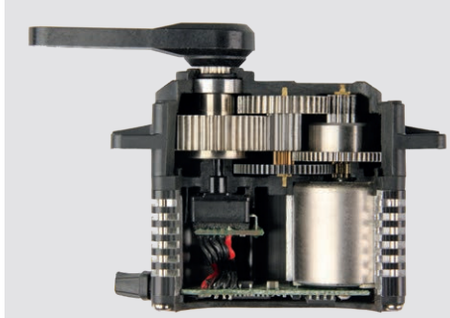
EN

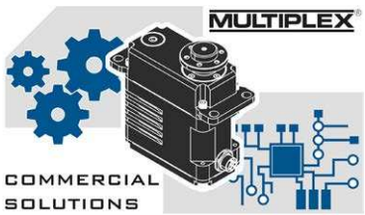
MULTIPLEX®

COMMERCIAL
SOLUTIONS

Innovative
Commercial Solutions

Actuators and Servos





Since 2002, MULTIPLEX Modellsport GmbH & Co.KG, based in Bretten, Germany, is part of the South Korean HITEC Group.

The products of Hitec RCD Korea, Inc. are used worldwide and, due to their diversity, are suitable for a wide variety of applications. For example, they are used as servos in the UAV sector, as actuators for automation and handling tasks in industry, or as actuators for the active aerodynamics of a racecar.

We will be happy to send you detailed specifications and additional information on request.

Contact us under:

Phone: +49 (0) 7252 58093-20

MULTIPLEX Modellsport GmbH & Co.KG

Hitec RCD Korea, Inc.

Hitec Group USA, Inc.

Hitec-MULTIPLEX Japan, Inc.

Hitec RCD Philippines, Inc.

PRODUCT OVERVIEW

Servos and linear actuators

HLS-series linear actuators

SG-series servos

HSB/HSR-series servos

D/DB/MD/MDB-series servos

Other servos for related industrial applications

Servo accessories

a. Programming devices

b. Servo output arms

ANALOGUE ACTUATORS

Analogue actuators are generally low-priced to mid-priced items, and most of them are equipped with inexpensive components. The motor is always a D.C. brushed unit. Actuators offer no user-programmable options. Communication is always based on a PWM signal with a frequency of 50Hz. The motor PWM is the same as the control frequency, i.e. it is also 50Hz. This means that the possibility to control activity (motor on or motor off) only occurs every 20ms. Slow movements or small corrections result in long motor-off periods in relation to motor-on periods. The motor voltage is always the same as the power supply voltage.

Advantages:

- Reasonable price
- Pleasant running sound thanks to low motor frequency
- Low power consumption

Disadvantages:

- Low holding moment
- Slow response characteristics
- Low resolution due to low control frequency
- Wide deadband (20ms)
- Slow movements may not be smooth

DIGITAL ACTUATORS

Digital actuators generally fall in the high mid-range to high-price category. Very high-quality components may be used, such as Hall sensors for position sensing, as well as brushless D.C. motors. Communication is based on a PWM signal with frequencies up to 330Hz (according to actuator type) or other interfaces such as CAN, UAVCAN, RS-485 or TTL. The motor frequency is independent of the control system and is usually in the range 300 - 500Hz. This results in a very small possible deadband of up to 2ms. Digital actuators also offer wide-ranging programming and protective functions, as well as allowing two-way communication (feedback) depending on type.

Advantages:

- Fast response characteristics
- Fast corrective activity
- High holding power
- User-variable deadband
- Good accuracy
- Two-way communication
- Programmability
- Safety functions
- High resolution

Disadvantages:

- In most cases more expensive
- In some cases unpleasant running sound due to high motor frequency
- Higher power consumption


HS-1100WP
WATER PROOF SERVO
HSBM9381TH
2WL1800801A00045
D951TW
HSB-9381TH
32bit
WIDE
VOLTAGE
BRUSHLESS
TITANIUM
GEAR
POWER EFFICIENT SYSTEM
HiTEC
PROGRAMMER
HFP-30
BACK
SET

INTERFACES

PWM communication

The conventional method of controlling Hitec actuators, with many advantages for simple tasks. Hitec PWM actuators can be controlled using a pulse width of 900 to 2100µs. The usual control frequency is 50Hz (20ms), but frequencies up to 330Hz are possible with particular actuator types for special applications.

Actuators with PWM communication can easily be controlled at low cost, and they are adequate for many applications where feedback is not required.

The interface is in widespread use, and many controllers offer suitable presets and libraries.

Pin layout of Hitec PWM actuators*

RS485 and TTL communication

There are a number of applications in several fields of operation for which feedback of the actual servo position is required, or at least desirable. Certain Hitec actuators are also available with RS485 and TTL interfaces, which enable them to work with two-way communication (feedback).

Hitec RS485 and TTL actuators communicate with external devices using the half-duplex process. TTL actuators of this type feature just one signal wire in addition to the voltage and earth conductors, whereas RS485 actuators feature two signal wires.

Pin layout of Hitec TTL actuators*

Pin layout of Hitec RS485 actuators*

CAN and UAVCAN communication

The industrial and UAV field is becoming increasingly significant. This progressive, fast and technically highly complex market demands innovation and reliability. Many applications require intelligent solutions and genuine feedback of position, torque and other parameters in order to assess the application or to gain information about the condition of the components.

The following protocols are available: CAN 2.0A, CAN 2.0B, DRONECAN, UAVCAN

Pin layout of Hitec CAN actuators (not applicable to the SG-series)

* Can be supplied fitted with the client's choice of connectors upon request.

FEATURE ÜBERSICHT

Mid-point and end-point adjustment (EPA / Neutral Settings)

Provides programmable mid-point and end-point servo positions.

Direction of rotation

Clockwise (CW) = when viewed from above, the servo output rotates clockwise when the signal width is increased.

Counter-Clockwise (CCW) = when viewed from above, the servo output rotates counter-clockwise when the signal width is increased.

Deadband (DB width)

The smaller the deadband, the sooner any corrective activity takes place when an angular change occurs. If the deadband is too low for the application, the result will be increased wear. Increasing the deadband results in loss of precision.

Travel speed

The servo's transit speed: 100% equates to maximum possible travel speed.

ID-read / Node-ID

Assignment of an actuator ID in TTL and CAN networks.

Fail Safe

If the signal is lost, the servo rotates to a pre-selected position.

Fail Safe limp mode

The servo goes into sleep mode: the motor is disabled and the servo position is not maintained. The servo can be moved by hand.

Soft Start setting

When switched on, the servo runs to the nominal position at low speed in order to minimise stress on the gearbox and peripherals. At the 100% setting the servo runs to the nominal position with maximum transit speed when switched on.

Overload protection

Protection mechanism designed to avoid damage to the servo if it is overloaded or stalled. A setting of 20% corresponds to a reduction in maximum torque by 80%.

Smart sense

An intelligent regulatory circuit adjusts the control parameters while the servo is in use, in order to reduce oscillation. Oscillation can be provoked by fluctuating inertia levels in the various applications.

It is also possible to influence the regulatory circuit manually (sensitivity ratio settings). A high value may result in high-speed oscillation at the servo. A low value may generate severely damped response characteristics.


HiTEC
SG33BL
1WF1601001B019
SG33BL
1WF1601001B019
SG33BL
1WF1601001B019

SERIES SUMMARY

HLS-series (Linear Actuators)

Electrical linear actuators generating straight-line travel movements, making them suitable as replacements for pneumatic and hydraulic cylinders in many applications.

SG-series (Industrial Servos)

The premium industrial servo line, consistently developed for requirements in the fields of automation, unmanned aviation and robotics. Basic equipment includes a powerful BLDC motor, a Hall sensor for zero-contact, zero-wear position sensing, and watertight construction. All SG-series servos also feature a Multi-Turn* and Continuous-Rotation** function.

HSB-series (Brushless Servos)

Mid-priced servo motors with powerful BLDC motors.

HSR-series (Servos with Multi-Turn)

Mid-priced servo motors with Multi-Turn* and in some cases Continuous-Rotation** function. Most are equipped with a BLDC motor.

D-series (Digital Servos)

Mid-priced digital servo motors with a coreless or brushed motor. Fitted with a high-quality potentiometer for position sensing.

MD-series (Digital Servos with Magnetic Encoder)

Mid-priced digital servo motors with a coreless or brushed motor. Fitted with a Hall sensor for position sensing.

DB-series (Brushless Servos)

Mid-priced digital servo motors with powerful BLDC motors. Fitted with a high-quality potentiometer for position sensing.

MDB-series (Brushless Servos with Magnetic Encoder)

Mid-priced digital servo motors with powerful BLDC motors. Fitted with a Hall sensor for position sensing.

MDR-series (Digital Servos with Magnetic Encoder and Multi-Turn)

Mid-priced digital servo motors with Multi-Turn* and in some cases Continuous-Rotation** function. Fitted with a coreless or brushed motor. Fitted with a Hall sensor for position sensing.

HS-series (Hitec Servo)

Low-priced analogue servo motors, fitted with a brushed motor and a potentiometer for position sensing.

HS-1XXX, HS-5XXX, HS-7XXX series (Hitec Servo)

Mid-priced digital servo motors fitted with a coreless or brushed motor and a potentiometer for position sensing.

*: Several rotations are possible for maximum angular travel.
**: The servo is capable of continuous rotation.

TWO-WAY COMMUNICATION (FEEDBACK)

Absolute position

The control system no longer has to rely on an actuator actually taking up the desired position; instead its current position can be read off with a resolution of 4096 steps.

Torque

Torque is a particularly important feature, as it allows the user to make assessments of the actual loads when the actuator is in use, as well as the condition of the components. Stiff mechanical systems can be detected and corrected in good time before they result in actuator overload. The torque value is derived from the motor PWM, and is therefore not an actual measurement, but it is adequately precise for the majority of applications.

Speed

How fast is the actuator when actually in use by the application? The actuator itself supplies the answer, thereby permitting important inferences to be drawn for many a control task.

Power supply voltage

The actuator constantly provides information on the momentary power supply voltage. The development or maintenance team can use this to detect potential weak points in the cable loom, for example: enabling high-resistance connectors to be replaced in good time.

Current drain

Current is the most important feedback element in preventing potential damage. Rising current over a given period of operation under a constant load is a reliable indication of an imminent fault. This may relate to the motor, the gearbox or the mechanical system being moved. Monitoring current drain opens up new possibilities in programming: effective system life can be extended by targeted optimisation of the internal control system (PID) and other parameters such as Soft Start (ramp) or deadband.

Micro-controller temperature

The temperature of the micro-controller is more than just a useful piece of information. Environmental conditions which include wide thermal variation can be very demanding on an actuator. Monitoring temperature in this way allows the development team to learn the thermal limits of the product, and to introduce appropriate measures to prevent premature failure.

Motor temperature

Are you asking too much of the actuator you are using? The motor temperature provides reliable information on whether an actuator is being operated close to its limit. This feedback is very important, especially if thermal conditions are widely variable.

Cycle counter

How many cycles does the actuator complete during use? How many parts were positioned? When must the actuator be replaced because the maximum cycle count has been reached? Some of our actuators supply this feedback in a convenient manner as part of the protocol.

MOTORTYPES OVERVIEW

Brushed Motor

Brushed DC motors are characterized primarily by their low price, but also by their high overload capacity (good heat dissipation). These motors are mainly used in analog servos. They are a first choice for applications with lower performance requirements or a relatively low number of cycles (e.g. locking mechanisms). The disadvantages are, in addition to the wear and tear of the sliders, an increased cogging torque and lower efficiency. The motor ramp-up time (acceleration) is between 22 and 40ms, depending on the type.

Coreless Motor

These extremely efficient motors (no cyclic magnetization losses) impress with very fast motor ramp-up times (acceleration) of just 7 to 11ms and high power delivery. Due to their design, (iron-)coreless motors have no cogging torque, which is reflected in smooth engine running. The wear is low and relates only to the conductor, which is used for commutation, and the bearings. A disadvantage is the low overload capacity of the coreless design, due to poor heat dissipation. Coreless motors therefore recommended for use in more demanding applications, where there are also occasional rest phases between cycles to allow cooling, or for control and regulation tasks in the low load range.

Brushless Motor

Powerful BLDC motors combine many advantages of modern drive technology and are almost wear-free (no sliders). In addition to high efficiency and smooth running, sensor-controlled brushless motors also offer a fast motor ramp-up time (acceleration) of just 11 to 14 ms and high torque right from a standing start. In contrast to coreless motors, good heat dissipation is provided via the laminated core, which minimizes thermal problems during continuous operation. These motors are highly recommended for demanding applications with frequent corrective measures. Most high-load actuators are therefore equipped with BLDC motors.


HiTEC
SG50BL
105CCN24V5520-MMTH
SG50BL
105CCN24V5520-MMTH
SG50BL
105CCN24V5520-MMTH

DMSZ
zertifiziert nach
DIN EN ISO 9001
22118

DMSZ

C E R T I F I C A T E

Deutsche Managementsystem Zertifizierungsgesellschaft mbH

hereby certifies that the company

Multiplex Modellsport GmbH & Co. KG

Westliche Gewerbestr.1
75015 Bretten / Germany

for the scope

Production, development and trading of flight models, remote control systems, actuators and charging-, drive- and controltechnology in model sports and industry.

has implemented and maintains a

Quality Management System.

An audit, documented in a report, has verified that this quality management system fulfills the requirements of the following standard:

DIN EN ISO 9001:2015

November 2015 edition

This certificate is valid from 2022-12-05 until 2025-12-04
Certificate Registration No.: QM 22118-Z02443
Griesheim, Germany 2022-12-05

DMSZ

Dietmar Kaiser
(Managing Director)

Hans-Werner Lortz
(Manager Certificate Authority)

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

HiTEC

ISO 9001 : 2015 CERTIFIED COMPANY

ISO 14001 : 2015 CERTIFIED COMPANY

HLS Linear Actuators

PROTOCOL & FEEDBACK LIST

Series	Item Name	Available Protocol				
		PWM	TTL	RS485	CAN	UAVCAN/ DroneCAN
HS Series	HS-5125MG	✓				
HS Series	HS-53	✓				
HS Series	HS-81	✓				
HS Series	HS-85MG	✓				
HS Series	HS-311	✓				
HS Series	HS-322HD	✓				
HS Series	HS-325HB	✓				
HS Series	HS-645MG	✓				
HS Series	HS-646WP	✓				
HS Series	HS-1005SGT	✓				
HS Series	HS-1100WP	✓				
D Series	D485HW	✓	✓			
D Series	D646WP	✓	✓			
D Series	D951TW	✓	✓			
D Series	D954SW	✓	✓			
D Series	D980TW	✓	✓			
DB Series	DB778WP	✓	✓			
DB Series	DB961WP	✓	✓			
HLS12 Series	HLS12 Liniear Servo	✓				
HSB Series	HSB-9465SH	✓				
HSB Series	HSB-9485SH	✓				
HSB Series	HSB-9381TH	✓				
HSB Series	HSB-M9381TH	✓				
HSR Series	HSR-2645CRH	✓				
MD Series	MD1100WP	✓	✓			
MD Series	MD250MW	✓	✓			
MD Series	MD261SW	✓	✓			
MD Series	MD485HW	✓	✓			
MD Series	MD85MG	✓	✓			
MDB Series	MDB1200WP	✓	✓			
MDB-CAN Series	MDB961WP-CAN 28V				✓	✓
MDB-CAN Series	MDB778WP-CAN DroneCAN				✓	✓
MDB-CAN Series	MDB777WP-CAN DroneCAN				✓	✓
MD-CAN Series	MD145SW-CAN UAVCAN/DroneCAN				✓	✓
MD-CAN Series	MD245MW-CAN UAVCAN/DroneCAN				✓	✓
MD-CAN Series	MD250MW-CAN UAVCAN/DroneCAN				✓	✓
MD-CAN Series	MD65MG-CAN UAVCAN/DroneCAN				✓	✓
MD-CAN Series	MD70MH-CAN UAVCAN/DroneCAN				✓	✓
MD-CAN Series	MD85MG-CAN UAVCAN/DroneCAN				✓	✓
MD-CAN Series	MD89MW-CAN UAVCAN/DroneCAN				✓	✓
MD-CAN Series	MD950TW-CAN UAVCAN/DroneCAN				✓	✓
MDR Series	MDR845WP	✓	✓			
MD-RS485 Series	MD245MW-RS485			✓		
MD-RS485 Series	MD250MW-RS485			✓		
MD-RS485 Series	MD950TW-RS485			✓		
MD-RS485 Series	MD980TW-RS485			✓		
SG Series	SG33BL-T-12V (DSUB)	✓	✓	✓		
SG Series	SG33BL-T-24V (DSUB)	✓	✓	✓		
SG Series	SG33BL-T-24V (Gland Cable)	✓	✓	✓		
SG-CAN Series	SG33BL-T-CAN-12V (Circular)				✓	✓
SG-CAN Series	SG33BL-T-CAN-24V (Circular)				✓	✓
SG-CAN Series	SG33BL-T-CAN-12V (Gland Cable)				✓	✓
SG-CAN Series	SG33BL-T-CAN-24V (Gland Cable)				✓	✓
SG-CAN Series	SG50BL-CAN 24V (Circular)				✓	✓

TORQUE* No value is read for the torque, instead the load on the servo is read out.

✓ ** The number of revolutions is read out via the position feedback. There is no sparate counter.

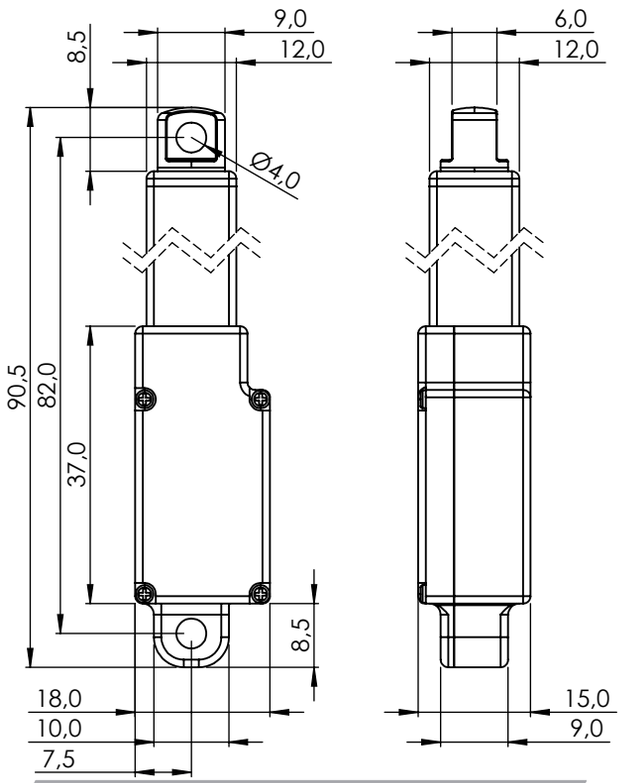
Series	Item Name	Available Feedback							
		POSITION	SPEED	TORQUE*	VOLTAGE	CURRENT	TURN COUNT	TEMP (MCU)	TEMP (MOTOR)
HS Series	HS-5125MG								
HS Series	HS-53								
HS Series	HS-81								
HS Series	HS-85MG								
HS Series	HS-311								
HS Series	HS-322HD								
HS Series	HS-325HB								
HS Series	HS-645MG								
HS Series	HS-646WP								
HS Series	HS-1005SGT								
HS Series	HS-1100WP								
D Series	D485HW	✓							
D Series	D646WP	✓							
D Series	D951TW	✓							
D Series	D954SW	✓							
D Series	D980TW	✓							
DB Series	DB778WP	✓							
DB Series	DB961WP	✓							
HLS12 Series	HLS12 Liniear Servo	✓							
HSB Series	HSB-9465SH								
HSB Series	HSB-9485SH								
HSB Series	HSB-9381TH								
HSB Series	HSB-M9381TH								
HSR Series	HSR-2645CRH								
MD Series	MD1100WP	✓							
MD Series	MD250MW	✓							
MD Series	MD261SW	✓							
MD Series	MD485HW	✓							
MD Series	MD85MG	✓							
MDB Series	MDB1200WP	✓							
MDB-CAN Series	MDB961WP-CAN 28V	✓	✓	✓	✓	✓	✓	✓	✓
MDB-CAN Series	MDB778WP-CAN DroneCAN	✓	✓	✓	✓	✓	✓	✓	✓
MDB-CAN Series	MDB777WP-CAN DroneCAN	✓	✓	✓	✓	✓	✓	✓	✓
MD-CAN Series	MD145SW-CAN UAVCAN/DroneCAN	✓	✓	✓	✓		✓	✓	
MD-CAN Series	MD245MW-CAN UAVCAN/DroneCAN	✓	✓	✓	✓		✓	✓	
MD-CAN Series	MD250MW-CAN UAVCAN/DroneCAN	✓	✓	✓	✓		✓	✓	
MD-CAN Series	MD65MG-CAN UAVCAN/DroneCAN	✓	✓	✓	✓		✓	✓	
MD-CAN Series	MD70MH-CAN UAVCAN/DroneCAN	✓	✓	✓	✓		✓	✓	
MD-CAN Series	MD85MG-CAN UAVCAN/DroneCAN	✓	✓	✓	✓		✓	✓	
MD-CAN Series	MD89MW-CAN UAVCAN/DroneCAN	✓	✓	✓	✓	✓	✓	✓	✓
MD-CAN Series	MD950TW-CAN UAVCAN/DroneCAN	✓	✓	✓	✓		✓	✓	
MDR Series	MDR845WP	✓	✓	✓	✓		✓ **	✓	
MD-RS485 Series	MD245MW-RS485	✓							
MD-RS485 Series	MD250MW-RS485	✓							
MD-RS485 Series	MD950TW-RS485	✓							
MD-RS485 Series	MD980TW-RS485	✓							
SG Series	SG33BL-T-12V (DSUB)	✓	✓	✓	✓		✓ **	✓	✓
SG Series	SG33BL-T-24V (DSUB)	✓	✓	✓	✓		✓ **	✓	✓
SG Series	SG33BL-T-24V (Gland Cable)	✓	✓	✓	✓		✓ **	✓	✓
SG-CAN Series	SG33BL-T-CAN-12V (Circular)	✓	✓	✓	✓	✓	✓	✓	✓
SG-CAN Series	SG33BL-T-CAN-24V (Circular)	✓	✓	✓	✓	✓	✓	✓	✓
SG-CAN Series	SG33BL-T-CAN-12V (Gland Cable)	✓	✓	✓	✓	✓	✓	✓	✓
SG-CAN Series	SG33BL-T-CAN-24V (Gland Cable)	✓	✓	✓	✓	✓	✓	✓	✓
SG-CAN Series	SG50BL-CAN 24V (Circular)	✓	✓	✓	✓	✓	✓	✓	✓

TORQUE* No value is read for the torque, instead the load on the servo is read out.

✓ ** The number of revolutions is read out via the position feedback. There is no sparate counter.

HLS12-3050, HLS12-30210, HLS12-30380

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



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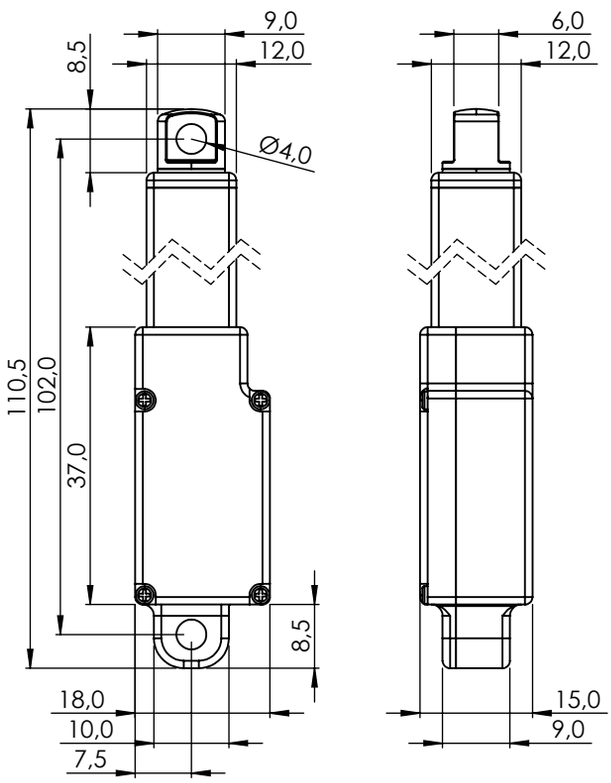
GENERAL SPECIFICATION

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)											
Operating Temperature Range	-10°C ~ +50°C (14°F ~ +122°F)											
Storage Temperature Range	-30°C ~ +80°C (-31°F ~ +176°F)											
Vibrations at no Load	-											
Connector Wire Lengt	160mm											
Connector Wire Gauge	24AWG											
Connector Wire Strand Count	40/0.08											
External Dimensions	82.0 x 15.0 x 18.0mm											
Weight	34.0g											
Ball Bearing	Flange Bearing											
Case Material	Engineering Plastic & Aluminum Pipe											
Gear Material	4 Metal Gears											
IP-Rating	IP4X											
Revision	Rev. 1.1 / 02.01.2024											
Changelog	-											

HLS12-5050, HLS12-50210, HLS12-50380

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



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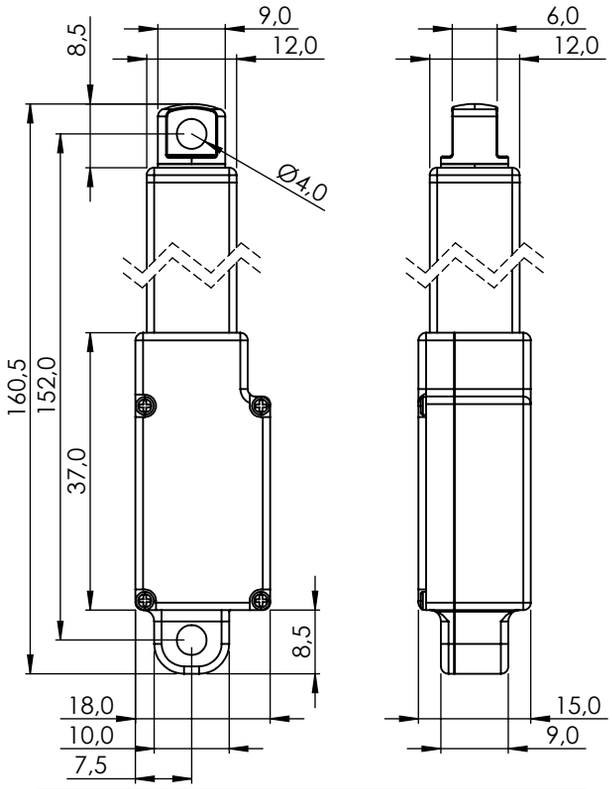
GENERAL SPECIFICATION

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)											
Operating Temperature Range	-10°C ~ +50°C (14°F ~ +122°F)											
Storage Temperature Range	-30°C ~ +80°C (-31°F ~ +176°F)											
Vibrations at no Load	-											
Connector Wire Length	160mm											
Connector Wire Gauge	24AWG											
Connector Wire Strand Count	40/0.08											
External Dimensions	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	-											

HLS-10050, HLS-100210, HLS-100380

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



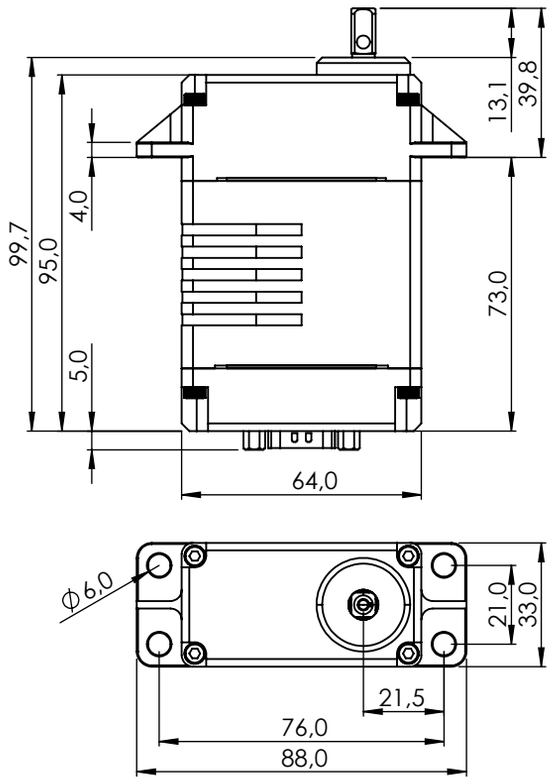
1:1

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)											
Operating Temperature Range	-10°C ~ +50°C (14°F ~ +122°F)											
Storage Temperature Range	-30°C ~ +80°C (-31°F ~ +176°F)											
Vibrations at no Load	-											
Connector Wire Length	160mm											
Connector Wire Gauge	24AWG											
Connector Wire Strand Count	40/0.08											
External Dimensions	152.0 x 15.0 x 18.0mm											
Weight	56.0g											
Ball Bearing	Flange Bearing											
Case Material	Engineering Plastic & Aluminum Pipe											
Gear Material	4 Metal Gears											
IP-Rating	IP4X											
Revision	Rev. 1.1 / 02.01.2024											
Changelog	-											

SG33BL-T-12V (DSUB)

#1-00932



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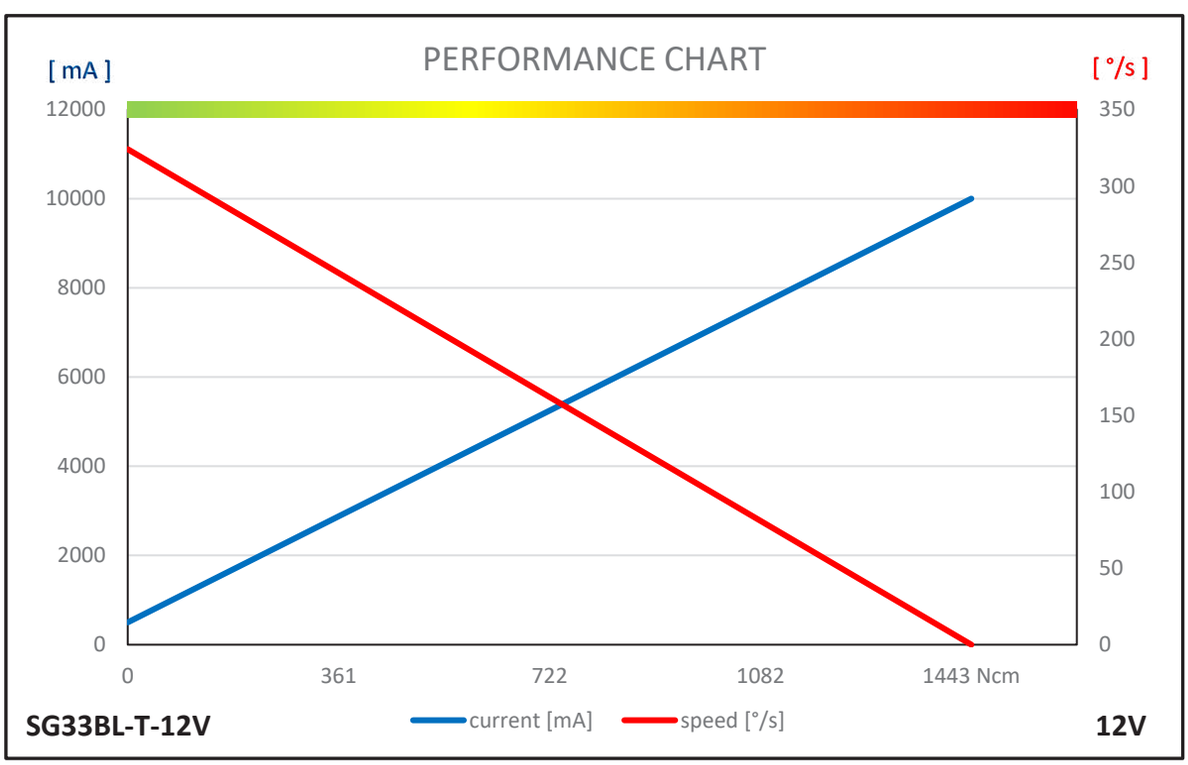
PERFORMANCE CHART

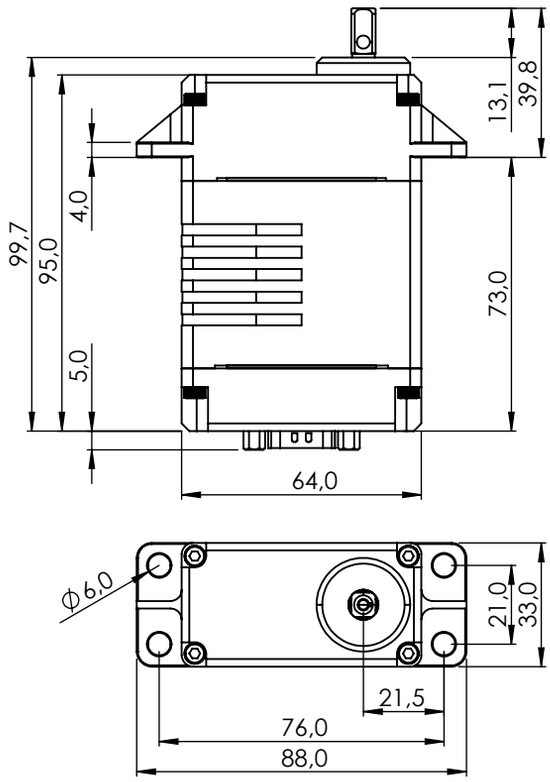


GENERAL SPECIFICATION

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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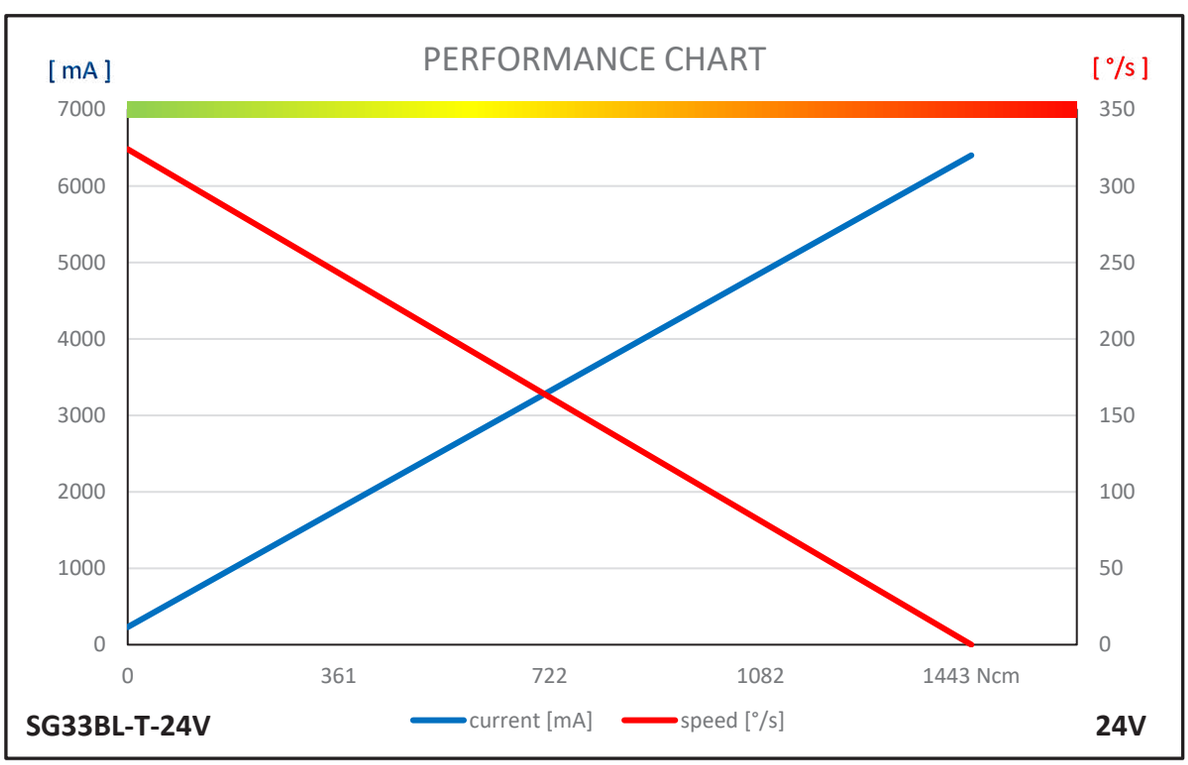
PERFORMANCE CHART

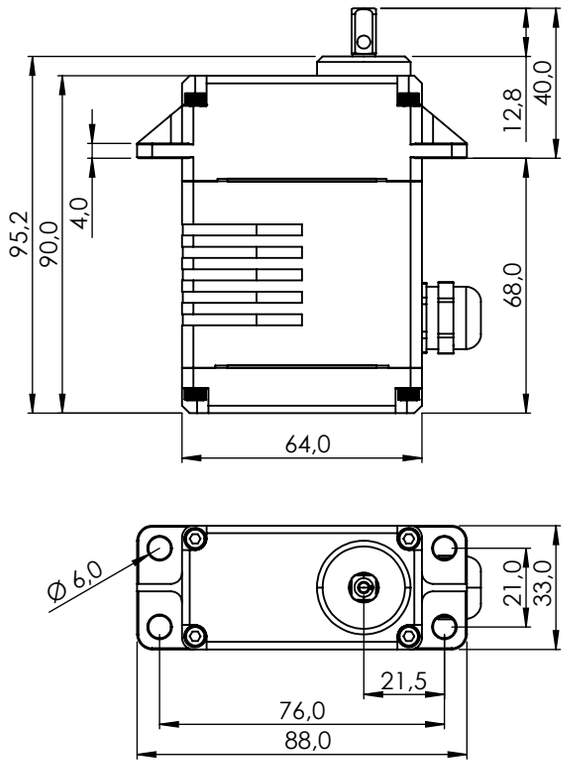


GENERAL SPECIFICATION

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-24V (GLAND CABLE)

#1-02463



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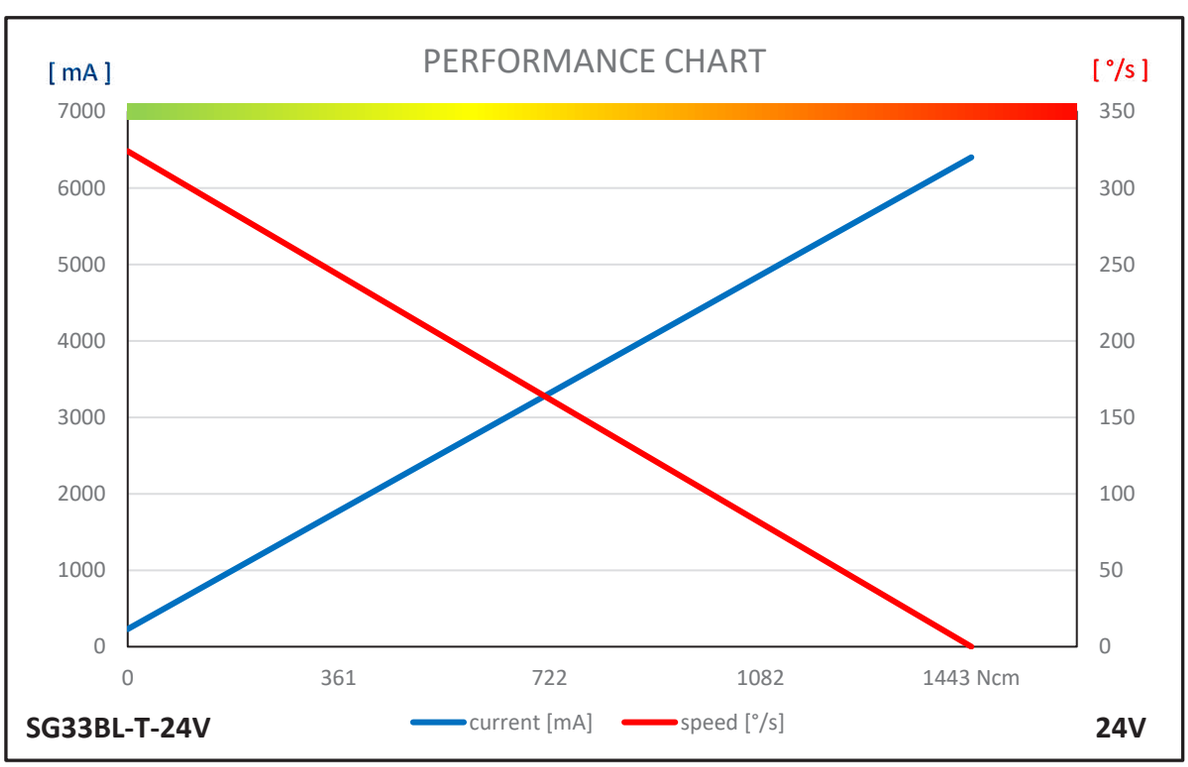
PERFORMANCE CHART

