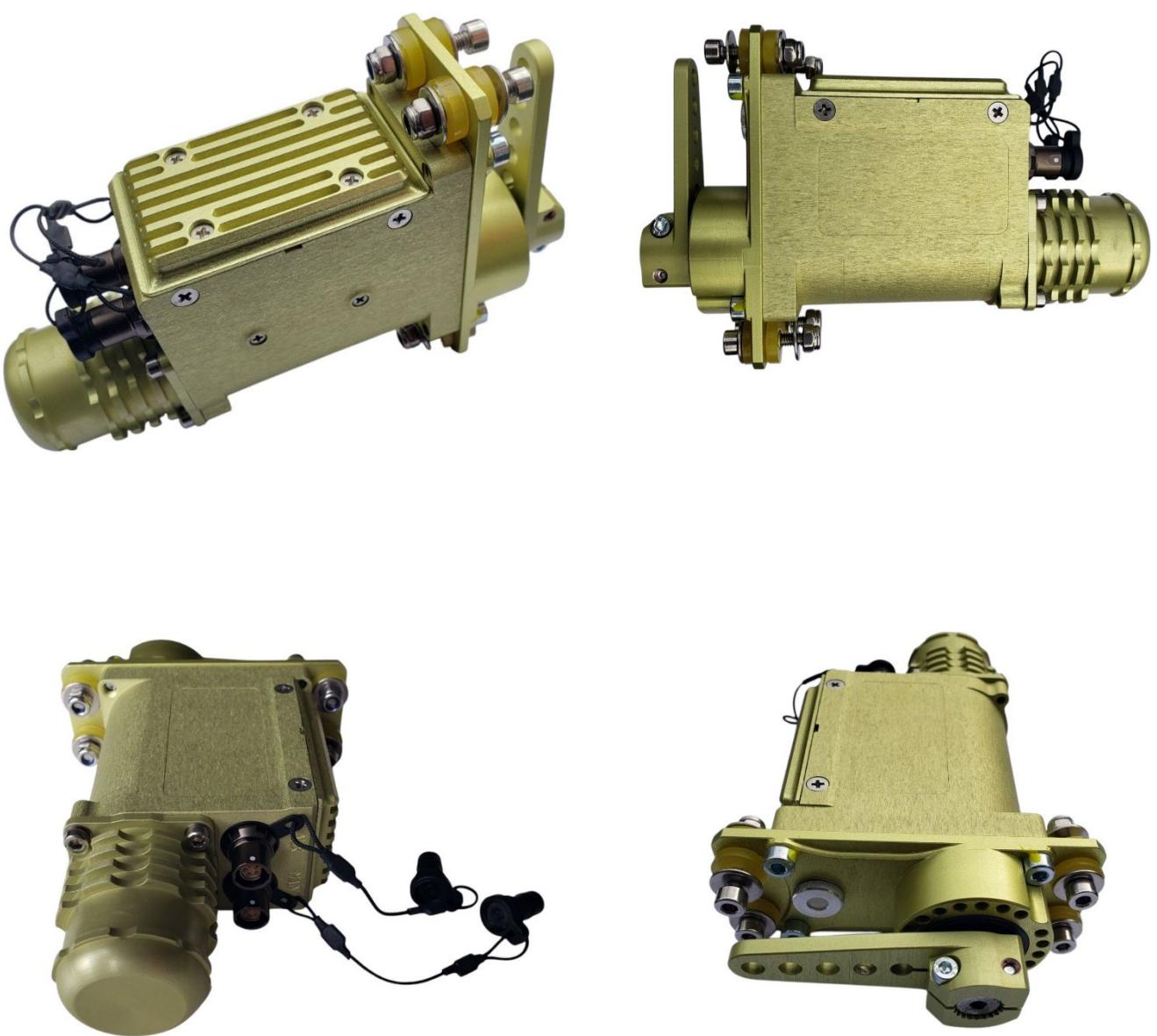

Type : SD-02B Rev. No. : 3
Date : Rev. Date : 4.03.2025

Servo actuator SD-02B-24-150

Technical Specification





Type : SD-02B Rev. No. : 3
Date : Rev. Date : 4.03.2025

TECHNICAL DESCRIPTION

1 SD-02B-24-150-2F [UV01.654116.30]

Rugged and durable rotating type servo actuator for professional intensive applications.

