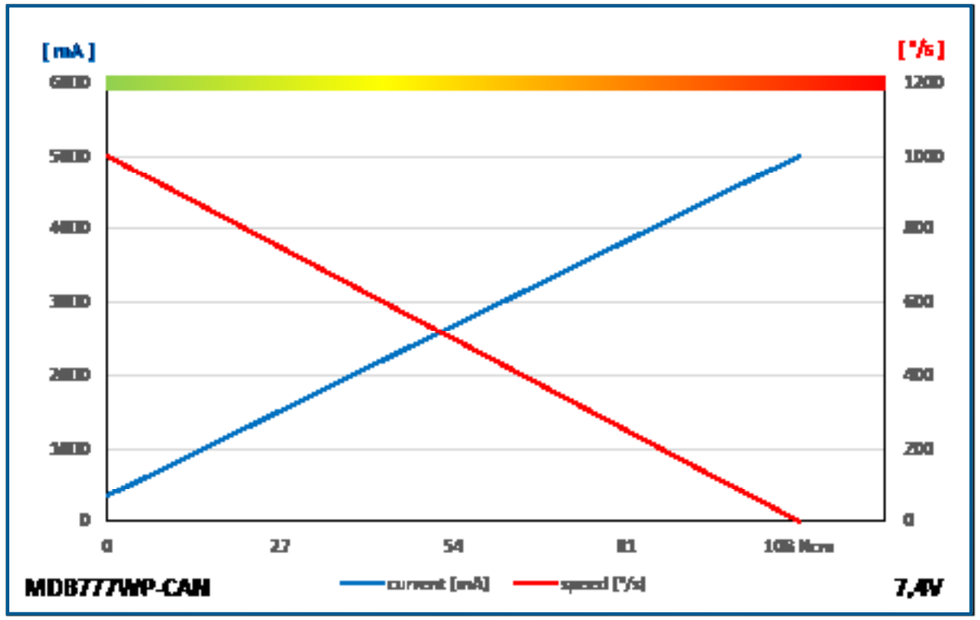
PERFORMANCE CHART

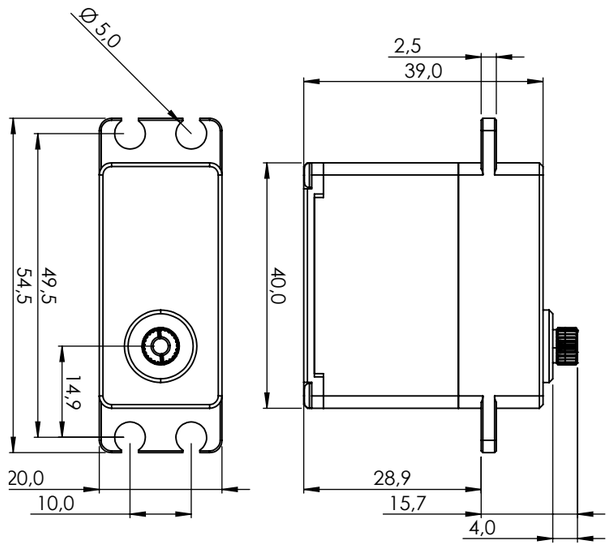


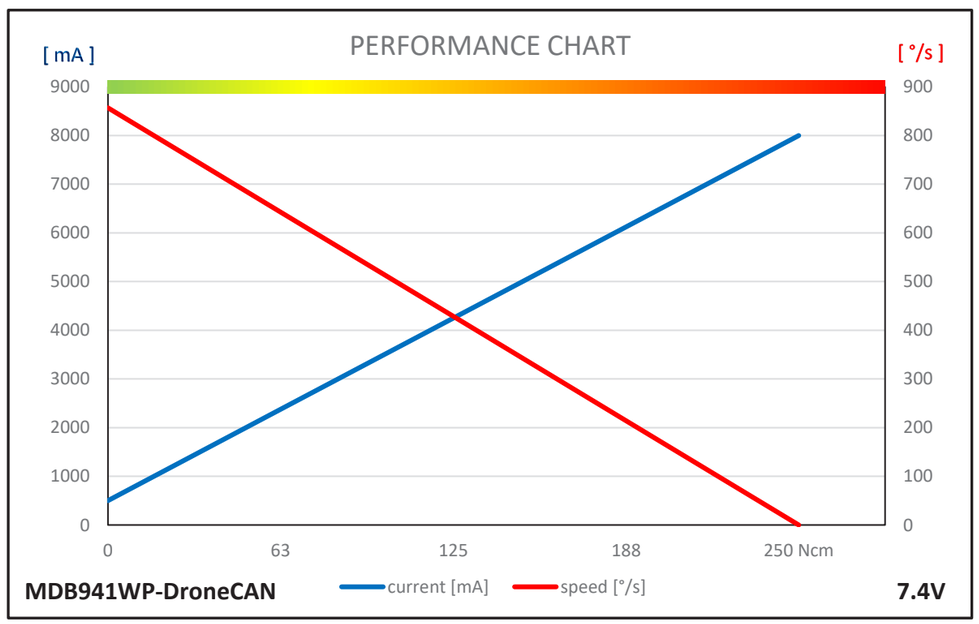
GENERAL SPECIFICATION

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	Rigt
	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-DRONECAN

1-03314



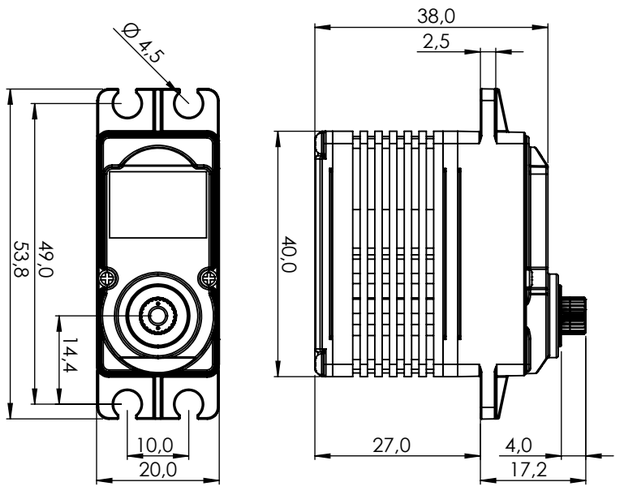


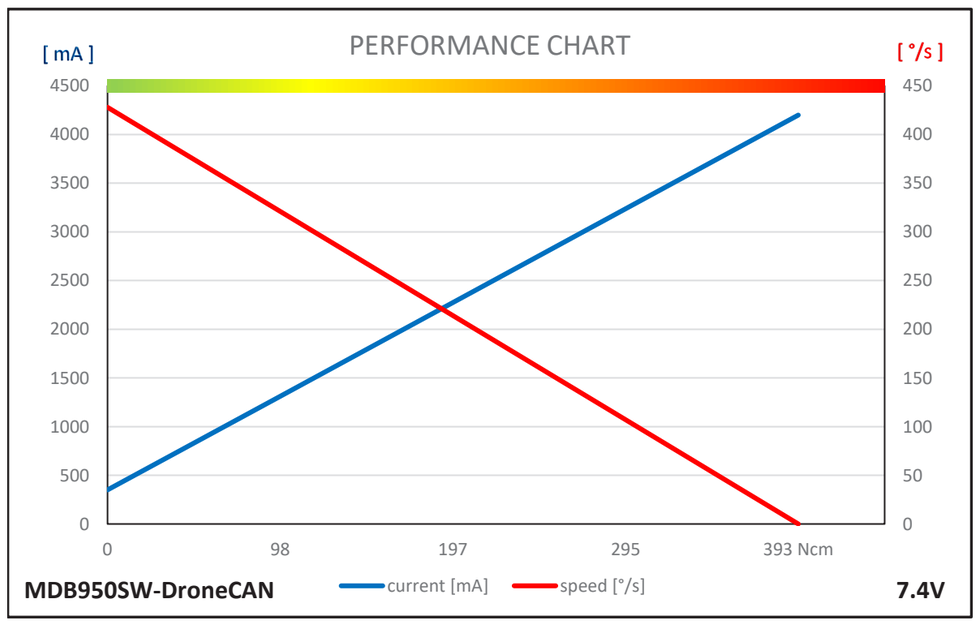
GENERAL SPECIFICATION

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 : ±60º(Default), ±150º(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 (11.811inch)		
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-DRONECAN

1-03313



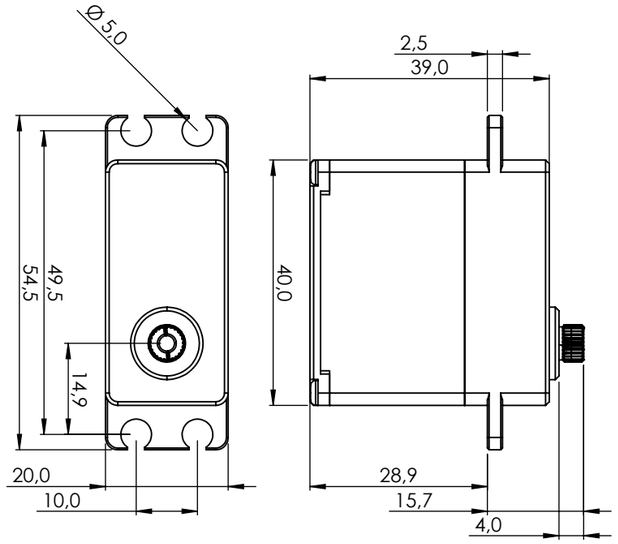


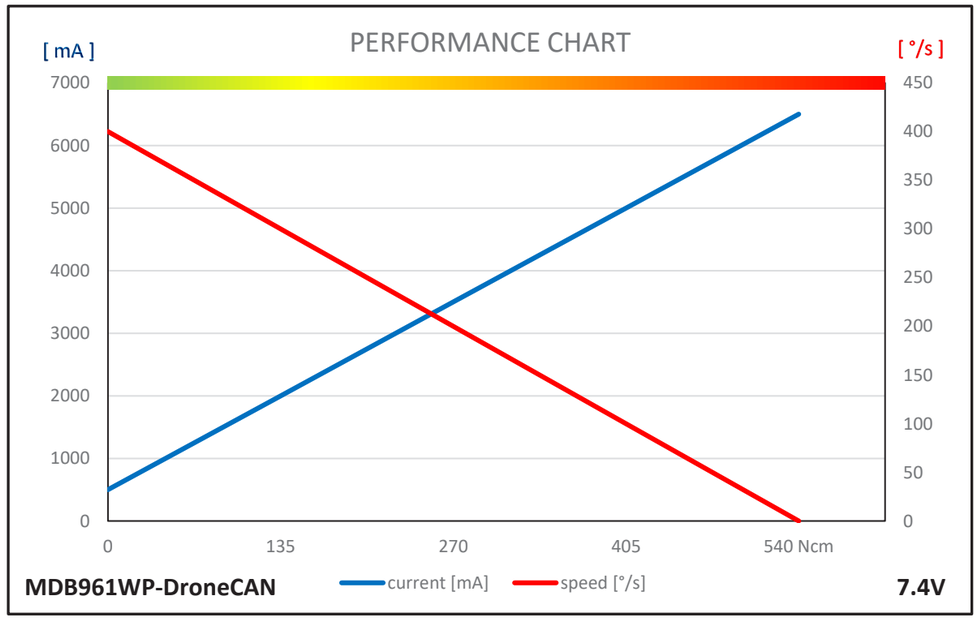
GENERAL SPECIFICATION

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 : ±60º(Default), ±150º(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 (11.811inch)		
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-UAVCAN / DRONECAN

1-03228



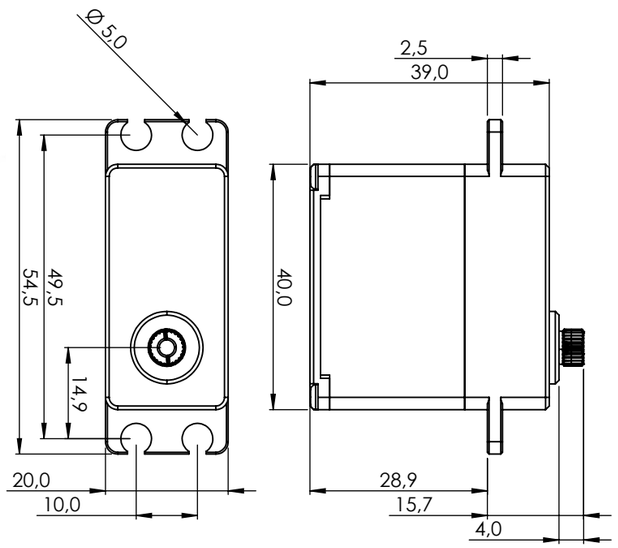


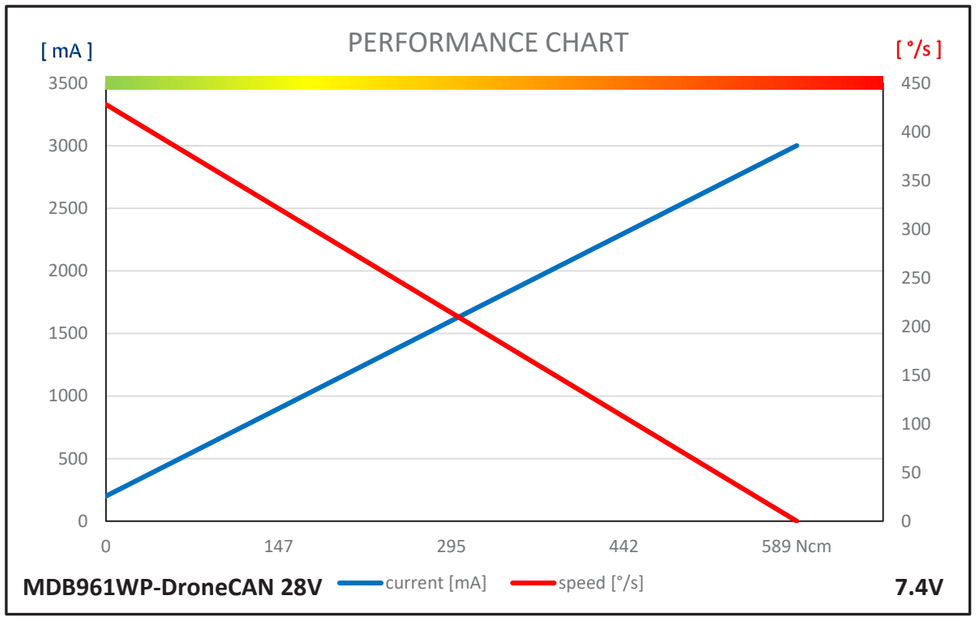
GENERAL SPECIFICATION

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 : ±60º(Default), ±150º(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 (11.811inch)		
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

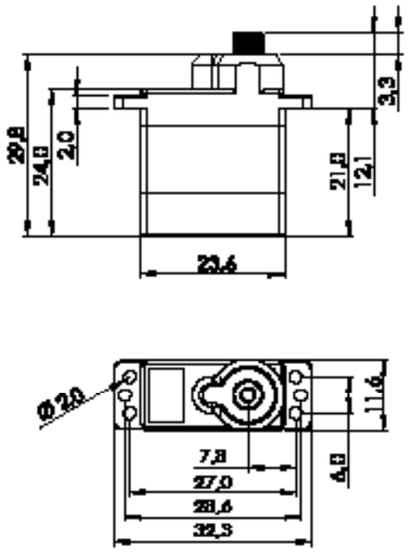




GENERAL SPECIFICATION

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 : ±60º(Default), ±150º(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 (11.811inch)		
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		

MD65MG-CAN/UAV/DRONECAN



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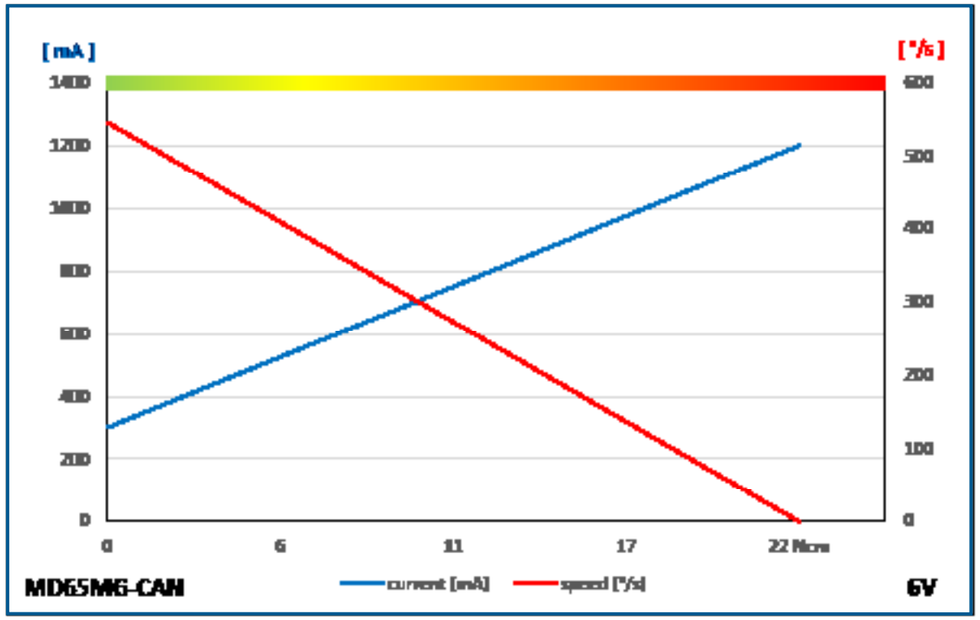
PERFORMANCE CHART

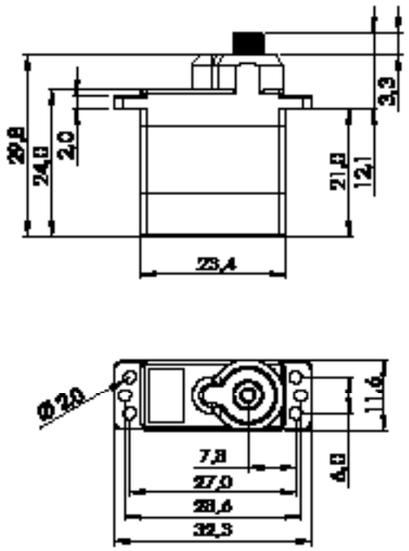


GENERAL SPECIFICATION

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	4.0V ~ 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	Rigt
	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

#1-01201,#1-01644



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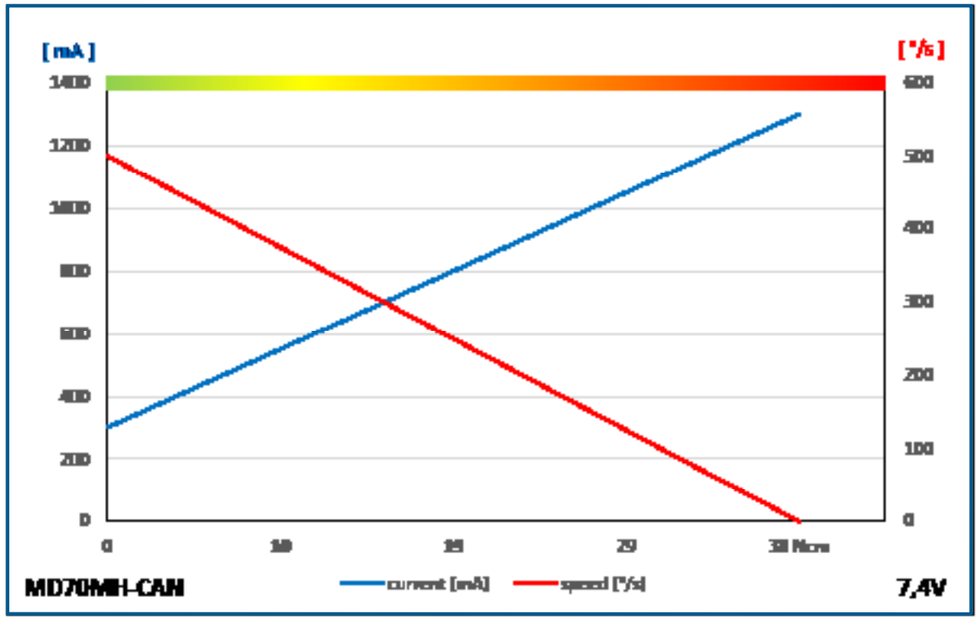
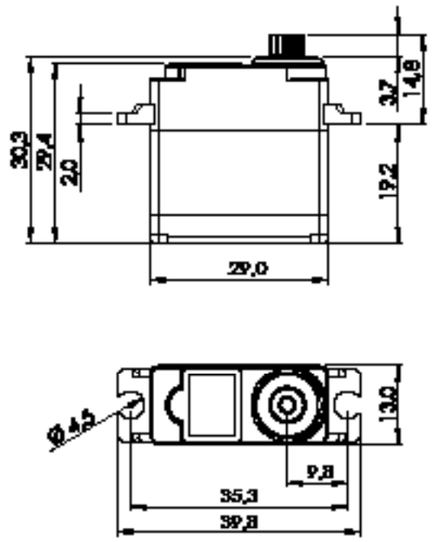


GENERAL SPECIFICATION

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	4.0V ~ 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	Rigt
	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-CAN/UAVCAN/DRONECAN



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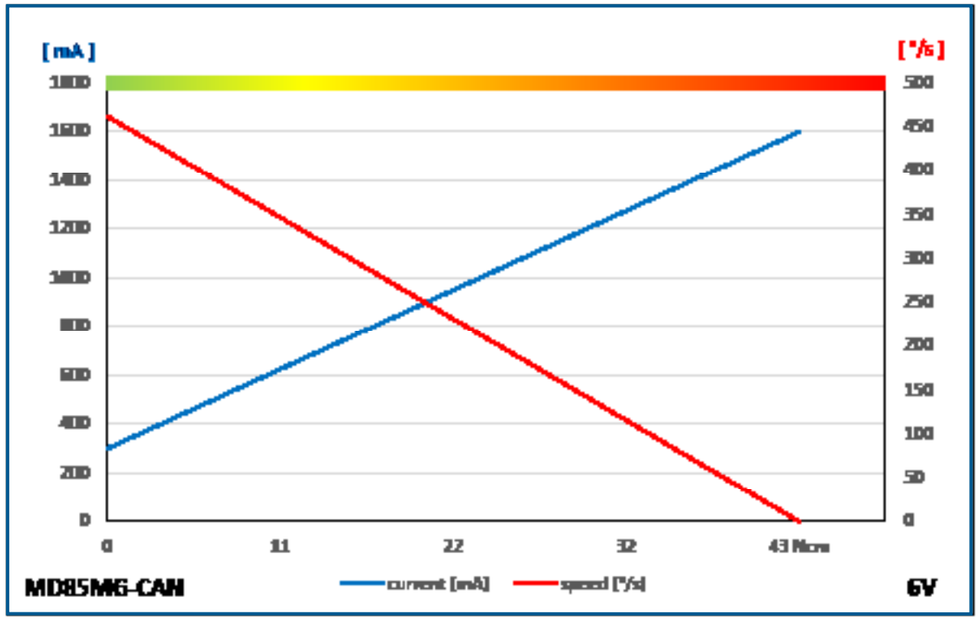
PERFORMANCE CHART