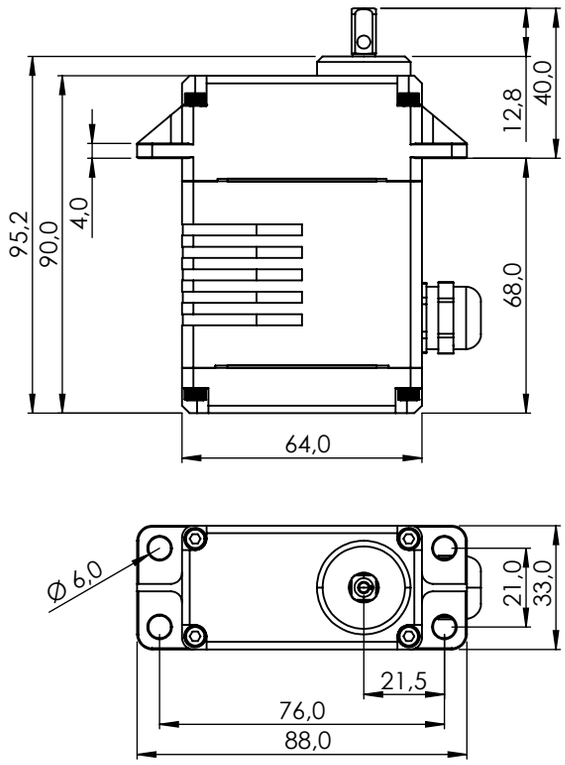


GENERAL SPECIFICATION

SG33BL-T-24V (Gland Cable)		
Control System	PWM / RS485 / TTL (Half Duplex)	
	Pulse Width 900µs|1500µs (Center)|2100µs	
Connector Type	-	
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)	
Rest Current	20mA	
Running Current at no Load	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 / 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 (GLAND CABLE)

#1-02345



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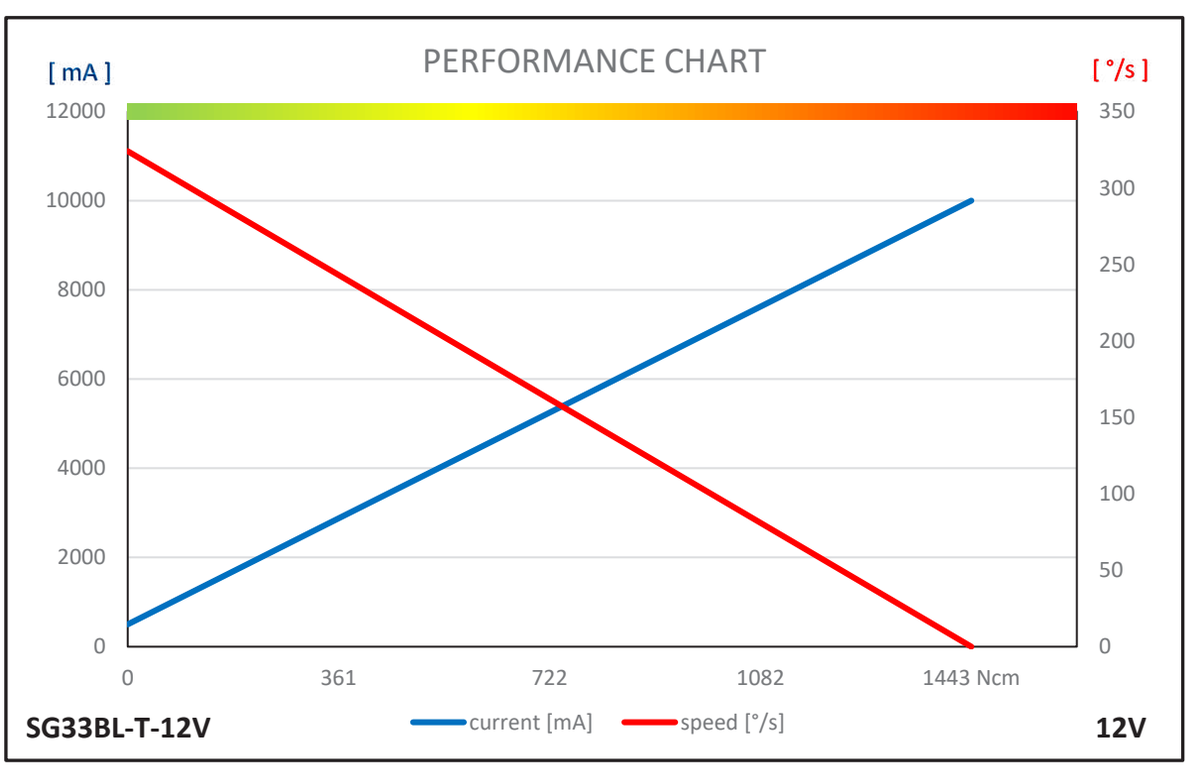
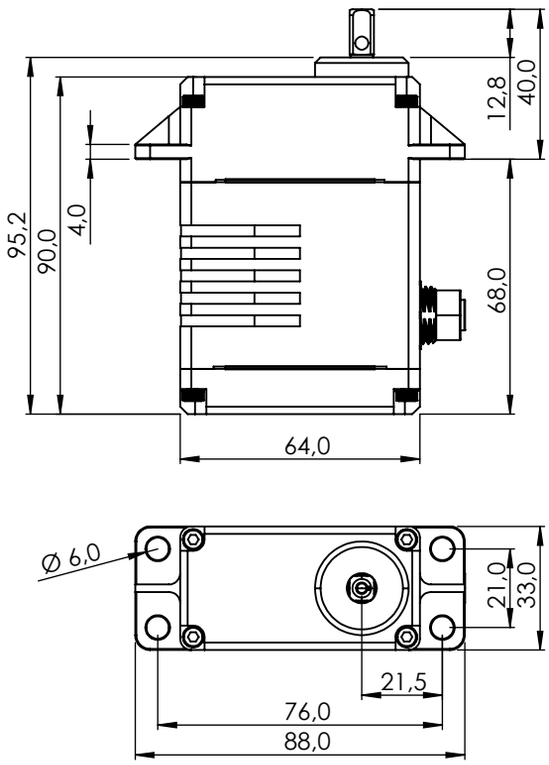
PERFORMANCE CHART



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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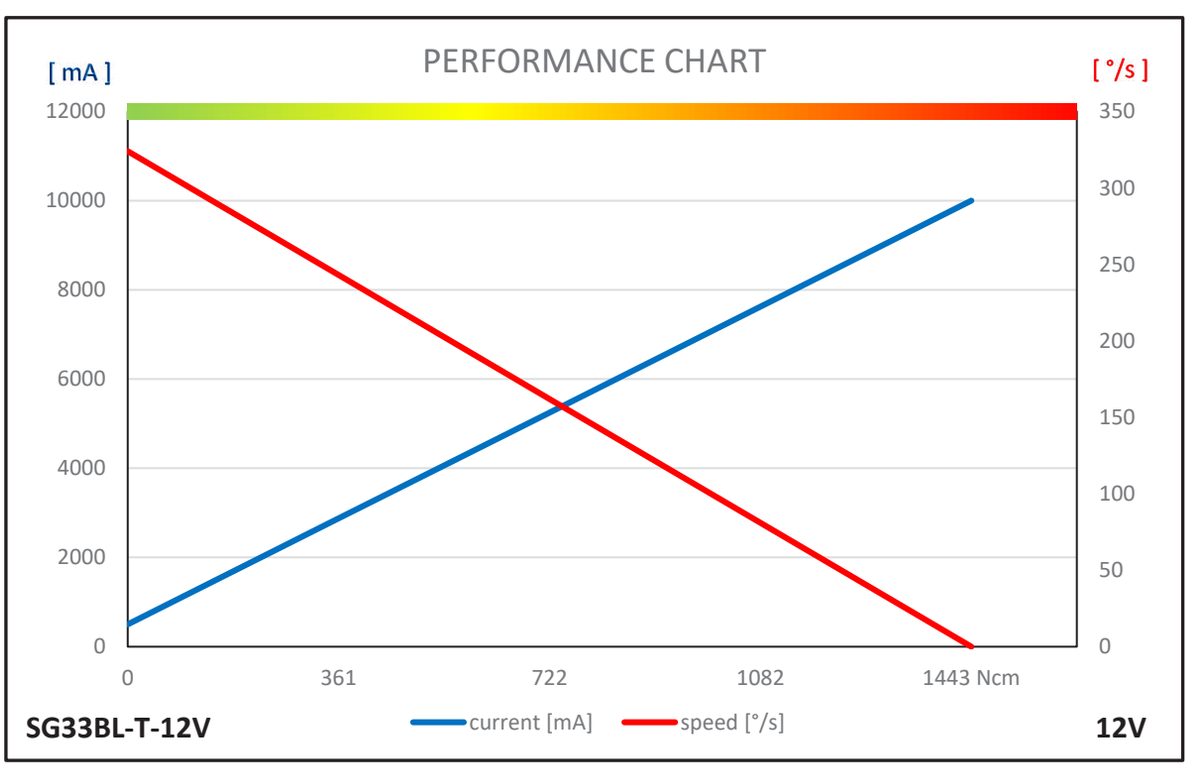
PERFORMANCE CHART

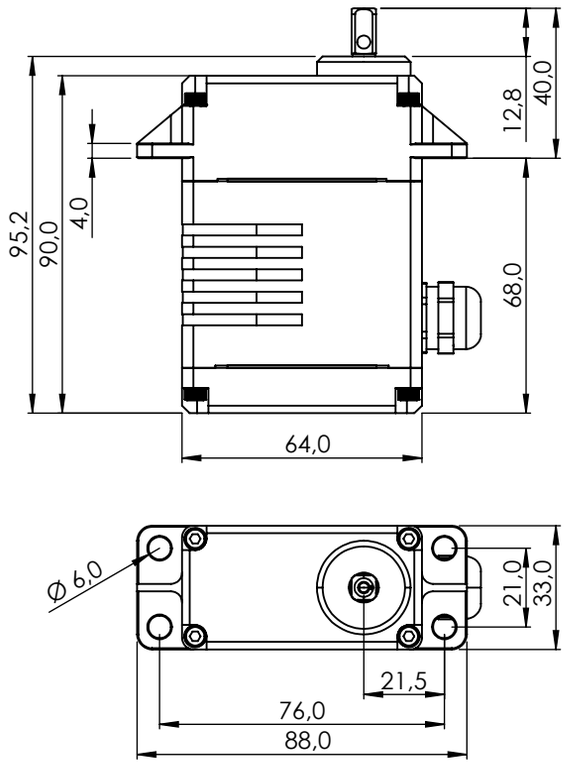


GENERAL SPECIFICATION

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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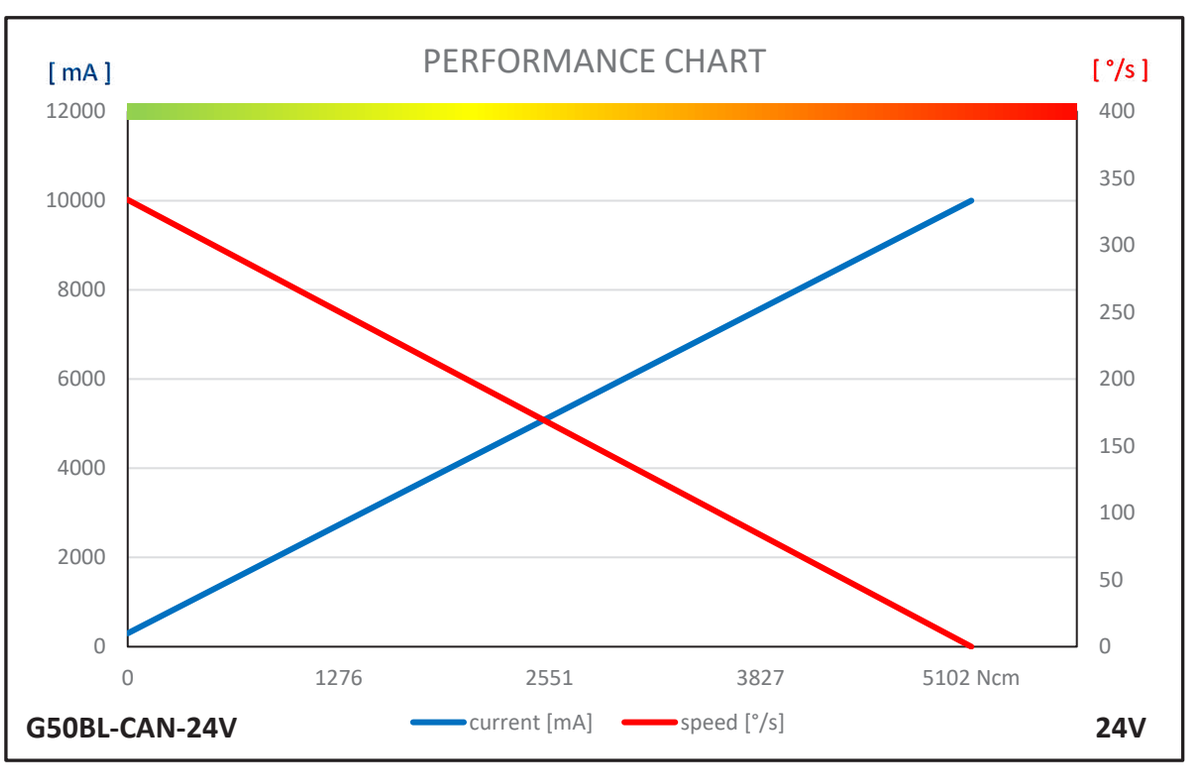
PERFORMANCE CHART

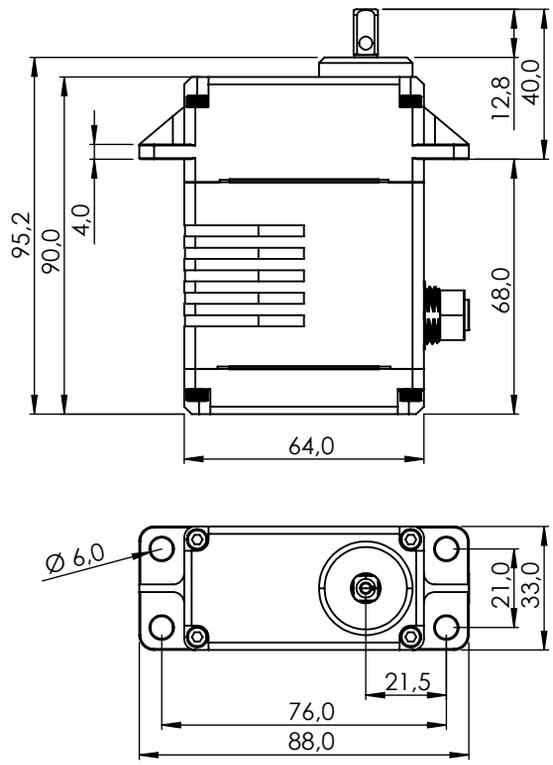


GENERAL SPECIFICATION

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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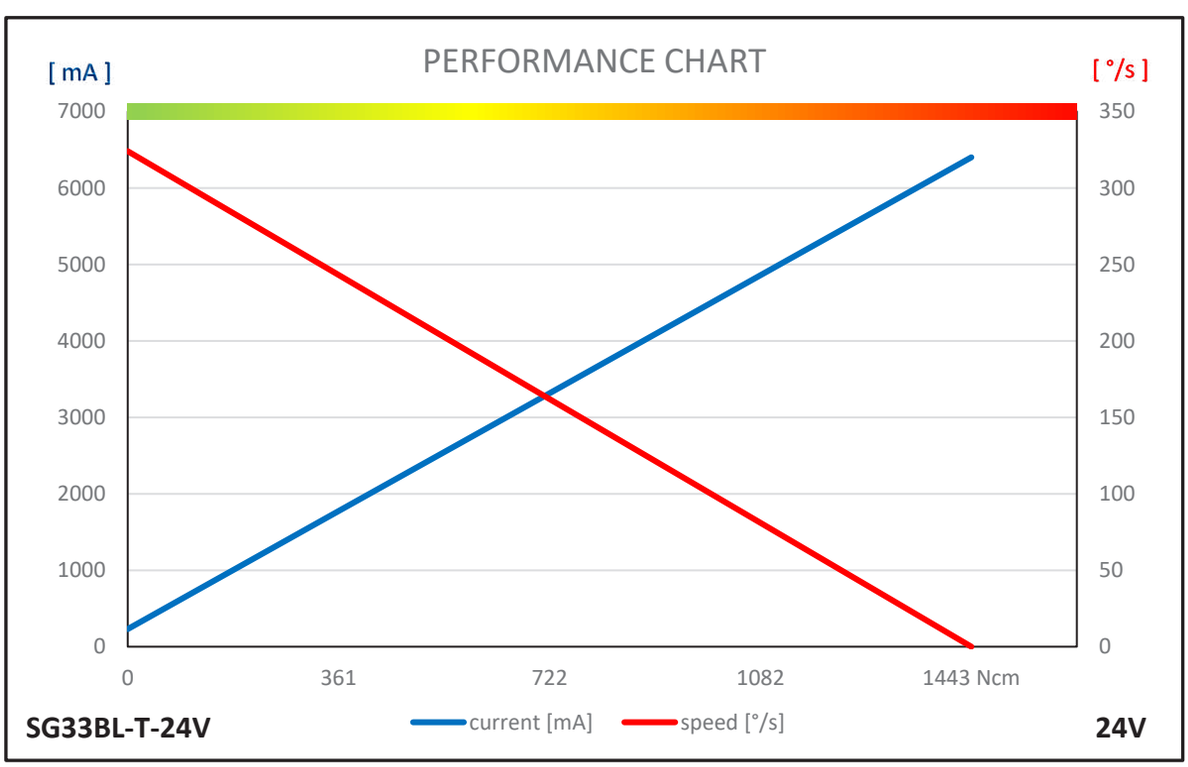
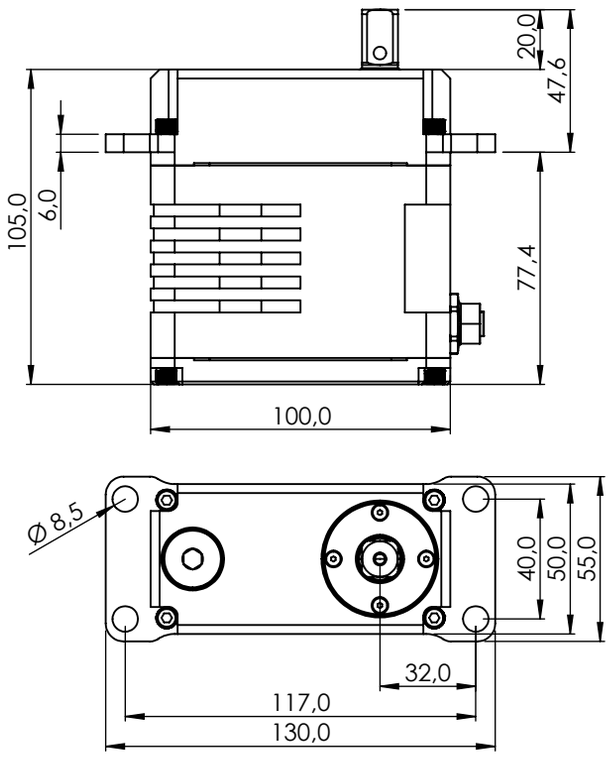
PERFORMANCE CHART



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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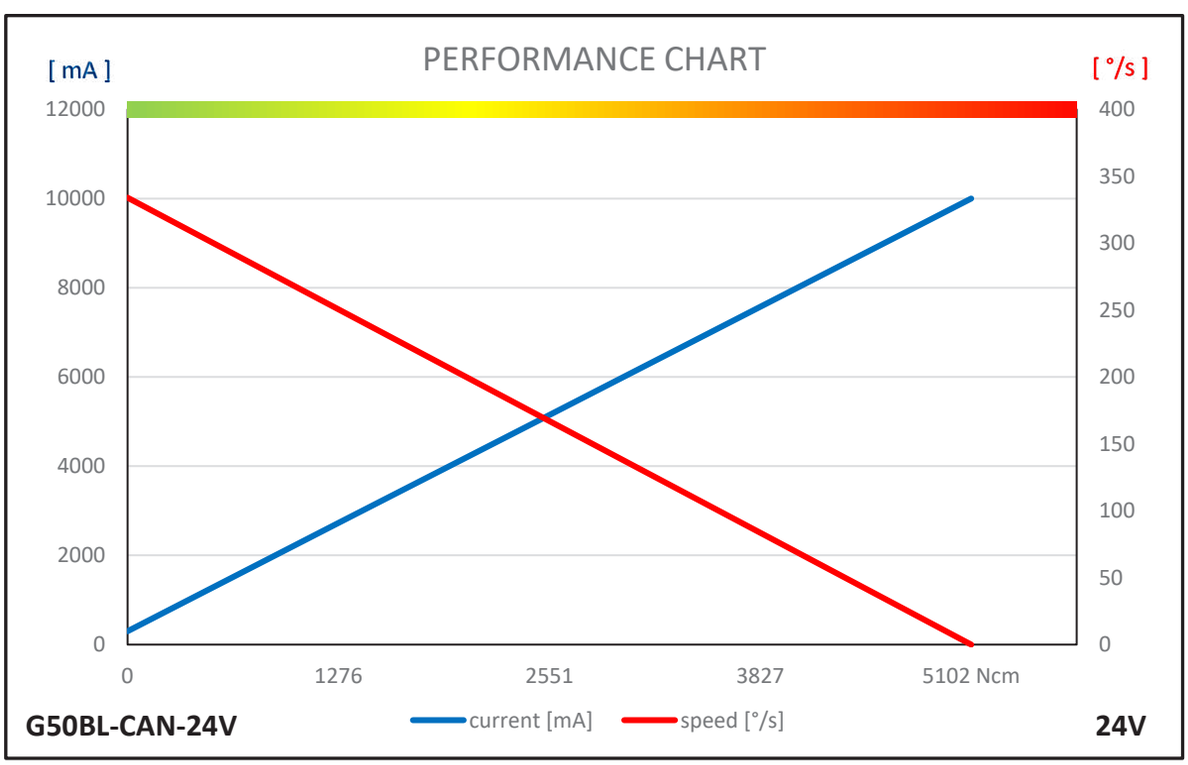
PERFORMANCE CHART



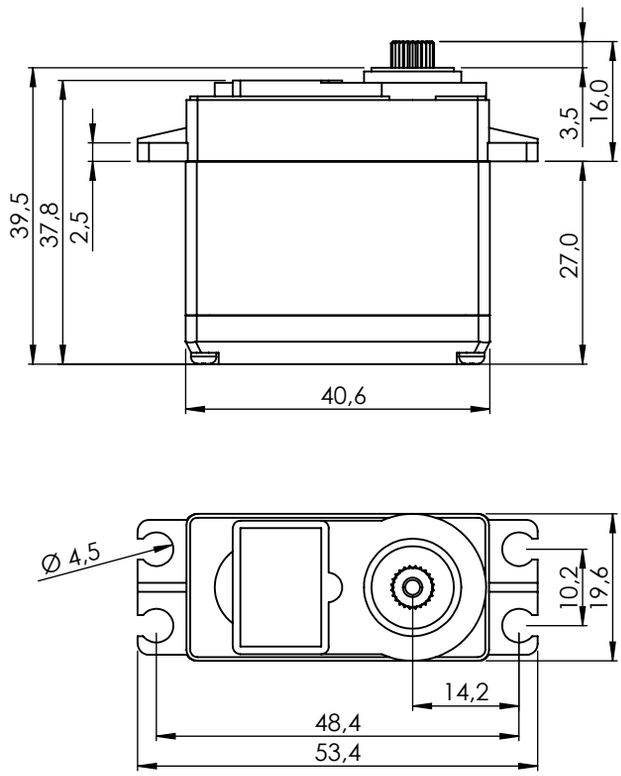
GENERAL SPECIFICATION

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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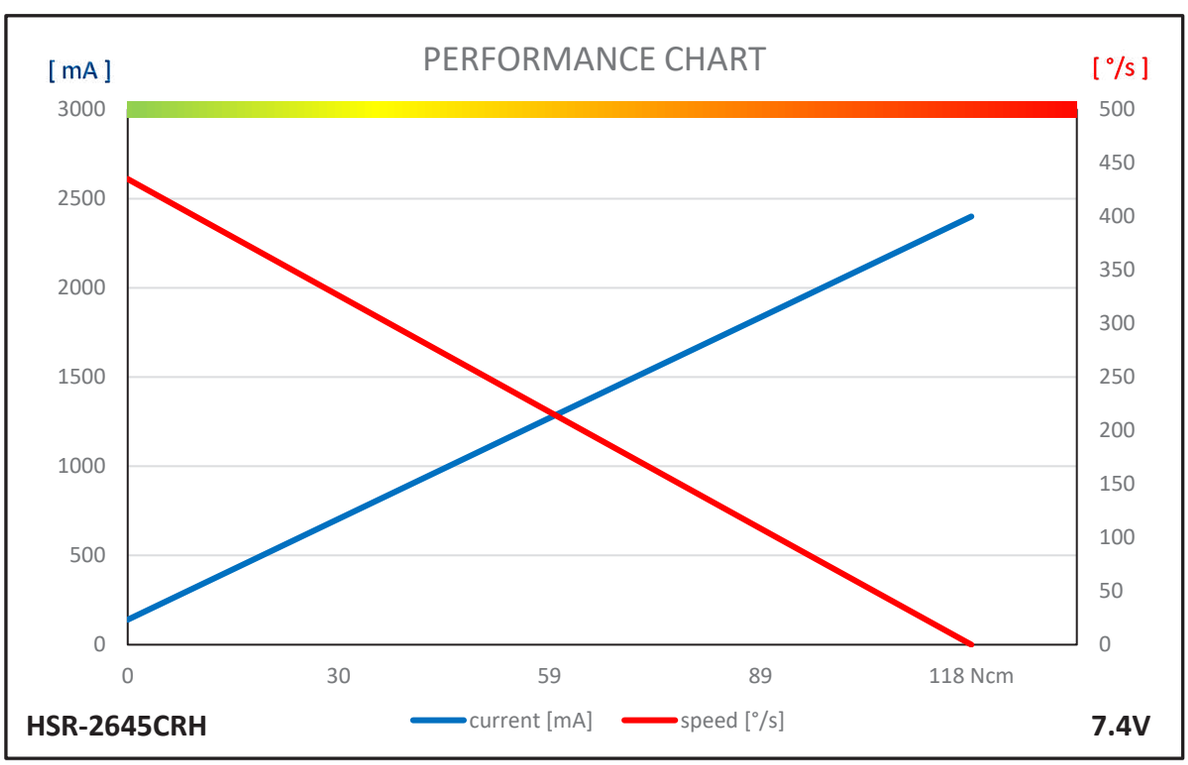
PERFORMANCE CHART



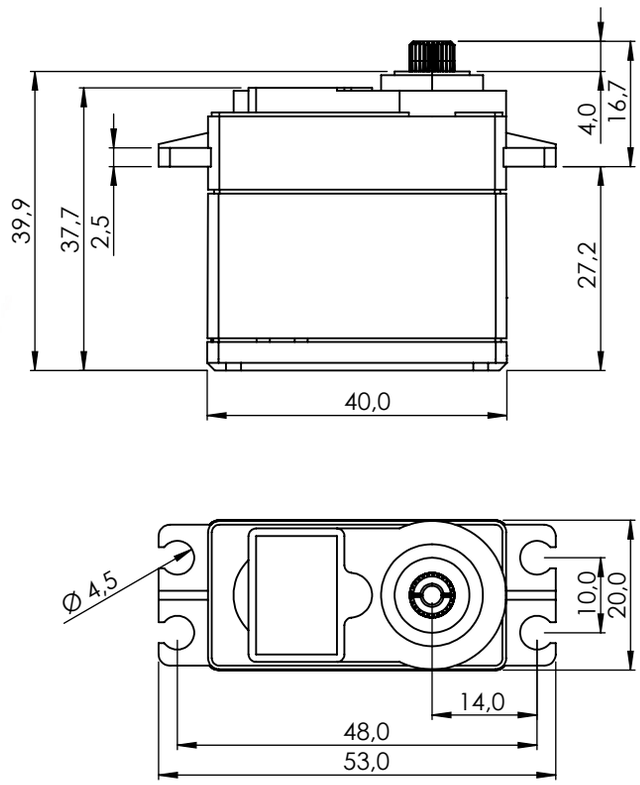
GENERAL SPECIFICATION

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

HSB-9465SH

#116465

#1-02355 GP 24 STÜCK



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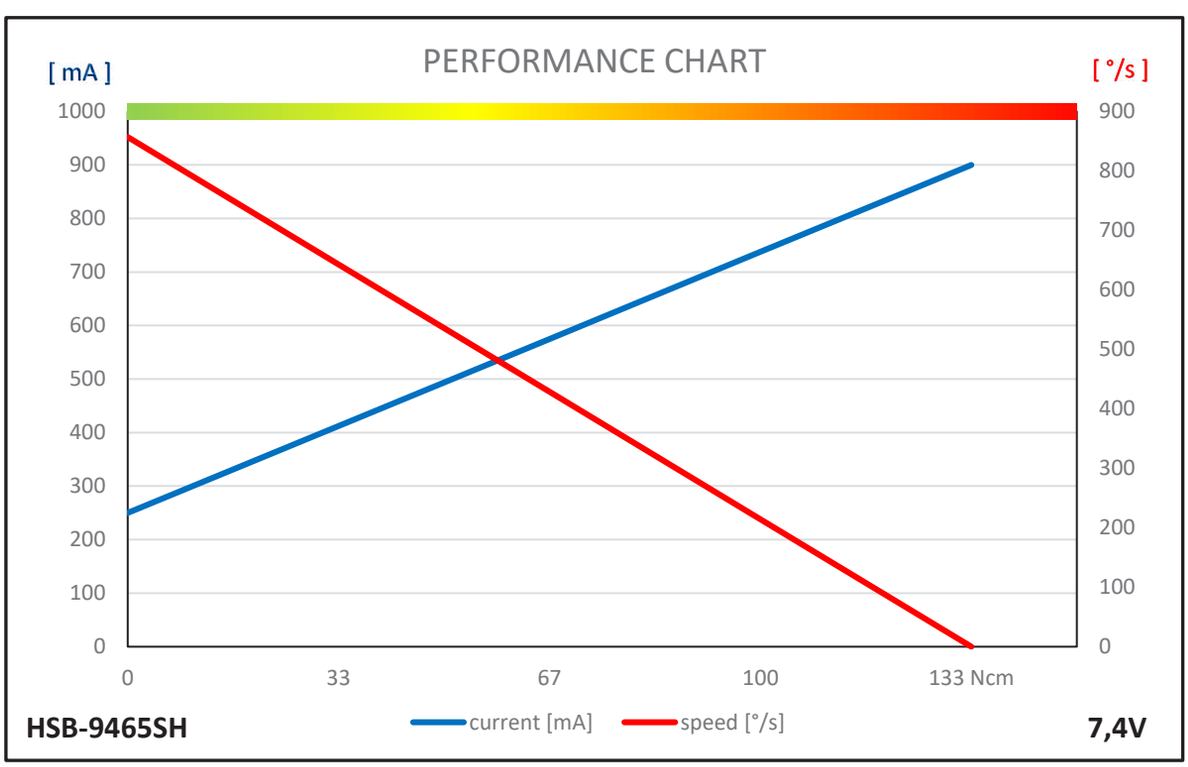
PERFORMANCE CHART



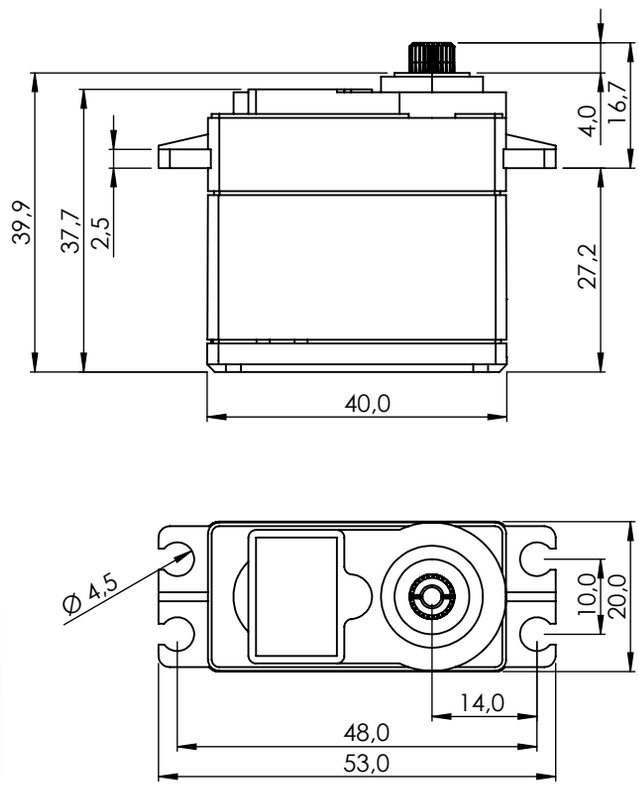
GENERAL SPECIFICATION

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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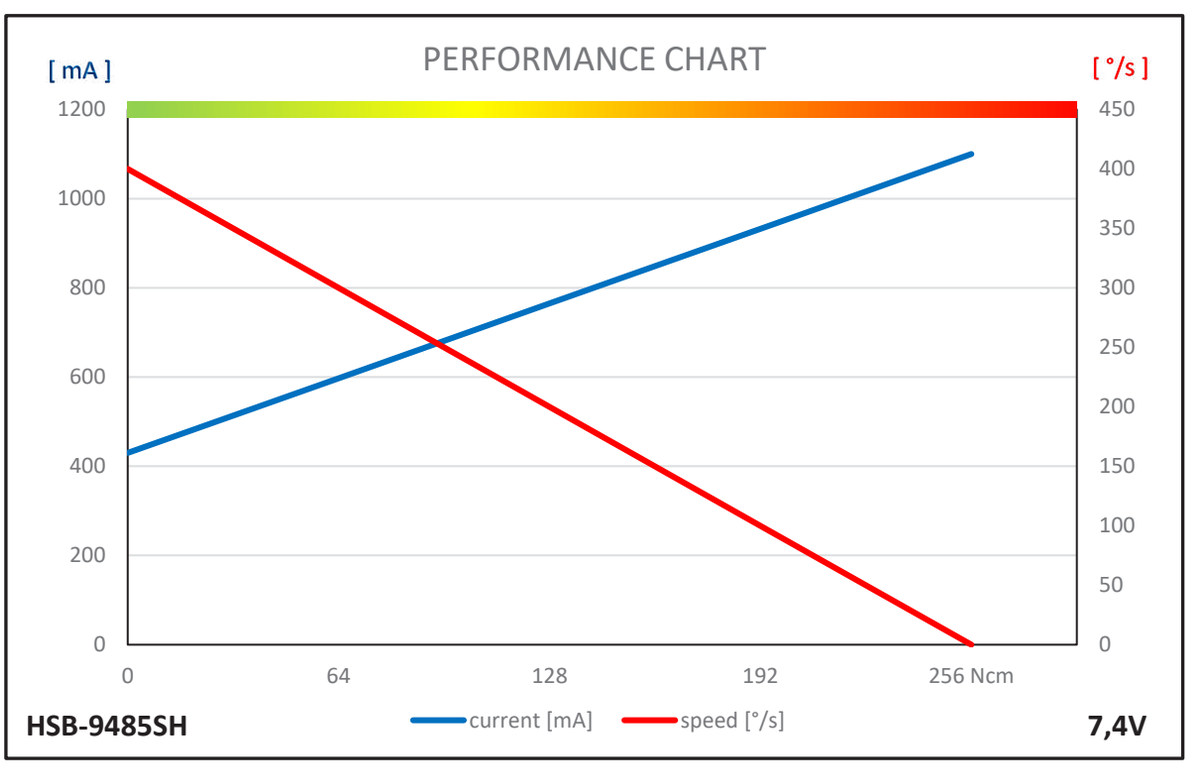
PERFORMANCE CHART



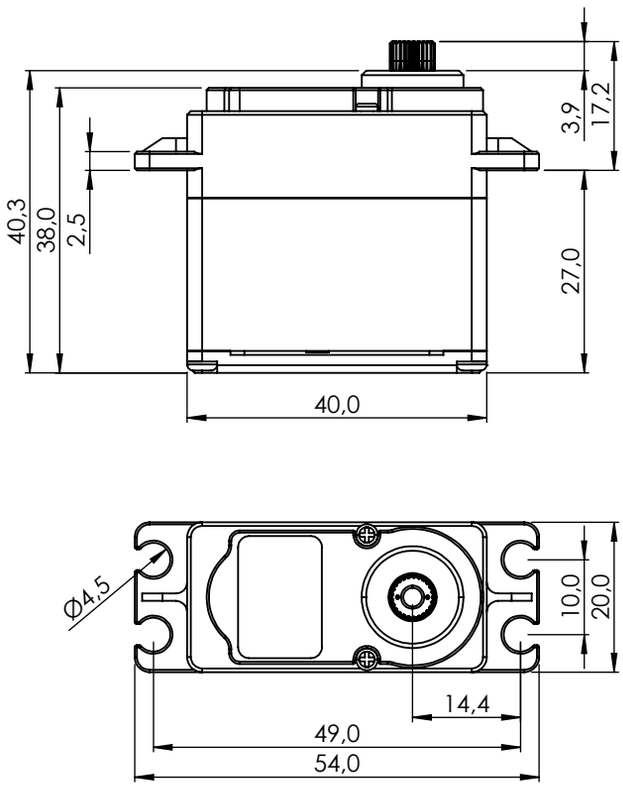
GENERAL SPECIFICATION

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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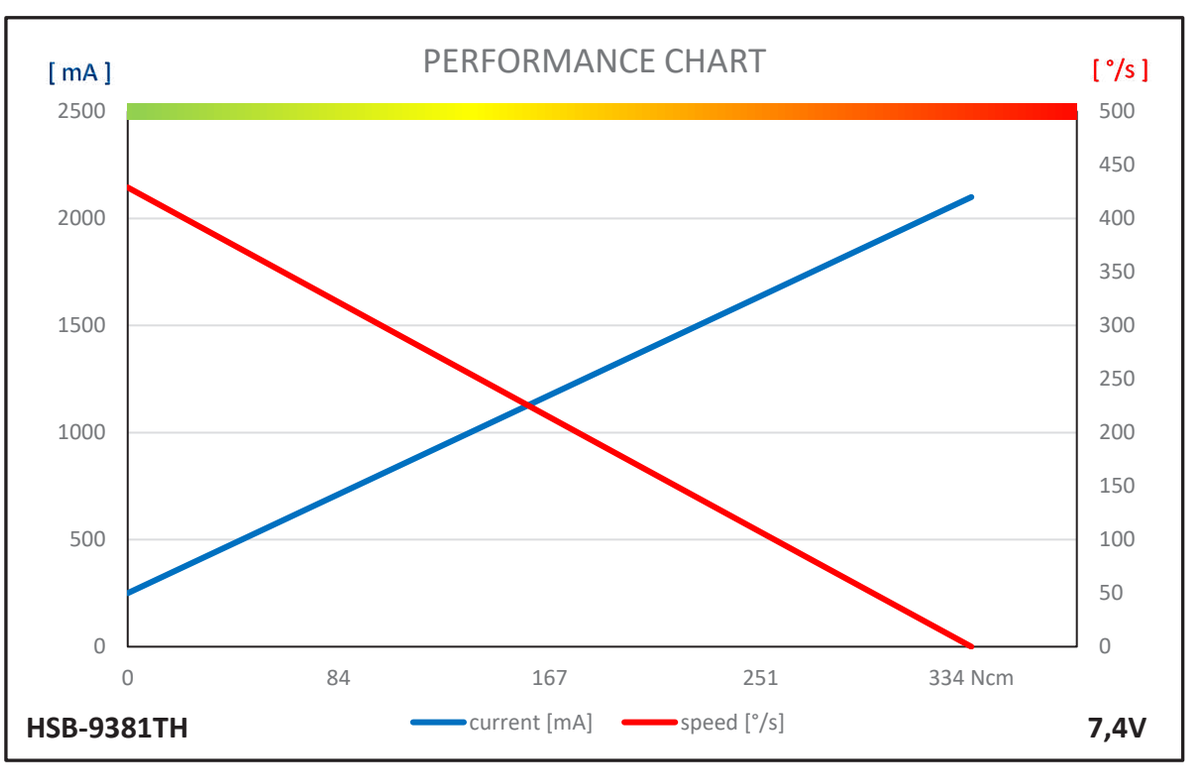
PERFORMANCE CHART



