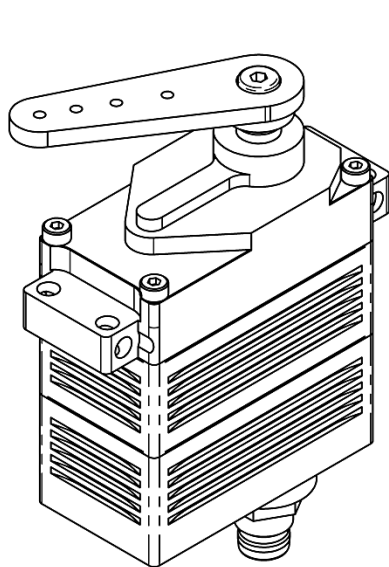
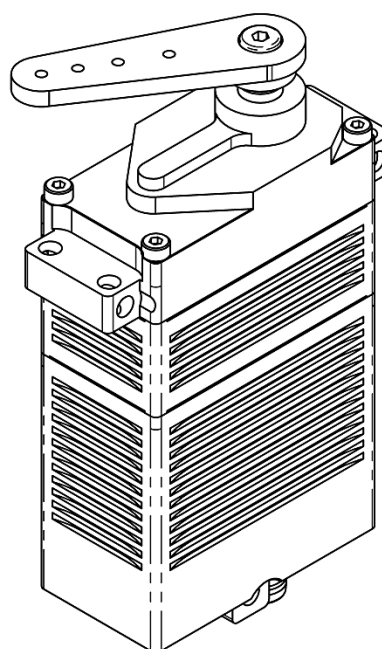


DA 22

Technical Specification



DA 22-12-2615
DA 22-30-2630



DA 22-12-4112
DA 22-30-4128

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1. General Description

We offer our DA 22 actuators in a short and a long case version - the longer being more powerful, i.e. offering higher continuous torque capabilities.

The CNC machined sealed cases, made of saltwater resistant aluminum, comply with the IP 67 standard for water/dust resistance and provide EMI/RFI shielding. All types of our DA 22 actuators use all steel gear trains with ISS gear protection system as an option and are fully programmable (motor overload protection, Fail Safe Position in case of PWM command signal lost, etc.). Integrated M8 round male connector (optional MIL specified connector or integrated shielded cable with screwed cable gland). The cases offer integrated lug mounts for both horizontal and vertical installation.

2. Operating Data

2.1. Operating Data 12V-Versions

	DA 22-12-2615...	DA 22-12-4112...
Supply Voltage (rated)	12 V DC	
Supply Voltage Range	10 ... 16 V DC	
Standby Current ¹ at rated voltage	< 0.1 A	< 0.1 A
Rated Current ¹ at rated voltage	0.4 A	0.75 A
Peak Current ¹ at rated voltage	0.8 A	1.7 A
Rated Torque ¹ at rated speed	80 Ncm (113 ozf-in)	120 Ncm (170 ozf-in)
Peak Torque ¹ at rated voltage	160 Ncm (226 ozf-in)	300 Ncm (424 ozf-in)
No Load Speed ¹ at rated voltage	210 °/s	250 °/s
Rated Speed ¹ at rated torque	120 °/s	180 °/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 ⁴	-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 # 985.3 (PWM) resp. # 985.8 (RS 485) required

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

4) Low Temperature Modification (-70°C /-94°F) on request

2.2. Operating Data 28V-Versions

		DA 22-30-2630...	DA 22-30-4128...
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	0.18 A	0.35 A
Peak Current ¹	at rated voltage	0.3 A	0.6 A
Rated Torque ¹	at rated speed	70 Ncm (99 ozf-in)	180 Ncm (255 ozf-in)
Peak Torque ¹	at rated voltage	150 Ncm (212 ozf-in)	300 Ncm (424 ozf-in)
No Load Speed ¹	at rated voltage	240 °/s	180 °/s
Rated Speed ¹	at rated torque	160 °/s	110 °/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 ⁴		-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 # 985.3 (PWM) resp. # 985.8 (RS 485) required

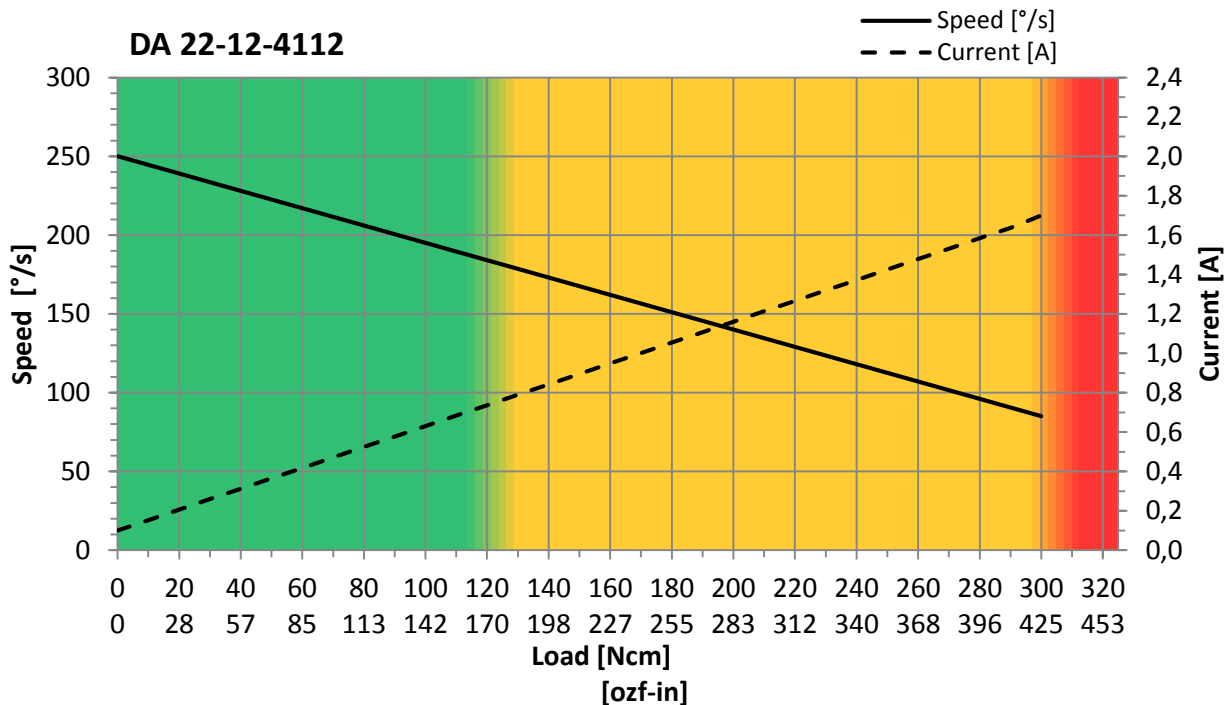
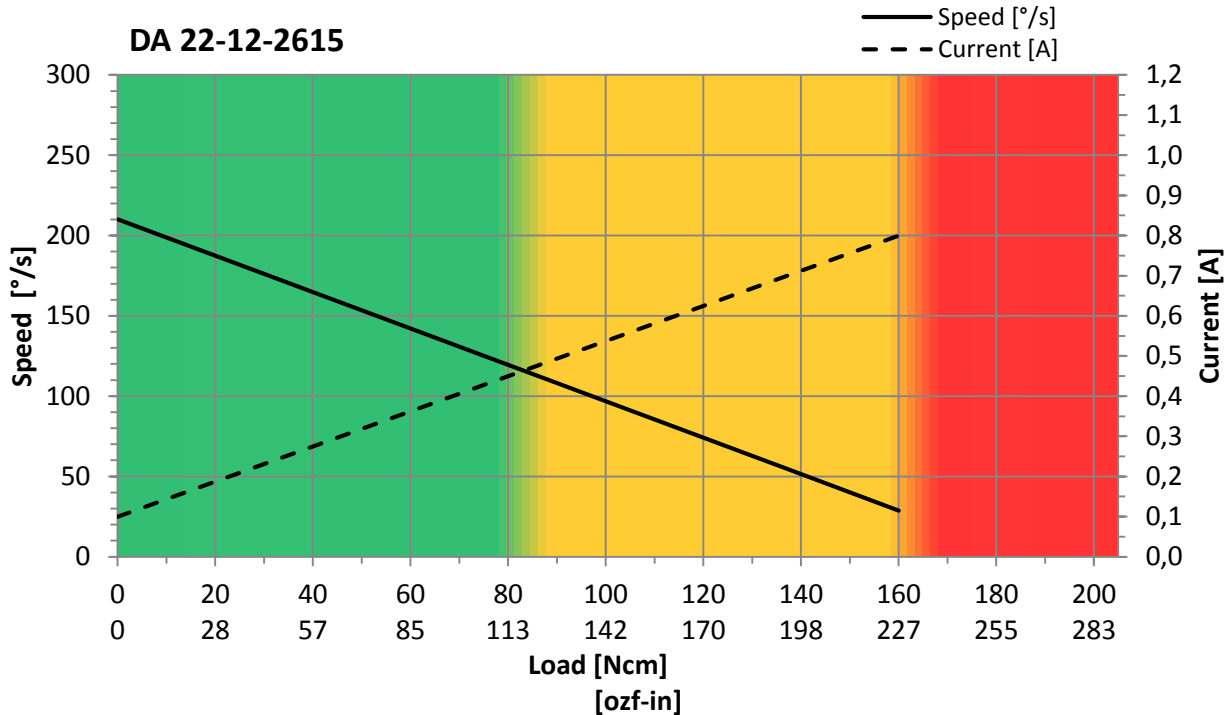
3) -20°C ... +50°C , Δt = 70°C (-4°F ... +122°F , Δt = 126°F)

