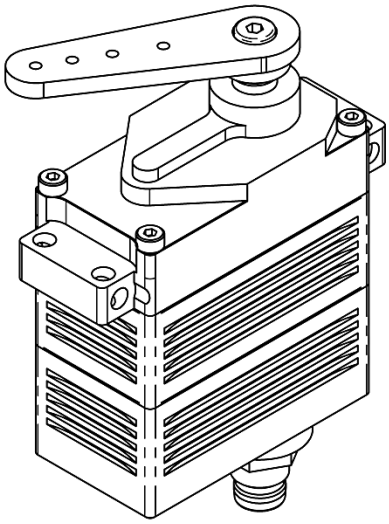
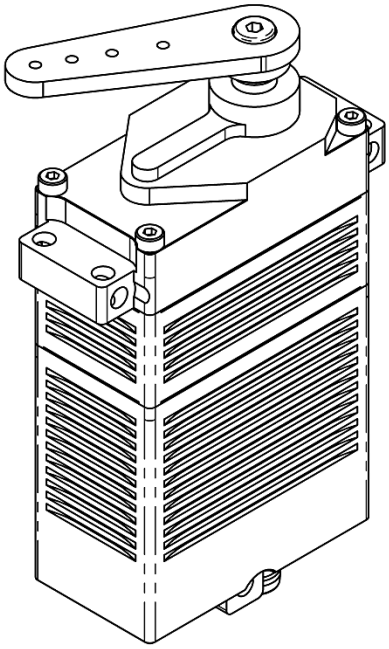
DA 22
Technical Specification





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

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

 www.volz-servos.com

Content

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

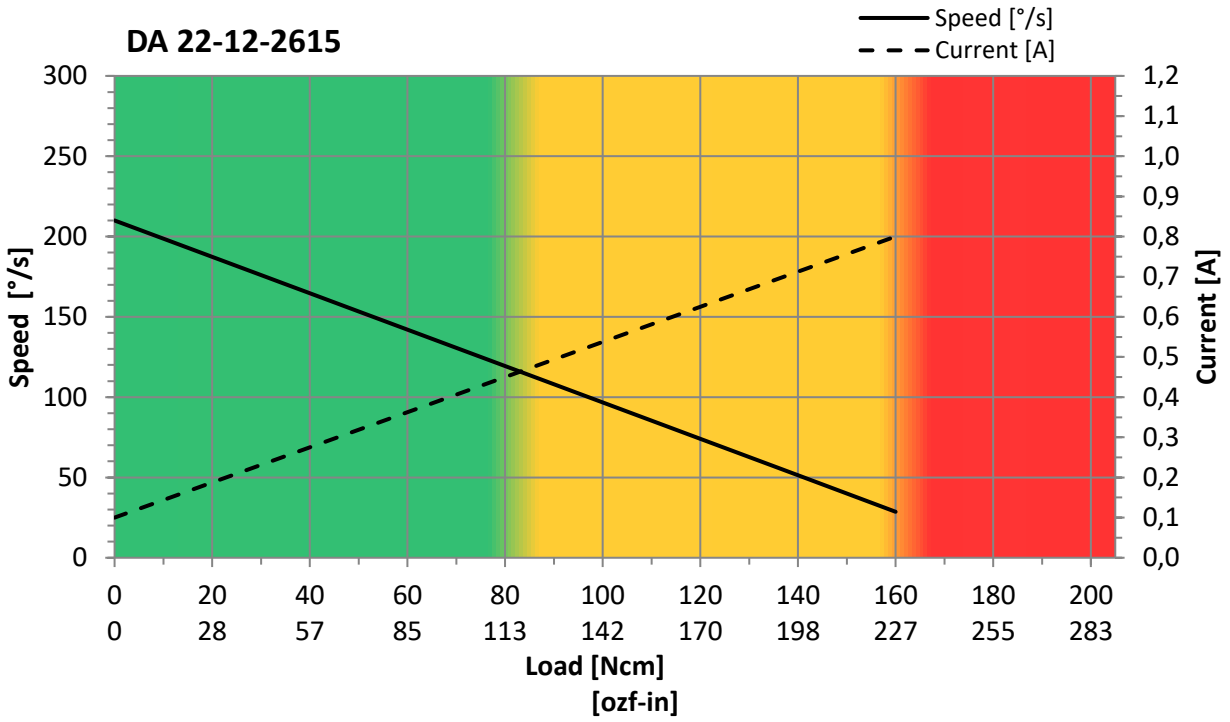
2.2. Operating Data 28V-Versions

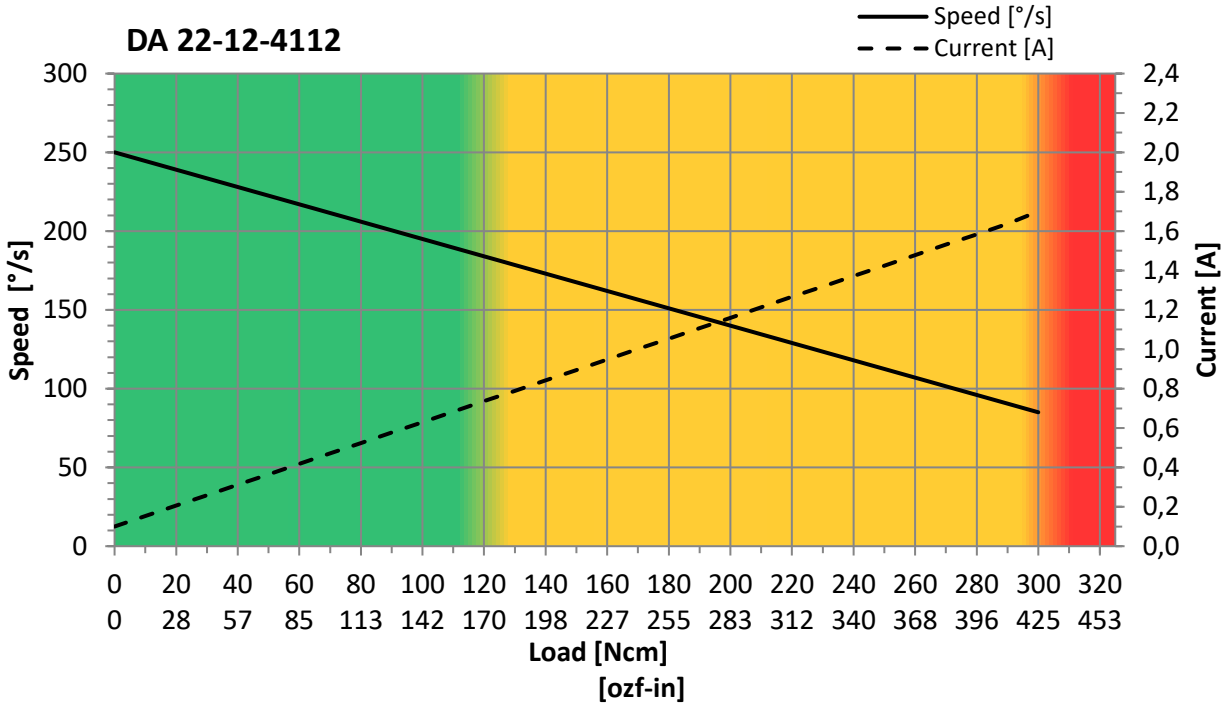
		DA 22-30-2630…	DA 22-30-4128…
Supply Voltage (rated)		28 V DC	
Supply Voltage Range		20 … 30 V DC	
Standby Current [1]	at rated voltage	< 0.01 A	< 0.01 A
Rated Current [1]	at rated voltage	0.18 A	0.35 A
Peak Current [1]	at rated voltage	0.3 A	0.6 A
Rated Torque [1]	at rated speed	70 Ncm (99 ozf-in)	180 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