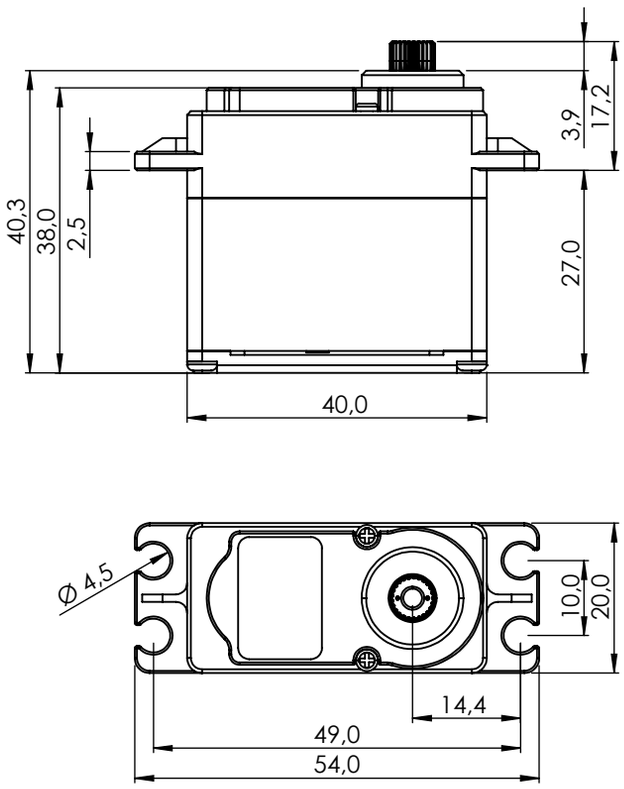
GENERAL SPECIFICATION

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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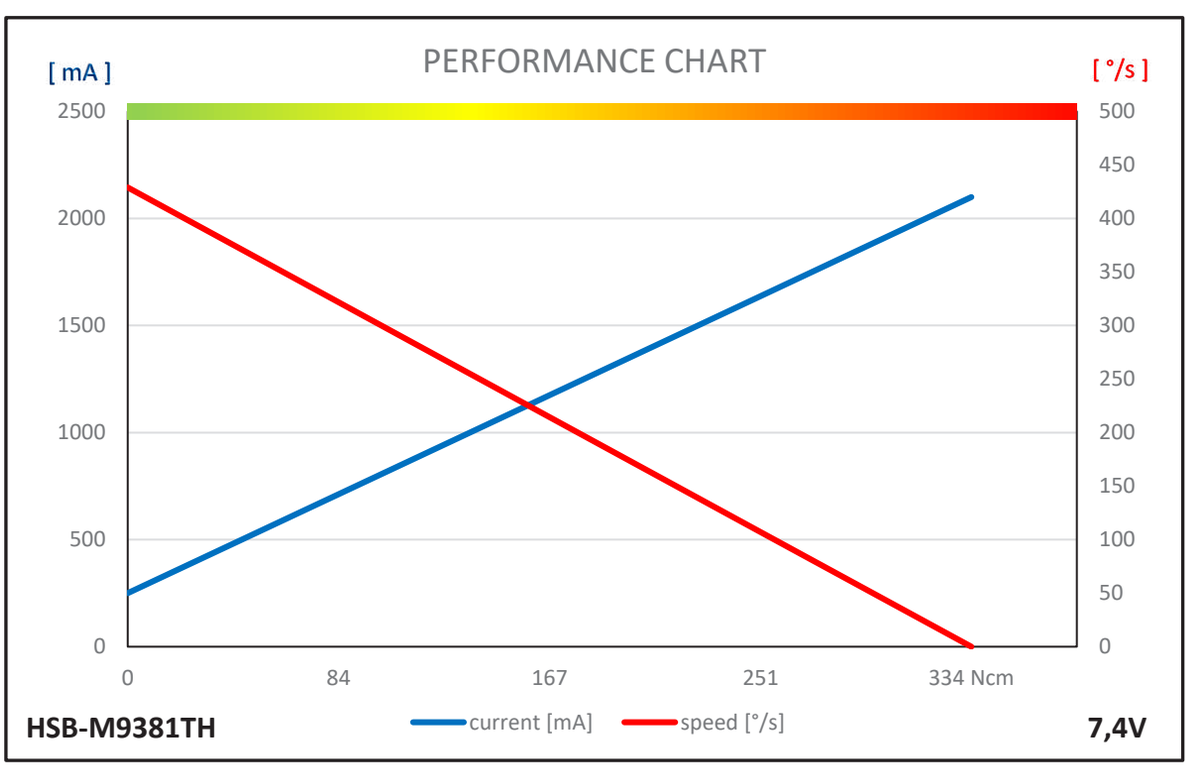
PERFORMANCE CHART

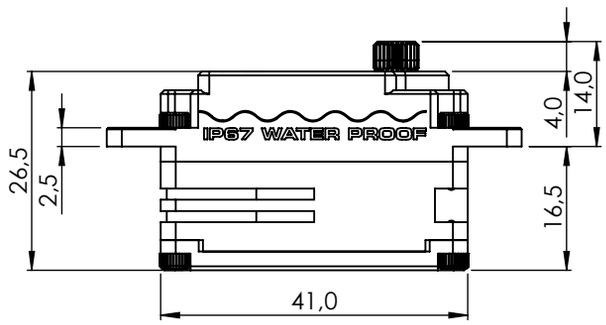


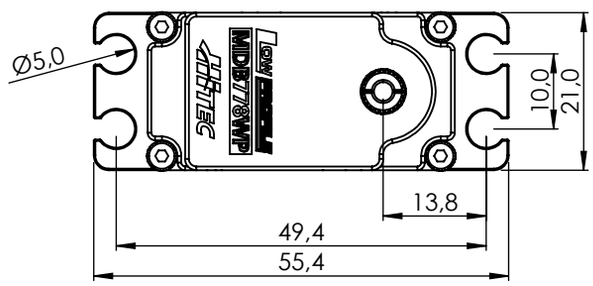
GENERAL SPECIFICATION

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		

DB778WP

#1-02853





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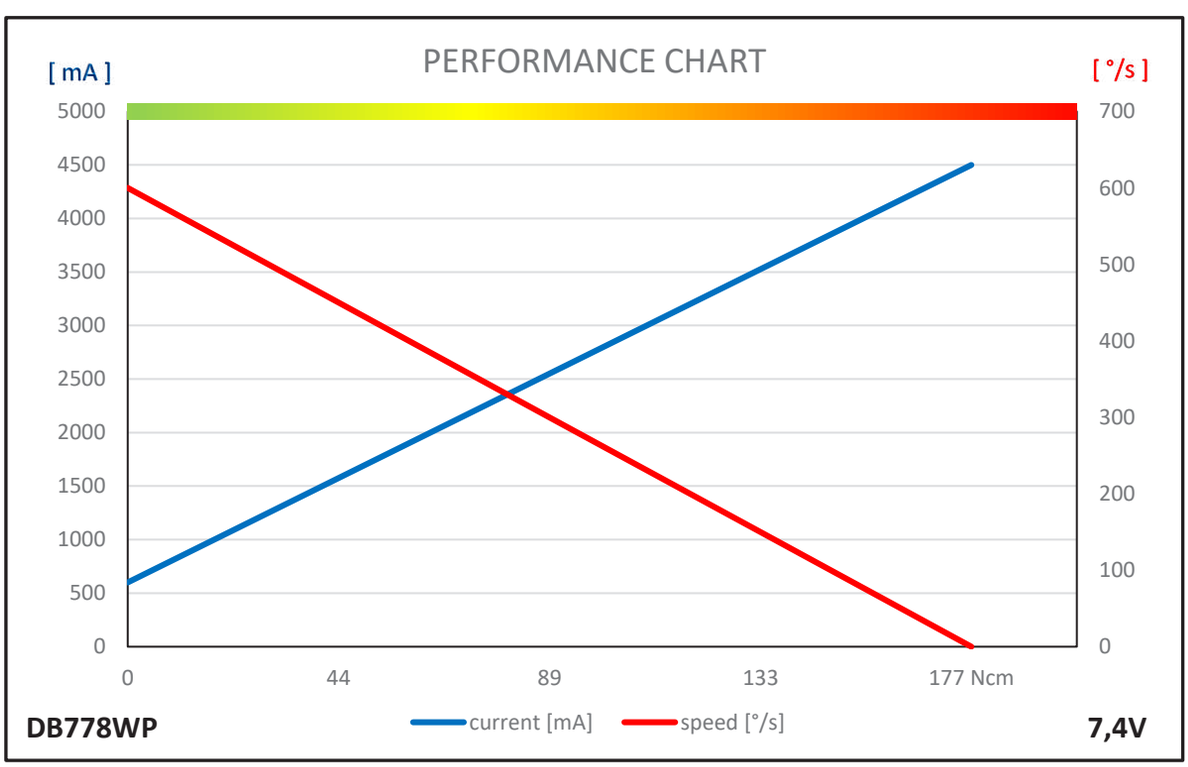
PERFORMANCE CHART

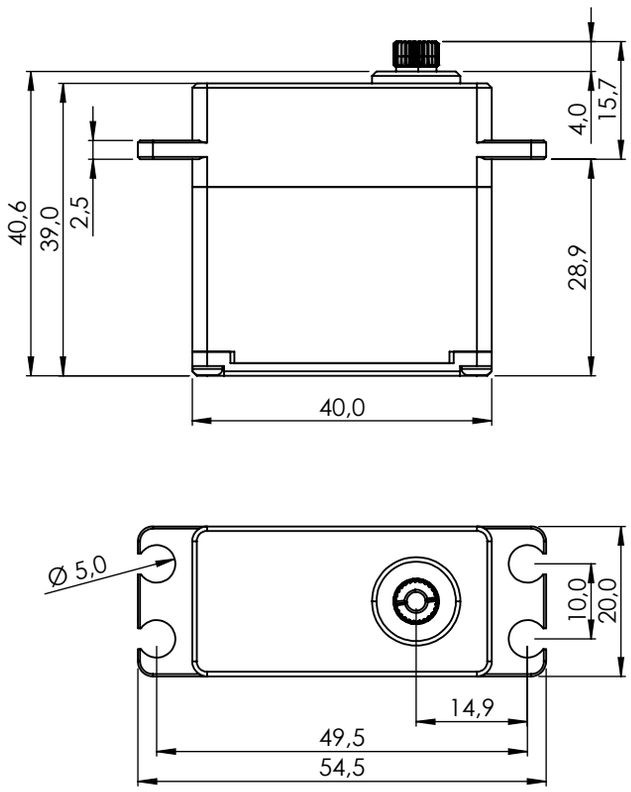


GENERAL SPECIFICATION

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			

DB961WP

#1-02571



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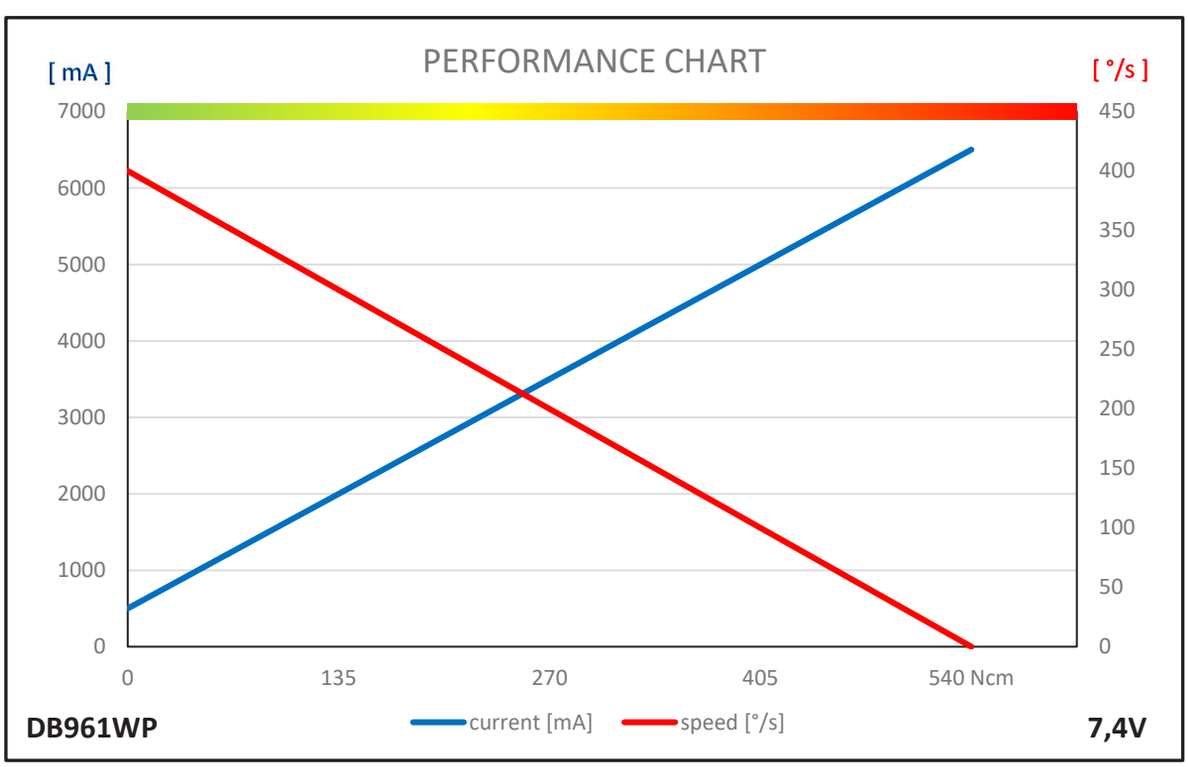
PERFORMANCE CHART

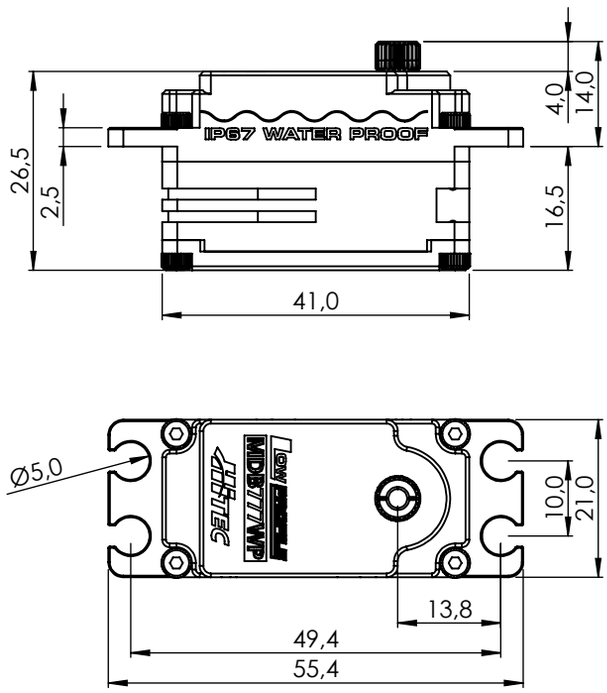


GENERAL SPECIFICATION

DB961WP			
Control System	PWM / TTL (Half Duplex)		
	Pulse Width 900µsl1500µs (Center)l2100µs		
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			

MDB-777WP-CAN/DroneCAN

#1-03030 #1-03031



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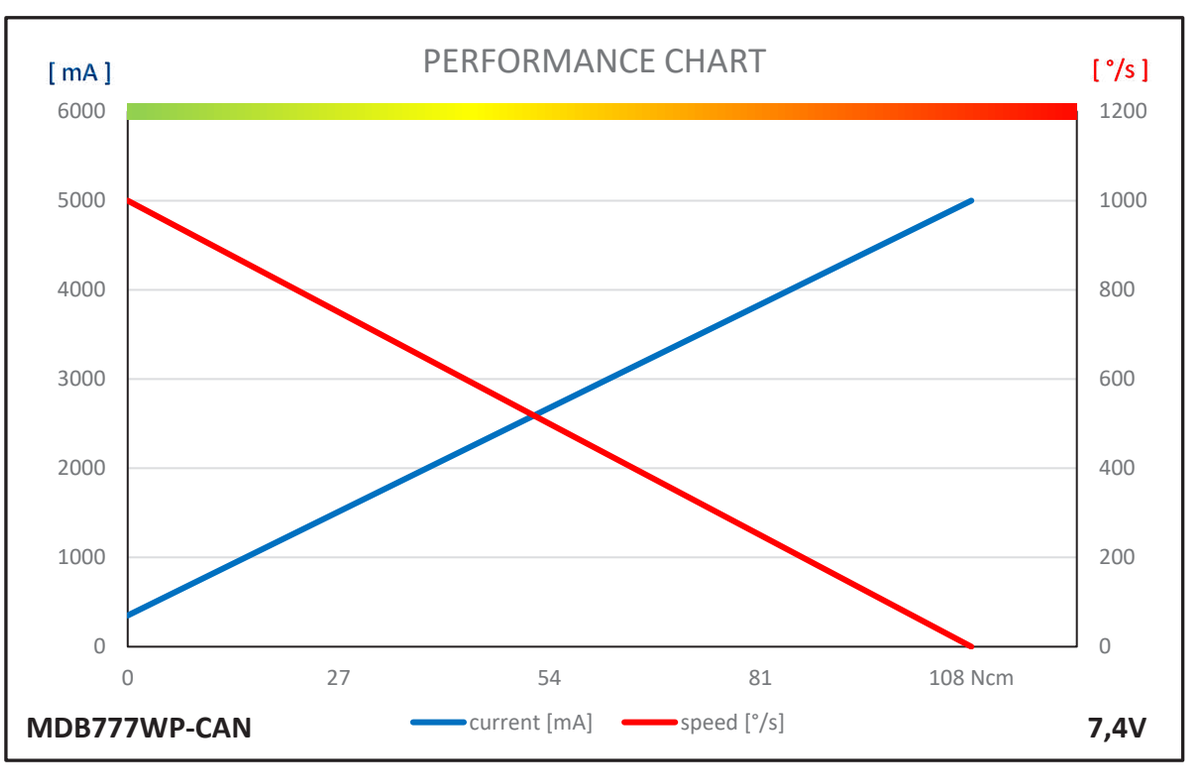
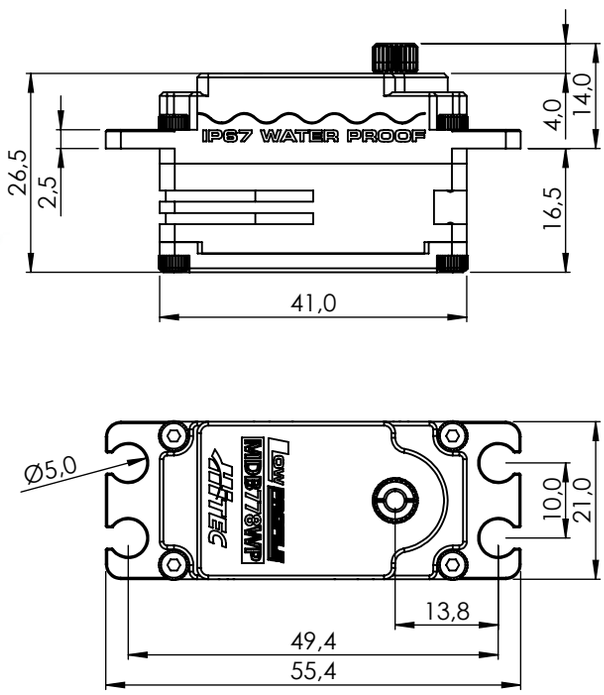
PERFORMANCE CHART



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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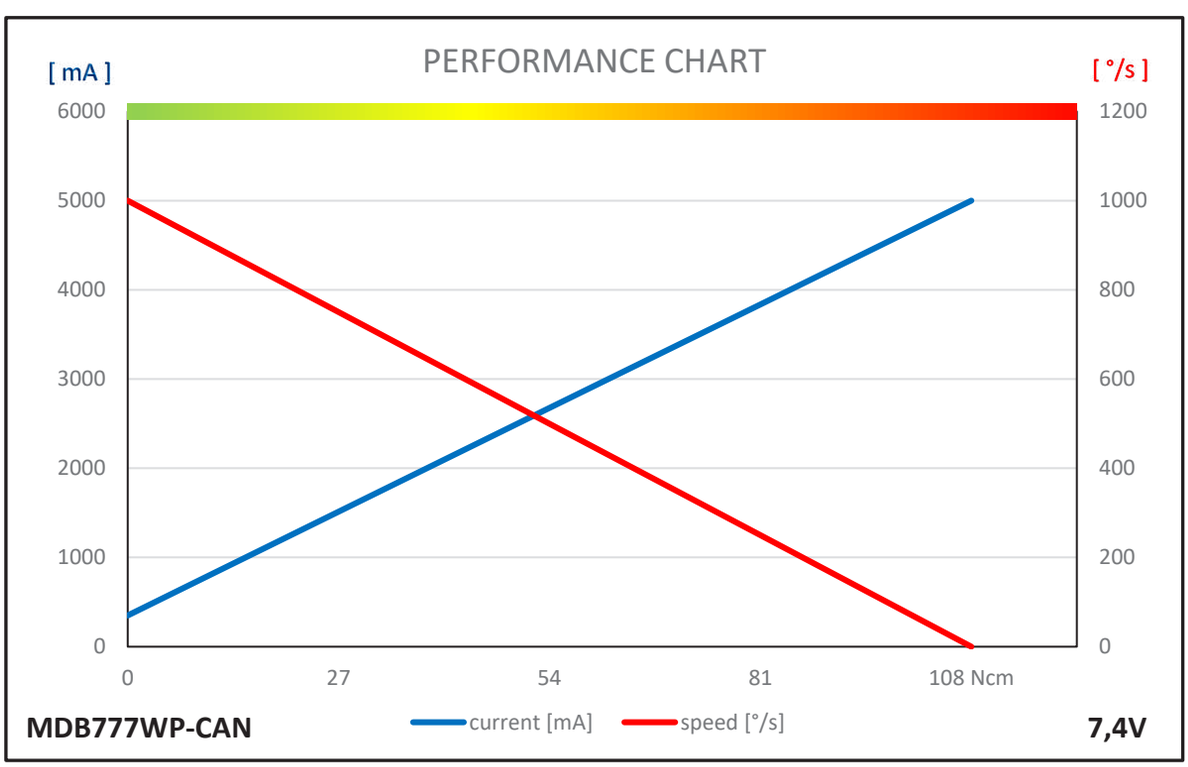
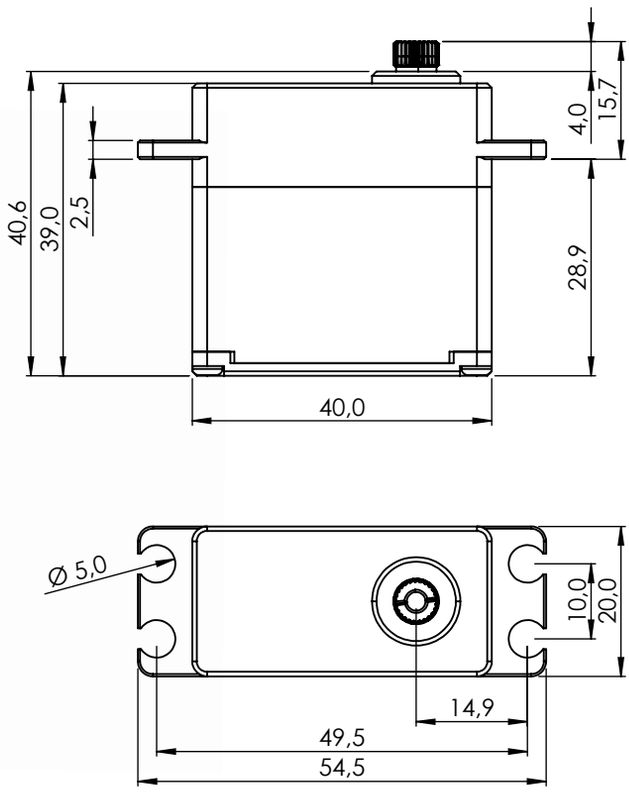
PERFORMANCE CHART



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				

MDB961WP-CAN 28V

#1-03003



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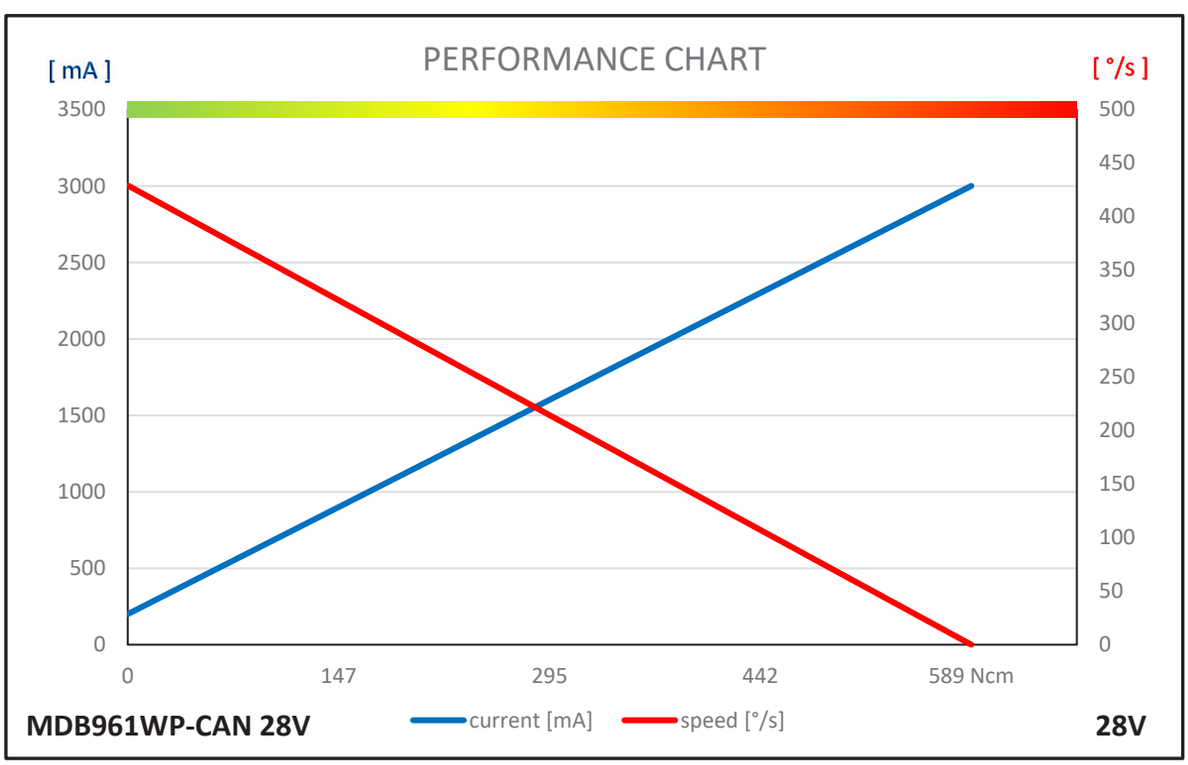
PERFORMANCE CHART

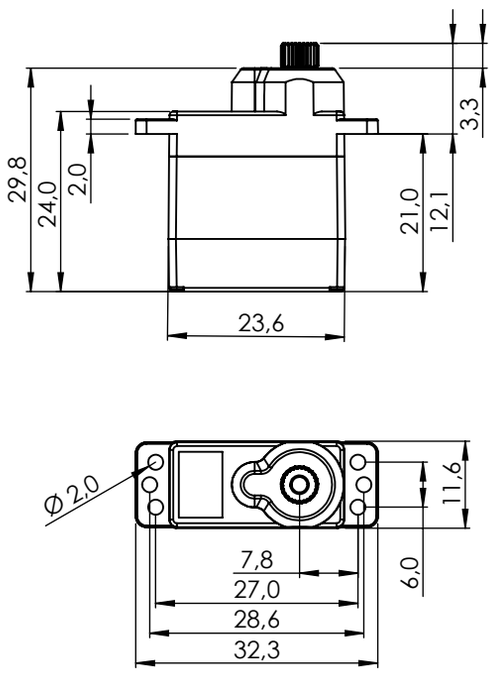


GENERAL SPECIFICATION

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				

MD65MG-CAN/UAV/DroneCAN

#1-01707, #1-01643



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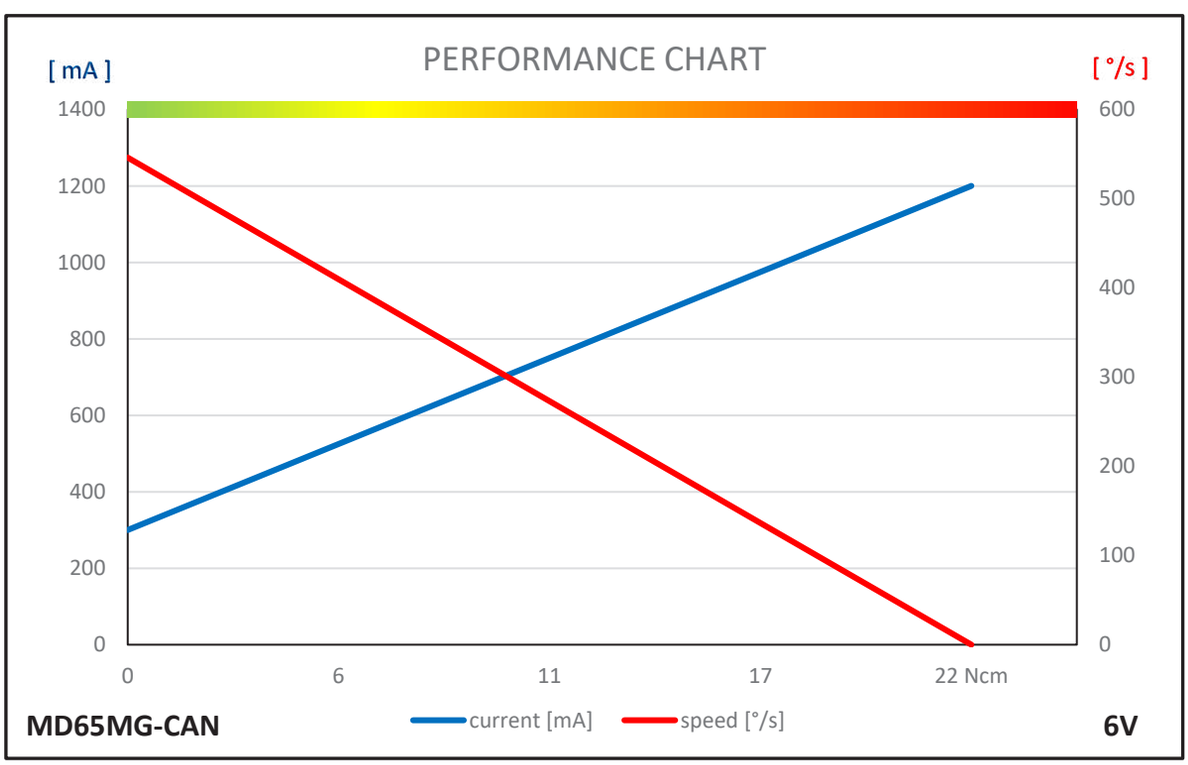
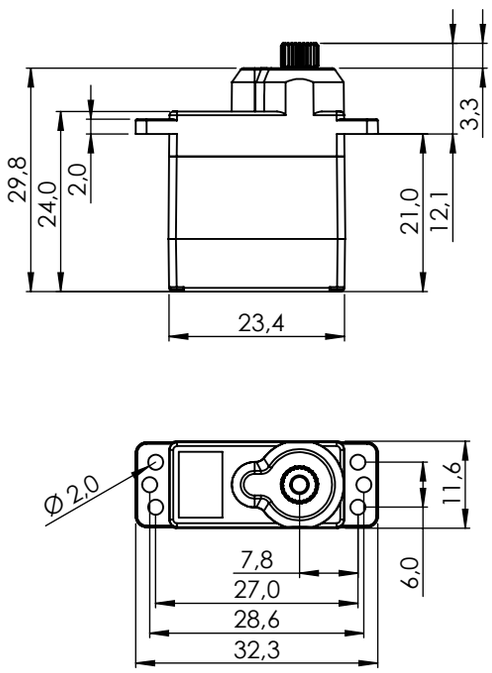
PERFORMANCE CHART



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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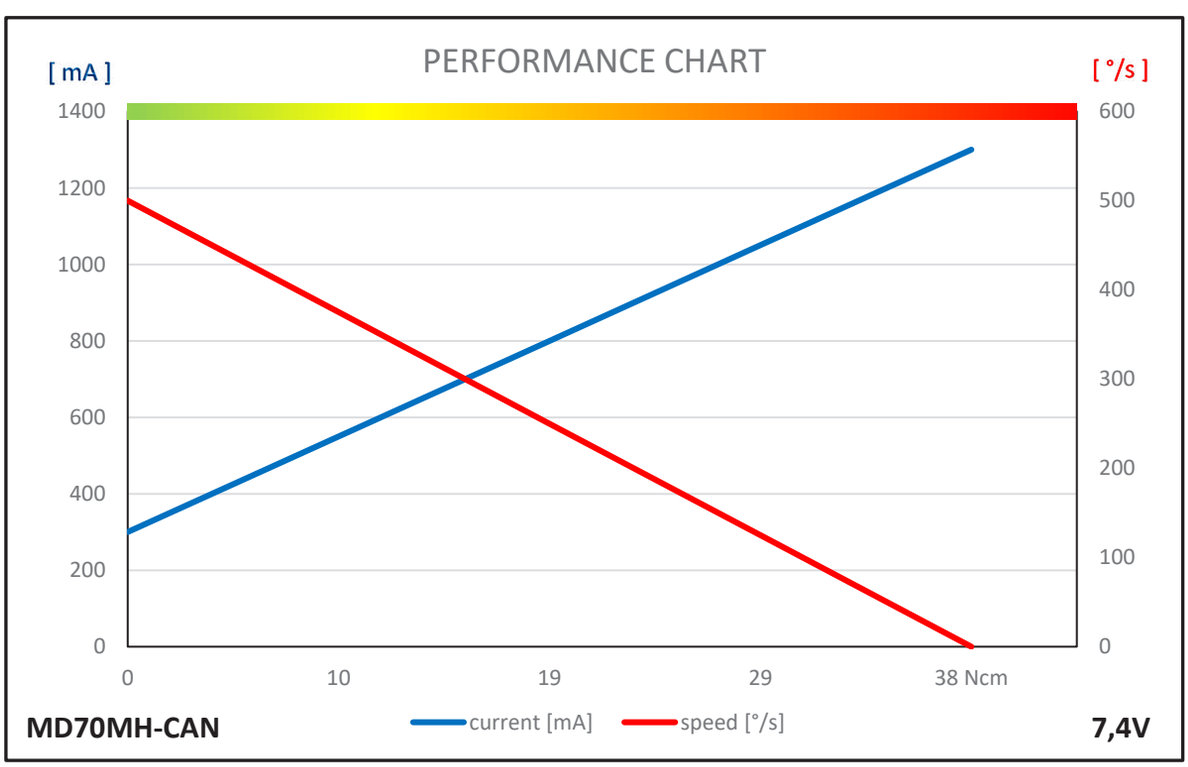
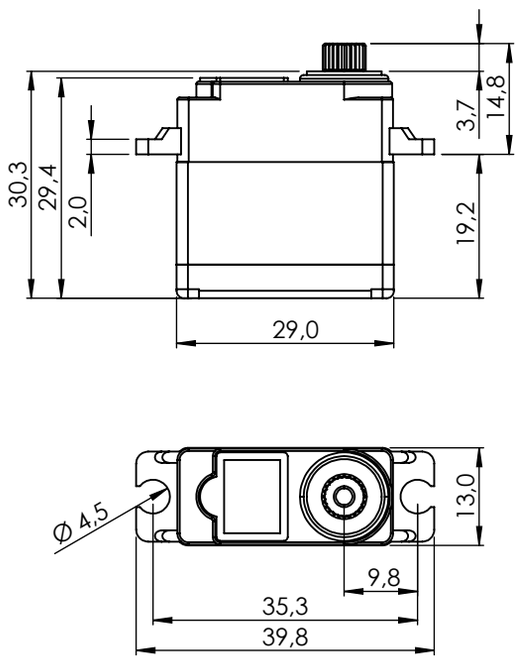
PERFORMANCE CHART