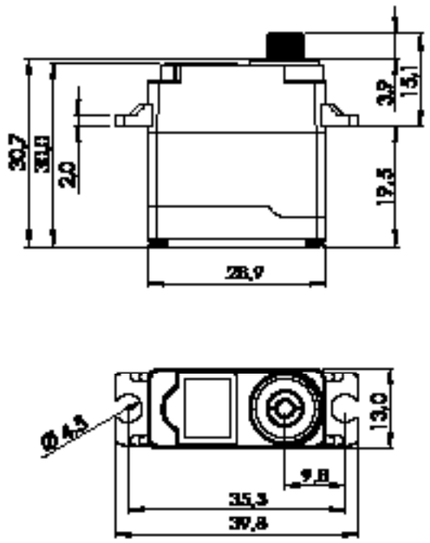


GENERAL SPECIFICATION

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	Rigt
	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 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				

MD89MW-CAN/UAVCAN/DRONECAN

#1-01972,#1-01973



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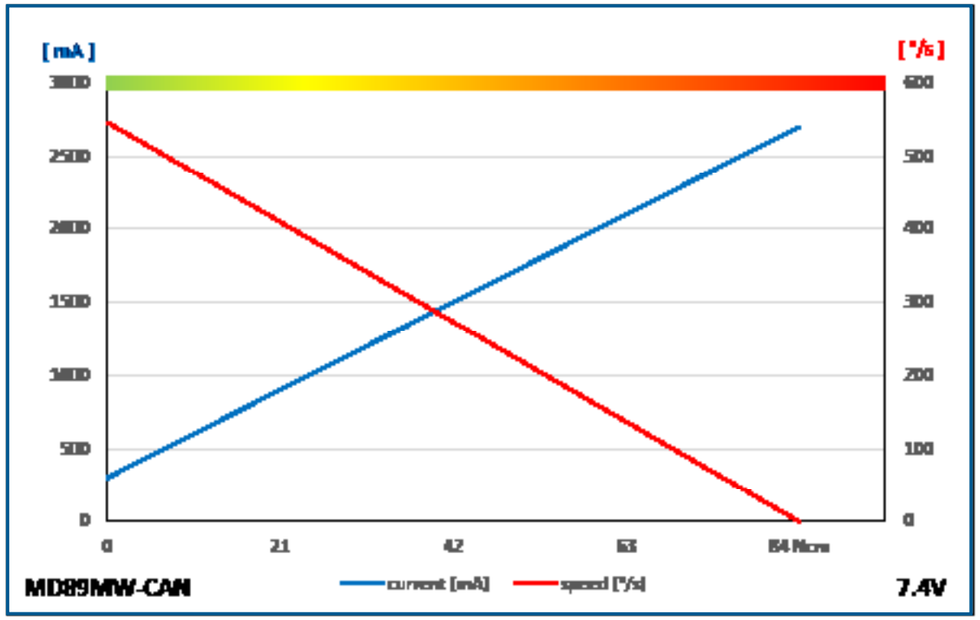
PERFORMANCE CHART

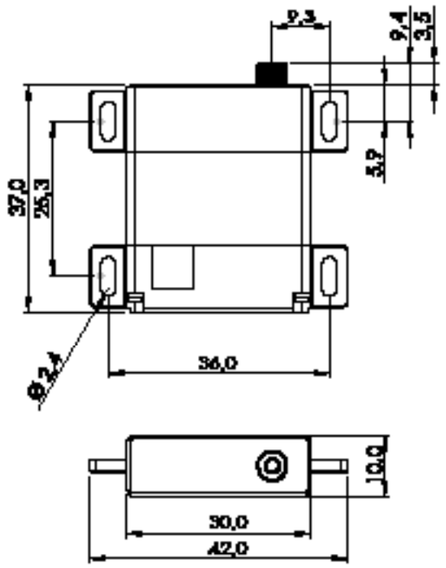


GENERAL SPECIFICATION

MD89MW-CAN/UAVCANDroneCAN				
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	4.0 ~ 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	Rigt
	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				

MD145SW-CAN/UAVCAN/DRONECAN

#1-01787,#1-01641



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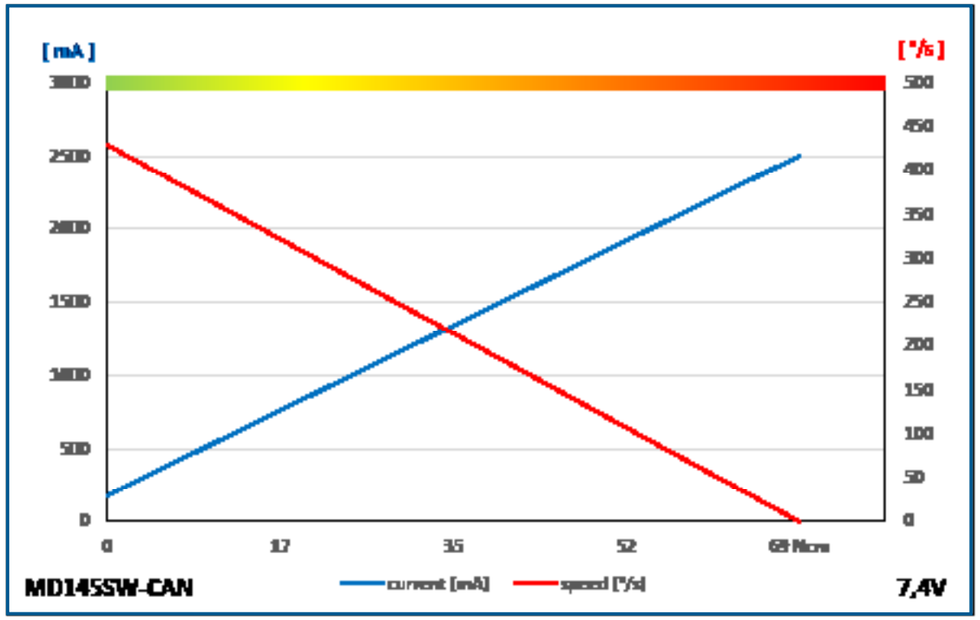
PERFORMANCE CHART

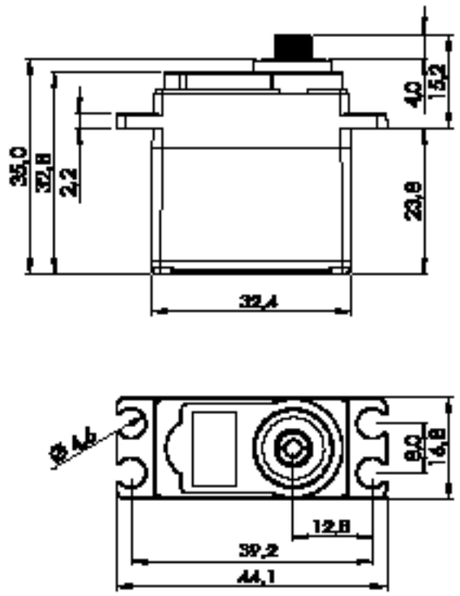


GENERAL SPECIFICATION

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	4.0V ~ 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	Rigt
	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				

MD245MW-CAN/UAVCAN/DRONECAN

#1-01574,#1-01642



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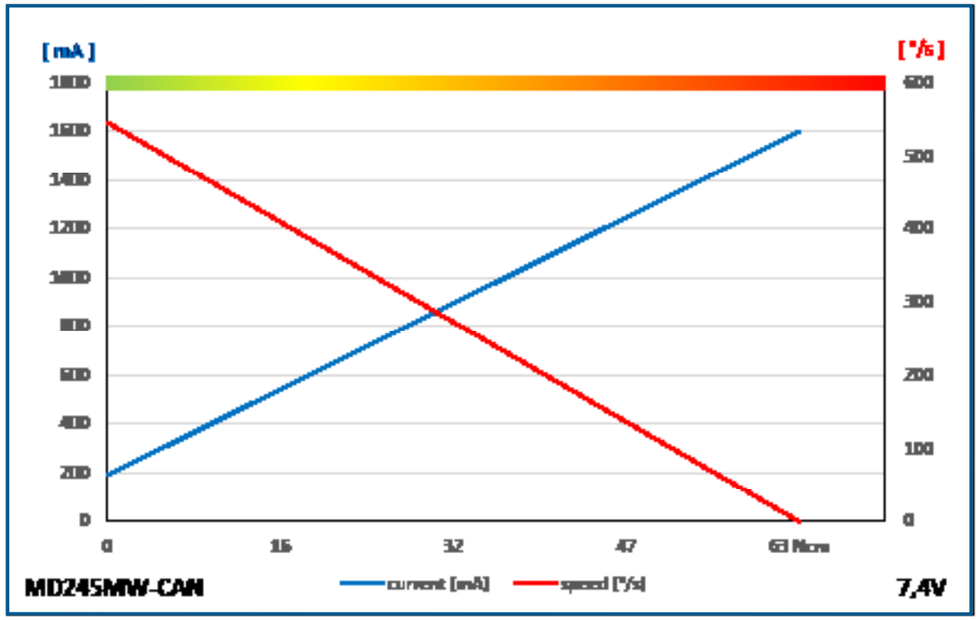
PERFORMANCE CHART

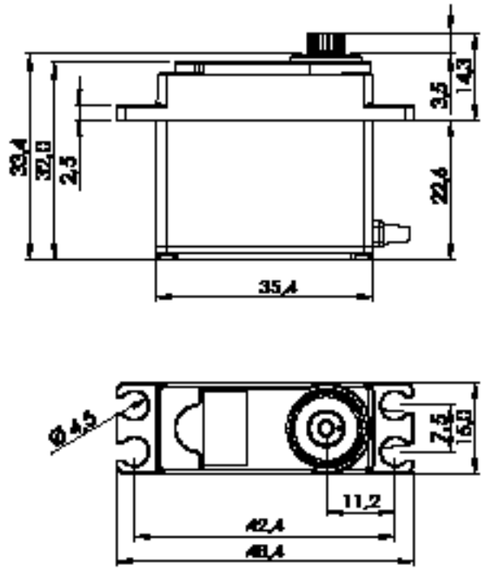


GENERAL SPECIFICATION

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	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	0.8kgcm (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	Rigt
	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-O25)			
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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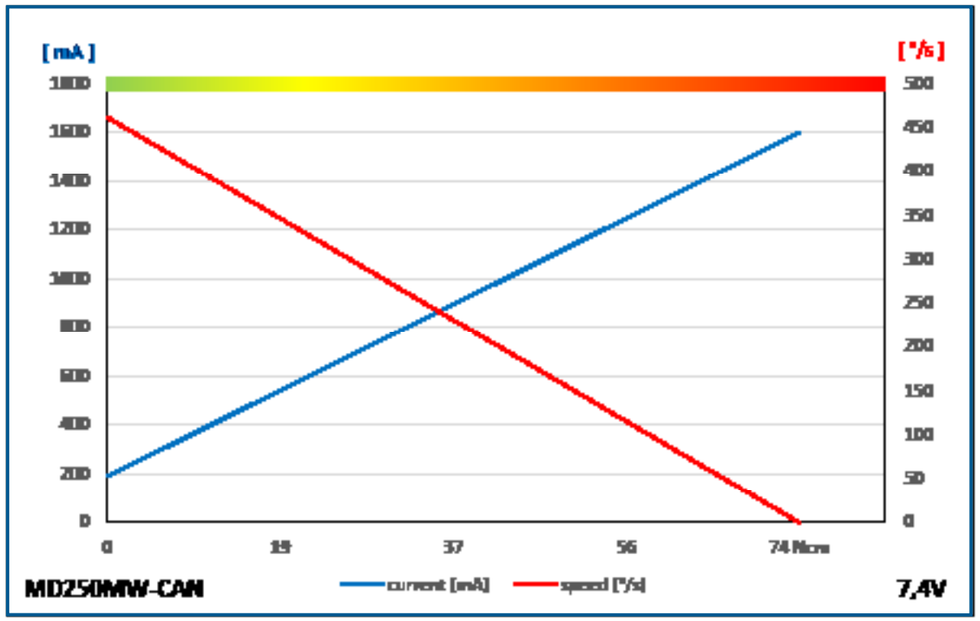
PERFORMANCE CHART

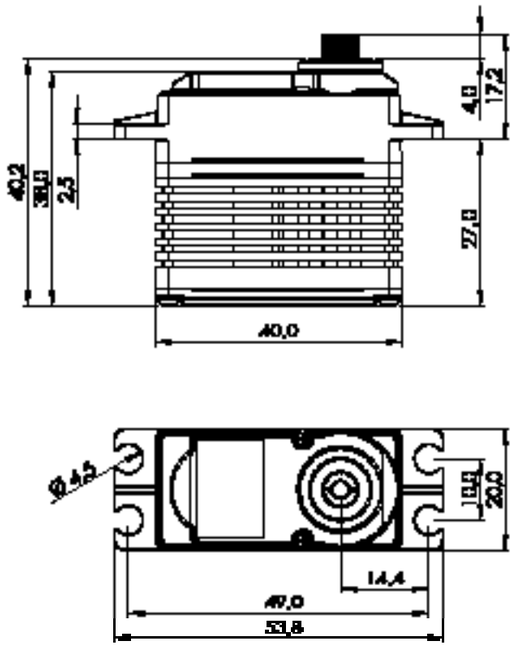


GENERAL SPECIFICATION

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	Rigt
	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-I25)			
IP-Rating	IP4X			
Revision	Rev. 1.1 / 03.01.2024			
Changelog	-			
*of the servo only w/o horns and accessories				

MD950TW-CAN/UAVCAN/DRONECAN

#1-01646,#1-01647



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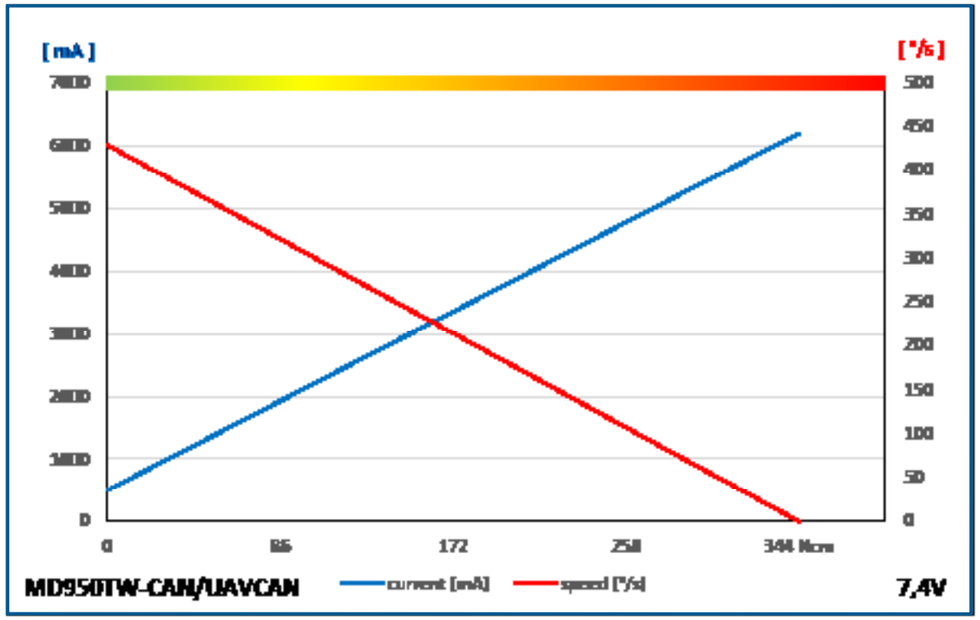
PERFORMANCE CHART

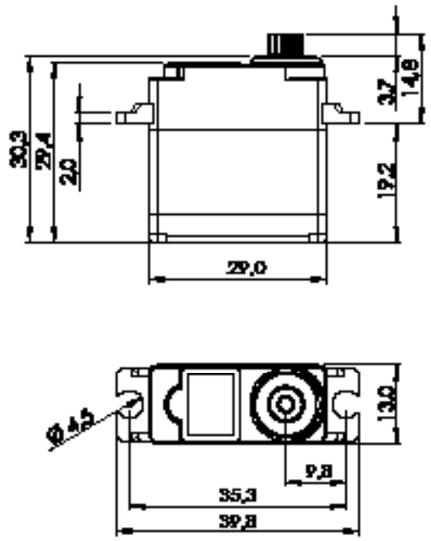


GENERAL SPECIFICATION

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	Rigt
	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				

MD85MG

#1-01656



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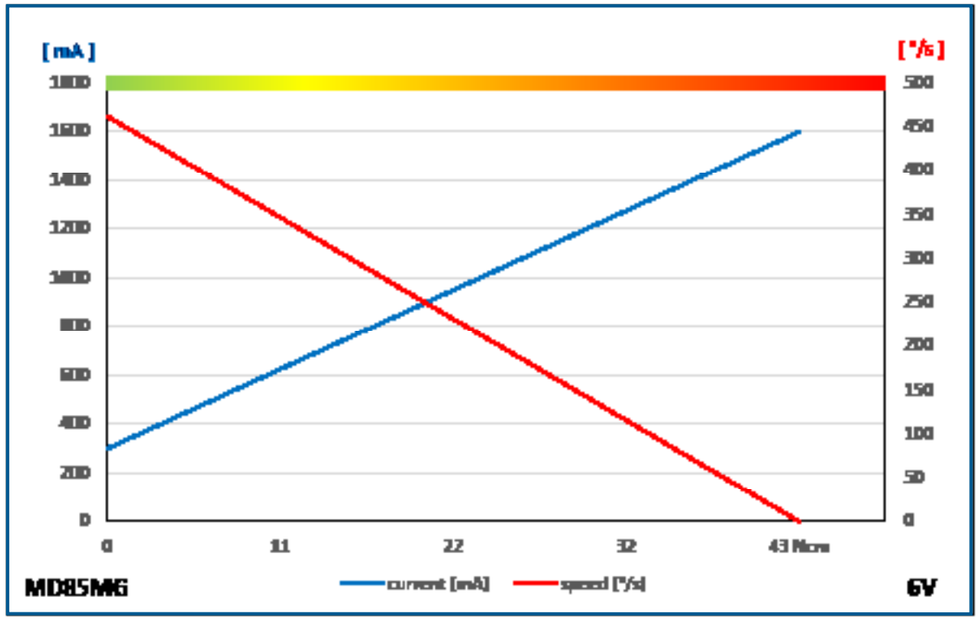
PERFORMANCE CHART

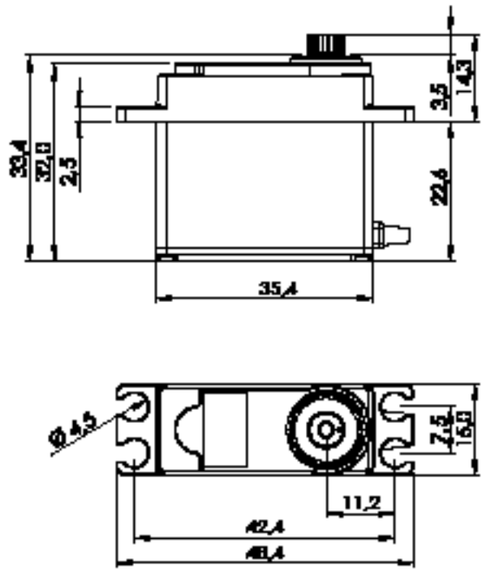


GENERAL SPECIFICATION

	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	
Ampflifier / MCU	32bit programmable Digital Amplifier with Mosfet Drive	
Operating Voltage Range	3.5V ~ 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	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	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		

MD250MW

#1-00707



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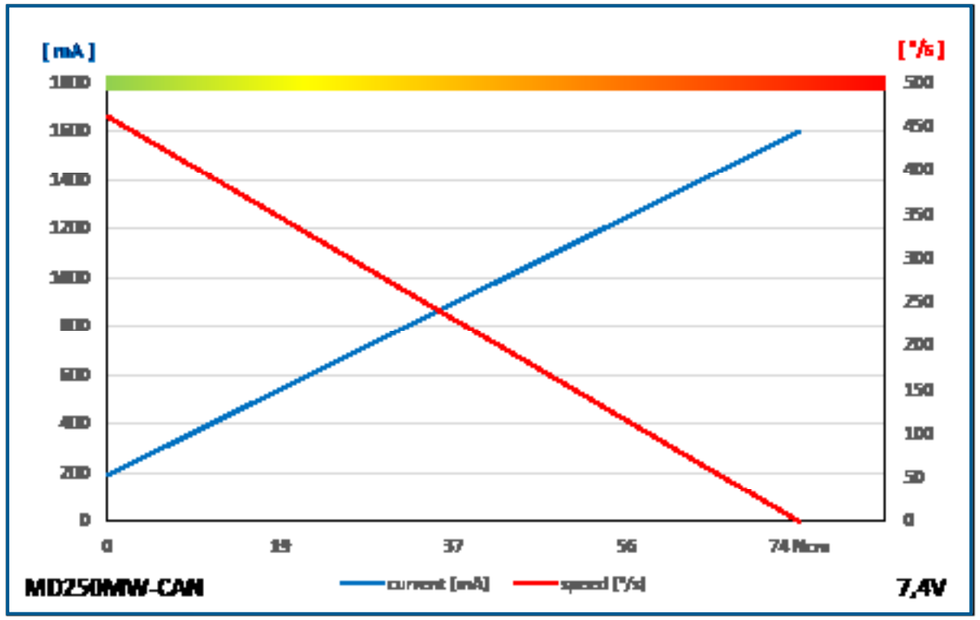


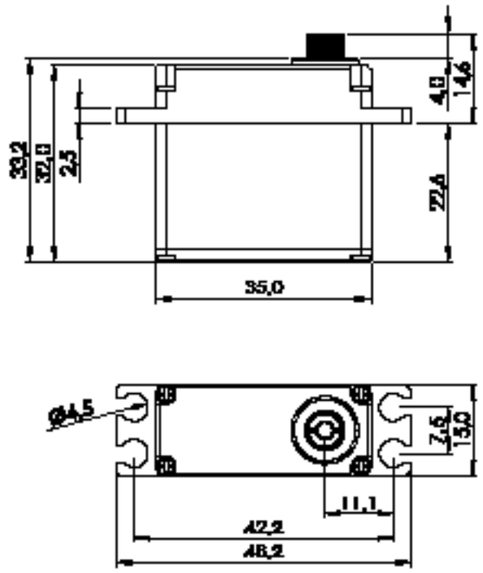
GENERAL SPECIFICATION

	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

MD261SW

#1-03052



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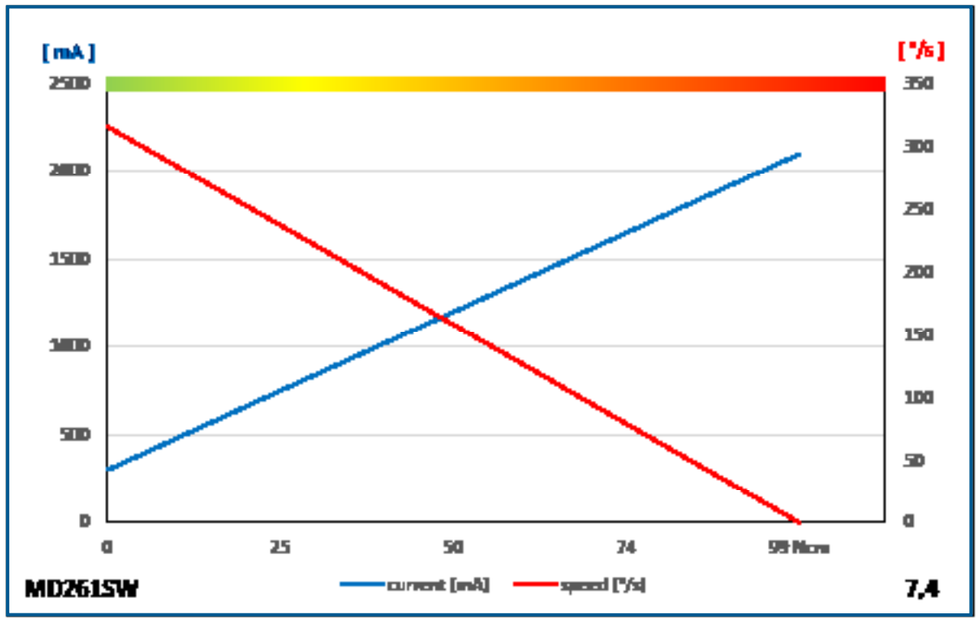


