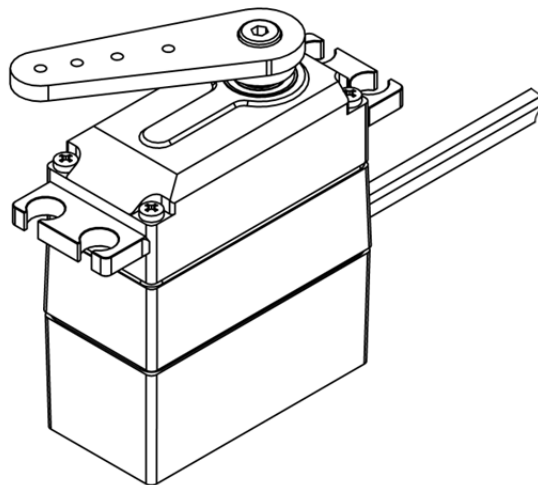


DA 20

Technical Specification



DA 20-06-2503
DA 20-06-2505
DA 20-12-2515
DA 20-30-2515
DA 20-30-2530



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1. General Description

The housings of our DA 20 series are made of CNC-machined aluminum elements with a bottom case part made of fibreglass-reinforced plastic. The aluminum parts are rugged, torsion-resistant and dissipate internal heat. As with all our actuators, the DA 20 also has a steel gear train and is fully programmable using our programming tool (available as accessories).

2. Operating Data

2.1. Operating Data 6V-Versions

	DA 20-06-2503...	DA 20-06-2505...
Supply Voltage (rated)	6 V DC	
Supply Voltage Range	5 ... 6 V DC	5 ... 8 V DC
Standby Current ¹ at rated voltage	< 0.01 A	< 0.01 A
Rated Current ¹ at rated voltage	0.8 A	0.6 A
Peak Current ¹ at rated voltage	3.0 A	2.3 A
Rated Torque ¹ at rated speed	22 Ncm (31 ozf-in)	30 Ncm (42 ozf-in)
Peak Torque ¹ at rated voltage	110 Ncm (156 ozf-in) *	150 Ncm (212 ozf-in)
No Load Speed ¹ at rated voltage	520 °/s	320 °/s
Rated Speed ¹ at rated torque	490 °/s	280 °/s
Default Travel Angle	±45° = 90° total travel	
Max. Standard Travel Angle ²	±85° = 170° total travel	
Extended Travel Angle (optional)	±165° = 330° total travel	
Backlash (mechanical)	< 0.5°	
Position Error under Temperature ³	< ±1.0°	
Operating Temperature Range	-30°C ... +70°C (-22°F ... +158°F)	
Storage Temperature Range	-35°C ... +80°C (-31°F ... +176°F)	

1) Tolerance ±10%

2) Programming Tool # 985.1 required

3) -20°C ... +50°C , Δt = 70°C (-4°F ... +122°F , Δt = 126°F)

* Stall operation not permissible

2.2. Operating Data 12V-Version

		DA 20-12-2515...
Supply Voltage (rated)		12 V DC
Supply Voltage Range		10 ... 16 V DC
Standby Current ¹	at rated voltage	< 0.01 A
Rated Current ¹	at rated voltage	0.45 A
Peak Current ¹	at rated voltage	0.8 A
Rated Torque ¹	at rated speed	80 Ncm (113 ozf-in)
Peak Torque ¹	at rated voltage	160 Ncm (227 ozf-in)
No Load Speed ¹	at rated voltage	210 °/s
Rated Speed ¹	at rated torque	130 °/s
Default Travel Angle		±45° = 90° total travel
Max. Standard Travel Angle ²		±85° = 170° total travel
Extended Travel Angle (optional)		±165° = 330° total travel
Backlash (mechanical)		< 0.5°
Position Error under Temperature ³		< ±1.0°
Operating Temperature Range		-30°C ... +70°C (-22°F ... +158°F)
Storage Temperature Range		-35°C ... +80°C (-31°F ... +176°F)

1) Tolerance ±10%

2) Programming Tool # 985.1 required

3) -20°C ... +50°C , Δt = 70°C (-4°F ... +122°F , Δt = 126°F)