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

#1-01573, #1-01645



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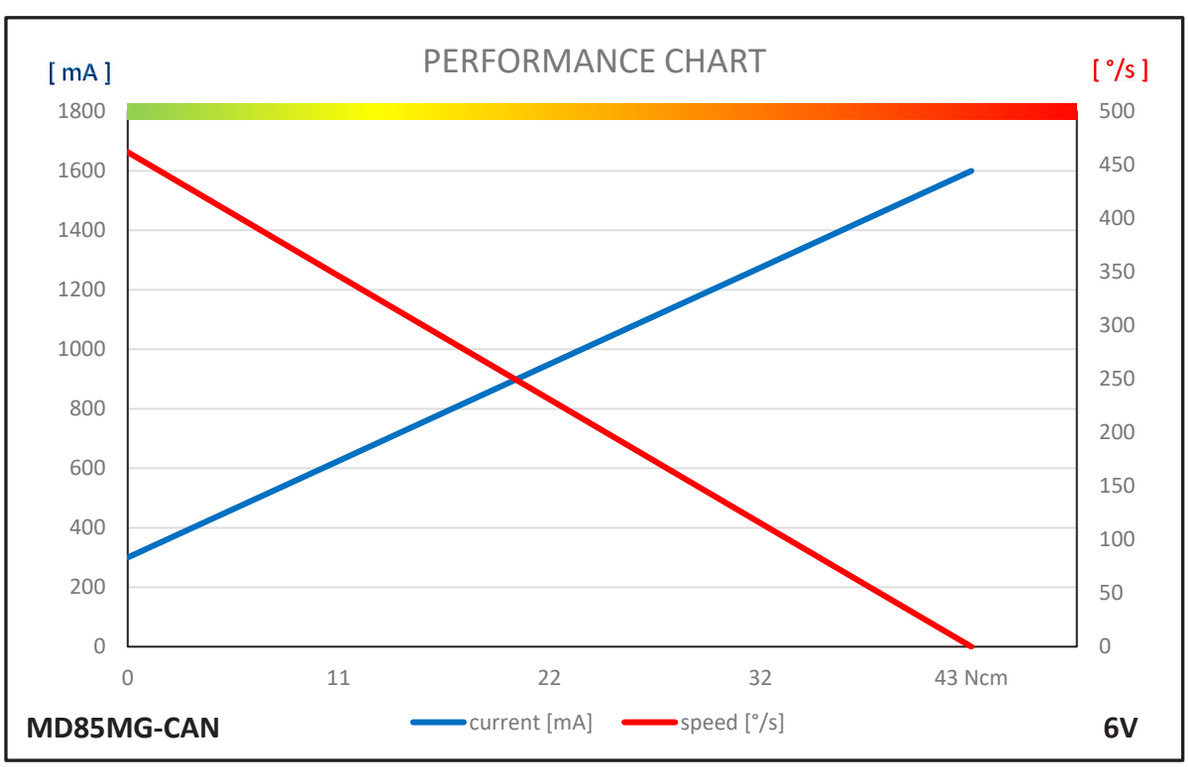
PERFORMANCE CHART

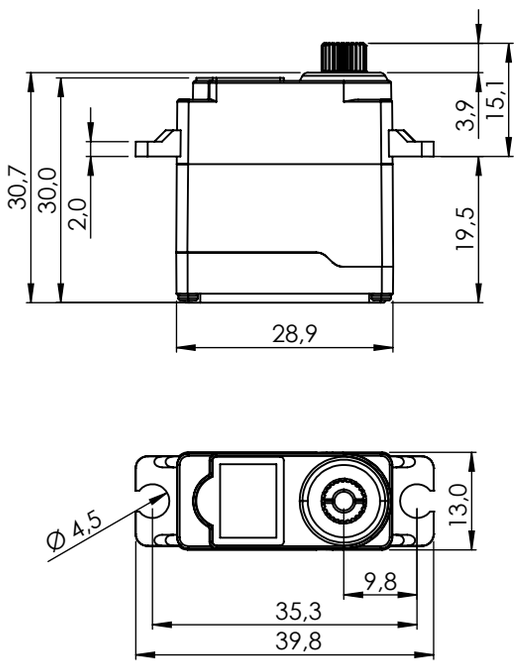


GENERAL SPECIFICATION

MD85MG-CAN/UAVCAN/DroneCAN				
Control System	CAN BUS			
	Protocol (Mode)	Standard 2.0A	Extended 2.0B	UAVCAN/DroneCAN
	Baud-Rate	10kbps ~ 1Mbps		
	Sample-Point	50% or 87.5%		
	Available SERVO ID	1 ~ 254		1 ~ 127
	Available Node ID	1 ~ 2047	1 ~ 536870911	1 ~ 127
	Input Signal Range	0 ~ 5V		
Connector Type	Hitec 4P			
Position Sensor Type	Contactless Magnetic Encoder			
Motor Type	Cored Carbon Brush			
Amplifier / MCU	32bit programmable Digital with Mosfet Drive			
Operating Voltage Range	4.0V ~ 8.4V			
Operating Voltage	At 4.8V	At 6.0V		
Operating Speed at no Load	353°/s (59RPM)	462°/s (77RPM)		
Stall Torque	3.6kgcm (35.3Ncm)	4.3kgcm (42.2Ncm)		
Peak Efficiency Torque	0.7kgcm (6.9Ncm)	0.9kgcm (8.8Ncm)		
Rest Current	30mA	30mA		
Running Current at no Load	260mA	300mA		
Stall Current	1300mA	1600mA		
Deadband Width	4Step	4Step		
Travel	Travel / Command	90° / 4096		
	Servo mode	Left	Center	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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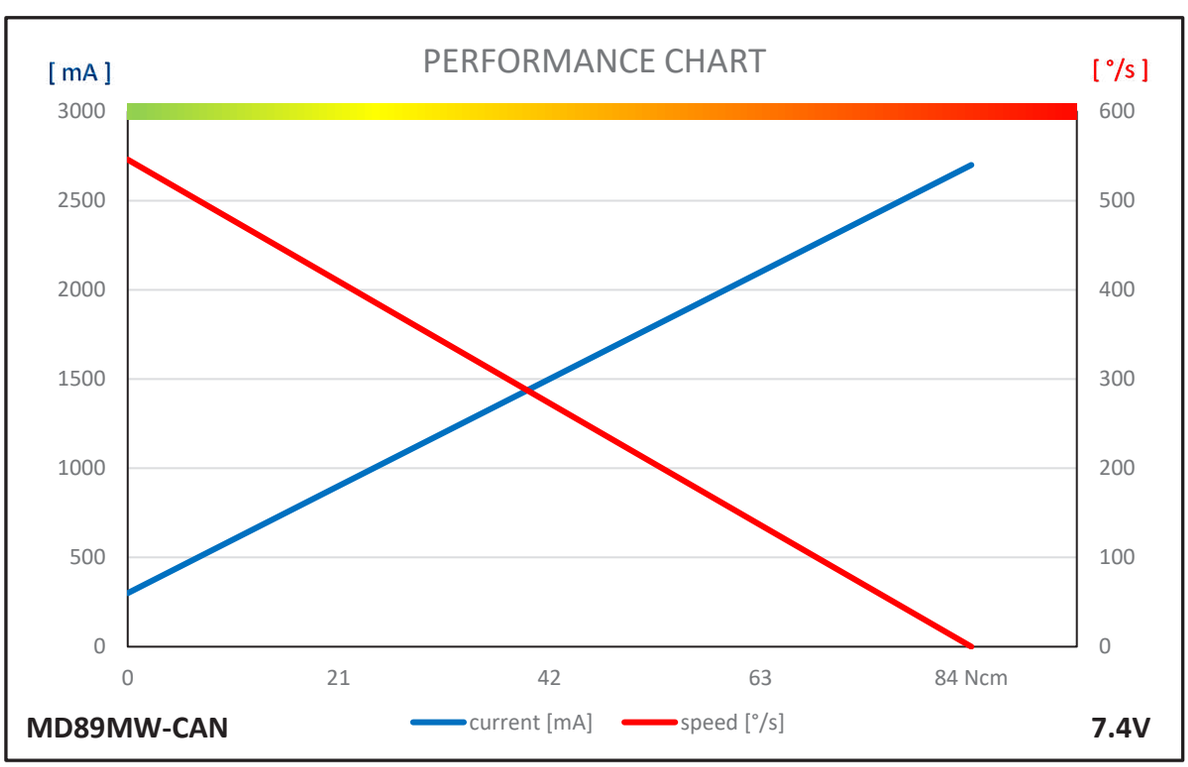
PERFORMANCE CHART

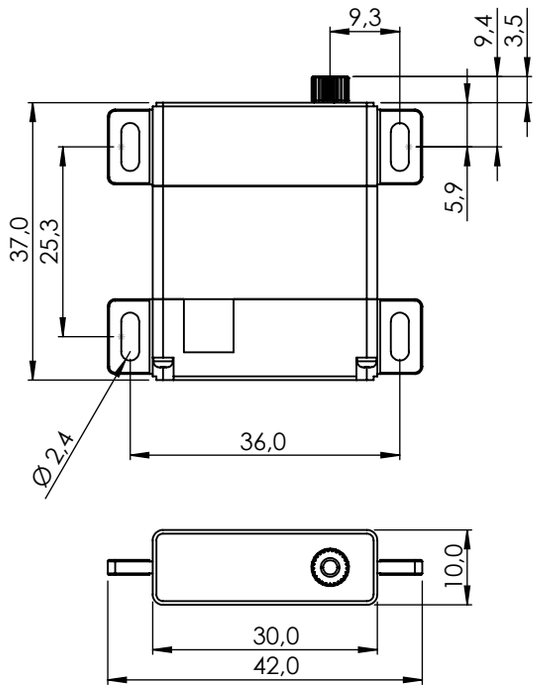


GENERAL SPECIFICATION

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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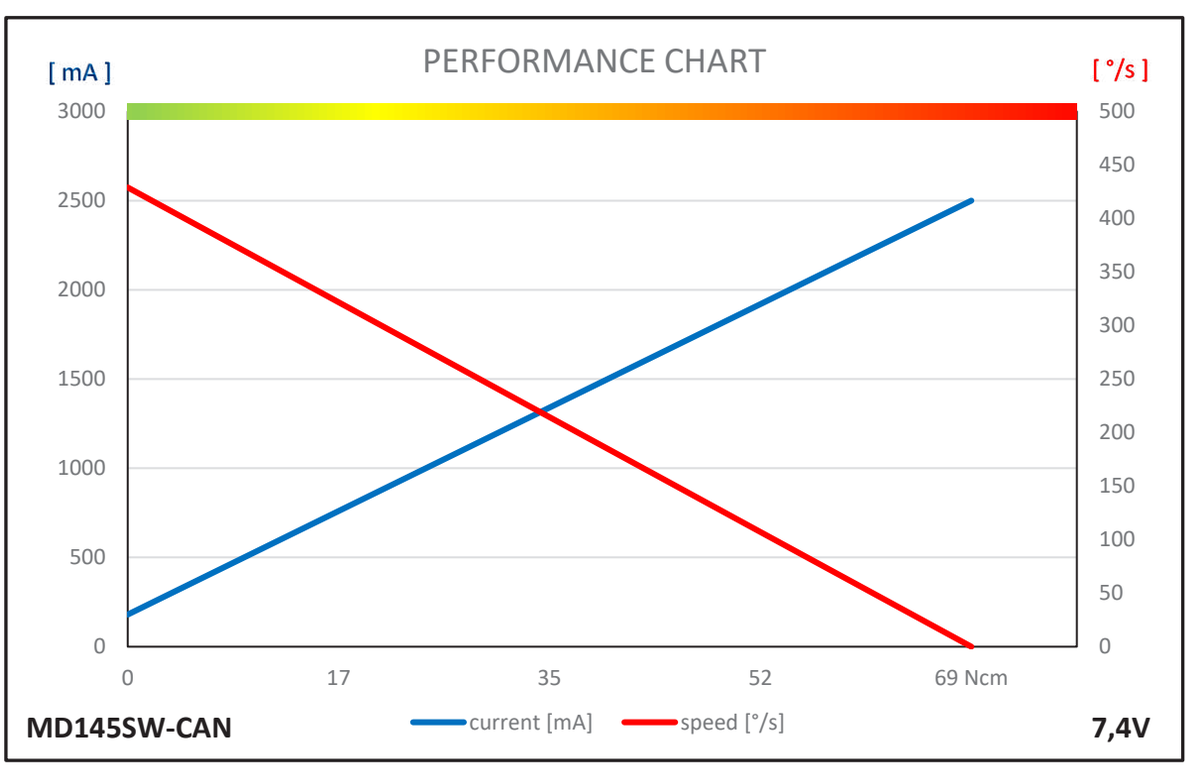
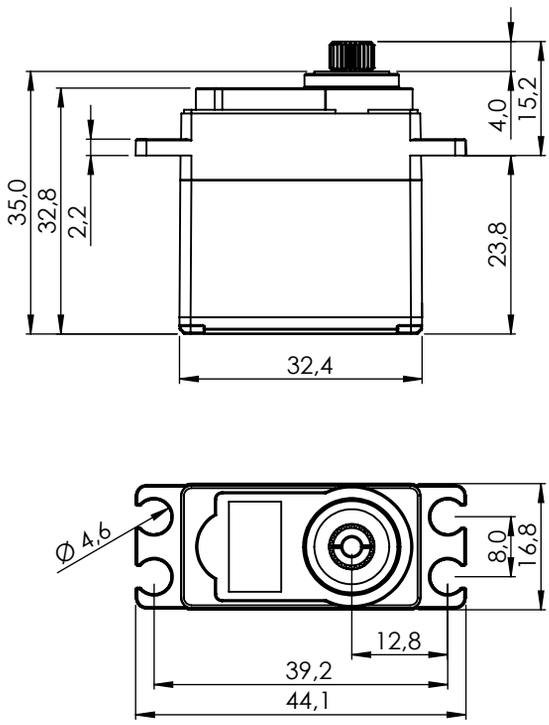
PERFORMANCE CHART



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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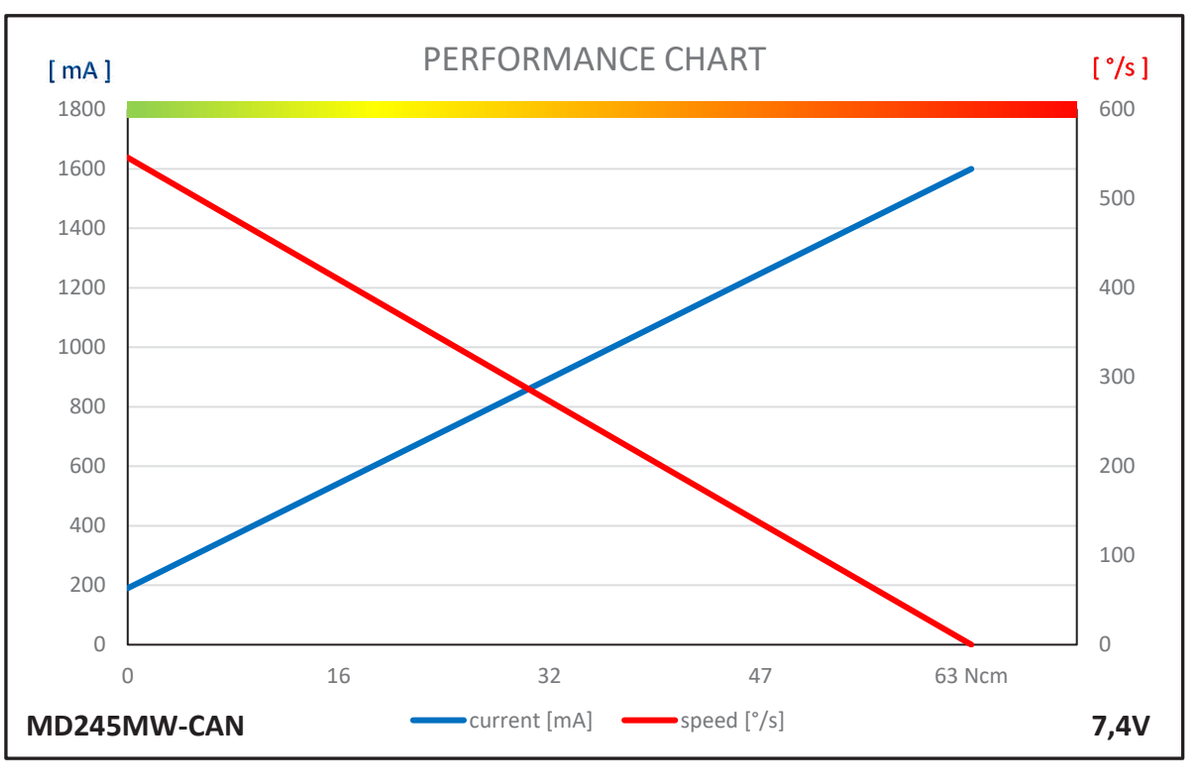
PERFORMANCE CHART

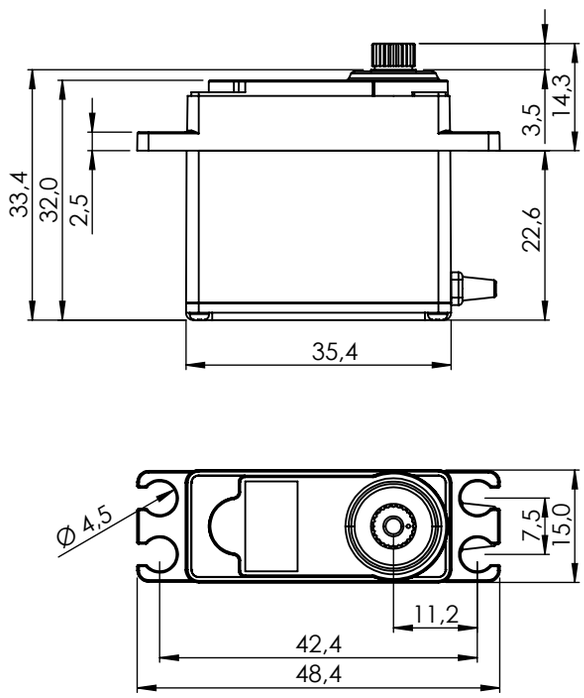


GENERAL SPECIFICATION

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-025)			
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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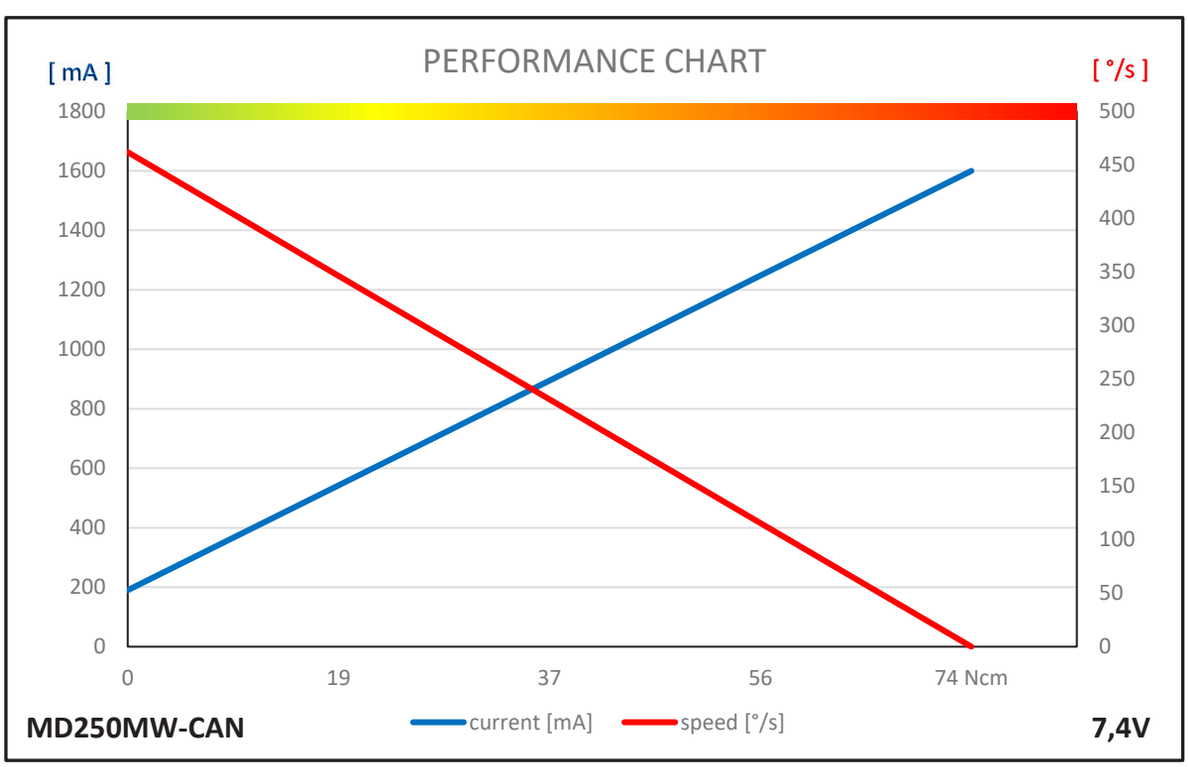
PERFORMANCE CHART

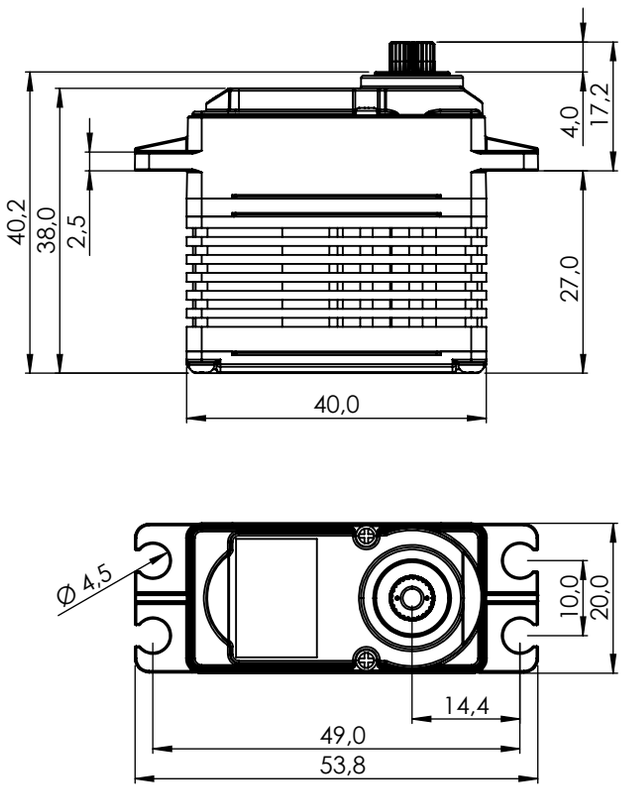


GENERAL SPECIFICATION

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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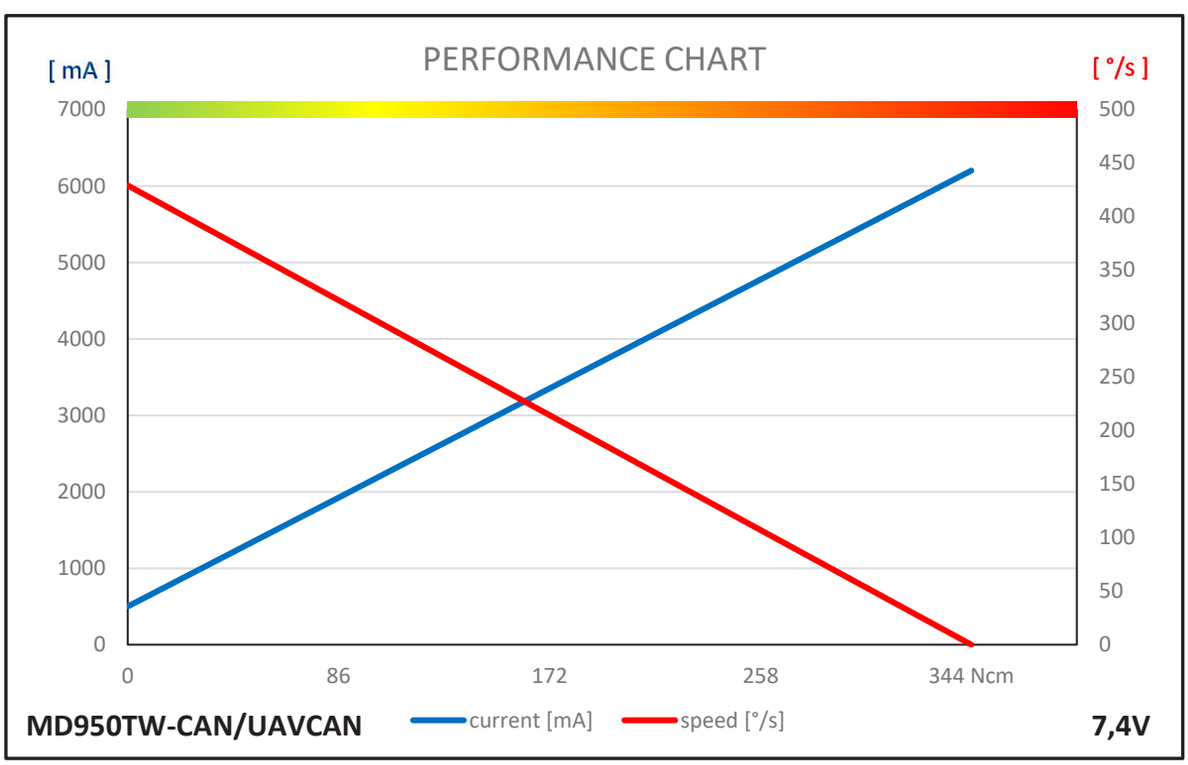
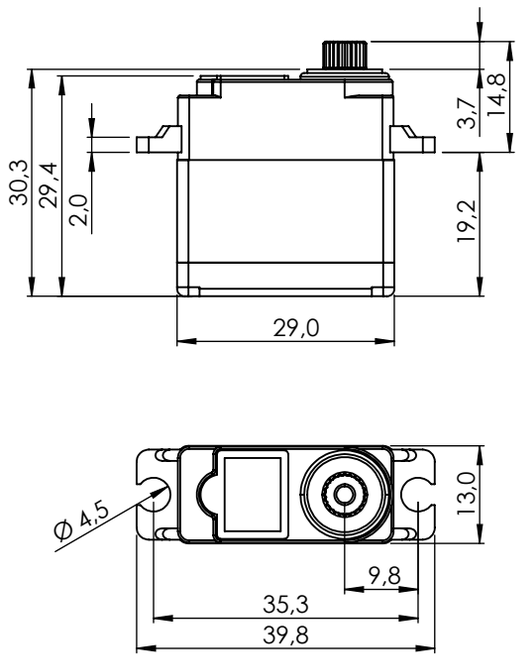


GENERAL SPECIFICATION

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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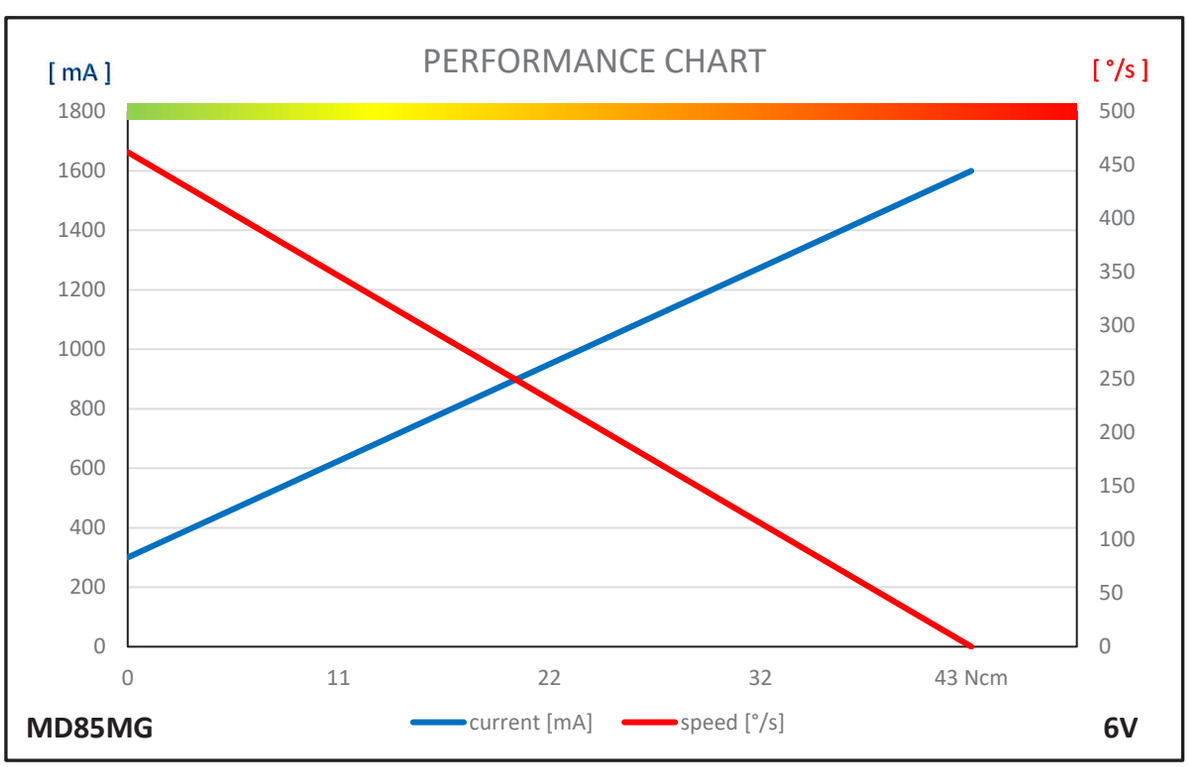
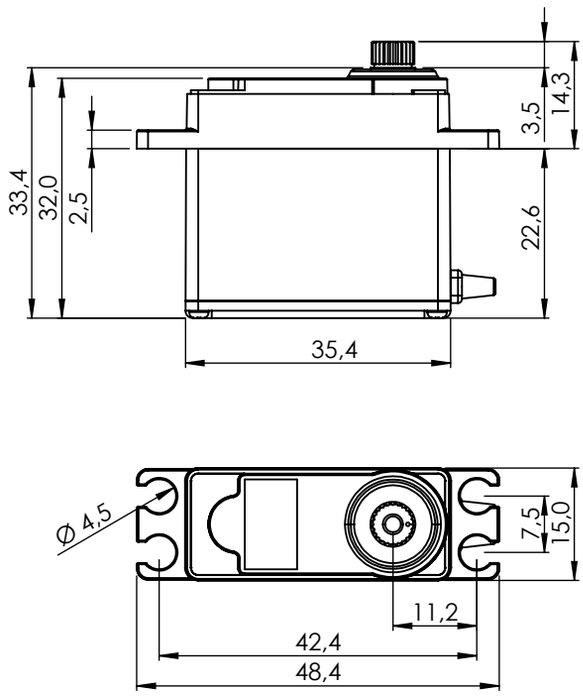


GENERAL SPECIFICATION

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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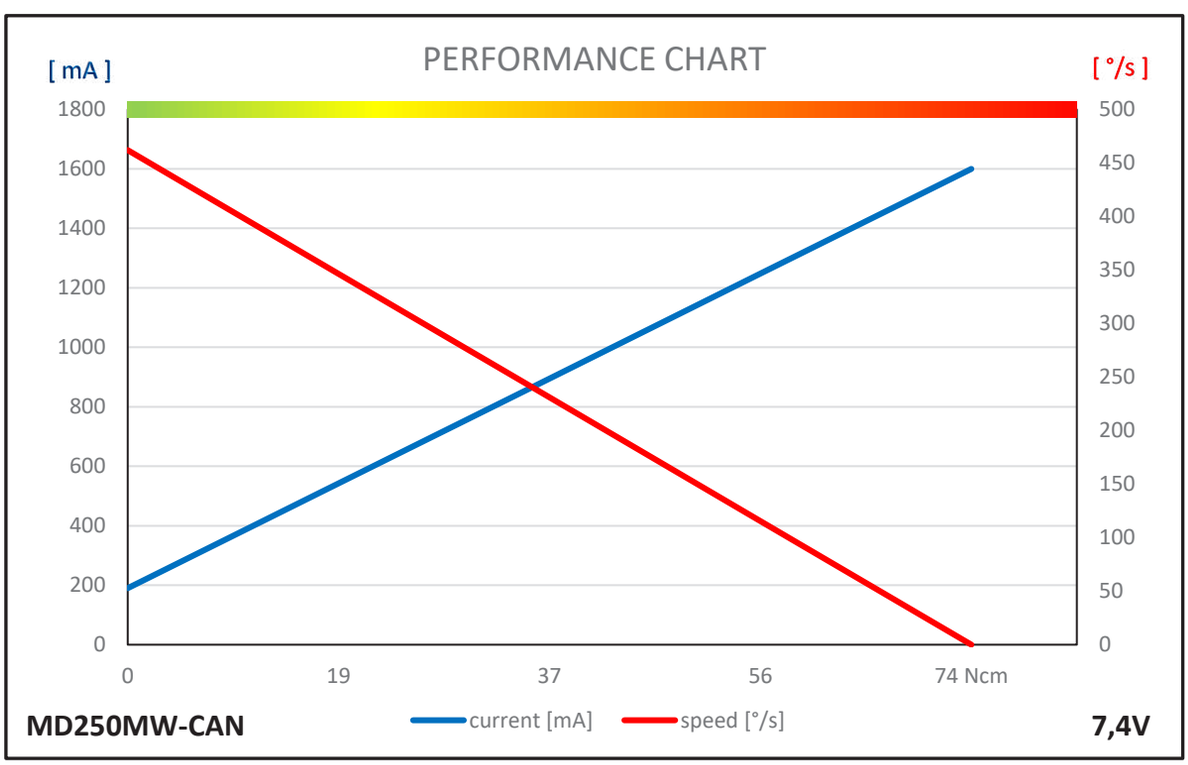
PERFORMANCE CHART



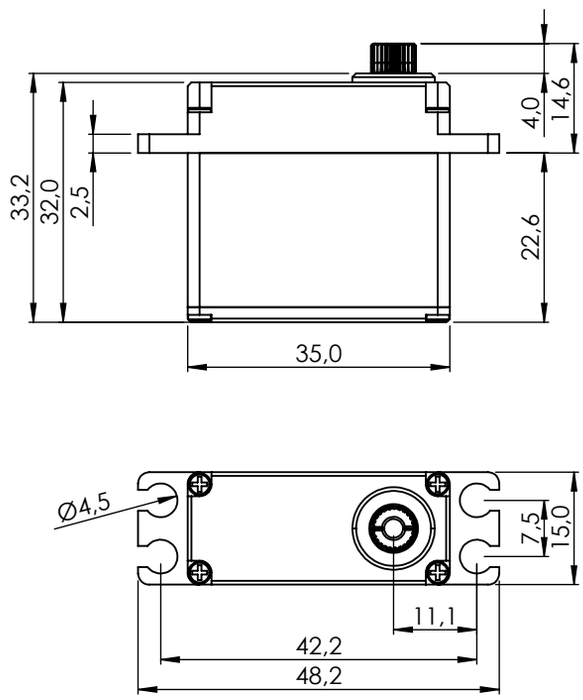
GENERAL SPECIFICATION

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

*of the servo only w/o horns and accessories

MD261SW

#1-03052



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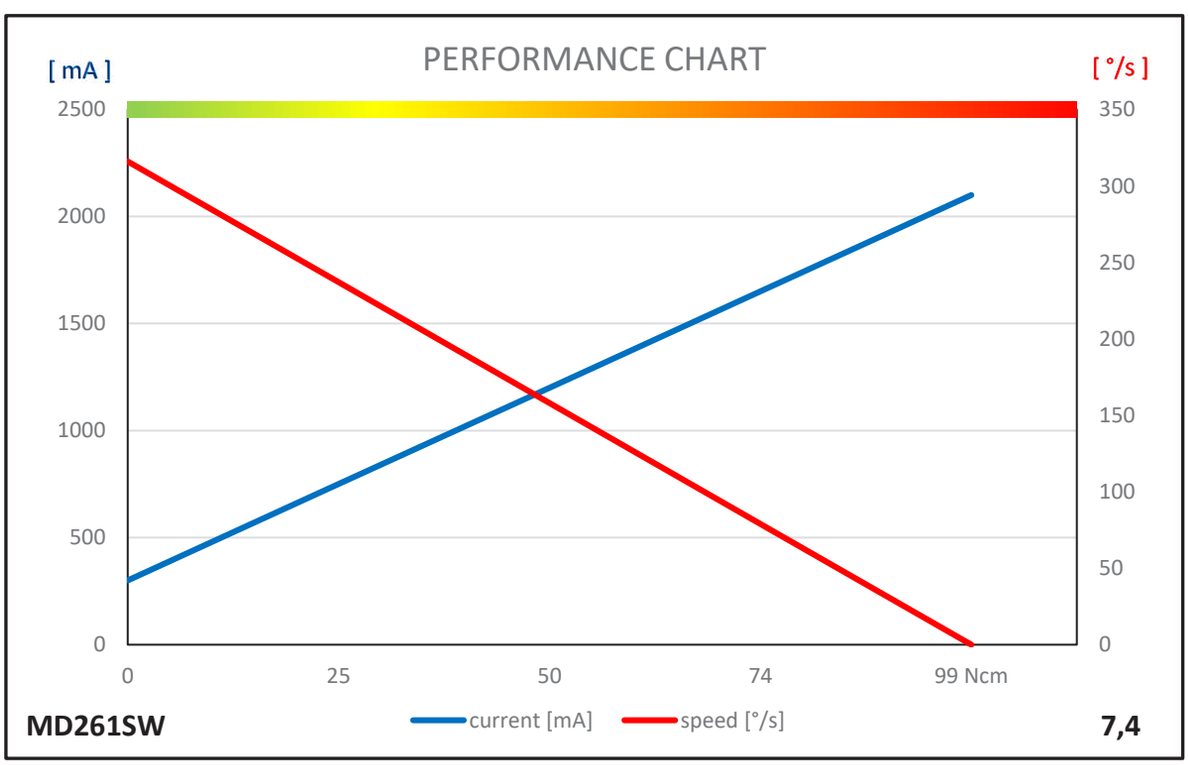
PERFORMANCE CHART



GENERAL SPECIFICATION

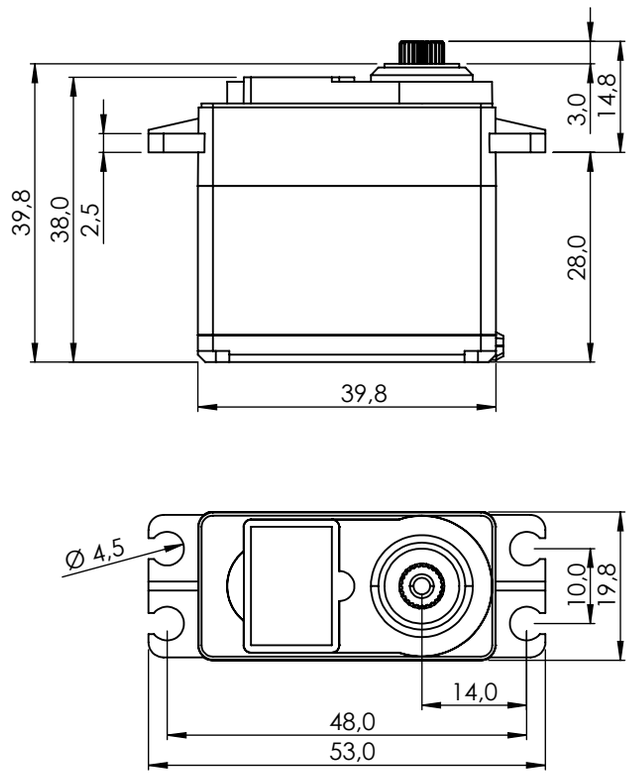
MD261SW			
Control System	PWM / TTL (Half Duplex)		
	Pulse Width 900µs|1500µs (Center)|2100µs		
Connector Type	Hitec 3P (JR 3P compatible)		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	Cored Carbon Brush		
Amplifier / MCU	32bit programmable Digital		
Operating Voltage Range	3.5V ~ 8.4V		
Operating Voltage	At 4.8V	At 6.0V	At 7.4V
Operating Speed at no Load	200°/s (33RPM)	261°/s (44RPM)	316°/s (53RPM)
Stall Torque	6.5kgcm (63.7Ncm)	8.1kgcm (79.5Ncm)	10.0kgcm (98.1Ncm)
Peak Efficiency Torque	1.3kgcm (12.8Ncm)	1.6kgcm (15.7Ncm)	2.0kgcm (19.6Ncm)
Rest Current	30mA	30mA	30mA
Running Current at no Load	220mA	260mA	300mA
Stall Current	1400mA	1700mA	2100mA
Deadband Width	2µs	2µs	2µs
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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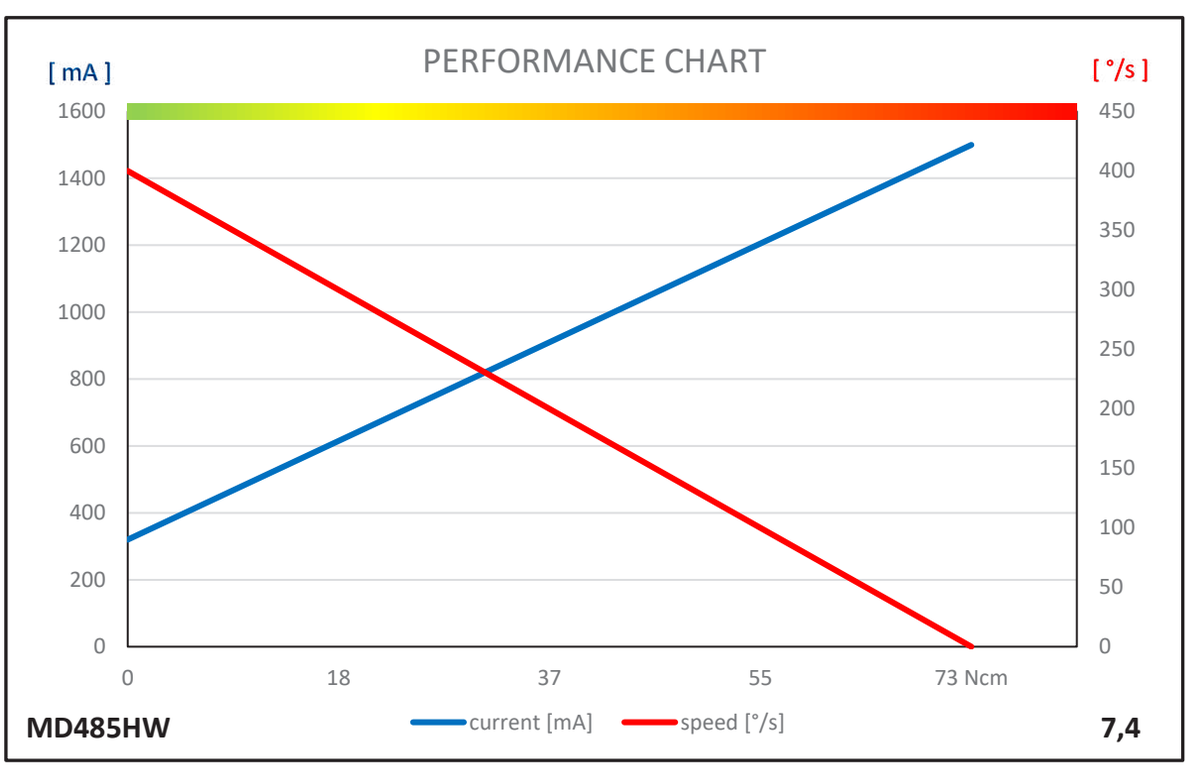


