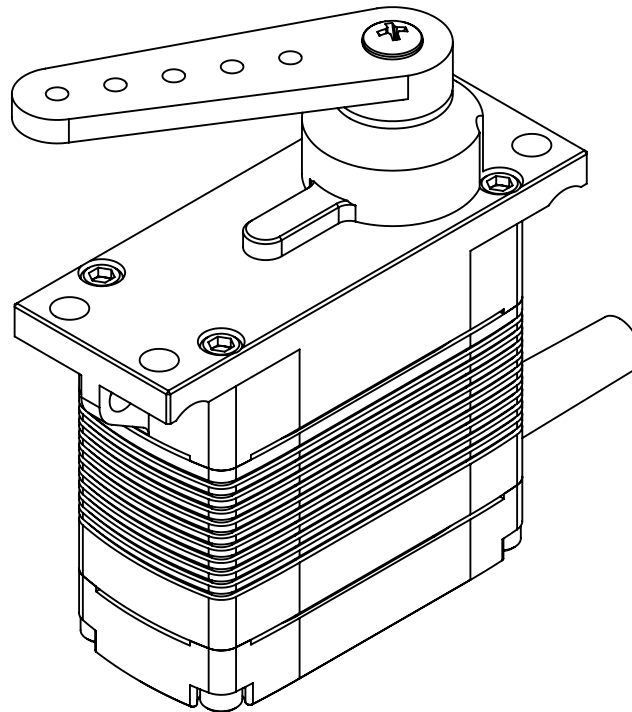


DA 15-N-ISS

Technical Specification



DA 15-N-ISS-XX-BLDC
DA 15-N-ISS-XX-BLDC-32

Content

1. General Description	3
2. Operating Data	4
3. Performance	6
4. Command Interface	9
4.1. PWM Command Interface	9
4.2. Position Feedback Signal	9
4.3. Serial / RS 485 Command Interface	10
4.4. RS 485 Protocol Specifications	10
5. Materials and Features	11
6. Dimensions	11
6.1. Installation Dimensions	12
6.2. Installation Dimensions	13
6.3. Output Shaft Spline	14
7. Electrical Connection options	15
7.1. PWM interface	15
7.2. RS 485 Interface	16
7.3. Single Ended Serial Interface	17
8. Accessories	18
8.1. Aluminum Servo Arm, short	19
8.2. Aluminum Servo Arm, long	20
8.3. Aluminum Mounting Frame	21
9. Item Number System	22

1. General Description

The DA 15-N-ISS is based on the well proven full brushless DA 15-N actuator and features the Internal Servo Safer System (ISS), unique in that size, making it the toughest micro actuator on the market.

The ISS is a mechanical gear protection system protecting the gear set against any kind of radial shock-loads exceeding a predefined limit (adjustable to customer requirements).

Its brushless motor and contactless, wear free position sensing system, make the DA 15-N-ISS immune to wear, vibration and shock loads. It has especially been designed for the usage in harsh environments and for safety critical applications that require an actuator with high endurance and which can withstand high shock loads (e.g. net recovery). The conductive aluminum case and the shielded connection cable are reducing the susceptibility to all kinds of EMI/RFI noise to the absolute minimum.

The servo is fully programmable.

Advantages of the full brushless actuator:

1. Maximized service life through vibration-resistant, brushless DC motor
2. Brushless motor technology eliminates the typical electromagnetic noise of brush-type motors and provides ultra-long endurance
3. Contactless, wear free position sensing system
4. Aluminum housing with minimal weight and size in functional design
5. The saltwater-resistant, HART-coat treated aluminum housing withstands at least 100 hours of saltwater spray without damage and meets the IP-67 standard for water and dust protection
6. Excellent immunity to any kind of electromagnetic noise achieved with aluminum housing, low electromagnetic emissions through brushless motor
7. Several programming possibilities, e.g. overload protection of the internal electric brushless motor, which allows to reduce the motor current if the motor is being overloaded