4) Low Temperature Modification (-70°C /-94°F) on request

* Stall operation not permissible

3. Performance

3.1. Performance 12V-Versions



Operation Mode:

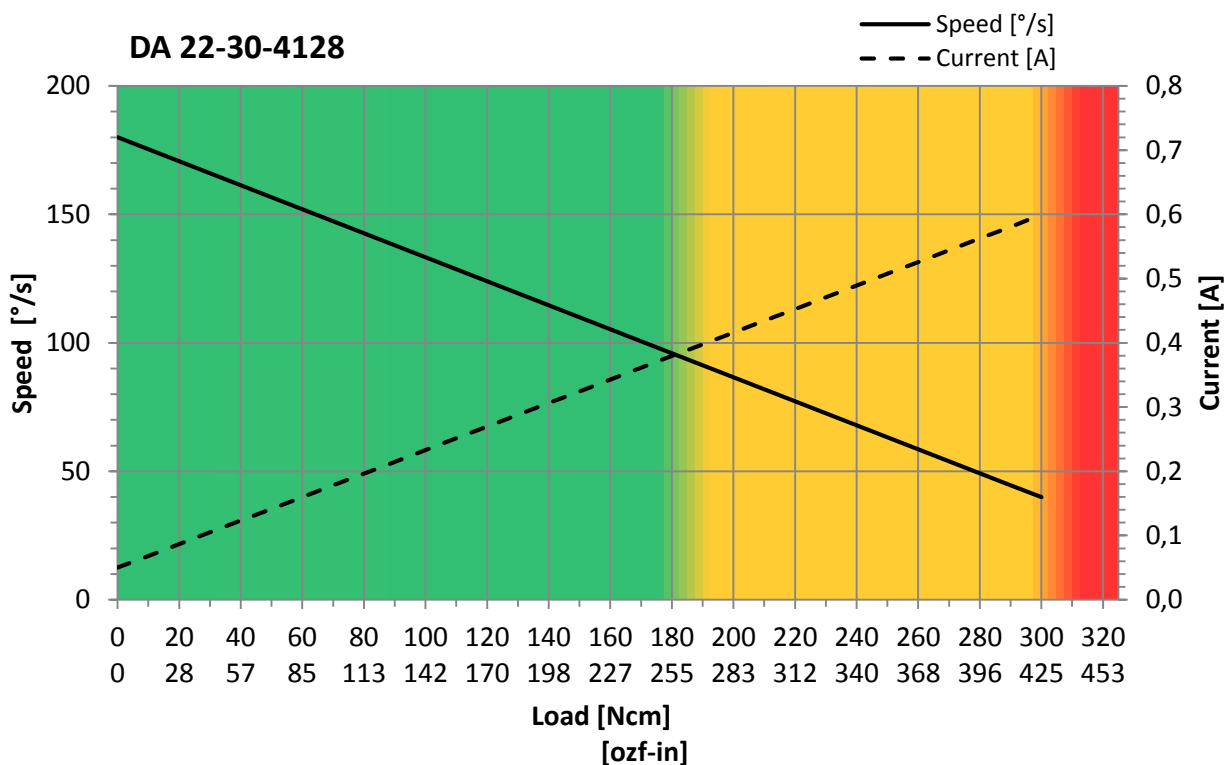
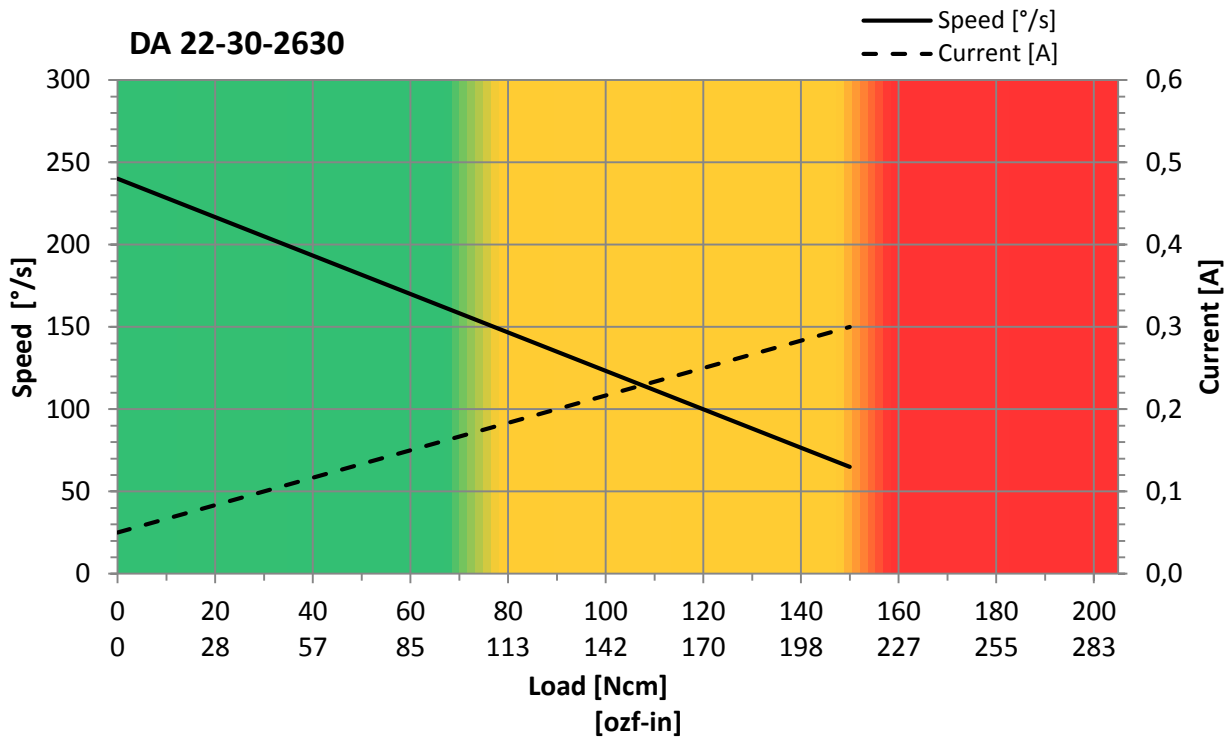
■ Continuous