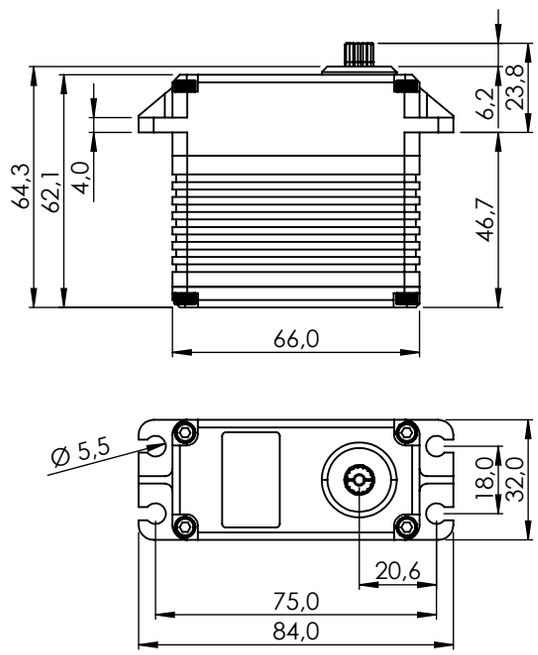
GENERAL SPECIFICATION

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

MDR845WP

#1-01329



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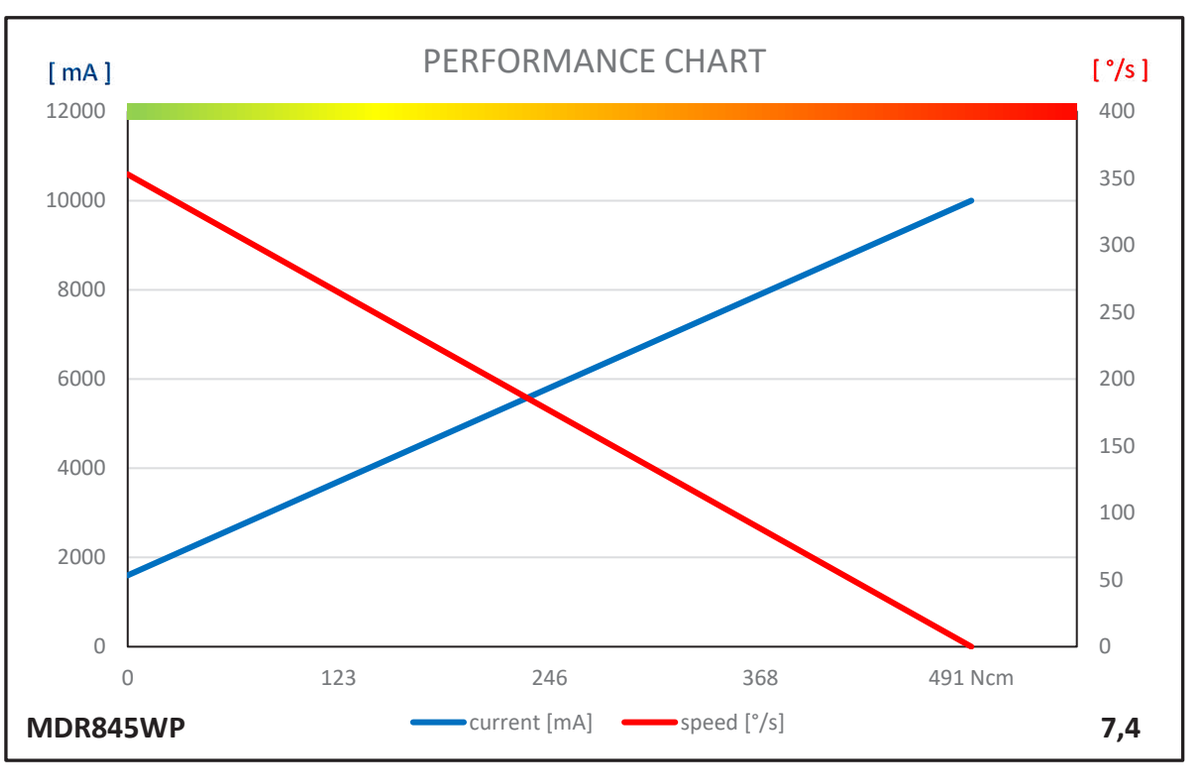


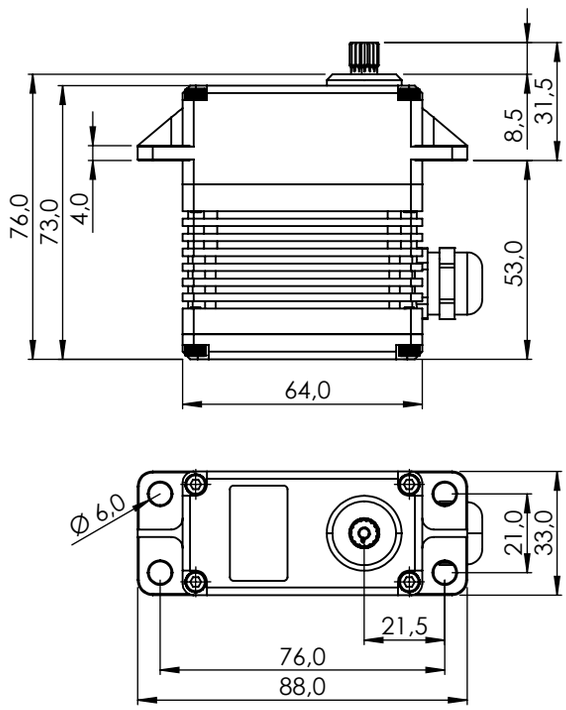
GENERAL SPECIFICATION

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

*of the servo only w/o horns and accessories

MD1100WP

#1-01638



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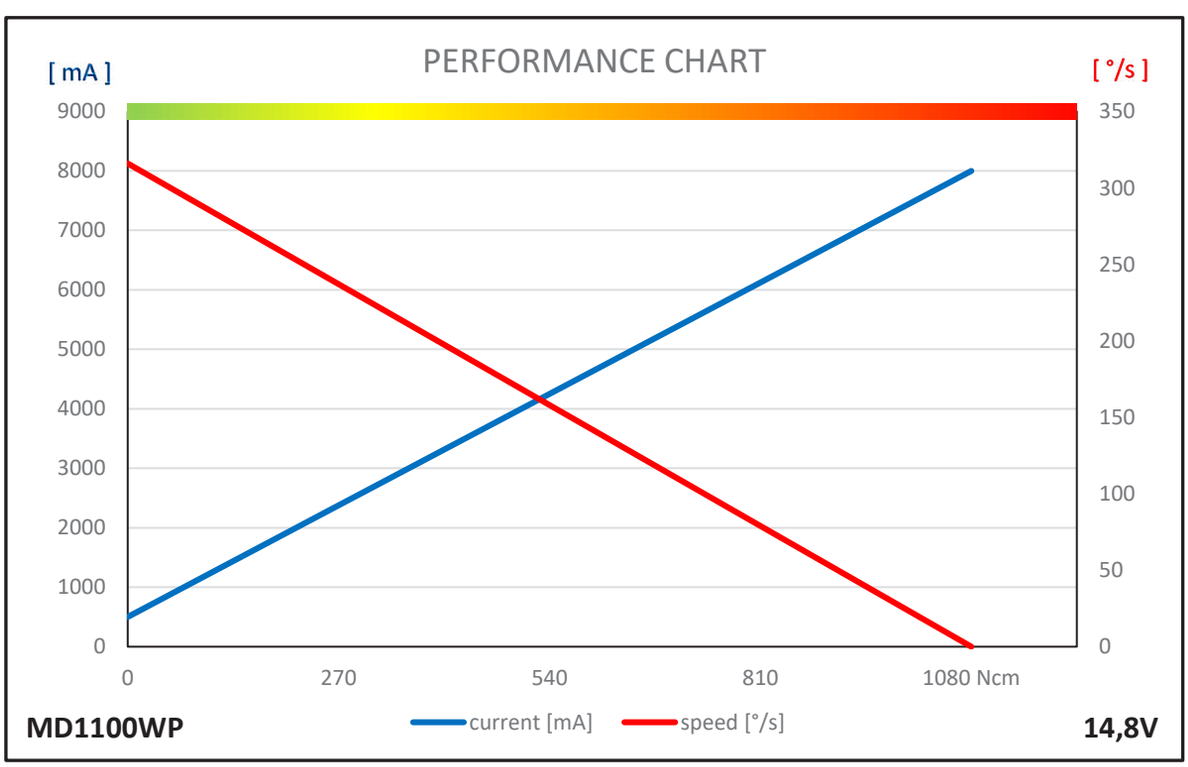
PERFORMANCE CHART

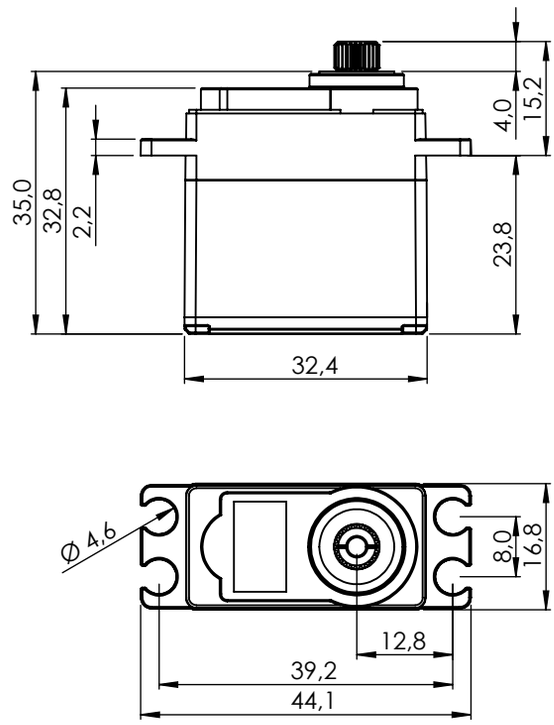


GENERAL SPECIFICATION

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			

MD245MW-RS485

#1-01677



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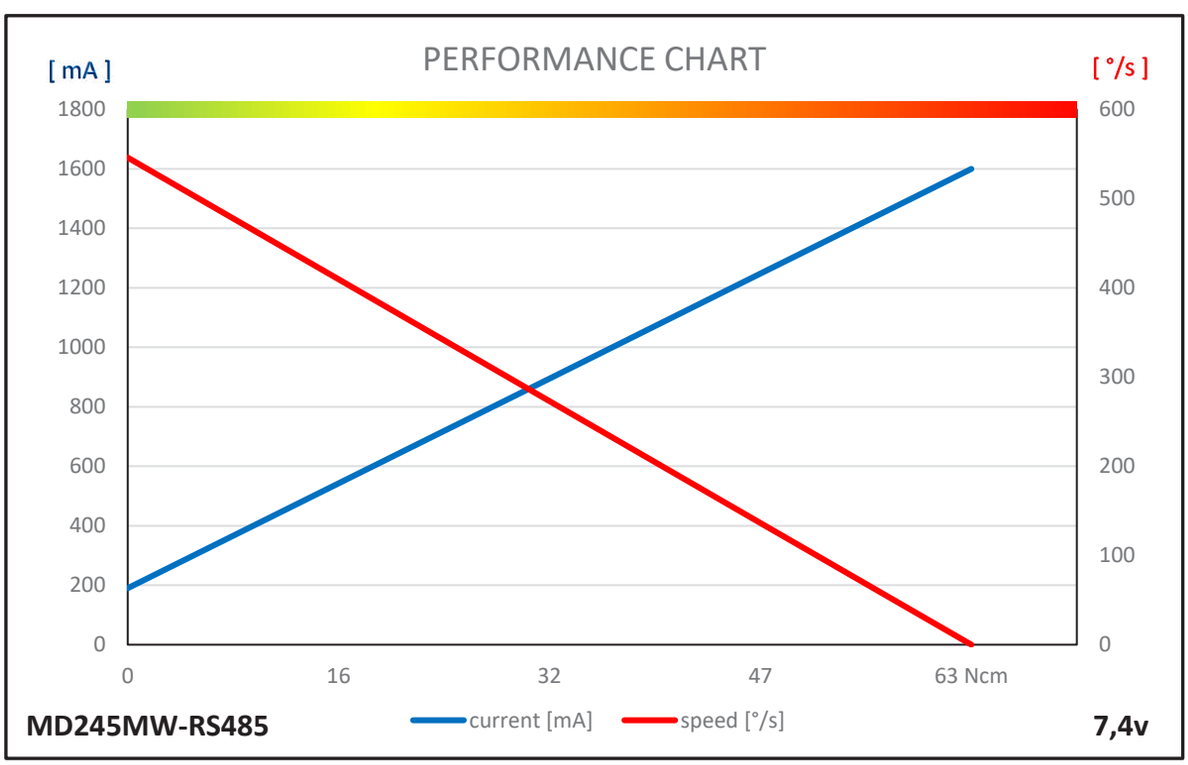
PERFORMANCE CHART



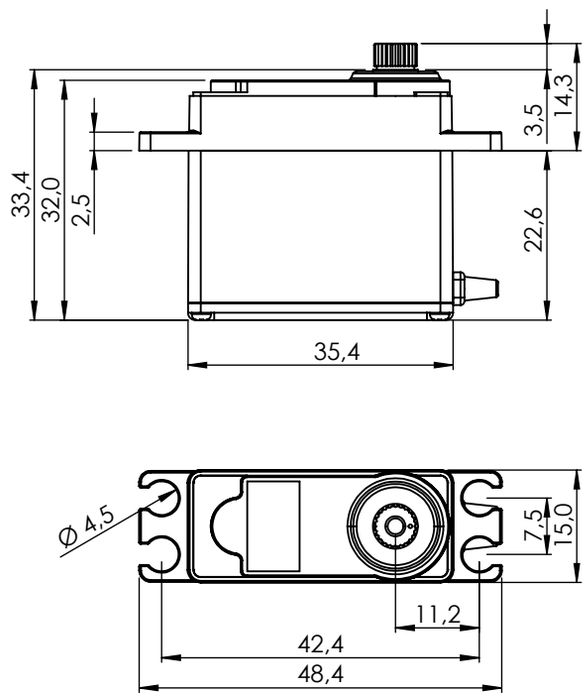
GENERAL SPECIFICATION

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-025)		
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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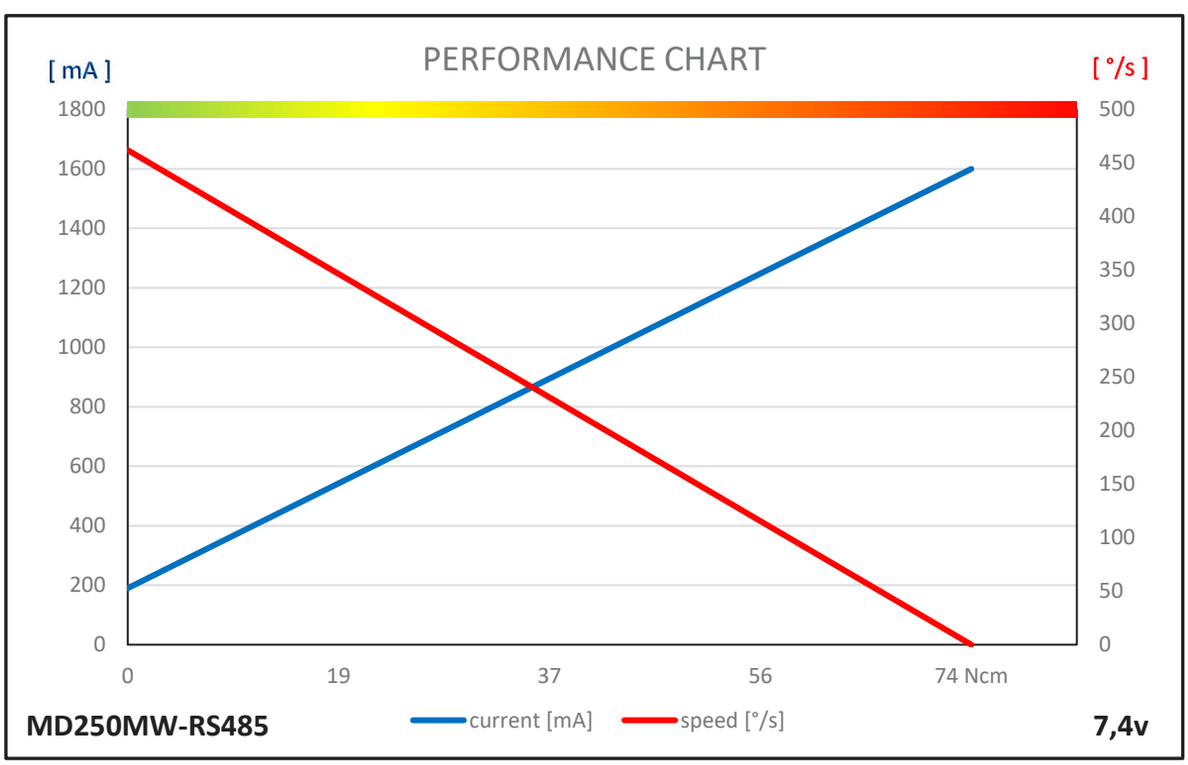
PERFORMANCE CHART



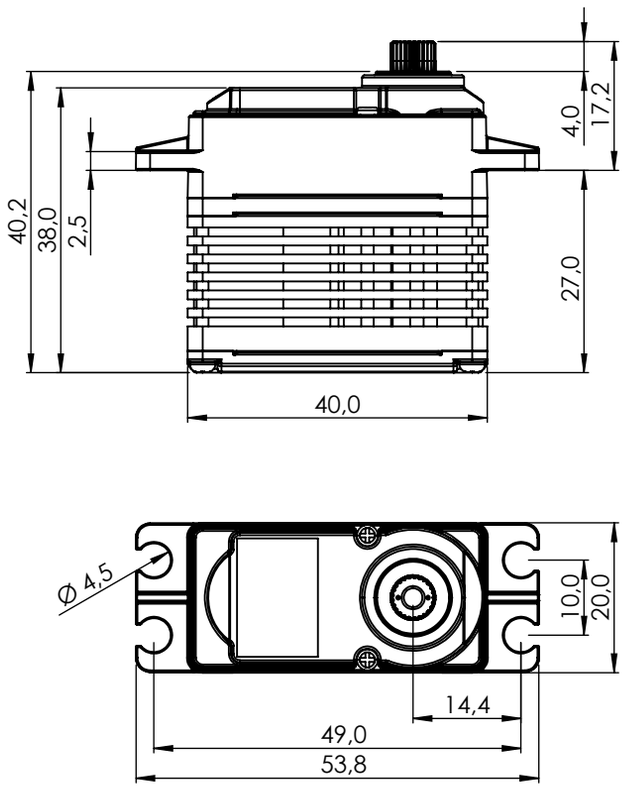
GENERAL SPECIFICATION

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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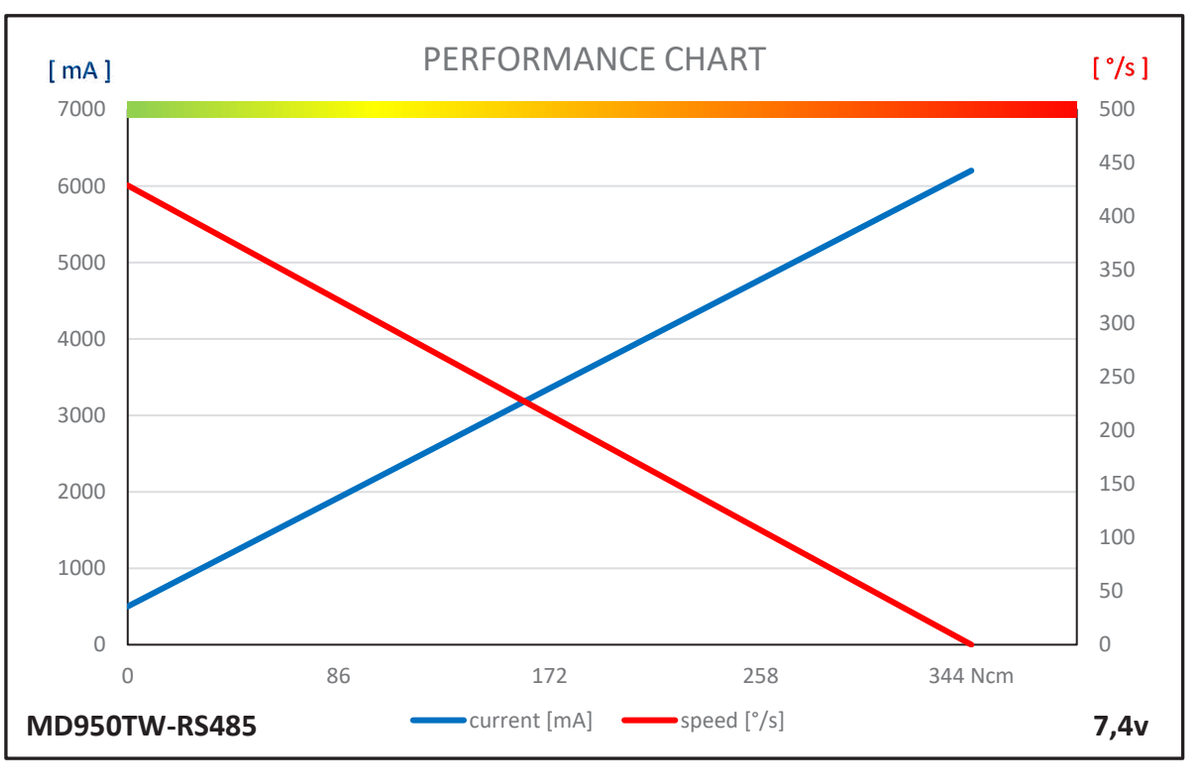
PERFORMANCE CHART



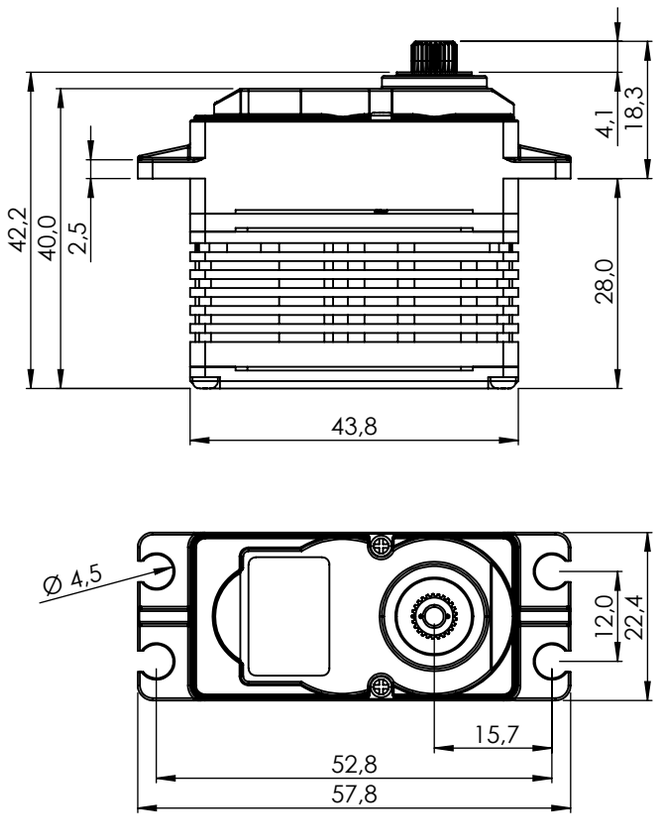
GENERAL SPECIFICATION

MD950TW-RS485			
Control System	RS485		
	Pulse Width -		
Connector Type	Hitec 4P		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	Coreless		
Amplifier / MCU	32bit programmable Digital		
Operating Voltage Range	4.0V ~ 8.4V		
Operating Voltage	At 4.8V	At 6.0V	At 7.4V
Operating Speed at no Load	261°/s (44RPM)	353°/s (59RPM)	429°/s (71RPM)
Stall Torque	21.0kgcm (206.0Ncm)	29.0kgcm (284.5Ncm)	35.0kgcm (343.4Ncm)
Peak Efficiency Torque	4.2kgcm (41.2Ncm)	5.8kgcm (56.9Ncm)	7.0kgcm (68.7Ncm)
Rest Current	30mA	30mA	30mA
Running Current at no Load	300mA	390mA	500mA
Stall Current	3700mA	4800mA	6200mA
Deadband Width	n/a	n/a	n/a
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

MD980TW-RS485

#XXXXX



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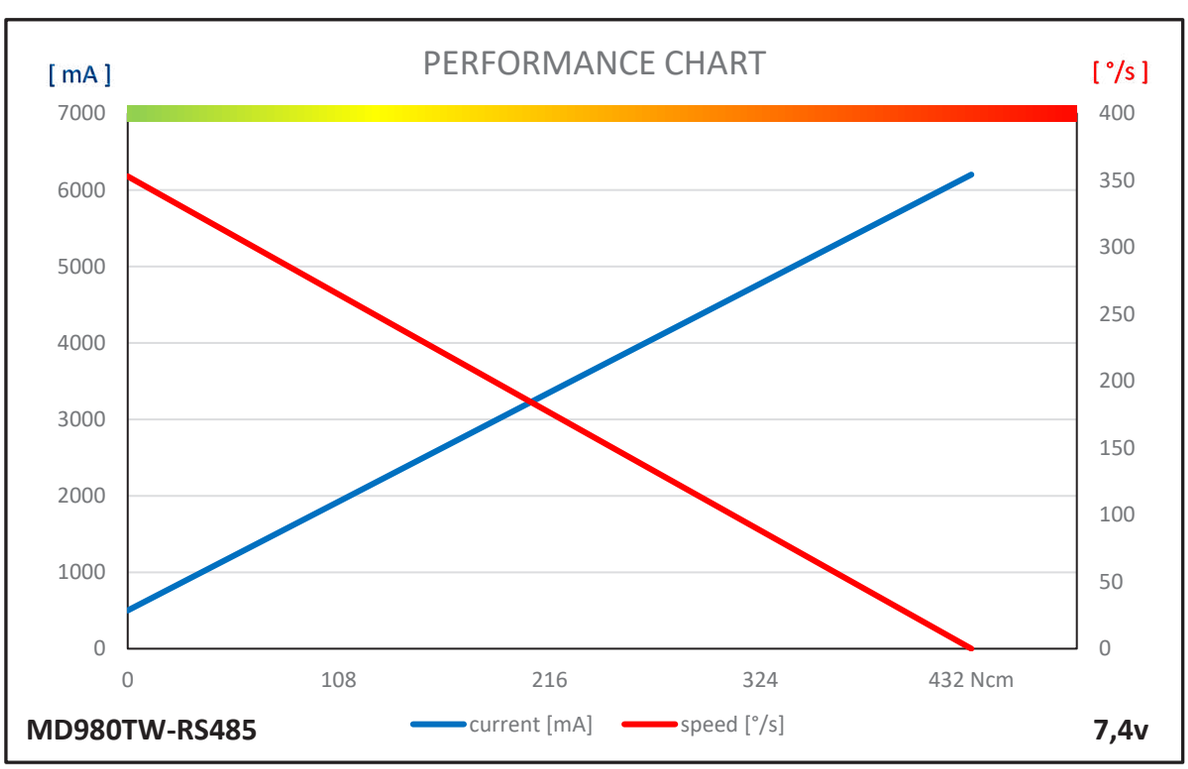
PERFORMANCE CHART



GENERAL SPECIFICATION

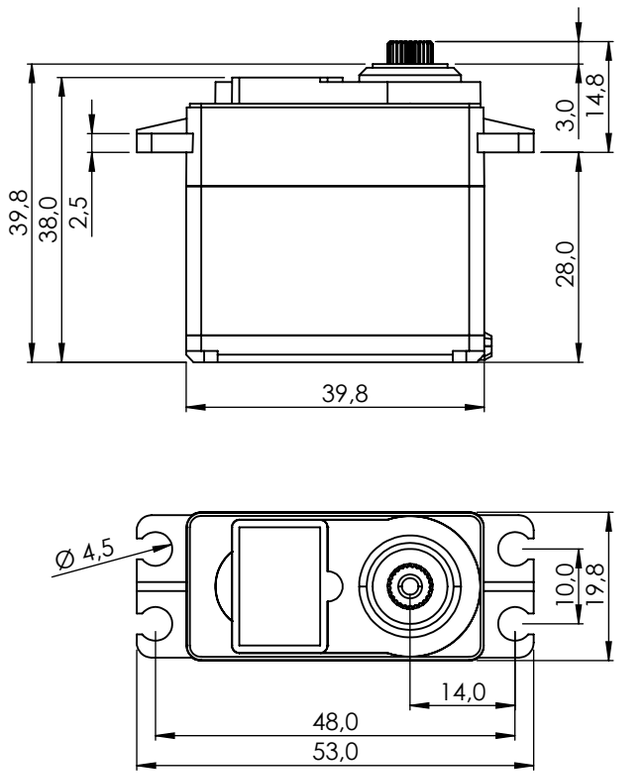
MD980TW-RS485			
Control System	RS485		
	Pulse Width -		
Connector Type	Hitec 4P		
Position Sensor Type	Contactless Magnetic Encoder		
Motor Type	Coreless		
Amplifier / MCU	32bit programmable Digital		
Operating Voltage Range	4.0V ~ 8.4V		
Operating Voltage	At 4.8V	At 6.0V	At 7.4V
Operating Speed at 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

D485HW

#1-00066

#1-02362 GP 30 Stück



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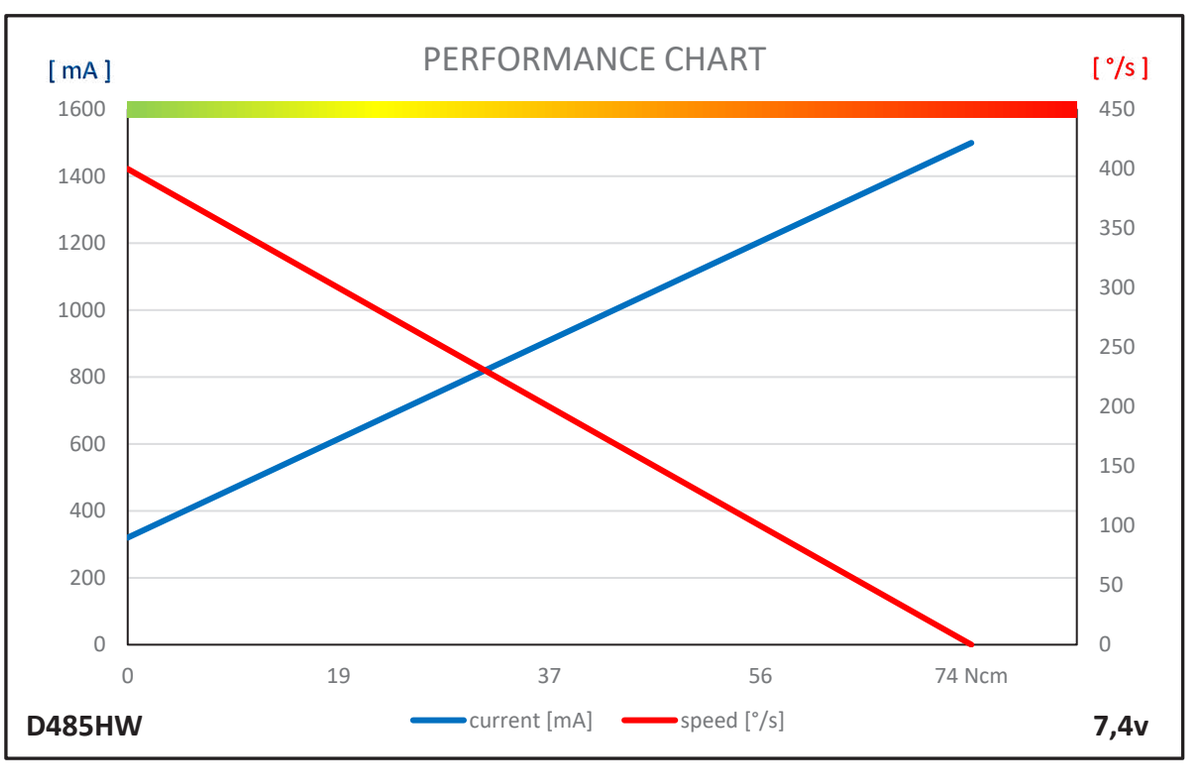
PERFORMANCE CHART



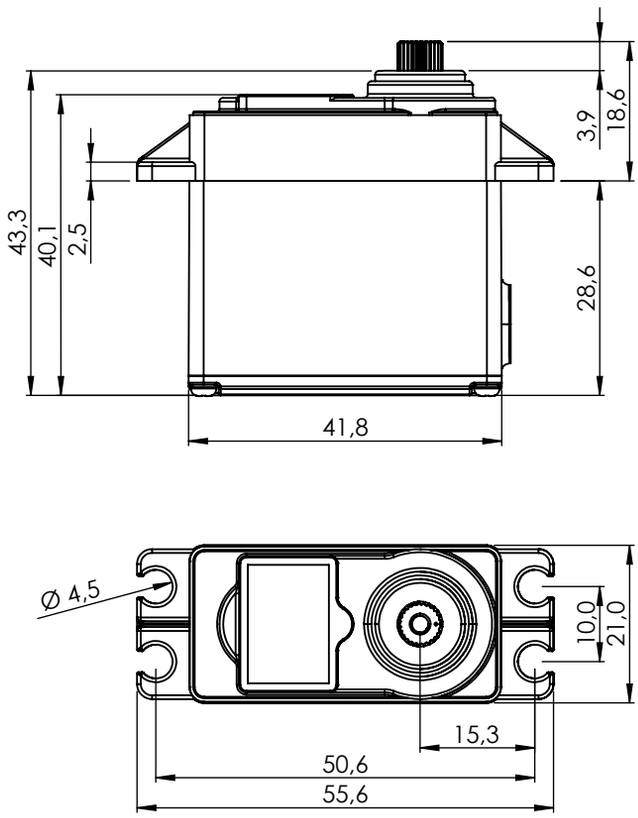
GENERAL SPECIFICATION

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

D646WP

#1-00072

#1-02354 GP 24 Stück



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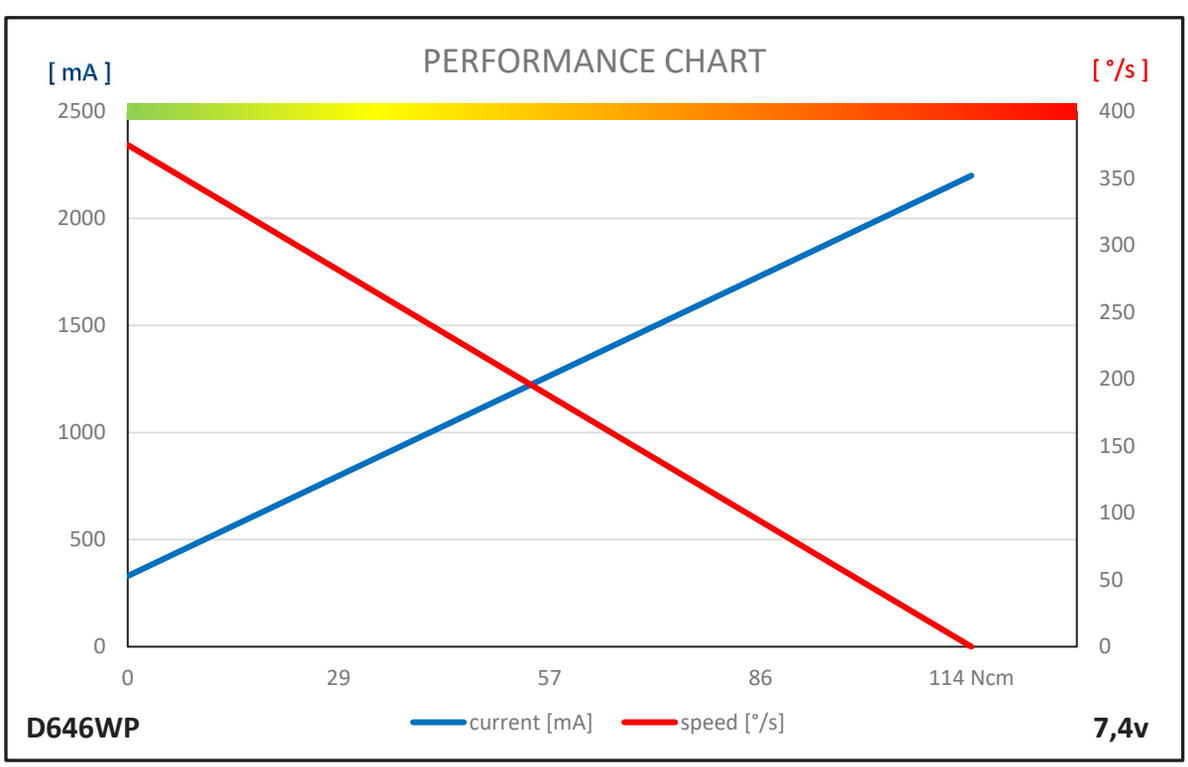
PERFORMANCE CHART