3. Performance

3.1. Performance 12V-Versions

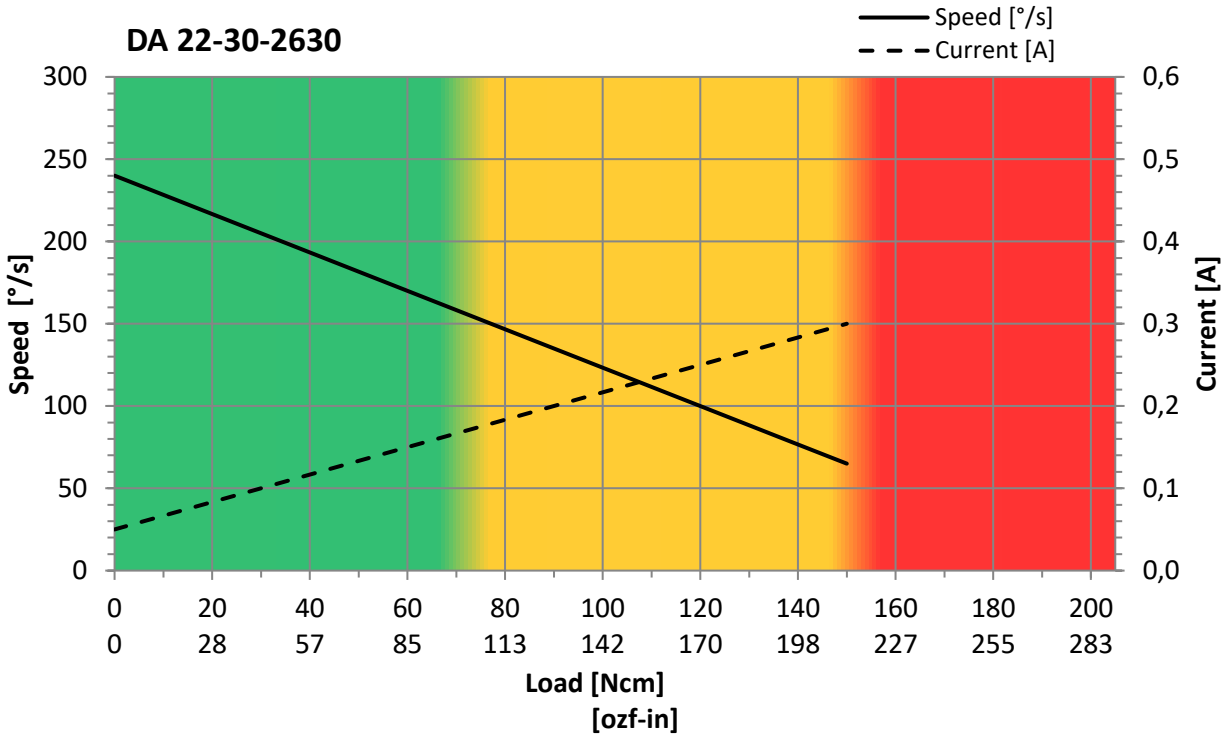




Operation Mode:

- Continuous
- Short Time
  < 10s , 60s cool down
- Overload
  < 1s , 60s cool down

3.2. Performance 28V-Versions

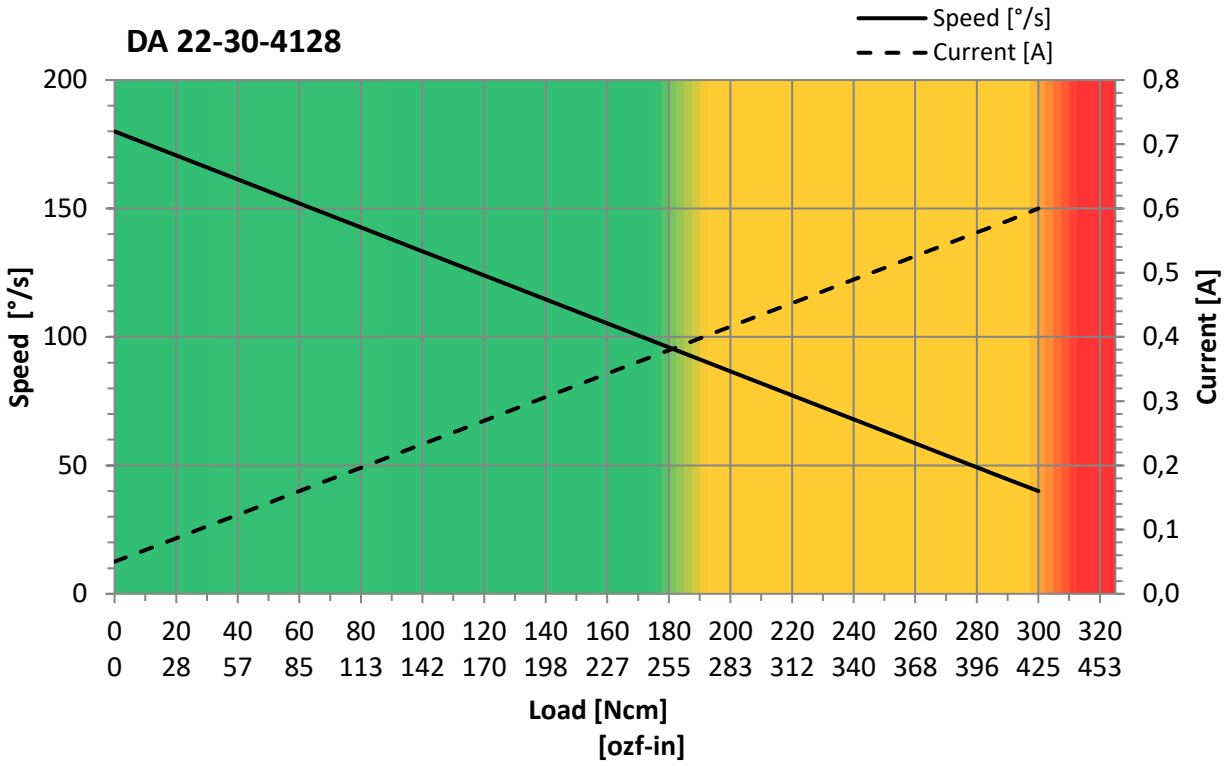


Operation Mode:

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 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 µs

4.2. RS 485 Command Signal

Valid for all Versions with RS 485 Command Signal

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

4.3. RS 485 Protocol Specifications

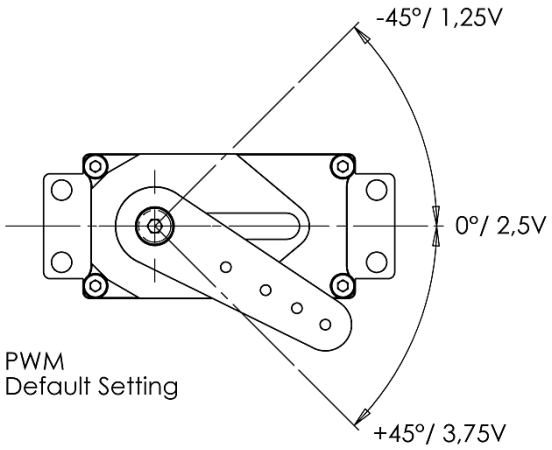
RS 485	DA 22-_ _-_ _ _ _-_-_-_-R-_ _
Number of Data Bits	8
Number of Stop Bits	1 or 2
Parity	None