■ Short Time
< 10s , 60s cool down

■ Overload
< 1s , 60s cool down

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3.2. 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. Command Signal

4.1. PWM Command Signal

Valid for all Versions with PWM Command Signal

PWM	DA 22-__-__-__-__-__-__-X-__
Signal Voltage	TTL-Level HIGH: min. 2.2V , max. 5.0V TTL-Level LOW: min. 0.0V , max. 0.8V
Frame Rate	2.6 ... 2000 ms
Valid Pulse Lengths	1.0 ... 2.0 ms
Pulse Lengths for Position Left / Center / Right	1.0 / 1.5 / 2.0 ms
Resolution	< 0.5 μ s

4.2. RS 485 Command Signal

Valid for all Versions with RS 485 Command Signal

RS 485	DA 22-__-__-__-__-__-__-R-__
Baud-Rate	115200 $\pm$ 1.5% bits/s
Protocol (Documentation available)	6 Byte (incl. 2 byte CRC)

4.3. RS 485 Protocol Specifications

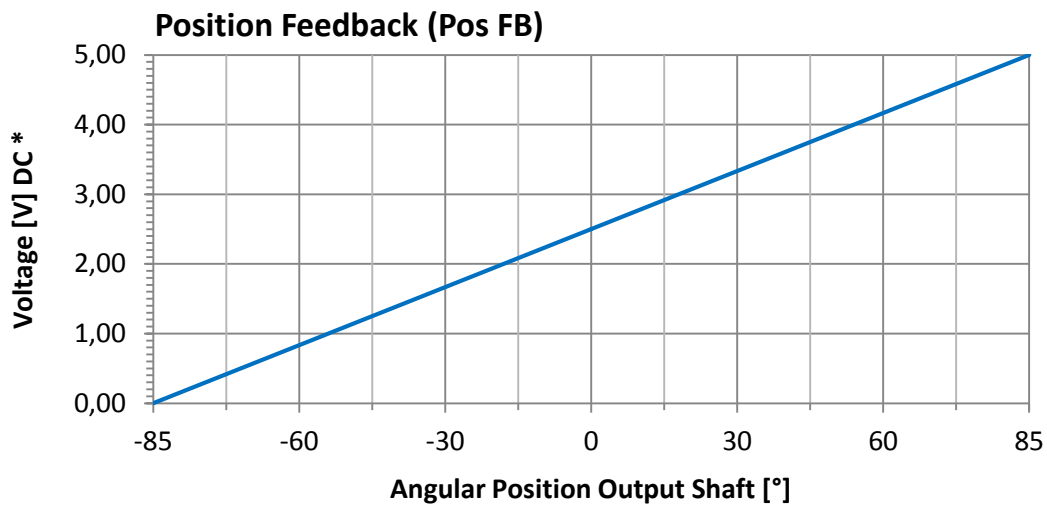
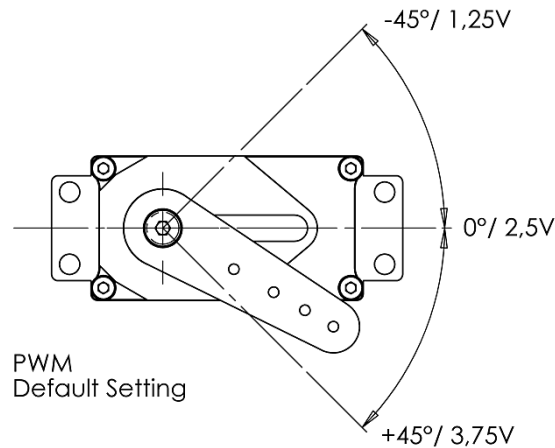
RS 485	DA 22-_-_-_-_-_-_-_-R-_-
Number of Data Bits	8
Number of Stop Bits	1 or 2
Parity	None

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

4.4. Position Feedback Signal (PWM Versions)

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 $\pm 5\%$

4.5. Position Feedback Value (RS 485 Versions)

Integrated in the RS 485 protocol a Position Feedback Value is available, representing the output shaft's angular position. Value readout by sending a request command. Detailed information is provided in the RS 485 documentation.

5. Materials and Protective Features

Case Material	Saltwater resistant Aluminum Alloy
Splash Water Resistance	IP 67 , waterproof to 1m depth
Salt Water Resistance	Case Material
EMI / RFI Shielding	Case Shielding
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
RS 485 Communication Interface	optional
Shielded Connecting Cable	Optional
MIL specified electrical Connector	Optional

6. Dimensions

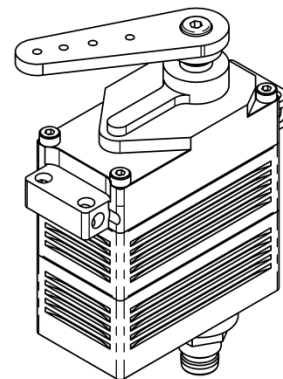
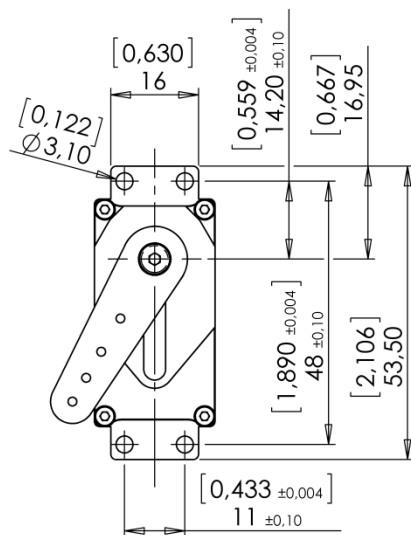
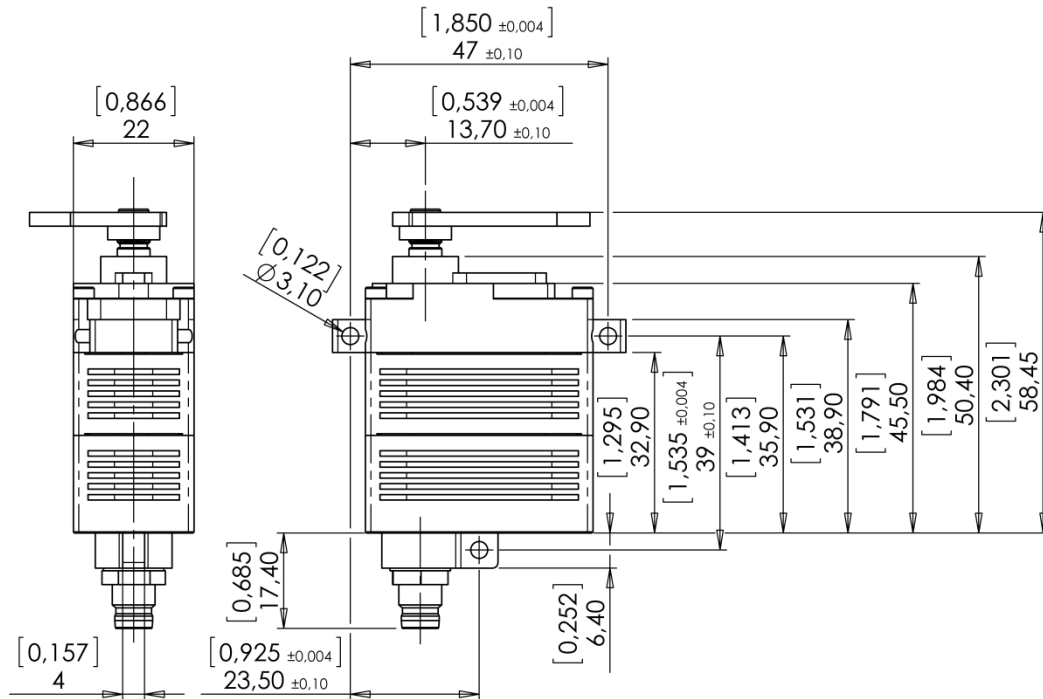
	DA 22-__-26-__...
Case Dimensions	41.5 mm x 45.5 mm x 22.0 mm ± 0.2 mm (1.634 in x 1.791 in x 0.866 in ± 0.008 in)
Weight	105g (3.70oz) $\pm 10\%$