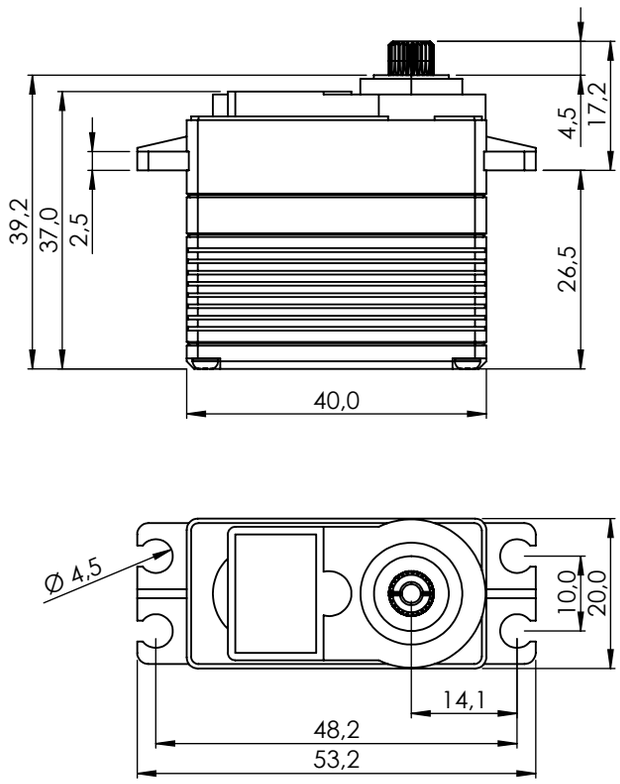


GENERAL SPECIFICATION

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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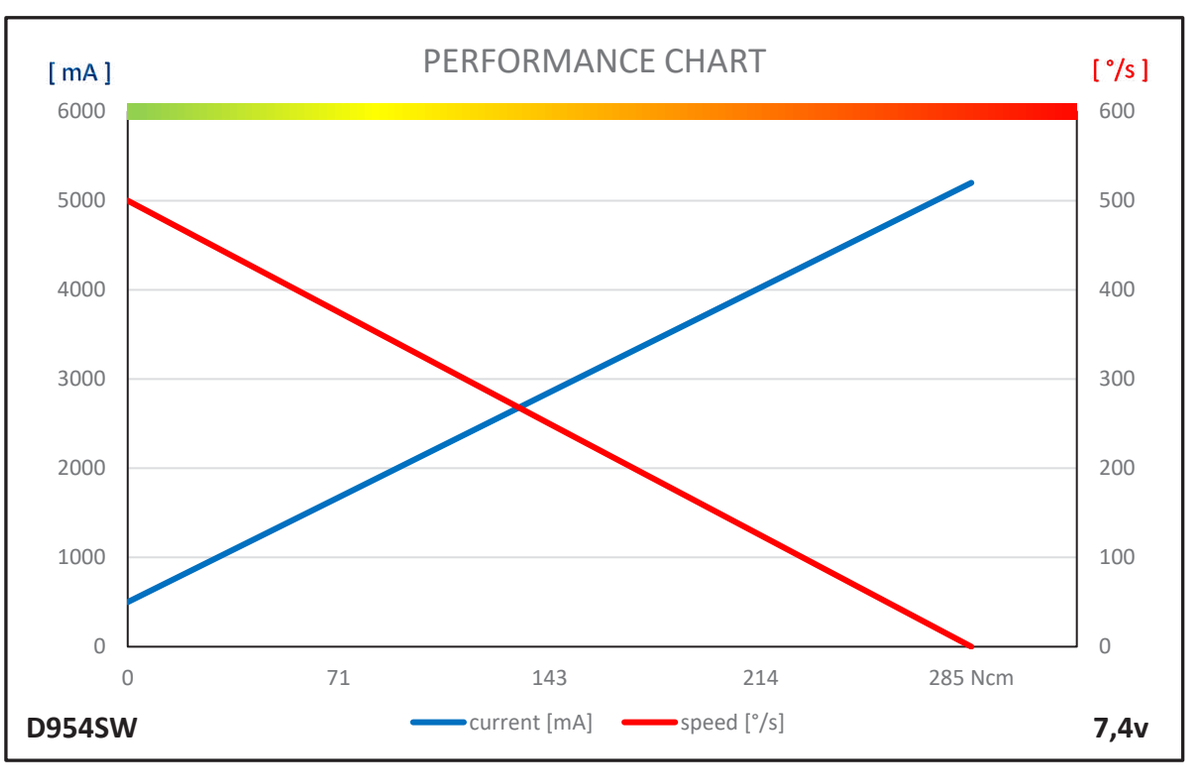
PERFORMANCE CHART



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	-		

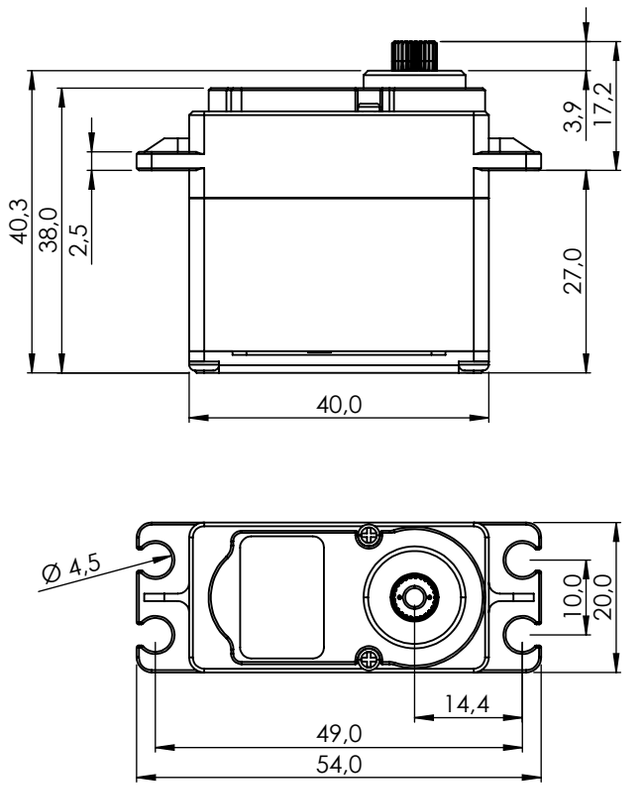
*of the servo only w/o horns and accessories

** also available with 270°

D951TW

#116951

#1-02359 GP 24 Stück



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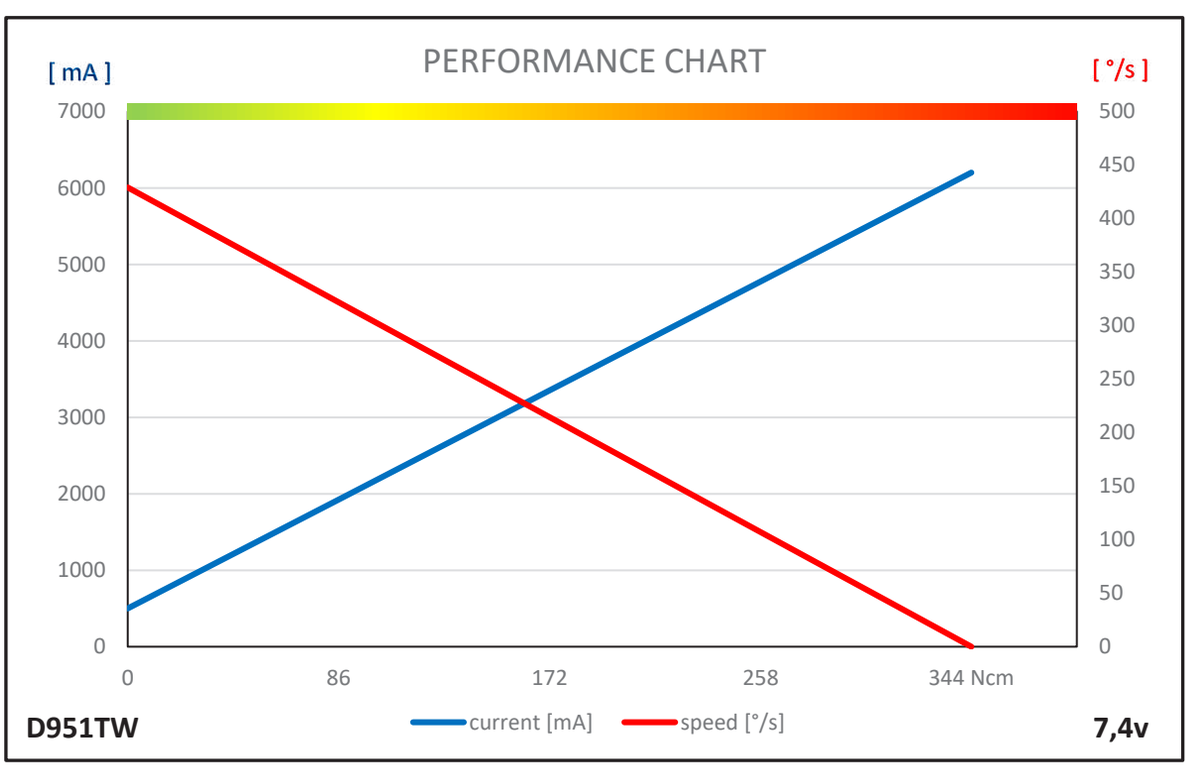
PERFORMANCE CHART



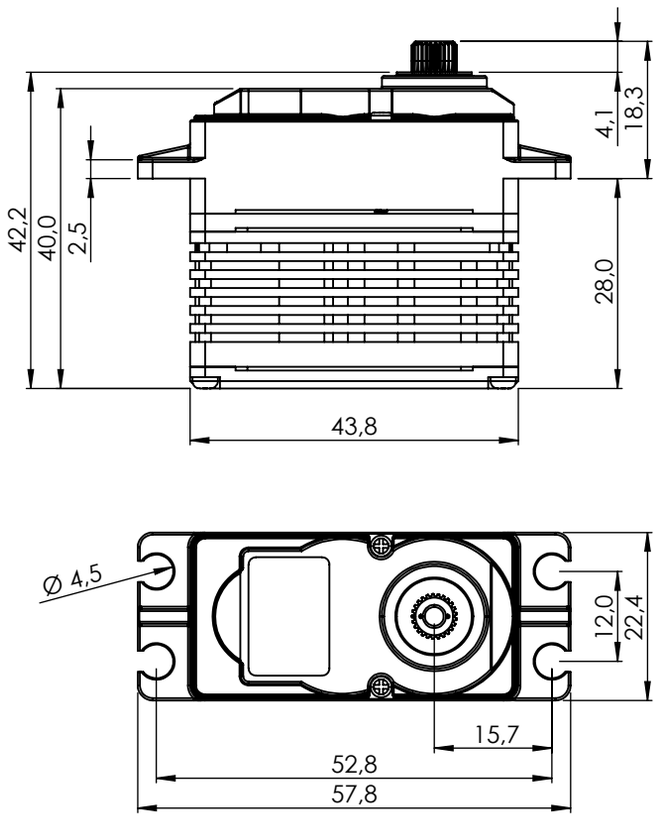
GENERAL SPECIFICATION

D951TW			
Control System	PWM / TTL (Half Duplex)		
	PWM Range 900µs I 1500µs I 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℃ ~ +80℃ (-22℉ ~+176℉)		
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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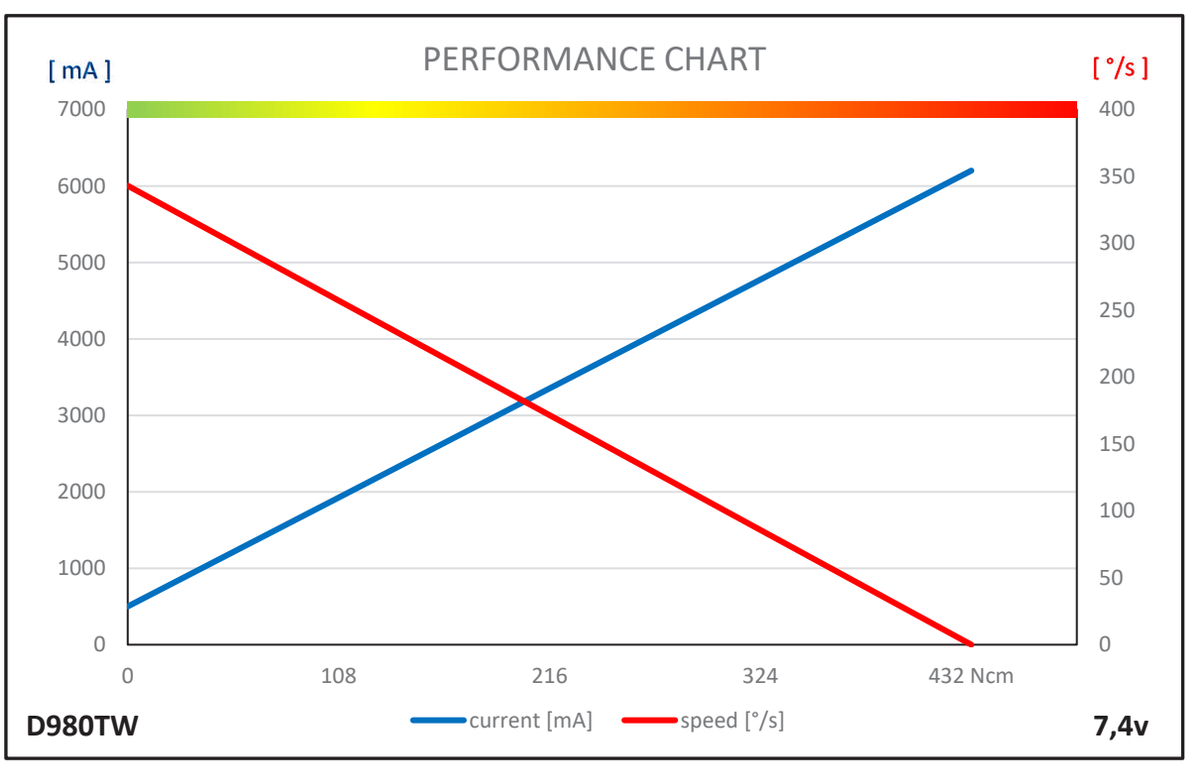
PERFORMANCE CHART



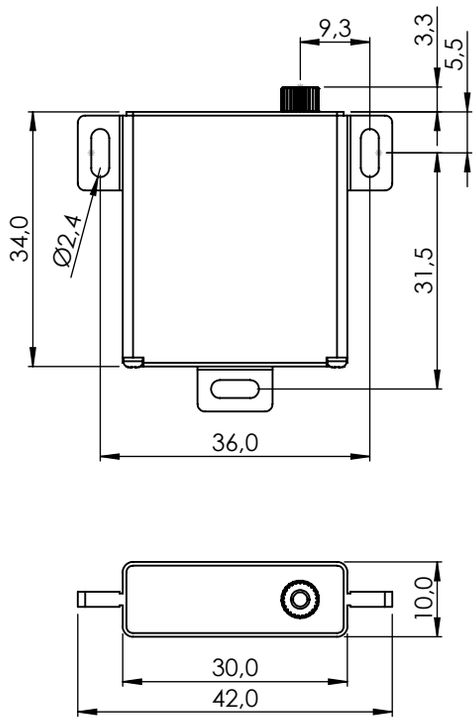
GENERAL SPECIFICATION

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-5125MG

#113125

#1-03035 GP 15 Stück



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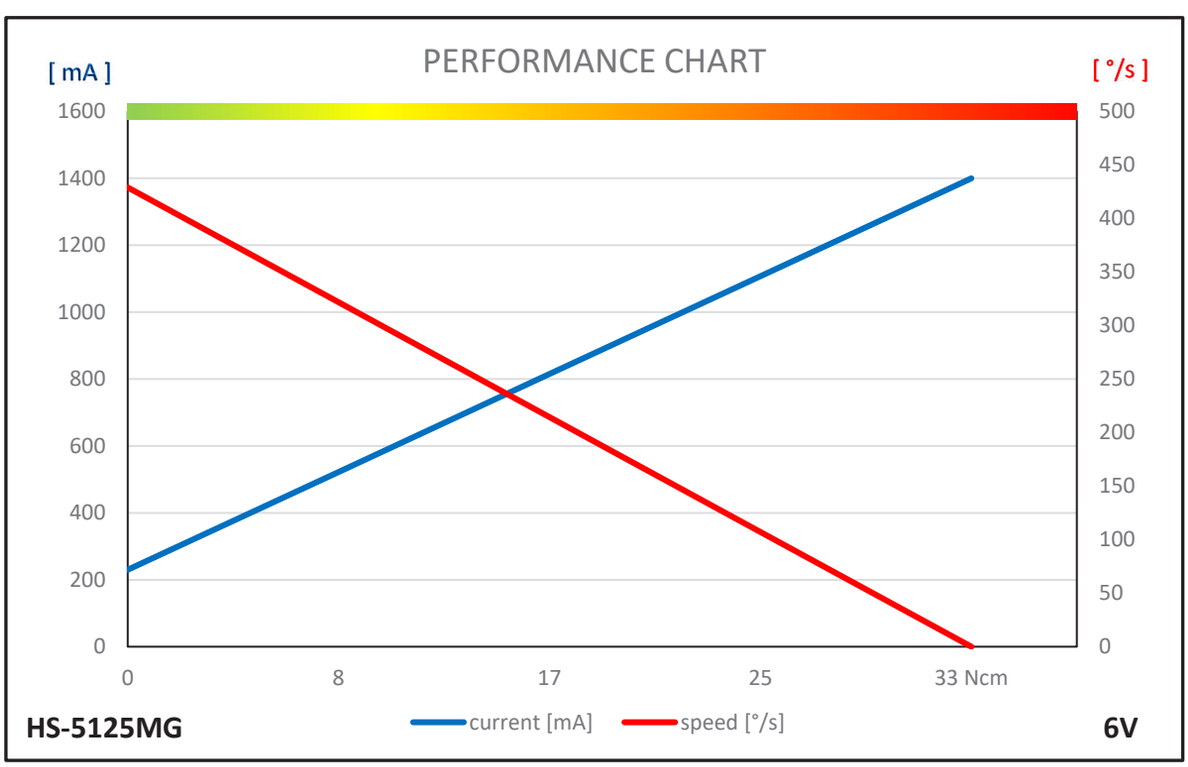
PERFORMANCE CHART



GENERAL SPECIFICATION

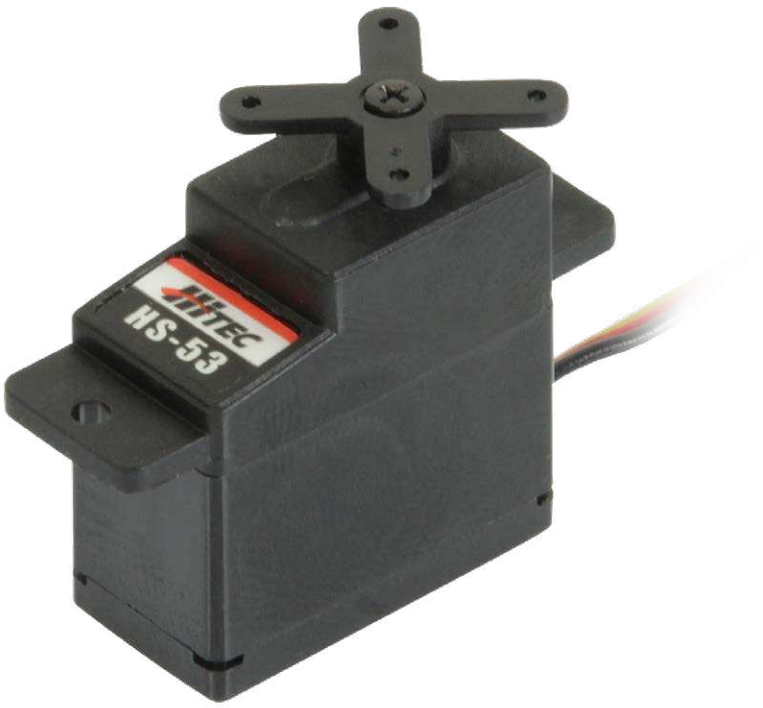
HS-5125MG		
Control System	PWM	
	Pulse Width 900µs|1500µs (Center)|2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Contact Analog Potentiometer	
Motor Type	Cored Metal Brush	
Amplifier / MCU	8bit programmable Digital	
Operating Voltage Range	3.5V ~ 8.4V	
Operating Voltage	At 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	-	

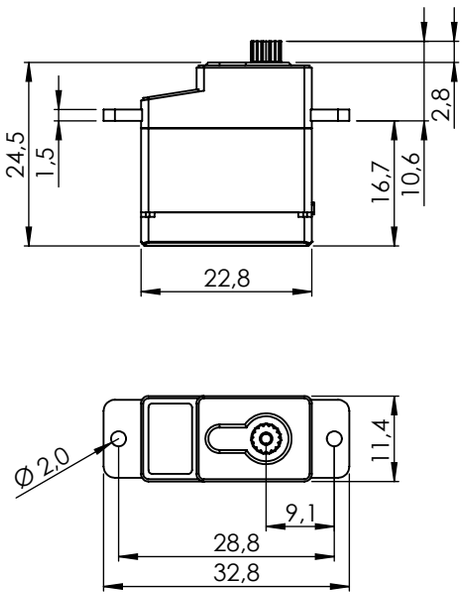
*of the servo only w/o horns and accessories

HS-53

#112053

#112054 GP 20 Stück





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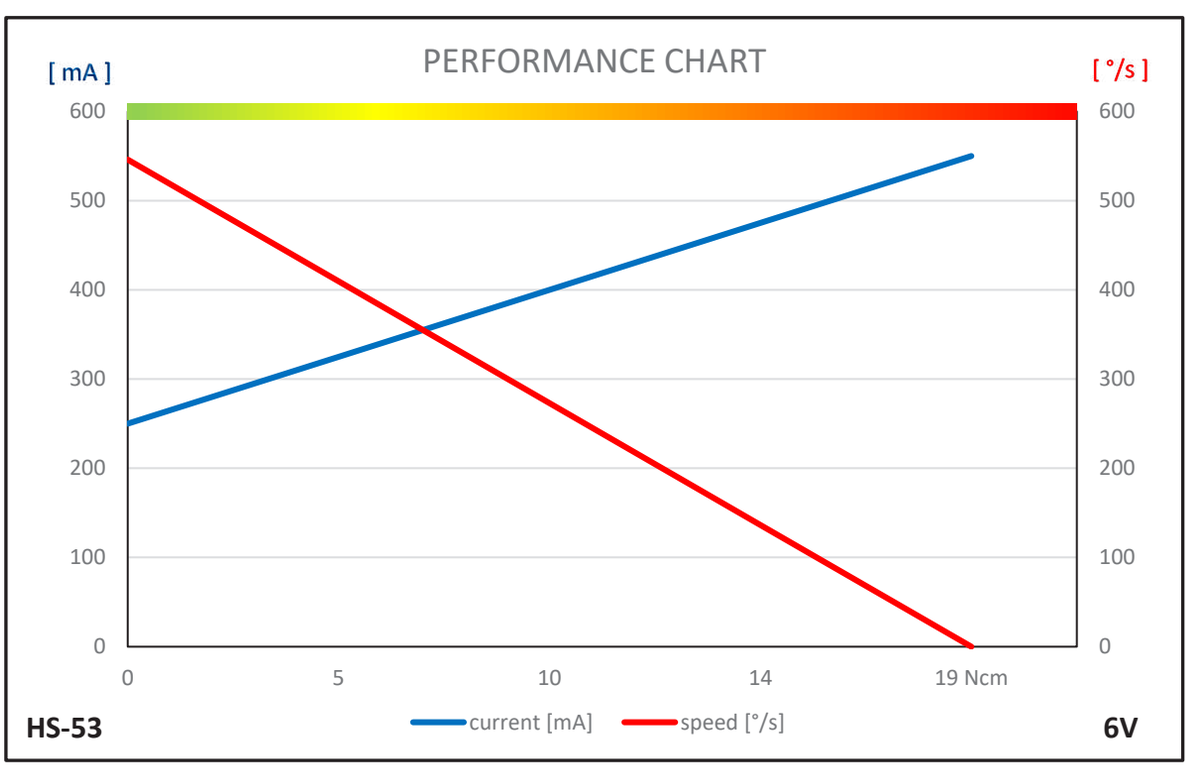
PERFORMANCE CHART



GENERAL SPECIFICATION

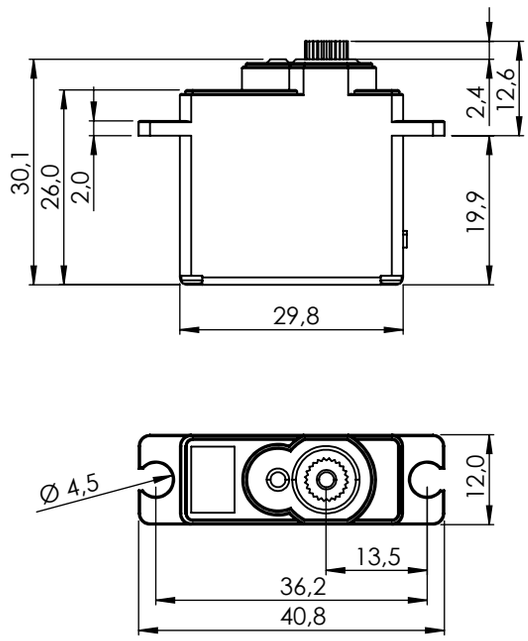
HS-53		
Control System	PWM	
	Pulse Width 900µs|1500µs (Center)|2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Direct Drive / 2 Slider	
Motor Type	Cored Metal Brush	
Amplifier / MCU	Analog	
Operating Voltage Range	4.8V ~ 6.0V	
Operating Voltage	At 4.8V	At 6.0V
Operating Speed 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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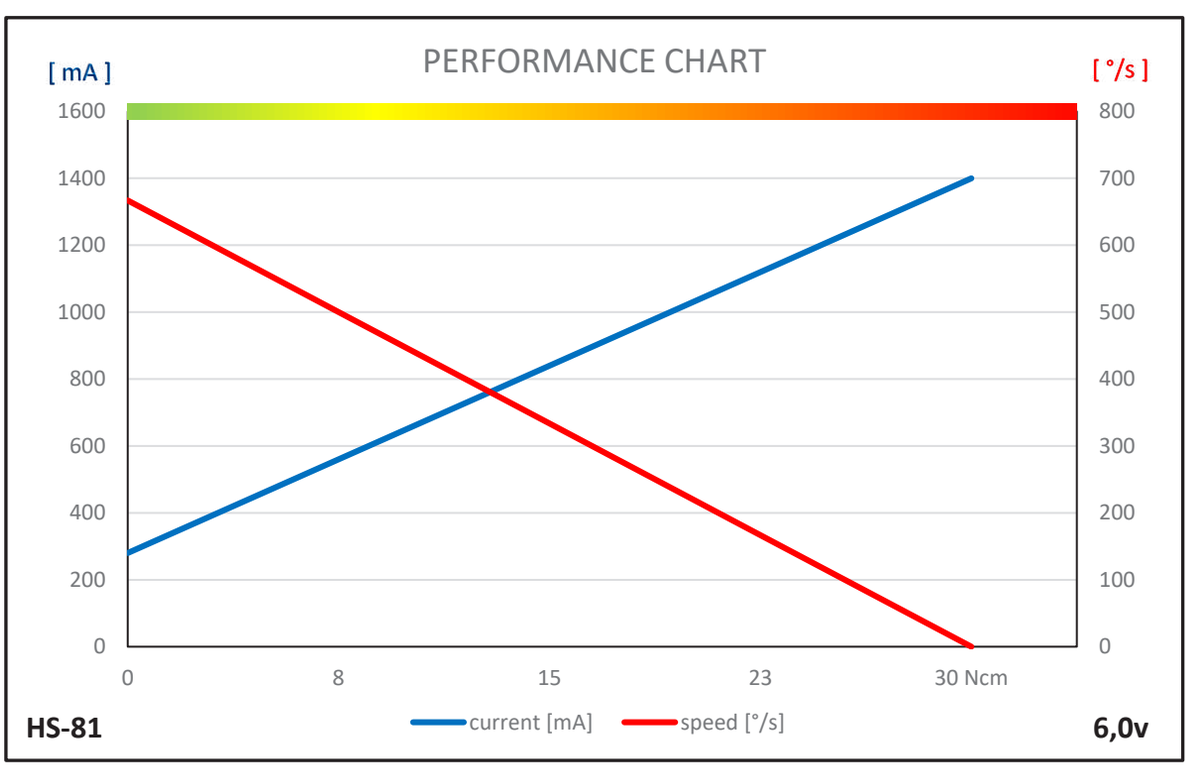
PERFORMANCE CHART



GENERAL SPECIFICATION

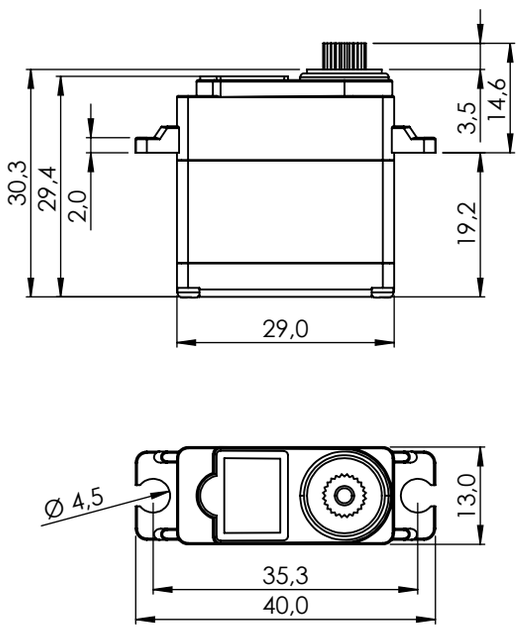
HS-81		
Control System	Pulse Width Modulation (PWM)	
	PWM Range '900µs I 1500µs I 2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Direct Drive	
Motor Type	Cored / 3 poles Ferrite Motor	
Amplifier / MCU	Analog	
Operating Voltage Range	4.8V ~ 6.0V	
Operating Voltage	At 4.8V	At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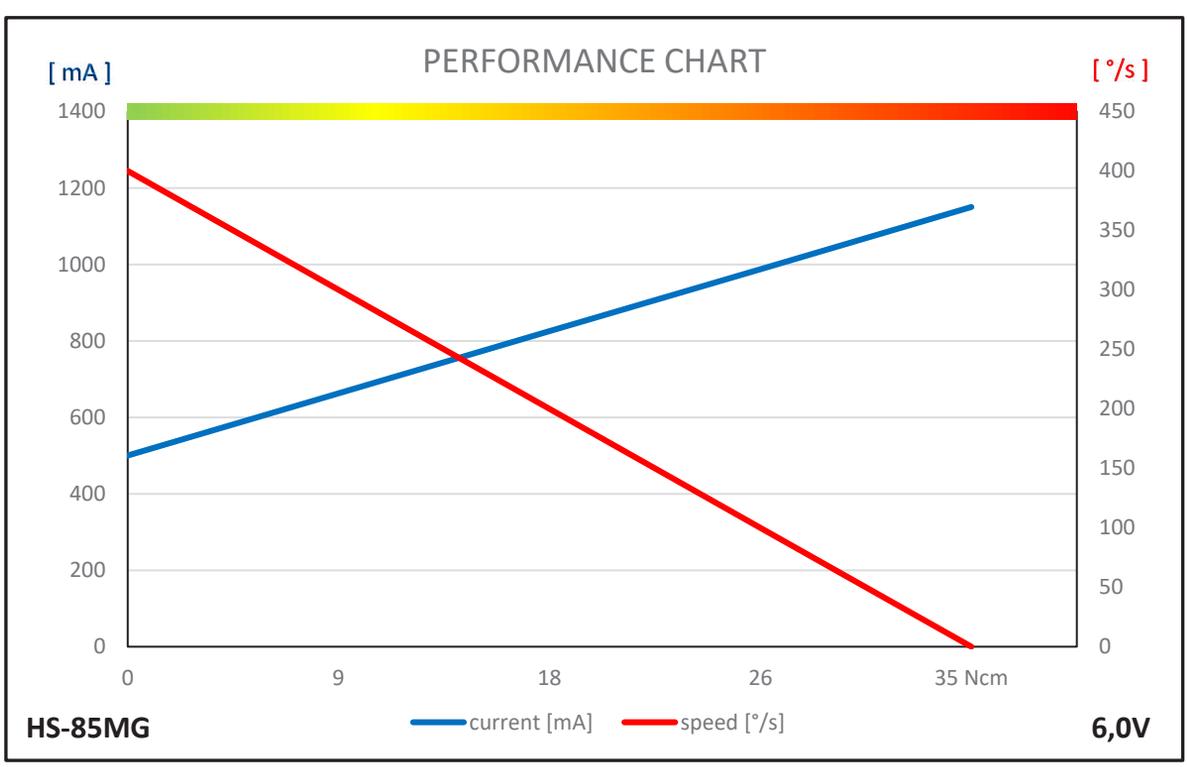
PERFORMANCE CHART



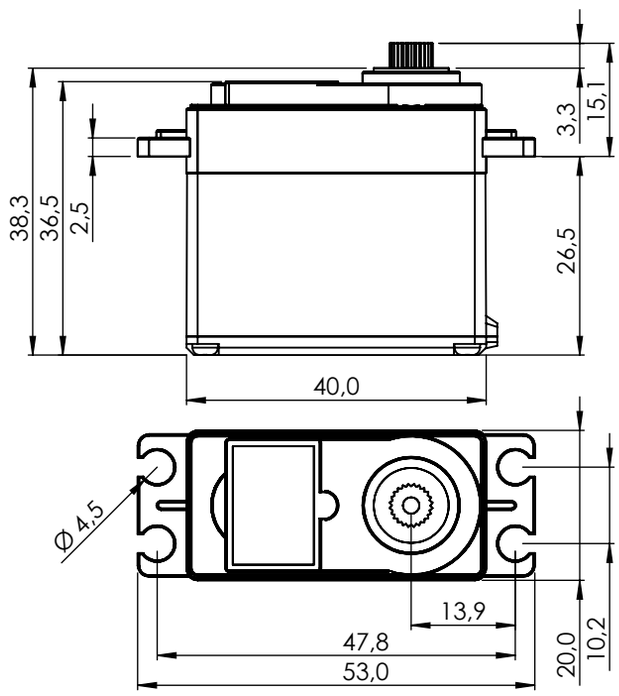
GENERAL SPECIFICATION

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



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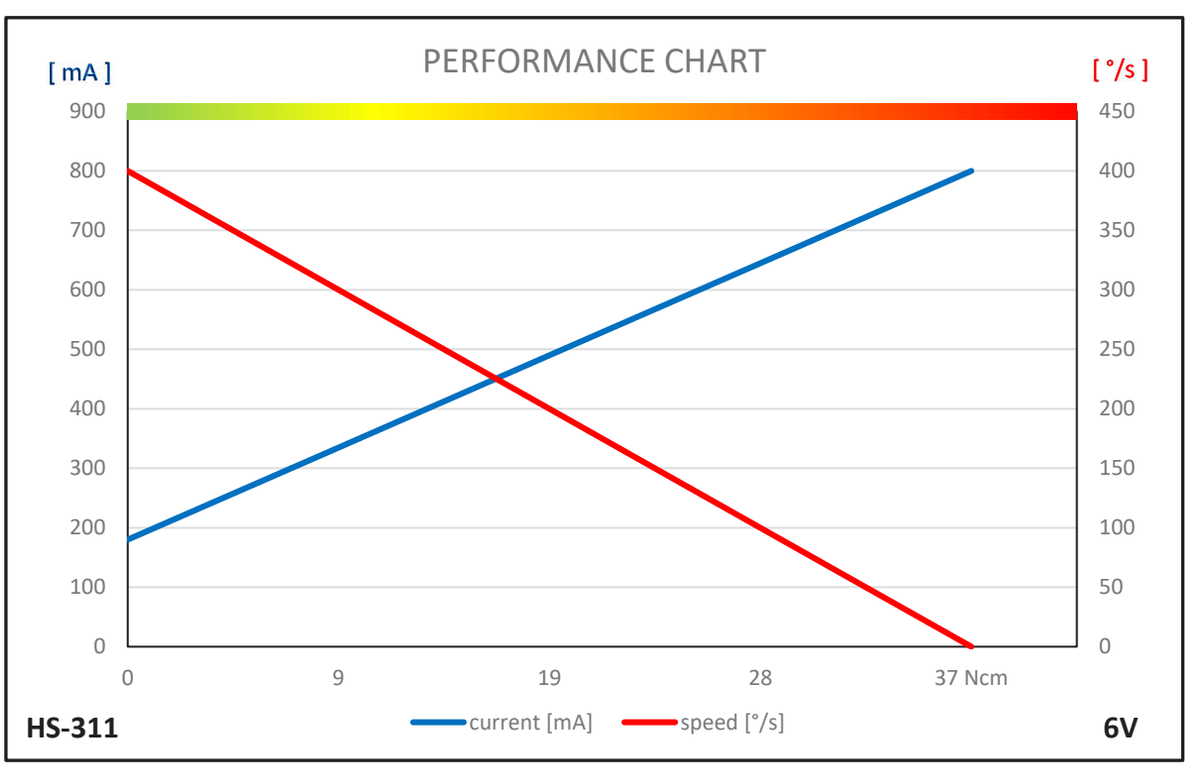
PERFORMANCE CHART



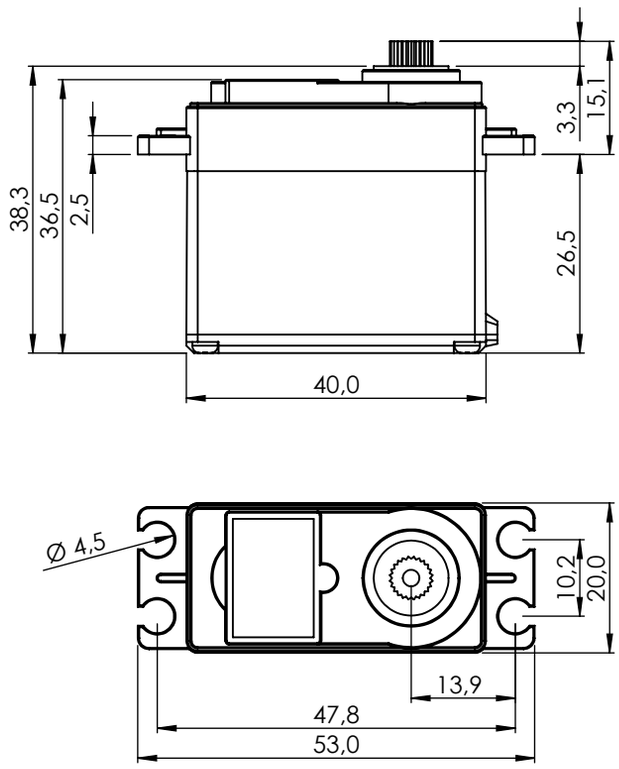
GENERAL SPECIFICATION

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

HS-322HD

#112322

#112326 GP 30 Stück



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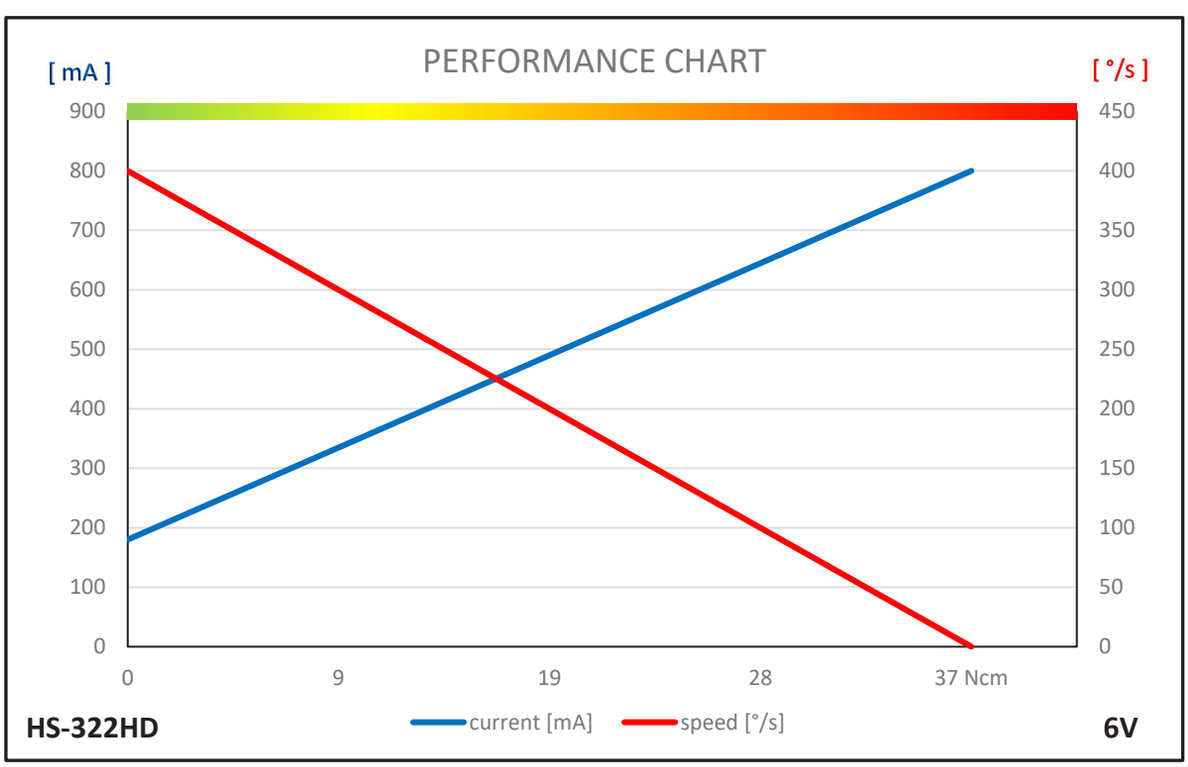
PERFORMANCE CHART