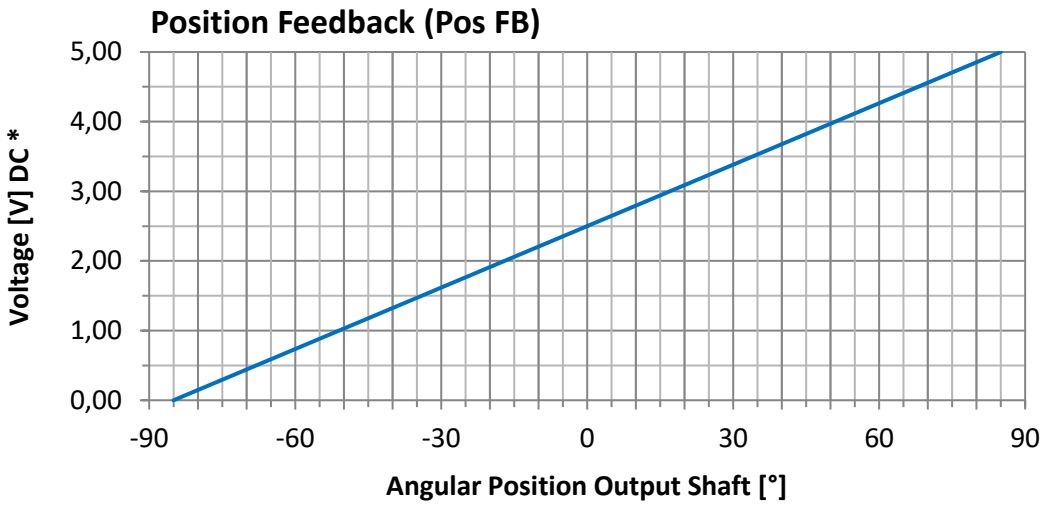
Command / Response Frame

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 ±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

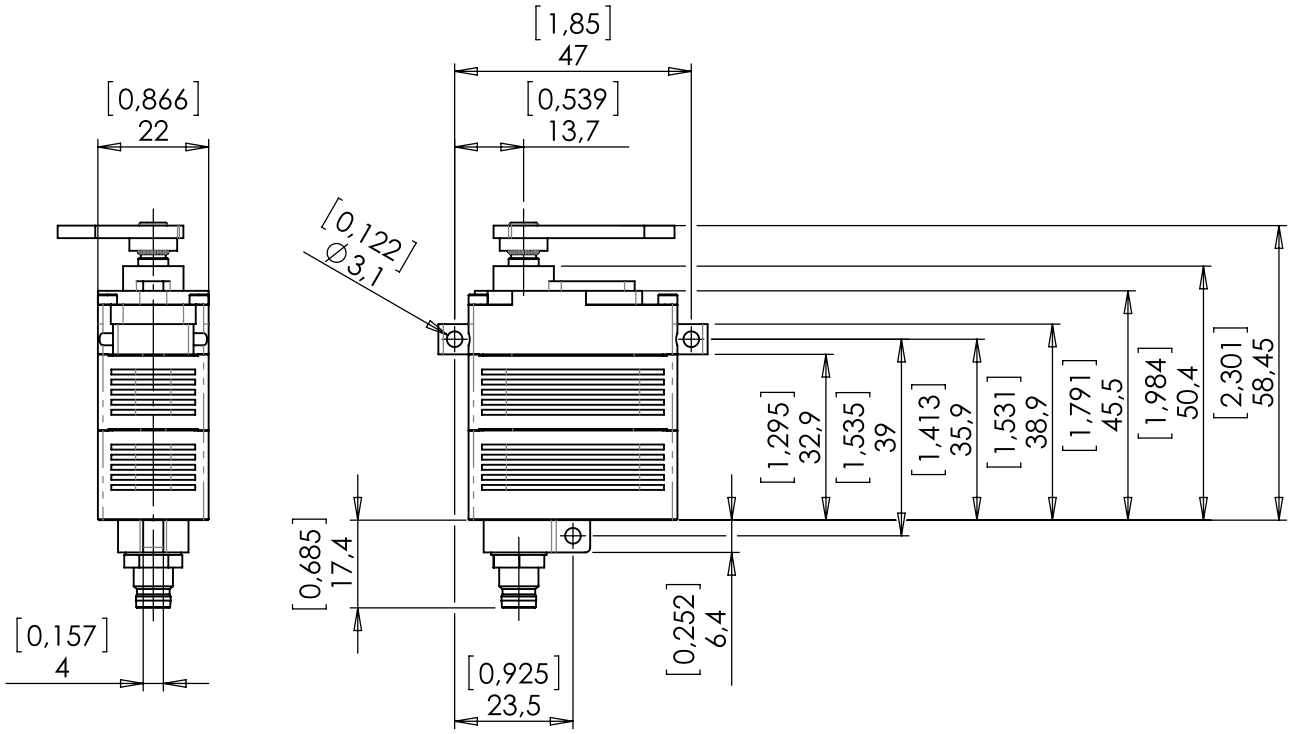
	DA 22-_ _-26_ _...
Case Dimensions	41.5 mm x 45.5 mm x 22.0 mm (1.634 in x 1.791 in x 0.866 in)
Weight	105g (3.70oz) ±10%

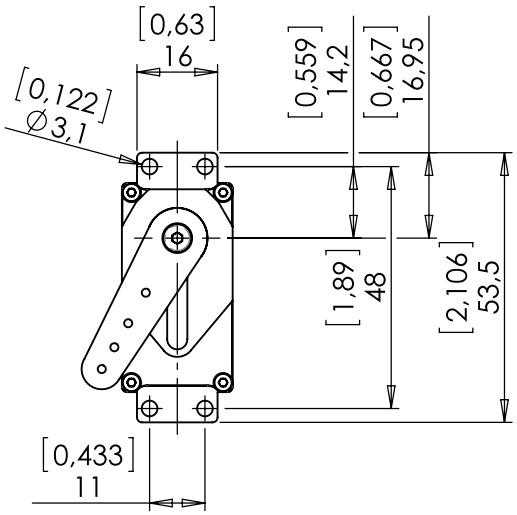
	DA 22-_ _-41_ _...
Case Dimensions	41.5 mm x 65.9 mm x 22.0 mm (1.634 in x 2.594 in x 0.866 in)
Weight	132g (4.66oz) ±10%

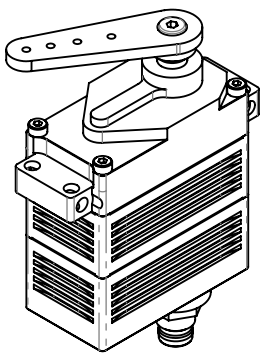
Standard Tolerances	Unless otherwise specified according to DIN ISO 2768 - m