GENERAL SPECIFICATION

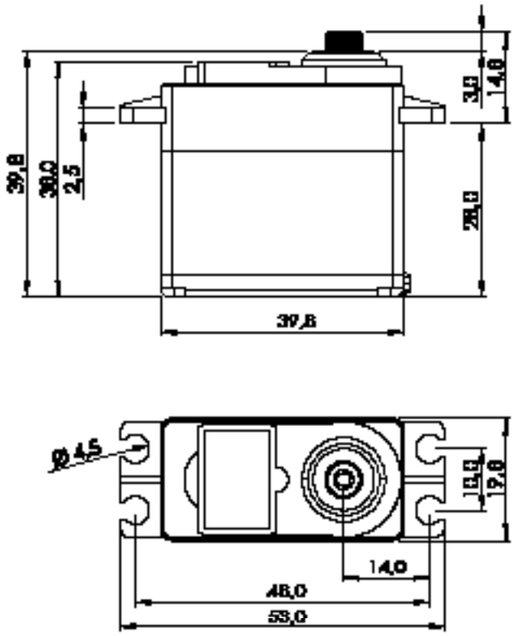
	MD261SW		
Control System	PWM / TTL (Half Duplex)		
	Pulse Width 900µs|1500µs (Center)|2100µs		
Connector Type	Hitec 3P (JR 3P compatible)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	Cored Carbon Brush		
Amplifier / MCU	32bit programmable Digital		
Operating Voltage Range	3.5V ~ 8.4V		
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
Opearting 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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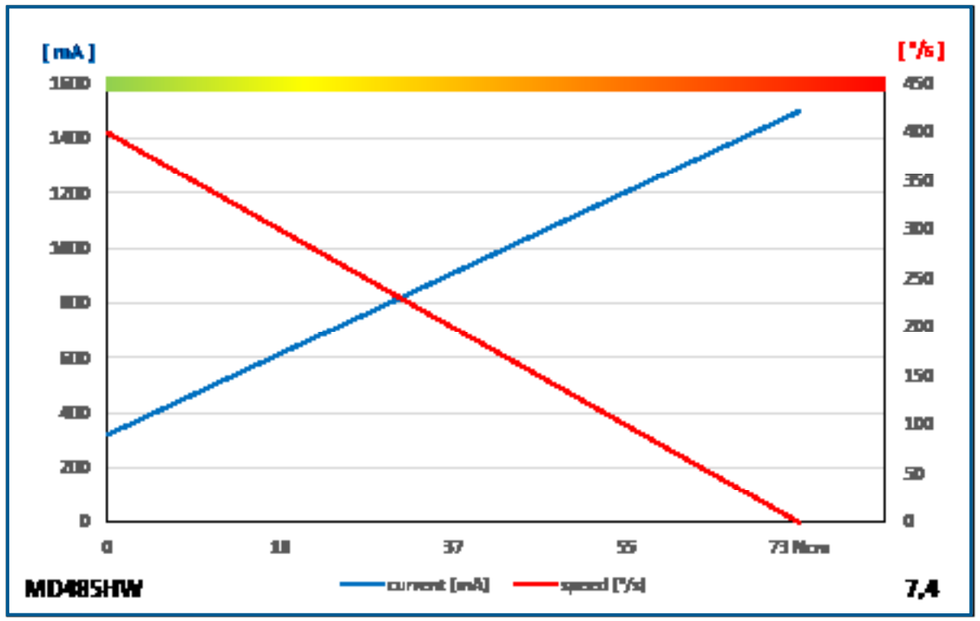


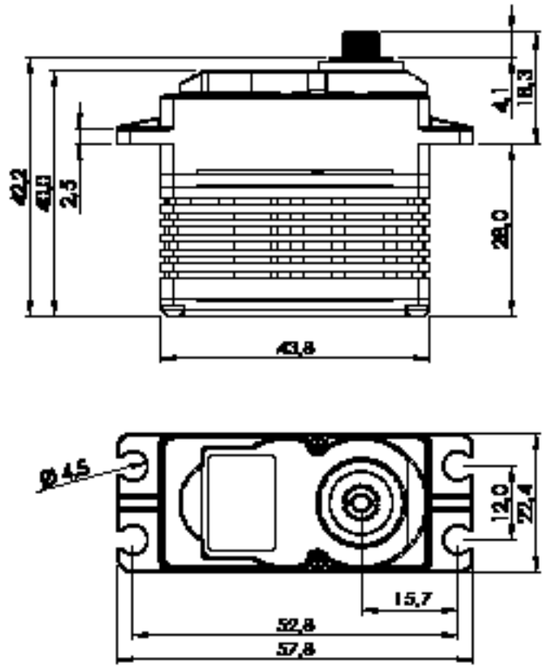
GENERAL SPECIFICATION

	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

MD980TW

1-03166



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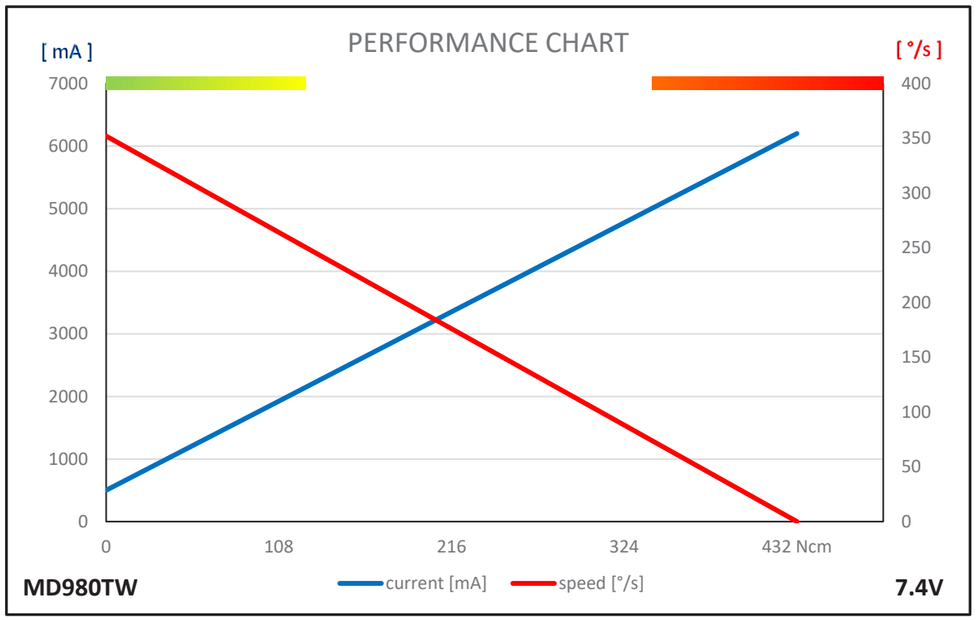
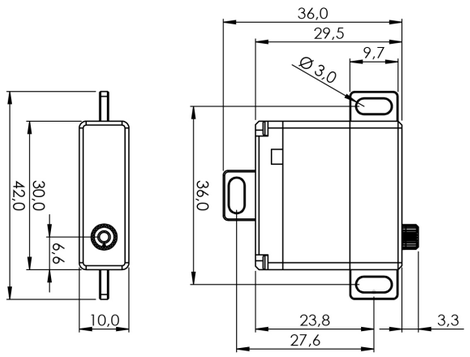


GENERAL SPECIFICATION

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: ±60º, Programmable: Max 320º / 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	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		

MD141SH

1-02852

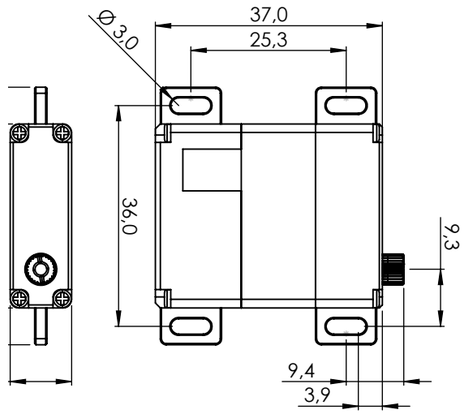


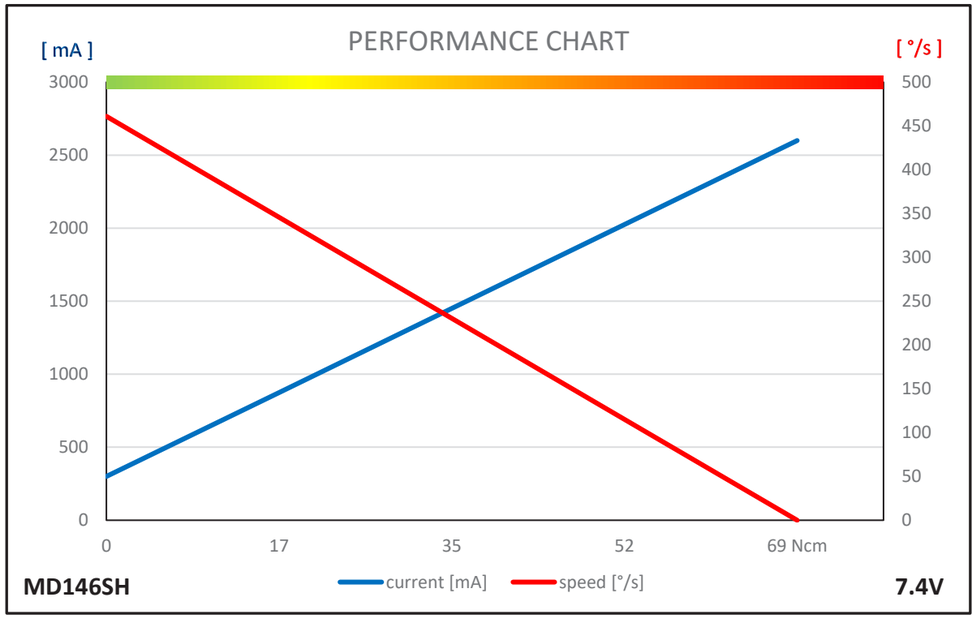
GENERAL SPECIFICATION

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: ±60º, Programmable: Max 320º / 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	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		

MD146SH

1-03090



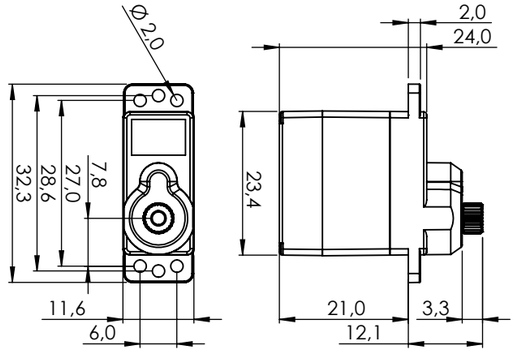


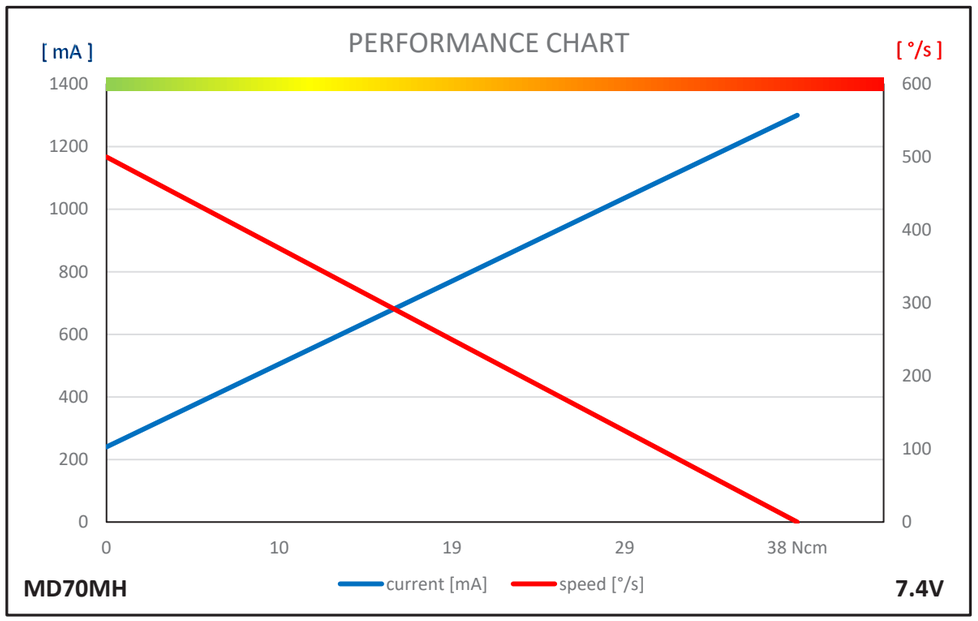
GENERAL SPECIFICATION

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: ±60º, Programmable: Max 320º / 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	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		

MD70MH

1-03277



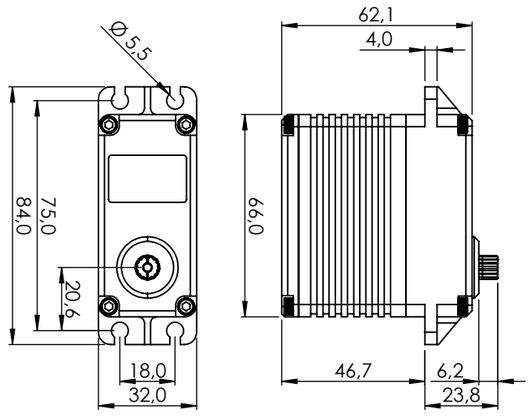


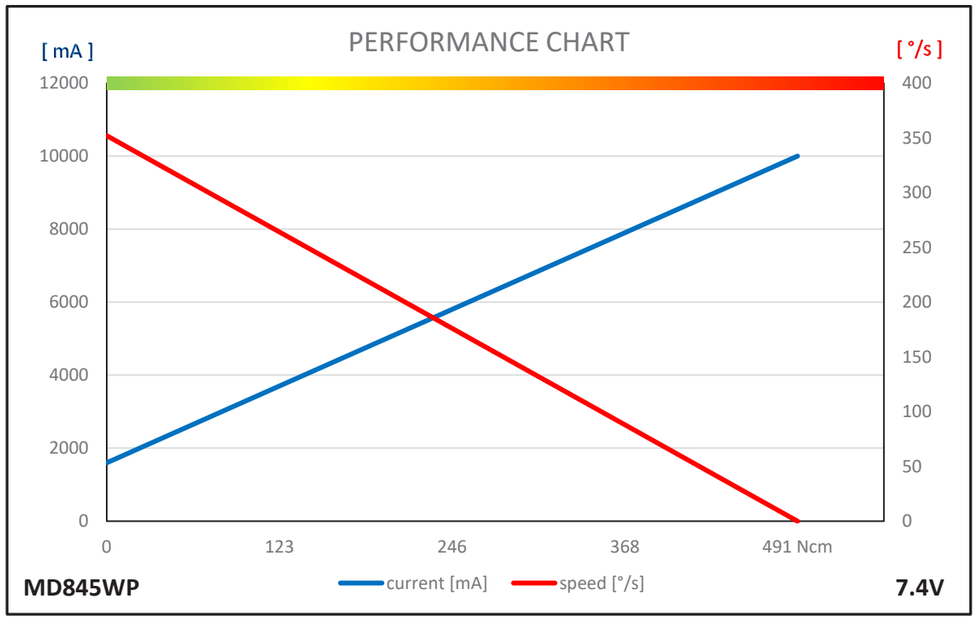
GENERAL SPECIFICATION

MD70MH			
Control System	PWM/TTL(Half Duplex)		
Position Sensor Type	Contactless Magnetic Encoder		
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 (43.05oz·in)	3.8kgf·cm (52.77oz·in)
Peak Efficiency Torque	-	0.6kgf·cm (8.33oz·in)	0.8kgf·cm (11.11oz·in)
Standing Current	-	30mA	30mA
No Load Running Current	-	200mA	240mA
Stall Current	-	1,000mA	1,300mA
Deadband	-	2µs	2µs
Operating Travel	Default: ±60º, Programmable: Max 320º / 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	13.0g (0.459oz)		
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	32bit programmable Digital		

MD845WP

1-03227



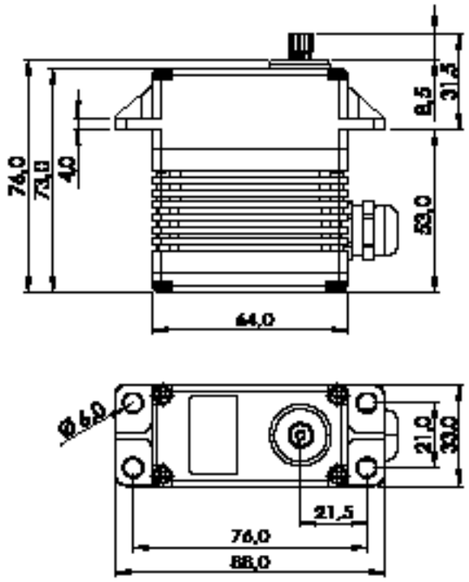


GENERAL SPECIFICATION

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	2µs	2µs	2µs
Operating Travel	Default: ±60º, Programmable: Max 320º / 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	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(Ø8)		
IP-Rating	IP67		
Servo Amplifier Type	32bit programmable Digital		

MD1100WP

#1-01638



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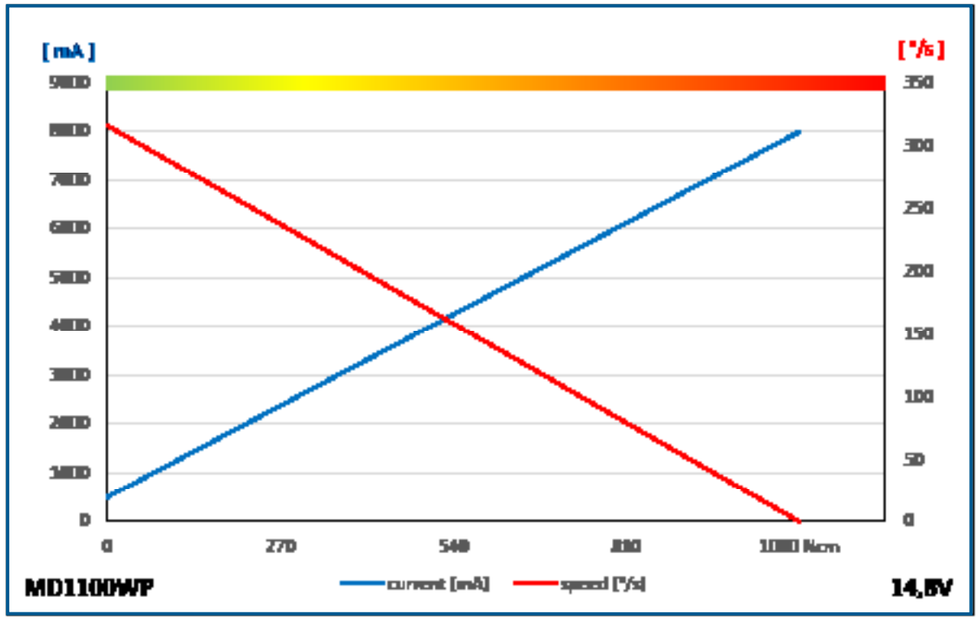
PERFORMANCE CHART



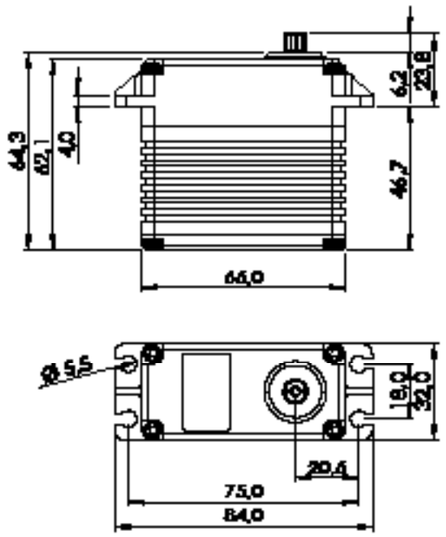
GENERAL SPECIFICATION

	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	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	90mA
Running Current at no Load	550mA	500mA
Stall Current	6500mA	8000mA
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	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

MDR845WP

#1-01329



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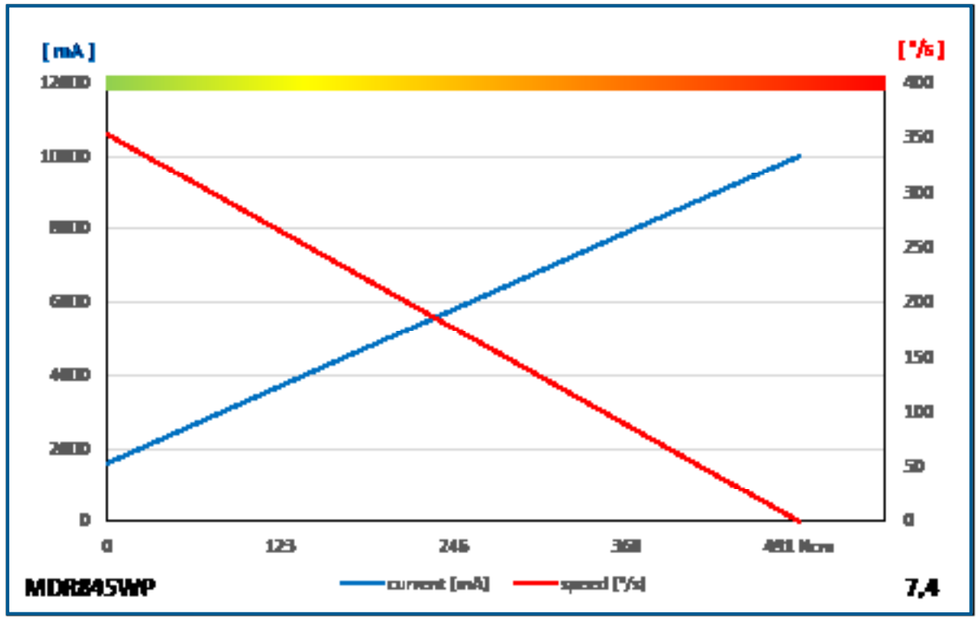
PERFORMANCE CHART