2. Operating Data

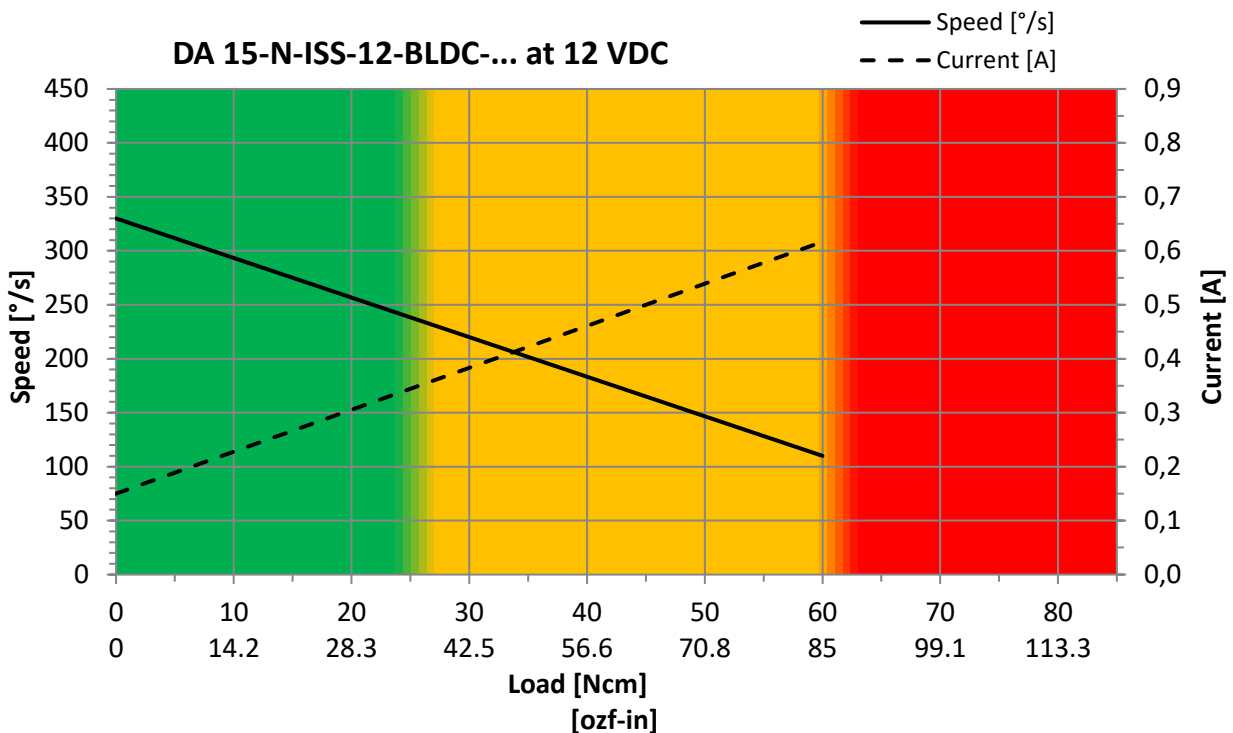
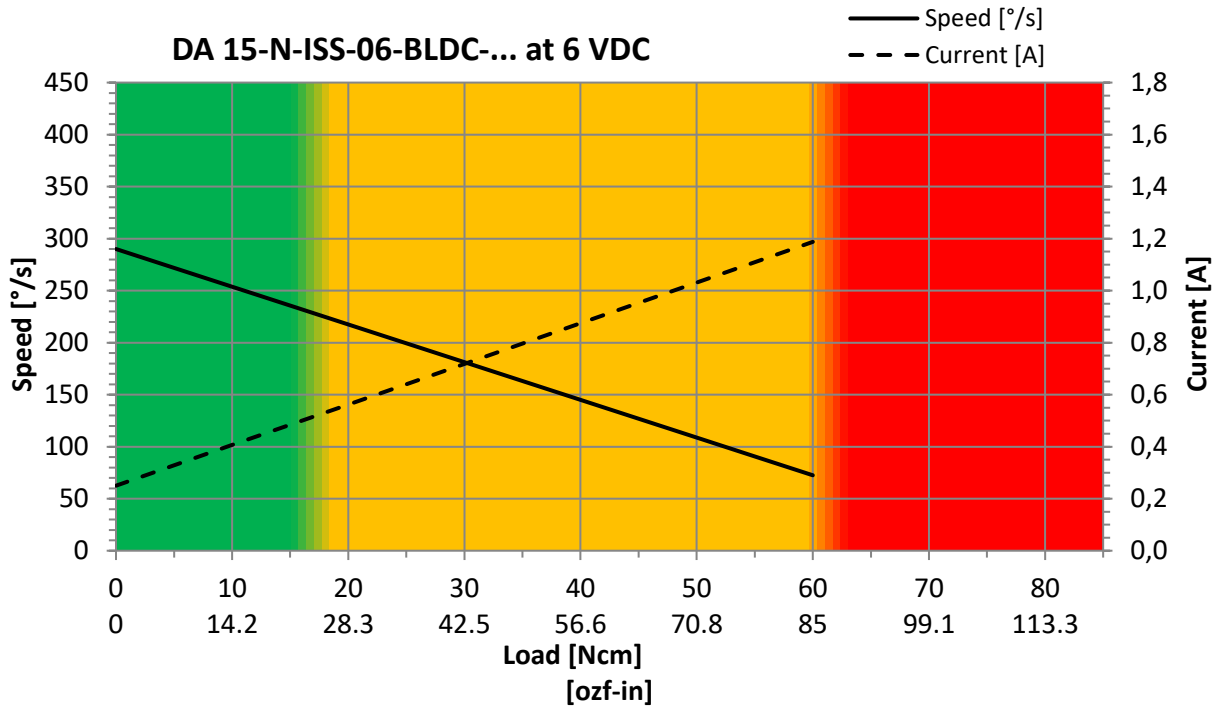
	DA 15-N-ISS-06-BLDC-...	DA 15-N-ISS-12-BLDC-...	DA 15-N-ISS-12-BLDC-...
Supply Voltage (rated)	6 VDC	12 VDC	14 VDC
Supply Voltage Range	5 ... 9 VDC	10 ... 16 VDC	10 ... 16 VDC
Standby Current ¹ at rated voltage	0.05 A	0.05 A	0.05 A
Rated Current ¹ at rated voltage	0.5 A	0.35 A	0.35 A
Peak Current ¹ at rated voltage	1.5 A	0.85 A	0.95 A
Rated Torque ¹ at rated speed	16 Ncm (22.7 ozf-in)	25 Ncm (35.4 ozf-in)	25 Ncm (35.4 ozf-in)
Peak Torque ¹ at rated voltage	60 Ncm (85 ozf-in)	60 Ncm (85 ozf-in)	60 Ncm (85 ozf-in)
No Load Speed ¹ at rated voltage	290 °/s	330 °/s	390 °/s
Rated Speed ¹ at rated torque	235 °/s	240 °/s	290 °/s
ISS Lockout Momentum	60 Ncm ... 70 Ncm ^{1/2}		
Default Travel Angle	±45° = 90° total travel		
Max. Travel Angle ³	±90° = 180° total travel		
Backlash (mechanical)	≤ 0.5°		
Position Error under Temperature ⁴	≤ ±1.0°		
Operating Temperature Range ⁵	-30°C ... +70°C (-22°F ... +158°F)		
Storage Temperature Range	-35°C ... +80°C (-31°F ... +176°F)		

- 1) Tolerance ±10%
- 2) Different lockout momentum on request
- 3) Programming Tool # 985.3 required
- 4) -20°C ... +50°C , Δt = 70°C (-4°F ... +122°F , Δt = 126°F)
- 5) Low Temperature Modification on request

	DA 15-N-ISS-06-BLDC-32-...	DA 15-N-ISS-12-BLDC-32-...	DA 15-N-ISS-12-BLDC-32-...
Supply Voltage (rated)	6 VDC	12 VDC	14 VDC
Supply Voltage Range	5 ... 9 VDC	10 ... 16 VDC	10 ... 16 VDC
Standby Current ¹ at rated voltage	0.05 A	0.05 A	0.05 A
Rated Current ¹ at rated voltage	0.5 A	0.35 A	0.35 A
Peak Current ¹ at rated voltage	1.5 A	0.85 A	0.95 A
Rated Torque ¹ at rated speed	11 Ncm (15.6 ozf-in)	18 Ncm (25.5 ozf-in)	18 Ncm (25.5 ozf-in)
Peak Torque ¹ at rated voltage	40 Ncm (56.6 ozf-in)	40 Ncm (56.6 ozf-in)	40 Ncm (56.6 ozf-in)
No Load Speed ¹ at rated voltage	540 °/s	620 °/s	730 °/s
Rated Speed ¹ at rated torque	410 °/s	415 °/s	505 °/s
ISS Lockout Momentum	60 Ncm ... 70 Ncm ^{1/2}		
Default Travel Angle	±45° = 90° total travel		
Max. Travel Angle ³	±90° = 180° total travel		
Backlash (mechanical)	≤ 0.5°		
Position Error under Temperature ⁴	≤ ±1.0°		
Operating Temperature Range ⁵	-30°C ... +70°C (-22°F ... +158°F)		
Storage Temperature Range	-35°C ... +80°C (-31°F ... +176°F)		

- 1) Tolerance ±10%
- 2) Different lockout momentum on request
- 3) Programming Tool # 985.3 required
- 4) -20°C ... +50°C , Δt = 70°C (-4°F ... +122°F , Δt = 126°F)
- 5) Low Temperature Modification on request