	DA 22-__-41-__...
Case Dimensions	41.5 mm x 65.9 mm x 22.0 mm ± 0.2 mm (1.634 in x 2.594 in x 0.866 in ± 0.008 in)
Weight	132g (4.66oz) $\pm 10\%$

6.1. Installation Dimensions

Standard M8 Connector

DA 22...26...M8



Not to scale

Dimensions [in] , mm

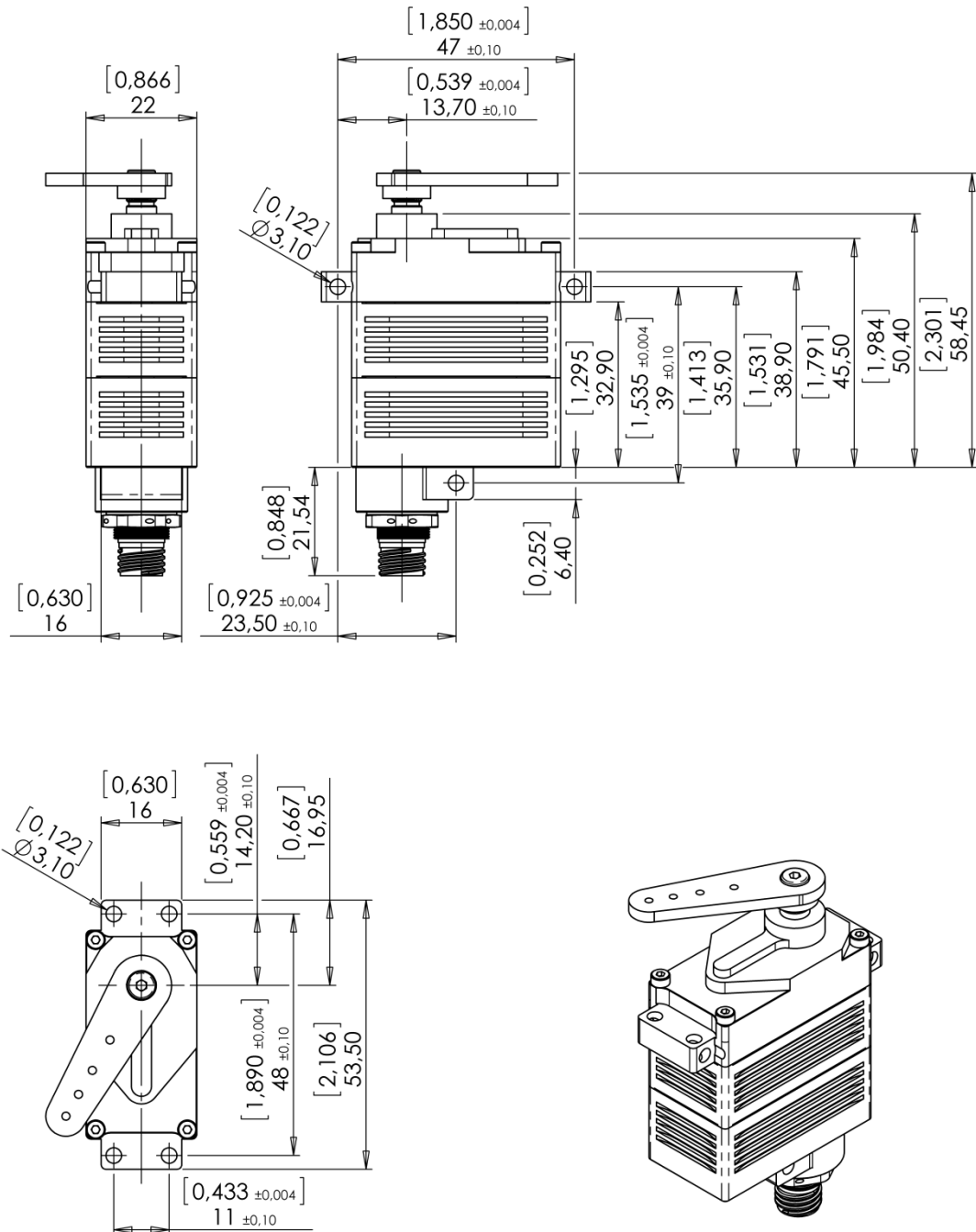
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Date: 10/2015

Revision: C (revised)