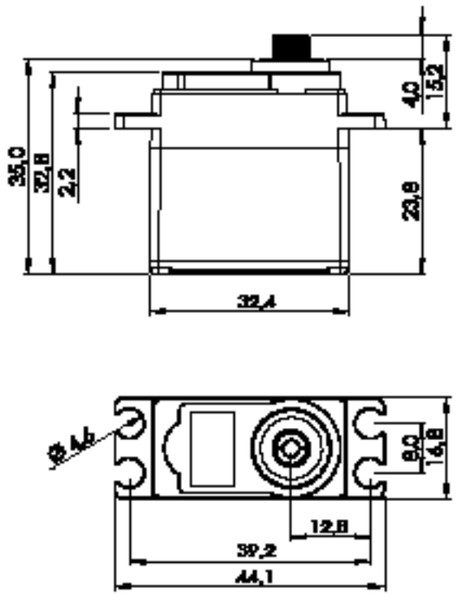
GENERAL SPECIFICATION

	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

MD245MW-RS485

#1-01677



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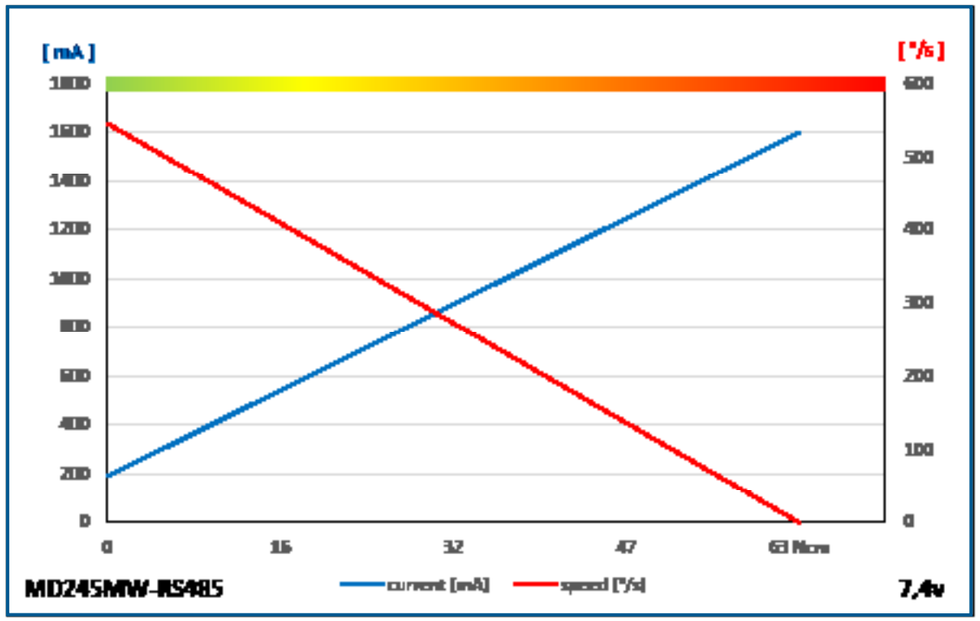
PERFORMANCE CHART



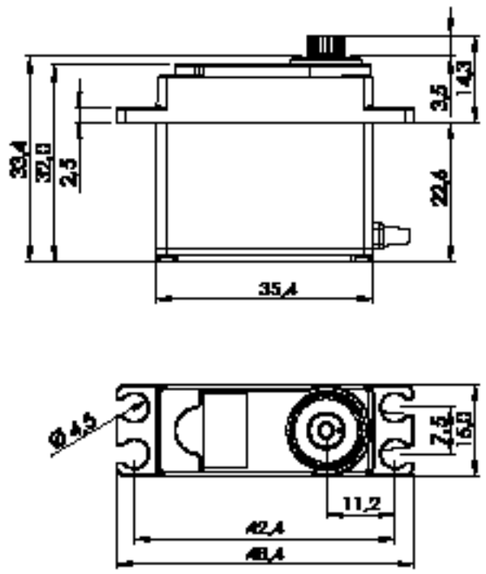
GENERAL SPECIFICATION

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
Opearting 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-RS485

#1-01676



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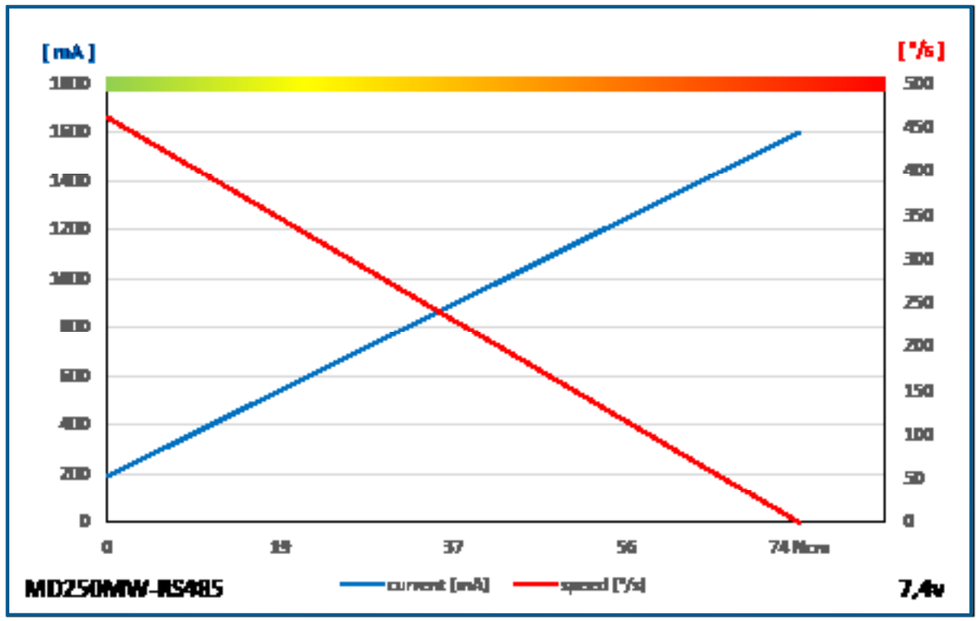
PERFORMANCE CHART



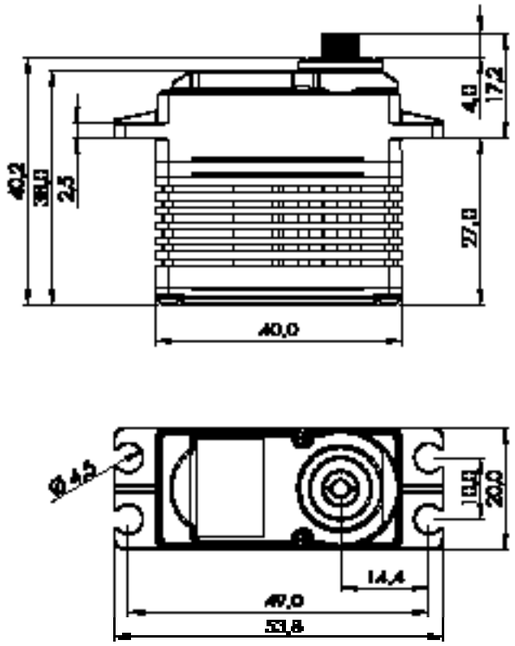
GENERAL SPECIFICATION

	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
Opearting 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

MD950TW-RS485

#1-01675



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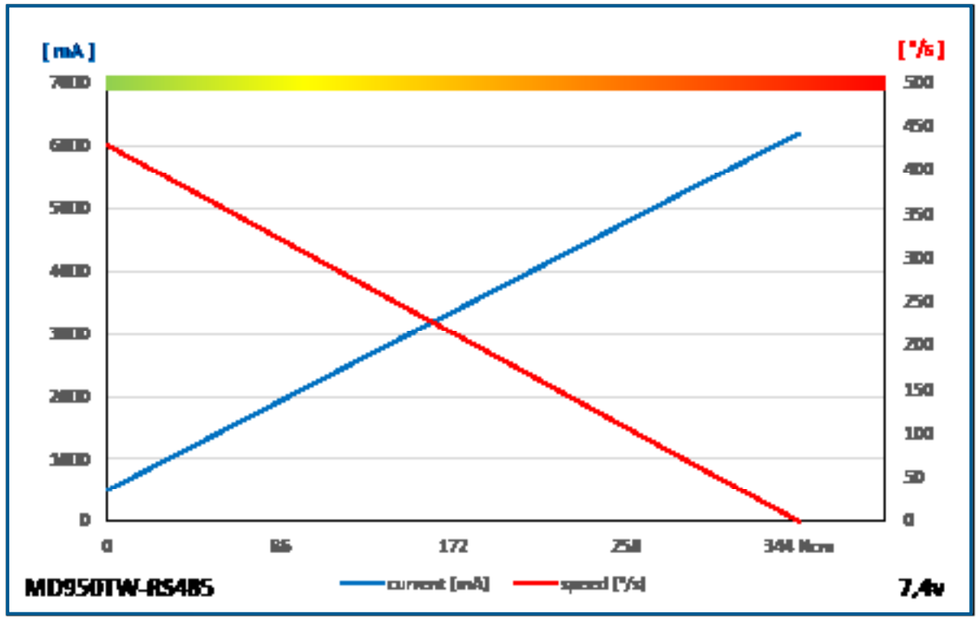
GENERAL SPECIFICATION

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
Opearting 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	-		

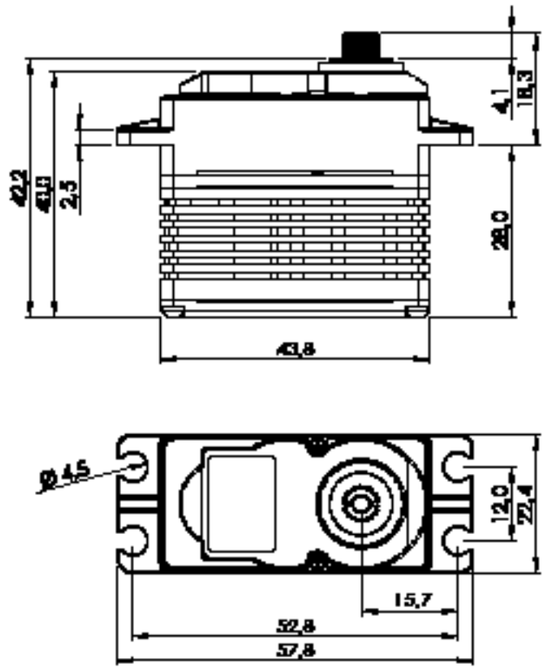
*of the servo only w/o horns and accessories

PERFORMANCE CHART



MD980TW-RS485

#1-03230



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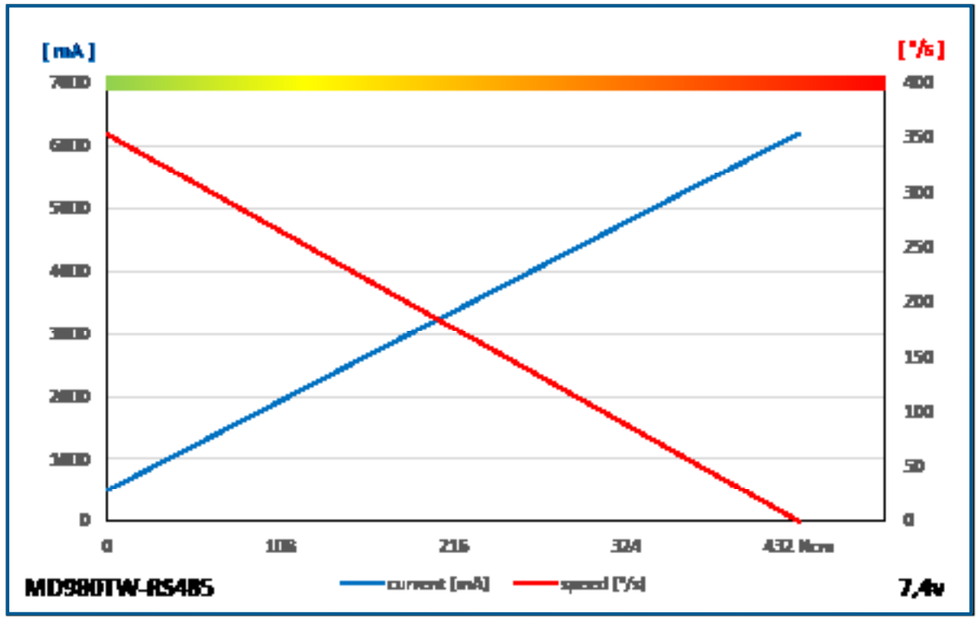
PERFORMANCE CHART



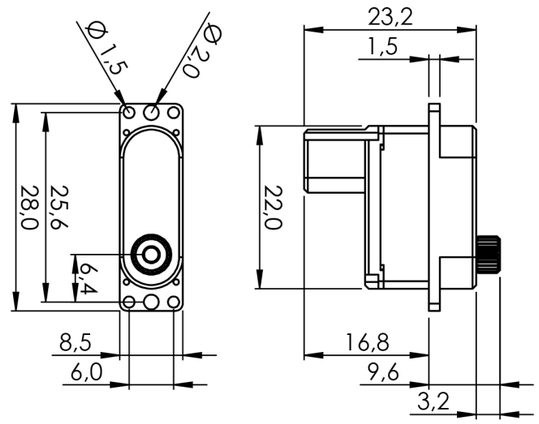
GENERAL SPECIFICATION

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
Opearting 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

D131MW

1-01494

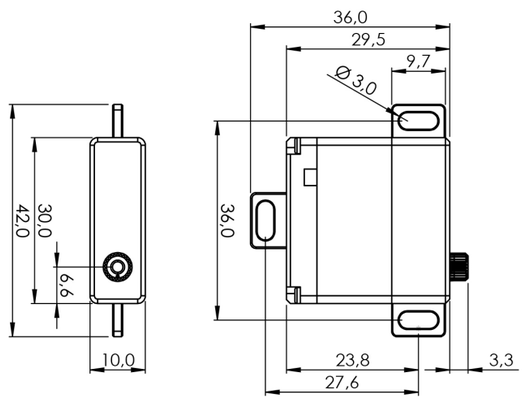


GENERAL SPECIFICATION

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	2µs	2µs	2µs
Operating Travel	Default: ±60º, Programmable: Max 175º / 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	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(Ø5)		
IP-Rating	IP4X		

D141SH

1-01496

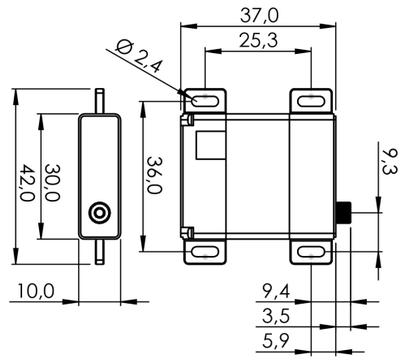


GENERAL SPECIFICATION

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: ±60º, Programmable: Max 175º / 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	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



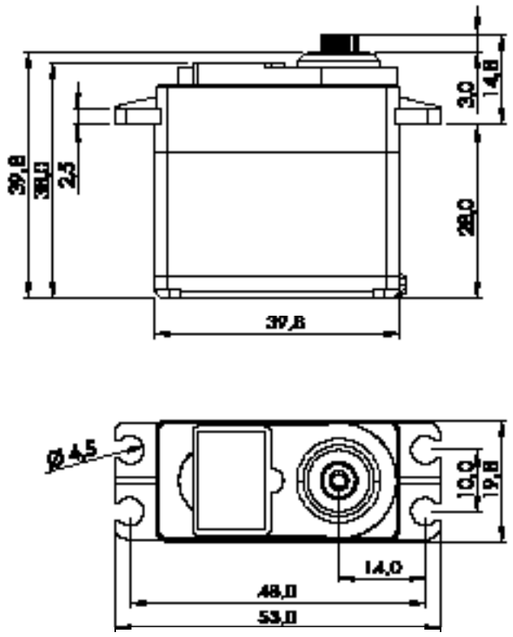
GENERAL SPECIFICATION

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: ±60º, Programmable: Max 175º / 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	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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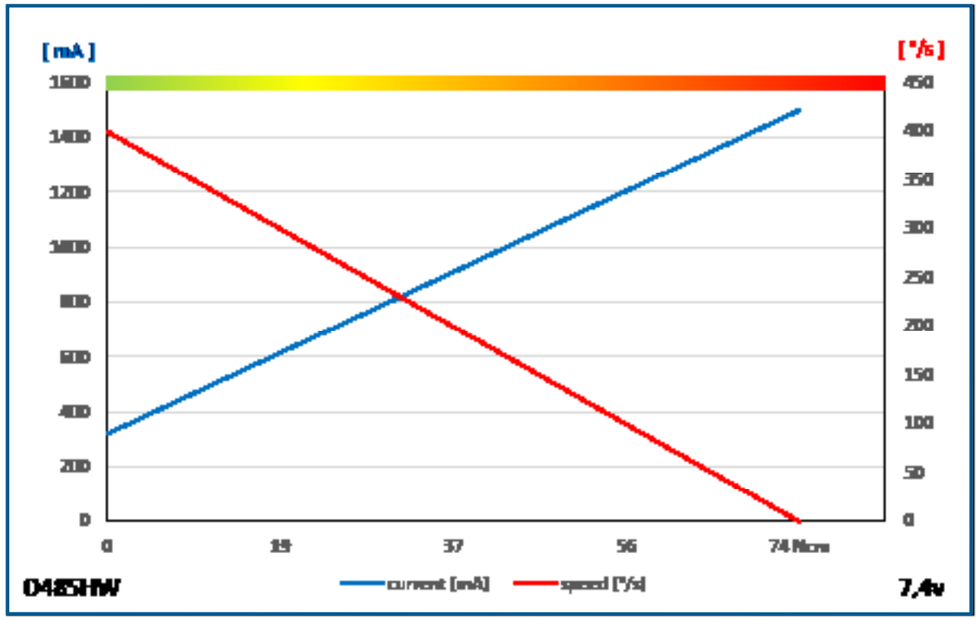
GENERAL SPECIFICATION

	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

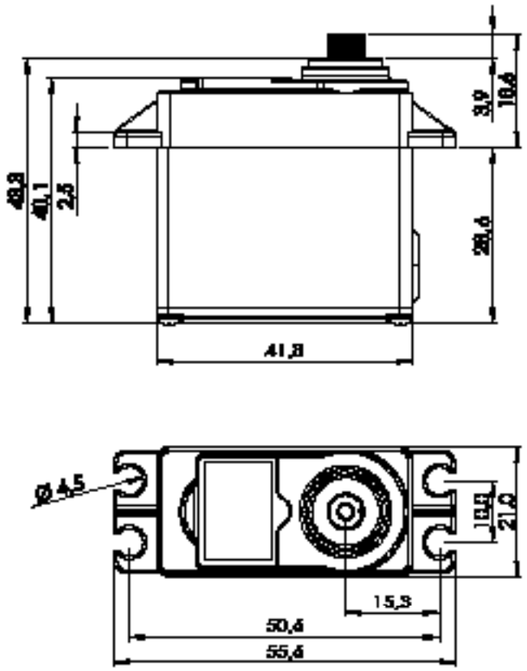
PERFORMANCE CHART



D646WP

#1-00072

#1-02354 GP 24 Stück



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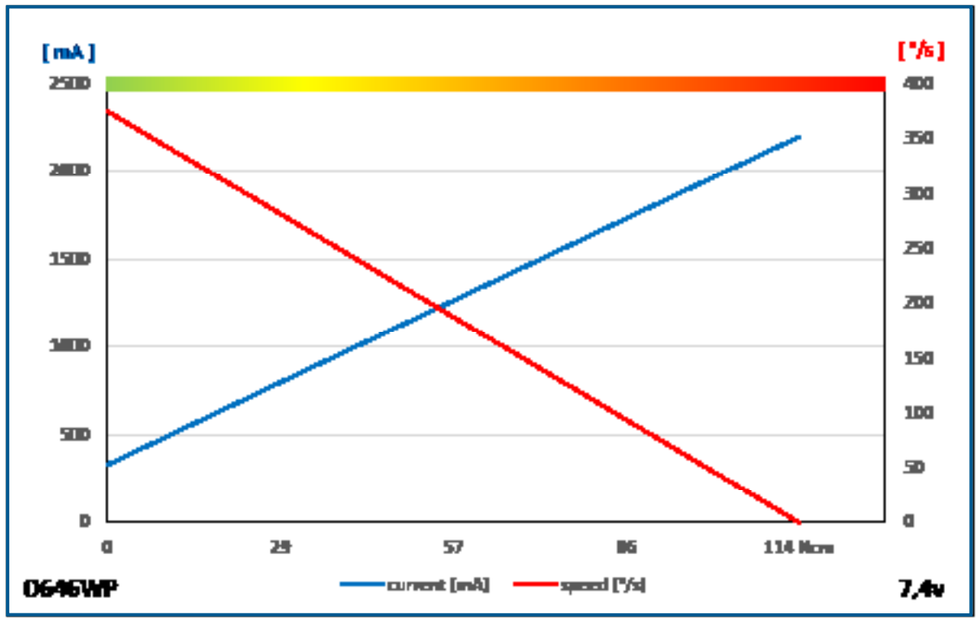
PERFORMANCE CHART



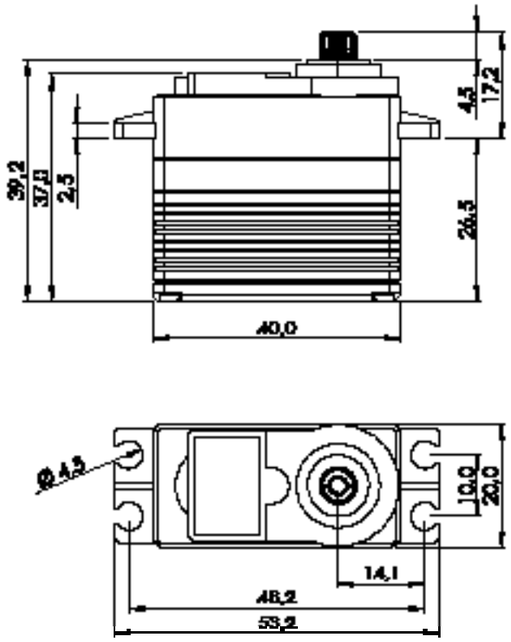
GENERAL SPECIFICATION

	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

D954SW

#116954



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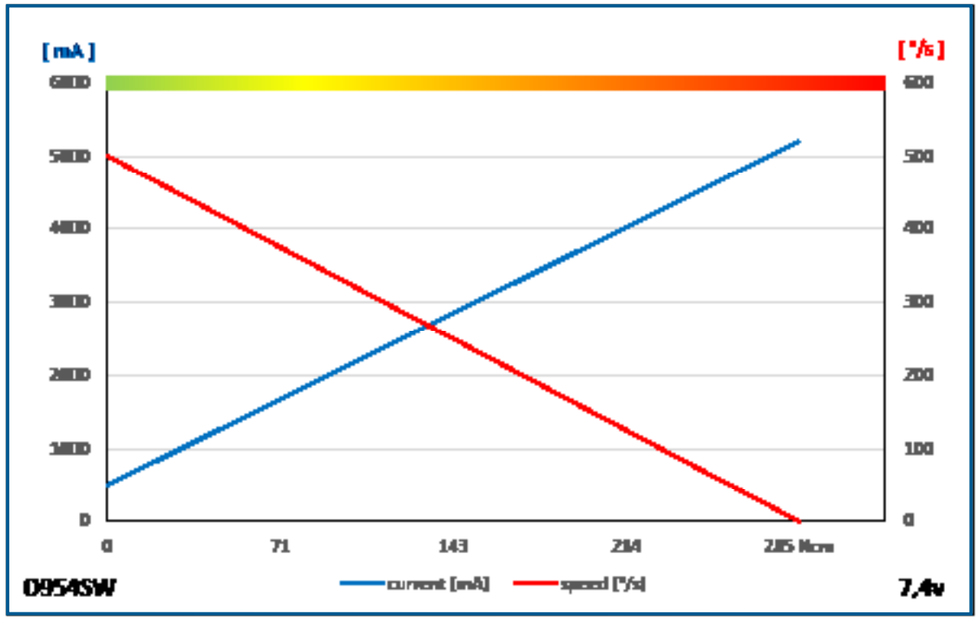
PERFORMANCE CHART