2.3. Operating Data 28V-Versions

		DA 20-30-2515...	DA 20-30-2530...
Supply Voltage (rated)		28 V DC	
Supply Voltage Range		20 ... 30 V DC	
Standby Current ¹	at rated voltage	< 0.01 A	< 0.01 A
Rated Current ¹	at rated voltage	0.3 A	0.2 A
Peak Current ¹	at rated voltage	0.6 A	0.3 A
Rated Torque ¹	at rated speed	50 Ncm (71 ozf-in)	70 Ncm (99 ozf-in)
Peak Torque ¹	at rated voltage	120 Ncm (170 ozf-in) *	150 Ncm (212 ozf-in)
No Load Speed ¹	at rated voltage	520 °/s	240 °/s
Rated Speed ¹	at rated torque	400 °/s	160 °/s
Default Travel Angle		±45° = 90° total travel	
Max. Standard Travel Angle ²		±85° = 170° total travel	
Extended Travel Angle (optional)		±165° = 330° total travel	
Backlash (mechanical)		< 0.5°	
Position Error under Temperature ³		< ±1.0°	
Operating Temperature Range		-30°C ... +70°C (-22°F ... +158°F)	
Storage Temperature Range		-35°C ... +80°C (-31°F ... +176°F)	

1) Tolerance ±10%

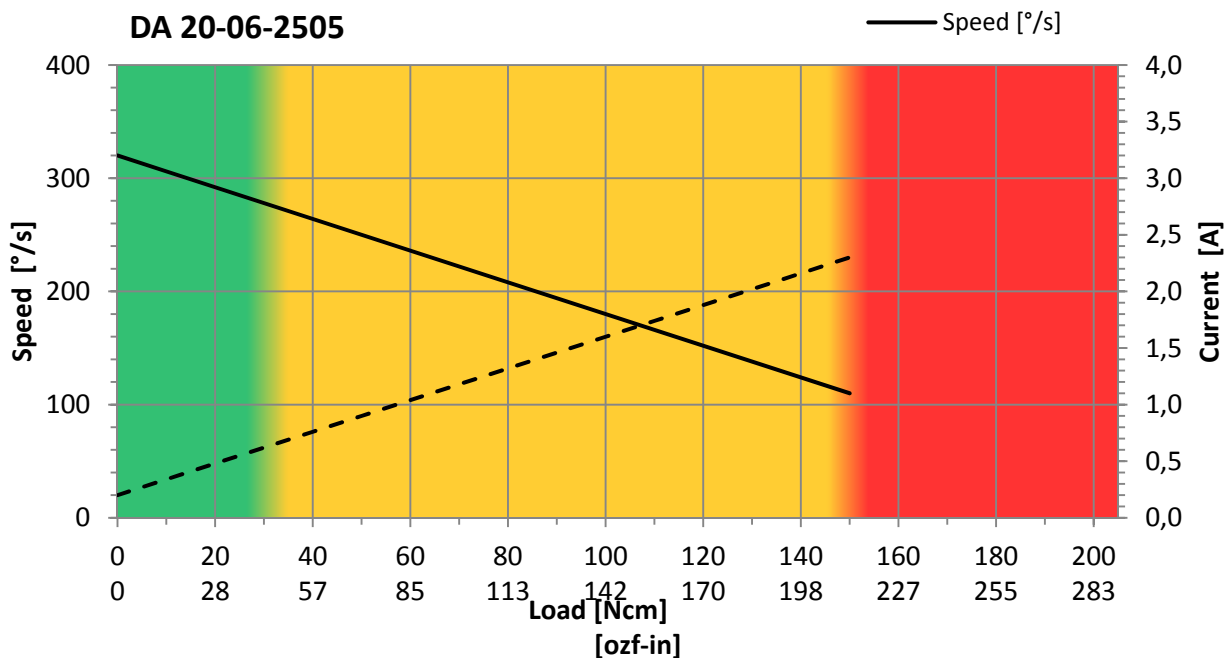
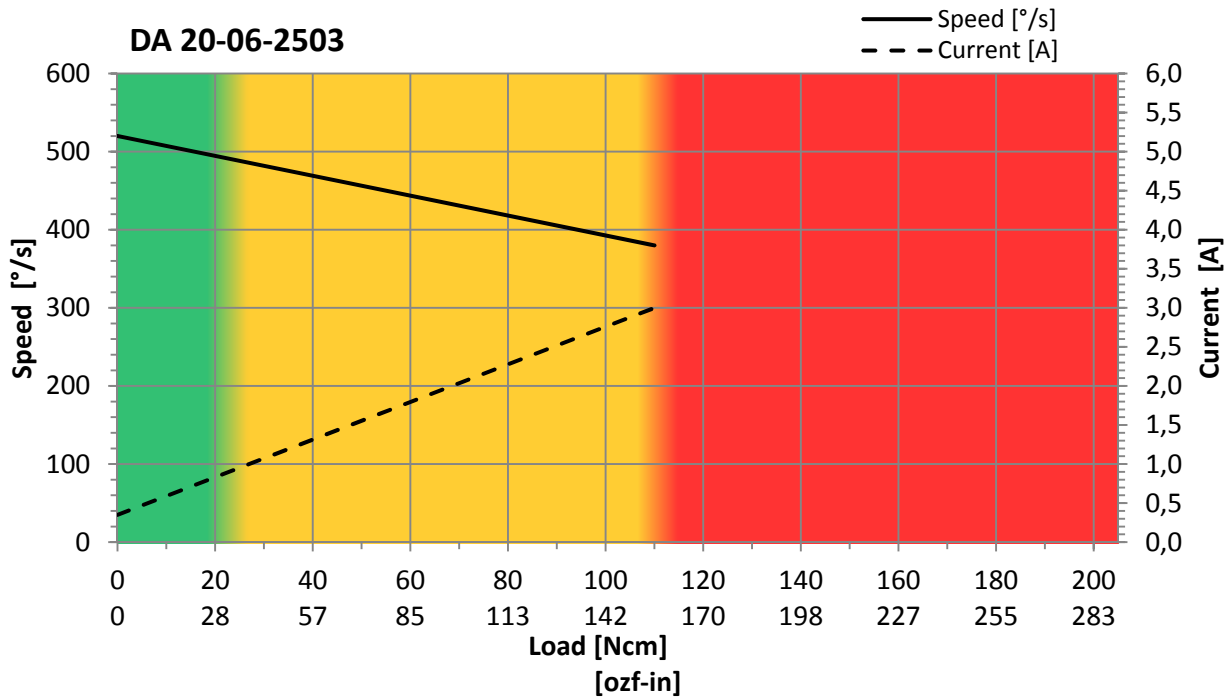
2) Programming Tool # 985.1 required