MIL-specified electrical Connector

DA 22. __.26 __. __. __. __. __. MM



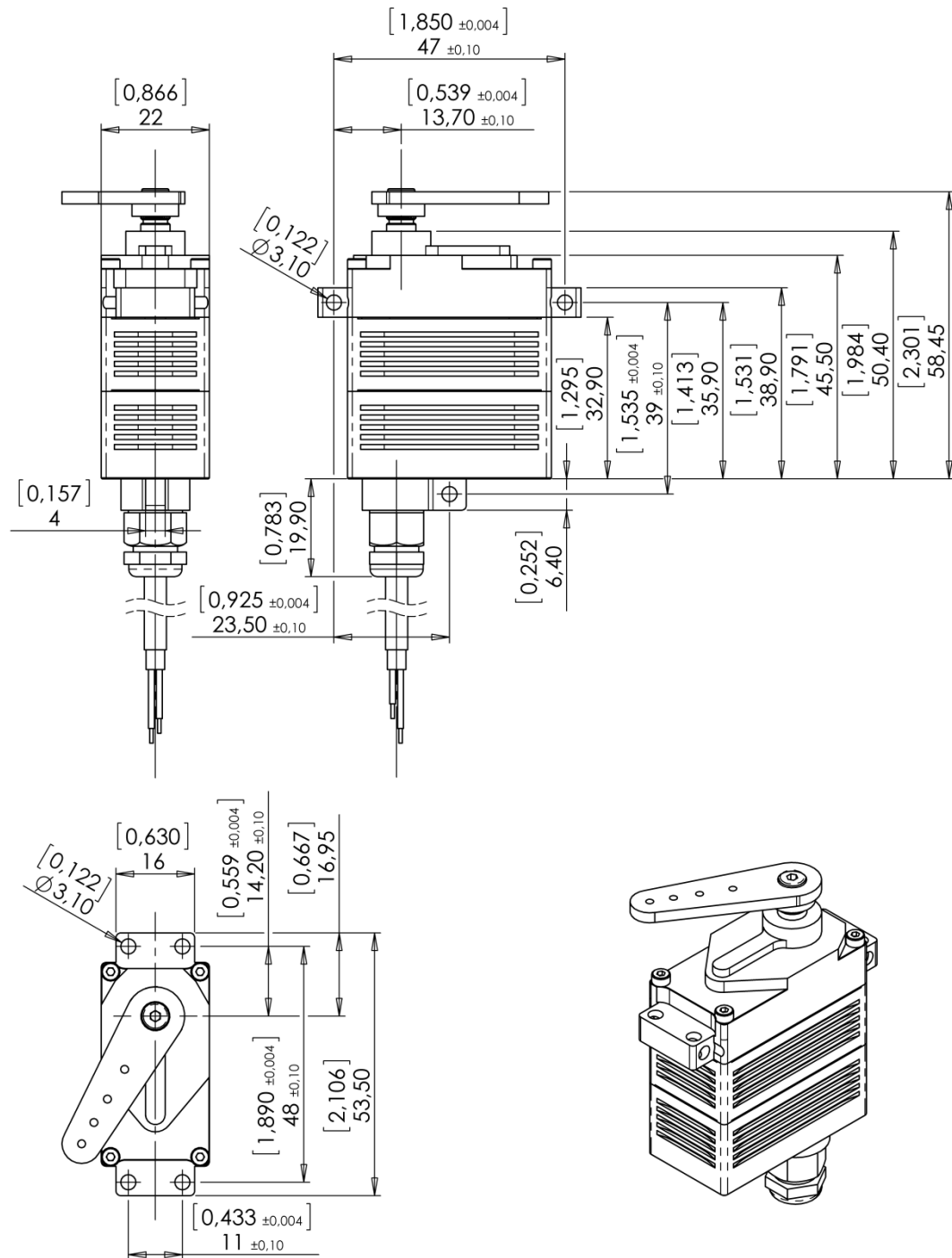
Not to scale

Dimensions [in] , mm

Content is subject to change without notice

Cable Gland with Shielded Cable

DA 22...26...SC...



Not to scale

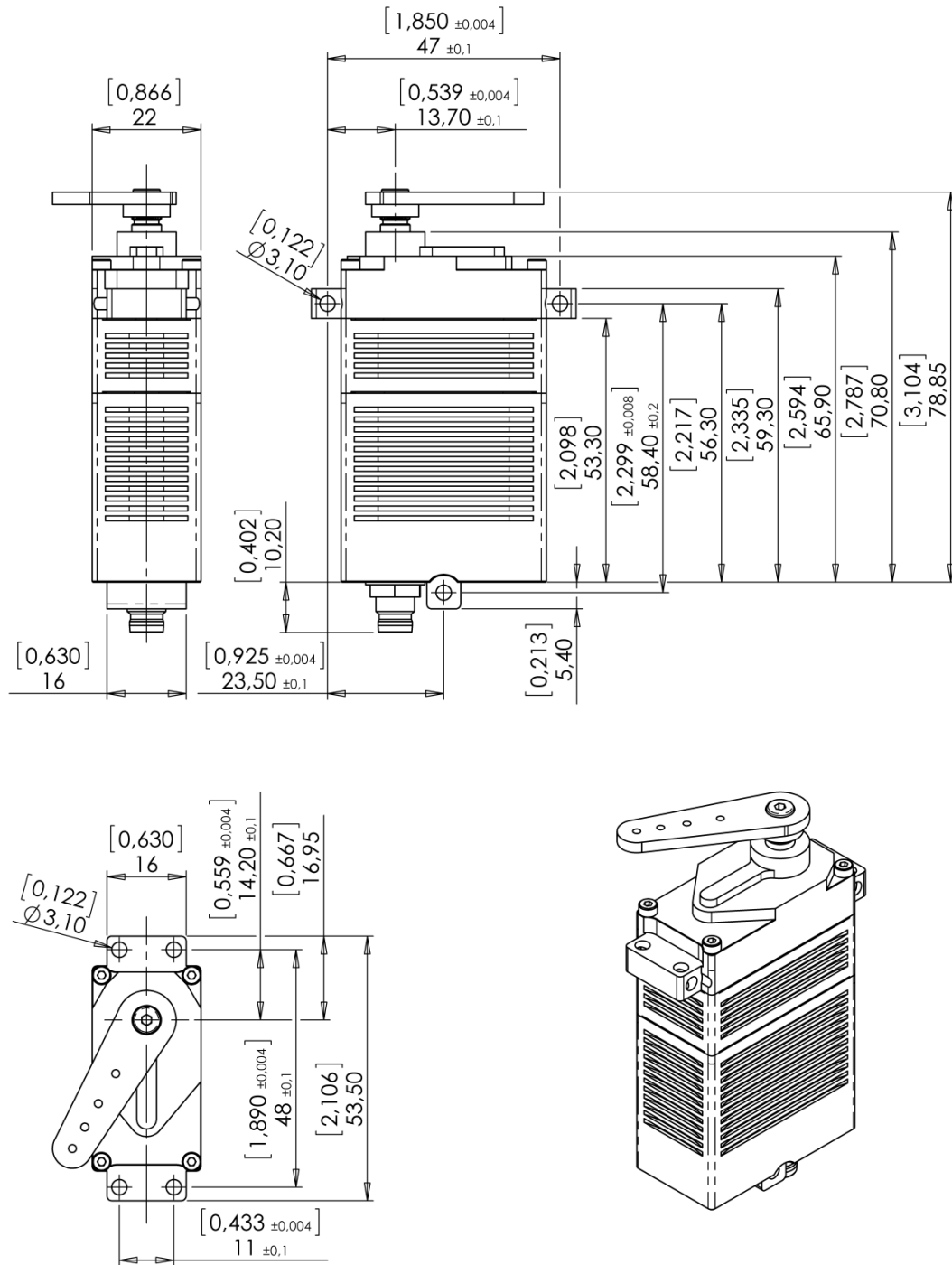
Dimensions [in] , mm

Content is subject to change without notice

Date: 10/2015

Revision: C (revised)

Standard M8 Connector
DA 22. __.41 __. __. __. __. M8



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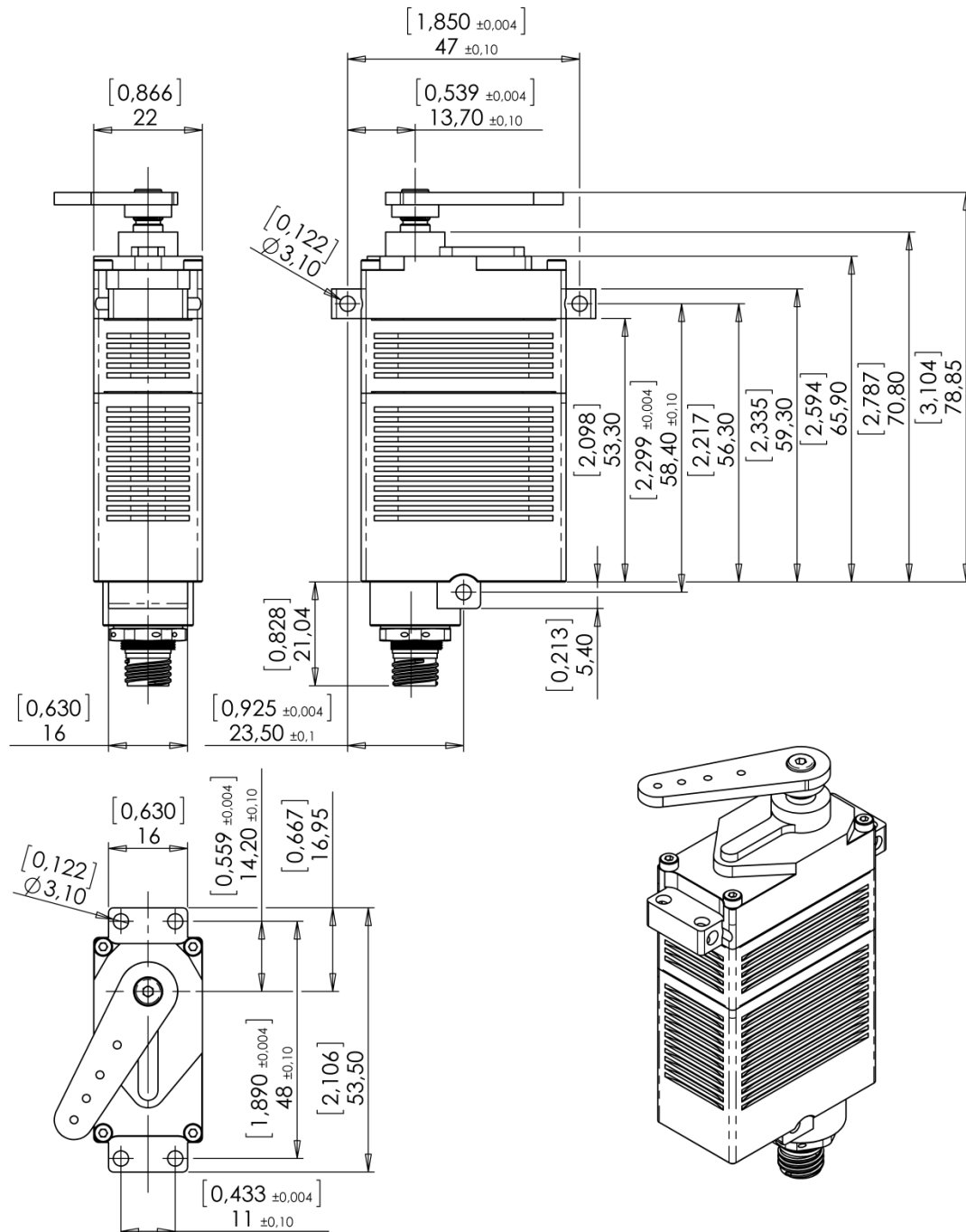
Dimensions [in] , mm