6.1. Installation Dimensions

Standard M8 Connector
DA 22._ _.26_ _._._._._.M8



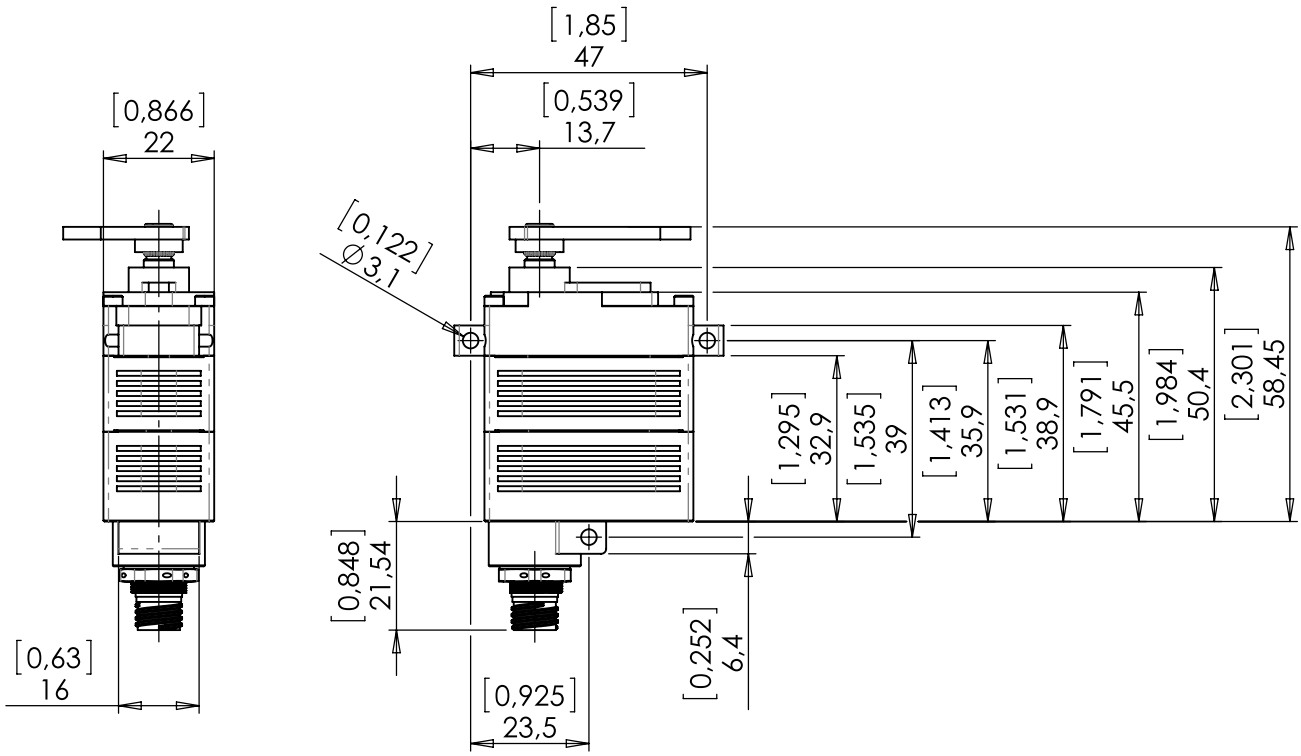


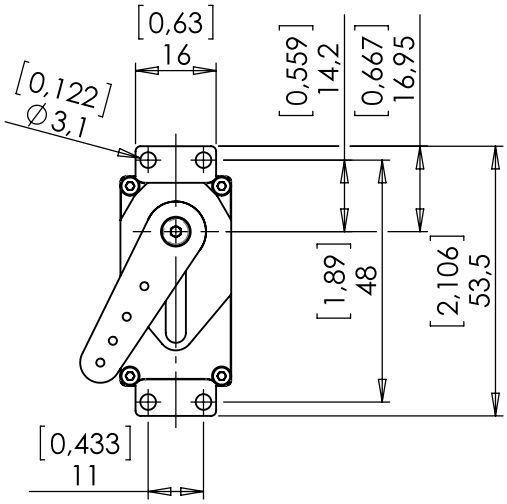


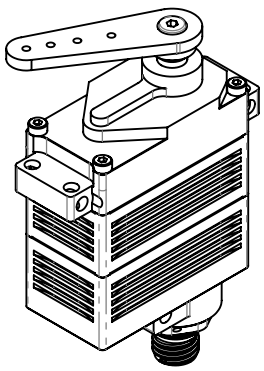
Not to scale

Dimensions [in] , mm

MIL-specified electrical Connector
DA 22._ _.26_ _._._._._.MM



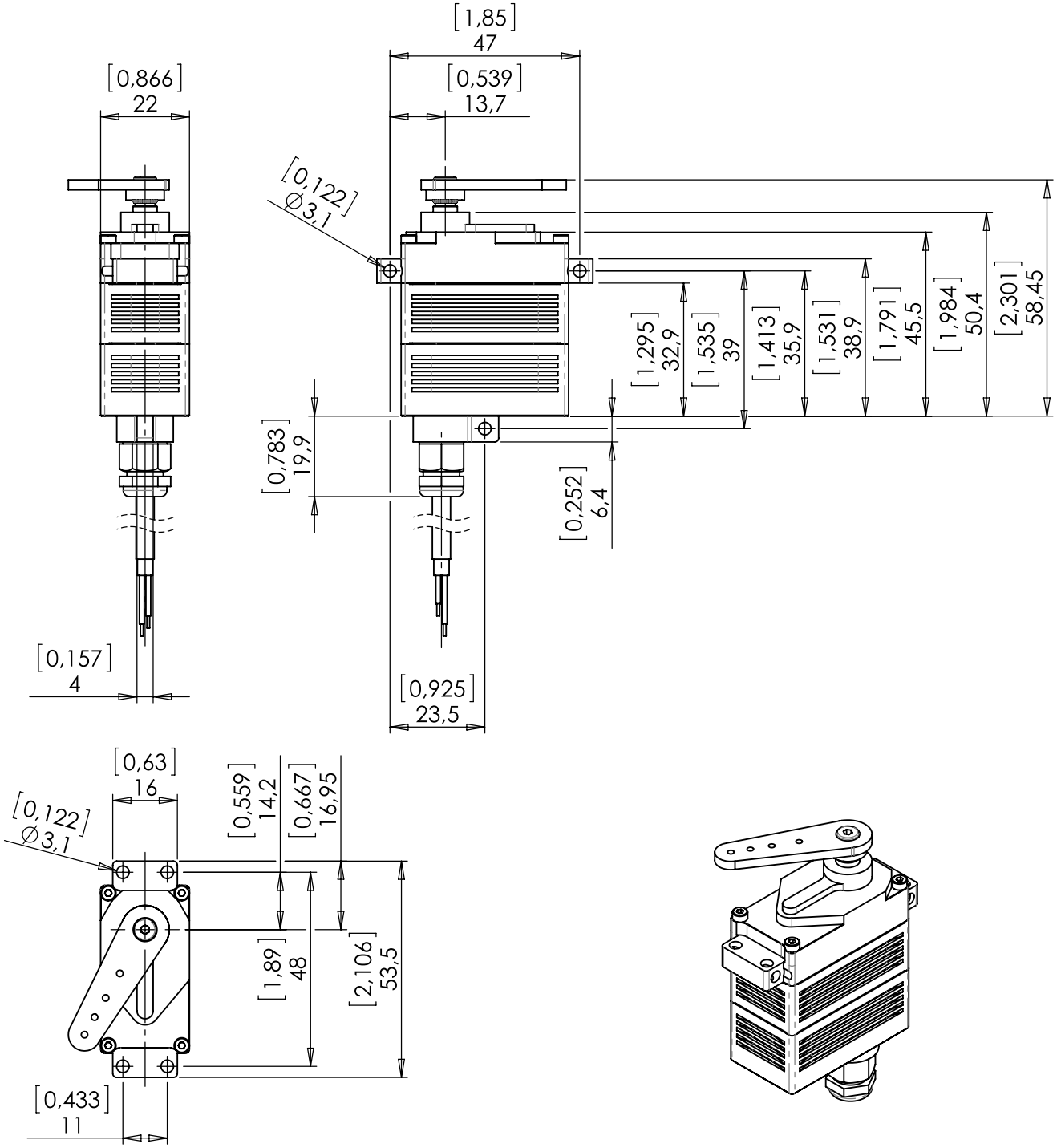




Not to scale

Dimensions [in] , mm

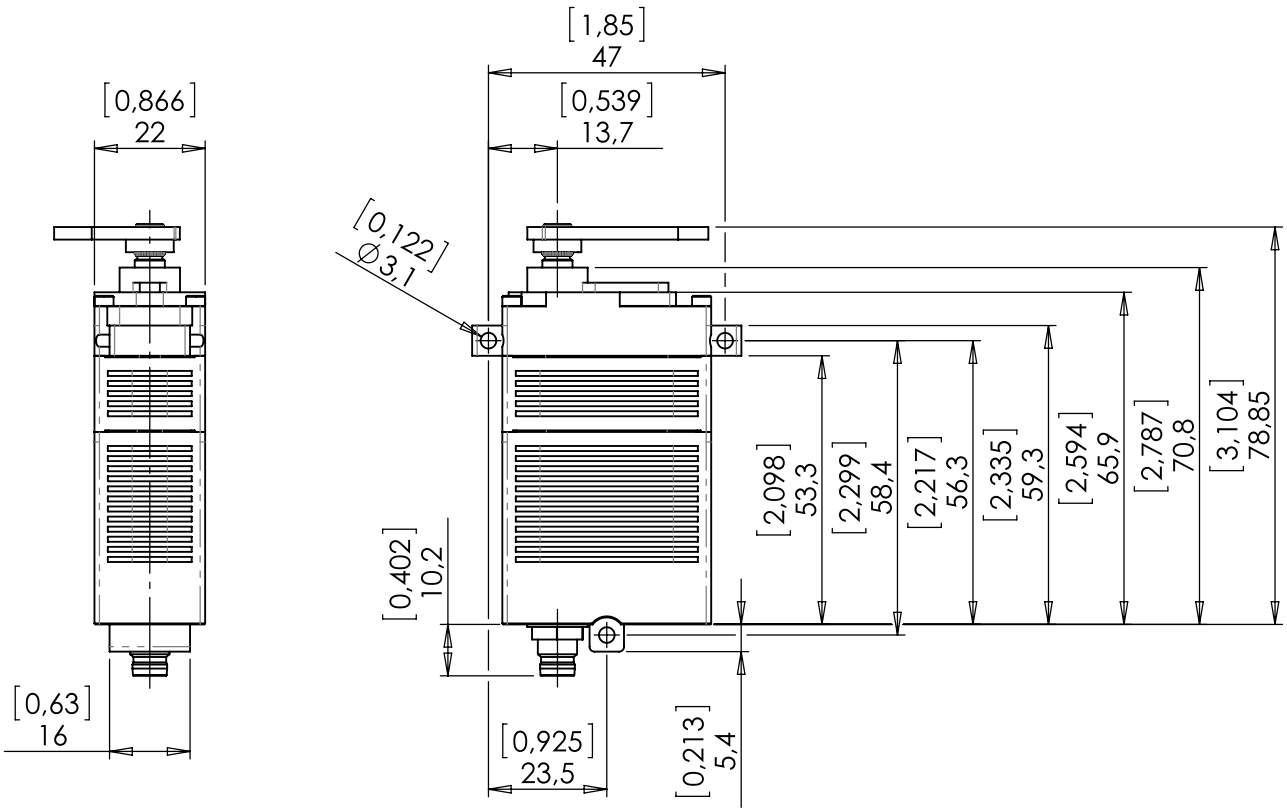
Cable Gland with Shielded Cable
DA 22._ _.26_ _._._._._.SC…