1.1 Application:

- Conversion of manned aircraft into UAV
- Equipping manned aircraft with automatic piloting system (APS)
- Swashplates, UAV control surfaces, thrust vector control (TVC), UGV brakes / transmissions, etc.
-

1.2 Technical specification:

- MIL spec. circular IP68 connector: Fischer Ultimate UR01-W-L-07-F-005-C-BK-1-E-2-A-B (5-pins) (matching plug: UP01-W-L-07-M-005-C-BK-1-E-2-Z-B)
- Anodized aluminum.
- Fixing type: intermediate bracket

Features:

- Brushless motor
- FOC (Field Oriented Control) servo drive with efficiency 99%. Ultra-Fast: current loop running at 75 kHz and position and velocity loops at 25 kHz.
- Two contactless encoders for dual-loop control (enhanced feedback signal resolution)
- Built in shunt resistor for regenerative braking (on request). The current version w/o shunt. If the shunt is embedded, then the upper voltage range must be 2-3 V less than current register 'Shunt enable voltage' value !!. If the input voltage exceeds the value in the register 'Shunt enable voltage' the servo actuator will be damaged!!! Default value 'Shunt enable voltage' 42 VDC.
- Reverse polarity protection.

Main feedback data from servo actuator:

- Actual position, actual velocity
- Bus voltage, active motor current
- Power stage & BL motor temperature
- Humidity control inside the case

1.3 Operating data:

Specification		SD-02B-24-150
Rated voltage		24 VDC
Absolute supply voltage range (min. – max.)		9–52 VDC
Recommended power supply voltage range ¹		12–36 VDC
Standby Current	at rated voltage	0.12 A
Rated Current	at rated voltage	2.28 A
Peak Current	at rated voltage	3.12 A
Rated Torque	at rated speed ²	4.3 Nm
Intermittent Torque ³		5.3 Nm
Peak Torque ⁴		6 Nm
Stall Torque		12 Nm
Rated Speed	at rated torque	278 deg/s
Maximum speed		400 deg/s
Travel Angle		± 179°
Backlash (mechanical)		≤ 0.6°
Position Error under Temperature		≤ 0.1°
Operating Temperature Range (of the environment)		-40°C ... +60°C (-40°F ... +140°F)
Storage Temperature Range		-40°C ... +90°C (-40°F ... +194°F)
Weight (including match connector)		480 g (16.9 oz) ±5%
IP Ratings (Ingress Protection)		IP66
Size		140 mm x 89 mm x 36 mm
Control interface		CANAerospace; UAVCAN (DRONECAN)

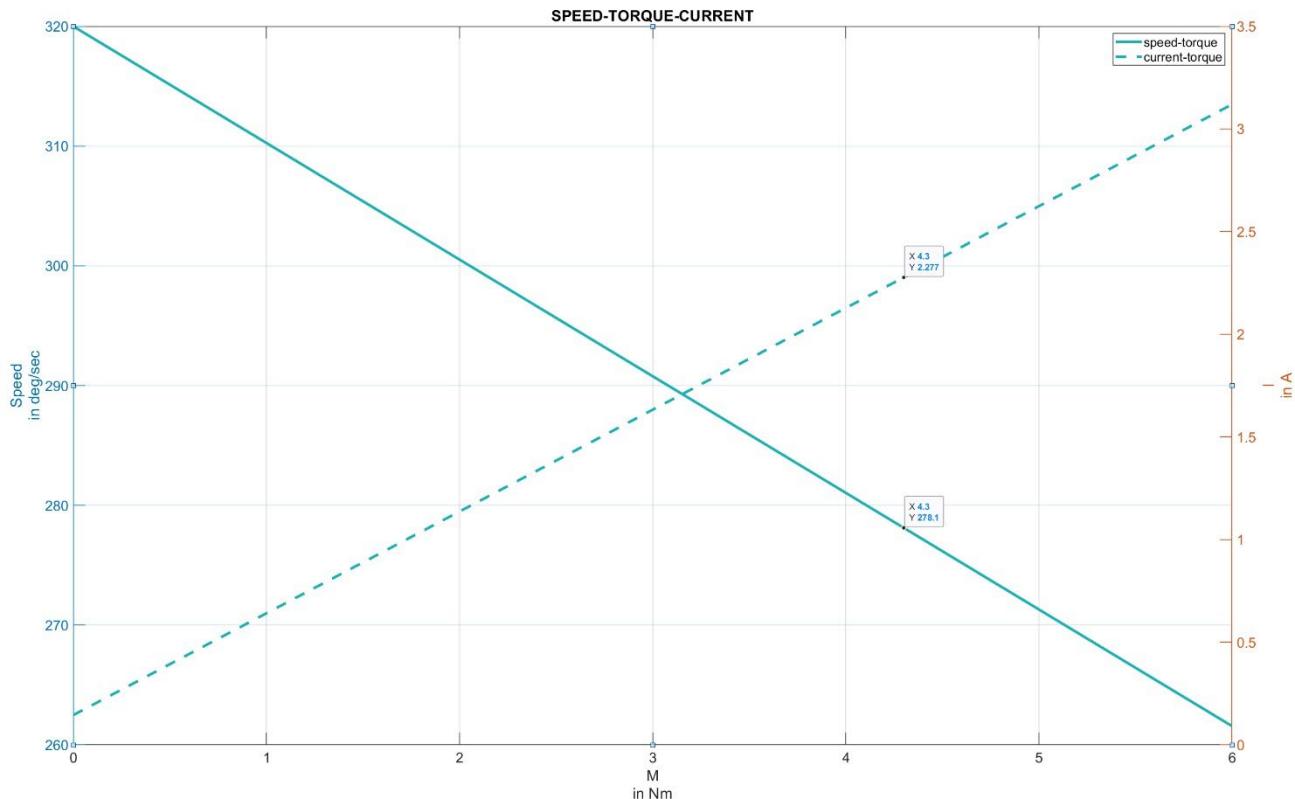
¹ This voltage range ensures a safety margin including power supply tolerances and regulation during acceleration and deceleration. If shunt present, upper voltage range must be 2-3 V less than current register ‘Shunt enable voltage’ value !!!.