3) -20°C ... +50°C , Δt = 70°C (-4°F ... +122°F , Δt = 126°F)

* Stall operation not permissible

3. Performance

3.1. Performance 6V-Versions



Operation Mode:

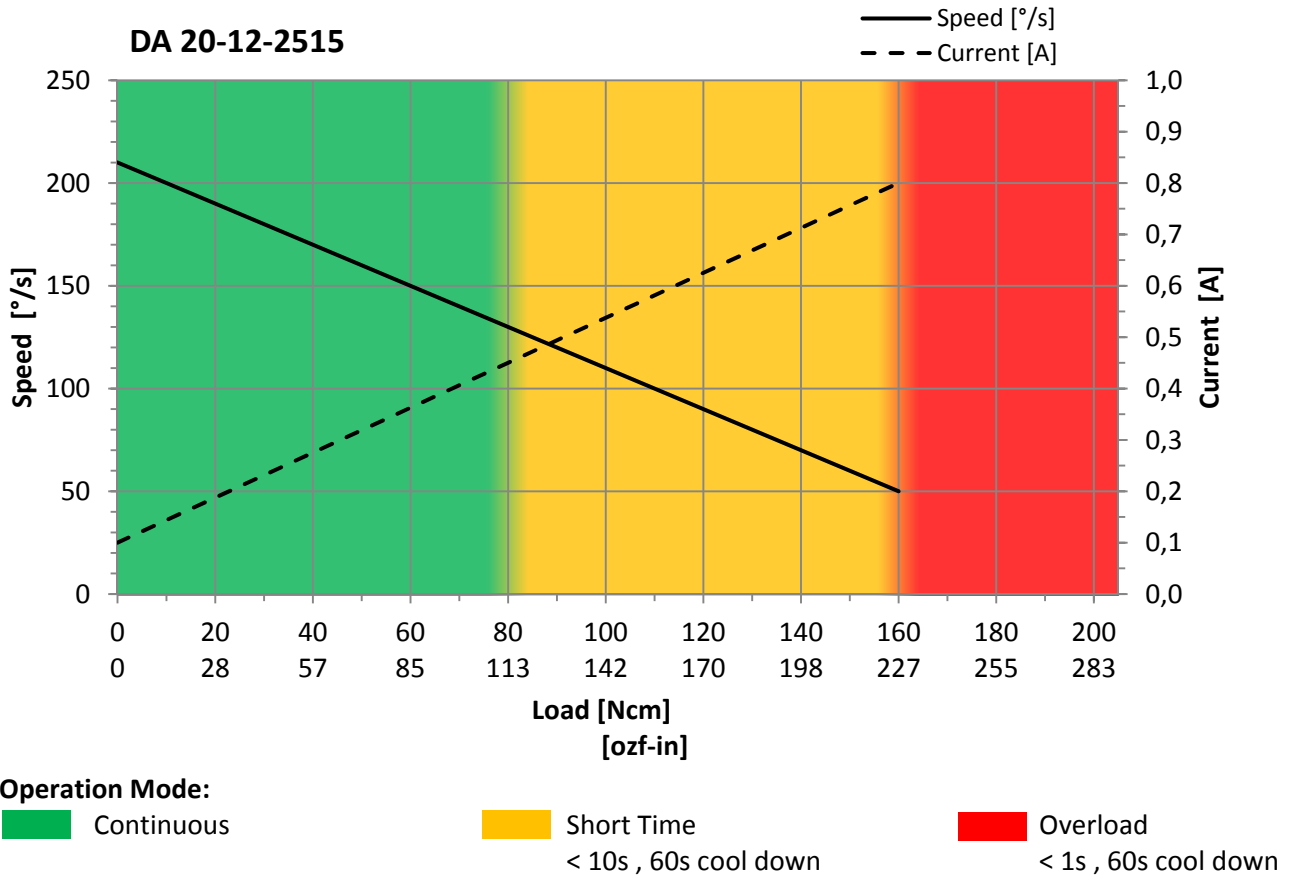
■ Continuous

■ Short Time
< 10s , 60s cool down