3. Performance

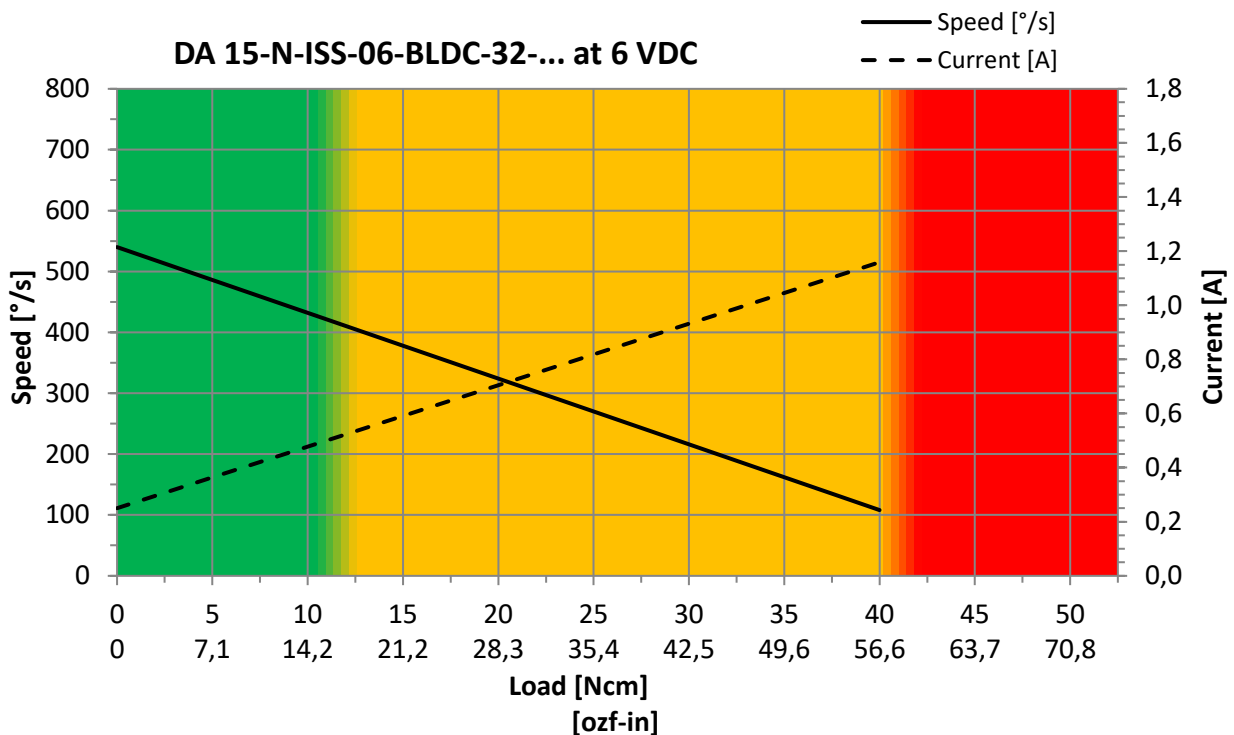
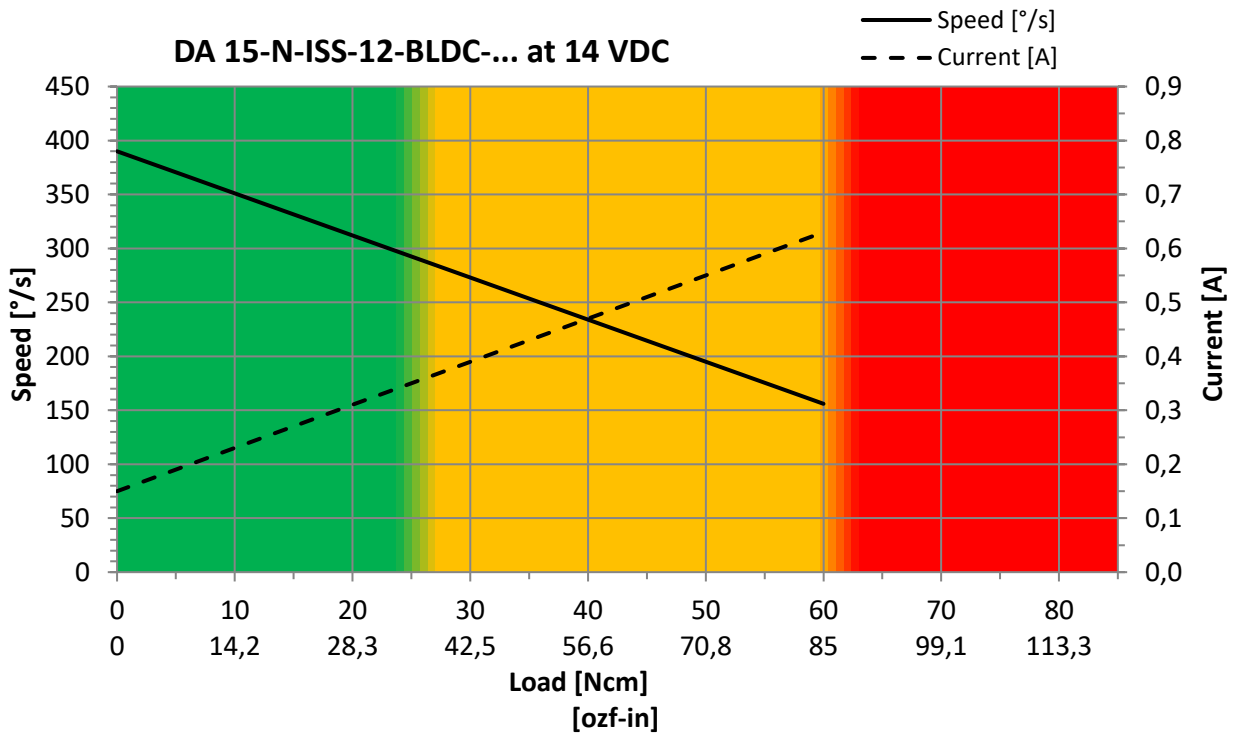


Operation Mode:

■ Continuous

■ Short Time
< 10s, 60s cool down

■ Overload
< 1s, 60s cool down

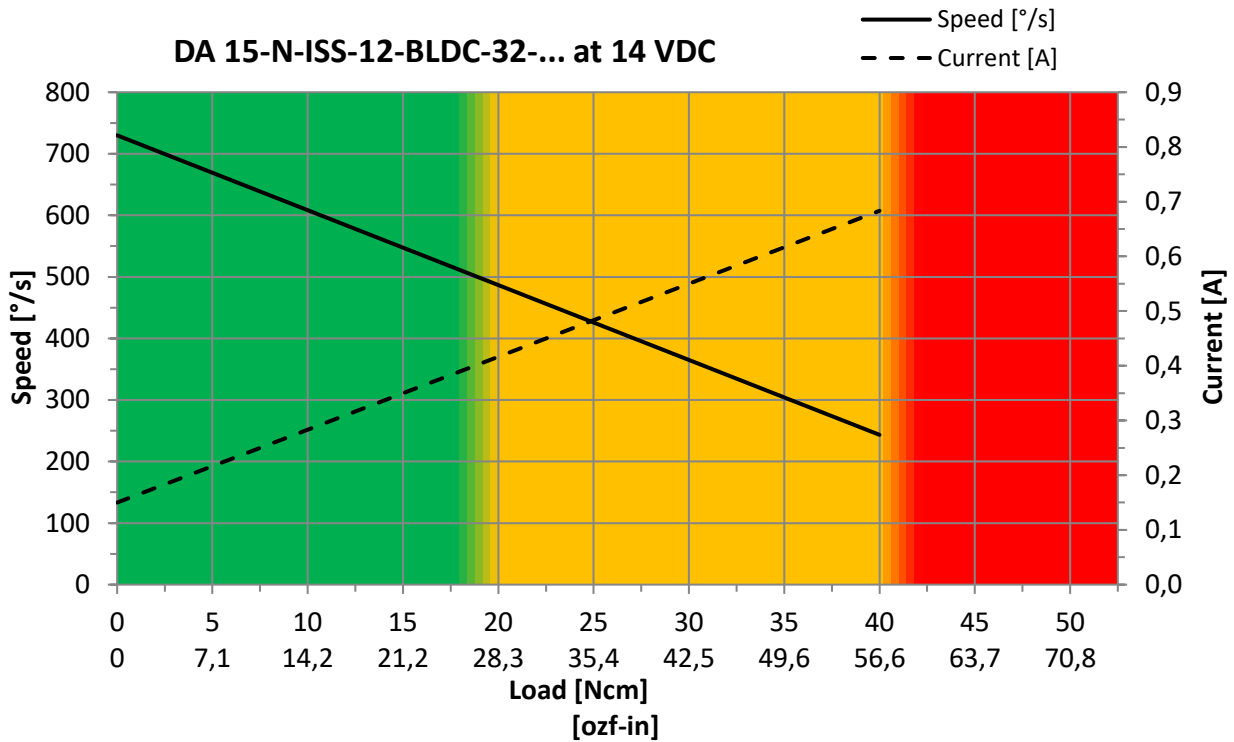
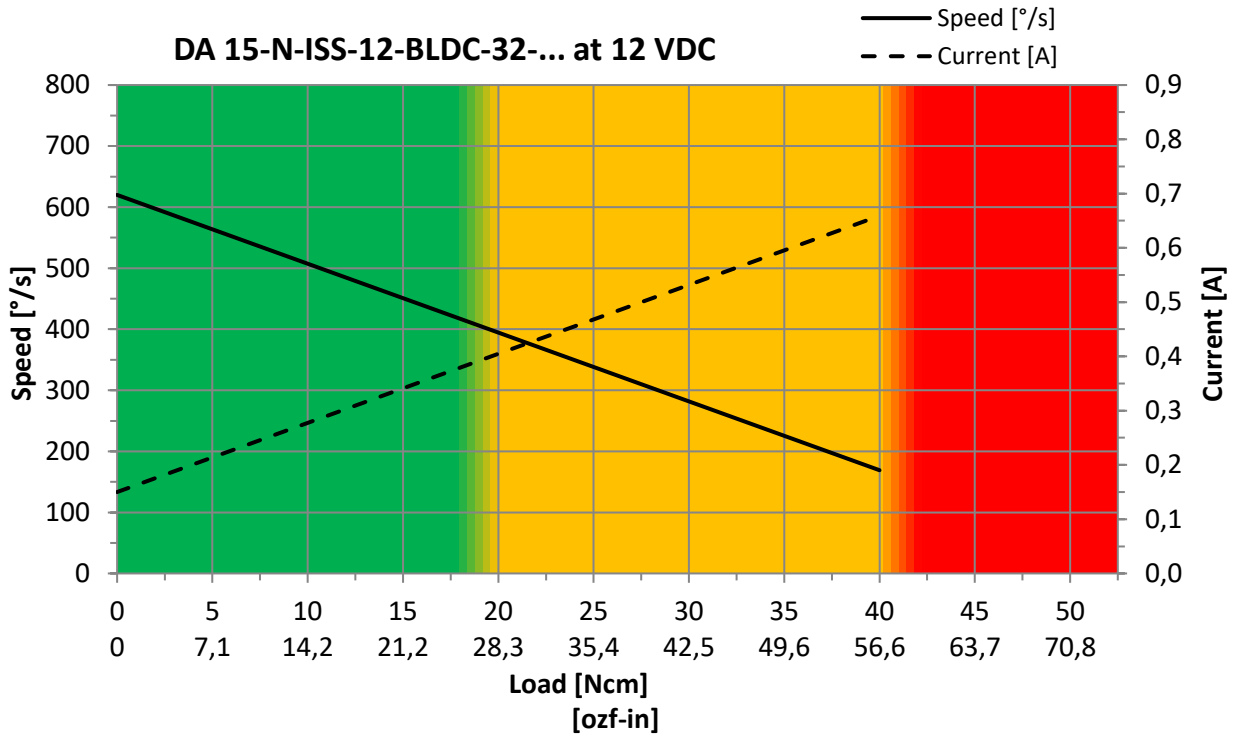


Operation Mode:

■ Continuous

■ Short Time
< 10s, 60s cool down

■ Overload
< 1s, 60s cool down



Operation Mode:

■ Continuous

■ Short Time
< 10s, 60s cool down

■ Overload
< 1s, 60s cool down

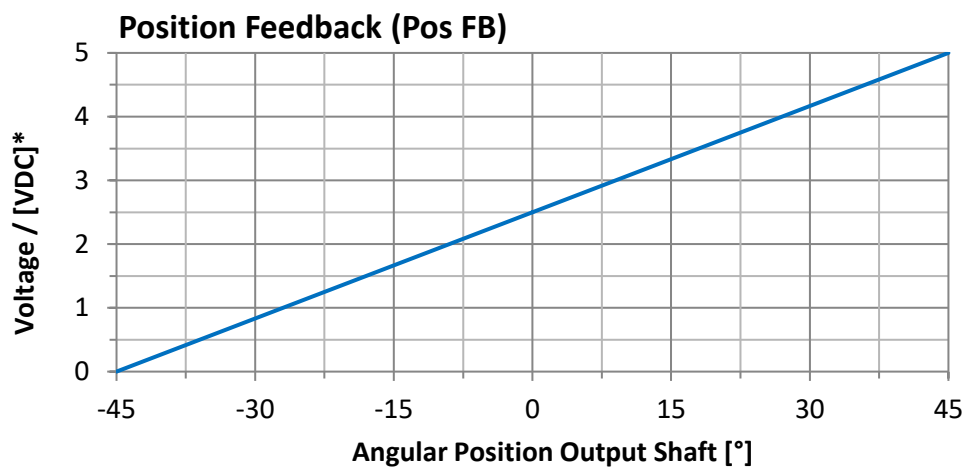
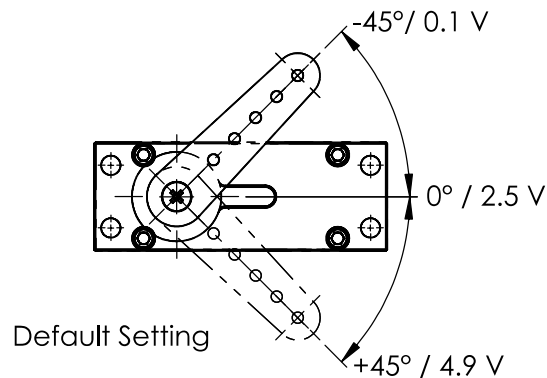
4. Command Interface