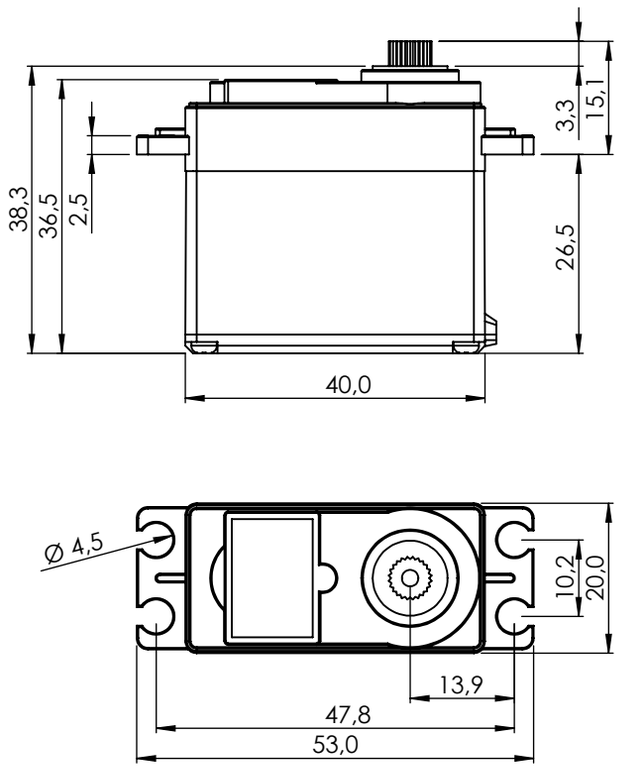
GENERAL SPECIFICATION

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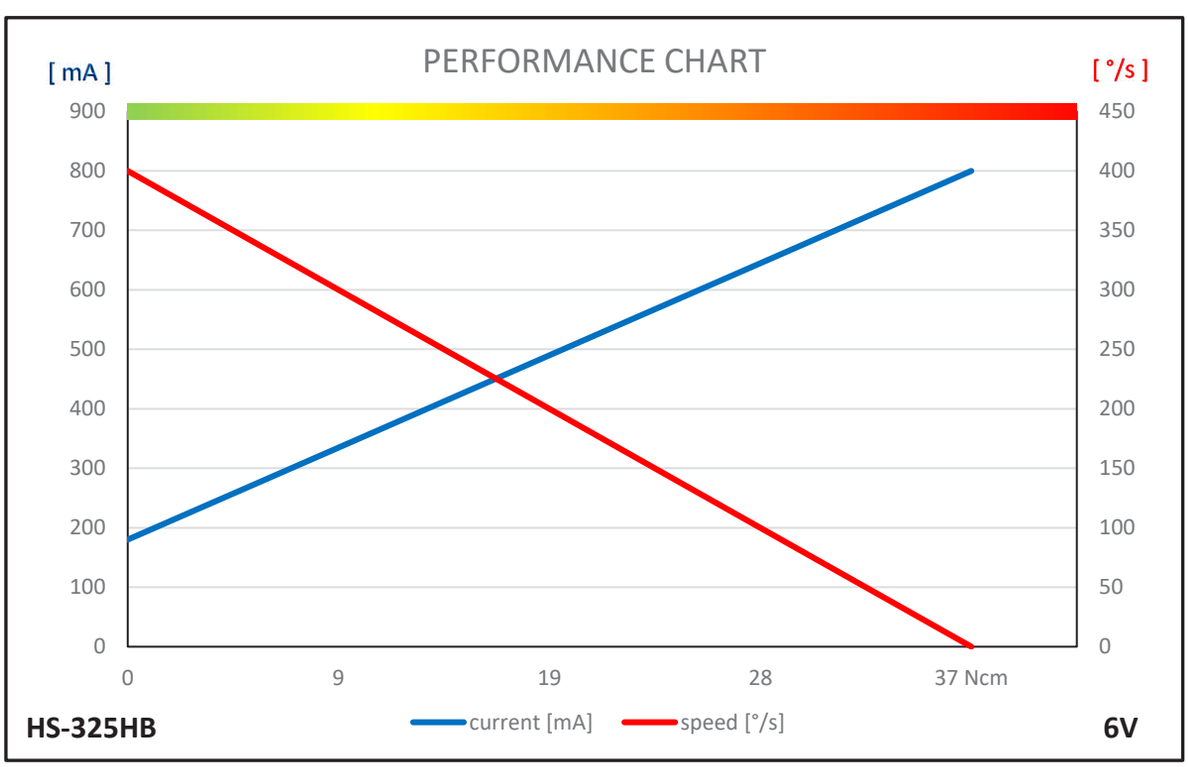
PERFORMANCE CHART



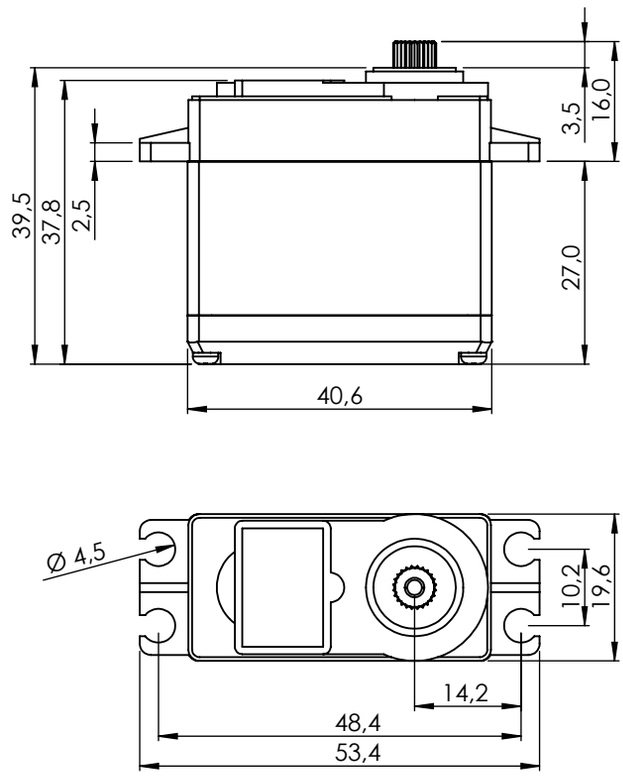
GENERAL SPECIFICATION

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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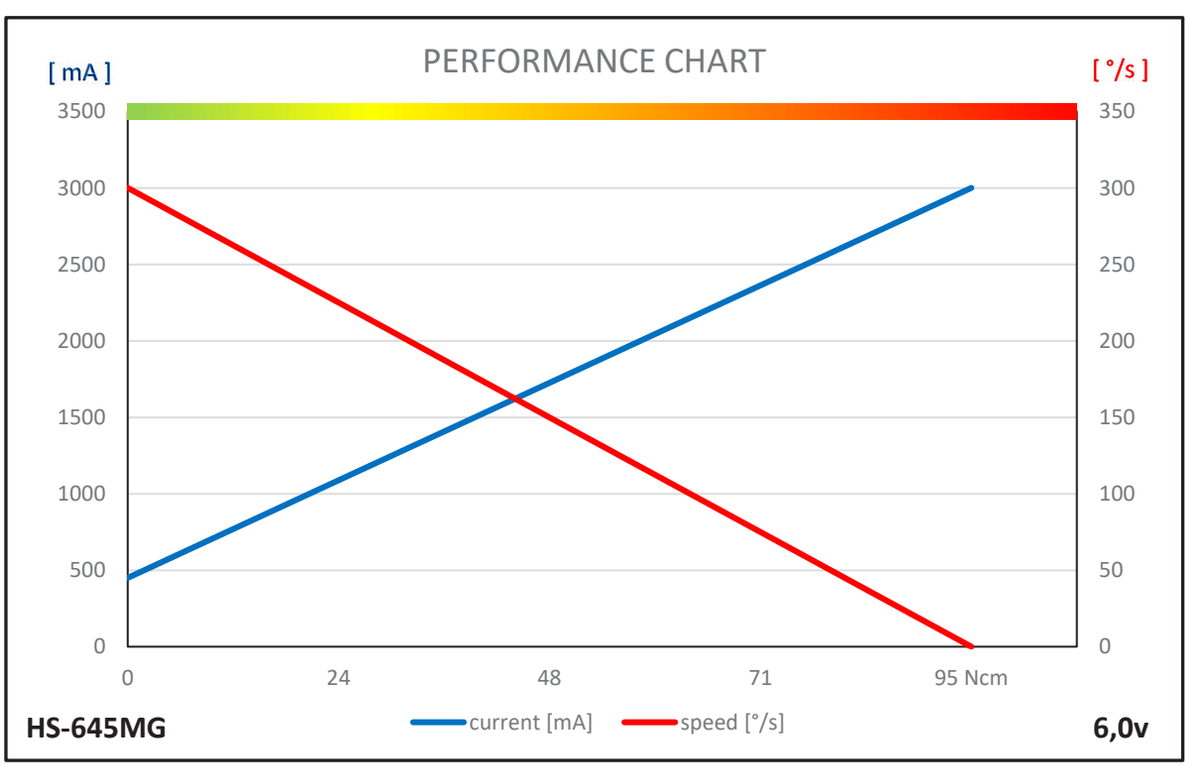
PERFORMANCE CHART



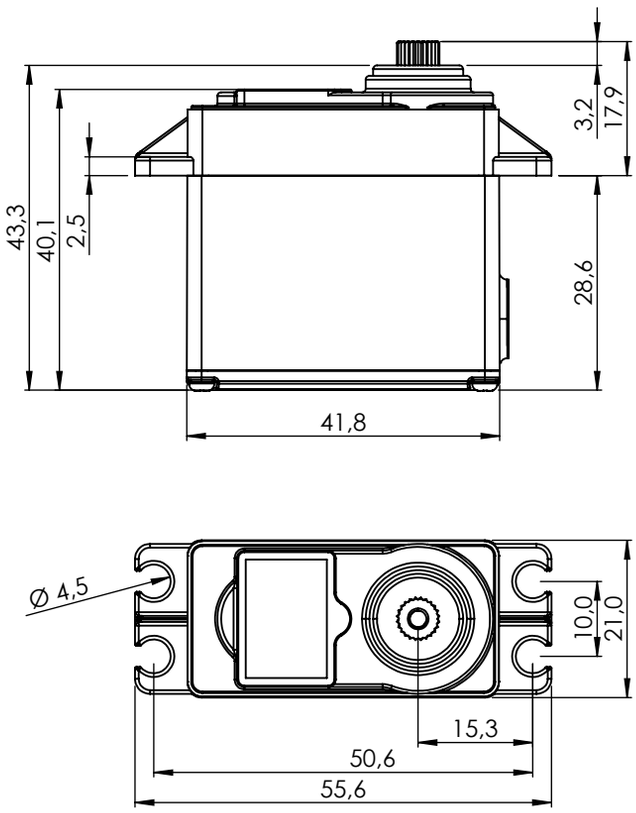
GENERAL SPECIFICATION

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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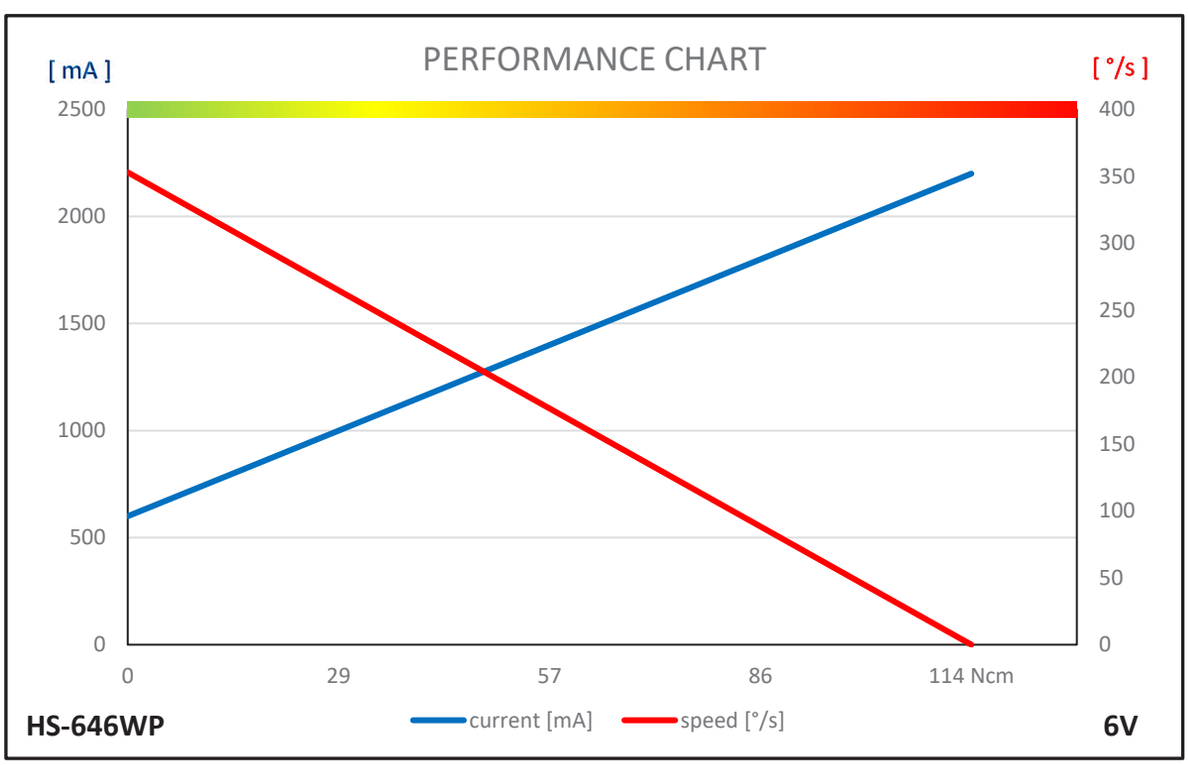
PERFORMANCE CHART



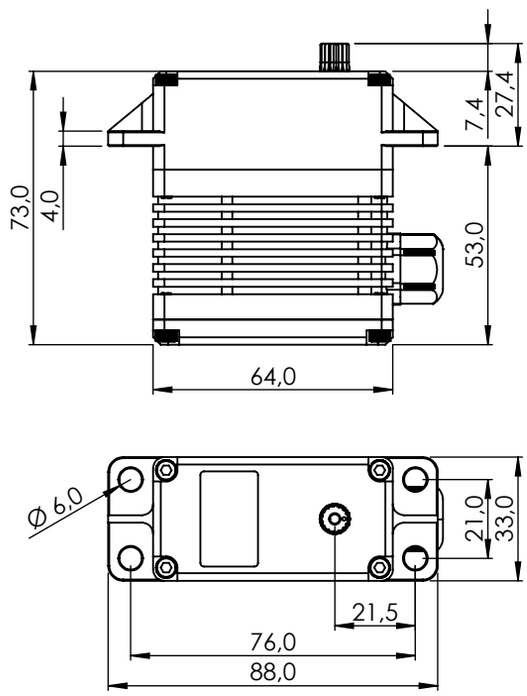
GENERAL SPECIFICATION

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

HS-1005SGT

#138105



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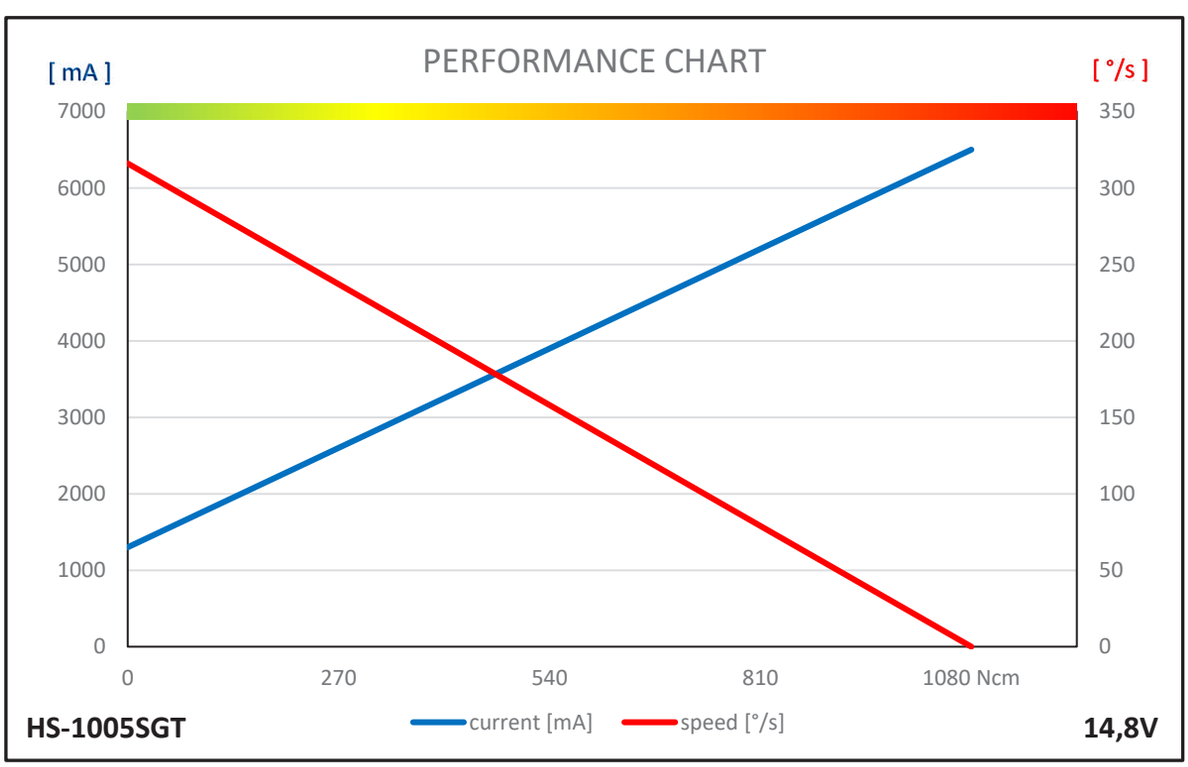
PERFORMANCE CHART



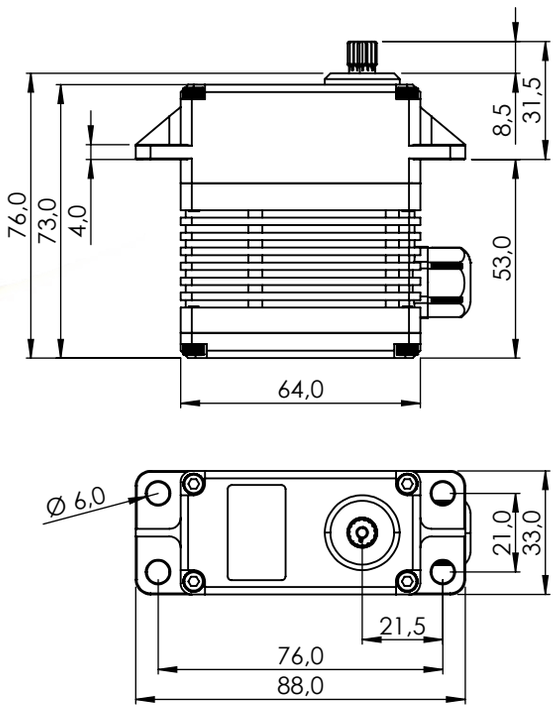
GENERAL SPECIFICATION

HS-1005SGT		
Control System	PWM	
	Pulse Width 900µs|1500µs (Center)|2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Indirect Drive / 1M Cycle Long Life	
Motor Type	Cored Carbon Brush	
Amplifier / MCU	Digital with Mosfet Drive	
Operating Voltage Range	9.0V ~ 16.8V (Signal: 3.5V ~ 8.4V)	
Operating Voltage	At 11.1V	At 14.8V
Operating Speed at no Load	231°/s (38RPM)	316°/s (53RPM)
Stall Torque	84.0kgcm (824.0Ncm)	110.0kgcm (1079.1Ncm)
Peak 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

HS-1100WP

#138100



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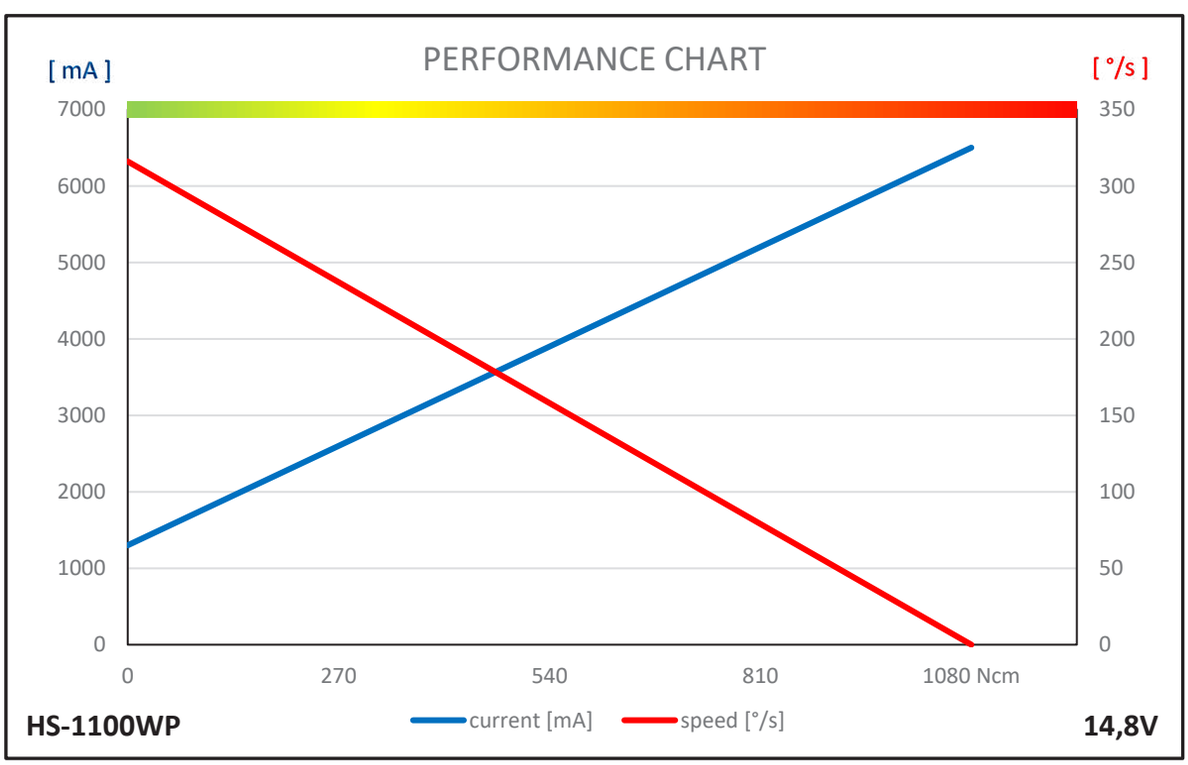
PERFORMANCE CHART



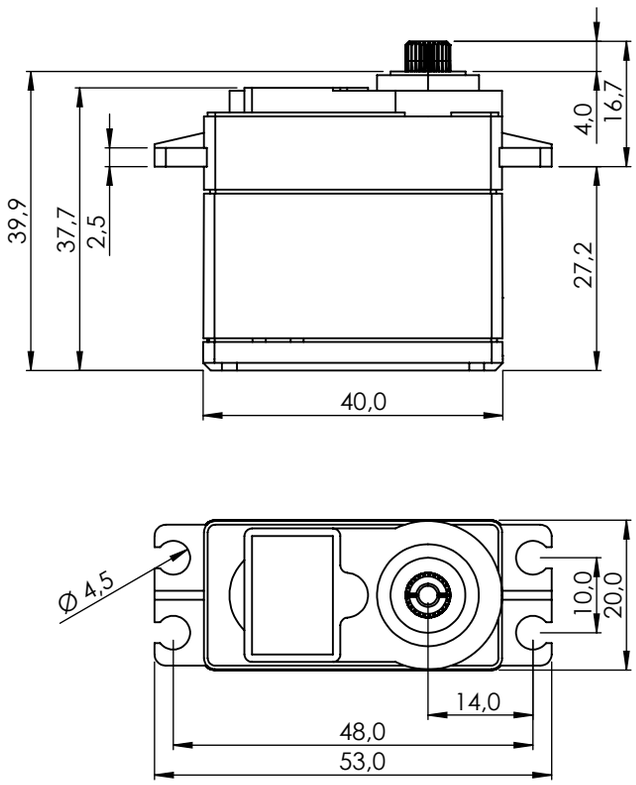
GENERAL SPECIFICATION

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

HSB-9485SH-270°

#1-00409



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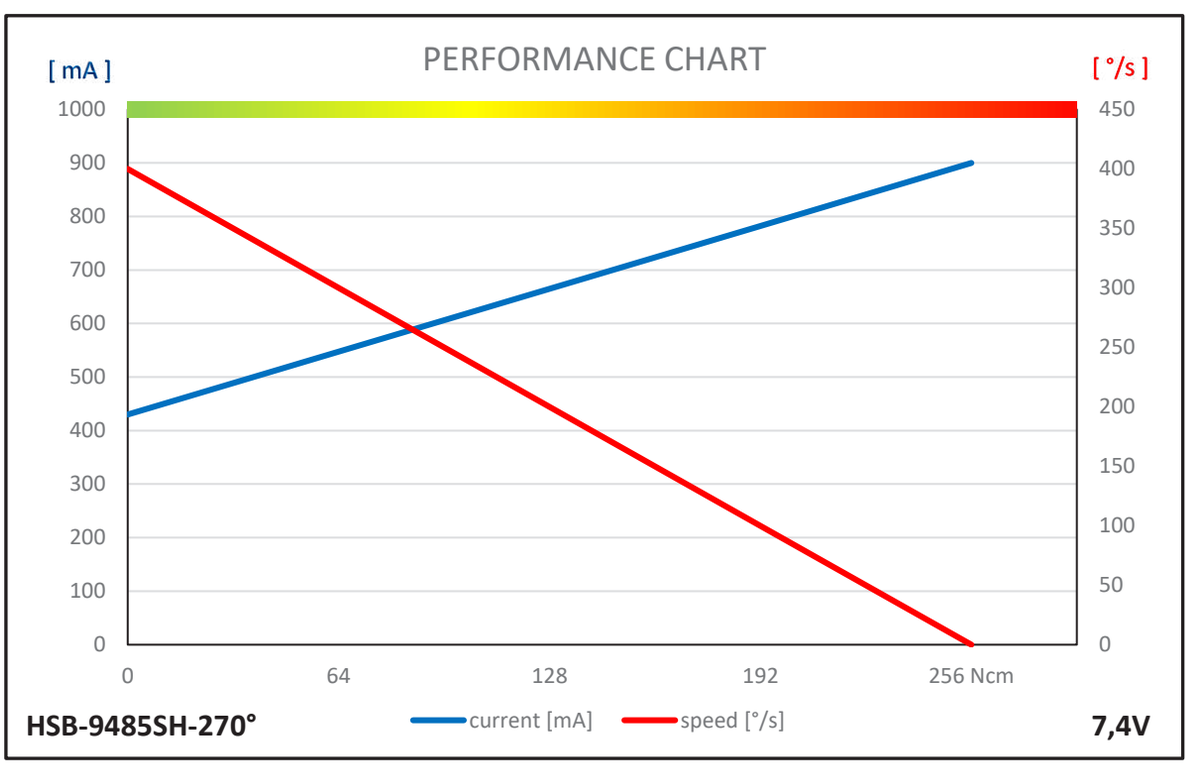
PERFORMANCE CHART



GENERAL SPECIFICATION

HSB-9485SH-270°		
Control System	PWM	
	Pulse Width 900µs|1500µs (Center)|2100µs	
Connector Type	Hitec 3P (JR 3P compatible)	
Position Sensor Type	Indirect Drive / 4 Slider / 1M 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		

Typical application for HiTEC servos –

here in a robot arm

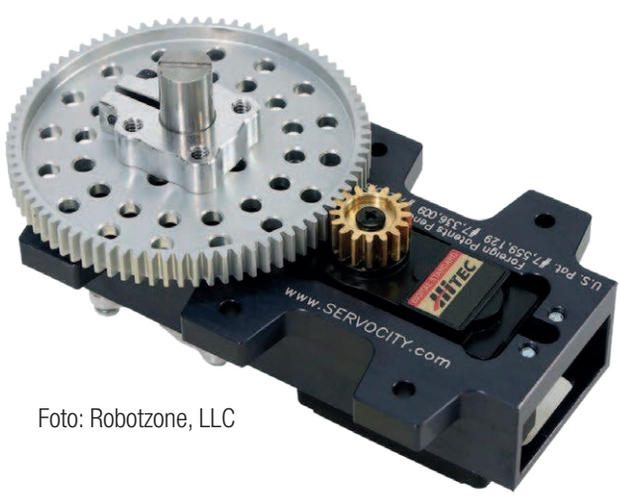


Foto: Robotzone, LLC

Typical application for HiTEC servos –

In this case in a robot gearbox

INDIVIDUAL ADAPTATION TO MEET CLIENTS' REQUIREMENTS

As an affiliate company to Hitec RCD Korea Inc. we are able to fulfil requirements specific to particular clients. The following adaptations / modifications are possible:

- Changes to cable type and cable length
- Change to different connector
- Different selection of accessories
- Adaptation to packaging (external packaging, container size)
- Programming service
- Installation service
- Expanded goods output testing (test stand, logging)
- Changes to printed legends (nameplate, serial No., etc.)
- Product adaptation (e.g. gearbox reduction ratio)
- Fulfilment of particular certification requirements
- Component tracing
- Special delivery agreements (order framework, guaranteed delivery capacity)

PROGRAMMING DEVICES

Hitec digital actuators include the facility to adjust various settings, and / or to activate safety features. Changes to these parameters can be made using various programming devices.

HFP-30

The Hitec HFP-30 offers comprehensive adjustment facilities and test functions. The compact dimensions of the HFP-30 make it ideal for mobile use, as no computer is required. All Hitec digital PWM actuators can be programmed using the HFP-30.

DPC-11

The Hitec DPC-11 is a reasonably priced programming interface which is used in conjunction with a computer running the Windows operating system. All settings can be modified conveniently in this way, with the option of saving the settings. For example, the selected settings can easily be archived, or transferred to further servos. The connection is via USB.

DPC-CAN

The Hitec DPC-CAN interface can be used to configure, update and test Hitec CAN and UAVCAN servos. Various software applications are available for this purpose. A computer running the Windows operating system is required for this. The connection is via USB.

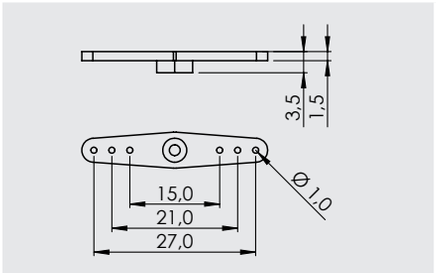
SERVO OUTPUT ARMS

A wide range of output arms is available for the entire Hitec servo portfolio. Most servos are supplied complete with a selection of suitable output devices.

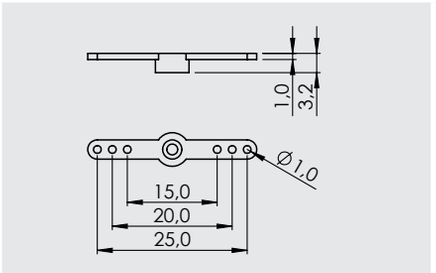
If you have particular requirements, it is possible to select items from our wide range. Please contact us for details.

15T (Ø4,0)

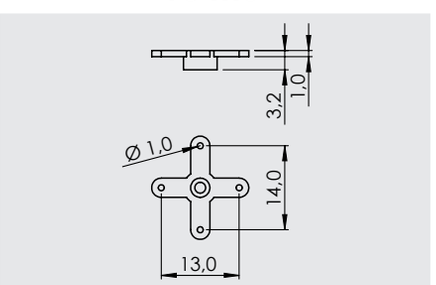
FS-IL15



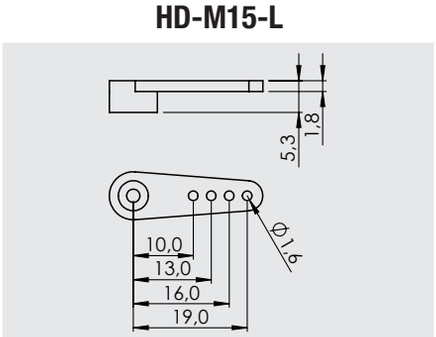
FS-IS15



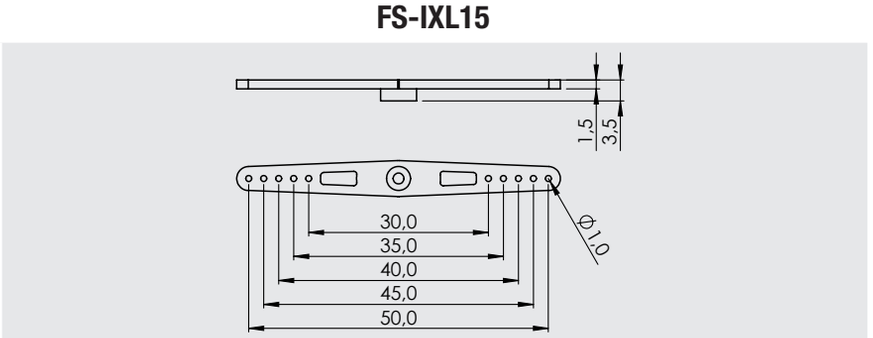
FS-X15



HD-M15-L

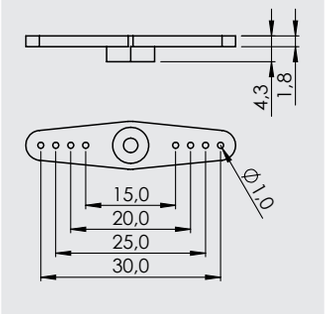


FS-IXL15

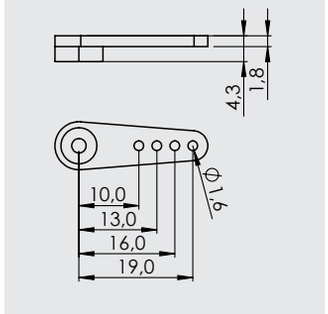


25T (Ø5,0)

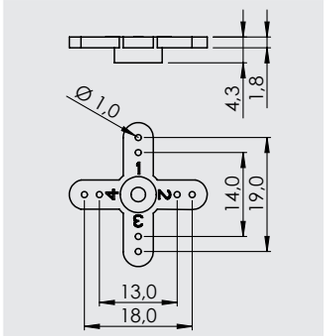
MS-I25



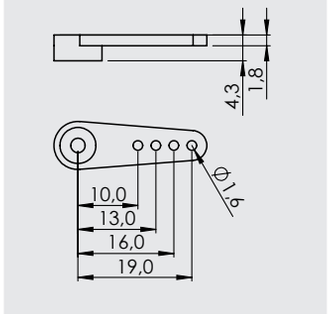
MS-L25



MS-X25

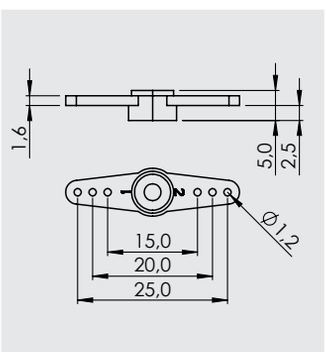


MS-ML25

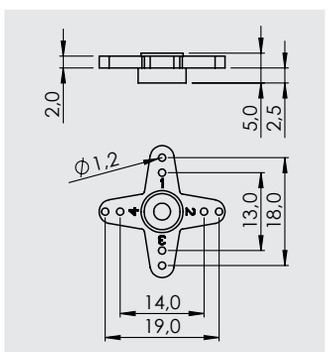


24T (Ø6,0)