GENERAL SPECIFICATION

	D954SW		
Control System	PWM / TTL (Half Duplex)		
	Pules 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	-		

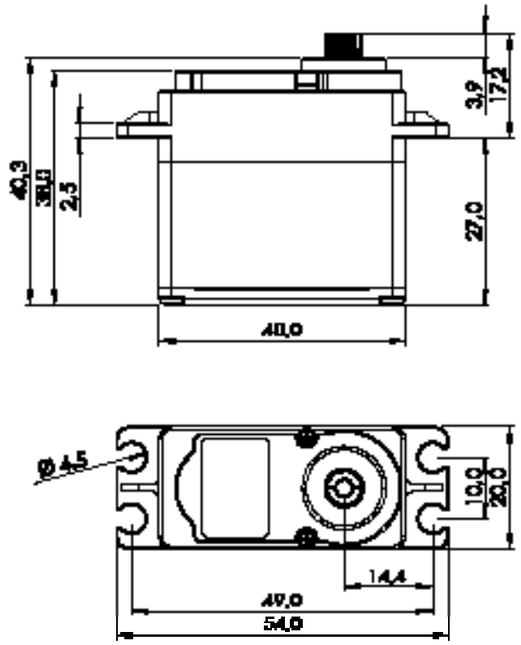
*of the servo only w/o horns and accessories

** also available with 270°

D951TW

#116951

#1-02359 GP 24 Stück



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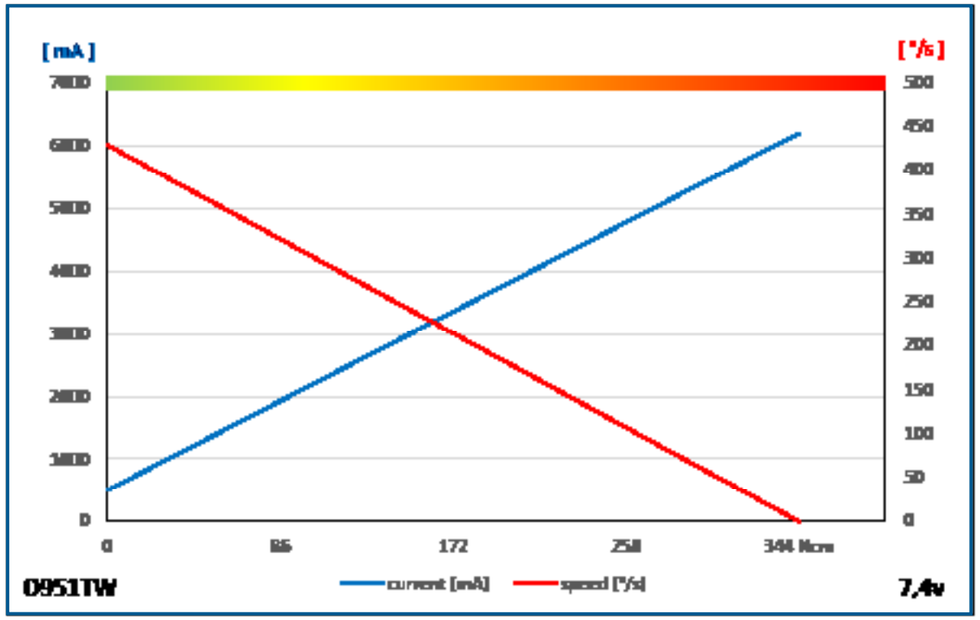
PERFORMANCE CHART



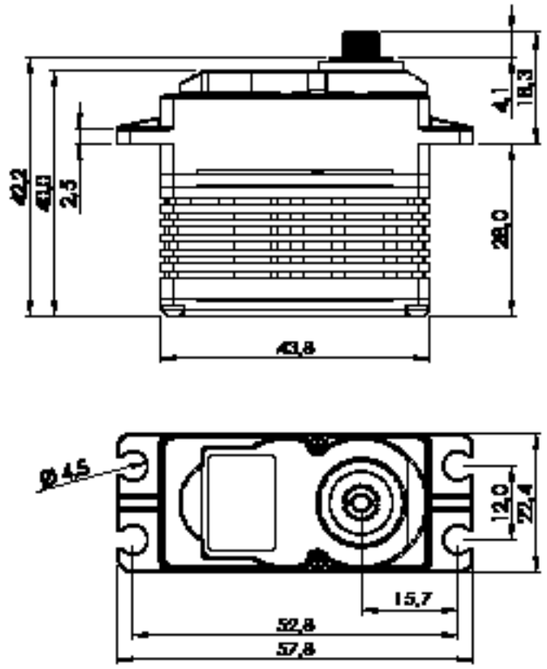
GENERAL SPECIFICATION

	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

D980TW

#1-02982



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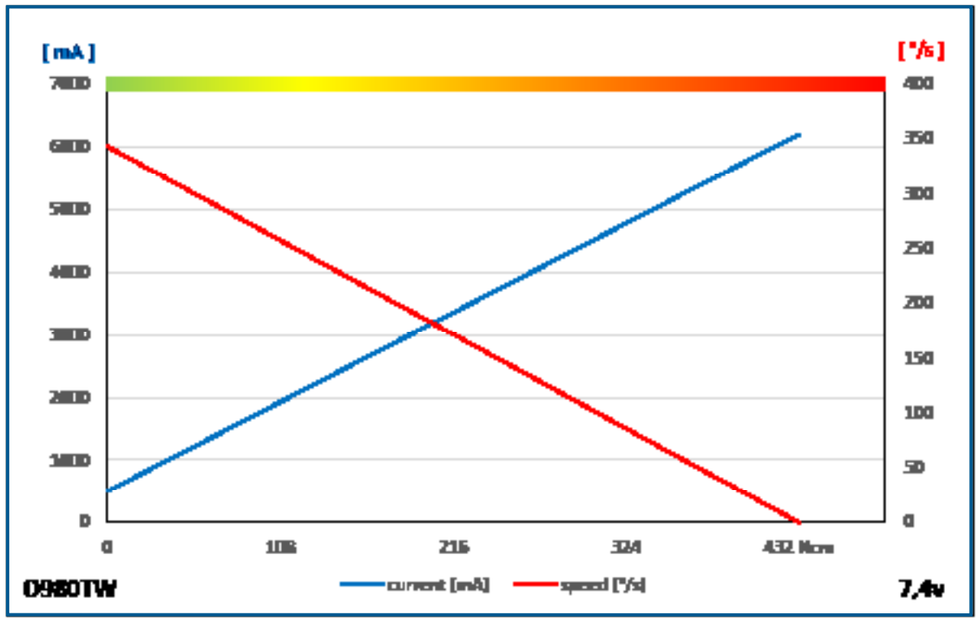
PERFORMANCE CHART



GENERAL SPECIFICATION

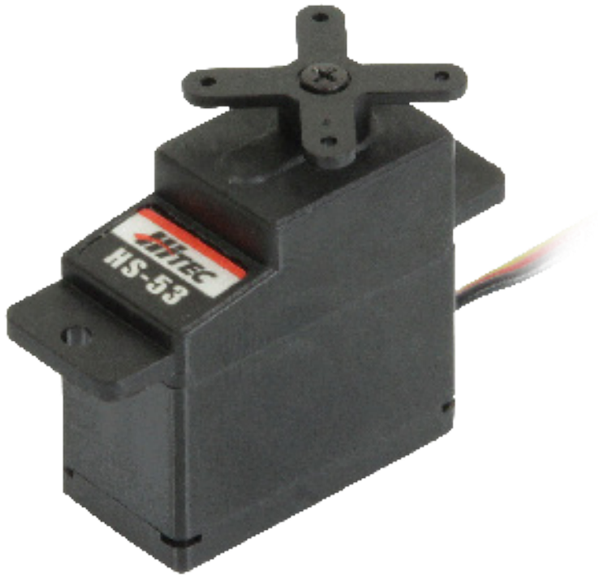
	D980TW		
Control System	PWM / TTL (Half Duplex)		
	Pulse Width 900µs|1500µs (Center)|2100µs		
Connector Type	Hitec 3P (JR 3P compatible)		
Position Sensor Type	Indirect Drive / 4 Slider / 1M Cylce Long Life		
Motor Type	Coreless		
Amplifier / MCU	32bit programmable Digital with Mosfet Drive		
Operating 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
Opearting 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	-		

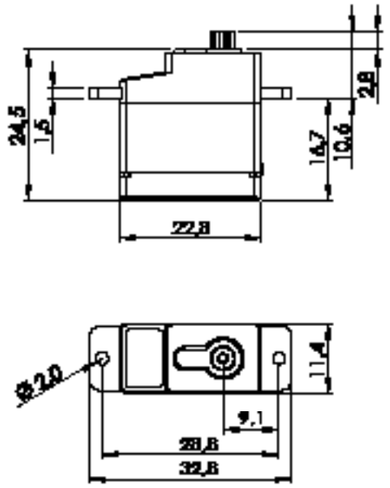
*of the servo only w/o horns and accessories

HS-53

#112053

#112054 GP 20 Stück





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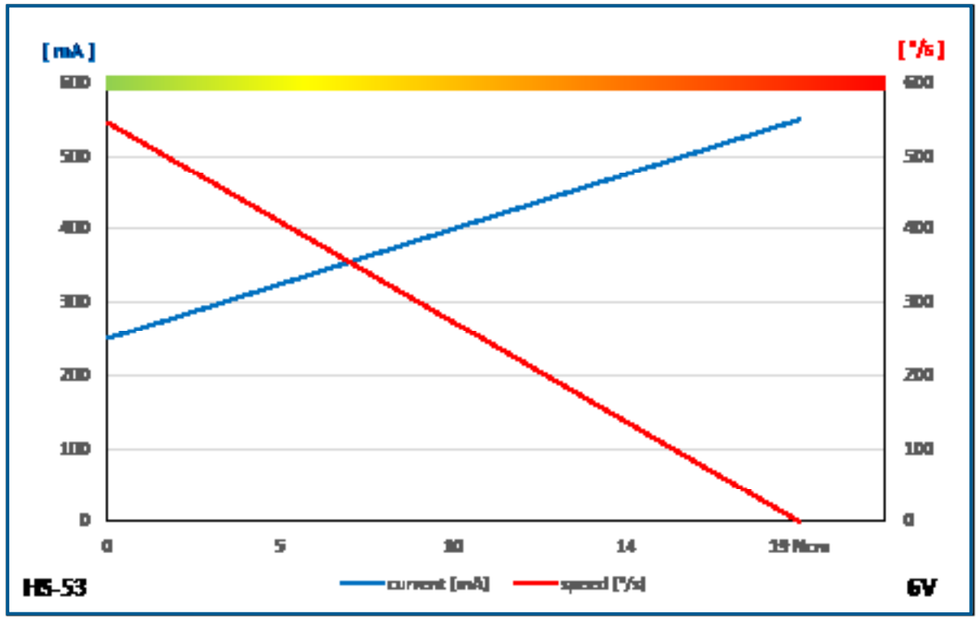
PERFORMANCE CHART



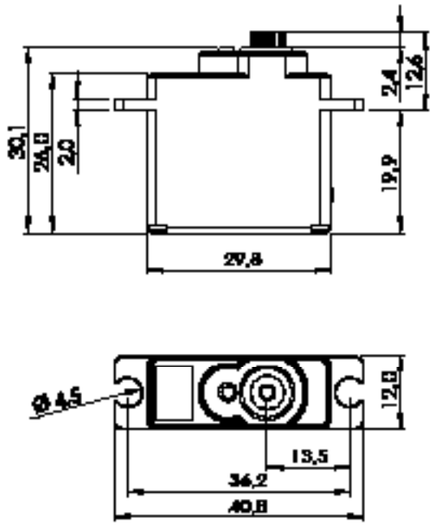
GENERAL SPECIFICATION

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	±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	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 Ø4.0	
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-81

#112081

#112084 GP 20 Stück



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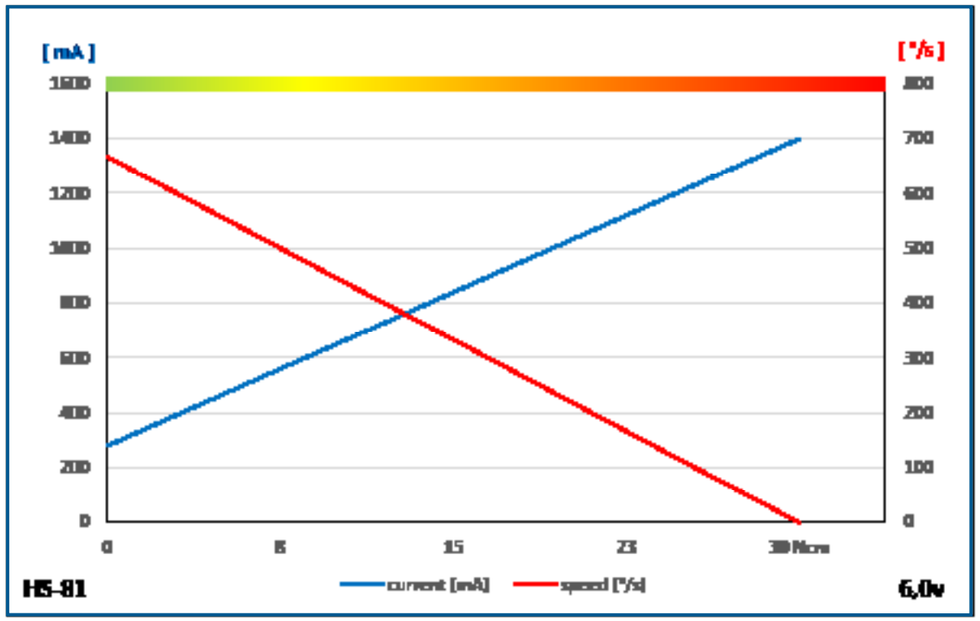
PERFORMANCE CHART



GENERAL SPECIFICATION

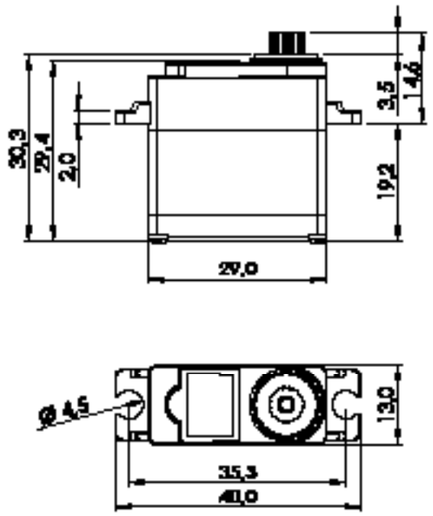
HS-81		
Control System	Pulse Width Modulation (PWM)	
	PWM Range '900µs | 1500µs | 2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Direct Drive	
Motor Type	Cored / 3 poles Ferrite Motor	
Amplifier / MCU	Analog	
Operating Voltage Range	4.8V ~ 6.0V	
Operating Voltage	At 4.8V	At 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-85MG

#112086

#112091 GP 20 Stück



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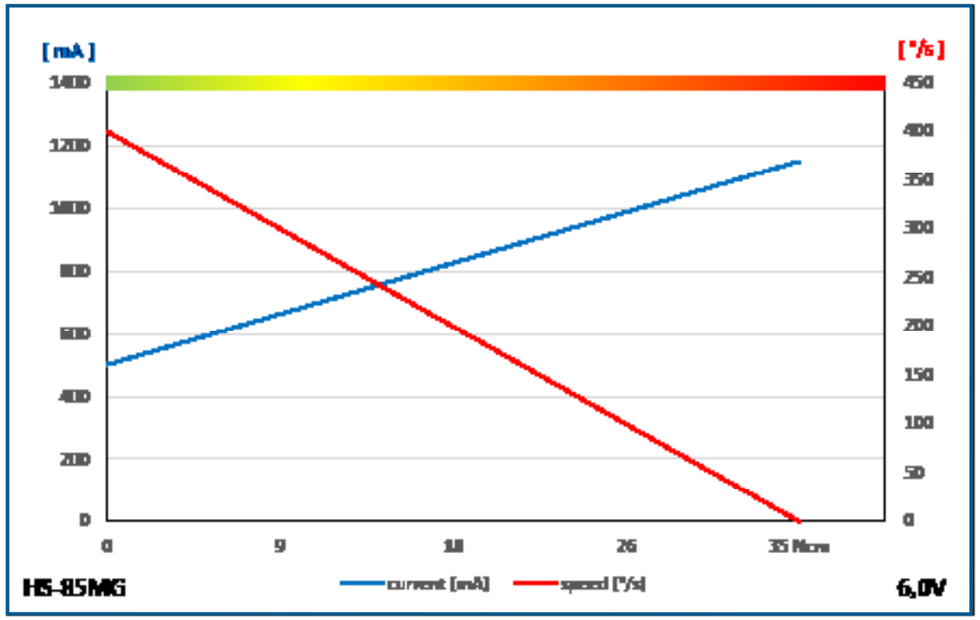
PERFORMANCE CHART



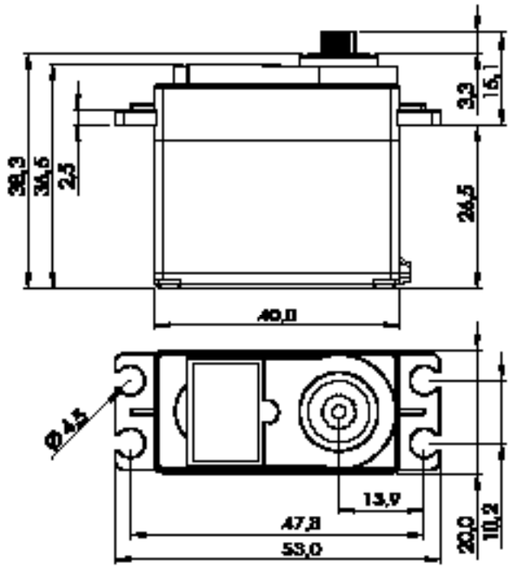
GENERAL SPECIFICATION

HS-85MG		
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 / 3 Pole 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	375°/s (63RPM)	429°/s (71RPM)
Stall Torque	3.0kgcm (29.4Ncm)	3.5kgcm (34.3Ncm)
Peak Efficiency Torque	0.6kgcm (5.9Ncm)	0.7kgcm (6.9Ncm)
Rest Current	8mA	8mA
Running Current at no Load	240mA	240mA
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	29.0 x 13.0 x 29.4mm	
Weight*	21.9g	
Ball Bearing	Single Ball Bearing	
Case Material	Engineering Plastic	
Gear Material	1 Resin & 4 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 / 04.01.2024	
Changelog	-	
*of the servo only w/o horns and accessories		

HS-311

#112311

#IND-112314 GP 30 Stück

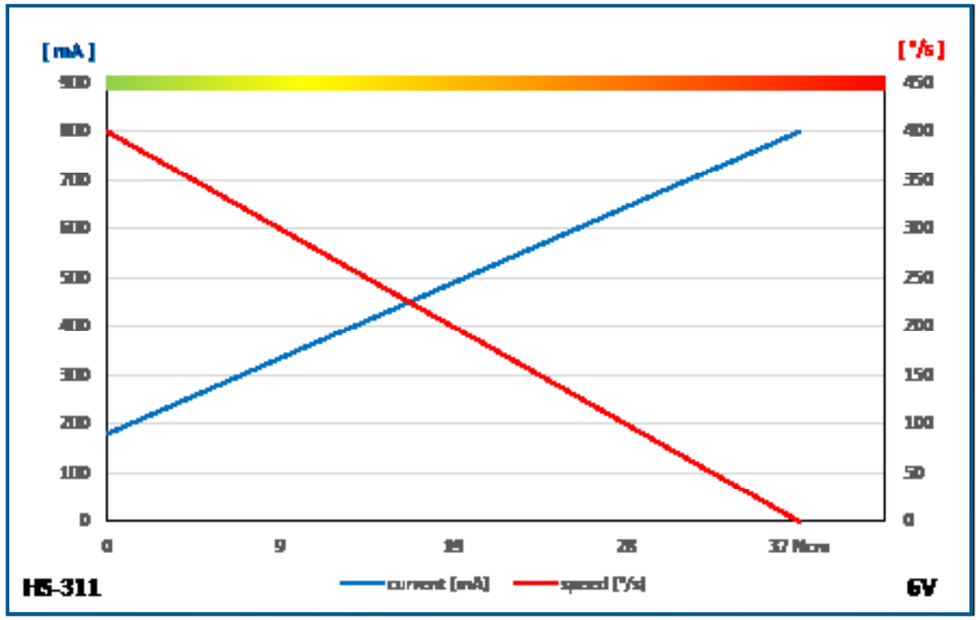


1:1

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		

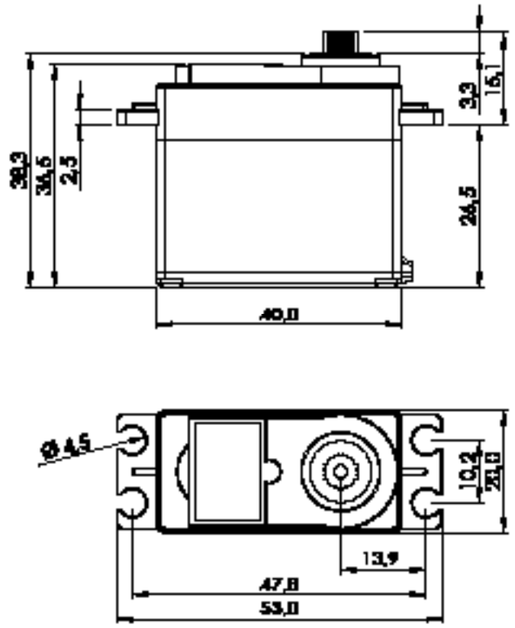
PERFORMANCE CHART



HS-322HD

#112322

#112326 GP 30 Stück



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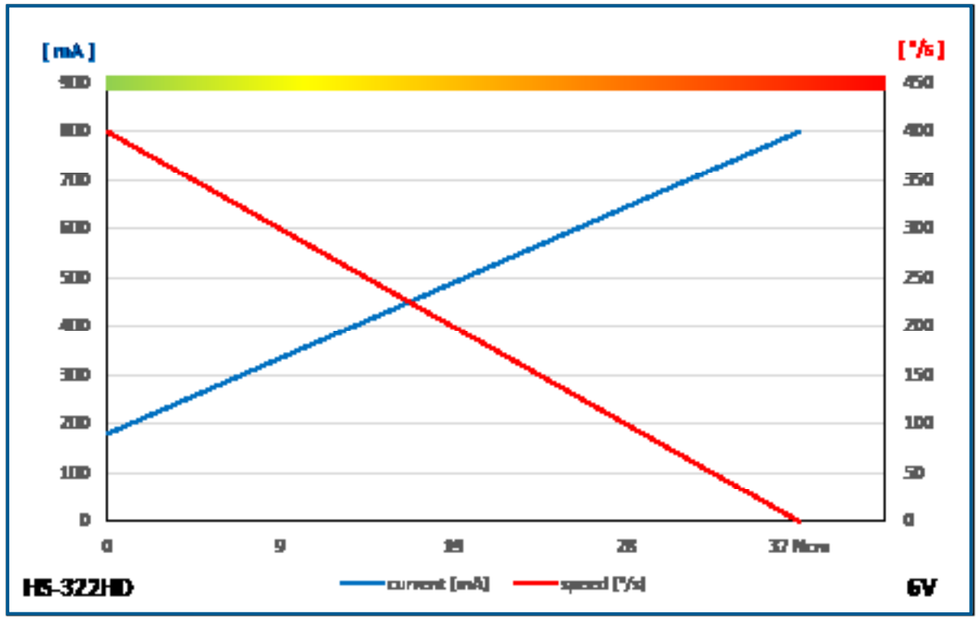
PERFORMANCE CHART