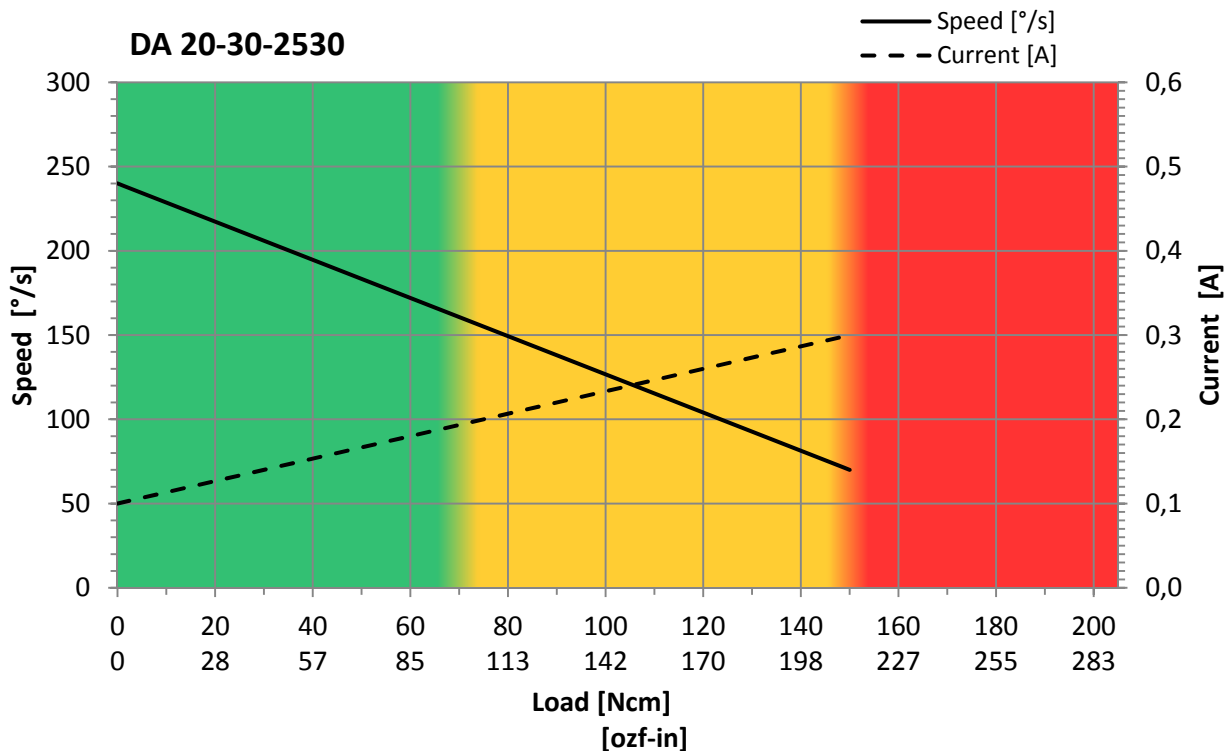
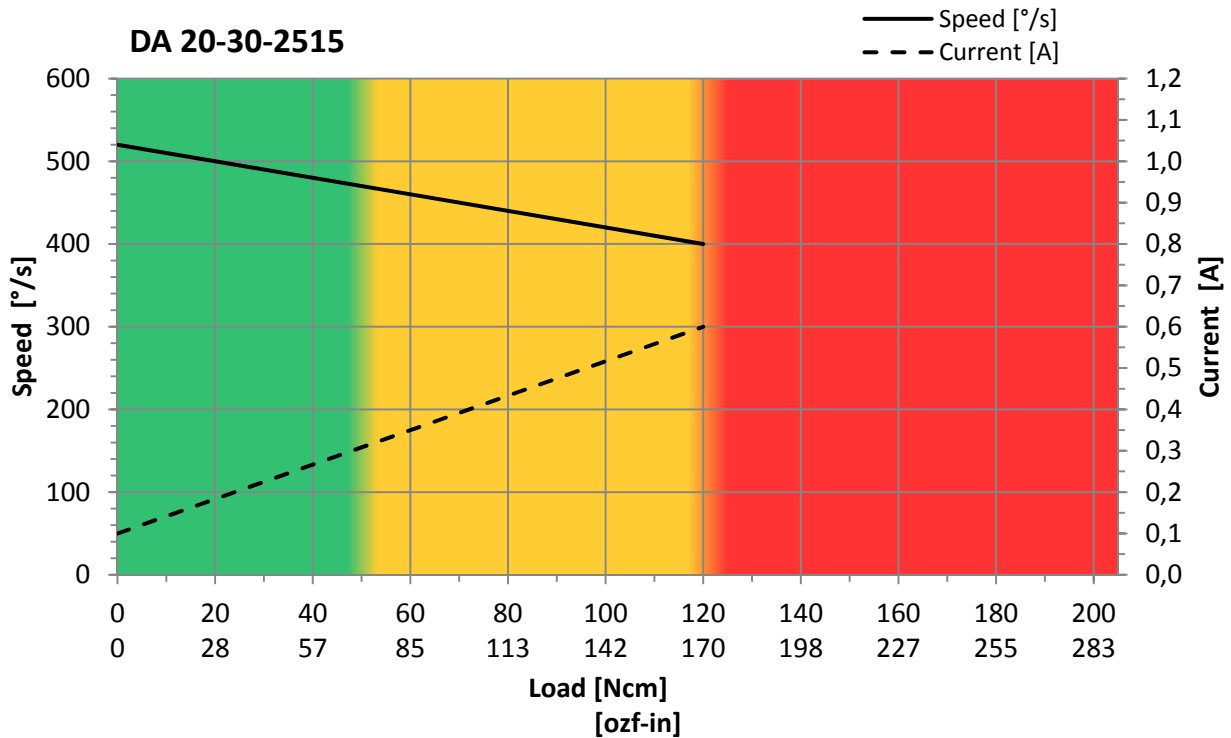
■ Overload
< 1s , 60s cool down

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

3.2. Performance 12V-Version



3.3. Performance 28V-Versions



Operation Mode:

■ Continuous

■ Short Time
< 10s , 60s cool down

■ Overload
< 1s , 60s cool down

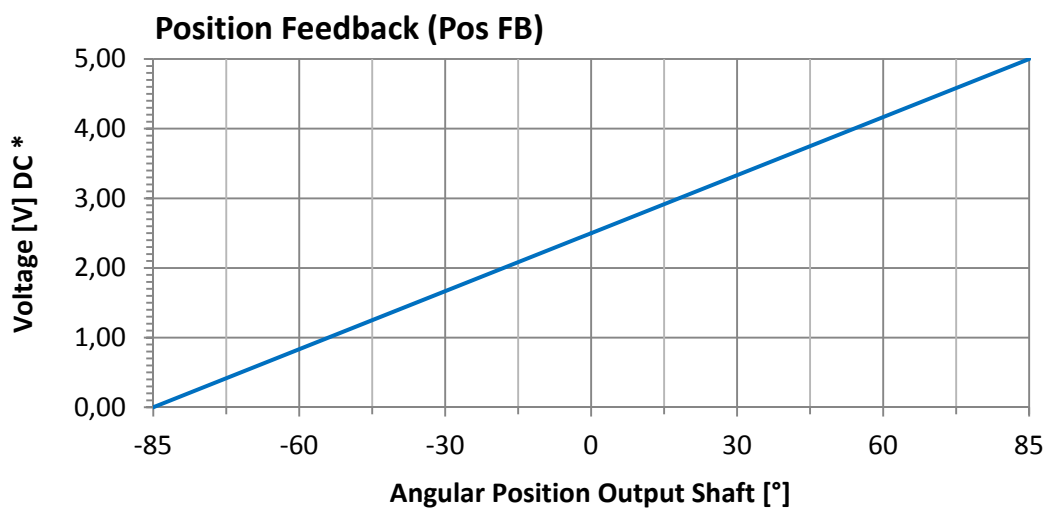
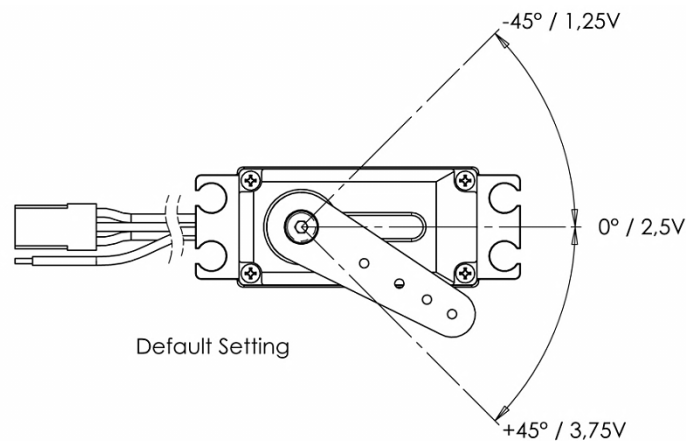
[Content is subject to change without notice](#)

4. PWM Command Signal

Signal Voltage	TTL-Level HIGH: min. 2.2V , max. 5.0V TTL-Level LOW: min. 0.0V , max. 0.8V
Frame Rate	7 ... 20 ms
Valid Pulse Lengths	0.8 ... 2.2 ms
Pulse Lengths for Position Left / Center / Right	1.0 / 1.5 / 2.0 ms
Resolution	< 1.0 μ s