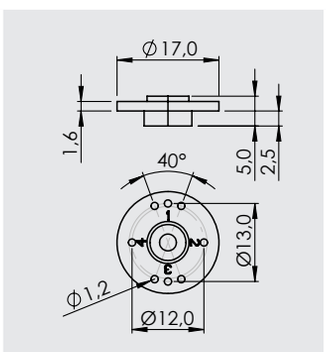
M-I24



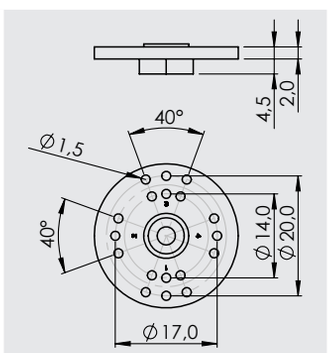
M-X24



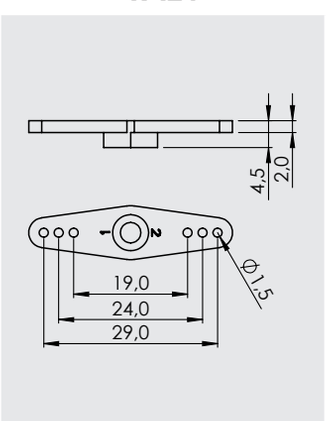
M-O24



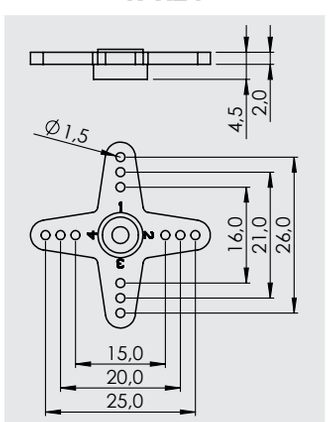
R-O24



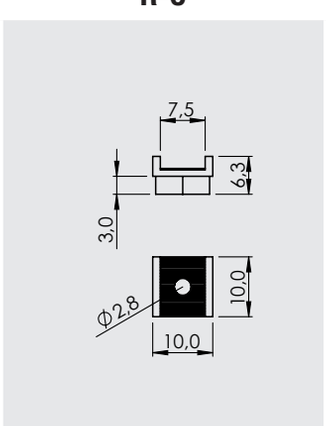
R-I24



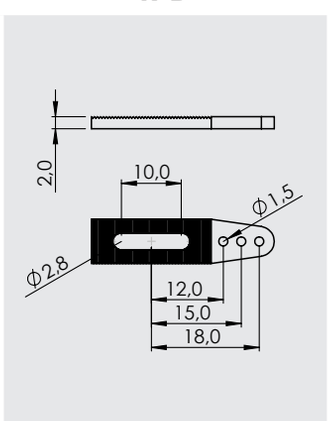
R-X24



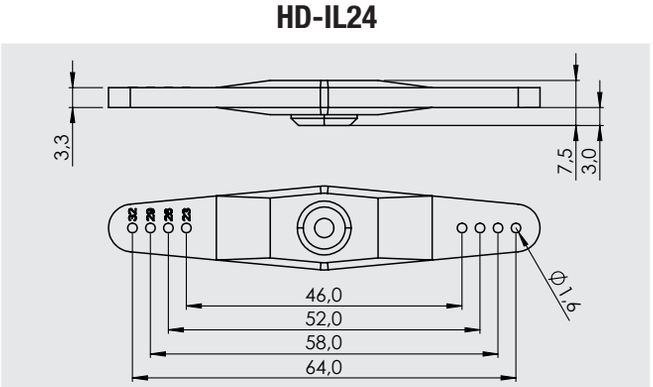
R-C



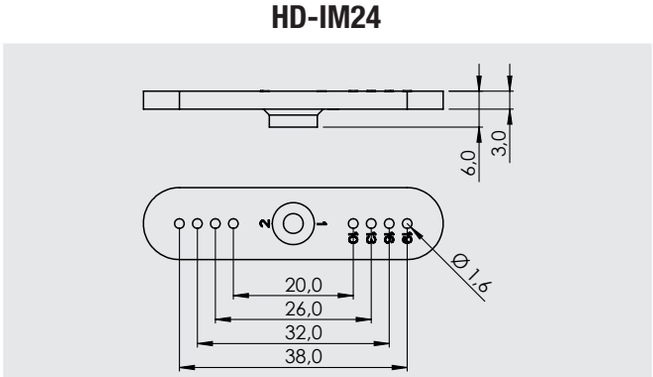
R-D



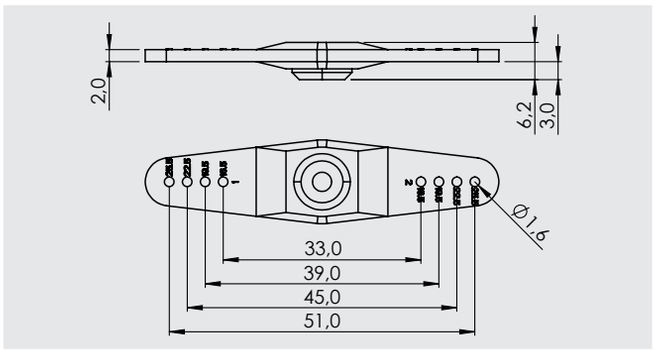
HD-IL24



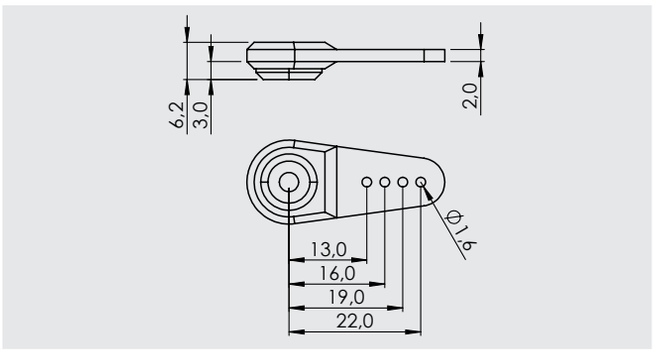
HD-IM24



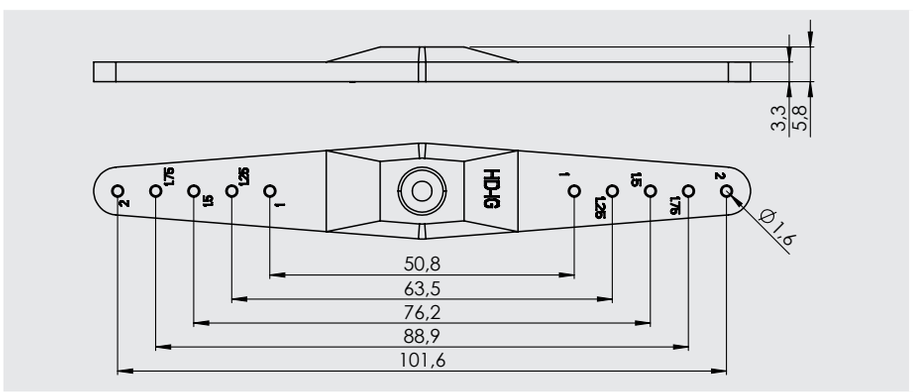
HD-IS24



HD-LS24



HD-IG24



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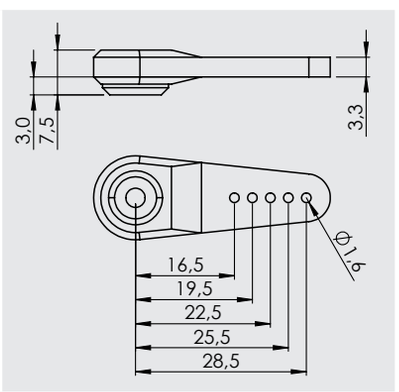

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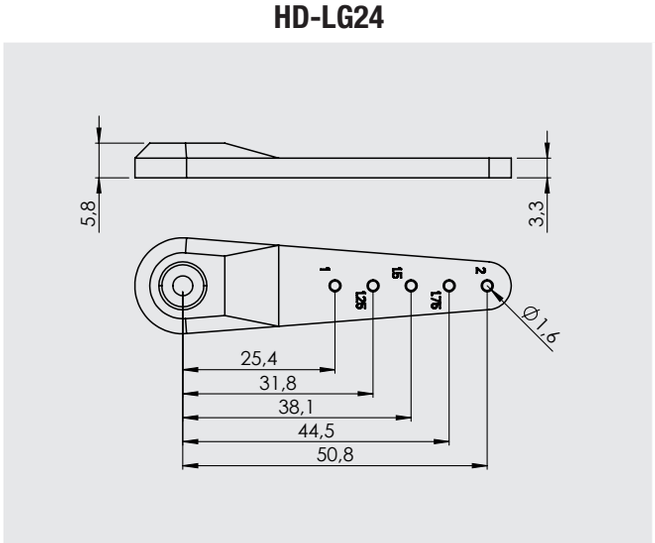

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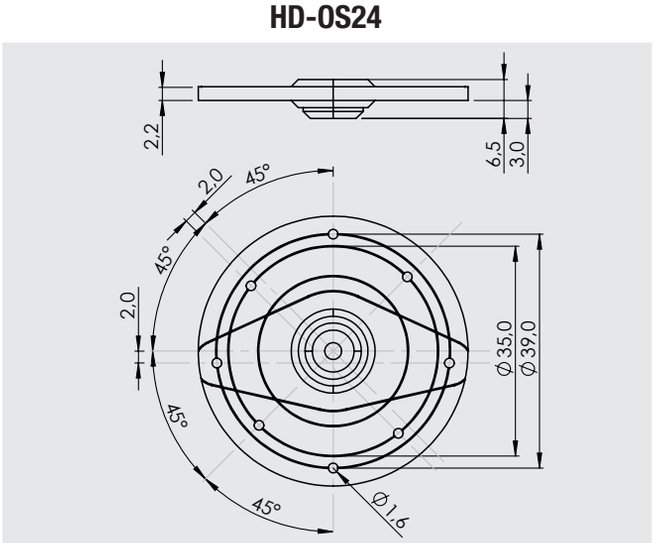

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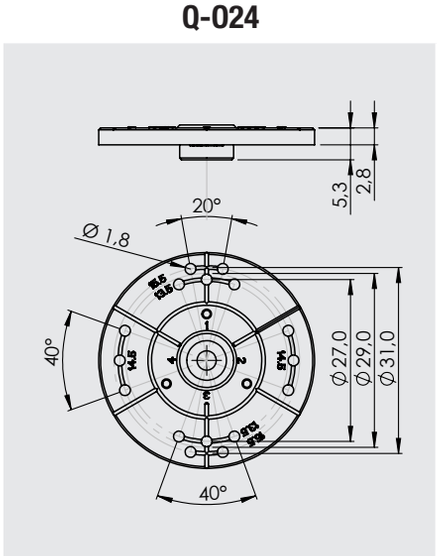

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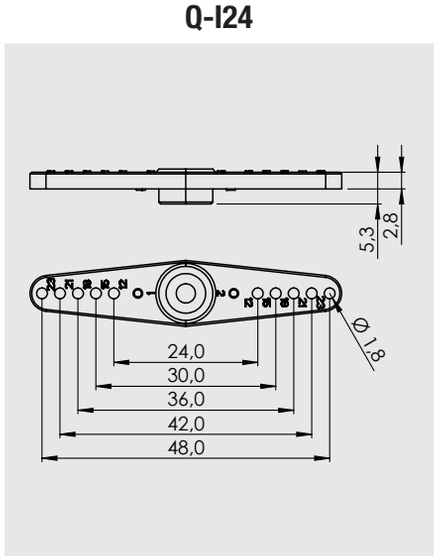

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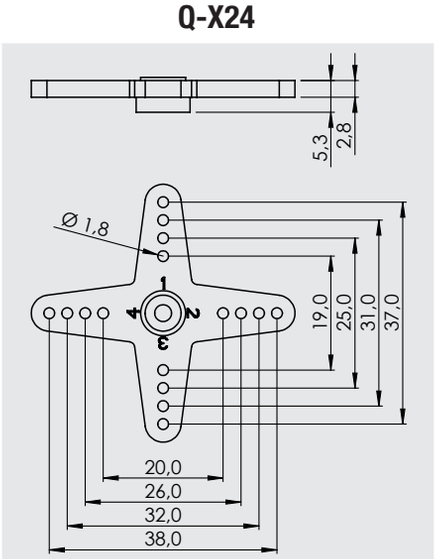

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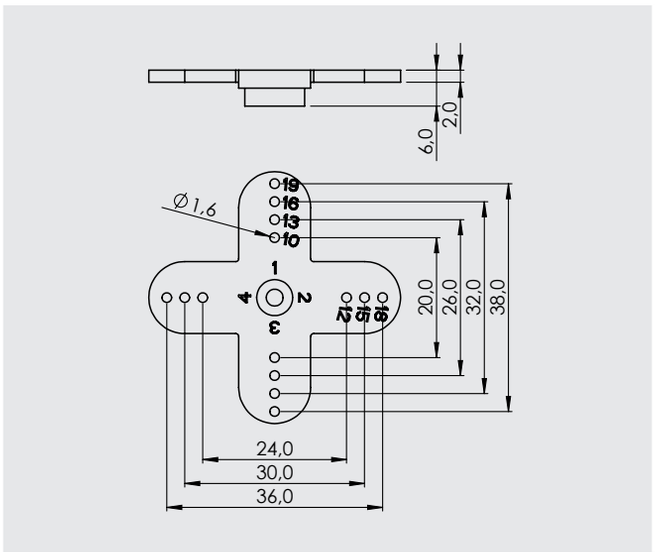

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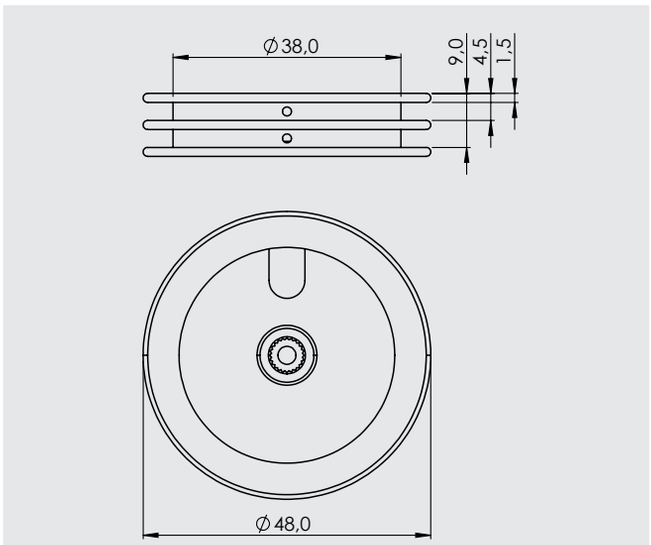

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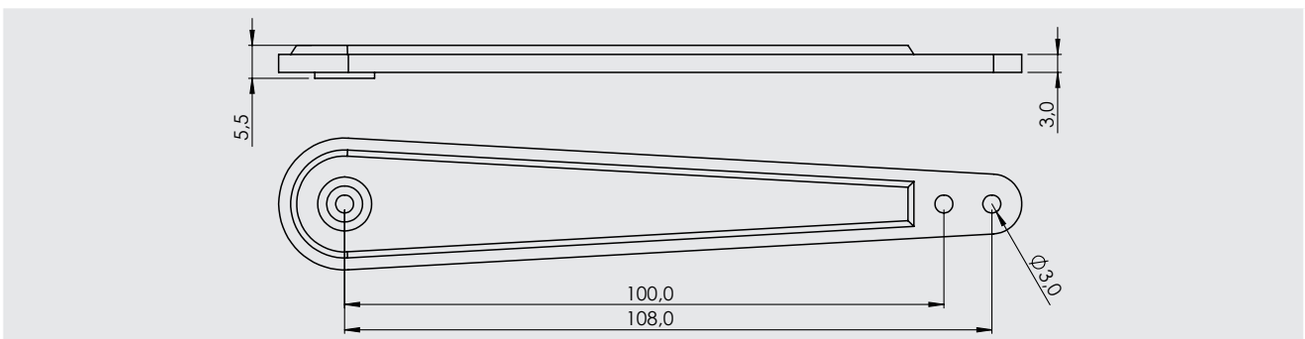

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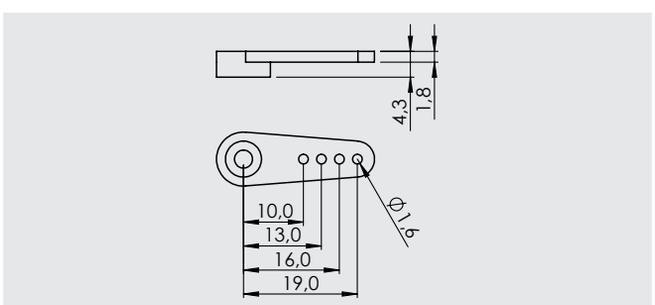

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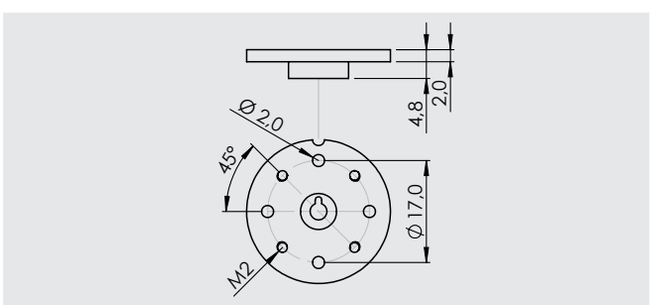

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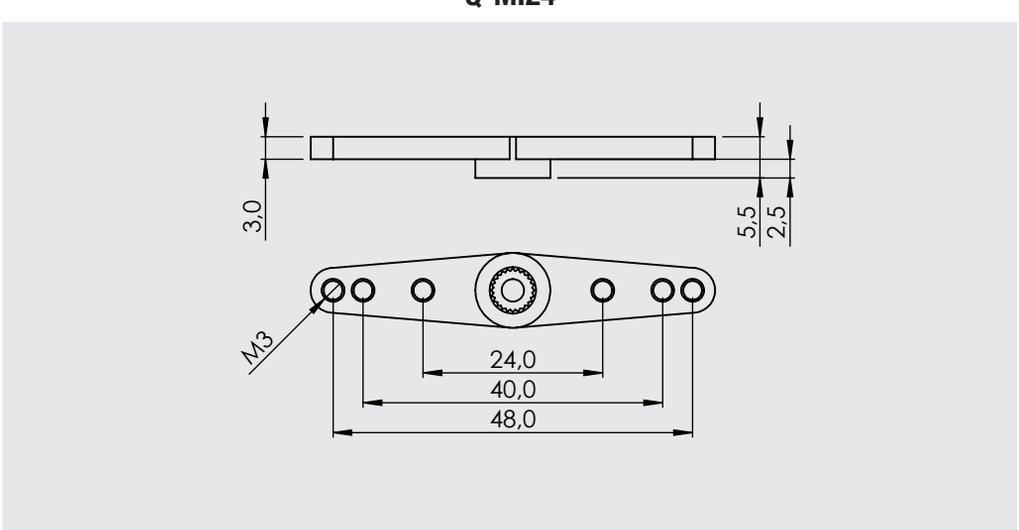

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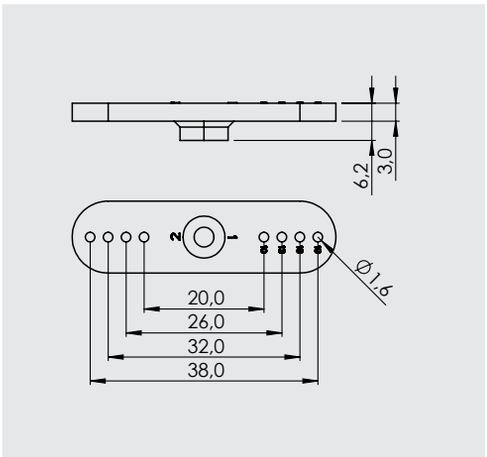

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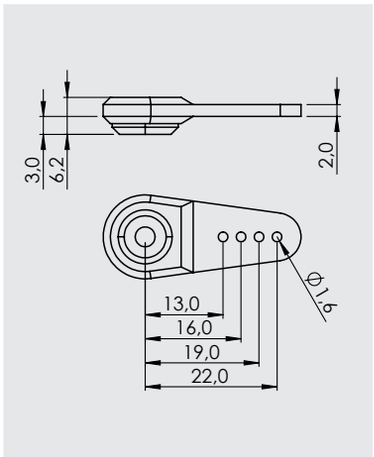

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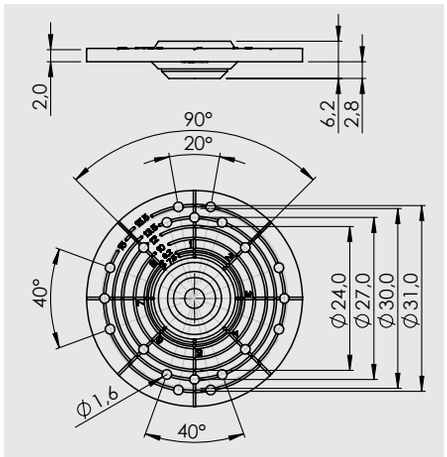

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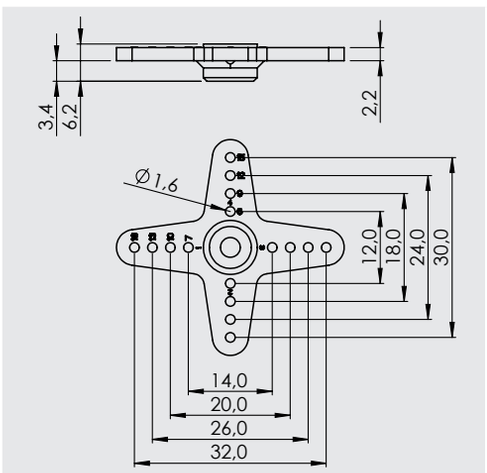

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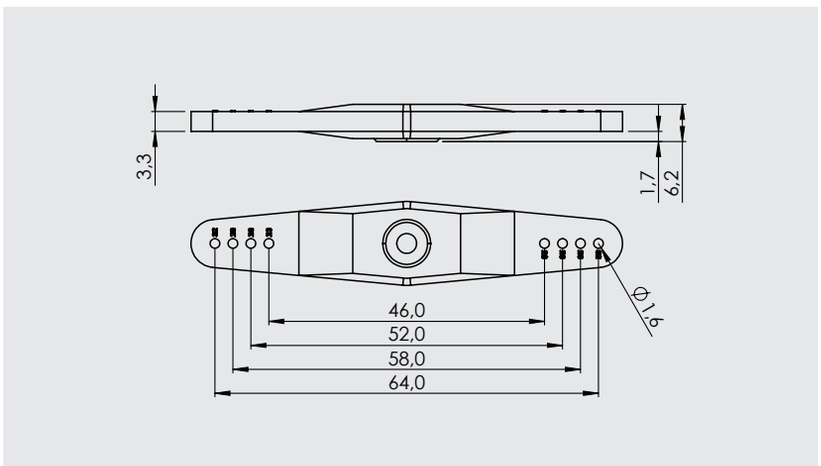

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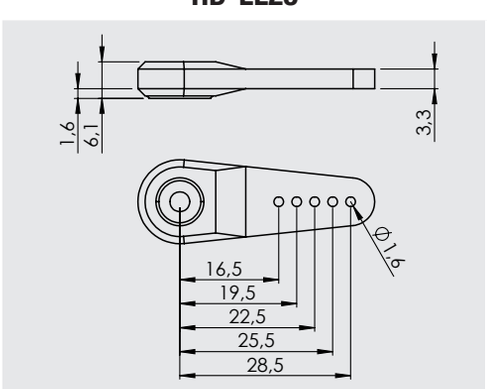

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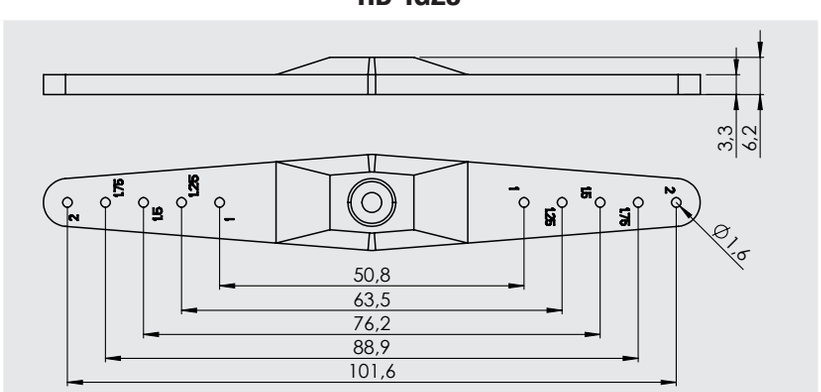

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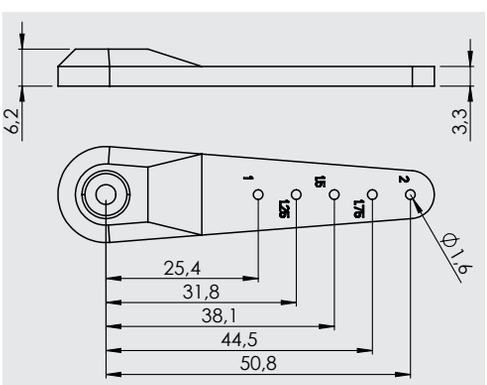

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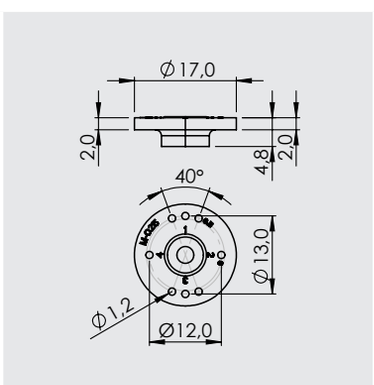

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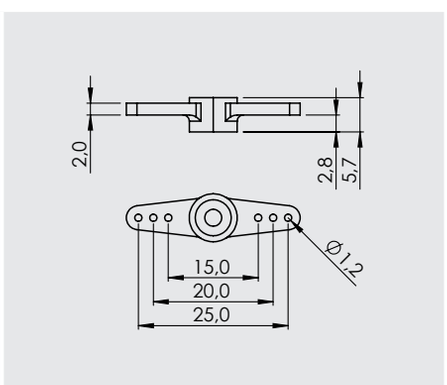

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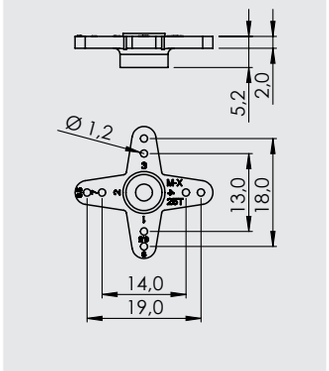

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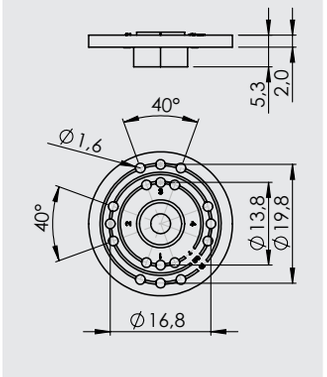

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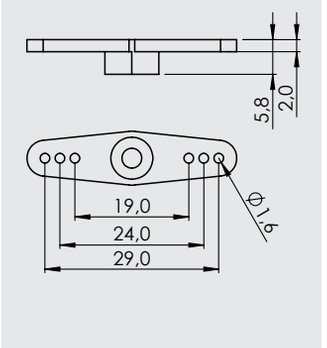

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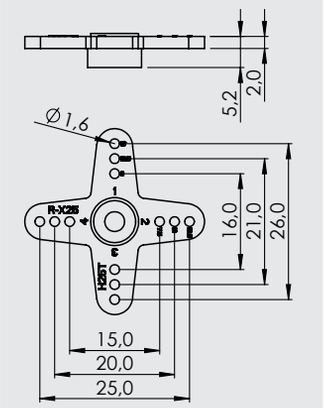

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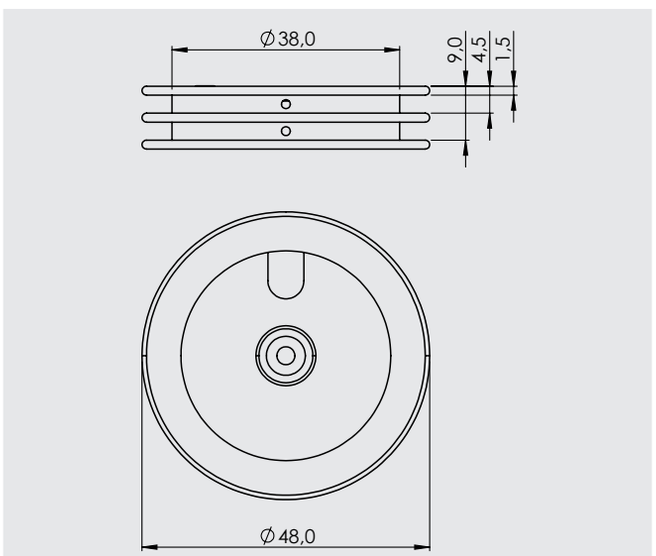

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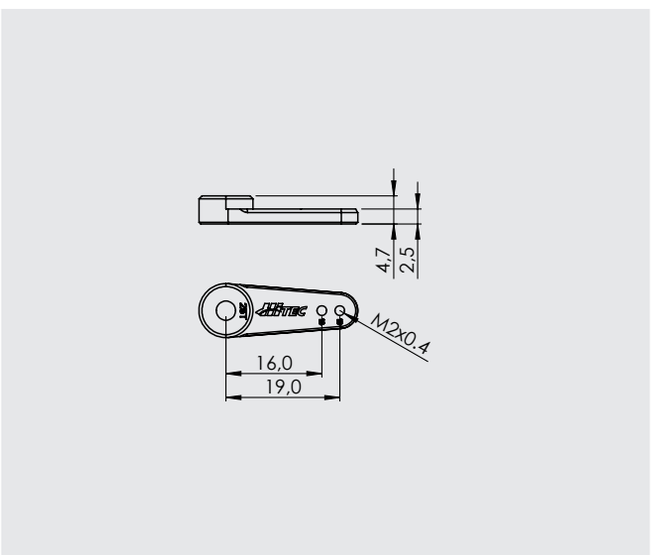

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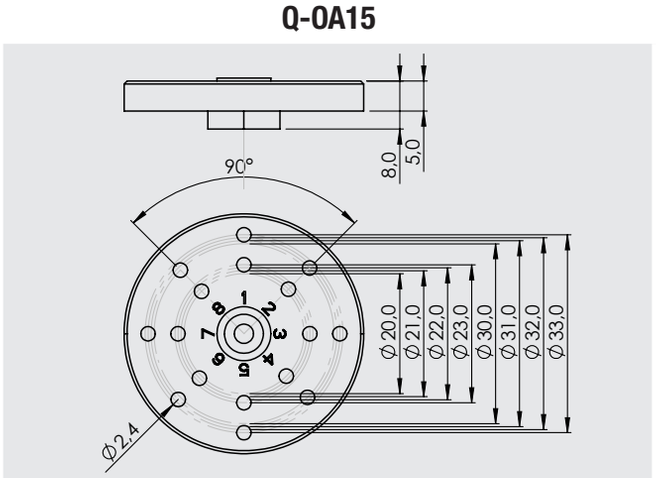

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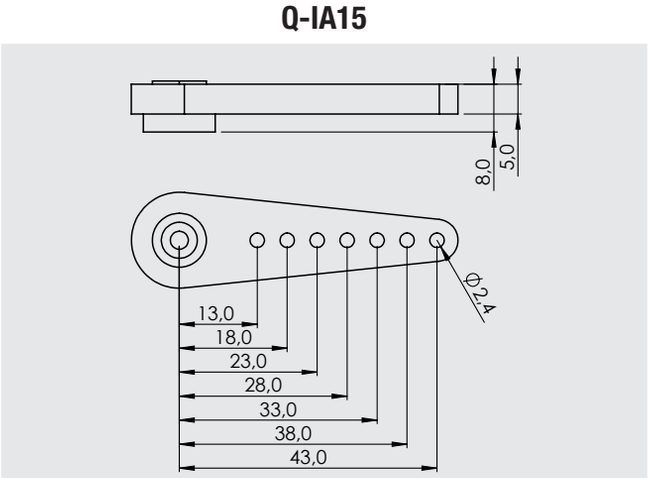

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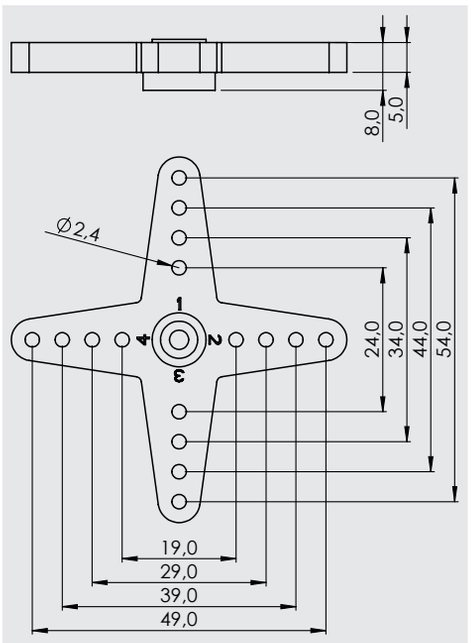

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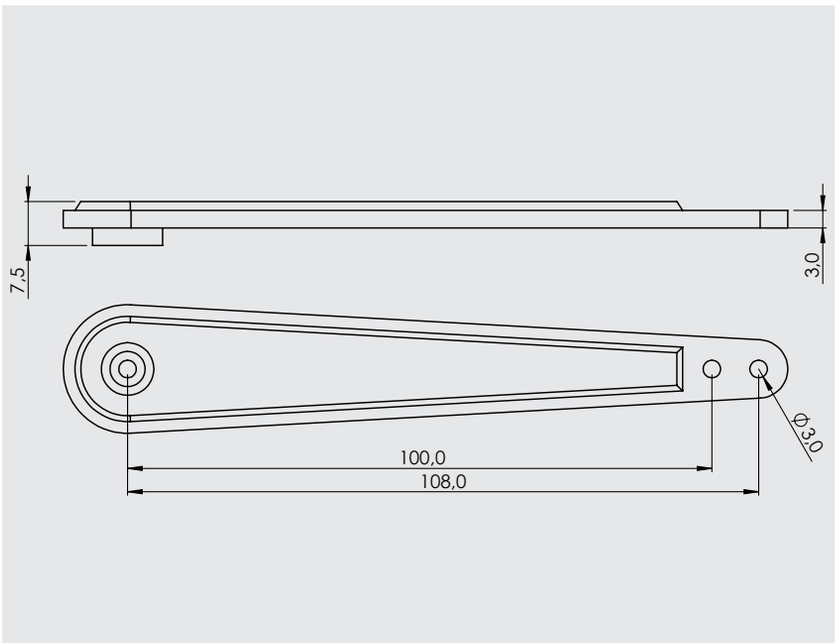

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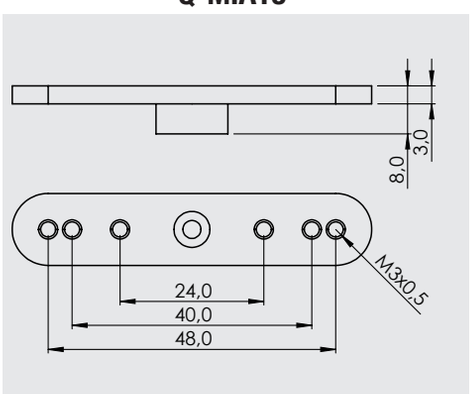

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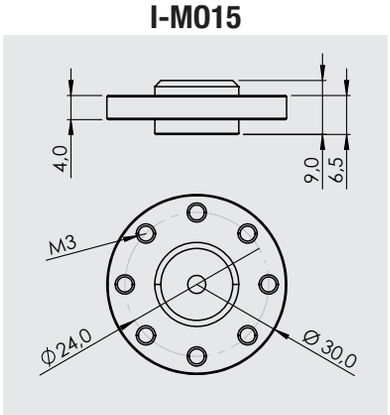
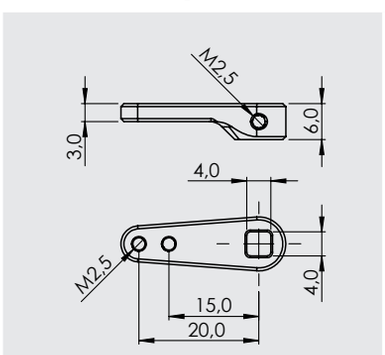
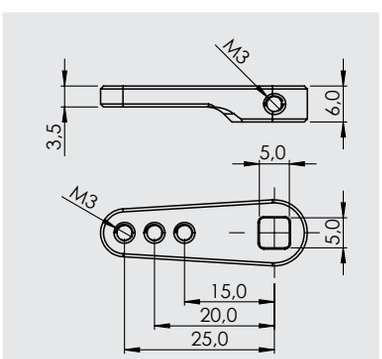


SQUARE 4 / SQUARE 5

MIS4-A

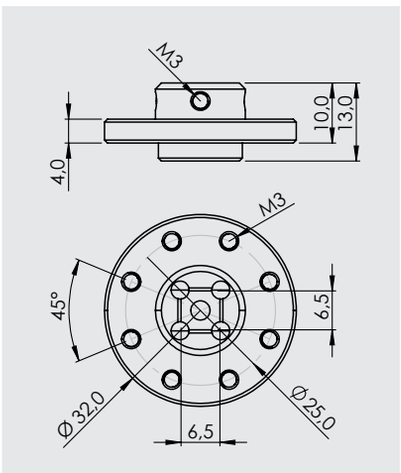


MIS5-A



SQUARE 6.5

MOS6.5-S



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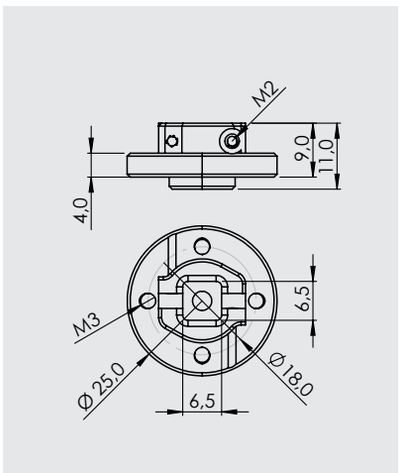

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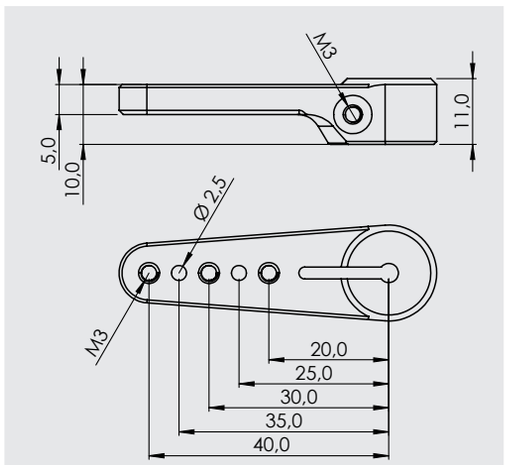

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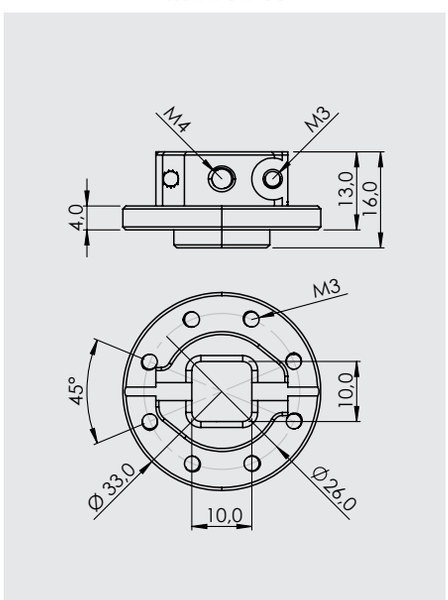

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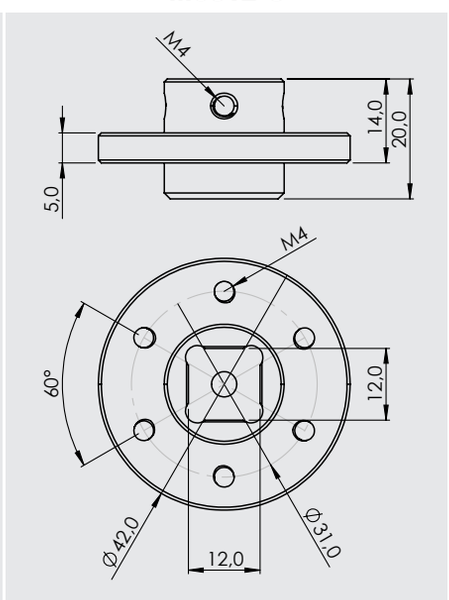

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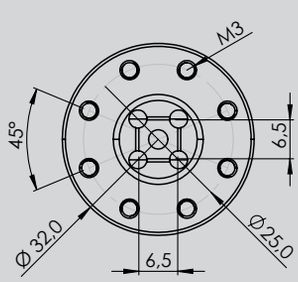

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