4.1. PWM Command Interface

PWM Signal Voltage	TTL-Level HIGH: min. 3.5 V, max. 5.5 V TTL-Level LOW: min. 0.0 V, max. 1.5 V
Frame Rate	2.6 ... 2000 ms
Valid Pulse Lengths	0.9 ... 2.1 ms
Pulse Length for Position Left / Center / Right	1.0 / 1.5 / 2.0 ms
Resolution	$\leq 1 \mu\text{s}$

4.2. Position Feedback Signal

The Position Feedback signal (Pos FB) is an analog output signal providing a voltage value, which is directly related to the output shaft's angular position. Reference is Supply Ground / Signal Ground (GND).



* Tolerance $\pm 5\%$

4.3. Serial / RS 485 Command Interface

Baud-Rate	115200 ±1.5% bits/s
Protocol (Documentation available)	6 Byte (incl. 2 byte CRC)

4.4. RS 485 Protocol Specifications

Number of Data Bits	8
Number of Stop Bits	1 or 2
Parity	None

Command / Response Frame

Byte #	Description
1	Command / Response-Code
2	Actuator ID
3	Argument 1
4	Argument 2
5	CRC High Byte
6	CRC Low Byte

5. Materials and Features

Case Material	Saltwater Resistant Aluminum Alloy
Case Surface Treatment	HART® - Coat
Splash Water Resistance	IP 67, waterproof to 1m depth
Salt Water Resistance	Case Material
EMI / RFI Shielding	Case Shielding
Motor Type	Brushless DC Motor
Gear Set Material	Hardened Steel
Position Sensor	Contactless
ISS Gear Protection System	Standard
Position Feedback	Standard
Shielded Connecting Cable	Standard

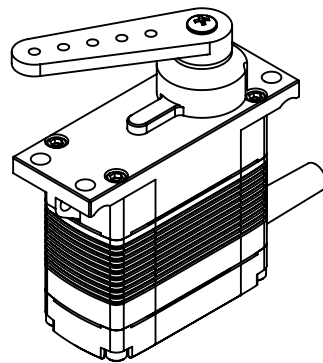
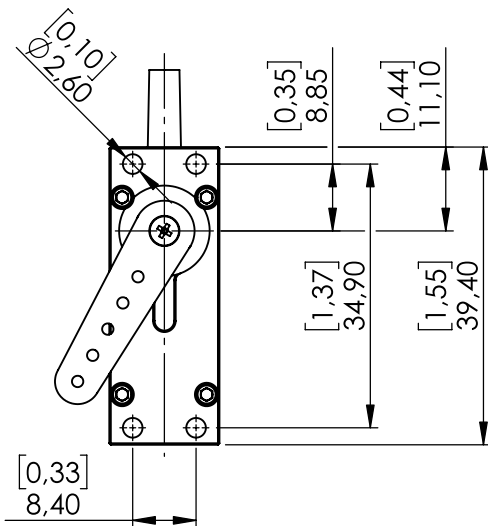
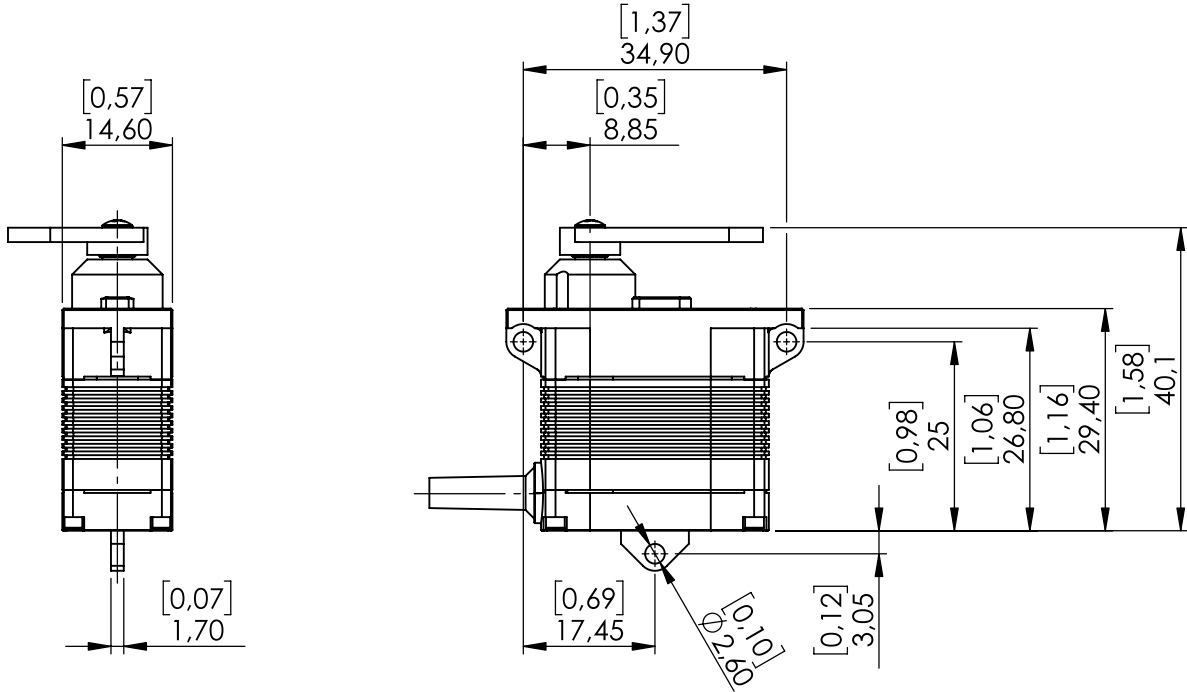
6. Dimensions

Case Dimensions	29.4 mm x 39.4 mm x 14.6 mm (1.157 in x 1.551 in x 0.575 in)
Weight	35g (1.23oz) ±10%

Standard Tolerances	Unless otherwise specified according to DIN ISO 2768 - m
---------------------	---