4.1. Position Feedback Signal

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



* Tolerance \pm 5%

5. Materials and Protective Features

Valid for all Versions

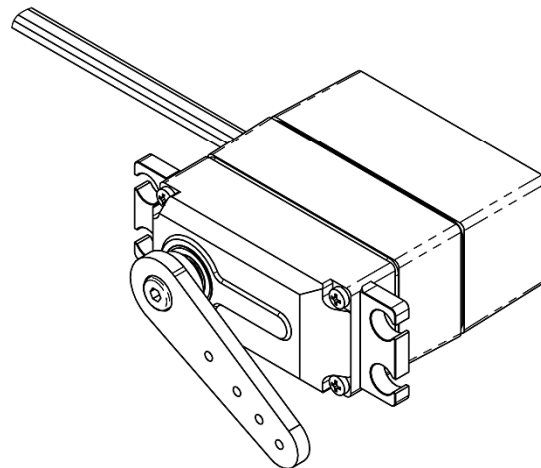
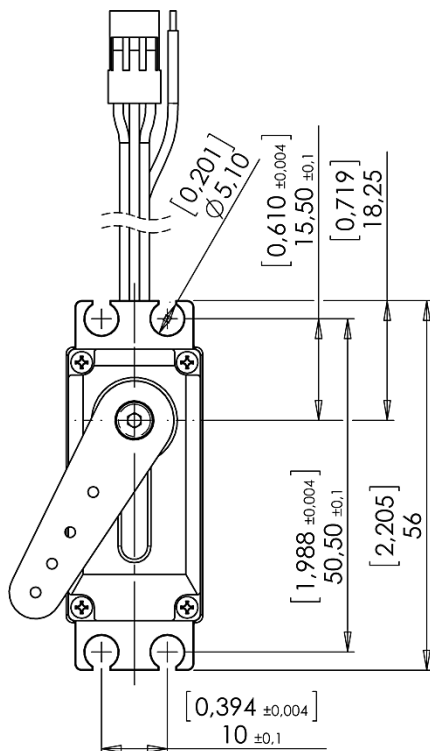
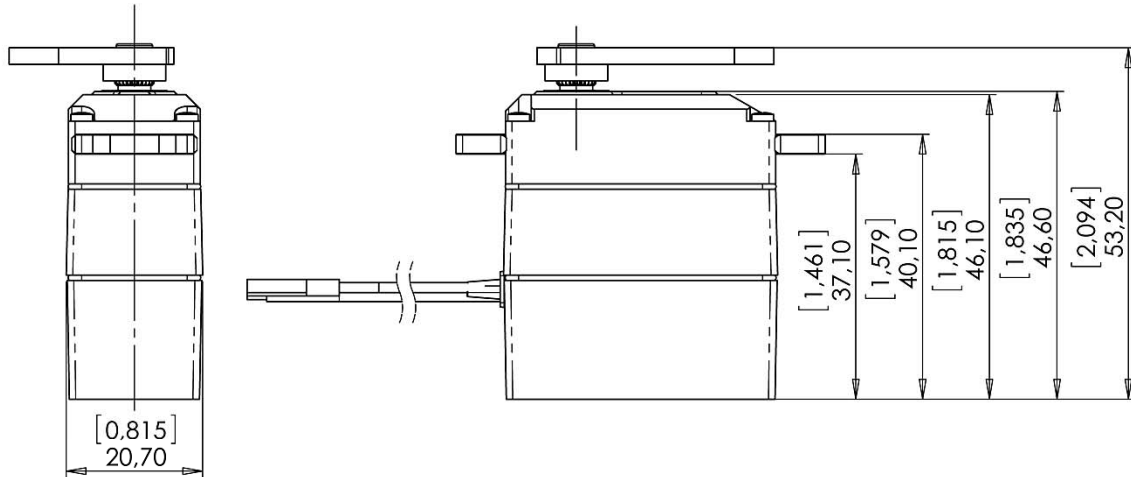
Case Material	Aluminum, Plastic Base
Splash Water Resistance	IP 51
Case Surface Treatment	not available
Salt Water Resistance	not available
EMI / RFI Shielding	not available
Motor Type	Brushed DC Motor
Gear Set Material	Hardened Steel
Position Sensor	Precision Potentiometer
ISS Gear Protection System	Optional
Position Feedback	Optional
Extended Travel Angle	Optional

6. Dimensions

Case Dimensions	41.6 mm x 46.1 mm x 20.7 mm ± 0.2 mm (1.638 in x 1.815 in x 0.815 in ± 0.008 in)
Weight	88g (3.1 oz) $\pm 10\%$

6.1. Installation Dimensions

Valid for all Versions



Not to scale

Dimensions [in] , mm

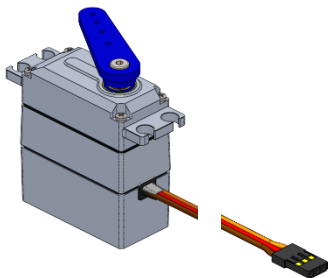

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7. Electrical Connection Options

Standard Connector

Item # DA 20._._.25._._.X._

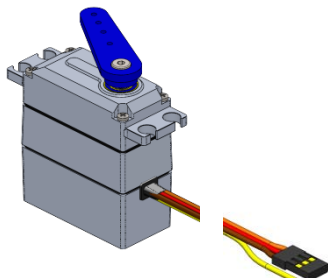
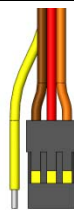
Leads Length 240mm (9.4in)

	 3 2 1	Standard Connector	
		Manufacturer	
		Type	similar to FCI Mini-PV 65039-034LF
	Mating	Standard PCB-Header 2.54mm (0.1in) Pitch	
	Pin Assignment		
1	Orange	SIG	Command Signal
2	Red	+V DC	Supply Voltage
3	Brown	GND	Supply Ground , Signal Ground

Standard Connector

Item # DA 20._._.25._._.P._

Leads Length 240mm (9.4in)