Content is subject to change without notice

Date: 10/2015

Revision: C (revised)

DA 22. __.41 __. __. __. __. __. MM

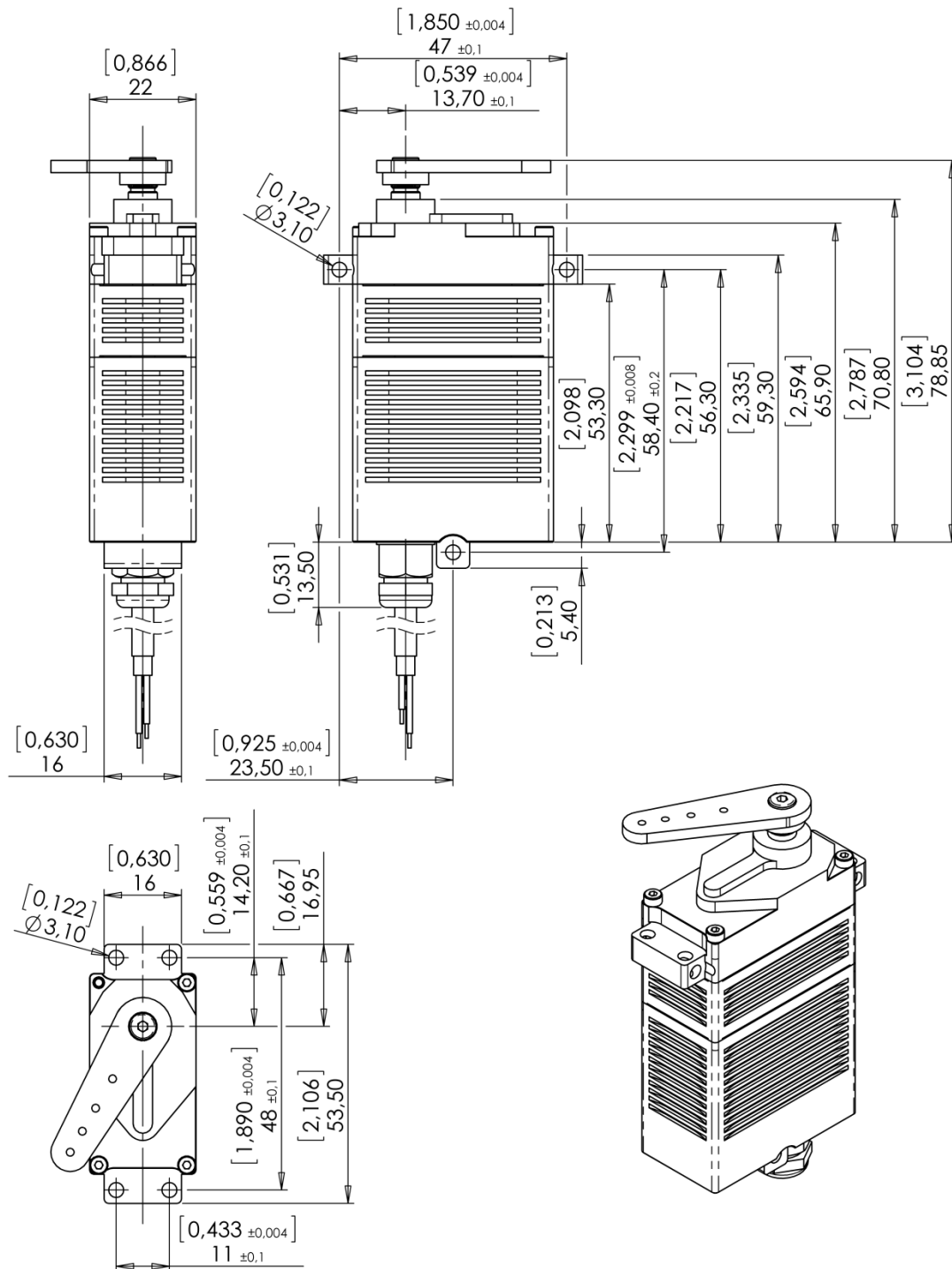


Not to scale

Dimensions [in] , mm

Content is subject to change without notice

Cable Gland with Shielded Cable
DA 22...41...SC...



Not to scale

Dimensions [in] , mm

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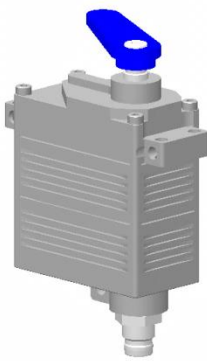
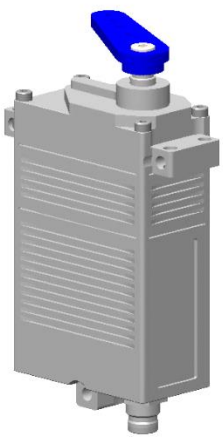
Date: 10/2015

Revision: C (revised)

Electrical Connection Options

Integrated M8 electrical Connector

Item # DA 22. _ _ . _ _ _ _ _ . _ _ _ _ . M8

M8 electrical Connector		
		Manufacturer Franz Binder GmbH & Co.
		Type Series 768 / 718, No. 09-3391-81-04
		Mating No. 77-3406-0000-20004-0200 No. 79-3386-42-04
	PWM Pin Assignment	
	1	+V DC Supply Voltage
	2	Pos FB Position Feedback Signal
	3	GND Supply Ground , Signal Ground
	4	SIG Command Signal
	RS 485 Pin Assignment	
	1	+V DC Supply Voltage
	2	RS 485 A Non Inverting RS 485 Input / Output (A)
	3	GND Supply Ground, Interface Ground
	4	RS 485 B Inverting RS 485 Input / Output (B)

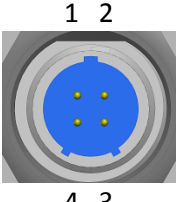
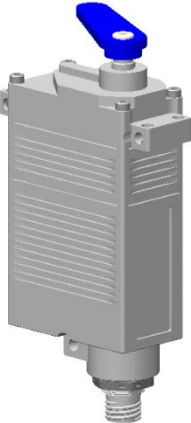
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Dimensions [in] , mm