6.1. Installation Dimensions

DA 15-N-ISS-...-BLDC-...-...-250



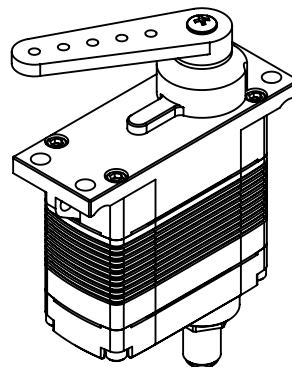
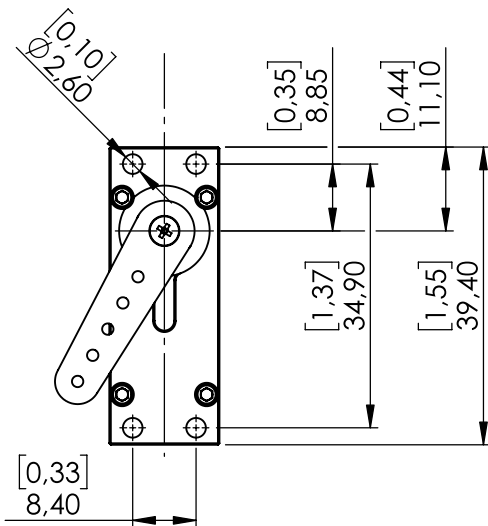
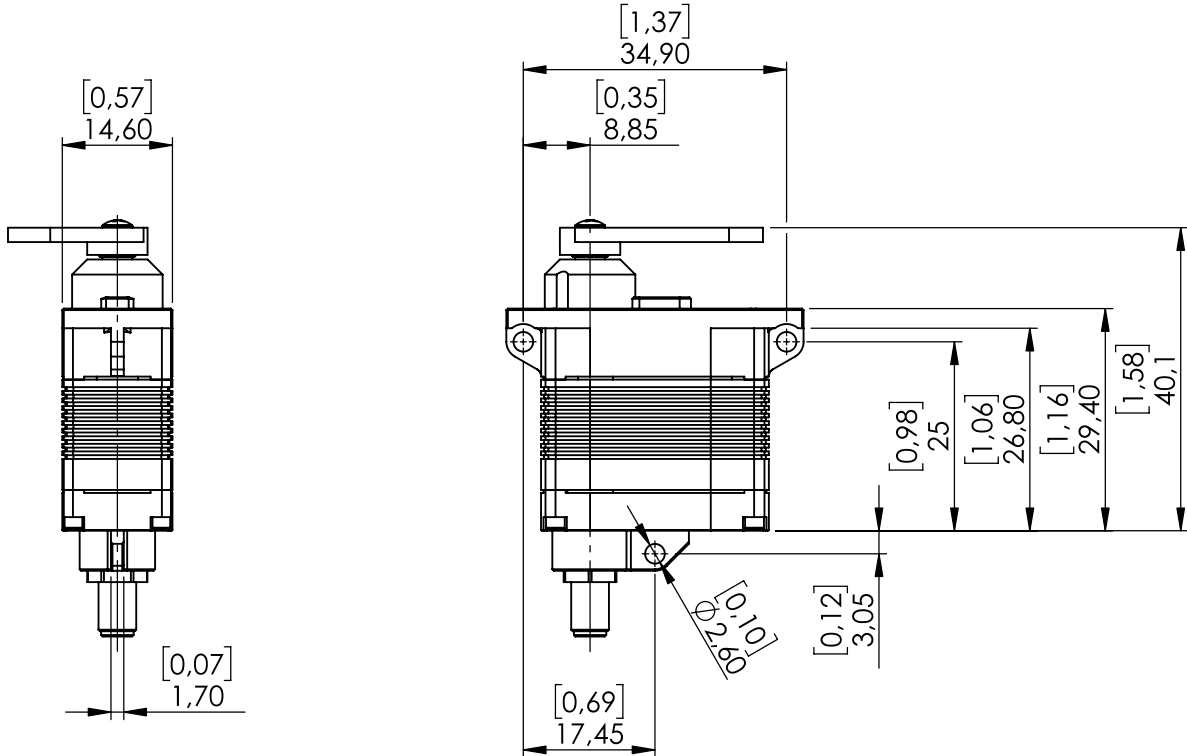
Not to scale