GENERAL SPECIFICATION

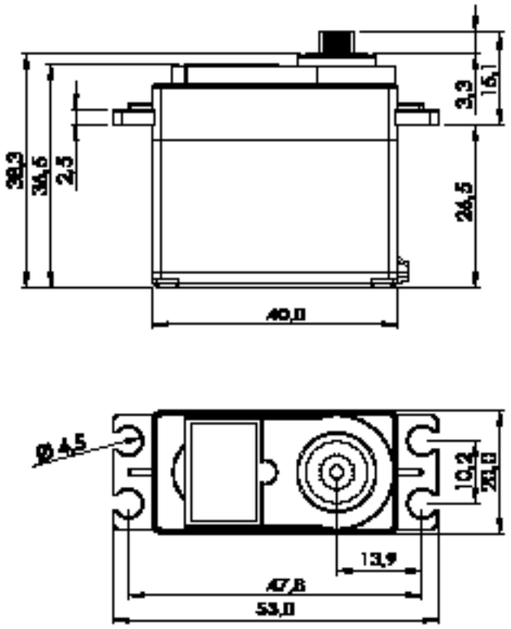
HS-322HD		
Control System	PWM	
	Pulse Width 900µs|1500µs (Center)|2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Direct Drive / 4 Slider	
Motor Type	Cored Metal Brush	
Amplifier / MCU	Analog	
Operating Voltage Range	4.8V ~ 6.0V	
Operating Voltage	At 4.8V	At 6.0V
Operating Speed 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	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

#112325

#1-02361 GP 30 Stück



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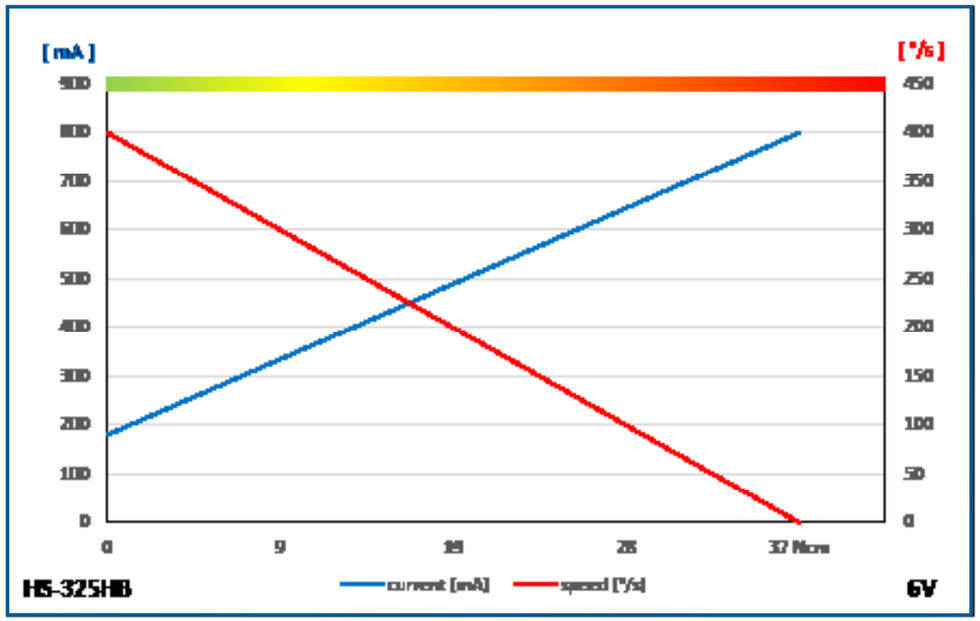
PERFORMANCE CHART



GENERAL SPECIFICATION

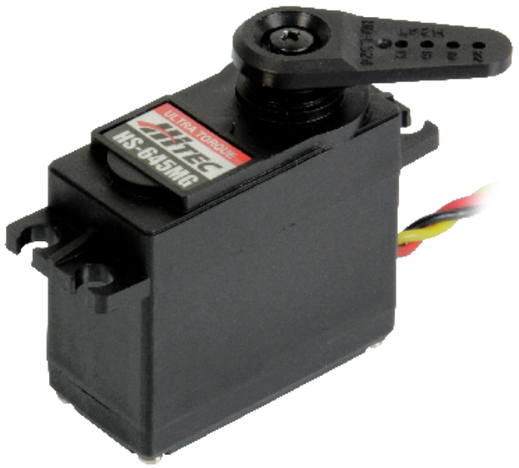
HS-325HB		
Control System	PWM	
	Pulse Width 900µs|1500µs (Center)|2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Direct Drive / 4 Slider	
Motor Type	Cored Metal Brush	
Amplifier / MCU	Analog	
Operating Voltage Range	4.8V ~ 6.0V	
Operating Voltage	At 4.8V	At 6.0V
Operating Speed 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	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	-	

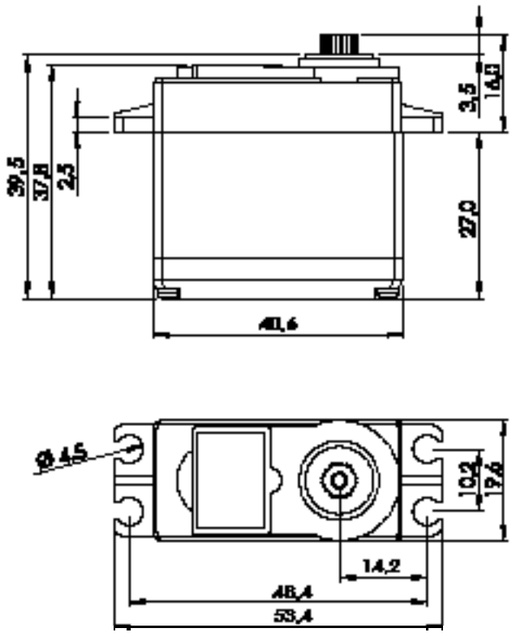
*of the servo only w/o horns and accessories

HS-645MG

#112645

#112648 GP 30 Stück





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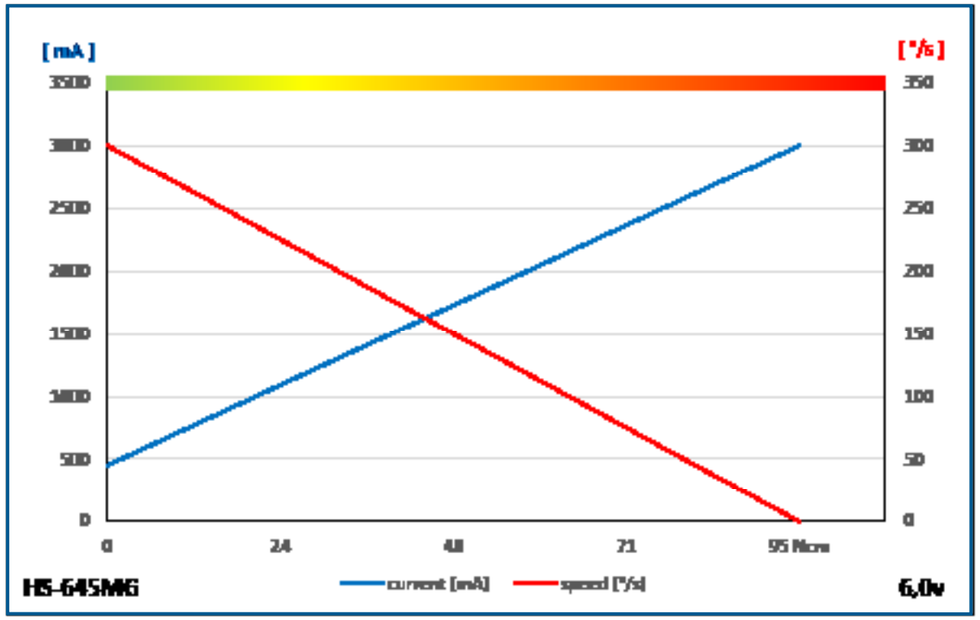
PERFORMANCE CHART



GENERAL SPECIFICATION

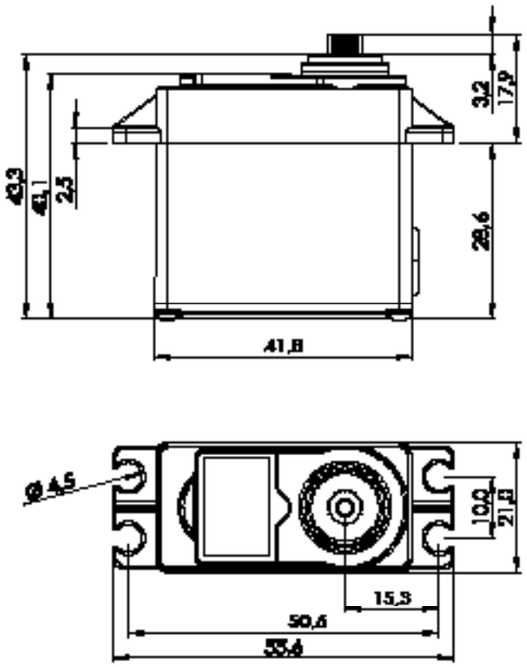
HS-645MG		
Control System	PWM	
	Pulse Width 900µs|1500µs (Center)|2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Contact Analog Potentiometer	
Motor Type	Cored Metal Brush	
Amplifier / MCU	Analog	
Operating Voltage Range	4.8V ~ 6.0V	
Operating Voltage	At 4.8V	At 6.0V
Operating 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 / Ø6.0	
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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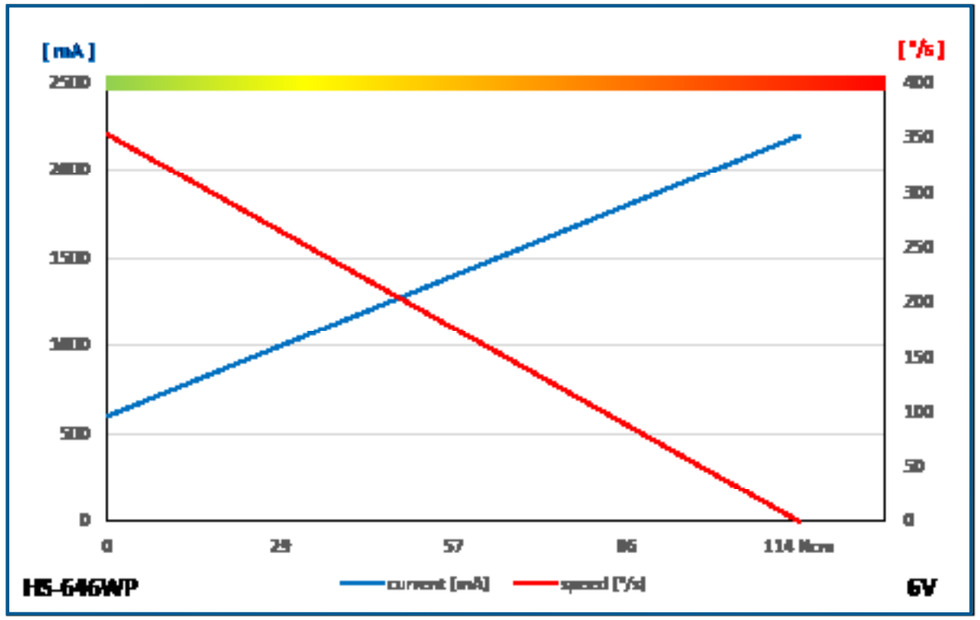
GENERAL SPECIFICATION

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	-	

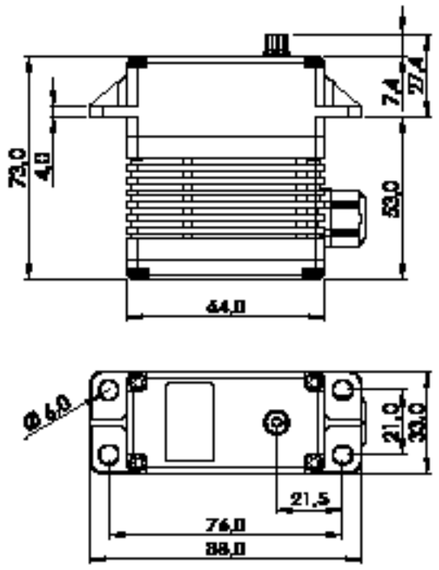
*of the servo only w/o horns and accessories

PERFORMANCE CHART



HS-1005SGT

#138105



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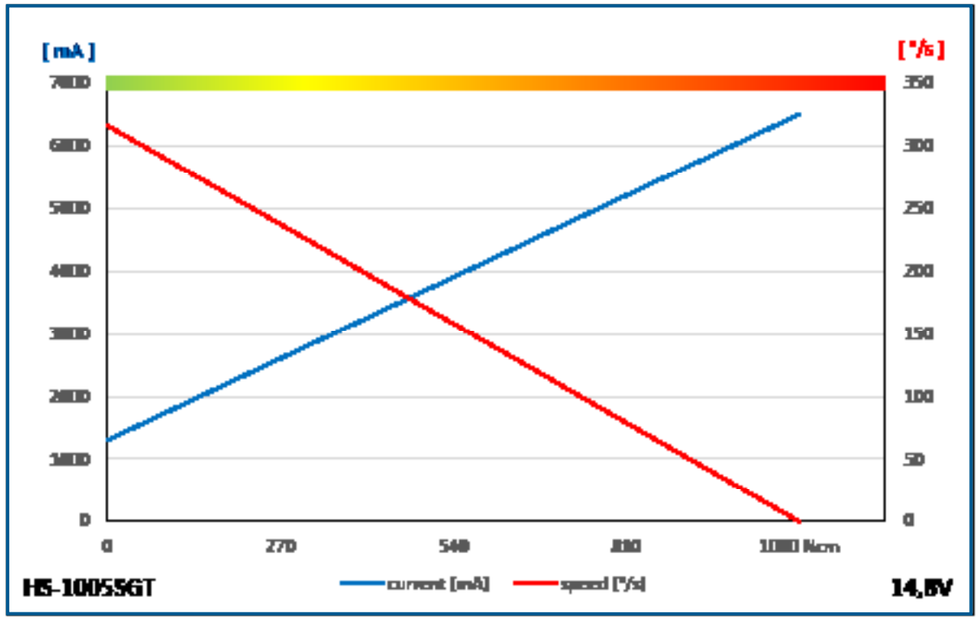
GENERAL SPECIFICATION

	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 Efficieny 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	-	

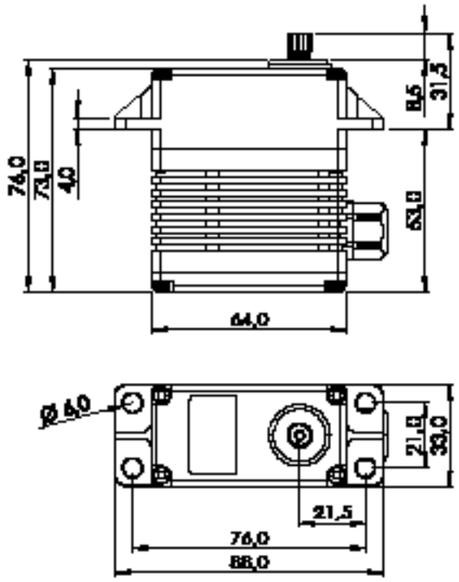
*of the servo only w/o horns and accessories

PERFORMANCE CHART



HS-1100WP

#138100



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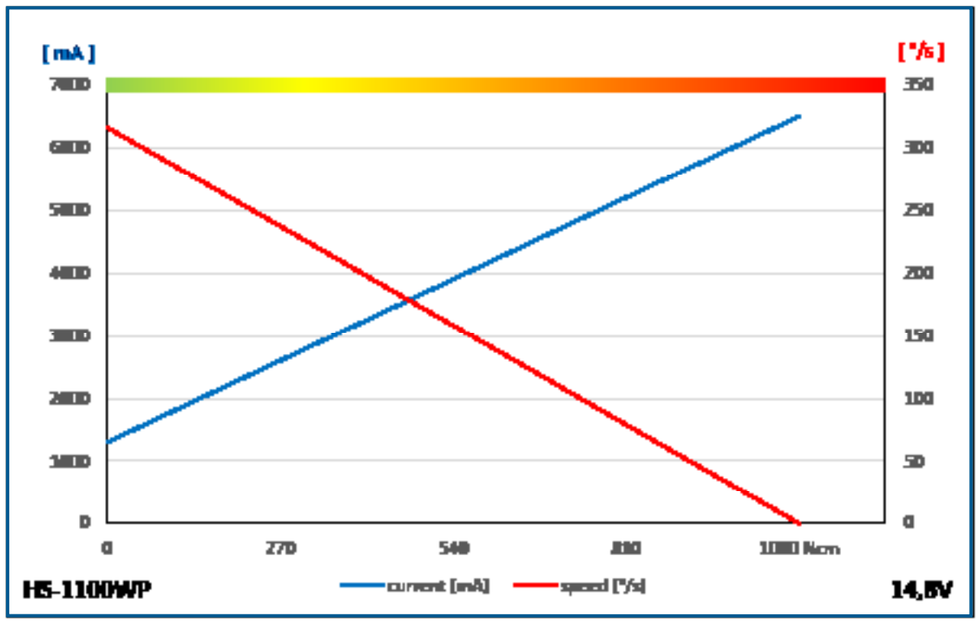
PERFORMANCE CHART



GENERAL SPECIFICATION

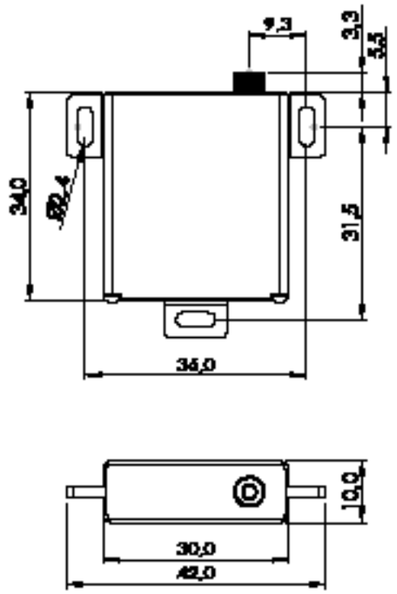
General Specification	HS-1100WP	
Control System	PWM	
	Pulse Width 900µs|1500µs (Center)|2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Indirect Drive / 1M Cycle Long Life	
Motor Type	5 Poles DC Cored Carbon Brush	
Amplifier / MCU	Digital with Mosfet Drive	
Operating Voltage 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	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-5125MG

#113125

#1-03035 GP 15 Stück



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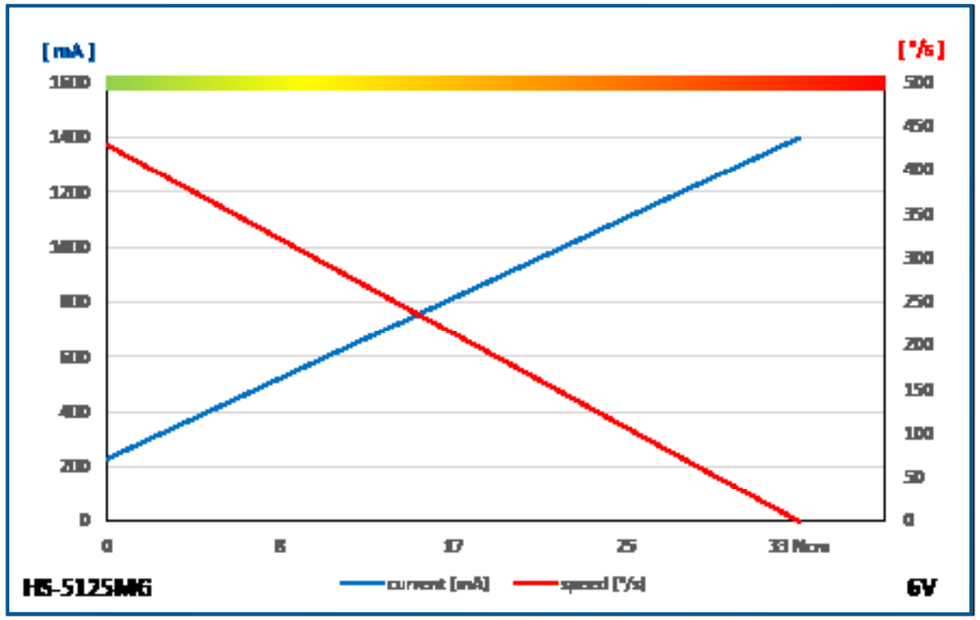
PERFORMANCE CHART

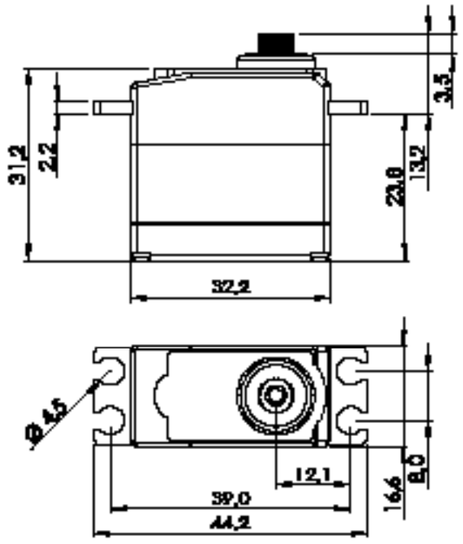


GENERAL SPECIFICATION

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	At 6.0V
Operating Speed at no Load	333°/s (56RPM)	429°/s (71RPM)
Stall Torque	2.8kgcm (27.5Ncm)	3.3kgcm (32.4Ncm)
Peak Efficiency Torque	0.6kgcm (5.9Ncm)	0.7kgcm (6.9Ncm)
Rest Current	3mA	3mA
Running Current at no Load	180mA	230mA
Stall Current	1100mA	1400mA
Deadband Width	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	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	-	
*of the servo only w/o horns and accessories		

HS-5245MG

#113245



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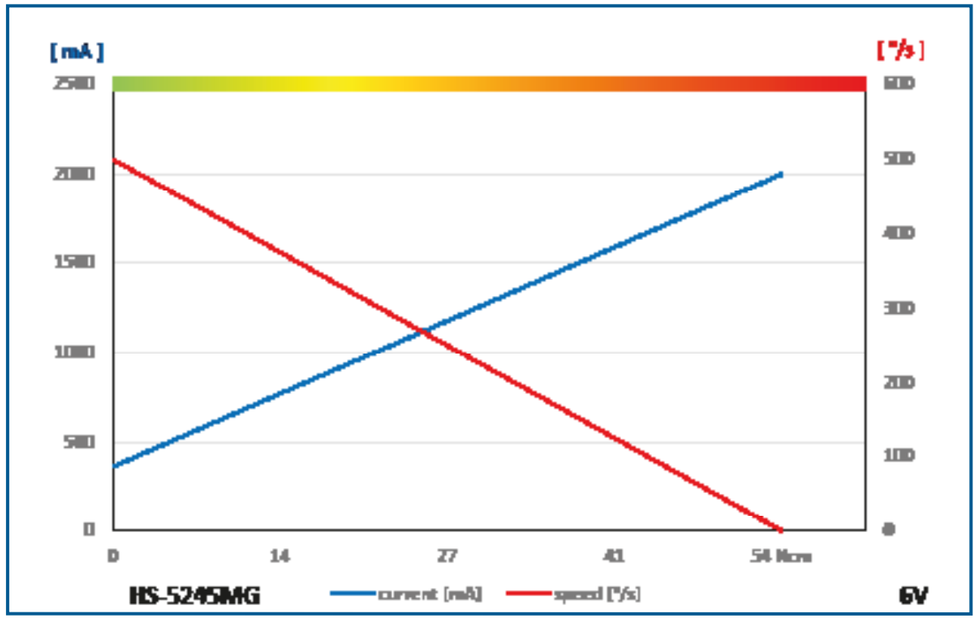
GENERAL SPECIFICATION

	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	-	

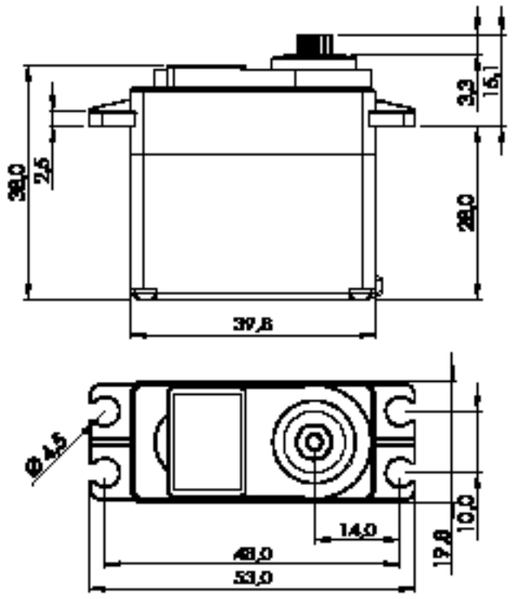
*of the servo only w/o horns and accessories
**At the Max voltage, it is recommended to be used only for a short time duration.