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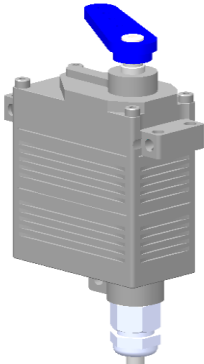
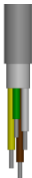
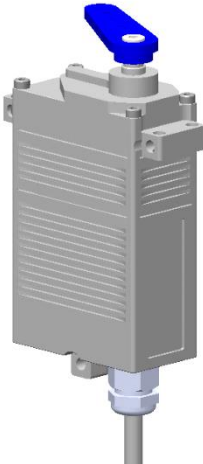
Integrated MIL-specified electrical Connector

Item # DA 22. _ _ . _ _ _ _ _ . _ _ . _ _ . MM

MIL-specified electrical Connector		
	1 2	Manufacturer Glenair Inc.
	4 3	Type # 801-011-07M6-4PA
	Mating	# 801-007-16M6-4SA , # 801-008-16M6-4SA
	PWM Pin Assignment	
	1	SIG Command Signal
	2	GND Supply Ground , Signal Ground
	3	Pos FB Position Feedback Signal
	4	+V DC Supply Voltage
	RS 485 Pin Assignment	
	1	+V DC Supply Voltage
	2	RS 485 A Non Inverting RS 485 Input / Output (A)
	3	GND Supply Ground, Interface Ground
	4	RS 485 B Inverting RS 485 Input / Output (B)

Integrated Cable Gland with 250mm (10in) Cable ⁵

Item # DA 22. _ _ . _ _ _ _ _ . _ _ . _ _ . SC250

	Cable Gland			
		Cable Type	LiYCY	
		Wire Gauge	3x0.25mm ² / 4x0.25mm ² (Pos FB)	
	PWM Pin Assignment			
	1	Green	+V DC	Supply Voltage
	2	Brown	GND	Supply Ground , Signal Ground
	3	White	SIG	Command Signal
	4	Yellow	Pos FB	Position Feedback Signal
	RS 485 Pin Assignment			
	1	Green	+V DC	Supply Voltage
	2	Brown	GND	Supply Ground, Interface Ground
	3	White	RS 485 A	Non Inverting RS 485 Input / Output (A)
	4	Yellow	RS 485 B	Inverting RS 485 Input / Output (B)

5) Custom cable length available. Replace „250“ in item # with required length in Millimeter.

NOTE: Shielding is not connected to case ground!

7. Accessories

Item	Item-No.
Aluminum Servo Arm (double sided)	1641.20
Aluminum Servo Arm (single sided)	1641.21
Aluminum Mounting Frame (DA 22-__-41...)	1641.30 incl. Hardware
Aluminum Mounting Frame (DA 22-__-26...)	1641.31 incl. Hardware
Connecting Cable, straight connector, 200cm (78in) ⁶	120.200
Connecting Cable, angular connector, 200cm (78in) ⁷	121.200
Programming Tool PWM	985.3
Programming Tool RS-485	985.8

6) Binder Series 718 , No. 79-3382-42-04, 4x0.25mm², open Leads

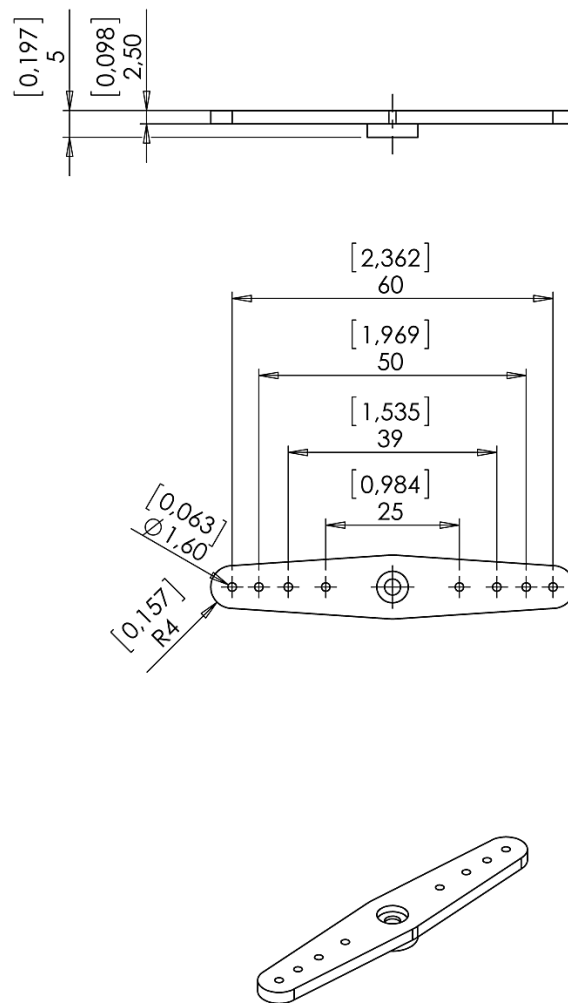
7) Binder Series 718 , No. 79-3384-42-04, 4x0.25mm², open Leads

All accessories to be purchased separately.

7.1. Aluminum Servo Arm, double sided

1641.20

Valid for all Versions



Not to scale

Dimensions [in] , mm

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

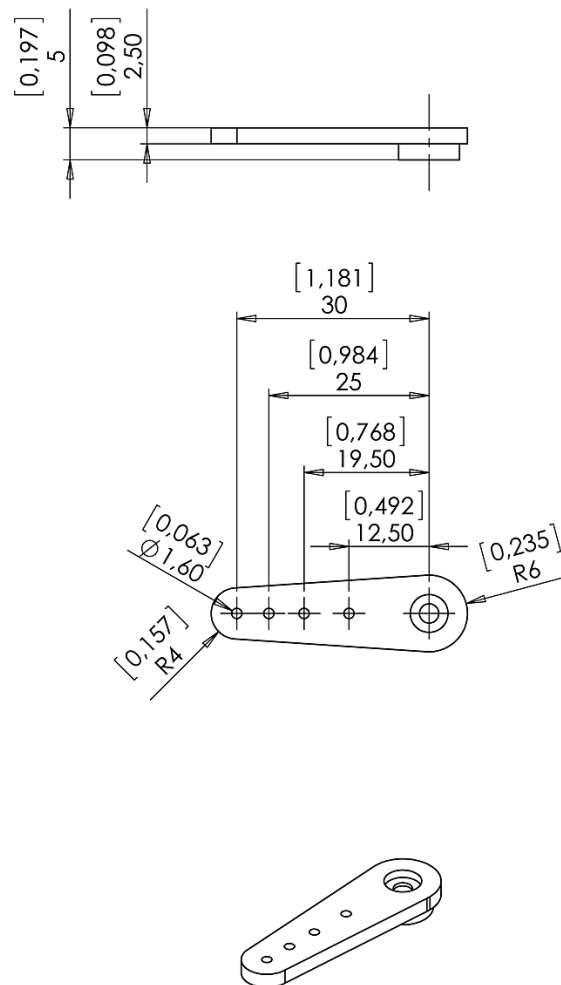
Date: 10/2015

Revision: C (revised)