	 4 3 2 1	Standard Connector	
		Manufacturer	
		Type	similar to FCI Mini-PV 65039-034LF
	Mating	Standard PCB-Header 2.54mm (0.1in) Pitch	
	Pin Assignment		
1	Orange	SIG	Command Signal
2	Red	+V DC	Supply Voltage
3	Brown	GND	Supply Ground , Signal Ground
4	Yellow	Pos FB	Position Feedback

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8. Accessories

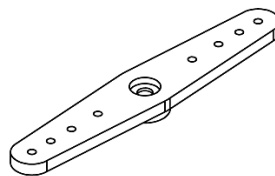
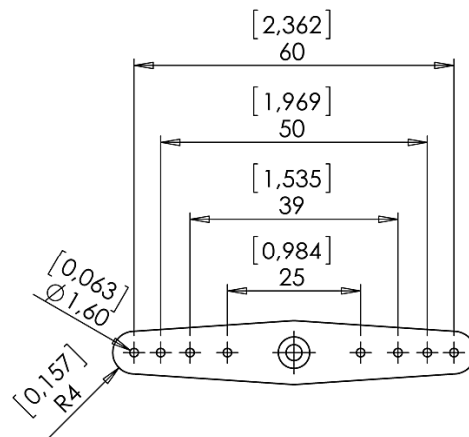
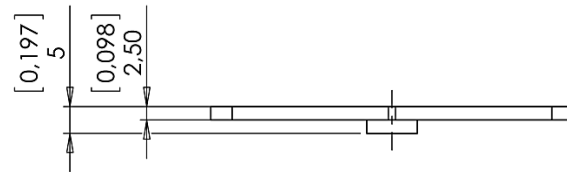
Item	Item-No.
Aluminum Servo Arm (double sided)	1641.20
Aluminum Servo Arm (single sided)	1641.21
Programming Tool DA 20	985.1

All accessories to be purchased separately.

8.1. Aluminum Servo Arm, double sided

1641.20

Valid for all Versions



Not to scale

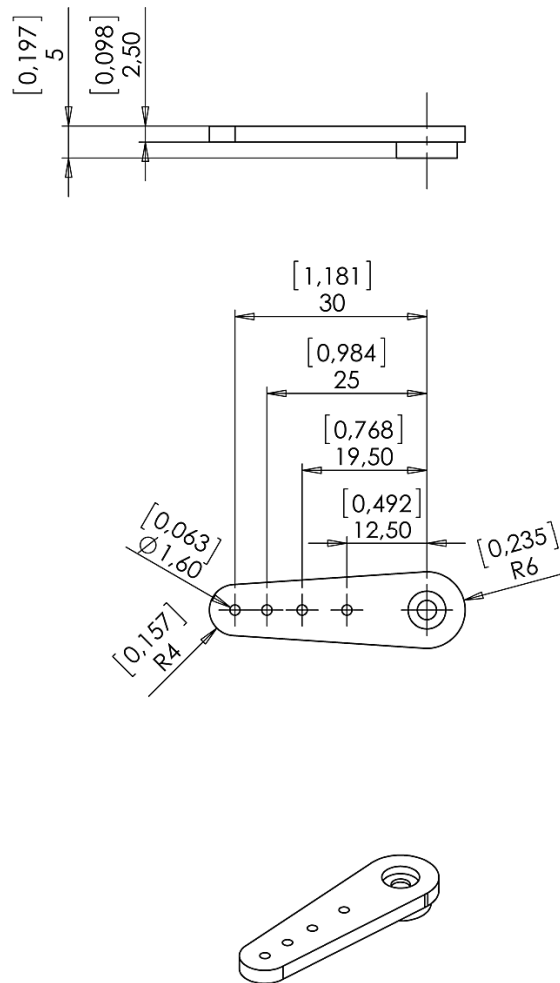
Dimensions [in] , mm

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8.2. Aluminum Servo Arm, single sided

1641.21

Valid for all Versions



Not to scale

Dimensions [in] , mm

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

9. Item Number System

DA	20	.	06	.	25	03	.	I	.	P	.	E
Servo Class		20mm Class						Extended Travel Angle		E integrated X without		
Supply Voltage		6 V DC 06 12 V DC 12 30 V DC 30						Position Feedback		P integrated X without		
				Servo Type				ISS Gear Protection System		I integrated X without		
				6 V 2503 6 V 2505 12 V 2515 30 V 2515 30 V 2530								



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