PERFORMANCE CHART



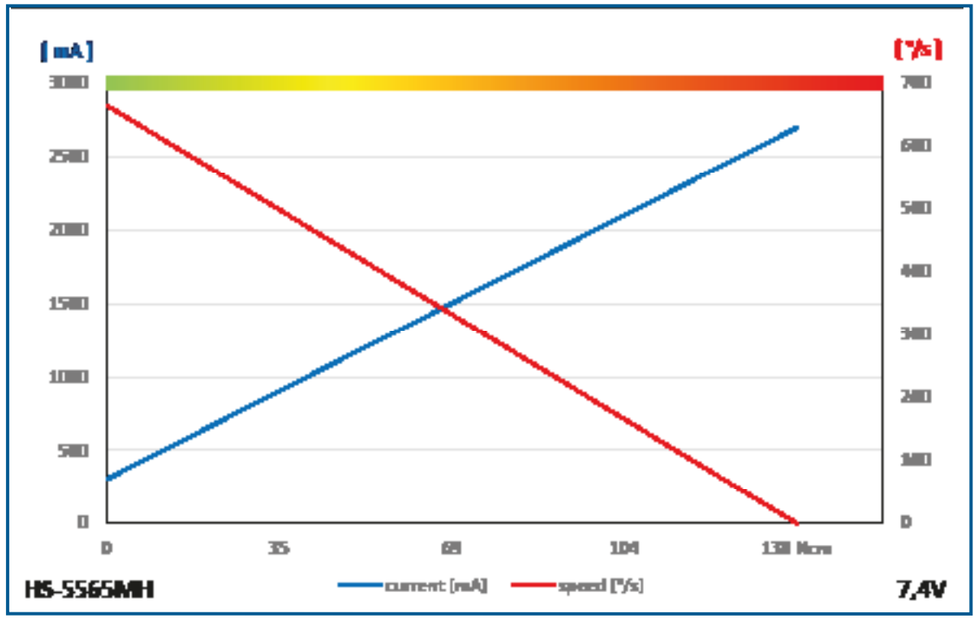
HS-5565MG

#114565



1:1

PERFORMANCE CHART



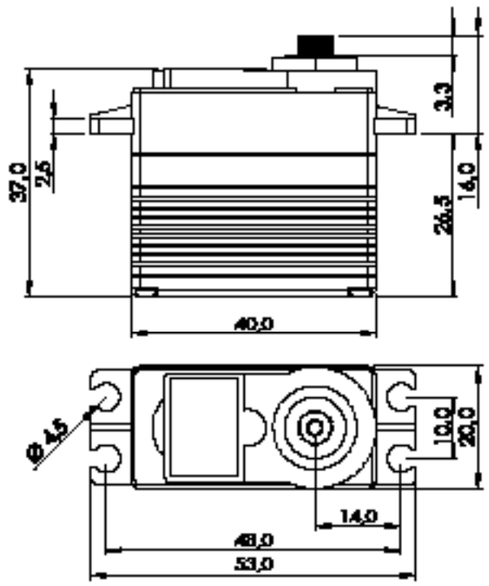
GENERAL SPECIFICATION

	HS-5565MG	
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 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	2µs	2µs
Operating Travel	Default	±60°
	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 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.

HS-7955TG

#113957



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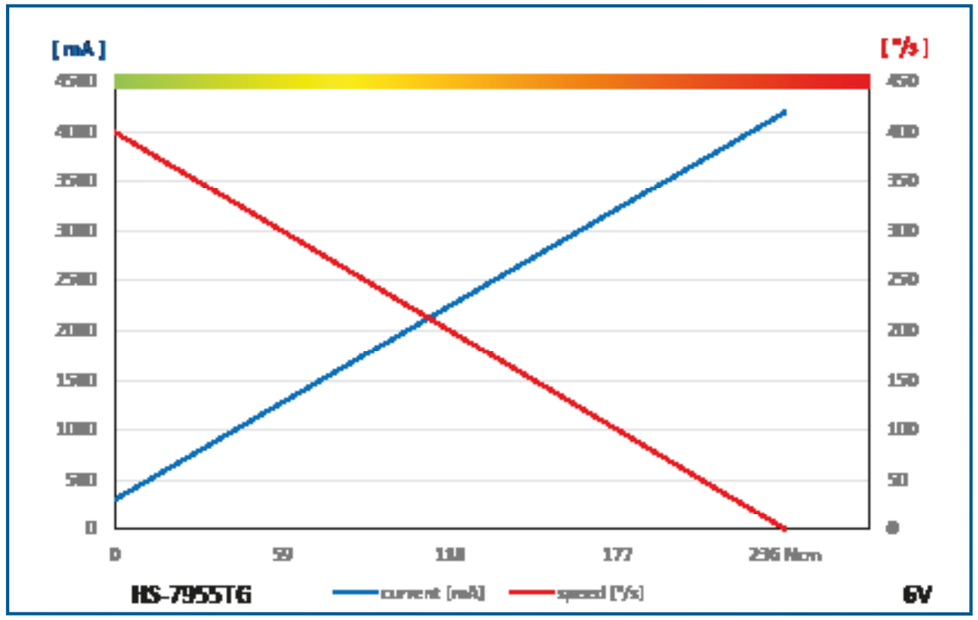
PERFORMANCE CHART



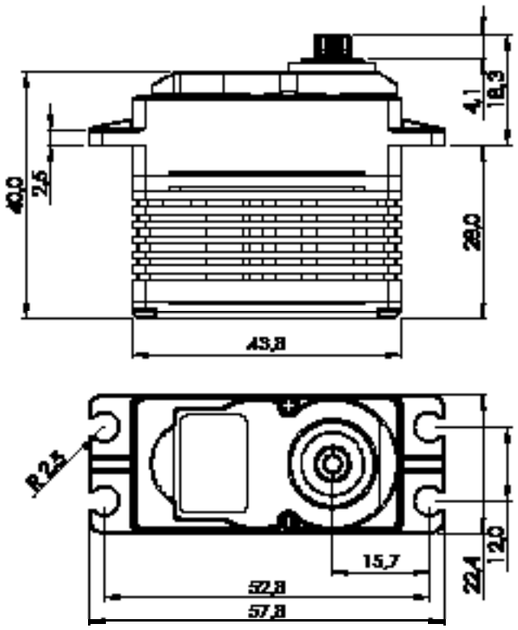
GENERAL SPECIFICATION

	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-M7990TH

#114990



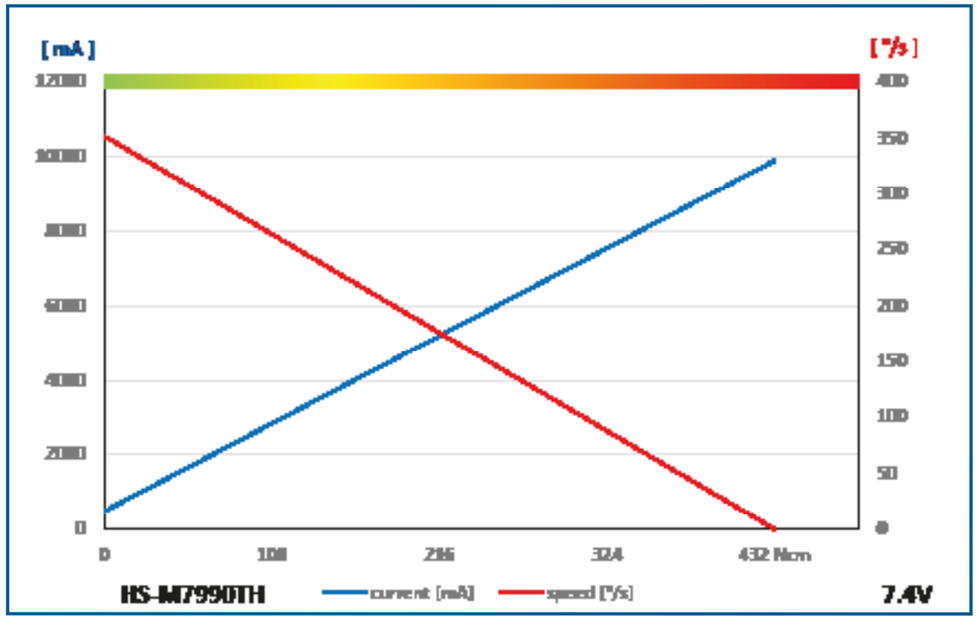
1:1

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 300º
	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	-	

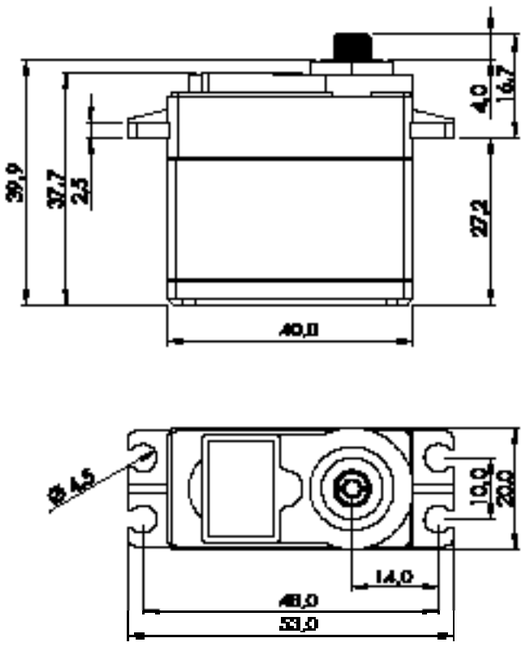
*of the servo only w/o horns and accessories
**At the Max voltage, it is recommended to be used only for a short time duration.

PERFORMANCE CHART



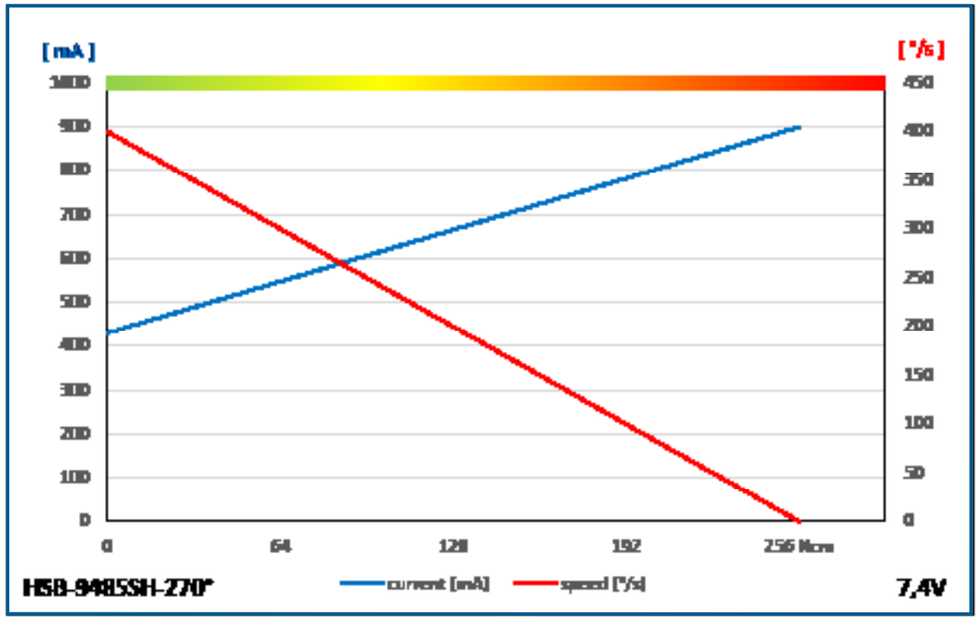
HSB-9485SH-270°

#1-00409



1:1

PERFORMANCE CHART

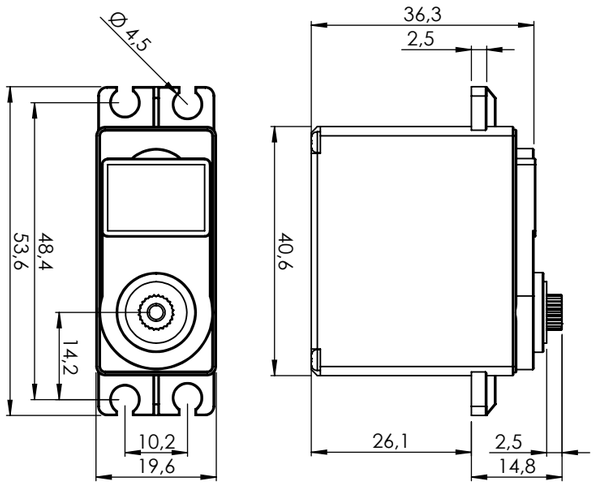


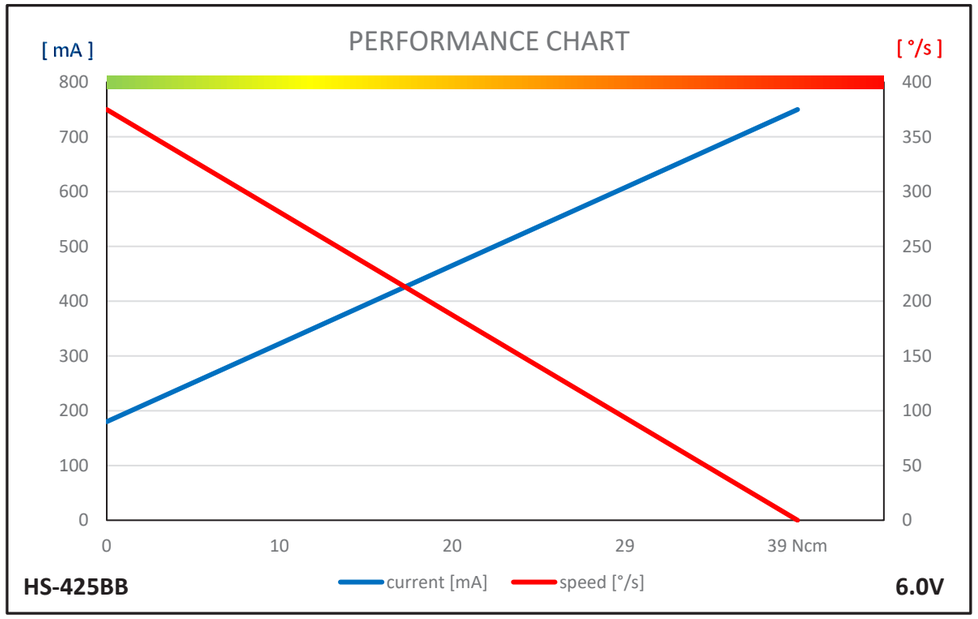
GENERAL SPECIFICATION

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 Cylce 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		

HS-425BB

1-03235



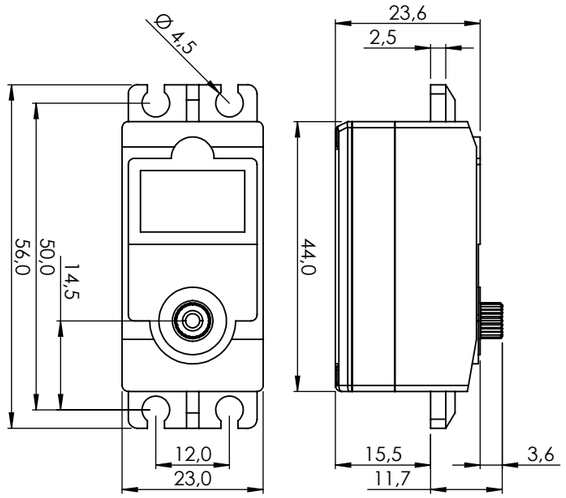


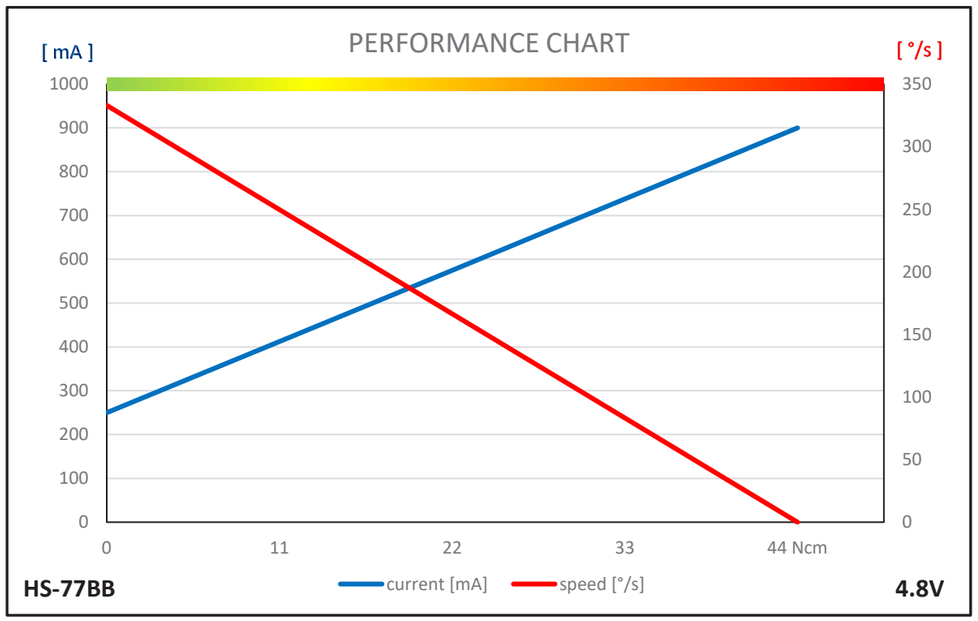
GENERAL SPECIFICATION

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: ±60º, 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	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-77BB

1-03236



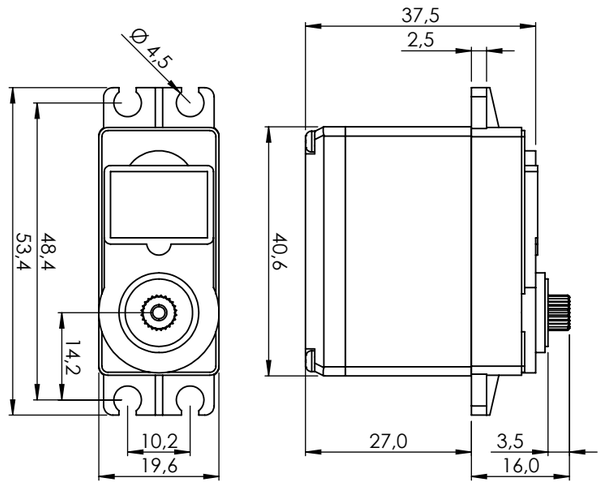


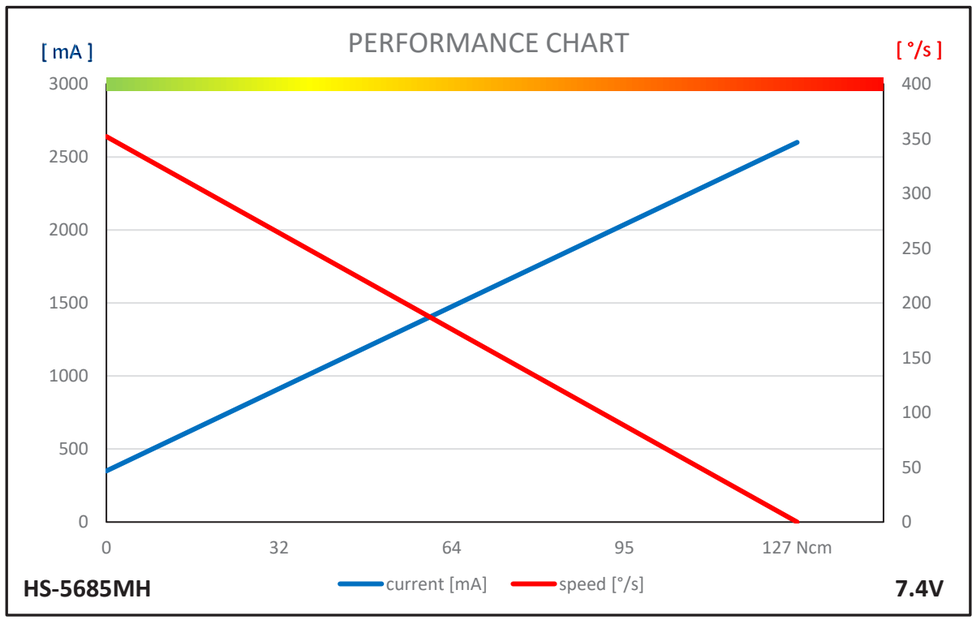
GENERAL SPECIFICATION

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: ±67.5º, 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	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(Ø6)		
IP-Rating	IP54		
Servo Amplifier Type	Analog Contorller		

HS-5685MH

1-03237



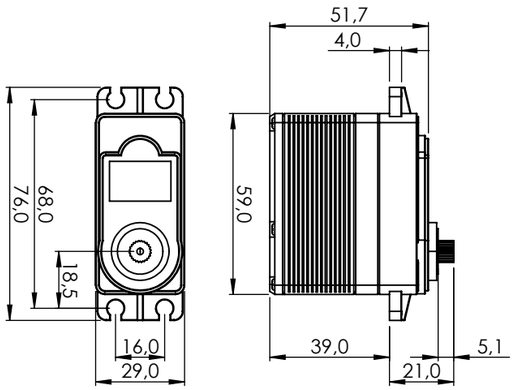


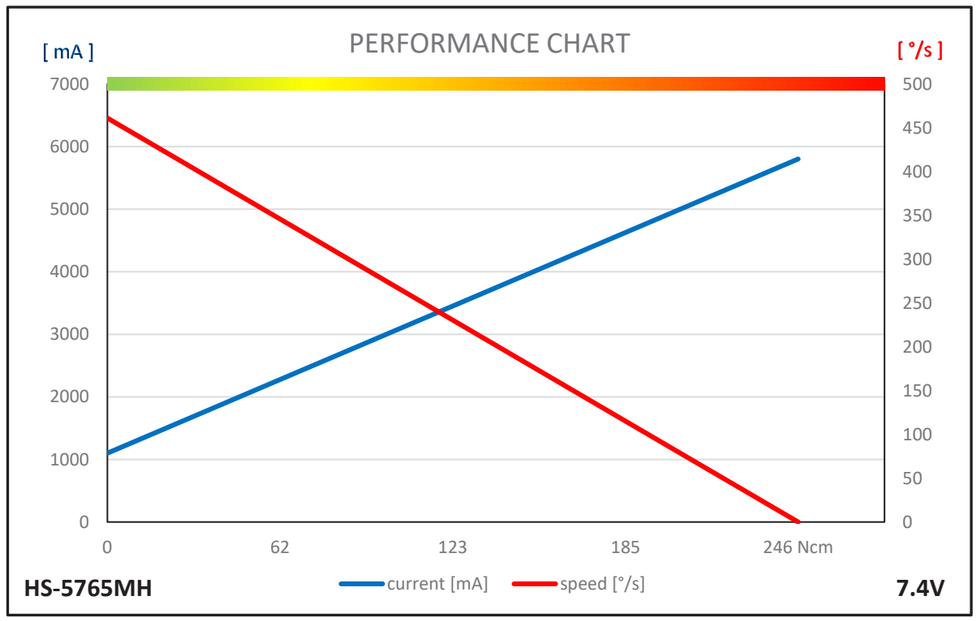
GENERAL SPECIFICATION

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: ±60º, Programmable: Max 175º / 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-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: ±60º, Programmable: Max 175º / 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 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		

Anwendungsbeispiel für HiTEC-Servos

Hier im Roboter-Arm

Typical application for HiTEC servos –

here in a robot arm

KUNDENINDIVIDUELLEANPASSUNG

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)

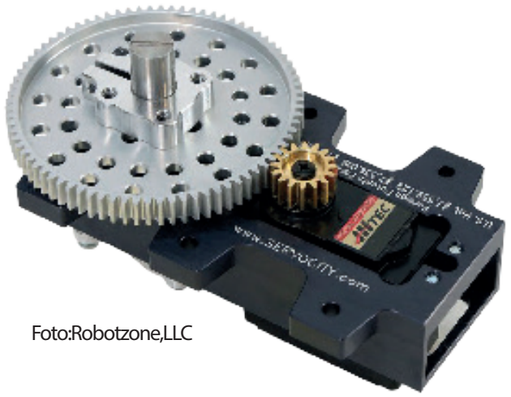


Foto:Robotzone,LLC

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.