Dimensions [in] , mm

Content is subject to change without notice

6.2. Installation Dimensions

DA 15-N-ISS-...-BLDC-...-...-C



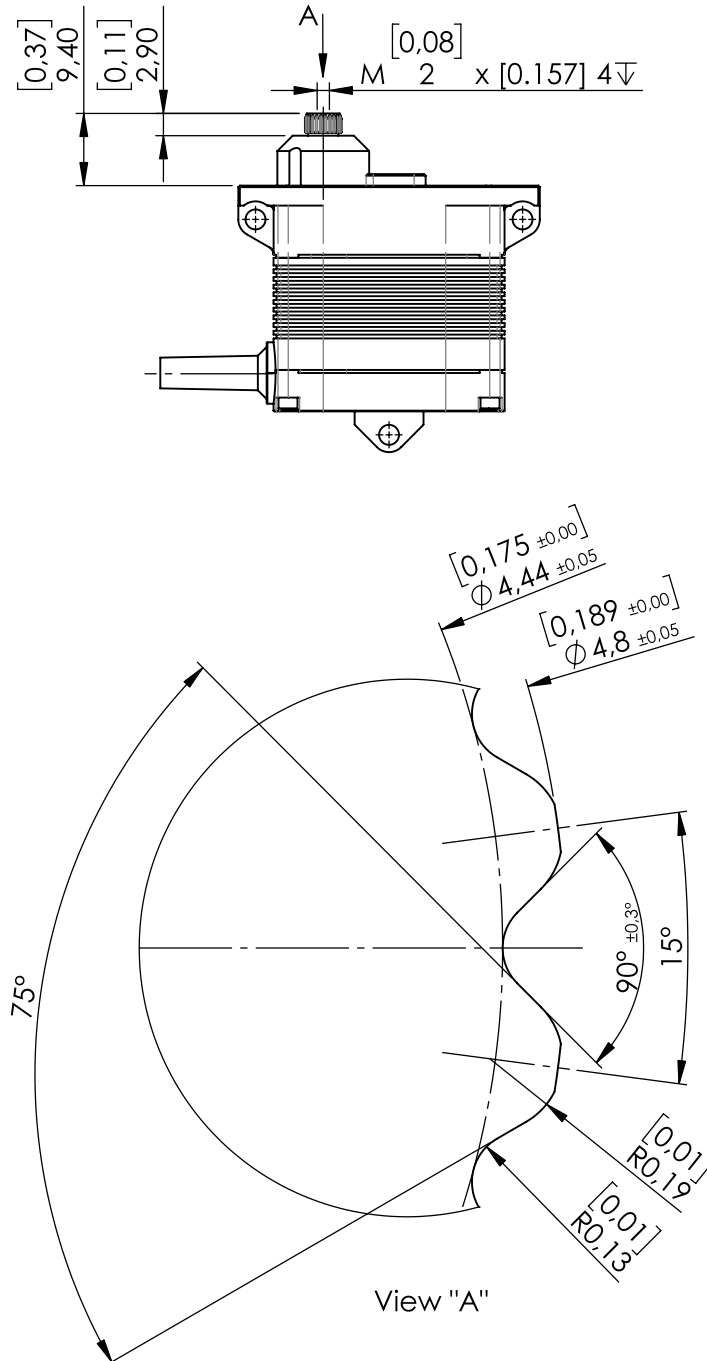
Not to scale

Dimensions [in] , mm

Content is subject to change without notice

6.3. Output Shaft Spline

Valid for all Versions



Not to scale

Dimensions [in] , mm

Content is subject to change without notice

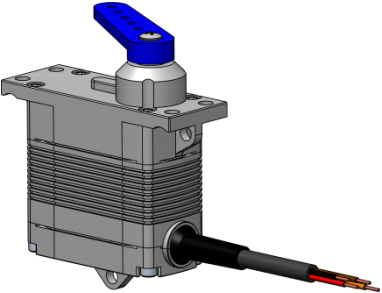

7. Electrical Connection options

7.1. PWM interface

Shielded Cable

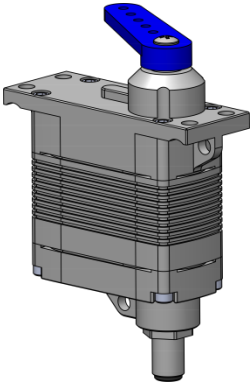

Item # DA 15.N.ISS._.BLDC._. - .250

Length 250mm (9.84in), open leads

		Shielded Cable	
		Description	Flexible shielded cable
		Type	LifYDY-UL
		Wire Gauge	4x AWG 28 (4x 0.08 mm ²)
	Pin Assignment		
1	Red	+VDC	Supply Voltage
2	Black	GND	Supply Ground, Signal Ground
3	Orange	SIG	PWM Command Signal
4	Brown	Pos FB	Position Feedback

Industrial Standard M5 electrical Connector ⁶

Item # DA 15.N.ISS._.BLDC._. - .C

	2 4	Shielded Cable	
		Manufacturer	Franz Binder GmbH & Co.
		Type	Series 707, No. 09 3111 86 04
		Mating	No. 79 3108 35 04 No. 79 3110 52 04
	Pin Assignment		
1	Brown	+VDC	Supply Voltage
2	Black	Pos FB	Position Feedback
3	White	GND	Supply Ground, Signal Ground
4	Blue	SIG	Command Signal

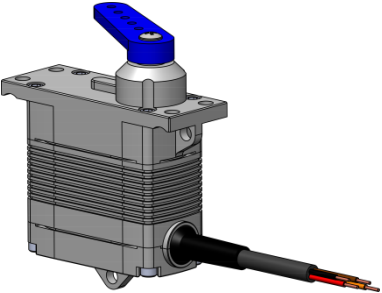

6) 200cm (78in) connecting cable with mating straight connector and open leads included

7.2. RS 485 Interface

Shielded Cable

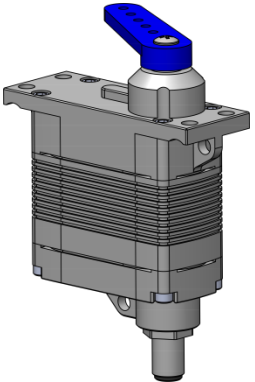

Item # DA 15.N.ISS._.BLDC._.R.250

Length 250mm (9.84in), open leads

		Shielded Cable	
		Description	Flexible shielded cable
		Type	LifYDY-UL
		Wire Gauge	4x AWG 28 (4x 0.08 mm ²)
	Pin Assignment		
1	Red	+VDC	Supply Voltage
2	Black	GND	Supply Ground, Signal Ground
3	Orange	RS 485 A	Non-Inverted Input / Output line
4	Brown	RS 485 B	Inverted Input / Output line

Industrial Standard M5 electrical Connector ⁶

Item # DA 15.N.ISS._.BLDC._.R.C

	2 4	Shielded Cable		
		Manufacturer	Franz Binder GmbH & Co.	
		Type	Series 707, No. 09 3111 86 04	
		Mating	No. 79 3108 35 04 No. 79 3110 52 04	
	1 3 mating face	Pin Assignment		
1	Brown	+VDC	Supply Voltage	
2	Black	RS 485 B	Inverted Input / Output line	
3	White	GND	Supply Ground, Signal Ground	
4	Blue	RS 485 A	Non-Inverted Input / Output line	

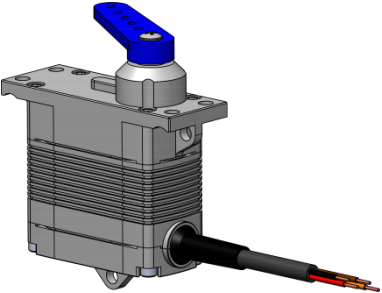

6) 200cm (78in) connecting cable with mating straight connector and open leads included

7.3. Single Ended Serial Interface

Shielded Cable

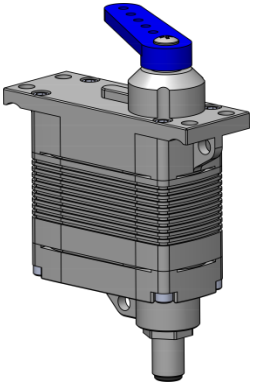

Item # DA 15.N.ISS._.BLDC._.SE.250

Length 250mm (9.84in), open leads

		Shielded Cable	
		Description	Flexible shielded cable
		Type	LifYDY-UL
		Wire Gauge	4x AWG 28 (4x 0.08 mm ²)
	Pin Assignment		
1	Red	+VDC	Supply Voltage
2	Black	GND	Supply Ground, Signal Ground
3	Orange	Serial	Bidirectional serial data line
4	Brown	DU	Don't Use

Industrial Standard M5 electrical Connector ⁶

Item # DA 15.N.ISS._.BLDC._.SE.C

	2 4	Shielded Cable	
		Manufacturer	Franz Binder GmbH & Co.
		Type	Series 707, No. 09 3111 86 04
		Mating	No. 79 3108 35 04 No. 79 3110 52 04
	Pin Assignment		
1	Brown	+VDC	Supply Voltage
2	Black	DU	Don't Use
3	White	GND	Supply Ground, Signal Ground
4	Blue	Serial	Bidirectional serial data line

6) 200cm (78in) connecting cable with mating straight connector and open leads included

8. Accessories

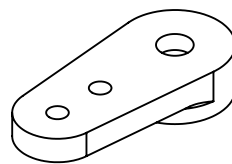
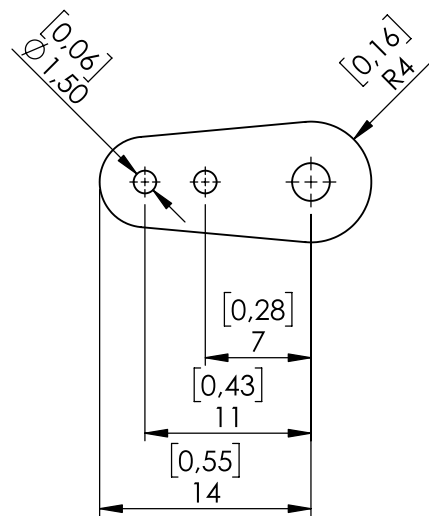
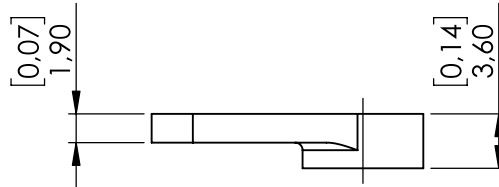
Item	Item-No.
Aluminum Servo Arm, short, single sided ⁷	1521.21
Aluminum Servo Arm, long, single sided	1521.22
Aluminum Mounting Frame	1521.31 incl. screws
Programming Tool	985.3
Programming Tool (Serial / RS 485)	985.5