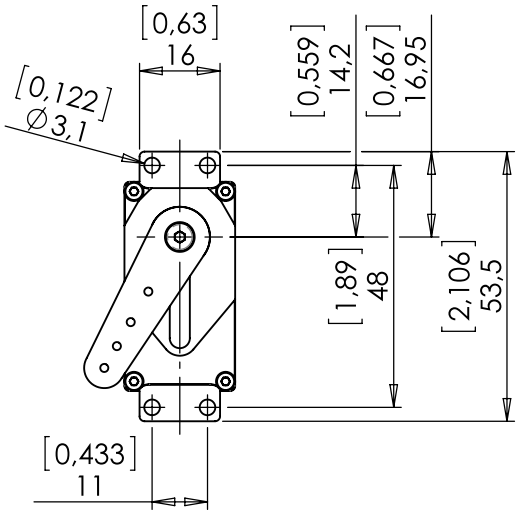


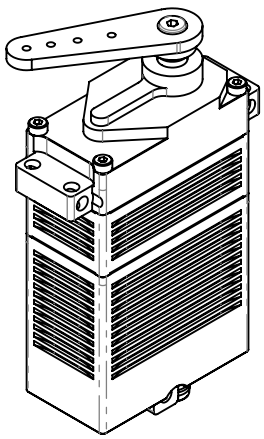
Not to scale

Dimensions [in] , mm

Standard M8 Connector
DA 22._ _.41_ _._._._._.M8



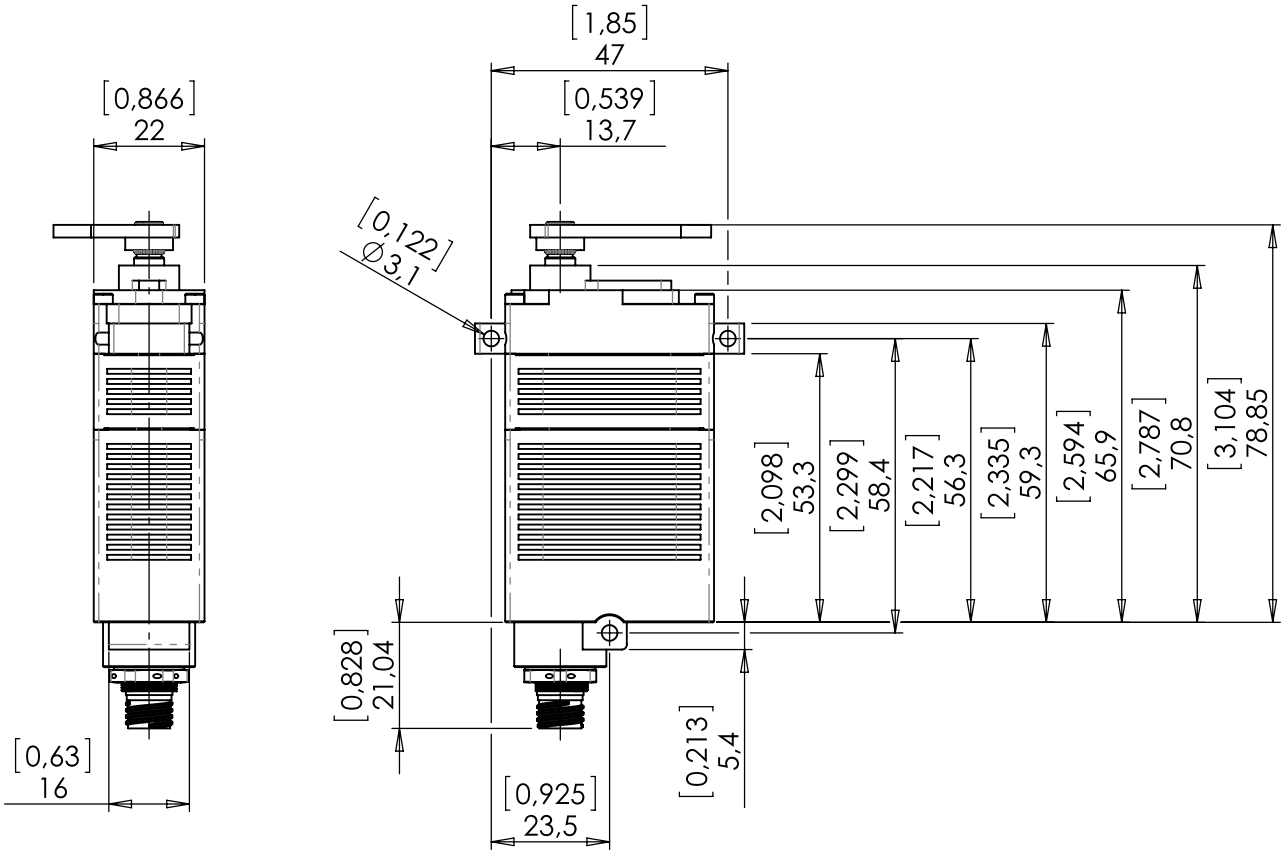


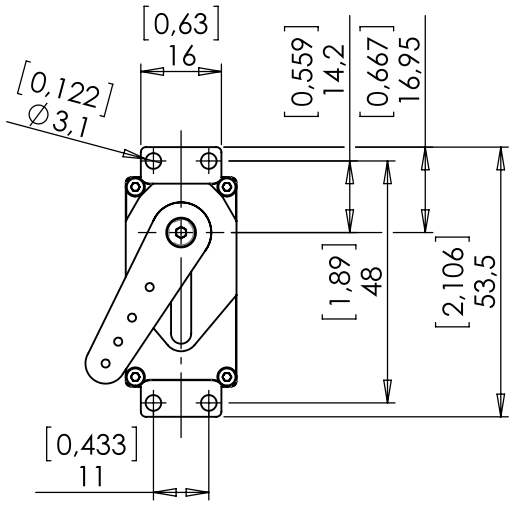


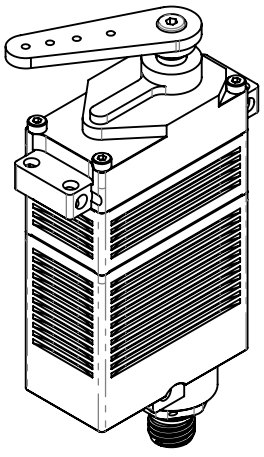
Not to scale

Dimensions [in] , mm

MIL-specified electrical Connector
DA 22._ _.41_ _._._._._.MM