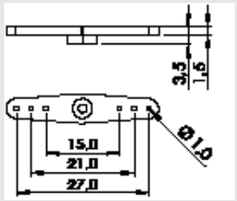
SERVO ABTRIEBSARME

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

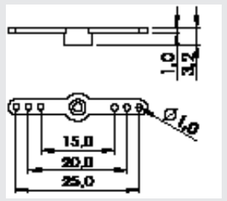
Bei Sonderwünschen können Sie aus dem breiten Sortiment wählen, bitte nehmen Sie hierzu Kontakt zu uns auf.

15T(Ø4,0)

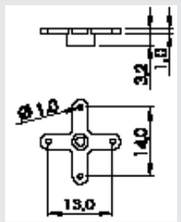
FS-IL15



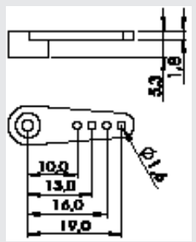
FS-IS15



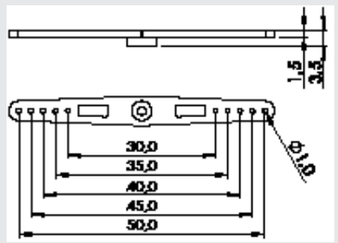
FS-X15



HD-M15-L

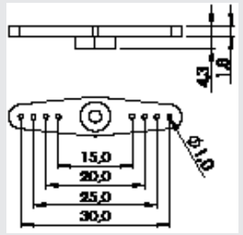


FS-IXL15



25T(Ø5,0)

MS-I25



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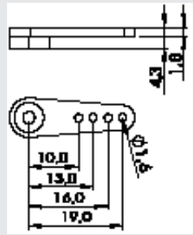

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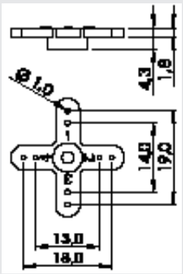

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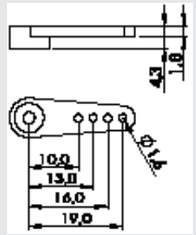

24T (Ø6,0)

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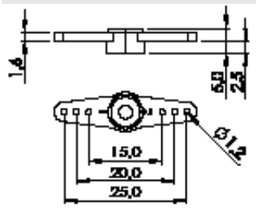

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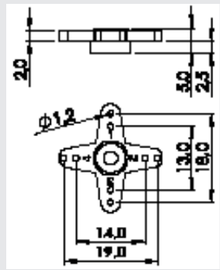

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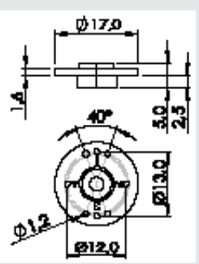
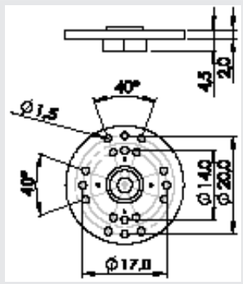


R-O24



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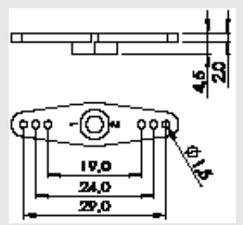

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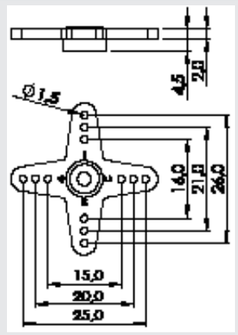

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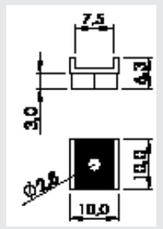

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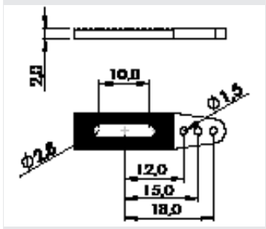

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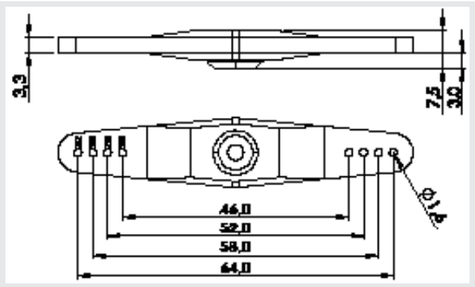

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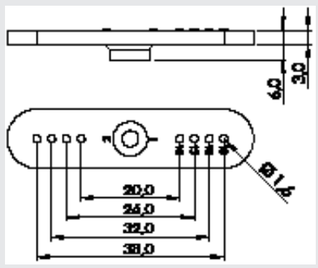
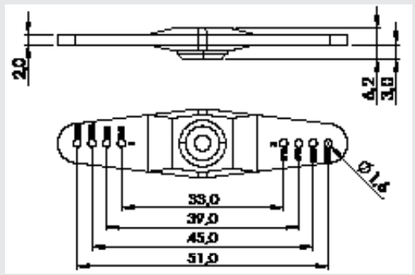


HD-IS24



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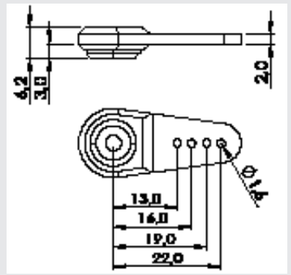

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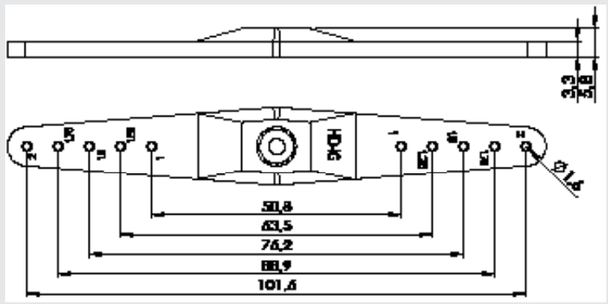

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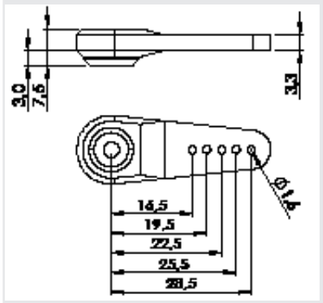
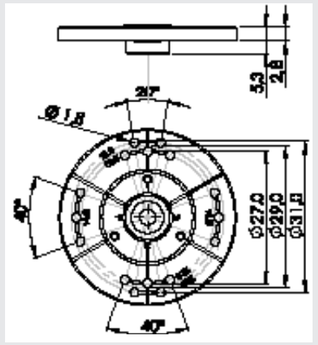


HD-LG24

HD-OS24

Q-O24



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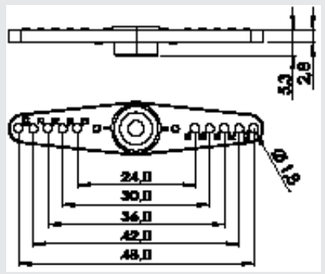

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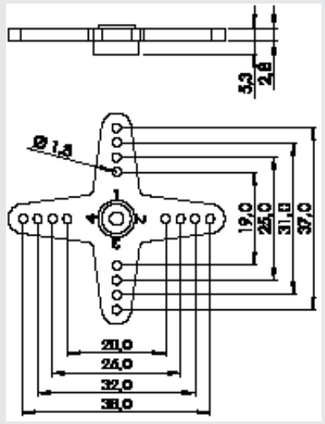

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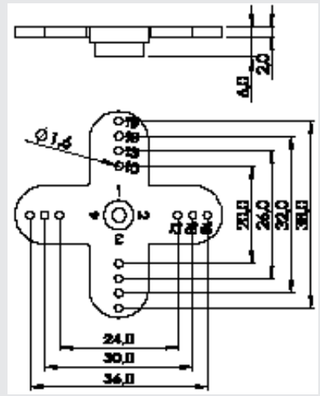
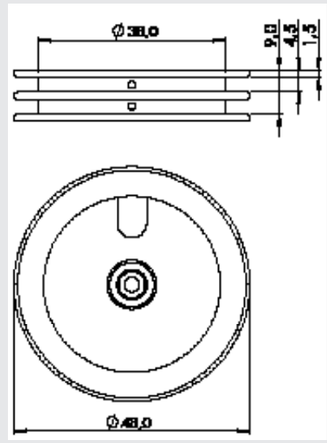
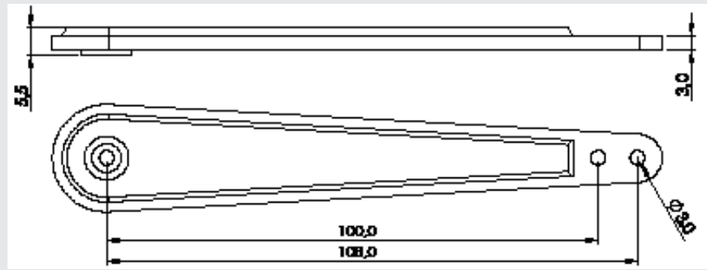


SP-24



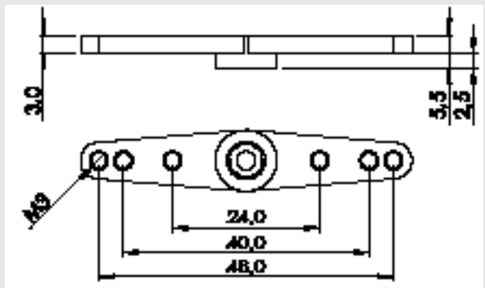
715SA-24



R-ML24

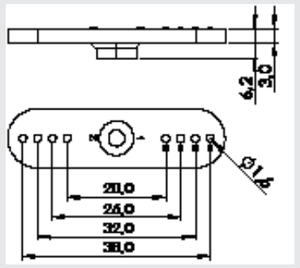
R-MO24

Q-MI24



H25T(Ø6,0)

HD-IM25



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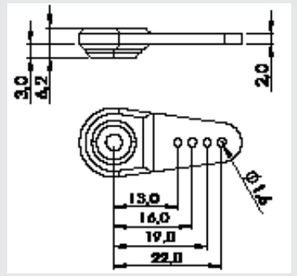

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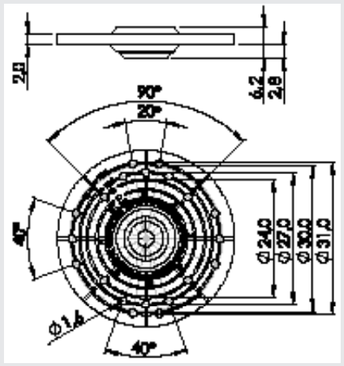

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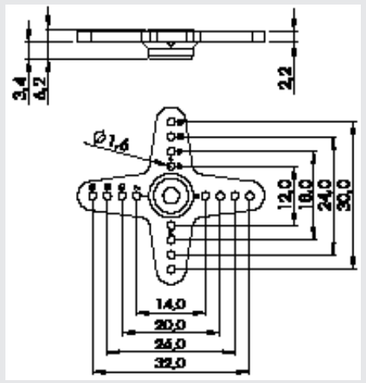

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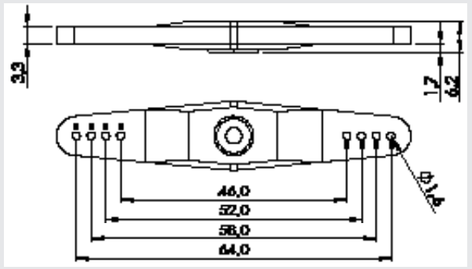

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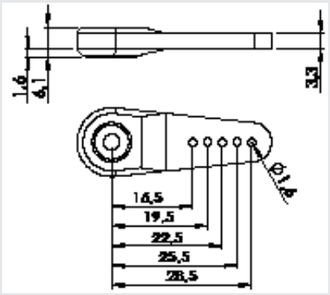

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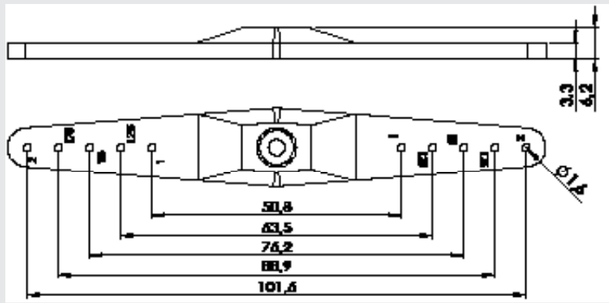
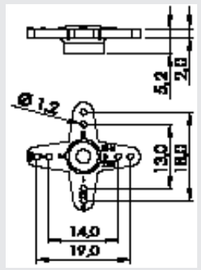
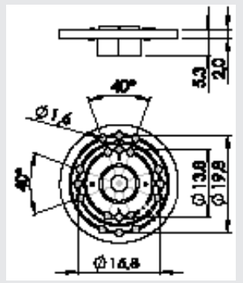


HD-LG25 M-O25 M-I25

M-X25



R-O25



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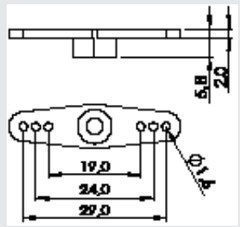
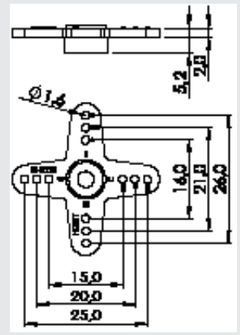
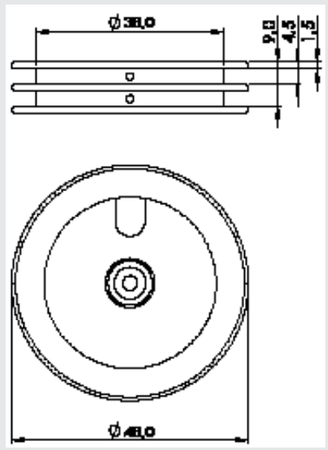


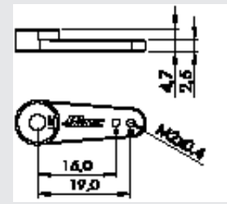
R-X25



SP-25



R-ML25



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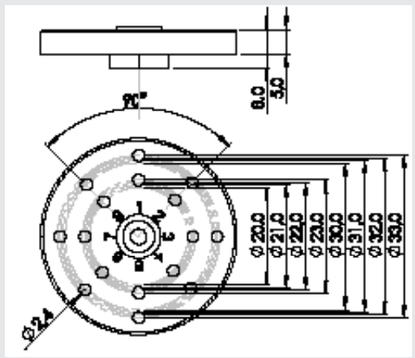
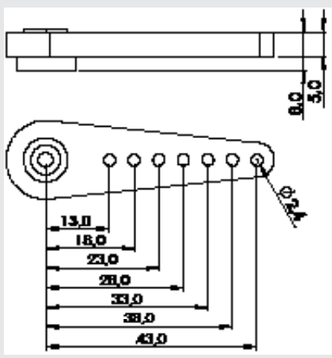
Q-OA15



Q-IA15



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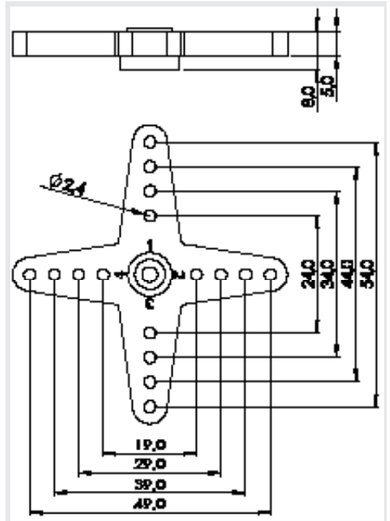
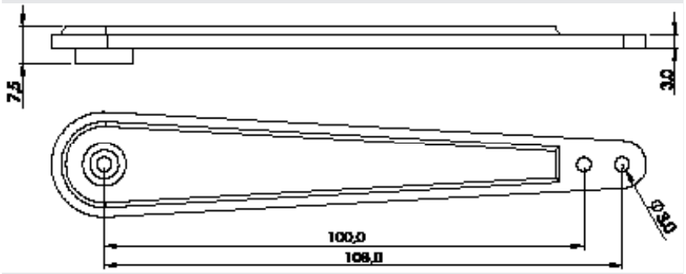
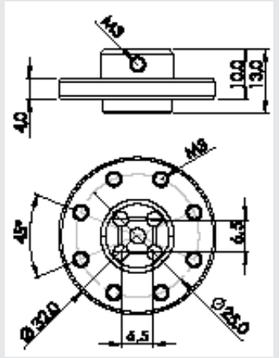


825SA-15

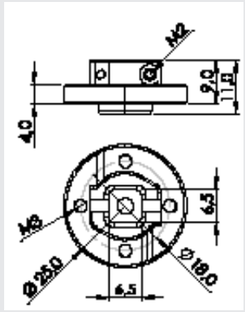


SQUARE6.5

MOS6.5-S



MOS6.5-A



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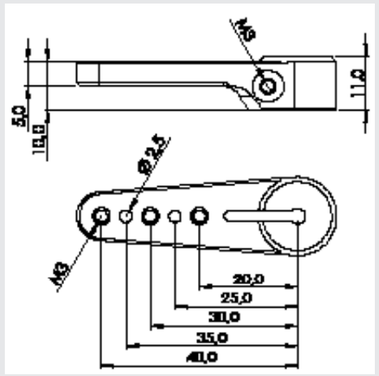

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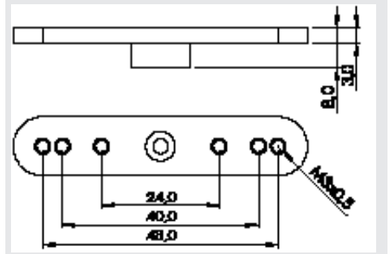
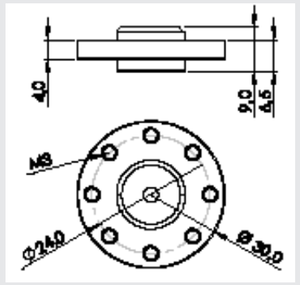
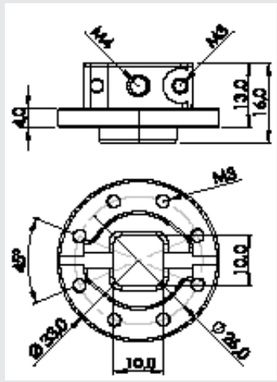


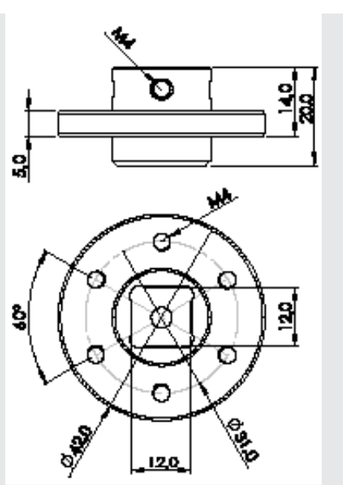
I-MO15



SQUARE10

SQUARE12

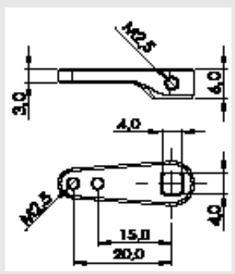




SQUARE4

SQUARE5

MIS4-A



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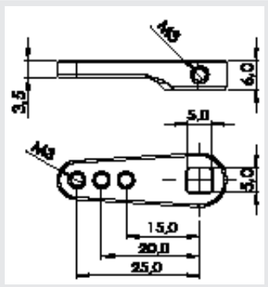

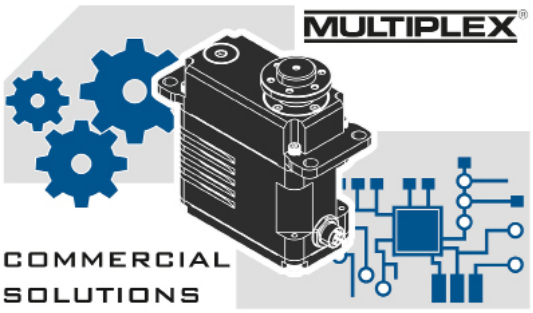

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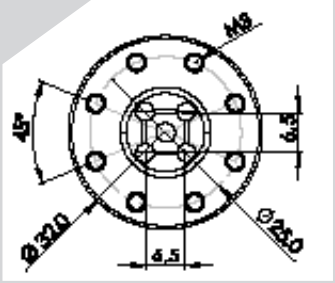

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