7) Single sided Servo Arm with fixation screws included

All accessories to be purchased separately

8.1. Aluminum Servo Arm, short

1521.21



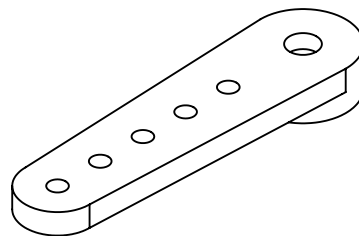
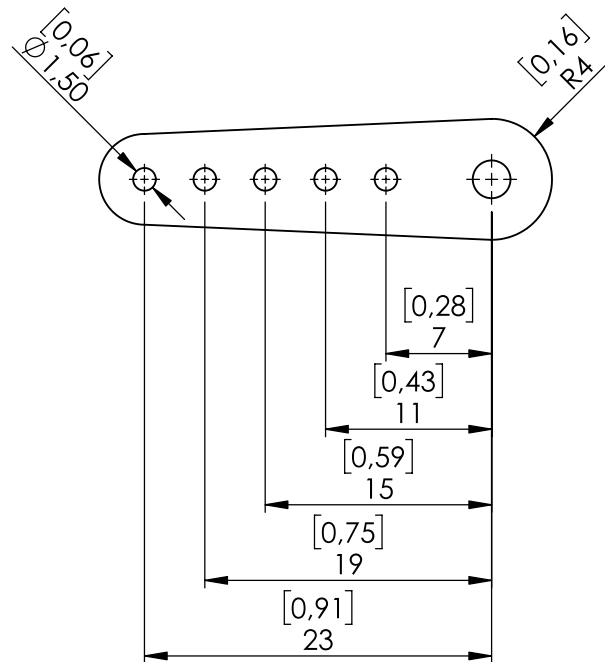
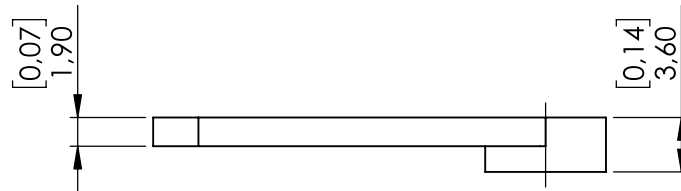
Not to scale

Dimensions [in] , mm

[Content is subject to change without notice](#)

8.2. Aluminum Servo Arm, long

1521.22



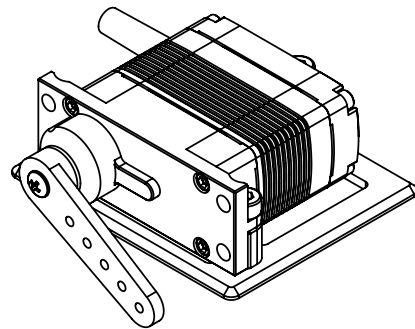
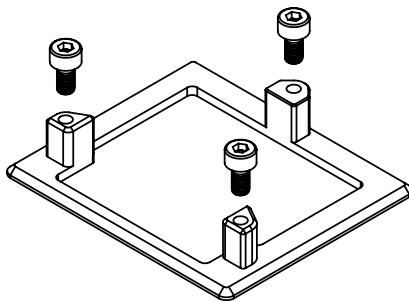
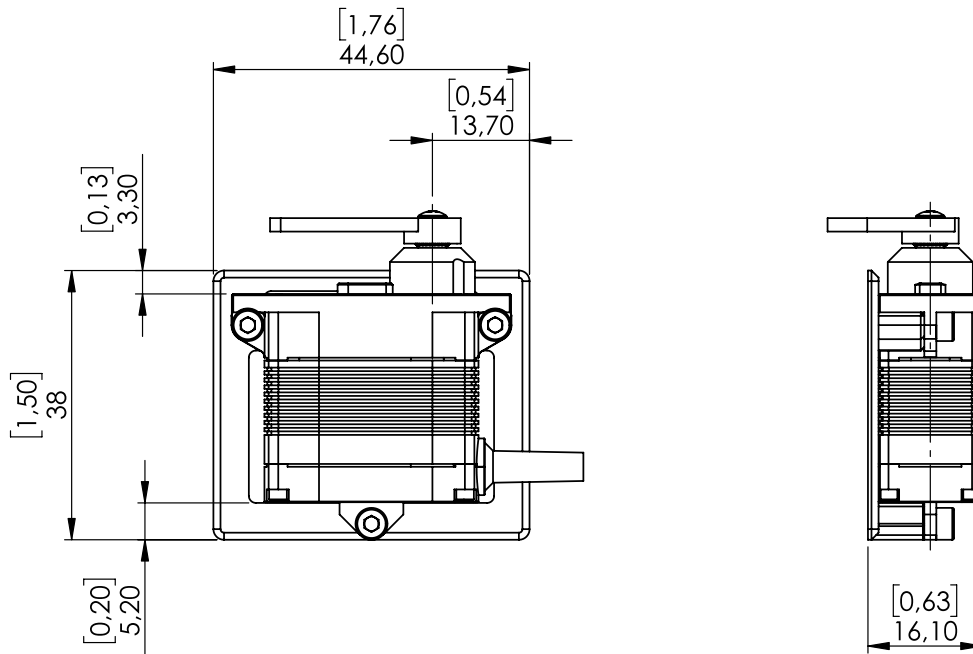
Not to scale

Dimensions [in] , mm

Content is subject to change without notice

8.3. Aluminum Mounting Frame

1521.31



Mounting Frame shown with installed actuator.

Not to scale

Dimensions [in] , mm

[Content is subject to change without notice](#)

9. Item Number System

DA	15	.	N	.	ISS	12	.	BLDC	.	-	.	-	.	250
Servo Class													Electrical Connection	
15 mm Class													250 Shielded cable, open leads, length 250mm	
													C Industrial Standard M5 Connector	
													Interface	
													- PWM Interface	
													R RS 485 Interface	
													SE Single Ended Serial Interface	
													Gear Set	
													- Standard	
													32 High Speed	
													Motor Type	
													BLDC Brushless Motor	
													Supply Voltage	
													6 V DC 06	
													12 V DC 12	



Volz Servos GmbH & Co. KG

Heinrich-Krumm-Straße 5
63073 Offenbach
Germany
Tel. +49-69-985580-0
Fax +49-69-985580-40

e-Mail mail@volz-servos.com

Website www.volz-servos.com