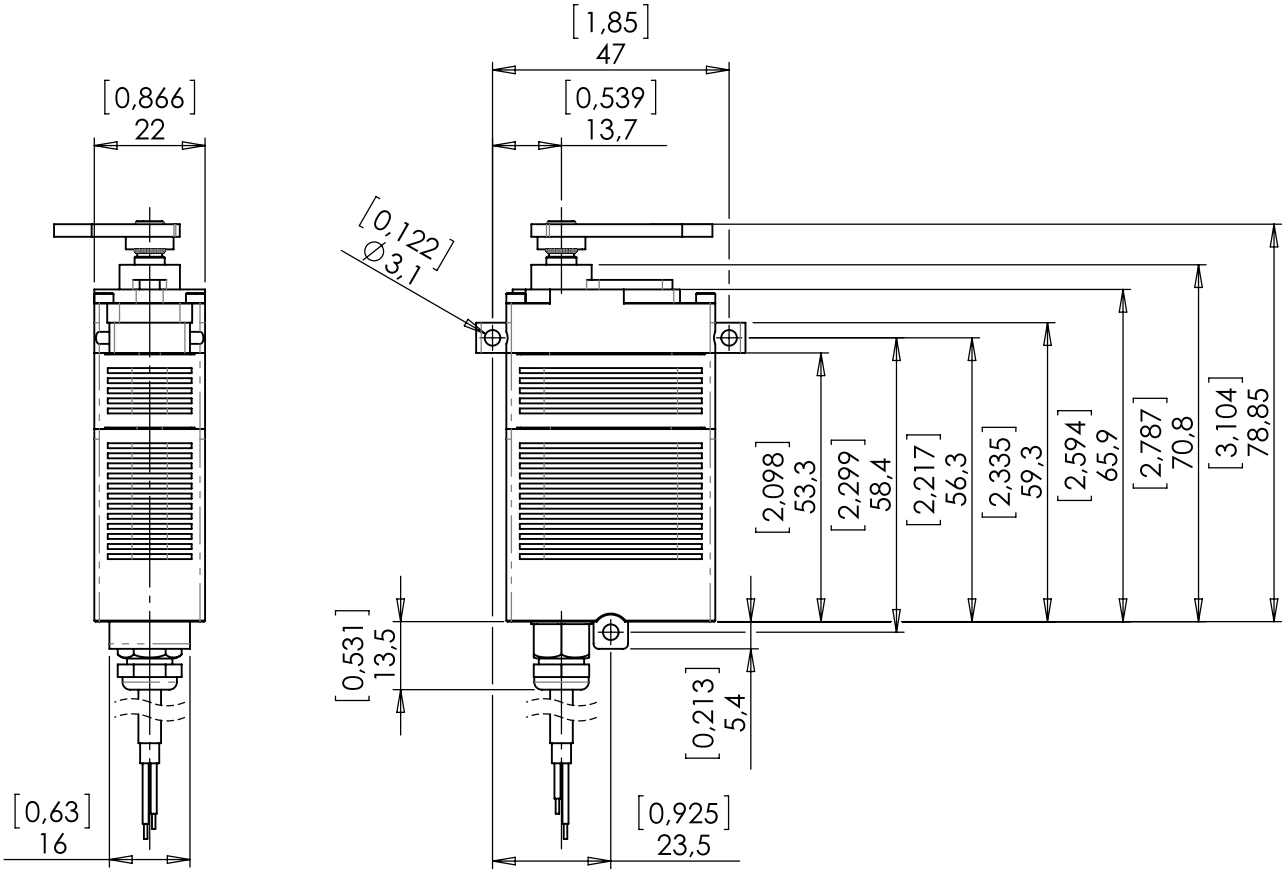


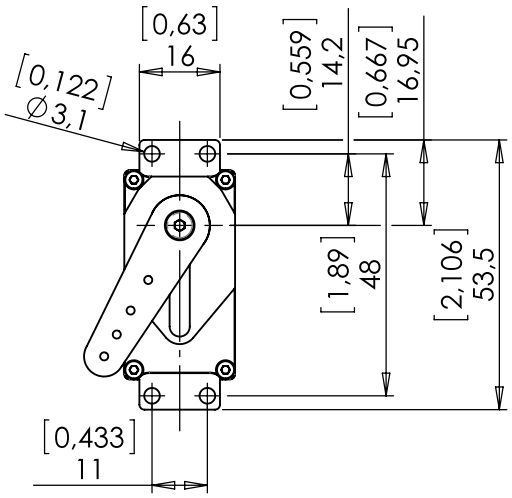


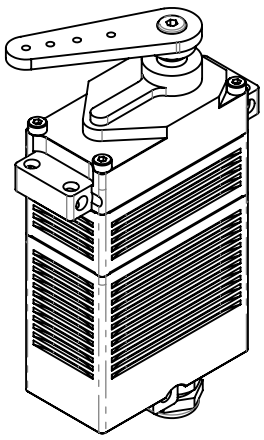
Not to scale

Dimensions [in] , mm

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





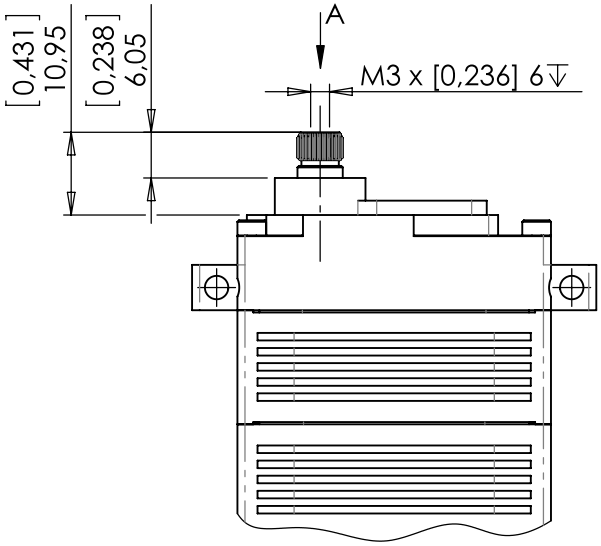


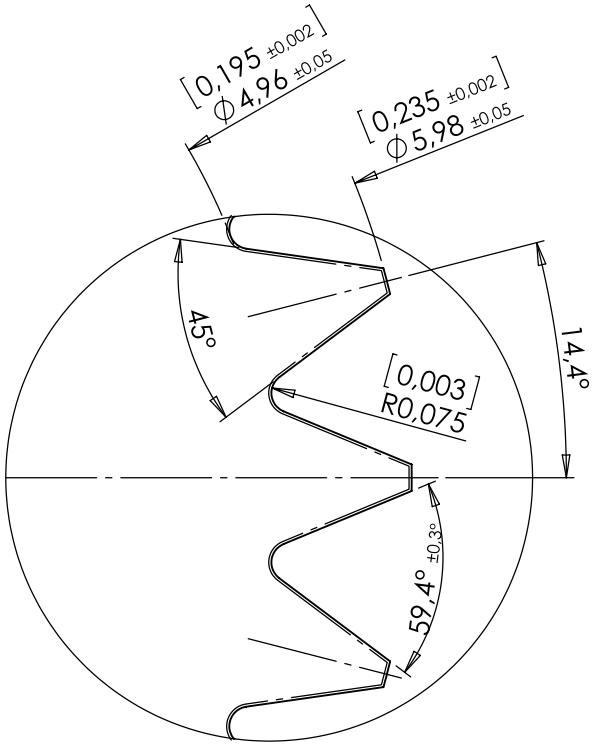
Not to scale

Dimensions [in] , mm

6.2. Output Shaft Spline

Valid for all Versions
DA 22._ _.26_ _ … / DA 22._ _.41_ _...