² **Continuous operation:** The continuous torque provides the maximum possible load applied to the output shaft; exceeding this value will reduce the service life.

³ **Intermittent operation:** The intermittent torque value may be applied for a short period. It should be for short intervals only and not exceed 25% of the continuous duty cycle.

⁴ **Peak torque:** This torque limit represents the absolute maximum torque supported by the gearbox for unexpected events generated randomly on the output shaft load. Such peak torque cannot occur in cyclic mode or in a timely repetitive manner. This parameter is not intended to be used as a dimensioning constraint to drive any loads. Gearhead output is able to support such torque value with a non-repetitive scheme few hundreds to few thousand times during its operation without impacting service life.

2 PERFORMANCE DATA



3 INTERFACE OPTIONS

CANaerospace (CAN2.0A)

Detailed information is provided in the document

‘UAVOS Servoactuator CANaerospace ICD’.

UAVCAN (DRONECAN) (CAN2.0B)

For more detailed information, please refer to the UAVCAN protocol data.

https://uavcan.org/specification/UAVCAN_Specification_v1.0-beta.pdf

RS485 (ADASI, DA26)

Use for connection with GUI USS.

Baud rate of 115,200 bit/s; max 100 frames/s.

Detailed information is provided in the documents

‘UAVOS Servoactuator ADASI ICD’.

‘DA26-RS485-Protocol-V116’.

4 CONNECTION

For normal work connect a cable with a mating connector Fischer Ultimate UP01-W-L-07-M-005-C-BK-1-E-2-Z-B to MAIN.

Assignment pin table MAIN

	Net	Description
1	CANL	L-signal CAN
2	CANH	H-signal CAN
3	GND	Supply Ground
4	+ V DC	Supply Voltage
5	SIG-GND	Signal Ground

For debug work with GUI ‘UAVOS Servomotor Studio’ connect a cable with a mating connector Fischer Ultimate UP01-W-L-07-M-005-C-BK-1-E-2-Z-B to AUX.

Assignment pin table AUX

	Net	Description
1	RS485B	Inverted signal RS485
2	RS485A	Non-inverted signal RS485
3	GND	Supply Ground
4	+ V DC	Supply Voltage
5	SIG-GND	Case Ground (Protective Earth)



Please, follow the instructions for use with [Fischer Ultimate connectors](#).

5 OPERATIONAL LIFETIME

To guarantee maximum safety and reliability, our SD-01B features a brushless motor, a contactless position sensor, extremely robust planetary gearhead (capable of withstanding frequent and sudden load changes, and operates with high efficiency) and all this is controlled by a ultra-fast servo drive (current loop running at 75 kHz and position and velocity loops at 25 kHz provides the best performance possible from servo actuator).

Gearhead (the service life of a gearhead is dependent on the following factors: input speed, output torque, operating conditions, environment and installation in other systems. service life is significantly extended if these limits are not pushed. Servo drive allows to stay within these limits.): under typical load conditions MTBF = 3000 - 5000 hours.

BL motor (because motor commutation occurs electronically (FOC, PWM frequency = 30...100 kHz) the service life is dependent primarily on the service life of the motor bearing): under typical load conditions MTBF = 10000 - 25000 hours.

Servo drive: MTBF > 146 000 hours.

Position sensors (contactless output shaft absolute feedback, contactless motor absolute feedback): MTBF > 100 000 hours.