7.2. Aluminum Servo Arm, single sided

1641.21

Valid for all Versions



Not to scale

Dimensions [in] , mm

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

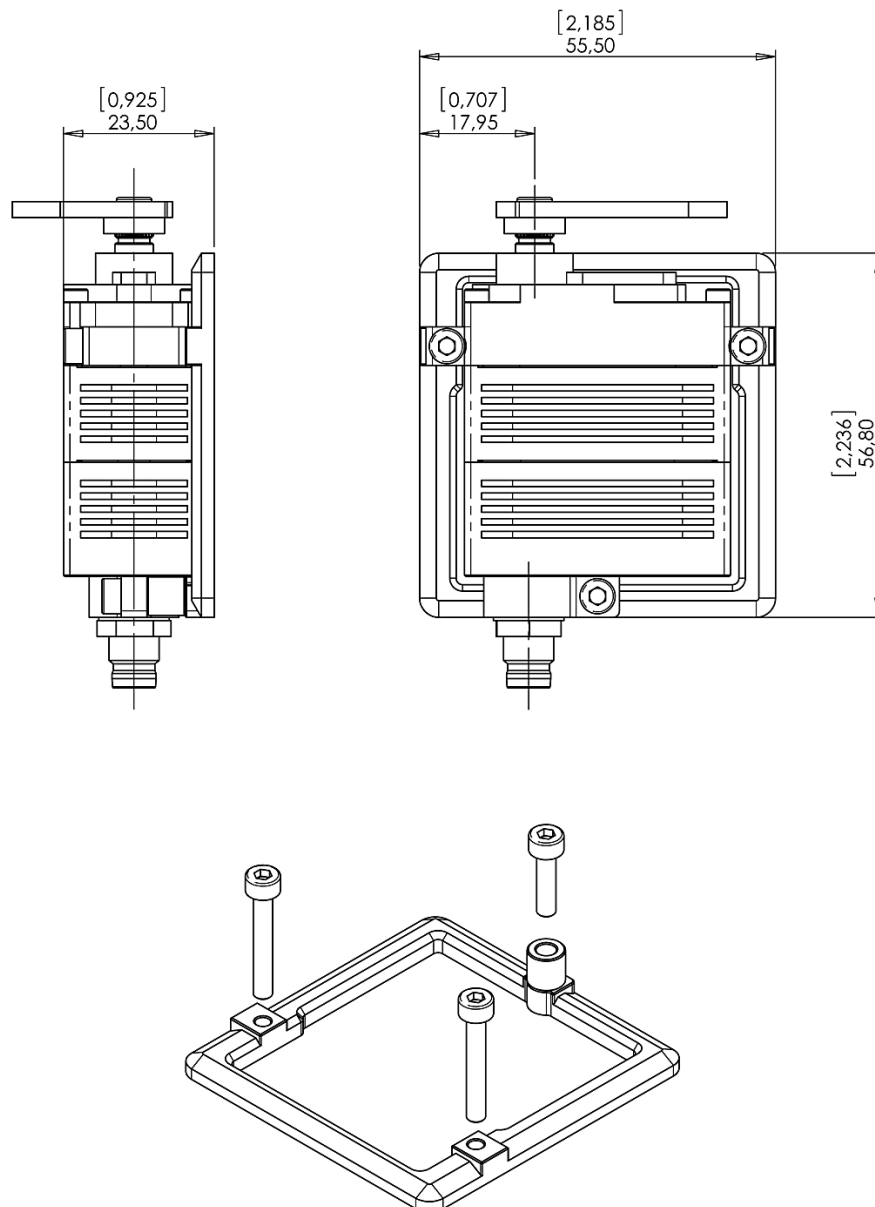
Date: 10/2015

Revision: C (revised)

7.3. Aluminum Mounting Frame

1641.31

Valid for DA 22-__-26-__...



Mounting Frame shown with installed actuator

Not to scale

Dimensions [in] , mm

Content is subject to change without notice

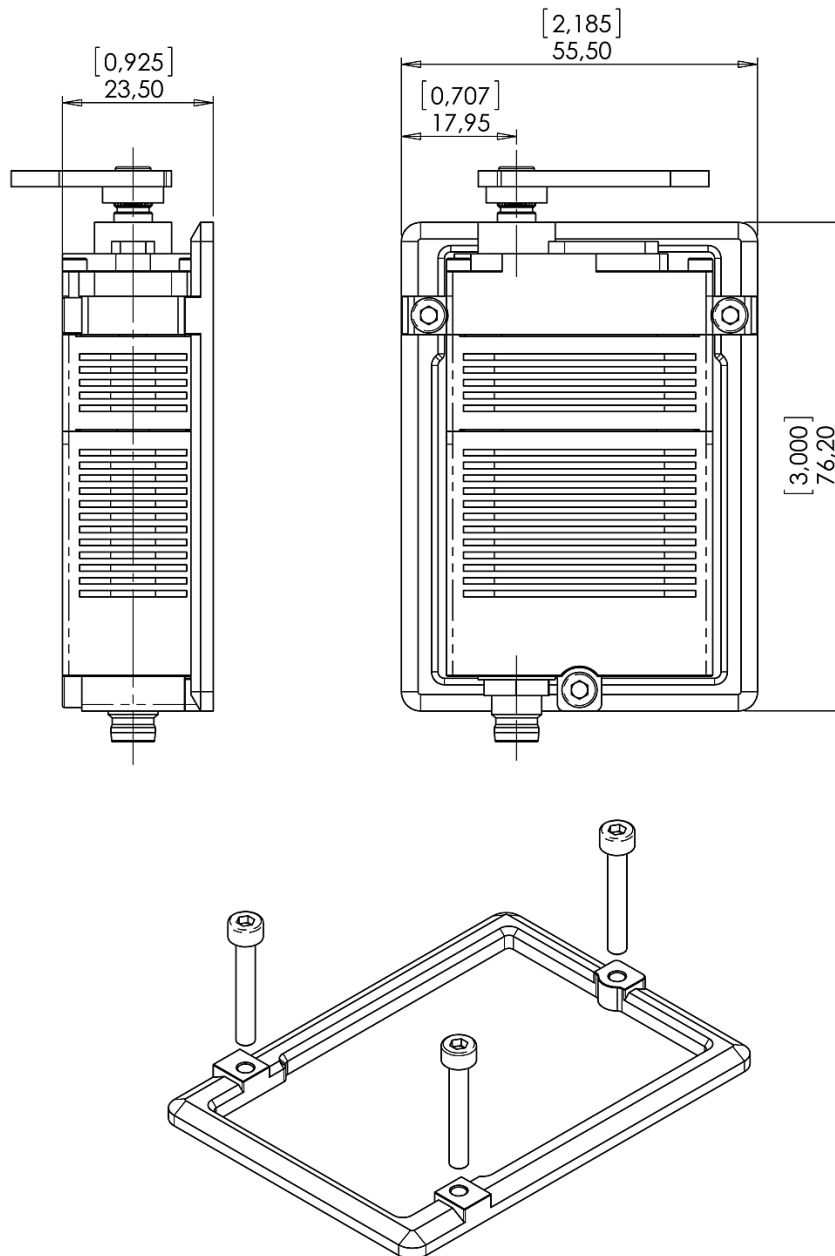
Date: 10/2015

Revision: C (revised)

7.4. Aluminum Mounting Frame

1641.30

Valid for DA 22-__-41-__...



Mounting Frame shown with installed actuator

Not to scale

Dimensions [in] , mm

Content is subject to change without notice

Date: 10/2015

Revision: C (revised)

8. Item Number System

DA 22 . 12 . 26 15 . I . P . E . R . M8

Servo Class

22mm Class

Supply Voltage

12 V DC 12
30 V DC 30

Servo Type

12 V 2615
12 V 4112

30 V 2630
30 V 4128

Electrical Connection

M8 Standard Connector
MM MIL spec. GLENAIR Mighty Mouse Connector
SC250 Cable Gland, Shielded Cable 250mm (10 in)

Command Interface

R RS 485
X PWM

Extended Travel Angle

E integrated
X without

Position Feedback

P integrated
X without

ISS Gear Protection System

I integrated
X without



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