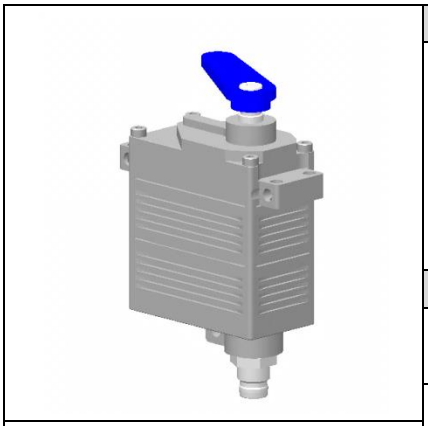
View "A"

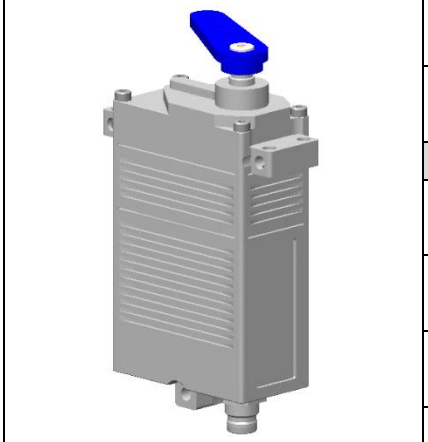
Not to scale

Dimensions [in] , mm

7. Electrical Connection Options

Integrated M8 electrical Connector **Item # DA 22._ _._ _ _ _._._._._.M8**



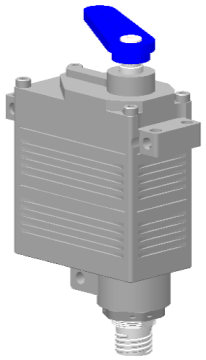


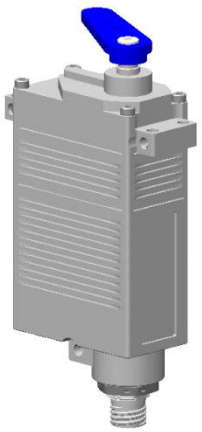
M8 electrical Connector		
2 4  1 3	Manufacturer	Franz Binder GmbH & Co.
	Type	Series 768 / 718, No. 09-3391-81-04
	Mating	No. 77-3406-0000-20004-0200 No. 79-3386-42-04

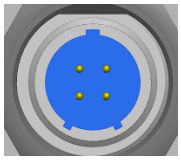
PWM Pin Assignment		
1	**+V DC**	Supply Voltage
2	**Pos FB**	Position Feedback Signal
3	**GND**	Supply Ground , Signal Ground
4	**SIG**	Command Signal

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)

Integrated MIL-specified electrical Connector **Item # DA 22._ _._ _ _ _._._._._.MM**



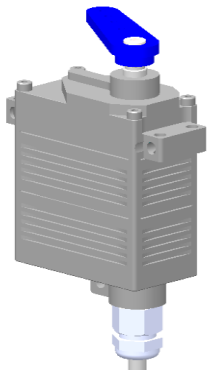


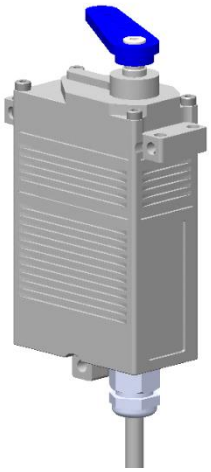
MIL-specified electrical Connector		
1 2  4 3	Manufacturer	Glenair Inc.
	Type	# 801-011-07M6-4PA
	Mating	# 801-007-16M6-4SA , # 801-008-16M6-4SA

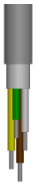
PWM Pin Assignment		
1	**SIG**	Command Signal
2	**GND**	Supply Ground , Signal Ground
3	**Pos FB**	Position Feedback Signal
4	**+V DC**	Supply Voltage

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	3x0.25mm² / 4x0.25mm² (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!

8. Accessories

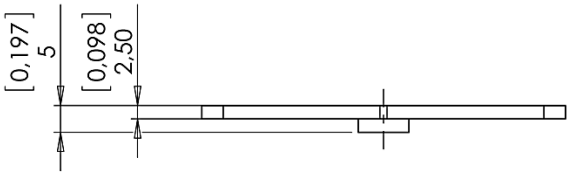
Item		Item-No.
Aluminum Servo Arm	(double sided)	1641.20
Aluminum Servo Arm	(single sided) [6]	1641.21
Aluminum Mounting Frame	(DA 22-_ _-41…)	1641.30 incl. Hardware
Aluminum Mounting Frame	(DA 22-_ _-26…)	1641.31 incl. Hardware
Connecting Cable, straight connector, 200cm (78in) [7]		120.200
Connecting Cable, angular connector, 200cm (78in) [8]		121.200
Programming Tool PWM		985.3
Programming Tool RS-485		985.8

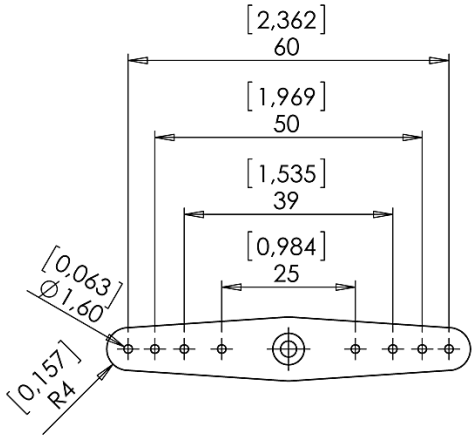
6) Single sided Servo Arm with fixation screw included
7) Binder Series 718 , No. 79-3382-42-04, 4x0.25mm^2, open Leads
8) Binder Series 718 , No. 79-3384-42-04, 4x0.25mm^2, open Leads

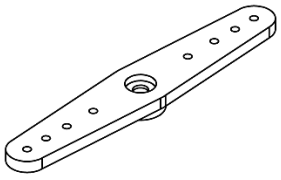
All accessories to be purchased separately.

8.1. Aluminum Servo Arm, double sided

1641.20
Valid for all Versions





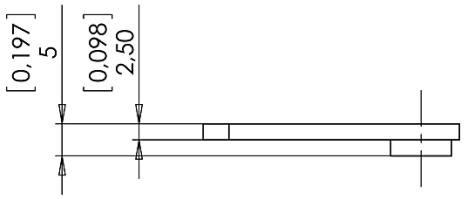


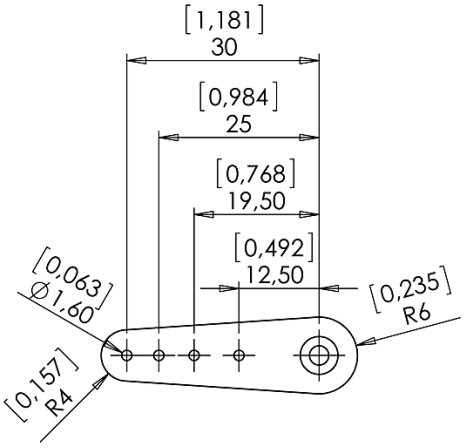
Not to scale

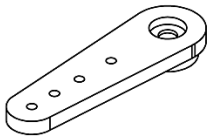
Dimensions [in] , mm

8.2. Aluminum Servo Arm, single sided

1641.21
Valid for all Versions





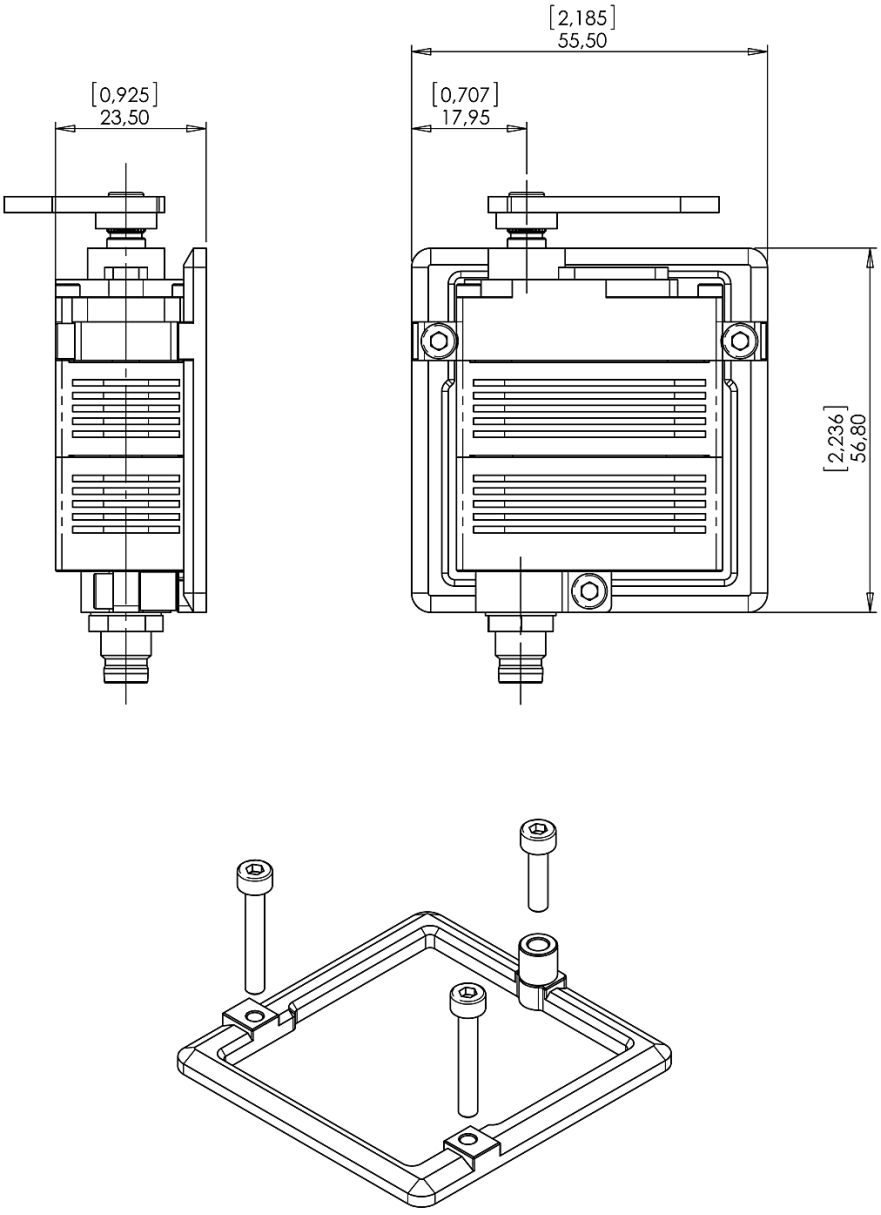


Not to scale

Dimensions [in] , mm

8.3. Aluminum Mounting Frame

1641.31
Valid for DA 22-_ _-26_ _...



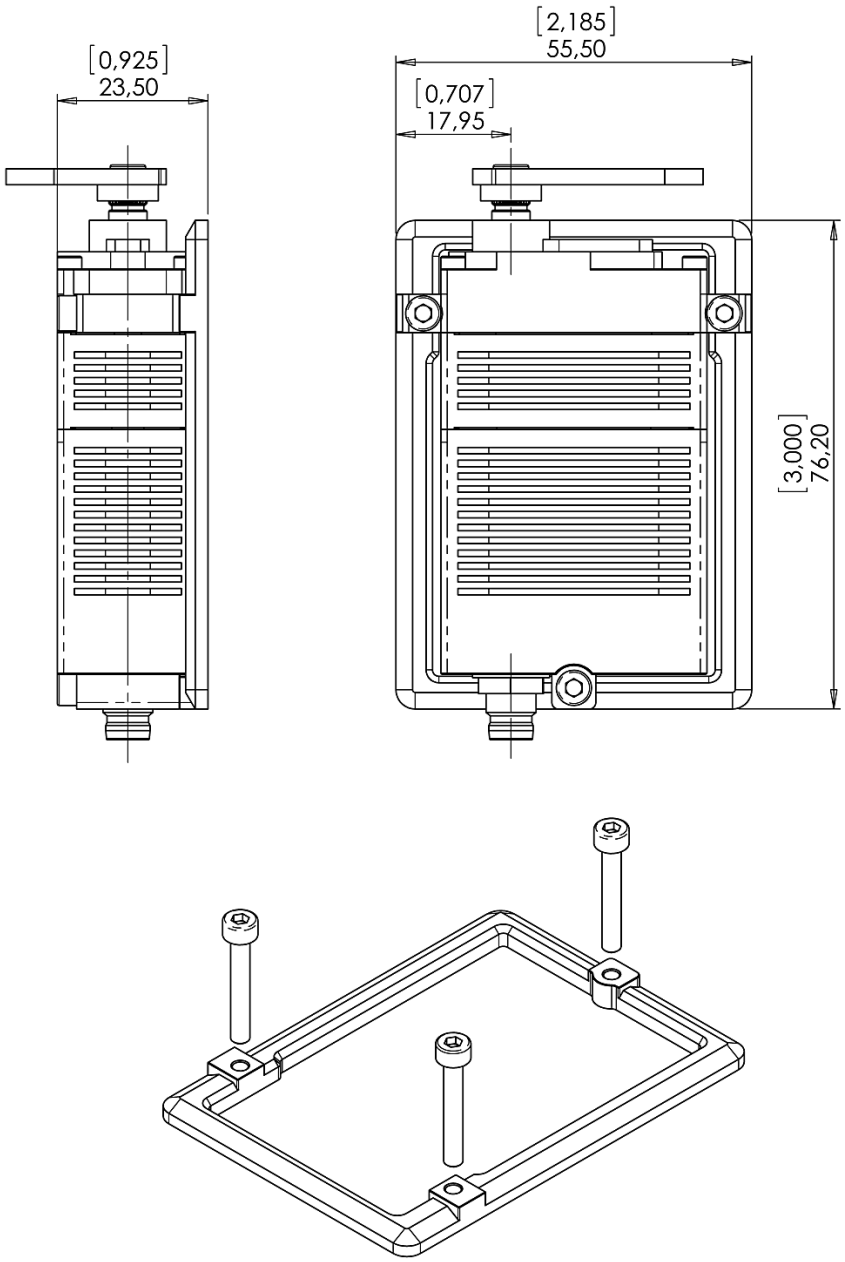
Mounting Frame shown with installed actuator

Not to scale

Dimensions [in] , mm

8.4. Aluminum Mounting Frame

1641.30
Valid for DA 22-_ _-41_ _...



Mounting Frame shown with installed actuator

Not to scale

Dimensions [in] , mm

9. 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**

ISS Gear Protection System
I integrated
X without

Position Feedback
P integrated
X without

Extended Travel Angle
E integrated
X without

Command Interface
R RS 485
X PWM

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

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